— 301 2839   —

LCD Driver Board Part# 1-905

This note accompanies the LCD Driver Board Part Number 1-905.

Connection

The LCD driver board is supplied with pin headers to suit both 14x1 and 7x2 LCD connection configurations. Select the header that matches the LCD and solder it to the **BACK** (component, non display side) of the LCD using the shorter length pins. Place the two double-sided foam pads on the back of the LCD to prevent the LCD and driver boards from touching. Position the driver board over the header- **ensure that pin 1 is connected to pin1** - solder in place

Configuration

The Driver Board includes two jumpers to configure the LCD. Note the configuration is read on power-up and is retained until powered up again.

One or Two Lines?

The LCD can be configured to operate with either 1 or 2 lines of display. With the line jumper installed the display uses 2 lines.

Baud Rate?

The Driver Board will accept RS-232 signals at either 2400 Baud (jumper missing) or 9600 Baud (jumper installed)

Display

The potentiometer on the Driver Board adjusts the display contrast- it has been adjusted at the factory but may be further adjusted to suite local lighting conditions.

Connecting up the Driver Board/LCD

The Driver Board requires just 3 connections, incoming signal, ground and +5v at approximately 5mA making it suitable for driving from either of the BASIC Stamps.

DB-9 Socket

Connect the signal line to pin 3 and ground to pin 5. Some PC software requires handshaking so you may need to make the following connections:

1 to 4 to 6
7 to 8

DB-25 Socket

Connect the signal line to pin 2 and ground to pin 7. Additional connections that may be needed are:
Pin 4 to 5
Pin 6 to 8 and 20.

Programming

Stamps

With the LCD signal line connected to pin 0 the following programme line should display the word "Hello"

SEROUT 0, N2400, ("Hello")   -Make sure the LCD is set for 2400Baud transfer
and for the Stamp2:
SEROUT 0,84+$4000,["Hello"]   -Make sure the LCD is set for 9600 Baud transfer

The LCD will accept all the common control codes. To differentiate between control codes and normal characters the LCD must first be sent the code 254. To clear the LCD screen therefore (control code 1):
SEROUT 0,N2400,(254,1)
Once the control code has been received the LCD will revert back to normal operation (ie expect to receive a normal character). The other control codes you may need are as follows:

Instruction/Action	Code
Clear Screen	1
Scroll display one character left	24
Scroll display one character right	28
Home (and undo scrolling)	0
Move cursor one character left	16
Move cursor one character right	20
Turn on underline cursor	14
Turn on blinking cursor	13
Turn off cursor	12
Blank the display (retaining data)	8
Restore the display (without cursor)	12
Print at eg position 8 (line 1)	128 + position ie 128+8=136
Print at eg position 8 (line 2)	192 + position ie 192+8=200

The Character RAM in the LCD is actually 40 per line- but the display only shows characters in the first 20 RAM locations per line. Following a Clear Screen and after sending the following string to the LCD-
ABCDEFGHIJKLMNOPQRSTUVWXYZ
the LCD would display:-
ABCDEFGHIJKLMNOPQRST- ie the first 20 RAM locations.

Note that the LCD/Driver requires approximately 500ms to settle down after powering up and data/control codes should not be sent to it during this period. Similarly a pause of 10ms should be inserted after a Clear Screen or Home command before other data is sent.

PC Operation
The following programme lines illustrate the equivalent lines to drive the LCD from QBASIC running on a PC.

OPEN "COM1:2400,N,8,1,CD0,CS0,DS0,OP0" FOR OUTPUT AS #1   'Sets up Com port 1 for 2400 baud
SLEEP 1   ' Pause for 1 second
PRINT #1, "Hello"   ' Prints the word "Hello" to the screen
SLEEP 10   ' Pause for 1 0 seconds
PRINT #1, CHR$(254); CHR$(1);   ' Clears the screen