

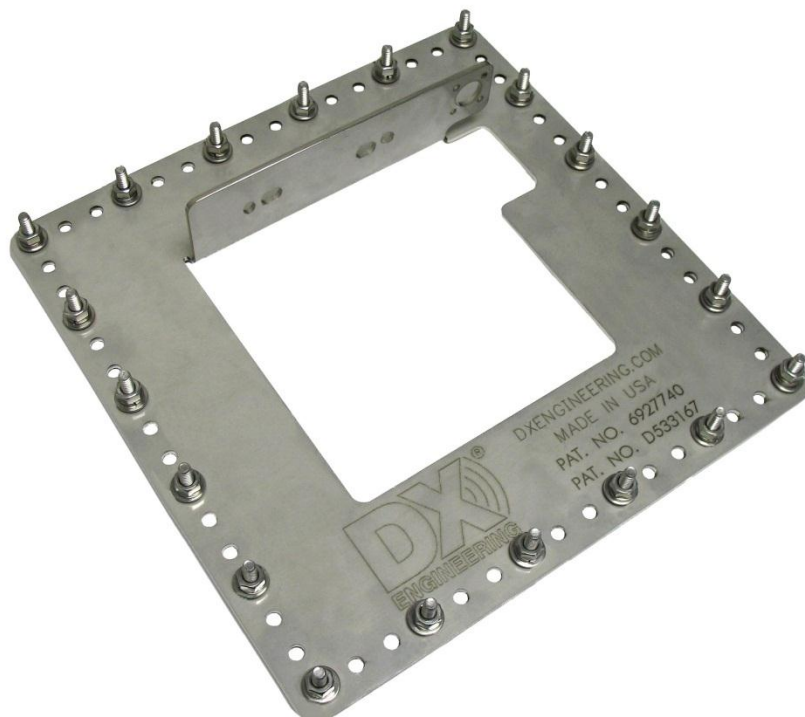


Radial Plate

DXE-RADP-3

Installation Guide

DXE-RADP-3-INS-Rev 0c
U.S. Patent Nos. 6,927,740 and D533,167



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Introduction

The patented **DXE-RADP-3** Radial Plate is made of 0.125 inch thick, laser cut 304 Stainless Steel. Outside dimensions are 11-5/8" x 11-5/8"; with an inside open area of 6" x 6". The plate has 60 laser drilled holes for attaching ground radial hardware, a built in bracket for attaching a V-Bolt Clamp for mounting, and laser cut holes for mounting a bulkhead SO-239 connector or a SO-239 feed through connection.

The DX Engineering Radial Plate is meant for those of you that have or are building a quarter wave vertical antenna and who want an easy, neat and effective way to connect those essential radial wires and the coax to your vertical antenna for the lowest takeoff angle and strongest signals.

This plate will work perfectly with the commercially available vertical antennas such as the Hustler® BTV series (4-BTV thru the 6-BTV), DX Engineering Vertical Antennas, or your very own home brew variety.

Advantages over the other plates on the market

First, the DX Engineering Radial Plate will attach easily and rigidly to a 4" x 4" or 6" x 6" wooden post using simple wood screws or a steel or aluminum pipe (up to 3" outside diameter) using a DX Engineering clamp, a fence post or whatever you have supporting your vertical. DX Engineering V-Bolt Clamps make it easy to attach the antenna and the Radial Plate to a vertical piece of 1-3/4" to 3" Outside Diameter (OD) galvanized steel pipe, which you have driven or cemented into the ground. For attaching to a 1/2" to 1-3/4" OD mounting pipe, the **DXE-CAV-11P** Stainless Steel V-Bolt Clamp. For attaching to a 1" to 2" OD mounting pipe, the **DXE-SSVC-2P** Stainless Steel V-Clamp, or the **DXE-CAVS-2P** Stainless Steel V-Bolt Clamp. The standard 1-1/2" galvanized water pipe (with its 1.9" OD) is just fine for this application and can usually be found at your local home building supply store. For mounting pipes between 2" and 3" OD, use the **DXE-SSVC-3P** Stainless Steel V-Clamp.

Second, this Radial Plate actually has a place where you can attach your coax. The Radial Plate assembly has been laser drilled for the readily available, optional SO-239 and Bulkhead Fittings. This is a MUST item for

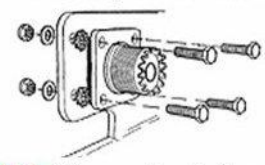


DXE-363-SST installed

proper handling of RF ground current! If you are going to be using a Hustler BTV or another brand of similar commercially available verticals, using this laser cut bulkhead connection hole is how to use a bulkhead fitting as a pass thru for your coax connection on the way to the antenna from the Radial Plate. This will ground your coax to the Radial Plate before it goes to the antenna.

If you are going to be using a home brew vertical antenna using aluminum tubing, then you should order the genuine Amphenol SO-239 complete with the correct Stainless Steel attaching hardware. Either the standard **DXE-83-1R-KIT** or the High Power Teflon® style **DXE-83-798-KIT**. Regardless of how you do it, it is *imperative* that your coax be grounded to the radials to complete the circuit for your radial current return for maximum performance.

Correct Hardware Assembly for SO-239



NOTE: Star washer between SO-239 and plate

DXE-83-1R,112-KIT or 798-KIT shown above

Third, the DX Engineering **RADP-3 Radial Plate** is laser cut from tough stainless steel so that it has smooth edges, won't corrode and will always look good. You will be proud of how good your installation looks.

Fourth, it is square. Why? Because a square has more lineal distance around it than the round plates you usually see. This allowed adequate spacing to put 60 holes in it; use larger bolts for more clamping power

and still not crowd them together. If you want to go all-out with 60 to 120 radials you will be able to put them on easily. Remember: The more current that flows in through your radials and then through this Radial Plate, the stronger your signal is going to be and the more DX stations that you are going to hear. So, put on as many radials as you can.

Fifth, DX Engineering supplies the correct Stainless Steel bolts, nuts, star washers, flat washers and lock washers to attach the radials. Since it's unknown how many radials that you want to attach (some experts suggest at least 32 radials) the first 20 sets of hardware are included with the plate. This means that with the supplied hardware that you can attach 20 radials or double them up and attach 40. If you want to attach more, order **DXE-RADP-1HWK** radial plate hardware kits.

Why a 1/4" bolts and not the *cheaper* #10 that others use? Because the 1/4" bolt has a lot more clamping force for the best connection possible. The Stainless Steel external star washers that are supplied have about twice the area of even the best star washers for the smaller bolts. You want the best connection that you can get here.

There are optional DX Engineering Radial Wire Kits available. The **DXE-RADW-500K/BD** contains a 500 foot spool of 14 gauge copper stranded wire with relaxed black PVC insulation, 20 Terminal Lugs and 100 Steel or Biodegradable Lawn Staples. The **DXE-RADW-1000K/BD** Radial Wire Kit contains a 1,000 foot spool of 14 gauge copper stranded wire with relaxed black PVC insulation, 40 Terminal Lugs and 200 Steel or Biodegradable Lawn Staples. The **RADW-20RT**, **-32RT** or **-65RT** contain sets of 20 radial wires with 1/4" terminals attached. These kits come in 20 Ft, 32 Ft, or 65Ft lengths.

Installation

The **DXE-RADP-3** kit includes:

1	Laser Cut Stainless Steel Radial Plate	20	1/4"-20 Stainless Steel Hex Nuts
20	1/4 -20 x 1" Stainless Steel Hex Head Bolts	20	1/4" Stainless Steel Split Lock Washers
20	1/4" Stainless Steel Flat Washers	20	1/4" Stainless Steel Star Washers

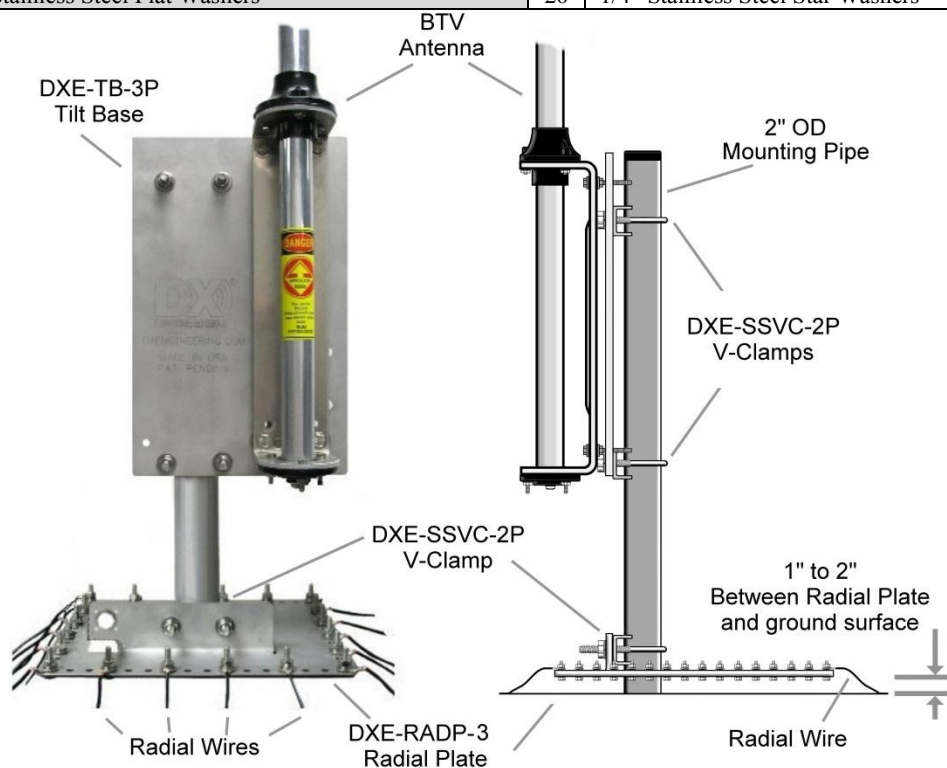
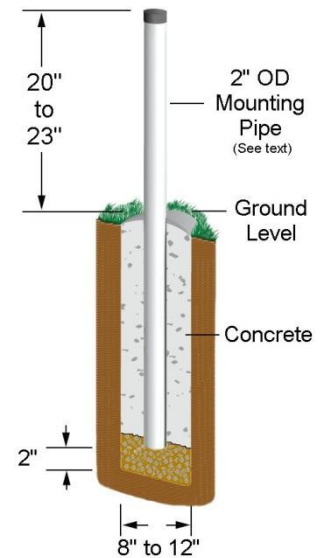


Figure 1: Completed assembly for Hustler® BTV (shown with optional BTV, DXE Clamps and DXE Tilt Plate)

Radial Plate Assembly to Pipe or Mast

Use a thick-walled galvanized steel mounting pipe *at least* 4 feet long. This will allow approximately 2 feet or more to be below ground and 2 feet above ground. Depending on the antenna you are installing, this height above ground may vary, check your antenna installation guide for details. A thick-walled steel pipe 1-3/4" OD to 3" OD **maximum** with a minimum thickness of 1/8" (1/4" preferred) should be used. 2" OD is recommended and the standard 1-1/2" galvanized water pipe (with its 1.9" OD) is just fine for this application and can usually be found at your local home building supply store. For permanent mounting, use a post-hole digger to make the hole deep enough to accommodate 2 feet of pipe and a couple inches of gravel at the bottom for drainage. Set the pipe on the gravel, use the pre-mix concrete to fill around the pipe, adding water and mixing as you fill or mix the concrete first, then pour in the hole (depending on the type of concrete obtained). Fill the hole until the concrete is level with the ground around it. Use a level as you fill the hole to be sure the pipe is straight. Allow to set overnight or longer depending on the type of concrete used. Your location, landscape and ground conditions may require different mounting solutions in order to have the mounting pipe and the vertical antenna in a secure position.



Note: *Galvanized steel, rather than aluminum, is much more suitable for mounting in concrete. Aluminum will quickly corrode due to incompatibility with the materials used to make concrete.*

Attach the Radial Plate to a metal mounting pipe or wooden post at the location you intend to use the antenna, making sure the unit is securely mounted. You need approximately 1" to 2" of clearance between the bottom of the Radial Plate and the ground to allow installation of radial wire hardware. If you are using an optional **DXE-TB-3P** or **4P** Tilt Base, allow approximately a 7" clearance from the Radial Plate surface to the bottom edge of the Tilt Base. Reference **Figure 1**.

Note: *The mounting hardware is not supplied. For best results, use one **DXE-SSVC-2P** V-Saddle Clamp for metal pipes from 1" to 2" OD or **DXE-CAVS-11P** for a metal pipe that is 1/2" to 1-3/4" OD or one **DXE-SSVC-3P** V-Saddle Clamp for metal pipes from 2" to 3" OD.*

Note: *You must use an anti-seize lubricant such as **UMI-81343** on all stainless hardware to prevent galling of the stainless steel threads.*

Ground Radials

The following procedure describes installation of radials onto the surface of the ground over an existing lawn. You may encounter installation in undeveloped ground, weeds, woods, and even sand. You will have to adapt your particular installation to your surroundings. Radial wires may also be buried up to 6" depending on local ground type and landscaping requirements.

Installing Ground Radials on Existing Lawn

The best time to do this is early spring but it can be done other times, as well. The idea behind this is to get the grass on your lawn to grow over the radials and protect them from the mower.



First, mow the grass pretty short in the areas where you will be laying

the radials down. Notice we didn't say "scalp" it. Just lower the mower until the grass is about 1 inch long after cutting. Readjust the height of the mower back to normal and put it away.

Next, connect the radials to the Radial Plate with wire terminal ends and stretch them out evenly around the antenna. Some AM broadcast engineers tell us that the radials should be as long as you can make them up to about 1/2-wavelength. If you can only do 1/4 or 1/8-wavelength in certain directions then do that and don't worry about it. You will be surprised how much better your vertical will work. After you install a few radials and see how much better your antenna performs you will have an urge to put in more of them. Don't resist, more really is better. (Note: the photos shown have red wire for picture clarity. The DX Engineering Bulk Radial Wire is black).



Starting from the antenna end of the radials, and about every 3 to 4 feet, hold the wire down with a radial wire anchor pin while pulling the radial out from the antenna to keep it taut. Push it in as far as possible to get the wire as close to the grass roots as possible. You can use a rubber mallet to drive it home. If the radial wire is sticking up any place due to uneven ground or the wire is loose just put another staple there. The idea is to get all parts of the wire down as close as possible to the ground so that the grass will grow over it.

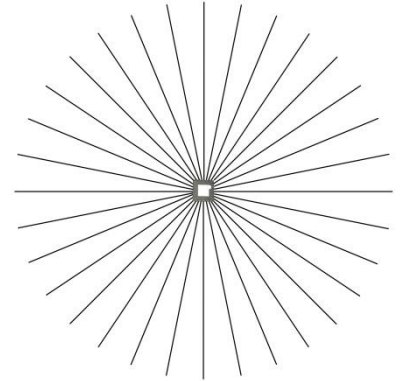
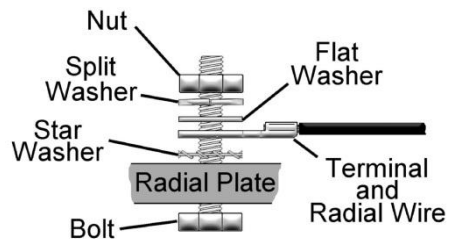
When you finish the last radial, your job is done and Mother Nature will do the rest. If you have done this in most parts of the country in early spring, the grass will grow up, surround the wire and pull it down firmly along its full length. If you do it in the fall after the grass has stopped growing, it will happen the next spring. This will be done so completely that in a few weeks you will have to actively look for the radials to see them. Your mower will miss them completely, too; but you and your contacts will hear them right away!

Attaching Ground Radial Wires to the Radial Plate

Using the 20 sets of supplied stainless steel hardware; connect the ground radial wires to the Radial Plate as shown.

Depending on the number of radial wires used, space them out evenly around the Radial Plate.

The Radial Plate will accommodate up to 60 radial wires (60 laser drilled holes), or up to 120 radials if doubled up.



Optional Items

UMI-81343, UMI-81464, DXE-NSBT8, DXE-NMBT8 - Never-Seez® & Anti-Seize

An anti-seize compound MUST be used on any Stainless Steel nuts, bolts, clamps or other hardware to prevent galling and thread seizure. Any of these products can be used for this purpose.

*UMI-81343	Anti-Seize, 1 oz. Squeeze Tube
*UMI-81464	Anti-Seize, 8.5 oz. Aerosol Can
*DXE-NSBT8	Never-Seez®, 8 oz. Brush Top
*DXE-NMBT8	Never-Seez®, 8 oz. Brush Top, Marine Grade

* These products are limited to domestic UPS Ground shipping only



DXE-CAVS V-Bolt Saddle Clamps

These V-Bolt Clamps are made to fit tubing from 1/2" to 2" OD as used in antenna construction. The supplied V-bolt is long enough to attach tubing to thick plates and is made with anti-corrosive properties. Designed for attachments that don't require resistance to torque. V-bolt made from high-strength 18-8 stainless steel. The V-saddle is cast from 535 aluminum with a rippled surface.

DXE-CAVS-11P	V-Bolt Saddle Clamp, 1/2 in. to 1-3/4 in. OD Applications
DXE-CAVS-2P	V-Bolt Saddle Clamp, 1 to 2 in. OD Applications



DXE-SSVC-2P - Stainless Steel V-Clamp for steel pipe, 2 inch V-bolt

This V-Clamp is made in one size that fits Steel tubing or pipe from 1 to 2" OD as used in antenna construction. The supplied V-bolt is long enough to attach tubing to thick plates and is made with anti-corrosive properties. The special Stainless Steel saddle has serrated teeth will clamp to the pipe securely by biting into the surface. For this reason, it is not recommended for softer aluminum tubing or pipe. Ideal for fastening a radial plate and antenna mounting to a steel pipe. Used to clamp 1 to 2" (OD) steel tubing or pipe. Designed for attachments that don't require resistance to torque. V-bolt and saddle made from high-strength 18-8 stainless steel



DXE-SSVC-3P - Stainless Steel V-Clamp for steel pipe, 3 inch V-bolt

This V-Clamp is made in one size that fits Steel tubing or pipe from 2 to 3" OD as used in antenna construction. The supplied V-bolt is long enough to attach tubing to thick plates and is made with anti-corrosive properties. The special Stainless Steel saddle has serrated teeth will clamp to the pipe securely by biting into the surface. For this reason, it is not recommended for softer aluminum tubing or pipe. Ideal for fastening a radial plate and antenna mounting to a steel pipe. Used to clamp 2 to 3" (OD) steel tubing or pipe. Designed for attachments that don't require resistance to torque. V-bolt and saddle made from high-strength 18-8 stainless steel



DXE-TB-3P - Tilt Base for Hustler® BTV Antennas

Tilt Base Kit for 1/4 wave Hustler® 4, 5 & 6-BTV Vertical Antennas

With a DX Engineering Tilt Base, operators can raise or lower their BTV vertical in seconds while leaving the base plate securely attached to the mounting pipe or post. One person can service the antenna - no more climbing ladders or removing brackets. Easily make repairs, tune your vertical or lay your antenna down before bad weather hits. Precision cut from 3/16 in. 304 Stainless Steel, this Tilt Base is virtually indestructible. Conveniently mounts to the same pipe or post that you use for the antenna and radial plate. No other hardware is required because the Hustler BTV series base section attaches directly to the Tilt Base. For other verticals, use the **DXE-TB-4P** Tilt Base.



Radial Plate Coax Connectors

DXE-363-SST	Bulkhead Fitting, SO-239 Socket, Silver Plating, Teflon® Insulation
DXE-112-KIT	SO-239, Chassis Mount Socket, Silver Plating, Teflon® Insulation
DXE-83-1R-KIT	Amphenol SO-239, Chassis Mount Socket, Glass Reinforced PBT Insulation Packaged with the correct stainless bolts, flat washers, star washers and Nyloc locking nuts.
DXE-83-798-KIT	Amphenol SO-239, Chassis Mount Socket, Teflon® Insulation Packaged with the correct stainless bolts, flat washers, star washers and Nyloc locking nuts.



DXE-RADP-1HWK - Radial Plate Wire Attachment Hardware Kit - Stainless Steel

20 Sets of ALL Stainless Steel Radial Hardware for use with the DX Engineering Stainless Steel Radial Plate.

(20) 1/4" Bolts (20) 1/4" Nuts (20) 1/4" Flat Washers (20) 1/4" Split Washers (20) 1/4" Star Washers



SUM-900031 - Automatic Wire Stripper/Crimper/Cutter, 24-10 Ga.

The wire stripper uses a spring-loaded design to make quick work of wires ranging from 24 to 10 gauge. Just insert the wire, squeeze the handle, and listen for the click. That's the sound of another perfect wire stripping job performed in about 2 seconds- a fraction of the time it takes your pocket knife to do the same job. An adjustable wire length guide helps you make uniform strips, and a built-in wire cutter and crimper helps you complete your wiring job. Spring-loaded design. Strips wires ranging from 24 to 10 gauge, built-in wire cutter and crimper .



DXE-RADW - 500K or 1000K Radial Wire Kits and Components

To achieve optimal performance with a ground-mounted vertical, install as many radials as possible. These bulk radial wire kits use stranded copper wire with black insulation that is UV resistant, hard to see and lays down easily, unlike the wire that is commonly available at the big box stores. It will last much longer in contact with soil than bare wire.

The DXE-RADW- 500K or 1000K kit provide everything you will need to build the perfect radial system!

- 500/1000 ft. spool of 14 AWG, stranded copper wire with vinyl insulation
- 20/40 lugs
- 100/200 radial wire anchor pins- Eliminating the need to bury your radials!
- Build up to 20/40 radials, 25 feet long



DXE-RADW-500K	Bulk Radial Wire Kit, 500 ft Spool of Wire, 20 Lugs, 100 Staples
DXE-RADW-1000K	Bulk Radial Wire Kit, 1000 ft Spool of Wire, 40 Lugs, 200 Staples

DXE-RADW-500KBD or 1000KBD - Bulk Radial Wire Kits and Components

To achieve optimal performance with a ground-mounted vertical, install as many radials as possible. These bulk radial wire kits use stranded copper wire with black insulation that is UV resistant, hard to see and lays down easily, unlike the wire that is commonly available at the big box stores. It will last much longer in contact with soil than bare wire. The biodegradable anchors allow easy installation of radial wires, and will degrade and disappear in a year or so when they are no longer needed.

The DXE-RADW-500 or 1000KBD kit provide everything you will need to build the perfect radial system!

- 500/1000 ft. spool of 14 AWG, stranded copper wire with vinyl insulation
- 20/40 lugs
- 100/200 biodegradable radial wire anchor pins- Eliminating the need to bury your radials!
- Build up to 20/40 radials, 25 feet long



DXE-RADW-500KBD	Bulk Radial Wire Kit, 500 ft Spool of Wire, 20 Lugs, 100 Biodegradable Staples
DXE-RADW-1000KBD	Bulk Radial Wire Kit, 1000 ft Spool of Wire, 40 Lugs, 200 Biodegradable Staples

DXE-STPL - Radial Wire Anchor Pins, 100/pack - No need to bury your radials!

DX Engineering Radial Wire Anchor Pins are perfect for fastening radials below the grass line to eliminate the risk of damaging your radials during lawn maintenance. 100 count - 6" Pins 11-Gauge

DXE-STPL-100P	Radial Wire Anchor Pins, 100/pack
DXE-STPL-300P	Radial Wire Anchor Pins, 300/pack



DXE-RADW - Radial Wire Kits

DXE-RADW-1K	Resonant Radial Wire Set for 10, 15, and 20m. Includes 1/4 in. Ring Terminals
DXE-RADW-40MK	Resonant Radial Wire Set for 40m. Includes 1/4 in. Ring Terminals
DXE-RADW-80MK	Resonant Radial Wire Set for 80m. Includes 1/4 in. Ring Terminals



DXE-RADW-20RT/-32RT/-65RT Pre-Assembled, Radial Wire, w/ 1/4" ring Terminals, 20 Pack

The DXE-RADW Radial Wire Kits include the highest quality 14 gauge stranded copper wire with a relaxed black PVC insulation for easy installation of your radial system. They allow fast and easy installation of your radial ground system, and permit you to mix and match different length to fit the available space. The stranded wire and relaxed insulation mean that the wire will lay flat as you place it on the ground - easy to install! The twenty pre-cut radial wires include 1/4" ring terminals professionally crimped on one end for quick and easy attachment to the radial plate. These Radial Wire Kits are designed for users of vertical antenna systems which have the need for a high quality radial system for optimum antenna performance. The 1/4" ring terminals are machine crimped for maximum grip. Soldering is not required for strength, but is recommended if installed in corrosive environments such as salt spray.



- Packed 20 Radial Wires per package
- 14 gage, stranded copper wire
- Black relaxed PVC insulation
- 1/4" Ring Terminal professionally crimped on each Radial Wire
- 3 lengths to choose from: 20 Ft (-20RT), 32 Ft (-32RT), 65 Ft (-65RT)

DXE-RADW-20RT	Package of 20 each 20 Ft Radials with 1/4" Ring Terminals
DXE-RADW-32RT	Package of 20 each 32 Ft Radials with 1/4" Ring Terminals
DXE-RADW-65RT	Package of 20 each 65 Ft Radials with 1/4" Ring Terminals

Technical Support

If you have questions about this product, or if you experience difficulties during the installation, contact DX Engineering at (330) 572-3200. You can also e-mail us at:

DXEngineering@DXEngineering.com

For best service, please take a few minutes to review this manual before you call.

Warranty

All products manufactured by DX Engineering are warranted to be free from defects in material and workmanship for a period of one (1) year from date of shipment. DX Engineering's sole obligation under these warranties shall be to issue credit, repair or replace any item or part thereof which is proved to be other than as warranted; no allowance shall be made for any labor charges of Buyer for replacement of parts, adjustment or repairs, or any other work, unless such charges are authorized in advance by DX Engineering. If DX Engineering's products are claimed to be defective in material or workmanship, DX Engineering shall, upon prompt notice thereof, issue shipping instructions for return to DX Engineering (transportation-charges prepaid by Buyer). Every such claim for breach of these warranties shall be deemed to be waived by Buyer unless made in writing. The above warranties shall not extend to any products or parts thereof which have been subjected to any misuse or neglect, damaged by accident, rendered defective by reason of improper installation, damaged from severe weather including floods, or abnormal environmental conditions such as prolonged exposure to corrosives or power surges, or by the performance of repairs or alterations outside of our plant, and shall not apply to any goods or parts thereof furnished by Buyer or acquired from others at Buyer's specifications. In addition, DX Engineering's warranties do not extend to other equipment and parts manufactured by others except to the extent of the original manufacturer's warranty to DX Engineering. The obligations under the foregoing warranties are limited to the precise terms thereof. These warranties provide exclusive remedies, expressly in lieu of all other remedies including claims for special or consequential damages. SELLER NEITHER MAKES NOR ASSUMES ANY OTHER WARRANTY WHATSOEVER, WHETHER EXPRESS, STATUTORY, OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS, AND NO PERSON IS AUTHORIZED TO ASSUME FOR DX ENGINEERING ANY OBLIGATION OR LIABILITY NOT STRICTLY IN ACCORDANCE WITH THE FOREGOING.

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