Wireless Matrix
SDT-5000

Installation and User Guide

Wireless Matrix SDT-5000 Installation and User Guide

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WIRELESS MATRIX
SDT-5000 INSTALLATION AND USER GUIDE

TABLE OF CONTENTS

SAFETY PRECAUTIONS 4
INTRODUCTION 7
TECHNICAL SUPPORT 7
PRE-INSTALLATION CONSIDERATIONS 8
General Considerations 8
Mounting Recommendations 9
Site Selection 9
Power Requirements 9
Regulatory Information 9
ANTENNA INSTALLATION 10
Attaching to a Free Standing Pole 11
Attaching to an Existing Structure (Meter Shed or Compressor Building) 11
Orientating the Antenna Using a Compass 12
Connecting the Cable to the *SDT-5000* 14
Cable Selection 14
Cable Assembly 14
Mating the Cable to the Junction Box 14
Aiming the Antenna 16
Using the Multi-meter and the RSSI to Aim the *SDT-5000* 16
Using an RS232 Connection and Terminal Program to Aim the *SDT-5000* 17
Status Line 21
Operational States 22
Sending a Test Message 25
SDT-5000 System Verification List 28
Trouble Shooting 28
WARRANTY 30
SDT-5000 COMPONENT LIST 31

Safety Precautions

Read and understand the entire manual and follow the safety instructions

WARNING!

1. Replace fuse with same type and rating for protection against fire and damage.
2. The *SDT-5000* is a Radio Frequency (*RF*) generating device. Do not operate the unit when anyone is in the vicinity noted in the *Safety Information* section of this guide. This could result in personal injury.
3. Do NOT operate the *SDT-5000* unit in areas where explosives are in use as the *RF* frequency could interfere with the operation, causing hazardous conditions. Do NOT operate the *SDT-5000* unit in areas where two-way radio communications is prohibited.
4. For safety purposes, use caution when determining the *SDT-5000* installation location.

CAUTION!

1. **READ THIS MANUAL IN ITS ENTIRETY!**
2. Keep all original Packing Materials.
3. Follow the instruction enumerated in the *Installation Section* of this guide to ensure proper hardware installation.
4. Ensure that the *SDT-5000* is installed in a location that will NOT affect the *RF* transmission.
5. Pay close attention to the electrical power installation requirements described in this guide.

Safety Information

Read and understand the complete *Installation Guide*, including the *Safety Precautions*, prior to using the *SDT-5000* Modem.

The *SDT-5000* is a radio unit used to receive and transmit data. When in operation, the *SDT-5000* transmits and receives *RF* signals to and from a Geo-stationary orbital satellite.

Follow appropriate guidelines when installing the *SDT-5000* near hazardous locations.

- As defined in *ANSI/ISA Standard S82.01*, *Electric and Electronic Test, Measuring, Controlling, and Related Equipment, General Requirements.*
- All electrical wiring and grounding must comply with *National Electrical Code* requirements and local inspection authorities.
- Metal enclosures and exposed metal parts of electrical instruments must be grounded in accordance with OSHA rules and regulations pertaining to *Design Safety Standards for Electrical Systems, 29 CFR, Part 1910, Subject S, dated 16 April 1981* (OSHA rulings agree with the *National Electric Code*).
- The unit must be installed in an unclassified area outside the Class I, Division 2, hazardous classified location as defined by ANSI/API RP 500 – 1998 *Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities Classified as Class I, Division 1 and Division 2.*
- The enclosure is designed so it is sealed at all times to protect from accidental electrical shock.

The *SDT-5000* must be used in accordance with the safety guidelines stated in this document. Failure to comply could result in physical harm and can be a hazard to the health of the operator of this unit.

Important Safety Notice

The *SDT-5000* satellite radio emits radio frequency (*RF*) energy when transmitting. Operators should maintain a safe distance from radio when transmitting. The safe distance of 20 cm is measured from the center of the antenna beam with respect to the *ANSI/IEEE C95.1-1992* standard. The *SDT-5000* uses a directional antenna. In the case of this antenna, the 20 cm distance should be maintained under the following conditions:

- The antenna is powered on and transmitting. The *SDT-5000* transmits only when the remote terminal unit (*RTU*) sends messages to the host computer. These transmission periods are typically less than 10 seconds. Otherwise, the *SDT-5000* remains in receive mode or sleep mode and does not emit *RF* energy.
- A person is blocking line-of-sight to the satellite during transmission. The satellite is 101° longitudes and the antenna will point in that direction at all times while in operation.
- A person must be exposed to transmissions, as described above, for a continuous period of at least thirty minutes to exceed recommended exposure limits set by the *Federal Communications Commission*.

The *SDT-5000* must be mounted a minimum distance of 20 cm away from all persons and must not be co-located or operating in conjunction with any other antenna.

Wireless Matrix SDT-5000 Installation and User Guide

Introduction

This guide explains procedures for installing the *Wireless Matrix SDT-5000* (Modem). The *SDT-5000* itself consists of a high gain antenna, which is mounted on top of a transceiver unit. A remote terminal unit (*RTU*) must be connected to the satellite modem before any communication with a remote host can take place.

The guide does not provide detailed installation instructions for every type of location. Instead, because of the variety of available locations, it outlines the installation process and allows the installer to choose appropriate options.

Though the installation process is straight forward, it is important to plan your installation carefully. By planning your installation you can avoid potential problems and determine the best approach to installing the *SDT-5000*. Be aware that changes to a component's position or mounting method may be necessary due to variations that could not be anticipated when writing this guide. Try to predict installation variations by reviewing the *Installation Instructions* section of this guide before installing the *SDT-5000* hardware.

Technical Support

Technical support is provided through your service provider. They will provide information and answers to questions about the hardware and software described in this guide.

Pre-Installation Considerations

You should perform a pre-installation evaluation before installing any *SDT-5000* components. A pre-installation evaluation will provide information about how and where to install the *SDT-5000* and will help identify potential installation issues. During the pre-installation evaluation, you should estimate available space for component placement, cable routing and inspect the location to determine the most suitable area for an antenna installation. After completing a pre-installation evaluation, you should know where to locate components, how to route cabling and what additional mounting accessories, wiring and cabling conduits will be required for the installation.

General Considerations

- Check for obstructions at the site below ground level when digging holes for the units mounted on poles.
- Stay at least 20 cm away from an operating antenna when you are above the level of the antenna base.
- **Do not remove the antenna cover**: removing the antenna cover will void the product warranty.
- Do not paint the antenna: paint on the antenna will void the product warranty. Paint may also interfere with signal transmission or reception.

Mounting Recommendations

- The antenna mount must support the antenna weight and wind force created by the nominal wind speeds for that location.
- An “unobstructed line of sight” from the antenna to the satellite is essential for reliable communications.
- Mount the antenna as far away from any noise producing sources as possible. *RF* interference can originate from any number of unexpected sources such as high-tension lines, electrical and radio equipment and telecommunication towers. When installed and properly maintained next to or in an existing structure, ensure antenna is well away from air conditioners, electrical motors or other electrical devices.

Site Selection

Your *SDT-5000* assembly has been thoroughly tested and designed for use in rugged weather conditions. However, care and attention is still required for a proper installation. Select a site with a clear unobstructed line of sight to the satellite.

The *SDT-5000* is environmentally sealed, so it may be mounted directly outdoors. The unit may be installed indoors behind a glass window, provided there is a line of sight from the antenna to the satellite through the window, and the window does not have a coating that reflects *RF* energy.

The *SDT-5000* was tested and certified to operate in Class 1, Div. 2, Groups C&D hazardous locations.

Power Requirements

The *SDT-5000* requires a 12-volt DC battery or other 12-volt power source for operation. The *SDT-5000* current draw, transmit mode: <1.3 A; receive mode: <425 mA; sleep mode: <15 mA

Regulatory Information

FCC ID: P5ISDT5
IC ID: 1478A-SDT5

Note: The *SDT-5000* must be mounted a minimum distance of 20 cm away from all persons and must not be co-located or operating in conjunction with any other antenna.

Antenna Installation

Wireless Matrix recommends placing other antennas (private radio or cellular) at least 3-feet from the antenna mount. A typical pole mounted antenna is displayed in figure 1.

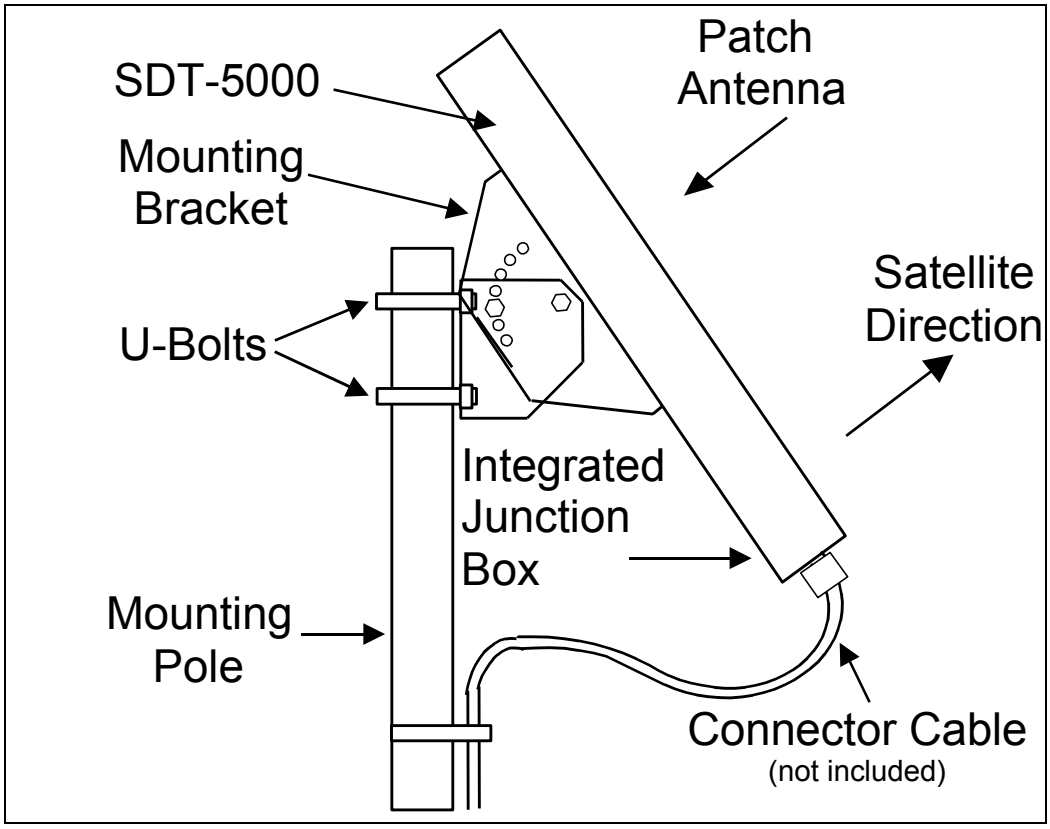

Figure 1. Typical Pole Mounted Antenna

Please refer to "*Appendix A*" for a listing of materials shown in figure 1 that are supplied and not supplied with the *SDT-5000*.

Attaching to a Free Standing Pole

1. An in-ground free standing pole installation will consist of a 10 to 12-foot 2 3/8 or 2 7/8-inch schedule 40 pipe installed in a hole filled with concrete.
2. Identify the installation site keeping in mind that the location must be outside any hazardous area and “unobstructed line of sight” to the satellite is essential.
3. Dig the hole at least 2-feet below the frost line where possible.
    a. The top of the concrete should be at least 6-inches below the frost line.
    b. The hole should be at least 12-inches in diameter.
4. In high wind areas, install a bolt or pipe in the bottom portion of the pole. This should prevent the pole from turning in the concrete pad causing misalignment of the antenna or solar panels and damage to the power-data cable.
5. Allow concrete to harden before proceeding with installation of antenna or solar panels.
6. Use proper sized pole brackets/U-bolts to affix antenna to pole.
7. Secure the cable with cable clamps or ties every 12 to 18-inches or run cable inside conduit or *Seal-Tite*. Avoid tight bends and kinks in the cable and grounding cable. The recommended tightest allowable bend radius is 2-inches.

Attaching to an Existing Structure (Meter Shed or Compressor Building)

1. Use two 1.5-inch Kindorf or equivalent channel, bolted to shed or building support struts. One to be installed near the bottom of the structure and the second to be installed near the top of the structure.
2. Use Kindorf or equivalent pipe brackets (for 2 3/8 or 2 7/8 inch pipe) to affix pole to Kindorf channel.
3. Use proper sized pipe brackets (for 2 3/8 or 2 7/8 inch pipe) to affix antenna base to pole.
4. Secure the cable with cable clamps or ties every 12 to 18-inches or run cable inside conduit or Seal-Tite. Avoid tight bends and kinks in the cable and grounding cable. The recommended tightest allowable bend radius is 2-inches.

Orientating the Antenna Using a Compass

Before powering up the antenna, it is important to orient the antenna in the general direction of the satellite. Failure to point the antenna in the general direction of the *SDT-5000* will cause the unit to go into a *Channel Search*, which could take as long as fifteen minutes to complete. Steps to point the antenna using the compass provided are described below.

1. Refer to the *Antenna Positioning Map* (see figure 2) for the correct positioning of the *SDT-5000*.

⇒ **NOTE:**
The below map diagram may vary 5 to 10 degrees, in regards to *Elevation* and *Azimuth*, depending on the specific location. It is provided solely as an aid to assist in positioning the *SDT-5000*.

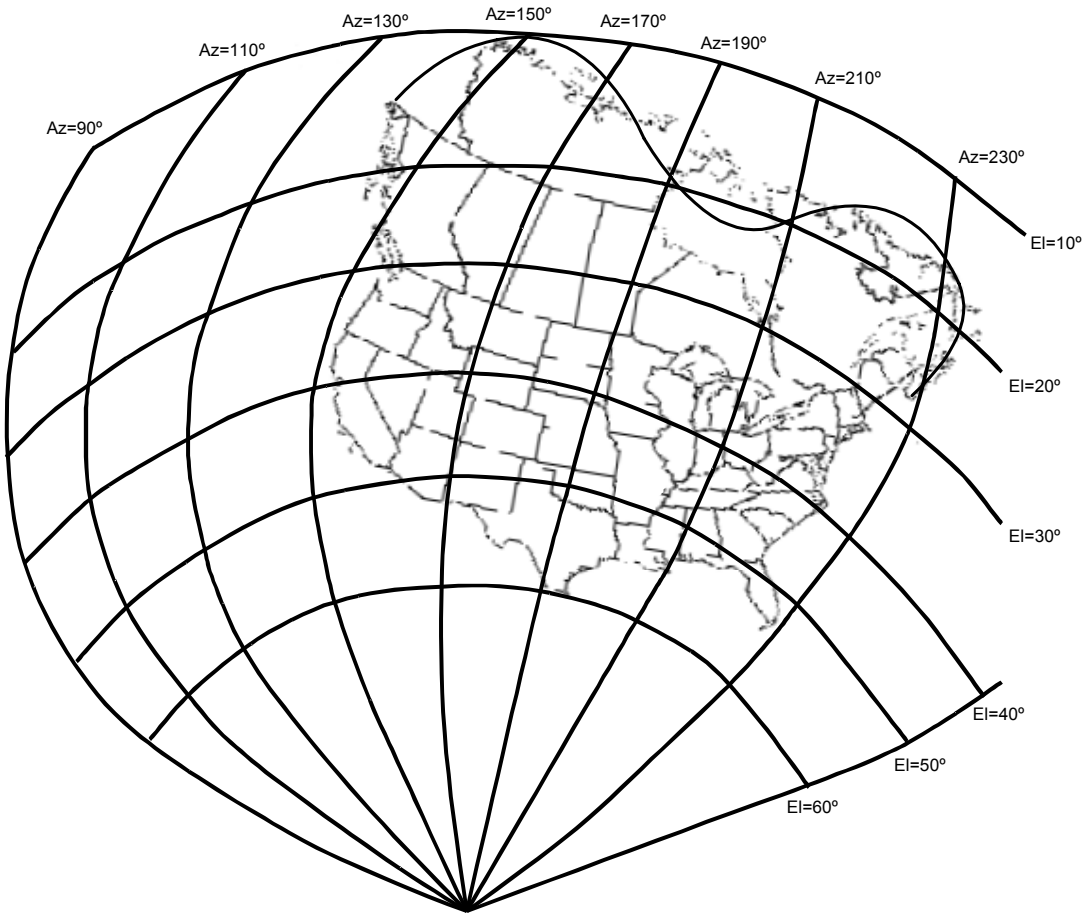

Figure 2. Antenna Positioning Map with Azimuth and Elevation Degrees

⇒ **NOTE:**
Figure 2 displays the extent of Wireless Matrix's satellite coverage into Canada.

2. Find the general installation location on the Antenna Positioning Map and make note of the specific *Azimuth* (150-240 Degree Range) and *Elevation* (30-60 Degree Range). Using the compass provided with the installation guide, find a flat surface and line up Magnetic North with the correct end of the Compass Hand. Once the hand is fixed on North, find the location's *Azimuth* on the compass face and position the *SDT-5000* in the same direction. Now that the *SDT-5000* is facing in the correct direction to satellite, it is necessary to adjust the Antenna's *Elevation*. Using the Antenna Positioning Map, find your *Elevation* and adjust accordingly. Line of sight is necessary for operation.

Connecting the Cable to the *SDT-5000*

The *SDT-5000* does not ship with a connector cable. This section describes instructions for cable selection, assembly and mating to the *SDT-5000.*

Cable Selection

The cable connecting the *SDT-5000* junction box to an RTU should have stranded wires, separately insulated, with an overall sheath around it sufficiently durable to withstand environmental and mechanical conditions.

It is recommended that shielded cable be used. This reduces signal leakage to/from the cable and improves noise immunity.

Signal lines should use 20 AWG stranded wire. Power and ground (power return) lines should use 14 AWG stranded wire.

The cable and the conduit shall be constructed of materials that are Class 1, Div. 2 compliant.

Cable Assembly

The cable connects to the junction box by individual wires being connected to terminal blocks inside the junction box. This end of the cable requires some insulation trimming and tinning of wire strands.

Each wire connecting to the junction box should have its insulation trimmed back by exactly ¼".

After the insulation has been trimmed, each wire should be tinned.

The cable shield should be attached to the power ground or the chassis ground.

Mating the Cable to the Junction Box

When cable wires are connected to the junction box they are inserted into the rounded oval holes of the terminal blocks, as shown in figure 3.

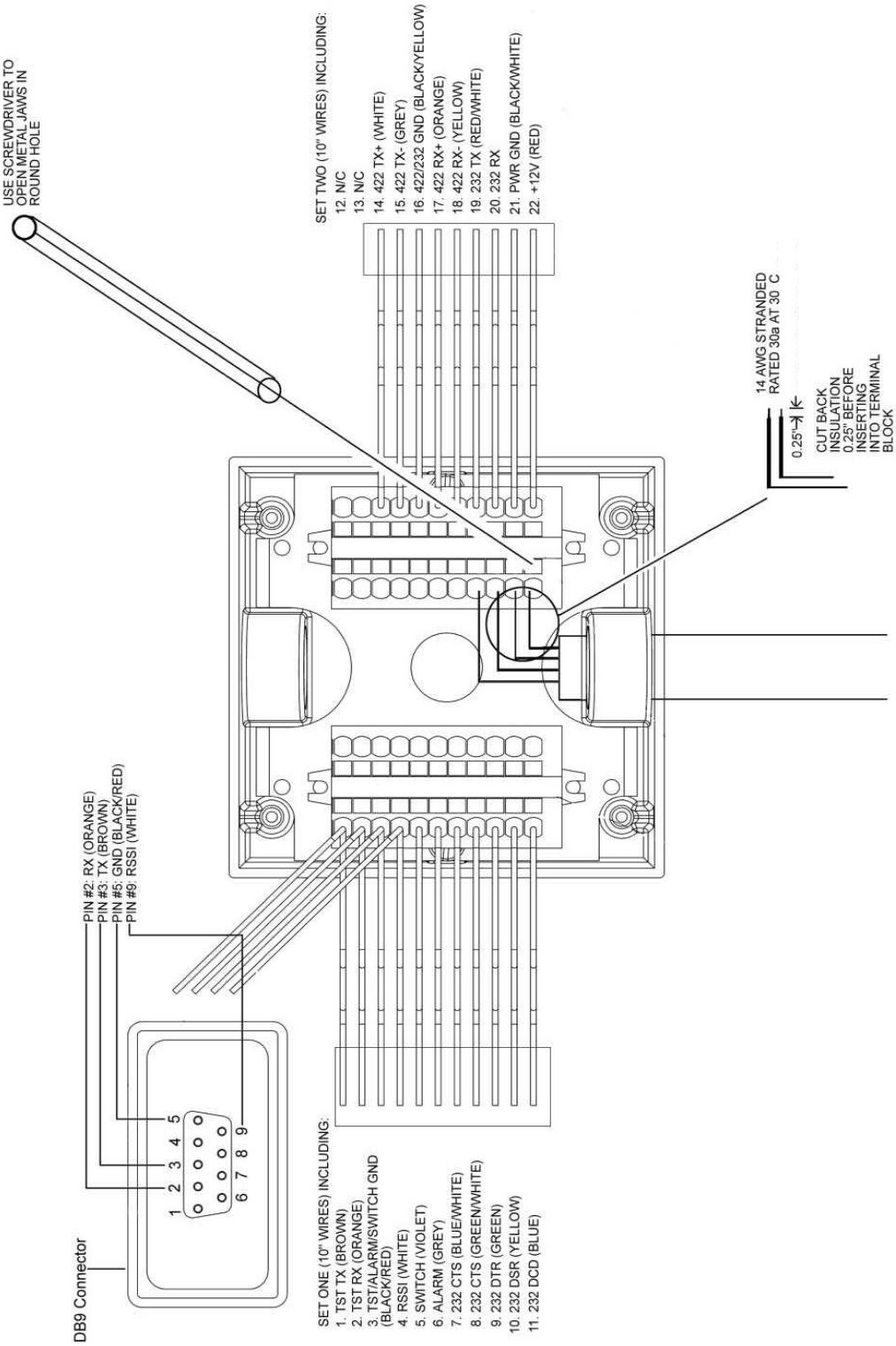

Figure 3. Mating Cable to Junction Box

1. Insert a small screwdriver into the square hole right next to the rounded oval hole.

NOTE:
This opens up the metallic jaws in the rounded oval hole.

2. Insert the wire into the rounded oval hole.
3. Remove the screwdriver. The jaws clamp down on the exposed wire at the end of the cable.
4. Repeat steps 1 through 3 for every wire in the cable that needs to be connected to the terminal blocks.
5. Unused wires in the cable sheath should be neatly rolled up and taped or secured so no electrical connection is made to the junction blocks.

Aiming the Antenna

Using the Multi-meter and the RSSI to Aim the *SDT-5000*

When the SDT-5000 is first powered up it provides a voltage proportional to its receive signal strength. The voltage is indicated on the receive signal strength indicator (RSSI) wire (white with red stripe) or pin "*9*" on the DB9 connector on the cover of the junction box.

1. Connect the positive lead of the voltmeter to the RSSI wire and the negative lead to a ground wire (white with black stripe).
2. Position the meter so the display is easy to view.
3. Power-up the SDT-5000. The RSSI voltage will rise and fall as the SDT-5000 is rotated.
4. Position the SDT-5000 so the RSSI voltage is at its maximum.
5. Rotate the SDT-5000 over a wide angel to ensure the maximum RSSI voltage has been found. The RSSI should be greater than 2 V.
6. The RSSI voltage is only generated for a short period of time. If the RSSI voltage is no longer displayed, power down the SDT-5000 and power it up again.
7. Once an optimal RSSI voltage is achieved, secure the bolts that lock the position of the SDT-5000.

Using an RS232 Connection and Terminal Program to Aim the *SDT-5000*

Complete the following steps to connect terminals and logon to the *SDT-5000* modem.

⇒ **NOTE:**
The sample screens for this task were obtained from ZOC.

1. Connect a *PC* based terminal communication program (i.e., hyper terminal, ZOC, or PROCOMM) to the test port of the cable assembly of the *SDT-5000* modem. The terminal should be configured as follows:

   9600 baud

   no parity

   8 data bits

   1 stop bit

   full duplex

   flow control none

2. Connect the unit to the battery using the supplied power cable. The unit should turn on and the *PC* terminal should display the following message:

Power up – self test in progress…

   The *SDT-5000* modem will require about 15 seconds to boot and run self-tests. During this self-test time the *SDT-5000* modem will print a number of diagnostic messages to the test port. Should the diagnostic messages not appear, check the terminal setup, serial cables and power cable connections.

3. Press the **Enter** key twice, and the following *Logon* (see figure 4) window should appear.

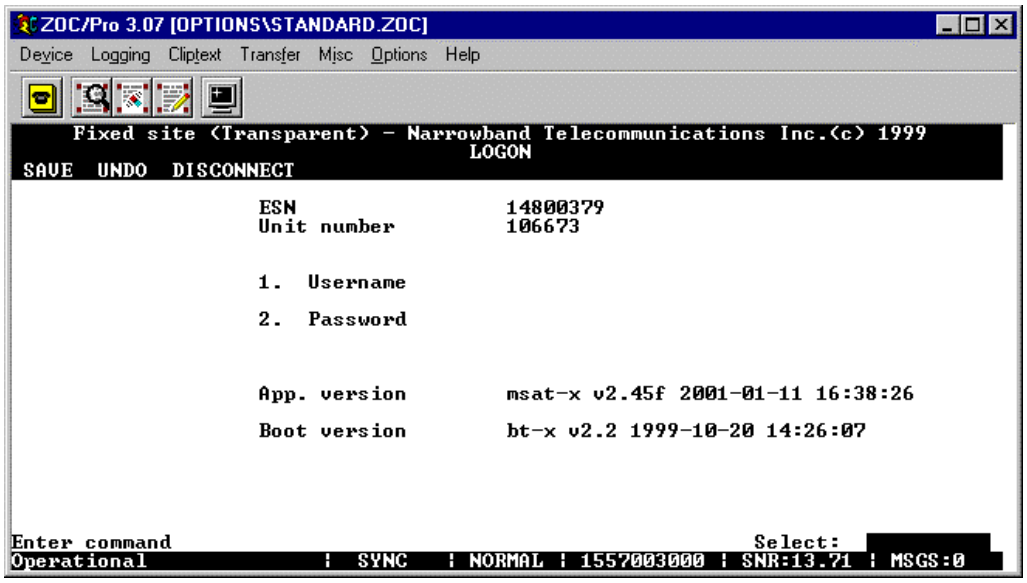

Figure 4. *LOGON* window

⇒ **NOTE:**
The windows displayed in this section are shown in the *Transparent* mode for example purposes. The same selections described below are applicable for all modes.

The window is displayed for 30 seconds to enter a username and password before the window will clear. If the window clears, press the **Enter** key twice again and the window will be displayed.

4. The *Select* field is displayed on the second line from the bottom of the window. When inputting a selection, the number selected will be displayed in the *Select* field. Type "*1*" and press the **Enter** key. The cursor moves to the *Username* field.
5. Type "*USER*" in the *Username* field. Press the **Tab** key. The cursor moves to the *Password* field.

⇒ **NOTE:**
The manufacturer sets the *USER's* default username to "*USER*" and the password to "*user*". The username and password are case sensitive.

6. Type the default password "*user*" in the *Password* field. Press the **Enter** key. The cursor moves to the *Select* field.

⇒ **NOTE:**
The *Select* field recognizes portions of commands as being unique. This means instead of typing "*SAVE*" and pressing the **Enter** key to save the changed data type "*S*" and press the **Enter** key because the "*S*" can normally be uniquely identified with the *Save* selection.

7. To complete the logon, type "*S*" (for save) in the *Select* field and press the **Enter** key. The *Main Menu* window (see figure 5) is displayed.

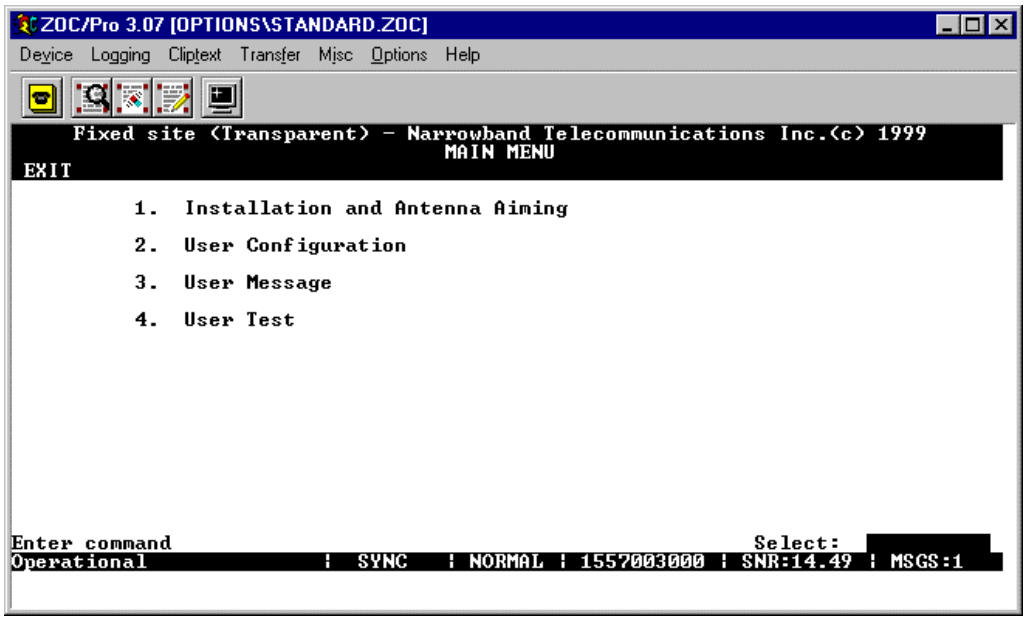

Figure 5. *Main Menu* window

8. From the *Main Menu*, select option "*1*" *Installation and Antenna Aiming* by typing "*1*" in the *Select* field. Press the **Enter** key. The *Installation and Antenna Aiming* window is displayed (see figure 6).

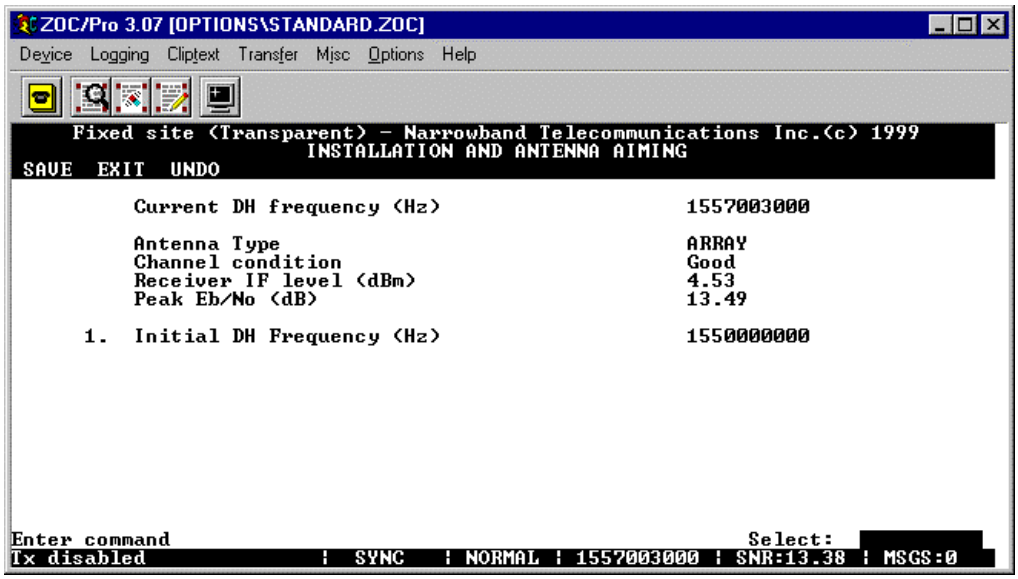

Figure 6. *Installation and Antenna Aiming* window

⇒ **NOTE:**

Do not change any information in the *Installation and Antenna Aiming* window. The purpose of the "*Installation and Antenna Aiming*" screen is to help aim the antenna during initial installation by monitoring the *Signal to Noise Ratio (SNR)*. The antenna aiming is aided by displaying the current *DH* frequency, the measured condition of the channel, and the signal quality.

CAUTION:

The *SDT-5000* will not transmit when it is in this screen. This is to protect the installer from exposure to *RF* energy. **Aim the antenna ONLY while in the "*Installation and Antenna Aiming*" screen**.

9. Wireless Matrix configures the *Initial DH Frequency* during commissioning, and the installer does not need to change this value unless directed by Wireless Matrix support personnel.
10. The antenna should be aimed according to its location in North America. From eastern North America, start by aiming the antenna in a southwesterly direction. From western North America, start by aiming the antenna in a southeasterly direction. From central North America, start by aiming the antenna in a "due south" direction.
11. While monitoring the *Signal to Noise Ratio* in the "*Installation and Antenna Aiming*" screen, rotate the antenna slowly in the horizontal direction and stop at the point that shows the highest reading. Then increase and decrease the antenna elevation until the highest *Signal to Noise* reading is displayed. If the receiver is tuned to a *DH Channel* (*SYNC* displayed on the *Status Line*), and the antenna is aimed in the optimum direction a *Signal to Noise Ratio* of above 16 dB should be displayed. If this is not the case, the antenna is either blocked or it hasn't been aimed accurately.
12. To navigate to another window or logoff the system, type "*E*" (for exit) in the *Select* field and press the **Enter** key. The *Main Menu* window (see figure 5) is displayed.
13. The unit will display "*Operational*" on the *Status Line*, and will be ready to send and receive messages to the Host.

Status Line

The *Status Line* is the last line (line 24) displayed on the *VT100* monitor for all windows. The fields on the status line are: the *Operational state*, *SYNC*, *DSP Mode*, *Current DH frequency* and *Signal to Noise Ratio* (*SNR*). Data on the *Status Line* is updated in real time and provides important information on the Wireless Matrix Modem's state.

⇒ **NOTE:**
References to *MET* or *MT* are synonymous with the Wireless Matrix Modem.

Table 1 describes the fields for the *Status Line*.

Table 1. Descriptions for *Status Line* fields

Function	Description
Operational state	The Wireless Matrix Modem has a number of possible states. Valid messages for this field are: "*Operational*", "*SASK Invalid*", "*MUI Invalid*", "*Channel Search*", "*BB Invalid*", "*Logon Pending*", "*MET Deactivated*", "*Ready for Commissioning*" and "*Fade*". Unless this field displays "*Operational*", there will be no communications sent or received. Refer to the section "*Operational States*" in this guide.
SYNC state	The Wireless Matrix Modem may be in *SYNC* or in the *NO SYNC* state with relation to the Data Hub (*DH*) frequency. If the Sync state is *SYNC* then the Wireless Matrix Modem is receiving the *Data Hub* signal. When in *SYNC* the *SYNC/TX LED* will be lit green. If the Sync state is *NO SYNC* the *SYNC/TX LED* will be turned off, and the Wireless Matrix Modem will be constantly searching for the *Data Hub* signal on all known *DH* frequencies. The Sync state will also be *NO SYNC* if the Wireless Matrix Modem is missing the Initial *DH* frequency. Valid messages for this field are: "*SYNC*", "*NO SYNC*", "*PILOT SEARCH*" or "*CHANNEL SEARCH*". Unless this field displays "*SYNC*", no messages will be sent or received.
DSP Mode	Display of the current Digital Signal Processor (*DSP*) mode should read *NORMAL* after a successful power up.
Current DH frequency	Display of the current *DH* frequency.

Table 1. Descriptions for *Status Line* fields (*continued*)

Function	Description
Signal to Noise Ratio	The Signal to Noise Ratio (*SNR*) is an indicator for the Wireless Matrix Modem receiving the satellite signal. If this value drops below "*16.00*" the Wireless Matrix Modem will have difficulty maintaining Sync and may experience a very high bit error rate. A value of "*16.00*" or above is an indicator of a normal operational signal.

Operational States

Operational states are defined by the Mobile Data Services (*MDS*) system and define the Wireless Matrix Modem's ability at an instant in time. The Wireless Matrix Modem will normally be in the *Operational* state if everything is functioning correctly. The state will be *Fade* or *Channel Search* if the Wireless Matrix Modem is having difficulty receiving *SYNC*.

Table 2 describes the fields for the *Status Line*.

Table 2. Descriptions for *Operational States*

Function	Description
Ready for Commissioning	The Wireless Matrix Modem has not been commissioned on the Mobile Data Services (*MDS*) network and is in the process of passing a series of tests and authentication procedures with the *DH*. You may see this state during installation or if internal parameters are corrupt. When the Wireless Matrix Modem has been successfully commissioned the state will change to *Operational*. If the Wireless Matrix Modem commissioning is unsuccessful, the state will normally change to *MET Deactivated* by the *Data Hub*.
Operational	*Operational* is the desired state for the Wireless Matrix Modem. *Operational* is an indication the unit is functioning normally and ready to communicate through the *DH* to anywhere you choose. The Wireless Matrix Modem may display *Channel Search* or *BB Invalid* for a few seconds before reaching the *Operational* state.

Table 2. Descriptions for *Operational States* (*continued*)

Function	Description
Channel Search	The Wireless Matrix Modem is tuning to various frequencies and searching for a Data Hub (*DH*) signal (there is more than one signal). This will occur under the following conditions: - the *Initial DH Frequency* is incorrect or was never entered. You may enter this value from the *Installation* window. - the *DH* signal is not present due to a blockage (e.g. truck, building, trees, mountain, etc.), or the system provider took the *DH* signal off air. - the antenna is out of alignment or damaged.
Pilot Search	When the channel search has failed to find a valid Data Hub (*DH*) frequency the Wireless Matrix Modem will search for pilot frequencies. Tuning to a pilot allows the Wireless Matrix Modem to correct for any frequency drift and restart the channel search.
Tx Disabled	The window is being modified and may receive data; however, it cannot send any data.
SASK Invalid	The Seed Access Security Key (*SASK*) parameter is incorrect. Check the *SASK* entered. Contact the Value Added Reseller (*VAR*) that provided the Wireless Matrix Modem to have it fixed.
MUI Invalid	The Mobile Data Services (*MDS*) User Identification (*MUI*) parameter is incorrect. Check the *MUI* entered. Contact the *VAR* that provided the Wireless Matrix Modem to have it fixed.
Fade	The Wireless Matrix Modem is receiving the current Data Hub (*DH*) channel with a Signal to Noise Ratio (*SNR*) that is below an acceptable level. This may occur under the following circumstances: - the *DH* signal is not present due to a blockage (e.g. truck, mountain, etc.), or the *DH* signal was taken off air by the system provider. - the Wireless Matrix Modem is crossing to a new beam. - the antenna is out of alignment or damaged.

Table 2. Descriptions for *Operational States* (*continued*)

Function	Description
BB Invalid	The Wireless Matrix Modem is in *SYNC*, it is continuously receiving blocks of bulletin board (*BB*) information (internal Wireless Matrix Modem parameters that define how the Wireless Matrix Modem is to operate). One of the blocks of data is received frequently (about once every second) and is called the *Descriptor*. If the *Descriptor* is not received within five minutes or illegal parameters are received, the Wireless Matrix Modem will set the state to *BB Invalid*. While in this state the Wireless Matrix Modem cannot transmit, but will continue looking for bulletin board information. This condition only occurs for a short time during installation, or when the *DH* signal is poor.
MET Deactivated	The *DH* has disabled the Wireless Matrix Modem for transmitting illegally or failing various tests when logging on. The unit needs to be reinitialized by the system provider. Contact the *VAR* that provided the Wireless Matrix Modem to have it reinitialized.
Logon Pending	The Wireless Matrix Modem is crossing satellite beams and must logon to the *MDS* network. The process is automatic and the Wireless Matrix Modem will only be in this state for an instant. This only occurs when a user moves the unit to another beam, as the beams are stationary.

Sending a Test Message

After the *SDT-5000* has been configured, Wireless Matrix recommends sending a test message to the Wireless Matrix echo port to ensure the unit is operating properly.

1. Select option "*3*" *User Message*" from the *Main Menu* window (see figure 5) by typing "*3*" in the *Select* field. Press the **Enter** key. The *User Message*" window (see figure 7) is displayed.

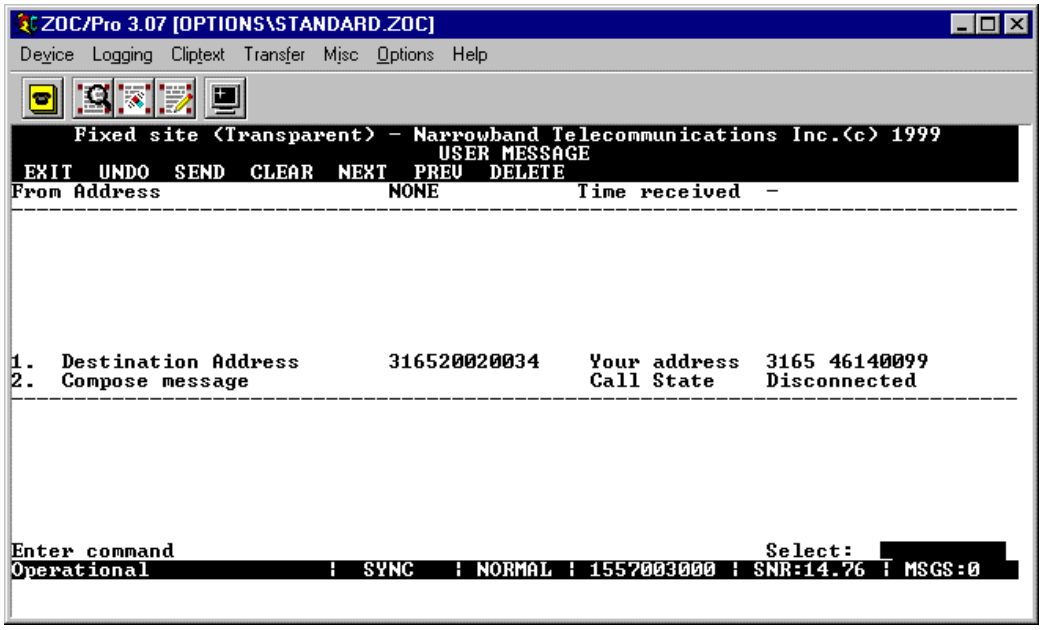

Figure 7. *User Message* window

2. The window is divided into two portions, an upper portion that receives the messages and a lower portion to compose and send messages. Enter "*1*" in the *Select* field. Press the **Enter** key. The cursor moves to the *Destination Address* field.
3. Input the echo port address of "*316520010034*" or "*316520020034*" in the *Destination Address* field.
4. **Tab** to the compose message field in the *Send* (lower) portion of the window.
5. Type a short message (7 lines or less) as displayed in figure 8.

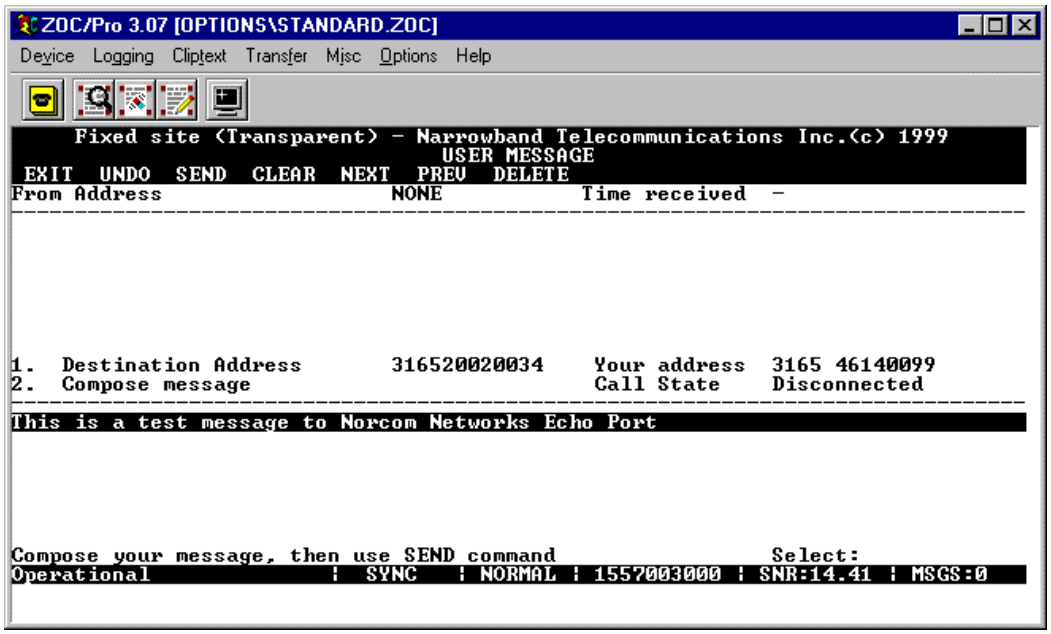

Figure 8. ***User Message (Send portion)*** **window**

6. Press the **Enter** key. The cursor moves to the *Select* field.
7. Type "*S*" for *Send* in the *Select* field. Press the **Enter** key.
8. As long as the status line at the lower left reads "*OPERATIONAL | SYNC*" and the *SNR* reads above "*16*", the message should be returned and displayed in the *Receive* (upper) portion of the *User Message* screen (see figure 9).

⇒ **NOTE:**
If the message is unsuccessful, refer to the "*Trouble Shooting*" section of this document.

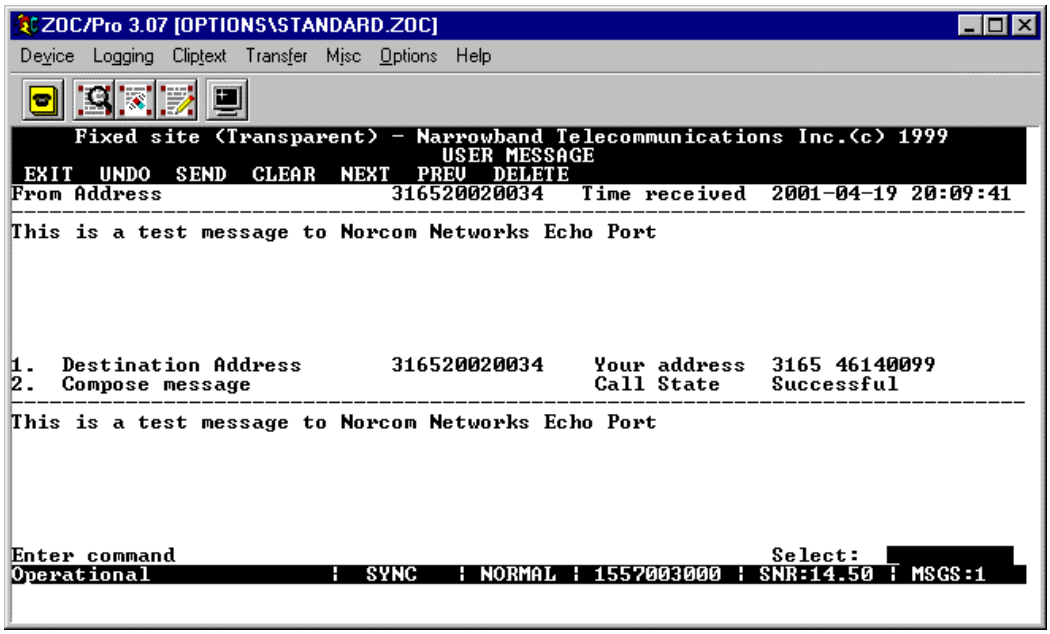

Figure 9. ***User Message (Receive portion)*** **window**

SDT-5000 System Verification List

To verify the *SDT-5000* System is operational, follow this checklist:

1. Verify the connection from the *RTU* or the end device going to the *SDT-5000* is secure.
2. Verify the power source output is 12 to 13-volts.
3. Attempt to send a message to the host or have the host send a message to the *RTU* or end device.

Trouble Shooting

The most common problems that affect the operation of the *SDT-5000* are power connections and configuration. PLEASE consult your service provider for details in configuring your *SDT-5000*.

Refer to table 3 for symptoms and suggestions for troubleshooting tips that may affect the operation of the *SDT-5000*.

Table 3. Symptom and Suggestions for Troubleshooting Potential Problems

Symptom	Suggestions
The *VT100* test application does not connect to the *SDT-5000*.	a. Check that the power source is properly connected to the antenna and the power source.
	b. Using the voltmeter, verify power is 12 to 13.5-volts.
	c. Check the power fuse, and ensure it is connected properly.
	d. Verify the *SDT-5000* is powered on.
	e. If the problem persists, test the cable for continuity and/or damage.
The *VT100 Test* port application connects to the *SDT-5000* but is unable to send test a message.	a. Check that your laptop *COM* port is fully operational.
	b. Verify that the *RTU* or end device is connected to the *RTU* inter-cable, NOT the *Test* inter-cable.
	c. Verify the *SDT-5000* cable is properly connected.
	d. Contact your service provider and verify the following: i. The address in the user logon screen corresponds with the *X.121* address of the *SDT-5000* unit. This address is also located on a label on the *SDT-5000*. ii. The correct destination address is configured in the user message screen. iii. The *SDT-5000* unit is commissioned and authorized for use.

Warranty

Wireless Matrix warrants that upon shipment to Customer from supplier's facility and for the Warranty Period, hereinafter defined, the Equipment shall be free from defective materials and faulty workmanship and capable of accessing the Service ("Good Working Order"). The warranty provided herein shall not apply to (i) hardware normally consumed in operation such as fuses, cables, or mounting brackets, (ii) defects which, due to no fault of Wireless Matrix, are the result of improper use or maintenance of the Equipment, (iii) improper operation of the Equipment used with other equipment, (iv) Equipment which, due to no fault of Wireless Matrix, has been subjected to any kind of detrimental exposure or has been involved in any accident, fire, explosion, Act of God, or any other cause not attributable to Wireless Matrix, (v) any Equipment which has been altered or repaired by any party other than Wireless Matrix without Wireless Matrix's prior consent, (vi) any Equipment sealed against the weather whereby the seal has been broken without Wireless Matrix's prior consent, or (vii) any Equipment hardware or software, including any revisions provided by Wireless Matrix, which has been improperly stored, installed or implemented. Customer shall de-install and return (unless otherwise directed by Wireless Matrix) the failed Equipment to Wireless Matrix. Wireless Matrix shall return the Equipment, or a new or reconditioned unit, at Wireless Matrix's option, free of charge to Customer via best way ground, unless otherwise specified by Customer (with additional costs thereof to Customer's account), during the one year from shipment ("Warranty Period"). Wireless Matrix's warranty obligation is limited to restoring the Equipment to Good Working Order. The repaired or replacement Equipment is warranted for the remainder of the original Warranty Period.

SDT-5000 Component List

SDT-5000 Component Name

SDT-5000 Modem with Antenna

Attached mounting bracket

Junction Box

This Manual

Recommended Components (Not Supplied)

Laptop with suitable *VT100* compatible communications software such as Windows *Hyper-terminal* Application

Mounting Pole either 2 3/8” or 2 7/8” diameter

U-bolts (depending on mounting pole width)

12-Volt Power Supply - A typical remote site will require a battery with recharging solar cell.

Multi-meter

Compass

7/16-inch and 9/16-inch (or adjustable) Wrench

Equipment and supplies to attach pole to existing structure or concrete in hole for free standing mount

Equipment and supplies to attach power leads and *RTU* inter-cable to remote measuring device

Equipment and supplies for routing through conduit or *Seal-Tite* if power supply or remote measuring device is located in a hazardous area

Serial cables and adapters as required to connect computer to test inter-cable