A 12v to 9v DC adapter for the MFJ-299 Desk Microphone

The MFJ-299 desk microphone **(photo 1)** is a favourite of mine and is my usual choice for HF use with my venerable Kenwood TS570S. I especially like the VU meter which allows one to easily monitor the level of out-going audio. Of course, the other included features of built in PTT transmit indicator LED, selectable compression and graphic equalizer make it a powerful unit indeed. The only negative, in my opinion, is that, for whatever reason, MFJ designed the MFJ-299 be powered only from a 9 volt battery, with no other option.

The problem is, if one forgets to switch the microphone off after use, then there is approx. 11mA continuously taken from the battery, which will necessitate it's replacement several times per year. True, the "on-air" LED (solid red on transmit) flashes approx twice per second, to remind that power is on. However, on my unit it was hard to see the led, unless close by and looking down at it.

At the time, I thought why not use the +8V DC that is available on the microphone connector of my Kenwood TS570S? Checking the TS570S specs revealed the Kenwood caution that no more than 10 mA should be taken from the +8V. With that, together with the less than ideal 8 volts, made it a marginal situation at best, so I decided to build up a simple 9 volt DC source and install it in the MFJ-299 in place of the battery. Ideally, it would be no larger than a conventional 9v battery and would take its power from the same 13.8 V DC bus I use to power my rigs, meter illumination, shack lighting etc.

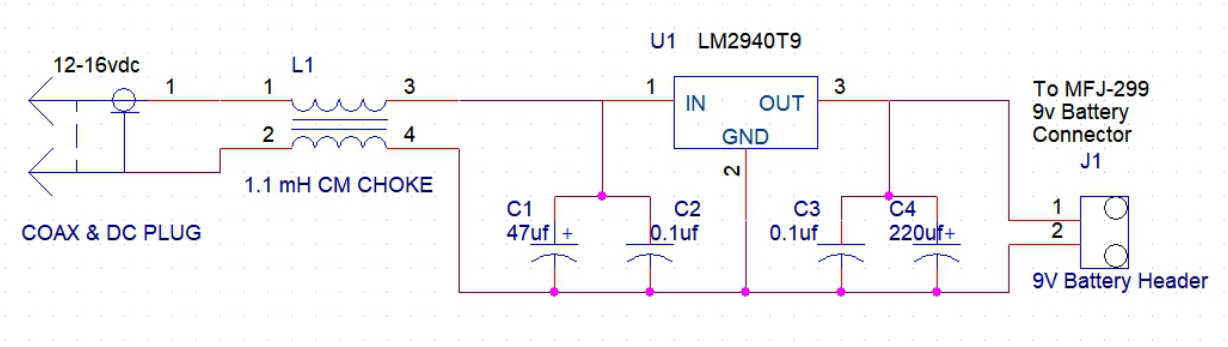
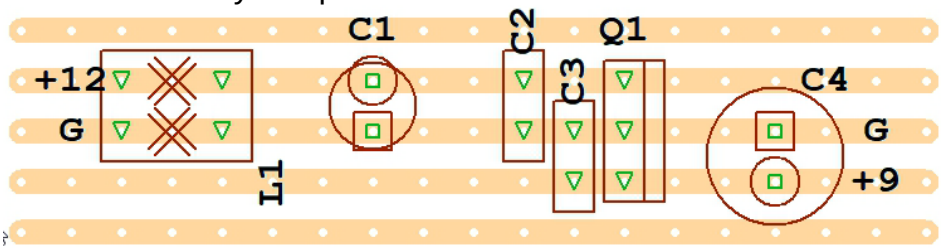


Photo 2 shows the simple schematic, using the low-drop-out voltage regulator LM2940T9, which will maintain the 9.0 v output as long as the input is 10 volts or higher. I included the common-mode choke L1, as a precaution to prevent RF from coming in on the 12V DC input. For L1, anything from 1 to 10 mH will work fine. In my case, I found some low cost 1.1 mH common mode chokes on eBay. However if you want to make your own, the Laird LFB127079 ferrite (Digikey 240-2278-ND) with 10 bifilar turns on it will work as well.

I decided to build the circuit on a small piece of perforated strip-board as shown in

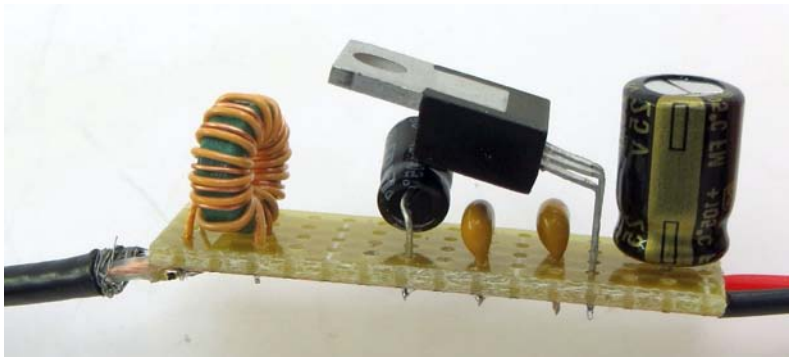
A 12v to 9v DC adapter for the MFJ-299 Desk Microphone

Photo 3. This is no larger than the standard 9 volt battery it is replacing and will easily fit into the battery compartment of the MFJ-299.



Note: As this is very low power application, no heat-sink is required for the LM2940T. However, should you want to use the circuit elsewhere as a 9 volt source at up to 1 amp output, make sure to fasten the LM2940T to an adequate heat-sink.

Photo 4 -- View of components mounted on strip-board



Re Strip-Boards
The strip-board I used here and prefer for most projects, consists of 0.1” wide copper strips on one side and hole perforations on a 0.1” grid. Photo 3 showing the component layout topside also shows shaded the bottom copper, as if you could see through the board.
The double X marks under L1 indicate that the copper strip is cut at that point, easily done with a dremel type cutter or even a sharp knife. Capacitor C1 was mounted on its side to provide space for bending U1 as shown.

A 12v to 9v DC adapter for the MFJ-299 Desk Microphone

Photo 5
Finished 9V supply, with battery output connector and shielded input cable with 12V DC connector. (less heat-shrink tubing, for clarity)

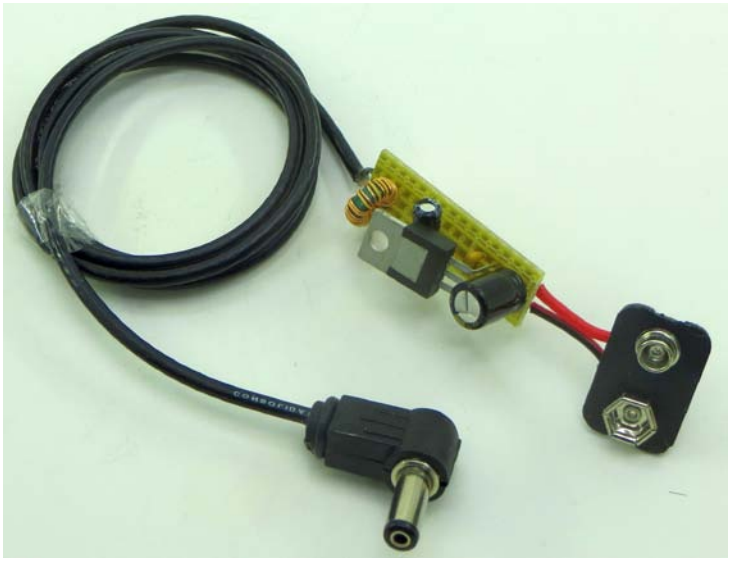
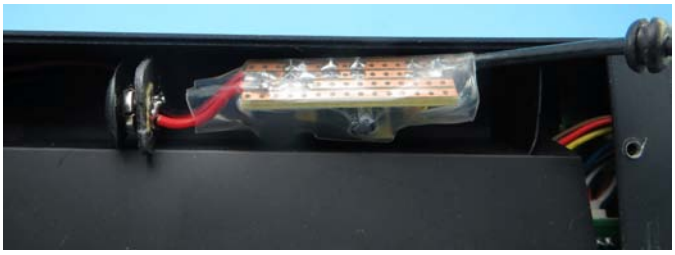


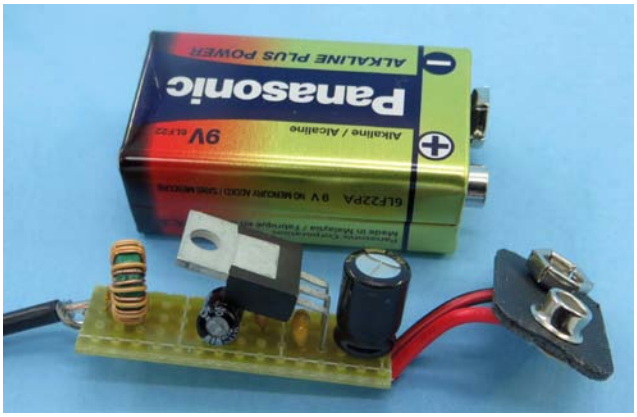
Photo 6
9V strip-board mounted in battery compartment of MFJ-299, showing DC input cable with grommet



A 12v to 9v DC adapter for the MFJ-299 Desk Microphone

Photo 7
Showing routing of shielded DC input cable (RG174) out through the corner of the battery compartment and cover.

Photo 8 Comparison of strip-board power supply to 9V battery



Parts used:

L1 1.1mH common mode choke (see text)
C1 47uf 25V electrolytic capacitor
C2,3 0.1uf 50V ceramic capacitor
C4 220uf 25V electrolytic capacitor
U1 LM2940-T9 LDO voltage regulator
J1 snap terminals taken from top of a dead 9V battery
Strip-board: 18 x 5 holes (approx 1.8" x 0.5") (Veroboard epoxy/fiber or CEM-1 strip-board, or equiv.) (www.veroboard.com)
Coax and plug: 24" of RG174 mini coax, DC power connector of your choice, I used 5.5mm x 2.1mm center
Grommet
Heatshrink tubing, clear, ¾" ID x 2.25" L (optional)