ARRL Periodicals Archive – Search Results

A membership benefit of ARRL and the ARRL Technical Information Service

ARRL Members: You may print a copy for personal use. Any other use of the information requires permission (see Copyright/Reprint Notice below).

Need a higher quality reprint or scan? Some of the scans contained within the periodical archive were produced with older imaging technology. If you require a higher quality reprint or scan, please contact the ARRL Technical Information Service for assistance. Photocopies are $3 for ARRL members, $5 for nonmembers. For members, TIS can send the photocopies immediately and include an invoice. Nonmembers must prepay. Details are available at www.arrl.org/tis or email photocopy@arrl.org.

QST on CD-ROM: Annual CD-ROMs are available for recent publication years. For details and ordering information, visit www.arrl.org/qst.

Non-Members: Get access to the ARRL Periodicals Archive when you join ARRL today at www.arrl.org/join. For a complete list of membership benefits, visit www.arrl.org/benefits.

Copyright/Reprint Notice

QST Issue: Oct 2011
Title: The Folded Skeleton Sleeve on Other Ham Bands
Author: Joel Hallas, W1ZR

Click Here to Report a Problem with this File

The Folded Skeleton Sleeve on Other Ham Bands

Joel R. Hallas, W1ZR

My recent article on the folded skeleton sleeve antenna generated a lot of interest.[1] Many wondered about using the design on other bands. I modified my *EZNEC* model and prepared designs for the bands requested, as well as some that I thought might be of interest to those who haven't yet requested them. The resulting dimensions are shown in Table 1. As shown in Figure 1(A), A is the overall width of the antenna while B is the length of the higher frequency parasitically coupled dipole. C is the gap size.

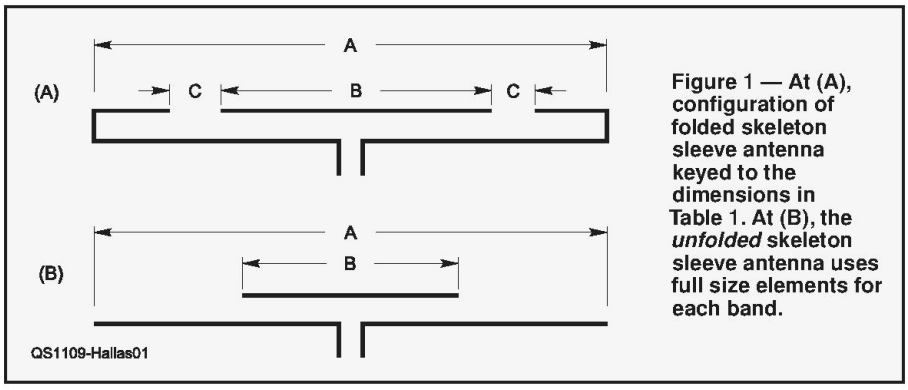

Figure 1 — At (A), configuration of folded skeleton sleeve antenna keyed to the dimensions in Table 1. At (B), the *unfolded* skeleton sleeve antenna uses full size elements for each band.

Builder Beware

Note that, unlike the design in the May article, I have not actually constructed these versions, so it is likely that some tweaking will be required. I would expect that they will be quite close, however. Also, as with wire dipoles, a single antenna will not cover all of 80 meters. I thus have one oriented toward the voice segment of the bands (75/40) and one lower in frequency (80/40).

As noted in my earlier article, this design should be adaptable to any of the various parallel window lines. The line I used was marked "JSC WIRE & CABLE #1317 18 AWG 19 STRAND MADE IN USA."[2] The conductors were stranded copper plated steel — a good choice for both flexibility and strength. If a different type of cable is selected, I would expect that differences in wire dimensions and dielectric properties would necessitate some changes in the lengths shown in order to achieve resonance on each band.

Give Credit Where It's Due

Since writing the original article, I have found that the concept of coupling to a single conductor, rather than the two or more of the traditional skeleton sleeve, was first described by Gary Breed, K9AY (of receiving loop fame) in an old *ARRL Antenna Compendium*.[3] He called it a "coupled resonator antenna." It could also be called a "half skeleton sleeve." The skeleton sleeve has been around for many years and has a parasitic element for the higher frequency on each side of the lower frequency directly fed element. In most cases, there is no particular benefit to two coupled resonators, although they more closely resemble the original surrounding sleeve.

The Plot Unfolds

The folding in of the ends of the original was done in order to make a coax fed antenna more compact than full size, suitable for small lots or for travel use. There is little reason not to do so. If size is not an issue, however, both dipoles can instead be made about full size. This configuration is shown in Figure 1(B) along with some examples in Table 1.

The unfolded version will have a slight edge on both bandwidth and gain on the lower band. In addition, the 40/20 unfolded version can work as well as any full size 40 meter dipole on 15 meters, potentially making it a three band arrangement (the 40/20 folded version doesn't come close). As many have found, a 40 meter dipole doesn't really work well on both 40 and 15, but it can be pressed into service. Usually the best results will be had if it is pruned for minimum SWR on 15 meters (typically 2.5 to 3:1) and tuned with an antenna tuner to work on both bands. If you don't use a tuner, pick your two favorite bands and enjoy.

With the exception of the 40/20 meter version, I assumed that the window line would be used for both dipoles in the unfolded version with the unused wire carefully cut away. For the 40/20 meter unfolded version, I actually built one using bare wire for the low frequency dipole section beyond the coupled resonator with the dimensions shown. For long term use, I think the elimination of the solder joint in mid span will aid longevity, and suggest making it all out of window line. That one I haven't built.

If you build one or more and get them trimmed to frequency, please send me "as-built" measurements details. I will compile them onto a page on the QST-in-Depth website.[4]

Table 1

Folded Skeleton Sleeve Antenna Dimensions (Figure 1A)

Bands (Meters)	*A (Feet)*	*B (Feet)*	*C (Inches)*
80/40	111.4	61.5	12.0
80/10	96.0	15.4	9.6
75/60	110.6	81.4	3.6
75/40	107.0	60.8	7.2
74/41 (MARS)*	100.2	59.8	7.2
40/30	58.0	43.0	6.0
40/20	56.3	30.8	4.0
30/20	42.0	30.7	7.8
30/17	40.8	24.1	5.5
20/17	30.6	24.0	4.2
20/15	29.6	20.5	9.1
20/10	27.6	15.4	3.6
17/15	24.3	20.5	9.0
17/12	23.6	17.4	9.6
15/10	10.0	7.7	4.2
10/6	14.4	8.3	5.6

Unfolded Skeleton Sleeve Antenna Dimensions (Figure 1B)

Bands (Meters)	*A (Feet)*	*B (Feet)*
40/20	64.0**	30.8
20/17	32.0	24.0
15/10	10.65	7.65

*Military affiliated radio system
**64 feet for uninsulated 40 meter extension, 63.4 if windowline used for full length.

Notes

[1]J. Hallas, W1ZR, "Getting on the Air — A Folded Skeleton Sleeve Dipole for 40 and 20 Meters," *QST*, May 2011, pp 58-60.

[2]Mine came from Davis RF. Their part number is LL450-553. See **www.davisrf.com/ladder.php**.

[3]G. Breed, K9AY, "The Coupled-Resonator Principle: A Flexible Method for Multiband Antennas," *The ARRL Antenna Compendium*, Vol 5, pp 109-112. Available from your ARRL dealer or the ARRL Bookstore, ARRL order no. 5625. Telephone 860-594-0355, or toll-free in the US 888-277-5289; **www.arrl.org/shop/**; **pubsales@arrl.org**.

[4]**www.arrl.org/qst-in-depth**