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

A "THUMP KILLER" MODIFICATION FOR KK7B'S CW TRANSCEIVER

◊ I have a modification to KK7B's "A Small High-Performance CW Transceiver" (*QST*, Nov 1995, pp 41-46) that might interest you. Rick's original is for 20 meters, but I built one for 40 meters. My 40-meter version works very well, but a couple of things about its performance bugged me. One I still haven't solved is the mysterious leakage of 12 to 14-kHz signals through the receive filter. The other was loud key clicks whenever the volume control was advanced past about one-quarter volume. You can correct this by adding a parallel pair of reverse connected 1N914 (or 1N4148 or 1N916 or equivalent) clamping diodes across pins 1 and 2 of the NE5532 audio amplifier (U7, the op amp immediately following the **VOLUME** control). See Figure 1. This kills the clicking but allows normal audio through unchanged. —*Dave Fifield, KQ6FR, 1717 Andover Ln, San Jose, CA 95124; e-mail* **fifield@lan.nsc.com**

Author Rick Campbell replies:

◊ Thanks for the copy of Dave's work. His solution looks good. I have two comments:

1. I omitted the diodes because I was afraid they would increase audio distortion to an unacceptable level. Maybe they are okay—I just didn't explore this.

2. The "mysterious leakage of 12 to 14-kHz" [energy] is no great mystery: The passband of the elliptical filter has very sharp skirts above 3 kHz, but they degrade above about 6 kHz. The best solution for this is to use ARRL's *Radio Designer* or *PSPICE* to design a filter to your own taste—a simple Butterworth will have minimal high-frequency leakage.[1] The one in the November 1995 rig was designed for microwave-IF use, so I didn't worry about the leakage.

I'm very glad to see all the interest that the November article and especially the February 1996 Technical Correspondence item have generated.[2] —*Rick Campbell, KK7B, 4105 NW Carlton Ct, Portland, OR 97229; e-mail* **rlcambe@mtu.edu**

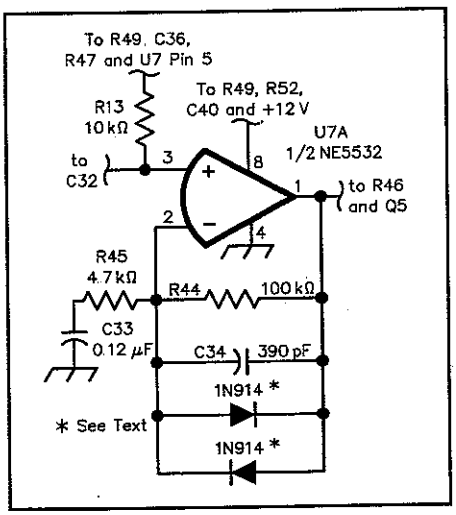

Figure 1—A partial schematic of KK7B's CW transceiver, with KQ6FR's modification to reduce audio key clicks

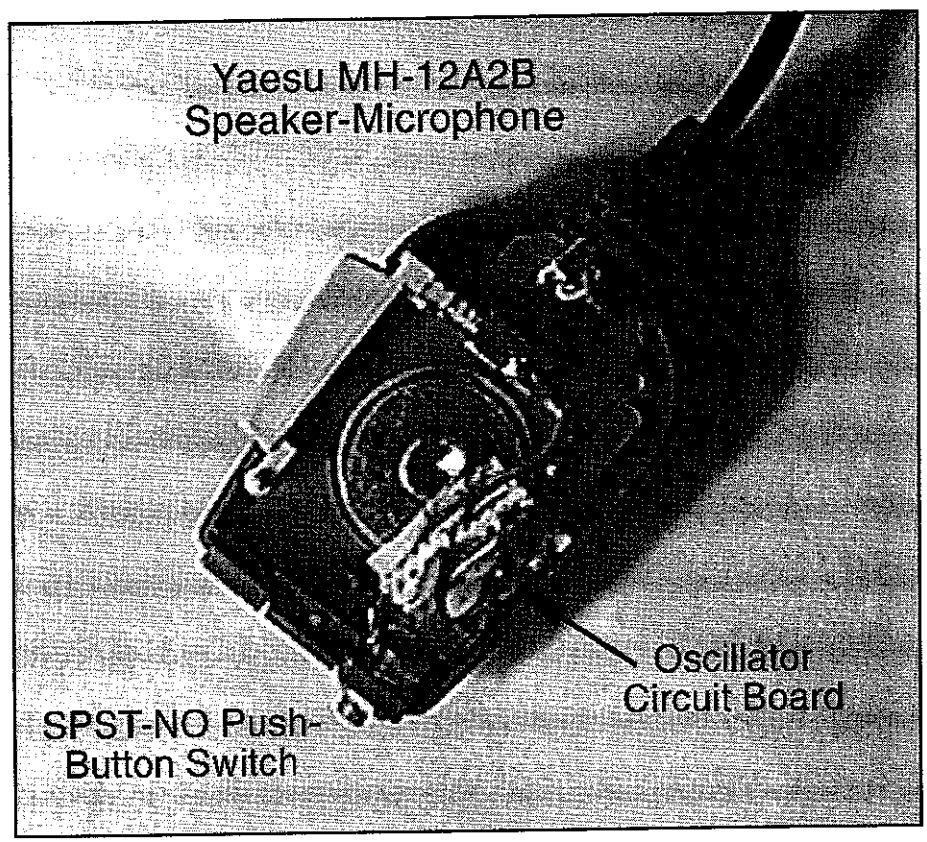

Figure 2—Photo of the interior of a Yaesu MH-12A2B speaker-microphone with added oscillator circuit board and push-button switch

[1]ARRL Publications are available from your local ARRL dealer or directly from ARRL. Mail orders to Pub Sales Dept, ARRL, 225 Main St, Newington, CT 06111-1494. You can call us toll-free at tel 888-277-5289; fax your order to 860-594-0303; or send e-mail to **pubsales@arrl.org**. Check out the full ARRL publications line on the World Wide Web at **http://www.arrl.org/catalog**.

[2]Rick Campbell, KK7B, "Direct-Conversion Receiver Noise Figure," *QST*, Feb 1996, pp 82-84

After KK7B's comments arrived at ARRL Headquarters, KQ6FR informed me that he solved the leakage problem by installing an external Oak Hills Research SCF-1A filter.—*Ed*

SPEAKER-MIKE MODIFICATIONS TO GENERATE A 1750-HZ TONE BURST FOR EUROPEAN REPEATER OPERATION

◊ Several years ago, I had the good fortune to travel to England on business and obtained a reciprocal license. Since European repeaters require a 1750-Hz tone burst to bring them up—and my whistling is not all that accomplished—I decided to install an oscillator in my Yaesu FT-470 dual-band H-T. A brief sojourn into the innards of the FT-470 convinced me that there was no way I could put anything inside the case. Also, I felt that drilling holes in the case and generally hacking around wouldn't do much for the radio's resale value.

Next, I turned to the Yaesu MH-12A2B

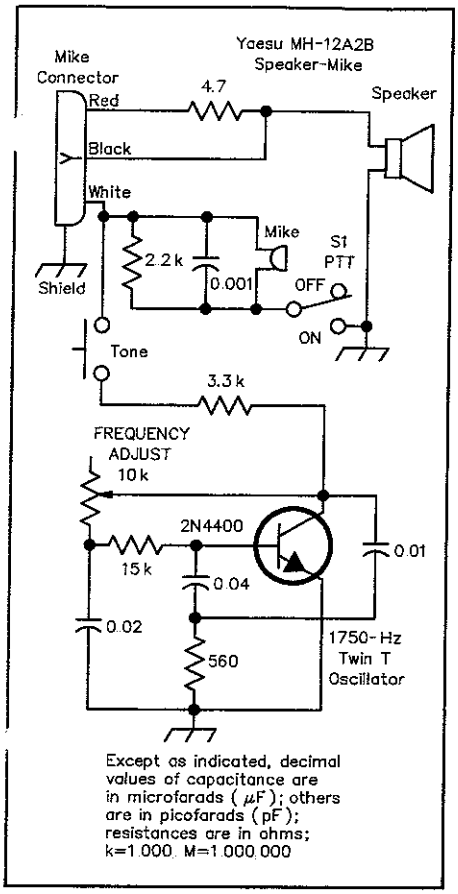

Figure 3—Schematic of the speaker mike and 1750-Hz oscillator circuits. [Use mica or metallized polystyrene capacitors for best frequency stability.—*Ed.*]

speaker-mike (Figure 2) that I use most of the time. I discovered adequate (if not ample) room to install a small oscillator. I originally intended to power the oscillator by means of a small lithium cell and inject the 1750-Hz signal through a capacitor to the microphone lead. Further investigation showed that well-regulated voltage for the microphone is always present across the l s

The audio oscillator is a Twin-T circuit from *The ARRL Handbook* (page 26.19; see Note 1). The oscillator is connected across the microphone and activated by a push-button switch in the output/power lead. (See Figure 3.) This provides an elegant means of directly injecting the 1750-Hz tone into the microphone lead while keying the transmitter at the same time. There's no need to press the PTT button when sending the tone.

The circuit is constructed on a small piece of perfboard and held in place by a piece of double-sided foam tape (Figure 2). I drilled a hole in the top of the microphone case to hold the normally open SPST push button. In retrospect, there is adequate room on the speaker-mike's PC board to mount all of the oscillator components.

To adjust the oscillator frequency, connect a high-impedance (greater than 1 MΩ) input of a frequency counter across the circuit and set **FREQUENCY ADJUST** for an output frequency of 1750 Hz. [It's a good idea to check deviation too.—*Ed.*] Better yet, monitor the oscillator's frequency with a frequency counter connected across the output of a receiver tuned to the H-T's transmit frequency. This provides zero loading to the oscillator during adjustment, but requires another receiver.

Most recent H-Ts handle the PTT function in the same manner as the FT-470, *ie*, the microphone load signals the PTT condition. As a result, I expect this approach—adding an oscillator to the speaker-mike—would work well with any modern H-T.

In operation, press and release the tone button first to open the repeater; then press the PTT button and initiate contact in the usual manner. If the PTT and tone buttons are both pressed at the same time, the resistance of the microphone circuit will load the oscillator and change its frequency. So keep your fingers off the PTT while sending the tone! This circuit has worked flawlessly on each of my excursions across the "pond," and I have had many enjoyable repeater QSOs as GØN3HAL.—*Dale H. Chidester N3HAL, 17 Rockwood Rd, Levittown, PA 19056; e-mail* **chidesterd@pt.cyanamid.com**

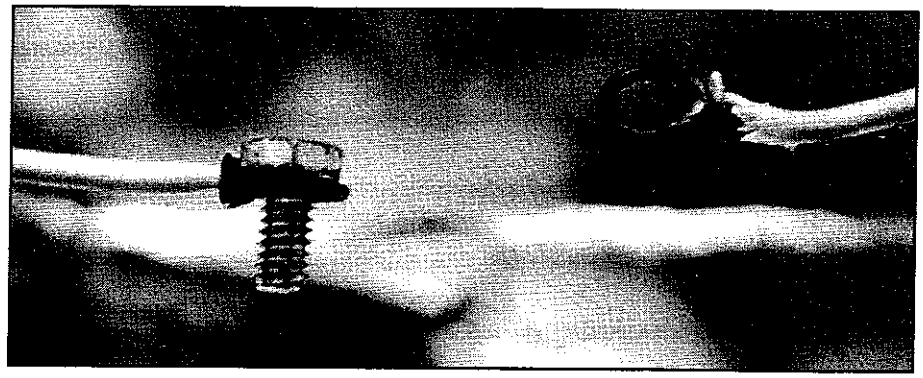

Figure 4—N5CPE uses loops at the wire ends to make secure antenna connections. This one is partially assembled.

EYE TO EYE ANTENNA CONNECTIONS

◊ I don't use clip leads to change bands or antenna configurations. They are prone to rust and do not grip well enough to bear the weight of the antenna. Instead, I use the antenna wires and a stainless-steel nut and bolt. First, strip just enough of each wire end (I use #14 AWG solid wire for my 75/160-meter dipole) to form a sturdy $^1/_2$-inch-diameter loop, without soldering. (See Figure 4.) Place a $^7/_{16}$ by $^1/_2$-inch-long stainless steel bolt through the loops and secure the connection with a nut. This allows me to raise the antenna without fear of failure. If you make a loop too large, use a 1-inch-long bolt with stainless-steel or bronze washers and snug the connection down tight.—*J. B. Guillaume, N5CPE, PO Box 567, Rougon, LA 70773-0567*

Don't despair if you use stranded wire! Get some fender washers (they're washers that are about six times their hole diameter) from your local auto-supply store and use them as end loops. Drill a hole near the edge of each washer and securely attach the stranded wire to the washer at the new hole. Simply bolt the washers together to make the connection.—*Ed.*

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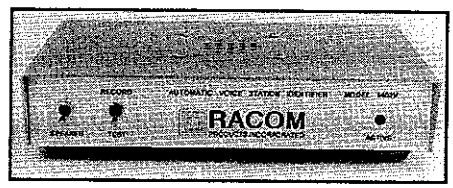
New Products

AUTO VOICE IDer FROM RACOM



◊ Racom's new Model 1402V automatic voice station identifier provides voice IDs for repeaters and base stations. Voice information can be recorded in the field with a microphone and is stored in nonvolatile memory (unaffected by power outages, etc). All operating parameters are set with switches. Features: three timers; three system monitors; 600-Ω output; and a built-in speaker, test switch and status LED.

For more information, contact Racom at 5504 State Road, Cleveland, OH 44134; tel 216-351-1755, fax 216-351-0392. QST