ZEUS MONITOR Feb. 2022

8-BIT HOBBY COMPUTER BOOTSTRAP CODE

Bootup

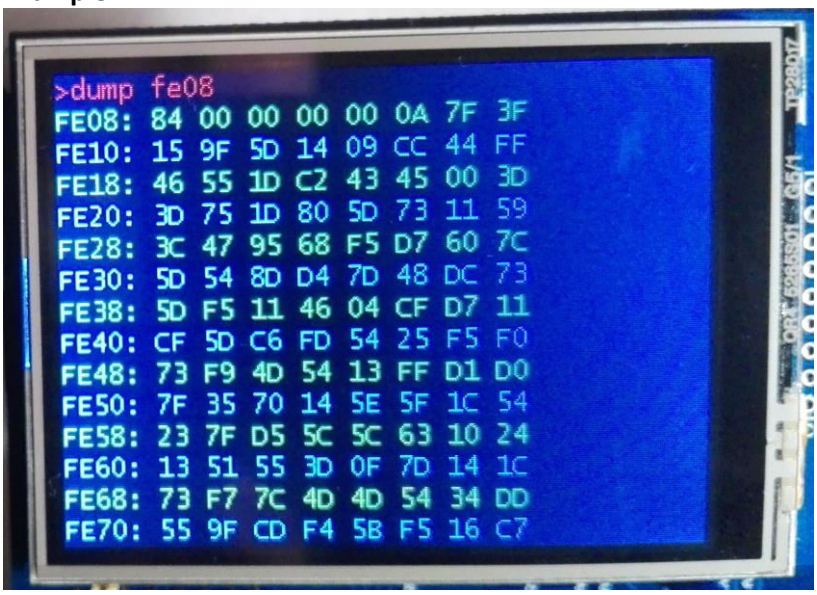
At the bootup the Monitor

1. copies memory block $0000-$3000 from bank F (EEPROM) to address $8000 (highmem);
2. counts number of memory banks in the system and enumerates them (address $0007);
3. jumps to $8000, configures system, switches to bank E and initiates it (writes reboot jump command to address $0000).

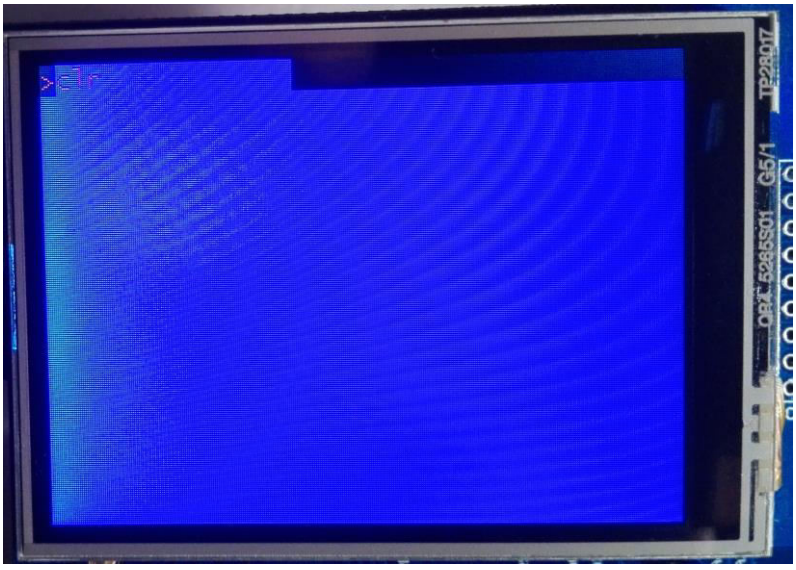
List of commands

- >clr
  Fills most of TFT screen (everything except command line) with background color.
- >dump (source)
  Dumps on TFT screen 0x70 bytes starting from specified memory address.
- >send (source) (bytes)
  Sends to UART specified number of bytes starting from specified memory address.
- >sysr (value)
  Sets system register value. Low nibble of sys reg is used by mem128 module for bank switching. Right after bank switch this new bank is initiated by writing corresponding jump instruction to address $0000 (in order to keep RESET function operational).
  Take it into concideration before closing EEPROM write enable jumper on the MEM module or else your EEPROM becomes unbootable after power off. So close the jumper ONLY after "SYSR XF" command or fix the jump address with use of LOAD command before power off.
- >load (dest) (byte1) (byte2)...
  Writes specified byte set starting from specified memory address.
- >move (dest) (source) (bytes)
  Writes specified number of bytes starting from specified memory address to another memory address.
- >jump (source)
  Sets Program Counter register (jumps) to specified memory address.
- >exec (source)
  Executes specified byte set ended with 0xC9 (RET instruction).
- >crc7 (byte1) (byte2)...
  Calculates crc7 sum augmented with bit0 = 1 (check SD phys layer specs) for specified byte set.

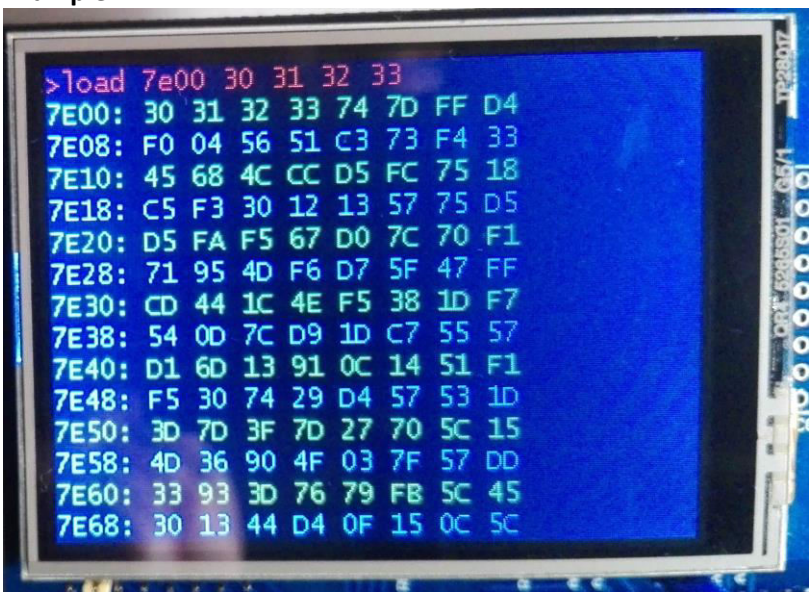
Example 1

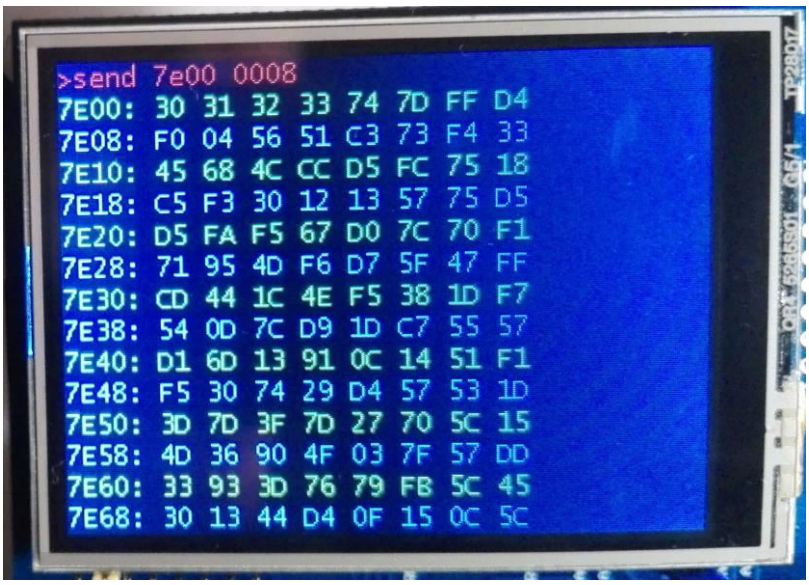

>dump fe08
FE08: 84 00 00 00 00 0A 7F 3F
FE10: 15 9F 5D 14 09 CC 44 FF
FE18: 46 55 1D C2 43 45 00 3D
FE20: 3D 75 1D 80 5D 73 11 59
FE28: 3C 47 95 68 F5 D7 60 7C
FE30: 5D 54 8D D4 7D 48 DC 73
FE38: 5D F5 11 46 04 CF D7 11
FE40: CF 5D C6 FD 54 25 F5 F0
FE48: 73 F9 4D 54 13 FF D1 D0
FE50: 7F 35 70 14 5E 5F 1C 54
FE58: 23 7F D5 5C 5C 63 10 24
FE60: 13 51 55 3D 0F 7D 14 1C
FE68: 73 F7 7C 4D 4D 54 34 DD
FE70: 55 9F CD F4 5B F5 16 C7

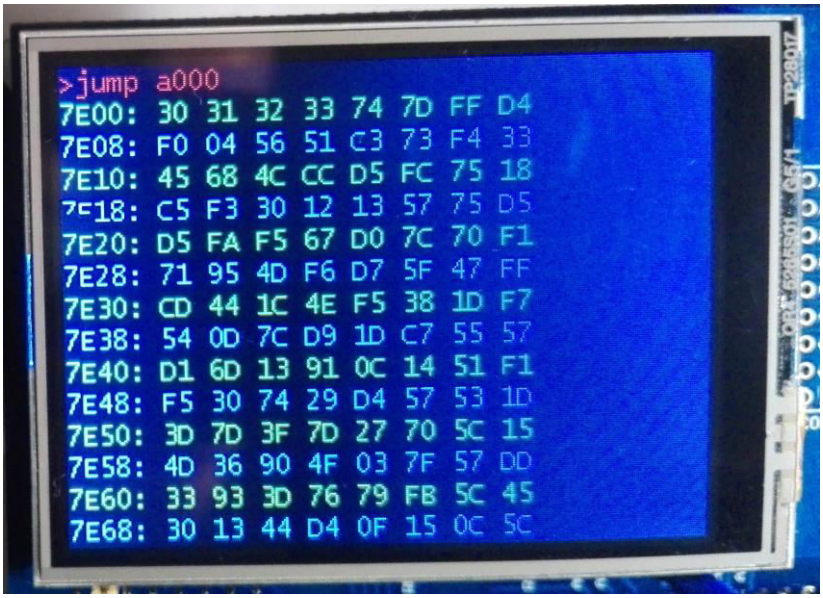

>load fe0a 00 10
FE08: 84 00 00 00 00 0A 7F 3F
FE10: 0F 9F 5D 14 09 CC 44 FF
FE18: 46 55 1D C2 43 45 00 3D
FE20: 3D 75 1D 80 5D 73 11 59
FE28: 3C 47 95 68 F5 D7 60 7C
FE30: 5D 54 8D D4 7D 48 DC 73
FE38: 5D F5 11 46 04 CF D7 11
FE40: CF 5D C6 FD 54 25 F5 F0
FE48: 73 F9 4D 54 13 FF D1 D0
FE50: 7F 35 70 14 5E 5F 1C 54
FE58: 23 7F D5 5C 5C 63 10 24
FE60: 13 51 55 3D 0F 7D 14 1C
FE68: 73 F7 7C 4D 4D 54 34 DD
FE70: 55 9F CD F4 5B F5 16 C7


>clr

Example 2

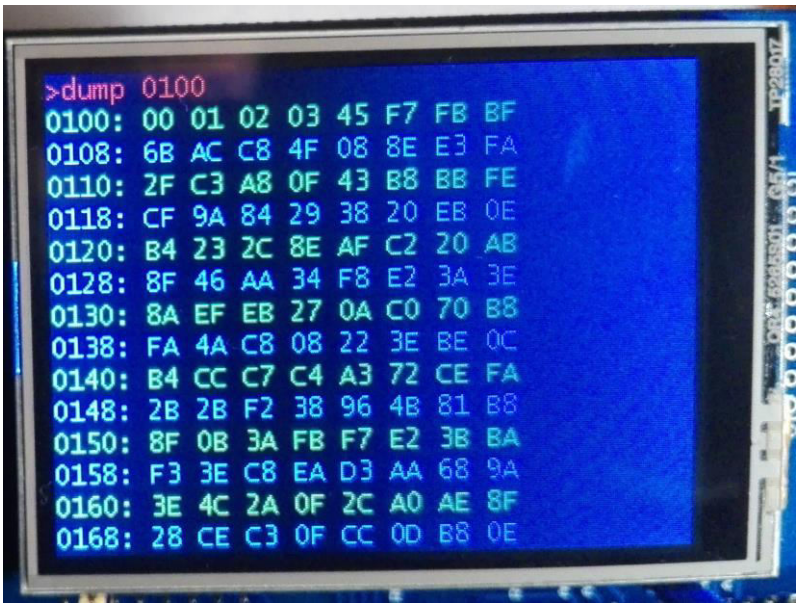

>load 7e00 30 31 32 33
7E00: 30 31 32 33 74 7D FF D4
7E08: F0 04 56 51 C3 73 F4 33
7E10: 45 68 4C CC D5 FC 75 18
7E18: C5 F3 30 12 13 57 75 D5
7E20: D5 FA F5 67 D0 7C 70 F1
7E28: 71 95 4D F6 D7 5F 47 FF
7E30: CD 44 1C 4E F5 38 1D F7
7E38: 54 0D 7C D9 1D C7 55 57
7E40: D1 6D 13 91 0C 14 51 F1
7E48: F5 30 74 29 D4 57 53 1D
7E50: 3D 7D 3F 7D 27 70 5C 15
7E58: 4D 36 90 4F 03 7F 57 DD
7E60: 33 93 3D 76 79 FB 5C 45
7E68: 30 13 44 D4 0F 15 0C 5C


>send 7e00 0008
7E00: 30 31 32 33 74 7D FF D4
7E08: F0 04 56 51 C3 73 F4 33
7E10: 45 68 4C CC D5 FC 75 18
7E18: C5 F3 30 12 13 57 75 D5
7E20: D5 FA F5 67 D0 7C 70 F1
7E28: 71 95 4D F6 D7 5F 47 FF
7E30: CD 44 1C 4E F5 38 1D F7
7E38: 54 0D 7C D9 1D C7 55 57
7E40: D1 6D 13 91 0C 14 51 F1
7E48: F5 30 74 29 D4 57 53 1D
7E50: 3D 7D 3F 7D 27 70 5C 15
7E58: 4D 36 90 4F 03 7F 57 DD
7E60: 33 93 3D 76 79 FB 5C 45
7E68: 30 13 44 D4 0F 15 0C 5C


>jump a000
7E00: 30 31 32 33 74 7D FF D4
7E08: F0 04 56 51 C3 73 F4 33
7E10: 45 68 4C CC D5 FC 75 18
7E18: C5 F3 30 12 13 57 75 D5
7E20: D5 FA F5 67 D0 7C 70 F1
7E28: 71 95 4D F6 D7 5F 47 FF
7E30: CD 44 1C 4E F5 38 1D F7
7E38: 54 0D 7C D9 1D C7 55 57
7E40: D1 6D 13 91 0C 14 51 F1
7E48: F5 30 74 29 D4 57 53 1D
7E50: 3D 7D 3F 7D 27 70 5C 15
7E58: 4D 36 90 4F 03 7F 57 DD
7E60: 33 93 3D 76 79 FB 5C 45
7E68: 30 13 44 D4 0F 15 0C 5C

Example 3


>crc7 00 01 02 03
45


>dump 0100
0100: 00 01 02 03 45 F7 FB BF
0108: 6B AC C8 4F 08 8E E3 FA
0110: 2F C3 A8 0F 43 B8 BB FE
0118: CF 9A 84 29 38 20 EB 0E
0120: B4 23 2C 8E AF C2 20 AB
0128: 8F 46 AA 34 F8 E2 3A 3E
0130: 8A EF EB 27 0A C0 70 B8
0138: FA 4A C8 08 22 3E BE 0C
0140: B4 CC C7 C4 A3 72 CE FA
0148: 2B 2B F2 38 96 4B 81 B8
0150: 8F 0B 3A FB F7 E2 3B BA
0158: F3 3E C8 EA D3 AA 68 9A
0160: 3E 4C 2A 0F 2C A0 AE 8F
0168: 28 CE C3 0F CC 0D B8 0E