Hints & Kinks

Edited by **Bob Schetgen, KU7G** • Senior Assistant Technical Editor

MODIFICATIONS TO YAESU FT-101—UPDATE

◊ Thanks for publishing my article on fitting 6146Bs into the FT-101,[1] but I would like to advise readers of a more suitable method of neutralizing the 6146Bs than shown in my original circuit.

Fit a 2000-pF, 1-kV capacitor across C11, which is a 200-pF used to decouple the cold end of the 12BY7A plate tuned circuit. First, this reduces the RF feedback from the output tubes, which is too great for neutralization of 6146Bs. Second, it increases decoupling of the driver tuned circuit, which provides increased drive level on all bands. With this modification, C125 (100-pF) remains unchanged from the original circuit.—*Roger Davis, ZS1J, PO Box 1099, Plettenberg Bay, 6600, Republic of South Africa*

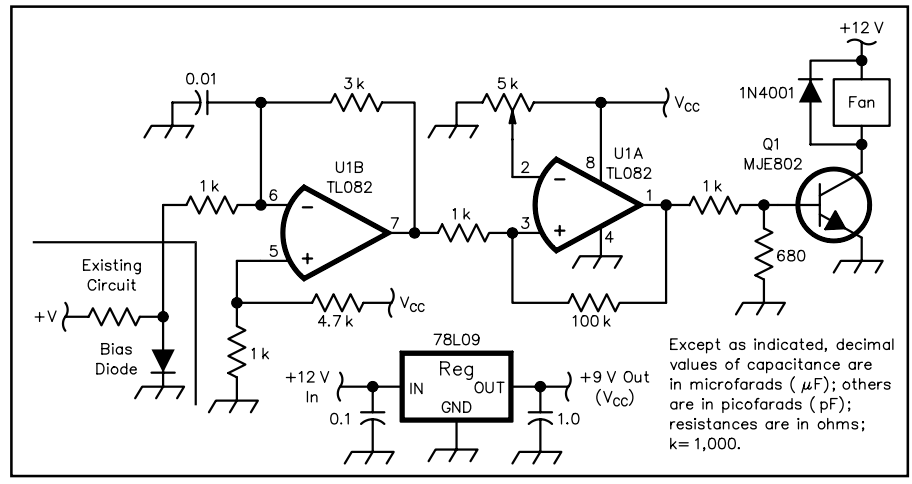

Figure 2—A schematic of W1HUE's fan-control circuit.

PROPER METHOD FOR APPLICATION OF PROTECTIVE TAPES

◊ Here is the military way to apply plastic tapes to secure and protect electrical wiring (see Figure 1):

1. Be sure that the surface to which the tape is applied is clean.

2. In some cases, you can improve tape adhesion by first coating with a product such as ABS, PCV or CPVC cement. This is especially effective on aluminum surfaces.

3. Start the tape in the center and wrap with firm tension continuously to one end back across the center to the other end and back to the center. Remove tension from the last inch and finish the wrap. Cut the tape; don't tear it.

4. You now have the ends tightly sealed and only one end exposed, but it is three layers thick and not apt to leak.

5. Use quality tape available from an electrical supply house: 3M type 88 or better.

6. If a little better water protection is required, use a sealer such as rubber adhesive tape before application of the 88 tape. Follow the same application procedure for the rubber tape.—*Lloyd G. Hanson, W9YCB, 490 E 300 N, Angola, IN 46703*

[1]R. Davis, ZS1J, "A New Life for Your FT-101," *QST*, May 1999, pp 68-69.

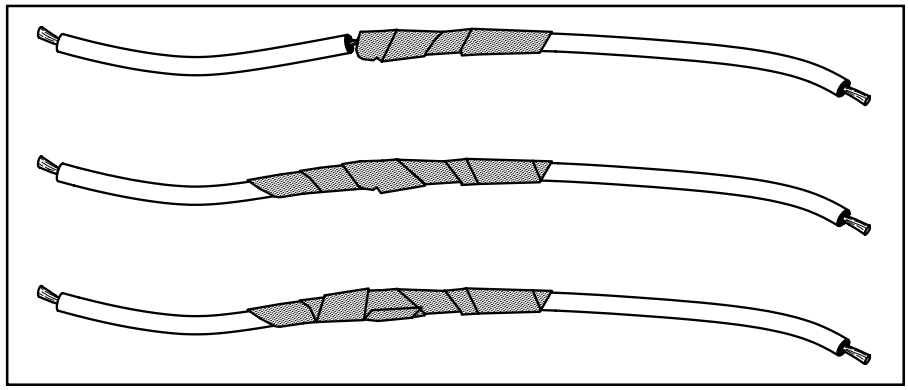

Figure 1—The right way to apply electrician's tape. See the text for instructions.

A SIMPLE TEMPERATURE SENSOR FOR COOLING-FAN CONTROL

◊ I recently built a solid-state RF power amplifier[2] and wanted to add a temperature-controlled fan for "on demand" cooling. I was contemplating mounting a thermistor on the amplifier's heat sink when I realized that a perfectly good temperature sensor was already present: The bias diode for the amplifier transistors! The diode (a 1N4997) is mounted on the heat sink between the power transistors. It compensates for the transistors' base-emitter junction temperature coefficient. All I needed to do was monitor the voltage drop across the diode and switch on the fan when it began to decrease, indicating a rise in temperature.

The circuit that I came up is shown in Figure 2. One half of the TL082 dual op amp amplifies the voltage change from the diode and adds a small dc offset. The other half is configured as a voltage comparator and drives an NPN transistor, Q1, to control a 12-V dc fan. When the input to the comparator drops below the threshold voltage set by the 5-kΩ trimpot, Q1 turns on to power the fan. A small amount of positive feedback is provided by the 100-kΩ resistor from the output to the input of the comparator. This causes the comparator to switch faster and improves stability by providing a small amount of hysteresis at the trip point. I used an MJE802 Darlington transistor (similar to a 2N6039) for Q1 simply because I happened to have one. The MJE802 will easily switch 1 A or more and is probably overkill unless there are multiple, parallel-connected fans. A 2N4401 should work just fine to control a small 12-V dc fan drawing 250 mA or less. If you want to use a lower power Darlington device, a 2N6426 would be a good choice. If you need to control a 120-V ac fan, then use Q1 to drive a 12-V relay.

The comparator trip point should be set

[2]"140-W (PEP) Amateur Radio Linear Amplifier for 2-30 MHz," Motorola Engineering Bulletin EB-63.