

# Lenco Lucille LCD initialisation sequence

v1.2 4 Nov 2018

LCD 10 pin interface : RST, RS, CS, SCL, SDA, GND, VDD, CAP, CAP, VLCD

RST	Reset, hardware reset.
RS	Register select, select data or command register.
CS	Chip select, active low, transitions on the falling edge of SCL. Held low for duration of a byte, or continuously for the duration of a byte sequence.
SCL	Clock, 17uS (21uS between clock pulses), only present during CS period.
SDA	Data, write clocked on rising edge of SCL.
GND	Sent most-significant-bit first, 8 bit words, 135uS delay between bytes.
VDD	0V
CAP, VLCD	+3.3V, LCD logic power supply.
	LCD power, generated higher supply voltage

From the instruction codes sent, it appears to have a Sitronix ST7032 compatible controller.

## LCD initialisation:

```
39 1C 5D 7C 6A 38 0C 06 01 01
40 00 11 0E 0A 0E 11 00 00 48 0E 11 11 11 11 1F 00 00 50 0E 11 11 11 1F 1F
00 00 58 0E 11 11 1F 1F 1F 00 00 60 0E 11 1F 1F 1F 1F 00 00 68 00 1F 11 11
11 11 1F 00 70 00 1F 1F 1F 1F 1F 00 78 00 04 0E 0E 1F 1F 04 00 80
20 20 20 57 65 6C 63 6F 6D 65 20 74 6F 20 20 20 C0 20 20 20 20 20 52 61 64
69 6F 20 20 20 20 20 20
```

Initial code, each byte written with a single pulse to the CS line, 1.5mS between writes

- 39 Function set -
    - Turn ON extended instruction set,
    - 8 bit,
    - 2 lines,
    - 5x8 font
  - 1C Extended instruction - Internal OSC frequency
    - 183Hz frame rate,
    - 1/4 Bias
  - 5D Extended instruction - Power/ICON control/Contrast set
    - ICON display ON,
    - Booster circuit ON,
    - Contrast set (high nibble) = 01
  - 7C Extended instruction -
    - Contrast set(low nibble) = C0
  - 6A Extended instruction - Follower control
    - Turn ON internal follower circuit
    - 1.5 follower ratio
- (should be 200mS delay for power to stabilise)

38 Function set -  
Turn OFF extended instruction set,  
8 bit,  
2 lines,  
5x8 font

0C Display on, cursor off, blink off

06 Entry mode increment, shift

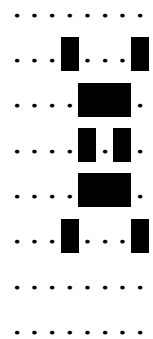
01 Clear display, set cursor address 0

3mS delay then writes a single byte

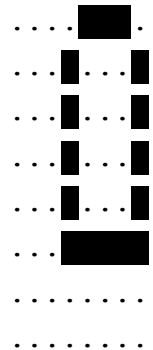
01 Clear display, set cursor address 0

Second initialisation sequence after 3mS, 136uS between bytes  
The following bytes are each written during a CS pulse duration  
Write to character generator (characters 0, through 7 are written)

40 CGRAM 0x00

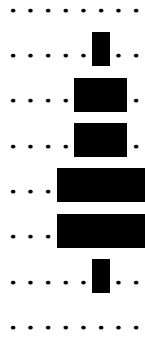


48 CGRAM 0x08





78 CGRAM 0x38



Display startup message

80 DRAM 00 - Position cursor line 1, character 1

20 20 20 57 65 6C 63 6F 6D 65 20 74 6F 20 20 20

" **Welcome to** "

C0 DRAM 40 - Position cursor line 2, character 1

20 20 20 20 20 52 61 64 69 6F 20 20 20 20 20 20

" **Radio** "