PTS

Expeditionary Communications

Raven HF 150W Antenna User Guide
ANT-PTS-000150-2-1

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System Components

Item	Qty	PTS Part No	Description
1	1	2003.0102	Resistor Tube
2	1	2003.0103	150W Balun
3	2	2003.0113	Guy Rope Extensions
4	1	2003.0120	Hoist Rope
5	2	2003.0105	Dipole Legs (54’)
6	3	3990.0065	Stakes
7	1	3520.0020	RG8X Cable
8	1	3990.0081	Bag (not pictured)

Warnings and Safety Instructions

Warning and important safety instructions appearing in this manual are not intended to cover all possible conditions or situations that may arise. Caution, and reasonable care must always be exercised when installing, maintaining, or operating PTS equipment. RF energy is present near the antenna during transmission. During low-power operation, maintain a minimum distance of 30 inches between the antenna and personnel. During power amplifier operation, follow standard safety practices by mounting the antenna well away from personnel.

Before setting up your mast, ensure the airspace above your site is clear of obstacles such as trees and power lines. This helps prevent interference with the deployment of your Raven HF 150W Antenna and reduces the risk of injury to yourself and others.

Raven HF 150W Antenna Description

The Raven is a horizontally polarized folded dipole antenna expeditionary system for Near Vertical Incidence Skywave (NVIS) 0-2,000 miles HF communications. It's a system that prioritizes ease of use and quick deployment. Its full spectrum of 1.8-30 MHz broadband coverage makes it an excellent antenna for ALE operations, eliminating the need for a tuner, coupler, and grounding rod. The entire expeditionary system, with the optional roll-up mast, can be deployed in 5 minutes, requiring less manpower, cost, and weight than traditional systems.

Specifications

Frequency Range	1.8 – 30 MHz
RF Power Capacity	150W
VSWR	1.5:1 Typ 1.7 Max
Impedance	50 Ohms Nominal
Max Required Width	16.76m (55’)
System Weight	3.99kg (8.8lbs)
Stored Dimensions	6” x 15” x 12”
Radiation Pattern	Omnidirectional
RF Connector	BNC, male to N-Type
RF Coaxial	RG8X 15.24m (50’)
Environmental	Designed to relevant sections of MIL-STD-810H (Temperature and Humidity)

Antenna Setup

Before deploying the Raven antenna, please Inspect the kit and validate components and serviceability. Select a clear site that won't prevent setup of the antenna.

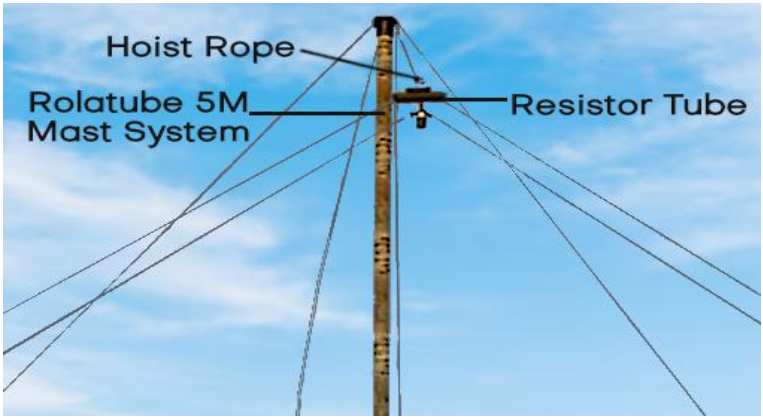
Erect mast system for operation. The pictures shown are the preferred system, a 5-meter mast with hoist rope. Mast system sold separately or included with the Raven HF Fly Away Kit (ANT-PTS-3051501-1).

Step 1: Connect balun to resistor tube with the snap link provided.

Step 2: Connect strain reliefs and u-type spade connectors from dipole legs to balun and resistor tube. Ensure one section of the same dipole leg is connected to the balun and resistor tube on the same side. Confirm they are tight and clean from debris. When you store the antenna for future operations, leave it connected for rapid deployment.

Step 3: Connect the RG8X cable and strain relief to the balun.

Step 4: Connect the top of the resistor tube to the hoist rope with snap link provided and raise it to the desired height on the mast. Secure the hoist rope to the base cap or any available point on the ground. Deploy legs into the desired configuration - Inverted V, Slope, or Horizontal.



Step 5: Use the tie-down ropes (located on the plastic wire holder) at the end of the legs provided. Before staking the legs, ensure the wire and spacers are not entangled, then stake the legs.

Step 6: Connect RG8X cable to radio. Turn on radio.
Perform VSWR (Voltage Standing Wave Ratio) test if available.

Step 7: To disassemble, reverse the order of steps 1-6.

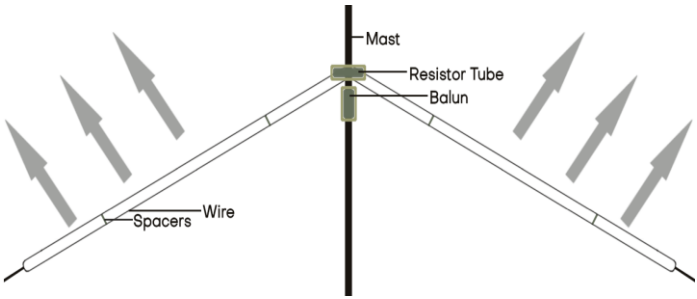
Antenna Configurations

Short-range 0-500 miles: Short-range communication includes air-to-ground and ground-to-ground communications. Typically, the height should be approximately 10–12 ft on the mast at the balun and 2–3 ft off the ground at the ends of the dipole antenna legs. The height of the balun on the mast may need to be lowered below 10 ft height for very short-range communications. Typically for HF communications, the lower frequencies 1.6 to 10 MHz are the best for both day and night. The signal will be an omnidirectional pattern. It is typically helpful for short-range communications to form a consistent downward curve in the antenna dipole legs on each side. However, do not let the dipole legs drop below the tie-off locations at the bottom. Generally, a slight curve is sufficient.

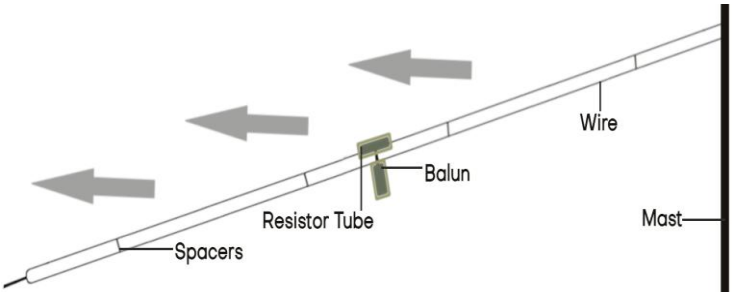
Mid-range500–1000 miles: For medium-range communications, frequencies from the 2–9 MHz range at night and morning and the 10–28 MHz range from 1100 to 1800 are typically best for operations. The height should typically be 12–15 ft at the balun, possibly with a slight downward curve. Adjusting the direction of the antenna can improve signal strength by aligning it more accurately with the distant station or communication target.

Long-range 1000 miles plus: For long-range to 2,000 miles, place the balun at 15–22 ft on the mast and do not allow any slack in the antenna. Keep the antenna reasonably tight but without exceeding an approximate 25-degree slope in the antenna to the ground.

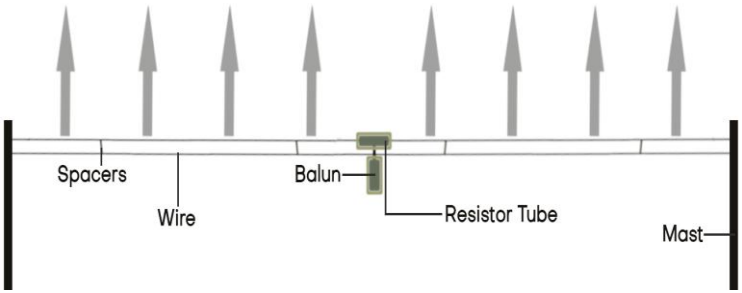
Inverted V



Slope



Horizontal



Troubleshooting

When troubleshooting communication issues, always ensure that every connection point is tightly secured. Be careful to avoid close proximity to metal structures to avoid communications transmission issues. Often, the pattern can become more circular when frequencies are above 10MHz to 30MHz range. To achieve better Gain you can deploy the antenna sideways to the target. Since it is an omnidirectional antenna, the signals will still go in all directions but will often be stronger at 90 degrees from the antenna. Don't exceed an estimated 25 deg slope from the top of the mast, otherwise the antenna will begin to function more like a whip antenna.

Maintenance Troubleshooting

Raven HF 150W components are COTS (commercial off-the-shelf) Class IX equipment and maintenance beyond general cleaning is not authorized. PTS Expeditionary Communications is the depot level for repairs; if an individual component fails or becomes damaged, please contact PTS Expeditionary Communications for troubleshooting and further instructions.

System Repair or Return

If a Raven HF 150W Antenna malfunctions or becomes nonfunctional, the user should notify PTS. Call toll free1-877-737-5832, commercial 256-539-6787 or contact via e-mail support@pts-inc.com to receive instructions for return and repair.

Be prepared to discuss and troubleshoot the problem. The Raven HF 150W Antenna should be available to facilitate actual troubleshooting. PTS will determine if the Raven HF 150W Antenna needs to be returned for repair/replacement.

If PTS determines the Raven HF 150W Antenna requires return for repair, PTS will assign a Return Material Authorization (RMA) number. The RMA number should be clearly posted on the outside of a proper size and structurally sound cardboard box as well as documented on a note inside the box detailing the specific problem or malfunction, customer, email, phone number and complete return address of the sender. Please do not include manuals, cables (unless specifically requested), radios, power amplifiers, etc. when returning the Raven HF 150W Antenna.

Label the package/case as follows:
PTS Expeditionary Communications
RMA # (contact PTS for RMA assignment)
1715 Eastgate Dr NE
Arab, Alabama 35016
Attention: Repairs

Warranty

PTS warrants all Raven HF 150W Antenna to be free from defects in material and workmanship for a period of twelve (12) months from the date of shipment. PTS shall not be obligated to repair or replace a Raven HF 150W Antenna if it becomes damaged by unauthorized maintenance or repair, incorrect operational set-up, abuse, or neglect.

PTS shall bear the domestic transportation costs to/from the PTS facility when a Raven HF 150W Antenna is returned within the warranty period, OCONUS shipping will be the responsibility of the user.

Contact Information

For inquiries concerning this manual, technical difficulties, or operational problems with the PTS BEU please reach out using the information below:

PTS Expeditionary Communications
Attn: Support
1318-B Putman Drive
Huntsville, AL 35816

Toll Free 1-877-737-5832
Commercial 256-539-6787
E-mail support@pts-inc.com

PTS Products

Power Supply Docking Station (PSDS)

Provides immediate power to tactical radios. Worldwide automatic voltage range: 85-260 VAC, 47-440 Hz, 22-32 VDC. High fidelity built in speaker. Low SWaP with no assembly or training required.

Battery Eliminator

Enables rapid installation of tactical radios in fixed and semi-fixed environments. PTS BE offers the solution for expeditionary tactical communications.

The PTS BE enables the tactical radio to operate on AC or DC power without the need for MIL-STD batteries or a Vehicular Adapter Assembly.

Fly Away HF Kit

This all inclusive kit provides the user with the Raven HF 150W antenna as well as a 5m Rolatube mast for quick deployment in any environment.