Garden Antennas™

GABU-1P Base Package
GAHR-1P: 10 – 20 m Coverage Package
GA30M-1P: 30 m Coverage Package
GA40M-1P: 40 m Coverage Package

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The DX Engineering Garden Antennas™ are low profile vertical antenna systems designed to blend into the environment while still providing superior DX performance. They can be removed and reinstalled in minutes, satisfying that fussy neighbor or strict CC&R’s. Configurations are available for the 40, 30, and 20 through 10 meter bands. You get full band coverage with an SWR of under 1.5:1 on all bands with the exception of 40 meters. The 40 meter assembly offers a 100 kHz bandwidth with an SWR under 1.5:1. Band changes are easily and quickly accomplished due to an innovative hub assembly.

The Garden Antenna system consists of a DXE-GABU-1P base unit and one or more band-specific assemblies that must be purchased separately. At least one of the band-specific assemblies along with the base unit is needed for the antenna to be operational. The DXE-GAHR-1P assembly covers the 10, 12, 15, 17 and 20 meter bands. The DXE-GA30M-1P is for 30 meters and the DXE-GA40M-1P covers the 40 meter band. These options allow the user to purchase only the bands of interest and to pre-configure each assembly for easy band changes.

**Included in the DXE-GABU-1P Base Unit:**
- Insulated Polymer Mounting Plate
- Threaded Brass Antenna Mounting Block
- Two V-Saddle Clamps for Mounting Antenna to a 1/2 to 1-3/4 in. O.D. Pipe (not included)
- 72 in. Aluminum Mast
- 24 in. Aluminum Mast extension
- Two 3/8 x 24 Threaded Adapters
- Impedance Matching Coil Assembly
- Aluminum Coil Mounting Bracket
- 16 in. Coax Feed point Pigtail
- Quick-Disconnect Mast Fitting with Protective Cover

**The DXE-GAHR-1P 10-20 Meter, 5-Band Assembly Includes:**
- Six 12 in. Stainless Hot Rodz
- Six 24 in. Stainless Hot Rodz
- Six 36 in. Stainless Hot Rodz
- Custom Machined Aluminum Hub
- 3/8 x 24 Thread to Smooth Adapter

**The DXE-GA30M-1P 30 Meter Assembly Includes:**
- Custom 30 Meter Coil
- Six 48 in. Stainless Hot Rodz
- Custom Machined Aluminum Hub
- 3/8 X 24 Thread to Thread Adapter

**The DXE-GA40M-1P 40 Meter Assembly Includes:**
- Custom 40 Meter Coil
- Six 48 in. Stainless Hot Rodz
- Custom Machined Aluminum Hub
- 3/8 x 24 Thread to Thread Adapter
Mounting Site Selection
Central to the efficiency of a vertical antenna and a shortened vertical in particular is the ground radial system. The best mounting site would allow the installation of at least 16 radials 1/4 wavelength long on the lowest band of operation. More is better. On 40m, this would be about 32 feet long. This might be difficult to do in some locations due to total lack of space or severe restrictions in your community. Maybe you are in a condo on the 23rd floor! Do the best you can with what you have, realizing the radial system is key to the efficiency of the antenna.

Installation
The Garden Antenna is designed to be mounted near the ground. The easiest and perhaps the stealthiest is to simply drive a three or four foot, 1/2 to 1-3/4 steel pipe (not included) into the ground, leaving just 6 or 8 inches above the ground.

![Figure 1: GA Base Unit Assembled with Optional Radial Plate](image)

Assembling the Base Unit
Using the two V-saddle clamps included in the base unit kit, mount the black polymer base plate to the mounting pipe as shown in Figure 1. Put the flat washers on the u-bolts against the base plate, then the lock washers and nuts. The clamps will hold very well without excessive tightening. The pipe should not extend more than 1 inch above the top of base plate.

**Note:** You must use an anti-seize lubricant on the clamp threads and other stainless steel hardware to prevent galling which can prevent proper tightening and make disassembly difficult.

Orient the brass mast mounting block so the 3/8 inch threaded hole is facing up. Use the 2 inch bolts and hardware to mount the block to the polymer base plate. Place a flat washer on each bolt, and insert them through the mounting block, then through the polymer base plate. Use another flat washer, then a lock washer and nut. Tighten firmly without excessive torque.
Matching Coil and Feedline Assembly
As shown in Figure 2, a 3/4 x 2 inch aluminum bracket is used to mount the matching coil and feedline pigtail. Use the 1/2 inch bolt and star washer to mount the bracket to the brass antenna mounting block. Place a star washer on one of the coil assembly mounting bolts and insert it through the bracket. Put on another star washer and attach the red lead from the feed line pigtail, then a nut and tighten. Install the black lead of the feed line pigtail to the other end of the coil assembly using another star washer and nut as shown. Connect your coax feedline to the pigtail using a female to female SO-239 adapter. If you are using a DX Engineering Radial Plate, the pigtail should connect to the radial plate using a bulkhead adapter such as the DXE-363-SST SO-239 bulkhead fitting. (See Figure 1)

Mounting the Quick Disconnect
The quick-disconnect fitting shown in Figure 3 is used to allow quick removal of the antenna if needed. If the quick disconnect is not needed, the mast can be mounted directly to the brass block using one of the threaded adapters. To use the quick-disconnect fitting, first disassemble it by turning the knurled portion while holding the bottom section. Unscrew the short threaded rod from the bottom section as shown in Figure 4. One end of the threaded rod has a 3/16 Allen head built into it. Screw the rod end with the Allen head back into the bottom quick-disconnect section until 1/2 of its length is inside (about 1/2 inch).
Insert a 3/16 Allen wrench through the bottom section of the fitting into the rod end and screw the bottom section to the brass antenna mounting block. Allow the bottom section of the quick disconnect fitting to turn with the Allen wrench to ensure that half of the rod stays in it while the other half is threaded into the brass mounting block. Use a 9/16" wrench on the quick disconnect fitting to tighten it. **Figure 1** shows the completed base assembly.

**Note:** You must use an anti-seize lubricant on all threads including the quick disconnect threads to prevent galling, which can prevent proper tightening and make disassembly difficult.

**Antenna Mast Assembly**

Using **Figure 5** for reference, assemble the 6 foot mast section to one of the 3/8 x 24 threaded adapters and tighten. Put a 3/4 x 24 nut on the other end of the adapter, then thread-in the quick disconnect fitting with the knurled sleeve. Use the nut to tighten the quick disconnect to the threaded adapter. Without the nut, the quick disconnect fitting will bottom out on the threaded adapter before it is tight.

For operation on 10 and 12 meters, only the lower mast is used along with the DXE-GAHR-1P Hot Rodz. See **Figure 6**. For all other bands, the 2 foot mast extension is needed. Use the second 3/8 x 24 threaded adapter to mate the two masts together.

![Image of Quick Disconnect and Lower Mast Assembly](image)

**Figure 5: Quick Disconnect and Lower Mast Assembly**

Install the mast assembly to the base unit by mating the quick disconnect sections and tightening the knurled sleeve. Do not use tools, hand-tightening is sufficient. If you don't use the quick disconnect fitting, screw the thread to thread adapter, without the nut, directly into the brass mounting block. The lower mast section is then installed directly to the adapter.
Assembly of Band-Specific Antennas

At least one of the band-specific assemblies must be used before the Garden Antenna is functional. All needed hardware is included with each assembly. Both the 72 inch and the 24 inch masts (96" total) along with a threaded coupler are included in the Base Assembly.

The **DXE-GAHR-1P** kit is for 10-20M, the **DXE-GA30M-1P** kit is for 30M and the **DXE-GA40M-1P** kit is for 40M.

<table>
<thead>
<tr>
<th>Base Mast Size</th>
<th>10M</th>
<th>12M</th>
<th>15M</th>
<th>17M</th>
<th>20M</th>
<th>30M</th>
<th>40M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Mast</td>
<td>72&quot;</td>
<td>72&quot;</td>
<td>96&quot;</td>
<td>96&quot;</td>
<td>96&quot;</td>
<td>96&quot;</td>
<td>96&quot;</td>
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<tr>
<td>RODZ Length</td>
<td>12&quot;</td>
<td>12&quot;</td>
<td>12&quot;</td>
<td>24&quot;</td>
<td>36&quot;</td>
<td>48&quot;</td>
<td>48&quot;</td>
</tr>
<tr>
<td>RODZ Adjustment</td>
<td>6&quot;</td>
<td>1&quot;</td>
<td>2.5&quot;</td>
<td>6&quot;</td>
<td>Full Size</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Band Kit      | DXE-GAHR-1P | - | - | - | - | - | DXE-GA30M-1P | DXE-GA40M-1P

**Figure 6: Hot Rodz Adjustment Table**

Assembly of DXE-GAHR-1P 10-20m Kit

This kit includes a custom Hot Rodz mounting hub and six 12", 24" and 36" Hot Rodz. The threaded to smooth adapter is used to mount the hub to the top of the mast. Protective rubber tips for the end of the Hot Rodz and an Allen wrench used for the setscrews in the hub are also included. A radial system is recommended for best performance.

The 12" Rodz are used for 10-15m, the 24" Rodz are used for 17m, and the 36" Rodz are used for 20M operation as indicated by the table in **Figure 6**.

Install the threaded to smooth adapter to the top of the appropriate mast length, depending on the desired operating band.

The 10-20m antenna should resonate at close to the following frequencies using the adjustments in **Figure 6** for the mast and Hot Rodz. The antenna features full band coverage with no tuning and an SWR of 1.5:1 or less.

- **10m** – 29.160 MHz
- **12m** – 24.960 MHz
- **15m** – 21.150 MHz
- **17m** – 18.125 MHz
- **20m** – 14.160 MHz

Once the desired resonance is achieved, use the base matching coil to reduce the SWR by compressing or expanding the wire turns on the coil form.
**Hub Assembly**
The custom machined hub mounts the Hot Rodz and attaches to the top of the antenna mast using set screws. Use the included Allen wrench to install set screws in all of the threaded holes in the hub. The threaded holes with close vertical spacing are used to secure the Hot Rodz in the hub. The two threaded holes spaced further apart are used to secure the hub to the top of the antenna as seen in Figure 8. The longer setscrews are used in these holes.

![Hub Mounting Screws](image1)

**Figure 8: Set screws**

Determine the desired band of operation and select the correct length Hot Rodz from the table in Figure 6. Install the black rubber tips on one end and insert the opposite end into the holes of the hub as shown in Figure 8.

The Rodz adjustment dimensions from the table in Figure 6 are measured from the center of the hub to one end of the Hot Rodz as shown in Figure 9. All the Rodz should be adjusted the same.

![Rodz Adjustment Dimension](image2)

**Figure 9 Rodz Adjustment Dimension**

As an example, to configure the DXE-GABU-1P Base and the DXE-GAHR-1P 10-20m kit for 10 or 12m operation, use just the 72" mast as indicated in Figure 6. Install the 12" Rodz in the hub and adjust them so there is 6" from the hub centerline to one end of the Rodz as shown in Figure 9. Install the hub onto the threaded to smooth adapter at the top of the mast using the two wider-spaced set screws. For 12m operation, simply re-adjust the Hot Rodz. All that's left to do is fine-tune the SWR using the base matching coil.
Assembly of DXE-GA30M-1P 30m Kit

The 30m kit includes a custom machined hub, a custom 30m loading coil, six 48" Hot Rodz, a threaded adapter with a locking nut and an Allen wrench. Protective rubber tips for the end of the Hot Rodz are also included. The 30m kit will cover the entire band with an SWR under 1.5:1. A radial system is recommended for best performance.

Make sure both the 72" and the 24" masts from the base assembly are connected together. The top coil requires the threaded adapter be used in the top mast section. Install the locking nut on one end of the adapter and thread the other end into the mast section. Install the loading coil to the adapter until it bottoms-out into the threads. Do not tighten or force the coil any further. Use the locking nut to tighten up the coil using limited torque.

Install the Hot Rodz into the hub. Adjust all the Rodz so 11" extends from the center of the hub to one side of each Rodz as shown in Figure 9. Install the hub to the top of the loading coil mast, using the wider spaced set screws shown in Figure 8. Turn the hub so its set screws are on the opposite side from the two existing set screw holes in the coil mast and tighten with the included Allen wrench.

The 30m antennas should resonate at approximately 10.105 MHz. Adjustment of the resonant frequency can be made by adjusting the Hot Rodz length. Once the desired resonance is achieved, use the base matching coil to reduce the SWR by compressing or expanding the wire turns on the coil form.
Assembly of DXE-GA40M-1P 40m Kit

The 40m kit includes a custom machined hub, a custom 40m loading coil, six 48" Hot Rodz, a threaded adapter with a locking nut and an Allen wrench. Protective rubber tips for the end of the Hot Rodz are also included. The 40m kit is tunable to cover the entire band and offers 100 kHz of bandwidth at a 1.5:1 SWR. A radial system is recommended for best performance.

Make sure both the 72" and the 24" masts from the base assembly are connected together. The top coil requires the threaded adapter be used in the top mast section. Install the locking nut on one end of the adapter and thread the other end into the mast section. Install the loading coil to the adapter until it bottoms-out into the threads. Do not tighten or force the coil any further. Use the locking nut to tighten up the coil using limited torque.

Install the Hot Rodz into the hub. Adjust all the Rodz so 2" extends from the center of the hub to one side of each Rodz as shown in Figure 9. Install the hub to the top of the loading coil mast, using the wider spaced set screws shown in Figure 8. Turn the hub so its set screws are on the opposite side from the two existing set screw holes in the coil mast and tighten with the included Allen wrench.

The 40m antenna should resonate at approximately 7.0 MHz. Adjustment of the resonant frequency can be made by adjusting the Hot Rodz length. Shorten the Hot Rodz, (increasing the Rodz Adjustment Dimension in Figure 9) to resonate the antenna higher in frequency. Once the desired resonance is achieved, use the base matching coil to reduce the SWR by compressing or expanding the wire turns on the coil form.
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.

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