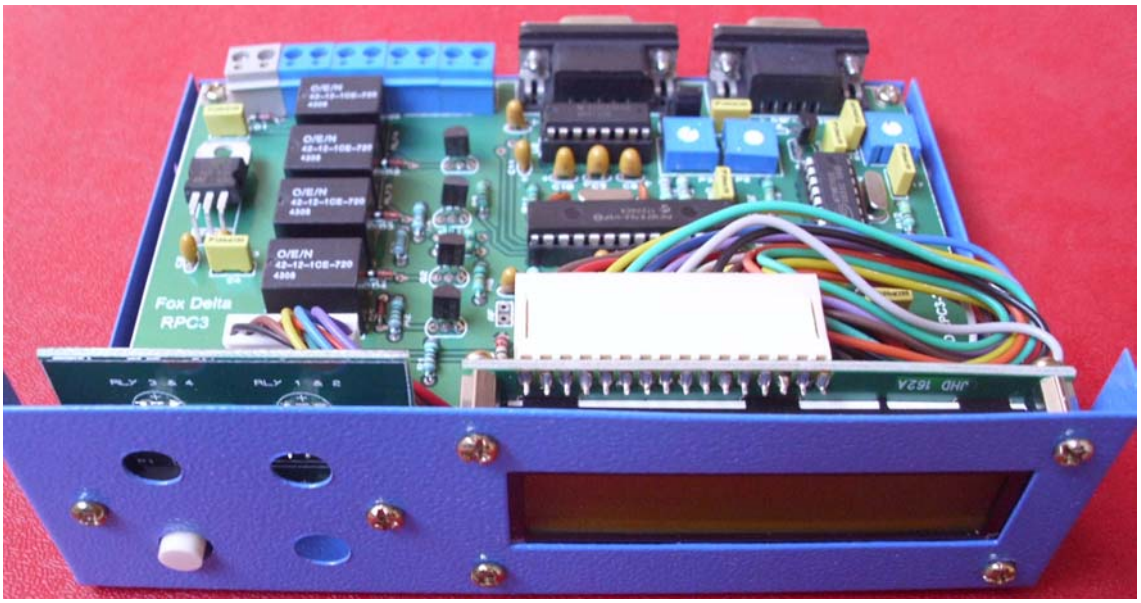
Fox Delta

Amateur Radio Projects & Kits

FD- RPC3

Technical Info Doc: PIC16F876A LCD DTMF Decoder by Max IK3SVW

RPC3-1209: DTMF Remote/Repeater Controller



RPC3 ready to use in a metal case:

DTMF Remote / Repeater Controller by IK3SVW:

Project is originally designed and published by Max IK3SVW.

As I had great interest in remote operation for repeaters atop mountains, I decided to make a good quality PCB and house in a metal case. This was done long back in Dec 2009!

Project document, firmware and software, are developed by Max/IK3SVW.
I have only made an effort to produce economical kits for the Radio Amateurs

Following are interesting features:

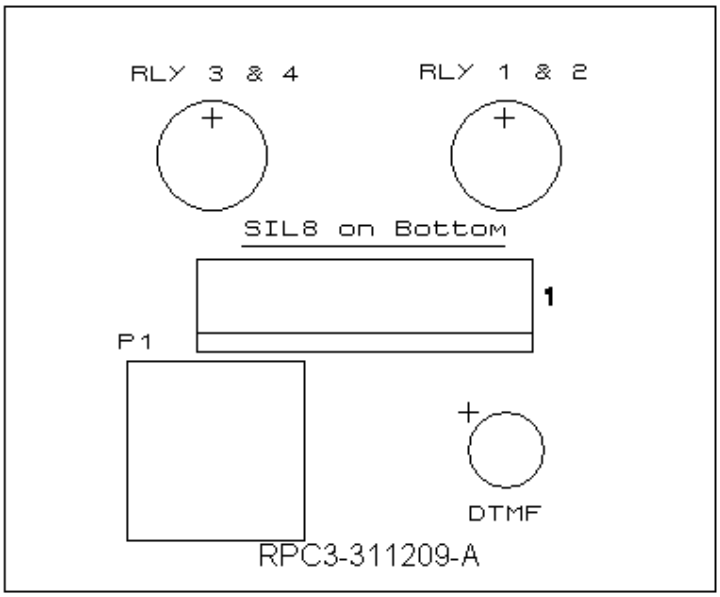
1. **Uses PIC18F766A controller**
2. **Operates Four 12V Relays**
3. **Uses MT8870 DTMF Decoder**
4. **PC configuration SW connects thru RS232**
5. **Front Panel LCD for activity monitoring**
6. **Software and Hardware Documents by Max/IK3SVW**
7. **12V operation.**
8. **Command transmitted by CW**
9. **Kit supplied in a powder coated metal case**
10. **Kits supplied with latest Firmware V3**
11. **Free download of V3 PIC WIN Software**

Project Details:

Project board is designed on a DSPTH FR4 Board measuring 14cm X 8cm. Small Keyboard PCB support Two Dual LED, One DTMF Led and a P1 Push button.

A free powder coated metal case is included with kits/assembled

Silk View of Key Board:



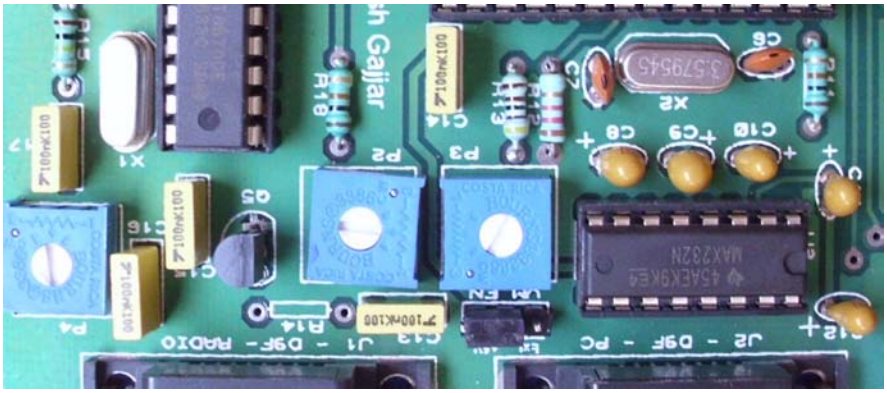
Dual LED:
Two CA Dual LED gives relay status

P1:
Pressing this button gives sequence stored in PIC flash memory.

DTMF LED:
Lights up on receipt of accepted DTMF tone pair

SIL8 Connector installs on Bottom side of KB PCB

Volt Meter and R14:



VM:

Volt-meter function is enabled when this header is installed with a shorting pin at EN. Use P3 to adjust voltage to display on LCD.

R14:
Install this resistor only if you want MIC/PTT action together (Kenwood Type Radios)

5V Regulator:

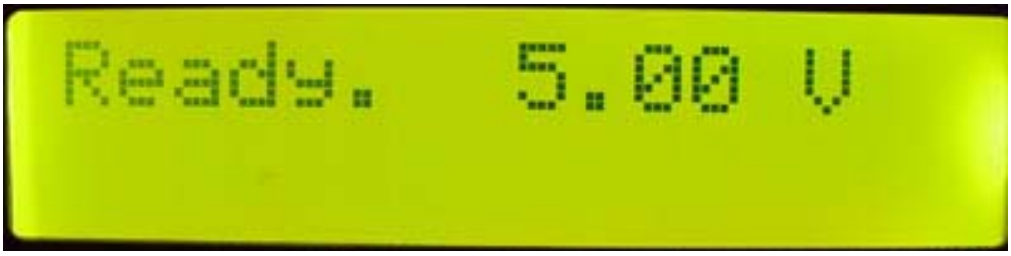
U1 is a 1A 5V regulator. It powers the entire board except Relays. Relays are 12V and receive 12V DC directly from DC12V Connector.

MIC AF adjust and Receiver Audio Presets:

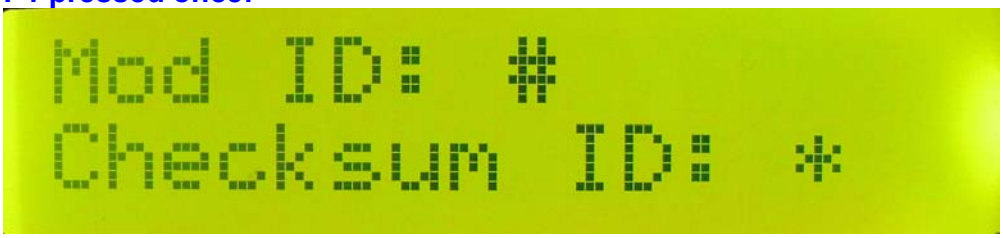
P2 is MIC AF Out control.
P4 adjust the incoming receiver audio.

LCD and P1 Front Panel Button:

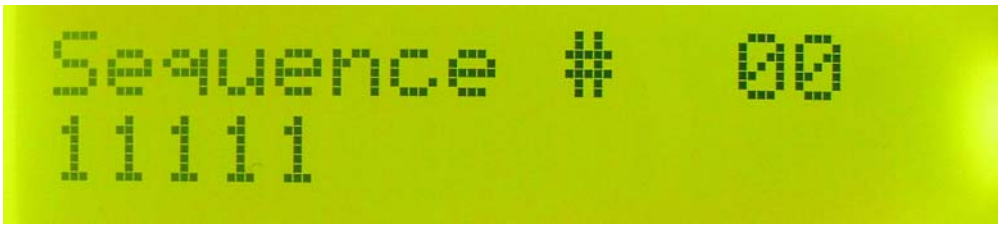
Power ON Status:



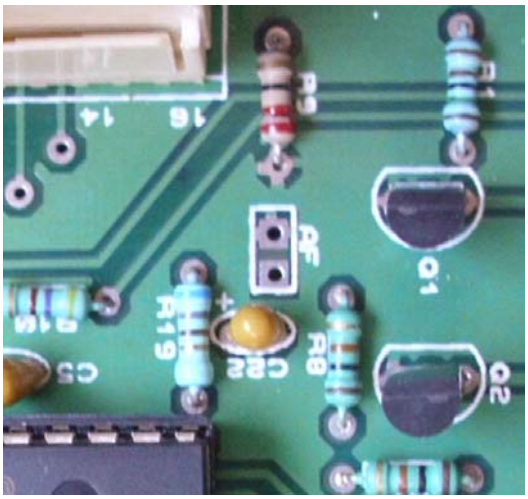
P1 pressed once:



P1 Pressed 2nd time:



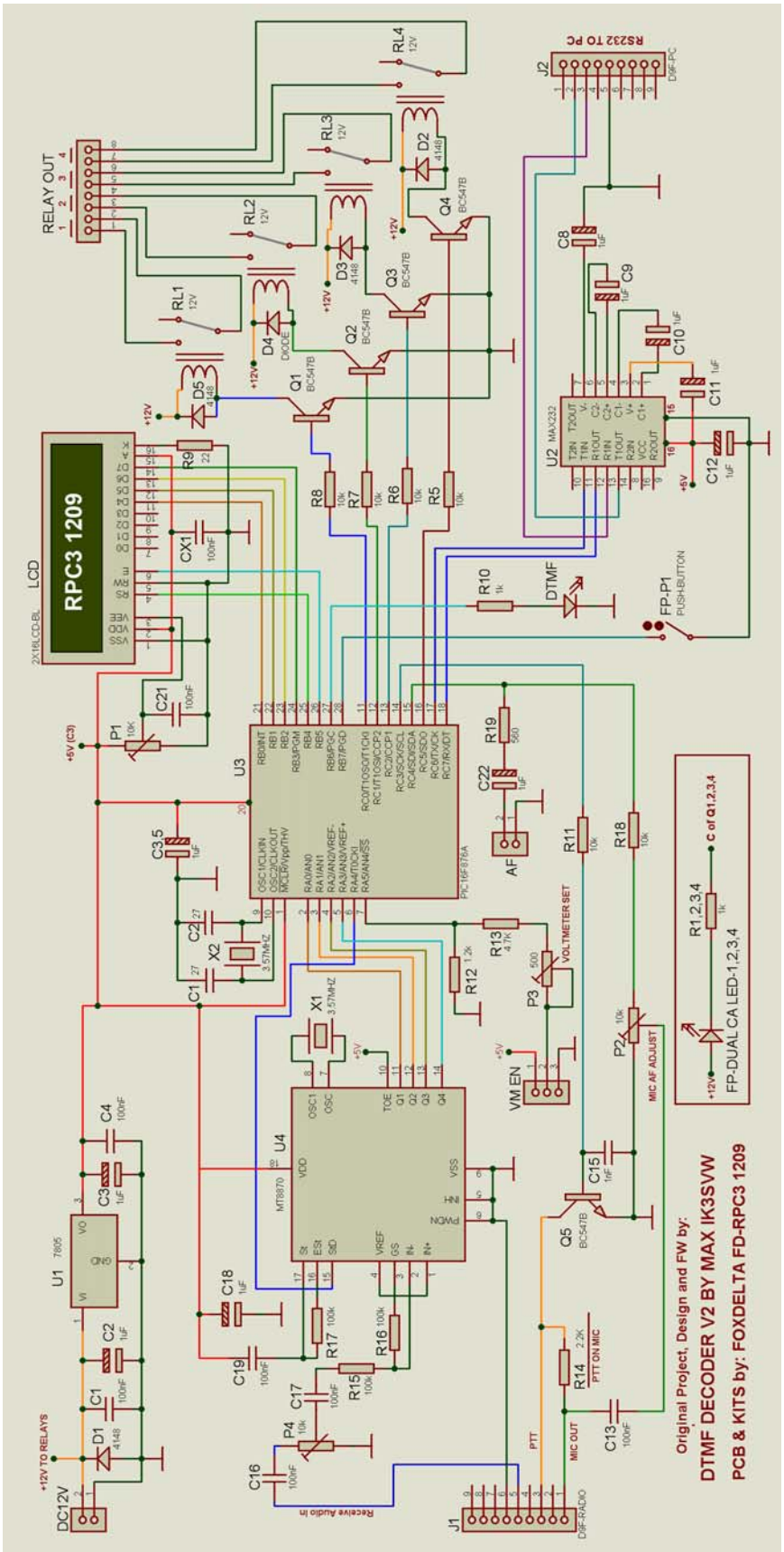
Additional Audio Out:



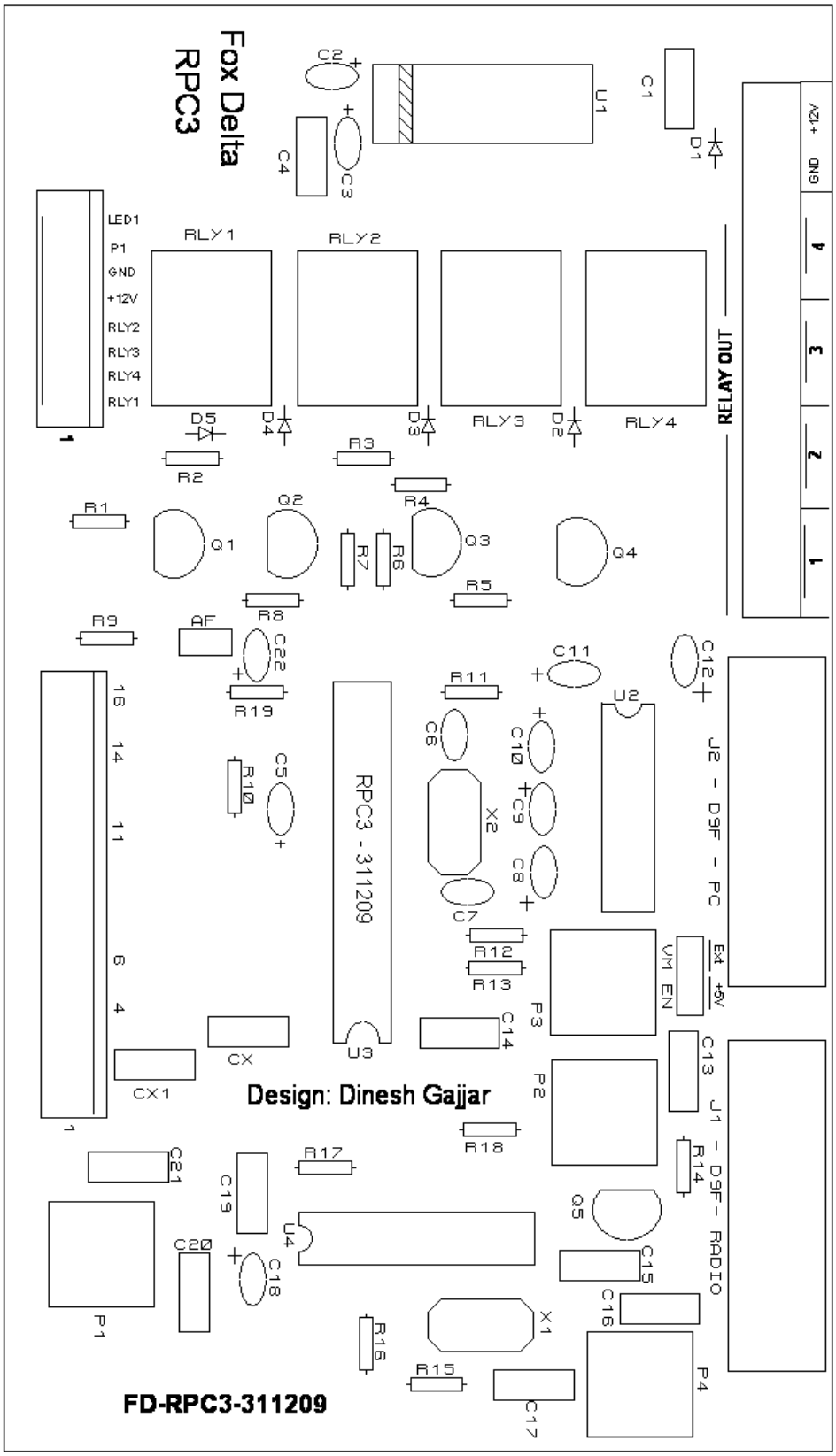
Lo-Z detected audio is available at points marked “AF”

May be used with a small amplifier to drive a speaker. Even tiny speaker may use connected directly

Schematic RPC3:



RPC3 TOP SIDE SILK:



RPC3-1209 Kit Parts List:

Quantity	Part ID	Details
1	U1	7805
1	U3	PIC16F876A Pre-programmed with FW by IK3SVW V3.00
1	U2	MAX232 DIP16
1	U4	MT8870 DIP18
4	RLY1-4	OEN42 12V Relays
5	D1, 2, 3, 4, 5	1N4148
5	Relay Out	2pin Screw terminals X 5
3	P1, P2, P4	10K Preset
1	P3	500 Ohms Preset (Volt Meter Adjust)
2	X1, X2	3.57MHZ HC49U Crystal
5	Q1, 2, 3, 4, 5,	BC547B
2	J1, J2	D9 Female PCB Connectors
1	LCD	2x16 with backlight
1	LED	3MM LED (DTMF on KB)
1	VM-En	3PIN Header
1	Set	SIL8 Male + Ribbon
1	Set	SIL16 Male (8+8) + 2 x 8Ribbon
1	Case	Powder Coated Metal case
1	Set	Hardware Keyboard
1	Set	Hardware Case
1	Set	Hardware LCD
1	KB Push Button	KB button 12MM
1+1	PCB	RPC3-1209 DSPTH PCB & KB PCB
2	KB LED	CA Dual LEDs
1	IC Socket	16PIN DIP (MAX232)
1	IC Socket	28PIN DIP Narrow (PIC876A)
1	IC Socket	18PIN DIP (8870)

Resistors:

Quantity	Part ID	Details
4	R1, 2, 3, 4,	1K
1	R12	1.2K
1	R10	560 Ohms
1	R9	22 Ohms
5	R5, 6, 7, 8, 13	4.7K
1	R11	10K
1	R14	2.2K
3	R15, 16, 17	100K

Capacitors:

Quantity	Part ID	Details
10	C1, 4, 14, 13, 16, 17, 19, 20, 21, CX1	0.1uF Poly
2	C15, CX	0.001uF Poly
10	C2, 3, 5, 22, 8, 9, 10, 11, 12, 18	1uF Tantalum
2	C6, 7	22pf / 27pf Ceramic

73s / Dinesh Gajjar / 10th January 2018

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