

## Deicers sold prior to May 2006: Installation and Operation

### Before Beginning De-Icer Installation:

#### CAUTION

It is YOUR responsibility to ensure that your installation meets all applicable electrical codes. We recommend that the installation be reviewed by a qualified electrician before you apply power.

All parts of the de-icer system within about 20 feet (6 meters) of any radiator must be shielded from RF energy, and the entire outdoor portion of the system must be made waterproof.

Note that unless an exterior box has been ordered specially, a de-icer control box purchased from Shively Labs is designed for interior installation only.

To prevent electrical short-circuiting, secure all cables to minimize wind-induced motion and chafing against edges of system or tower components.

It is important that you ground both the tower junction box and the control box.

When testing the thermostat in step 10, be sure to disconnect one or both thermostat leads before taking resistance readings. Otherwise, readings may be affected by other components.

The resistance readings in tables 3 through 6 are for the Shively-supplied portion of the systems only, and do not take into account any long run of cable to the tower and up to the antenna.

An improperly installed de-icer can over-heat and damage your antenna.

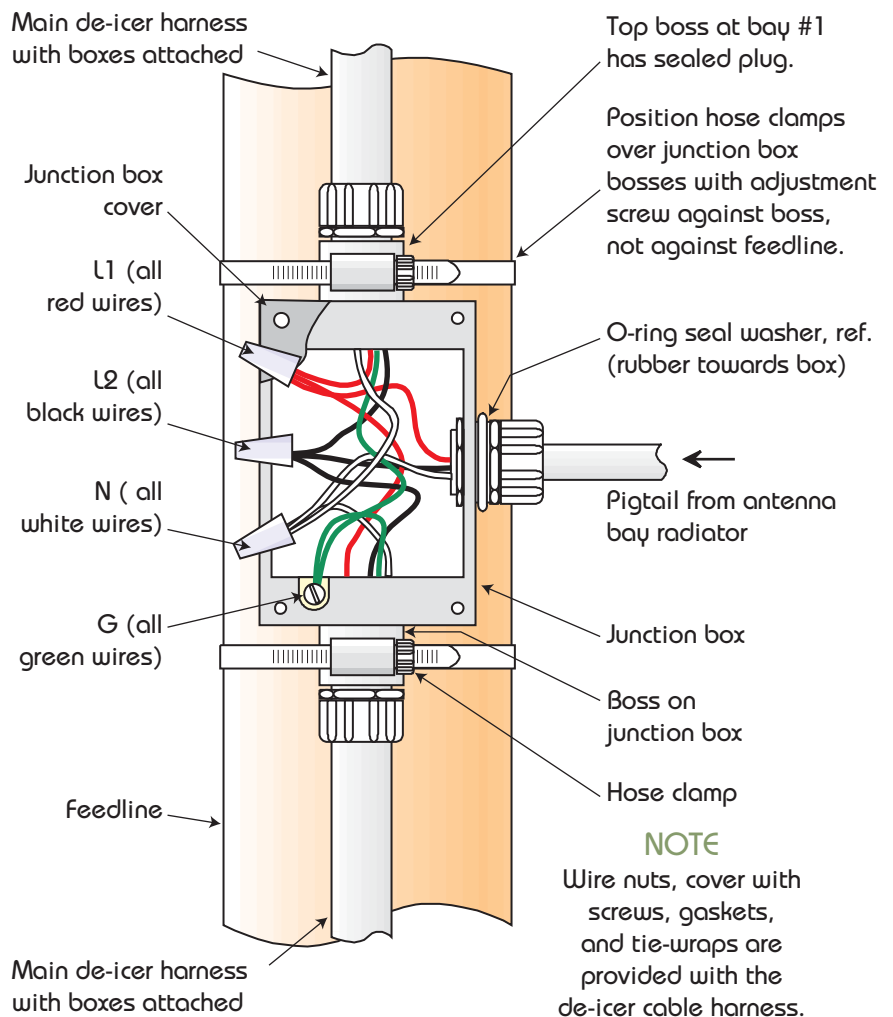


Figure 1. Bay junction box installation

### Installation Procedure:

The de-icer system consists of the heating elements in the bays, their branch cables, and the main harness. The main harness consists of a bay junction box for each antenna bay, interbay cables, and a "pigtail" of wires extending about 10 feet (3 meters) which you will connect to the tower junction box you are to provide.

Your system may also include specially-ordered items, such as a ground-mounted control box, a power cable extending up the tower, or a tower-mounted thermostat.

The de-icer system requires 220 VAC, 50 - 60 Hz., single-phase. Table 5 shows approximate current draws for various configurations.

## Install the de-icer system as follows:

- Install the main de-icer harness with its bay junction boxes as shown in the installation drawing and Figures 1 and 2.
- (Center-fed antenna only) You may find that the feedline mounts are in the way when mounting the bottom-most bay junction box. If necessary, using hose clamps, secure the bay junction box to the mounting bar provided, then secure the mounting bar to the feedline section. See Figure 3.
- Connect the leads from each bay de-icer to the main harness in that bay's junction box as shown in Figure 1. Secure any slack in these cables to the feedline with tie-wraps to avoid wind damage.
- Furnish a tower junction box as shown in Figure 4.
- Using tie-wraps, secure the entire length of the de-icer harness to the RF feedline at about 24" (60 cm) intervals. Run the ten-foot pigtail along a feedline mount to the tower junction box and secure it to the mount and the tower.
- Furnish a main control box as shown in Figure 5.
- You may locate the thermostat, if applicable, at your discretion. We recommend mounting it as closely as practical to the antenna.
- Wire the thermostat and the main control box as shown in Figure 5.
- Run a power cable from the control box in the building to the tower junction box and connect it to the de-icer harness pigtail(s) in the tower junction box.
- After installation is complete, measure the resistance from each heater leg to ground to ensure that there are no short-circuits. Resistance should be infinite.
- Measure the resistance across the thermostat circuit and from it to ground in the same way. Test at the location shown in Figure 5. Be sure to disconnect one or both thermostat leads before taking resistance readings.
- Thermostat readings should be as shown in Table 1 (single thermostat) or Table 2 (tandem thermostat).
- Measure the resistance across each heater leg. Be sure to add in the resistance of any long cable runs from the control box to the antenna. Compare readings against Table 3.
- Turn the de-icer on by switching it to Manual, and measure its current draw with an ammeter. Compare this reading with Table 4.
- Record the resistance and current readings in your maintenance log for future reference in troubleshooting the de-icer system.

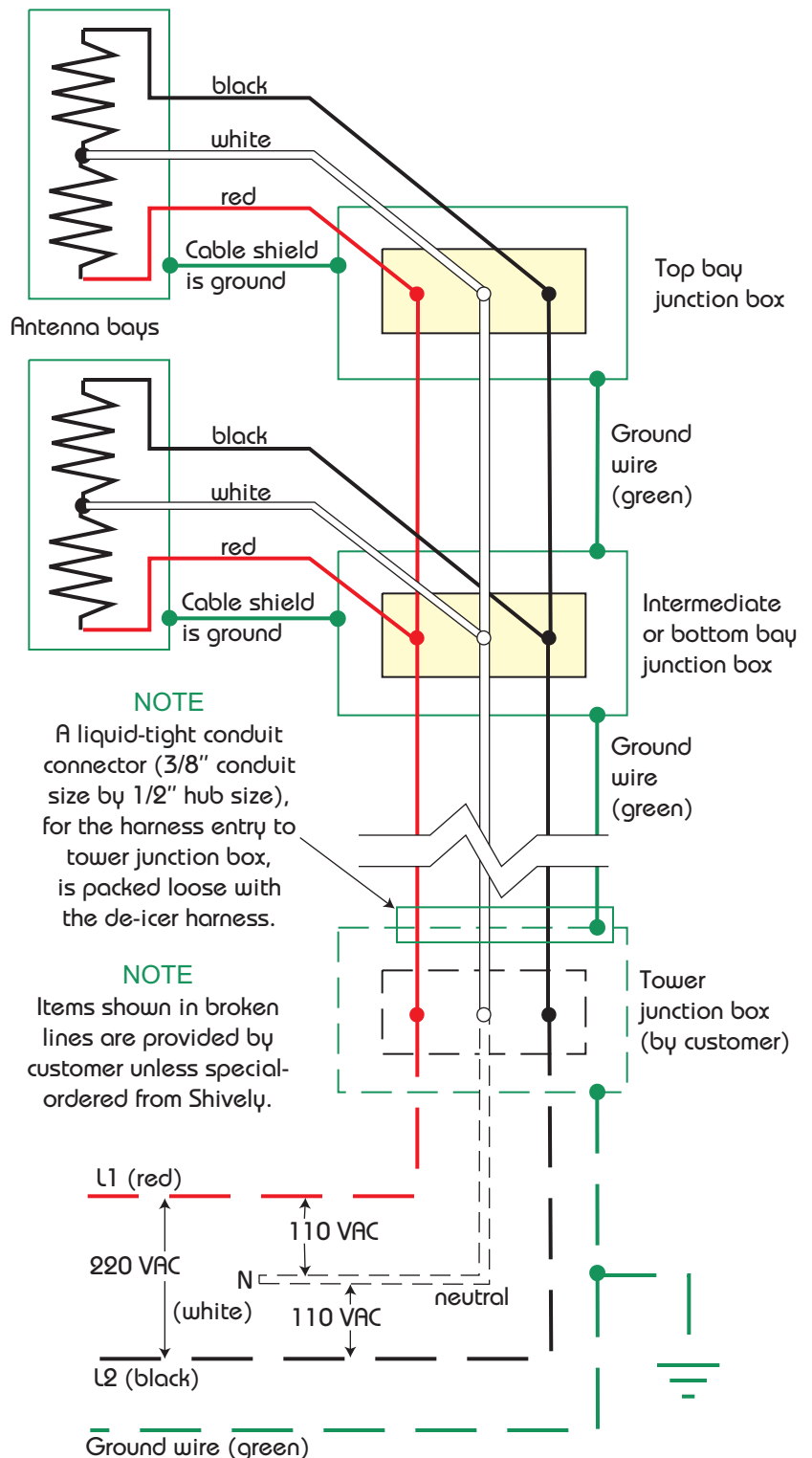


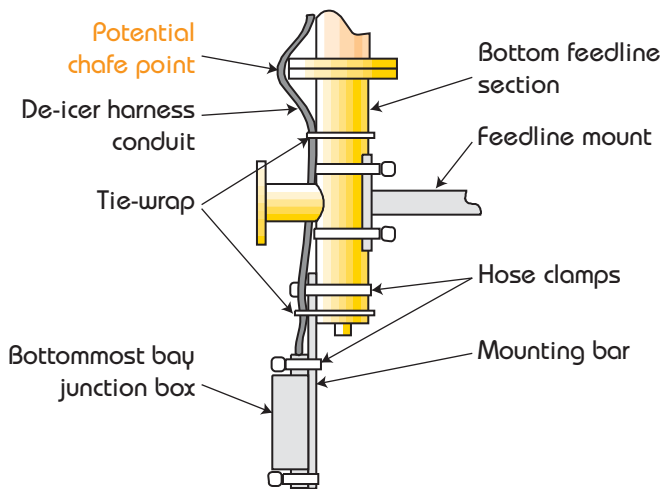
Figure 2. System Electrical Schematic Diagram

Table 1. Single Thermostat Readings

| Reading Location | Ambient Temperature        | Resistance = 0 ohms (short circuit)   | Resistance = infinite ohms (open circuit) |
|------------------|----------------------------|---------------------------------------|-------------------------------------------|
| Leg-to-Ground    | Any                        | Defective thermostat or shorted leads | OK                                        |
| Leg-to-Leg       | Above about 38° F (3.3° C) | Defective thermostat or shorted leads | OK                                        |
|                  | Below about 38° F (3.3° C) | OK                                    | Defective thermostat or broken leads      |

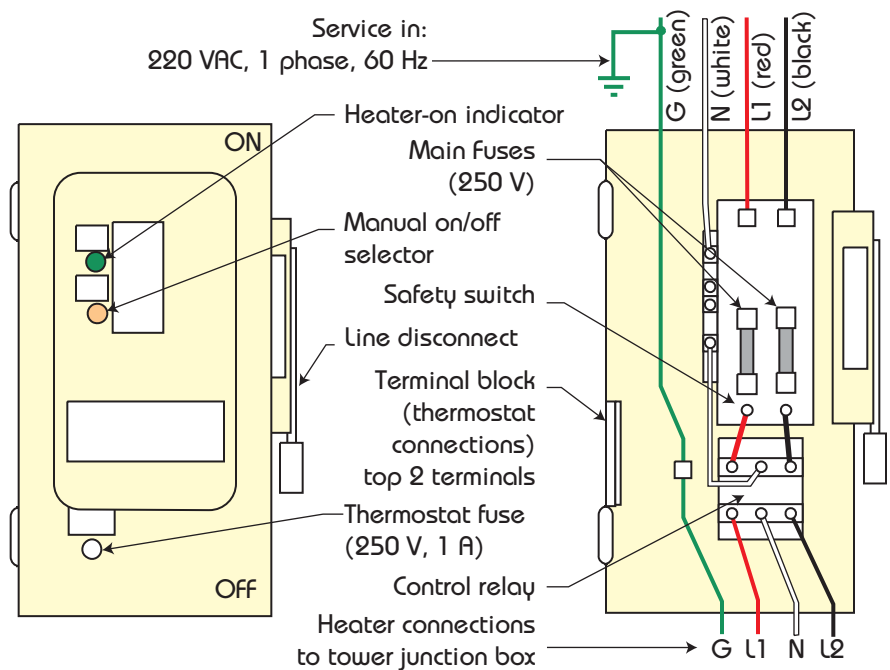
Table 2. Tandem Thermostat Readings

| Reading Location | Ambient Temperature                                 | Resistance = 0 ohms (short circuit)   | Resistance = infinite ohms (open circuit) |
|------------------|-----------------------------------------------------|---------------------------------------|-------------------------------------------|
| Leg-to-Ground    | Any                                                 | Defective thermostat or shorted leads | OK                                        |
| Leg-to-Leg       | Above about 38° F (3.3° C)                          | Defective thermostat or shorted leads | OK                                        |
|                  | Between about 10° and about 38° F (-6.7° to 3.3° C) | OK                                    | Defective thermostat or broken leads      |
|                  | Below about 10° F (-6.7° C)                         | Defective thermostat or shorted leads | OK                                        |



(for center-fed antennas only)  
Figure 3. Mounting of Bottommost Bay Junction Box

Figure 4. Tower Junction Box Layout





## Operation:

### WARNING

The broadcast industry has recently recognized the potential medical hazards of intense radio frequency radiation. Don't expose personnel to personal harm. For reference, see CFR 29, Section 1910.97, the OSHA standard for exposure to non-ionizing radiation. Whenever a rigger is on the tower in the area of the antenna, shut off the transmitter and lock it off so that it cannot be turned on accidentally.

### CAUTION

Never operate the antenna system without proper purging and constant positive dry gas pressure. Shively Labs will not accept responsibility for antenna failure after operation without proper purging or positive pressure of dry air or dry nitrogen.

Don't leave the de-icer on for extended periods when the weather is above 60° F (16° C); it may overheat and be damaged.

### Operating the De-Icer System:

There is a generous margin of safety built into the de-icer system, and operation for prolonged periods below 60° F (16° C) will do no harm. If icing conditions are expected, the heaters should be turned on ahead of time as a preventive measure. It is much easier to prevent ice formation than to remove a heavy coating. Thermostatic control systems which sense temperature conducive to ice formation are highly desirable and are available from Shively Labs upon request.

If you have the Shively Labs de-icer control box, you have the choice of manual or automatic operation. There are three switch settings: AUTOMATIC, OFF, and MANUAL. When the switch is set to AUTOMATIC, the thermostat turns the heaters on and off according to the temperature.

When the switch is set to OFF, the thermostat is overridden and the heaters will stay off no matter what the temperature.

When the switch is set to MANUAL, the thermostat is overridden and the heaters will stay on no matter what the temperature.

The rate of ice removal will vary greatly with temperature, wind speed, and type of ice. As a guide, the de-icers will remove 1/4 inch (6 mm) of clear ice at 32° F (0° C) in still air in about 15 minutes.

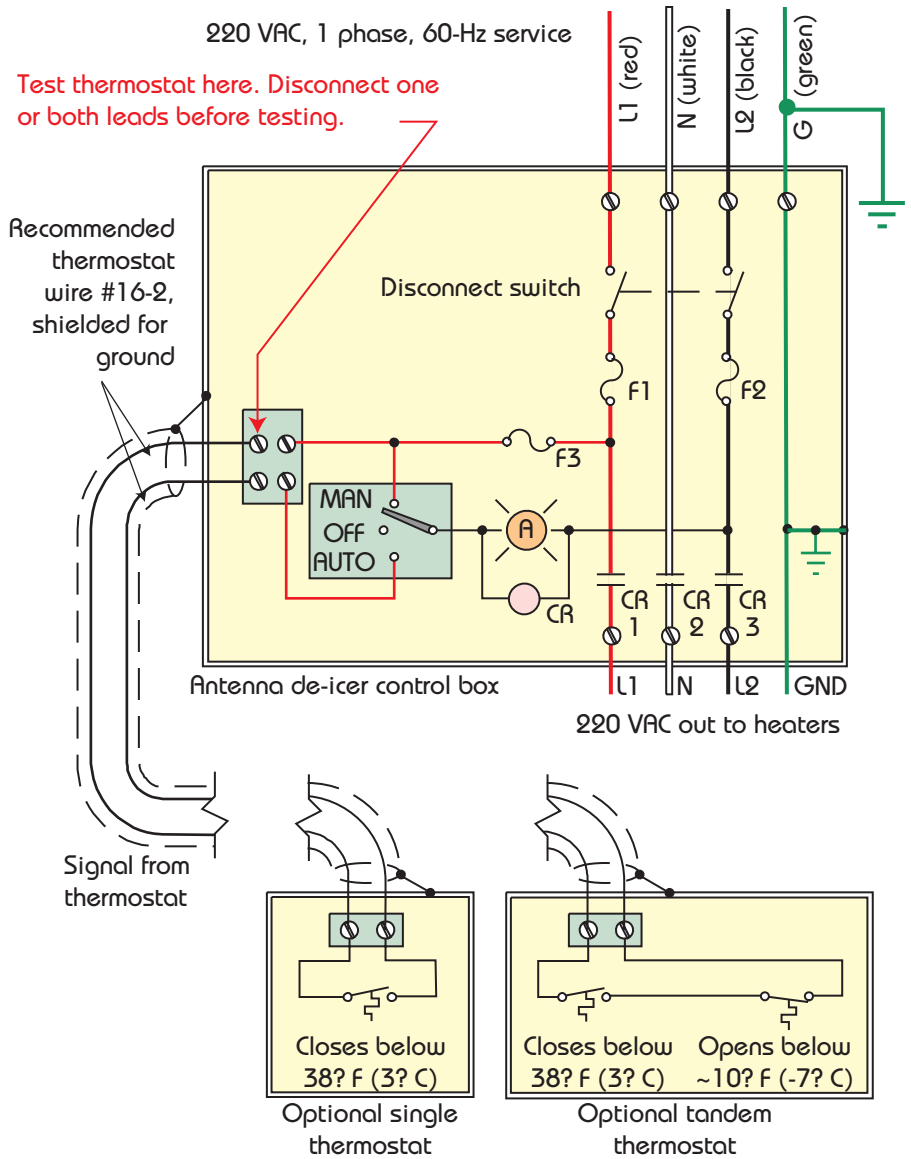


Figure 5. Main Control Box Electrical Schematic