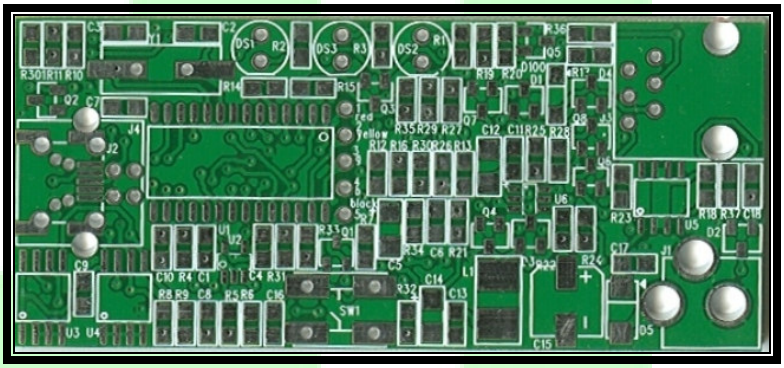
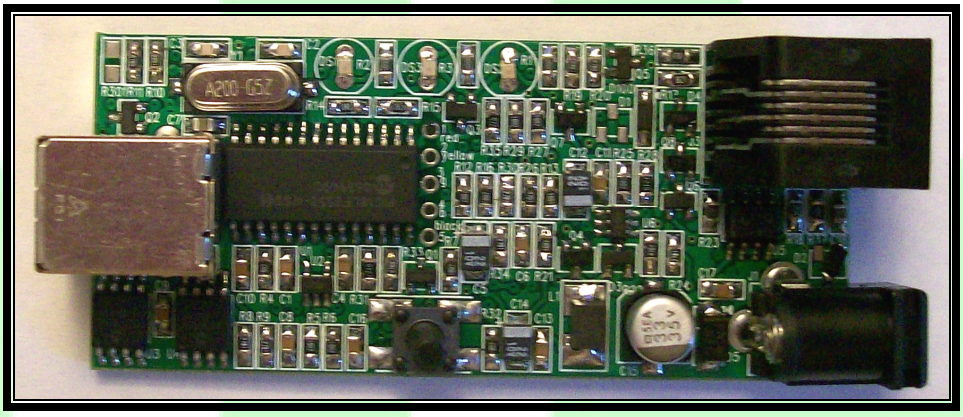
Step by Step
Assembly Guide for CB0703
(PICkit 2)

By Au Group Electronics

April. 2008





Website: www.AuElectronics.com Support: Support@AuElectronics.com

1. What you need:

a. Bare printed circuit board (Part# CB0703)
b. Schematic Drawing and Reference PCB assembly drawing of CB0703 (Both are free to download from www.AuElectronics.com)
c. All electronic components (all components are list in the schematic drawing, and are available from www.AuElectronics.com)
d. Soldering toolsets, solder paste or liquid flux, multi-meter, oscilloscope, etc
e. PC software: "Microchip MPLAB ***V7.62 or above***" and "PICkit 2 Setup ***v2.40a or above***" (both are available free from Microchip web site)
f. Programming toolset: a functioning PICKit2 or ICD2, etc. (only required If the PIC18F2550 is not pre-programmed,)

2. Assemble components step by step:

a. Solder all components to the CB0703 PCB board.

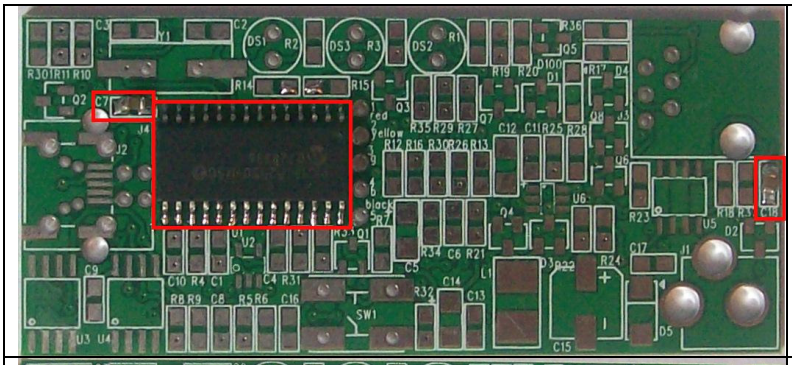
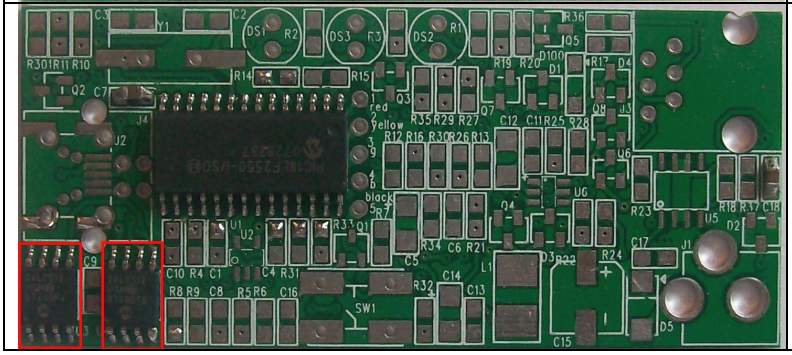
Basic sequence for Do-It-Yourself (DIY) hand-soldering:

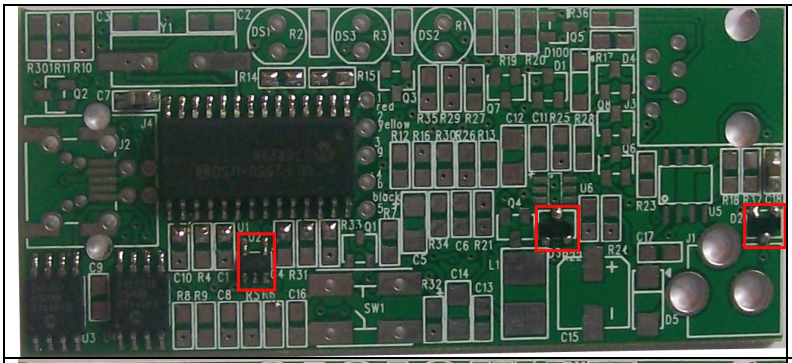
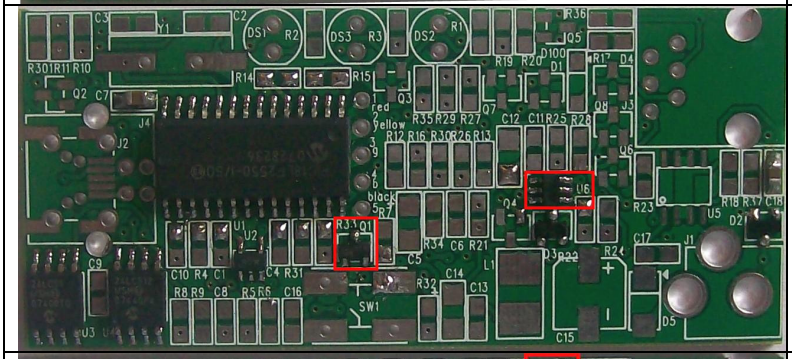
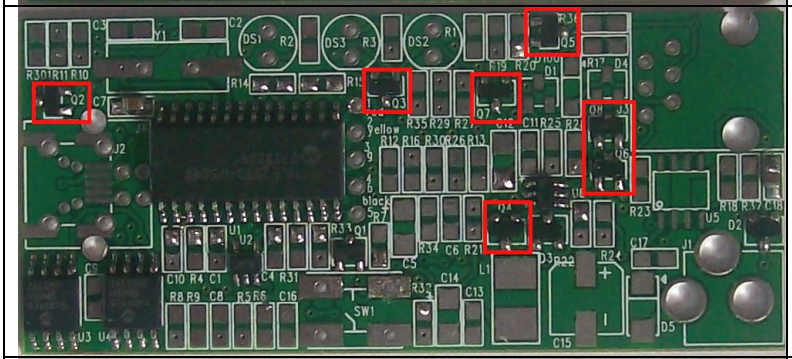
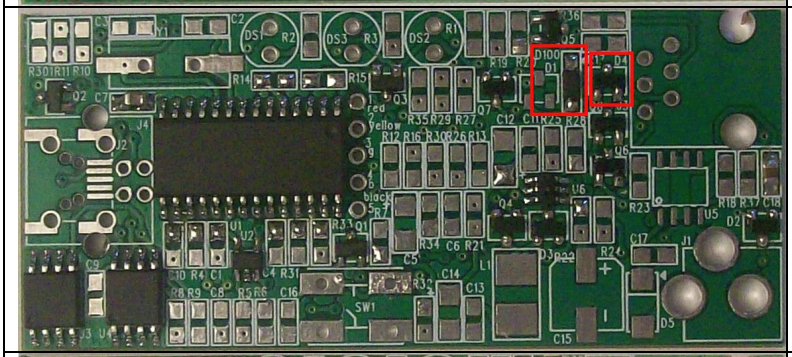
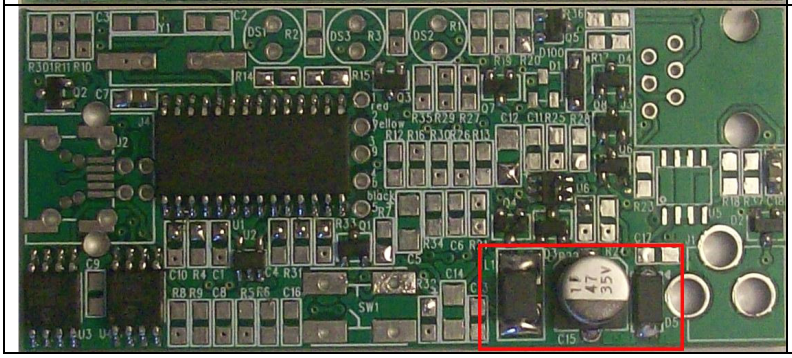
- **From the center of the board to the edge**
- **From one side to the other side**
- **From SMD-components to through-hole-components**
- **From small components to big components**

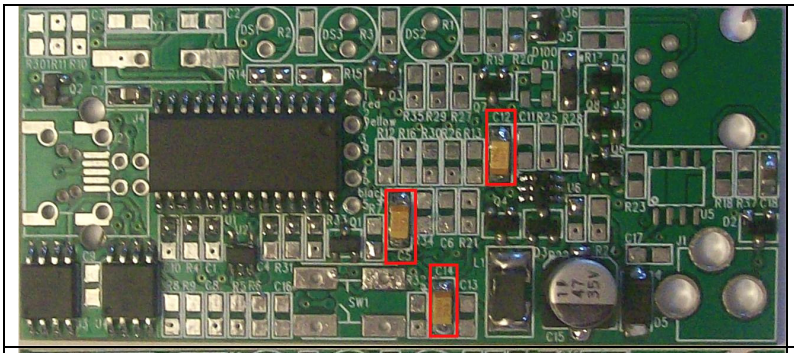
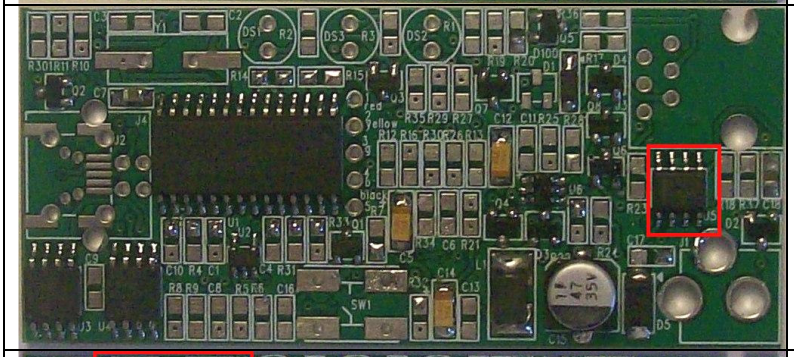
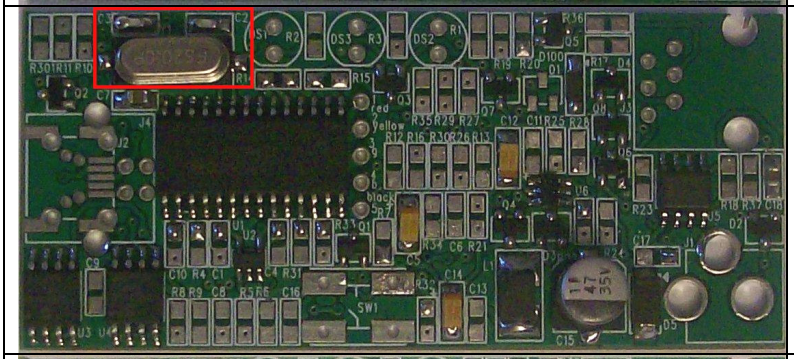
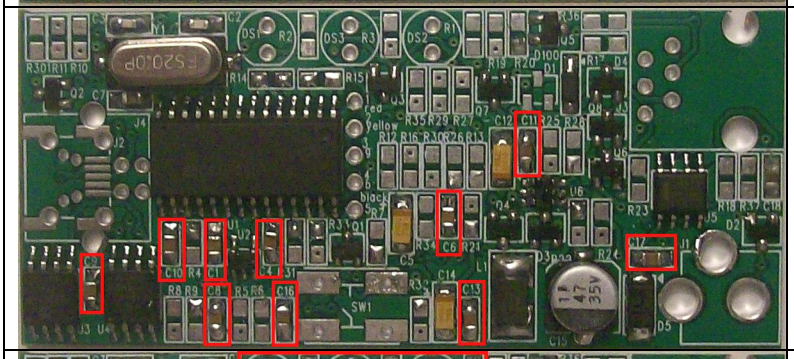
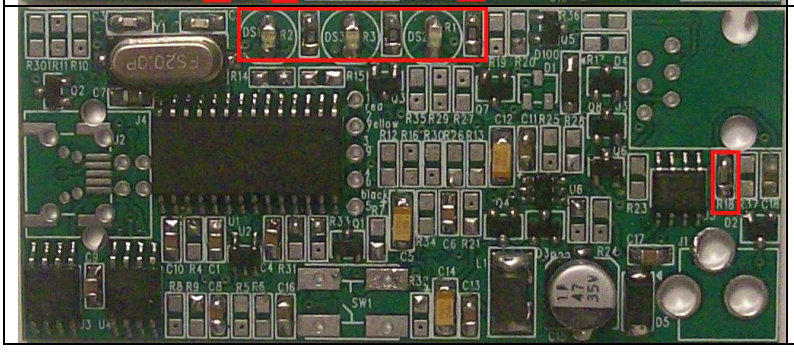
There are two assembly-drawings attached, one can be used for part number reference, the other one can be used for pin numbers reference.

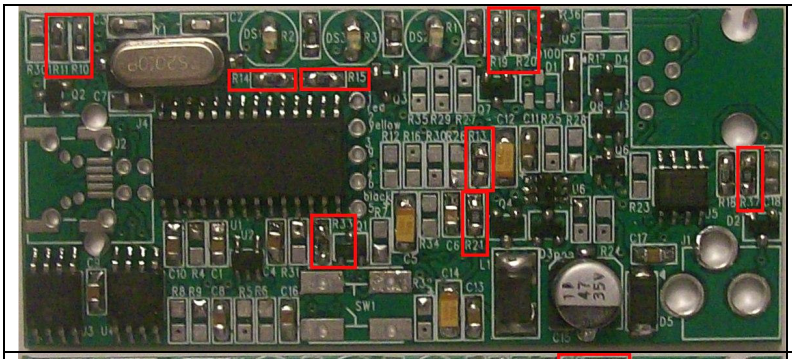
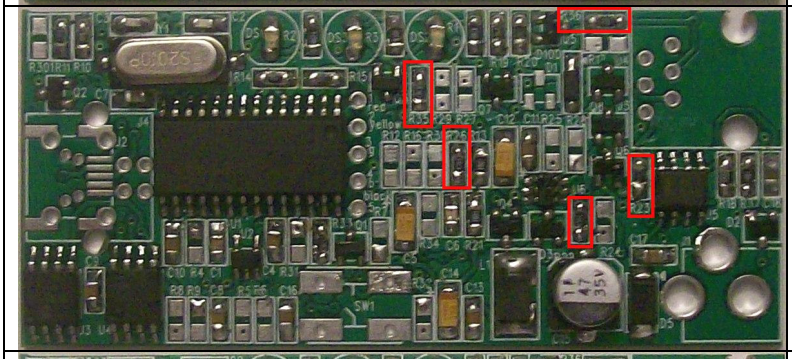
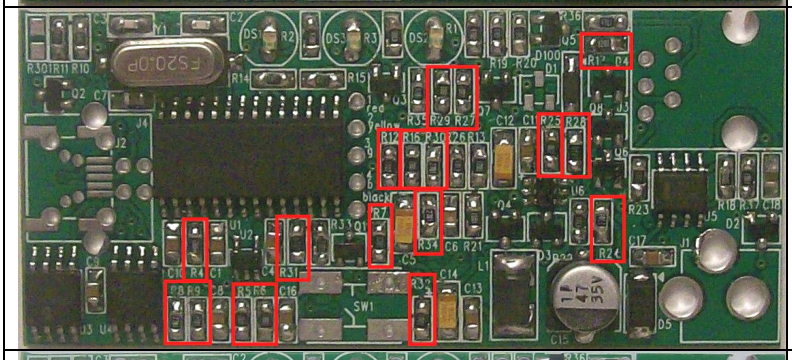
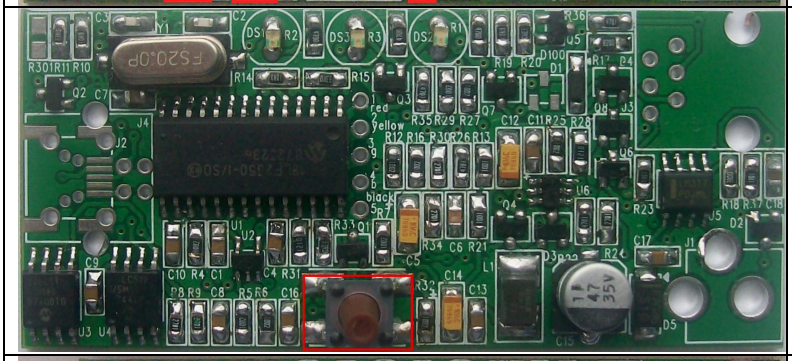
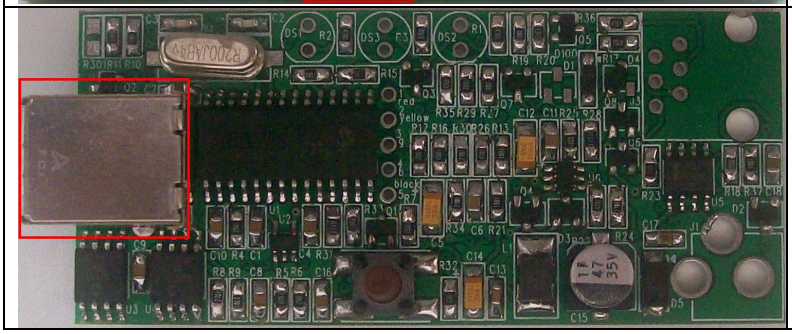
Table 1 illustrates one assemble sequence step by step. (Other sequences are possible)

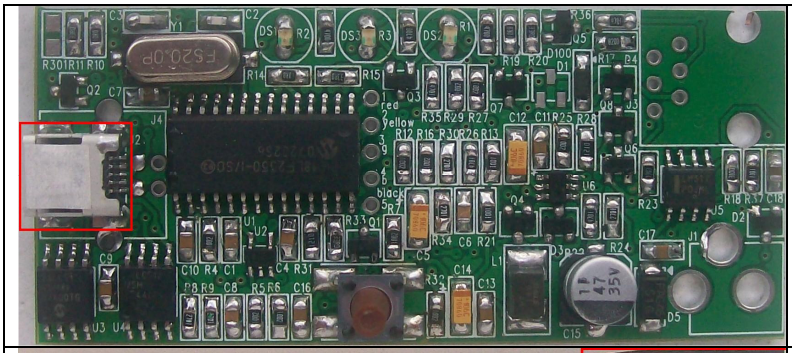
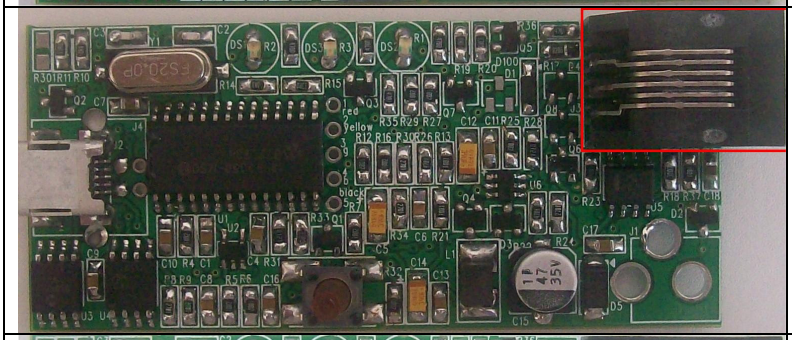
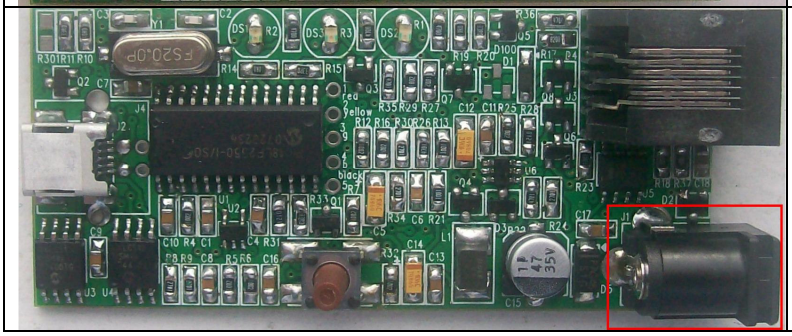
Table 1 - Assemble CB0703 Step by Step

	→U1 →C7 (note: Make sure C7 does not interfere with J4 or Y1) →C18
	→U3, U4 (note: make sure there is enough space for C9 between U3 and U4)

	→U2 →D2, D3
	→U6 →Q1
	→Q4,Q7,Q8 →Q2,Q3,Q5,Q6
	→D4 →D100 or D1 (note: for D100 and D1, only one is required, D100 is illustrated here)
	→D5 →C15 →L1

	→C5,C12,C14
	→U5
	→Y1 →C2,C3
	→C1,C4,C6,C8,C9,C10, C11,C13,C16,C17
	→DS1, DS2, DS3 →R1,R2,R3,R18

	→R10,R14,R19 →R11,R15,R20,R33 →R13,R21,R37
	→R22, R26,R35, R36 →R23,
	→R17 →R28, R31, →R8,R9,R24,R30,R34, →R4,R5,R6,R7,R12, R16, R25,R27,R29,R32
	→SW1
	→J4 or J2 (Note: J4 shows here. J2 and J4, only one is required)

	→J2 or J4 (Note: J2 shows here. J2 and J4, only one is required)
	→J3
	→J1

b. **Clean** all flux residual from the board.

c. **Dry** the whole assembled board after clean.

d. Visual **inspect** and **verify** circuit connectivity (using multi-meter), make sure no short-circuit or open-circuit. Fix all issue if found.

e. **Program** PIC18F2550 on-board by using ICD2 or another PICkit2 as following:
   i. Power up the board by USB or dedicated power source if the enhanced power supply circuit is installed.
   ii. The Hex of ***"PK2V021000.hex"*** or a hex-file in similar name should be found under folder "C:\Program Files\Microchip\PICkit 2 v2". Import this hex file to MPLAB or any other programming tools you are using.
   iii. Program the PIC18F2550 Chipset by ICD2 or any other functioning PICkit2.

A 5-position program-pad is designed on CB0703 for ICSP connection (In Circuit Serial Programming) from ICD2, PICKit 2 or any other ICSP programmers.

Table 2 – ICSP Pin-out on CB0703 5-position program-pad

Pad name on CB0703	ICSP Pin-out
1 red	Ground
2 yellow	ICSPCLK
3 g	ICSPDAT
4 b	VPP
Black 5	+ 5V

Note:
1. If a pre-programmed PIC18F2550 chipset is used, it is not required to program the PIC18F2550 again.

*2. If there is no *.hex file found, send an email to Au Group Electronics to request.*

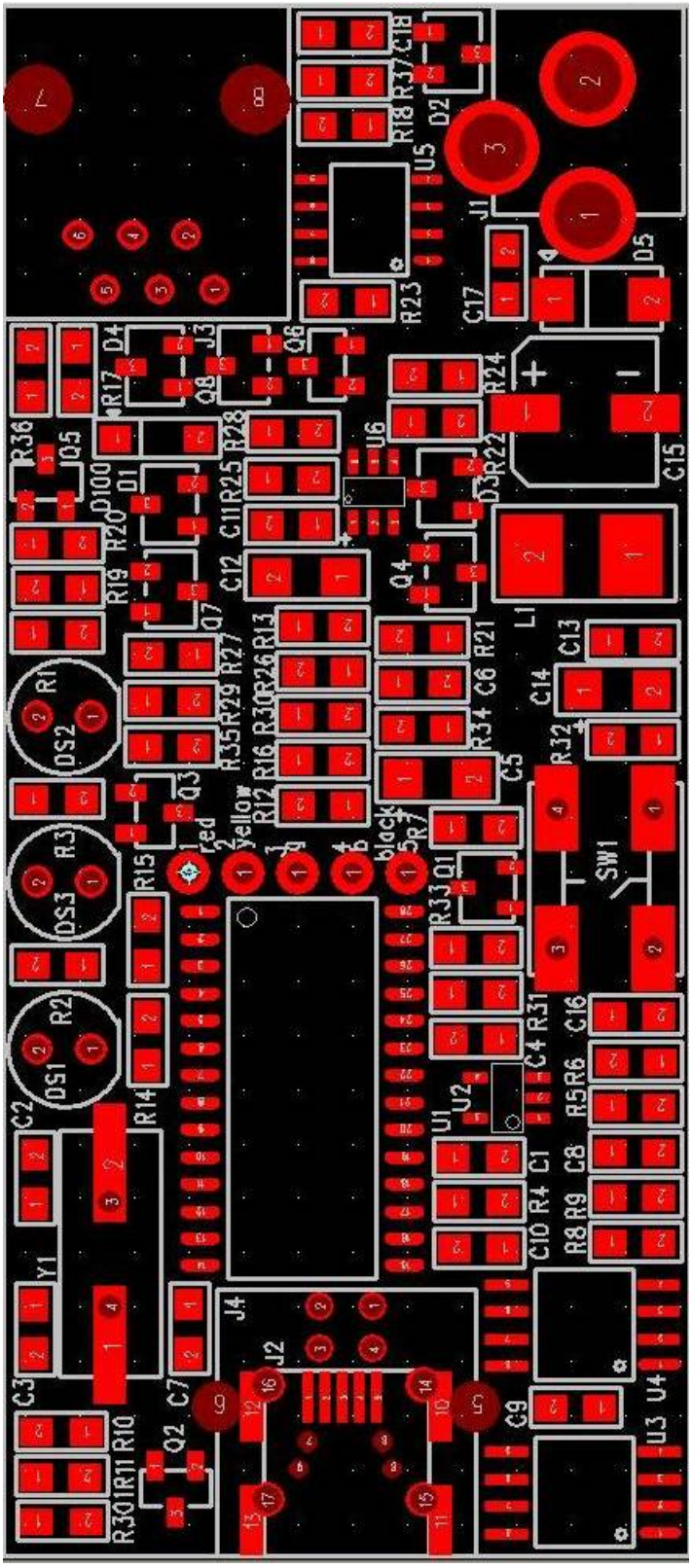
3. If there is no ICD2 or any other ICSP tool available, you need purchased at least one pre-programmed PIC18F2550 chipset (part#: PPIC18F2550) from Au Group Electronics (http://www.auelectronics.com/Hardware-CB0703.htm).

After the last step, the whole board should start functioning.

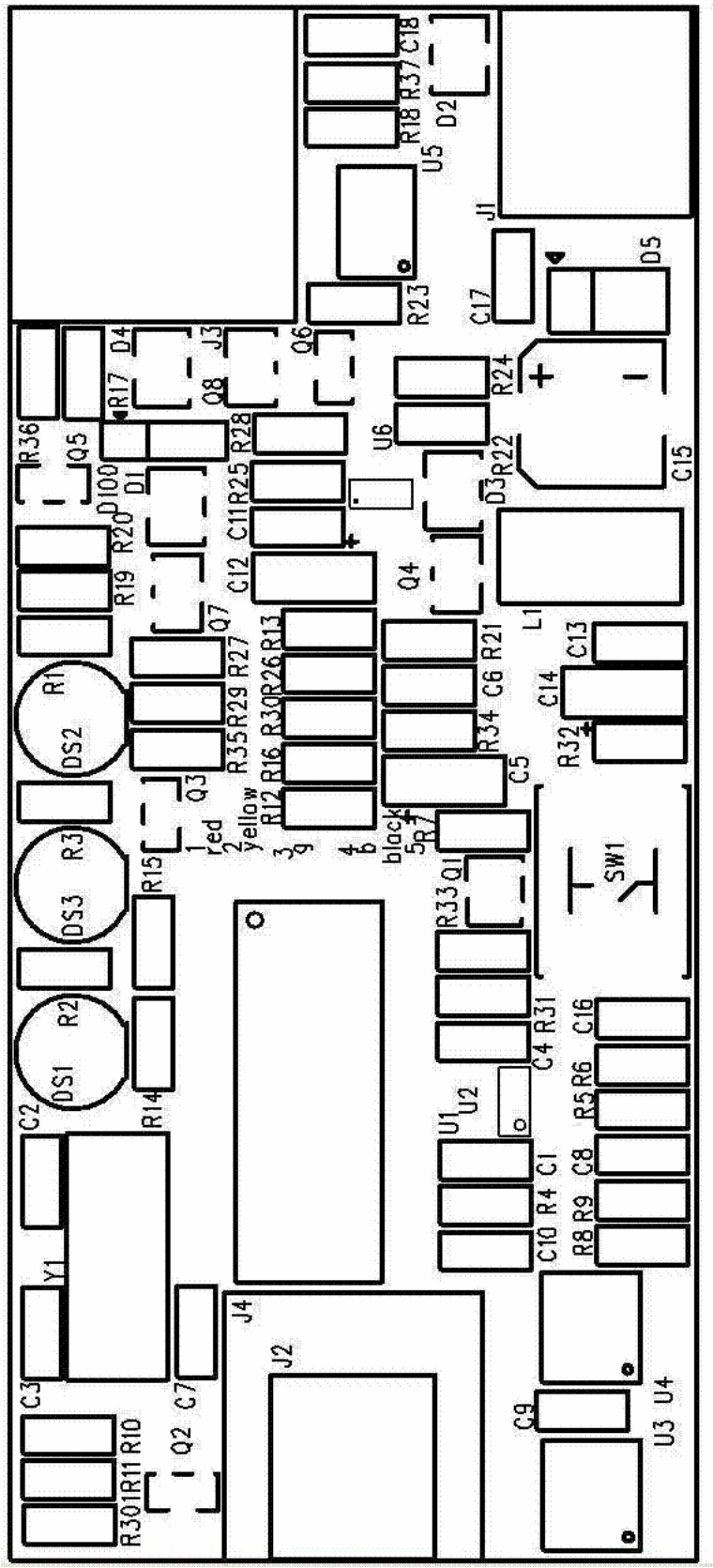
For any technical question, please contact: Support@AuElectronics.com

Attachment 1

CB0703 Assembly drawing with pin



CB0703 Assembly drawing without pin



Qty	10	Description	CAP .10uF 50V Ceramic X7R 0805
Reference	C1,C4,C6, C8, C9, C10, C11, C13, C16, C17		

Qty	1	Description	CAP 47uF 35v ±20%; 6.6 x6.6x6.3mm; 105°C; SMD
Reference	C15		

Qty	1	Description	CAP 1 uF 50V Ceramic 0805
Reference	C18		

Qty	2	Description	CAP 27pF 50V Ceramic CHIP 0805 SMD
Reference	C2, C3		

Qty	3	Description	CAP Tantalum 10uF 16V 10% SMD;- 55°C to + 85°; package 3216-18 (EIA)
Reference	C5, C12, C14		

Qty	1	Description	CAP CERM .47UF 16V X7R ±10% 0805, General Purpose MLCC
Reference	C7		

Qty	1	Reference	D1 and D100 only one required
Description	D1/ D100		
D1: SOT23, MMBD4148-TP; D100: SOD123, 1N4148W			

Qty	2	Reference	
Description	D2, D3		
DIODE SCHTKY SGL 30V 200mA SOT23; **BAT54** E6327;			

Qty	1	Reference	
Description	D4		
DIODE SCHOTTKY 40V 1.0A SOT-23; **ZHCS1000**, 200mA;trr 12ns			

Qty	1	Reference	
Description	D5		
Diode **S1G** GPP 1A 400V SMA			

Qty	1	Reference	DS1
Description	LED		
3mm Hi-eff Diffused,LTL-1Che; Round, T-1; 12.6 Millicandelal; 2.1 V, RH			

Qty	1	Reference	DS2
Description	LED		
3mm Diffused, LTL-1CHG;Round,T-1; 12.6 Millicandelal; 2.1 V GL			

Qty	1	Reference	DS3
Description	LED		
3mm Transparent, LTL-1CHYE; Round, T-1; 40 Millicandelal;2.1 V YH			

Qty	1	Reference	J1
Description	Power jack		
male 16v 2.5A 2.1ID-5.5OD (mm) 2conductors, 3contacts; through hole right angle			

Qty	1	Reference	
Description	J2 / J4		
J2: USB Mini-B 5POS, SMD J4: USB Type B,ThroughHole			

Qty	1	Reference	J3
Description	CONN MOD JACK 6-6 RJ12 R/A PCB		

Qty	1	Reference	L1
Description	Inductor; 680uH, +/- 10 %, 50mA,1812, Ferrite core		

Qty	1	Reference	Q1
Description	**IRLML6402TRPBF,** P Channel,Vds:-20V , Id:-3.7A, 65mohm,Vgs:-4.5V		

Qty	4	Reference	Q2, Q3, Q5, Q6
Description	Transistor PNP **MMBT3906** 40V 300mW SOT23 200mA		

Qty	3	Reference	Q4, Q7, Q8
Description	Transistor NPN **MMBT2222AK** GP40V SOT23 600mA		

Qty	4	Reference	R1, R2, R3, R18
Description	Res 300 Ohm 0.1W 0805 SMD+/-1%		

Qty	10	Reference	R4, R5, R6, R7, R12, R16, R25, R27, R29, R32
Description	Res 10K Ohm +/-1% 0.1W150V +/-100 ppm 0805		

Qty	3	Reference	R10, R14, R19
Description	Res 10 Ohm 0.1W 1% 0805 SMD150V		

Qty	1	Reference	
Description	R17		
Resistor 820 Ohm +/-1% 0.1W150V +/-100 ppm 0805			

Qty	5	Reference	R8, R9, R24, R30, R34
Description	Resistor 2.7KOhm +/-1% 0.1W150V +/-100 ppm 0805		

Qty	4	Reference	R11, R15, R20, R33
Description	Resistor 47Ohm +/-1% 0.1W 150V+/-100 ppm 0805		

Qty	3	Reference	R13, R21, R37
Description	Resistor 1k Ohm +/-1% 0.1W 150V+/-100 ppm 0805		

Qty	5	Reference	R22, R26,
Description	R35, R36, R301		
Res 4.7kOhm +/-1% 0.1W 150V +/-100 ppm 0805			

Qty	1	Reference	
Description	R23		
Resistor 100k Ohm 0.125W 1% 0805SMD 100V			

Qty	2	Reference	R28,R31
Description	Resistor 121 Ohm +/-1% 0.125W 150V +/-100 ppm 0805		

Qty	1	Description	TACT SWITCH
Reference	SW1		

Qty	1	Reference	
Description	U1		
uC (Blank/ Pre-Programmed) **PIC18F2550**-I/SO with USB module			

Qty	1	Reference	
Description	U2		
IC OPAMP 1.8V 1MHZ SOT23-5 **MCP6001UT-I/OT**			

Qty	2	Reference	
Description	U3, U4		
IC SRL EE 512K 64KX8 **24LC512-I/SM**; 400kHz 2.5V 8SOIC			

Qty	1	Reference	U5
Description			
IC 3-TERM ADJ REG8-SOIC **LM317L**			

Qty	1	Reference	
Description	U6		
Dual N/P **FDC6420C** Channel; Vds:20V, Id:3A, Rds(on): 70mohm, Vgs:4.5V, Super SOT-6			

Qty	1	Reference	
Description	Y1		
Crystal 20.000 MHz SMT 18PFHCM49 AT Cut SMD metal-cantype			