

ANTENNAS AND SIGNAL IMPROVING ACCESSORIES

Band and Bandwidth Antenna Improvisations

In general, low-band antennas for ham and SWB operation have limited bandwidths. For example, in ham application, a tuner is often needed to obtain entire-band matching on 80 and 160 meters, and, sometimes, on 40 meters, too. A tuner is an added expense and must become a part of the tune-up procedure for the transmitter. An antenna cut as a dipole on one band performs poorly on two adjacent bands because they ham or tropical SWB bands. A tuner can help in matching an antenna but does little in improving the performance of a miscut antenna itself.

There are ways of using jumpers and add-ons to devise more benefits from a given antenna with good results. In this column, we will use the W9INN-40-80-160M broadbender, Fig. 1, as an example. This antenna was detailed in the column of the previous issue. The same ideas covered this month can also be used with other low-band ham, SWB and MW/LW antennas.

Operation At Both Ends Of A Ham Band

In the first example, a jumper of proper length will be added to the 40M wire of the

W9INN antenna which will permit low SWR, no-tuner operation on the CW portion of the 40M band. If you recall, our W9INN antenna was cut for sideband operation with a mid-frequency of 7.22 MHz. In the modification, the first step is to place an insulator, Fig. 2, into the 40M wire about 9' up from the feed point. A jumper directly across the insulator permits sideband operation in accordance with a frequency centered about 7.225 MHz.

The 40M wire is made resonant at the CW end of the band by removing the jumpers and substituting a 20" stiff wire loop across the insulator, Fig. 3. An antenna bridge can be used to advantage in cutting this loop for resonance on a specific CW center frequency. The set up is ideal for the SSB operator who, on occasion, likes to do a bit of CW DX'ing. Similar ideas can be used to do some occasional DX'ing on the 80M and 160M CW bands. On 80 meters, a straight 1'10" length of stiff wire is clipped to the 80/160 wire at the resonator, Fig. 4, for CW operation. Use a stepladder or lower the antenna wire a bit by releasing the rope that pulls up on the antenna at the end stake.

Keep the loop and the add-on you make.

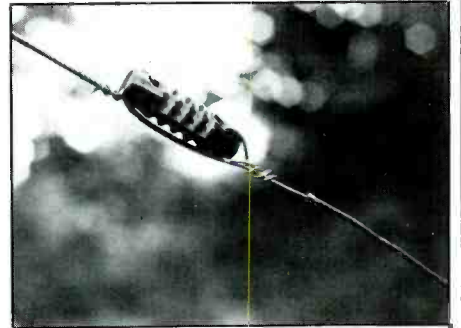


Fig. 2. Insertion of insulator in 40M wire.

Anytime you want to do some CW operation you will have the items that will permit you to operate on the ends of the bands with a low SWR and no tuner.

In the installation, a permanent set up was made for 160M operation. First, the wire end was cut back and resonated to 1950 kHz at the high-frequency end of the 160M band. An appropriate jumper and clip was prepared, along with an experimental length of wire, and attached to the end insulator, Fig. 5A. The opposite end of the wire was attached to a second insulator,

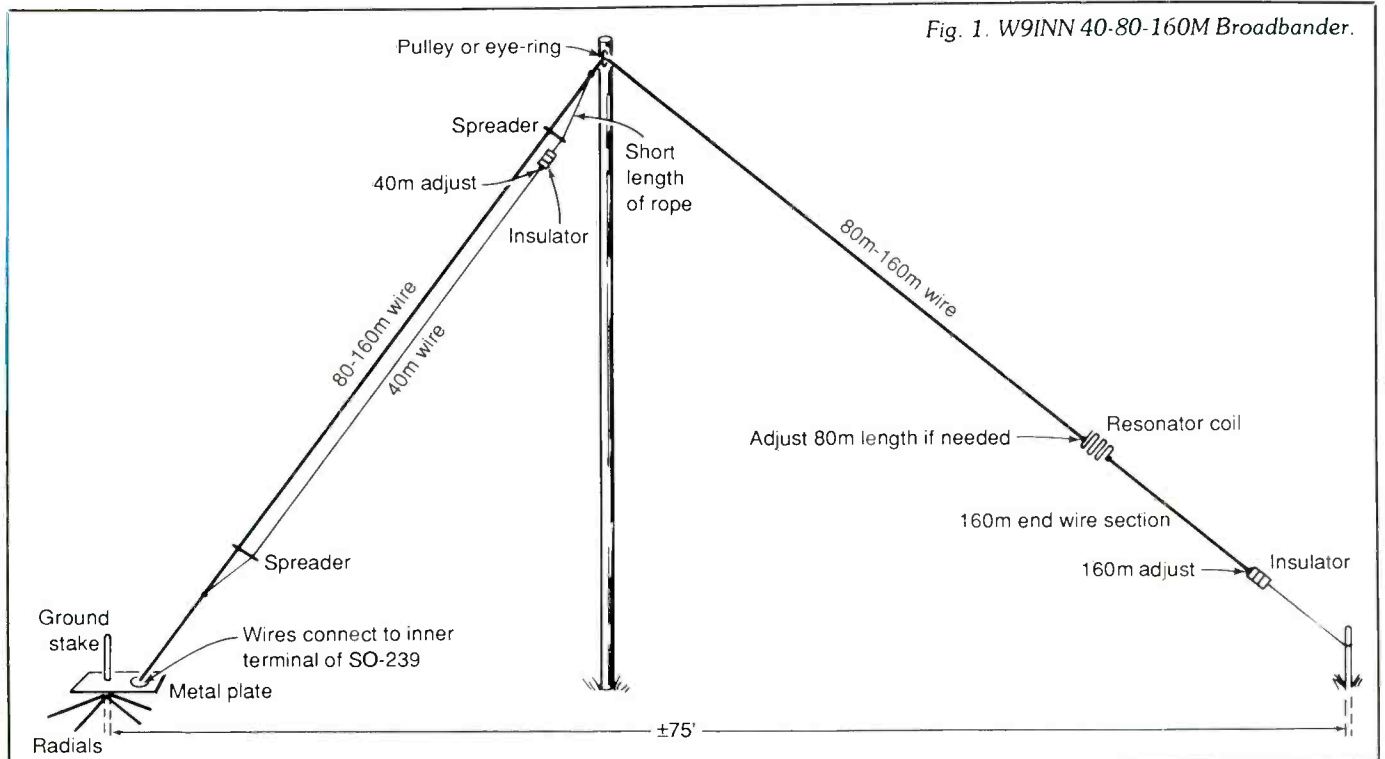


Fig. 1. W9INN 40-80-160M Broadbender.

**THE TOP RATED
ALPHA DELTA MODEL DX-SWL
SHORTWAVE SLOPER ANTENNA**

Some Notes On Its Development

- Experience gained over the years in producing high power transmitting antennas led to the introduction of the DX-SWL—the first commercially available world band sloper combining AM broadcast, tropical bands and 60 thru 13 meters.

What does transmitting experience have to do with shortwave reception? Plenty! If a transmit antenna is not designed to precise parameters, it will not pass the RF "smoke test"—there will be burned connections, shorted components, high standing waves and generally lousy performance. On the other hand, a receive-only antenna of shoddy design can go unnoticed—except by your receiver and the weak DX signal you're trying to receive. DX-SWL antennas are used daily in 2 kw transmit service, as well as for world class reception.

- We recognized early on that a **Sloper** can outperform a dipole at the same height, for many incoming wave angles. The **Sloper** really shines on weak, low angle DX signals. A **Sloper** also requires only a single, elevated support—it's easier to install than a dipole.

- The model DX-SWL is designed with specially coated 12 ga. solid copper wire elements which are 25% greater in diameter than the more commonly used 14 ga. wire. Engineers know that a larger diameter yields less resistance, and thus less loss per unit length. Even though 14 ga. wire is cheaper, it is not acceptable for use in any Alpha Delta antenna.

- Because DX-SWL antennas are used worldwide in less than ideal environments, only high quality stainless steel hardware is used. Even though it is more costly than plated hardware used in other cheaper brands, we know that you want to put an antenna up once, and forget it. Climbing great heights to replace rusted connections is no fun. Due to the direct sun, high heat environment of some DX-SWL installation sites, we use only specially selected white coil form material. Black forms used by other brands are not acceptable due to heat absorption and possible coil distortion.

- Before you buy any shortwave antenna, check out the design details and transmit capabilities thoroughly—even if you're not going to transmit. We don't want your investment to go up in smoke!

Model DX-SWL Sloper Antenna is available for **\$69.95** at your **Alpha Delta Dealer**. For direct orders send \$69.95 plus \$4.00 shipping (USA only). Call for export order prices.

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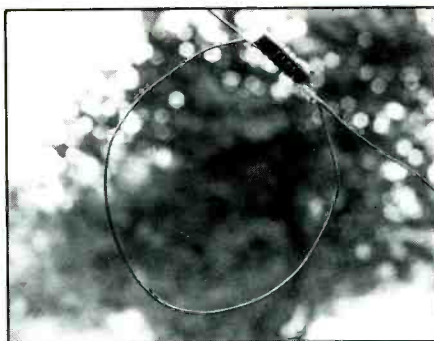


Fig. 3. CW loop across insulator

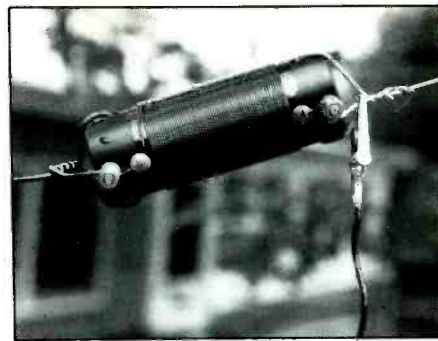


Fig. 4. Clip-on wire for tuning 80M wire to CW portion of band.

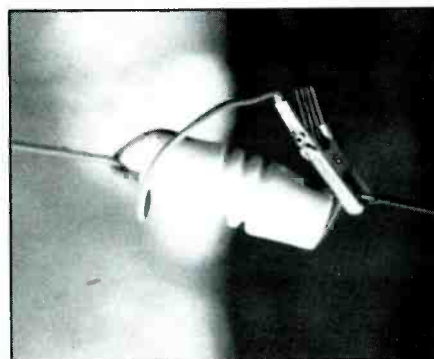


Fig. 5A. Use of jumper to lower resonant frequency on 160.

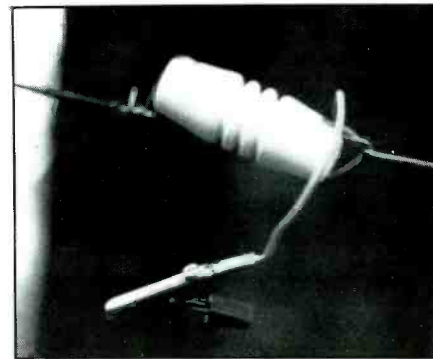


Fig. 5B.

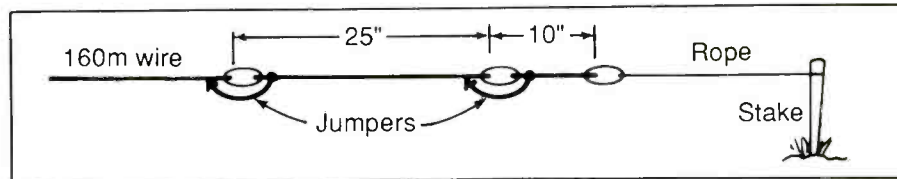


Fig. 6. Jumpers for selection of three portions of the 160M band.

Fig. 6. A length was chosen experimentally to resonate the antenna to 1845 kHz with the jumper closed, Fig. 5B. Finally, a third insulator was attached in the same way to permit low-SWR CW operation at the very low frequency end of the 160M band. An antenna bridge such as the MFJ-204B is a big assist in cutting the wire for a particular band segment.

**Adding 20M To
The W9INN Antenna**

The addition of a 20M wire permits operation on this DX band and sets up a good performing 15, 20, 40, 80 and 160M antenna system. With wires resonated on the appropriate sideband frequencies you can change bands by only retuning your receiver. You will have a low SWR on each of the bands and each antenna will be tuned for resonance.

The 20M antenna operates as a 3/4 wavelength element against ground and has a physical length of 51'7". Our exact resonant frequency was 14.225 MHz. The 20 meter addition was mounted on a second plastic pipe the same height as the first one, Fig. 7, and was spaced approximately

7' from the first mast. The presence of the 20M wire had no influence on the W9INN 80-160M wire. The resonant frequency of the 40M wire was shifted slightly an unimportant amount.

**Shortwave
Broadcast Results**

The basic W9INN antenna performs well as a receiving antenna on the 13, 41 and 75M SWB bands because each is on, or near, to the resonant 80, 40 and 15M ham bands. Results are good on the 120M band as well when the 80/160M wire is resonated near the high frequency end of the 160M band. Also, 80/160M wire has odd-order harmonics that produce resonance and fine performance on the 19M and 31M SWB bands. The presence of the 20M wire also helps to frequency spread the SWB reception capability of the antenna.

It is possible to peak the 49 or 60M pick up, if you wish to do so, by temporarily adding either an 8'4" or 12'3" length, respectively, across the 40M wire at the newly installed insulator for adding CW capability on 40M, Fig. 3. By adding one of the two wires you can set up a quarter wavelength wire on

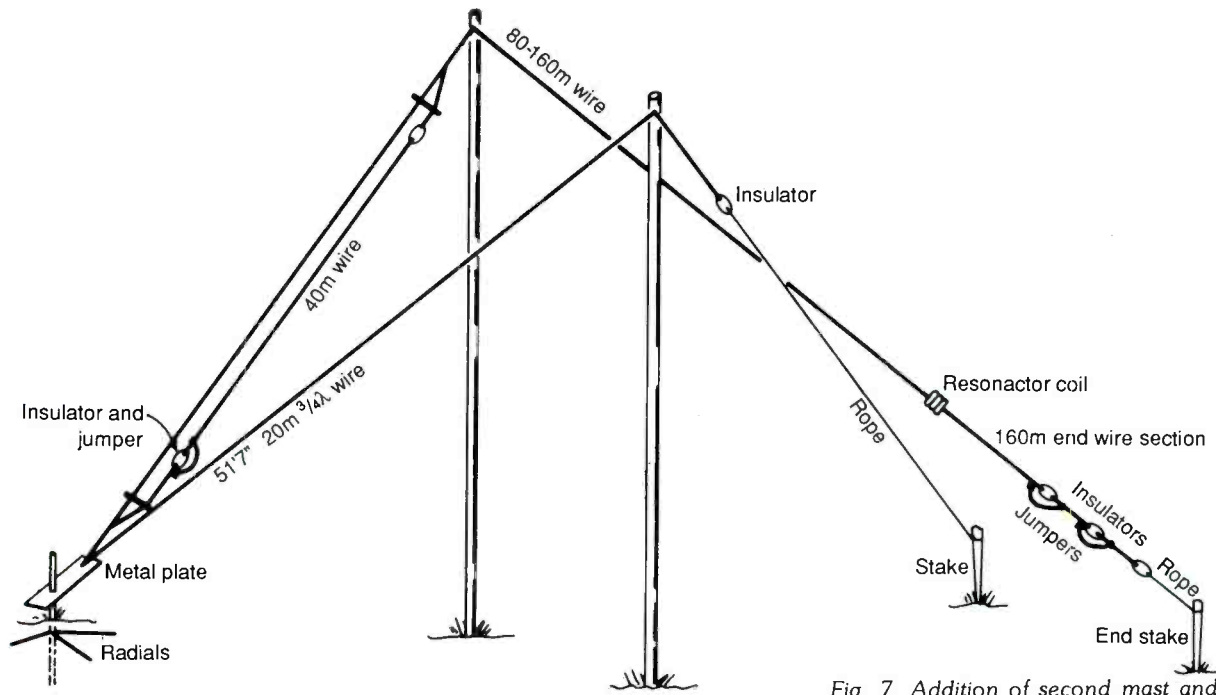


Fig. 7. Addition of second mast and $\frac{3}{4}\lambda$ 20M wire plus other changes.

either the 49M or 60M SWB bands. You can use two short wooden stakes to set up a small triangular support for the wires as they come away from the insulator ends. Don't let the wires curl or lay on the ground.

end support stake, Fig. 7. When all the clips associated with the end antenna are closed, the antenna resonates well up into the broadcast band. You have a resonant antenna on the AM broadcast band which is

good in picking up the weaker broadcast signals for identification.

The total length occupied by this modified antenna from feed point to end stake is 116'. It's really an all-bander. **PC**

Broadcast Band (BCB) Reception

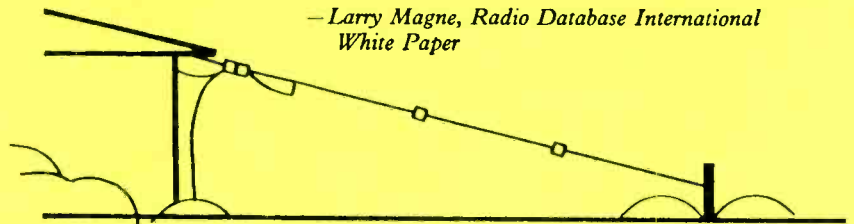
If you are a BCB enthusiast you can easily add broadcast band capability to the antenna. As you know, more people now share an active interest in all-band radio reception, and ham radio, than ever before. It is a good thing. The AM broadcast band addition to the installation is a wire that connects to the very end insulator of the 80/160M wire with a jumper, Fig. 8. What you see is the last insulator of the three associated with the 160M band operation, Fig. 6. A jumper clip is associated with a length of #16 plastic covered hook-up wire. This wire is wrapped tightly around the rope that extends between the last insulator and the support stake, Fig. 8. A 25' length of wire is wrapped tightly around the rope attaches to the



Fig. 8. Adding BCB capability to the 160-80-40 broadbender.

"The Best Results throughout the Shortwave Spectrum."

—Larry Magne, Radio Database International White Paper



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- Overall length just 60 feet. Requires only a single elevated support—easier to install than a dipole
- 50 ohm feedpoint at apex of antenna for maximum DX reception. A UHF connector is provided on the mounting bracket for easy connection to your coax.
- A top overall rating in Radio Database International's hard-hitting White Paper, "RDI Evaluates the Popular Outdoor Antennas."

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There's alot happening on the shortwave broadcast bands. Don't miss a thing by skimping on your antenna. Get world class, multi-band DX reception with the Alpha Delta model DX-SWL Sloper. Just \$69.95 plus shipping from your local Alpha Delta dealer.