

SWTPC 6800 TIC-TAC-TOE PROGRAM TICTAC-1

This program allows the operator to play the game of TIC-TAC-TOE at the serial control terminal. The program uses $06B0_{16}$ (1812_{10}) words of memory and is meant to be loaded to memory starting from location 0020_{16} . The program is actually in two parts with the first part residing in locations 0020_{16} to $00A2_{16}$ and the second part residing in locations 0100_{16} to $06B0_{16}$. Due to the length of this program, it should be dumped to cassette or paper tape after loading. This will make it easier to load the program the next time you wish to use it.

To use the TIC-TAC program load it in step by step using the MIKBUG memory change function or through cassette or paper tape. The program counter addresses $A04816$ and $A04916$ must then be set to 01 and 00 respectively. The TIC-TAC program can now be initiated as described in the "Go to User's Program" section of Engineering Note 100. If the program was loaded correctly the computer should respond with "HELLO I AM A SWTPC 6800 COMPUTER I AM PROGRAMMED TO PLAY TIC-TAC-TOE..." The computer will then give some instructions, print a sample tic-tac-toe grid and will ask for "YOUR PLAY:": The numbers 1-9 designate the squares 1-9 as shown on the sample grid. When the computer says "YOUR PLAY:" simply type in the number of the square that you wish to occupy with a W. The computer will then come back with "NEW=" and some number. The new number is the square that the computer chose to occupy. An updated grid is then printed. If you type in a wrong character the computer responds with "INVALID CHARACTER" or if you choose an occupied square the computer tells you so and asks for another play. When the game is finished and the computer asks if you want to play again, type a Y for yes or an N for no. The program can be exited at any time by pressing the RESET button and can be restarted by re-setting the program counter to 0100 and initializing the program as described earlier.

The original source listing of this program is contained in the Motorola "46800 User Library, however. the program was slightly modified to enable it to work with the SWTPC 6800 MIKBUG; firmware and CT-1024 terminal system. These modifications did not change the internal workings of the program or its ability to run on TTY's or other type terminals.

The program sends out control character commands to home-up and erase the screen on those CT-1024 terminal systems having the CT-CA computer controlled cursor option. You should program the jumpers on your CT-CA option so a control P (1016) generates a Home-Up and a Control V (1616) generates an Erase to End of Frame (EOF).

If after loading your TIC-TAC program it fails to work properly go back and re-check each memory location from 0020_{16} to $06B0_{16}$ to be sure that the program was loaded correctly. If it was and the program still does not work properly run the two memory diagnostics described in the Software Section of the System Documentation Notebook on the memory being used to verify that the memory being used is operational. Running the diagnostics of course will cause whatever was stored in the memory being tested to be erased, so the TIC-TAC program should be re-entered.

0020 0A	0059 20	0092 A0	0100 7E
0021 20	005A 21	0093 47	0101 04
0022 31	005B 20	0094 00	0102 E8
0023 20	005C 39	0095 10	0103 10
0024 21	005D 20	0096 00	0104 16
0025 20	005E 20	0097 00	0105 7F
0026 32	005F 04	0098 00	0106 7F
0027 20	0060 00	0099 05	0107 48
0028 21	0061 72	009A BA	0108 45
0029 20	0062 00	009B 05	0109 4C
002A 33	0063 22	009C C0	010A 4C
002B 0D	0064 00	009D 05	010B 4F
002C 0A	0065 26	009E C6	010C 20
002D 2D	0066 00	009F 05	010D 49
002E 2D	0067 2A	00A0 CC	010E 20
002F 2D	0068 00	00A1 06	010F 41
0030 21	0069 3B	00A2 65	0110 4D
0031 2D	006A 00		0111 20
0032 2D	006B 3F		0112 41
0033 2D	006C 00		0113 20
0034 21	006D 43		0114 53
0035 2D	006E 00		0115 57
0036 2D	006F 54		0116 54
0037 2D	0070 00		0117 50
0038 0D	0071 58		0118 43
0039 0A	0072 00		0119 20
003A 20	0073 5C		011A 36
003B 34	0074 04		011B 38
003C 20	0075 05		011C 30
003D 21	0076 09		011D 30
003E 20	0077 CB		011E 20
003F 35	0078 06		011F 43
0040 20	0079 73		0120 4F
0041 21	007A 03		0121 4D
0042 20	007B 00		0122 50
0043 36	007C 00		0123 55
0044 0D	007D 10		0124 54
0045 0A	007E 16		0125 45
0046 2D	007F 7F		0126 52
0047 2D	0080 7F		0127 00
0048 2D	0081 4E		0128 00
0049 21	0082 45		0129 00
004A 2D	0083 57		012A 00
004B 2D	0084 3D		012B 0D
004C 2D	0085 32		012C 0A
004D 21	0086 04		012D 00
004E 2D	0087 00		012E 0D
004F 2D	0088 00		012F 0A
0050 2D	0089 53		0130 49
0051 0D	008A 4B		0131 20
0052 0A	008B 49		0132 41
0053 20	008C 4C		0133 4D
0054 37	008D 4C		0134 20
0055 20	008E 3D		0135 50
0056 21	008F 30		0136 52
0057 20	0090 20		0137 4F
0058 38	0091 04		0138 47

0139 52	0172 53	01AB 49	01E4 59
013A 41	0173 54	01AC 4E	01E5 20
013B 4D	0174 2E	01AD 56	01E6 54
013C 4D	0175 0D	01AE 41	01E7 41
013D 45	0176 0A	01AF 4C	01E8 4B
013E 44	0177 59	01B0 49	01E9 45
013F 20	0178 4F	01B1 44	01EA 4E
0140 54	0179 55	01B2 20	01EB 2C
0141 4F	017A 20	01B3 52	01EC 20
0142 20	017B 50	01B4 45	01ED 50
0143 50	017C 4C	01B5 50	01EE 4C
0144 4C	017D 41	01B6 4C	01EF 45
0145 41	017E 59	01B7 59	01F0 41
0146 59	017F 20	01B8 21	01F1 53
0147 0D	0180 42	01B9 20	01F2 45
0148 0A	0181 59	01BA 50	01F3 20
0149 54	0182 20	01BB 4C	01F4 54
014A 49	0183 54	01BC 45	01F5 52
014B 43	0184 59	01BD 41	01F6 59
014C 2D	0185 50	01BE 53	01F7 20
014D 54	0186 49	01BF 45	01F8 41
014E 41	0187 4E	01C0 20	01F9 47
014F 43	0188 47	01C1 54	01FA 41
0150 2D	0189 20	01C2 59	01FB 49
0151 54	018A 41	01C3 50	01FC 4E
0152 4F	018B 20	01C4 45	01FD 2E
0153 45	018C 4E	01C5 20	01FE 20
0154 0D	018D 55	01C6 41	01FF 20
0155 0A	018E 4D	01C7 47	0200 04
0156 59	018F 42	01C8 41	0201 59
0157 4F	0190 45	01C9 49	0202 4F
0158 55	0191 52	01CA 4E	0203 55
0159 20	0192 20	01CB 3A	0204 52
015A 41	0193 46	01CC 04	0205 20
015B 52	0194 52	01CD 54	0206 50
015C 45	0195 4F	01CE 48	0207 4C
015D 20	0196 4D	01CF 41	0208 41
015E 22	0197 20	01D0 54	0209 59
015F 4F	0198 31	01D1 20	020A 3A
0160 22	0199 20	01D2 4C	020B 20
0161 20	019A 54	01D3 4F	020C 04
0162 41	019B 4F	01D4 43	020D 59
0163 4E	019C 20	01D5 41	020E 4F
0164 44	019D 39	01D6 54	020F 55
0165 20	019E 20	01D7 49	0210 20
0166 59	019F 20	01D8 4F	0211 57
0167 4F	01A0 20	01D9 4E	0212 49
0168 55	01A1 20	01DA 20	0213 4E
0169 20	01A2 20	01DB 49	0214 21
016A 50	01A3 20	01DC 53	0215 04
016B 4C	01A4 20	01DD 20	0216 49
016C 41	01A5 20	01DE 41	0217 20
016D 59	01A6 20	01DF 4C	0218 57
016E 20	01A7 20	01E0 52	0219 49
016F 46	01A8 0D	01E1 45	021A 4E
0170 49	01A9 0A	01E2 41	021B 21
0171 52	01AA 04	01E3 44	021C 04

021D 54	0256 4C	028F 41	02C8 52
021E 49	0257 4C	0290 56	02C9 41
021F 45	0258 3A	0291 45	02CA 43
0220 20	0259 20	0292 20	02CB 54
0221 47	025A 30	0293 0D	02CC 45
0222 41	025B 2D	0294 0A	02CD 52
0223 4D	025C 4C	0295 45	02CE 0A
0224 45	025D 4F	0296 4E	02CF 0A
0225 2E	025E 57	0297 4A	02D0 0A
0226 04	025F 2C	0298 4F	02D1 0A
0227 57	0260 20	0299 59	02D2 0A
0228 4F	0261 54	029A 45	02D3 0A
0229 55	0262 4F	029B 44	02D4 0A
022A 4C	0263 20	029C 20	02D5 0A
022B 44	0264 39	029D 50	02D6 04
022C 20	0265 2D	029E 4C	02D7 50
022D 59	0266 48	029F 41	02D8 4C
022E 4F	0267 49	02A0 59	02D9 45
022F 55	0268 47	02A1 49	02DA 41
0230 20	0269 48	02A2 4E	02DB 53
0231 4C	026A 20	02A3 47	02DC 45
0232 49	026B 20	02A4 0D	02DD 20
0233 4B	026C 20	02A5 0A	02DE 54
0234 45	026D 20	02A6 59	02DF 59
0235 20	026E 20	02A7 4F	02E0 50
0236 54	026F 20	02A8 55	02E1 45
0237 4F	0270 20	02A9 20	02E2 20
0238 20	0271 20	02AA 4D	02E3 22
0239 50	0272 20	02AB 41	02E4 59
023A 4C	0273 20	02AC 59	02E5 22
023B 41	0274 20	02AD 20	02E6 20
023C 59	0275 20	02AE 52	02E7 4F
023D 20	0276 20	02AF 45	02E8 52
023E 41	0277 04	02B0 53	02E9 20
023F 47	0278 54	02B1 54	02EA 22
0240 41	0279 48	02B2 41	02EB 4E
0241 49	027A 41	02B3 52	02EC 22
0242 4E	027B 4E	02B4 54	02ED 2E
0243 3F	027C 4B	02B5 20	02EE 04
0244 20	027D 20	02B6 42	02EF D6
0245 04	027E 59	02B7 59	02F0 22
0246 10	027F 4F	02B8 20	02F1 96
0247 16	0280 55	02B9 54	02F2 54
0248 00	0281 2E	02BA 59	02F3 97
0249 00	0282 20	02BB 50	02F4 22
024A 54	0283 49	02BC 49	02F5 96
024B 59	0284 20	02BD 4E	02F6 5C
024C 50	0285 48	02BE 47	02F7 97
024D 45	0286 4F	02BF 20	02F8 54
024E 20	0287 50	02C0 41	02F9 96
024F 4E	0288 45	02C1 4E	02FA 2A
0250 45	0289 20	02C2 59	02FB 97
0251 57	028A 59	02C3 0D	02FC 5C
0252 20	028B 4F	02C4 0A	02FD D7
0253 53	028C 55	02C5 43	02FE 2A
0254 4B	028D 20	02C6 48	02FF D6
0255 49	028E 48	02C7 41	0300 26

0301 96	033A E6	0373 30	03AC 78
0302 3B	033B 00	0374 9E	03AD 2B
0303 97	033C 85	0375 92	03AE 25
0304 26	033D 10	0376 31	03AF BD
0305 96	033E 27	0377 31	03B0 03
0306 58	033F 06	0378 7D	03B1 23
0307 97	0340 C1	0379 00	03B2 22
0308 3B	0341 58	037A 96	03B3 25
0309 96	0342 27	037B 26	03B4 82
030A 43	0343 1F	037C 02	03B5 BD
030B 97	0344 20	037D 6E	03B6 03
030C 58	0345 0E	037E 00	03B7 23
030D D7	0346 85	037F 84	03B8 21
030E 43	0347 20	0380 0F	03B9 86
030F 30	0348 27	0381 97	03BA BD
0310 EE	0349 06	0382 95	03BB 02
0311 00	034A C1	0383 DE	03BC EF
0312 31	034B 4F	0384 94	03BD 03
0313 31	034C 27	0385 EE	03BE AF
0314 7A	034D 15	0386 97	03BF 7E
0315 00	034E 20	0387 6E	03C0 03
0316 74	034F 04	0388 00	03C1 BF
0317 26	0350 C1	0389 96	03C2 BD
0318 06	0351 20	038A 77	03C3 03
0319 86	0352 27	038B 84	03C4 23
031A 04	0353 0F	038C 0F	03C5 21
031B 97	0354 85	038D 80	03C6 62
031C 74	0355 40	038E 05	03C7 63
031D 6E	0356 26	038F 97	03C8 21
031E 02	0357 03	0390 78	03C9 65
031F EE	0358 7C	0391 96	03CA 69
0320 00	0359 00	0392 75	03CB 22
0321 6E	035A 96	0393 81	03CC 65
0322 00	035B 74	0394 01	03CD 68
0323 30	035C 00	0395 26	03CE 88
0324 9F	035D 96	0396 2B	03CF BD
0325 92	035E 78	0397 96	03D0 02
0326 AE	035F 00	0398 76	03D1 EF
0327 00	0360 96	0399 81	03D2 03
0328 34	0361 20	039A 06	03D3 C2
0329 7F	0362 C9	039B 2E	03D4 7C
032A 00	0363 85	039C 12	03D5 00
032B 96	0364 40	039D 81	03D6 7B
032C 32	0365 26	039E 05	03D7 BD
032D 4D	0366 C5	039F 2E	03D8 03
032E 2B	0367 7C	03A0 09	03D9 23
032F 43	0368 00	03A1 2D	03DA 12
0330 16	0369 96	03A2 31	03DB 53
0331 C4	036A 74	03A3 7D	03DC 41
0332 0F	036B 00	03A4 00	03DD 15
0333 58	036C 96	03A5 78	03DE 59
0334 D7	036D 0D	03A6 2A	03DF 41
0335 95	036E 79	03A7 2C	03E0 14
0336 DE	036F 00	03A8 20	03E1 57
0337 94	0370 96	03A9 05	03E2 41
0338 EE	0371 20	03AA 7D	03E3 82
0339 60	0372 B9	03AB 00	03E4 BD

03E5	03	041E	BD	0457	20	0490	03
03E6	23	041F	03	0458	09	0491	23
03E7	11	0420	23	0459	81	0492	05
03E8	53	0421	22	045A	08	0493	62
03E9	42	0422	63	045B	26	0494	64
03EA	15	0423	41	045C	4C	0495	51
03EB	58	0424	25	045D	7D	0496	05
03EC	42	0425	69	045E	00	0497	62
03ED	84	0426	41	045F	78	0498	67
03EE	BD	0427	24	0460	2A	0499	51
03EF	03	0428	67	0461	47	049A	05
03F0	23	0429	41	0462	BD	049B	63
03F1	11	042A	82	0463	03	049C	64
03F2	59	042B	BD	0464	23	049D	51
03F3	45	042C	03	0465	01	049E	05
03F4	12	042D	23	0466	62	049F	61
03F5	58	042E	21	0467	55	04A0	06
03F6	45	042F	63	0468	67	04A1	9D
03F7	86	0430	42	0469	01	04A2	59
03F8	BD	0431	25	046A	66	04A3	86
03F9	02	0432	68	046B	68	04A4	BD
03FA	EF	0433	42	046C	49	04A5	02
03FB	03	0434	84	046D	01	04A6	EF
03FC	D4	0435	BD	046E	63	04A7	04
03FD	7F	0436	03	046F	65	04A8	62
03FE	00	0437	23	0470	01	04A9	D6
03FF	7B	0438	21	0471	42	04AA	77
0400	96	0439	69	0472	53	04AB	96
0401	76	043A	45	0473	67	04AC	75
0402	81	043B	22	0474	01	04AD	81
0403	01	043C	68	0475	63	04AE	02
0404	2E	043D	45	0476	57	04AF	2E
0405	09	043E	86	0477	68	04B0	0A
0406	2D	043F	BD	0478	82	04B1	27
0407	3C	0440	02	0479	BD	04B2	04
0408	7D	0441	EF	047A	03	04B3	C1
0409	00	0442	04	047B	23	04B4	20
040A	78	0443	1E	047C	02	04B5	2E
040B	2A	0444	96	047D	64	04B6	17
040C	37	0445	75	047E	55	04B7	C1
040D	20	0446	81	047F	02	04B8	30
040E	0F	0447	02	0480	55	04B9	2E
040F	96	0448	26	0481	66	04BA	13
0410	76	0449	5F	0482	02	04BB	81
0411	81	044A	96	0483	61	04BC	04
0412	02	044B	76	0484	69	04BD	27
0413	27	044C	81	0485	02	04BE	04
0414	04	044D	09	0486	63	04BF	C1
0415	81	044E	2D	0487	67	04C0	40
0416	05	044F	09	0488	02	04C1	2E
0417	26	0450	2E	0489	64	04C2	0B
0418	05	0451	10	048A	67	04C3	C1
0419	7D	0452	7D	048B	02	04C4	80
041A	00	0453	00	048C	66	04C5	2E
041B	78	0454	78	048D	69	04C6	15
041C	2B	0455	2B	048E	84	04C7	BD
041D	26	0456	52	048F	BD	04C8	03

04C9 23	0502 06	053B CE	0574 0A
04CA 05	0503 92	053C 00	0575 84
04CB 86	0504 CE	053D 87	0576 0F
04CC 20	0505 00	053E BD	0577 97
04CD 04	0506 20	053F 06	0578 76
04CE C1	0507 BD	0540 92	0579 BD
04CF 80	0508 06	0541 CE	057A 06
04D0 2E	0509 92	0542 02	057B A1
04D1 0A	050A CE	0543 01	057C 20
04D2 BD	050B 00	0544 BD	057D C3
04D3 03	050C 62	0545 06	057E 81
04D4 23	050D 86	0546 94	057F 31
04D5 01	050E 20	0547 7C	0580 2D
04D6 82	050F C6	0548 00	0581 28
04D7 BD	0510 09	0549 77	0582 81
04D8 02	0511 DF	054A 26	0583 39
04D9 EF	0512 60	054B 03	0584 2E
04DA 04	0513 EE	054C 7C	0585 24
04DB D2	0514 00	054D 00	0586 84
04DC BD	0515 A7	054E 79	0587 0F
04DD 03	0516 00	054F B6	0588 48
04DE 23	0517 5A	0550 80	0589 97
04DF 02	0518 27	0551 04	058A 95
04E0 84	0519 06	0552 01	058B DE
04E1 BD	051A DE	0553 2B	058C 94
04E2 02	051B 60	0554 F2	058D EE
04E3 EF	051C 08	0555 BD	058E 60
04E4 04	051D 08	0556 E1	058F A6
04E5 DC	051E 20	0557 AC	0590 00
04E6 20	051F F1	0558 81	0591 81
04E7 DF	0520 86	0559 53	0592 20
04E8 CE	0521 04	055A 26	0593 26
04E9 00	0522 97	055B 22	0594 1D
04EA 62	0523 74	055C 96	0595 86
04EB 86	0524 86	055D 75	0596 4F
04EC 31	0525 01	055E 81	0597 A7
04ED DF	0526 97	055F 01	0598 00
04EE 60	0527 75	0560 26	0599 96
04EF EE	0528 7F	0561 48	059A 79
04F0 00	0529 00	0562 CE	059B 84
04F1 A7	052A 7B	0563 02	059C 03
04F2 00	052B 7F	0564 46	059D 97
04F3 81	052C 00	0565 BD	059E 7A
04F4 39	052D 7C	0566 06	059F 4C
04F5 27	052E BD	0567 92	05A0 97
04F6 07	052F 06	0568 BD	05A1 74
04F7 DE	0530 A1	0569 E1	05A2 BD
04F8 60	0531 96	056A AC	05A3 02
04F9 08	0532 76	056B 81	05A4 EF
04FA 08	0533 81	056C 30	05A5 05
04FB 4C	0534 0A	056D 2D	05A6 A2
04FC 20	0535 2C	056E 04	05A7 7E
04FD EF	0536 0A	056F 81	05A8 03
04FE CE	0537 8A	0570 39	05A9 89
04FF 01	0538 30	0571 23	05AA CE
0500 03	0539 97	0572 02	05AB 01
0501 BD	053A 8F	0573 86	05AC AB

05AD	BD	05E6	DF	061F	DF	0658	BD
05AE	06	05E7	60	0620	60	0659	02
05AF	92	05E8	EE	0621	EE	065A	EF
05B0	20	05E9	00	0622	00	065B	06
05B1	95	05EA	A6	0623	A6	065C	4B
05B2	CE	05EB	00	0624	00	065D	CE
05B3	01	05EC	81	0625	81	065E	02
05B4	CD	05ED	5A	0626	20	065F	1D
05B5	BD	05EE	27	0627	27	0660	BD
05B6	06	05EF	07	0628	1C	0661	06
05B7	92	05F0	DE	0629	DE	0662	94
05B8	20	05F1	60	062A	60	0663	20
05B9	8D	05F2	5C	062B	08	0664	08
05BA	86	05F3	08	062C	08	0665	DE
05BB	5A	05F4	08	062D	20	0666	60
05BC	97	05F5	20	062E	F0	0667	86
05BD	22	05F6	EF	062F	CE	0668	20
05BE	20	05F7	86	0630	00	0669	A7
05BF	0F	05F8	58	0631	20	066A	00
05C0	86	05F9	A7	0632	BD	066B	20
05C1	5A	05FA	00	0633	06	066C	C8
05C2	97	05FB	CA	0634	92	066D	CE
05C3	26	05FC	30	0635	CE	066E	02
05C4	20	05FD	D7	0636	02	066F	27
05C5	09	05FE	85	0637	0D	0670	BD
05C6	86	05FF	CE	0638	BD	0671	06
05C7	5A	0600	00	0639	06	0672	92
05C8	97	0601	7D	063A	94	0673	BD
05C9	3F	0602	BD	063B	20	0674	E1
05CA	20	0603	06	063C	30	0675	AC
05CB	03	0604	92	063D	CE	0676	81
05CC	7C	0605	CE	063E	02	0677	59
05CD	00	0606	00	063F	16	0678	26
05CE	7C	0607	20	0640	BD	0679	03
05CF	96	0608	BD	0641	06	067A	7E
05D0	74	0609	06	0642	94	067B	05
05D1	8B	060A	92	0643	20	067C	0A
05D2	03	060B	7D	0644	28	067D	81
05D3	90	060C	00	0645	86	067E	4E
05D4	7A	060D	7B	0646	4F	067F	26
05D5	97	060E	26	0647	A7	0680	0C
05D6	74	060F	2D	0648	00	0681	CE
05D7	BD	0610	96	0649	DF	0682	02
05D8	02	0611	75	064A	60	0683	78
05D9	EF	0612	7C	064B	BD	0684	BD
05DA	05	0613	00	064C	03	0685	06
05DB	D7	0614	75	064D	23	0686	92
05DC	7D	0615	81	064E	21	0687	BD
05DD	00	0616	04	064F	62	0688	E1
05DE	7C	0617	27	0650	63	0689	AC
05DF	26	0618	03	0651	21	068A	7E
05E0	4E	0619	7E	0652	65	068B	04
05E1	C6	061A	05	0653	69	068C	E8
05E2	01	061B	41	0654	22	068D	CE
05E3	CE	061C	CE	0655	65	068E	02
05E4	00	061D	00	0656	68	068F	D7
05E5	62	061E	62	0657	8A	0690	20

0691 DE
0692 8D
0693 0D
0694 A6
0695 00
0696 81
0697 04
0698 27
0699 06
069A BD
069B E1
069C D1
069D 08
069E 20
069F F4
06A0 39
06A1 86
06A2 0A
06A3 BD
06A4 E1
06A5 D1
06A6 86
06A7 0D
06A8 BD
06A9 E1
06AA D1
06AB 86
06AC 00
06AD BD
06AE E1
06AF D1
06B0 39

END