

The RADIO WORKS

Where Ham Radio Is a Contact Sport!tm

Catalog 261B

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2006 was a good year for the RADIO WORKS. 2007 will be even better. If all goes well, there will be some significant changes. First, is this catalog. It's our first mini-catalog. Its purpose is to make it practical for us to mail our catalog using "first class" mail instead of the unreliable and slow "Bulk Mail" we are using now. The mini-catalog will include all the products available at the time of printing. The long descriptions will be missing. Those will be featured on our web site where you will find our complete General Catalog in the form you're used to. Second, I'm planning a complete redo of the web site. It's been several years since it was created. I'll be going for a completely new look, but the site will still have all the features of the old site. As usual, I'll be adding more material as it is developed. I want to have even more reference material and a really useful FAQ database. I also plan to publish all of our manuals and other publications

from the past. You'll be able to download that product manual that mysteriously disappeared after you got your antenna in the air. All-in-all, we will be able to serve you much better through the new website.

Third, we'll be distributing our products through many of your favorite dealers. We are simply overloaded at times and product distribution through established dealers will reduce those frustrating times when you have problems getting through on the phone. There are many other advantages, too, like walking into a store and taking your new antenna, balun or Line Isolator home with you. This will also give me some time to develop some antenna ideas I've been working on. This program will start in the Summer of 2007. Ask your favorite dealer to stock our products.

I need to address a real problem that you will experience in the coming months, and it's going to affect more than just your hobby. As you probably know, copper, silver, and gold prices are going up almost daily. I've been advised to expect a large increase in copper prices over the next year. I have already seen copper prices double in the past few months. We'll do our best to hold down price increases, but they will probably prove necessary throughout the year. The increase in petroleum and metal prices will affect just about everything the RADIO WORKS produces. We are not going to compromise quality by trying to purchase cheap substitutes, so we may have to make price adjustments along the way. I know that you've always expected the best from us, and we don't plan to disappoint you.

New! Full Catalog On-line

This is a mini-catalog. The full catalog is available on our web site. You can download or view all or specific parts of the full, General Catalog. The General Catalog is available in Acrobat PDF format to make downloading easy.

Other On-line Features

Sales - Monthly, last minute and clearance sales are featured.

Jim's Notebook - All sorts of useful information about antennas, plus many articles from the "Reference Catalog" and Jim's "Most Asked Questions" books are available here.

Jim's Hamshack - It's a virtual tour of my ever changing hamshack, my latest nostalgia and Classic Rigs collection plus the new station I'm working on. I wonder what I'll do this time? You don't suppose that I'll finally go digital, do you?

There's lots more - It can take a couple of hours to see everything.

A Note About Email

I try to answer your email promptly, but

I now receive between 600 and 1000 SPAM messages each day, so I am using aggressive filtering provided by my ISP and an exceptional filter for "Outlook" by Cloudmark.

Please don't send attachments. My SPAM filters will look very closely at attachments and often delete your message or attachment if anything looks suspicious.

Be specific with "Subject Lines." Spam filters are looking for vague and misspelled words. Even if everything looks right, you may still be filtered if you use an ISP that is supporting suspicious or high volume traffic. Further, you might not receive my messages because your ISP rejects my ISP. It's one of the largest in the country and has a huge traffic volume.

I try to respond to all questions and other email correspondence quickly, but there can be delays. If you don't hear from me within a few days, send your message again. Let me hear from you.

Messages asking about our products are answered first. General questions and those unrelated to our products fall farther back in the queue.

The RADIO WORKS is Baluns

The RADIO WORKS introduced a full line of precision, 'Current-type' baluns several years ago. They were instantly popular because 'Current-type,' baluns avoid the bad habits that conventional 'Voltage-type' baluns exhibit. 'Voltage-type' baluns try to produce equal and opposite voltages at the balun's balanced output port regardless of the load impedance. Since low impedance antennas are current fed, a balun that produces equal and opposite currents at its output over a wide range of load impedances is desirable. There is little to be gained by forcing the voltages of the two antenna halves, whether the antenna is balanced or not, to be equal and opposite relative to the ground side of the balun input. The antenna field is proportional to the currents in the elements, not the voltages at the feed point.

Misconceptions

1. Baluns will not necessarily improve SWR (the exception is when a balun is used as part of a matching network, i.e. 4:1 baluns used in loops)
2. They are not lightning arresters, the winding inductance in most baluns is too low.
3. Built-in spark gaps don't work. The radio equipment is long gone before the 'gap' arcs.
4. Baluns do not allow multiband operation of single band, coax fed antennas. Nor do they make antennas more broadbanded.

These are all generalizations. Of course, there may be specific exceptions to any of them.

A balun really has only two jobs

1. Isolate transmission line from the antenna.
2. Provide balanced output current

Proper Balun Design

A properly engineered balun will include these design points:

1. High winding inductance (reactance)
2. Low stray capacitance
3. Very short internal transmission lines-
<< 1/4 wave, the shorter the better.
4. High power components- high voltage wire and insulation to withstand high power or a mismatch.
5. Large wire gauge reduces I²R losses.
6. Large cores - prevents saturation and provides the necessary inductive reactance values on the low bands.
7. Mechanical considerations:
Weatherproofing, rustproof hardware and a strong case to withstand high physical loads.

To insure the utmost in reliability, wires from the internal windings of the *B1*, *B4*, *Y1*, and *RemoteBaluns* are brought directly outside the case for connection to the antenna. This eliminates any chance of an unreliable connection. The trade-off is that the holes where these wires exit the balun's case must be sealed. Coax Seal® is included with each balun for this purpose and to seal the coaxial connector.

The transmission lines or the balun's windings are carefully designed for optimum impedance. The all-important wire used to make these internal transmission line(s) or other windings are insulated with a material similar to Teflon®.

All 1:1 and some 4:1 models are Current-type designs. Current-type baluns are extraordinarily saturation resistant and provide superior reactance characteristics. Signal distortion and RFI due to core saturation is practically eliminated. Current-type baluns are very forgiving when feeding antennas that do not provide an ideal load.

Retrofit Line Isolators

A very useful application for Line Isolators is to install them in series with a beam antenna's normal feed system. The proper location is between the antenna's balun or matching device/system and the feedline. Doing this will not affect antenna matching unless the feedline is acting as part of the antenna. This is, of course, not a desirable situation, and the installation of the Line Isolator will point out that a major problem exists with the antenna. In beam installations, using a Line Isolator in series with the antenna's feed system can substantially improve the antenna's front-to-back and front-to-side ratios. It does this by providing the antenna with balanced current at the feedpoint and by very effectively preventing the feedline from acting as part of the antenna. It is a seldom appreciated fact that ineffectively decoupled feedlines can act as efficient vertical antennas that can degrade an otherwise excellent radiation pattern. The addition of a Line Isolator or a proper balun can significantly reduce feedline radiation and dramatically decrease RFI and TVI. Beam antennas, especially, benefit from improved balanced drive and superior feedline isolation, but even simple dipoles benefit from properly selected and installed baluns and Line Isolators. Receiver noise also may be reduced by eliminating signal pickup by the feedline.

RFI Applications

Current-type baluns and Line Isolators are especially effective in reducing RF current on the outer surface of a coaxial cable's shield while having no effect on the signal carried within the cable. Current-type devices are singularly well suited to this application, because of several exceptional features that are not present in other balun designs. In the list of desirable characteristics is a very high load isolation over a very wide bandwidth, extremely low loss characteristics and a wide, low SWR bandwidth.

Important - Power Ratings

All RADIO WORKS' products power ratings are for standard duty-cycle SSB and CW transmissions. We do not rate any of our products for high duty-cycle modes including AM, RTTY and high duty-cycle digital modes. Essentially, these modes require devices designed for commercial service. It's either that or use low power levels. I have checked on prices for a commercial 2 kW baluns and the price was more than \$1500. This is certainly beyond the range of most of our budgets. I know that there are some amateur radio baluns that claim power ratings of very high values. However, they say nothing about a duty-cycle rating, nor the load conditions under which they will survive their rated power. I am being up-front with our ratings.

Beside the problem of duty-cycle is the popularity of the use of older transmitters which run "class-C" output stages. It is common for these transmitters to have a high harmonic and spurious signal content. Some antenna components, among them, high quality current baluns and Line Isolators, absorb much of the harmonic and spurious energy which results in core saturation and excessive heating. You may say that this doesn't happen in other types of devices. The reason is that these devices just pass the harmonics and spurious signals along to the antenna. This isn't to say that current baluns and Line Isolators can be used as "low pass filters." Their functions are different and they should be used together.

PSK-31

I often receive questions about the compatibility of PSK-31 and our products since I warn against high duty-cycle modes. The operating habits and power used by most PSK operators are perfectly compatible with our baluns, Line Isolators and antennas. IMD levels will not be elevated and the typical duty-cycle is not significant when running power below 100 watts on PSK.

B1-2K Plus



Balun Type
Ratio
Operating Bandwidth
Power Loss, dB
Saturation Resistant?
Internal Xmsn line Z
Core type
SSB/CW Power @ 3.5 MHz*
SSB/CW Power @ 50 MHz
Output Balance
Load Variation Tolerance
Input Connector
Output Connector
Size

Current
1:1
80 - 6 m
Nil
Yes
50-ohms
HF/VHF ferrite
1.5 kW if SWR <3:1
300 watts
Excellent
Excellent
SO-239
Wire
2.3" x 8"

Uncompromising Performance

The B1-2K follows the same tradition of the uncompromising performance established by the incomparable C1 and B4 baluns. (The C1-2K balun was produced nearly 20 years ago and is not in current production. It has been replaced with newer models.) The B1-2K is built into a conventional case with eyebolts. It is here that the similarity with other products ends. The B1-2K is a full power balun. The RADIO WORKS' design brings the wires from the balun's windings directly outside the case so you may solder them directly to your antenna wire.

The Best, Low Cost Current Balun

B1-4K Ultra

Balun Type
Ratio
Operating Bandwidth
Power Loss, dB
Saturation Resistant?
Internal Xmsn line Z
Core type, Ferrite
SSB/CW Power @ 3.5 MHz*
SSB/CW Power @ 50 MHz
Output Balance
Load Variation Tolerance
Input Connector
Output Connector
Size

Current
1:1
160 - 10 m
Nil
Yes
50-ohms
HF
4 kW
Excellent
Excellent
SO-239
Wire
2.3" x 8"

B1-5K Plus

Current
1:1
160 - 6 m
Nil
Yes
50-ohms
HF/VHF
5 kW
600 watts
Excellent
Excellent
SO-239
Wire
2.3" x 8"

B1-4K

By popular request, I've brought back the B1-4K, the **maximum isolation** version of the B1-5K. **The power rating is 4 kW PEP and frequency range is 160 - 10 meters.**

The isolation factor of the B1-4K Ultra is about 10 times that of the B1-5K and more than 20 times the isolation provided by other manufacturer's baluns.

B1-5K

The B1-5K's specifications are impeccable. It is as close to a laboratory quality unit as we can get with an economical balun made to handle high power. The B1-5K has a nearly flat reactance curve from 160 meters to 6 meters. I do not know of another balun with this combination of precision, specifications, high power rating, and construction quality.

Prices and specifications are subject to change without notice.



Y1-5K

Specifications

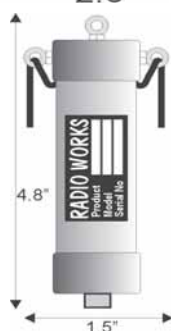
Balun Type:	Current
Ratio:	1:1
Bandwidth:	160 - 6 m
Coupling Coefficient:	100%
Power Loss in dB:	Nil
Internal transmission Line Z:	50 Ohms
Core:	Ferrite
Power rating @ 3.5 MHz*	5 kW if SWR <3:1
Output balance:	Excellent
Load variation tolerance:	Excellent
Size:	2.5" x 9"
*Important: CW/SSB duty-cycle only. Not rated for AM, RTTY or other high duty-cycle modes.	

IMPROVED PERFORMANCE

If the manufacturer of your beam does not specify a particular balun for your beam, use the Y1-5K, a T-4 or T-4 Plus (see the note in the previous column). Unless a specific balun is part of the antenna's matching system, and this is not usually the case, substituting the Y1-5K will not adversely affect antenna matching.

Adding the Y1-5K or T-4 Line Isolator can improve the front-to-side and front-to-back ratios in many beams by maximally isolating the feed line from the beam.

For beams fed directly with coax and those using coiled-coax choke baluns, consider using the T-4 Line Isolator as an alternative to the Y1-5K. The T-4 is an excellent choice for all unbalanced, directly fed beam antennas.



	B1-200	B4-100
Balun Type	Current	Voltage
Ratio	1:1	4:1
Operating Bandwidth	80 - 10 m	80 - 10 m
Power Loss, dB	Nil	Nil
Saturation Resistant?	Yes	Yes
Internal Xmsn line Z	50-ohms	50-ohms
Core type	Ferrite	Ferrite
SSB/CW Power @ 3.5 MHz*	200 W if SWR <3:1	200 W if SWR <3:1
Output Balance	Excellent	Excellent
Load Variation Tolerance	Excellent	Excellent
Input Connector	SO-239	SO-239
Output Connector	Wire	Wire
Size	1.5" x 4.8"	1.5" x 4.8"

The Same Uncompromising Performance

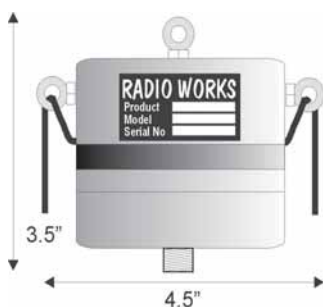
Our new 200 watt baluns offer the same outstanding performance as the B1-2K and the B4-2K. Only the package and components are smaller to meet the need for a physically small balun for barefoot, QRP, SWL, barefoot rigs, stealth and similar interests.

Special cores and high quality wire rated for high temperature and high dielectric ratings are used in this balun series. Now you have the parts you need to build small, carry-along antennas or those hidden, stealth antennas you've been planning. Finally, you have a precision, high spec. balun in a small size to meet your special needs.

*Important: SSB/CW duty-cycles only. Not rated for AM, RTTY or other high duty-cycle modes.

Prices and specifications are subject to change without notice.

RemoteBalun™



Balun Type	Current
Ratio	4:1
Operating Bandwidth	160 - 10 m
Power Loss, dB	<0.8 dB nominal
Saturation Resistant?	Very Good
Internal Xmsn line Z	40-ohms equiv
Core type	HF ferrite
SSB/CW Power @ 3.5 MHz*	1.5 kW *
Output Balance	Excellent
Load Variation Tolerance	Excellent
Recommended Coax	Low-loss types
Recommended Coax Length	<16 feet
Input Connector	SO-239
Output Connector	Wire
Size	3.5" x 3.5"

The RemoteBalun - A Proven Solution Still The Best!

The RADIO WORKS brought you the RemoteBalun many years ago, and it was an immediate success. At the time there was no other balun on the market designed specifically for this purpose. In fact, back then, 'Current Baluns' were nearly unknown in Amateur Radio circles. As is always the case, success breeds copies, and soon there were lots of copies of the RemoteBalun (at least in name, but little more).

*Power must be derated under some conditions.
CW/SSB duty-cycle only. Not rated for AM, RTTY, and other high duty-cycle modes.

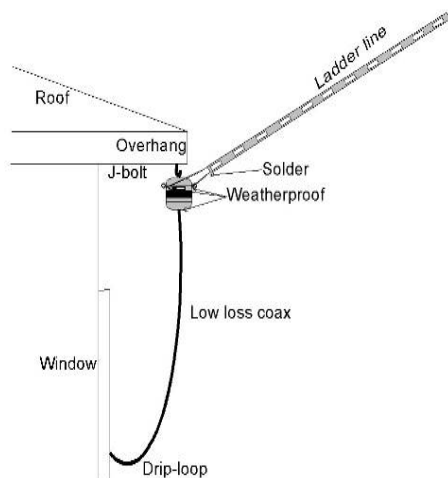
Applications: Open-wire to coax interface, external to the operating position. **Use with tuner.**

Prices and specifications are subject to change without notice.

The RemoteBalun

We increased the RemoteBalun's winding inductance without restricting bandwidth. We improved the output balance and lowered losses. We added 160 meters and increased the power rating safety factor.* We increased the high SWR load tolerance. **We made a better RemoteBalun.**

The **RemoteBalun** is based on the B4-2KX, network compensated, Current Balun technology. Special winding techniques insure wide operating bandwidth and high power handling. Massive ferrite cores keep everything under control and the specifications on target. Try the **RemoteBalun**; it's what an "external balun" should be.



A different kind of balun - The RemoteBalun™ Description

The RemoteBalun™ is the interface between balanced feeders and coaxial cable. The RemoteBalun™ is a rugged 4:1 current-type balun.

A short length of low loss coaxial cable connects your transmatch to the RemoteBalun™. The inconvenience of routing balanced feeders into the radio room is eliminated.

Baluns work best at low to moderate impedance levels. Often, a RemoteBalun will be used to drive very high impedance loads. Efficiency suffers when any balun operates under highly mismatched conditions. The power rating of the balun must be down-rated as the efficiency falls.

The RemoteBalun™ has more of everything - higher power rating, a wider load operating range, and a high efficiency design. A new, custom-made transmission line is used in the RemoteBalun™ to achieve this improved level of performance. This means that more power is delivered to the antenna, and **you have a bigger signal!**

Power Rating - Important

Putting a specific value on this specification is not possible because the power rating depends on so many factors. The load impedance and reactance presented to the RemoteBalun, combined with the operating frequency and duty cycles are interrelated factors which must be taken into account. The 1500 watt power rating assumes normal duty cycle modes (CW and SSB) with the balun operating into a moderate impedance. Monitor your SWR on your tuner's SWR meter. Any drift in SWR while operating may indicate that the RemoteBalun™ is overloaded. Reduce power or change the length of the ladder line feeding the antenna to lower the lead Z. This may reduce the impedance to tolerable levels.



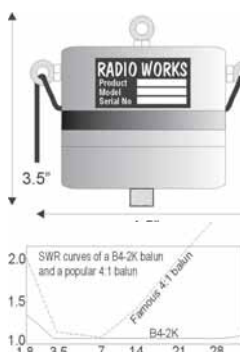
1.5 kW, 4:1 Broadband BALUN

B4-1.5K

Something Special

Balun type	Voltage
Ratio	4:1
Operating Bandwidth	80 - 10 m
Power Loss, dB	<0.8 dB nominal
Saturation Resistant?	Yes
Internal Xmsn line Z	40-ohms equivalent
Core type	HF ferrite
SSB/CW Power @ 3.5 MHz*	1.5 kW* if SWR < 3:1
Output Balance	Good
Load Variation Tolerance	Good
Input Connector	SO-239
Output Connector	Wire
Size	3.5 x 9.5" overall

- An effective, wideband design
- Laboratory developed & optimized
- Oversize components
- Saturation resistant design
- Special high voltage wire insulation
- L-C Network compensation = wide bandwidth
- Wire from internal windings are brought outside of the case where you solder them directly to your antenna wire. There are no unreliable connectors possible.
- Stainless-steel eyebolts
- Clearly written manual.



Balun Type	Voltage
Ratio	4:1
Operating Bandwidth	80 - 10 m
Power Loss, dB	<0.6 dB nominal
Saturation Resistant?	Moderate
Internal Xmsn line Z	40-ohms, equiv
Core type	Ferrite
SSB/CW Power @ 3.5 MHz*	1.5 kW if SWR < 3:1
Output Balance	Very Good
Load Variation Tolerance	Very Good
Input Connector	SO-239
Output Connector	Wire
Size	3.5" x 3.5"

B4-2K

B4-2KX

Current
4:1
160 - 10 m
<0.8 dB nominal
Moderate
45-ohms equiv
2 x Ferrite
same as B4-2K
Excellent
Excellent
SO-239
Wire
3.5" x 3.5"

The B4-2KX is the Only 4:1 Broadband Current Balun

Current-type™ baluns have several major advantages over common Voltage-type baluns. Simply stated, Current-type™ baluns are more tolerant of imperfect loads while providing excellent output balance and feedline isolation. Very wide bandwidth and high power operation are additional characteristics of all RADIO WORKS' Current-type™ baluns. The electrical specifications of each RADIO WORKS' balun far exceed industry standards.

Something Special - The B4-2K is a high quality 4:1 balun. Special ferrite toroids manage reactance and provide the very high inductance values necessary in an effective 4:1 balun. Problems with other 4:1 baluns now on the market include low winding inductance, leakage inductance, high loss, poor balance, and inferior construction. In comparison, we use large, efficient, toroid cores, heavy, high-voltage wire, and special winding techniques. This combined with our exclusive L-C compensation networks achieves wide bandwidth with a high power safety factor. It's an unbeatable combination. It's an unbeatable balun.

Prices and specifications are subject to change without notice.



T-4, T-4 Plus & T-4G, T-4G Plus

Used at "Voice of America" to solve ground loop problems.
Nothing Else Even Comes Close!



The T-4 Plus

The "Plus" versions of the T-4 add increased isolation at higher frequencies. With most of today's new rigs featuring all bands including 6 meters, we've developed a Line Isolator for these new rigs. You get all of the performance of the T-4, plus the added performance of improved ferrites which work well into the VHF range.

T-4G Plus

The T-4G Plus is the grounded version of the T-4 Plus. Its ground strap provides a direct path to earth so that RF traveling along the outside of the coaxial cable's shield sees a path straight to ground. Any stray RF heading for your shack sees only a very high impedance and seeks the direct ground path. The T-4G Plus should be located directly at a properly installed ground rod or other station ground system. In applications where access to earth ground is not possible, use the T-4 Plus.

Use jumpers and connectors of your choice.

All Line Isolators have SO-239's at their input and output. This permits you to use jumpers of the required length, with the connector of your choice for the application.

T-4, T-4 Plus & T-4G, T-4G Plus Specifications

Type:	Current
Ratio Input/Output:	1:1
Design Impedance:	50 ohms
Internal XMSN line Z:	50 ohms
Bandwidth:	160-10 T-4, T-4G 160-6 m T-4+, T-4G+, T-4-500, T-5G
Winding Z @ 3.5 MHz:	>33 K (All T-4 & T-4G) 75K (T-5G)
Winding Z @ 14 MHz:	>80 K (All T-4 & T-4G) 50K (T-5G)
Winding Z @ 50 MHz:	>4 K (T-4+), 2K (T-4-500), >1K (T-5G)
Coefficient of coupling:	100%
Power loss in dB:	Nil
Power handling: *	> 1500 watts (All T-4 models but T-4-500) 500 watts (T-4-500)
Input connector:	SO-239
Output connector:	SO-239

* CW/SSB duty-cycle only. Not rated for AM, RTTY or other high duty-cycle modes. Derate power @ 28 MHz.

T-4
T-4G

T-4 Plus
T-4G Plus



T-4-500 \$33.95

New "500 watt" Line Isolator with exceptional performance

A Smaller, better LINE ISOLATOR?

The isolation factor is actually higher than the standard models. They are far smaller in size and weight, too. The rating is 500 watts in SSB and CW service. That makes them perfect for interconnecting a transceiver and a linear amplifier. In low power installations, considerable space can be saved using these new units.



T-5 G An Even Better Line Isolator

Added Isolation at VHF frequencies

The T-5G is a T-4G and a T-6G VHF Line Isolator in a single. This extends the T-5G's isolation into the VHF spectrum. This is important with today's solid state transmitters which use broadband output amplifiers. Wideband power amplifiers often produce energy from the low HF frequencies to the VHF region. Modern transceivers have filter in the output stages to reduce this RF energy to tolerable levels, but the filters in the transmitter are only so good and problems are exacerbated when ground loops develop around the communications system. The T-5G solves this problem by helping break up ground loops and keeping RF off the coax's shield well into the VHF spectrum. The result is a cleaner communication system and less interaction between HF and VHF equipment. The T-5G is used with HF equipment. The T-6G is a VHF Line Isolator and is available only on special order.

Why two ground straps?

In communications equipment, signals travel in two direction. The receiver can pick up trash collected by a coax cable's shield acting as a random length antenna. The ground strap nearest the antenna provides a direct path to ground for RF impressed on the shield from outside sources.

When transmitting, if the transmitter is not well grounded, unwanted RF can appear on the station's ground system and be conducted and radiated by the coax's shield. Thus, for maximum isolation, two ground straps are used.

What we are doing here is to provide a direct path to ground, eliminating the condition where one end of the Line Isolator is looking at a very high inductive reactance before going to ground.

In some cases, you will only want to ground one end of the T-5G. This is best determined experimentally.

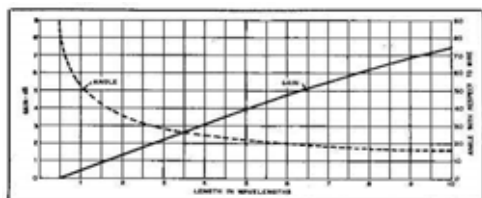
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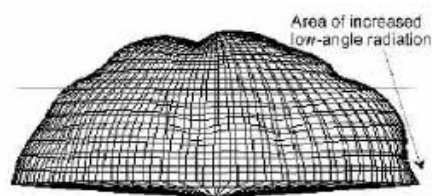
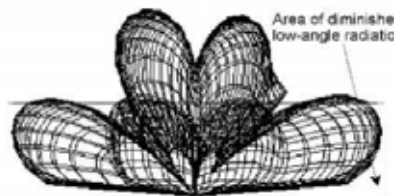
A New World Record

High Performance Wire Antennas

The CAROLINA WINDOM and SuperLoop are in the prestigious class of high performance antennas. Previous catalogs had many pages dedicated to this subject. We didn't have room in this catalog, but the information is available on our web site at www.radioworks.com. You'll find all of the useful information from our previous catalogs on our web site. Included below are some graphics from those articles. Drop by radioworks.com and check out all the details.



This is a **treasure map** - think **GAIN!** Contained within this diagram is one of Mother Nature's important secrets. The mystery of wonderfully loud signals emanating from insignificant looking antennas strung between two cooperative trees is explained in this simple chart. This map to the "Treasure Island" of incredible antenna performance was borrowed with permission from the 14th edition of the ARRL Antenna Book, page 7-1.



Presented here are two radiation patterns. Each is a CAROLINA WINDOM 80 operating on 20 meters. In *pattern to the left*, the vertical radiator has been removed. In the pattern to the right, the vertical radiator is operating. What an amazing difference the Vertical Radiator makes. As you can see, when the vertical radiator is absent, radiation at low takeoff angles diminishes as the radiation pattern approaches the horizon. On the other hand, in the pattern where the Vertical Radiator is operating, radiation from the antenna continuously increases up to a point less than 5 degrees above the horizon. This is the point where "ground-effects" prevent a zero-degree takeoff angle. The incredible performance of the CAROLINA WINDOM is the result of this significant radiation pattern improvement at the all important very low takeoff angles.

Do's and Do Not's of Antenna Installation

Do's

Inspect coaxial cable for flaws in its jacket. Don't be concerned about minor jacket irregularities.

Pay particular attention to station grounding. This is especially critical when your station is not on the ground floor.

In most cases, it is OK to bury standard coax. You can add some protection by running it inside standard garden hose. Bury coax below the frost line.

Carefully seal any coaxial connector exposed to weather. Follow the procedure outlined in this publication.

Check available space before purchasing an antenna. Make sure the antenna will fit. Reasonable bending of the elements will not hurt. Elements must never be bent back on themselves. If space is limited, consider alternatives.

To avoid kinks in antenna wire, roll out the wire using a hand-over-hand technique.

Antennas will work in trees. In most cases, it doesn't hurt if the wire touches leaves, though you might set a leaf or two on fire. If you want, consider using insulated wire.

Definitely use Dacron™ antenna support line. Nylon, Polypropylene, Hemp, Cotton, or other rope types are not suitable in this application. Use Kevlar™ only if you don't want any stretch in support lines, however some stretch is desirable.

Install your antenna as far away as possible from your or your neighbor's house. Antenna installations close to houses are great candidates for RFI and TVI problems.

Don'ts

Do not change the length of manufactured antennas. Antenna lengths are critical.

Do not roll up the ladder line in G5RVs or SuperLoops.

Do not bury Ladder Line or let it get close to the ground or anything metal. Do not run it along side other cables. It must be in the clear.

Do not rely too much on inexpensive antenna analyzers. You can't be sure what parameter you're actually measuring.

Do not support a CAROLINA WINDOM so that its Vertical Radiator is closer than 15' minimum to a tower or other metal object. If less than 15', direct it away from the metal pole or tower at an angle.

Do not tie down the Vertical Radiator of a CAROLINA WINDOM. It must move with the antenna, or the connectors will pull apart. The weight of the coax and Line Isolator is usually enough to keep the Vertical Radiator in place.

Don't lay the CAROLINA WINDOM's Vertical Radiator on your roof.

Don't use heavy weights in combination with pulleys to hold an antenna taut. Free falling weights accelerate the antenna like a bow string. The wire may fail.

Don't worry about coax losses. With a coax length less than a couple of hundred feet, when the SWR is below 5:1 or so, you can't measure the loss in signal strength. Use a tuner to make your rig happy when the SWR is higher than your rig will accept.

New, Smaller,
Better



This is the new Low Profile CAROLINA WINDOM 80 LP

Shown is the complete assembly, including the Matching Transformer, Line Isolator and new Vertical Radiator, #16 hard drawn wire and end insulators.

Standard Type - This is the conventional CAROLINA WINDOM made with **full-size components**, #14 stranded, hard-drawn stranded antenna wire and a 1.5 kW power rating. Other wire types are available on special order.

LP Models - These are the new 'Low Profile' versions of the standard CAROLINA WINDOMS. The only difference are the smaller sized components, the #16 antenna wire and the **600-watt power rating**. Performance is the same.



Here are the new Matching Transformer and Line Isolator compared to the standard Matching Transformer.

CAROLINA WINDOM

Earned its reputation honestly, one QSO at a time™
All Bands, 80 -10 meters + WARC

Features

Outstanding on all bands covered
One antenna that does it all
Unusually low angle radiation pattern
Easily beats G5RV, dipoles, trap antennas
Enhanced, low angle, Vertical Radiator
High efficiency - no ground losses
Ground independent - radials not needed
The secret is the inverted VERTICAL RADIATOR
Matching Unit enhances vertical radiation
Use Transmatch

Chosen by 'Big Gun' DX'ers and DX'peditions.

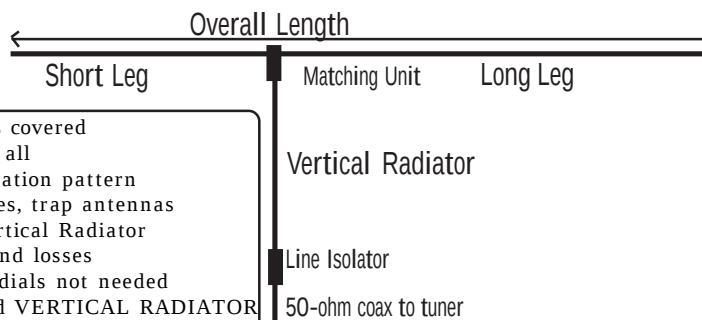
Specifications

Model	CW 160	CW80	CW40	CW40+
Coverage	160-10	80-10	40-10	40-10
Overall length	265'	135'	66'	66'
Short leg	83'	50'	25'	25'
Long leg	182'	83'	41'	41'
Vertical Radiator	22'	22'	10'	18'
	LP models have the same dimensions			
Recommended ht.	>40'	>35'	>25'	>30'
Gain	As much as 10db*			
Feedline	50-ohm, RG-8X recommended			
Tuner	Manual tuner recommended. Will work with newer rigs with automatic tuners.			
Power rating SSB**	All models rated 1500 watts CW/			

* Based on user reports and field evaluations.

Gain is the result of the low takeoff angles.

** CW/SSB duty-cycles only. Not rated for AM, RTTY or other high duty-cycle modes.



General Mounting Requirements

Mounting height at top of vertical section: >30'
Absolute minimum angle between legs = 126-degrees
Recommended min. angle between legs = 140-degrees
Minimum height at ends = 8'

It isn't easy to put out a respectable signal on 160 meters. It may be even harder on 80 meters because everyone has a strong signal. The CAROLINA WINDOM 160 comes to the rescue. The CAROLINA WINDOM is the antenna that has helped put many 160 and 80 meter stations on the map.

The CAROLINA WINDOM was the first antenna to take advantage of 'VERT™' (Vertically Enhanced Radiation Technique). 'VERT™' is a radiating feed line technique that produces a controlled, low angle vertical radiation pattern. The effect is absent from most ordinary antennas. Field tests, user reports and seven product reviews confirm that the CAROLINA WINDOM will give you a remarkable performance advantage.

The off-center fed CAROLINA WINDOM provides unusually good performance on all bands covered, including the WARC bands. It's an ideal antenna for those of you who do not wish to use a tower and beam. The CAROLINA WINDOM is also ideal for those of you who want a high performance antenna to cover the bands not covered by your beam antenna.

The Real Secret

It's the Vertical Radiator. Combined with the Dedicated Matching Unit and special Line Isolator, it is responsible for the low-angle, vertical radiation pattern.

Far more complete details are available on our web site at www.radioworks.com

Automatic tuner Range Extender

MFJ-914 1.8 - 30 MHz, 300 watts. Many auto-tuners do not have the necessary tuning range to match a CAROLINA WINDOM. The MFJ-914 solves the problem for only about \$60. Or, use the fantastic, new LDG or MFJ automatic tuners.

Coax Length

Use any 50-ohm coax. RG-8X is recommended. Any length may be used in most installations.

Prices and specifications are subject to change without notice.

The RADIO WORKS 1-800-280-8327 <http://www.radioworks.com>

The “Short” Versions of the CAROLINA WINDOM

Formally known as the CAROLINA BEAM

The “Short” CAROLINA WINDOM™

The Short CAROLINA WINDOM™ is the antenna for everyone - DX, rag chewer, or net operator. You get full CAROLINA WINDOM performance on the lower bands and enhanced performance on the higher bands, and, all that in a shorter version of the antenna. There is no reason everyone shouldn't take advantage of their secret weapon.

The Short “CAROLINA WINDOM” combines the best characteristics of the CAROLINA WINDOM and the ‘BOBTAIL CURTAIN’ BEAM.

The Short CAROLINA WINDOM™ is part CAROLINA WINDOM and part Bobtail Curtain (sometimes called a “Half-square”). It takes advantage of the best characteristics of both antennas. You have the performance advantages of the Bobtail Curtain, combined with the additional performance and convenience of the CAROLINA WINDOM. The Short CAROLINA WINDOM™ thus takes the lead in simple, high performance antenna systems. It sets the new standard for high performance, all band, wire antenna systems.

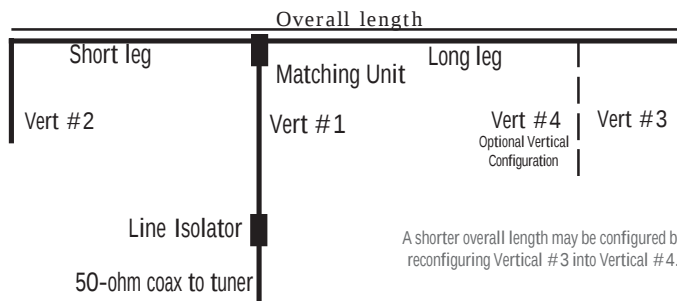
The Short CAROLINA WINDOM™ has three vertical radiators directly interconnected by the single horizontal radiator. It is this unique integration of horizontal and vertical radiation components that accounts for the outstanding performance of this antenna system.

PERFORMANCE

I compared the Short CAROLINA WINDOM 40'™ (40-10 meters) and CAROLINA WINDOM 40'™ against our G5RV. During daylight operation when incoming signals arrive at high angles, all antennas perform similarly, with the G5RV coming in last. The Short CAROLINA WINDOM 40'™ was down a bit from the CAROLINA WINDOM 40'™ due to the Short CAROLINA WINDOM's extremely low takeoff radiation angle. However, at night, or anytime the band lengthens for long-haul DX, the Short CAROLINA WINDOM™ outperforms the G5RV by a couple of ‘S-units,’ sometimes more. Of course, the improvement depends on direction and distance. The CAROLINA WINDOM 40'™ outperformed the G5RV nearly as well as the Short CAROLINA WINDOM 40'™ until the bands really lengthened out and then the Short CAROLINA WINDOM 40 really moved to the front of the pack.

The Short CAROLINA WINDOM's performance and characteristics are similar to the full-size CAROLINA WINDOM. The shorter length is the result of folding the antenna to provide the two extra Vertical Radiators. The result is higher performance (depending on propagation).

The phased multiple vertical radiator sections are the reason for the outstanding low-angle, long-haul performance of the Short CAROLINA WINDOM™. The three vertical sections generate a very low angle radiation pattern while radiation from the horizontal portions of the antenna provides a medium-to-high angle pattern.



Model	CW “Short” 80	CW “Short” 40
Coverage	80-10	40-10
Overall length	100'	50'
Minimum overall	84'	42'
	with optional Vertical #4 configuration*	
Vertical #1	16'	8'
Vertical #2	22'	10'
Vertical #3	16'	8'
Vertical #4	32'	16'
Short leg	34'	17'
Long leg, normal	66'	33'
Long leg, w/vert#4	50'	25'
	LP models have the same dimensions	
Recommended ht.	>40'	>30'
Feedline	50-ohm, RG-8X recommended	
Tuner	Manual tuner recommended. Will work with newer rigs with automatic tuners.	
Power rating	All models rated 1500 watts CW/SSB**	

Gain is the result of the low takeoff angles.

*Antenna is configured with either Vertical #3 or Vertical #4.

Insulators are in place for either configuration.

** CW/SSB duty-cycles only. Not rated for AM, RTTY or other high duty-cycle modes.

Short CAROLINA WINDOM

For long-haul operation the “Short” CAROLINA WINDOM is in a **class by itself**. When the band gets hot, you get hotter - no more standing in line waiting your turn. And, you don't have to give up casual operating, just because the “Short” CAROLINA WINDOM is a **DX antenna**. Non-DX'ers need a big signal, too. Besides, the “Short” CAROLINA WINDOM 80'™ is **field reconfigurable**. You can select just the right combination of medium-angle and low-angle patterns. In fact, you can configure it as a standard CAROLINA WINDOM if you wish. It's the perfect, high performance, antenna choice for the DX'er, traffic-handler, rag-chewer, or dedicated SWL.

The “Short” CAROLINA WINDOM **requires far less space** than other high performance antennas. Just look at the overall length in the specifications. Also, the antenna will work at reasonable heights. When the band opens, you will be ready!

Visit our web site for more detailed information

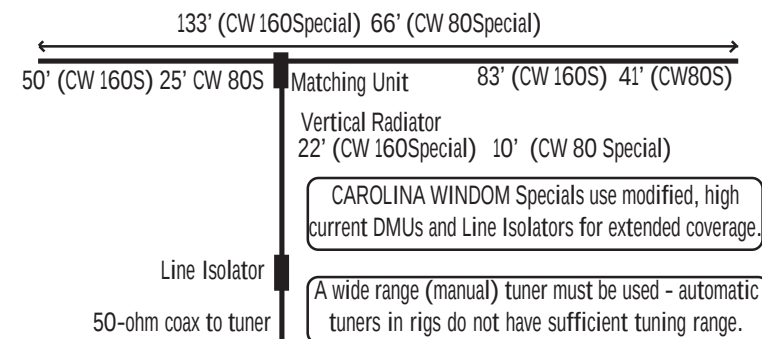
Prices and specifications are subject to change without notice.

The RADIO WORKS 1-800-280-8327 <http://www.radioworks.com>

CAROLINA WINDOM 160 Special

CAROLINA WINDOM 80 Special

CW 160 Special is used by the club station 4U1WB at the World Bank



Model	CW 160 Special	CW 80Special
Coverage	160-10	80-10
Overall length	133'	66'
Vertical Radiator	22'	10'
Short leg	50'	25'
Long leg, normal	83'	41'
Recommended ht.	>40'	>30'
Feedline	50-ohm, RG-8X recommended	
Tuner	Manual tuner required for lowest frequency band. Some newer rigs will tune the higher bands with their built-in tuners.	
Power rating	500 watts on the lowest frequency band. 1500 watts on all higher bands. CW/SSB**	

160 meter operation

The characteristics of the CAROLINA WINDOM outlined on the previous pages hold for the CAROLINA WINDOM 160 Special and the CAROLINA WINDOM 80 Special.

The CAROLINA WINDOM was designed for 80-10 meter operation with optimization on 80, 40, and 20 meters. It has always been a top performer on 80 meters. Now, with its new, improved DMU and Line Isolator, the CAROLINA WINDOM 160 Special may be used on 160 meters, too. If you want to get your feet wet on 160 meters, but can't put up a full-size 160 meter antenna, the CAROLINA WINDOM 160 Special is a good choice. You don't give up any of the CAROLINA WINDOM's superior performance on 80-10 m, and you pick up acceptable 160 meters performance in the bargain. Performance on 160 m will be down one or two S-units from a full-sized CAROLINA 160. **Using the CW 40 on 80 meters is possible for the same reasons.**

** CW/SSB duty-cycles only. Not rated for AM, RTTY or other high duty-cycle modes.

Note: Power Reduction on the lowest frequency band.
The CAROLINA WINDOM has been modified to permit operation on the band lower than usual for the length of the antenna. **You MUST reduce transmitter output power to under 500 watts PEP, CW/SSB.** Excessive power levels will destroy the Dedicated Matching Transformer or Line Isolator.

- IMPORTANT - CAROLINA WINDOM tower mounting technique

Keep the Vertical Radiator section well away from conductive objects such as towers, masts, gutters, metal roofing, etc. Detuning the Vertical Radiator will destroy the excellent performance of the CAROLINA WINDOM.

To facilitate tower mounting, an extra end-insulator is included and you can install it on the long leg of the antenna. Use this insulator to support the antenna from a standoff on the tower. This standoff can be any length over 2 feet. The Vertical Radiator and LINE ISOLATOR™ should be held at least 15 feet away from the tower. Full details are given in the instruction manual.

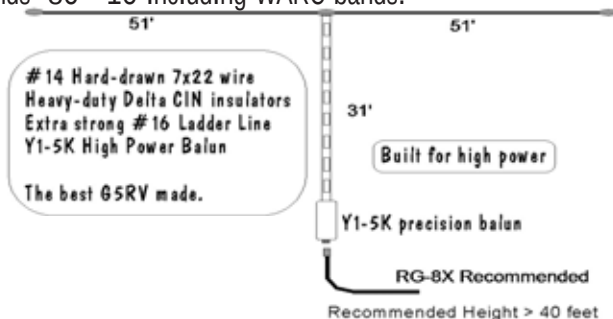
G5RV Plus

All bands 80 - 10 including WARC bands.

The RADIO WORKS' 'G5RV PLUS' has two outstanding improvements over the many copycat versions of the G5RV on the market. First, I have added a Y1-5K, our precision, Current-type balun at the transition between the balanced stub and unbalanced coaxial cable feed line. The second improvement is the choice and length of matching stub.

After careful analysis, a change in stub resonance and a specific feed line length was necessary to achieve the best match on each band. Still, the match is not perfect on any band. It is lowest on 20 meters where the SWR drops to around 1.8:1 under ideal conditions. On all other bands, the SWR will be higher. Even with a slightly elevated SWR, losses in the system are low. Unless you are using a rig with tube finals that can accept a moderately high SWR, an antenna tuner is necessary. This advice goes for any G5RV. Contrary to what many antenna makers claim, the G5RV requires a transmatch unless your rig can tolerate a moderately high SWR.

Combining these technical improvements with the G5RV's own attributes produces a very good antenna system. The RADIO WORKS' NEW G5RV is an excellent combination of performance modifications, high quality, and **high power** parts. You can't find a G5RV that works better than this one.



Watch out for all the cheaply constructed G5RV antennas now made by just about everyone with a soldering iron. Sure, a G5RV is a "no brainer" when it comes to making an antenna. It's simple, and anyone can make one and put it on the market. Of course, if you want one that will stay in the air more than a few months, take a look at the construction. One major manufacturer uses little pieces of printed circuit board for insulators. Quality parts are the major ingredients in any successful antenna. Don't accept less than the best.

Prices and specifications are subject to change without notice.

The RADIO WORKS 1-800-280-8327 <http://www.radioworks.com>

New Dimensions - Even Better performance

SuperLoop 80™

SPECIFICATIONS

Freq. coverage: 80 - 10 meters
Polarization: Both vertical and horizontal
Matching method: Combination of reactance + stub & dedicated tuning unit.

Tuner needed: Yes, all bands
Power Rating: 1500 Watts, CW/SSB**

** CW/SSB duty-cycles only. Not rated for AM, RTTY, and other high duty-cycle modes.

Coax length is not critical. Any length may be used.

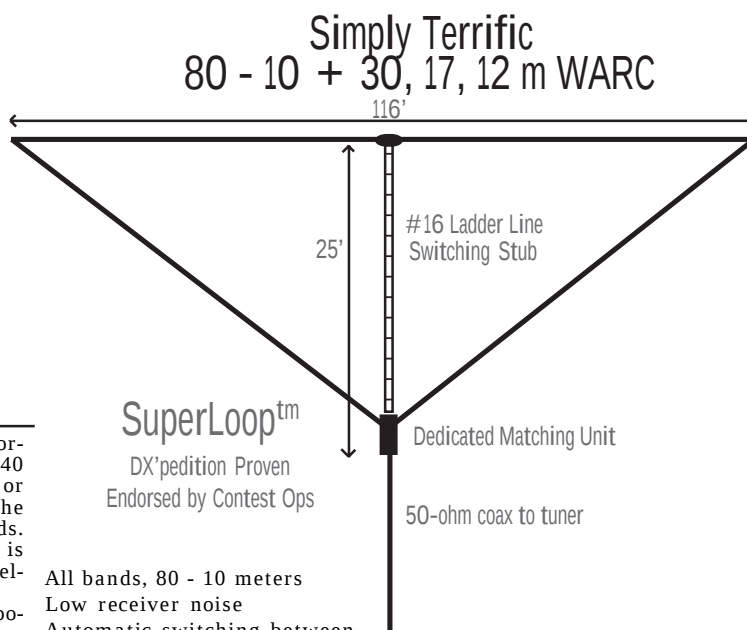
RG-8X is recommended.

The RADIO WORKS' SuperLoop 80™ is a high performance, full size, full-wave 80 meter loop antenna. On 40 meters the SuperLoop 80™ is a 2 wavelength open loop or Bi-Square. The stub in the top leg of the antenna opens the loop when operating on 40 meters and selected other bands. This improves the antenna's radiation pattern. Its gain is around 4 dB, but it will seem much higher due to its excellent, low angle, radiation pattern.

The Dedicated Matching Unit with all the other components in the antenna work together to provide a well managed SWR on all bands. While the SWR is not below 2:1, it is low enough to permit the use of coaxial cable. System losses are low.

The SuperLoop 80™ is an outstanding performer on all bands, 80 - 10 meters. Combine all band operation, coax feed, with gain on all bands, and the New SuperLoop 80™ is the obvious choice in a multiband DX loop antenna system.

Many of the newer rigs with automatic antenna tuners will tune the SuperLoop on all bands. If you have an older rig, you can still use your auto-tuner if you add the MFJ-914 tuning range extender. MFJ & LDG automatic tuners will work with the SuperLoop as do all manual tuners.



All bands, 80 - 10 meters

Low receiver noise

Automatic switching between multi-wavelength modes

Exceptional Performance on every band!

50 Ohm Feed

Superb receive antenna - SWLs take note

All parts, DMU, ready to go. Solder only two wires

Easy to follow instructions

Visit our web site for more information

Custom Modified Antennas

We can build CAROLINA WINDOMS and dipoles with insulated wire. It is not possible to use insulated wire with loop antennas. The wire will not twist back on itself well enough to hold an insulator in place.

Wire types available -

#13 (19-strand) VariFlex copper-clad steel insulated wire.

Very tough, slick, black insulation.

#12 (259-strand) PE insulated copper wire

A copper wire with a tough black insulation. Not as stiff as #13 and not as strong.

#14 (168-strand) PE insulated copper wire

Same as above but with #14 wire.

#12 (259-strand) PVC insulated copper

A very flexible insulated copper wire.

#14 (168-strand) PVC insulated copper

As above with #14 wire.

#12 (7-strand) Copper-clad steel Uninsulated - This is the standard copper-clad (copperweld-type) wire.

To calculate the price of the antenna, simply multiply the cost, per foot, of the wire times the length of the antenna. Add the building cost (\$10) plus the price of the antenna and the cost of the wire.

Example - A CAROLINA WINDOM 80 is 133 feet long. #13 wire is desired. Multiply 133 (wire length) times the current wire price = cost of the antenna. Add to that the building cost of \$10.

Nearly all of the antennas we have ever offered are available on special order. All of the antennas listed below are special purpose, high performance antenna systems that are not popular enough to give full details in this catalog and to keep in stock. As a service to our friends and customers, we will custom-build them for you on request. Below is a list of some of these antennas.

Allow two weeks for delivery. Call us at our 800-280-8327 number for further information, estimated date of delivery, and to make any special requests. **We do not custom design new antenna systems for specific situations.**

SuperLoop 40 Half-size version of the SuperLoop 80 covering 40-10 m. \$139.95

BigSig Loop Single band 3/2 wave loops with about 3 dB gain. No tuner needed. From \$60 - \$100

Vertically Radiating Dipole A special dipole system using the "VERT" system to produce a vertically polarized pattern. From \$90 - \$120

CAROLINA WINDOM Shortwave Shortwave version of the CW 40. Simply excellent and priced at \$125.

Ultima Dipole™ High power conventional dipoles. Available in 2 kW and 3 kW models. Top quality parts. Models for any band. Prices range from \$60 to \$125.

See our web site for more antennas and complete details.

Prices and specifications are subject to change without notice.

Kits for RFI and Weatherproofing



RFI Kits

To make solving RFI problems easier, we have assembled kits of parts that you will need. Each kit contains a Line Isolator™, a 3-foot deluxe jumper cable and six RFI cores. *Caution: In mobile installations, it is not safe to use your radio equipment when your vehicle is in motion. RFI can effect the vehicle's onboard computer.*

RFI Kit #1 T-4, jumper, and 1/4" cores

RFI Kit #2 T-4-500, jumper, and 1/4" cores

RFI Kit #3 T-4, jumper, and 1/2" cores.

Consider purchasing extra RFI cores, jumpers and Line Isolators™ and weatherproofing for emergency situations



Weatherproofing Kits

All cables used outside in the weather **MUST** be properly sealed. (The technique detailed on our website is the one I use... Jim) Here is a kit of everything you'll need to seal a couple of dozen RF connectors. Illustrated instructions are included.

Contains -

- 1 roll of 3/4" x 60' black electrical tape
- 1 roll of 3/4" x 30' black cold shrink tape
- 1 roll of 1/2" x 12' Coax-Seal
- 1 tube of STUF

Coax & Connector Weatherproofing

Sealing coaxial connectors and other antenna components is a multi step operation. Connectors are sealed from the inside and the outside. **STUF™**, **Coax-Seal™**, **Cold-shrink tape**, and quality **electrical tape** are all used to ensure lasting and reliable weatherproofing. When all products are applied properly, you should enjoy years of trouble-free service. Such confidence in the long term performance of your antenna system is well worth the slight extra effort.

Coax-Seal™

CoaxSeal® is your first line of defense in your coax cable's war against the ruinous effects of the weather. CoaxSeal® is a hand-moldable, plastic mastic, suitable for sealing a wide variety of materials, metals, plastics, and vinyls to accomplish a tenacious and waterproof, long-lasting seal for coaxial cable. CoaxSeal® is black, tacky, nonconductive, non-contaminating, 100% waterproof, and has low vapor transmission rate. It has self-healing qualities.

- #101 Pack** 1/2" x 10"
- #104 Roll** 1/2" x 5'
- #105 Roll** 1/2" x 12'
- #105 Box** = 4 rolls
- #106 Roll** 1" x 12'
- #106 Box** = 4 rolls

See W4THU's 5-step, foolproof, sealing process for connectors. It's been used under saltwater for years without failure. Details on our web site.

STUF

This a viscous white compound with dielectric properties that exceed those of the connectors to which it is applied. STUF forces air and moisture out of the connector from the inside during assembly, sealing it from the inside. One tube will fill several connectors. Tube contains a volume of 3.2 cubic inches, enough for a couple of dozen PL-259's.

Do not use without Coax Seal or Cold Shrink outer protection.



Cold Shrink Tape

Ideal moisture barrier
Resists sunlight
Long-term protection
No heat needed, just wrap

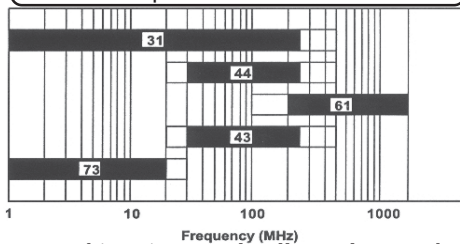
Cold Shrink tape is wrapped around the connector with a slight stretch. After a few hours, the tape shrinks and forms a solid weatherproof seal. I like to use Cold Shrink tape over a layer of Coax-Seal as you will see on the next page. Illustrated instructions are included in the product manual.

3/4" x 30' roll

Prices and specifications are subject to change without notice.

The RADIO WORKS 1-800-280-8327 <http://www.radioworks.com>

A new RFI bead material outperforms all others



Up to this point, nearly all popular RFI beads were made with #73 material. As you can see from the chart above, they were useful from 1 through about 25 MHz. To cover the frequencies up to 300 MHz you would have to switch to #43 material. Now, at the RADIO WORKS, our new RFI "core," which replaces about 6 beads, covers the spectrum from below 1 MHz all the way up to 300 MHz. Just as important, the impedance of the new bead is higher than previous types.

Use several cores in series under difficult circumstances



Beads are now available in two sizes with inside diameters of .25" and .5". Both use the same new #31 ferrite material available to you now from the RADIO WORKS. Use the MFJ-805 RFI Detector to find the wires and cables carrying unwanted stray RF in and out of your shack and equipment. Then use either the MFJ-701 "break apart" toroid cores or use our new and highly effective RFI cores to stop RFI problems.

These cores have "snap-together" baskets which securely hold the core halves together. Combine these with our famous Line Isolators, and you have the latest and most effective weapons for the fight against RFI.

Use on all rig interconnecting cables including computer monitor cables and computer audio cables.

1/4" RFI Core - fits RG-8X, RG-59, 58 and any 1/4" cables including smaller power, rotator, computer monitor & audio.

1/2" RFI Core - fits RG-8, RG-213, 9913, 9086, 9096 and any standard size coax and most rotator cables.



MJF-701 RFI-free Choke Kit Pack of 4 cores

Use is similar to our Ferrite cores. These toroids are useful for control cables and power wires. Also works with small diameter coax like RG-58 and RG-8X. Eliminate RFI from .5 MHz to 200 MHz. These snap-apart toroids are effective because you can wrap several turns of wire on each core.

RFI Solutions

MFJ-854 RF Current Meter



Calibrated - this is the important feature. Measurements are repeatable so you can quantify improvements. It will accept cable sizes up to 1/2". Pocket-sized RFI Detector tracks down and eliminate RFI caused by radiating cables and coax. If you don't know where the problem is coming from, you can't effectively eliminate the problem. 5 calibrated ranges to 3 Amps, plus a 30 ma. variable range sensitive down to 1 ma. 1 - 30MHz.



If you have RFI problems, you need the MFJ-854. It makes finding offending RFI easy. Once you find the problem, you can fix it.

RADIO WORKS

Line Isolators



MFJ-852

Power Line Noise Detector

Plug in headphones and hear the noise you're tracking. Uses a 9 volt battery. Use this ultra-sensitive pocket-sized RFI detector to track down and eliminate RFI caused by radiating cables and wires. It'll tell you exactly where cable is radiating RFI so you can eliminate it with simple toroid or clamp-on RFI cores. Use it to find RFI generated by consumer devices, computers and high-tech office equipment. The MFJ-852 and MFJ-854 should be in everyone's arsenal of RFI test gear.

The original RFI "Quick Fix." Our Line Isolators have solved RFI that have eluded solution for years. Users report instant and complete elimination of RFI problems in many cases. Combine the Line Isolators with our new RFI "snap-together" ferrite cores and the MFJ toroids, and you will have the best weapons possible on the RFI battleground.

We have all the grounding supplies you need to insure a proper RF ground at your station. This is the first step in RFI protection.



MFJ-1164

Price:

S q u a s h
o b n o x i o u s
p o w e r
l i n e
c o m p u t e r
h a s h

noise 6 S-units! Filters and reduces AC power line RFI, hash, noise, transients, surges generated by computers, motors, RF transmitters, static/lightning by 30 db and up to 60-80 dB with good earth ground. Nano-second overvoltage protection.

Provides inductive isolation, capacitive decoupling, RFI rejection, overvoltage protection of both common mode and differential signals. Rejects/shunts undesired signals to ground.

Four 3-wire, 15 Amp, 120 VAC outlets spaced for large AC adapters. 25 Amps/3000 Watts maximum. Fused. 51/2 ft. cord. Wing nut for ground. Mounting holes. Rugged aluminum case, 12Wx31/2Hx2D in.

RFI or TVI prevention is not complete unless the RFI Quick Fix™ is installed.



Each product on these two pages is important in the war on TVI and RFI, but the place to start is with the RFI Quick Fix™. The RFI Quick Fix™ is the installation of one or more of the RADIO WORKS' Line Isolators. Installing our Line Isolators is the single most effective thing you can do to solve RFI problems or to prevent them in the first place. The RFI Quick Fix™ isn't complete without the best RF station ground you can install. A good RF ground is the heart of any RFI prevention scheme. Once the RFI Quick Fix™ and the RF ground situation is properly attended to, the next step is to install Ferrite cores on any control or power lead that you suspect may be contributing to your RFI problems. Once all of your RFI problems are disposed of, then give some thought to Lightning Surge protection. Ferrite cores are indispensable in computerized stations. All those interconnecting cables are an easy entry point for RF to get inside your computer and create all sorts of mischief. As we add more ancillary equipment to our stations, it's becoming more and more difficult to solve RFI induced difficulties. Fortunately, the RADIO WORKS has all the right tools to get the job done properly.

Prices and specifications are subject to change without notice.

TVI & RFI Suppression



MFJ-702B

200 w Low Pass TVI filter for use between your transmitter and antenna or between your transmitter and linear or tuner. Attenuation is 50 dB @ 54 MHz.

Guardian Angel™
Lightning Surge Protector



MFJ-270U shown

MFJ-270U
400 w PEP

Ultra-fast gas discharge tube safely shunts up to 5000 amps of peak impulse current harmlessly to an independent ground connection. It

has an SWR of less than 1.1:1 and an insertion loss of less than 0.1 dB.

MFJ-97 replacement gas tube

MFJ- 272 MF

1500 watts PEP with PL-259 and SO-239 connector

MFJ-272

1500 watts PEP with PL-259 connectors

MFJ-97H replacement gas



MFJ-711B

Shieldbreaker™ high pass filter effectively suppresses annoying TVI. Has standard "F" male and female connectors so adaptors are not needed.

The MFJ-711 can drastically reduce or eliminate most TV interference coming from nearby radio transmitters. Install between your cable and VCR or TV set. Reduces signal received from transmitters operating below 30 MHz. An MFJ exclusive shield-braking circuit prevents your antenna cable from acting like an HF antenna, thereby reducing or eliminating the chance of harmful TVI interference.



MFJ-931 Artificial RF Ground

Creating an artificial RF ground effectively places your rig near actual earth ground potential even if your rig is on the second floor or higher where no earth ground is possible. Reduces chances of TVI/RFI. The MFJ-931 creates an artificial RF ground. It resonates a random length of wire thrown along the floor and produces a tuned counterpoise. When used with a conventional ground system, the MFJ-931 places a far away RF ground directly at your rig — no matter how far away it is. It reduces the electrical length of the ground connection wire to virtually zero by tuning out its reactance. Tune with the built-in RF ammeter. 1.8 - 30 MHz.



MFJ-704 Low Pass Filter

Passband -	1.8 - 30 MHz
Cutoff frequency	40 MHz
Power capacity	1500 w
Impedance	52 ohms



MFJ-264



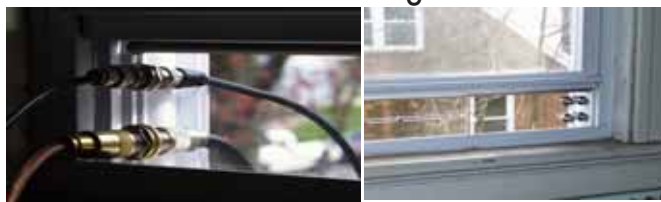
MFJ-260C

Dummy Loads

MFJ-264 - 50 Ohm, 1500 watts for 10 seconds, 100 w continuously. 1.8 - 650 MHz. SWR < 1.3:1 @ 650 MHz. Dry, air cooled.

MFJ-260C - 300 watt, air cooled, noninductive resistor. Full load for 30 seconds, derated curve to 5 minutes. SWR < 1.5:1 @ 150 MHz, < 1.1:1 @ 30 MHz.

Window Feedthrough Panels



Bring your cables into your shack the easy way.

I've been suggesting this method of cable entry for years. Now, it's easy to do. Just purchase one of these easily installed panels and your shack access problems are solved.

PaneRelief™ adjustable feedthrough panel. **Fits windows 19.5" to 32.5" wide. Also available in 19.5-32.5" and 25.5 - 38.5" widths.** Clear Plexiglas, includes connectors. Great when you can't drill holes in the house. Includes two double-female connectors.

PainRelief™ panel with 4 UHF feedthrough connectors. **Fits windows 20.5" to 32.5" wide.** Wider width is available. **Additional connectors are available on special order.** Order as many as you like. Each added pair increases the minimum width by about 1.5".
UHF/UHF, UHF/BNC, BNC/BNC \$ per pair additional
Ladder line (single) \$ additional

Prices and specifications are subject to change without notice.

The RADIO WORKS 1-800-280-8327 <http://www.radioworks.com>

MFJ Tuners

We always have the latest MFJ models.



MFJ-962D

- Rated 1500 watts PEP Input
- 800 watts PEP Output
- Switch selected wide range inductor
- Peak and average reading cross-needle
- New, more accurate directional coupler
- 6 position ceramic antenna switch
- 2 coax lines (direct or through tuner)
- Random wire and balanced output
- 4:1 current balun

Meter light uses 12 VDC or MFJ-1312B



MFJ-949E

- Rated 300 watts
- Built-in 300 watt dummy load
- Peak and average reading cross-needle
- Selectable 300/30 watt meter ranges
- 8 position ceramic antenna switch
- 2 coax lines (direct or through tuner)
- Random wire and balanced output
- 4:1 balun for balanced lines

Meter light uses 12 VDC or MFJ-1312B



MFJ-976

1500 watt balanced tuner

- 12-2000 ohm tuning range
- 1.8-30MHz continuous tuning range
- For all balanced line types
- Four separate 500 pf variables
- True active peak reading meter
- Heavy 1:1 current balun give superb balance and stays cool at full power
- Peak and average meter readings
- True active peak reading lighted Cross-Needle SWR/Wattmeter lets you read SWR, true peak or average forward and reflected power all at a glance on 300/3000 Watt ranges. The MFJ-976 unit measures 12W x 6H x 5 3/4 inches.



MFJ-986

Differential-T Circuit

- Rated 3000 watts PEP Input Power
- 1500 watts PEP Output Power
- Roller inductor, 3-digit turns counter
- Peak and average reading cross-needle
- New, more accurate directional coupler
- 6 position ceramic antenna switch
- 2 coax lines (direct or through tuner)
- Random wire and balanced output

Current balun

Meter light uses 12 VDC or MFJ-1312B



MFJ-941E

- Rated 300 watts
- Selectable 300/30 watt meter ranges
- 8 position ceramic antenna switch
- 2 coax lines (direct or through tuner)
- Random wire and balanced output
- 4:1 balun for balanced lines

Meter light uses 12 VDC or MFJ-1312B, \$14.95

MFJ-914

Auto-tuner Range Extender



- 1.8 - 30 MHz
- 300 watts
- 7 Load Positions
- Dummy Load Connector
- Ground & bypass
- Ground terminal

Extends the tuning range of your rig's auto-tuner by a large factor. With this accessory, your rig's auto-tuner will easily match our CAROLINA WINDOM or SuperLoop or G5RV under nearly all conditions.



MFJ-969

Roller Inductor 160 - 6 m

All of the features of the MFJ-949E, plus MFJ's superb AirCore™ roller inductor.

- 300 watts PEP
- Full 160 to 6 meter coverage
- Match nearly any antenna
- 8 position antenna switch

Meter light uses 12 VDC or MFJ-1312B,



MFJ-901B

- Rated 200 watts PEP
- Small size, 5" x 2.5" x 6"
- 4:1 balun for balanced lines



Remember to order jumpers to interconnect equipment.



MFJ-989C

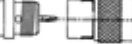
- MFJ's BIG Tuner
- 3 kW PEP SSB input
- 1.5 kW PEP SSB output
- Super heavy duty components
- Massive transmitting capacitors
- "AirCore Roller Inductor"
- True Current Balun
- Built-in Dummy Load
- Lexan Front Panel

Meter uses 12 VDC or MFJ-1312B

Prices and specifications are subject to change without notice.

Custom Jumpers

Installing RF connectors is not difficult, but it takes a lot of practice and the correct tools to do it properly and make them look and work right. We have the special tools and install dozens of connectors every day. This custom service usually delays your order only two or three days. *Check for availability of Gold PL-259 and New N Silver-Teflon.*

Choose connector and coax type	Connector Type	9086, 9096 9096F	RG-213 RG-213+	RG-58, 59 RG-8X	BR-240 RG-8X DS Buryflex
	PL-259 Silver-Teflon				
	PL-259 Gold-Teflon				
	NEW N Silver-Teflon				
	BNC Crimp				

Jumper Price = Sum of cost of connectors installed + price of coax
The connector price is included in the installation charge

Factory Made Jumpers Unequaled Quality

Quality RG-8X
 RG-8X 18"
 RG-8X 3 foot
 RG-8X 6 foot
 RG-8X 9 foot
 RG-8X 21 foot
 RG-8X 100 foot

Special Price

Our factory jumpers are gray or black in color. We supply black whenever possible. No choice.



Coaxial Jumpers with Molded Strain-relief

Combine the best RG-8X I've ever seen and assemble the PL-259s with precision connector assembly machines and then apply the strain relief boots with expensive molding machines and you have an unequaled RG-8X jumper that's perfect for all of your station's needs. You can't buy better jumpers and they are available now, directly from the RADIO WORKS. The rubber boots are so good that it is all but impossible to pull the connectors apart. Stock up now. Check out the 100' special.

Coaxial Cable Specifications

	RG-8X+ RG-8X	Super 240	RG-8X Double Braid	RG-213	RG-213+	SuperCable	Super 400	ExtraFlex	BuryFlex
Z, Ohms	50	50	50	50	50	50	50	50	50
VF	78%	84%	78%	66%	66%	84%	84%	84%	84%
Dielectric	fp	fp	fp	p	p	p/air	fp	p/air	fp
Center	#16 sc	#16 sc	#16 sc	#13 sc	#13 sc	#9.5 c	.109 scca	#9 sc	#9 sc
Shield type	c	c/al	c/al	c	c	tc/al	tc/al	tc/al	c
Shield 1	95%	bc	95 bc	95%	96%	95%	91%	95%	91%
Shield 2		100%	100%			100%	100%	100%	
Jacket	IIA/I	PE	I	IIA	IIA	I	PE	IIA	PE
O.D.	.242"	.242"	.242"	.405"	.405"	.405"	.405"	.405"	.406

Attenuation per 100 feet of coax

10 MHz	1.1	.9	1.1	.55	.55				.52
50 MHz	2.5	1.7	2.5	1.3	1.3	.64	0.90		1.1
144 MHz	3.7	3.0	3.7	1.9	1.9	1.3	1.5	1.35	1.5
200 MHz	5.4	3.7	5.4	2.7	2.7	1.6	1.85	1.7	2.0
400 MHz	8.0	5.3	8.0	4.1	4.1	2.5	2.80	2.5	2.9
900 MHz		7.6					4.0	4.2	4.9

Conductor: al = aluminum c = copper tc = tinned copper bc= bare copper sc = stranded copper wire scca = solid copper clad aluminum
 Dielectric: p = polyethylene fp = foam polyethylene
 Jacket: I = PVC Polyvinyl chloride IIA = Non-contaminating PE = Polyethylene

Prices and specifications are subject to change without notice.

The RADIO WORKS 1-800-280-8327 <http://www.radioworks.com>

Rig Saver™ Jumpers "take the load off"

Hand built jumpers for hand held transceivers and other equipment. Cables are flexible, so they take the twisting load off the delicate antenna connectors on your hand held. All cables are made with 8" RG-316. All Rig Savers™



RS-1

SMA male to SMA Female



RS-2

BNC Female to SMA Male



RS-3

SO-239 to SMA Male



RS-4

BNC Male to BNC Female



RS-5

SO-239 to BNC Male



Super 400

per ft in 50' increments

Due to its special nature, this cable is available only in 50' increments.

This is a copy of LMR 400 made by one of our most reliable coax manufacturers. Some report that it is better than the original. As you can see from its specifications, its loss is similar to our 9096IIA which is one of the best, low loss coaxial cables of the 9913 type available. It features a solid copper-clad aluminum center conductor and a tough foamed polyethylene dielectric. It's a perfect solid-dielectric alternative to ExtraFlex.

CONNECTORS:

PL-259 - Standard types
N - Use special type, in stock



ExtraFlex 9096IIA

10 - 99'

100 - 499'

See web site for spool price

This is International 9096-IIA. This is a top-of-the-line, flexible 9913-type coax. Construction is excellent with a 19-strand center conductor. It bends as easily as conventional RG-8 or RG-213. Will handle the legal power limit even at UHF.

RECOMMENDATIONS:

All VHF and UHF installations. HF runs over 200' feet. A must for crank-up towers and rotatable antennas in systems where low loss cables are needed.

CONNECTORS:

PL-259 - Standard types
N - Use special 9913 type



Bury Flex™

per ft in 50' increments

See web site for spool price

Due to its special nature, this cable is available only in 50' increments

It's highly flexible for rotator loops and applications requiring nonrigid coaxial cable. The jacket is Polyethylene, PVC, so this is a true directly buriable cable. Low loss is insured by a slightly enlarged center conductor (vs. 9913) and the high tech foam PE dielectric.

RECOMMENDATIONS:

All ExtraFlex 9096IIA applications.

CONNECTORS:

PL-259 - Standard types
N - Use special 9913 type



SuperCable

10 - 99'

100' - 499'

SuperCable is International's type 9086. It is a very low loss, double shielded, high quality coaxial cable. 9086 is similar to Belden 9913 but has better braid coverage.

RECOMMENDATIONS:

Use for 2 meters and up unless cable runs are short where RG-213 is suitable. Use in high performance HF installations when cable runs are over 200'.

CONNECTORS:

PL-259 - Standard types
N - Use special 9913 type



RG-213

10 - 99'

100' - 499'

Call for availability

RG-213 is the standard 50 coax replacing RG-8 which was the popular choice for years. RG-213 is similar to RG-8 but is built to a much higher standard.

RECOMMENDATIONS:

All HF installations and short runs on VHF and UHF. Use RG-8X for wire antenna installations due to the size and heavy weight of this cable. Good for HF runs out to 200'.

CONNECTORS:

PL-259 - Standard types
N - Standard types



RG-213 Plus

10 - 99'

100' - 499'

There are always ways to improve a product and that is what was done to RG-213 Plus. It features an improved braid and even better quality, non-contaminating jacket.

RECOMMENDATIONS:

All RG-213 recommendations apply.

CONNECTORS:

PL-259 - Standard types
N - Standard types



Premium RG-8X

10 - 99'

100' - 999'

100' with PL-259 on each end

Premium Quality RG-8X is a low loss, low cost, 50 ohm coax that **WILL** handle the legal power limit. Losses on HF are only slightly higher than RG-213. **LOW** cost, **LOW** weight, and **LOW** loss make RG-8X a very **best buy!**

CONNECTORS:

PL-259 - Std types + UG-176
BNC - Special crimp type



RG-8X Plus

10 - 99'

100' - 999'

Most RG-8X is made with a type IA jacket. RG-8X Plus uses a Military type IIA, non-contaminating jacket which is preferred by many users. Except for jacket, the specs on this coax are identical to our Premium RG-8X.

CONNECTORS:

PL-259 - Std types + UG-176
BNC - Special crimp type



Super-240

10 - 99'

100' - 999'

Solid Center Conductor

Factory rated for 1.5 kW @ 30 MHz

This is an RG-8X size version of the popular LMR-400 type, low loss coax. Gas-injected foam dielectric. 100% shield - bonded aluminium tape plus tinned copper braid. DC breakdown 1500 V. Shield effectiveness is >90dB **Top of the Line!** Special crimp-on connectors are available. Standard type OK.

CONNECTORS:

PL-259 - Std types + UG-176
BNC - Special crimp type



RG-8X Double Shield

This is our new, double shielded, top quality RG-8X. Braid is 95% over 100% coverage tinned aluminium foil. The construction is similar to larger, low loss cables. Velocity factor is 78%. All other specs are the same as our quality RG-8X. The extra shielding provides far less cable leakage and stray signal pickup. Loss is slightly lower than standard RG-8X. Standard PL-259 connectors with UG-176 adaptors and N-200 connectors plus UG-176 adaptor work with this cable.

See web site for spool price

Prices and specifications are subject to change without notice.

Antenna Wire, Ground Strap, Ladder Line, Rotator Cable

#14 Stranded (7x22) Hard-drawn /ft



This is the standard antenna wire. Stranding is very tight, well beyond industry standards. It is flexible, has long service life, and is easy to use. For all wire antennas up to 150' between supports.

#14 Stranded (7x22) Copper-Clad /ft



Stronger than #14 hard-drawn. A bit harder to work with. Use when heavy weather is a factor. See VariFlex #14 below.

SPECIAL ANTENNA WIRES

#13 VariFlex Insulated (19 strand) /ft



#13 copper-clad steel. Extremely tough jacket over a very flexible wire. Combination is about as stiff as hard-drawn 7-strand wire. Use whenever a very strong insulated wire is desired, in trees, for example. This wire is resistant to acid rain and corrosive contaminants in the air. Copper-clad steel wire.

#26 VariFlex Insulated (19 strand) CW /ft



Insulated with a thin, tough, black, polyethylene jacket. This wire is made specifically for hidden antennas. It is extremely strong for its very small size. Use sky colored buttons for insulators, and an antenna made of this wire is nearly impossible to see in the air.

Flex-Weave™ is a revolutionary hybrid antenna wire. It is strong, doesn't kink or rust. It is available in bare and insulated versions. Jacket is a high grade polymer PVC or PE. The bare and PVC insulated versions are amazingly flexible. This virtually kink-free wire can be tied into a knot (just like rope) at the insulators. This size is excellent for quads, wire beams, dipoles, and long wires.



Bare Copper

#14 168-strand, bare per foot

#12 259-strand, bare per foot

100% copper rope-type construction for strength, ultra-flexibility, and easy handling.



PVC or Polyethylene Insulated

#14 168-strand PVC Insulated. /ft

#12 259-strand PVC Insulated. /ft

Jacket is a high grade polymer PVC. Color is black.

#14 168-strand PE Insulated.

#12 259-strand PE Insulated. /ft

Jacket is a tough quality .015" slick **black polyethylene**. It's very tough. Perfect for heavy weather. Polyethylene insulation is not as flexible as PVC.

GROUND BRAID



For ground systems. Much more effective than any heavy gauge wire. Tinned for long life.

1/2" Tinned Copper Braid (CMA approx. 9600) /ft

1" Tinned Copper Braid (CMA approx. 20,800) /ft

2" Solid Copper Strap .020" thick /ft

.020" x 2" Soft Copper strap is easily bendable. Strap ground rods together. Solder ground wires from each piece of equipment directly to this low inductance strap. Makes a low impedance ground. Most ground strap is only .010" thick or less. This is twice as heavy.

Ground Strap



For connecting ground wires to ground stakes.

Ladder Line

This new, stranded, heavy-duty, poly-coated, window-type, Ladder-Line has become the new standard, replacing the old type made with #18 solid wire. Power rating far exceeds the legal limit.

#16 stranded, copper-clad conductors, actual impedance is approx. 420-ohms



#14 stranded, copper-clad conductors, actual impedance is approx. 390-ohms

10-99'
100' - 999'
1000' Spool

10-99'
100' - 999'
1000' Spool

Rotator Disconnect



Makes rotator installations easy. Pre-wire the rotator with a plug and jack assembly. No need to try to wire your rotator while on your tower. We use simple 8 pin trailer-type plug and jacks that splice into your rotator line.



Rotator Cable

R1 2 X #18, 6 x #22

Sold in 50-foot increments

R2 2 X #16, 6 x #18

Sold in 50-foot increments

Prices and specifications are subject to change without notice.

The RADIO WORKS 1-800-280-8327 <http://www.radioworks.com>

RF Connectors - Top Quality , Low Prices

 PL-259 Silver/Teflon	 PL-259 Gold/Teflon Currently Unavailable	 For RG-8X, RG-59 UG-176 Nickel	 For RG-8X, RG-59 UG-176S Silver	 For RG-8X, RG-59 UG-176G Gold Currently Unavailable	 For RG-58 UG-175 Nickel	 For RG-58 UG-175S Silver	 UHF T M-359
 #406 Bulkhead 2" UG-363	 Bulkhead 4"	 Bulkhead 6"	 #408 PL-258 Barrell	 #407 SO-239 4-hole	 #407S SO-239S Silver-Teflon	 #409 SO-239 Single-hole	 #410 UHF DM
 #303 UHF/BNC UG-273	 #904 UHF/RCA	 #925 UHF/TNC	 #876 UHF(f)/N(f)	 #611 UHF/N UG-83		 #1573 SMA/UHF	 #1578 SMA/BNC
 #601 N Nickel	 #601S N Silver Teflon	 #663 N Nickel for 9913	 #665 N Silver for 9913	 Assembles like a PL-259 RG-8X, 213, 9913 N-200 Silver Teflon	 #609 N/UHF UG-146	 #610 N 'L' UG-27	 #613 N/BNC UG-201
 #603 N chassis 4-hole	 #604 N DM UG-57	 #605 N DF UG-29	 #614 N 'T' UG-107	 #721 N/TNC			

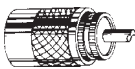
Prices and specifications are subject to change without notice.

Top Quality, Lowest Prices

RF Connectors

 #308 BNC 4-hole Chassis	 #304 BNC SH Chassis	 #305 BNC DF UG-914	 #307 BNC 'L' UG-306	 #309 BNC 'T' UG-247	 #319 BNC 3F	 #310 BNC DM UG-491	 #306 BNC/UHF UG-255
 #612 BNC/N UG-349	 #903A BNC/RCA	 #901 RCA/BNC	 #421 RCA/UHF	 #714 TNC/BNC	 #723 TNC/UHF		

100 foot RG-8X with connectors



PL-259

Silver & Teflon
Gold & Teflon

Bag of 20
Currently Unavailable - Call



Top Quality RG-8X
2 PL-259s installed
Molded-on strain-relief
Unbeatable price

Prices and specifications are subject to change without notice.

The RADIO WORKS 1-800-280-8327 <http://www.radioworks.com>

Antenna Support Line

Synthetic Rope Characteristics Man-made fiber ropes are stronger and more durable than those made of natural fibers. Most chemicals, rot, or mildew do not affect synthetic rope. Most synthetic rope may be stored wet or dry.

NYLON Nylon is highly elastic and can absorb sudden shock loads that would break ropes of other fibers. It has very good resistance to abrasion, rot, oils, gasoline, grease, marine growth and most chemicals. Nylon deteriorates more rapidly than Polyester when subjected to direct sunlight. Due to the characteristic stretch of nylon, wire antenna installations will require frequent retensioning of the support ropes.

POLYESTER (i.e., Dacron®) Dacron® Polyester is not quite as strong as nylon, but has far better resistance to ultraviolet degradation from sunlight. It is not as elastic as nylon and therefore does not stretch as much as nylon. These characteristics are a plus in an antenna support rope. Other than these two distinctions, the nylon and polyester characteristics are practically the same.

POLYPROPYLENE This is a strong, lightweight rope. It is waterproof, and resistant to rot, oils, gasoline and most chemicals. Polypropylene is subject to rapid deterioration when exposed to direct sunlight, so its life is very short when used as an antenna support rope.

POLYETHYLENE Polyethylene is similar to Polypropylene, but is slightly heavier. It is not as strong. It, too, deteriorates quickly in direct sunlight.

Our *new 3/8" single-braid Dacron* line is perfect for running through trees. We have found that it lasts better than the 5/16" double-braid we used to sell. This line is very substantial and cannot be used to hold the antenna in the air directly. It is too strong and will break the antenna wire in high winds and it is too large to fit through the holes in the end insulators.

KEVLAR®

By weight, Kevlar® is stronger than steel. This is the material used in 'bulletproof vests.' The molecular structure is such that it does not stretch and this characteristic makes it perfect for many antenna applications (boom and element support in beams, and general antenna use). Without a protective jacket, it deteriorates rapidly in sunlight. To counter this problem, Kevlar rope, meant for out-of-doors use, has a protective outer jacket made of Dacron® Polyester. The combination results in an incredibly strong, stretchless, long life rope. *Remember, Kevlar does not stretch. take this into account when using it with wire antennas in trees.*



KEVLAR®

The Vertical Antenna Support Line

Our Kevlar line is perfect for guying vertical antennas. It is strong (500 pound test), is made to endure severe weather and the devastating UV effects of the sun. Most importantly, Kevlar line DOES NOT STRETCH. You don't have to keep readjusting the length of the guys.

We recommend guying all verticals. One set of guys will dramatically increase the survivability of the antenna in heavy weather. If the vertical antenna is over 25 feet tall, you might want to consider using two or more sets of guys. Follow the antenna's instructions for guying. If instructions are not included with your antenna, you can just tie our Kevlar line to any appropriate point on the antenna. Kevlar line is nonconductive.

Do not use this Kevlar line to guy towers.

Mil Spec

Specification

	Mil Spec Dacron®	Double Braided Dacron®	New Mil Spec Dacron®	New Kevlar® + Dacron®	New Kevlar® + Dacron®
Size	#5 (3/16")	3/16"	3/8"	.075"	1/8"
Static Test Weight, pounds	750	770	2000+	500	770
Max working load, pounds	140	150	400	120	150
Color	Olive Drab	Black	Olive Drab	Black	Black
Abrasion resistance	Excellent	Excellent	Excellent	Excellent	Excellent
Initial stretch	Good	Good	Good	None	None
Insulation properties	Very high	Very high	Very high	Very high	Very high
Maximum length	3000 feet *	500 feet	500 feet	200 feet **	500 feet

Price per 100' hank

Spool Price

* 3000 foot spools of Mil Spec Dacron may not be continuous.

Full spools may have one or two splices.

** Available only in 200 foot spools You may order up to the spool length in continuous length. i.e 400' hank

Compared with Nylon, Dacron polyester is a far longer lasting and durable antenna support line.

Prices and specifications are subject to change without notice.

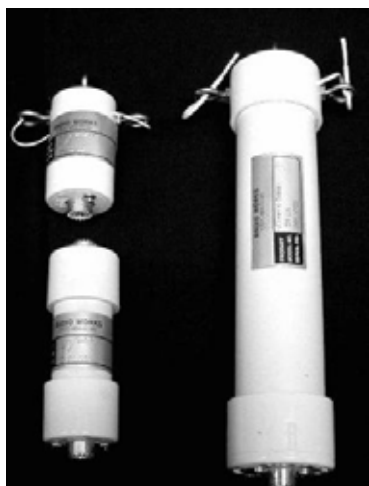


Rope Grip™

The Rope Grip™ works perfectly with our 3/16" Double-braid line. The Rope Grip™ is great for adjusting the tension on your antenna support lines. The harder the rope pulls, the harder the Rope Grip™ grips.

Note: Rope Grip™ does not work well with our Mil Spec rope. The single diamond weave type is not compatible.

All rope is factory fresh



The **most important center insulator** in any antenna, i.e. dipole, sloper, etc., is a **quality Current balun**. We build the best current baluns, and each has the needed stainless steel wire strain relief eyebolts and center support eyebolt. No other center-insulator is needed.



#6 16C
Ceramic Dogbone Insulator



NEW
Ceramic Strain Insulators
17A01, ceramic strain insulator for a 3/16" wire. It has a 5/16" hole with 2-5/16" length and 1-3/8" dia.

17B01, ceramic strain insulator for a 1/4" wire. It has a 5/8" hole with 3-1/2" length 2-1/2" diameter.

Insulators



End-Insulators

#1 - 6" Universal

Works as a strain insulator or conventional end-insulators. Ribs are spiral cut for winding loading coils, etc. Black plastic.

#2 - Plastic Strain

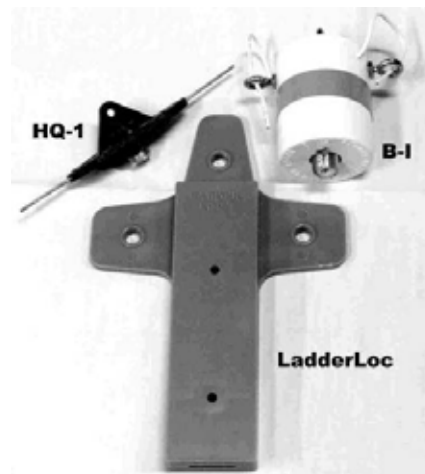
These inexpensive plastic strain insulators are great for any light-duty project. They are not suitable for tower guying, but are OK for masts, verticals, etc. We use them on wire antennas, because you can install them in the middle of a wire without removing the end-insulators.

#3 - HQ-2

The HQ-2 end-insulator is made by the same manufacturer as the HQ-1 center-insulator. These are only about 1 1/2" long. Yet, with its deep ribs, the leakage path is nearly 6". They are glass-filled and nearly impossible to break.

#5 - Delta CIN

Rugged, UV resistant DELTALLOY. Long leakage path. This is the insulator we use in most of our antennas. That says it all!



Center-Insulators

HQ-1

The HQ-1 is a light weight but incredibly tough glass-filled ABS plastic center-insulator. A built-in drip-lip over the SO-239 connector helps weatherproof the connector. They are perfect for any type wire antenna that does not require a balun at the feedpoint.

RADIO WORKS' B-I

Top quality conventional center insulator made just like our baluns. #14 insulated wire are brought directly outside the case for soldering to your antenna to avoid any chance of failure so prevalent with screw and nut compression connectors. Stainless steel hardware. You can't build a more reliable center insulator.

Ladder-Loc

If you use ladder line, this is the correct center insulator for your project. It properly supports and strain relieves ladder line for the longest possible life.

Full instructions are included. 9" x 6"

ORDER BY FAX

(757) 483-1873

ORDER BY Telephone

1-800-280-8327 orders only

Product information email

jim@radioworks.com

I'll answer as quickly as possible, but I'm often away from the office, so delays are possible.

ORDER BY MAIL

Mail all orders to:
The RADIO WORKS
Box 6159
Portsmouth, VA. 23703

GUARANTEES

Manufacturer's warranties prevail.

If any RADIO WORKS' product proves to be defective, the defective part will be repaired or replaced, at our option, if returned in original condition within 30 days. Since we have no control over individual product usage or installation, products that fail due to excessive power operation, improper use or installation are not eligible under this guarantee.

Please see our web site at www.radioworks.com for further information concerning Back Orders, Returns, shipping and other information, and the latest pricing.

GUIDE TO SHIPPING COST

Antennas and wire are heavy items. Here is a guide to help estimate shipping charges. Consider the distance and weight when estimating shipping cost.

Minimum S&H is \$10.

As a general guide, on orders approaching \$100, add 15% S&H. If you are ordering heavy items, such as coaxial cable and large quantities of wire, allow for the extra weight. **YOU WILL BE CREDITED FOR ANY OVERAGE.**

PAYMENT

Visa and Master Charge, Money Orders, Bank Checks, and personal checks.

Allow 10 days for personal checks to clear. Allow travel time for your letter to reach us and the shipment to return. The handling charge is \$3.

Prices and specifications are subject to change without notice.

The RADIO WORKS 1-800-280-8327 <http://www.radioworks.com>

The RADIO WORKS stocks and builds many more products than we could fit into this catalog. Please visit our website at www.radioworks.com for additional products and expanded information. In this volatile metal and petroleum market, prices are subject to change quickly and sometimes, dramatically. For the latest prices and information, please consult our web site.

You asked for them.
We have them -
The correct pulleys for
antenna support rope.



Micro Block

Sheave diameter = .875"
Line size = 3/16" & 1/4"
Breaking strength = 1200 #
Shackle pin dia = 3/16"
Length = 1.5"
2 3/8" with swivel
Max Working Load = 200 #
Ball bearings

Tough Delrin sheave is UV stabilized for years of trouble-free service.

Stainless Steel Pulleys



Bullet Block

Sheave diameter = 1.125"
Max line size = 5/16"
Breaking strength = 2000 #
Shackle pin dia = 3/16"
Length = 2"
2 3/4" with swivel
Max Working Load = 300 #
Roller bearings

Tough Delrin sheave is UV stabilized for years of trouble-free service.



Big Bullet Block

Sheave diameter = 1.5"
Line size = 5/16" & 3/8"
Breaking strength = 2000 #
Length = 2.5"
Max Working Load = 300 #

Large diameter sheave with low turning friction.
Tough Delrin sheave is UV stabilized for years of trouble-free service.

I have suggested using high quality marine "Sailboat" pulleys in several of my publications. This type pulley is precision made so that there is little space between the sheave and sides of the pulley. Unlike hardware store pulleys, it's impossible for the rope to jam by rolling off the sheave.

Since pulleys of this type are almost impossible to find in most areas of the country, I have selected five different models which are well suited for use with the high quality antenna support rope that we sell. They are manufactured by one of the preeminent makers of sailboat rigging.

I recommend using the "swivel" pulleys because they do not twist your antenna wire if the rope twists under tension (which often happens). It's a must for loops.

General Features

Ball bearings carry both the line load and prevent sheave from rubbing on the cheeks of the block.

Roller bearings permit maximum loads in a small pulley.

All pulleys have stainless side plates to properly distribute loads.

Delrin™ and aluminum sheaves provide the strength, endurance and chemical resistance required by marine applications and harsh environments.

Do not use with wire or Kevlar line.

Important - These pulleys are designed specifically to protect soft support ropes. These are not the correct pulleys for use with wire or Kevlar.

Prices and specifications are subject to change without notice.