

Notes for the FDIM 2015 Buildathon Signal Generator

Operational Highlights:

4 pos. DIP switch for controlling power ON/OFF and High/Low signal output through the YELLOW RCA connector.

H = high level signal output

L = Low level signal output (output thru additional Pi attenuator)

M = Microprocessor (dotted 'play' area & osc.) power On/Off

P = Power On/Off direct to the oscillator circuit

RA1, RA, RA3 resistors form a resistive attenuator circuit which turns the high level signal from the driver transistor into a low level signal. You can change the values of these 4 resistors to make your own custom PI attenuator.

The two 2N2222 transistors and associated resistors & capacitors form a 2 stage oscillator/driver RF signal generator. The oscillator circuit is quite nimble and will oscillate over a wide frequency range. Simply changing crystals will cause the oscillate at a different frequency or band.

Lx / 0 ohm socket pins require either a ZERO ohm jumper or axial inductor to be inserted (hairpin style) into the sockets for the crystal(s) to be connected to the oscillator circuit.

0 ohm jumper = purely capacitive crystal load

axial choke = additional inductive load on the crystal raises the operational frequency of the oscillator

XTL1/XTL2 are 2 sockets for the crystal(s) which control the oscillating frequency. You can use either a single crystal or 2 crystals in parallel (super VXO) for a larger frequency swing.

The center pins of the crystal sockets are connected to the ground plane. The crystals can be modified to include a grounding pin in-between the crystal leads and attached to the crystal case.

When the J1 jumper is removed, the polyvaricon capacitor presents a variable capacitive load to the crystal(s) thereby modifying the frequency output. The polyvaricon cap is a 2 section cap with 1 section being 140pf and the second being 60pf. The stock board layout places both sections in parallel so the variable capacitive load is approximately 0 to 200pf.

When the J1 jumper is inserted, the polyvaricon cap load is SWAMPED by the .1uf cap on the other side of the jumper pins.

Interesting MODs one can do to the FDIM Sig/Gen board:

The dotted area in the upper left corner of the board is laid out for a Picaxe 08M micro and 2N3906 keying circuit. One can populate this section and create programs for the Picaxe that keys the Sig Gen circuitry under program control....
Beacon Transmitter? Morse coded debugging signal?

Small ultra miniature switches between the 2 outer polyvaricon lugs and the pcb pads so you could de-parallel the polyvaricon sections thereby allowing 0-60pf, 0-140pf & 0-200pf capacitive loading.

Wire up a straight key to the KEY pads by the DIP switches so that you can KEY the RF signal for additional debugging flexibility.

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