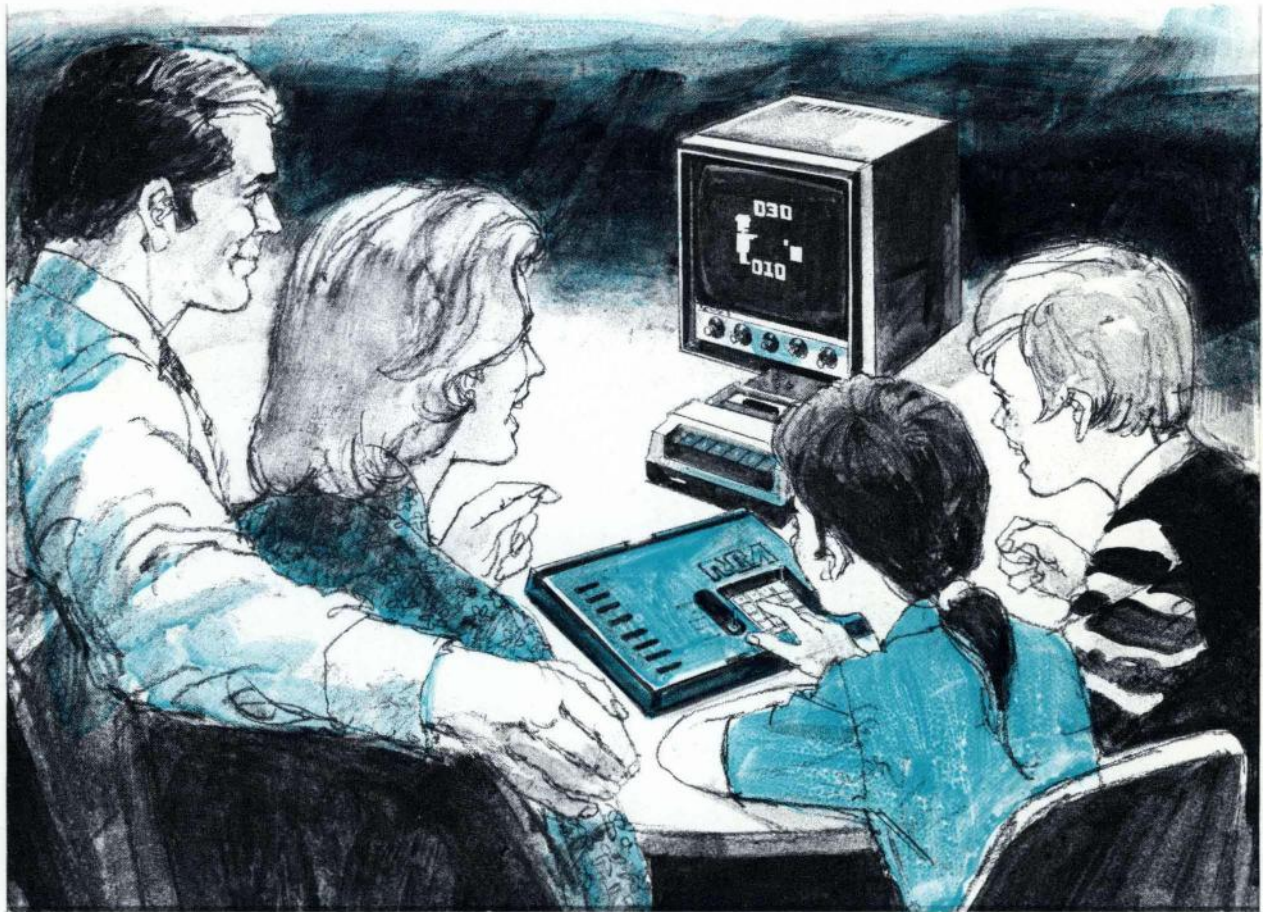


RCA

RCA COSMAC Game Manual



RCA COSMAC

Game Manual

The logo for RCA COSMAC VIP is located to the right of the title. It features a stylized 'V' with a small square above it, followed by an 'I' and a 'P' that are also stylized with geometric shapes.

RCA COSMAC VIP MARKETING
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Lancaster, PA 17604

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Foreword

This Manual contains program listings for sixteen games specially designed for use with the RCA COSMAC VIP (Video Interface Processor) CDP18S711 or CDP18S022. These games supplement the twenty video games listings provided in the basic Instruction Manual for the RCA COSMAC VIP. All sixteen new games require the CHIP-8 interpreter program which loads at 0000. The games start at 0200 and are eight pages.

The listings for these sixteen games are in the same form as the twenty games in the **RCA COSMAC VIP Instruction Manual**. The first column is the memory location at which the instruction byte in the second column is stored. The comments in the third column, which indicate the function of the instruction byte, are not stored in memory.

When you store these new games, all sixteen will easily fit on a 30-minute cassette. If you run into any problems, go back to your **RCA COSMAC VIP Instruction Manual** for a refresher. If you have been developing your own video games, however, you won't need it.

These sixteen games were developed by the computer hobbyists whose names are given below with the titles of the games they developed and programmed. They hope that you will have as much fun playing them as they did in developing them.

Incidentally, if you have developed and programmed any unique new video games or other similar interesting applications of the COSMAC VIP and would like to share them with other hobbyists, tell us about them. We have started our planning for the next edition of the **RCA COSMAC VIP Game Manual** and might be interested in purchasing software that qualifies for publication in it. Contact:

RCA VIP Marketing
New Holland Avenue
Lancaster, PA 17604

RCA COSMAC VIP Games

Game Title	Programmed By	Page
1. VIP Pinball	Andrew Modla	5
2. VIP Message Center	Andrew Modla	11
3. VIP Bingo	Andrew Modla	17
4. VIP Blackjack	Andrew Modla	21
5. VIP Slide	Joyce Weisbecker	28
6. VIP Reversi	Philip Baltzer	30
7. VIP Bowling	Gooitzen van der Wal	33
8. VIP Deflection	John Fort	39
9. VIP Animal Race	Brian Astle	45
10. VIP Most Dangerous Game	Peter Maruhnic	51
11. VIP Sum Fun	Joyce Weisbecker	57
12. VIP Sequence Shoot	Joyce Weisbecker	59
13. VIP Biorhythm	Jef Winsor	61
14. VIP Programmable Spacefighters	Jef Winsor	67
15. VIP Lunar Lander		74
16. VIP Blockout	Steve Houk	78

1. VIP Pinball

The VIP PINBALL game simulates the action of real pinball machines. The object of the game is to keep your ball in play and score as many points as you can by ball contact with point bumpers. The point value of bumpers changes randomly when hit. Points range from 2 to 9. A score greater than 999 stops the game.

VIP PINBALL can be played by one or two persons. Players take turns scoring points and control flippers on their own keyboard throughout the game. A player can change ball direction with a special key. However, overuse of this feature will result in a "TILT".

How To Play VIP Pinball

1. Load the CHIP-8 interpreter at 0000-01FF and the game starting at 0200.
2. Turn RUN switch on.
3. Select the one-player game with key 1. Select the two-player game with key 2.
4. In the two-player game, players alternate turns. Players get five balls. The number of balls remaining is shown at the right or left of the players score. Your turn to put a ball in play is shown by a flashing digit (balls remaining) on your side of the TV screen.
5. To put a ball in play, press key 1.
6. Press key 4 to control the left flipper and key 6 to control the right flipper.
7. You can press key 0 to reverse the direction of the ball. This feature is handy for saving a ball (outside the flipper range) that will go out of bounds. This feature simulates physically pushing on a PINBALL game cabinet. Pressing key 0 causes the ball to move at high speed. While the ball travels at high speed, key 0 has no effect.
8. If you overuse key 0, you will cause a "TILT" and the game will stop. If the two-player option was selected and the other player has balls left, press key 1 to put a new ball in play.
9. The game is over when either player scores more than 999 points, when both players have "TILT", or when both use all their balls.

```

0200 6E01 VE=01
0202 EEA1 SKIP;VE NE KEY
0204 120E GO 020E
0206 6E02 VE=02
0208 EEA1 SKIP;VE NE KEY
020A 1212 GO 0212
020C 1200 GO 0200
020E 6800 V8=00
0210 1214 GO 0214
0212 6801 V8=01
0214 6501 V5=01
0216 66E8 V6=E8
0218 A67F I=067F
021A 0634 MLS@0634
021C FC01
021E 4C00 SKIP;VC NE 00
0220 1234 GO 0234
0222 0634 MLS@0634
0224 F001
0226 0603 MLS@0603
0228 122A GO 022A
022A 05E3 MLS@05E3
022C 70FF V0+FF
022E 3000 SKIP;V0 EQ 00
0230 1226 GO 0226
0232 121A GO 021A
0234 A68A I=068A
0236 0642 MLS@0642

```

```

0238 A69A I=069A
023A 0628 MLS@0628
023C 0501
023E 4800 SKIP;V8 NE 00
0240 1246 GO 0246
0242 0628 MLS@0628
0244 0501
0246 A690 I=0690
0248 063A MLS@063A
024A F801
024C C107 V1=RND
024E 7103 V1+03
0250 063A MLS@063A
0252 F101
0254 063A MLS@063A
0256 F101
0258 4800 SKIP;V8 NE 00
025A 1262 GO 0262
025C 6A01 VA=01
025E 252E DO 052E
0260 2550 DO 0550
0262 6A00 VA=00
0264 252E DO 052E
0266 2550 DO 0550
0268 6116 V1=16
026A 600A V0=0A
026C A67C I=067C

```

```

026E D013 SHOW 3MI@V0V1
0270 6019 V0=19
0272 D013 SHOW 3MI@V0V1
0274 6024 V0=24
0276 D013 SHOW 3MI@V0V1
0278 6033 V0=33
027A D013 SHOW 3MI@V0V1
027C 6104 V1=04
027E 247C D0 047C
0280 71FF V1+FF
0282 3100 SKIP;V1 EQ 00
0284 127E GO 027E
0286 2578 D0 0578
0288 2592 D0 0592
028A 6A00 VA=00
028C 6400 V4=00
028E 6E01 VE=01
0290 EEA1 SKIP;VE NE KEY
0292 12A8 GO 02A8
0294 24B4 D0 04B4
0296 FF07 VF=TIME
0298 3F00 SKIP;VF EQ 00
029A 128E GO 028E
029C 2550 D0 0550
029E 6F04 VF=04
02A0 FF15 TIME=VF
02A2 6101 V1=01
02A4 8413
02A6 128E GO 028E
02A8 4400 SKIP;V4 NE 00
02AA 2550 D0 0550
02AC A69A I=069A
02AE FA1E I=I+VA
02B0 F065 V0:V0=MI
02B2 70FF V0+FF
02B4 0640 MLS@0640
02B6 F055 MI=V0:V0
02B8 2550 D0 0550
02BA A693 I=0693
02BC 0628 MLS@0628
02BE 0301
02C0 6502 V5=02
02C2 663F V6=3F
02C4 0603 MLS@0603
02C6 12C8 GO 02C8
02C8 6404 V4=04
02CA C707 V7=RND
02CC 2572 D0 0572
02CE A693 I=0693
02D0 F065 V0:V0=MI
02D2 F015 TIME=V0
02D4 24B4 D0 04B4
02D6 FF07 VF=TIME
02D8 3F00 SKIP;VF EQ 00
02DA 12D6 GO 02D6
02DC 0603 MLS@0603
02DE 12EA GO 02EA
02E0 12DC GO 02DC
02E2 A64D I=064D
02E4 F41E I=I+V4
02E6 F065 V0:V0=MI
02E8 8400 V4=V0
02EA 8C40 VC=V4
02EC 05E3 MLS@05E3
02EE 61EF V1=EF
02F0 8165 V1=V1-V6
02F2 4F00 SKIP;VF NE 00
02F4 1334 GO 0334
02F6 0608 MLS@0608
02F8 13AA GO 03AA
02FA A693 I=0693
02FC 0634 MLS@0634
02FE F100
0300 3103 SKIP;V1 EQ 03
0302 130A GO 030A
0304 6E00 VE=00
0306 EEA1 SKIP;VE NE KEY
0308 135A GO 035A
030A 78FF V8+FF
030C 3800 SKIP;V8 EQ 00
030E 132E GO 032E
0310 A69D I=069D
0312 0634 MLS@0634
0314 FE00
0316 4E00 SKIP;VE NE 00
0318 1326 GO 0326
031A 7EFF VE+FF
031C 063A MLS@063A
031E FE00
0320 887D V8=V7
0322 6C08 VC=08
0324 12EC GO 02EC
0326 A693 I=0693
0328 0628 MLS@0628
032A 0301
032C 1320 GO 0320
032E 0603 MLS@0603
0330 132E GO 032E
0332 12CE GO 02CE
0334 6F2D VF=2D
0336 FF18 TONE=VF
0338 FF15 TIME=VF
033A 24B4 D0 04B4
033C FF07 VF=TIME
033E 3F00 SKIP;VF EQ 00
0340 133A GO 033A
0342 A690 I=0690
0344 0634 MLS@0634
0346 F800
0348 8A83

```

```
034A A69A I=069A
034C FA1E I=I+VA
034E F065 V0:V0=MI
0350 4000 SKIP;V0 NE 00
0352 1358 GO 0358
0354 128C GO 028C
0356 2486 DO 0486
0358 1358 GO 0358
035A A691 I=0691
035C FA1E I=I+VA
035E F065 V0:V0=MI
0360 4000 SKIP;V0 NE 00
0362 137C GO 037C
0364 0640 MLS@0640
0366 70FF V0+FF
0368 F055 MI=V0:V0
036A A69D I=069D
036C 0628 MLS@0628
036E 1800
0370 A693 I=0693
0372 0628 MLS@0628
0374 0101
0376 2568 DO 0568
0378 2570 DO 0570
037A 12EA GO 02EA
037C 246E DO 046E
037E 24A4 DO 04A4
0380 A690 I=0690
0382 0634 MLS@0634
0384 F800
0386 A69A I=069A
0388 FA1E I=I+VA
038A 6000 V0=00
038C F055 MI=V0:V0
038E 8A83
0390 78FF V8+FF
0392 A690 I=0690
0394 063A MLS@063A
0396 F800
0398 3800 SKIP;V8 EQ 00
039A 1358 GO 0358
039C 6E01 VE=01
039E EEA1 SKIP;VE NE KEY
03A0 13A4 GO 03A4
03A2 139C GO 039C
03A4 24A4 DO 04A4
03A6 246E DO 046E
03A8 1342 GO 0342
03AA 6D02 VD=02
03AC FD18 TONE=VD
03AE 2570 DO 0570
03B0 A67A I=067A
03B2 8160 V1=V6
03B4 0634 MLS@0634
03B6 F201
03B8 8125 V1=V1-V2
03BA 4F00 SKIP;VF NE 00
03BC 141E GO 041E
03BE 8160 V1=V6
03C0 0634 MLS@0634
03C2 F201
03C4 8215 V2=V2-V1
03C6 4F00 SKIP;VF NE 00
03C8 141E GO 041E
03CA 6107 V1=07
03CC 8162 V1=V1&V6
03CE A65F I=065F
03D0 F11E I=I+V1
03D2 F065 V0:V0=MI
03D4 8100 V1=V0
03D6 4100 SKIP;V1 NE 00
03D8 141E GO 041E
03DA 2486 DO 0486
03DC 252E DO 052E
03DE 24B4 DO 04B4
03E0 A689 I=0689
03E2 F11E I=I+V1
03E4 F065 V0:V0=MI
03E6 8F00 VF=V0
03E8 A697 I=0697
03EA 4A01 SKIP;VA NE 01
03EC A69A I=069A
03EE 6903 V9=03
03F0 0640 MLS@0640
03F2 F065 V0:V0=MI
03F4 0640 MLS@0640
03F6 80F4 V0=V0+VF
03F8 6C0A VC=0A
03FA 80C5 V0=V0-VC
03FC 3F00 SKIP;VF EQ 00
03FE 1402 GO 0402
0400 700A V0+0A
0402 F055 MI=V0:V0
0404 0640 MLS@0640
0406 79FF V9+FF
0408 3900 SKIP;V9 EQ 00
040A 13F0 GO 03F0
040C 3F00 SKIP;VF EQ 00
040E 1356 GO 0356
0410 C201 V2=RND
0412 3200 SKIP;V2 EQ 00
0414 141A GO 041A
0416 247C DO 047C
0418 141C GO 041C
041A 2486 DO 0486
041C 252E DO 052E
041E 24B4 DO 04B4
0420 46E8 SKIP;V6 NE E8
0422 1466 GO 0466
0424 46EF SKIP;V6 NE EF
```


0426	1466	GO	0466	0494	7901	V9+01
0428	6100	V1=00		0496	7201	V2+01
042A	6C02	VC=02		0498	A689	I=0689
042C	05E3	MLS@05E3		049A	F11E	I=I+V1
042E	0608	MLS@0608		049C	F065	V0:V0=MI
0430	7101	V1+01		049E	F029	I=V0(LSDP)
0432	6C07	VC=07		04A0	D295	SHOW 5MI@V2V9
0434	05E3	MLS@05E3		04A2	00EE	RET
0436	0608	MLS@0608		04A4	A66E	I=066E
0438	7102	V1+02		04A6	6018	V0=18
043A	6C09	VC=09		04A8	6100	V1=00
043C	05E3	MLS@05E3		04AA	D014	SHOW 4MI@V0V1
043E	0608	MLS@0608		04AC	6020	V0=20
0440	7104	V1+04		04AE	A672	I=0672
0442	6C03	VC=03		04B0	D014	SHOW 4MI@V0V1
0444	05E3	MLS@05E3		04B2	00EE	RET
0446	0608	MLS@0608		04B4	A68E	I=068E
0448	7108	V1+08		04B6	F065	V0:V0=MI
044A	6C04	VC=04		04B8	0640	MLS@0640
044C	05E3	MLS@05E3		04BA	3000	SKIP;V0 EQ 00
044E	4105	SKIP;V1 NE 05		04BC	14D6	GO 04D6
0450	12E2	GO 02E2		04BE	6E04	VE=04
0452	4107	SKIP;V1 NE 07		04C0	EEA1	SKIP;VE NE KEY
0454	12E2	GO 02E2		04C2	14EE	GO 04EE
0456	410D	SKIP;V1 NE 0D		04C4	A69C	I=069C
0458	12E2	GO 02E2		04C6	F065	V0:V0=MI
045A	4101	SKIP;V1 NE 01		04C8	0640	MLS@0640
045C	12E2	GO 02E2		04CA	3000	SKIP;V0 EQ 00
045E	410A	SKIP;V1 NE 0A		04CC	14E2	GO 04E2
0460	146A	GO 046A		04CE	6E06	VE=06
0462	410B	SKIP;V1 NE 0B		04D0	EEA1	SKIP;VE NE KEY
0464	146A	GO 046A		04D2	14F8	GO 04F8
0466	2568	DO 0568		04D4	00EE	RET
0468	12EA	GO 02EA		04D6	70FF	V0+FF
046A	A655	I=0655		04D8	A68E	I=068E
046C	12E4	GO 02E4		04DA	F055	MI=V0:V0
046E	88A0	V8=VA		04DC	4004	SKIP;V0 NE 04
0470	6A01	VA=01		04DE	2578	DO 0578
0472	2550	DO 0550		04E0	14C4	GO 04C4
0474	6A00	VA=00		04E2	70FF	V0+FF
0476	2550	DO 0550		04E4	A69C	I=069C
0478	8A80	VA=V8		04E6	F055	MI=V0:V0
047A	00EE	RET		04E8	4004	SKIP;V0 NE 04
047C	A689	I=0689		04EA	2592	DO 0592
047E	C007	V0=RND		04EC	00EE	RET
0480	7002	V0+02		04EE	2502	DO 0502
0482	F11E	I=I+V1		04F0	6009	V0=09
0484	F055	MI=V0:V0		04F2	6D02	VD=02
0486	690B	V9=0B		04F4	FD18	TONE=VD
0488	A675	I=0675		04F6	14D8	GO 04D8
048A	F11E	I=I+V1		04F8	2514	DO 0514
048C	F065	V0:V0=MI		04FA	6009	V0=09
048E	8200	V2=V0		04FC	6D02	VD=02
0490	A667	I=0667		04FE	FD18	TONE=VD
0492	D297	SHOW 7MI@V2V9		0500	14E4	GO 04E4

```
0502 A0E9 I=00E9
0504 0625 MLS@0625
0506 0628 MLS@0628
0508 0F01
050A 0628 MLS@0628
050C FF01
050E 0628 MLS@0628
0510 F806
0512 1524 GO 0524
0514 A0EC I=00EC
0516 0625 MLS@0625
0518 0628 MLS@0628
051A 1F01
051C 0628 MLS@0628
051E FF01
0520 0628 MLS@0628
0522 F008
0524 0628 MLS@0628
0526 0008
0528 0628 MLS@0628
052A 0000
052C 00EE RET
052E 6200 V2=00
0530 6B30 VB=30
0532 4A01 SKIP;VA NE 01
0534 6B00 VB=00
0536 6900 V9=00
0538 A694 I=0694
053A 4A01 SKIP;VA NE 01
053C A697 I=0697
053E F91E I=I+V9
0540 F065 V0:V0=MI
0542 F029 I=V0(LSDP)
0544 DB25 SHOW 5MI@VBV2
0546 7B06 VB+06
0548 7901 V9+01
054A 3903 SKIP;V9 EQ 03
054C 1538 GO 0538
054E 00EE RET
0550 A69A I=069A
0552 FA1E I=I+VA
0554 F065 V0:V0=MI
0556 4000 SKIP;V0 NE 00
0558 156E GO 056E
055A F029 I=V0(LSDP)
055C 6200 V2=00
055E 6126 V1=26
0560 4A01 SKIP;VA NE 01
0562 6116 V1=16
0564 D125 SHOW 5MI@V1V2
0566 00EE RET
0568 610A V1=0A
056A 8145 V1=V1-V4
056C 8410 V4=V1
056E 00EE RET

0570 C703 V7=RND
0572 7703 V7+03
0574 8870 V8=V7
0576 00EE RET
0578 A0E9 I=00E9
057A 0625 MLS@0625
057C 0628 MLS@0628
057E 0801
0580 0628 MLS@0628
0582 0001
0584 0628 MLS@0628
0586 0006
0588 0628 MLS@0628
058A 0808
058C 0628 MLS@0628
058E 0800
0590 00EE RET
0592 A0EC I=00EC
0594 0625 MLS@0625
0596 0628 MLS@0628
0598 0001
059A 0628 MLS@0628
059C 0001
059E 0628 MLS@0628
05A0 1008
05A2 0628 MLS@0628
05A4 1008
05A6 0628 MLS@0628
05A8 1000
05AA 00EE RET
05AC 01D6
05AE D6C6
05B0 D7C6
05B2 D6C6
05B4 CBD7
05B6 D6D6
05B8 D6CB
05BA D6C1
05BC D7C1
05BE D6C1
05C0 CBF8
05C2 08F4
05C4 56D3
05C6 F808
05C8 F556
05CA D38E
05CC F63B
05CE D5F8
05D0 01F4
05D2 56F8
05D4 80AE
05D6 D38E
05D8 FE3B
05DA D5F8
05DC 01F5
```

05DE 56F8
05E0 0130
05E2 D5F8
05E4 FCA7
05E6 96B7
05E8 E7F8
05EA 05BD
05EC F8AD
05EE F4F4
05F0 ADF8
05F2 F5A6
05F4 E672
05F6 AE93
05F8 BC4D
05FA ACDC
05FC 4DAC
05FE DC8E
0600 2656
0602 D4F8
0604 00BC
0606 300B
0608 F801
060A BCF8
060C F5A6
060E E672
0610 AE9B
0612 BFF0
0614 AFEF
0616 8EF3
0618 BE8E
061A F23A
061C 1F15
061E 159C
0620 3A24
0622 9E5F
0624 D49B
0626 BAD4
0628 455A
062A E58A
062C F4AA
062E 159A
0630 7C00
0632 BAD4

0634 45A6
0636 0A56
0638 302A
063A 45A6
063C 065A
063E 302A
0640 2AD4
0642 F814
0644 AFF8
0646 005A
0648 1A2F
064A 8F3A
064C 45D4
064E 0309
0650 0103
0652 0001
0654 0902
0656 0708
0658 0901
065A 0003
065C 0102
065E 0300
0660 0102
0662 0203
0664 0304
0666 00FC
0668 FCFC
066A FCFC
066C FCFC
066E 7222
0670 2222
0672 4742
0674 4272
0676 0815
0678 2532
067A 598E
067C E0A0
067E E004
0680 0702
0682 1706
0684 3F08
0686 1704
0688 0800

0200 1300 GO 0300
0202 5DBF
0204 717C
0206 466F
0208 734B
020A 7577
020C 3D51
020E 6355
0210 6780
0212 5994
0214 AC4D
0216 A183
0218 8F8B
021A 5D61
021C 3987
021E 6FA7
0220 9297
0222 9D99
0224 A56B
0226 B5B6
0228 DCF6
022A D1BA
022C D9C4
022E CC41
0230 C8D6
0232 E1EA
0234 F2E5
0236 FBEE
0238 B0F8
023A 8888
023C 98F8
023E 88F8
0240 8888
0242 1020
0244 4088
0246 9090
0248 F810
024A 10F8
024C 0808
024E 0808
0250 88F8
0252 4878
0254 48F8
0256 4848
0258 48F8
025A 8098
025C 88F8
025E 8888
0260 88F8
0262 88F8
0264 8080
0266 80F8
0268 80E0
026A 80F8
026C 1020

026E 40F8
0270 80F8
0272 08F8
0274 80F8
0276 88F8
0278 88F8
027A 0808
027C F808
027E 3808
0280 F880
0282 E080
0284 8080
0286 80F8
0288 88F8
028A 9088
028C C8A8
028E 9888
0290 D8A8
0292 8888
0294 8888
0296 F888
0298 8888
029A 5020
029C 5088
029E 88A8
02A0 D888
02A2 90E0
02A4 9088
02A6 88F8
02A8 2020
02AA 2020
02AC F820
02AE 2020
02B0 F8F8
02B2 F8F8
02B4 F800
02B6 0000
02B8 0000
02BA 2020
02BC 2000
02BE 2060
02C0 2020
02C2 2070
02C4 F8A0
02C6 F828
02C8 F808
02CA 3800
02CC 20F8
02CE A0F8
02D0 2000
02D2 0000
02D4 00A8
02D6 5050
02D8 0000
02DA 0070

```
02DC 0000
02DE 0020
02E0 4020
02E2 20F8
02E4 2020
02E6 00F8
02E8 0020
02EA 0000
02EC F800
02EE 00F8
02F0 00F8
02F2 0050
02F4 2050
02F6 0020
02F8 0020
02FA 0008
02FC 1020
02FE 4080
0300 A5B5 I=05B5
0302 054D MLS@054D
0304 0000
0306 A5B6 I=05B6
0308 6000 V0=00
030A 054D MLS@054D
030C 3F01
030E 70FF V0+FF
0310 3000 SKIP;V0 EQ 00
0312 130A GO 030A
0314 6E01 VE=01
0316 EEA1 SKIP;VE NE KEY
0318 1322 GO 0322
031A 6E02 VE=02
031C EEA1 SKIP;VE NE KEY
031E 1322 GO 0322
0320 1314 GO 0314
0322 88E0 V8=VE
0324 2534 DO 0534
0326 6636 V6=36
0328 6400 V4=00
032A 6500 V5=00
032C 4802 SKIP;V8 NE 02
032E 650B V5=0B
0330 2512 DO 0512
0332 6F02 VF=02
0334 FF15 TIME=VF
0336 6E01 VE=01
0338 EEA1 SKIP;VE NE KEY
033A 137C GO 037C
033C 6E02 VE=02
033E EEA1 SKIP;VE NE KEY
0340 13A4 GO 03A4
0342 6E03 VE=03
0344 EEA1 SKIP;VE NE KEY
0346 1392 GO 0392
0348 6E04 VE=04
034A EEA1 SKIP;VE NE KEY
034C 1430 GO 0430
034E 6E06 VE=06
0350 EEA1 SKIP;VE NE KEY
0352 140E GO 040E
0354 6E07 VE=07
0356 EEA1 SKIP;VE NE KEY
0358 13DE GO 03DE
035A 6E08 VE=08
035C EEA1 SKIP;VE NE KEY
035E 13E6 GO 03E6
0360 6E09 VE=09
0362 EEA1 SKIP;VE NE KEY
0364 13F4 GO 03F4
0366 6E00 VE=00
0368 EEA1 SKIP;VE NE KEY
036A 1430 GO 0430
036C FF07 VF=TIME
036E 3F00 SKIP;VF EQ 00
0370 1336 GO 0336
0372 450A SKIP;V5 NE 0A
0374 1332 GO 0332
0376 252C DO 052C
0378 252C DO 052C
037A 1332 GO 0332
037C 6D02 VD=02
037E FD18 TONE=VD
0380 450A SKIP;V5 NE 0A
0382 1332 GO 0332
0384 252C DO 052C
0386 4600 SKIP;V6 NE 00
0388 6637 V6=37
038A 76FF V6+FF
038C 2512 DO 0512
038E 24EE DO 04EE
0390 1332 GO 0332
0392 6D02 VD=02
0394 FD18 TONE=VD
0396 450A SKIP;V5 NE 0A
0398 1332 GO 0332
039A 252C DO 052C
039C 4636 SKIP;V6 NE 36
039E 66FF V6=FF
03A0 7601 V6+01
03A2 138C GO 038C
03A4 2534 DO 0534
03A6 450A SKIP;V5 NE 0A
03A8 1332 GO 0332
03AA 24C6 DO 04C6
03AC 8360 V3=V6
03AE A5B6 I=05B6
03B0 F41E I=I+V4
03B2 055F MLS@055F
03B4 F300
03B6 7401 V4+01
```

```

03B8 4400 SKIP;V4 NE 00
03BA 1490 GO 0490
03BC A5B6 I=05B6
03BE F41E I=I+V4
03C0 0559 MLS@0559
03C2 F100
03C4 413F SKIP;V1 NE 3F
03C6 8160 V1=V6
03C8 62C0 V2=C0
03CA 8212 V2=V2&V1
03CC 4200 SKIP;V2 NE 00
03CE 13D2 GO 03D2
03D0 8160 V1=V6
03D2 8610 V6=V1
03D4 450A SKIP;V5 NE 0A
03D6 13DC GO 03DC
03D8 252C DO 052C
03DA 2512 DO 0512
03DC 1332 GO 0332
03DE 00E0 ERASE
03E0 2534 DO 0534
03E2 634F V3=4F
03E4 1404 GO 0404
03E6 2534 DO 0534
03E8 450A SKIP;V5 NE 0A
03EA 1332 GO 0332
03EC 252C DO 052C
03EE 6324 V3=24
03F0 24C6 DO 04C6
03F2 13AE GO 03AE
03F4 4802 SKIP;V8 NE 02
03F6 1332 GO 0332
03F8 2534 DO 0534
03FA 450A SKIP;V5 NE 0A
03FC 1400 GO 0400
03FE 252C DO 052C
0400 24FA DO 04FA
0402 634E V3=4E
0404 4802 SKIP;V8 NE 02
0406 140A GO 040A
0408 6500 V5=00
040A 2512 DO 0512
040C 13AE GO 03AE
040E 6D02 VD=02
0410 FD18 TONE=VD
0412 6101 V1=01
0414 6F0F VF=0F
0416 FF15 TIME=VF
0418 EE9E SKIP;VE EQ KEY
041A 142A GO 042A
041C FF07 VF=TIME
041E 3F00 SKIP;VF EQ 00
0420 1418 GO 0418
0422 7101 V1+01
0424 413C SKIP;V1 NE 3C

```

```

0426 142A GO 042A
0428 1414 GO 0414
042A 6380 V3=80
042C 8311 V3=V3/V1
042E 13AE GO 03AE
0430 2534 DO 0534
0432 A5B6 I=05B6
0434 F41E I=I+V4
0436 0559 MLS@0559
0438 F100
043A 9610 SKIP;V6 NE V1
043C 1488 GO 0488
043E 450A SKIP;V5 NE 0A
0440 145A GO 045A
0442 252C DO 052C
0444 4801 SKIP;V8 NE 01
0446 75FF V5+FF
0448 A5B5 I=05B5
044A 054D MLS@054D
044C 0100
044E 145A GO 045A
0450 6400 V4=00
0452 4802 SKIP;V8 NE 02
0454 145A GO 045A
0456 65FF V5=FF
0458 00E0 ERASE
045A A5B6 I=05B6
045C F41E I=I+V4
045E 0559 MLS@0559
0460 F600
0462 464F SKIP;V6 NE 4F
0464 1494 GO 0494
0466 464E SKIP;V6 NE 4E
0468 149C GO 049C
046A 61C0 V1=C0
046C 8162 V1=V1&V6
046E 4180 SKIP;V1 NE 80
0470 14D8 GO 04D8
0472 463F SKIP;V6 NE 3F
0474 1450 GO 0450
0476 4802 SKIP;V8 NE 02
0478 14A2 GO 04A2
047A 7501 V5+01
047C 2512 DO 0512
047E 4E04 SKIP;VE NE 04
0480 14C2 GO 04C2
0482 6E05 VE=05
0484 EEA1 SKIP;VE NE KEY
0486 14C2 GO 04C2
0488 7401 V4+01
048A 4400 SKIP;V4 NE 00
048C 1450 GO 0450
048E 145A GO 045A
0490 252C DO 052C
0492 1450 GO 0450

```

```
0494 00E0 ERASE
0496 4802 SKIP;V8 NE 02
0498 1488 GO 0488
049A 149E GO 049E
049C 24FA DO 04FA
049E 65FF V5=FF
04A0 1488 GO 0488
04A2 A5B5 I=05B5
04A4 0559 MLS@0559
04A6 F100
04A8 054D MLS@054D
04AA 0000
04AC A08F I=008F
04AE 054A MLS@054A
04B0 4100 SKIP;V1 NE 00
04B2 0567 MLS@0567
04B4 2512 DO 0512
04B6 6F10 VF=10
04B8 FF15 TIME=VF
04BA FF07 VF=TIME
04BC 3F00 SKIP;VF EQ 00
04BE 14BA GO 04BA
04C0 147E GO 047E
04C2 2534 DO 0534
04C4 1332 GO 0332
04C6 4802 SKIP;V8 NE 02
04C8 14CE GO 04CE
04CA 7501 V5+01
04CC 14D4 GO 04D4
04CE A08F I=008F
04D0 054A MLS@054A
04D2 0567 MLS@0567
04D4 2512 DO 0512
04D6 00EE RET
04D8 607F V0=7F
04DA 8062 V0=V0&V6
04DC 6F0F VF=0F
04DE FF15 TIME=VF
04E0 FF07 VF=TIME
04E2 3F00 SKIP;VF EQ 00
04E4 14E0 GO 04E0
04E6 70FF V0+FF
04E8 3000 SKIP;V0 EQ 00
04EA 14DC GO 04DC
04EC 1488 GO 0488
04EE 6F06 VF=06
04F0 FF15 TIME=VF
04F2 FF07 VF=TIME
04F4 3F00 SKIP;VF EQ 00
04F6 14F2 GO 04F2
04F8 00EE RET
04FA A030 I=0030
04FC 054A MLS@054A
04FE 053E MLS@053E
0500 A0C8 I=00C8
0502 054A MLS@054A
0504 6028 V0=28
0506 054D MLS@054D
0508 0001
050A 70FF V0+FF
050C 3000 SKIP;V0 EQ 00
050E 1506 GO 0506
0510 00EE RET
0512 450A SKIP;V5 NE 0A
0514 1532 GO 0532
0516 A59D I=059D
0518 F51E I=I+V5
051A F51E I=I+V5
051C 0559 MLS@0559
051E F901
0520 0559 MLS@0559
0522 FA00
0524 A202 I=0202
0526 F61E I=I+V6
0528 0559 MLS@0559
052A F700
052C A200 I=0200
052E F71E I=I+V7
0530 D9A5 SHOW 5MI@V9VA
0532 00EE RET
0534 6B02 VB=02
0536 FB18 TONE=VB
0538 EEA1 SKIP;VE NE KEY
053A 1538 GO 0538
053C 00EE RET
053E F800
0540 AF9A
0542 BF4A
0544 5F1F
0546 8A3A
0548 43D4
054A 9BBA
054C D445
054E 5AE5
0550 8AF4
0552 AA15
0554 9A7C
0556 00BA
0558 D445
055A A60A
055C 5630
055E 4F45
0560 A606
0562 5A30
0564 4F2A
0566 D4F8
0568 06AD
056A F8FF
056C A6E6
056E 8AAC
```


0570 9ABC
0572 8CAA
0574 9CBA
0576 F805
0578 AEF8
057A 07AF
057C F800
057E 560A
0580 FEF1
0582 5AF8
0584 007C
0586 0056
0588 2A2F
058A 8F3A
058C 7F0A
058E FEF1
0590 FA7F
0592 5A2A

0594 2E8E
0596 3A79
0598 208D
059A 3A72
059C D402
059E 1908
05A0 190E
05A2 1914
05A4 191A
05A6 1920
05A8 1926
05AA 192C
05AC 1932
05AE 1938
05B0 1938
05B2 1938
05B4 0D00

3. VIP Bingo

VIP BINGO automatically calls and verifies BINGO numbers. The computer selects numbers randomly and displays the last three numbers drawn. After a player calls "BINGO", the computer will check the player's numbers against a list stored in its memory. The computer adds the numbers checked to give the player a score for that round of play.

There are two modes for drawing numbers. Using the **manual** mode, the operator must press a key to obtain a new number. Using the **automatic** mode, the computer draws numbers every twelve seconds until halted by the operator. Using a third mode, **verify**, the operator enters numbers on the keyboard for the computer to check against the list of numbers called.

How To Play VIP Bingo

1. Load the CHIP-8 interpreter at 0000-01FF and the game starting at 0200.
2. Turn RUN switch on.

3. Key "A" starts calling numbers in the **manual** mode. Press key "A" for every new number. New numbers appear at the bottom of the display and are rolled upward.

4. Key "B" starts calling the numbers in the **automatic** mode. New numbers appear every twelve seconds until all numbers are called. You can press key "A" to enter the **manual** mode, or key "C" to stop calling numbers.

5. Key "C" starts the **verify** mode. Enter two digits for each number making up a winning BINGO card. (Note: press 01 for B-1, 02 for B-2, 75 for 0-75, etc.) If the number was called, "OK" will show; if it was not called, "NO" will show. If all five numbers are OK, press key "F" to display the score for the numbers entered. The score will be displayed followed by "PT" (point total). You do not have to enter any number for "FREE". If one of the numbers verified was not called, you can resume calling numbers as in Step 3 or 4. You may also press key "C" to restart verify if you make a mistake entering a number.

```

0200 604F V0=4F
0202 A454 I=0454
0204 2386 D0 0386
0206 654B V5=4B
0208 6E0A VE=0A
020A EEA1 SKIP;VE NE KEY
020C 121C GO 021C
020E 6E0B VE=0B
0210 EEA1 SKIP;VE NE KEY
0212 121C GO 021C
0214 6E0C VE=0C
0216 EEA1 SKIP;VE NE KEY
0218 1286 GO 0286
021A 1208 GO 0208
021C 2392 D0 0392
021E 88E0 V8=VE
0220 237A D0 037A
0222 237A D0 037A
0224 4500 SKIP;V5 NE 00
0226 1208 GO 0208
0228 C77F V7=RND
022A 7701 V7+01
022C 624B V2=4B
022E 8275 V2=V2-V7
0230 3F00 SKIP;VF EQ 00
0232 1238 GO 0238
0234 77B5 V7+B5
0236 122C GO 022C

```

```

0238 A454 I=0454
023A F71E I=I+V7
023C F065 V0:V0=MI
023E 3000 SKIP;V0 EQ 00
0240 1224 GO 0224
0242 041A MLS@041A
0244 6001 V0=01
0246 F055 MI=V0:V0
0248 75FF V5+FF
024A 239C D0 039C
024C 6D08 VD=08
024E FD18 TONE=VD
0250 6628 V6=28
0252 6D0F VD=0F
0254 FD15 TIME=VD
0256 6E0A VE=0A
0258 EEA1 SKIP;VE NE KEY
025A 121C GO 021C
025C 6E0B VE=0B
025E EEA1 SKIP;VE NE KEY
0260 121C GO 021C
0262 6E0C VE=0C
0264 EEA1 SKIP;VE NE KEY
0266 1286 GO 0286
0268 FD07 VD=TIME
026A 3D00 SKIP;VD EQ 00
026C 1256 GO 0256

```

026E	23C8	DO 03C8	02DC	239C	DO 039C
0270	600A	V0=0A	02DE	A454	I=0454
0272	70FF	V0+FF	02E0	F71E	I=I+V7
0274	3000	SKIP;V0 EQ 00	02E2	040E	MLS@040E
0276	1272	GO 0272	02E4	F100	
0278	23C8	DO 03C8	02E6	4100	SKIP;V1 NE 00
027A	76FF	V6+FF	02E8	1324	GO 0324
027C	3600	SKIP;V6 EQ 00	02EA	6302	V3=02
027E	1252	GO 0252	02EC	6202	V2=02
0280	480B	SKIP;V8 NE 0B	02EE	6F00	VF=00
0282	1220	GO 0220	02F0	6003	V0=03
0284	1208	GO 0208	02F2	A4A0	I=04A0
0286	2392	DO 0392	02F4	F21E	I=I+V2
0288	00E0	ERASE	02F6	040E	MLS@040E
028A	6400	V4=00	02F8	FC00	
028C	A4A3	I=04A3	02FA	A4A3	I=04A3
028E	6000	V0=00	02FC	F31E	I=I+V3
0290	F033	MI=V0(3DD)	02FE	040E	MLS@040E
0292	6E0A	VE=0A	0300	F100	
0294	EEA1	SKIP;VE NE KEY	0302	81F4	V1=V1+VF
0296	121C	GO 021C	0304	81C4	V1=V1+VC
0298	6E0B	VE=0B	0306	6C0A	VC=0A
029A	EEA1	SKIP;VE NE KEY	0308	81C5	V1=V1-VC
029C	121C	GO 021C	030A	3F00	SKIP;VF EQ 00
029E	6E0C	VE=0C	030C	1310	GO 0310
02A0	EEA1	SKIP;VE NE KEY	030E	710A	V1+0A
02A2	1286	GO 0286	0310	0414	MLS@0414
02A4	6E0F	VE=0F	0312	F100	
02A6	EEA1	SKIP;VE NE KEY	0314	72FF	V2+FF
02A8	132E	GO 032E	0316	73FF	V3+FF
02AA	2364	DO 0364	0318	70FF	V0+FF
02AC	4EFF	SKIP;VE NE FF	031A	3000	SKIP;V0 EQ 00
02AE	1292	GO 0292	031C	12F2	GO 02F2
02B0	87E0	V7=VE	031E	A41C	I=041C
02B2	A4A1	I=04A1	0320	2354	DO 0354
02B4	0414	MLS@0414	0322	1292	GO 0292
02B6	FE01		0324	A426	I=0426
02B8	817E		0326	6401	V4=01
02BA	811E		0328	1320	GO 0320
02BC	811E		032A	6400	V4=00
02BE	8174	V1=V1+V7	032C	1208	GO 0208
02C0	8714	V7=V7+V1	032E	2392	DO 0392
02C2	2364	DO 0364	0330	237A	DO 037A
02C4	4EFF	SKIP;VE NE FF	0332	A451	I=0451
02C6	12C2	GO 02C2	0334	4400	SKIP;V4 NE 00
02C8	0414	MLS@0414	0336	A4A3	I=04A3
02CA	FE00		0338	F265	V0:V2=MI
02CC	87E4	V7=V7+VE	033A	6910	V9=10
02CE	614B	V1=4B	033C	6A19	VA=19
02D0	8175	V1=V1-V7	033E	F029	I=V0(LSDP)
02D2	4F00	SKIP;VF NE 00	0340	D9A5	SHOW 5MI@V9VA
02D4	1292	GO 0292	0342	7906	V9+06
02D6	4700	SKIP;V7 NE 00	0344	F129	I=V1(LSDP)
02D8	1292	GO 0292	0346	D9A5	SHOW 5MI@V9VA
02DA	237A	DO 037A	0348	7906	V9+06

```
034A F229 I=V2(LSDP)
034C D9A5 SHOW 5MI@V9VA
034E A430 I=0430
0350 2354 DO 0354
0352 1208 GO 0208
0354 6020 V0=20
0356 6119 V1=19
0358 D015 SHOW 5MI@V0V1
035A 7008 V0+08
035C 6B05 VB=05
035E FB1E I=I+VB
0360 D015 SHOW 5MI@V0V1
0362 00EE RET
0364 6E0A VE=0A
0366 7EFF VE+FF
0368 EEA1 SKIP;VE NE KEY
036A 1372 GO 0372
036C 3E00 SKIP;VE EQ 00
036E 1366 GO 0366
0370 1376 GO 0376
0372 2392 DO 0392
0374 00EE RET
0376 6EFF VE=FF
0378 00EE RET
037A A030 I=0030
037C 03FF MLS@03FF
037E 03F3 MLS@03F3
0380 A0CA I=00CA
0382 03FF MLS@03FF
0384 6024 V0=24
0386 0402 MLS@0402
0388 0001
038A 70FF V0+FF
038C 3000 SKIP;V0 EQ 00
038E 1386 GO 0386
0390 00EE RET
0392 6B02 VB=02
0394 FB18 TONE=VB
0396 EEA1 SKIP;VE NE KEY
0398 1396 GO 0396
039A 00EE RET
039C 613C V1=3C
039E 8175 V1=V1-V7
03A0 4F00 SKIP;VF NE 00
03A2 13E2 GO 03E2
03A4 612D V1=2D
03A6 8175 V1=V1-V7
03A8 4F00 SKIP;VF NE 00
03AA 13E6 GO 03E6
03AC 611E V1=1E
03AE 8175 V1=V1-V7
03B0 4F00 SKIP;VF NE 00
03B2 13EA GO 03EA
03B4 610F V1=0F
03B6 8175 V1=V1-V7
03B8 4F00 SKIP;VF NE 00
03BA 13EE GO 03EE
03BC A44C I=044C
03BE 6010 V0=10
03C0 6119 V1=19
03C2 D015 SHOW 5MI@V0V1
03C4 A4A6 I=04A6
03C6 F733 MI=V7(3DD)
03C8 A4A7 I=04A7
03CA 6019 V0=19
03CC 040E MLS@040E
03CE FC00
03D0 FC29 I=VC(LSDP)
03D2 D015 SHOW 5MI@V0V1
03D4 A4A8 I=04A8
03D6 7006 V0+06
03D8 040E MLS@040E
03DA FC00
03DC FC29 I=VC(LSDP)
03DE D015 SHOW 5MI@V0V1
03E0 00EE RET
03E2 A448 I=0448
03E4 13BE GO 03BE
03E6 A444 I=0444
03E8 13BE GO 03BE
03EA A43F I=043F
03EC 13BE GO 03BE
03EE A43A I=043A
03F0 13BE GO 03BE
03F2 01F8
03F4 00AF
03F6 9ABF
03F8 4A5F
03FA 1F8A
03FC 3AF8
03FE D49B
0400 BAD4
0402 455A
0404 E58A
0406 F4AA
0408 159A
040A 7C00
040C BAD4
040E 45A6
0410 0A56
0412 3004
0414 45A6
0416 065A
0418 3004
041A 2AD4
041C 0302
041E 0202
0420 03C9
0422 4A4C
0424 4AC9
```

0426 0203
0428 0202
042A 024F
042C 49C9
042E 494F
0430 0302
0432 0302
0434 02DF
0436 44C4
0438 0404
043A E040
043C 4640

043E E090
0440 D0B6
0442 9090
0444 F080
0446 B690
0448 F090
044A 9690
044C F050
044E 7650
0450 F000
0452 0000

4. VIP Blackjack

VIP BLACKJACK (also known as TWENTY-ONE) is a one-or two-player game. The VIP BLACKJACK (one-player) game uses 2048 bytes (minimum system). The SUPER VIP BLACKJACK (two-player) game requires 3072 bytes.

These games follow standard BLACKJACK rules. The VIP computer is the dealer. Both the dealer and players try to get cards that add up to "21". Each number card counts its face value; Ten, Jack, Queen, and King count 10; and Aces count as either one or eleven. A hand containing an Ace that counts as eleven and does not cause the total to exceed 21, is a "soft" hand. All other hands are "hard."

The VIP BLACKJACK dealer draws on soft 17, hard 16, or less. The dealer deals from two standard decks. Before dealing a new hand, if the number of cards in the combined decks is less than 22, the dealer automatically shuffles the cards. Pair splitting and insurance are not allowed. All winning hands pay 1 to 1, except blackjack, which pays 2 to 1.

Players who lose their stakes are dropped from the game. The game ends either when both players have lost their stakes, or when one player breaks 999.

How To Play VIP Blackjack (One-Player)

1. Load the CHIP-8 interpreter at 0000-01FF and the game starting at 0200.
2. Turn RUN switch on.
3. Select one-player blackjack by pressing key '1'.
Select two-player blackjack by pressing key '2'.
4. Your stakes will appear at the bottom right corner of your TV screen.
5. Whenever "CUT" appears on the screen, the dealer will shuffle the cards and wait for you to cut. Press key 0 to continue play.

6. Whenever "BET" appears on the screen, you enter your single-digit bet by pressing key 1 through 9, press key 0 to enter a bet of 10. Your bet will be displayed slightly above and to the left of your stakes.

7. After all bets are entered, two cards will be dealt to you and the dealer. The dealer's cards are on the top of the screen. One of the dealer's cards will be face down (hole card).

8. If the dealer has a natural (21) and you do not, you lose your bet. If you also have a natural, you get your bet back, and a "T" for tie appears in the bet position.

9. If the dealer does not have a natural and you do, you get three times your bet back. a "W" for win appears in the bet position.

10. When neither you nor the dealer has a natural, the word "HIT" will appear on your screen. You must either stand, hit, or double down.

It is your turn when your bet flashes.

—You Stand (indicating you have enough cards) by pressing key 0.

—You Hit (Indicating you want another card) by pressing key 1.

You can draw up to 5 additional cards for a maximum of 7 cards in your hand.

—You Double Down (indicating you want one more card and double your bet) by pressing key 2. Your bet will change on the screen.

You keep your turn after Hitting if the card count is 21 or less. You give up your turn after Standing, Doubling Down, or Busting (going over 21).

11. After you have finished your turn, the dealer turns up his hole (down) card. If you are still in the game, the dealer draws cards to his hand whenever it adds up to soft 17, hard 16, or less.

12. If the dealer goes over 21, you win unless you already busted. If you win, a "W" appears in the bet position and you receive twice your bet. If you tie the dealer (push), a "T" appears and you get your bet back. If your hand is less than the dealer's, you lose your bet.

```

0200 A68D I=068D
0202 061E MLS@061E
0204 A6B2 I=06B2
0206 24AA DO 04AA
0208 6A00 VA=00
020A 24E4 DO 04E4
020C A6BE I=06BE
020E 0610 MLS@0610
0210 F100
0212 4101 SKIP;V1 NE 01
0214 25F2 DO 05F2
0216 A6C4 I=06C4
0218 0610 MLS@0610
021A F701
021C 4700 SKIP;V7 NE 00
021E 1214 GO 0214
0220 6600 V6=00
0222 6115 V1=15
0224 A6BF I=06BF
0226 0610 MLS@0610
0228 F200
022A 8125 V1=V1-V2
022C 4F00 SKIP;VF NE 00
022E 1254 GO 0254
0230 0604 MLS@0604
0232 6801
0234 2588 DO 0588
0236 600D V0=0D
0238 A68D I=068D
023A 0604 MLS@0604
023C 0801
023E 70FF V0+FF
0240 3000 SKIP;V0 EQ 00
0242 123A GO 023A
0244 6E00 VE=00
0246 EEA1 SKIP;VE NE KEY
0248 124C GO 024C
024A 1244 GO 0244
024C 25E8 DO 05E8
024E A0BF I=00BF
0250 0601 MLS@0601
0252 05F9 MLS@05F9
0254 2576 DO 0576
0256 46FF SKIP;V6 NE FF
0258 129A GO 029A
025A 6E0A VE=0A
025C 7EFF VE+FF
025E EEA1 SKIP;VE NE KEY
0260 1268 GO 0268
0262 3E00 SKIP;VE EQ 00
0264 125C GO 025C
0266 1256 GO 0256
0268 6D02 VD=02
026A FD18 TONE=VD
026C 24BC DO 04BC

```

```

026E A6B2 I=06B2
0270 F41E I=I+V4
0272 0616 MLS@0616
0274 FE00
0276 74FF V4+FF
0278 6100 V1=00
027A 4E00 SKIP;VE NE 00
027C 6101 V1=01
027E 061C MLS@061C
0280 0616 MLS@0616
0282 F100
0284 2330 DO 0330
0286 3F00 SKIP;VF EQ 00
0288 1294 GO 0294
028A 24E4 DO 04E4
028C 24C0 DO 04C0
028E 24D6 DO 04D6
0290 76FF V6+FF
0292 1256 GO 0256
0294 2328 DO 0328
0296 24E4 DO 04E4
0298 1256 GO 0256
029A A0BF I=00BF
029C 0601 MLS@0601
029E 05F9 MLS@05F9
02A0 A69A I=069A
02A2 0604 MLS@0604
02A4 0008
02A6 0604 MLS@0604
02A8 0008
02AA 6602 V6=02
02AC 6AC0 VA=00
02AE 2590 DO 0590
02B0 6A02 VA=02
02B2 2412 DO 0412
02B4 4601 SKIP;V6 NE 01
02B6 6100 V1=00
02B8 2592 DO 0592
02BA 76FF V6+FF
02BC 3600 SKIP;V6 EQ 00
02BE 12AC GO 02AC
02C0 6A00 VA=00
02C2 2466 DO 0466
02C4 8640 V6=V4
02C6 6A02 VA=02
02C8 2466 DO 0466
02CA 4415 SKIP;V4 NE 15
02CC 1310 GO 0310
02CE 6A00 VA=00
02D0 4615 SKIP;V6 NE 15
02D2 23F8 DO 03F8
02D4 4700 SKIP;V7 NE 00
02D6 120C GO 020C
02D8 258C DO 058C
02DA 4700 SKIP;V7 NE 00

```

```

02DC 12E2 GO 02E2
02DE 6A00 VA=00
02E0 233A DO 033A
02E2 258C DO 058C
02E4 4700 SKIP;V7 NE 00
02E6 120C GO 020C
02E8 FD07 VD=TIME
02EA 3D00 SKIP;VD EQ 00
02EC 12E8 GO 02E8
02EE 2402 DO 0402
02F0 2466 DO 0466
02F2 8640 V6=V4
02F4 6210 V2=10
02F6 8265 V2=V2-V6
02F8 4F00 SKIP;VF NE 00
02FA 1300 GO 0300
02FC 2590 DO 0590
02FE 12F0 GO 02F0
0300 3411 SKIP;V4 EQ 11
0302 1308 GO 0308
0304 3300 SKIP;V3 EQ 00
0306 12FC GO 02FC
0308 4700 SKIP;V7 NE 00
030A 120C GO 020C
030C 23CA DO 03CA
030E 120C GO 020C
0310 2402 DO 0402
0312 4700 SKIP;V7 NE 00
0314 120C GO 020C
0316 6A00 VA=00
0318 4615 SKIP;V6 NE 15
031A 1320 GO 0320
031C 23A8 DO 03A8
031E 120C GO 020C
0320 23B2 DO 03B2
0322 120C GO 020C
0324 23B2 DO 03B2
0326 120C GO 020C
0328 24B8 DO 04B8
032A 24BC DO 04BC
032C 6500 V5=00
032E 1530 GO 0530
0330 24E4 DO 04E4
0332 24B8 DO 04B8
0334 24BC DO 04BC
0336 6501 V5=01
0338 132E GO 032E
033A 6600 V6=00
033C 6F0C VF=0C
033E FF15 TIME=VF
0340 6E01 VE=01
0342 EEA1 SKIP;VE NE KEY
0344 135E GO 035E
0346 6E02 VE=02
0348 EEA1 SKIP;VE NE KEY

034A 137E GO 037E
034C 6E00 VE=00
034E EEA1 SKIP;VE NE KEY
0350 137A GO 037A
0352 FF07 VF=TIME
0354 3F00 SKIP;VF EQ 00
0356 1340 GO 0340
0358 24D6 DO 04D6
035A 24D6 DO 04D6
035C 133C GO 033C
035E 25E8 DO 05E8
0360 6601 V6=01
0362 2590 DO 0590
0364 2466 DO 0466
0366 6115 V1=15
0368 8145 V1=V1-V4
036A 4F00 SKIP;VF NE 00
036C 13A8 GO 03A8
036E 4600 SKIP;V6 NE 00
0370 137C GO 037C
0372 245A DO 045A
0374 4207 SKIP;V2 NE 07
0376 137C GO 037C
0378 1352 GO 0352
037A 25E8 DO 05E8
037C 00EE RET
037E 25E8 DO 05E8
0380 3600 SKIP;V6 EQ 00
0382 1352 GO 0352
0384 2330 DO 0330
0386 3F00 SKIP;VF EQ 00
0388 13A2 GO 03A2
038A 24E4 DO 04E4
038C 24C0 DO 04C0
038E 24BC DO 04BC
0390 8340 V3=V4
0392 232C DO 032C
0394 24D6 DO 04D6
0396 6F1E VF=1E
0398 FF15 TIME=VF
039A FF07 VF=TIME
039C 3F00 SKIP;VF EQ 00
039E 139A GO 039A
03A0 1362 GO 0362
03A2 2328 DO 0328
03A4 24E4 DO 04E4
03A6 1352 GO 0352
03A8 24C0 DO 04C0
03AA 6D2D VD=2D
03AC FD18 TONE=VD
03AE FD15 TIME=VD
03B0 13EA GO 03EA
03B2 24C0 DO 04C0
03B4 A688 I=0688
03B6 23BE DO 03BE

```



```

03B8 13E8 GO 03E8
03BA 24C0 DO 04C0
03BC A683 I=0683
03BE 6B19 VB=19
03C0 6926 V9=26
03C2 D9B5 SHOW 5MI@V9VB
03C4 24E4 DO 04E4
03C6 2328 DO 0328
03C8 00EE RET
03CA 6A00 VA=00
03CC 2466 DO 0466
03CE 6115 V1=15
03D0 8165 V1=V1-V6
03D2 4F00 SKIP;VF NE 00
03D4 13E0 GO 03E0
03D6 9460 SKIP;V4 NE V6
03D8 13B2 GO 03B2
03DA 8465 V4=V4-V6
03DC 4F00 SKIP;VF NE 00
03DE 13A8 GO 03A8
03E0 23BA DO 03BA
03E2 2328 DO 0328
03E4 3F00 SKIP;VF EQ 00
03E6 13F0 GO 03F0
03E8 24E4 DO 04E4
03EA 4A00 SKIP;VA NE 00
03EC 6700 V7=00
03EE 00EE RET
03F0 A6BE I=06BE
03F2 0604 MLS@0604
03F4 0101
03F6 13EA GO 03EA
03F8 23BA DO 03BA
03FA 2328 DO 0328
03FC 3F00 SKIP;VF EQ 00
03FE 13F0 GO 03F0
0400 13E2 GO 03E2
0402 6A02 VA=02
0404 6100 V1=00
0406 6202 V2=02
0408 2592 DO 0592
040A A69C I=069C
040C 0610 MLS@0610
040E F100
0410 1592 GO 0592
0412 C13F V1=RND
0414 620C V2=0C
0416 8215 V2=V2-V1
0418 3F00 SKIP;VF EQ 00
041A 1420 GO 0420
041C 71F3 V1+F3
041E 1414 GO 0414
0420 A68D I=068D
0422 F11E I=I+V1
0424 0610 MLS@0610

```

```

0426 F200
0428 4200 SKIP;V2 NE 00
042A 1412 GO 0412
042C 72FF V2+FF
042E 0616 MLS@0616
0430 F200
0432 7101 V1+01
0434 245A DO 045A
0436 7201 V2+01
0438 0616 MLS@0616
043A F200
043C 8020 V0=V2
043E 0610 MLS@0610
0440 F301
0442 70FF V0+FF
0444 3000 SKIP;V0 EQ 00
0446 143E GO 043E
0448 0616 MLS@0616
044A F100
044C A6BF I=06BF
044E 0610 MLS@0610
0450 F300
0452 73FF V3+FF
0454 0616 MLS@0616
0456 F300
0458 00EE RET
045A A6A2 I=06A2
045C 4A02 SKIP;VA NE 02
045E A69A I=069A
0460 0610 MLS@0610
0462 F200
0464 00EE RET
0466 245A DO 045A
0468 0610 MLS@0610
046A F001
046C 6400 V4=00
046E 6C00 VC=00
0470 6300 V3=00
0472 4000 SKIP;V0 NE 00
0474 14A4 GO 04A4
0476 0610 MLS@0610
0478 F101
047A 4101 SKIP;V1 NE 01
047C 7C01 VC+01
047E 620A V2=0A
0480 8215 V2=V2-V1
0482 4F00 SKIP;VF NE 00
0484 14A6 GO 04A6
0486 8414 V4=V4+V1
0488 70FF V0+FF
048A 3000 SKIP;V0 EQ 00
048C 1476 GO 0476
048E 4C00 SKIP;VC NE 00
0490 14A4 GO 04A4
0492 740A V4+0A

```

```
0494 7CFF VC+FF
0496 7301 V3+01
0498 6215 V2=15
049A 8245 V2=V2-V4
049C 3F00 SKIP;VF EQ 00
049E 148E GO 048E
04A0 74F6 V4+F6
04A2 73FF V3+FF
04A4 00EE RET
04A6 740A V4+0A
04A8 1488 GO 0488
04AA 0604 MLS@0604
04AC 0201
04AE 0604 MLS@0604
04B0 0001
04B2 0604 MLS@0604
04B4 0001
04B6 00EE RET
04B8 6302 V3=02
04BA 00EE RET
04BC 6408 V4=08
04BE 00EE RET
04C0 A0CC I=00CC
04C2 0601 MLS@0601
04C4 6005 V0=05
04C6 0604 MLS@0604
04C8 0001
04CA 0604 MLS@0604
04CC 0007
04CE 70FF V0+FF
04D0 3000 SKIP;V0 EQ 00
04D2 14C6 GO 04C6
04D4 00EE RET
04D6 24BC DO 04BC
04D8 8340 V3=V4
04DA 73FF V3+FF
04DC 6B19 VB=19
04DE 6923 V9=23
04E0 6C02 VC=02
04E2 151A GO 051A
04E4 24B8 DO 04B8
04E6 6003 V0=03
04E8 A6B2 I=06B2
04EA F31E I=I+V3
04EC 0610 MLS@0610
04EE FF00
04F0 3F00 SKIP;VF EQ 00
04F2 1506 GO 0506
04F4 73FF V3+FF
04F6 70FF V0+FF
04F8 3000 SKIP;V0 EQ 00
04FA 14E8 GO 04E8
04FC A6C4 I=06C4
04FE FA1E I=I+VA
0500 0616 MLS@0616
0502 FF00
0504 00EE RET
0506 6001 V0=01
0508 A6C4 I=06C4
050A FA1E I=I+VA
050C 0616 MLS@0616
050E F000
0510 24B8 DO 04B8
0512 73FE V3+FE
0514 6B1B VB=1B
0516 6930 V9=30
0518 6C03 VC=03
051A A6B2 I=06B2
051C F31E I=I+V3
051E F065 V0:V0=MI
0520 F029 I=V0(LSDP)
0522 D9B5 SHOW 5MI@V9VB
0524 7301 V3+01
0526 7906 V9+06
0528 7CFF VC+FF
052A 3C00 SKIP;VC EQ 00
052C 151A GO 051A
052E 00EE RET
0530 6F00 VF=00
0532 6003 V0=03
0534 A6B2 I=06B2
0536 F41E I=I+V4
0538 0610 MLS@0610
053A F200
053C A6B2 I=06B2
053E F31E I=I+V3
0540 0610 MLS@0610
0542 F100
0544 3500 SKIP;V5 EQ 00
0546 1566 GO 0566
0548 81F4 V1=V1+VF
054A 8124 V1=V1+V2
054C 620A V2=0A
054E 8125 V1=V1-V2
0550 3F00 SKIP;VF EQ 00
0552 1556 GO 0556
0554 710A V1+0A
0556 0616 MLS@0616
0558 F100
055A 74FF V4+FF
055C 73FF V3+FF
055E 70FF V0+FF
0560 3000 SKIP;V0 EQ 00
0562 1534 GO 0534
0564 00EE RET
0566 81F5 V1=V1-VF
0568 8125 V1=V1-V2
056A 620A V2=0A
056C 8124 V1=V1+V2
056E 3F00 SKIP;VF EQ 00
```

```

0570 1556 GO 0556
0572 71F6 V1+F6
0574 1556 GO 0556
0576 A64F I=064F
0578 6918 V9=18
057A 6B09 VB=09
057C D9B5 SHOW 5MI@V9VB
057E 7908 V9+08
0580 6D05 VD=05
0582 FD1E I=I+VD
0584 D9B5 SHOW 5MI@V9VB
0586 00EE RET
0588 A663 I=0663
058A 1578 GO 0578
058C A659 I=0659
058E 1578 GO 0578
0590 2412 DO 0412
0592 A63A I=063A
0594 4A02 SKIP;VA NE 02
0596 A62A I=062A
0598 8020 V0=V2
059A 0610 MLS@0610
059C F401
059E 0610 MLS@0610
05A0 F501
05A2 70FF V0+FF
05A4 3000 SKIP;V0 EQ 00
05A6 159A GO 059A
05A8 A648 I=0648
05AA D457 SHOW 7MI@V4V5
05AC 4100 SKIP;V1 NE 00
05AE 15D8 GO 05D8
05B0 4101 SKIP;V1 NE 01
05B2 15C0 GO 05C0
05B4 6309 V3=09
05B6 8315 V3=V3-V1
05B8 4F00 SKIP;VF NE 00
05BA 15C0 GO 05C0
05BC F129 I=V1(LSDP)
05BE 15D2 GO 05D2
05C0 A67A I=067A
05C2 410A SKIP;V1 NE 0A
05C4 A66D I=066D
05C6 410B SKIP;V1 NE 0B
05C8 A672 I=0672
05CA 410C SKIP;V1 NE 0C
05CC A676 I=0676
05CE 410D SKIP;V1 NE 0D
05D0 A67E I=067E
05D2 7401 V4+01
05D4 7501 V5+01
05D6 D455 SHOW 5MI@V4V5
05D8 6D02 VD=02
05DA FD18 TONE=VD
05DC 6F18 VF=18
05DE FF15 TIME=VF
05E0 FF07 VF=TIME
05E2 3F00 SKIP;VF EQ 00
05E4 15E0 GO 05E0
05E6 00EE RET
05E8 6B02 VB=02
05EA FB18 TONE=VB
05EC EEA1 SKIP;VE NE KEY
05EE 15EC GO 05EC
05F0 00EE RET
05F2 6FFF VF=FF
05F4 FF18 TONE=VF
05F6 15F6 GO 05F6
05F8 01F8
05FA 005A
05FC 2A8A
05FE 3AF9
0600 D49B
0602 BAD4
0604 455A
0606 E58A
0608 F4AA
060A 159A
060C 7C00
060E BAD4
0610 45A6
0612 0A56
0614 3006
0616 45A6
0618 065A
061A 3006
061C 2AD4
061E F839
0620 AFF8
0622 005A
0624 1A2F
0626 8F3A
0628 21D4
062A 1000
062C 1800
062E 2000
0630 2800
0632 3000
0634 3800
0636 0800
0638 0000
063A 3911
063C 3210
063E 2B11
0640 2410
0642 3909
0644 3208
0646 2B09
0648 FEFE
064A FEFE

```

064C FEFE
064E FEFB
0650 4A7B
0652 4AFB
0654 DF04
0656 8404
0658 C493
065A 91F1
065C 9193
065E 9F04
0660 0404
0662 84F4
0664 8484
0666 84F7
0668 5F44
066A 4444
066C C4B8

066E A8A8
0670 A8B8
0672 1010
0674 1090
0676 F090
0678 90B0
067A F090
067C F090
067E 90A0
0680 C0A0
0682 9088
0684 88A8
0686 D888
0688 F820
068A 2020
068C 2003

5. VIP Slide

Slide is a two-person game. Each player tries to slide a "puck" over the high-scoring "spots" without hitting the back wall.

How To Play VIP Slide

1. Load the CHIP-8 interpreter at 0000-01FF and the game starting at 0200.
2. Turn RUN switch on.
3. The puck moves up and down randomly. Press

"0"-key to stop the puck. The puck will move towards the spots after you release the key. The longer you hold the key down, the further the puck travels (maximum time approximately 2.5 seconds).

4. You get 2 points for hitting the first spot, 4 points for either of the next two spots, and 8 points for either of the last two. The highest score possible is 216 (two spots can be hit on one slide).

5. If you hit the back wall, though, you get zero points for that slide, even though you've hit a spot.

6. Each player gets 3 pucks per turn and 6 turns in a game.

```

0200 00E0 ERASE
0202 A360 I=0360
0204 6800 V8=00
0206 6900 V9=00
0208 6201 V2=01
020A 230E DO 030E
020C 62FF V2=FF
020E 230E DO 030E
0210 6A00 VA=00
0212 6B00 VB=00
0214 6406 V4=06
0216 6C00 VC=00
0218 2328 DO 0328
021A 6C01 VC=01
021C 2328 DO 0328
021E A359 I=0359
0220 6D28 VD=28
0222 6E12 VE=12
0224 DDE3 SHOW 3MI@VDVE
0226 6D30 VD=30
0228 6E0E VE=0E
022A DDE3 SHOW 3MI@VDVE
022C 6E16 VE=16
022E DDE3 SHOW 3MI@VDVE
0230 6D38 VD=38
0232 6E0A VE=0A
0234 DDE3 SHOW 3MI@VDVE
0236 6E1A VE=1A
0238 DDE3 SHOW 3MI@VDVE
023A 6C00 VC=00
023C 6D03 VD=03
023E 2258 DO 0258
0240 6C01 VC=01
0242 6D3B VD=3B
0244 2258 DO 0258
0246 74FF V4+FF
0248 3400 SKIP;V4 EQ 00
024A 123A GO 023A
024C 620F V2=0F
024E F218 TONE=V2
0250 6118 V1=18
0252 F115 TIME=V1

```

```

0254 1366 GO 0366
0256 1256 GO 0256
0258 6204 V2=04
025A 234C DO 034C
025C A357 I=0357
025E 6E03 VE=03
0260 DDE2 SHOW 2MI@VDVE
0262 6503 V5=03
0264 6600 V6=00
0266 6E70 VE=70
0268 A35C I=035C
026A 6805 V8=05
026C 6909 V9=09
026E D894 SHOW 4MI@V8V9
0270 6D01 VD=01
0272 6111 V1=11
0274 C218 V2=RND
0276 7208 V2+08
0278 234C DO 034C
027A D894 SHOW 4MI@V8V9
027C 89D4 V9=V9+VD
027E D894 SHOW 4MI@V8V9
0280 71FF V1+FF
0282 E0A1 SKIP;V0 NE KEY
0284 1292 GO 0292
0286 3100 SKIP;V1 EQ 00
0288 1274 GO 0274
028A 4DFF SKIP;VD NE FF
028C 1270 GO 0270
028E 6DFF VD=FF
0290 1272 GO 0272
0292 6202 V2=02
0294 F218 TONE=V2
0296 6210 V2=10
0298 234C DO 034C
029A 3E00 SKIP;VE EQ 00
029C 7EFE VE+FE
029E E0A1 SKIP;V0 NE KEY
02A0 1296 GO 0296
02A2 6210 V2=10
02A4 234C DO 034C
02A6 E0A1 SKIP;V0 NE KEY

```

```
02A8 1296 GO 0296
02AA 6204 V2=04
02AC 234C DO 034C
02AE 83E0 V3=VE
02B0 83E4 V3=V3+VE
02B2 8230 V2=V3
02B4 234C DO 034C
02B6 7E02 VE+02
02B8 D894 SHOW 4MI@V8V9
02BA 7801 V8+01
02BC D894 SHOW 4MI@V8V9
02BE 4F01 SKIP;VF NE 01
02C0 12F8 GO 02F8
02C2 3E70 SKIP;VE EQ 70
02C4 12AE GO 02AE
02C6 6280 V2=80
02C8 237A DO 037A
02CA 2328 DO 0328
02CC 3C00 SKIP;VC EQ 00
02CE 12D4 GO 02D4
02D0 8A64 VA=VA+V6
02D2 12D6 GO 02D6
02D4 8B64 VB=VB+V6
02D6 2328 DO 0328
02D8 A35C I=035C
02DA D894 SHOW 4MI@V8V9
02DC 6220 V2=20
02DE F218 TONE=V2
02E0 75FF V5+FF
02E2 3500 SKIP;V5 EQ 00
02E4 1264 GO 0264
02E6 A357 I=0357
02E8 6E03 VE=03
02EA 6D03 VD=03
02EC 3C00 SKIP;VC EQ 00
02EE 6D3B VD=3B
02F0 DDE2 SHOW 2MI@VDVE
02F2 6204 V2=04
02F4 234C DO 034C
02F6 00EE RET
02F8 6202 V2=02
02FA F218 TONE=V2
02FC 483C SKIP;V8 NE 3C
02FE 12D8 GO 02D8
0300 4825 SKIP;V8 NE 25
0302 7602 V6+02
0304 482D SKIP;V8 NE 2D
0306 7604 V6+04
0308 4835 SKIP;V8 NE 35
030A 7608 V6+08
030C 1374 GO 0374
030E 613F V1=3F
0310 D891 SHOW 1MI@V8V9
0312 71FF V1+FF
0314 8824 V8=V8+V2
0316 3100 SKIP;V1 EQ 00
0318 1310 GO 0310
031A 611F V1=1F
031C D891 SHOW 1MI@V8V9
031E 71FF V1+FF
0320 8924 V9=V9+V2
0322 3100 SKIP;V1 EQ 00
0324 131C GO 031C
0326 00EE RET
0328 A361 I=0361
032A 6E02 VE=02
032C 6D08 VD=08
032E FA33 MI=VA(3DD)
0330 4C00 SKIP;VC NE 00
0332 1338 GO 0338
0334 6D28 VD=28
0336 FB33 MI=VB(3DD)
0338 F265 V0:V2=MI
033A F029 I=V0(LSDP)
033C DDE5 SHOW 5MI@VDVE
033E 7D06 VD+06
0340 F129 I=V1(LSDP)
0342 DDE5 SHOW 5MI@VDVE
0344 7D06 VD+06
0346 F229 I=V2(LSDP)
0348 DDE5 SHOW 5MI@VDVE
034A 00EE RET
034C 7202 V2+02
034E 72FF V2+FF
0350 3200 SKIP;V2 EQ 00
0352 134E GO 034E
0354 00EE RET
0356 01C0
0358 C0E0
035A A0E0
035C F0F0
035E F0F0
0360 8000
0362 0004
0364 00D4
0366 F107 V1=TIME
0368 3100 SKIP;V1 EQ 00
036A 1366 GO 0366
036C 72FF V2+FF
036E 3200 SKIP;V2 EQ 00
0370 124E GO 024E
0372 1372 GO 0372
0374 3E70 SKIP;VE EQ 70
0376 12AE GO 02AE
0378 12C6 GO 02C6
037A F215 TIME=V2
037C F207 V2=TIME
037E 3200 SKIP;V2 EQ 00
0380 137C GO 037C
0382 00EE RET
```

6. VIP Reversi

REVERSI is a game over 100 years old, which has become popular recently under the name OTHELLO. The game is played on an 8×8 square, using two kinds of markers. In VIP REVERSI one player has the open markers and the other player the solid markers. The score for either player at any time is the total number of his markers on the square.

How To Play VIP Reversi

1. Load the CHIP-8 interpreter at 0000-01FF and the game starting at 0200.

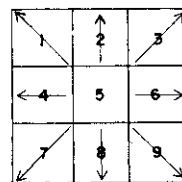
2. Turn RUN switch on.

3. The 8×8 square will be formed and the starting marker configuration shown, having two of each kind of marker in the center four locations of the square. The starting score for each player is shown as 02 above a line of his markers.

4. Your VIP indicates the player's turn by blinking that player's score and also blinking a cursor-dot in the 8×8 square. A player moves the blinking cursor-dot in the 8×8 square by pressing the direction keys 1-4 and 6-9 as shown.

```
0200 6D02 VD=02
0202 6E02 VE=02
0204 6C00 VC=00
0206 A2D7 I=02D7
0208 6B00 VB=00
020A 6A11 VA=11
020C DAB3 SHOW 3MI@VAVB
020E 3A2D SKIP;VA EQ 2D
0210 121A GO 021A
0212 4B1C SKIP;VB NE 1C
0214 121E GO 021E
0216 7B04 VB+04
0218 120A GO 020A
021A 7A04 VA+04
021C 120C GO 020C
021E 6A1D VA=1D
0220 6B0C VB=0C
0222 DAB3 SHOW 3MI@VAVB
0224 7A04 VA+04
0226 7B04 VB+04
0228 DAB3 SHOW 3MI@VAVB
022A A2DA I=02DA
022C DAB3 SHOW 3MI@VAVB
022E 7AFC VA+FC
0230 DAB3 SHOW 3MI@VAVB
0232 7BFC VB+FC
0234 DAB3 SHOW 3MI@VAVB
0236 7A04 VA+04
0238 DAB3 SHOW 3MI@VAVB
023A 6002 V0=02
023C 22DE DO 02DE
```

5. When the cursor-dot is properly located, the player presses key 5 to place his marker on the square. You will find that your VIP will not allow you to make a non-valid play. The only



placements allowed are ones for which at least one of the other player's markers is surrounded between an existing marker of your own and your new marker being placed. All these markers must be in consecutive positions on the square and can be in any horizontal, vertical, or diagonal direction. Once a new marker has been placed, your VIP will change all such surrounded markers of the other player to your kind and change the scores.

6. Sometimes it may not be possible for a player to make a valid move. If this happens he must forfeit his move by pressing the "F" key! The game ends when neither player can play or when the 8×8 square is completely filled with markers. The goal is to end the game with the highest score. Do not be discouraged if during the game you seem to be losing because this is a game with dramatic reversals! Develop a winning strategem and become a champion!!

```
023E 6034 V0=34
0240 22DE DO 02DE
0242 A2D7 I=02D7
0244 6034 V0=34
0246 22DE DO 02DE
0248 2394 DO 0394
024A 6901 V9=01
024C 230C DO 030C
024E 6800 V8=00
0250 237E DO 037E
0252 6900 V9=00
0254 4909 SKIP;V9 NE 09
0256 1272 GO 0272
0258 7901 V9+01
025A E99E SKIP;V9 EQ KEY
025C 1254 GO 0254
025E 4905 SKIP;V9 NE 05
0260 128C GO 028C
0262 3800 SKIP;V8 EQ 00
0264 239E DO 039E
0266 230C DO 030C
0268 3800 SKIP;V8 EQ 00
026A 239E DO 039E
026C 6102 V1=02
026E F118 TONE=V1
0270 1250 GO 0250
0272 690F V9=0F
0274 E99E SKIP;V9 EQ KEY
0276 1250 GO 0250
0278 3800 SKIP;V8 EQ 00
027A 22EC DO 02EC
```

```

027C 7C80 VC+80
027E 3800 SKIP;V8 EQ 00
0280 22EC D0 02EC
0282 6118 V1=18
0284 F118 TONE=V1
0286 E9A1 SKIP;V9 NE KEY
0288 1286 GO 0286
028A 1250 GO 0250
028C 3800 SKIP;V8 EQ 00
028E 237E D0 037E
0290 23A8 D0 03A8
0292 3100 SKIP;V1 EQ 00
0294 1250 GO 0250
0296 83A0 V3=VA
0298 8480 V4=VB
029A 6900 V9=00
029C 23D0 D0 03D0
029E 4200 SKIP;V2 NE 00
02A0 1250 GO 0250
02A2 2394 D0 0394
02A4 A2DA I=02DA
02A6 D343 SHOW 3MI@V3V4
02A8 3C00 SKIP;VC EQ 00
02AA 12B0 GO 02B0
02AC A2D7 I=02D7
02AE D343 SHOW 3MI@V3V4
02B0 3C00 SKIP;VC EQ 00
02B2 12B8 GO 02B8
02B4 7D01 VD+01
02B6 12BA GO 02BA
02B8 7E01 VE+01
02BA 23FA D0 03FA
02BC 23D0 D0 03D0
02BE 3200 SKIP;V2 EQ 00
02C0 12BA GO 02BA
02C2 2394 D0 0394
02C4 81D0 V1=VD
02C6 81E4 V1=V1+VE
02C8 3140 SKIP;V1 EQ 40
02CA 1278 GO 0278
02CC 242E D0 042E
02CE 242E D0 042E
02D0 2388 D0 0388
02D2 242E D0 042E
02D4 12CC GO 02CC
02D6 0100
02D8 4000
02DA E9A0
02DC E0D4
02DE 610B V1=0B
02E0 D013 SHOW 3MI@V0V1
02E2 7004 V0+04
02E4 D013 SHOW 3MI@V0V1
02E6 7004 V0+04
02E8 D013 SHOW 3MI@V0V1
02EA 00EE RET
02EC A440 I=0440
02EE 3C00 SKIP;VC EQ 00
02F0 1306 GO 0306
02F2 6502 V5=02
02F4 FD33 MI=VD(3DD)
02F6 6604 V6=04
02F8 F265 V0:V2=MI
02FA F129 I=V1(LSDP)
02FC D565 SHOW 5MI@V5V6
02FE 7507 V5+07
0300 F229 I=V2(LSDP)
0302 D565 SHOW 5MI@V5V6
0304 00EE RET
0306 6534 V5=34
0308 FE33 MI=VE(3DD)
030A 12F6 GO 02F6
030C 6700 V7=00
030E 4909 SKIP;V9 NE 09
0310 1372 GO 0372
0312 4908 SKIP;V9 NE 08
0314 135E GO 035E
0316 4907 SKIP;V9 NE 07
0318 1366 GO 0366
031A 4906 SKIP;V9 NE 06
031C 1356 GO 0356
031E 4904 SKIP;V9 NE 04
0320 134E GO 034E
0322 4903 SKIP;V9 NE 03
0324 1342 GO 0342
0326 4901 SKIP;V9 NE 01
0328 1336 GO 0336
032A 4B00 SKIP;VB NE 00
032C 1332 GO 0332
032E 7BFC VB+FC
0330 00EE RET
0332 67FF V7=FF
0334 00EE RET
0336 4B00 SKIP;VB NE 00
0338 1332 GO 0332
033A 4A11 SKIP;VA NE 11
033C 1332 GO 0332
033E 7AFC VA+FC
0340 132E GO 032E
0342 4B00 SKIP;VB NE 00
0344 1332 GO 0332
0346 4A2D SKIP;VA NE 2D
0348 1332 GO 0332
034A 7A04 VA+04
034C 132E GO 032E
034E 4A11 SKIP;VA NE 11
0350 1332 GO 0332
0352 7AFC VA+FC
0354 00EE RET
0356 4A2D SKIP;VA NE 2D
0358 1332 GO 0332
035A 7A04 VA+04
035C 00EE RET
035E 4B1C SKIP;VB NE 1C

```



```

0360 1332 GO 0332
0362 7B04 VB+04
0364 00EE RET
0366 4B1C SKIP;VB NE 1C
0368 1332 GO 0332
036A 4A11 SKIP;VA NE 11
036C 1332 GO 0332
036E 7AFC VA+FC
0370 1362 GO 0362
0372 4B1C SKIP;VB NE 1C
0374 1332 GO 0332
0376 4A2D SKIP;VA NE 2D
0378 1332 GO 0332
037A 7A04 VA+04
037C 1362 GO 0362
037E 2388 DO 0388
0380 22EC DO 02EC
0382 239E DO 039E
0384 7880 V8+80
0386 00EE RET
0388 6110 V1=10
038A F115 TIME=V1
038C F107 V1=TIME
038E 3100 SKIP;V1 EQ 00
0390 138C GO 038C
0392 00EE RET
0394 22EC DO 02EC
0396 7C80 VC+80
0398 22EC DO 02EC
039A 7C80 VC+80
039C 00EE RET
039E A2D7 I=02D7
03A0 DAB3 SHOW 3MI@VAVB
03A2 00EE RET
03A4 A2DA I=02DA
03A6 13A0 GO 03A0
03A8 23A4 DO 03A4
03AA 81F0 V1=VF
03AC 23A4 DO 03A4
03AE 4100 SKIP;V1 NE 00
03B0 13CC GO 03CC
03B2 239E DO 039E
03B4 81F0 V1=VF
03B6 239E DO 039E
03B8 3100 SKIP;V1 EQ 00
03BA 13C4 GO 03C4
03BC 3C00 SKIP;VC EQ 00
03BE 13C8 GO 03C8
03C0 6180 V1=80
03C2 00EE RET
03C4 3C00 SKIP;VC EQ 00
03C6 13C0 GO 03C0
03C8 61FF V1=FF
03CA 00EE RET
03CC 6100 V1=00
03CE 00EE RET

```

```

03D0 8A30 VA=V3
03D2 8B40 VB=V4
03D4 7901 V9+01
03D6 4905 SKIP;V9 NE 05
03D8 7901 V9+01
03DA 6200 V2=00
03DC 490A SKIP;V9 NE 0A
03DE 00EE RET
03E0 230C DO 030C
03E2 23A8 DO 03A8
03E4 4100 SKIP;V1 NE 00
03E6 13D0 GO 03D0
03E8 3180 SKIP;V1 EQ 80
03EA 13F2 GO 03F2
03EC 3200 SKIP;V2 EQ 00
03EE 00EE RET
03F0 13D0 GO 03D0
03F2 47FF SKIP;V7 NE FF
03F4 13D0 GO 03D0
03F6 7201 V2+01
03F8 13E0 GO 03E0
03FA 8190 V1=V9
03FC 690A V9=0A
03FE 8915 V9=V9-V1
0400 230C DO 030C
0402 81A0 V1=VA
0404 8135 V1=V1-V3
0406 3100 SKIP;V1 EQ 00
0408 141A GO 041A
040A 81B0 V1=VB
040C 8145 V1=V1-V4
040E 3100 SKIP;V1 EQ 00
0410 141A GO 041A
0412 8190 V1=V9
0414 690A V9=0A
0416 8915 V9=V9-V1
0418 00EE RET
041A 239E DO 039E
041C 3C00 SKIP;VC EQ 00
041E 1426 GO 0426
0420 7D01 VD+01
0422 7EFF VE+FF
0424 142A GO 042A
0426 7DFF VD+FF
0428 7E01 VE+01
042A 242E DO 042E
042C 1400 GO 0400
042E 6104 V1=04
0430 F118 TONE=V1
0432 2388 DO 0388
0434 00EE RET
0436 1424 GO 0424
0438 4A2D SKIP;VA NE 2D
043A 1424 GO 0424
043C 7A04 VA+04
043E 1420 GO 0420

```

7. VIP Bowling

Bowling is a great game for recreation and competition requiring skill and a little bit of luck. This program simulates bowling closely with regular scoring and the option of using three different spins on the ball.

How To Play VIP Bowling

1. Load the CHIP-8 interpreter at 0000-01FF and the game starting at 0200.
2. Turn RUN switch on.
3. Up to 6 persons can compete. Make the choice by pressing KEY 1, 2, 3, 4, 5, or 6. The players will be referred to as A, B, C, D, E, and F.
4. It is possible to play up to 10 frames in one game. Make your choice of the number of frames by pressing KEY 1, 2, 3, 5, 6, 7, 8, 9, or 0 (for 10 frames).
5. It is possible to choose 3 ball speeds (KEY 1, 2, or 3). The speed option only affects the ball after it is released.
6. At the start of a player's turn, the video will display whose turn it is and whether he is working on a spare, strike, 2 strikes, or nothing.

```

0200 6314 V3=14
0202 6400 V4=00
0204 255E D0 055E
0206 6005 V0=05
0208 25B4 D0 05B4
020A 630C V3=0C
020C 25BC D0 05BC
020E 6906 V9=06
0210 89B5 V9=V9-VB
0212 3B00 SKIP;VB EQ 00
0214 4F00 SKIP;VF NE 00
0216 120C GO 020C
0218 FB29 I=VB(LSDP)
021A D345 SHOW 5MV3V4
021C 8DB0 VD=VB
021E 7D09 VD+09
0220 6314 V3=14
0222 640C V4=0C
0224 257A D0 057A
0226 6005 V0=05
0228 25B4 D0 05B4
022A 630C V3=0C
022C 25BC D0 05BC
022E 6909 V9=09
0230 89B5 V9=V9-VB
0232 4F00 SKIP;VF NE 00
0234 122C GO 022C
0236 FB29 I=VB(LSDP)

```

Release the ball by pressing one of the following keys: KEY 1, 2, 3, 5, 7, 8, or 9.

—KEY 5 will cause a straight ball.

—KEY 1, 2, and 3 will cause the ball to spin up—KEY 1 before the first pin, KEY 2 after the first pin, and KEY 3 after the second pin.

—KEY 7, 8, and 9 will cause the ball to spin down—KEY 7 before the first pin, KEY 8 after the first pin, KEY 9 after the second pin.

7. After the player's turn ends, the video will display whose turn it was, the frame, and the score. The next player follows the instructions at 6 above.

8. After all players have had their turn in a frame, the video will display the total of each player and whether he is working on a spare, 1 strike, 2 strikes, or nothing. It will display the frame number and the total number of frames to go (unless the last frame was played).

After pressing any key, player A can start in the next frame. Continue with instruction 6 above.

9. If all frames in the game have been finished, press any key again. The players who are still working on a spare will receive 1 more ball, and those working on 1 or 2 strikes will receive 2 balls.

10. After all players have finished the game the final score will be displayed.

```

0238 D345 SHOW 5MV3V4
023A 3B00 SKIP;VB EQ 00
023C 1246 GO 0246
023E 6B0A VB=0A
0240 6307 V3=07
0242 6001 V0=01
0244 25B4 D0 05B4
0246 80B0 V0=VB
0248 A6A6 I=06A6
024A F055 MI=V0:V0
024C 6E00 VE=00
024E 6314 V3=14
0250 6418 V4=18
0252 6005 V0=05
0254 25B4 D0 05B4
0256 A64A I=064A
0258 25B6 D0 05B6
025A 600E V0=0E
025C 25B4 D0 05B4
025E 25B4 D0 05B4
0260 600D V0=0D
0262 25B4 D0 05B4
0264 630C V3=0C
0266 25BC D0 05BC
0268 6903 V9=03
026A 89B5 V9=V9-VB
026C 3B00 SKIP;VB EQ 00

```

```

026E 4F00 SKIP;VF NE 00
0270 1266 GO 0266
0272 FB29 I=VB(LSDP)
0274 D345 SHOW 5MV3V4
0276 6000 V0=00
0278 4B02 SKIP;VB NE 02
027A 6004 V0=04
027C 4B01 SKIP;VB NE 01
027E 6008 V0=08
0280 A4A9 I=04A9
0282 F055 MI=V0:V0
0284 25DE DO 05DE
0286 A694 I=0694
0288 6000 V0=00
028A 6100 V1=00
028C F055 MI=V0:V0
028E 7101 V1+01
0290 3112 SKIP;V1 EQ 12
0292 128C GO 028C
0294 6C0A VC=0A
0296 7E01 VE+01
0298 2608 DO 0608
029A 6A00 VA=00
029C 2376 DO 0376
029E 6300 V3=00
02A0 6410 V4=10
02A2 255E DO 055E
02A4 25C6 DO 05C6
02A6 80C0 V0=VC
02A8 25B4 DO 05B4
02AA 6302 V3=02
02AC 641B V4=1B
02AE 257A DO 057A
02B0 25C6 DO 05C6
02B2 80E0 V0=VE
02B4 2596 DO 0596
02B6 6330 V3=30
02B8 6400 V4=00
02BA A67C I=067C
02BC D349 SHOW 9MV3V4
02BE 7308 V3+08
02C0 D349 SHOW 9MV3V4
02C2 A696 I=0696
02C4 FC1E I=I+VC
02C6 F065 V0:V0=MI
02C8 6401 V4=01
02CA 3001 SKIP;V0 EQ 01
02CC 12EA GO 02EA
02CE 6339 V3=39
02D0 A66F I=066F
02D2 D347 SHOW 7MV3V4
02D4 A6A7 I=06A7
02D6 F065 V0:V0=MI
02D8 6332 V3=32
02DA 6402 V4=02

```

```

02DC 25B4 DO 05B4
02DE 12F4 GO 02F4
02E0 633A V3=3A
02E2 6402 V4=02
02E4 FB29 I=VB(LSDP)
02E6 D345 SHOW 5MV3V4
02E8 12D4 GO 02D4
02EA 4000 SKIP;V0 NE 00
02EC 12E0 GO 02E0
02EE 6331 V3=31
02F0 A675 I=0675
02F2 D347 SHOW 7MV3V4
02F4 25DE DO 05DE
02F6 9CD0 SKIP;VC NE VD
02F8 12FE GO 02FE
02FA 7C01 VC+01
02FC 1298 GO 0298
02FE 00E0 ERASE
0300 6300 V3=00
0302 6400 V4=00
0304 257A DO 057A
0306 25C6 DO 05C6
0308 80E0 V0=VE
030A 300E SKIP;V0 EQ 0E
030C 1312 GO 0312
030E 25B4 DO 05B4
0310 1314 GO 0314
0312 2596 DO 0596
0314 6C0A VC=0A
0316 6300 V3=00
0318 7409 V4+09
031A 80C0 V0=VC
031C 25B4 DO 05B4
031E 25C6 DO 05C6
0320 A68A I=068A
0322 FC1E I=I+VC
0324 F065 V0:V0=MI
0326 8500 V5=V0
0328 A690 I=0690
032A FC1E I=I+VC
032C F065 V0:V0=MI
032E 2598 DO 0598
0330 25F4 DO 05F4
0332 9CD0 SKIP;VC NE VD
0334 1344 GO 0344
0336 7C01 VC+01
0338 6924 V9=24
033A 8935 V9=V9-V3
033C 3F01 SKIP;VF EQ 01
033E 1316 GO 0316
0340 6325 V3=25
0342 131A GO 031A
0344 6337 V3=37
0346 6400 V4=00
0348 4E0E SKIP;VE NE 0E

```

```
034A 134A GO 034A
034C A6A6 I=06A6
034E F065 V0:V0=MI
0350 9E00 SKIP;VE NE V0
0352 135A GO 035A
0354 2596 DO 0596
0356 F90A V9=KEY
0358 1294 GO 0294
035A F90A V9=KEY
035C 6E0E VE=0E
035E 6C0A VC=0A
0360 2608 DO 0608
0362 4000 SKIP;V0 NE 00
0364 136E GO 036E
0366 6A00 VA=00
0368 4001 SKIP;V0 NE 01
036A 6A01 VA=01
036C 2376 DO 0376
036E 9CD0 SKIP;VC NE VD
0370 12FE GO 02FE
0372 7C01 VC+01
0374 1360 GO 0360
0376 25DE DO 05DE
0378 00E0 ERASE
037A A684 I=0684
037C 6200 V2=00
037E 6100 V1=00
0380 D121 SHOW 1MV1V2
0382 7108 V1+08
0384 3140 SKIP;V1 EQ 40
0386 1380 GO 0380
0388 721F V2+1F
038A 421F SKIP;V2 NE 1F
038C 137E GO 037E
038E A685 I=0685
0390 6100 V1=00
0392 6201 V2=01
0394 D12F SHOW FMV1V2
0396 6210 V2=10
0398 D12F SHOW FMV1V2
039A A647 I=0647
039C 6127 V1=27
039E 620E V2=0E
03A0 D124 SHOW 4MV1V2
03A2 6120 V1=20
03A4 620A V2=0A
03A6 2590 DO 0590
03A8 D124 SHOW 4MV1V2
03AA 6133 V1=33
03AC 6206 V2=06
03AE 2590 DO 0590
03B0 2590 DO 0590
03B2 D124 SHOW 4MV1V2
03B4 6139 V1=39
03B6 6202 V2=02
03B8 2590 DO 0590
03BA 2590 DO 0590
03BC 2590 DO 0590
03BE D124 SHOW 4MV1V2
03C0 6B00 VB=00
03C2 A642 I=0642
03C4 6101 V1=01
03C6 620E V2=0E
03C8 631A V3=1A
03CA 6401 V4=01
03CC D125 SHOW 5MV1V2
03CE 6822 V8=22
03D0 6902 V9=02
03D2 6501 V5=01
03D4 E5A1 SKIP;V5 NE KEY
03D6 1410 GO 0410
03D8 6502 V5=02
03DA E5A1 SKIP;V5 NE KEY
03DC 1414 GO 0414
03DE 6503 V5=03
03E0 E5A1 SKIP;V5 NE KEY
03E2 1418 GO 0418
03E4 6505 V5=05
03E6 E5A1 SKIP;V5 NE KEY
03E8 141C GO 041C
03EA 6507 V5=07
03EC E5A1 SKIP;V5 NE KEY
03EE 1422 GO 0422
03F0 6508 V5=08
03F2 E5A1 SKIP;V5 NE KEY
03F4 1420 GO 0420
03F6 6509 V5=09
03F8 E5A1 SKIP;V5 NE KEY
03FA 141E GO 041E
03FC D125 SHOW 5MV1V2
03FE 9230 SKIP;V2 NE V3
0400 1406 GO 0406
0402 8244 V2=V2+V4
0404 13CC GO 03CC
0406 3401 SKIP;V4 EQ 01
0408 13C8 GO 03C8
040A 6301 V3=01
040C 64FF V4=FF
040E 13CC GO 03CC
0410 79FC V9+FC
0412 1422 GO 0422
0414 79FC V9+FC
0416 1420 GO 0420
0418 79FC V9+FC
041A 141E GO 041E
041C 79FE V9+FE
041E 7809 V8+09
0420 7809 V8+09
0422 25EE DO 05EE
0424 248E DO 048E
```

```

0426 A690 I=0690
0428 FC1E I=I+VC
042A F065 V0:V0=MI
042C 8800 V8=V0
042E A696 I=0696
0430 FC1E I=I+VC
0432 F065 V0:V0=MI
0434 8900 V9=V0
0436 3A00 SKIP;VA EQ 00
0438 1466 GO 0466
043A 4903 SKIP;V9 NE 03
043C 1458 GO 0458
043E 3900 SKIP;V9 EQ 00
0440 145C GO 045C
0442 2626 DO 0626
0444 4B0A SKIP;VB NE 0A
0446 1484 GO 0484
0448 2614 DO 0614
044A A6A7 I=06A7
044C 80B0 V0=VB
044E F055 MI=V0:V0
0450 7A01 VA+01
0452 3B0A SKIP;VB EQ 0A
0454 13C0 GO 03C0
0456 139A GO 039A
0458 2626 DO 0626
045A 79FF V9+FF
045C 2626 DO 0626
045E 79FF V9+FF
0460 3E0E SKIP;VE EQ 0E
0462 1442 GO 0442
0464 1448 GO 0448
0466 4901 SKIP;V9 NE 01
0468 147A GO 047A
046A 2626 DO 0626
046C A6A7 I=06A7
046E F065 V0:V0=MI
0470 80B4 V0=V0+VB
0472 400A SKIP;V0 NE 0A
0474 1486 GO 0486
0476 25DE DO 05DE
0478 1488 GO 0488
047A 2626 DO 0626
047C 79FF V9+FF
047E 3E0E SKIP;VE EQ 0E
0480 146A GO 046A
0482 1476 GO 0476
0484 7901 V9+01
0486 7901 V9+01
0488 2614 DO 0614
048A 00E0 ERASE
048C 00EE RET
048E 6300 V3=00
0490 6F00 VF=00
0492 3F00 SKIP;VF EQ 00

```

```

0494 14AE GO 04AE
0496 D125 SHOW 5MV1V2
0498 5180 SKIP;V1 EQ V8
049A 149E GO 049E
049C 8390 V3=V9
049E 7103 V1+03
04A0 8234 V2=V2+V3
04A2 413D SKIP;V1 NE 3D
04A4 00EE RET
04A6 D125 SHOW 5MV1V2
04A8 6000 V0=00
04AA 25E0 DO 05E0
04AC 1492 GO 0492
04AE D125 SHOW 5MV1V2
04B0 6627 V6=27
04B2 6702 V7=02
04B4 642A V4=2A
04B6 8415 V4=V4-V1
04B8 3F00 SKIP;VF EQ 00
04BA 14F8 GO 04F8
04BC 6430 V4=30
04BE 8415 V4=V4-V1
04C0 3F00 SKIP;VF EQ 00
04C2 14CE GO 04CE
04C4 6436 V4=36
04C6 8415 V4=V4-V1
04C8 3F00 SKIP;VF EQ 00
04CA 14F6 GO 04F6
04CC 760C V6+0C
04CE 7606 V6+06
04D0 4200 SKIP;V2 NE 00
04D2 1514 GO 0514
04D4 6405 V4=05
04D6 8425 V4=V4-V2
04D8 3F00 SKIP;VF EQ 00
04DA 1522 GO 0522
04DC 640D V4=0D
04DE 8425 V4=V4-V2
04E0 3F00 SKIP;VF EQ 00
04E2 151E GO 051E
04E4 6415 V4=15
04E6 8425 V4=V4-V2
04E8 3F00 SKIP;VF EQ 00
04EA 151A GO 051A
04EC 641A V4=1A
04EE 8425 V4=V4-V2
04F0 3F00 SKIP;VF EQ 00
04F2 1516 GO 0516
04F4 1514 GO 0514
04F6 760C V6+0C
04F8 4200 SKIP;V2 NE 00
04FA 1514 GO 0514
04FC 6409 V4=09
04FE 8425 V4=V4-V2
0500 3F00 SKIP;VF EQ 00

```

```
0502 1520 GO 0520
0504 6411 V4=11
0506 8425 V4=V4-V2
0508 3F00 SKIP;VF EQ 00
050A 151C GO 051C
050C 6419 V4=19
050E 8425 V4=V4-V2
0510 3F00 SKIP;VF EQ 00
0512 1518 GO 0518
0514 15EE GO 05EE
0516 7704 V7+04
0518 7704 V7+04
051A 7704 V7+04
051C 7704 V7+04
051E 7704 V7+04
0520 7704 V7+04
0522 A647 I=0647
0524 D674 SHOW 4MV6V7
0526 3F00 SKIP;VF EQ 00
0528 1530 GO 0530
052A D674 SHOW 4MV6V7
052C A642 I=0642
052E 1498 GO 0498
0530 7B01 VB+01
0532 25EA DO 05EA
0534 C007 V0=RND
0536 8004 V0=V0+V0
0538 B53A GO 053A+V0
053A 1550 GO 0550
053C 154E GO 054E
053E 154A GO 054A
0540 1548 GO 0548
0542 1550 GO 0550
0544 154E GO 054E
0546 154A GO 054A
0548 7710 V7+10
054A 77F8 V7+F8
054C 1554 GO 0554
054E 7708 V7+08
0550 77FC V7+FC
0552 7606 V6+06
0554 641B V4=1B
0556 8475 V4=V4-V7
0558 3F00 SKIP;VF EQ 00
055A 1522 GO 0522
055C 152C GO 052C
055E A64A I=064A
0560 25B6 DO 05B6
0562 A64D I=064D
0564 D345 SHOW 5MV3V4
0566 7304 V3+04
0568 600A V0=0A
056A 25B4 DO 05B4
056C A652 I=0652
056E D345 SHOW 5MV3V4
0570 7304 V3+04
0572 600E V0=0E
0574 25B4 DO 05B4
0576 A65A I=065A
0578 15B6 GO 05B6
057A 600F V0=0F
057C 25B4 DO 05B4
057E A65A I=065A
0580 25B6 DO 05B6
0582 600A V0=0A
0584 25B4 DO 05B4
0586 A65F I=065F
0588 D345 SHOW 5MV3V4
058A 7306 V3+06
058C 600E V0=0E
058E 15B4 GO 05B4
0590 D124 SHOW 4MV1V2
0592 7208 V2+08
0594 00EE RET
0596 6500 V5=00
0598 A6A8 I=06A8
059A F033 MI=V0(3DD)
059C F265 V0:V2=MI
059E 8050 V0=V5
05A0 3000 SKIP;V0 EQ 00
05A2 15AA GO 05AA
05A4 3100 SKIP;V1 EQ 00
05A6 15AC GO 05AC
05A8 15B0 GO 05B0
05AA 25B4 DO 05B4
05AC 8010 V0=V1
05AE 25B4 DO 05B4
05B0 8020 V0=V2
05B2 15B4 GO 05B4
05B4 F029 I=V0(LSDP)
05B6 D345 SHOW 5MV3V4
05B8 7305 V3+05
05BA 00EE RET
05BC A664 I=0664
05BE D347 SHOW 7MV3V4
05C0 FB0A VB=KEY
05C2 D347 SHOW 7MV3V4
05C4 00EE RET
05C6 A66B I=066B
05C8 D344 SHOW 4MV3V4
05CA 7302 V3+02
05CC 00EE RET
05CE A656 I=0656
05D0 D342 SHOW 2MV3V4
05D2 7303 V3+03
05D4 00EE RET
05D6 A658 I=0658
05D8 15D0 GO 05D0
05DA 6040 V0=40
05DC 15E0 GO 05E0
```

05DE 60A0 V0=A0	063A FC1E I=I+VC
05E0 F015 TIME=V0	063C F055 MI=V0:V0
05E2 F007 V0=TIME	063E 789C V8+9C
05E4 3000 SKIP;V0 EQ 00	0640 00EE RET
05E6 15E2 GO 05E2	0642 F8F8
05E8 00EE RET	0644 F8F8
05EA 6001 V0=01	0646 F8F0
05EC 15F0 GO 05F0	0648 9090
05EE 6008 V0=08	064A F090
05F0 F018 TONE=V0	064C F080
05F2 00EE RET	064E 8080
05F4 A696 I=0696	0650 80E0
05F6 FC1E I=I+VC	0652 A0A0
05F8 F065 V0:V0=MI	0654 E040
05FA 4000 SKIP;V0 NE 00	0656 4080
05FC 00EE RET	0658 C0C0
05FE 4001 SKIP;V0 NE 01	065A F090
0600 15CE GO 05CE	065C F0A0
0602 4003 SKIP;V0 NE 03	065E 90D8
0604 25D6 DO 05D6	0660 A888
0606 15D6 GO 05D6	0662 8888
0608 00E0 ERASE	0664 F090
060A FC29 I=VC(LSDP)	0666 1070
060C 631E V3=1E	0668 4000
060E 640D V4=0D	066A 4000
0610 25B6 DO 05B6	066C 8000
0612 15F4 GO 05F4	066E 8000
0614 A690 I=0690	0670 040C
0616 FC1E I=I+VC	0672 1C3C
0618 8080 V0=V8	0674 7CFC
061A F055 MI=V0:V0	0676 FCFC
061C A696 I=0696	0678 FCFC
061E FC1E I=I+VC	067A FCFC
0620 8090 V0=V9	067C FF81
0622 F055 MI=V0:V0	067E 8181
0624 00EE RET	0680 8181
0626 88B4 V8=V8+VB	0682 8181
0628 6063 V0=63	0684 FF80
062A 8085 V0=V0-V8	0686 8080
062C 3F00 SKIP;VF EQ 00	0688 8080
062E 00EE RET	068A 8080
0630 A68A I=068A	068C 8080
0632 FC1E I=I+VC	068E 8080
0634 F065 V0:V0=MI	0690 8080
0636 7001 V0+01	0692 8080
0638 A68A I=068A	

8. VIP Deflection





In the VIP DEFLECTION game you position mirrors anywhere on the display screen. The object of the game is to deflect a ball off the mirrors a maximum number of times before hitting the target.

The number of deflections times the target number gives you deflection points. These are added to your previous point total. If you fail to hit the target you get no points. The winner of the game is the player who accumulates 257 or more deflection points.

How To Play VIP Deflection

1. Load the CHIP-8 interpreter at 0000-01FF and the game starting at 0200.
2. Turn RUN switch on.
3. After the scores appear a letter, the target with a number, and the ball. The letter signifies the player who will program the mirrors. This sequence will be repeated until there is a winner.
4. To program the mirrors select the proper mirror type by using Table 1 as a guide. Key 1 will place a horizontal mirror on the board. Key 2 selects a vertical mirror, Key 3 a slant-left mirror, and Key 4 a slant-right mirror.

Table 1 — Mirror Types

KEY SELECTION	MIRROR
1	
2	
3	
4	

92CS-31182

5. After a mirror has been selected you may position the mirror by using keys 1 through 4 and 6 through 9 (see Table 2 for movement of a mirror). Once a mirror has been selected and positioned it may be fixed into position by pressing key 5.

Table 2 — Mirror Positioning and Ball Direction

Key Selection	Positioning and Direction
1	up and to the left
2	up
3	up and to the right
4	left
6	right
7	down and to the left
8	down
9	down and to the right

6. You may position up to 10 mirrors on the game board. After you have the maximum amount on the board you must press key 0 to progress to the fire mode. If you wish to progress to the fire mode with less than 10 mirrors programmed you may do so by pressing key 0. You fire the ball in the direction you want by using keys 1 through 4 and keys 6 through 9 (see Table 2).

7. After the ball has reached the target or leaves the game board, the player's score is computed and displayed and a new ball and target appear.


```

0200 6A00 VA=00
0202 6B00 VB=00
0204 680A V8=0A
0206 6C01 VC=01
0208 6D01 VD=01
020A 6E0A VE=0A
020C 6750 V7=50
020E 6900 V9=00
0210 2400 DO 0400
0212 6490 V4=90
0214 243E DO 043E
0216 00E0 ERASE
0218 C037 V0=RND
021A C117 V1=RND
021C A54C I=054C
021E F155 MI=V0:V1
0220 A530 I=0530
0222 D017 SHOW 7MV0V1
0224 1228 GO 0228
0226 D011 SHOW 1MV0V1
0228 C03F V0=RND
022A C11F V1=RND
022C A54E I=054E
022E F155 MI=V0:V1
0230 A548 I=0548
0232 D011 SHOW 1MV0V1
0234 3F00 SKIP;VF EQ 00
0236 1226 GO 0226
0238 A54C I=054C
023A F165 V0:V1=MI
023C 7001 V0+01
023E 7101 V1+01
0240 84C0 V4=VC
0242 3E0A SKIP;VE EQ 0A
0244 84D0 V4=VD
0246 F429 I=V4(LSDP)
0248 D015 SHOW 5MV0V1
024A 124E GO 024E
024C D015 SHOW 5MV0V1
024E C038 V0=RND
0250 C118 V1=RND
0252 FE29 I=VE(LSDP)
0254 D015 SHOW 5MV0V1
0256 3F00 SKIP;VF EQ 00
0258 124C GO 024C
025A 64A0 V4=A0
025C 243E DO 043E
025E D015 SHOW 5MV0V1
0260 F20A V2=KEY
0262 4200 SKIP;V2 NE 00
0264 12C8 GO 02C8
0266 4932 SKIP;V9 NE 32
0268 1260 GO 0260
026A A537 I=0537
026C 4201 SKIP;V2 NE 01
026E 1282 GO 0282
0270 A53C I=053C
0272 4202 SKIP;V2 NE 02
0274 1282 GO 0282
0276 A540 I=0540
0278 4203 SKIP;V2 NE 03
027A 1282 GO 0282
027C A544 I=0544
027E 3204 SKIP;V2 EQ 04
0280 1260 GO 0260
0282 601E V0=1E
0284 610E V1=0E
0286 D015 SHOW 5MV0V1
0288 6405 V4=05
028A 243E DO 043E
028C D015 SHOW 5MV0V1
028E 6309 V3=09
0290 E3A1 SKIP;V3 NE KEY
0292 129C GO 029C
0294 73FF V3+FF
0296 3300 SKIP;V3 EQ 00
0298 1290 GO 0290
029A 1286 GO 0286
029C 4305 SKIP;V3 NE 05
029E 12C0 GO 02C0
02A0 2448 DO 0448
02A2 40FF SKIP;V0 NE FF
02A4 6000 V0=00
02A6 41FF SKIP;V1 NE FF
02A8 6100 V1=00
02AA 643C V4=3C
02AC 4202 SKIP;V2 NE 02
02AE 6440 V4=40
02B0 9040 SKIP;V0 NE V4
02B2 70FF V0+FF
02B4 641C V4=1C
02B6 4201 SKIP;V2 NE 01
02B8 6420 V4=20
02BA 9140 SKIP;V1 NE V4
02BC 71FF V1+FF
02BE 1286 GO 0286
02C0 F30A V3=KEY
02C2 247A DO 047A
02C4 7905 V9+05
02C6 1260 GO 0260
02C8 6700 V7=00
02CA F30A V3=KEY
02CC 4300 SKIP;V3 NE 00
02CE 12CA GO 02CA
02D0 4305 SKIP;V3 NE 05
02D2 12CA GO 02CA
02D4 6409 V4=09
02D6 8435 V4=V4-V3
02D8 3F01 SKIP;VF EQ 01
02DA 12CA GO 02CA

```

```
02DC A54E I=054E
02DE F165 V0:V1=MI
02E0 A548 I=0548
02E2 D011 SHOW 1MV0V1
02E4 2448 DO 0448
02E6 40FF SKIP;V0 NE FF
02E8 1358 GO 0358
02EA 41FF SKIP;V1 NE FF
02EC 1358 GO 0358
02EE 4040 SKIP;V0 NE 40
02F0 1358 GO 0358
02F2 4120 SKIP;V1 NE 20
02F4 1358 GO 0358
02F6 D011 SHOW 1MV0V1
02F8 4F01 SKIP;VF NE 01
02FA 1302 GO 0302
02FC 6405 V4=05
02FE 243E DO 043E
0300 12E2 GO 02E2
0302 D011 SHOW 1MV0V1
0304 24A4 DO 04A4
0306 4200 SKIP;V2 NE 00
0308 1310 GO 0310
030A 24C0 DO 04C0
030C D011 SHOW 1MV0V1
030E 12E2 GO 02E2
0310 4700 SKIP;V7 NE 00
0312 1358 GO 0358
0314 A54C I=054C
0316 F165 V0:V1=MI
0318 A530 I=0530
031A 6305 V3=05
031C 6415 V4=15
031E D017 SHOW 7MV0V1
0320 F418 TONE=V4
0322 D017 SHOW 7MV0V1
0324 243E DO 043E
0326 73FF V3+FF
0328 3300 SKIP;V3 EQ 00
032A 131C GO 031C
032C 3E0A SKIP;VE EQ 0A
032E 133E GO 033E
0330 80C0 V0=VC
0332 24F4 DO 04F4
0334 8A14 VA=VA+V1
0336 4F01 SKIP;VF NE 01
0338 135E GO 035E
033A 7C01 VC+01
033C 134A GO 034A
033E 80D0 V0=VD
0340 24F4 DO 04F4
0342 8B14 VB=VB+V1
0344 4F01 SKIP;VF NE 01
0346 1362 GO 0362
0348 7D01 VD+01
034A 78FF V8+FF
034C 4800 SKIP;V8 NE 00
034E 1364 GO 0364
0350 3E0A SKIP;VE EQ 0A
0352 120A GO 020A
0354 6E0B VE=0B
0356 120C GO 020C
0358 6430 V4=30
035A F418 TONE=V4
035C 134A GO 034A
035E 6AFF VA=FF
0360 1364 GO 0364
0362 6BFF VB=FF
0364 2400 DO 0400
0366 A530 I=0530
0368 9AB0 SKIP;VA NE VB
036A 136A GO 036A
036C 600D V0=0D
036E 6107 V1=07
0370 8BA5 VB=VB-VA
0372 3F00 SKIP;VF EQ 00
0374 602D V0=2D
0376 6440 V4=40
0378 D017 SHOW 7MV0V1
037A 243E DO 043E
037C D017 SHOW 7MV0V1
037E 6440 V4=40
0380 F418 TONE=V4
0382 1376 GO 0376
0384 76AC
0386 7795
0388 CCDC
038A A081
038C 10C0
038E 5544
0390 E42C
0392 07CC
0394 9CD3
0396 4BC8
0398 EE6D
039A 0C40
039C B8DC
039E 8A5C
03A0 B421
03A2 3463
03A4 33B3
03A6 3333
03A8 63B8
03AA 73B3
03AC BB36
03AE 3135
03B0 3233
03B2 327F
03B4 7331
03B6 9337
```

```

03B8 3293
03BA F332
03BC 03B2
03BE 1334
03C0 9BFF
03C2 F2F7
03C4 BF3F
03C6 BBB2
03C8 B6AC
03CA 7FFB
03CC B3BB
03CE BFDD
03D0 F3FF
03D2 B111
03D4 98B5
03D6 7F3F
03D8 BEAF
03DA BBB9
03DC 83AD
03DE EAFB
03E0 CCCE
03E2 CCC8
03E4 ECEC
03E6 DACC
03E8 DCFC
03EA CDCA
03EC CC8C
03EE C8E8
03F0 CEEC
03F2 A8CD
03F4 CACC
03F6 CCC4
03F8 CC6C
03FA CCCC
03FC 8DEC
03FE D9CD
0400 00E0 ERASE
0402 6508 V5=08
0404 6610 V6=10
0406 A549 I=0549
0408 FA33 MI=VA(3DD)
040A F265 V0:V2=MI
040C 242C D0 042C
040E 6528 V5=28
0410 A549 I=0549
0412 FB33 MI=VB(3DD)
0414 F265 V0:V2=MI
0416 242C D0 042C
0418 650E V5=0E
041A 6608 V6=08
041C 600A V0=0A
041E F029 I=V0(LSDP)
0420 D565 SHOW 5MV5V6
0422 652E V5=2E
0424 600B V0=0B

```

```

0426 F029 I=V0(LSDP)
0428 D565 SHOW 5MV5V6
042A 00EE RET
042C F029 I=V0(LSDP)
042E D565 SHOW 5MV5V6
0430 7506 V5+06
0432 F129 I=V1(LSDP)
0434 D565 SHOW 5MV5V6
0436 7506 V5+06
0438 F229 I=V2(LSDP)
043A D565 SHOW 5MV5V6
043C 00EE RET
043E F415 TIME=V4
0440 F407 V4=TIME
0442 3400 SKIP;V4 EQ 00
0444 1440 GO 0440
0446 00EE RET
0448 4303 SKIP;V3 NE 03
044A 7001 V0+01
044C 4306 SKIP;V3 NE 06
044E 7001 V0+01
0450 4309 SKIP;V3 NE 09
0452 7001 V0+01
0454 4301 SKIP;V3 NE 01
0456 70FF V0+FF
0458 4304 SKIP;V3 NE 04
045A 70FF V0+FF
045C 4307 SKIP;V3 NE 07
045E 70FF V0+FF
0460 4307 SKIP;V3 NE 07
0462 7101 V1+01
0464 4308 SKIP;V3 NE 08
0466 7101 V1+01
0468 4309 SKIP;V3 NE 09
046A 7101 V1+01
046C 4301 SKIP;V3 NE 01
046E 71FF V1+FF
0470 4302 SKIP;V3 NE 02
0472 71FF V1+FF
0474 4303 SKIP;V3 NE 03
0476 71FF V1+FF
0478 00EE RET
047A D015 SHOW 5MV0V1
047C A500 I=0500
047E F71E I=I+V7
0480 4201 SKIP;V2 NE 01
0482 6306 V3=06
0484 4202 SKIP;V2 NE 02
0486 6308 V3=08
0488 4203 SKIP;V2 NE 03
048A 6309 V3=09
048C 4204 SKIP;V2 NE 04
048E 6307 V3=07
0490 4204 SKIP;V2 NE 04
0492 7004 V0+04

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0494	6405	V4=05	0502	0208
0496	F255	MI=V0:V2	0504	0309
0498	2448	D0 0448	0506	0701
049A	74FF	V4+FF	0508	0802
049C	3400	SKIP;V4 EQ 00	050A	0903
049E	1496	GO 0496	050C	0103
04A0	770F	V7+0F	050E	0301
04A2	00EE	RET	0510	0406
04A4	8500	V5=V0	0512	0604
04A6	8610	V6=V1	0514	0709
04A8	A550	I=0550	0516	0907
04AA	8490	V4=V9	0518	0204
04AC	F265	V0:V2=MI	051A	0307
04AE	5050	SKIP;V0 EQ V5	051C	0402
04B0	14B6	GO 04B6	051E	0608
04B2	9160	SKIP;V1 NE V6	0520	0703
04B4	00EE	RET	0522	0806
04B6	74FF	V4+FF	0524	0109
04B8	3400	SKIP;V4 EQ 00	0526	0206
04BA	14AC	GO 04AC	0528	0408
04BC	6200	V2=00	052A	0602
04BE	00EE	RET	052C	0804
04C0	8500	V5=V0	052E	0901
04C2	8610	V6=V1	0530	FCFC
04C4	4201	SKIP;V2 NE 01	0532	FCFC
04C6	A500	I=0500	0534	FCFC
04C8	4202	SKIP;V2 NE 02	0536	FCF8
04CA	A50C	I=050C	0538	0000
04CC	4203	SKIP;V2 NE 03	053A	0000
04CE	A518	I=0518	053C	8080
04D0	4204	SKIP;V2 NE 04	053E	8080
04D2	A524	I=0524	0540	8040
04D4	6206	V2=06	0542	2010
04D6	F165	V0:V1=MI	0544	0810
04D8	9300	SKIP;V3 NE V0	0546	2040
04DA	14EA	GO 04EA	0548	8000
04DC	72FF	V2+FF	054A	0000
04DE	3200	SKIP;V2 EQ 00	054C	1113
04E0	14D6	GO 04D6	054E	1409
04E2	8050	V0=V5	0550	1807
04E4	8160	V1=V6	0552	0319
04E6	A548	I=0548	0554	0803
04E8	00EE	RET	0556	1A09
04EA	8310	V3=V1	0558	031B
04EC	6405	V4=05	055A	0A03
04EE	F418	TONE=V4	055C	1C0B
04F0	7701	V7+01	055E	0324
04F2	14E2	GO 04E2	0560	0704
04F4	6100	V1=00	0562	2308
04F6	8104	V1=V1+V0	0564	0422
04F8	77FF	V7+FF	0566	0904
04FA	3700	SKIP;V7 EQ 00	0568	210A
04FC	14F6	GO 04F6	056A	0420
04FE	00EE	RET	056C	0B04
0500	0107		056E	2000

0570 0321
0572 0103
0574 2202
0576 0323
0578 0303
057A 2404
057C 0313
057E 0004
0580 1201
0582 0411
0584 0204
0586 1003
0588 040F
058A 0404
058C 0F0F
058E 0110
0590 0F01
0592 110F
0594 0112
0596 0F01
0598 130F
059A 010C
059C 0404
059E 0B05
05A0 040A
05A2 0604
05A4 0907
05A6 0408
05A8 0804
05AA 1904
05AC 031A
05AE 0503
05B0 1B06
05B2 031C
05B4 0703
05B6 1D08

05B8 0309
05BA 1003
05BC 0A11
05BE 030B
05C0 1203
05C2 0C13
05C4 030D
05C6 1403
05C8 2C10
05CA 032D
05CC 1103
05CE 2E12
05D0 032F
05D2 1303
05D4 3014
05D6 032B
05D8 1703
05DA 2C18
05DC 032D
05DE 1903
05E0 2E1A
05E2 032F
05E4 1B03
05E6 E6ED
05E8 CDCE
05EA 39D5
05EC A950
05EE 4D10
05F0 6C6E
05F2 27E8
05F4 02B3
05F6 A18D
05F8 B5D0
05FA CFBE
05FC DCE6
05FE D14F

9. VIP Animal Race

ANIMAL RACE is a fun game for one person, with an element of luck—sure to put a smile on your face. Five different animals race against one another and you have the chance to test your expertise at picking the winner.

How To Play Animal Race

1. Load the CHIP-8 interpreter at 0000-01FF and the game starting at 0200.
2. Turn RUN switch on.
3. Wait until the animals are lined up and ready to start, then select an animal by pressing a letter A through E. A mark will appear to the left of the animal to remind you of the one you have selected.

4. Decide you much you want to bet (up to a limit of \$9), then press that key.

5. After the race is over press zero (or any key) to start the next race. Your winnings or losses will be computed and the new total displayed at the beginning of the next race.

Hints for Expert Players

All animals move at approximately the same speed but they start from different positions. The odds for each animal are related to the starting position but include a random element. Some races favor the player and you should bet up to the limit on these. Some races are unfavorable and you should bet carefully on these.

You can win the game by accumulating \$256 or more.

```

0200 6D0A VD=0A
0202 6E02 VE=02
0204 680E V8=0E
0206 690B V9=0B
0208 A5B5 I=05B5
020A 2482 DO 0482
020C 682C V8=2C
020E 2484 DO 0484
0210 681D V8=1D
0212 6918 V9=18
0214 2484 DO 0484
0216 6B00 VB=00
0218 6C23 VC=23
021A 2458 DO 0458
021C 24C0 DO 04C0
021E 6821 V8=21
0220 6900 V9=00
0222 A4D8 I=04D8
0224 FB1E I=I+VB
0226 D894 SHOW 4MI@V8V9
0228 FE18 TONE=VE
022A 7B04 VB+04
022C 4B1C SKIP;VB NE 1C
022E 6B04 VB=04
0230 7CFF VC+FF
0232 24C0 DO 04C0
0234 3C00 SKIP;VC EQ 00
0236 121A GO 021A

```

```

0238 00E0 ERASE
023A F918 TONE=V9
023C 2458 DO 0458
023E 24C0 DO 04C0
0240 6A00 VA=00
0242 6B0A VB=0A
0244 A600 I=0600
0246 FA1E I=I+VA
0248 F765 V0:V7=MI
024A 620C V2=0C
024C 7401 V4+01
024E FB29 I=VB(LSDP)
0250 D245 SHOW 5MI@V2V4
0252 6213 V2=13
0254 F329 I=V3(LSDP)
0256 D245 SHOW 5MI@V2V4
0258 6217 V2=17
025A A6A0 I=06A0
025C D245 SHOW 5MI@V2V4
025E 7A08 VA+08
0260 7B01 VB+01
0262 3A28 SKIP;VA EQ 28
0264 1244 GO 0244
0266 6820 V8=20
0268 6902 V9=02
026A A5E2 I=05E2
026C 2480 DO 0480

```

```

026E 6226 V2=26
0270 6308 V3=08
0272 D237 SHOW 7MI@V2V3
0274 A5FD I=05FD
0276 FD33 MI=VD(3DD)
0278 F265 V0:V2=MI
027A 632C V3=2C
027C 6409 V4=09
027E 4000 SKIP;V0 NE 00
0280 1288 GO 0288
0282 F029 I=V0(LSDP)
0284 D345 SHOW 5MI@V3V4
0286 128C GO 028C
0288 4100 SKIP;V1 NE 00
028A 1292 GO 0292
028C F129 I=V1(LSDP)
028E 6331 V3=31
0290 D345 SHOW 5MI@V3V4
0292 F229 I=V2(LSDP)
0294 6336 V3=36
0296 D345 SHOW 5MI@V3V4
0298 A680 I=0680
029A 6824 V8=24
029C 6911 V9=11
029E 2484 DO 0484
02A0 6836 V8=36
02A2 A6A5 I=06A5
02A4 D895 SHOW 5MI@V8V9
02A6 6F0A VF=0A
02A8 FF15 TIME=VF
02AA 244A DO 044A
02AC 3010 SKIP;V0 EQ 10
02AE 12B8 GO 02B8
02B0 FF07 VF=TIME
02B2 3F00 SKIP;VF EQ 00
02B4 12AA GO 02AA
02B6 12A4 GO 02A4
02B8 FE18 TONE=VE
02BA 8C00 VC=V0
02BC 6A09 VA=09
02BE 8AC5 VA=VA-VC
02C0 4F01 SKIP;VF NE 01
02C2 12A4 GO 02A4
02C4 4C0F SKIP;VC NE 0F
02C6 12A4 GO 02A4
02C8 D895 SHOW 5MI@V8V9
02CA 4F00 SKIP;VF NE 00
02CC 12C8 GO 02C8
02CE FC29 I=VC(LSDP)
02D0 D895 SHOW 5MI@V8V9
02D2 24A0 DO 04A0
02D4 A5F6 I=05F6
02D6 632C V3=2C
02D8 6417 V4=17
02DA D347 SHOW 7MI@V3V4
02DC 6336 V3=36
02DE 6418 V4=18
02E0 A6A5 I=06A5
02E2 D345 SHOW 5MI@V3V4
02E4 6F0A VF=0A
02E6 FF15 TIME=VF
02E8 244A DO 044A
02EA 3010 SKIP;V0 EQ 10
02EC 12F6 GO 02F6
02EE FF07 VF=TIME
02F0 3F00 SKIP;VF EQ 00
02F2 12E8 GO 02E8
02F4 12E2 GO 02E2
02F6 FE18 TONE=VE
02F8 8B00 VB=V0
02FA 8AD0 VA=VD
02FC 8AB5 VA=VA-VB
02FE 4F00 SKIP;VF NE 00
0300 12E2 GO 02E2
0302 4B00 SKIP;VB NE 00
0304 12E2 GO 02E2
0306 6A09 VA=09
0308 8AB5 VA=VA-VB
030A 4F00 SKIP;VF NE 00
030C 12E2 GO 02E2
030E D345 SHOW 5MI@V3V4
0310 4F00 SKIP;VF NE 00
0312 130E GO 030E
0314 FB29 I=VB(LSDP)
0316 D345 SHOW 5MI@V3V4
0318 2494 DO 0494
031A 00E0 ERASE
031C 24C0 DO 04C0
031E 24A0 DO 04A0
0320 A4D6 I=04D6
0322 6038 V0=38
0324 6100 V1=00
0326 D011 SHOW 1MI@V0V1
0328 7101 V1+01
032A 3120 SKIP;V1 EQ 20
032C 1326 GO 0326
032E 601E V0=1E
0330 610F V1=0F
0332 6A03 VA=03
0334 FA29 I=VA(LSDP)
0336 D015 SHOW 5MI@V0V1
0338 FE18 TONE=VE
033A 2494 DO 0494
033C 7AFF VA+FF
033E D015 SHOW 5MI@V0V1
0340 3A00 SKIP;VA EQ 00
0342 1334 GO 0334
0344 6A00 VA=00
0346 A600 I=0600
0348 FA1E I=I+VA

```

```

034A F665 V0:V6=MI
034C A600 I=0600
034E FA1E I=I+VA
0350 70FF V0+FF
0352 4000 SKIP;V0 NE 00
0354 135A GO 035A
0356 F055 MI=V0:V0
0358 1372 GO 0372
035A C001 V0=RND
035C 7002 V0+02
035E 9150 SKIP;V1 NE V5
0360 8165 V1=V1-V6
0362 7106 V1+06
0364 7201 V2+01
0366 F255 MI=V0:V2
0368 A500 I=0500
036A F11E I=I+V1
036C D246 SHOW 6MI@V2V4
036E 4238 SKIP;V2 NE 38
0370 1380 GO 0380
0372 7A08 VA+08
0374 4A18 SKIP;VA NE 18
0376 FE18 TONE=VE
0378 3A28 SKIP;VA EQ 28
037A 1346 GO 0346
037C FE18 TONE=VE
037E 1344 GO 0344
0380 F218 TONE=V2
0382 6806 V8=06
0384 6908 V9=08
0386 A5E2 I=05E2
0388 2484 DO 0484
038A 87A6
038C 8776
038E 8776
0390 770A V7+0A
0392 97C0 SKIP;V7 NE VC
0394 13C0 GO 03C0
0396 A694 I=0694
0398 2484 DO 0484
039A 24B2 DO 04B2
039C FB29 I=VB(LSDP)
039E 8DB5 VD=VD-VB
03A0 D895 SHOW 5MI@V8V9
03A2 3D00 SKIP;VD EQ 00
03A4 13EE GO 03EE
03A6 2490 DO 0490
03A8 D895 SHOW 5MI@V8V9
03AA 24B2 DO 04B2
03AC A525 I=0525
03AE 6808 V8=08
03B0 6903 V9=03
03B2 D895 SHOW 5MI@V8V9
03B4 6F10 VF=10
03B6 2496 DO 0496

03B8 D895 SHOW 5MI@V8V9
03BA 89F3
03BC 13B2 GO 03B2
03BE 00EE RET
03C0 A68A I=068A
03C2 2484 DO 0484
03C4 24B2 DO 04B2
03C6 A600 I=0600
03C8 FA1E I=I+VA
03CA F665 V0:V6=MI
03CC 6700 V7=00
03CE 87B4 V7=V7+VB
03D0 73FF V3+FF
03D2 3300 SKIP;V3 EQ 00
03D4 13CE GO 03CE
03D6 A5FD I=05FD
03D8 F733 MI=V7(3DD)
03DA F265 V0:V2=MI
03DC 4100 SKIP;V1 NE 00
03DE 13E4 GO 03E4
03E0 F129 I=V1(LSDP)
03E2 2486 DO 0486
03E4 F229 I=V2(LSDP)
03E6 D895 SHOW 5MI@V8V9
03E8 8D74 VD=VD+V7
03EA 4F01 SKIP;VF NE 01
03EC 140C GO 040C
03EE A600 I=0600
03F0 FA1E I=I+VA
03F2 F665 V0:V6=MI
03F4 A500 I=0500
03F6 F11E I=I+V1
03F8 D245 SHOW 5MI@V2V4
03FA 6F18 VF=18
03FC FF15 TIME=VF
03FE FF07 VF=TIME
0400 244A DO 044A
0402 3010 SKIP;V0 EQ 10
0404 1238 GO 0238
0406 3F00 SKIP;VF EQ 00
0408 13FE GO 03FE
040A 13F8 GO 03F8
040C 2490 DO 0490
040E 00E0 ERASE
0410 640E V4=0E
0412 6200 V2=00
0414 6140 V1=40
0416 A5E2 I=05E2
0418 6806 V8=06
041A 6908 V9=08
041C 2484 DO 0484
041E A68A I=068A
0420 2484 DO 0484
0422 A600 I=0600
0424 F11E I=I+V1

```


0426 D248 SHOW 8MI@V2V4	0494 6F3C VF=3C
0428 7201 V2+01	0496 FF15 TIME=VF
042A 3240 SKIP;V2 EQ 40	0498 FF07 VF=TIME
042C 1436 GO 0436	049A 3F00 SKIP;VF EQ 00
042E 7409 V4+09	049C 1498 GO 0498
0430 3420 SKIP;V4 EQ 20	049E 00EE RET
0432 1412 GO 0412	04A0 A69E I=069E
0434 140E GO 040E	04A2 6800 V8=00
0436 7108 V1+08	04A4 89CE
0438 4178 SKIP;V1 NE 78	04A6 899E
043A 6148 V1=48	04A8 899E
043C 6D07 VD=07	04AA 89C5 V9=V9-VC
043E 8D22 VD=VD&V2	04AC 79BB V9+BB
0440 4D00 SKIP;VD NE 00	04AE D892 SHOW 2MI@V8V9
0442 1416 GO 0416	04B0 00EE RET
0444 6F04 VF=04	04B2 A5F6 I=05F6
0446 2496 DO 0496	04B4 6808 V8=08
0448 1422 GO 0422	04B6 6910 V9=10
044A 6000 V0=00	04B8 D897 SHOW 7MI@V8V9
044C E0A1 SKIP;V0 NE KEY	04BA 6810 V8=10
044E 00EE RET	04BC 6911 V9=11
0450 7001 V0+01	04BE 00EE RET
0452 4010 SKIP;V0 NE 10	04C0 6A00 VA=00
0454 00EE RET	04C2 A600 I=0600
0456 144C GO 044C	04C4 FA1E I=I+VA
0458 A600 I=0600	04C6 F465 V0:V4=MI
045A 6100 V1=00	04C8 A500 I=0500
045C 6604 V6=04	04CA F11E I=I+V1
045E 2466 DO 0466	04CC D246 SHOW 6MI@V2V4
0460 2466 DO 0466	04CE 7A08 VA+08
0462 2466 DO 0466	04D0 3A28 SKIP;VA EQ 28
0464 2466 DO 0466	04D2 14C2 GO 04C2
0466 C001 V0=RND	04D4 00EE RET
0468 7001 V0+01	04D6 0101
046A C203 V2=RND	04D8 817E
046C 872E	04DA 1800
046E 6306 V3=06	04DC 9942
0470 8375 V3=V3-V7	04DE DB00
0472 C701 V7=RND	04E0 0000
0474 8374 V3=V3+V7	04E2 8181
0476 8304 V3=V3+V0	04E4 0000
0478 F355 MI=V0:V3	04E6 00C3
047A 7124 V1+24	04E8 3C66
047C F61E I=I+V6	04EA 1842
047E 00EE RET	04EC 42C3
0480 2486 DO 0486	04EE 4200
0482 2486 DO 0486	04F0 E7E7
0484 2486 DO 0486	04F2 0000
0486 D895 SHOW 5MI@V8V9	04F4 00EE
0488 6F05 VF=05	04F6 8E8A
048A FF1E I=I+VF	04F8 8A8A
048C 7808 V8+08	04FA EEEE
048E 00EE RET	04FC 88EC
0490 2492 DO 0492	04FE 28EE
0492 2494 DO 0494	0500 0302

0502	020E	0570	2222
0504	0A0A	0572	001D
0506	0506	0574	2242
0508	0612	0576	6605
050A	1E05	0578	001D
050C	0506	057A	2242
050E	0612	057C	6680
0510	1E28	057E	001D
0512	0506	0580	2242
0514	0612	0582	6610
0516	1E10	0584	001D
0518	0506	0586	2242
051A	0612	0588	6608
051C	1E02	058A	001D
051E	0506	058C	2242
0520	0612	058E	6601
0522	1E05	0590	0002
0524	003F	0592	131E
0526	3F3D	0594	1212
0528	2524	0596	0217
052A	0041	0598	382E
052C	4147	059A	0624
052E	6E0A	059C	0424
0530	0041	059E	2F3A
0532	4147	05A0	5611
0534	6D90	05A2	0006
0536	0041	05A4	3522
0538	4147	05A6	3628
053A	6F00	05A8	0006
053C	0041	05AA	3522
053E	4147	05AC	3600
0540	6E12	05AE	0217
0542	0041	05B0	382E
0544	4147	05B2	0628
0546	6D90	05B4	01E9
0548	0003	05B6	ADEB
054A	060E	05B8	A9A9
054C	1426	05BA	515B
054E	0005	05BC	5551
0550	0A22	05BE	5174
0552	2040	05C0	5474
0554	0300	05C2	5457
0556	0268	05C4	F795
0558	3618	05C6	F7A5
055A	060F	05C8	9577
055C	1A16	05CA	4446
055E	4803	05CC	4477
0560	0005	05CE	EFA8
0562	0A42	05D0	AEE2
0564	0C00	05D2	BEF3
0566	0005	05D4	9293
0568	0A42	05D6	929F
056A	0000	05D8	1715
056C	000B	05DA	1711
056E	1E3E	05DC	1177

05DE 1517
05E0 1517
05E2 2B2A
05E4 1212
05E6 13A8
05E8 A8A8
05EA A8B8
05EC AEAA
05EE EEAA
05F0 AAAE
05F2 A8AE
05F4 A84E
05F6 2078
05F8 A070
05FA 28F0
05FC 2000
05FE 0100
0600 0200
0602 0302
0604 001E
0606 1800
0608 0124
060A 0301
060C 0642
060E 1200
0610 0148
0612 0008
0614 0D66
0616 1800
0618 026C
061A 0303
061C 138A
061E 1800
0620 0190
0622 0301
0624 1AAE
0626 1800
0628 0108
062A 3806
062C 0018
062E 1801
0630 0104
0632 3100
0634 0518
0636 1801
0638 7F48
063A 1C1C
063C 0B4C
063E 1800
0640 0302
0642 020E

0644 5E04
0646 2654
0648 0506
064A 06D2
064C A24C
064E E6C1
0650 0506
0652 C6D2
0654 E2CC
0656 B890
0658 0586
065A 0652
065C 224C
065E 5E60
0660 0506
0662 86D2
0664 A28C
0666 C6C1
0668 0506
066A 8692
066C 228C
066E 9830
0670 0506
0672 0612
0674 620C
0676 3E10
0678 00EE
067A 631A
067C 24C0
067E 00EE
0680 F090
0682 F790
0684 9078
0686 4070
0688 4078
068A ABA9
068C A9A9
068E 53A2
0690 322A
0692 26A2
0694 8E8A
0696 8A8A
0698 EEEE
069A 88EC
069C 28EE
069E C0C0
06A0 1848
06A2 0848
06A4 1CE0
06A6 2060
06A8 0040

10. VIP Most Dangerous Game

VIP MOST DANGEROUS GAME pits a hunter against a hunted in a maze. The hunter must shoot the hunted before either time runs out or the hunted escapes the maze. However, neither the hunted nor the hunter can see a wall in the maze until he runs into it. There is always at least one path through the maze.

How To Play VIP Most Dangerous Game

1. Load the CHIP-8 interpreter at 0000-01FF and the game program starting at 0200.

2. Turn RUN switch on.

3. Hunted's turn:

When the arrow appears in the lower left, it is the hunted's turn. Keys 2-4-6-8 control direction (up-left-right-down, respectively). The hunted continues to move until a) he makes 5 moves, b) he hits a wall, or c) key 0 is pressed.

4. Hunter's turn:

When the arrow appears in the lower right, it is the hunter's turn. The hunter's turn consists of two modes, the move and the shoot. Keys 2-4-6-8 and 0 control both modes. Like the hunted, the hunter continues to move until a) he makes 3 moves, b) he hits a wall, or c) key 0 is pressed. If he hits the wall, case b), he cannot fire a bullet. The hunter may fire one of his bullets using the direction keys 2-4-6-8. The bullet will travel four squares in the corresponding direction, unless a wall is encountered. If the hunter prefers not to use a bullet, he must press key 0.

5. Repeat steps 4 and 5 until:

a) The number of turns (upper left on the display) expire. The hunted wins.

b) The hunter lands on or shoots the hunted. The hunter wins.

c) The hunted lands on the hunter, thereby giving up. The hunter wins.

d) The hunted reaches the lower right corner of the maze with at least 1 move remaining in his turn. The hunted wins, by escaping the maze.

6. Variations of VIP MOST DANGEROUS GAME may be played by changing certain bytes in the program.

LOCATION	DEFAULT	MEANING
0215	0F	Number of turns in the game.
0217	06	Number of bullets hunter has at start.
0219	03	Number of moves per turn for the hunter.
0221	01	Number of squares per move (hunted and hunter).
022B	05	Number of moves per turn for the hunted.
024B	01	If zero, walls are invisible.
0355	04	Number of squares a bullet will go.
04E3	70	Probability (out of 100 _{hex}) of a wall appearing.
04EB	FE	If FF, a wall may appear at previously tested boundaries.

```

0200 6001 V0=01
0202 A5F0 I=05F0
0204 F055 MI=V0:V0
0206 60FF V0=FF
0208 6100 V1=00
020A F055 MI=V0:V0
020C 7101 V1+01
020E 3180 SKIP;V1 EQ 80
0210 120A GO 020A
0212 00E0 ERASE
0214 600F V0=0F
0216 6106 V1=06
0218 6203 V2=03
021A 6300 V3=00
021C 642E V4=2E
021E 651E V5=1E
0220 6601 V6=01
0222 A671 I=0671
0224 F655 MI=V0:V6
0226 A5EF I=05EF
0228 D451 SHOW 1MV4V5
022A 6205 V2=05
022C 6412 V4=12
022E 6502 V5=02
0230 D451 SHOW 1MV4V5
0232 A678 I=0678
0234 F655 MI=V0:V6
0236 A5EF I=05EF
0238 6204 V2=04
023A 6114 V1=14
023C D121 SHOW 1MV1V2
023E 7104 V1+04
0240 3130 SKIP;V1 EQ 30
0242 123C GO 023C
0244 7204 V2+04
0246 3220 SKIP;V2 EQ 20
0248 123A GO 023A
024A 6E01 VE=01
024C A671 I=0671
024E 22D6 DO 02D6
0250 2310 DO 0310
0252 2372 DO 0372
0254 3F00 SKIP;VF EQ 00
0256 126A GO 026A
0258 2310 DO 0310
025A 231A DO 031A
025C 2332 DO 0332
025E 3F00 SKIP;VF EQ 00
0260 1288 GO 0288
0262 231A DO 031A
0264 A682 I=0682
0266 22D6 DO 02D6
0268 124C GO 024C
026A 3F01 SKIP;VF EQ 01
026C 128C GO 028C

026E 00E0 ERASE
0270 6005 V0=05
0272 22A6 DO 02A6
0274 2310 DO 0310
0276 2424 DO 0424
0278 2310 DO 0310
027A 22A6 DO 02A6
027C 22A6 DO 02A6
027E 2310 DO 0310
0280 70FF V0+FF
0282 3000 SKIP;V0 EQ 00
0284 1272 GO 0272
0286 1200 GO 0200
0288 3F01 SKIP;VF EQ 01
028A 126E GO 026E
028C 00E0 ERASE
028E 6005 V0=05
0290 22A6 DO 02A6
0292 231A DO 031A
0294 2424 DO 0424
0296 231A DO 031A
0298 22A6 DO 02A6
029A 22A6 DO 02A6
029C 231A DO 031A
029E 70FF V0+FF
02A0 3000 SKIP;V0 EQ 00
02A2 1290 GO 0290
02A4 1200 GO 0200
02A6 6A10 VA=10
02A8 6B10 VB=10
02AA A5C8 I=05C8
02AC DAB5 SHOW 5MVAVB
02AE 7A08 VA+08
02B0 A5CD I=05CD
02B2 DAB5 SHOW 5MVAVB
02B4 7A08 VA+08
02B6 A5D2 I=05D2
02B8 DAB5 SHOW 5MVAVB
02BA 7A08 VA+08
02BC A5D7 I=05D7
02BE DAB5 SHOW 5MVAVB
02C0 00EE RET
02C2 0100
02C4 0000
02C6 0000
02C8 0000
02CA 0000
02CC 0000
02CE 0000
02D0 0000
02D2 0000
02D4 00D4
02D6 F165 V0:V1=MI
02D8 A682 I=0682
02DA F155 MI=V0:V1

```

```
02DC 8310 V3=V1
02DE 6A01 VA=01
02E0 6B04 VB=04
02E2 22EC DO 02EC
02E4 8030 V0=V3
02E6 6A33 VA=33
02E8 22EC DO 02EC
02EA 00EE RET
02EC A67F I=067F
02EE F033 MI=V0(3DD)
02F0 F265 V0:V2=MI
02F2 4000 SKIP;V0 NE 00
02F4 1308 GO 0308
02F6 F029 I=V0(LSDP)
02F8 DAB5 SHOW 5MVAVB
02FA 7A05 VA+05
02FC F129 I=V1(LSDP)
02FE DAB5 SHOW 5MVAVB
0300 7A05 VA+05
0302 F229 I=V2(LSDP)
0304 DAB5 SHOW 5MVAVB
0306 00EE RET
0308 4100 SKIP;V1 NE 00
030A 1300 GO 0300
030C 7A02 VA+02
030E 12FC GO 02FC
0310 6A03 VA=03
0312 6B17 VB=17
0314 A5DC I=05DC
0316 DAB7 SHOW 7MVAVB
0318 00EE RET
031A 6A37 VA=37
031C 6B17 VB=17
031E A5E3 I=05E3
0320 DAB7 SHOW 7MVAVB
0322 00EE RET
0324 0100
0326 0000
0328 0000
032A 0000
032C 0000
032E 0000
0330 00D4
0332 A671 I=0671
0334 F665 V0:V6=MI
0336 23A0 DO 03A0
0338 3F03 SKIP;VF EQ 03
033A 1342 GO 0342
033C 72FF V2+FF
033E 3200 SKIP;V2 EQ 00
0340 1336 GO 0336
0342 A671 I=0671
0344 F265 V0:V2=MI
0346 A671 I=0671
0348 F655 MI=V0:V6
034A 4F01 SKIP;VF NE 01
034C 00EE RET
034E 3F02 SKIP;VF EQ 02
0350 4100 SKIP;V1 NE 00
0352 1364 GO 0364
0354 6604 V6=04
0356 6301 V3=01
0358 23A0 DO 03A0
035A 4F00 SKIP;VF NE 00
035C 1364 GO 0364
035E 71FF V1+FF
0360 4F01 SKIP;VF NE 01
0362 00EE RET
0364 70FF V0+FF
0366 6F00 VF=00
0368 4000 SKIP;V0 NE 00
036A 6FFF VF=FF
036C A671 I=0671
036E F155 MI=V0:V1
0370 00EE RET
0372 A678 I=0678
0374 F665 V0:V6=MI
0376 442E SKIP;V4 NE 2E
0378 351E SKIP;V5 EQ 1E
037A 1380 GO 0380
037C 6F01 VF=01
037E 00EE RET
0380 23A0 DO 03A0
0382 4F01 SKIP;VF NE 01
0384 139C GO 039C
0386 3F03 SKIP;VF EQ 03
0388 1390 GO 0390
038A 72FF V2+FF
038C 3200 SKIP;V2 EQ 00
038E 1376 GO 0376
0390 6F00 VF=00
0392 A678 I=0678
0394 F265 V0:V2=MI
0396 A678 I=0678
0398 F655 MI=V0:V6
039A 00EE RET
039C 6FFF VF=FF
039E 00EE RET
03A0 A684 I=0684
03A2 F955 MI=V0:V9
03A4 A5EF I=05EF
03A6 2430 DO 0430
03A8 6F00 VF=00
03AA 4000 SKIP;V0 NE 00
03AC 13F6 GO 03F6
03AE 4301 SKIP;V3 NE 01
03B0 D451 SHOW 1MV4V5
03B2 6C00 VC=00
03B4 6D00 VD=00
03B6 4002 SKIP;V0 NE 02
```

```

03B8 6CFF VC=FF
03BA 4004 SKIP;V0 NE 04
03BC 6DFF VD=FF
03BE 4006 SKIP;V0 NE 06
03C0 6D01 VD=01
03C2 4008 SKIP;V0 NE 08
03C4 6C01 VC=01
03C6 8A40 VA=V4
03C8 8B50 VB=V5
03CA 241A D0 041A
03CC 2424 D0 0424
03CE 241A D0 041A
03D0 24AE D0 04AE
03D2 A5EF I=05EF
03D4 4000 SKIP;V0 NE 00
03D6 1404 GO 0404
03D8 241A D0 041A
03DA 2424 D0 0424
03DC 241A D0 041A
03DE 4F01 SKIP;VF NE 01
03E0 1412 GO 0412
03E2 84A0 V4=VA
03E4 85B0 V5=VB
03E6 76FF V6=VF
03E8 3600 SKIP;V6 EQ 00
03EA 13CA GO 03CA
03EC 6D02 VD=02
03EE FD18 TONE=VD
03F0 4301 SKIP;V3 NE 01
03F2 DAB1 SHOW 1MVAVB
03F4 6F03 VF=03
03F6 A684 I=0684
03F8 8A40 VA=V4
03FA 8B50 VB=V5
03FC F965 V0:V9=MI
03FE 84A0 V4=VA
0400 85B0 V5=VB
0402 00EE RET
0404 6D10 VD=10
0406 FD18 TONE=VD
0408 DAB1 SHOW 1MVAVB
040A 4300 SKIP;V3 NE 00
040C D451 SHOW 1MV4V5
040E 6F02 VF=02
0410 13F6 GO 03F6
0412 6D20 VD=20
0414 FD18 TONE=VD
0416 6F01 VF=01
0418 13F6 GO 03F6
041A DAB1 SHOW 1MVAVB
041C 8AD4 VA=VA+VD
041E 8BC4 VB=VB+VC
0420 DAB1 SHOW 1MVAVB
0422 00EE RET
0424 6808 V8=08

```

```

0426 F815 TIME=V8
0428 F807 V8=TIME
042A 3800 SKIP;V8 EQ 00
042C 1428 GO 0428
042E 00EE RET
0430 6000 V0=00
0432 D451 SHOW 1MV4V5
0434 E0A1 SKIP;V0 NE KEY
0436 1440 GO 0440
0438 7002 V0+02
043A 300A SKIP;V0 EQ 0A
043C 1434 GO 0434
043E 1430 GO 0430
0440 6D08 VD=08
0442 FD18 TONE=VD
0444 3F00 SKIP;VF EQ 00
0446 D451 SHOW 1MV4V5
0448 E0A1 SKIP;V0 NE KEY
044A 1448 GO 0448
044C 00EE RET
044E 841E
0450 844E
0452 852E
0454 8326
0456 3F01 SKIP;VF EQ 01
0458 1464 GO 0464
045A 7410 V4+10
045C 75FF V5+VF
045E A5EC I=05EC
0460 D453 SHOW 3MV4V5
0462 00EE RET
0464 7411 V4+11
0466 A5EA I=05EA
0468 D451 SHOW 1MV4V5
046A 00EE RET
046C 0100
046E 00D4
0470 A4A0 I=04A0
0472 810E
0474 8014 V0=V0+V1
0476 F01E I=I+V0
0478 F265 V0:V2=MI
047A A5F1 I=05F1
047C 8084 V0=V0+V8
047E F01E I=I+V0
0480 F065 V0:V0=MI
0482 F11E I=I+V1
0484 8100 V1=V0
0486 F065 V0:V0=MI
0488 F21E I=I+V2
048A 8210 V2=V1
048C 8205 V2=V2-V0
048E 3F00 SKIP;VF EQ 00
0490 8100 V1=V0
0492 F065 V0:V0=MI

```

```
0494 8200 V2=V0
0496 8215 V2=V2-V1
0498 3F00 SKIP;VF EQ 00
049A 8010 V0=V1
049C 00EE RET
049E 0100
04A0 0700
04A2 07F0
04A4 0600
04A6 F907
04A8 07F8
04AA 0608
04AC 00D4
04AE 6000 V0=00
04B0 3A10 SKIP;VA EQ 10
04B2 4A30 SKIP;VA NE 30
04B4 00EE RET
04B6 3B00 SKIP;VB EQ 00
04B8 4B20 SKIP;VB NE 20
04BA 00EE RET
04BC 81A6
04BE 8116
04C0 71FC V1+FC
04C2 82B6
04C4 A68E I=068E
04C6 FF55 MI=V0:VF
04C8 882E
04CA 888E
04CC 888E
04CE 8814 V8=V8+V1
04D0 A5F1 I=05F1
04D2 F81E I=I+V8
04D4 F065 V0:V0=MI
04D6 40FF SKIP;V0 NE FF
04D8 14E0 GO 04E0
04DA 40FE SKIP;V0 NE FE
04DC 15BE GO 05BE
04DE 15AA GO 05AA
04E0 C3FF V3=RND
04E2 6670 V6=70
04E4 8364 V3=V3+V6
04E6 4F01 SKIP;VF NE 01
04E8 14F4 GO 04F4
04EA 60FE V0=FE
04EC A5F1 I=05F1
04EE F81E I=I+V8
04F0 F055 MI=V0:V0
04F2 15BE GO 05BE
04F4 8326
04F6 3F01 SKIP;VF EQ 01
04F8 151E GO 051E
04FA 3201 SKIP;V2 EQ 01
04FC 1508 GO 0508
04FE 6A00 VA=00
0500 6000 V0=00
```

```
0502 2470 DO 0470
0504 8B00 VB=V0
0506 1542 GO 0542
0508 320F SKIP;V2 EQ 0F
050A 1516 GO 0516
050C 6B00 VB=00
050E 6001 V0=01
0510 2470 DO 0470
0512 8A00 VA=V0
0514 1542 GO 0542
0516 6001 V0=01
0518 2470 DO 0470
051A 8A00 VA=V0
051C 1500 GO 0500
051E 3100 SKIP;V1 EQ 00
0520 152C GO 052C
0522 6A00 VA=00
0524 6002 V0=02
0526 2470 DO 0470
0528 8B00 VB=V0
052A 1542 GO 0542
052C 3107 SKIP;V1 EQ 07
052E 153A GO 053A
0530 6B00 VB=00
0532 6003 V0=03
0534 2470 DO 0470
0536 8A00 VA=V0
0538 1542 GO 0542
053A 6003 V0=03
053C 2470 DO 0470
053E 8A00 VA=V0
0540 1524 GO 0524
0542 5AB0 SKIP;VA EQ VB
0544 1564 GO 0564
0546 3AFE SKIP;VA EQ FE
0548 4AFF SKIP;VA NE FF
054A 1556 GO 0556
054C A5F1 I=05F1
054E F81E I=I+V8
0550 60FE V0=FE
0552 F055 MI=V0:V0
0554 15BE GO 05BE
0556 A5F0 I=05F0
0558 F065 V0:V0=MI
055A 7001 V0+01
055C A5F0 I=05F0
055E F055 MI=V0:V0
0560 8A00 VA=V0
0562 1596 GO 0596
0564 83A0 V3=VA
0566 83B5 V3=V3-VB
0568 4F00 SKIP;VF NE 00
056A 1572 GO 0572
056C 83A0 V3=VA
056E 8AB0 VA=VB
```


0570 8B30 VB=V3
0572 4AFE SKIP;VA NE FE
0574 1556 GO 0556
0576 3BFE SKIP;VB EQ FE
0578 4BFF SKIP;VB NE FF
057A 1596 GO 0596
057C 63FF V3=FF
057E A5F1 I=05F1
0580 4380 SKIP;V3 NE 80
0582 1596 GO 0596
0584 F065 V0:V0=MI
0586 7301 V3+01
0588 5B00 SKIP;VB EQ V0
058A 1580 GO 0580
058C A5F1 I=05F1
058E F31E I=I+V3
0590 80A0 V0=VA
0592 F055 MI=V0:V0
0594 1580 GO 0580
0596 A5F1 I=05F1
0598 F81E I=I+V8
059A 80A0 V0=VA
059C F055 MI=V0:V0
059E 4E00 SKIP;VE NE 00
05A0 15AA GO 05AA
05A2 A68E I=068E
05A4 F265 V0:V2=MI
05A6 244E D0 044E
05A8 15AA GO 05AA
05AA A68E I=068E
05AC FF65 V0:VF=MI
05AE 244E D0 044E
05B0 6D1E VD=1E

05B2 FD18 TONE=VD
05B4 244E D0 044E
05B6 A68E I=068E
05B8 F565 V0:V5=MI
05BA 6000 V0=00
05BC 00EE RET
05BE A68E I=068E
05C0 FF65 V0:VF=MI
05C2 6001 V0=01
05C4 00EE RET
05C6 0100
05C8 8A8A
05CA AADA
05CC 8A8A
05CE CBAA
05D0 9A8A
05D2 2F28
05D4 AE68
05D6 2F7B
05D8 4B7B
05DA 504B
05DC 1020
05DE 40BF
05E0 4020
05E2 1008
05E4 0402
05E6 FD02
05E8 0408
05EA E000
05EC 8080
05EE 8080
05F0 00D4

11. VIP Sum Fun

The object of this game is to add up the three digits which appear in the middle of the screen and then hit the key representing the total as fast as you can.

How To Play VIP Sum Fun

1. Load the CHIP-8 interpreter at 0000-01FF and the game starting at 0200.
2. Turn RUN switch on.

3. You get twenty sets of three digits per game and between zero and ten points per set. The faster you enter the correct total, the more points you win.

4. If you wait more than 3 seconds you get zero points. The correct sum is shown above the three digits after you enter it, and there is a pause before the next set appears.

5. The score is shown in the upper right-hand corner of the screen. The maximum number of points you can score is 200. Between 120 and 159 points is above average. A score of 160 or higher is outstanding.

```

0200 00E0 ERASE
0202 6A00 VA=00
0204 2262 D0 0262
0206 6380 V3=80
0208 228A D0 028A
020A 6514 V5=14
020C C003 V0=RND
020E C103 V1=RND
0210 C203 V2=RND
0212 6400 V4=00
0214 8404 V4=V4+V0
0216 8414 V4=V4+V1
0218 8424 V4=V4+V2
021A 225A D0 025A
021C 12A4 GO 02A4
021E 6390 V3=90
0220 2282 D0 0282
0222 E4A1 SKIP;V4 NE KEY
0224 122C GO 022C
0226 3600 SKIP;V6 EQ 00
0228 76FF V6+FF
022A 121E GO 021E
022C 2294 D0 0294
022E 6310 V3=10
0230 2282 D0 0282
0232 229A D0 029A
0234 6380 V3=80
0236 228A D0 028A

```

```

0238 00E0 ERASE
023A 8A64 VA=VA+V6
023C 2262 D0 0262
023E 75FF V5+FF
0240 4500 SKIP;V5 NE 00
0242 124A GO 024A
0244 6360 V3=60
0246 228A D0 028A
0248 120C GO 020C
024A 6412 V4=12
024C F418 TONE=V4
024E 631A V3=1A
0250 228A D0 028A
0252 74FE V4+FE
0254 3400 SKIP;V4 EQ 00
0256 124C GO 024C
0258 1258 GO 0258
025A 6810 V8=10
025C 6913 V9=13
025E 2270 D0 0270
0260 00EE RET
0262 6830 V8=30
0264 6900 V9=00
0266 A2B0 I=02B0
0268 FA33 MI=VA(3DD)
026A F265 V0:V2=MI
026C 2270 D0 0270

```

```
026E 00EE RET
0270 F029 I=V0(LSDP)
0272 D895 SHOW 5MI@V8V9
0274 7806 V8+06
0276 F129 I=V1(LSDP)
0278 D895 SHOW 5MI@V8V9
027A 7806 V8+06
027C F229 I=V2(LSDP)
027E D895 SHOW 5MI@V8V9
0280 00EE RET
0282 73FF V3+FF
0284 3300 SKIP;V3 EQ 00
0286 1282 GO 0282
0288 00EE RET
028A F315 TIME=V3
028C F307 V3=TIME
028E 3300 SKIP;V3 EQ 00
```

```
0290 128C GO 028C
0292 00EE RET
0294 6302 V3=02
0296 F318 TONE=V3
0298 00EE RET
029A 6816 V8=16
029C 690A V9=0A
029E F429 I=V4(LSDP)
02A0 D895 SHOW 5MI@V8V9
02A2 00EE RET
02A4 660A V6=0A
02A6 6380 V3=80
02A8 2282 DO 0282
02AA E4A1 SKIP;V4 NE KEY
02AC 122C GO 022C
02AE 121E GO 021E
```

12. VIP Sequence Shoot

You score points by having the sharp-shooter hit the targets in the proper sequence.

How To Play VIP Sequence Shoot

1. Load the CHIP-8 interpreter at 0000-01FF and the game starting at 0200.
2. Turn RUN switch on.
3. Pressing the key C causes the little man to shoot the top target, key D shoots the one below it, key E the next lower, and key F the bottom target.

4. One of the four targets flashes and the computer waits for you to shoot it. When you press the correct key you get one point. Then two flash, one after the other. Shoot the one that flashed first, then shoot the other. This gives you two more points. Three targets (when hit in the same order as they flashed) add three points to your score.

5. Each time you shoot such a series of targets in proper sequence, your score increases by the number of targets you hit. And the next series you see is longer by one target. The maximum length of sequence is 22 targets, that is a score of 254.

6. Improper sequencing of shots in any series ends the game.

```

0200 00E0 ERASE
0202 6E00 VE=00
0204 6D00 VD=00
0206 A326 I=0326
0208 6808 V8=08
020A 690B V9=0B
020C D89C SHOW CMI@V8V9
020E A332 I=0332
0210 6917 V9=17
0212 D899 SHOW 9MI@V8V9
0214 A33B I=033B
0216 6810 V8=10
0218 6913 V9=13
021A D892 SHOW 2MI@V8V9
021C 6832 V8=32
021E 6902 V9=02
0220 2312 DO 0312
0222 690A V9=0A
0224 2312 DO 0312
0226 6912 V9=12
0228 2312 DO 0312
022A 691A V9=1A
022C 2312 DO 0312
022E 22F6 DO 02F6
0230 61FF V1=FF
0232 2318 DO 0318
0234 6C00 VC=00
0236 7D01 VD=01

```

```

0238 8AD0 VA=VD
023A 2270 DO 0270
023C 7AFF VA+FF
023E 3A00 SKIP;VA EQ 00
0240 123A GO 023A
0242 6000 V0=00
0244 A400 I=0400
0246 FC1E I=I+VC
0248 F055 MI=V0:V0
024A 22AC DO 02AC
024C 3A00 SKIP;VA EQ 00
024E 125A GO 025A
0250 22F6 DO 02F6
0252 8ED4 VE=VE+VD
0254 22F6 DO 02F6
0256 3E16 SKIP;VE EQ 16
0258 1232 GO 0232
025A 6212 V2=12
025C F218 TONE=V2
025E 611A V1=1A
0260 F115 TIME=V1
0262 F107 V1=TIME
0264 3100 SKIP;V1 EQ 00
0266 1262 GO 0262
0268 72FE V2+FE
026A 3200 SKIP;V2 EQ 00
026C 125C GO 025C

```

```

026E 126E GO 026E
0270 CB03 VB=RND
0272 7B0C VB+0C
0274 80B0 V0=VB
0276 A400 I=0400
0278 FC1E I=I+VC
027A F055 MI=V0:V0
027C 7C01 VC+01
027E 61FF V1=FF
0280 2318 DO 0318
0282 6832 V8=32
0284 691A V9=1A
0286 4B0C SKIP;VB NE 0C
0288 6902 V9=02
028A 4B0D SKIP;VB NE 0D
028C 690A V9=0A
028E 4B0E SKIP;VB NE 0E
0290 6912 V9=12
0292 2312 DO 0312
0294 6160 V1=60
0296 2318 DO 0318
0298 2312 DO 0312
029A 610F V1=0F
029C 2318 DO 0318
029E 2312 DO 0312
02A0 610F V1=0F
02A2 2318 DO 0318
02A4 2312 DO 0312
02A6 610F V1=0F
02A8 2318 DO 0318
02AA 00EE RET
02AC 6A00 VA=00
02AE A400 I=0400
02B0 FA1E I=I+VA
02B2 7A01 VA+01
02B4 F065 V0:V0=MI
02B6 3000 SKIP;V0 EQ 00
02B8 12BE GO 02BE
02BA 6A00 VA=00
02BC 00EE RET
02BE FB0A VB=KEY
02C0 6102 V1=02
02C2 F218 TONE=V2
02C4 8B05 VB=VB-V0
02C6 4B00 SKIP;VB NE 00
02C8 12D2 GO 02D2
02CA 61FF V1=FF
02CC 2318 DO 0318
02CE 6A01 VA=01
02D0 00EE RET
02D2 70F2 V0+F2
02D4 6813 V8=13
02D6 6913 V9=13
02D8 A321 I=0321
02DA D891 SHOW 1MI@V8V9
02DC 6108 V1=08
02DE 2318 DO 0318
02E0 4F01 SKIP;VF NE 01
02E2 12F0 GO 02F0
02E4 D891 SHOW 1MI@V8V9
02E6 6108 V1=08
02E8 2318 DO 0318
02EA 7804 V8+04
02EC 8904 V9=V9+V0
02EE 12DA GO 02DA
02F0 6102 V1=02
02F2 F118 TONE=V1
02F4 1340 GO 0340
02F6 A380 I=0380
02F8 FE33 MI=VE(3DD)
02FA F265 V0:V2=MI
02FC F029 I=V0(LSDP)
02FE 6810 V8=10
0300 6902 V9=02
0302 D895 SHOW 5MI@V8V9
0304 F129 I=V1(LSDP)
0306 7806 V8+06
0308 D895 SHOW 5MI@V8V9
030A F229 I=V2(LSDP)
030C 7806 V8+06
030E D895 SHOW 5MI@V8V9
0310 00EE RET
0312 A322 I=0322
0314 D894 SHOW 4MI@V8V9
0316 00EE RET
0318 71FF V1+FF
031A 3100 SKIP;V1 EQ 00
031C 1318 GO 0318
031E 00EE RET
0320 0180
0322 F0F0
0324 F0F0
0326 7C7C
0328 FE7C
032A 7C70
032C 7C38
032E 7F7F
0330 7C7C
0332 7C7C
0334 7C38
0336 3838
0338 3838
033A 3EE0
033C 8000
033E D4D4
0340 D891 SHOW 1MI@V8V9
0342 12AE GO 02AE

```

13. VIP Biorhythm

The theory of Biorhythm states that there are three predominant cycles that can influence human behavior. These include a 23-day physical cycle, a 28-day emotional cycle, and a 33-day intellectual cycle. All three cycles start at birth and continue throughout life.

Each cycle consists of a positive and a negative period. Physical, emotional, and intellectual aspects are enhanced during positive periods. Poor performance is indicated by the negative period of a cycle.

A critical day occurs on the crossover from the positive to negative period or vice versa. A critical day indicates instability in a particular aspect.

How To Use VIP Biorhythm

1. Load the CHIP-8 interpreter at 0000-01FF and Biorhythm starting at 0200.
2. Turn RUN switch on.

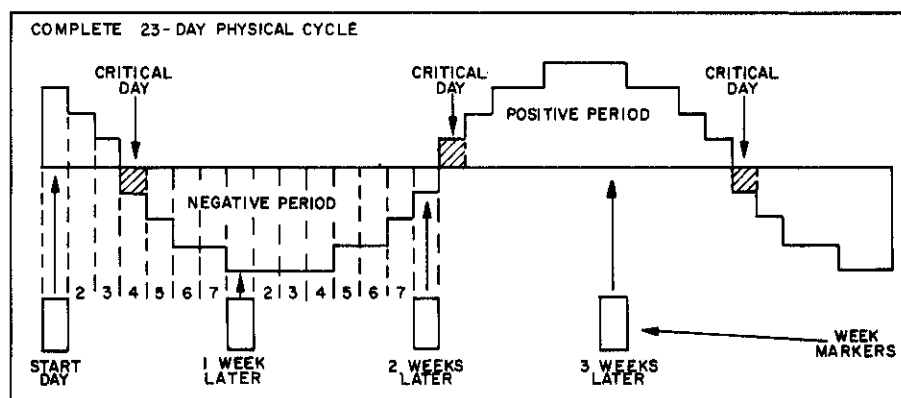
3. Enter birthdate using 2-digit month, 2-digit day, and 4-digit year.

4. Enter start date using 2-digit month, 2-digit day, and 4-digit year. The start date indicates the first day of the 32-day Biorhythm chart the program will generate.

5. After a period of calculation proportional to the span of time involved, the three cycle curves will be shown for a 32-day period. Each horizontal bit position represents one day in the cycle. The start day, on the left, and every seventh day are indicated by week markers. The first day of a positive or negative period is a critical day.

6. To advance the start date hold key F down until the desired date is reached. To decrement the start date hold key B down. These functions allow changing the start date slightly without reentering all the dates and waiting for the calculations to be performed.

7. Press key 0 to clear the screen and enter a new set of dates.



92CM-31180

INTERPRETATION

	Physical	Emotional	Intellectual
Positive Period (Up)	strong, vigorous	good moods, cooperative	good judgment, sharp mentally
Negative Period (Down)	tire easily, less stamina	low enthusiasm, feelings subdued	low attentiveness and concentration
Critical Days (Crossover)	susceptible to injury or illness, low endurance	emotionally unstable, upset easily	poor memory, prone to mistakes

```

0200 A584 I=0584
0202 6100 V1=00
0204 6219 V2=19
0206 D125 SHOW 5MI@V1V2
0208 A588 I=0588
020A 620D V2=0D
020C D125 SHOW 5MI@V1V2
020E A441 I=0441
0210 6201 V2=01
0212 D125 SHOW 5MI@V1V2
0214 A513 I=0513
0216 6131 V1=31
0218 620E V2=0E
021A D124 SHOW 4MI@V1V2
021C A444 I=0444
021E 6209 V2=09
0220 61FF V1=FF
0222 7107 V1+07
0224 D122 SHOW 2MI@V1V2
0226 3122 SKIP;V1 EQ 22
0228 1222 GO 0222
022A 3209 SKIP;V2 EQ 09
022C 1232 GO 0232
022E 6215 V2=15
0230 1220 GO 0220
0232 6300 V3=00
0234 6500 V5=00
0236 6600 V6=00
0238 2500 DO 0500
023A 2518 DO 0518
023C 6000 V0=00
023E 4400 SKIP;V4 NE 00
0240 1248 GO 0248
0242 700A V0+0A
0244 74FF V4+FF
0246 123E GO 023E
0248 A608 I=0608
024A F055 MI=V0:V0
024C 2500 DO 0500
024E 2518 DO 0518
0250 A608 I=0608
0252 F065 V0:V0=MI
0254 8044 V0=V0+V4
0256 A600 I=0600
0258 F31E I=I+V3
025A F055 MI=V0:V0
025C 7301 V3+01
025E 3308 SKIP;V3 EQ 08
0260 1238 GO 0238
0262 A600 I=0600
0264 F765 V0:V7=MI
0266 4000 SKIP;V0 NE 00
0268 12B2 GO 02B2
026A 4100 SKIP;V1 NE 00
026C 12B2 GO 02B2
026E 4400 SKIP;V4 NE 00
0270 12B2 GO 02B2
0272 4500 SKIP;V5 NE 00
0274 12B2 GO 02B2
0276 680C V8=0C
0278 8805 V8=V8-V0
027A 4F00 SKIP;VF NE 00
027C 12B2 GO 02B2
027E 680C V8=0C
0280 8845 V8=V8-V4
0282 4F00 SKIP;VF NE 00
0284 12B2 GO 02B2
0286 8860 V8=V6
0288 8825 V8=V8-V2
028A 4F00 SKIP;VF NE 00
028C 12B2 GO 02B2
028E 5620 SKIP;V6 EQ V2
0290 12B8 GO 02B8
0292 8870 V8=V7
0294 8835 V8=V8-V3
0296 4F00 SKIP;VF NE 00
0298 12B2 GO 02B2
029A 5730 SKIP;V7 EQ V3
029C 12B8 GO 02B8
029E 8840 V8=V4
02A0 8805 V8=V8-V0
02A2 4F00 SKIP;VF NE 00
02A4 12B2 GO 02B2
02A6 5400 SKIP;V4 EQ V0
02A8 12B8 GO 02B8
02AA 8850 V8=V5
02AC 8815 V8=V8-V1
02AE 3F00 SKIP;VF EQ 00
02B0 12B8 GO 02B8
02B2 F518 TONE=V5
02B4 00E0 ERASE
02B6 1200 GO 0200
02B8 8800 V8=V0
02BA 8910 V9=V1
02BC 8A80 VA=V8
02BE 253C DO 053C
02C0 4B00 SKIP;VB NE 00
02C2 12D2 GO 02D2
02C4 3B29 SKIP;VB EQ 29
02C6 12B2 GO 02B2
02C8 8920 V9=V2
02CA 8A30 VA=V3
02CC 2554 DO 0554
02CE 3B03 SKIP;VB EQ 03
02D0 12B2 GO 02B2
02D2 8950 V9=V5
02D4 8A40 VA=V4
02D6 253C DO 053C
02D8 4B00 SKIP;VB NE 00
02DA 12EA GO 02EA

```

```
02DC 3B29 SKIP;VB EQ 29
02DE 12B2 GO 02B2
02E0 8960 V9=V6
02E2 8A70 VA=V7
02E4 2554 DO 0554
02E6 3B03 SKIP;VB EQ 03
02E8 12B2 GO 02B2
02EA 6C00 VC=00
02EC 6D00 VD=00
02EE 6E00 VE=00
02F0 24F2 DO 04F2
02F2 8050 V0=V5
02F4 39AA SKIP;V9 EQ AA
02F6 12FE GO 02FE
02F8 8015 V0=V0-V1
02FA 24B6 DO 04B6
02FC 132A GO 032A
02FE 24B6 DO 04B6
0300 24DC DO 04DC
0302 8015 V0=V0-V1
0304 1308 GO 0308
0306 24DC DO 04DC
0308 24B6 DO 04B6
030A 7801 V8+01
030C 380D SKIP;V8 EQ 0D
030E 131C GO 031C
0310 6801 V8=01
0312 7301 V3+01
0314 3364 SKIP;V3 EQ 64
0316 131C GO 031C
0318 6300 V3=00
031A 7201 V2+01
031C 24F2 DO 04F2
031E 49AA SKIP;V9 NE AA
0320 132A GO 032A
0322 6003 V0=03
0324 80E2 V0=V0&VE
0326 F018 TONE=V0
0328 1306 GO 0306
032A 246A DO 046A
032C 680B V8=0B
032E E8A1 SKIP;V8 NE KEY
0330 1340 GO 0340
0332 680F V8=0F
0334 E8A1 SKIP;V8 NE KEY
0336 1340 GO 0340
0338 6800 V8=00
033A E8A1 SKIP;V8 NE KEY
033C 12B2 GO 02B2
033E 132C GO 032C
0340 246A DO 046A
0342 480B SKIP;V8 NE 0B
0344 134E GO 034E
0346 13A4 GO 03A4
0348 0100

034A 0714
034C 1BD4
034E 2448 DO 0448
0350 A600 I=0600
0352 F765 V0:V7=MI
0354 75FF V5+FF
0356 3500 SKIP;V5 EQ 00
0358 137C GO 037C
035A 74FF V4+FF
035C 3400 SKIP;V4 EQ 00
035E 1370 GO 0370
0360 640C V4=0C
0362 77FF V7+FF
0364 37FF SKIP;V7 EQ FF
0366 1370 GO 0370
0368 6763 V7=63
036A 76FF V6+FF
036C 46FF SKIP;V6 NE FF
036E 1392 GO 0392
0370 8840 V8=V4
0372 8150 V1=V5
0374 8260 V2=V6
0376 8370 V3=V7
0378 24DC DO 04DC
037A 8500 V5=V0
037C 7CFF VC+FF
037E 4CFF SKIP;VC NE FF
0380 6C16 VC=16
0382 7DFF VD+FF
0384 4DFF SKIP;VD NE FF
0386 6D1B VD=1B
0388 7EFF VE+FF
038A 4EFF SKIP;VE NE FF
038C 6E20 VE=20
038E A600 I=0600
0390 F755 MI=V0:V7
0392 2448 DO 0448
0394 680B V8=0B
0396 E8A1 SKIP;V8 NE KEY
0398 1342 GO 0342
039A 680F V8=0F
039C E8A1 SKIP;V8 NE KEY
039E 1342 GO 0342
03A0 132A GO 032A
03A2 7F00 VF+00
03A4 2448 DO 0448
03A6 A600 I=0600
03A8 F765 V0:V7=MI
03AA 8840 V8=V4
03AC 8260 V2=V6
03AE 8370 V3=V7
03B0 24DC DO 04DC
03B2 9050 SKIP;V0 NE V5
03B4 6500 V5=00
03B6 7501 V5+01
```


03B8	4501	SKIP;V5	NE	01	0426	8080	
03BA	7401	V4+01			0428	8000	
03BC	340D	SKIP;V4	EQ	0D	042A	0000	
03BE	13D0	GO 03D0			042C	001F	
03C0	6401	V4=01			042E	1C1F	
03C2	7701	V7+01			0430	1E1F	
03C4	3764	SKIP;V7	EQ	64	0432	1E1F	
03C6	13D0	GO 03D0			0434	1F1E	
03C8	6700	V7=00			0436	1F1E	
03CA	7601	V6+01			0438	1F29	
03CC	4664	SKIP;V6	NE	64	043A	2E37	
03CE	1392	GO 0392			043C	3C2B	
03D0	7C01	VC+01			043E	3035	
03D2	7D01	VD+01			0440	3AE0	
03D4	7E01	VE+01			0442	A0E0	
03D6	24C2	DO 04C2			0444	8080	
03D8	138E	GO 038E			0446	D4D4	
03DA	0107				0448	6500	V5=00
03DC	0E0E				044A	6602	V6=02
03DE	1616				044C	6304	V3=04
03E0	160E				044E	A600	I=0600
03E2	0E07				0450	F31E	I=I+V3
03E4	0100				0452	F065	V0:V0=MI
03E6	050B				0454	A609	I=0609
03E8	0B12				0456	F033	MI=V0(3DD)
03EA	1212				0458	F265	V0:V2=MI
03EC	120B				045A	8410	V4=V1
03EE	0B05				045C	2518	DO 0518
03F0	00EE				045E	8420	V4=V2
03F2	0107				0460	2518	DO 0518
03F4	0E0E				0462	7301	V3+01
03F6	1616				0464	3308	SKIP;V3 EQ 08
03F8	1616				0466	144E	GO 044E
03FA	1616				0468	00EE	RET
03FC	0E0E				046A	6420	V4=20
03FE	0701				046C	6506	V5=06
0400	0005				046E	6600	V6=00
0402	0B0B				0470	87C0	V7=VC
0404	1212				0472	A3DA	I=03DA
0406	1212				0474	249C	DO 049C
0408	1212				0476	3400	SKIP;V4 EQ 00
040A	0B0B				0478	1472	GO 0472
040C	0500				047A	6420	V4=20
040E	EE00				047C	6506	V5=06
0410	0000				047E	660C	V6=0C
0412	0080				0480	87D0	V7=VD
0414	0000				0482	A3F2	I=03F2
0416	0000				0484	249C	DO 049C
0418	8080				0486	3400	SKIP;V4 EQ 00
041A	0000				0488	1482	GO 0482
041C	0000				048A	6420	V4=20
041E	8080				048C	6506	V5=06
0420	8000				048E	6618	V6=18
0422	0000				0490	87E0	V7=VE
0424	0080				0492	A562	I=0562

```
0494 249C DO 049C
0496 3400 SKIP;V4 EQ 00
0498 1492 GO 0492
049A 00EE RET
049C F71E I=I+V7
049E F065 V0:V0=MI
04A0 30EE SKIP;V0 EQ EE
04A2 14A8 GO 04A8
04A4 6700 V7=00
04A6 00EE RET
04A8 A40F I=040F
04AA F01E I=I+V0
04AC D568 SHOW 8MI@V5V6
04AE 74FF V4+FF
04B0 7501 V5+01
04B2 7701 V7+01
04B4 00EE RET
04B6 8C04 VC=VC+V0
04B8 8D04 VD=VD+V0
04BA 8E04 VE=VE+V0
04BC 24C2 DO 04C2
04BE 24C2 DO 04C2
04C0 00EE RET
04C2 6B17 VB=17
04C4 8CB5 VC=VC-VB
04C6 4F00 SKIP;VF NE 00
04C8 7C17 VC+17
04CA 6B1C VB=1C
04CC 8DB5 VD=VD-VB
04CE 4F00 SKIP;VF NE 00
04D0 7D1C VD+1C
04D2 6B21 VB=21
04D4 8EB5 VE=VE-VB
04D6 4F00 SKIP;VF NE 00
04D8 7E21 VE+21
04DA 00EE RET
04DC A42C I=042C
04DE F81E I=I+V8
04E0 F065 V0:V0=MI
04E2 3802 SKIP;V8 EQ 02
04E4 00EE RET
04E6 8920 V9=V2
04E8 8A30 VA=V3
04EA 2554 DO 0554
04EC 4B03 SKIP;VB NE 03
04EE 7001 V0+01
04F0 00EE RET
04F2 69AA V9=AA
04F4 9260 SKIP;V2 NE V6
04F6 5370 SKIP;V3 EQ V7
04F8 6900 V9=00
04FA 5840 SKIP;V8 EQ V4
04FC 6900 V9=00
04FE 00EE RET
0500 6400 V4=00
```

```
0502 E4A1 SKIP;V4 NE KEY
0504 150E GO 050E
0506 7401 V4+01
0508 340A SKIP;V4 EQ 0A
050A 1502 GO 0502
050C 1500 GO 0500
050E F40A V4=KEY
0510 00EE RET
0512 010C
0514 1290
0516 60D4
0518 A438 I=0438
051A F51E I=I+V5
051C F165 V0:V1=MI
051E A349 I=0349
0520 F61E I=I+V6
0522 F065 V0:V0=MI
0524 F429 I=V4(LSDP)
0526 D105 SHOW 5MI@V1V0
0528 4503 SKIP;V5 NE 03
052A 7601 V6+01
052C 4507 SKIP;V5 NE 07
052E 7601 V6+01
0530 7501 V5+01
0532 4508 SKIP;V5 NE 08
0534 6500 V5=00
0536 00EE RET
0538 416A SKIP;V1 NE 6A
053A 7E51 VE+51
053C 6B00 VB=00
053E A42C I=042C
0540 FA1E I=I+VA
0542 F065 V0:V0=MI
0544 8095 V0=V0-V9
0546 4F01 SKIP;VF NE 01
0548 00EE RET
054A 6B29 VB=29
054C 491D SKIP;V9 NE 1D
054E 3A02 SKIP;VA EQ 02
0550 6B39 VB=39
0552 00EE RET
0554 4A00 SKIP;VA NE 00
0556 8A90 VA=V9
0558 6B03 VB=03
055A 8AB2 VA=VA+VB
055C 3A00 SKIP;VA EQ 00
055E 6B00 VB=00
0560 00EE RET
0562 0107
0564 070E
0566 0E16
0568 1616
056A 1616
056C 160E
056E 0E07
```

0570 0701
0572 0005
0574 050B
0576 0B12
0578 1212
057A 1212
057C 1212
057E 0B0B

0580 0505
0582 00EE
0584 E040
0586 4040
0588 E080
058A E080
058C E0D4

14. VIP Programmable Spacefighters

Programmable Spacefighters is a combat game involving 2 to 8 spaceships competing for the domination of a contained field in space. The field of play is a two-dimensional representation of the surface of an oblong spheroid.

The movement and fire of each spacefighter is controlled by programming a series of commands into each fighter's instruction storage table. Once all the spacefighters are programmed they carry out their commands by sequentially executing a single step at a time. The play of the game is divided into rounds. Each spacefighter may execute between 1 and 15 commands per round.

The fighters all have the same appearance and capabilities. Players distinguish between fighters by examining the defense strength and position of their fighter at the beginning of every round.

Each fighter may face in any of 8 directions. All firing and forward movement occurs in the direction a fighter is currently facing. As a spacefighter crosses outside the two-dimensional field of play it wraps around and re-enters on the opposite side of the field. Laser bursts terminate when they travel outside the field or hit a target.

Each round consists of a selected number of steps. Each step is executed in 2 parts. During the first part, every spacefighter wishing to fire may execute a fire operation. The defense strength of any fighter which is hit by a laser burst is reduced by 1 and a small flash appears.

After all fighters have had an opportunity to execute fire instructions, the movement part of the step begins. Any fighter which has had its defense strength reduced to 0 is destroyed and a longer flash appears. The defense strength is changed to a special code so that the fighter will no longer be programmable or take part in the execution phase. The destroyed fighter will still be open to examination during the Defense/Position Check phase. Fighters having a defense strength greater than 0 may execute a movement command if there is one. Breaking each step into 2 such parts removes any strategic advantage to moving first.

The nature of the game, in that there are variable parameters and no fixed victory conditions, allows the players a lot of freedom. Two to eight players can command single fighters. Four or less players can each command multiple fighters. Two fleets could compete to destroy their opponents' flagship first. Handicaps can be implemented through an imbalance of fighters in different fleets. An odd number of players can play in a free-for-all or team

game. In a non-combat approach, a full complement of spacefighters could be programmed to perform in kaleidoscopic or other type formations.

How To Play VIP Programmable Spacefighters

1. Load the CHIP-8 interpreter at 0000-01FF and the game starting at 0200.

2. Turn RUN switch on.

3. Initialization of Game.

Various parameters are entered at the start of the game to determine the number of spacefighters and other aspects of play.

S: Enter number of spacefighters. 1 to 8 spacefighters may be used. The program will adjust invalid entries to the nearest valid number.

D: Enter defense strength. A spacefighter may be hit from 1 to F times by laser fire before being destroyed.

E: Enter number of command entries. A spacefighter may be programmed with 1 to F commands during the programming phase of each round.

C: Enter clock duration/no clock. A timer clock 1 to F phorseks in duration may be selected. Each phorsek equals 4 seconds. The clock is not enabled if a 0 is entered. The clock time is the time allowed for each fighter to be set up.

F: Enter fire power available. A spacefighter may be allowed to fire 1 to F laser bursts per round.

A: Enter accumulation/no accumulation. A spacefighter may be allowed to accumulate all unused laser bursts by entering 1 to F. Accumulation is not allowed if a 0 is entered.

4. Presentation of Field and Spacefighters.

The two-dimensional representation of the playing field consists of 10 vertical by 15 horizontal positions indicated by grid markings around the perimeter. The spacefighters will be in their initial positions.

5. Defense/Position Check.

Enter number of spacefighter to be examined.

S: Current spacefighter being examined.

D: Defense strength of current spacefighter.

Enter 0 to end defense/position check phase.

6. Program Spacefighters.

Surviving spacefighters are programmed in ascending order. Enter 0 to begin programming first spacefighter. Defense strength and position are shown during programming.

E: Indicates number of entries left after current command.

C: Indicates time remaining to program current fighter if clock was selected.

COMMAND	FUNCTION	
1	ROTATE 45° CCW, MOVE FWD	S: 1 or 2 D: 1 E: F C: 0 F: F A: 0
2	MOVE FWD	
3	ROTATE 45° CW, MOVE FWD	
4	ROTATE 45° CCW	
5	FIRE	
6	ROTATE 45° CW	
B	ERASE ALL COMANDS AND REPROGRAM CURRENT SPACEFIGHTER	
E	END PROGRAMMING OF CURRENT SPACEFIGHTER	
7-A,C,D,F	REST, NO OPERATION	
0	REST; BEGIN PROGRAM- MING NEXT SPACEFIGHTER	

ENTER 0 TO BEGIN PROGRAMMING EACH
SUCCESSIVE SPACEFIGHTER.

7. Execute Commands

Enter 0 after all spacefighters are programmed to start execution of commands.

8. The recommended starting point when trying the game out is with 1 or 2 spacefighters, any defense, F (15₁₀) entries per round, no clock, F(15₁₀) fire power and any accumulation:

Use the above to try out the movement and fire execution of the fighters. Try performing loops, figure 8's, tight turns, maximum fire coverage techniques, etc. Start out simple when first playing the game against an opponent. Eight spacefighters can get very complicated.

9. Changing different parameters creates very different effects on the play of the game. The main effect of a large number of fighters is a more complicated game. A large number of entries per round results in a more lively game involving farsighted planning. Fewer entries involves more thinking and reacting to immediate developments but is not without strategy when there are multiple fighters opposing each other. The clock provides pressure which can be greatly increased by the moves-to-time ratio. More fire power produces a more violent game while less fire power increases the importance of movement and positioning. Accumulation of fire power can have long range effects if there is low fire power and a large number of moves per round.

```
0200 611E V1=1E
0202 620E V2=0E
0204 A5D5 I=05D5
0206 D123 SHOW 3MV1V2
0208 6500 V5=00
020A 2570 D0 0570
020C 7501 V5+01
020E 3506 SKIP;V5 EQ 06
0210 120A GO 020A
0212 A5FB I=05FB
0214 F565 V0:V5=MI
0216 4400 SKIP;V4 NE 00
0218 6401 V4=01
021A 4200 SKIP;V2 NE 00
021C 6201 V2=01
021E 4100 SKIP;V1 NE 00
0220 6101 V1=01
0222 4000 SKIP;V0 NE 00
0224 6001 V0=01
0226 6608 V6=08
0228 8602 V6=V6&V0
022A 3600 SKIP;V6 EQ 00
022C 6008 V0=08
022E 8610 V6=V1
0230 8150 V1=V5
0232 A5FB I=05FB
0234 F455 MI=V0:V4
0236 8360 V3=V6
0238 6400 V4=00
023A 00E0 ERASE
023C 6E00 VE=00
023E 8BE0 VB=VE
0240 6A03 VA=03
0242 A5A5 I=05A5
0244 255E D0 055E
0246 F265 V0:V2=MI
0248 6A05 VA=05
024A A600 I=0600
024C 255E D0 055E
024E F455 MI=V0:V4
0250 2564 D0 0564
0252 7E01 VE+01
0254 A5FB I=05FB
0256 F065 V0:V0=MI
0258 50E0 SKIP;V0 EQ VE
025A 123E GO 023E
025C A5BD I=05BD
025E 653E V5=3E
0260 6601 V6=01
0262 D56D SHOW DMV5V6
0264 6610 V6=10
0266 D56D SHOW DMV5V6
0268 661F V6=1F
026A 75F7 V5+F7
026C D561 SHOW 1MV5V6
026E 3511 SKIP;V5 EQ 11
0270 126A GO 026A
0272 6500 V5=00
0274 6100 V1=00
0276 6208 V2=08
0278 2592 D0 0592
027A 7501 V5+01
027C 7206 V2+06
027E 3503 SKIP;V5 EQ 03
0280 1278 GO 0278
0282 A5FE I=05FE
0284 F065 V0:V0=MI
0286 1470 GO 0470
0288 2592 D0 0592
028A 6104 V1=04
028C 7201 V2+01
028E A5D5 I=05D5
0290 D123 SHOW 3MV1V2
0292 72FA V2+FA
0294 3203 SKIP;V2 EQ 03
0296 1290 GO 0290
0298 6000 V0=00
029A 12A6 GO 02A6
029C 2538 D0 0538
029E F065 V0:V0=MI
02A0 2540 D0 0540
02A2 A5A4 I=05A4
02A4 F065 V0:V0=MI
02A6 7001 V0+01
02A8 4064 SKIP;V0 NE 64
02AA 6000 V0=00
02AC 2538 D0 0538
02AE F055 MI=V0:V0
02B0 2540 D0 0540
02B2 FE0A VE=KEY
02B4 4E00 SKIP;VE NE 00
02B6 12D0 GO 02D0
02B8 7EFF VE+FF
02BA 6608 V6=08
02BC 86E2 V6=V6&VE
02BE 3600 SKIP;V6 EQ 00
02C0 6E07 VE=07
02C2 252C D0 052C
02C4 2518 D0 0518
02C6 2506 D0 0506
02C8 4710 SKIP;V7 NE 10
02CA 12C6 GO 02C6
02CC 2518 D0 0518
02CE 12B2 GO 02B2
02D0 A5F5 I=05F5
02D2 F965 V0:V9=MI
02D4 252C D0 052C
02D6 43F0 SKIP;V3 NE F0
02D8 1362 GO 0362
02DA FA0A VA=KEY
```

```

02DC 2518 DO 0518
02DE A5FD I=05FD
02E0 F065 V0:V0=MI
02E2 8D00 VD=V0
02E4 24FC DO 04FC
02E6 6800 V8=00
02E8 600E V0=0E
02EA F055 MI=V0:V0
02EC 7801 V8+01
02EE 380F SKIP;V8 EQ 0F
02F0 12EA GO 02EA
02F2 24DE DO 04DE
02F4 7DFF VD+FF
02F6 24E4 DO 04E4
02F8 252C DO 052C
02FA 2506 DO 0506
02FC 3710 SKIP;V7 EQ 10
02FE F70A V7=KEY
0300 A5FE I=05FE
0302 F065 V0:V0=MI
0304 4000 SKIP;V0 NE 00
0306 131A GO 031A
0308 F807 V8=TIME
030A 3800 SKIP;V8 EQ 00
030C 131A GO 031A
030E 24E4 DO 04E4
0310 79FF V9+FF
0312 24DE DO 04DE
0314 4900 SKIP;V9 NE 00
0316 133C GO 033C
0318 24E4 DO 04E4
031A 4710 SKIP;V7 NE 10
031C 12F8 GO 02F8
031E 370B SKIP;V7 EQ 0B
0320 1326 GO 0326
0322 24E4 DO 04E4
0324 12DE GO 02DE
0326 370E SKIP;V7 EQ 0E
0328 132E GO 032E
032A 24E4 DO 04E4
032C 133C GO 033C
032E 24FC DO 04FC
0330 FD1E I=I+VD
0332 8070 V0=V7
0334 F055 MI=V0:V0
0336 24E4 DO 04E4
0338 3D00 SKIP;VD EQ 00
033A 12F4 GO 02F4
033C 252C DO 052C
033E 2518 DO 0518
0340 A5FC I=05FC
0342 F065 V0:V0=MI
0344 8600 V6=V0
0346 A5FA I=05FA
0348 F565 V0:V5=MI
034A 252C DO 052C
034C 4600 SKIP;V6 NE 00
034E 1356 GO 0356
0350 8544 V5=V5+V4
0352 4F01 SKIP;VF NE 01
0354 65FF V5=FF
0356 8450 V4=V5
0358 6A05 VA=05
035A A600 I=0600
035C 24D8 DO 04D8
035E EA9E SKIP;VA EQ KEY
0360 135E GO 035E
0362 A5FB I=05FB
0364 F065 V0:V0=MI
0366 7E01 VE+01
0368 50E0 SKIP;V0 EQ VE
036A 12D0 GO 02D0
036C A5F0 I=05F0
036E FD65 V0:VD=MI
0370 7DFF VD+FF
0372 6E00 VE=00
0374 252C DO 052C
0376 43F0 SKIP;V3 NE F0
0378 1384 GO 0384
037A 24FC DO 04FC
037C FD1E I=I+VD
037E F065 V0:V0=MI
0380 4005 SKIP;V0 NE 05
0382 1412 GO 0412
0384 7E01 VE+01
0386 A5FB I=05FB
0388 F065 V0:V0=MI
038A 50E0 SKIP;V0 EQ VE
038C 1374 GO 0374
038E 6E00 VE=00
0390 6900 V9=00
0392 252C DO 052C
0394 4300 SKIP;V3 NE 00
0396 1406 GO 0406
0398 43F0 SKIP;V3 NE F0
039A 13BA GO 03BA
039C 24FC DO 04FC
039E FD1E I=I+VD
03A0 F065 V0:V0=MI
03A2 300E SKIP;V0 EQ 0E
03A4 69FF V9=FF
03A6 4002 SKIP;V0 NE 02
03A8 13E4 GO 03E4
03AA 4001 SKIP;V0 NE 01
03AC 13D6 GO 03D6
03AE 4003 SKIP;V0 NE 03
03B0 13D6 GO 03D6
03B2 4004 SKIP;V0 NE 04
03B4 13DE GO 03DE
03B6 4006 SKIP;V0 NE 06

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03B8 13DE GO 03DE
03BA 7E01 VE+01
03BC A5FB I=05FB
03BE F065 V0:V0=MI
03C0 6C00 VC=00
03C2 FC15 TIME=VC
03C4 FC07 VC=TIME
03C6 3C00 SKIP;VC EQ 00
03C8 13C4 GO 03C4
03CA 5E00 SKIP;VE EQ V0
03CC 1392 GO 0392
03CE 3900 SKIP;V9 EQ 00
03D0 4D00 SKIP;VD NE 00
03D2 129C GO 029C
03D4 1370 GO 0370
03D6 7003 V0+03
03D8 8500 V5=V0
03DA 24C0 DO 04C0
03DC 13E8 GO 03E8
03DE 8500 V5=V0
03E0 24C0 DO 04C0
03E2 13FC GO 03FC
03E4 252C DO 052C
03E6 2564 DO 0564
03E8 8600 V6=V0
03EA 248E DO 048E
03EC A5C8 I=05C8
03EE 6F00 VF=00
03F0 D122 SHOW 2MV1V2
03F2 4F01 SKIP;VF NE 01
03F4 1400 GO 0400
03F6 8060 V0=V6
03F8 D122 SHOW 2MV1V2
03FA 24D2 DO 04D2
03FC 2564 DO 0564
03FE 13BA GO 03BA
0400 D122 SHOW 2MV1V2
0402 252C DO 052C
0404 13FC GO 03FC
0406 63F0 V3=F0
0408 24D2 DO 04D2
040A 2478 DO 0478
040C 2564 DO 0564
040E 2478 DO 0478
0410 13BA GO 03BA
0412 252C DO 052C
0414 4400 SKIP;V4 NE 00
0416 1384 GO 0384
0418 74FF V4+FF
041A 24D2 DO 04D2
041C 8700 V7=V0
041E 248E DO 048E
0420 4FFF SKIP;VF NE FF
0422 1384 GO 0384
0424 6603 V6=03
0426 8B70 VB=V7
0428 8B62 VB=VB&V6
042A 6A03 VA=03
042C A5DF I=05DF
042E 255E DO 055E
0430 6F02 VF=02
0432 FF18 TONE=VF
0434 D123 SHOW 3MV1V2
0436 8CF0 VC=VF
0438 D123 SHOW 3MV1V2
043A 8070 V0=V7
043C 3C01 SKIP;VC EQ 01
043E 141E GO 041E
0440 8510 V5=V1
0442 8620 V6=V2
0444 6B00 VB=00
0446 9BE0 SKIP;VB NE VE
0448 1464 GO 0464
044A 252E DO 052E
044C 43F0 SKIP;V3 NE F0
044E 1464 GO 0464
0450 5150 SKIP;V1 EQ V5
0452 1464 GO 0464
0454 5260 SKIP;V2 EQ V6
0456 1464 GO 0464
0458 3300 SKIP;V3 EQ 00
045A 73FF V3+FF
045C 24D4 DO 04D4
045E 2482 DO 0482
0460 2482 DO 0482
0462 1384 GO 0384
0464 7B01 VB+01
0466 A5FB I=05FB
0468 F065 V0:V0=MI
046A 50B0 SKIP;V0 EQ VB
046C 1446 GO 0446
046E 1384 GO 0384
0470 3000 SKIP;V0 EQ 00
0472 1288 GO 0288
0474 72FA V2+FA
0476 128A GO 028A
0478 6F03 VF=03
047A A5DF I=05DF
047C D123 SHOW 3MV1V2
047E A5E2 I=05E2
0480 D123 SHOW 3MV1V2
0482 FF18 TONE=VF
0484 A5E8 I=05E8
0486 D123 SHOW 3MV1V2
0488 A5E5 I=05E5
048A D123 SHOW 3MV1V2
048C 00EE RET
048E A5F1 I=05F1
0490 F01E I=I+V0
0492 F065 V0:V0=MI

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0494	8204	V2=V2+V0	0502	255E	D0 055E
0496	6001	V0=01	0504	00EE	RET
0498	F01E	I=I+V0	0506	2564	D0 0564
049A	F065	V0:V0=MI	0508	6700	V7=00
049C	8104	V1=V1+V0	050A	E7A1	SKIP;V7 NE KEY
049E	6F00	VF=00	050C	1514	G0 0514
04A0	310E	SKIP;V1 EQ 0E	050E	7701	V7+01
04A2	14A8	G0 04A8	0510	3710	SKIP;V7 EQ 10
04A4	613B	V1=3B	0512	150A	G0 050A
04A6	6FFF	VF=FF	0514	2564	D0 0564
04A8	313E	SKIP;V1 EQ 3E	0516	00EE	RET
04AA	14B0	G0 04B0	0518	7E01	VE+01
04AC	6111	V1=11	051A	6507	V5=07
04AE	6FFF	VF=FF	051C	6608	V6=08
04B0	32FD	SKIP;V2 EQ FD	051E	FE29	I=VE(LSDP)
04B2	14B8	G0 04B8	0520	D565	SHOW 5MV5V6
04B4	621B	V2=1B	0522	660E	V6=0E
04B6	6FFF	VF=FF	0524	F329	I=V3(LSDP)
04B8	321E	SKIP;V2 EQ 1E	0526	D565	SHOW 5MV5V6
04BA	00EE	RET	0528	7EFF	VE+FF
04BC	6200	V2=00	052A	00EE	RET
04BE	14B6	G0 04B6	052C	8BE0	VB=VE
04C0	252C	D0 052C	052E	6A05	VA=05
04C2	8600	V6=V0	0530	A600	I=0600
04C4	2564	D0 0564	0532	255E	D0 055E
04C6	8060	V0=V6	0534	F465	V0:V4=MI
04C8	4504	SKIP;V5 NE 04	0536	00EE	RET
04CA	70FE	V0+FE	0538	A5A4	I=05A4
04CC	7001	V0+01	053A	6500	V5=00
04CE	6607	V6=07	053C	6601	V6=01
04D0	8062	V0=V0&V6	053E	00EE	RET
04D2	8BE0	VB=VE	0540	A630	I=0630
04D4	6A05	VA=05	0542	F033	MI=V0(3DD)
04D6	A600	I=0600	0544	F265	V0:V2=MI
04D8	255E	D0 055E	0546	F129	I=V1(LSDP)
04DA	F455	MI=V0:V4	0548	D565	SHOW 5MV5V6
04DC	00EE	RET	054A	F229	I=V2(LSDP)
04DE	68F0	V8=F0	054C	7505	V5+05
04E0	F815	TIME=V8	054E	D565	SHOW 5MV5V6
04E2	00EE	RET	0550	00EE	RET
04E4	6507	V5=07	0552	6C00	VC=00
04E6	6614	V6=14	0554	4A00	SKIP;VA NE 00
04E8	FD29	I=VD(LSDP)	0556	00EE	RET
04EA	D565	SHOW 5MV5V6	0558	8CB4	VC=VC+VB
04EC	A5FE	I=05FE	055A	7AFF	VA+FF
04EE	F065	V0:V0=MI	055C	1554	G0 0554
04F0	4000	SKIP;V0 NE 00	055E	2552	D0 0552
04F2	00EE	RET	0560	FC1E	I=I+VC
04F4	661A	V6=1A	0562	00EE	RET
04F6	F929	I=V9(LSDP)	0564	6A03	VA=03
04F8	D565	SHOW 5MV5V6	0566	8B00	VB=V0
04FA	00EE	RET	0568	A5C8	I=05C8
04FC	8BE0	VB=VE	056A	255E	D0 055E
04FE	6A0F	VA=0F	056C	D123	SHOW 3MV1V2
0500	A628	I=0628	056E	00EE	RET

0570 620D V2=0D	05B6 0000
0572 611A V1=1A	05B8 351B
0574 2592 D0 0592	05BA 0417
0576 6121 V1=21	05BC 0049
0578 259E D0 059E	05BE 0000
057A A5FB I=05FB	05C0 4000
057C F51E I=I+V5	05C2 0040
057E F055 MI=V0:V0	05C4 0000
0580 6678 V6=78	05C6 4000
0582 F615 TIME=V6	05C8 0040
0584 F607 V6=TIME	05CA A000
0586 3600 SKIP:V6 EQ 00	05CC C040
0588 1584 GO 0584	05CE 8040
058A 611A V1=1A	05D0 8040
058C 2592 D0 0592	05D2 C000
058E 6121 V1=21	05D4 A040
0590 15A0 GO 05A0	05D6 0040
0592 A5EB I=05EB	05D8 6000
0594 F51E I=I+V5	05DA 2040
0596 F065 V0:V0=MI	05DC 2000
0598 F029 I=V0(LSDP)	05DE 6040
059A D125 SHOW 5MV1V2	05E0 4040
059C 00EE RET	05E2 2040
059E F30A V3=KEY	05E4 8000
05A0 8030 V0=V3	05E6 E000
05A2 1598 GO 0598	05E8 8040
05A4 0106	05EA 2005
05A6 3B0F	05EC 0D0E
05A8 0211	05EE 0C0F
05AA 0C00	05F0 0AFD
05AC 291B	05F2 FD00
05AE 0423	05F4 0303
05B0 0000	05F6 0300
05B2 1D1B	05F8 FDFD
05B4 042F	05FA FDD4

15. VIP Lunar Lander

You are descending to the floor of a 250-foot crater. The right side of the TV display shows amount of fuel, feet from the bottom, and fall rate per cycle. Length of fall rate cycle changes from about $\frac{1}{4}$ second to one second. The fall rate increases by one foot per second/per cycle. The computer will update the display only at the end of each cycle.

The left side of the display shows the Lunar Lander descending from 250 feet. The Lander will first appear at one of sixteen locations. It will then slowly drop down the crater. The crater walls have rock formations protruding from them which must be avoided. If either rocket motor should touch any part of the crater, the Lander will explode in a cloud of smoke, and disintegrate. (Remember, these are atomic thrusters and react like miniature atomic bombs upon impact.)

When you reach 32 feet, the display will change, and you will see the crater floor. You must now land between the rock formations on the floor, and maintain a minimum fall rate. As you drop your fall rate to zero, you soon discover that the Lander becomes more and more unstable just as any hovering object would. And now with perfect skill you guide the ship in for a perfect touch down, or?

How To Play VIP Lunar Lander

1. Load the CHIP-8 interpreter at 0000-01FF and the game starting at 0200.

2. Key 2 controls the thrust of the Lunar Lander. One tone beep equals one pound of fuel and one foot of thrust.

3. Key 4 controls the horizontal stabilizing engine, and moves the Lander one foot to the left per one pound of fuel.

4. Key 6 controls stabilization to the right.

5. Stabilization controls only react after: (a) a complete fall cycle, or (b) after the key 1 thrust control is pressed. You must be aware of this at all times or you will crash even though either key 4 or 6 is pressed.

6. At the end of each cycle, the Lunar Lander will move randomly at the rate of one foot either right or left. Therefore, as the fall rate approaches zero, the Lander becomes more uncontrollable, and your horizontal stabilizers react more quickly. (Just like the real thing.)

7. If you land too fast, the Lander will bounce and flip over.

8. If you run out of fuel, the Lander will crash.

9. You will not be allowed to go above 250 feet. If you try to do so you will just waste fuel.

10. Once you reach 32 feet and move into the landing display, you will not be allowed to rise above 26 feet. Trying to do so will waste fuel.

11. Game Options

You may select one of three options at the beginning of the game.

Option: 1—You start at 250 feet. You are given 150 pounds of fuel. You must land at 5 feet per second or less. The initial descent display is easy to maneuver through.

Option: 2—You start at 250 feet. You have 200 pounds of fuel. You must land at 3 feet per second or less. The initial descent display is hard to maneuver through.

Option: 3—You start at 32 feet. You have 100 pounds of fuel. You must land at 3 feet per second or less. This display allows you to practice landing. You should consider Option: 2 as the complete game when trying for Astronaut Ratings.

12. Astronaut Ratings

The computer will award you with ratings depending on how good a lander you are:

You will obtain the rating of Astronaut by landing without regard to fall rate or fuel. You must not exceed fall rate, or zero fuel.

You will obtain the rating of Astronaut Pilot, by landing with regard to fuel. 80 pounds or more if you land between the two rock formations on the floor, and 50 pounds or more if you land between the crater wall and a rock formation.

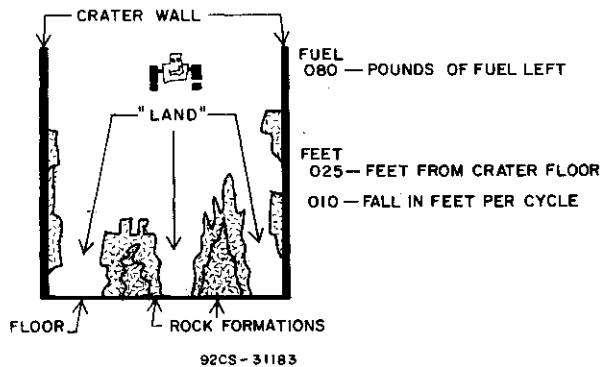
You will obtain the rating of Astronaut Captain by landing the ship with regard to fuel as per above, and if the fall rate is two feet per second or less. (Not an easy task, as you will soon discover.)

13. About Graphics

This game has some interesting graphic displays when you run out of fuel, crash, land too fast, when you land successfully. I will leave them to your discovery, as they are fun to watch.

14. Landing Sites

The final landing display will appear somewhat like the illustration below. You may land in any of the three locations pointed to. To land between the crater walls and the rock formations, you will have to first bring the Lander to a zero fall rate while hovering in the center landing area. Then bring the ship up and just over the rock formation, and then let it drop down to the landing site. At the last moment, a few



taps on the thruster button will slow the Lander to the required fall rate. It will take you many tries to land here, but don't give up, it can be done!!

NOTE: VIP Lunar Lander requires at least 3K of RAM. RAM memories are available to increase your VIP from 2K to 3K at your local computer store or by contacting:

RCA VIP Marketing
New Holland Avenue
Lancaster, PA 17604

0200	1202	6330	F315	A414	6105	6200	256C	A438;
0210	6108	6212	2568	A456	6100	621A	2542	2542;
0220	1798	0000	0000	A4E1	6100	6200	D121	7201;
0230	321F	122C	612E	6200	D121	7201	321F	1238;
0240	15B6	A4D1	6100	6200	D125	A570	FA33	F265;
0250	6331	6406	2258	00EE	F029	D345	7305	F129;
0260	D345	7305	F229	D345	00EE	0000	A4D6	6118;
0270	6200	D125	A573	FB33	F265	6331	6413	2258;
0280	00EE	0000	A4CC	6130	6200	D125	A576	FC33;
0290	F265	6331	641A	2258	00EE	0000	6AFA	6BFA;
02A0	A570	F265	6331	6406	2258	00EE	A573	F265;
02B0	6331	6413	2258	00EE	A576	F265	6331	641A;
02C0	2258	00EE	0000	0000	6602	C70F	6800	770B;
02D0	6E02	6302	E3A1	23D2	6304	E3A1	257C	6306;
02E0	E3A1	236E	12E6	7C01	8EC0	7BFF	4B00	165E;
02F0	4B1A	2394	7EFF	7801	23EA	3E00	12EA	C001;
0300	3000	1308	7701	130A	77FF	22A0	224A	22AC;
0310	2274	23EA	22B8	228C	12D0	0000	6302	E3A1;
0320	13D2	00EE	6300	6A96	6BFA	6C04	A346	6130;
0330	6200	252E	A355	6130	620D	252E	224A	2274;
0340	228C	12C8	0000	EA8A	EA8A	8EE8	88E8	88EE;
0350	0000	0000	00EE	88EE	888E	EE84	E484	E400;
0360	0000	0000	7AFF	3A00	13D6	1854	0000	F618;
0370	7701	7AFF	4A00	1854	23EA	6306	E3A1	136E;
0380	00EE	77FF	C0F8	FEFF	E080	A384	6101	620C;
0390	D126	00EE	25BE	A4E2	6100	6201	D12F	A4F1;
03A0	720F	D12F	A500	6126	6201	D12F	720F	D12F;
03B0	A51E	610D	6218	D127	A525	611F	6218	D127;
03C0	A4DE	6100	621F	D121	7108	3130	13C6	00EE;
03D0	0000	F618	1364	3C00	7CFF	4BFA	13E6	4B1A;
03E0	13E6	7B01	7BFF	3E00	7EFF	A4DB	D785	6F00;
03F0	A4E1	8980	7905	8D70	DD91	4F01	16D4	DD91;

0400	6F00	7D07	DD91	4F01	17F4	DD91	A4DB	D785;
0410	131C	0000	8A8A	8A8A	EE8B	CAAB	9A8A	BCB4;
0420	BCA8	AC47	4547	4575	4564	544C	45EE	A8AE;
0430	A8EE	F0D0	F0A0	B000	97A4	C7A4	9751	5471;
0440	2521	C341	D901	C1AB	2B3B	2A2A	D555	D594;
0450	DDDC	08C8	48C8	97A4	C7A4	9751	5571	2420;
0460	4342	EB42	4383	02BB	8083	BB12	9392	92BD;
0470	959D	95BD	4544	4444	75EE	284E	88EE	EF8D;
0480	8F8A	EB77	5477	5157	5555	7550	5500	EE8A;
0490	8E8A	EAE	A4E4	8484	EAB	EAA	AA20	20A0;
04A0	6020	EEA8	EEA2	AEEF	4D4F	4A4B	7456	5554;
04B0	745D	555D	D555	5C48	4848	C806	EEA4	E484;
04C0	8E8E	8A8A	8AEE	E040	4040	4000	EE88	EE82;
04D0	8EE8	88E8	888E	EE84	E484	8418	3CA5	FFBD;
04E0	0080	4040	4040	4040	6060	6060	6060	6070;
04F0	7060	6060	6060	6070	7060	4040	0000	0000;
0500	0301	0F0F	0101	0101	0000	0000	0000	0007;
0510	0F0F	0F0F	0F0F	0F0F	0F0F	8F8F	8F8F	28F8;
0520	FC7C	787C	7C10	3030	78F8	F0F8	0000	6300;
0530	6405	D125	7301	F41E	7108	3303	1532	00EE;
0540	0000	6300	6405	D125	7301	F41E	7108	3304;
0550	1546	00EE	0000	6300	6405	D125	7301	F41E;
0560	7108	3305	155A	00EE	252E	152E	252E	1542;
0570	0104	0900	0407	0002	0100	B3BF	F618	77FF;
0580	7AFF	4A00	1854	23EA	6304	E3A1	157C	00EE;
0590	5848	A59E	6126	6214	159A	D126	00EE	030F;
05A0	FF7F	0701	FF00	A5A4	6109	620F	D121	610B;
05B0	6210	D121	1772	2592	238A	25A6	1326	2592;
05C0	238A	25A6	00EE	4747	80FF	A8AB	A8AE	88FF;
05D0	F080	A080	A0A0	F000	22A0	224A	22AC	2274;
05E0	22B8	228C	A76C	D786	4701	163A	4702	163A;
05F0	4703	163A	4704	163A	4705	163A	4706	163A;
0600	4724	1612	4725	1612	4726	1612	6DFF	163A;
0610	0000	6E00	7702	A5C8	D781	78FF	7E01	3E0D;
0620	1618	A5C9	77F4	7801	D787	7708	A5D0	D787;
0630	17FC	F888	A888	A8A8	F800	6E00	7702	A5C8;
0640	D781	78FF	7E01	3E0D	1640	A5C9	7701	7801;
0650	D787	7708	A632	D787	3DFF	17FC	1816	6F00;
0660	6605	86C5	3F01	1680	15D8	0000	0000	0000;
0670	0000	BDFF	A53C	1838	1078	D8D8	7810	3800;
0680	A677	7702	78FD	D788	26A8	168C	A677	D788;
0690	A672	77FE	7804	D785	A47E	610C	6200	252E;
06A0	6D02	FD18	1698	25C4	22A0	224A	22AC	2274;
06B0	22B8	228C	00EE	414A	AE5D	BBBD	BE80	B2B4;
06C0	4C40	484D	4741	4342	B56A	292C	E3C4	DF2F;
06D0	1F2F	8820	2748	6E02	26DC	1740	A4DB	D786;
06E0	A6C8	D786	78FF	FE18	A47E	610C	6200	252E;
06F0	7D01	3D0A	16DE	6D00	00EE	A6D2	7702	780D;

0700	8570	8680	8070	8980	D781	D781	273A	78FF;
0710	7001	75FF	76FE	79FE	D782	D782	D092	D092;
0720	D562	D562	7D01	273A	A47E	610C	6200	252E;
0730	A6D2	3D05	170E	1738	1756	6E02	FE18	00EE;
0740	780A	26E0	16FA	1742	6D00	F818	26A8	8A70;
0750	8B80	7B05	00EE	A47E	610C	6200	252E	A76A;
0760	1762	DAB2	6E02	FE18	1756	C0C0	183C	A5FF;
0770	BD24	611F	6217	D121	00EE	EEAA	AEA8	E8EB;
0780	4A4A	4A4B	A2B2	AAA6	A230	9013	9038	7010;
0790	7640	70E0	20E0	20E0	1892	6109	6208	2568;
07A0	F00A	4001	17B0	4002	17CE	4003	17D8	17A0;
07B0	18A0	600B	F055	6096	A327	F055	A329	60FA;
07C0	F055	A2CD	6000	F055	17EA	17EC	0000	A5AF;
07D0	600E	F055	A661	18AA	18B2	6064	F055	A329;
07E0	6020	F055	A2CD	601A	F055	F307	3300	17EA;
07F0	00E0	1226	2748	7A07	16D6	BFBB	6F00	6031;
0800	80A5	3F00	1832	4C00	1842	4C01	1842	4C02;
0810	1842	1836	0000	6F00	604F	80A5	3F00	1832;
0820	1806	0000	A4A2	6103	6200	2556	6E02	FE18;
0830	00EE	2824	1832	2824	A4BC	610B	6206	252E;
0840	1836	2824	A48E	6108	6206	2542	1842	6AA1;
0850	A4DB	D785	A677	7702	78FD	D788	26A8	A677;
0860	D788	77FE	7803	A672	D785	D785	A346	6130;
0870	6200	252E	6E02	FE18	7BFF	7C01	7801	4B1B;
0880	2394	3B00	1866	26A8	2748	7A03	6E02	26E0;
0890	1740	A673	611B	620F	D121	A77A	179A	0000;
08A0	A661	6005	F055	A5AF	17B2	6003	F055	60C8;
08B0	17B8	A661	6003	F055	A327	17DA	76F6	327F;
08C0	0010	1800	FF7E	C7FD	8050	35C9	A42E	6780;
08D0	0080	1000	6FFF	7F73	3800	C917	8727	A33F;
08E0	0000	94C8	FFEF	FFED	C890	FEFC	FF27	2930;
08F0	9058	8C12	FF7F	7F77	9180	1FE9	62D7	3B2B;

16. VIP Blockout

VIP Blockout is a fast action two-player game of skill, strategy, coordination, and excitement!

Two players each using their own keypad control the movement of their respective lines (one solid and one checkered).

The object is for each player to maneuver his/her line in such a manner as to avoid collision with another line while at the same time trying to cause the opponent to collide with one. As the play continues, the speed of movement increases demanding faster thought and response.

How To Play VIP Blockout

1. **DO NOT** load the CHIP-8 interpreter! The entire game listing starting at location 0000 is provided. Load game in location 0000 through 048F.
2. Turn RUN switch on.
3. Movement of each player's line is controlled by pressing 2 to move line up, 8 down, 4 left and 6 right.

4. If the program is executed in a normal manner, by flipping the toggle switch to run, the playing field is defined by a border around its perimeter. However, if key 0 on either keypad is pressed while the run switch is flipped, the border is not generated and then the lines can wrap around the screen.

5. A match consists of nine games, the winner getting the most points.

NOTES: 1. This game is programmed in color and has sound effects. It can be used with the VP590 Color board and VP595 Simple Sound board, or it will run on a standard VIP without color and sound enhancement.

2. This game requires a minimum of one VIP expansion keyboard (VP580) or two expansion keyboards for exciting "dual action". Expansion keyboards plug directly into the VP590 color graphics board or into the VP585 expansion keyboard interface. For these and other VIP accessories, contact your local computer store or:

RCA VIP Marketing
New Holland Avenue
Lancaster, PA 17604

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0000  91BB FF01 B2B6 F8CF A2F8 81B1 F846 A190;
0010  B4F8 1BA4 F802 B5F8 FFA5 D496 B7E2 94BC;
0020  45AF F6F6 F6F6 3244 F950 AC8F FA0F F9F0;
0030  A605 F6F6 F6F6 F9F0 A74C B38C FC0F AC0C;
0040  A3D3 301B 8FFA 0FB3 4530 4022 6912 D400;
0050  0001 0101 0100 0101 0101 0102 0100 0101;
0060  007C 7583 8BFE B4B7 BC91 EB00 D970 9905;
0070  06FA 07BE 06FA 3FF6 F6F6 2252 07FA 1FFE;
0080  FEFE F1AC 9BBC 45FA 0FAD A7F8 D0A6 93AF;
0090  8732 F327 4ABD 9EAE 8E32 A49D F6BD 8F76;
00A0  AF2E 3099 9D56 168F 5616 308E 00EC F8D0;
00B0  A693 A78D 32D9 06F2 2D32 BEF8 01A7 46F3;
00C0  5C02 FB07 32D2 1C06 F232 CEF8 01A7 06F3;
00D0  5C2C 168C FC08 AC3B B3F8 FFA6 8756 12D4;
00E0  9BBF F8FF AF93 5F8F 32DF 2F30 E500 42B5;
00F0  42A5 D48D A787 32AC 2A27 30F5 0000 05F6;

```

0100	33A4	3095	0045	A398	56D4	F881	BCF8	95AC;
0110	22DC	1256	D406	B8D4	06A8	D464	0A01	E68A;
0120	F4AA	3B28	9AFC	01BA	D4F8	81BA	06FA	0FAA;
0130	0AAA	D4E6	06BF	93BE	F81B	AE2A	1AF8	005A;
0140	0EF5	3B4B	560A	FC01	5A30	404E	F63B	3C9F;
0150	562A	2AD4	0022	8652	F8F0	A707	5A87	F317;
0160	1A3A	5B12	D422	8652	F8F0	A70A	5787	F317;
0170	1A3A	6B12	D415	8522	7395	5225	45A5	86FA;
0180	0FB5	D445	E6F3	3A82	1515	D445	E6F3	3A88;
0190	D445	0730	8C45	0730	84E6	6226	45A3	3688;
01A0	D43E	88D4	E606	FA77	5607	FA77	F4FA	7756;
01B0	15D4	0000	4556	D445	E6F4	56D4	45FA	0F3A;
01C0	C407	56D4	AF22	F8D3	738F	F9F0	52E6	07D2;
01D0	56F8	FFA6	F800	7E56	D419	89AE	93BE	99EE;
01E0	F456	76E6	F4B9	5645	F256	D445	AA86	FA0F;
01F0	BAD4	3788	D43F	88D4	E663	D4E6	3FFC	6BD4;
0200	92BD	F89F	AD0D	320A	45D4	0045	FA0F	AF32;
0210	3146	FA3F	F6F6	F622	52E2	06FA	1FFE	FEFE;
0220	F1AC	12F8	D0BC	075C	9CFC	08AC	2F8F	3A26;
0230	D407	BD46	AC06	BC8C	FA07	2252	E2F8	C0BE;
0240	9CF6	F6F6	F6FA	07AD	9CFE	FEFE	FEFE	F4AE;
0250	8CF6	F6F6	F6FA	07AF	9EB7	8EA7	8DBC	F804;
0260	AC9D	5787	FC08	A72C	8C3A	619C	3273	FF01;
0270	BC30	5E1E	8EFA	E7AE	8F32	7E2F	3058	12D4;
0280	92BD	F89F	ADFA	C0BC	94AC	F8AA	5C94	BCAC;
0290	0CFB	9132	9CF8	915C	F801	5DD4	F800	5DD4;
02A0	E265	22D4	0000	0000	0000	0000	0000	0000;
02B0	0000	0000	0000	0000	0000	0000	0000	0000;
02C0	0000	0000	0000	0000	0000	0000	0000	0000;
02D0	0000	0000	0000	0000	0000	0000	0000	0000;
02E0	0000	0000	0000	0000	0000	0000	0000	0000;
02F0	0000	0000	0000	0000	0000	0280	00E0	004B;
0300	6609	6700	1486	6701	A490	6000	6100	F155;
0310	2424	8EFF	2360	2424	6C05	6170	6270	B1C0;
0320	6880	6920	3701	244C	6104	6204	6C08	633A;
0330	641A	6D02	CA01	6500	4A00	2376	4A01	23AE;
0340	3F00	13E6	236A	7501	3502	1338	2350	1336;
0350	F8F8	6E02	FE18	4902	135E	79FF	78FE	8E90;
0360	FE15	FE07	3E00	1362	00EE	3A00	1372	6A01;
0370	00EE	6A00	00EE	6B02	EBA1	1384	7B02	3B0A;
0380	1378	8BC0	8CB0	4B02	1398	4B04	139E	4B06;
0390	13A4	7100	7202	13A8	7100	72FE	13A8	71FE;
03A0	7200	13A8	7102	7200	A481	D122	00EE	6B02;
03B0	EBF5	13BC	7B02	3B0A	13B0	8BD0	8DB0	4B02;
03C0	13D0	4B04	13D6	4B06	13DC	7300	7402	13E0;
03D0	7300	74FE	13E0	73FE	7400	13E0	7302	7400;
03E0	A483	D342	00EE	6EFF	FE15	FE18	4A00	D122;
03F0	4A01	D342	FE07	3E00	13EC	A490	F165	A490;


```
0400      3A00    7001   3A01  7101     F155  00E0  2424  76FF;
0410      3600    1312   6E02  FE18     6E04  FE15  FE07  3E00;
0420      141C    1414   6C04  6130     622D  B1C0  6C06  6134;
0430      622D    B1C0   A490  6110     6200  2444  A491  6128;
0440      2444    00EE   F065  F029     D125  00EE  A483  6100;
0450      6200    D121   3F00  D121     62FF  D121  7101  3F01;
0460      1450    71FF   D121  6201     6100  D121  3F00  D121;
0470      61FF    D121   7201  3F01     1468  72FF  D121  00EE;
0480      01C0    C080   40D4  E7A1     1306  E7F5  1306  1308;
0490      0000    0000   0000  0000     0000  0000  0000  0000;
04A0      0000    0000   0000  0000     0000  0000  0000  0000;
04B0      0000    0000   0000  0000     0000  0000  0000  0000;
04C0      0000    0000   0000  0000     0000  0000  0000  0000;
04D0      0000    0000   0000  0000     0000  0000  0000  0000;
04E0      0000    0000   0000  0000     0000  0000  0000  0000;
04F0      0000    0000   0000  0000     0000  0000  0000  0000;
```