Technical Details & Assembly Note: 35MHZ LCD PIC16F628/A Frequency Counter

Rev1011

35MHZ LCD PIC16F628/A FREQUENCY COUNTER

Introduction:

Frequency counter is a very important test instrument for Radio Amateurs, especially those who wish to develop or test circuits. There are lots of frequency counters in the market but building one was never so easy & exciting with Microprocessors doing lots of work for us.

This Frequency counter Project is based on PIC16F628/A Microprocessor chip manufactured by Microchip. Almost similar to previous FC1 project except that

1. **Project uses PIC16F628/A chip**
2. **Place for a 9V battery**
3. **RS232 output for PC connectivity.**
4. **Supplied with a Powder Coated metal cases.**

In this counter, we have possibility to supply external 12V or have an Internal 9V battery, selected from front panel switches.

Counter firmware is **Auto-Ranging** and drives a 16x1 LCD. Counter is designed on 8 X 14cm PTH Double Sided PCB. I could make this board much smaller but I preferred this size, keeping in mind the available cases made for other projects!!

Measured frequency is also available at RS232 level at D9F connector on board. This may be read by running simple win Hyper Terminal. No special Windows program is available and this is left up to the user to decide what and how data may be used on PC.

A small update from previous design is that, we can power front-end RF amp from three possible sources:

1. From 9V (may change with battery getting discharged)
2. +5V and (steady)
3. 9V from MAX232 chip. (Steady but loading on MAX232)

No attempt is made to include a Prescaler as objective of this project is to use PIC at its maximum possible capabilities and limit its use to PIC's Frequency measurement limits. Although FC1 Rev1011 is states as a 35MHZ counter, it may work to as high as 50MHZ on some PIC chips.

Completed FC1 Rev1011 Frequency Counter:
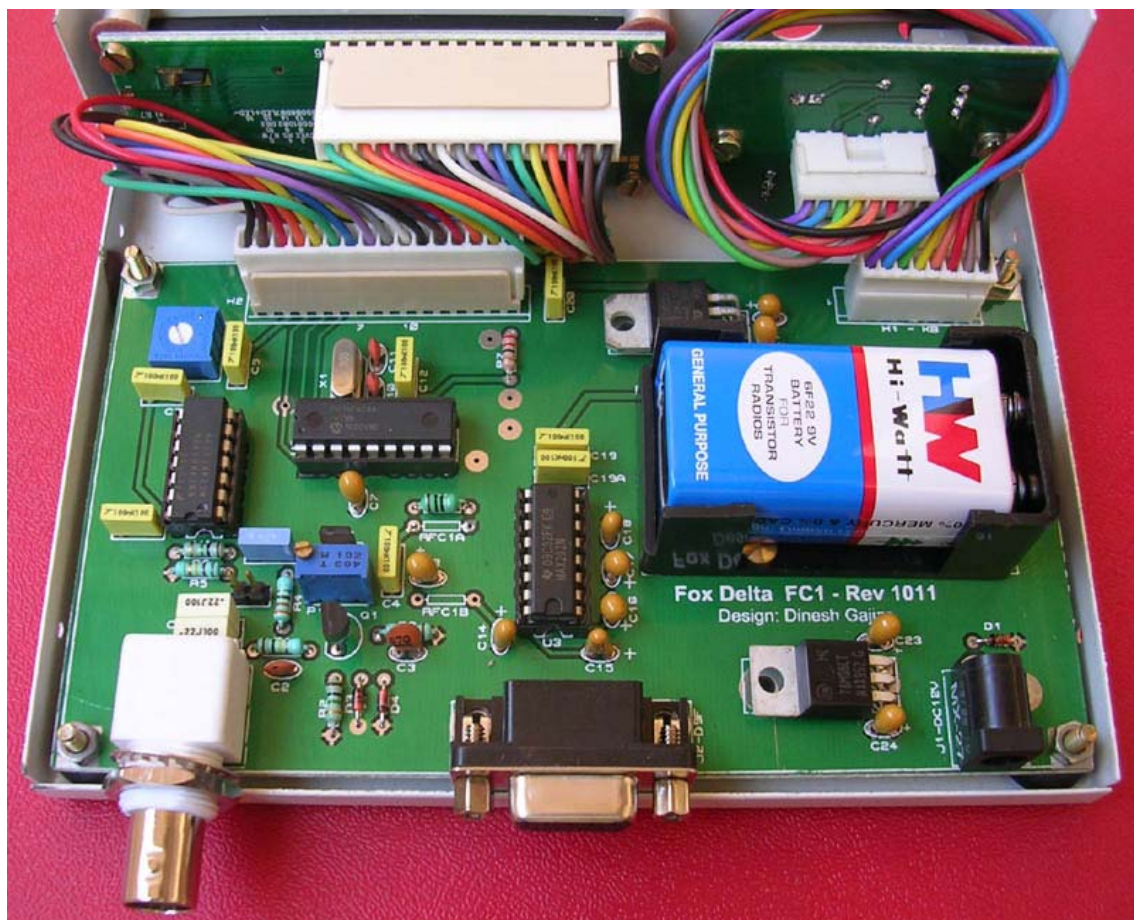
Front RF Amplifier is powered in above FC1 from 9V available from Battery.

Schematic: 35MHZ PIC 16F628/A LCD Frequency Counter:

FC-1 Rev1011: 35MHZ PIC 16F628 Frequency Counter http://www.foxdelta.com
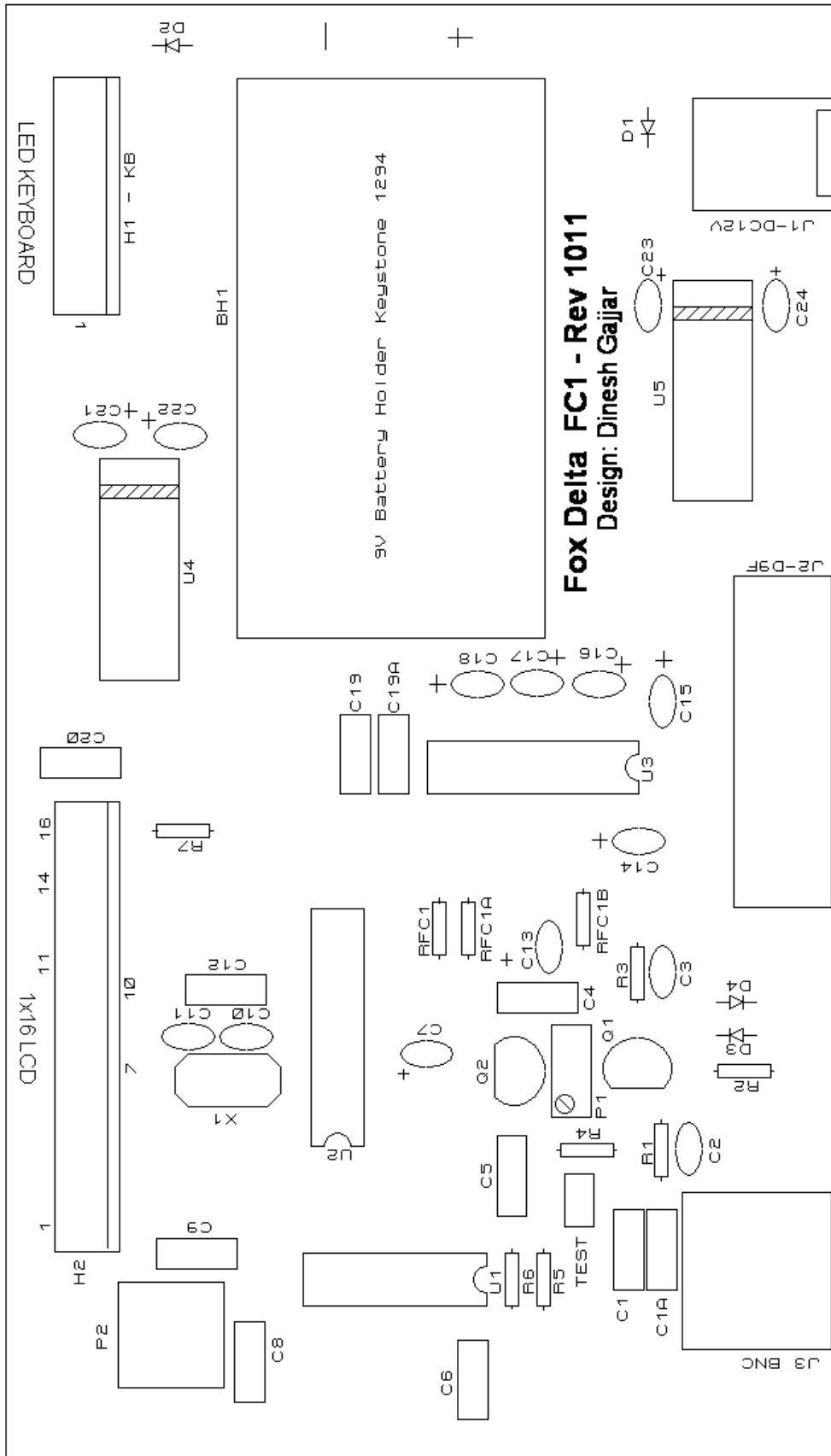
Design: Dinesh Gajjar
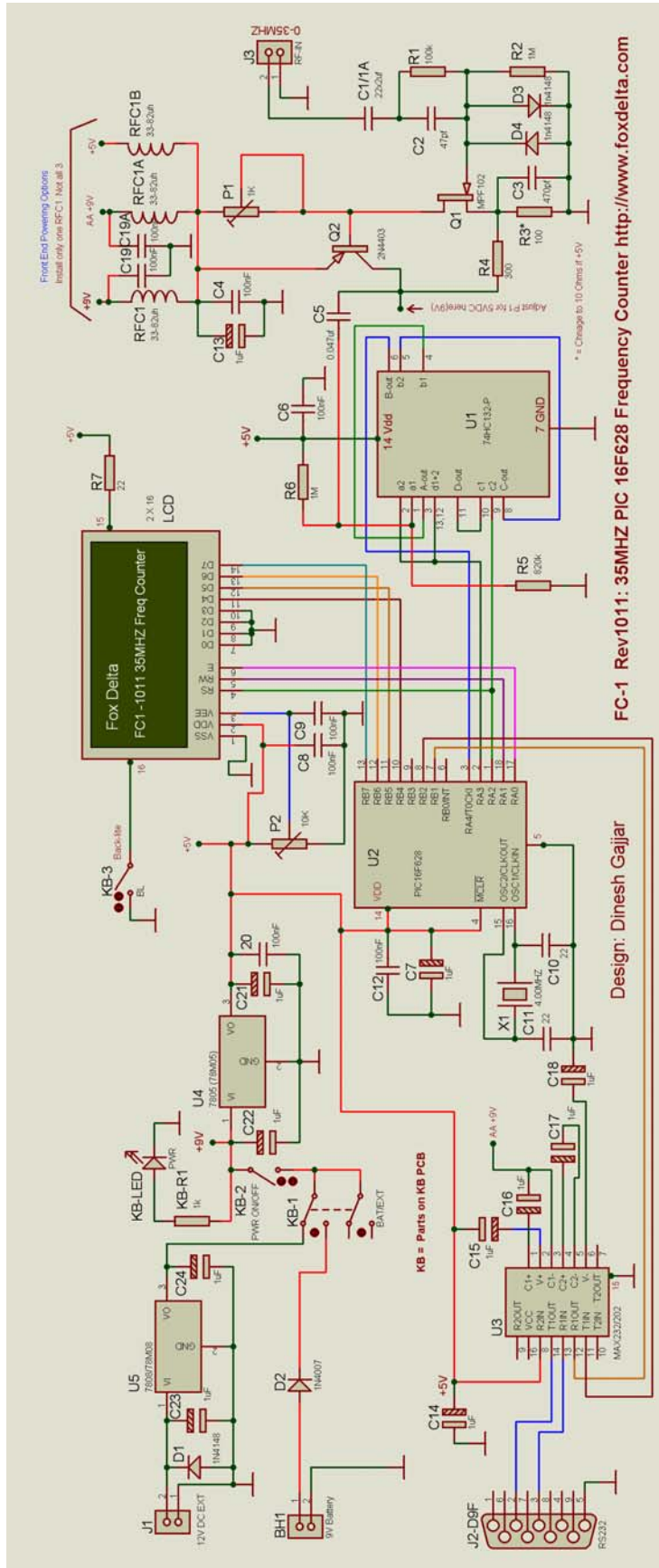
FC1 REV1011 Parts List:

Quantity	Check	Part ID / Details
1		PIC16F628 with FW FC1-1011.hex U2
1		MPF102 (Q1)
1		FC1-1011 DSPTH PCB with mounting hardware
1		FC1-1011-2 Keyboard PCB with hardware
1		74HC132 U1
1		MAX232 U3 (MAX202 Option)
1		2N4403 (Q2)
3		Front Panel KB Push Switches
1		3mm LED
2		2x 8 PIN SIL Male with 1x Female ribbon cable
3		1N4148 (D1, 3, 4)
1		1N4007 (D2)
1		78M05 +5V Regulator T0-220 U4
1		BNC connector for RF IN: J2
1		7808 (U5)
1		16X1 LCD Display with mounting hardware
1**	X	Battery Holder Keystone 1294
2		2x 16SIL Male and 1x Female Cable
1		DC Connector: J1
1		D9F R/A Connector J2
1		BNC Connector MX416
1		4.000MHZ Crystal X1
1		10K Preset Bourns 3386 (P2)
1		1K Preset Bourns 3296 (P1)
1		14 Pin IC Socket
1		18 Pin IC Socket
1		16 Pin IC Socket

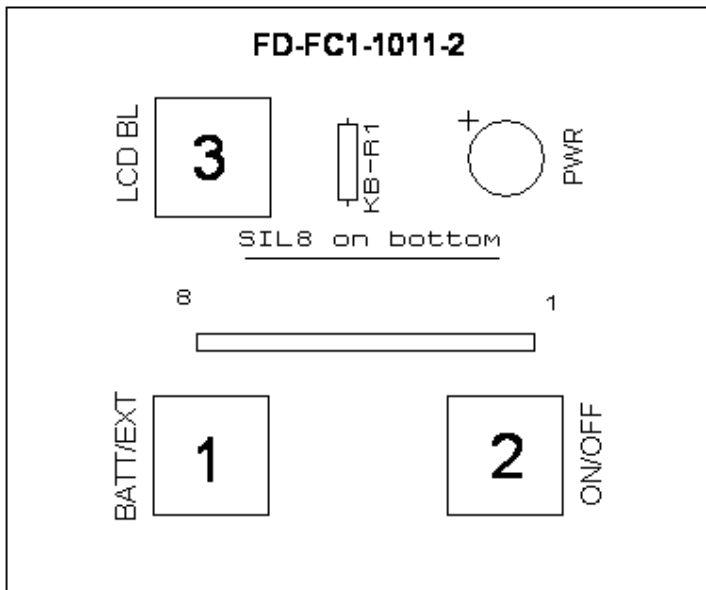| Quantity	Check	ID	Part Value
1		R1	100K
2		R2, 6	1M
1		R3	100
1		R4	330
1		R5	820K
1		R7	22
1		KB-R1	1K
1		RFC1	33-82uH

Quantity	Check	ID	Part Value
2		C1, C1A	0.22uf Poly
11		7, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24	1uf Tantalum
1		C2	47pf
1		C3	470pf
8		C4, 6, 20, 9, 8, 21, 12, 19	0.1uf Poly
2		C10, 11	22pf
1		C5	0.047uf

* Battery case may be an option. Please check at checkout.

Silk Snap of FC1 REV1011 Board:

Fox Delta FC1 - Rev 1011
Design: Dinesh Gajjar

Front panel Key Board:

FD-FC1-1011-2

LCD BL

3

KB-R1

+ PWR

SIL8 on bottom

8   1

BATT/EXT

1

2

ON/OFF

73s / Dinesh Gajjar
14th Dec 2011

For more details, please visit http://www.foxdelta.com