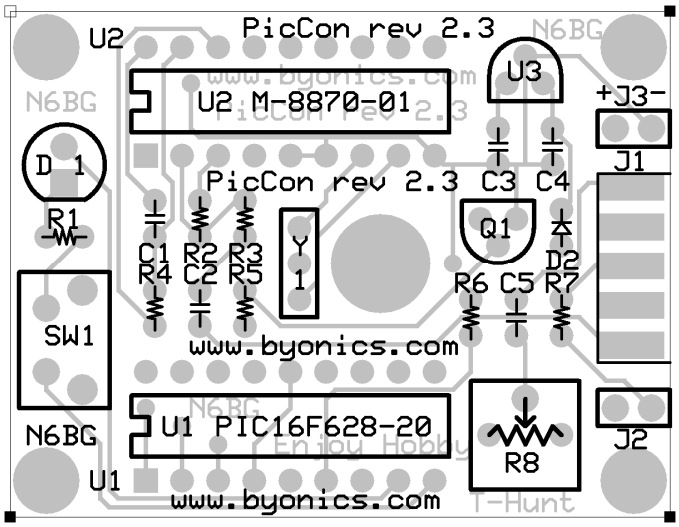
PicCon

Assembly Instructions

version 1.03

These assembly instructions will aid in the building of PicCon. A complete Owner's Manual, which includes this information, plus pictures and further instructions, can be found at **http://www.byonics.com/piccon**.

Printed Circuit Board



Parts List

U1	PIC16F628-20/P programmed with PICPAC firmware
U2	M-8870-01 DTMF decoder
U3	78L05 +5V voltage regulator
Y1	3.579 MHz ceramic resonator
Q1	2N2222A NPN transistor
R1	1 K Ω resistor (brn-blk-red)
R2, R3	100 K Ω resistor (brn-blk-yel)
R4	300 K Ω resistor (org-blk-yel)
R5	10 K Ω resistor (brn-blk-org)
R6	220 K Ω resistor (red-red-yel)
R7	2.2 K Ω resistor (red-red-red)
R8	10 K Ω trimmer potentiometer (103)
C1, C2, C3, C4, C5	0.1 µf capacitor (104)
D1	Green T1-3/4 LED
D2	1N4148 diode
SW1	SPST switch (mom. cont.)
J1	DB9 female solder cup connector
J2	1x2 jumper header post
	Jumper shunt
	18 Pin DIP sockets (2)
PCB	PicCon Printed Circuit Board

Assembly Instructions

PicCon is a fairly simple construction project that can usually be built in less than an hour. You will need a low wattage pencil-type soldering iron with a small tip, some thin solder, and a pair of diagonal cutters. The integrated circuits (U1 & U2) are static sensitive, so use standard precautions. For each item, insert on the component side (white silk-screened side), then turn the board over and solder the leads to the pads on the trace side. Be sure to only solder the correct pad, and do not let any solder touch any other pad or trace. Trim any excess leads with diagonal cutters after soldering each component. The following checklist will be useful to insure all components are properly assembled.

- Install the two 18-pin IC sockets, one for U1, and one for U2. Be sure to align the notched end of the socket with the marked end on the silk screen. First solder just two diagonally opposite pins of a socket, and check that the socket sits flat on the PCB. Then solder the remaining socket pins. Do not insert the chips into the sockets at this time.

- Install capacitors C1 – C5. (0.1uf, 104). Direction does not matter. Bend the leads apart slightly after insertion to prevent them from falling out when the PCB is upside-down for soldering.

- Install resistors R1 (1K, brn-blk-red), R2 & R3 (100K, brn-blk-yel), R4 (300K, org-blk-yel), R5 (10K, brn-blk-org), R6 (220K, red-red-ytel), and R7 (2.2K, red-red-red). For each resistor, bend one of the leads 180 degrees at the bulb of the resistor so that both leads are parallel and 0.1 inch apart. Install vertically on the board. Polarity does not matter. Bend the leads apart once inserted to hold in place and insert all 7 resistors before soldering.

- Install transistor Q1 (2N2222A) Be sure to orient flat side to match the flat side shown on the silk-screen pattern.

- Install voltage regulator U3 (78L05). Be sure to orient flat side to match the flat side shown on the silk-screen pattern.

- Install ceramic resonator Y1 (3.579 Mhz), which provides the clock oscillation for the chip. Direction does not matter.

- Install glass diode D2. (1N4148). Bend like resistors. The black stripe should be nearest the top edge of the board, electrically closest to the pad just below C4.

- Install potentiometer R8, (10K, 103),

- Install LED D1 (green). Be sure to align the flat side of the LED with the shape on the silk-screen. If the LED does not have a flat side, insert the anode (long lead) into the round pad closest to top edge of the board and the cathode (short lead) into the square pad next to R1.

- Install switch SW1. Leads may need to be bent a bit. Switch should snap into place.

- Install 1x2 jumper post J2. Insert short side through the board.

- Install female DB-9 radio connector J1. Wedge the board in between the two rows of solder cups, with the 5 pins aligned with the 5 pads on the PCB. Solder just one pin first, and insure the connector is on straight. Then solder on both sides of the PCB, all nine cups to the pads.

Assembly Completion

After all components have been installed, inspect the solder side of the board for poor or cold solder joints. All pads should be shiny and smooth. Inspect for any undesired solder bridges. Use an ohmmeter or multimeter to be sure power (socket pin 14) and ground (socket pin 5) on U1 are not connected. It would even be a good idea to power the board (see below), and confirm +5 volts between socket pins 14 and 5. If the board looks ready, complete the assembly as follows.

- Insert programmed microprocessor U1 (PIC16F628). The chips is static sensitive, so ground yourself by touching a large metal object before touching the chip. The rows of pins may need to be bent slightly. Be sure to align the notch on the chip with the notch on the socket, as well as the notch on the silk-screen. Be sure that the chips are in their correct sockets. An improperly inserted chip may become permanently damaged.

- Insert DTMF Decoder U2 (M-8870-01). Follow the instructions for U1 above.

Please refer to the PicCon Owner's Manual available at **http://www.byonics.com/piccon** to complete the assembly, and for more details and pictures. The User's Manual has details on interfacing, testing notes, hints, and troubleshooting suggestions. Feel free to email any questions or comments at **http://www.byonics.com/contact**.

Thank you for purchasing PicCon.