Raymarine 37STV Satellite TV System

User's Guide

Document Number: 81304-2
Date: March 2009

Trademarks and registered trademarks

Autohelm, HSB, Raymarine, Raytech, Sail Pilot, SeaTalk and Sportpilot are registered trademarks of Raymarine Limited.

Apelco is a registered trademark of Raymarine Holdings Limited (Registered in all major marketing territories).

AST, Autoadapt, auto GST, Autoseastate, Autotrim, Bidata, Marine Intelligence, Maxiview, On Board, Raychart, Raynav, Raypilot, Raystar,ST40, ST60, Seaclutter, Smart Route, Tridata and Waypoint Navigation are trademarks of Raymarine Limited.

DIRECTV is an official trademark of DIRECTV Inc., a unit of GM Hughes Electronics.

DISH™ Network is an official trademark of EchoStar Communications Corporation.

ExpressVu is a property of Bell ExpressVu, a wholly owned subsidiary of Bell Satellite Services.

All other product names mentioned are trademarks or registered trademarks (if applicable) of their respective companies.

- Powered by Intellian Technologies -

Contents

Safety Notices

WARNING

Product installation

This equipment must be installed in accordance with the instructions contained in this handbook. Failure to do so may result in poor product performance, personal injury and/or damage to your boat.

CAUTION

In-line fuse

If you do not have a breaker in the power circuit, an in-line 5 A quick blow fuse should be fitted to the positive (blue) lead of the power cable.

Antenna unit cover

To prevent damage to the antenna unit cover, always use the base plate when lifting the unit.

Connectors

Take care not to damage the exposed connectors below the base plate when moving the unit. DO NOT use these connectors to lift the unit.

Transit packaging

Before installing or operating the unit, open the unit cover and remove the foam transit packaging inserts from the base plate.

Antenna coating

Application of paint or other finishes to the antenna unit exterior may degrade performance beyond acceptable limits.

Important information

Introduction

This handbook contains an explanation of how to install, connect and maintain your Raymarine 37STV Satellite TV System.

Your Raymarine 37STV Satellite TV System provides uninterrupted television access to hundreds of TV channels in all types of weather conditions.

On the open sea or at the dock, your Raymarine Satellite TV System automatically identifies, acquires and tracks compatible signals from all digital video broadcast (DVB) satellites.

However, no machine can perform its intended function unless installed, operated and maintained properly. Please carefully read and follow the recommended procedures contained in this handbook.

INTENDED USE - The intended application for Raymarine Satellite TV Systems is for leisure marine boats and workboats not covered by IMO Carriage Regulations. **THEY ARE NOT** intended for installation and use in any other situation.

Geographic location

Your Raymarine Satellite TV System is programmed to receive signals from selected satellites in the following areas:

- North America.
- Europe.

Satellite TV is transmitted with signals that have either linear or circular polarization. You cannot receive signals that have linear polarization on a system that is set up for circular polarization, or circular polarized signals on a system that is set up for linear polarized signals. If your geographic location changes it will be necessary to change the antenna low noise block (LNB) for one appropriate to the area in which you are operating. You may also need to change your control board, ACU software and satellite receivers (IRDs). For full details of changing your geographic area of operation, contact Raymarine Product Support.

Television reception

For full functionality of your Raymarine 37STV Satellite TV System, it is necessary to subscribe to the relevant service(s) from the appropriate service provider(s). Full details of service providers can be found in “Satellite service providers” on page 56.

EMC conformance

All Raymarine equipment and accessories are designed to the best industry standards for use in the leisure marine market.

The design and manufacture of Raymarine equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) standards, but correct installation is required to ensure that performance is not compromised.

Declaration of conformity

CE This product conforms with EU Directive 89/336/EC and is labelled with the CE conformity mark.

Waste Electrical and Electronic Equipment Directive

The Waste Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electrical and electronic equipment. Whilst the WEEE Directive does not apply to some Raymarine products, we support its policy and ask you to be aware of how to dispose of this product.

The crossed out wheelie bin symbol, illustrated above, and found on our products, signifies that this product should not be disposed of in general waste or landfill.

Please contact your local dealer, national distributor or Raymarine Technical Services for information on product disposal.

Restriction on the use of certain Hazardous Substances

European models of this product use components that comply with the Restriction of the use of certain Hazardous Substances (RoHS) Directive 2002/95/EC.

Warranty

To register your Raymarine 37STV Satellite TV System ownership, please take a few minutes to fill out the warranty registration card found in the box, or visit **www.raymarine.com** and register on-line.

It is important that you register your product to receive full warranty benefits. Your system package includes a barcode label indicating the serial number of the unit. You should stick this label to the warranty registration card.

Handbook information

To the best of our knowledge, the information in this handbook was correct as it went to press. However, Raymarine cannot accept liability for any inaccuracies or omissions it may contain. In addition, our policy of continuous product improvement may change specifications without notice. As a result, Raymarine cannot accept liability for any differences between the product and the handbook.

Installation

EMC Installation guidelines

All Raymarine equipment and accessories are designed to the best industry standards for use in the recreational marine environment.

Their design and manufacture conforms to the appropriate Electromagnetic Compatibility (EMC) standards, but correct installation is required to ensure that performance is not compromised. Although every effort has been taken to ensure that they will perform under all conditions, it is important to understand what factors could affect the operation of the product.

The guidelines given here describe the conditions for optimum EMC performance, but it is recognized that it may not be possible to meet all of these conditions in all situations. To ensure the best possible conditions for EMC performance within the constraints imposed by any location, always ensure the maximum separation possible between different items of electrical equipment.

For optimum EMC performance, it is recommended that wherever possible:

- Raymarine equipment and cables connected to it are:
  - At least 3ft.(1m) from any other equipment transmitting or carrying radio signals. In the case of Single Side Band (SSB) radio, the distance should be increased to 7ft.(2m).
  - More than 7ft. (2m) from the path of a radar beam. A radar beam can normally be assumed to spread 20 degrees above and below the radiating element.
- The equipment is supplied from a separate battery to that used for engine start. Voltage drops below 10V, and starter motor transients, can cause the equipment to reset. This will not damage the equipment, but may cause the loss of some information and may change the operating mode.
- Raymarine specified cables are used. Cutting and rejoining these cables can compromise EMC performance and must be avoided unless doing so is detailed in the installation manual.

Suppression Ferrite

If a suppression ferrite is attached to a cable, this ferrite should not be removed. If the ferrite needs to be removed during installation it must be reassembled in the same position. Always use the ferrites supplied by Raymarine.

Connections to other equipment

If your Raymarine equipment is to be connected to other equipment using a cable not supplied by Raymarine, a suppression ferrite MUST always be attached to the cable near the Raymarine unit.

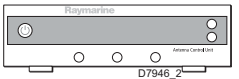
System components

Raymarine STV Antenna Unit

Houses the antenna positioning mechanism, low noise block (LNB), power supply and control elements within a molded radome. Connectors on the underside of the base plate join the power, signal and control cabling from the below deck units.

Antenna Control Unit (ACU)

Controls power to the antenna unit via the on/off switch. The five soft keys enable satellite programming and antenna diagnostics to be carried out.

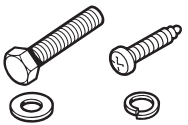


Installation Kit

Contains the items required for securing the antenna unit and ACU to your boat.

4 x Hexagonal bolts. 4 x Flat washers.

4 x Spring washers. 4 x Self tapping screws.



System cables

Your Raymarine STV package also includes the following cables:

R08321 - 10 m Power Cable - used for connecting the ACU/system to the boat's DC power supply.

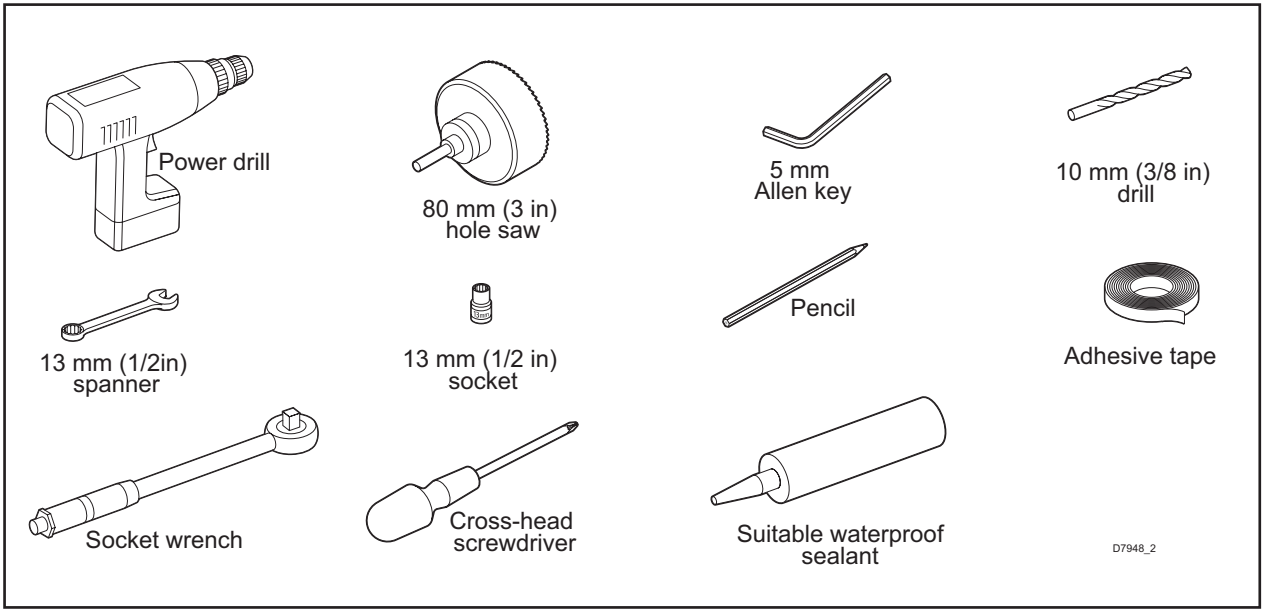
RO8257 – 3m RF cable – used for connecting the ACU to the Integrated Receiver Decoder (IRD)

R08135 - 15m RF cable - used for connecting the antenna and ACU.

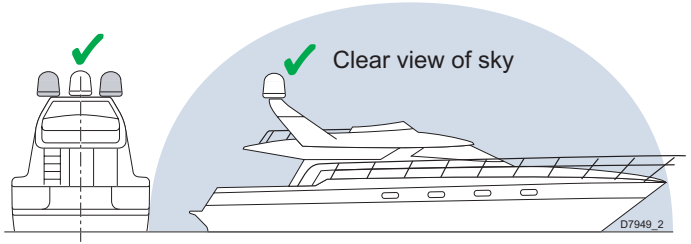
CD-ROM

Contains the software for programming and carrying out system diagnostics using a personal computer.

Tools required for installation

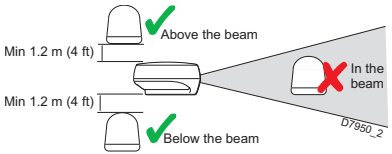


Planning the installation



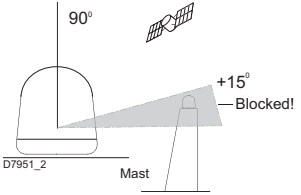
When choosing a location for the antenna, consider the following points:

- Make sure you place it where there is an all round clear view of the horizon.
- It should not be too high above the water – the maximum recommended height is one not exceeding half the length of your boat.
- It should be as near to the centreline of the boat as possible.
- The mounting platform should be rigid and not subject to excessive vibration.
- It should be away from the edge of the boat – this will avoid unnecessary motion which can affect reception.



It should be clear of any radar as this may prevent the antenna working correctly.

Make sure nearby objects do not block the antenna. It requires a $+15^{o}$ to $+90^{o}$ look angle to receive satellite signals.



Cables

You need to consider the following points before installing the system cables:

- All cables need to be adequately clamped and protected from physical damage and exposure to heat – avoid running cables through bilges, doorways, or close to moving objects.
- Acute bends must be avoided.
- Where a cable passes through an exposed bulkhead or deckhead, a watertight gland or swan neck tube should be used.

Power Requirements

You need to consider the following power requirements:

- Your Raymarine Satellite TV system has been designed to work on a boat's power supply rated at 12 V DC.
- If your boat's power supply is rated at 24 V DC you will need to install a suitable DC power inverter to reduce the supply voltage to 12 V DC.
- If your IRD(s) and television(s) require a 220/240 V AC power supply, you will need to install a suitable DC to AC converter to operate the units from your boat's DC power supply.

Extending the cables

The cables that have been supplied with your Raymarine Satellite TV system should be of adequate length to complete the installation on most boats. However, should it be necessary to extend a cable the following points should be considered:

Power cable

This cable is supplied at a length of 10 m.

RF cable

This cable is supplied at a length of 15 m.

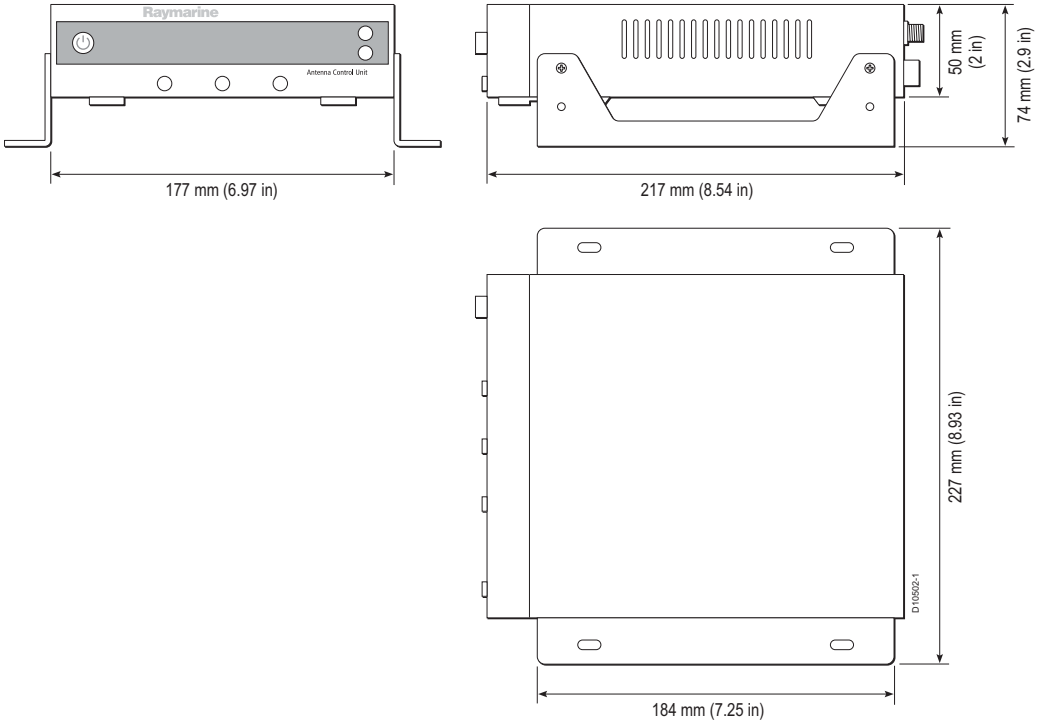
If a longer length is required you should replace this cable with Part No. A42120 which will extend the available cable length to 30 m.

Note: The stated cable lengths should not be exceeded as this may result in reduced performance of your system.

Installing the ACU

ACU dimensions

The dimensions of the ACU are shown below:

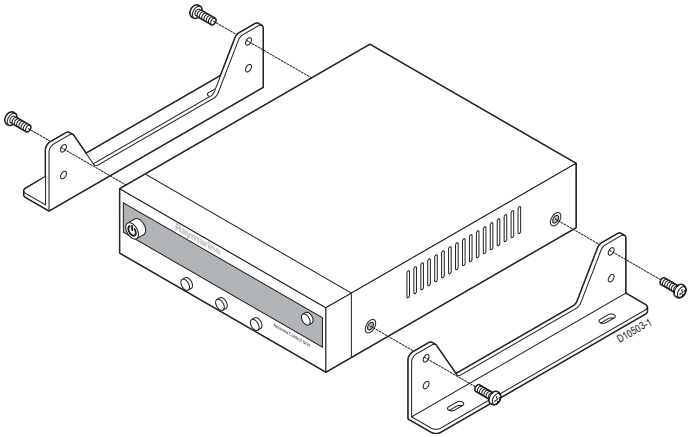


Installation site

The ACU should be installed below decks, in a position that is:

- Dry.
- Well ventilated.
- Easily accessible.
- Near your main TV viewing area.

The ACU should be installed using the two fixing brackets supplied. These brackets can be placed on the sides of the unit to provide a top or bottom fix.



To install the ACU:

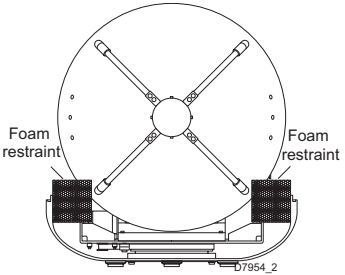
1. Select the installation site, ensuring that the proposed site meets the criteria described above.
2. Using the screws supplied fix the mounting brackets to the sides of the ACU.
3. Place the ACU in the position where it is going to be installed.
4. Connect the cables to the rear of the ACU.
5. Using a pencil, mark the 4 hole positions (2 each side) for securing the mounting brackets.
6. Using a suitable drill bit, drill the 4 holes in the required position.

   It is good practice to countersink the mounting holes to avoid damage to the mounting surface.
7. Using suitable screws, secure the ACU into position.

Installing the antenna

Preparing the antenna

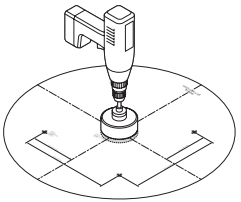
1. Using a 5 mm allen key, remove the antenna dome retaining bolts and dome.
2. Remove the foam transit restraints from the antenna base.
3. Replace and secure the antenna dome.

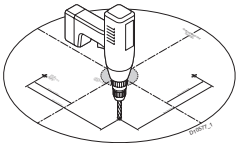


Preparing the mount

1. Using adhesive tape, attach the template to the mounting surface, ensuring that it is parallel to your boat's centreline as marked on the template.
2. Using a suitable hole saw, remove the shaded center portion.
3. Drill four 10 mm holes in the positions indicated.

   It is good practice to countersink the mounting holes, and smooth the edges of the center hole with a suitable file to avoid damage to the mounting surface.

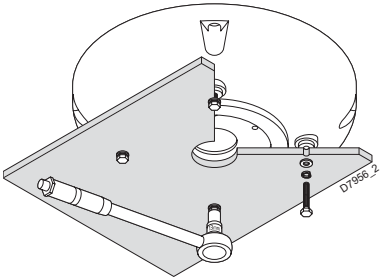




Securing the antenna

Secure the antenna to the base using bolts, spring washers and flat washers.

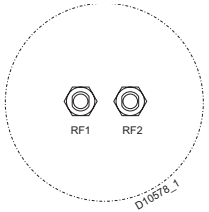
The bolts should be tightened to ensure that the foam sealing ring is compressed to prevent water ingress.



Connecting the system cables

Connecting the antenna

Note: It is good practice to coat the threads of all connectors with a small amount of a suitable waterproof marine sealant prior to securing them.



To connect the antenna:

1. Remove the protective cap from the RF1 connector.
2. Connect the RF cable to the RF connector and secure it using a 13 mm spanner. Take care not to overtighten the nut, as this will damage the connector.

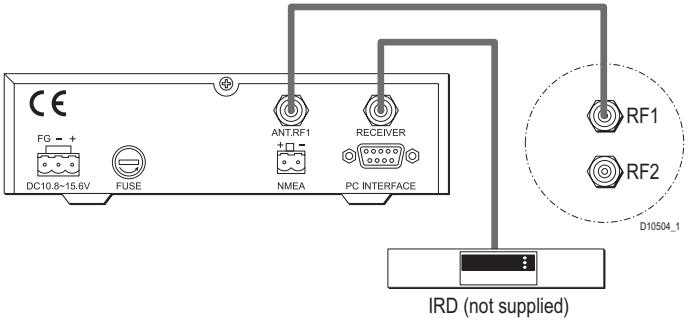
Note: The base plate connectors must be suitably protected from water ingress when the antenna unit is installed on an open structure, e.g. a tuna tower.

Connecting the ACU

CAUTION

In-line fuse

If you do not have a breaker fitted in the power circuit, an in-line 5 A quick-blow fuse should be fitted to the positive (brown) lead of the power cable.



To connect the ACU:

1. Connect the RF cable from the RF1 connector on the antenna to the ***ANT RF1*** connector on the rear of the ACU.
2. Connect a 3m RF cable from the '***RECEIVER***' connector on the rear of the ACU to '***RF***' on the IRD.
3. Connect the power cable to the rear of the ACU.
4. Connect the power cable to the 12 V DC power source.

Configuring the system

Your Raymarine Satellite TV system can be connected with multiple IRDs at the same time to receive pictures in different cabins offering the maximum choice of channels. In all cases the ACU must be connected to the RF1 connector of the antenna base plate. Select the set up for your area of operation from the following combinations.

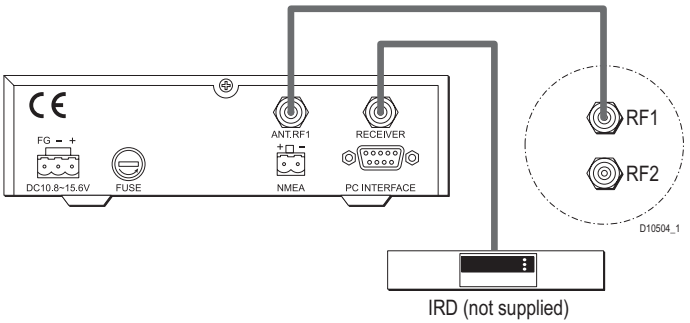
North America

The following section shows the set up combinations for North America.

For information on High Definition (HD) satellite switching and technical tips refer to “HD information” on page 59.

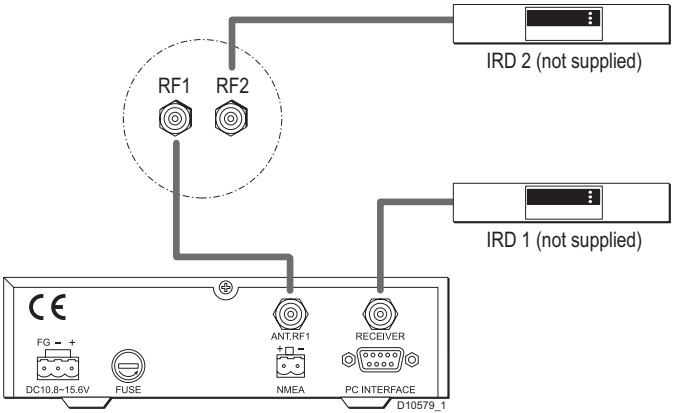
Single IRD

This is the basic method for connecting your Raymarine 37STV Satellite TV System.



The 3 m ACU set-top cable should be connected from the ***RECEIVER*** port of the ACU to ‘***LNB***’, ‘***ANT***’ or ‘***Satellite In***’ on the rear panel of the IRD.

Twin IRDs (Non HD)



You can connect two IRDs to your antenna as shown in the diagram above. However, only one of the IRDs can be configured as a two satellite receiver. The other IRD needs to be configured as a one satellite receiver.

The two satellite receiver determines which satellite is tracked, while the other receiver can watch any channel which is available from the tracked satellite.

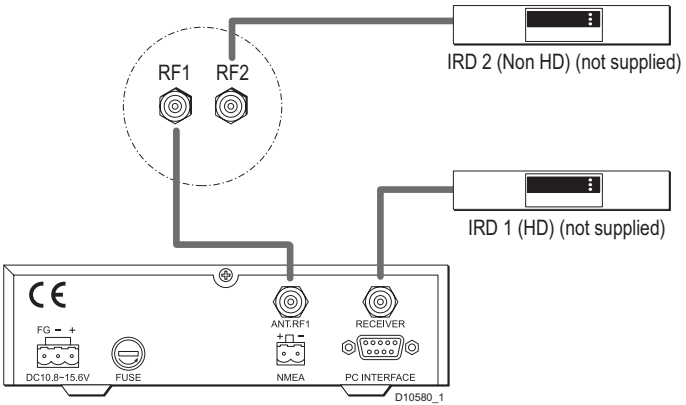
To connect twin IRDs (Non HD):

1. Connect the system as for a single IRD as described in “Single IRD” on page 14.
2. Remove the protective cover from the RF2 connector on the antenna base plate.
3. Connect an RF cable to the RF2 connector on the antenna base plate.
4. Connect the other end of the RF cable to ‘***LNB***’, ‘***ANT***’ or ‘***Satellite In***’ on the rear panel of the second IRD.

Full details on configuring your system IRDs will be found in the relevant Manufacturer’s handbook.

Twin IRDs (DirecTV HD version)

In this example you can connect two IRDs to your system, one that is HD compatible and one that is non-HD compatible.



To connect twin IRDs (DirecTV HD version):

1. Connect an RF cable from ‘***RF1***’ on the antenna base plate to ‘***ANT RF1***’ on the ACU.
2. Connect an RF cable from ‘***RECEIVER***’ on the ACU to the HD compatible IRD.
3. Connect an RF cable from ‘***RF2***’ on the antenna base plate to the non-HD compatible IRD.

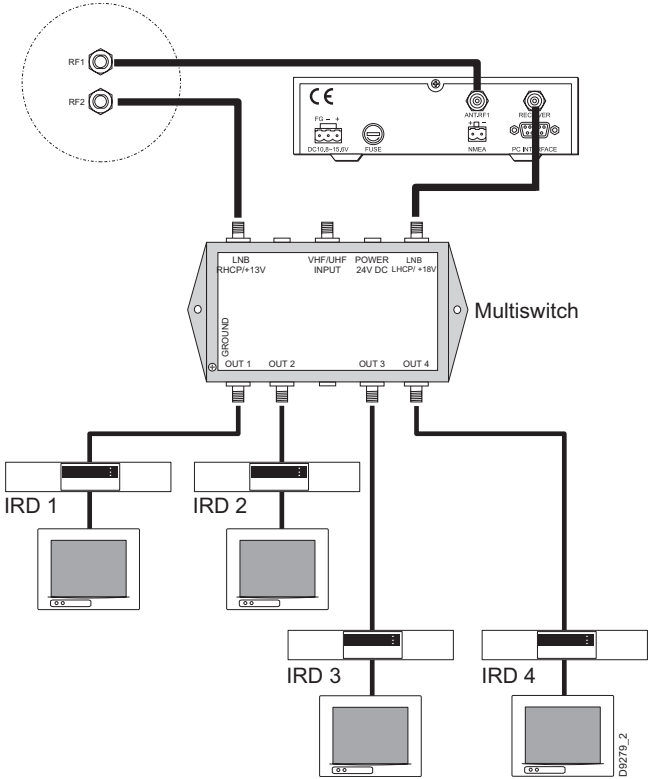
   The ACU now makes the HD adjustment for the HD IRD. Because the other IRD is not connected to the ACU, it cannot receive an HD signal from DTV110 West.

Multiple IRDs

In order to connect three or four IRDs to the antenna, you will need to purchase an *active multiswitch* with two satellite ‘in’ ports (Raymarine recommends the Channel Master 6314 IFD), and the necessary additional RF cables.

The multiswitch has to be installed between the antenna unit and the IRDs as shown in the following diagram.

When you use a multiswitch, the signal from the satellite receiver can no longer tell the antenna when to automatically change satellites. In order to change the satellite being tracked, you must use the ACU. For example, in some areas DirecTV programming is found on DTV101 and DTV119 (local channels). When tracking DTV101, all of the receivers can receive programmes from that satellite. If you want to see programmes on DTV119, you need to manually change the satellite being tracked by pressing Satellite B on the ACU. This means that all the receivers can then watch the programmes available on DTV119.



To connect three or four IRDs:

1. Connect an RF cable to '***RF1***' and another to '***RF2***' on the antenna base plate.
2. Connect '***RF1***' on the antenna base plate to '***ANT RF1***' of the ACU.
3. Connect an RF cable from '***RECEIVER***' on the ACU to '***LNB LHCP/+18V'*** on the multiswitch.
4. Connect the '***RF2***' cable to '***LNB RHCP/+13V***' on the multiswitch.
5. For each output required, connect an RF cable from an '***OUT***' connector of the multiswitch to the '***LNB***' or '***ANT***' connector of the individual IRD units.
6. Terminate any unused connections with a suitable 75 Ohm DC terminator block.
7. Connect the multiswitch to the appropriate DC power supply.

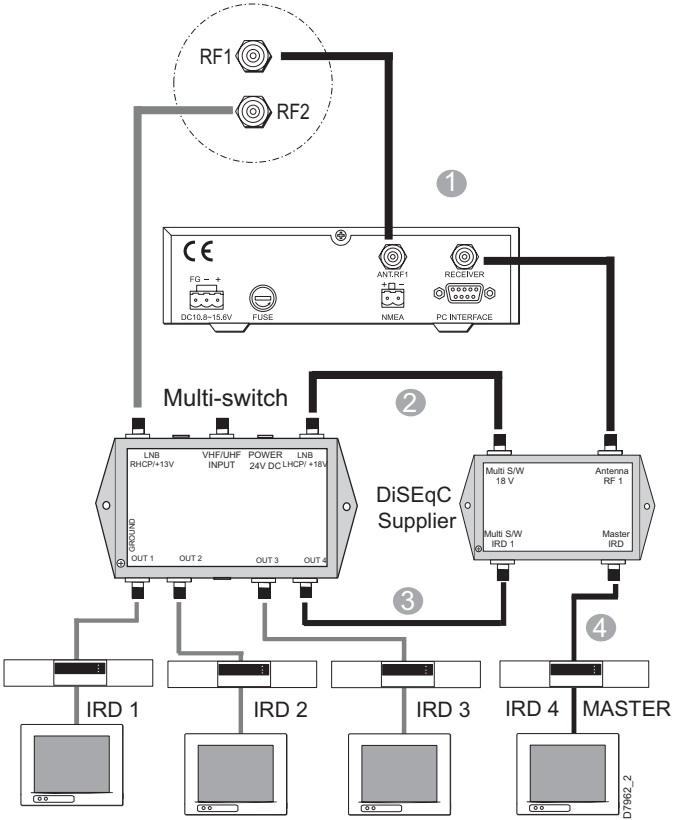
Multiple IRDs - DirecTV

This version of a multi-switch uses a multi-switch and a DiSEqC supplier - Raymarine Part No. A96014 - and enables you to change the satellite being tracked as you change channels using the IRD master instead of the ACU.

To connect a multi-switch and DiSEqC supplier:

Note: Numbers in brackets refer to the diagram.

1. Connect an RF cable between '***RF1***' of the antenna base plate and '***ANT RF1***' on the ACU.
2. Connect an RF cable between '***RECEIVER***' on the ACU and '***ANTENNA RF1***' of the DiSEqC supplier. (1)
3. Connect an RF cable between '***RF2***' of the antenna base plate and '***LHB RHCP/+13V***' of the multi-switch.
4. Connect an RF cable between '***Multi S/W 18V***' of the DiSEqC supplier and '***LHCP (+18V)'*** of the multiswitch. (2)



5. Connect an RF cable between '***Multi S/W IRD1***' of the DiSEqC supplier and any '***OUT***' of the multi-switch. (3).
6. Connect an RF cable between '***Master IRD***' of the DiSEqC supplier and '***Satellite***' of the Master IRD (4).
7. With the system powered:
   - Set the ACU to ***ON***.
   - The IRDs to ***OFF***.
   - The television receivers to ***OFF***.
8. Confirm that the antenna detects and tracks the DirecTV101 satellite.
9. Set the Master IRD to ***ON***.
10. Set the Master IRD television receiver to ***ON***.
11. Set the remaining IRDs to ***ON***.
12. Set the remaining television receivers to ***ON***.

The system can now be controlled using the Master IRD.

Note 1: The optimal setting for DirecTV service is; SAT A - DTV101, SAT A - DTV119, SAT B - DTV101 and SAT B* - DTV110#. For full details refer to "HD information" on page 59.*

When using the multi-switch and DiSEqC supplier the power setting has to be changed for all three satellites (DTV101, DTV119, and DTV110#) to 18V only. This change can be made in two places:

- In the Edit Satellite Information section of the ACU set up menu. You have to change one satellite at a time and change the power setting (Voltage) to 18V only. This should be repeated for all three satellites then saved. You can press '***NEXT***' on the ACU until you get to the Power Setting section.

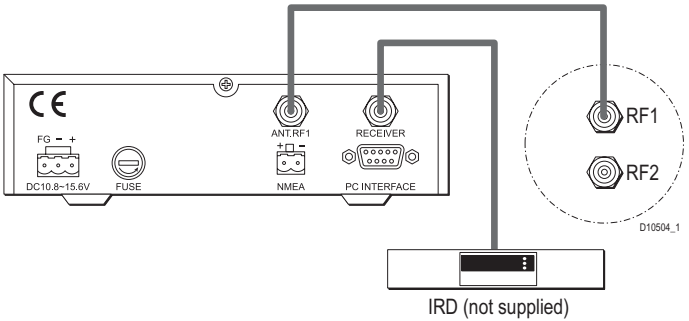
- Use the supplied PC program (This is the recommended method). Load the appropriate folder for DirecTV with multi-switch and DiSEqC supplier and follow the instructions in “Loading default satellite information using the CD-ROM” on page 39.

Europe

The following section shows the set up combinations for Europe.

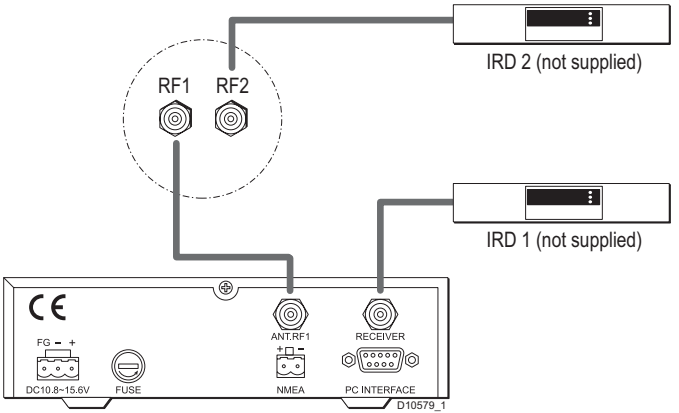
Single IRD

This is the basic method for connecting your Raymarine 37STV Satellite TV System.



The 3 m ACU set-top cable should be connected from the ***RECEIVER*** port of the ACU to ‘***LNB***’, ‘***ANT***’ or ‘***Satellite In***’ on the rear panel of the IRD.

Twin IRDs



You can connect two IRDs to your antenna as shown in the diagram above. However, only one of the IRDs can be configured as a two satellite receiver. The other IRD needs to be configured as a one satellite receiver.

The two satellite receiver determines which satellite is tracked, while the other receiver can watch any channel which is available from the tracked satellite.

To connect twin IRDs:

1. Connect the system as for a single IRD as described in “Single IRD” on page 14.
2. Remove the protective cover from the RF2 connector on the antenna base plate.
3. Connect an RF cable to the RF2 connector on the antenna

base plate.

4. Connect the other end of the RF cable to '***LNB***', '***ANT***' or '***Satellite In***' on the rear panel of the second IRD.

Full details on configuring your system IRDs will be found in the relevant Manufacturer's handbook.

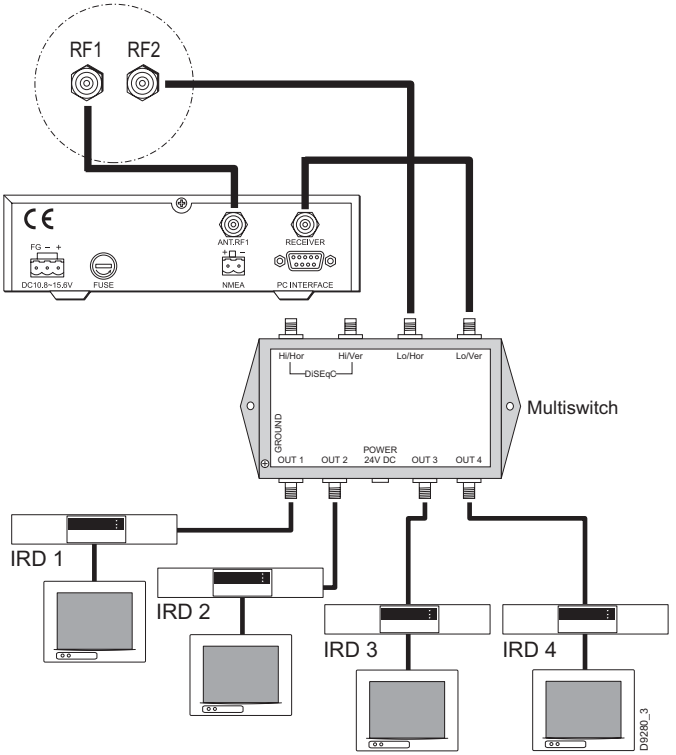
Multiple IRDs

IMPORTANT: Due to satellite polarization, incorrect connection in systems using multiple IRDs will result in signal degradation. Make sure you select the correct method of connection for your area of operation.

In order to connect three or four IRDs to the antenna you will have to purchase a suitable *universal LNB multiswitch* and the necessary additional RF cables.

The multiswitch has to be installed between the antenna unit and the IRDs as shown in the following diagram.

You should connect to either the vertical or horizontal high and low pairs depending on whether you want to watch channels in the high or low bands. Only those channels in the selected band will be available for viewing.



To connect three or four IRDs:

1. Connect an RF cable to ***RF1*** and another to ***RF2*** on the antenna base plate.

2. Connect the RF1 cable to '***ANTENNA***' on the rear of the ACU.
3. Connect the RF2 cable to '***Lo/Hor***' on the multiswitch.
4. Connect an RF cable from '***RECEIVER***' on the rear of the ACU to '***Lo/Ver***' on the multiswitch.
5. For each output required, connect an RF cable from an '***OUT***' connector of the multiswitch to the '***LNB***' or '***ANT***' of the individual IRD units.

Note: If you prefer watching programmes in the high band, repeat Steps 3 and 4, but connect the RF cables to 'Hi/Hor' or 'Hi/Ver'.

Connecting the system to a GPS

For improved satellite tracking, you can connect your satellite TV system directly to your boat's NMEA 0183 GPS system. To do this you will need two lengths of cable suitable for connecting to your GPS system and the green 2-way ACU GPS connector supplied with your 37STV Satellite TV System.

To connect the system to a GPS:

1. Strip back the insulation of each cable and connect a cable to each terminal of the 2-way connector.
2. Tighten the locking screws.
3. Connect the cable from the ***+ve*** terminal of the ACU GPS connector to the NMEA ***OUT*** wire of the boat's GPS system.
4. Connect the cable from the ***-ve*** terminal of the ACU GPS connector to the ***ground wire*** of the boat's GPS system.
5. Refit the ACU GPS connector to the rear of the ACU.

Operation

Introduction

This section of the handbook describes how to set up your Raymarine Satellite TV System after installation using the ACU or the Graphical User Interface (GUI) and includes the following functions:

- System start up.
- Changing the default satellite.
- Monitoring the antenna status.
- Entering set up mode.
- Setting the satellite pair.
- Setting the GPS.
- Editing satellite information.
- Setting the local frequency.
- Setting the DiSEqC method.
- Display versions.
- Setting antenna go position.
- Setting antenna move step.
- Setting the factory default parameters.
- Performing diagnostic tests.

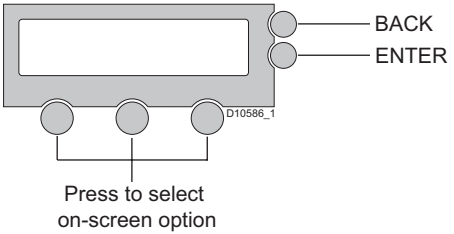
Many of the above functions will only be required at initial installation of your system.

Note: The satellite names shown on the ACU screen in the following illustrations may differ from those on your ACU depending on your geographic location.

Set up using the ACU

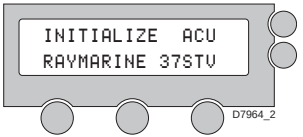
ACU soft keys

The ACU soft keys are used for the following functions:

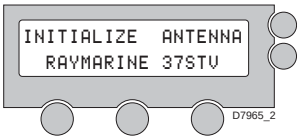


Start up

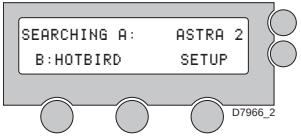
With the system installed and power applied, the ACU screen will show the following sequence:



1. Communication is being established between the antenna and the ACU.



2. The antenna is initialized.

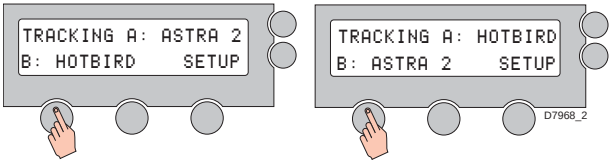


3. The antenna is searching for Satellite A.

4. The antenna has located the satellite and is now tracking.

If during this procedure the message ‘ANT SETUP MODE RESTART’, then, ANT OUT OF CONTROL CHECK ANT LINES’ appears there is a problem with the ACU to antenna RF cable. Check that the centre core of the RF cable has not been flattened, remake the connections ensuring that they are tightened.

Changing the default satellite

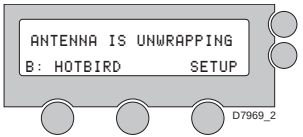


Your ACU is programmed with two default satellites. To change the default satellite, press the left hand soft key. The default satellite changes and is automatically tracked by the antenna.

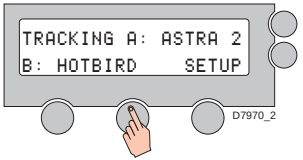
Monitoring the current state of the antenna

1. Antenna is searching for satellite A.

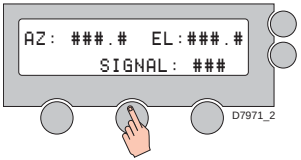
2. Antenna is tracking Satellite A



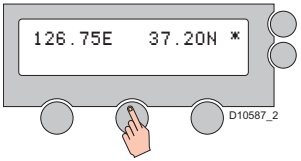
3. Antenna is unwrapping the cable.



4. Antenna is again tracking satellite A. Press center soft key to display position detail.



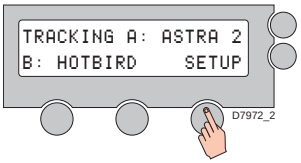
5. Antenna position detail and signal strength is displayed.
   Press center soft key to display NMEA GPS page.



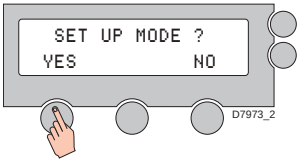
6. The NMEA GPS information is displayed.
   Press center soft key to return to antenna status display.

Set up mode

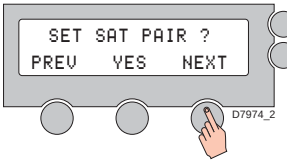
To enter set up mode:



1. With the antenna tracking. Press SETUP.



2. Press YES to enter set up mode.



3. Press YES to set the satellite pair.

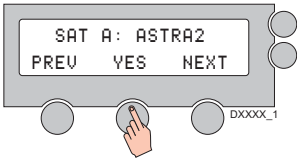
Setting the satellite pair

The satellite pair can be changed if you change service providers. There are two ways in which this function can be carried out:

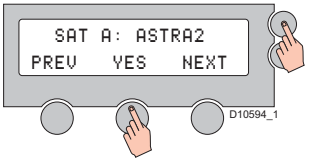
- Non DiSEqC method - all users except DirecTV.
- DiSEqC method - DirecTV users.

Non DiSEqC method

To set the satellite pair:

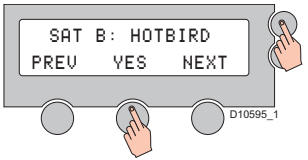


1. Follow steps 1 thru 3 for entering set up mode. Press YES to set satellite pair.



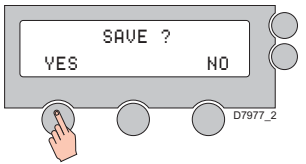
2. Set satellite A.

   Press NEXT to show alternative satellite name.
   Press YES to set chosen satellite to SAT A.
   Press BACK to return to main set up menu or correct input errors.



3. Set satellite B.

   Press NEXT to show alternative satellite name.
   Press YES to set chosen satellite to SAT B.
   Press BACK to return to main set up menu or correct input errors.

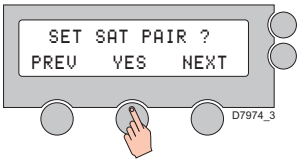


4. Press YES to save selections.

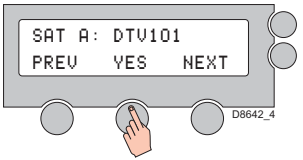
   Press NO to cancel and return to main set up menu.

DiSEqC method

To set the satellite pair:

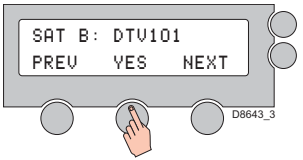


1. Follow steps 1 thru 3 for entering set up mode - see “Set up mode” on page 23.
   Press YES to set satellite pair.



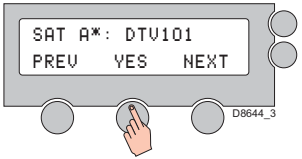
2. Set satellite A.

   Press NEXT or PREV to show alternative satellite name.
   Press YES to set chosen satellite to SAT A.
   Press BACK to correct input errors or return to main set up menu.

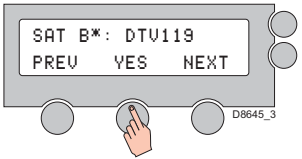


3. Set satellite B.

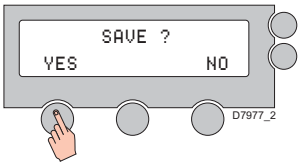
   Press NEXT or PREV to show alternative satellite name.
   Press YES to set chosen satellite to SAT B.
   Press BACK to correct input errors or return to main set up menu.



4. Set satellite A when DiSEqC is active from IRD.
   Press NEXT or PREV to show alternative satellite name.
   Press YES to set chosen satellite to SAT A.
   Press BACK to correct input errors or return to main set up menu.



5. Set satellite B when DiSEqC is active from IRD.
   Press NEXT or PREV to show alternative satellite name.
   Press YES to set chosen satellite to SAT B.
   Press BACK to correct input errors or return to main set up menu.



6. Press YES to save selections.
   Press NO to cancel and return to main set up menu.

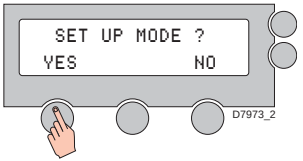
Note 1: DiSEqC is not used with Dish Network or ExpressVu satellites. This menu is displayed when the DiSEqC method - see page 31 - is set to "Use to change Sat".

2: The optimal setting for DirecTV applications are as follows: SAT A - DTV101, SAT A - DTV119, SAT B - DTV101, SAT B* - DTV110#.*

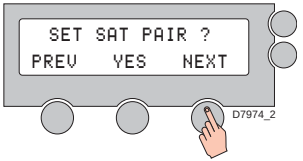
Setting the GPS using the ACU

Note: This function enables you to manually input a GPS position. This information can be input automatically if you connect your system to a NMEA 0183 GPS input - refer to "Connecting the system to a GPS" on page 20.

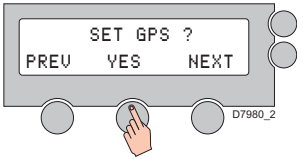
To set the GPS using the ACU:



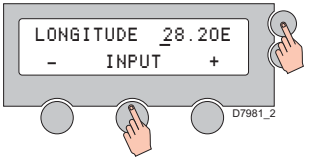
1. Press YES to enter set up mode.



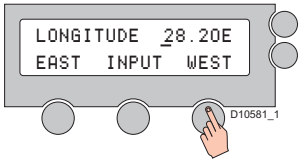
2. Press NEXT to enter GPS set up mode.



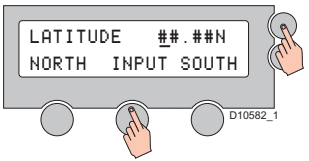
3. Press YES to set GPS/



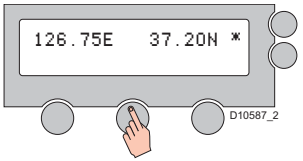
4. Input the longitude data.
   + increases a value. - decreases a value.
   Change the underscored digit using the +/- buttons.
   Press INPUT to accept a value.
   Press BACK to move to previous digit.



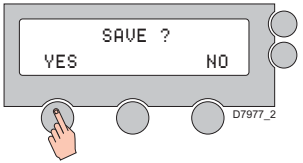
5. When you have input the numerical value for longitude the screen changes to enable you to select EAST or WEST.



6. Input the latitude data.
   + increases a value. - decreases a value.
   Change the underscored digit using the +/- buttons.
   Press INPUT to accept a value.
   Press BACK to move to previous digit.



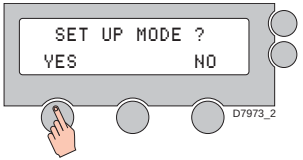
7. When you have input the numerical value for latitude the screen changes to enable you to select NORTH or SOUTH.



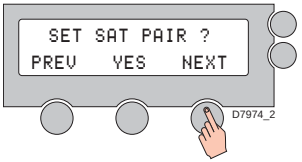
8. Press YES to accept the data.
   Press NO to cancel and return to main set up menu.

Note: With the system connected to a GPS antenna, the position will be updated in real time.

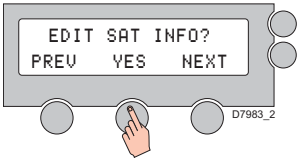
Edit satellite information



1. Press YES to enter set up mode.



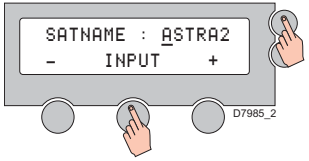
2. Press NEXT twice to enter Edit Sat Info mode.



3. Press YES to enter edit mode.

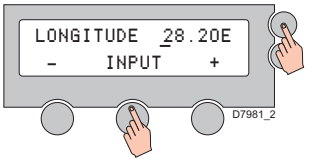
4. Set the satellite name.

   NEXT or PREV- shows next satellite name.
   SELECT - sets the displayed satellite for editing.



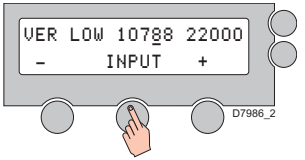
5. Input satellite name.

   \+ advances the value.
   \- decreases the value.
   Change the underscored digit using the +/- buttons.
   Press INPUT to move to next character.
   Press BACK to correct input errors or return to main set up menu.

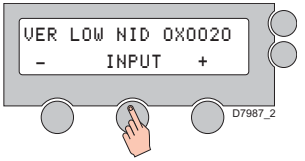


6. Input satellite position.

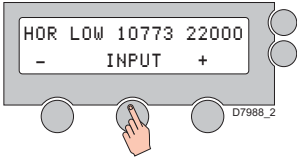
   \+ advances the value.
   \- decreases the value.
   Change the underscored digit using the +/- buttons.
   Press INPUT to move to next digit.
   Press BACK to correct input errors or return to main set up menu.



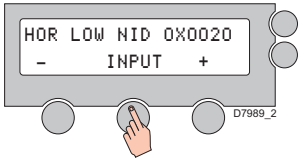
7. Input the tracking frequency (MHz) and symbol rate (kHz) for Vertical Low Band.



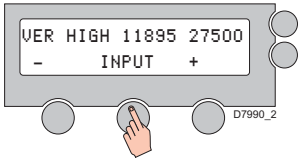
8. Input the Network ID (NID) for Vertical Low Band.



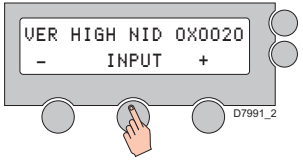
9. Input the tracking frequency (Mhz) and symbol rate (kHz) for Horizontal Low Band.



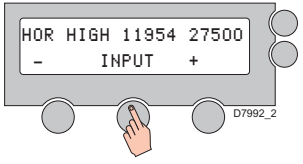
10. Input the NID for Horizontal Low Band.



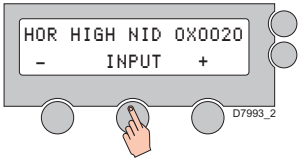
11. Input the tracking frequency (MHz) and symbol rate (kHz) for the Vertical High Band.



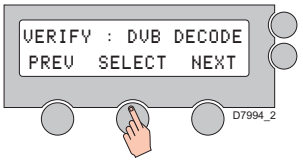
12. Input the NID for Vertical High Band.



13. Input the tracking frequency (MHz) and symbol rate (kHz) for Horizontal High Band.

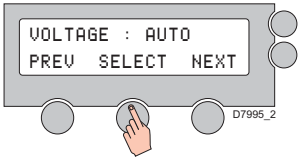


14. Input the NID for Horizontal High Band.



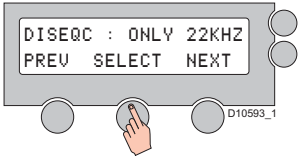
15. Select the verification method (1) of tracking satellite.

PREV - shows previous method.
SELECT - set the displayed method.
NEXT - shows next method.



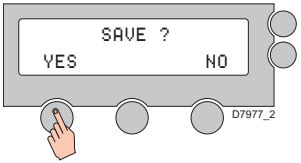
16. Select the voltage supply method (2).

AUTO recommended.
This is only changed when using a DirecTV HD system with multi-switch in North America. In that instance the Power setting should be changed to “18 V only” for all three satellites.



17. Select the DiSEqC method (3).

AUTO recommended.



18. Press YES to accept the data.

    Press NO to cancel and return to main set up mode.

1. Verification method.

   SIGNAL - use only signal level for tracking.

   DVB LOCK - use only DVB Lock signal for tracking.

   DVB DECODE - verify satellite using DVB decode method for tracking.

   DSS LOCK - decode only DSS Lock signal for tracking.

2. Power supplying method.

   AUTO - change voltage to LNB by IRD voltage.

   ONLY 13 V - always supply 13 V to LNB.

   ONLY 18 V - always supply 18 V to LNB.

3. DiSEqC supplying method.

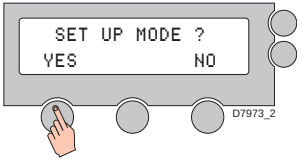
   AUTO - change signal to LNB by IRD DiSEqC.

   ONLY 0KHZ - always supply 0 kHz to LNB.

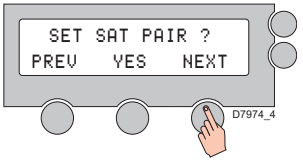
   ONLY 22KHZ - always supply 22 kHz to LNB.

Setting the local frequency

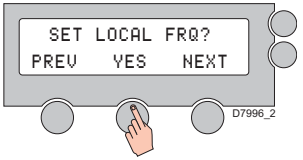
LNB systems in regions with circular polarization



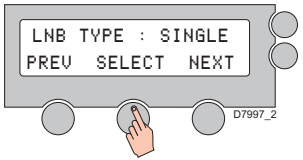
1. Press YES to enter set up mode.



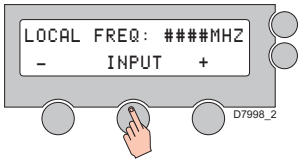
2. Press NEXT 3 times to enter local frequency mode.



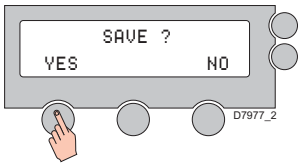
3. Press YES to set local frequency.



4. Select SINGLE LNB type.
   PREV - shows previous LNB type.
   SELECT - sets the displayed LNB type.
   NEXT - shows the next LNB type.
   ENTER - moves to the next screen.



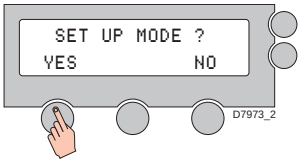
5. Input local frequency for the LNB.
   + advances the value.
   - decreases the value.
   Change the underscored digit using the +/- buttons.
   Press INPUT to move to next character.
   BACK moves to previous character.
   ENTER - moves to the next screen.



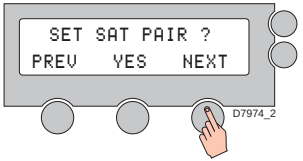
6. Press YES to accept the data.
   Press NO to cancel and return to main set up menu.

Note: Raymarine does not recommend changing the LNB type unless instructed to do so.

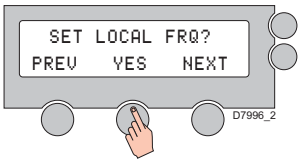
LNB systems in regions with linear polarization



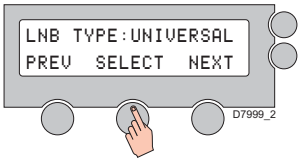
1. Press YES to enter set up mode.



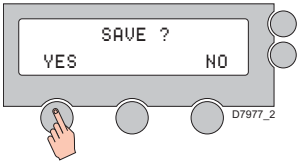
2. Press NEXT 3 times to enter local frequency menu.



3. Press YES to set local frequency.



4. Select UNIVERSAL LNB type.
   PREV - shows previous LNB type.
   SELECT - sets the displayed LNB type.
   NEXT - shows the next LNB type.

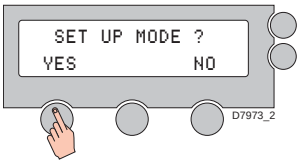


5. Press YES to accept the data.

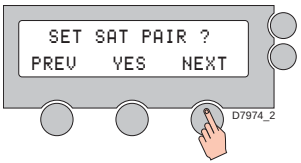
   Press NO to cancel and return to main menu.

Note: Raymarine does not recommend changing the LNB type unless instructed to do so.

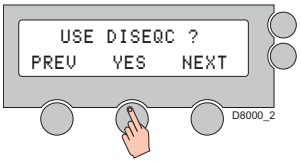
Setting the DiSEqC method



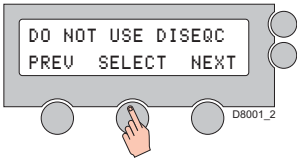
1. Press YES to enter set up mode.



2. Press NEXT four times to go to Use DiSEqC menu.

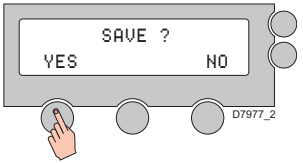


3. Press YES to enter DiSEqC menu.



4. Select the DiSEqC method (1).

   PREV - shows last method.
   SELECT - sets the displayed method.
   NEXT - shows next DiSEqC method.



5. Press YES to accept the selection.

   Press NO to cancel and return to main set up menu.

1. DiSEqC method

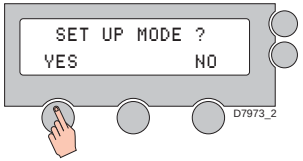
   DO NOT USE DISEQC - DiSEqC is not used.

   USE TO CHANGE BAND - DiSEqC is used to change high and low bands (Europe).

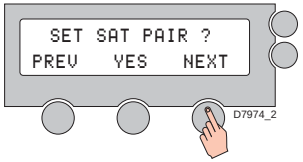
   USE TO CHANGE SAT - DiSEqC is used to change satellite being tracked (US- DirecTV).

Display version

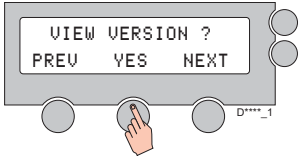
This sequence enables you to see what version of antenna and ACU software versions are installed on your system.



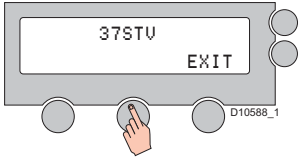
1. Press YES to enter set up mode.



2. Press NEXT five times to go to View Version menu.

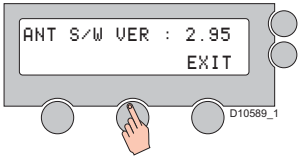


3. Press YES to view software version.



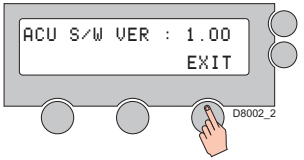
4. Antenna product name is shown.

   Press EXIT to return to main set up menu.



5. Antenna software version is shown.

   Press EXIT to return to main set up menu.



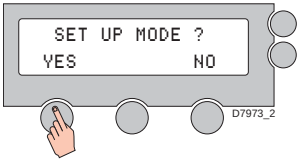
6. ACU software version is shown.

   Press EXIT to return to main set up menu.

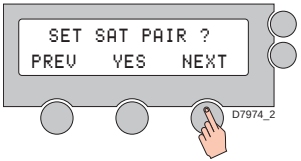
Note: The ACU automatically scrolls between steps 4, 5 and 6 of this sequence.

Display power

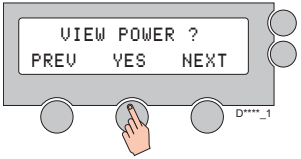
This sequence enables you to see the power levels of the ACU, Antenna and IRDs that are installed on your system.



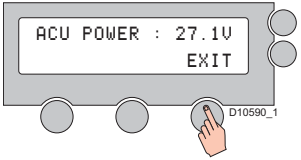
1. Press YES to enter set up mode.



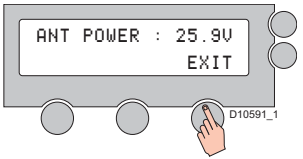
2. Press NEXT six times to show View Power menu.



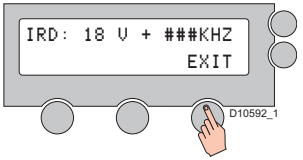
3. Press YES to enter View Power menu.



4. ACU voltage is shown.
   Press center soft key to view
   Press EXIT to return to main set up menu.



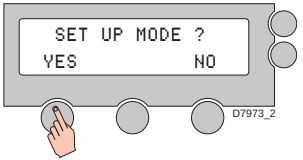
5. Antenna voltage is shown.
   Press center soft key to view IRD voltage.
   Press EXIT to return to main set up menu.



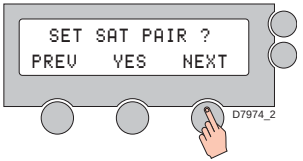
6. IRD voltage and frequency are shown.
   Press EXIT to return to main set up menu.

Note: The ACU automatically scrolls between steps 4, 5 and 6 of this sequence.

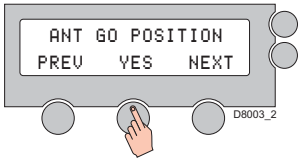
Setting antenna go position



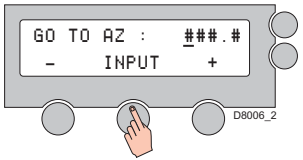
1. Press YES to enter set up mode.



2. Press NEXT eight times to show Ant Go Position menu.

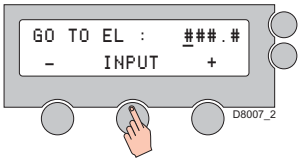


3. Press YES to enter Ant Go Position menu.



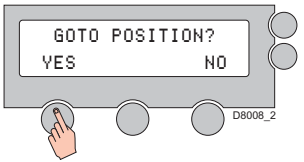
4. Input required azimuth (AZ) value.

   \+ increases a value.
   \- decreases a value.
   Change the underscored digit using the +/- buttons.
   Press INPUT to accept a value and move to next digit.
   Press BACK to correct input errors or return to main set up menu.
   Press ENTER to move to next step.



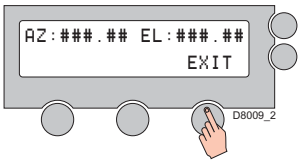
5. Input required elevation (EL) value.

   \+ increases a value.
   \- decreases a value.
   Change the underscored digit using the +/- buttons.
   Press INPUT to accept a value and move to next digit.
   Press BACK to correct input errors or return to main set up menu.
   Press ENTER to move to next step.



6. Press YES to move the antenna to input position.

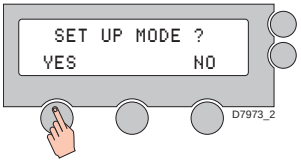
   Current position updates as the antenna moves.
   Press NO to return to Ant Go Position Menu.



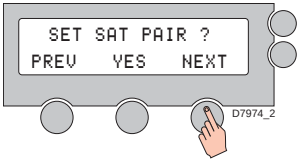
7. Press EXIT to return to main set up menu.

Setting antenna move step

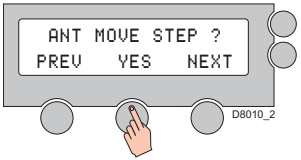
This sequence enables you to move the antenna in 1^{o} steps using the ACU.



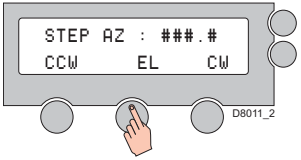
1. Press YES to enter set up mode.



2. Press NEXT nine times to show Ant Move Step menu.

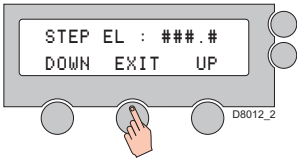


3. Press YES to enter Ant Move Step menu.



4. Move the antenna in the azimuth (AZ) axis.

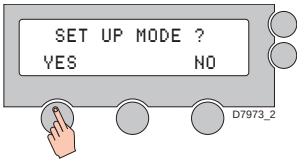
   CW - move clockwise.
   EL - go to the elevation control screen.
   CCW - move counter clockwise.



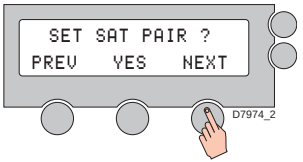
5. Move the antenna in the elevation (EL) axis.

   UP - moves in the up direction.
   EXIT - go to Ant Move Step menu.
   DOWN - move in down direction.
   Press BACK to correct input errors or return to previous ‘STEP AZ’ menu.

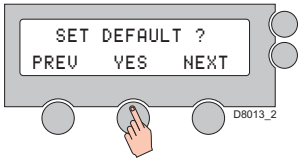
Setting the factory default parameters



1. Press YES to enter set up mode.



2. Press NEXT 11 times to go to set default screen/



3. Press YES to set default parameters.

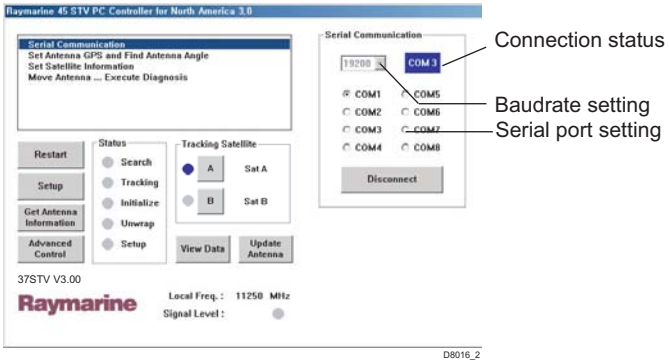
Perform antenna diagnosis

For full details of performing antenna diagnosis refer to “Antenna diagnosis” on page 45

Set up using the Graphical User Interface

You can also set up your Raymarine 37 STV Satellite TV System using the Graphical User Interface (GUI) which can be found on the CD-ROM supplied with the system.The CD-ROM contains folders for the different areas of operation.

Open the folder for your area of operation and double-click the.exe icon. The GUI will appear on screen. The method of operation is the same for all versions of the GUI.

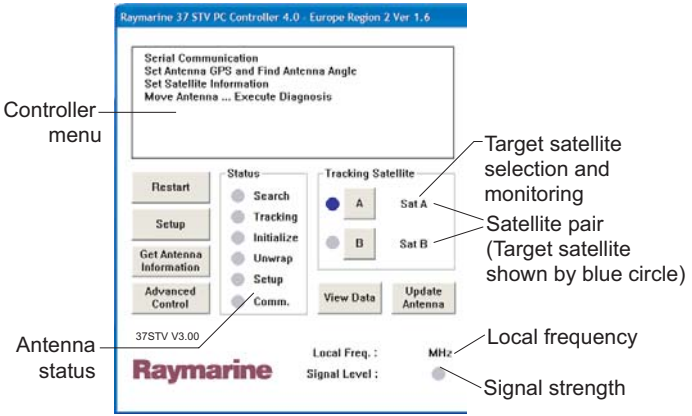


The GUI program enables you to set up the system antenna using a PC to maximize system performance and diagnostics.

To operate the GUI

1. Connect one end of the PC serial cable to the serial port or serial to USB converter on the computer.
2. Connect the other end of the PC serial cable to the '*PC INTERFACE*' connector on the rear of the ACU.
3. Place the CD-ROM supplied with your system into the CD-ROM drive of the computer.
4. Using Windows Explorer, access the contents of the CD and open the folder for your area of operation.
5. Double-click the.exe icon. The GUI appears on screen.
6. Power up the antenna and ACU.

GUI main menu



The GUI main menu enables you to select a function and see the antenna status at a glance. It consists of the following areas:

Controller menu

The controller menu enable you to select the task that you want to carry out. Place the cursor over the required task, which will be highlighted in blue, click, and the GUI will change to show the data boxes relevant to that task.

Antenna status

The antenna status information shows monitoring and set up information for your antenna.

Target satellite selection and monitoring

This section enables you to set up satellite tracking and monitoring.

Satellite pair

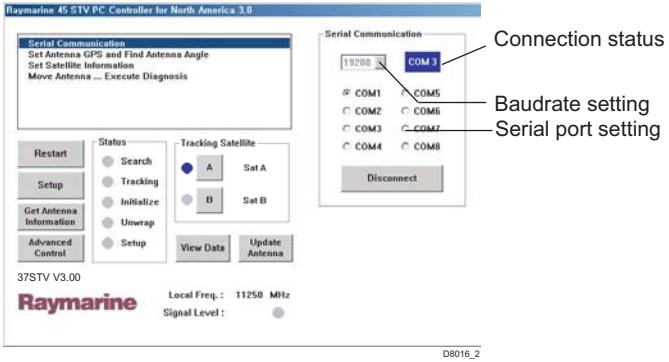
This section shows the satellite pair. The satellite being tracked is indicated by the blue circle.

Local frequency and signal strength

This section shows the local satellite frequency and signal strength.

Serial port set up

Having connected the ACU to your PC, communication must be established between the two. This requires the communication speed and the serial port to be set up. You can then use the GUI to configure the antenna settings.



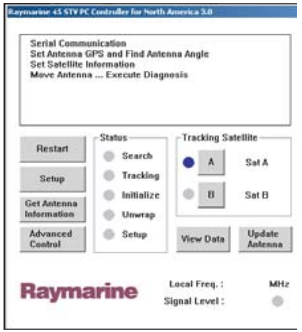
To set up the serial port

1. Connect the ACU and PC as described in “To operate the GUI” on page 37.
2. From the menu options select ‘*Serial Communications*’. The Serial Communication screen appears.
3. Click the circle next to the serial port number that you want to use. The selected port is shown next to the baudrate setting.
4. Click the ‘*Connect/Disconnect*’ soft key to establish communication. The soft key label changes to show the connection status as you click it.

Once communication between the ACU and antenna has been established you can configure the settings for your antenna.

The GUI control soft keys

The following section describes the operation of the different GUI soft keys.



Restart

Click this soft key to restart the antenna tracking the chosen satellite.

Setup

Click this soft key to enter the GUI set up mode before making any changes.

Get Antenna Information

Click this soft key to display the current system settings.

Advanced control

This is a password protected area for dealer use only.

View Data

Click this soft key to load the factory default settings into the GUI program.

Update antenna

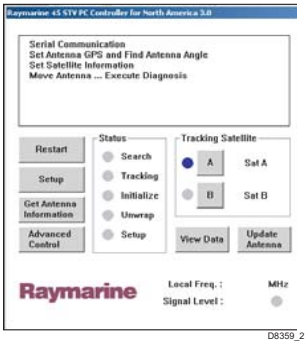
Click this soft key to send the factory default settings to the antenna. Remember that this will not restart the system.

Loading default satellite information using the CD-ROM

The following section enables you to load new satellites into the ACU using the CD-ROM.

To load new satellites:

1. Insert the CD-ROM into your PC.
2. Select the appropriate folder for your region of operation.
3. Open the GUI for your region.

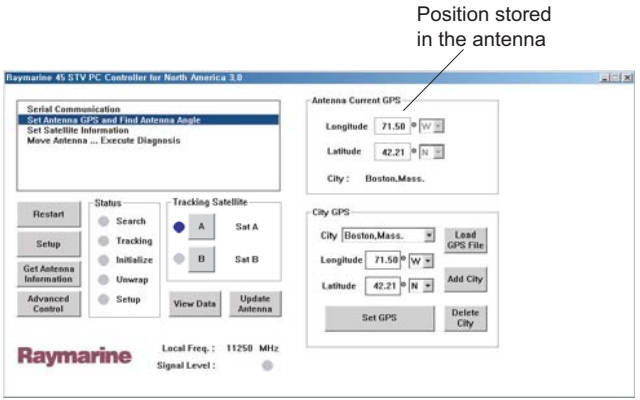


4. Press '***Setup'***. A dialog box appears, click '***OK'*** to confirm or '***Cancel'*** to exit set up.

5. Press '***View Data'***. A dialog box appears asking if you want to load the default settings for your region.
6. Press '***Yes'.*** The satellites will now populate the buttons in the '***Tracking Satellites*** 'section.
7. Press '***Update Antenna***'. This will send the new satellite information to the antenna.
8. Press '***Restart***' to initialize the antenna.

Setting the GPS

Your system antenna uses GPS information to enable it to track the satellite faster. The better the GPS information, the better the antenna performance.



D8017_2

There are two ways in which GPS information can be edited.

Method 1 - Your actual position

By obtaining your exact position from your boat's GPS system, you can input this into the antenna memory.

1. Click '*Set Antenna GPS And Find Antenna Angle*' in the menu options. The Set GPS screen appears.
2. Click '*Setup*'. The GUI enters set up mode.
3. Click on the Longitude box in the 'City GPS' section and enter your longitude in decimal degrees format, e.g. 71.50^{o}.
4. Click the drop-down arrow at the right of the longitude box and select W or E according to your longitude.
5. Click on the latitude box and enter your latitude in degrees and minutes format.
6. Click the drop-down arrow at the right of the latitude box and select N or S according to your latitude.
7. Click '*Set GPS*' to save this information and set the GPS.
8. Click '*Restart*', the system leaves set up mode and the antenna starts tracking.

Method 2 - Selecting the nearest city

If you are unable to enter your exact position, you can enter the latitude and longitude for the nearest city.

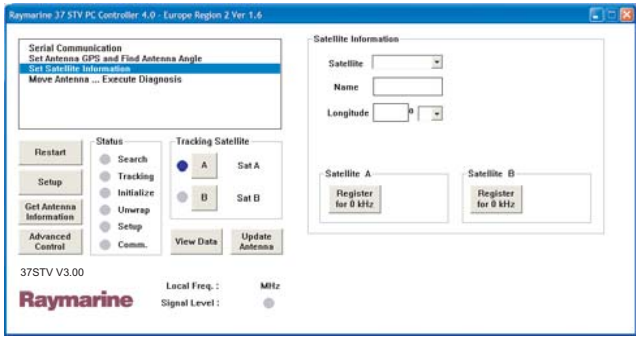
1. Click '*Set Antenna GPS And Find Antenna Angle*' in the menu options. The Set GPS screen appears.
2. Click '*Setup*'. The GUI enters set up mode.
3. Click on the arrow at the right of the '*City'* box. A drop-down menu of city names according to your area of operation (US or Europe) appears.
4. Scroll down the list and select the city which is nearest to

your current position. The latitude and longitude information for the selected city is displayed.

5. Click '*Set GPS*' to save this information.
6. Click '*Restart*'. The system leaves set up mode and the antenna starts tracking.

Editing the satellite information

This section of the GUI enables you to edit satellite information.



D8018_2

To edit a satellites information

1. Click '*Set Satellite Information*' in the menu options. The set satellite information screen appears.
2. Click '*Setup*'. The GUI enters set up mode.
3. Click on the arrow at the right of the Satellite box. A drop-down list of satellites appears.
4. Scroll down and select the satellite that you want to edit. The satellite name and its longitude will be displayed.

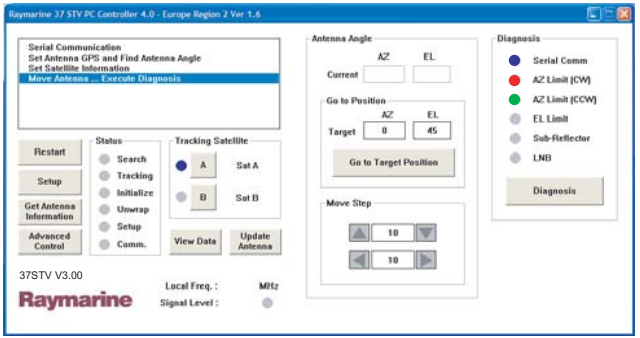
You can now change and edit the data for the selected satellite using the following command soft keys:

- Register for Satellite A - registers the selected satellite as SAT A of the satellite pair.
- Register for Satellite B - registers the selected satellite as SAT B of the satellite pair.

5. Click '*Restart*'. The system leaves set up mode and the antenna starts tracking.

Setting antenna angle and move step

You can move the antenna to a new target position or carry out diagnosis using the Move antenna - Execute diagnosis function of the GUI.



D8020_2

There are two methods for moving (stepping) the antenna to a new position:

- Positioning based on an absolute angle.
- Positioning based on a relative angle.

To position using an absolute angle:

1. Click '*Move Antenna - Execute Diagnosis*' in the menu options. The move antenna screen appears.
2. Click '*Setup*'. The GUI enters set up mode.
3. Enter the azimuth (AZ) and elevation (EL) angle values in the corresponding '*Target*' boxes of the '*Go to position*' box.
4. Click '*Go to Target Position*'. The antenna will move to the new target position.
5. Click '*Restart*'. The system leaves set up mode and the antenna starts tracking.

To position using a relative angle:

1. Click '*Move Antenna - Execute Diagnosis*' in the menu options. The move antenna screen appears.
2. Click '*Setup*'. The GUI enters set up mode.
3. Enter the angle that you want the antenna to move to in the relevant boxes of the '*Move Step*' box. The box marked with up/down arrows will adjust the EL position, the box marked with left/right arrows adjusts the AZ position.
4. Click the arrow corresponding to the direction that you want the antenna to move.
5. Click '*Restart*'. The system leaves set up mode and the antenna starts tracking.

Antenna diagnosis

The antenna diagnosis function automatically tests the operation of the system and shows its status.

To carry out antenna diagnosis:

1. Click '*Move Antenna - Execute Diagnosis*' in the menu options. The move antenna screen appears.
2. Click '*Setup*'. The GUI enters set up mode.
3. Click the '*Diagnosis*' soft key. Antenna diagnosis is automatically carried out.

   As each function is tested the result is shown by the circle next to the function title in the diagnosis box changing color.

   - Blue - shows the function is operating correctly.
   - Green - shows the function is being tested.
   - Red - shows that there is a fault with that function.

   If a fault is diagnosed refer to "Troubleshooting" on page 43 for possible solutions.
4. Click '*Restart'*. The system leaves set up mode and the antenna starts tracking.

Maintenance and troubleshooting

Introduction

This section deals with the maintenance and troubleshooting that can be carried out by the system user.

Maintenance

WARNING

Power supply

Ensure that the system is isolated from your boat's power supply before carrying out any maintenance.

Your Raymarine Satellite TV system has been designed to require minimal maintenance. The following routine maintenance checks will ensure that your system maintains peak performance:

- Examine the cables for signs of damage, such as chafing, cuts or nicks.
- Check that all cables are firmly attached.
- Wash the exterior of the antenna cover with fresh water to remove salt deposits; a mild detergent may be added to remove grime. DO NOT use abrasive cleaners or solvents such as acetone as this may result in irreparable damage to the unit.
- The antenna is not a sealed unit, DO NOT use a power spray to wash the exterior as this may result in water ingress and damage to the unit.
- Twice a year remove the antenna cover and examine the interior for signs of corrosion.

Troubleshooting

Your Raymarine product has been subjected to comprehensive test and quality assurance programs prior to packing and shipping. However, if your unit should develop a fault, please refer to the following table to identify the most likely cause and the corrective action required to restore normal operation.

If you still have a problem after referring to the table, contact your local Raymarine dealer, national distributor or Raymarine Product Support for further advice.

Symptom	Possible cause*							
	1	2	3	4	5	6	7	8
Antenna not functioning or displays 'ANT OUT OF CONTROL' message	X				X			
No picture on TV set			X		X	X		X
Intermittent picture for short intervals		X	X	X	X	X		X
System works at the dock but not underway		X						
System will not find satellite		X	X	X	X	X	X	X

Symptom	Possible cause*							
	1	2	3	4	5	6	7	8
'Snowy' television picture				X				

*Note: *for an explanation of the possible causes and their remedies refer to the following paragraphs.*

1. Blown fuse, low power or wiring

- Check that the in-line quick blow fuse (if fitted) has not blown, or the circuit breaker has not tripped. Replace fuse with one of the same type and rating.
- If you have extended the power cable from the antenna unit, check that there is no power loss.
- Check the system wiring and connections.

2. Satellite Signal Blocked

Satellite signals can be blocked or degraded by buildings, other boats or equipment on your boat. Check that the antenna has a clear view of the sky.

3. Outside satellite coverage zone

Your system will provide excellent reception within the antenna coverage area for your satellite television service. However, signal quality may degrade as you approach the edges of this zone. Refer to "Satellite coverage areas" on page 47 to check the viable coverage area for your antenna.

4. Radar interference

The energy levels radiated by radar units can overload the antenna front end circuits. Make sure that your antenna is installed as described in "Planning the installation" on page 8 of this handbook with regards to your radar unit.

5. Incorrect or loose RF connectors

As part of the regular maintenance recommended by Raymarine, all connections should be checked to ensure that they have not become loose. A loose RF connector can reduce signal quality or cause the antenna not to work.

6. Multi-switch interference

If you have multiple IRD's connected to your system, make sure that you are using an ACTIVE not PASSIVE multi-switch.

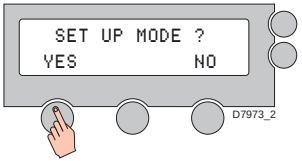
7. IRD troubleshooting

- Your IRD may be the cause of less than ideal operation.
- Check the IRD's configuration to ensure that it is programmed for the area in which you are operating.
- Unplug the IRD from the power supply for 15 seconds. Reconnect and allow the system to initialize.

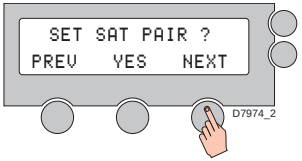
8. LNB fault

If you have an LNB fault it may require replacing. Contact your local dealer, national distributor or Raymarine Product Support for further assistance.

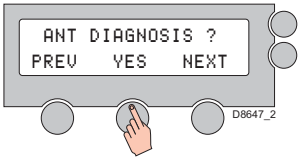
Antenna diagnosis



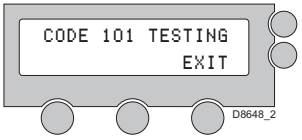
1. Press YES to enter set up mode.



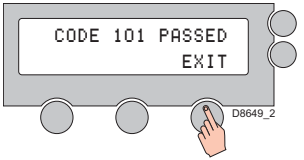
2. Press NEXT 10 times to go to Antenna Diagnosis menu.



3. Press YES to enter diagnosis mode.



4. Code being tested is shown.
   Press EXIT to return to main set up menu.



5. Code has been tested and passed or failed.
   Press EXIT to return to main set up menu.

Code	Test
Code 101	Communication between antenna and ACU is being tested. If failed, check the RF cable connections
Code 102	AZ CW (clockwise) limit switch is tested. If failed, check the limit switch, motor and belt for azimuth axis.
Code 103	AZ CCW (counter clockwise) limit switch is tested. If failed, check the limit switch, motor and belt for azimuth axis.
Code 104	EL axis is tested. If failed, check the limit switch, motor and belt for elevation axis
Code 105	Sub-reflector is tested. If failed, check sub-reflector.
Code 106	LNB tested. If failed, check the LNB and control board.

Technical Support

You can obtain Technical Support for your Raymarine Satellite TV System from the following:

www.raymarine.com

United States

Raymarine Technical Support
1-800-539-5539 extension 2444, or
(603) -881-5200

Product Repair and Service
Raymarine Product Repair Center
21 Manchester Street,
Merrimack, NH 03054 - 4801
1-800-539-5539

Opening hours:
Monday through Friday 0815 - 1700
Eastern Standard or Eastern Daylight
Savings Time.

Europe

Technical Support
Services
Accessories

Tel:
+44(0)23 9271 4713

Fax:
+44(0)23 9266 1228

Help us to help you

When requesting service, please quote the following product information:
Equipment type ● Model number ● Serial number

Satellite information

Introduction

This section contains information on satellites in your region and includes;

- Satellite coverage areas.
- Satellite coverage by geographic location.
- Satellite tracking information

Satellite coverage areas

The following satellite coverage maps do not guarantee coverage. This can be affected by climatic conditions that may cause variation in the satellite signal.

Climatic conditions

Atmospheric conditions that may cause a significant loss of signal level include:

- Rain
- Snow
- Heavy fog
- Solar activity, e.g. sun spot and flare activity.

By far the most common of these conditions is rain. Rain drops in the atmosphere will reduce the signal from the satellite, the heavier the rain the higher the signal loss. The effect of his signal loss is that the antenna's ability to remain locked to the satellite signal becomes severely affected. This in turn means degradation or in some cases a complete loss of satellite signal.

When the amount of rain contained in the atmosphere decreases the antenna will re-acquire the satellite signal.

European satellites

Astra 1G/H

Astra 2A South

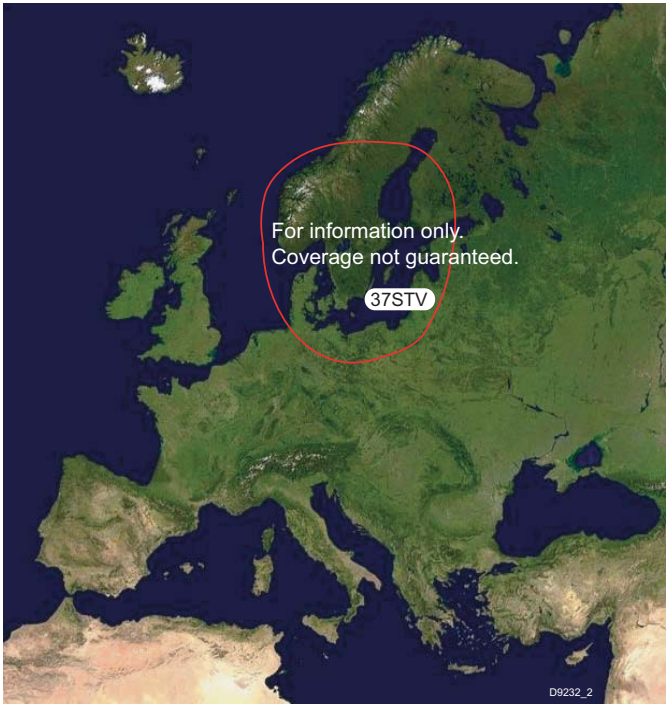
Hotbird

Hotbird Widebeam

Hispasat

Thor II

Sirius

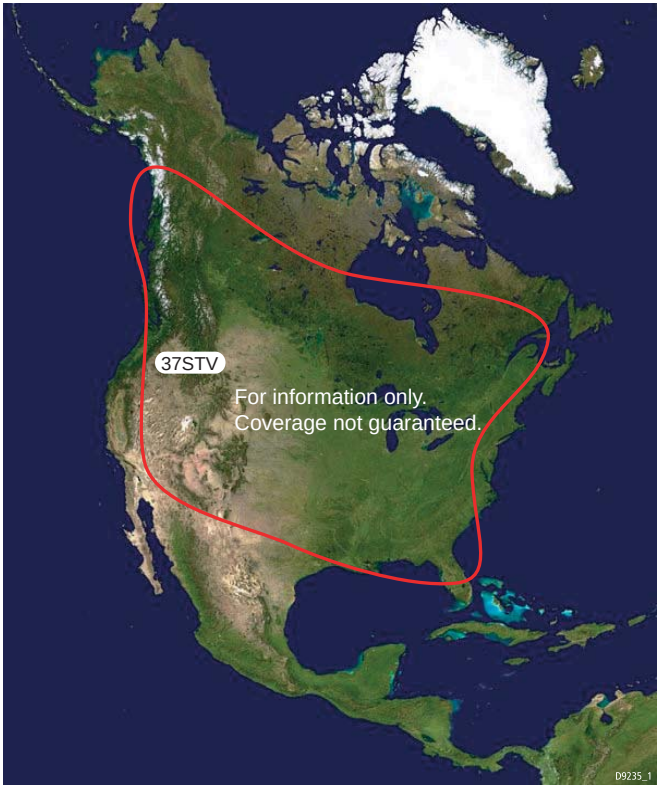

For information only.
Coverage not guaranteed.
37STV
D9232_2

US satellites

Direct TV

Dish Network

ExpressVu


37STV
For information only.
Coverage not guaranteed.
D9235_1

Satellite coverage by geographic location

The following table details satellite coverage by geographic location. To receive a satellite television service other than the ‘free to air’ channels you will need to subscribe to the service from the relevant service provider.

Europe

Country	Satellites	Service provider
England	Astra - AST 02AS0 Astra - AST 02AN0	Astra www.ses-astra.com
Germany	Primary: Astra - AST 01GKU	Astra www.ses-astra.com
	Secondary (limited channels) Hotbird - HOT234KW Astra - AST01EH1 Astra - AST01FH1 Astra - AST01EV1	Hotbird www.eutelsat.com
France	Hotbird - HOT234KS Hotbird - HOT234KW	Hotbird www.eutelsat.com
	Astra - AST101GKU	Astra www.ses-astra.com

Europe

Country	Satellites	Service provider
Spain	Primary: Astra - AST101GKU	Hispasat www.hispasat.com
	Secondary (limited channels): Hispasat - HIS01AKS Hispasat - HIS01CKS Hotbird - HOT234KW Astra - AST01EV1	Astra www.ses-astra.com Hotbird www.eutelsat.com
Italy	Hotbird - HOT234KS Hotbird - HOT234KW	Hotbird www.eutelsat.com
Scandinavia	Primary: Sirius - SIR002KN Thor - THO002KU	Sirius www.nsab.se
	Secondary (limited channels): Sirius- SIR003KN Thor - THO001KU Thor - THO-003KU	Thor www.telenor.com
Greece	Hotbird - HOT-234KW	Hotbird www.eutelsat.com

United States

Satellite	Service Provider
NIMIQ1 - NIM001KB NIMIQ2 - NIM002KB	Bell ExpessVu www.expessvu.com
Echostar 3 - ECH003KB Echostar 6.8 - ECH008KB Echostar 7 - ECH007KB Echostar 1.2 - ECH001KB	Echostar Communications Corp. www.dishnetwork.com
DIRECTV 2.3 - DTV123KB DIRECTV 6 - DTV006KB	DirecTV Inc. www.directv.com

Satellite tracking

Your Raymarine 37STV Satellite TV System can track a variety of DVB compatible and DSS (DirecTV) satellites.Your system contains a pre-programmed library of either European or North American satellites, whichever are applicable to your system. There are also two open slots which can be programmed with user defined satellites.

Satellite service providers

The following tables contain the information that is required to manually enter data for both European and North American satellites:

European satellites

Satellite Name	**Frequency**	**Transponder symbol rate**	**FEC code**	**Satellite network ID**	**LNB polarization** (vertical (V) or horizontal (H))	**LNB band**	**Decoding type**
Astra 1	11038	22000	5/6	0x0001	V	L	DVB
	10832	22000	5/6	0x0001	H	L	DVB
	11856	27500	3/4	0x0001	V	H	DVB
	11992	27500	3/4	0x0085	H	H	DVB
Astra 2	10788	22000	5/6	0x0020	V	L	DVB
	10733	22000	5/6	0x0020	H	L	DVB
	11895	25700	2/3	0x0020	V	H	DVB
	11876	25700	2/3	0x0020	H	H	DVB
Hispasat	11771	27500	3/4	0x0031	V	L	DVB
	11811	27500	3/4	0x0036	H	L	DVB
	12303	27500	3/4	0x0031	V	H	DVB
	11851	27500	3/4	0x0036	H	H	DVB

European satellites

Satellite Name	Frequency	Transponder symbol rate	FEC code	Satellite network ID	LNB polarization (vertical (V) or horizontal (H))	LNB band	Decoding type
Hot-Spot	11393	27500	3/4	0x013E	V	L	DVB
	11642	27500	3/4	0x013E	H	L	DVB
	11958	27500	3/4	0xFBFF	V	H	DVB
	11862	27500	3/4	0xFBFF	H	H	DVB
Hot-Wide	11393	27500	3/4	0x013E	V	L	DVB
	11179	27500	3/4	0x013E	H	L	DVB
	12380	27500	3/4	0x013E	V	H	DVB
	12437	27500	3/4	0x013E	H	H	DVB
Sirius	11747	27500	3/4	0x0056	V	L	DVB
	11766	27500	3/4	0x0055	H	L	DVB
	12054	27500	3/4	0x0056	V	H	DVB
	11766	27500	3/4	0x0055	H	H	DVB
Thor	11216	24500	7/8	0x0046	V	L	DVB
	11229	24500	7/8	0x0046	H	L	DVB
	12456	28000	3/4	0x0046	V	H	DVB
	12476	27800	3/4	0x0046	H	H	DVB

North American Satellites

Satellite Name	Frequency	Transponder symbol rate	FEC code	Satellite network ID	LNB polarization (vertical (V) or horizontal (H))	LNB band	Decoding type
ExpressVu91	12428 12443	20000 20000	5/6 5/6	0x0100 0x0100	RHCP LHCP	U U	DVB DVB
ExpressVu82	12428 12443	20000 20000	5/6 5/6	0x0101 0x0101	RHCP LHCP	U U	DVB DVB
EchoStar61	12632 12443	20000 20000	3/4 5/6	0x1002 0x1002	RHCP LHCP	U U	DVB DVB
EchoStar110	12428 12443	20000 20000	5/6 5/6	0x1006 0x1006	RHCP LHCP	U U	DVB DVB
EchoStar119	12428 12443	20000 20000	5/6 5/6	0x1004 0x1004	RHCP LHCP	U U	DVB DVB
EchoStar148	12428 12443	20000 20000	5/6 5/6	0x1009 0x1009	RHCP LHCP	U U	DVB DVB
DirecTV73	12370 12355	20000 20000	2/3 2/3	0xFFF7 0xFFF7	RHCP LHCP	U U	DSS DSS
DirecTV101	12428 12443	20000 20000	6/7 6/7	0xFFF0 0xFFF0	RHCP LHCP	U U	DSS DSS
DirecTV119	12428 12443	20000 20000	5/6 5/6	0x1004 0x1004	RHCP LHCP	U U	DVB DVB

HD information

Introduction

This section contains information and technical tips for using High Definition (HD) compatible satellite and television receivers with US versions of the Raymarine 37STV Satellite TV System.

Satellite switching

The satellite receiver has the ability to switch satellites automatically using a DiSEqC signal. As you change channels on the television, the receiver will send a DiSEqC signal when another satellite is required.

The receiver is able to switch between SAT A and SAT A* or SAT B and SAT B*, but you cannot automatically change from the Satellite A pair to the Satellite B Pair.

Foe example, if you are watching a channel on SAT A (DTV101) and decide to change the channel, the new channel may be on a different satellite. If the channel is on a different satellite, the receiver will send the DiSEqC signal and tell the antenna to switch to SAT A* (DTV119).

If an HD channel on DTV110# is requested, you will have to manually press the SAT B soft key on the ACU. This will change the satellite pair to SAT B and SAT B*. As you change channels now you have the option to switch automatically between DTV101 and DTV110#. To return to the Satellite A pair, simply press the SAT A soft key on the ACU.

In an installation that uses a multi switch, “Multiple IRDs - DirecTV” on page 16, a DiSEqC supplier is required if three DirecTV satellites are used. This additional accessory is required because the multi switch does not allow the DiSEqC signal to pass properly. Since the original signal cannot pass, there is no satellite switching. In this case you could only track two satellites - SAT A and SAT B - and it would require a manual soft key press on the ACU to switch satellites. Since some systems use three satellites, the DiSEqC supplier is required.

Technical tips

1. Only the Master receiver has the ability to change the satellites automatically - this receiver should be HD compatible.

   The Master receiver can change satellites between DTV101, DTV119 and DTV110#. Any other receivers in the system do not have the ability to change the satellite being tracked, only watch the channels on the current satellite, i.e. if the Master receiver is tracking DTV101, then all the remaining receivers in the system can only watch channels on DTV101.
2. During the set up of your HD receiver, you should select the option that states “Oval Dish with 3 LNBs”. This will tell the receiver that it will have to be able to look for three satellites.
3. During set up, the receiver will look for each of the three DirecTV satellites. Since the ACU is set up with two satellite

pairs. you will have to carry out a manual soft key press during this section of the set up procedure. The test will check for DTV101 and you will get an OK. It will then check for DTV119, and you will again get an OK. As it begins searching for DTV110# you will have to manually press the SAT B pair on the ACU. The receiver will then be able to locate DTV110#.

4. Once set up is complete, the receiver will start downloading the guide. As this occurs the receiver will tell the ACU when to switch satellites. Since the receiver can only switch between the main satellite and the DiSEqC satellite - SAT A and SAT A* or SAT B and SAT B* - the guide will be likely to only download channels from two of the three satellites at this time. The channels from the third satellite will populate the guide over a period of time. This period of time can be as little as 20 minutes or extend to several hours. You will not be able to watch all of the channels until the guide is fully populated.

Technical specification

General	
Approvals CE - conforms to FCC - verified to	 EU Directive 89/336/EEC CFR:47: Part 15
Dimensions Antenna Antenna dish Antenna Control Unit	 43 cm(16.92”) dia x 44 cm (17.32”) high 37cm (14.57”) dia 178 mm x 54 mm x 217 mm (7.0” x 2.13” x 8.54”)
Weight Antenna Antenna Control Unit	 8 kg (17.63 lbs) 1.2 kg (2.65 lbs)
Environmental Operating temperature range Storage temperature range Humidity limits	 -10^{o}C to +50^{o}C -20^{o}C to +70^{o}C 95% Relative Humidity
Operating voltage	10.8 - 15.6 V DC
Power consumption	Typical 30 W Maximum 50 W

Antenna system performance	
Frequency	Ku Band 10.7 to 12.75 GHz
Minimum EIRP	50 dBW
Azimuth range	680^{o}
Elevation range	+10^{o} ~ +80^{o}
Roll and pitch range	Roll $\pm$25^{o}, Pitch $\pm$15^{o}
Roll and pitch tracking	60^{o} per second
Roll and pitch rate	60^{o} per second