

# HF ANTENNAS

**FIXED STATION,  
MOBILE, TACTICAL**

**WIDE CHOICE  
OF MOUNTS**

**FAST, ONE- OR TWO-  
PERSON ASSEMBLY**

**NVIS  
APPLICATIONS**

**MIL  
CONSTRUCTION**

**BROADBAND/  
NARROWBAND**

**POWER HANDLING  
TO 5 kW**

One of the most critical aspects of good HF communications is the choice and deployment of the antenna system. Careful selection of the antenna, its location, and tuning are the most important factors in ensuring strong, reliable communications. DWC offers a wide range of antennas for HF fixed station, mobile, tactical, and marine usage. DWC transceivers and amplifiers are designed to operate with any antenna systems having a 50-ohm impedance. The antenna system should be carefully matched and the VSWR should not exceed 1.5:1 for best results.

## Fixed-Station Antennas

High-end HF antenna systems for fixed stations include the broadband log-periodics or omni-directional antennas such as conical monopole arrays or SPIRA-CONES. The best overall antennas for long-range HF fixed-station operation are either log-periodic or directional array. These provide excellent coverage for short and medium-to-long range applications. DWC can source these antennas for user applications; however, they are large, extremely expensive, and require considerable real estate to install.

For semi-permanent and less expensive installations, the 1/2-wavelength dipole antenna is easy to erect and provides superior performance to all but complex directional arrays. The downside is that the 1/2-wave dipole operates on one frequency, generally with a bandwidth of about 2% on either side of center frequency. An alternative to the dipole is a long-wire antenna using an antenna

tuner. While this will operate on all channel frequencies and allow ALE scanning, the efficiency is considerably lower than the dipole antenna, and a separate antenna tuner is required. When limited space is a factor, and multiple frequency operation is necessary, it is probably best to use a narrowband antenna like a whip or long-wire with an antenna tuner. DWC's fixed-station dipole and wire antennas are described in Table 1.

Another option to consider, when space is available, is the use of a loaded, broadband antenna. While these generally have lower efficiency, they do not require an antenna tuner and do allow operation on all channels in the transceiver. DWC's ABB series is a line of both 125W and 1 kW broadband antennas that have proven medium-range performance up to 2000 miles. These are shown in Table 2. Mast kits containing mast sections, guying equipment and the necessary tools are also available from DWC to facilitate the erection of antennas.

Another form of narrowband antenna that can be used in a fixed station is the vertical whip. This antenna requires a tuner but is especially useful when space is at a premium and long-range communication is desired. Note that the ground system is an essential part of the whip installation since the vertical whip, unlike the broadband antenna, is a ground-dependent antenna, so proper grounding techniques must always be used. In general, the longer the antenna, the more efficient it is. DWC's



RAPAS is a whip with a standard length of 32 feet made up of rugged 4-foot sections. Antennas of shorter or longer length can be conveniently constructed by adding or removing 4-foot sections which screw together easily.

**Table 1  
Fixed-Station Dipole and Long-Wire Antennas**

Part No.	Description	Application	Input
AD1	Single-frequency dipole	Fixed station, fixed frequency, long-range	50-ft. RG213 feedline
AD2	Two-frequency dipole	Fixed station, fixed frequency, long-range	50-ft. RG213 feedline
AD3	Three-frequency dipole	Fixed station, fixed frequency, long-range	50-ft. RG213 feedline
AD4	Four-frequency dipole	Fixed station, fixed frequency, long-range	50-ft. RG213 feedline
ALW	Long-wire antenna kit	Fixed station; requires antenna tuner	75-ft. with hang-up rope and insulators

**Table 2  
Broadband HF Antennas**

Part No.	Length	Rated RF Power	Application	Input/Load
ABB100A	142 ft.	125W	Fixed station, low power, better low-frequency efficiency than the ABB100B	100-ft. RG-213 with PL-259 (UHF) connector
ABB100B	112 ft.	125W	Fixed station, low power	100-ft. RG-213 with PL-259 (UHF) connector
ABB1000A	142 ft.	1000W	Fixed station, high power, better low-frequency efficiency than the ABB1000B	100-ft. RG-213 with PL-259 (UHF) connector
ABB1000B	112 ft.	1000W	Fixed station, high power	100-ft. RG-213 with PL-259 (UHF) connector

Note: Add "N" to the part number to obtain antenna with N connector on coaxial feedline (e.g., ABB1000AN is ABB1000A with N connection)

### Mobile Antenna Systems

The vehicular antenna is generally a whip with a maximum length of 16 feet. Over much of the HF range, this length represents only a small fraction of a wavelength; therefore, the whip must be electrically lengthened by using an antenna tuner. Again, this results in lower efficiency and requires a good tuner and careful installation. The lead-in wire from the tuner to the antenna becomes part of the radiator, so it must be kept as short as possible to maximize radiation from the actual antenna. DWC's selection of whips is detailed in Table 3. It includes a variety of mounting arrangements ranging from a very rigid vertical base, to flexible spring bases, to a special tilt-adaptor base. NVIS operation (omni-directional, close-in coverage) can be obtained by tying down any whip into a horizontal attitude. The flexible spring base and tilt-adaptor systems both work well in this application.

**Table 3**  
**Mobile, Marine and Fixed-Station Whip Antennas**

Part No.	Length	Rated RF Power	Mounting and Construction	Application
MAR-12	12 ft.	1000W	Flexible spring base with side-mount bracket, feed-thru design; fiberglass, 3 section	Vehicular; medium-range (omni-directional) in vertical attitude or NVIS when tied down
MAR-16	16 ft.	1000W	Flexible spring base with side-mount bracket, feed-thru design; fiberglass, 4 section	Vehicular; long-range (omni-directional) in vertical attitude or NVIS when tied down
RA-MAS	16 ft.	400W	Rigid base with flange bracket, feed-thru design; fiberglass, 4 section	Vehicular; long-range (omni-directional)
RA-PAS	32 ft.	1000W	Rigid base meant for horizontal surface mounting, side-fed; fiberglass, 8 section	Transportable fixed station; long-range (omni-directional)
MAR-16T	16 ft.	1000W	Flexible spring base and tilt whip adapter with side-mount bracket, feed-thru design; fiberglass, 4 section	Vehicular; long-range (omni-directional) or NVIS. Antenna can be locked in one of four separate positions from vertical to horizontal.
AW7	23 ft.	500W	Anodized aluminum mounting flange, side-fed; epoxy fiberglass composite antenna	Fixed station or marine; long-range (omni-directional)
AW10	36 ft.	5000W	Galvanized ductile iron mounting flange, side-fed; fiberglass antenna	Fixed station or marine; long-range (omni-directional)
AWM	9 ft.	150W	Spring and base with insulator; stainless steel	Vehicular; medium-range

### Automatic Antenna Tuners

An efficient, rapid tuning, automatic antenna tuner is a necessity for use with narrowband HF antenna systems like whips and long-wires. DWC offers three tuners to satisfy these requirements. The AT7000B and RAT7000B are 150W, completely automatic tuners designed to match whips and long-wires to 50 ohms over the 1.6 to 30 MHz band. They both have 100 memory channels for ALE scanning or silent tuning. The AT7000B is packaged in an immersible fiberglass case, while the RAT7000B is in a rugged metal case. The RAT1000 is a completely automatic waterproof unit which will also tune whips and long-wires over the 1.6 to 30 MHz HF band. It has 10 memory channels for rapid-tune applications.

## Tactical Antenna Systems

Table 4 illustrates a group of antennas that can be used in a tactical mode with DWC's PRC1099A manpack radio. The standard antenna is the AT-271A/U 10-foot whip. The internal matching network in the radio is designed to tune over the 1.6 to 30 MHz range. A variety of dipole, long-wire and NVIS antennas are available to satisfy other tactical communication requirements.

**Table 4**  
**Tactical Antennas**

Part No.	Description	Application	Input
AT-271A/U	10-ft. collapsible whip	Tactical; PRC1099A standard manpack antenna	Direct connection to radio antenna port
ALW-R	100-ft. rugged long-wire antenna kit	Tactical; can use with PRC1099A internal antenna tuner; includes rope and counterpoise	Use LWA on radio antenna port
ALD-REM	Lightweight dipole kit with long-wire adapter and counterpoise	Tactical; can use with PRC1099A internal antenna tuner; provides NVIS operation; includes rope and counterpoise	25-ft. 300-ohm transmission line; use LWA on radio antenna port
LWA	Long-wire adapter	For use with long-wire antennas and PRC1099A internal tuner	Connects to PRC1099A antenna port for use with other than short whip
AGK	50-ft. braided 2-wire set	Tactical antenna grounding kit	Connects to PRC1099A ground lug
NVISKIT	Transportable, deployable Near Vertical Incidence Skywave (NVIS) antenna (AS-2259) with mounting base	Tactical NVIS usage; deployable by 2 people in 20 minutes	Connects to PRC1099A antenna port or output of antenna tuner
ALD	Lightweight Dipole Kit	Tactical, fixed-frequency, long-range communications	33-ft. RG-58 feedline; connects to 50-ohm port on PRC1099A

*Specifications are subject to change without notice*