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QST Issue: Feb 1992
Title: Black Conductive Component-Protection Foam Damages Parts
Author: Mike Mitchell, W8RJ

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Hints and Kinks

Conducted By David Newkirk, WJ1Z
Senior Assistant Technical Editor

TRY AN EXTENDED DOUBLE ZEPP ANTENNA

☐ Although the extended double Zepp (EDZ) antenna (Fig 1) has been in just every antenna handbook since the year one, hams seldom use it. Its overall length is 1.28 wavelengths (1.28 λ), and it's bidirectional broadside. Fed with open-wire line and a balanced antenna tuner, an EDZ also makes a fine multiband antenna. Let's look at an extended double Zepp for 17 meters. We can calculate the overall length of its two wire elements with the formula

$$\frac{984}{f\ (MHz)} \times 1.28 = \text{length in feet (Eq 1)}$$

Using this formula, an 18.15-MHz EDZ works out to be 69.4 feet long. At this frequency, the EDZ exhibits 3 dBd gain [*AB* page 8-34][1] in a figure-8 pattern with two major and four minor lobes. It still performs usefully when operated on several bands lower in frequency than 17, however: At 20 meters, a 17-meter EDZ acts as two slightly long half waves in phase, exhibiting between 1.6 and 2 dBd gain [*AB* page 8-32]. At 40 meters, it's a slightly long ½-λ dipole [*AB* page 2-16, 2-17, 3-11 and 3-12]. All of these modes are directional broadside if the EDZ is positioned at least ½ λ high at 40 meters [*AB* pages 3-8 and 3-9]. At 15 meters, it exhibits a four-leaved-clover pattern, with minor lobes broadside; *at 10 and 12 meters, it's close to two full* waves in phase and produces a pattern similar to that at 15 meters. It can even be used as a short 75-meter dipole—not bad for a 70-foot piece of wire!

Scaled for 28.7 MHz—43 feet, 10 inches long—the extended double Zepp gives a 3-dBd-gain, figure-8 pattern at 10 meters and a similar pattern with a bit less gain at 12 meters. It acts as two halfwaves in phase at 15 meters, with about 1.6 dBd gain and a figure-8 pattern. At 17 and 20 meters, it's somewhat long for a half-wave dipole; a tuner can make it work at 40. On all of these bands, assuming that it's at least ½ λ high at its lowest band of operation, the 10-meter EDZ is directional broadside.

There's nothing magic about the extended double Zepp. It's a tried-and-true dipole that offers useful gain at its design frequency and good multiband performance.—*Bob Baird, W7CSD, North Bend, Oregon*

[1]This and the other *AB* references in this item refer to pages in G. Hall, ed, *The ARRL Antenna Book*, 16th ed (Newington: ARRL, 1991), available as #2065 from The ARRL Bookshelf.

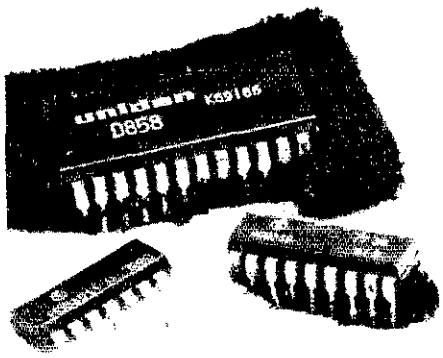

Fig 2—Mike Mitchell discovered that eight years of storage in conductive foam ruined these ICs; their pins are corroded almost clear through and break off easily. *(NTØZ photo)*

BLACK CONDUCTIVE COMPONENT-PROTECTION FOAM DAMAGES PARTS

☐ Saving a supply of static-sensitive active devices in black conductive foam? I've discovered the hard way that this "protection" has a time limit of less than eight years! Some ICs I know I've stored for eight years have been completely ruined by the foam's corrosive action (Fig 2).—*Mike Mitchell, W8RJ, Toledo, Ohio*

USE YOUR EXISTING CAR SOUND SYSTEM FOR BETTER MOBILE/HAND-HELD AUDIO

☐ How many times have you heard or said on the local repeater, "Say again—I'm in a noisy area"? There's only one answer: *too* many! Fixes for this problem usually employ outboard audio amplifiers and external speakers that require 12-V connections and lots of cabling.

I amplify my radio through my car's existing cassette player and sound system via a CD-player-to-cassette adapter. This device consists of an audio coupler in a cassette shell that plugs into a portable CD player via a cable and 1/8-inch stereo plug. (I use the CD adapter that came with my CD player. Radio Shack sells a similar product [*CD Player-to-Cassette Adapter*, 12-1951, page 56 of the 1992 RS catalog].) For ham radio use, I convert the adapter to monaural operation, which allows my car sound system's balance and fader controls to route the radio audio to just one speaker or all four. You can do this conversion three ways.

The first and easiest way is to buy a 1/8-inch stereo-to-mono adapter (RS 274-368). The second method involves removing some of the plastic between the

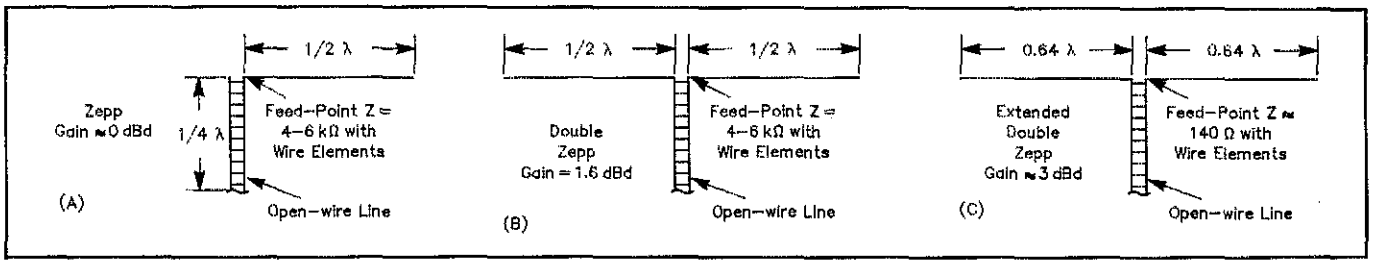

Fig 1—Evolution of the extended double Zepp antenna. At A, the classic Zepp—a ½-λ wire end-fed via an open-wire feeder operated with one of its two wires unterminated. (Antenna lore tells us that this feed method received its name from its use in zeppelin radio installations.) Commonly, Zepp systems use a feeder length of ¼ λ (or an odd multiple thereof) to transform the antenna's high feed-point impedance to a low impedance at the feeder terminals. Assuming efficient feed, this system exhibits 0 dBd gain—that is, *no gain* relative to a half-wave dipole cut for the same frequency and erected in the same position.

B shows a double Zepp, also known as *two half waves in phase* or (incorrectly) a center-fed Zepp. This is a form of *collinear* antenna because each ½-λ wire acts as an element, and because both elements lie along one line. It's also a *dipole*—a *full-wave* dipole that *exhibits about 1.6 dB gain relative to a half-wave dipole in the same position. As with the Zepp, feeders cut to an odd multiple of* ¼ λ make for least-hassle feed with the double Zepp, but a good balanced antenna tuner should be able to handle whatever impedance appears at the feed-line input terminals.

A double Zepp becomes a *extended* double Zepp when you make its wires 0.64 λ long instead of 0.5 λ. Its gain increases, too—to about 3 dB relative to a half-wave dipole in the same position and cut for the same frequency.

The rough feed-point impedances shown here are for wire elements (fatter elements, such as those made of aluminum tubing, will lower these values somewhat) and convey only the resistive portion of the antennas' impedance. For more on the extended double Zepp antenna, see *The ARRL Antenna Book* and J. Reh, "An Extended Double Zepp Antenna for 17 Meters," *QST*, December 1987, pp 25-27.