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QST Issue: Feb 1995
Title: An IC Amplifier for the ARRL Handbook RX Noise Bridge
Author: Mark Shelhamer, WA3YNO

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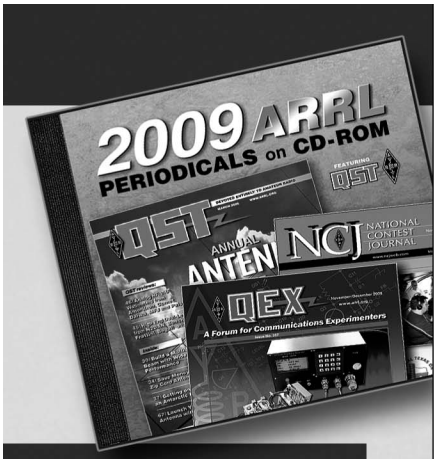

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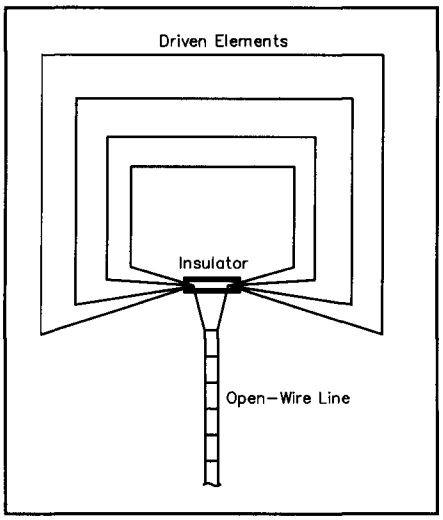

Figure 2—Curtis, NT5E, simplified his quad feed by connecting its elements' feed points together and feeding all three simultaneously with open-wire line.

yielded results better than those claimed by the antenna manufacturer. NT5E went on the air with a new antenna, and the performance proved well worth the work. Using the tuner, I was able to operate anywhere in the bands with a 1:1 SWR. The only drawback was that I still needed antennas for 7, 10 and 24 MHz—or did I?

A quick check proved that the system would load up at 10 and 24 MHz. More careful adjustments were required for tuning up at 7 MHz. We roughly measured its radiation pattern as similar to that of a half-wave loop. My antenna had grown—at least in terms of frequency coverage! Further rough measurements at 7 MHz showed that there was a slight front-to-back ratio, possibly because of the reflectors present for 14, 18, 21 and 28 MHz.

The choice of using open-wire line lowered the system's cost, allowed me to operate anywhere in the antennas's intended bands, and gave me the unexpected flexibility of operation on three additional bands. I encourage others to use this simple method of feeding their quads or other balanced antennas.—*Curtis Robb, NT5E, Boerne, Texas*

STALKING THE ELUSIVE TOUCH-CONTROLLED LAMP

◊ In addition to the usual power-line noise problems, I had been bothered by a very unusual noise on 40 meters. It was a 60-Hz noise, very intense, and had a bandwidth of about 30 kHz. In this 30-kHz segment, which varied about 50 kHz from day to day, but seemed to focus on the CW band, I noticed some variation in amplitude, with a maximum on the high-frequency end. I found that the whole pattern repeated itself at 213-kHz intervals, and was detectable over a range of about 1.5 to 17 MHz. I was able to peak it up in a particular direction with the antenna, and began to search halfheartedly for it.

Driving in the car with an HF receiver was unproductive. I walked the area many, many times with a portable shortwave receiver, but was never able to hear the noise. After several years, I had all but given up. One day, I walked the neighborhood again, and found that when I approached a particular utility pole a block away, within 2 or 3 feet, I began to hear the noise. When I placed the receiver antenna adjacent to a telephone cable bundle running down the pole into an underground service, I thought the receiver would jump out of my hands. The power service was also hot with noise, but with less intensity. No other poles in the area had any similar noise except one across the street from the one described; I assumed this to have a more passive role. At last I was getting closer!

The most frustrating part of all was getting through the red tape in the telephone company. It took days and days of phone calls and references to supervisors of supervisors to finally be put in touch with an engineer who deals only with interference problems. I didn't realize the phone company had such people! He was very understanding and agreed to meet me at the pole.

Since the phone company runs coming down the pole went into junction boxes above the underground segments, I was able to get them to disconnect the services, one at a time, while I monitored the noise on the pole. When one service was disconnected, the noise disappeared! Finally we had narrowed it to the house of origin! The phone man scratched his head and bid me adieu.

I was unable to detect the noise between the pole and the house, since it was an underground run. Once inside the house, the noise was everywhere. Within minutes, I had focused on the kitchen. However, the intensity was greater on the kitchen stove than on any of the telephone cords! I noticed that when I touched the hood of the stove, the noise varied somewhat in my receiver. The owner of the house, who was very cooperative (fortunately), explained that the hood light was activated by touch! Bingo! He also mentioned that he occasionally got a shock from the hood. When he unplugged the cord from the stove going to the light, the noise disappeared. It had been going on over six years—since he had built the house and installed this stove!

I had inquired about these touch switches as possible sources years ago, but nobody seemed to know much about them. The power company was of no help. I hope this experience will benefit another ham!—*Jim McCook, W6YA, Leucadia, California*

AN IC AMPLIFIER FOR THE *ARRL HANDBOOK* RX NOISE BRIDGE

◊ Figure 3 shows a simplified version of the RX noise bridge that appears in recent editions of the *ARRL Handbook*. An LM703, ECG703 or NTE703 RF amplifier IC replaces the original version's two-transistor amplifier in the original version. The Zener diode serves as a wideband noise source. The amplifier's noise output is such that pulsing is not necessary to identify it in most cases, so I omitted the original circuit's 555 timer IC oscillator. A 9-V battery supplies the circuit's power.

I constructed the circuit on a small piece of scrap PC board, attaching the board directly to the input connector (BNC) center pin for support. C1 came from my junk box, as did R1. (R1 must be isolated from the case; I did this by using fiber shoulder washers in its mounting hole.) The case is a small aluminum box.—*Mark Shelhamer, WA3YNO, Baltimore, Maryland*

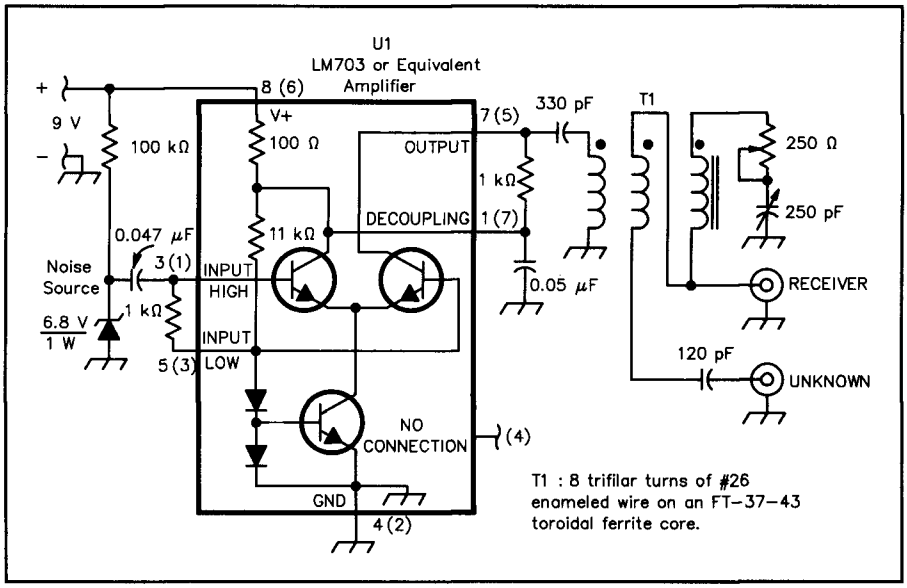

Figure 3—Mark, WA3YNO, simplifies the *ARRL Handbook* noise bridge (pages 26.33-26.36 in the 1995 edition) by replacing its two-transistor amplifier with a one-IC circuit. (The circuit comes from an LM703 application note, and its component values are not critical.) Because the LM703 is obsolete, this *QST* rendition of Mark's circuit shows two sets of pin numbers. Those outside parentheses apply to the metal-can LM703 and its NTE/ECG replacement; those inside the parens are for National Semiconductor's mini-DIP LM703N. Discrete parts, or a hybrid based on discrete parts and a differential amplifier chip (say, a CA3028A), could replace the LM703. Discrete silicon diodes (1N914 or 1N4148) would do for those inboard diodes.