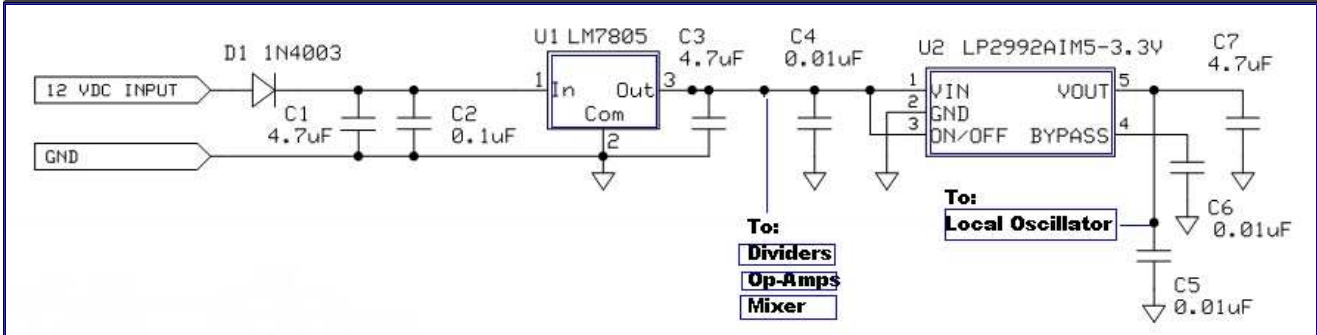


I - Power Supply Stage

Home Page Power Supply Local Oscillator Dividers Op Amps; BPF(s) Mixer Comments

Schematic




Theory of Operation

The power supply delivers two rails to the receiver. The 5 volt rail (from U1, the LM7805 regulator) powers the dividers, the mixers, and the op-amps. The second rail is a 3.3 volt rail (from U2, the LP2992 5 V to 3.3 V regulator), providing 3.3 Vdc to the Si570 in the local oscillator stage.

Summary Build Steps

- Fasten board hardware
- Install U2
- Install SMT Caps
- Install U1 and D1
- Install the ceramic caps
- Install Ground testpoint/ENRX
- [Testing](#)

Bill of Materials

Designation	Component	Type	Qty	Notes
C01	4.7 μ F	ceramic		 code 475
C02	0.1 μ F	SMT 1206		bottom (black-marked strip)
C03	4.7 μ F	ceramic		
C04	0.01 μ F	SMT 1206		bottom
C05	0.01 μ F	SMT 1206		bottom
C06	0.01 μ F	SMT 1206		bottom
C07	4.7 μ F	ceramic		code 475
misc	shorting wire		1	for /ENRX grounding
D1	1N4003	Diode		
U1	LM7805	TO-220 5 volt regulator		(top)
U2	LP2992AIMS-3.3V	SOT23-5 3.3v Regulator		(bottom)

Installation Notes

Board Hardware

Fasten board mounting hardware

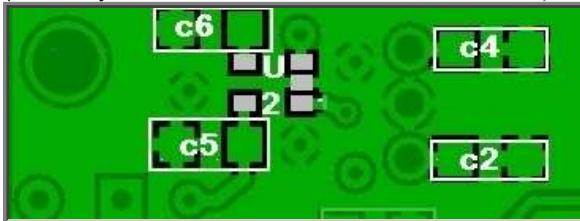
(Pay no attention to the mounting as depicted in the "[completed board](#)" pictures - the author got it backward when those pictures were taken. Thanks to Tom Williams K9AC, who commented:

Shouldn't the 4 nylon spacers be on the bottom of the board. They serve no purpose on top since they are shorter than most of the components. The bottom of the board is left in contact with whatever surface it is sitting on. Hopefully, not conductive metal.)

1. 3/8" 4-40 screws (4) thru each of the 4 corner mounting holes
2. Insert each from bottom of board
3. The stack is: screw, 1/8" nylon spacer, (then the board), nylon washer, and hex nut


Bottomside Components

(You may want to refer to the [board bottom view](#))



Install U2 (LP2292AIM5-3.3v)

- Install U2 (LP2292AIM5-3.3v) on the bottom side of the board.
- Install this first, so as to avoid having to work around the SMT caps.
- Take care with this IC. It is very tiny and installation is very prone to solder bridges. (see the [SMT IC Installation Guidelines](#)).
- Take [ESD precautions](#) when working with this IC.

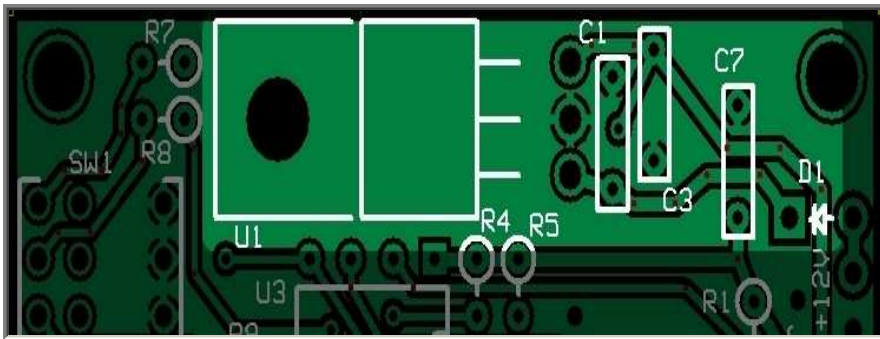
Check	Designation	Component	Type	Qty	Notes	Orientation
	U2	SOT23-5 LP2992AIMS-3.3V	3.3v Regulator 3.3v Regulator		(bottom - code="LFEA")	

Install 4 SMT Caps

Install SMT Capacitors C2, C4, C5, C6 on the bottom of the board. (see [guidelines for installing SMT Capacitors](#))

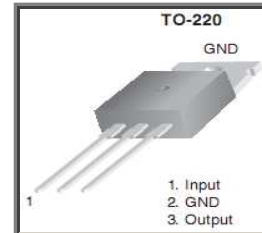
Check	Designation	Component	Type
	C02	0.1 µF	SMT 1206 (black-marked strip) See caveat on 1206 Caps
	C04	0.01 µF	SMT 1206
	C05	0.01 µF	SMT 1206
	C06	0.01 µF	SMT 1206

Topside Components



Install U1 (LM7805)

- Install the 5 volt regulator. It mounts on top of the circuit board and the tab is fastened to the circuit board by 4-40 hardware (4-40 machine screw, #4 star lock washer, and hex nut) provided in the kit.
- Bolt U1 to the board and solder and clip the leads.



Check	Designation	Component	Type
	U1	LM7805	TO-220 5 volt regulator

Install D1 (1N4003)

Install D1 "hairpin" style, with the anode end snugged against the round hole and the cathode end as a hairpin into the square hole



Check	Designation	Component	Type
	D1	1N4003	Diode

Install ceramic Capacitors

Install C1, C3, and C7 topside to the right of U1. See the [guidelines on installing Ceramic Capacitors](#).

Check	Designation	Component	Type
	C01	4.7 μ F (code 475)	ceramic
	C03	4.7 μ F (code 475)	ceramic
	C07	4.7 μ F (code 475)	ceramic



Finally, Install /ENRX Loop



Install a loop for ground testpoints.

- Install a short piece of hookup wire (the long lead snipped from D1 after its installation is great for this purpose) into the two holes designated "/ENRX" to allow a ground test point and, [later](#), ground the RX Enable signal.
- Note, use a fairly stout piece of wire because this will get a lot of abuse during testing.

Check	Designation	Component
	misc	shorting wire (e.g., cutoff lead from D1)

Board as Installed

Top



Bottom



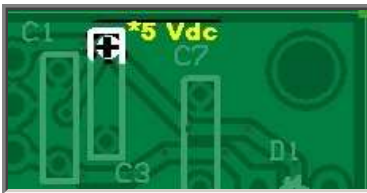
Testing

Current Draw (DMM - 3.1 mA)

- Before you power the board up for the first time, connect a ma meter in series with the power lead and to be safe, put a 1k ohm resistor in series with the power lead. This can be in either the + or - line. This will limit the current flow if you have a short on the board.
- After you see that the current isn't excessive (should be < 5 mA using a 9 V battery), remove it, and re-measure the current draw.
- The current draw with this initial stage and no other loads should be on the order of 3.1 mA
- The author's board measured 3.12 mA with a \$30 DMM).

5 Volt Rail (DMM - 5 Vdc)

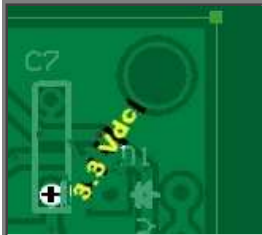
- Using a DMM, measure the



voltage with respect to ground at the top end of C3.

- This should be approximately 5 volts DC.
- The author's board measured 4.98 Vdc).

3.3 Volt Rail (DMM - 3.3 Vdc)



- Using a DMM, measure the voltage with respect to ground at the lower end of C7.
- This should be approximately 3.3 volts DC (the author's board provided 3.29 Vdc).
- If you do not get a good 3.3 Vdc reading, go back and check the soldering on the IC. (The author's first test actually yielded only 1.6 mV. The problem turned out to be a poor solder joint on pin 2 of U2.)