

Satellite Antenna De-icing Systems for Patriot Antennas



- **Automatic De-icing System for Protection against Snow and Ice**
- **Simple to Field Install and Operate**
- **Engineered for Customer Specified Voltages**
- **Low Energy Costs**
- **User selectable Automatic, Off or Manual On Modes**
- **Available for Patriot Reflector Sizes: 1.0, 1.2, 1.5, 1.8, 2.4, 3.1, 3.8, 4.5, 5.0, 6.3 and 7.5 Meter**

DESCRIPTION

The Viking SATCOM De-icing system consists of a factory pre-wired control unit, heater pads for reflector coverage, and a feedhorn heater. All systems are engineered to be easily assembled, installed and operated.

The control unit has three modes of operation: Automatic, Manual Off and Manual On. The Automatic mode allows the control to monitor the ambient temperature and sense the presence of moisture. An ambient temperature of less than 40 degrees F and the presence of moisture activate a heater contactor. The heater contactor is rated up to 50 amps. The heaters will remain on for a factory preset time of one hour longer than conditions warrant. The Manual Off mode turns the heaters off, regardless of the weather conditions. The Manual On mode turns the heaters on, regardless of the weather conditions. Control units are factory preset to operate on 120 to 240 volts, single or three phase power. All cabling to attach the heater pads is factory pre-wired. The larger systems have a control unit with remote moisture sensor.

The heater pads consist of heater wire sandwiched between layers of aluminum foil. Heater pads allow for a faster install without the need for templates. The aluminum foil is coated with an aggressive acrylic adhesive and a peel and stick liner. Watt density of the heater pads, depending on the reflector, is between 40 and 55 watts per square foot. The aggressive acrylic adhesive adheres to a variety of substrates and will not release when pad temperature increases. Heater pads have water resistant connectors that plug into the cables from the control unit.

The feedhorn heaters consist of heater wire attached to a strap and covered with heatshrink. They are attached to a rib on the feedhorn.

Installation of the de-ice system consists of applying the heater pads to the backside of the reflector, mounting the control unit / moisture sensor, routing power to the control unit, attaching the feedhorn heater, and connecting the heater pads to the control cables.

The De-icing systems can be custom made for a variety of antennas and applications.

Typical Installation

Instruction Manual for the Patriot 4.5 meter Prime Focus 240 Volt Half Coverage Ku Band Heater System

Materials Provided List

<u>Quantity</u>	<u>Part Number</u>	<u>Description</u>
8	85142	Heater pad for 4.5 meter half coverage 240 volt
8	85143	Heater pad for 4.5 meter half coverage 240 volt
8	85144	Heater pad for 4.5 meter half coverage 240 volt
1	85146	Controller for 4.5 meter half coverage 240 V with mounting feet and feedhorn heater attached
2		Cable tie 36" for controller to mast attachment
18		Grommets
1		Foil strips for lead wire attachment
1		Instruction manual for 4.5 meter Prime Focus 240 volt half coverage

Tools and Supplies Needed

Standard slotted screwdriver (medium)
Drill
1/4" drill bit
7/16" drill bit
Adjustable wrench
Clean rags
Windex glass cleaner
Cable tie straps
Cable supplying power to the control and heater system

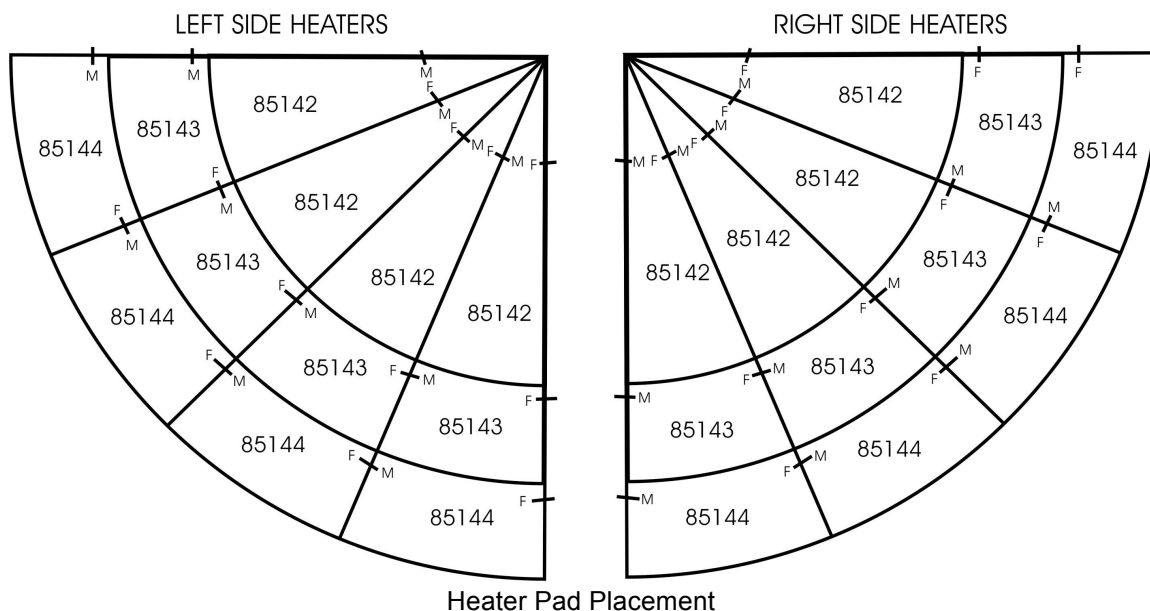
Read these instructions carefully and follow all of the procedures for installing this system. All electrical wiring must be performed in accordance with all applicable electrical codes.



Control and Harness

APPLY THE HEATER PADS TO THE REFLECTOR PANELS

1. Properly support the reflector panel so that no distortion results from heater pad attachment.
2. The surface temperature of the panel should be above 50 degrees Fahrenheit, 10 degrees Celsius for proper adhesion of the heater pads.
3. Thoroughly clean the rear of the reflector panels with Windex and dry thoroughly.
4. Test fit the pads by laying all of them on the back of the reflector and orienting them for the best alignment. See the Heater Pad Placement drawing for the proper locations.
5. Remove the backing paper from the heater pads one at a time and carefully apply to the cleaned reflector. Smooth each pad as it is placed on the reflector. The adhesive is pressure sensitive so be sure to apply pressure and rub the heater pad as it is smoothed to activate the adhesive and adhere properly.



CONNECT THE HEATER PAD LEADS

1. Plug the heater pad connectors together as illustrated on the Heater Pad Placement Drawing. The connectors are difficult to fully seat, and will not properly seal until a small snap is felt.
2. Use the supplied foil strips to anchor any connected leads with excess slack.

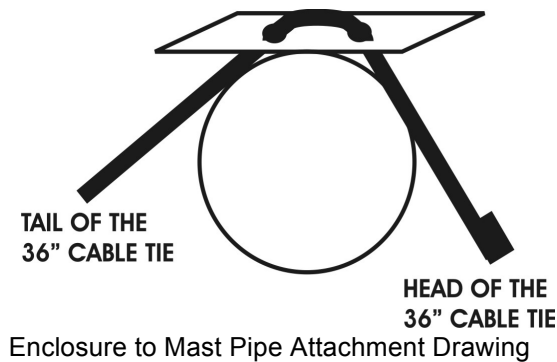
*** Note: Holes may be drilled through the radial beams to allow for lead connections. All pass through holes must have a grommet installed for wire protection. Grommets insert into 7/16" hole.**

ASSEMBLE AND CALIBRATE THE REFLECTOR

ATTACH THE CONTROL ENCLOSURE TO THE MAST PIPE

1. Pass a 36" strap through the back of a hole drilled through the mounting bracket secured to the control enclosure.
2. Return the strap through the adjacent hole so that both ends of the strap are behind the control enclosure when finished.
3. Repeat step #2 for the other mounting bracket with a second strap.

4. Place the control enclosure against the mast pipe and tighten the straps sufficiently to secure. The cables exiting from the enclosure should exit in the downward direction. The final adjustment of the control enclosure must be done before the cable ties are fully tightened. The control enclosure must be mounted within six feet of the center of the reflector to ensure adequate heater pad cable length.

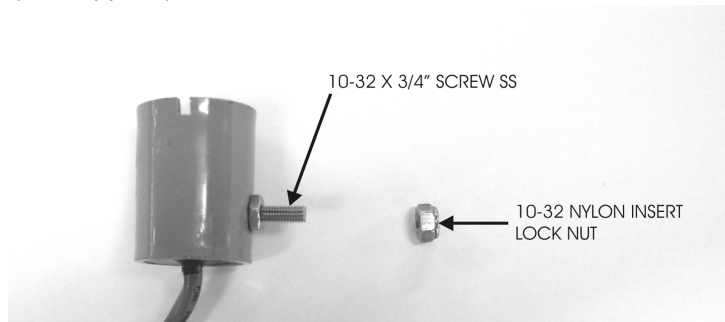


ROUTE HEATER PAD CABLES AND CONNECT TO THE HEATER PADS

1. Route the heater pad cables and connect to the heater pads as illustrated in the System Wiring drawing on page 6.
2. Use tie straps (not supplied) to anchor the heater pad cables at a point where the leads enter or exit the heater pads and at a point where they branch.

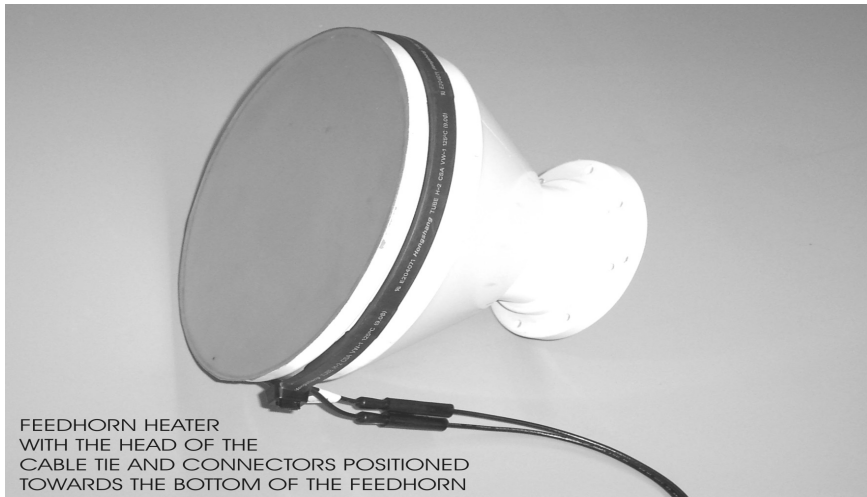
MOUNT THE MOISTURE SENSOR

1. Drill a $\frac{1}{4}$ " hole in the reflector and mount the moisture sensor with the nylock provided. The sensor should be mounted in an area where the moisture sensor grid is parallel with the horizon and it will receive a representative amount of falling and blowing precipitation.
2. Use one tie strap (not supplied) to anchor the sensor cable near the moisture sensor.



ATTACH THE FEEDHORN HEATER TO THE FEEDHORN

1. Route the feedhorn heater cable along the feedhorn support arm.
2. Place the feedhorn heater around the feedhorn and loosely attach it by passing the tail of the strap through the head. Be sure the heater wire in the feedhorn heater is against the feedhorn.
3. Position the heater with the head of the cable tie and the connectors toward the bottom of the feedhorn and tighten the strap fully. Do not cut the tail off of the feedhorn heater at this time. It will be done when the final test of the system is performed. See the Feedhorn Heater Placement picture for proper placement.
4. Use one tie strap (not supplied) to anchor the Feedhorn Heater Cable near the feedhorn heater.



Feedhorn Heater Placement

ROUTE POWER TO THE CONTROL ENCLOSURE

1. Unscrew the cordgrip nuts sufficiently to allow the cables to move in and out of the enclosure. Sufficient cable slack should still be available to move the cables in and out.
2. Remove the four screws securing the cover on the control enclosure.
3. Remove the enclosure lid as the cables are fed through the cordgrip.
4. Wire 240 volt single phase AC power to the L1 and L3 positions on the contactor. An empty hole has been supplied in the side of the enclosure for wiring power in.

* The entire system supplies 4835 watts of heat and draws approximately 20.1 amps.

5. Replace the enclosure cover as cable is pulled from the inside of the enclosure. Leave a minimum of one inch of the SJTW cable protruding from the inside of the cordgrips.
6. Tighten the cordgrips until all cables are secured. Over tightening can damage the cordgrip.
7. Replace the four cover screws securing the lid and tighten sufficiently.

SECURE ALL CABLES WITH TIE STRAPS

1. Secure the entire lengths of the heater pad cables, the feedhorn heater cable, and the moisture sensor cable with tie straps (not supplied).

TEST THE HEATER SYSTEM

1. Apply 240 VAC single phase power to the system.
2. Allow the sensor to go through its start-up test.
3. When the sensor enters the Automatic Enabled mode (steady green indicator), push the selector switch twice to place the sensor in the Manual On mode (steady amber indicator).
4. Wait a few minutes and feel the surface of the reflector for warmth. The feedhorn heater should also feel warm to the touch. Retighten the feedhorn heater strap while the heater is warmed and cut off all but ½" of the excess strap material.
5. Return the system to the Automatic Enabled mode by pressing the selector switch one more time.

FINALIZE ALL OTHER INSTALLATION ISSUES

DE-ICE CONTROL SPECIFICATIONS

The control operates electric heaters to prevent the build-up of snow and ice on the reflector when conditions are conducive to their formation. That is, during precipitation when the ambient temperature is below 40 F.

1. The controller will assure a minimum On time of approximately one hour. The system will continue to supply heat as long as conditions warrant it.
2. The controller provides AUTO, OFF, and ON functions. These modes are user selectable through a single push button switch which alternates through each mode.
 - The normal power-up mode is AUTO. In this mode, the controller will turn on the heater contactor when conditions are conducive to the formation of snow and ice.
 - When in the OFF mode, the heater contactor remains disengaged regardless of the weather conditions.
 - When in the ON mode, the heater contactor is engaged until the controller mode is changed or the power is reset.
3. The control provides two indicator lights. The green indicator lights when the control is in the AUTO mode. The yellow indicator lights when the heater contacts are closed and the heaters are on.
4. The moisture sensor is heated to melt snow and ice for detection as moisture.
5. The controller has been factory preset to operate on 240 volt single phase power.
6. The heater contactor provided is rated at 50 amps resistive. The heater system draws approximately 20.1 amps.
7. The control panel and heater contactor are housed in a UL and CSA rated, weather resistant, gasketed enclosure.

