

10

Satellite Access Procedures

Sample Script for Telephone Conversation with a Hub or Satellite Operator (Manual operation)

User to SO: Hello, my name is ___ and I'm calling from ___. My number is ___.

I am ready to start transmitting on satellite NSS7, Transponder
K18, Slot C at 14114MHz.

SO to User: OK, please bring up a clean carrier

User Action: Turn on Clean Carrier at low power

User Action: Press CW Minimum Quick Key

SO to User: OK we see that, please increase power

SO to User: Increase carrier to nominal

User Action: Press CW Nominal Quick Key.

User to SO: Increasing power. It will take a few seconds

User to SO: We are at nominal power

SO to User: Looks good. Go ahead and modulate

User Action: Turn on modulation

User Action: Press Modulated Nominal Quick Key

10 Satellite Access Procedures

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Operating the GLOBETrekker™ in Manual Mode

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Norsat GLOBETrekker

This chapter enables a user to manually align the antenna towards the desired satellite; peak on the satellite; and verify that they are on the correct satellite. This chapter also takes users through a satellite access procedure.

Manual Antenna Alignment Overview

There are eight steps in the manual operation:

1. Launch LinkControl Application and Choose a Profile
2. Identify Location
3. Verify Target Satellite
4. Check Clearance Distance
5. Check if there is a DVB Carrier on the target Satellite
6. Point the Antenna
7. Acquire Satellite and Peak Antenna
8. Call Hub (or Satellite) Operator to Access Satellite

Step 1a: Launch Link Control Application

The LinkControl application will launch automatically once the GLOBETrekker has been powered up.

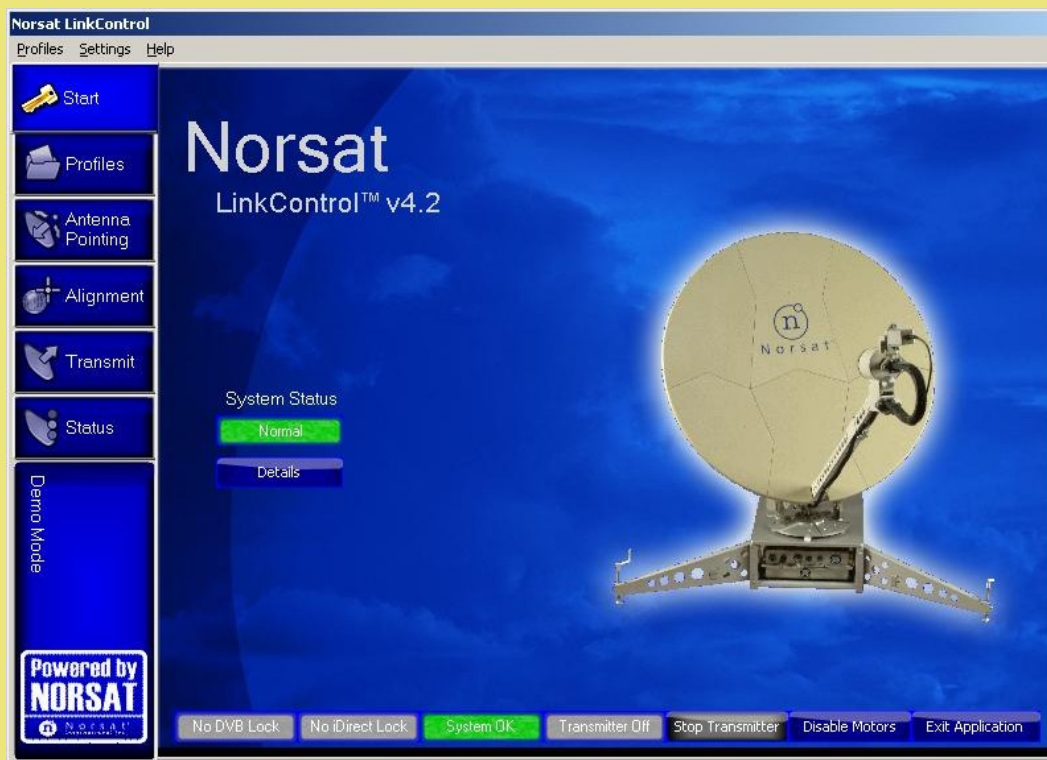
Access to the LinkControl application screen will be available after the laptop has been connected to the GLOBETrekker baseband unit and the laptop has been powered up.

It may take several minutes for the application to appear on the screen. The application will open with the Startup screen being displayed as in [Figure 36](#).

The LinkControl application performs numerous diagnostics upon start-up.

The operator should allow the LinkControl application to fully complete its diagnostics before attempting to take control of the application. The results of the diagnostics can be viewed by pressing the DETAILS button below the System Status indicator.

Figure 34 Startup Screen



This process is password-protected and is accessible only to users designated as "administrator(s)" in LinkControl.

If you are using the GLOBETrekker for the first time, the system will come with an Administrator password. This can be changed at a later date.

To enter Administrator mode:

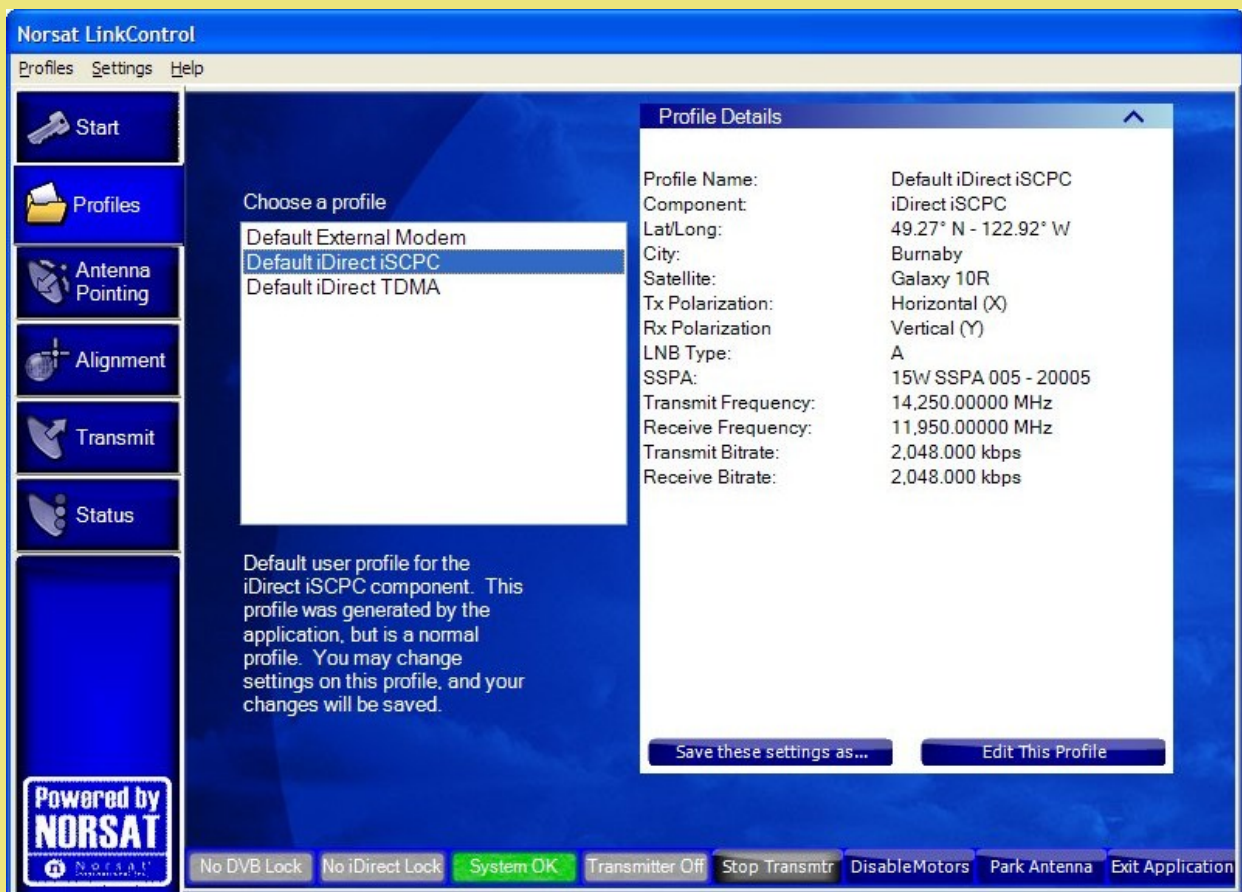
- 1 On the Menu bar press Settings -> Enter Admin Mode
- 2 Enter the Administrator password. By default the password is "Administrator".
Note: Passwords are case sensitive

To exit Administrator mode and enter Operator mode:

- 1 On the Menu bar press Settings
- 2 Select Exit Admin Mode

Step 1b: Choose a Profile**Choose an Existing Profile:**

- a Click on the Profiles tab on the left side of the screen; refer to [Figure 37](#).
- b Click on a profile in the list of profiles under **Choose a profile**.
- c A summary of the selected profile is displayed on the right side of the screen.

Figure 35 Choose a Profile

Step 2: Identify Location

To point the antenna to a satellite, complete the following steps.

- 1 Click **Antenna Pointing** on the Toolbar. The **Antenna Pointing Screen** opens as shown in [Figure 38](#). The **Antenna Orientation** fields display the antenna pointing values.

Figure 36 Antenna Pointing Screen



The world map in [Figure 38](#) shows the GLOBETrekker position and the position of the selected satellite.

Ground Location

The LinkControl application must know your current ground location in order to calculate the look angles required to point the antenna at the satellite.

The location of the terminal can be determined in three different ways:

- i) manually entering the latitude and longitude
- ii) selecting your location from the City list
- iii) or by using the supplied GPS receiver.

If the selected profile does not already have the GLOBETrekker's current location, use the following steps:

To select location from the city list

- 1 Click on **Select City**
- 2 Expand the continent and country trees by clicking on the **+** sign.
- 3 Click on the nearest city.
- 4 Click **OK**.

To determine location using the GPS:

- 1 Ensure the GPS is connected. If this was not done during the set up, the GPS will not be initialized.

To initialize the GPS:

- a Click on **View GPS Data**
 - b Click on **Initialize**
 - c Click on **Close**
- 2 If the **Use GPS Data** button is green, it has acquired a location. Press the button to use the GPS information as its position.

Note: The GPS unit requires a clear and unobstructed view of the sky to operate properly. If portions of the sky are blocked, it may impact acquisition time.

To manually enter latitude and longitude:

- 1 Enter the Latitude in the box or select the value using the scroll arrows.
- 2 Select the North or South radio button.
- 3 Enter the Longitude in the box or select the value using the scroll arrows.
- 4 Select the East or West radio button.

Note: The format for latitude and longitude is <Degrees.Decimal Degrees>

Step 3: Verify Target Satellite

Confirm the satellite name that appears in the white **Target Satellite** box on the **Select Satellite** drop down screen.

Step 4: Check Clearance Distance

- 1 Click on the **Alignment** tab.
- 2 On the **Alignment** screen, click the **Clearance Distance** tab.
- 3 Ensure that there are no obstructions within the clearance range listed.
For more information on clearance distances refer to Chapter 1 – Safety Basics.

Step 5: Check if there is a DVB Receiver on the Target Satellite

- 1 Click the DVB Receiver Lock tab on the left side menu.
- 2 Check to see if a DVB carrier appears in the box in the upper right corner as shown in [Figure 39](#).
- 3 Select a DVB carrier if one is present (DVB listed to the right of the **Current Rx Polarization:** section as shown in [Figure 39](#)).

Figure 37 DVB Receiver Lock



If no DVB carriers appear in the box, you will need to rely on the presence of either a beacon or modem carrier (Step 7 in the following pages) when acquiring the satellite signal.

Step 6: Point the Antenna

Once the Norsat LinkControl application has its location and desired satellite, it will automatically calculate the look angles required to point the antenna at the satellite.

The application calculates four values:

- Compass Azimuth – magnetic compass bearing to which the antenna should be set
- Elevation – angle to which the inclinometer should be set
- Polarization – angle to which the feed should be rotated
- True Azimuth – bearing relative to Geographic North rather than Magnetic North

Aligning the Antenna

To align the antenna, click **Alignment** on the GLOBETrekker Functions Toolbar on the left side menu. The **Alignment** screen opens.

Adjusting the Azimuth

- Click on Antenna Position sub screen.
- Adjust the azimuth plate on the baseband unit until the compass bearing matches the degrees shown in the **Compass Azimuth** field (as shown in [Figure 40](#)), using the arrows inside the Azimuth positioning box.

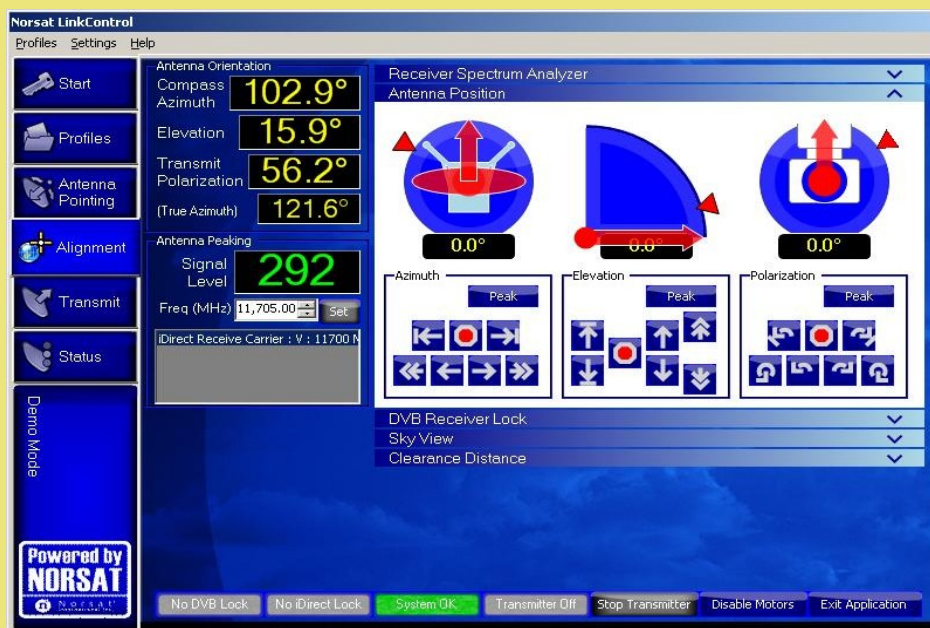
Adjusting Antenna Elevation

To adjust the antenna elevation, adjust the elevation of the antenna to match the degrees as shown in the **Elevation** field (as shown in [Figure 40](#)) using the arrows inside the Elevation positioning box.

Setting Antenna Polarization

Set the Tx polarization to match the value set in the **Transmit Polarization** field (as shown in [Figure 40](#)) using the arrows inside the Polarization positioning box.

Figure 38 Antenna Pointing Screen



Step 7: Acquire Satellite and Peak Antenna

Acquiring the satellite and peaking the antenna involves the use of the built-in spectrum analyzer, a DVB lock indicator, and a modem lock indicator.

The process of acquiring a satellite and peaking the antenna is easiest when a satellite has a DVB carrier and a beacon. Where a DVB carrier does not exist a beacon can still be used.

Note: When neither a DVB carrier nor a beacon exists, other types of carriers, if present, and/or reference satellites can still be used to acquire a particular satellite. This chapter does not address such occurrence. To learn more about how to handle such situations, attend a Norsat training session.

The reference level (dBm) and the dB per division functions will be set to auto mode (these are pre-selected and set from the factory).

Note: Advanced users can deselect either or both the reference level and the dB per division in order to configure the spectrum analyzer to settings of their choice. Additionally, the Center Frequency and Frequency Span are also adjustable using scroll arrows.

The process of acquiring a satellite and peaking the antenna requires the use of the Spectrum Analyzer Screen.

Viewing the Receive (Rx) Spectrum Analyzer Screen

To open the Receiver Spectrum Analyzer Screen, click the down arrow beside the **Spectrum Analyzer**. The **Receive Spectrum Analyzer Screen** opens as shown in [Figure 41](#).

The **Receive Spectrum Analyzer** screen, shown in [Figure 41](#) displays physical parameters along the X axis and the Y axis as follows:

- frequency along the X axis
- signal amplitude along the Y axis

Figure 39 Alignment Screen with Rx Spectrum Analyzer

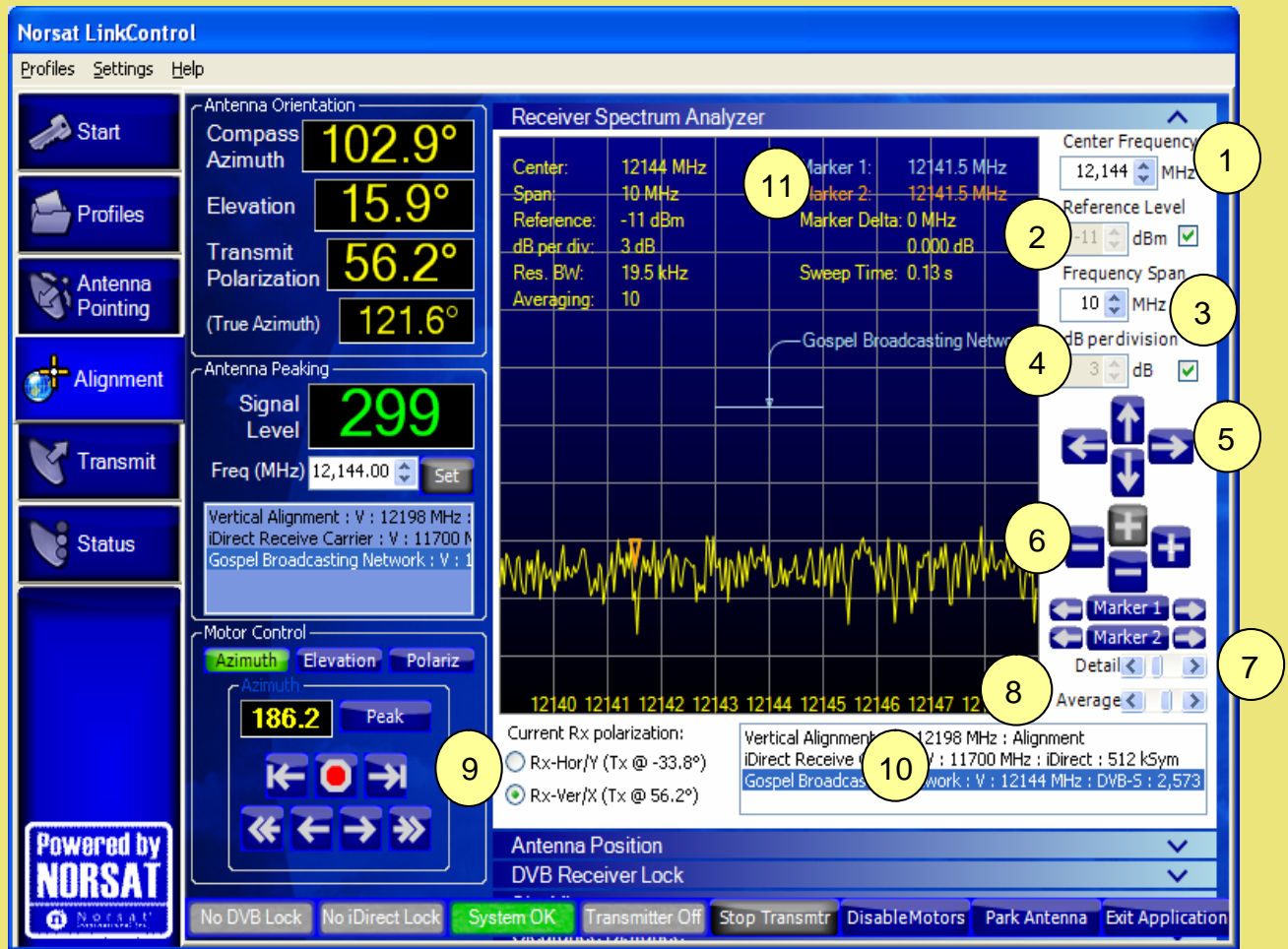


Table 5 lists the controls and the functions for the **Receive Spectrum Analyzer**.

Refer to [Figure 41](#) for locations of the functions on the screen.

Table 5 Controls on the Rx Spectrum Analyzer	
Controls	Functions
Rx Spectrum Analyzer	
1. Center frequency (MHz)	<p>To change the Center frequency, complete the following steps:</p> <ol style="list-style-type: none"> 1 Click the up/down arrows to increase or decrease the frequency OR 2 Type in the desired frequency OR 3 Use the horizontal arrows to adjust the frequency. 4 Set a marker to the desired frequency. 5 Click on either Marker 1 or Marker 2 depending on the pre-selected frequency setting. <p>Note: see number 5 in table for more detail.</p>
2. Reference level (dBm)	<p>To adjust the Reference level field, complete the following steps:</p> <ol style="list-style-type: none"> 1 Click the up arrow to increase the reference level by 5dB. This moves the trace down the screen. 2 Click the down arrow to decrease the reference level by 5dB. This moves the trace up the screen. <p>Hint: the check box to the right of the Reference Level settings should be unchecked (deselected) to make manual changes to the reference level settings and checked (selected) when the system is operating.</p> <p>Note: see number 5 in table for more detail.</p>
3. Frequency Span (MHz)	<p>To adjust the Span frequency, use the + / - buttons and complete the following steps:</p> <ol style="list-style-type: none"> 1 Click the right + button to decrease Span frequency. 2 Click the left - button to increase the Span frequency. <p>Note: see number 6 in table for more detail.</p>

Table 5 Controls on the Rx Spectrum Analyzer - continued

Controls	Functions
Rx Spectrum Analyzer	
4. dB per division	<p>To adjust the dB per div, use the + / - buttons and complete the following steps.</p> <ol style="list-style-type: none"> 1 Click the upper + button to decrease the dB per div by 1dB. 2 Click the lower - button to increase the dB per div by 1dB. 3 Range is 3 to 10dB per division in steps of 1 dB. <p>Hint: the check box to the right of the Reference Level settings should be unchecked (deselected) to make manual changes to the reference level settings and checked (selected) when the system is operating.</p> <p>Note: see number 6 in table for more detail.</p>
5. Frequency Adjust and Reference Adjust	<p>Frequency adjustment controls (center frequency):</p> <ul style="list-style-type: none"> ▪ Are the Left and Right arrow buttons. ▪ Left arrow for DOWN frequency adjust and Right arrow for UP frequency adjust. <p>Reference adjustment controls (reference level):</p> <ul style="list-style-type: none"> ▪ Up and Down arrow buttons. ▪ Up arrow for UP reference adjust and Down arrow for DOWN reference adjust.
6. Frequency Span and Strength Span Adjust	<p>Frequency Span adjustment controls (frequency span):</p> <ul style="list-style-type: none"> ▪ Are the Left and Right Minus/Plus signs. ▪ Left side Minus Increases frequency span and Right side Plus sign Decreases frequency span. <p>Strength Span adjustment controls (dB per division):</p> <ul style="list-style-type: none"> ▪ Are the Top and Bottom Plus/Minus signs. ▪ Top Plus sign Decreases strength span and Bottom Minus sign Increases strength span.

Table 5 Controls on the Rx Spectrum Analyzer - continued	
Controls	Functions
Rx Spectrum Analyzer	
7. Detail	<p>Detail controls the number of sweep samples used in drawing the signal trace in the Spectrum Analyzer.</p> <p>Increasing the sweep detail increases the amount of time required to draw the trace on the spectrum analyzer. It is normal to leave this set to high detail as it may be difficult to distinguish signals when the detail is set too low.</p> <p>Detail changes the resolution bandwidth of the Spectrum Analyzer. The following resolution bandwidths are available:</p> <ul style="list-style-type: none"> ▪ 600Hz, 1.2KHz, 2.4KHz, 4.9KHz, 9.8KHz, 19.5KHz and 39.1KHz
8. Signal Averaging	Controls the number of sweep samples averaged and displayed as one trace; Averaging ranges from 1 (no averaging) to 16.
9. Rx and Tx polarization	<p>Rx polarization radio buttons control the types of carriers which appear in the carrier selection list (see #10 in Figure 41 or this table).</p> <p>This enables a user to check for a known signal on the opposite polarization to help verify the correct satellite.</p> <p>To view alternate polarization signals, complete the following steps:</p> <ol style="list-style-type: none"> 1 Click the radio button to select the type of polarization. 2 Adjust the polarization settings on the feed assembly. 3 Return to the desired polarization type before Tx.
10. Carrier selection list	<p>The carrier selection list enables a user to set the spectrum analyzer to view a particular signal.</p> <p>Clicking on a carrier in the list automatically sets the Center frequency and Span to match the selected carrier.</p>

Table 5 Controls on the Rx Spectrum Analyzer - continued

Controls	Functions
Rx Spectrum Analyzer	
11. Marker Functions (MHz)	<ul style="list-style-type: none"> ▪ measures the amplitude difference (marker delta); the bandwidth of signals and changes the Center frequency <p>To set a marker, complete the following steps:</p> <ol style="list-style-type: none"> 1 On the Spectrum Analyzer, move the pointer to the spot you wish to mark. 2 To set Marker 1, left click with mouse, Marker1 is displayed as a blue arrow. 3 To set Marker 2, right click with mouse, Marker 2 is displayed as an orange arrow.

The acquisition process involves:

- 1 Choosing a DVB-S carrier or Beacon carrier from the list as shown in [Figure 41](#), box 10.
- 2 Sweeping for a Signal.
 - a Click on the Azimuth button in the Motor Control box, as shown in [Figure 41](#).
 - b Use the arrows until a signal appears in your main screen as shown in [Figure 41](#) (if no signal appears or is visible, use different carrier or change Span).
- 3 Verifying the satellite. Perform the following for each of the carriers that appear in [Figure 41](#), box 10.
 - a Select the carrier, either DVB carrier or Beacon carrier.
 - b Look at the Receive Spectrum Analyzer screen and if the beacon carrier is chosen, ensure that spike appears in middle of the screen. If DVB carrier is chosen, ensure that signal is in the center of the screen and that list bandwidth is close in width to the horizontal line (indicator) displayed on the screen. In [Figure 41](#), indicator is for the Gospel Broadcasting network DVB carrier.

You are now pointing at the satellite and need to peak the antenna to maximize your signal strength.

The peaking process involves:

- 1 Setting DVB Carrier
- 2 Sweeping the Azimuth
- 3 Confirming DVB and Modem Lock

Peaking the Antenna

To peak the antenna, complete the following steps:

- 1 Choose a DVB-S carrier. To select the carrier, click on a carrier in the list shown on [Figure 41](#), box 10.
- 2 Reset the frequency span to 10 MHz (if the frequency span is currently set at a level higher than 10 MHz). The reading on the signal level indicator in the Antenna Peaking box ([Figure 41](#)) should be green.

Hint: If the signal strength indicator is red it cannot be used for peaking, reset your frequency span until it turns green.

- 3 Use the nudge left/right arrows to adjust the Azimuth such that the reading on the signal level indicator is the highest that can be achieved. This number will vary depending upon the satellite.
- 4 Click on Elevation button in the Motor Control Box to activate this control. Use the nudge left/right arrows to adjust Elevation such that the reading on the signal level indicator reaches the highest number that can be achieved.
- 5 Once the highest signal level has been achieved, peaking is complete.
- 6 Verify that you have a DVB Lock and iDirect Modem Lock.
- 7 You are now ready to call the Hub operator to gain access to the satellite.

Step 8: Call Network Operator to Access Satellite.

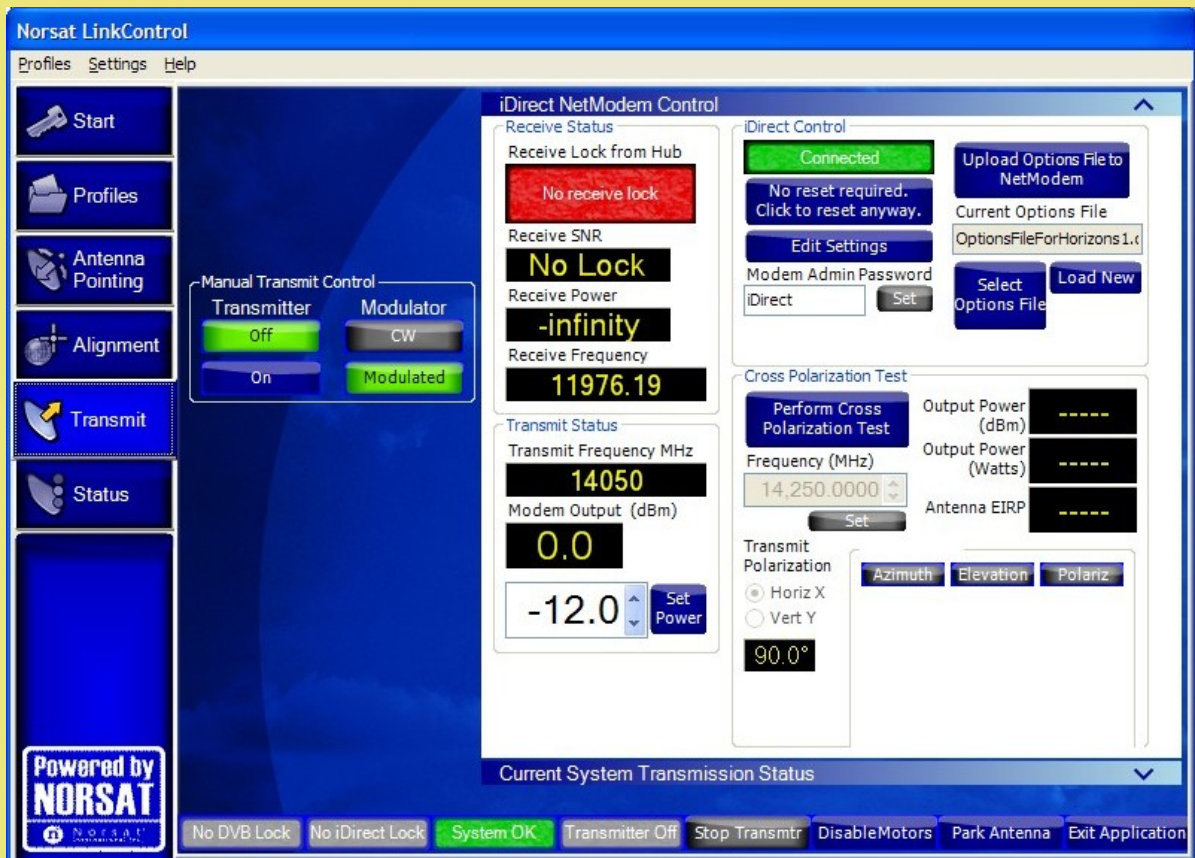
- 1 Go to the **Transmit** tab and click the iDirect NetModem control.
- 2 The user should call the Network/Satellite Operator to:
 - i. Identify themselves and their location (leave your phone number)
 - ii. Indicate that they have scheduled satellite time (leave time, freq.)
 - iii. Indicate purpose of the transmission (example: data transfer)
 - iv. Indicate that you are ready to start transmitting on satellite, transponder and frequency slot allocation (example: NSS7, Transponder K18, Slot C)

The satellite operator may in turn verify some parameters and ask some questions.

Such parameters/ questions may include:

- Are you aligned and peaked on the satellite?
 - Modem settings.
 - Confirm Uplink frequency and polarization.
- 3 When directed by the hub/satellite operator to start transmitting at low power, unmodulated carrier (also known as a CW or continuous wave) , click on the Perform Cross Polarization button in the Cross Polarization test box (refer to [Figure 42](#)). The transmitter will now be **On** and modulator **CW** button will turn green.
 - 4 Wait for further instructions while the operator checks the cross pol and frequency of the carrier. The operator may instruct you to adjust the transmit power, frequency, polarization, and / or antenna pointing.

Figure 40 iDirect NetModem Controls Screen



- 5 When directed, slowly increase power to operating level and stop.
- 6 Wait for further instructions while carrier specifications are checked.
- 7 When directed, modulate the signal and verify the downlink (adjust power if in SCPC mode).
- 8 Wait for further instructions while your carrier and bandwidth is checked

The controller will verify your phone number and the end time for your uplink. The controller will remind you to call the NOC again just before the end of the uplink (Goodnight call).

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Disassembling the GLOBETrekker

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Norsat GLOBETrekker

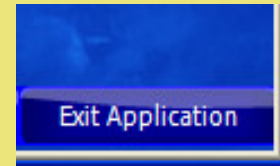
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Disassembling the GLOBETrekker

The chapter explains how to disassemble the GLOBETrekker through step by step instructions.

Powering Down the GLOBETrekker (Graceful Shutdown)

- 1 To power down the GLOBETrekker properly, first exit the LinkControl application by clicking on the **Exit Application** button located on the bottom right-hand side of the LinkControl screen.
- 2 Next, shutdown the Windows XP application and then turn the power to laptop the OFF.



Disconnecting the Laptop

- 1 Turn the power off to the laptop.
- 2 Disconnect the laptop control unit from the baseband unit.

Disconnecting the Power Supply

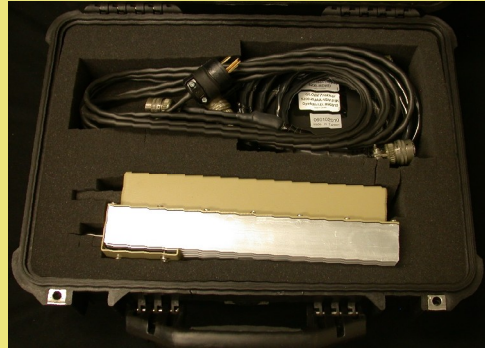
To detach the cables from the power supply, perform the following steps:

- 1 Detach the AC cable from the power source.
- 2 Detach the AC cable from the three pin male connector on the power supply.
- 3 Detach one end of the DC cable from the baseband unit front panel.
- 4 Detach the other end of the DC cable from the four pin female connector on the power supply.



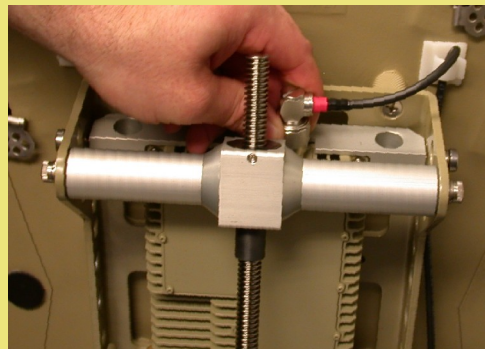
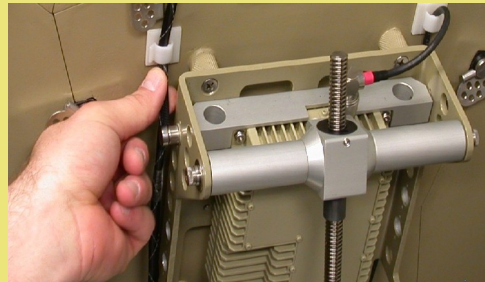
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Repackage the power supply into the options case as shown.



Disconnecting the Cables

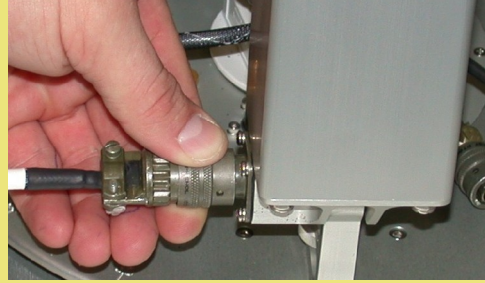
- 1 Unclip the cables from the boom arm and the back of the antenna.
- 2 Detach the 90° male N connector (color coded red) from the top of the BUC.
- 3 Detach the 12 pin female amphenol connector from the SSPA.



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Disassembling the GLOBETrekker

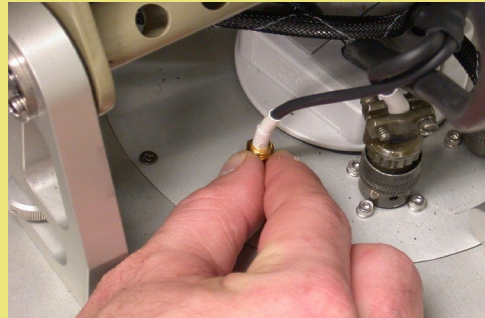
- 4 Detach the 6 pin female amphenol connector from the elevation assembly.



- 5 Detach the 3 pin male amphenol connector from the baseband unit.



- 6 Detach the 4 pin male amphenol connector and the Subminiature A (SMA) connector from the baseband (GPS antenna and Compass cable).



- 7 Detach the 8 pin amphenol connector from the base of the feed assembly.



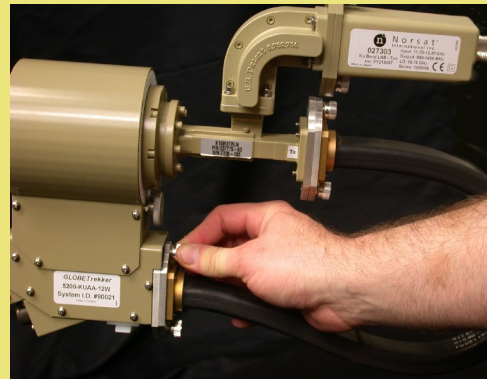
12 Disassembling the GLOBETrekker

- 8 Detach the male N connector from the LNB.



Disconnecting the Waveguide from the Feed Assembly

- 1 Detach one end of the flexible waveguide from the bottom region of the feed assembly using the thumb screws.



- 2 Detach the other end from the middle region of the feed assembly.

