



# Fox Delta

Amateur Radio Projects & Kits

FD- SWM3-QRP

Tech. Information Document: Dual Channel LCD SWR Meter For QRP Radios: 10W HF

**This project is developed for Amateur Radio Community by:**

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**10W LCD DUAL Channel SWR / POWER Meter: SWM3-QRP: PCB Rev 1021**



*Front Panel Switches: Power ON/OFF (Left) Battery/USB Power (Right)*

**Following task achieved thru this new design:**

1. Simple single micro controller.
2. Dual Channel SWR Meter Firmware for QRP/10W SWR Measurement by [I2TZK](#)
3. USB Powered and 9V Battery operation.
4. QRP HF Balanced internal bridge and external access for additional HF Bridge.
5. Back light control using an FET
6. SWR, FWD, POWER and Actual Power to antenna calculations.
7. Bar graph for SWR & Forward Power
8. Compact Design
9. Kit / Assembled Includes free powder coated metal case

## SWM3 Dual Channel SWR Meter: SWM3-QRP-1021



D9 Male connector (J1) is available for external (Optional) second HF QRP Bridge

Toroid Winding Details:

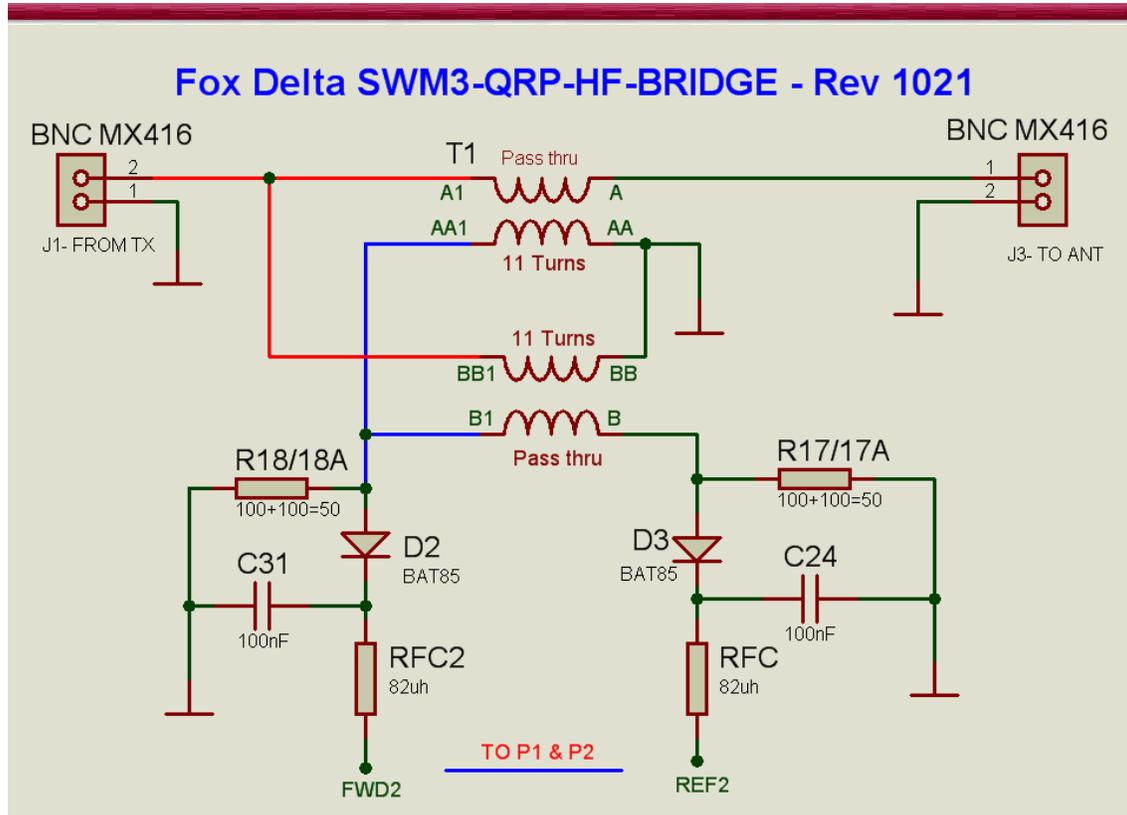


Wind 10 to 11 turns of supplied copper wire.

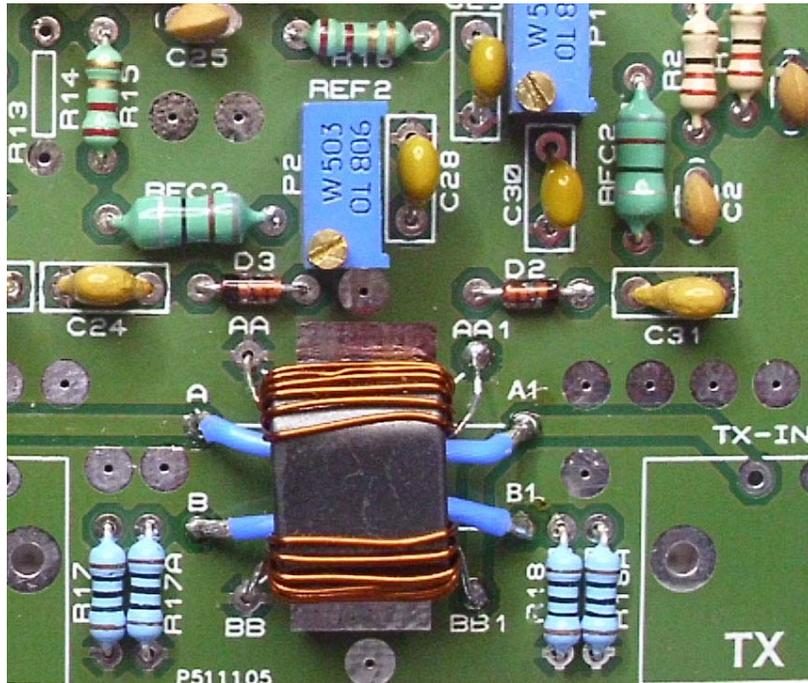
Follow direction of windings as detailed in picture on left.

Bottom side two wires goes to TX side: AA1, BB1

## Schematic Internal HF Bridge



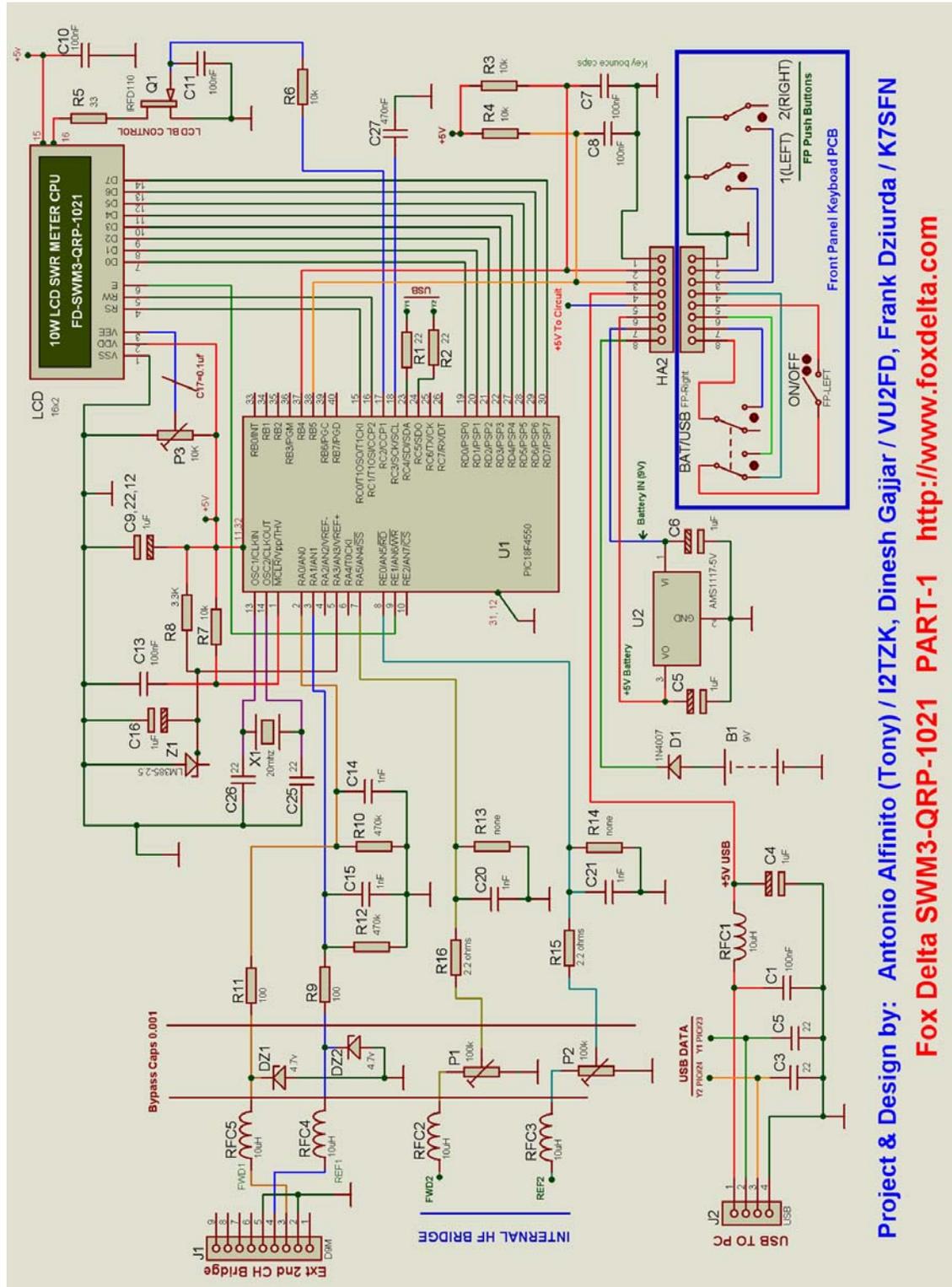
## Place Toroid on PCB:



Two Teflon wires, each approx 3cm long are supplied for Links.

Solder both link wires as per detailed on picture at left

# Schematic Dual Channel HF SWR Meter CPU Board: SWM3-QRP

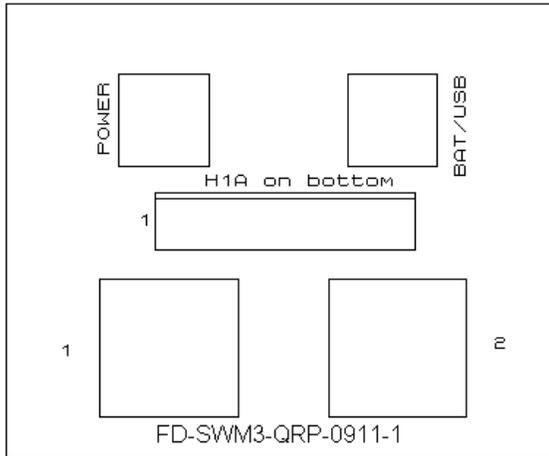


Project & Design by: Antonio Alfinito (Tony) / I2TZK, Dinesh Gajjar / VU2FD, Frank Dziurda / K7SFN  
 Fox Delta SWM3-QRP-1021 PART-1 <http://www.foxdelta.com>

## SWM3-QRP-1021 KIT Parts List:

Quantity	Part ID	Part Details
1	U1	PIC18F4550 Pre-Programmed DIP40 QRP V1.0
1	U2	AMS1117-5V SMT (Pre-Soldered)
1	Q1	IRFD110
1	Z1	LM385-2.5V TO92
2	ZD1, 2	Zener Diode 4.7v
2	FP-Push Switch	ON/OFF Switches Front Panel
2	KB -Push Buttons	12mm Push Buttons for Front Panel KB
1	J2	USB R/A Socket
2	ANT/TX	BNC R/A
1	PCB-KB	Double Sided PTH PCB LED-KB-0911-1
1	PCB	Double Sided PTH PCB SWM3-QRP-1021
1	B1	Battery Case 9V Keystone 1294 (Option)
1	HA1	16PIN SIL Male and Ribbon for LCD
1	T1	Fair-rite Binocular core 2843000302 with 1M Long #28 copper wire
1	HA2	8PIN SIL Male and Ribbon for Keyboard
1	LCD	2x16 LCD with Backlight
1	P3	10K Preset (LCD Contrast)
1	X1	20MHZ Crystal in HC49U
1	D1	1N4007
2	D2, 3	BAT85
1	40DIP	IC Socket
1	J1	D9M R/A Socket (Ext Bridge)
3	RFC1, 4, 5	RFC Inductors (10-47uH)
2	RFC 2, 3	RFC Inductors ( 82uH )
2	P1, 2	100K Bourns 3296 10T Presets
1	Set Hw	Nut / Bolts for LCD and KB Mounting
1	Case	Free Powder Coated Metal Case + HW
All Resistors ¼ W 5%		
2	2.2 Ohms	R15, 16 (used as a Jumper)
4	10K	R3, 4, 6, 7,
1	3.3K	R8
1	33	R5
6	100 ohms	R17, 17A, 18, 18A, 9, 11
2	22 ohms	R1, 2
Capacitors		
7	1uf Tantalum/35V	C4, 5, 6, 9, 12, 16, 22
4	22pf	Ceramic – R2, 3, 26, 25
1	0.47 Ploy	C27,
9	0.1uf Poly	C1, 7, 8, 10, 11, 17, 24, 13, 31,
10	0.001uf Poly	C18, 15, 19, 20, 21, 14, 23, 29, 28, 30

### Front Panel Keyboard:

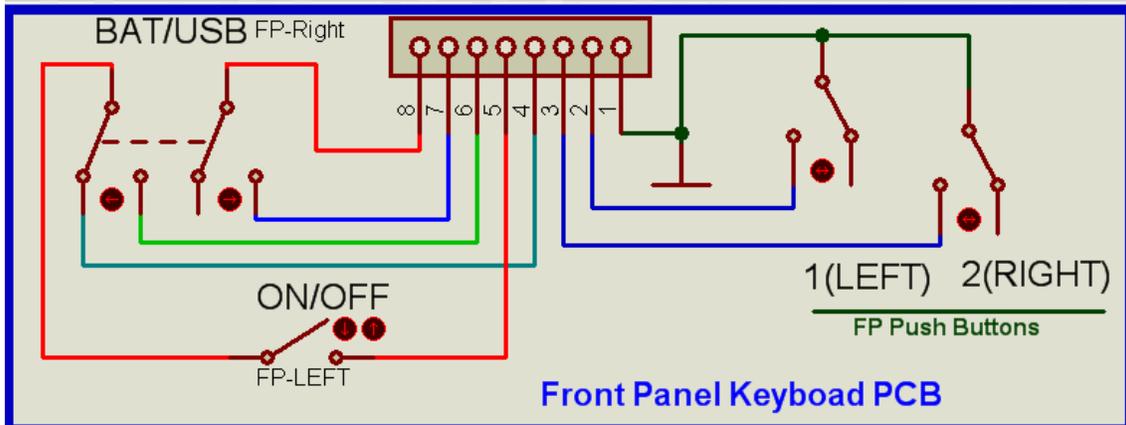


This is a small double-sided PTH PCB housing 2 push buttons and two Push ON/OFF switches.

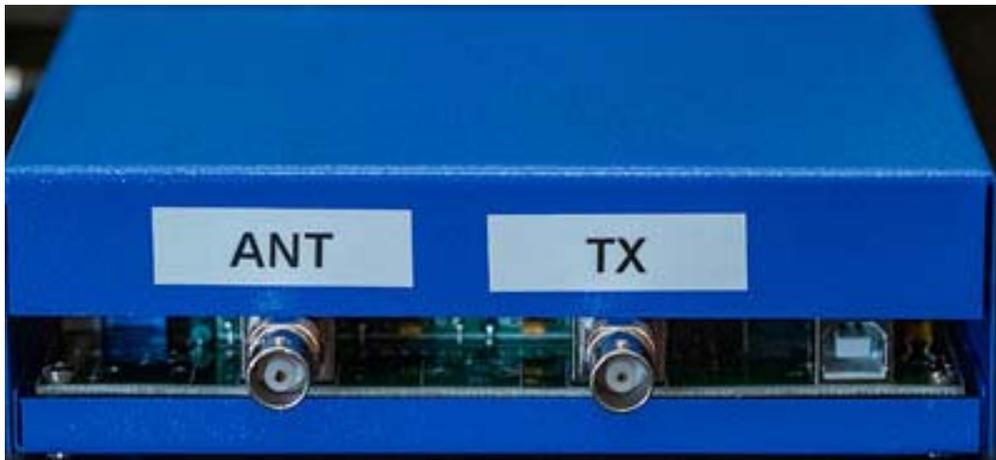
Push Button functions are same as that used for SWM3.  
Push ON/OFF switches:

**Power ON/OFF**  
**Battery / USB POWER**

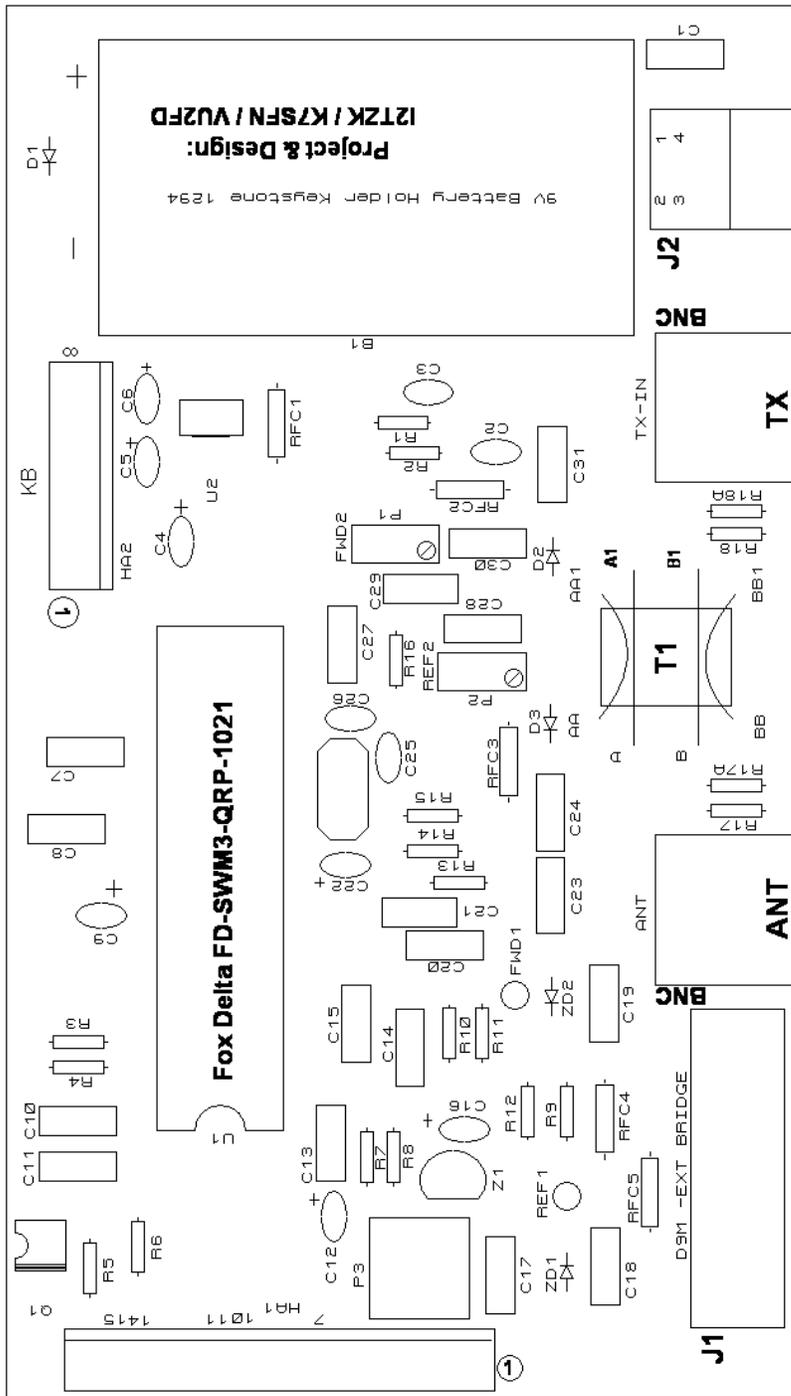
### Key Board Schematic:



### Back Side of SWM3-QRP:



**SWM3-QRP-1021 Board TOP View:**



73s

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For more details, please visit Project Page: <http://www.foxdelta.com>