Before you start:

1. Separate all the parts in the kit according to component type.
2. Use a multimeter as shown to measure all the resistors. It is fine if the resistance you measure is within ±5% of the specified value.
3. Arrange the resistors according to their values.

Waveform Generator DIY Kit User's Manual

Surface Mount Assembly Instructions

Note:

If you are building the full kit including surface mount parts, this is the right page!

If you are building the kit with the surface mount parts pre-assembled, please skip to the next page.

Tools:

1. Solder paste
2. Stencil
3. Spackle knife
4. Tweezers
5. Reflow oven

Please wear gloves while working with solder paste.

Step 0: Assemble Main Board Surface Mount Parts

0.0. Resistors

R1, R9:	10 kΩ
R7:	0.24 Ω
R8:	3.32 kΩ

0.3. Micro USB connector

J2: Micro USB

0.5. ATmega

U1: ATmega328 P-AU

0.8. Op-Amp

U5: Dual-operational amplifier

0.1. Diode

D1: 1N5819

0.4. Inductor

L1: 270 uH

0.6. Linear Regulator

U2: Linear regulator

Oven

0.2. Ceramic capacitors

C1, C2, C8, C11:	100 nF
C3, C4:	12 pF
C14:	1500 pF

1.11. Crystal

Y1: 16 MHz Crystal

0.7. Inverter

U4: -5V inverter

Waveform Generator DIY Kit User's Manual

Through-Hole Assembly Instructions

Before you start:

1. Separate all the parts in the kit according to component type.
2. Use a multimeter as shown to measure all the resistors. It is fine if the resistance you measure is within ±5% of the specified value.
3. Arrange the resistors according to their values.

Note:

If you are building the kit with the surface mount parts pre-assembled, this is the right page!

If you are building the full kit including surface mount parts, please see the previous page.

Tools:

1. Soldering iron
2. Solder wire
3. Snips
4. Screwdriver

Step 1: Assemble Main Board

1.0. Resistors

R3, R11:	560 kΩ
R4:	180 kΩ
R5:	470 Ω
R6, R10:	1 kΩ

1.1. Waveform generator chip

U3: MAX038-CPP

1.2. Ceramic capacitors

C5:	4.7 uF
C6:	33 nF
C7:	15 pF
C9:	220 pF
C10, C12, C16, C17:	1 uF
C13, C15:	100 uF
C18:	5 pF

1.3. Micro USB connector

J2: Micro USB

This component is already attached to the board, but the through-hole pins need to be hand-soldered.

1.4. Buttons

SW1, SW2: Pushbuttons

1.5. Electrolytic capacitors

C13, C15: 100 uF

Note: The positive side of the capacitor (longer lead) gets soldered to the square pad (unfilled semicircle).

1.6. Switch

SW3: Triple throw switch

1.7. Male-male pin headers

J1:	1 x 6
J3:	1 x 2

1.8. Male-female pin headers

MOD1: 1 x 8

1.9. BNC connector:

J4: BNC coaxial connector

1.10. Potentiometers:

RV1:	500 kΩ
RV2:	20 kΩ
RV3:	10 kΩ

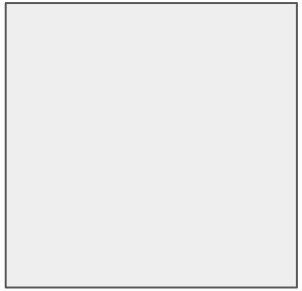
Step 2: Assemble LCD

2.0. Male-male pin headers

1 x 8

Solder the shorter ends of the pin headers to the bottom of the LCD board.

2.1. Connect the LCD to the main board



Step 3: Test and Use

3.1 Power up the board

Plug your 5V battery into the micro USB connector (J2). Do not apply more than 5V.
Disconnect power before step 3.2.

3.2 Attach LCD board

Plug the LCD into the female pin headers (MOD1) on the main board.

3.1 Check voltages

- Connect the board to power again.
- Connect the COM probe of your multimeter to TP2 (GND) and the other probe to TP1. You should measure -5 V.
- Now connect the probe at TP1 to TP3. You should measure about +3.3 V.
- Finally, connect the probe at TP3 to TP4. You should measure about +5 V.

3.4 Use

1. Connect the BNC cable to the BNC connector (J4) on the waveform generator. Also boot up your oscilloscope and connect the scope probes.
2. Attach the waveform generator BNC cable to the oscilloscope probe, making sure to match red to red and black to black.
3. Turn the waveform generator to a low frequency, around 5 - 20 Hz.
4. Adjust the settings on your oscilloscope until the waveform is satisfactory.

Display and Controls