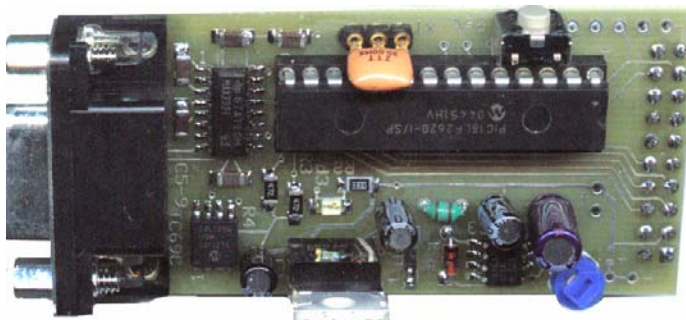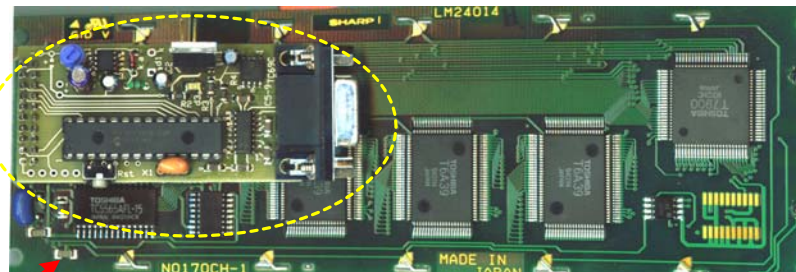# T69B1 Graphic LCD Development Board Rev 1.0

T69B1 shown assembled

Mounting example
Shown mounted directly to the backside of a Sharp 240x64 LCD

A small (1.25"x2.5") LCD interface development board specifically designed for T6963C based LCD's with 2x10 headers for LCDs such as the Optrex DMF5005, Sharp LM24014, Solomon LM6270, Sanyo DG0572 etc. This board makes it very easy for developers to experiment with graphic LCDs since it can mount directly to the LCD via its 2x10 female header. The board includes a PIC microcontroller, an RS232 interface IC, a 256kb Eeprom for storage and a -15v variable negative voltage supply for the LCD's display panel. It alsoincludes a 5v regulator. The PIC can be programmed by the developer/user so that the LCD can be used for whatever their design requires. Sample demo code written in PICBasicPro and aslo Proton+ is available at the COMPSys Workbench website in the support section.

It will work with most T6963C based LCDs that have a2x10 header as shown on the right
(as seen from the backside of the LCD)

FS D6 D4 D2 D0 nc CE WR 5v Gnd
O   O   O   O   O   O   O   O   O   O
O   O   O   O   O   O   O   O   O   □ Pin 1
nc D7 D5 D3 D1 Rst CD RD Vlcd Gnd

PARTS LIST

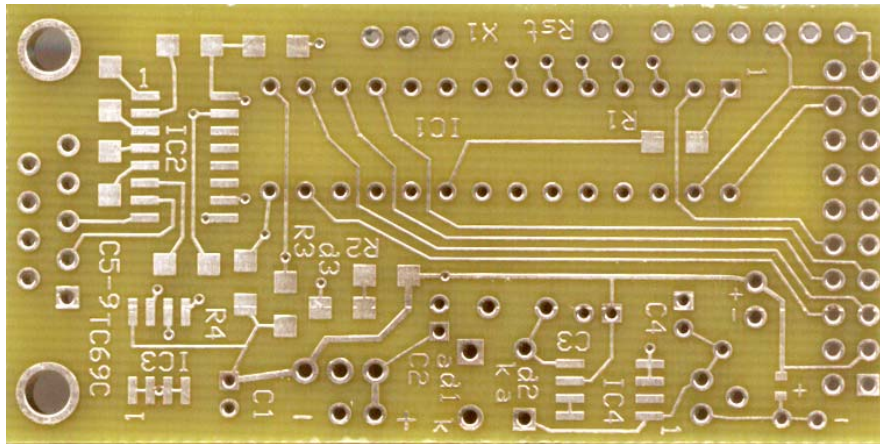|	
C1,C3 10uf radial cap	IC1 PIC mcu 28 pin
C2 1uf or .1uf radial cap	IC2 RS232 IC
C4 100uf radial cap	IC3 I2C Eeprom
C5-C9 1uf smd cap	IC4 Max637
R1,R3,R4 4.7k smd res	LM7805 regulator
R2 330 smd res	X1 20Mhz resonator
R5 10k or 20k POT	Printed circuit board
D1 IN4001 diode	DB9F connector
D2 IN4148 diode	2x10 Female LCD header
L1 180 MH inductor	Push button Reset Switch
	28 pin IC socket

IMPORTANT!
Please read before proceeding any further.
It is assumed that you purchased this kit with the knowledge that it will require soldering parts to a printed circuit board. **This assembly will require some very delicate soldering.** if you feel that you do not have the necessary soldering skills, please seek assistance from someone who does. Small mistakes in soldering can result in many frustrating hours of re-doing work. **Double check each component for value , orientation and placement on the pcb before actually soldering it!** Please use a very fine tip (25W max) soldering iron and quality solder such as .022 (or finer) silver-based solder. Other tools required include small tweezers, long nosed pliers, diagonal cutters and a multimeter.
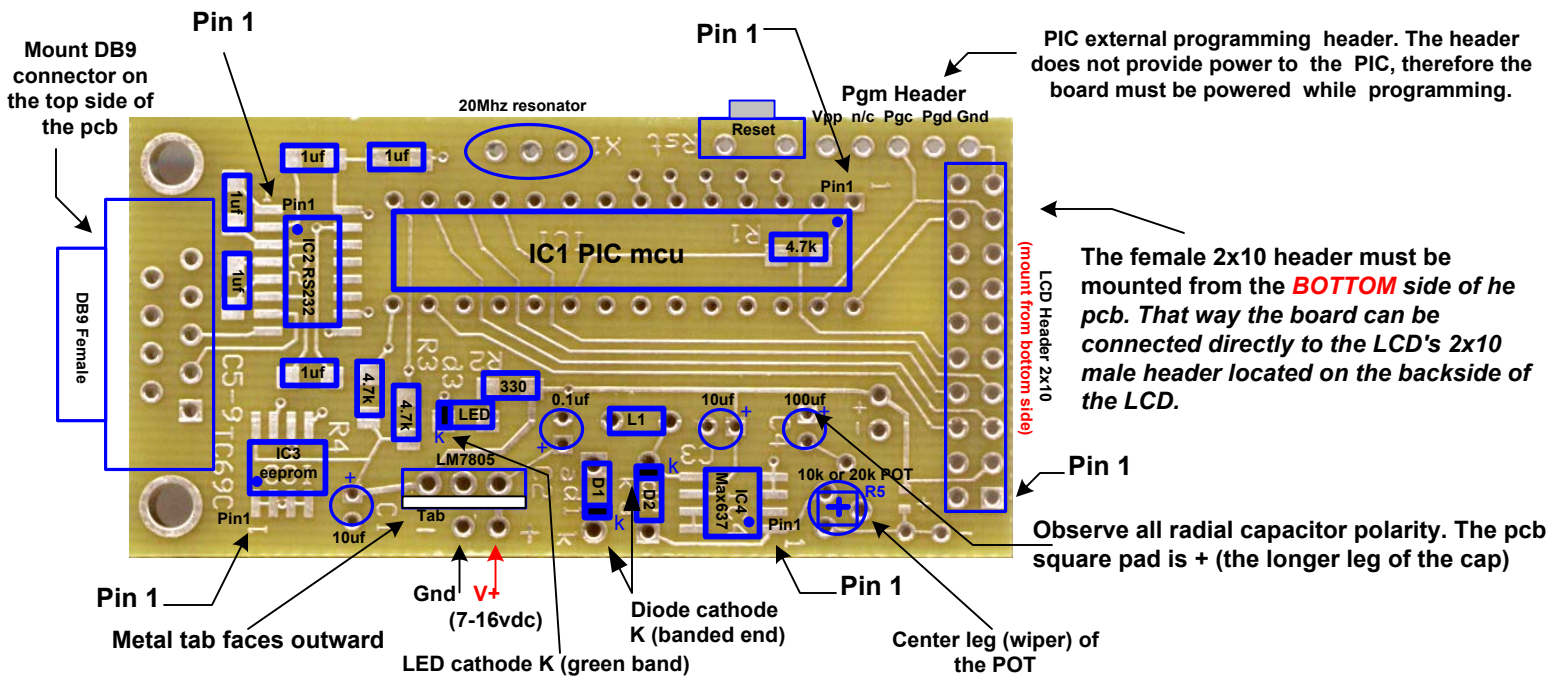

Disclaimer and Terms of Agreement

Assembly - Component placement

Blank pcb

Mount DB9 connector on the top side of the pcb

Pin 1

Pin 1

PIC external programming header. The header does not provide power to the PIC, therefore the board must be powered while programming.

20Mhz resonator

Pgm Header
Vpp n/c Pgc Pgd Gnd

Reset

Pin1

1uf   **1uf**

1uf

Pin1

IC2 RS232

DB9 Female

IC1 PIC mcu

4.7k

LCD Header 2x10 (mount from bottom side)

The female 2x10 header must be mounted from the *BOTTOM* side of he pcb. That way the board can be connected directly to the LCD's 2x10 male header located on the backside of the LCD.

1uf   **4.7k**

4.7K

330

LED

0.1uf   **L1**   **10uf**   **100uf**

K

IC3 eeprom

LM7805

Tab

D1   **D2**   k   **IC4 Max637**

K

10k or 20k POT
R5

Pin 1

Pin1

Observe all radial capacitor polarity. The pcb square pad is + (the longer leg of the cap)

Pin1   **10uf**

Pin 1

Pin 1

Metal tab faces outward

Gnd **V+**
(7-16vdc)

Diode cathode K (banded end)

Center leg (wiper) of the POT

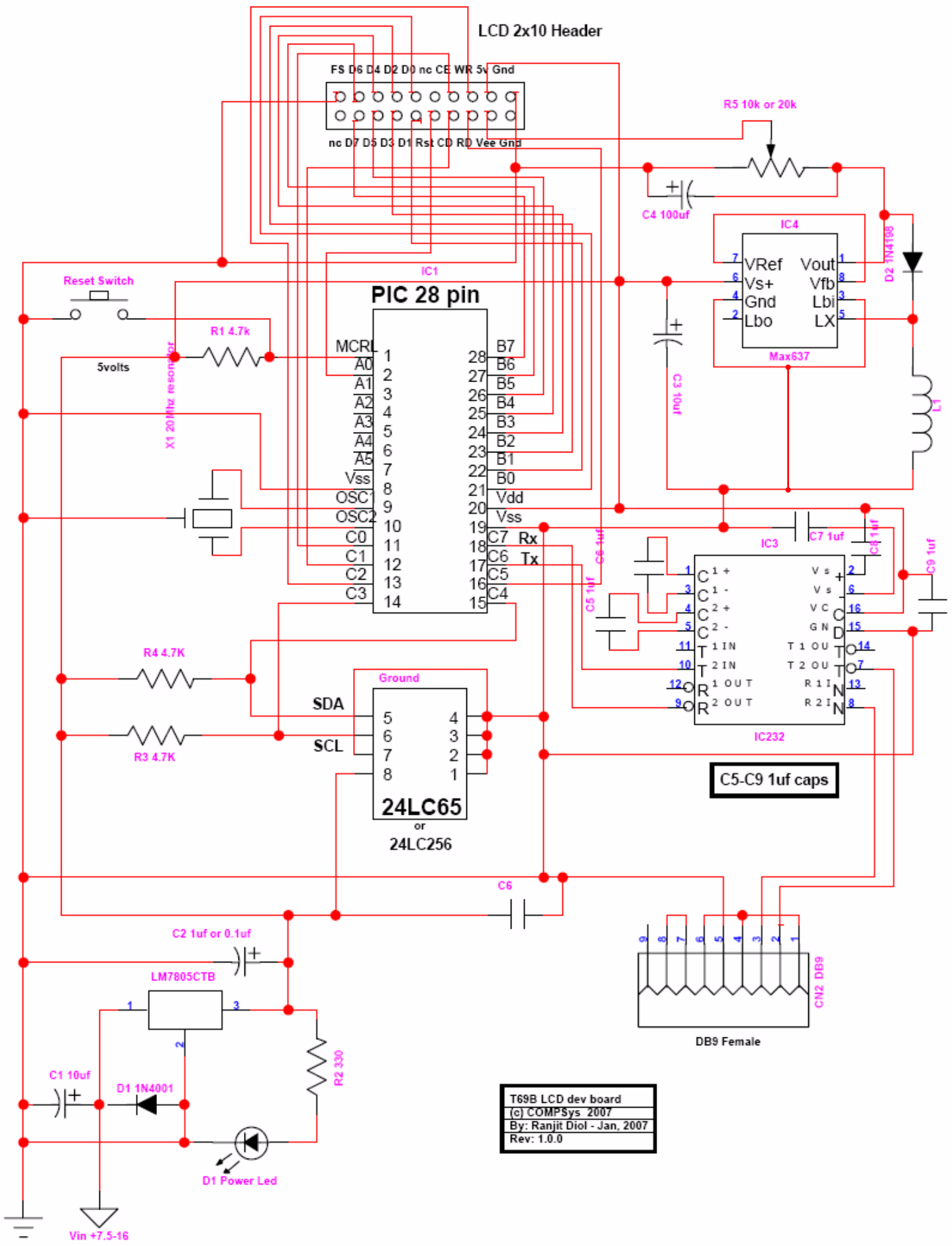**LED cathode K (green band)**

Component locations and orientation

Assembly Steps

1. Mount and solder all SMD resistors and capacitors. C5-C9 are 1uf SMD caps, R1,3,4 are 4.7k SMD resistors, R2 is a 330 ohm smd res. Note: R1 mounts inside the IC1 socket area

2. Solder the SMD LED. Observe the location of the cathode (k) on the pcb, the green band end of the LED is the cathode

3. Carefully align and solder the I2C eeprom (IC3). **Make sure to orient the SOIC correctly! Use very little solder!**

4. Do the same with the IC232 (IC2) SOIC and the Max637 (IC4)

5. Solder the large black 1N4001 diode (D1) and the small glass diode 1N4148 (D2) Observe cathode (K) orientation. Banded end is the cathode. Also, mount the 180Mh inductor (L1)

6. Orient and mount C1,3 10uf, C2 1uf (or .1uf) and C4 100uf radial caps. The longer lead is +. Square pads on the pcb are +

7. Mount the 10k or 20k POT. Observe the position of the center leg (wiper) of the POT.

8. Mount and solder the 5v regulator and. Make sure that the metal TAB faces the outer edge of the pcb.

9. Mount the reset switch with the button facing outward and also mount the 20Mhz resonator (X1)

8. Align and solder the IC 28 pin socket to the top side of the pcb.

9. Mount and solder the DB9F connector from the top side of the pcb.

10. Mount and solder the 2x10 female header from the *BOTTOM* side of the pcb.

11. *DOUBLE CHECK ALL YOUR WORK*. Inspect for solder bridges and cold solder joints.

T69B Graphic LCD development board schematic

LCD 2x10 Header

FS D6 D4 D2 D0 nc CE WR 5v Gnd

nc D7 D5 D3 D1 Rst CD RD Vee Gnd

R5 10k or 20k

C4 100uf

D2 1N4198

IC4

7	VRef	Vout	1
6	Vs+	Vfb	8
4	Gnd	Lbi	3
2	Lbo	LX	5

Max637

L1

Reset Switch

IC1

5volts

R1 4.7k

X1 20 Mhz resonator

C3 10uf

PIC 28 pin

MCRL	1	28	B7
A0			
A1	2	27	B6
A2	3	26	B5
A3	4	25	B4
A4	5	24	B3
A5	6	23	B2
Vss	7	22	B1
OSC1	8	21	B0
OSC2	9	20	Vdd
C0	10	19	Vss
C1	11	18	C7 Rx
C2	12	17	C6 Tx
C3	13	16	C5
	14	15	C4

C5 1uf   C6 1uf   C7 1uf   C8 1uf   C9 1uf

IC3

1	C1+	Vs+	2
3	C1-	Vs-	6
4	C2+	VCC	16
5	C2-	GND	15
11	T1 IN	T1 OUT	14
10	T2 IN	T2 OUT	7
12	R1 OUT	R1 IN	13
9	R2 OUT	R2 IN	8

IC232

C5-C9 1uf caps

R4 4.7K

Ground

SDA

5	4
6	3
7	2
8	1

SCL

R3 4.7K

24LC65
or
24LC256

C6

CN2 DB9

DB9 Female

C2 1uf or 0.1uf

LM7805CTB

| 1 | | 3 |
| | 2 | |

R2 330

C1 10uf

D1 1N4001

D1 Power Led

Vin +7.5-16

T69B LCD dev board
(c) COMPSys 2007
By: Ranjit Diol - Jan, 2007
Rev: 1.0.0

Subject to change without notice. Due to any recent board changes component label names may not be the same as on the pcb