RXCV - Economy midi to control voltage converter
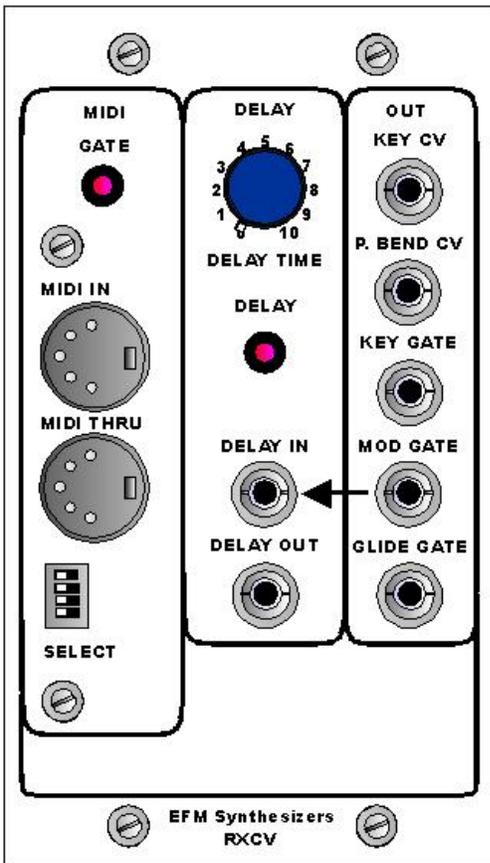

Economy midi to control voltage converter. Features...

- Pitch (Key-CV)
- Pitch Bend (P. Bend CV)
- Gated Mod (Mod CV)
- Key Gate
- Glide Gate
- Selectable midi channel (1-16)
- Varable Mod-CV delay
- +/-12 or +/- 15V

The RXCV was our first *Midi to Control Voltage* converter. It was built in collaboration with Trevor Page of Resonance and designed to be a simple interface for TB303 type synthesizers. Trevor changed the face of do it yourself synthesizers by allowing us to use his excellent firmware for a small token fee. All of the EFM midi to CV converters use Trevors code and many projects would not be possible without it. Although I've said it before, it can't be said enough ...Thank You!!

Check out his 9090 analogue drum machine project....

Link to Trevors Place - http://www.resonance.fsnet.co.uk/

How It Works

The basic functions were enhanced so that all gated controls were switched to the positive rail and a delay function was added for changing the on/off mod gate to a slowly rising *mod control voltage.* The circuit is designed to be powered by a central modular supply of ether +/-12V or +/-15V. There is an on board +5V regulator for the PIC, DAC, inserter and opto coupler. Midi data is read by the PIC. The PIC interprets the data and switches it's outputs to comply with the midi messages. It will respond to pitch, pitch bend, modulation, key down and more that one key down messages all others are ignored. Pitch and pitch bend control voltage outputs are obtained by switching a dual 7528 DAC. Gate, Glide (Slide), and Mod controls are generated by the PIC.

A DG442 *quad analog switch* was added to help isolate the PIC from external sources. This has the extra benefit of converting the PICs +5V output to +12V. The *delay generator* is built from a complementary fet pair in a 4007. It's normal state is high. When triggered the output from the 4007 goes low and then rises. The time it take to do this is set by the *Mod Delay* pot and is variable from immediate response to almost a full second. First draining then charging the 10uF capacitor C10. When connected to a VCA used to control a LFOs output level, it has the effect of delaying the Mod and then gently applying it smoothly and slowly much like you would do naturally with a mod lever. You can elect to have automatic mod after every note played by plugging the *Key Gate* output into the *Delay Input* .

Assembly

See General Instructions Here - General Instructions <- not working yet!

- Press the overlay on the panel blank
- Drill and clean the holes
- Remove the application tape and cutouts
- Mount the jacks, switches, pots ect... to the panel.
- Install the resistors
- Install the IC sockets
- Install the capacitors
- Cut and solder header strip pins in pads used to connect wire to the board
- Install the +5V regulator
- Install the on board jacks and switches
- Plug the ICs into their sockets
- Mount the L-Brackets to the board with 440 screws and nuts, using the non threaded end of the bracket
- Mount the board to the panel with 440 screws using the threaded end of the bracket
- Wire the panel mounted parts to the header pins.
- Apply power and adjust T1 until you have -10.56V on pin 4 of U5

NOTES:

- Earlier versions of the document specified U6 as a TLO74. If you are using a +/12V supply to obtain the correct reference voltage of -10.56V a LM324 should be used, +/-15V applications should not have this problem and a TLO74 can be installed.
- The values for R1,R2,R3 and R4 have been changed.
- S2 is no longer used in favor of switching jacks.

PC Board Wiring
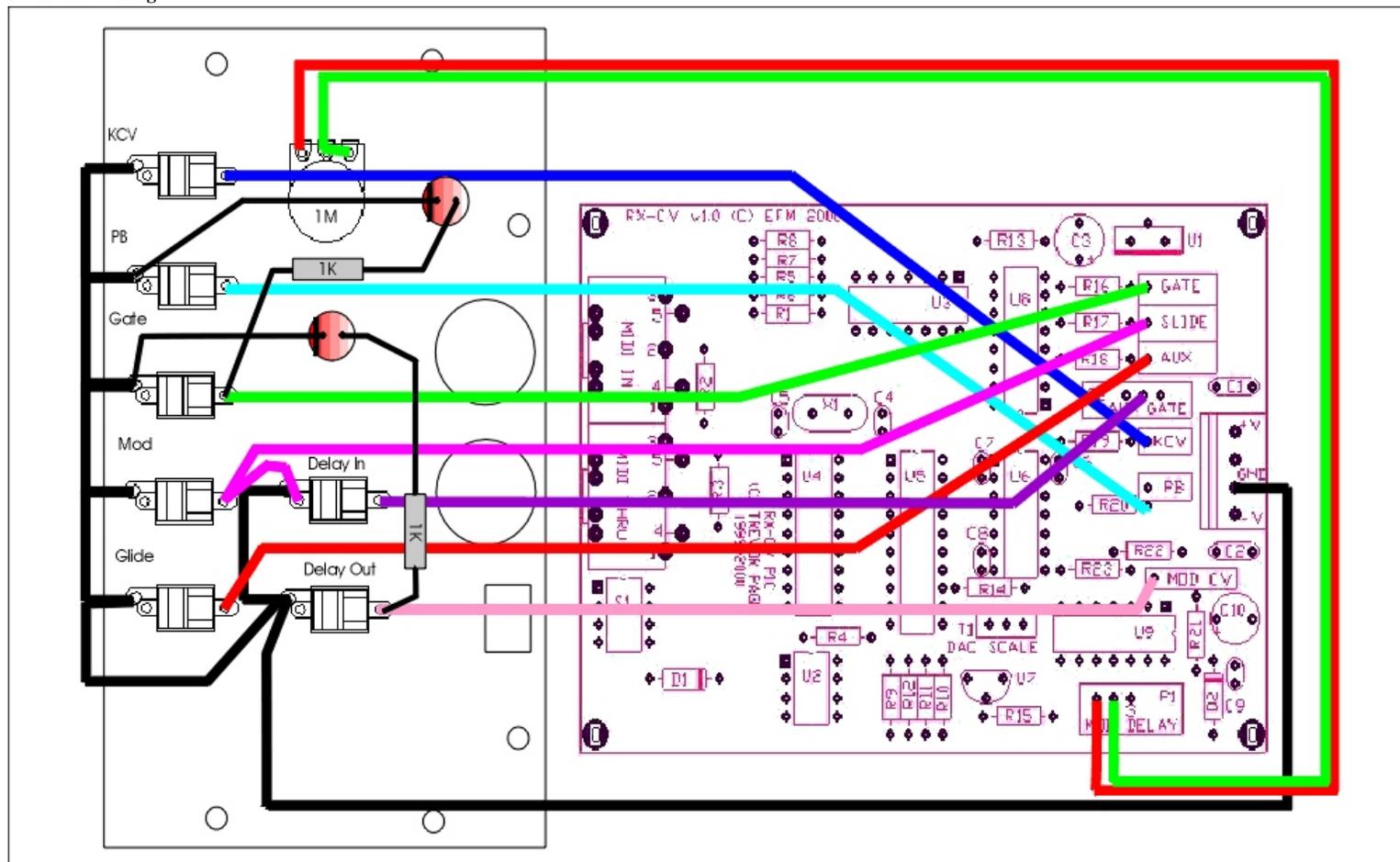
Small Kit		
C6, C7	Capacitor - Ceramic - 10pF	2
C3,C10	Capacitor - Ele - 10uf/16V	2
C1, C2	Capacitor - Ceramic - 0.1uf	2
C8	Capacitor - Ceramic - 0.01uf	1
C5, C4	Capacitor - Ceramic - 22pF	2
C9	Capacitor - Ceramic - 470pF	1

D1, D2	Diode - Signal - 1N4148	2
U1	IC - Regulator - LM7805	1
U2	IC - Opto Coupler - 6N138	1
U3	IC - TTL - Hex Inverter - 74LS04	1
U4	IC - PIC - 16F84-10	1
U5	IC - DAC - TLC7528CN	1
U6	IC - Opamp Quad - LM324	1
U7	IC - Voltage Referance - LM336Z 5.0	1
U8	IC - CMOS - DG442	1
U9	IC - CMOS - CD4007	1
R14	Resistor - 1% Metal Film - 47K	1
R13, R15	Resistor - 1% Metal Film - 2K2	2
R1, R2, R3	Resistor - 1% Metal Film - 220R	3
R21	Resistor - 1% Metal Film - 330K	1
R22, R16, R17, R18, R9, R10, R11	Resistor - 1% Metal Film - 10K	8
R4,R12,R23, R19, R20, R5, R6, R7, R8	Resistor - 1% Metal Film - 1K	8
X1	Crystal - 4Mhz	1
PC-Board	PC-Board	1
Full Kit		
P1	Pot - 16mm - 50K	1
Knob	Knob - Eagle	1
S1	Switch - 8 pin DIP	1
J2,J3	Jack - DIN 5 pin PC Mount	2
J4,J5,J6,J7,J8,J9,J10	Jack - Mini - 1/8th	7
Brackets	Bracket - L-Bracket	2
IC - Socket - 8 pin	IC - Socket - 8 pin	1
IC - Socket - 14 pin	IC - Socket - 14 pin	3
IC - Socket - 16 pin	IC - Socket - 16 pin	1
IC - Socket - 18 pin	IC - Socket - 18 pin	1
IC - Socket - 20 pin	IC - Socket - 20 pin	1
T1	Trimmer - 10T - 50K	1
J1	Connector - 4 Pin - 0.156 Header	1
Panel - Aluminium	Panel - Aluminium	1
Overlay	Overlay	1

RX-CV v1.0 (C) EFM 2000
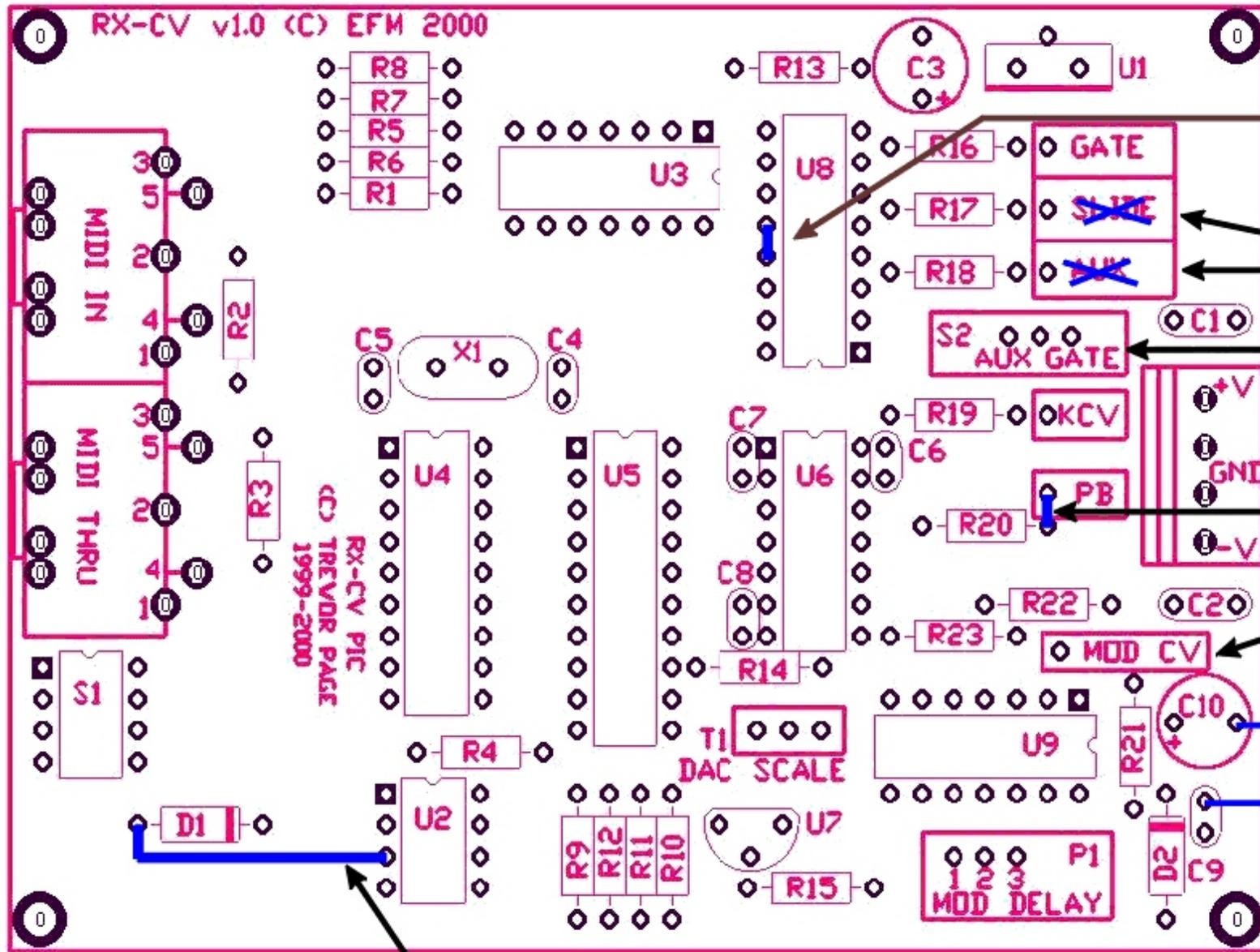
Connect Pins 12 and 13 together on U8.

Slide and Mod are misslabled.

Mod

Slide

S2 is not used. Connect the center pad to Delay Input.

The PB pad is grounded. Break this trace and connect the PB output to R20 here.

Mod CV is now called Delay Out

Add a diode at C9 to ground

Add a jumper from D1 to U2 pin 3.