

# Power supply

mcHF uses a chain of linear regulators to provide all needed voltages. The top one is software controlled from the MCU. Linear regulators chain was chosen against switching supply for simplicity and easier EMC management.

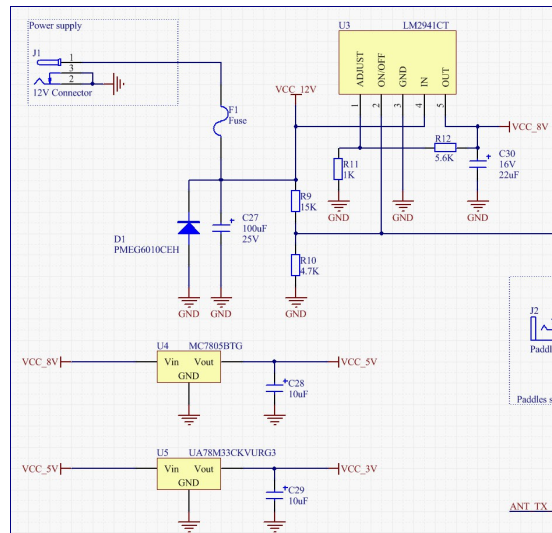


Fig1: Power supply schematics(click for larger view)

Voltages needed by mcHF – 12V for final PA, 8V for the speaker amp and TX quad preamp, 5V for most of the RF modules, LCD etc. and 3.3V for the digital logic – MCU and Codec. The main concern here is the voltage drop in the chain to be as small as possible because eventually it is converted to heat. As the first two regulators use the output PA transistors heatsink, this is a concern. So the drop in U3 is  $12 - 8.5 = 3.5$  V, the drop in U4 is  $8.5 - 5 = 3.5$  V and finally U5 drop is  $5 - 3.3 = 1.7$  V.

The way power up works is by holding the U3 INHIBIT pin high from the incoming 12V supply via divider R9/R10. The idle voltage is 2.6V, enough to keep the regulator in OFF mode and not give to much reverse current to the MCU GPIOs connected via D2. Pressing the power button on the UI pcb will provide low level to the pin 3 of U3, which will put the U3 in ON state, which in turn will cause the MCU to boot and execution of the startup firmware routines will provide constant low level to D2 and keep the U3 ON. Power off is just switching MCU GPIO pin to high and powering off the whole regulator chain.

Power supply module also provides accessories interface – optocouple isolator for PTT control of external amplifier and buffering of the MCU PTT signal to 5V levels for all RF modules that needs it.