

COVER SHEET ALPHA DELTA MULTI-BAND DIPOLES; Models DX-CC, DX-DD, DX-EE, DX-LB, DX-LB PLUS

Power ratings; MAX output (Assuming SWR at the FEED POINT, not tuner, is 2:1 or less). Alpha Delta tests antennas, in the clear (no surrounding objects), at a height of 35 ft., as an inverted-V with the ends at 10 ft. above ground. Approximate SWRs at 1.5:1, or less, and resonances at our test site, depending on antenna model, are: 1810 kHz, 3800 kHz, 7100 kHz, 14,150 kHz, 28,300, (Use your tuner for 15 meters). With different local site conditions your SWR and resonant frequency will vary, which is normal.

- Model DX-CC:** 80 thru 10 meters, 1000 watts CW/PEP, ICAS duty cycle.
- Model DX-DD:** same for 80 and 40 meters as Model DX-CC.
- Model DX-EE:** 40 thru 10 meters, 1000 watts CW/PEP, ICAS duty cycle.
- Model DX-LB:** 160, 80 meters, 600 watts CW/PEP; 40 meters, 1000 watts CW/PEP, ICAS duty cycle.
- Model DX-LB PLUS:** same as above for 160 and 80 meters, and same as Model DX-CC on 40 thru 10 meters.

IMPORTANT NOTE: All models shown above are limited to 250 watts RF output for continuous key down modes like RTTY to prevent overheating of components.

NOTE: With any **attic installation**, limit power to 100 watts max, any mode. This will minimize coupling to attic wiring, HVAC ducting and outside aluminum gutters and will minimize RFI to home electronics and burglar alarm systems. In your individual site, even lower power may be necessary. Attic installations will require a wide range (10:1) antenna tuner to minimize SWR and broaden out SWR bandwidth. Keep antenna wires as far away as possible (> 3 ft.) from the above metal items, and NEVER touching them. Also offset (> 2 ft.) antenna wires from any wood roof/attic trusses or roof material so they are not in direct contact.

NOTE: Our tests show that the "open coil" design of our ISO-RES (tm) (Isolator/Resonator) coils are the most efficient designs for multi-band operation, and approach mono-band performance. Typical "trap" designs, where the coils are enclosed in a metal or sealed housing, do not show this efficiency and, in fact, can show significant losses depending upon the trap design. The ISO- RES (tm) coils have a UV protective dip on them and require no further coating. Also, remove any bubble wrap or packing material from the coils before installing. Do not apply any other material over them as this will affect the tuning and efficiency. With the "open coil" design it is NORMAL for the frequency to shift with rain, snow or conditions of high humidity. Just re-adjust your tuner until dry again. This is a small inconvenience to maintain this high efficiency design.

NOTE: Alpha Delta antennas are designed to be used without a balun. Tests show that HF antennas installed less than 1/2 wavelength high (e.g., less than 60 ft. high on 40 meters.) have earth capacity coupling which tends to "even out" the pattern. If you have problems with RF on the coax, just wind about 8 turns of your coax at about an 8" diameter, tape, and install near the feed point of the antenna. Try to make the windings as in-line as possible, and not "scrambled", for best results. This is a "choke balun".

NOTE: In conditions utilizing an antenna tuner to compensate for FEED POINT (not tuner) SWRs over 2:1, such as tuning wide ranges of 80 meters, attic installations, less than ideal installations causing high SWRs or using high power with high SWRs, the Model SEP static protector MUST be removed from the Model DELTA-C center insulator to prevent "false triggering" of the device. The antenna will operate normally without it.

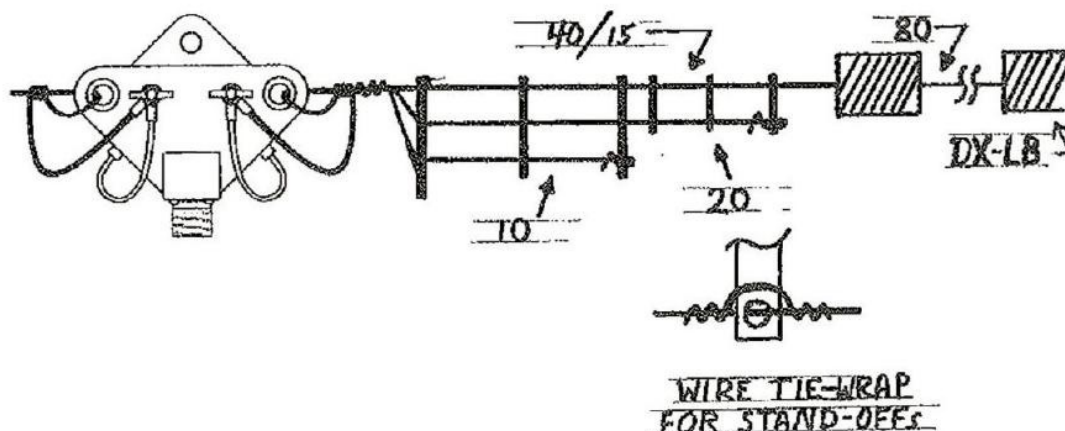
NOTE: Antennas have not been tested with ladder (open line) and we have no details on such installations. If ladder line is used, the SEP static voltage module (on DX-CC, DD, EE) on the rear of the DELTA-C center insulator will need to be removed to prevent "false triggering" as it is designed for 50 ohms.

NOTE: For inverted-V configurations, the "Included Angle" across the center feed point, from one wire to the other, **MUST** be 90 degrees or wider for proper tuning. This is front view. Sharp V angles will cause coupling from one wire to the other and cause high SWR readings. Also, no part of the wires, even the ends, should be closer than 20 ft. from roof tops, gutters or any surrounding metal objects.

Multi-Band Wire Dipole Instruction Sheets for Models:

- **DX-CC** 80/40/20/15/10 meter parallel dipole, 82 ft. Overall
- **DX-DD** 80/40 meter single wire dipole, 82 ft. Overall
- **DX-EE** 40/20/15/10 meter parallel dipole, 40 ft. Overall
- **DX-LB** 160/80/40 meter single wire dipole, 100 ft. Overall
- **DX-LB Plus** Same as Model DX-LB above, but adds 20-10 meters with parallel wires.

Alpha Delta HF wire dipoles are precision made products, manufactured in the U.S.A in our ISO-9001 certified facility for the highest quality possible. Due to the design of the ISO-RES inductor coils (not traditional lossy traps), the efficiency of the antennas is outstanding and they are used worldwide with great DX results around the globe! Stainless steel hardware and insulated high tensile strength solid copper 12 ga. wire is used to withstand the most severe environments. When you put it up, it **STAYS** up!



Models DX-CC, DX-DD and DX-EE employ Model SEP gas tube static discharge modules for added safety. They are not used in models DX-LB and LB Plus, since these antennas are used with wide range tuners that have wide SWR voltage swings which could "false trigger" the Model SEP.

CAUTION! CAUTION! CAUTION! Never install antennas near power lines or drop lines as contact with these lines is DANGEROUS and could cause bodily injury or death! Think SAFETY!

Any HF antenna should be installed in the "clear", away from surrounding objects (metal objects or roof tops) which could de-tune the antenna and impair performance. Any antenna wire should not be closer than 4-6 ft. from any tree, branch or limb (yes, they will de-tune an antenna). Clearance should be at least 20 ft. from any metal objects or roof tops. Our test height is 35 ft., "in the clear" but lower heights can be useable depending on the installation site and terrain. Specific SWR bandwidths for each model and each band are a function of the installation "site" conditions, except as noted in the instruction sets below.

BE SURE to read the attached document "Problem Solvers for Wire Antenna Installations" before installing your antenna. Also, read the sheet "Alpha Delta Model DELTA-C Antenna Hardware Kit" for information on the operation of the Model SEP gas tube static protector. Although the sheet was written for the "kit", the information applies to the assembled antennas as well. Balanced feed line can be used with the antennas, but the SEP must be removed to prevent "false triggering" of the gas tube.

INSTALLATION and ASSEMBLY INSTRUCTIONS

Refer to the graphic drawings when assembling any model, as they apply to all models, with specific differences noted for the individual model instructions. All models are designed to be used with 50 ohm coax cable. No balun is required for proper operation. The antennas are rated for 1 kW SSB/CW output, assuming a FEEDPOINT SWR of 2:1 or less.

The first spacer stand-off on Models DX-CC, EE, LB Plus should be spaced out about 12 in. from the DELTA-C center insulator, on each side of the antenna. Evenly space the remainder stand-offs.

If RF on the coax is a problem, simply wind a “choke balun” with the coax that’s used for your feed line. Wind approx 8 turns, at about an 8 inch diameter and tape (with outdoor rated black electrical tape), like a donut, and place this “donut” near the feedpoint of the antenna. You should leave about 2 ft. of your coax sticking out of this “donut” for connection to the antenna. Then attach the end of your coax to the antenna connector on the DELTA-C center insulator, with the coax connector that is already on your feed line. Secure this “donut” to the mast or support to provide strain relief for the coax connector on the Model DELTA-C center insulator.

The ISO-RES coils have been coated with a special UV light block polymer and require no further coating. However, be sure to remove any packing material around them.

• Model DX-DD

1. Unroll the wire elements, removing any kinks that may have been induced in packaging.
2. This antenna is a single wire dipole (each side approx 41 ft. long) covering 80 and 40 meters. It does not use parallel wires, and is essentially the “top wire” of the antenna shown in the drawing.
3. Since it is a shortened HI-Q antenna on 80 meters, it has a narrow SWR bandwidth of about 65-70 kHz. Do an SWR “run” about every 20 kHz to determine where the minimum is. Then, it can be adjusted to your desired frequency with the “end” wires which go from the coils to the end insulators, or be used with a wide range antenna tuner. Check for the resonant point first, before trimming.
4. The 80 meter wire sections can be shortened (to raise the resonant freq) by pulling them through the end insulators and twisting them back on themselves like a “bread wrapper tie”. About 6 inches will move the freq from about 3700 kHz into the 3900 range. Based on your installation site, it may be a different amount. They do not need to be cut. 40 meter bandwidth is quite broad and requires little, or no tuning. You will find an efficient

wide range antenna tuner is a very handy device to broaden out the bandwidth of an antenna.

- **Model DX-CC**

1. Unroll the wire elements, removing any kinks that may have been induced in packaging.
2. At each side of the center insulator you will find 3 wires: (A.) The 80/40/15 meter wire with an ISO-RES coil and 3 long and 3 short stand-offs installed. It is approx 41 ft. long. (B.) The 20 meter wire, approx 16 ft. long. (C.) The 10 meter wire, approx 8 ft. Long.

3. With the antenna wires laid out on the ground, fully extended, run the 20 and 10 meter wires through the stand-offs as shown in the graphic with the 20 meter wires running through the center holes of the 3 long stand-offs, and the bottom holes of the 3 short stand-offs. The end of the 20 meter wire should be twisted back on itself (about 2 inches) through, and around the last short stand-off for proper support.
The 10 meter wires run through the bottom holes of the 3 long stand-offs, as shown. The end of the 10 meter wire should be twisted back on itself (about 2 inches) through, and around the last long stand-off.

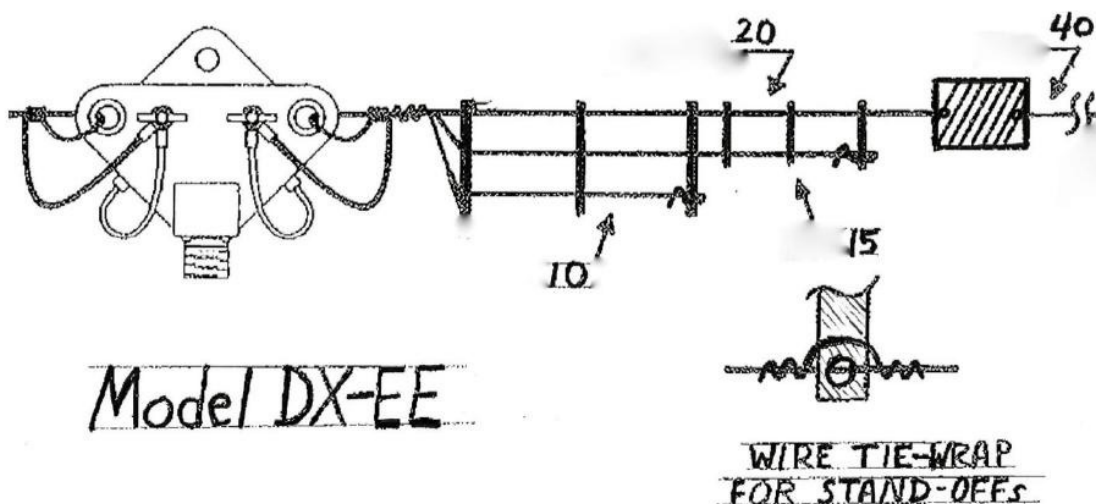
All of the stand-offs should be spaced as equally as possible for best support. When all the wires and stand-offs have been positioned properly, tightly wrap wire-ties around the top and bottom of each stand-off and antenna wire to prevent movement. For the wire-ties, cut approx 6 inch lengths from the 12 ft. coil of wire provided. See the graphic for example.
4. For 80 meter tuning and operation, see para. 3 and 4 for the Model DX-DD antenna. The same information applies to the Model DX-CC.
5. It should be noted that there is no separate tuning or adjustments for 15 meters. This band operates as a third harmonic from the 40 meter section. As a result of this design, there is usually an upward shift of resonance on 15 meters, instead of the usual mathematical "times 3". Since there is no

adjustment for this band, just use an antenna tuner to adjust to resonance. The efficiency is not impaired.

Model DX-EE

1. Unroll the DX-EE wire elements, removing any kinks that may have been induced during the packaging operation.
2. At *each* side of the DELTA-C center insulator, you will find 3 wires:
 - (A.) The 40/20 meter wire with an ISO-RES inductor and 3 long and 2 short stand-off insulators (not 3 as shown on the graphic). This wire is approx 20 ft. Long.
 - (B.) The 15 meter wire, approx 11 ft. Long.
 - (C.) The 10 meter wire, approx 8 ft. Long.
3. In the case of the Model DX-EE, and referring to the graphic, the "top wire" and coil of the DX-EE is for 20 and 40 meters. The length from the center insulator to the coil tunes 20 meters and the length from the coil to the end insulator tunes 40 meters. The "middle wire" tunes 15 meters and the "bottom wire" tunes 10 meters.

With the antenna wires laid out on the ground in a fully extended condition, run the 15 and 10 meters through the stand-offs, with the 15 meter wires running through the center holes of the 3 long stand-offs and the bottom holes of the 2 short stand-offs. The end of the 15 meter wire should be run through, and around the last stand-off and twisted back on itself (about 2 inches) for



support. The 10 meter wire is run through the bottom holes of the 3 long stand-offs. The end of the 10 meter wire should be run through, and around the last long stand-off and twisted back on itself (about 2 inches) for support.

4. All of the stand-offs should be spaced as equally as possible along the wires for the best support. When all the stand-offs and wires have been positioned properly, tightly wrap wire-ties around the top and bottom of each stand-off and antenna wire to prevent movement. See the example in the graphic. For the wire-ties, cut approx 6 in. lengths from the 12 ft. coil of wire provided.

Since the Model DX-EE is a shortened HI-Q antenna on 40 meters, it has a narrow SWR bandwidth of about 50-60 kHz. The 40 meter sections can be shortened to the SSB section of the band by pulling the wires through the end insulators an additional 3 inches each side, and twisted back on themselves. This length will vary due to the installation site, so check the SWR resonance first. The wires don't have to be cut. Then, a wide range antenna tuner should be employed to broaden out its bandwidth.

- **Model DX-LB and LB Plus**

1. The Model DX-LB antenna is the same as the Model DX-DD, but with the addition of an extra coil and extender wire for 160 meters. Read the information on the Model DX-DD instruction set. The antenna is greatly shortened on 160 meters (100 ft. Vs. 260 ft.) and its SWR bandwidth is about 20 kHz. It can be trimmed to your section of the band or used with a wide range antenna tuner to broaden it out. However, its efficiency is excellent and we have had many reports of good DX being worked on 160 meters. For this band, install the antenna as high as possible, greater than 40 ft., for best results. Due to the extra coil, the SWR bandwidth on 80 meters is narrowed to about 40 kHz and a tuner should be employed.
2. The Model DX-LB Plus is the same as the Model DX-LB but with the addition of parallel wires for 20-10 meters. For assembly of these wires, follow the instruction set for the Model DX-CC, since they are the same. Also, read the information for the Model DX-DD and the information for the basic Model DX-LB. These instruction sets will provide information for assembly and operation for the bands 160-10 meters.

ALPHA DELTA Model DELTA-C Antenna Hardware Kit

This kit contains 1 DELTA-C Center Insulator, antenna connecting hardware, 1 Model SEP Arc-Plug™ static Electricity Protector (installed on the back of the Delta-C) and 2 Model DELTA-CIN End Insulators.

DELTA-C components are molded of high impact UV and RF resistant material called DELTALLOY™. It is tough and practically indestructible. Only stainless steel is used for exposed hardware.

For proper installation, feed the antenna wire through the strain relief holes on each side of the DELTA-C Center Insulator, wrap it back on itself approximately 3-5 turns, then route the end of the antenna wire to the solder lug on each set of connection hardware.

A small loop may be formed from the wrap to lug to relieve tension. See Fig. 1 for suggested connection method (be sure to reinstall the hardware in the same sequence as provided – washers, nuts, etc. and do not over tighten the wing nuts).

Approximate antenna lengths can be determined for 1/2 wavelength antennas (necessary when feeding in the center with coax cable) by using the formula:

$$\text{Length (feet)} = \frac{468}{\text{Frequency (in MHz)}}$$

Some typical antenna lengths (overall total for both sides of dipole) are listed in table 1. (See fig. 2).

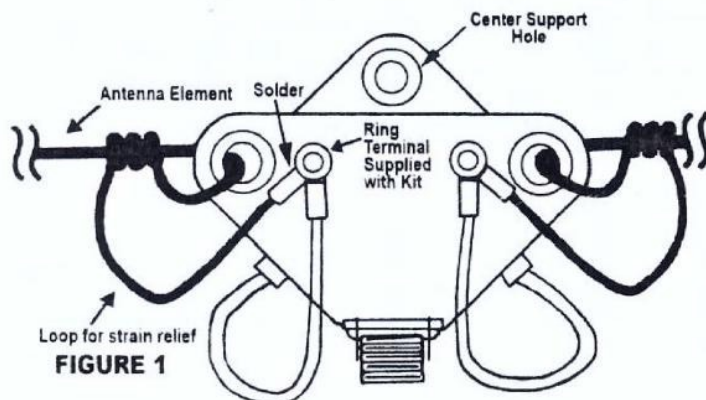


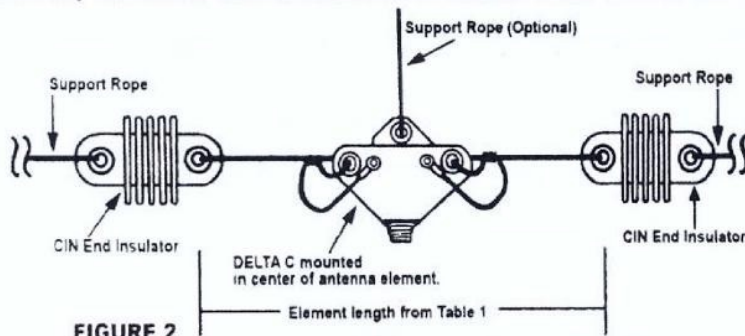
TABLE 1
1/2 Wave overall lengths (approximations)

Amateur Bands	Shortwave Broadcast Bands
160 Meters- 260 ft.	120 Meters- 195 ft.
80 Meters- 126 ft.	90 Meters- 142 ft.
40 Meters- 66 ft.	75 Meters- 120 ft.
30 Meters- 46 ft.	60 Meters- 98 ft.
20 Meters- 33 ft.	49 Meters- 79 ft.
17 Meters- 26 ft.	41 Meters- 63 ft.
15 Meters- 22 ft.	31 Meters- 51 ft.
12 Meters- 19 ft.	25 Meters- 40 ft.
10 Meters- 16.5 ft.	22 Meters- 34 ft.
	19 Meters- 30 ft.
	16 Meters- 27 ft.
	15 Meters- 25 ft.
	13 Meters- 22 ft.

Model SEP Arc-Plug® Static Electricity Protector is a special gas tube component designed to "bleed off" slow rising static electricity build-up of the kind generated by thunderstorms, high wind driven snow or sand or by a harmless looking cloudy day. These static charges have been measured to several thousand volts and can damage or destroy sensitive components in receiver or transceiver front end circuitry.

For proper operation of the Protector, it will be necessary to ground the coax shield at the entrance to the building. Your station may already meet these requirements if your coax shield circuitry is grounded to a ground bus, bulkhead, strap, braid or ground rod through the connector on your coax. If the Model SEP protector takes a strong surge "hit" beyond its rating, it is designed to fail "shorted" to indicate the need for replacement. This will be indicated by a large increase in VSWR, or a "dead" receiver since the antenna will be shorted to ground at the Center Insulator. Your equipment will still be protected until removal or replacement.

To remove the Model SEP Protector, simply remove the antenna connection hardware and remove the SEP which is installed in the cavity on the back of the Model DELTA-C Center Insulator. Reinstall the hardware in the same sequence as provided.



When using the DELTA-C for high power transmitting it may be necessary to remove the SEP Cartridge when VSWR exceeds 2:1.

Also, to assure the maximum protection of your sensitive equipment from lightning/EMP induced surges, we recommend the use of our Alpha Delta Transi-Trap Surge Protector at the point where the feedline enters the building.