Brother FAX-645 LCD initialisation sequence

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LCD 6 pin interface : DATA, CLK, STB, GND, +5V, GND

CLK 28uS (35.714kHz), only present during STB period

STB active low, transitions on the falling edge of CLK. Held low for duration of a byte, or continuously for duration of a byte sequence.

DATA write clocked on rising edge of CLK

DATA sent least-significant-bit first, 8 bit words, 800uS delay between bytes

LCD initialisation:

```
08 20 F8 01

06 0C 40 0A 00 0E 01 0F 11 0F 00 0A 00 0E 11 11 11 0E 00 0A 00 11 11 11 13
0D 00 06 09 1C 80 1C 09 06 00

0C 80 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 80 0C

...

0C 80 50 4C 45 41 53 45 20 57 41 49 54 20 20 20 20 20 8F 0C

...
```

Initial code, each byte written with a single pulse to the STB line,

`08` - Display off, cursor off, blink off

`20` - Mode 4 bit, 1 line, 5x7 font

`F8` - Set Data cursor to 0x78 (but writes no data as strobe goes high again)

`01` - Clear display. 20mS delay before next sequence.

Second initialisation sequence after 24mS, 800uS between bytes

`06` - Right data entry, no scroll

`0C` - Display on, cursor off, blink off

The following bytes are written with STB held low for the duration

`40` - Write to character generator (characters 0, 1, 2, 3 written)

```
0A 00 0E 01 0F 11 0F 00 -     .#.#.
                              .....
                              .###.
                              ....#
```

```
                                .####
                                #...#
                                .####
                                .....

0A 00 0E 11 11 11 0E 00 -       .#.#.
                                .....
                                .###.
                                #...#
                                #...#
                                #...#
                                .###.
                                .....

0A 00 11 11 11 13 0D 00 -       .#.#.
                                .....
                                #...#
                                #...#
                                #...#
                                #..##
                                .##.#
                                .....

06 09 1C 80 1C 09 06 00 -       ..##.
                                .#..#
                                ###..
                                .....
                                ###..
                                .#..#
                                ..##.
                                .....
```

First displayed data written at 100mS after initialisation start, then repeated again at 131mS and 165mS

`0C` - Display on, cursor off, blink off

The following bytes are written with STB held low for the duration

`80` - Write characters to display starting at cursor position 0

`20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20` - " " , blank

The following two bytes are written with separate strobes and terminate the displayed character write

`80` - Position cursor to position 0, but writes no characters as strobe goes high again

`0C` - Display on, cursor off, blink off

Text written at 198mS, then repeated sequence of blanking and rewriting again at 2.9S, 3.6S and 4.0S

`0C` - Display on, cursor off, blink off

The following bytes are written with STB held low for the duration

80 - Write characters to display starting at cursor position 0

50 4C 45 41 53 45 20 57 41 49 54 20 20 20 20 20 - "PLEASE WAIT   "

The following two bytes are written with separate strobes and terminate the displayed character write

8F - Position cursor to position 15, but writes no characters as strobe goes high again

0C - Display on, cursor off, blink off

At 4.5S Display then blanked again and "TELEPHONE   " displayed