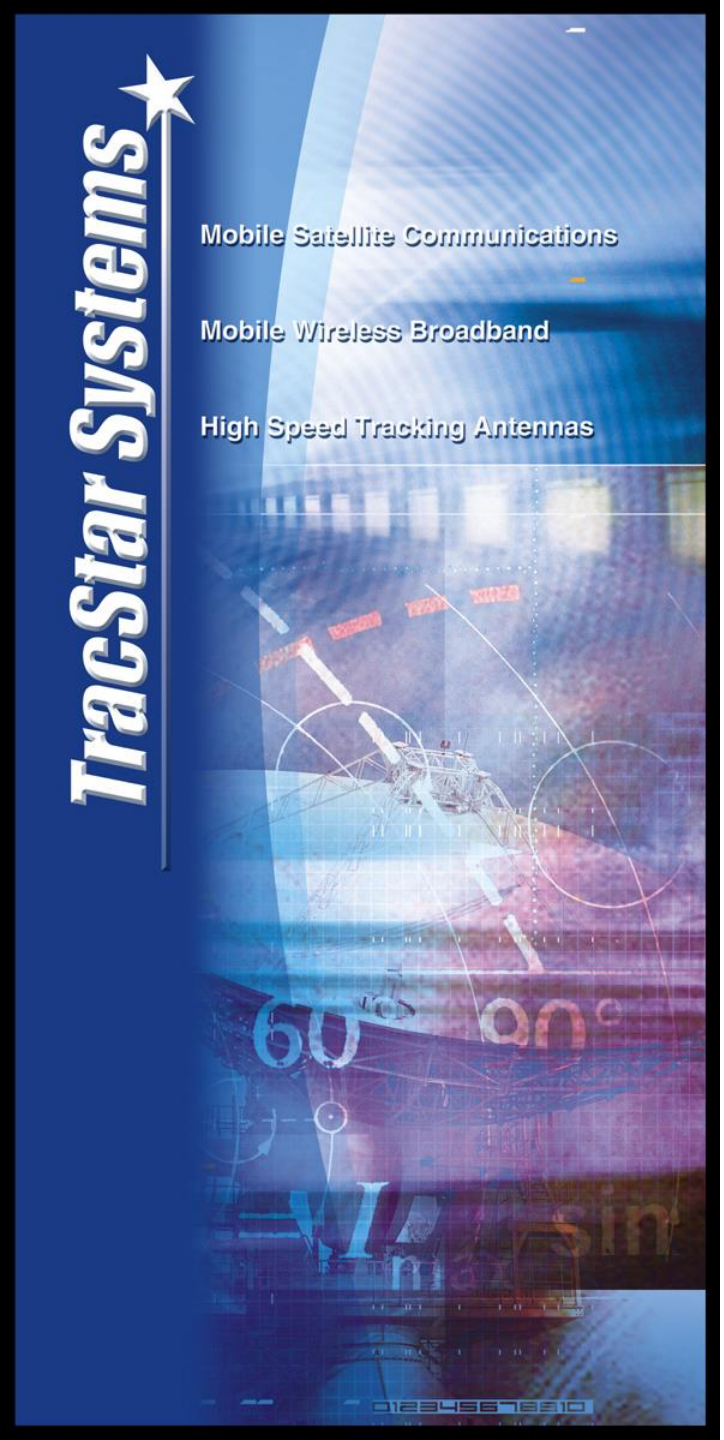


TracStar SYSTEMS

Technical Support Training

MVS Series Antennas

Models covered in this document:

MVS 750
MVS 960
MVS 960TB
MVS 1200

And variations of above

!! CAUTION !!

Antennas are shipped fully configured for a particular Customer. Incorrect Changes to antenna settings may render the antenna inoperable.

Change controller settings with caution.

www.mytracstar.com/esupport/

888-650-9054

24/7 Technical Support Line

888-650-9054

407-956-5477

TracStar Office

M-F 8 a.m.- 5 p.m.

407-650-9054

Online Support Resource

www.mytracstar.com/esupport/

Agenda

- Product overviews
- Antenna Description
- Antenna Subsystems
- Basic Antenna Setup
- Acquisition Process
- Common Error Messages
- Minor Error Messages
  - Field Repairable
- Major Error Messages
  - Potentially Recoverable
  - Potentially Fatal Errors
- Installation Guidelines

MVS750

- Effective Aperture 75cm
- Pol/ El/ Az Positioner
- Channel Master Reflector
- Stow Height 12”

Physical Components Overview

The 750, as the smallest of our line is Made for life on the Road. With the optional Bird-on-a-wire kit, the system is capable of not just passing data, but receiving dishnetwork signals as well in CONUS.

MVS750P

Rugged Case Design

MVS960

- Effective Aperture 96cm
- Pol /El/ Az Positioner
- Stow Height 17in

MVS960SB (Split-Boom)

- As compact as the 960, this system can handle nearly as much weight as The 1200 and also has a motorized polarity.

MVS960P

- 96cm Removable Reflector
- Rugged Case design
- 2-Man setup under 5 mins.

MVS1000P

- Effective Aperture 1.0 Meter
- 4 Piece Removable Reflector
- Rugged Case Design

MVS1200P2/MVS1200P4

- Effective Aperture 1.2 Meter
- 2 Piece or 4 Piece Removable Reflector
- Rugged Case Design

MVS1200

- 1.2M Prodelin Reflector
- Stow height 19”
- Feed Rotated over El/Az
- Pre-wired for stow-alert signal

Antenna Description

- Three axis, polarization over elevation over azimuth
- Configurable for operation on most Ku satellites
- Designed for turn-key operation, performs precise antenna to satellite alignment with the push of a button or switch

Pedestal Description:

- High precision motors with optical encoders
- Very low backlash drive system
- Each antenna is fully integrated with;
  1. GPS
  2. Compass
  3. DVB Receiver
  4. Base level sensor
  5. TracStar Control System with User Interface

Physical Components Overview

The 750, 960's, 1000, and 1200p2/4's all polarize by rotating the reflector, feed, and RF equipment as one.

Physical Components Overview

The Key difference separating the 960SB and 1200 from our other systems is The Boom structure with motorized feed & OMT Assembly.
Here, only the OMT, LNB, and Transmit Flex-Twist waveguide rotate.

Physical Components Overview

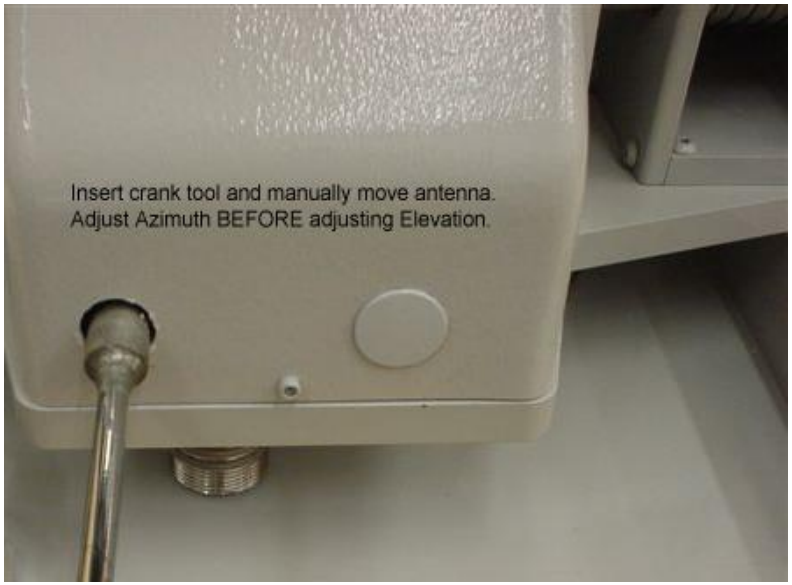
All TracStar MVS series antennas have Pedestal Elevation [A] and Azimuth [B] Low Back-lash axis Drive Cable Systems

A

B

Physical Components Overview

Manual Crank Access is a stock option on the MVS 960P, 1000, and 1200 series.

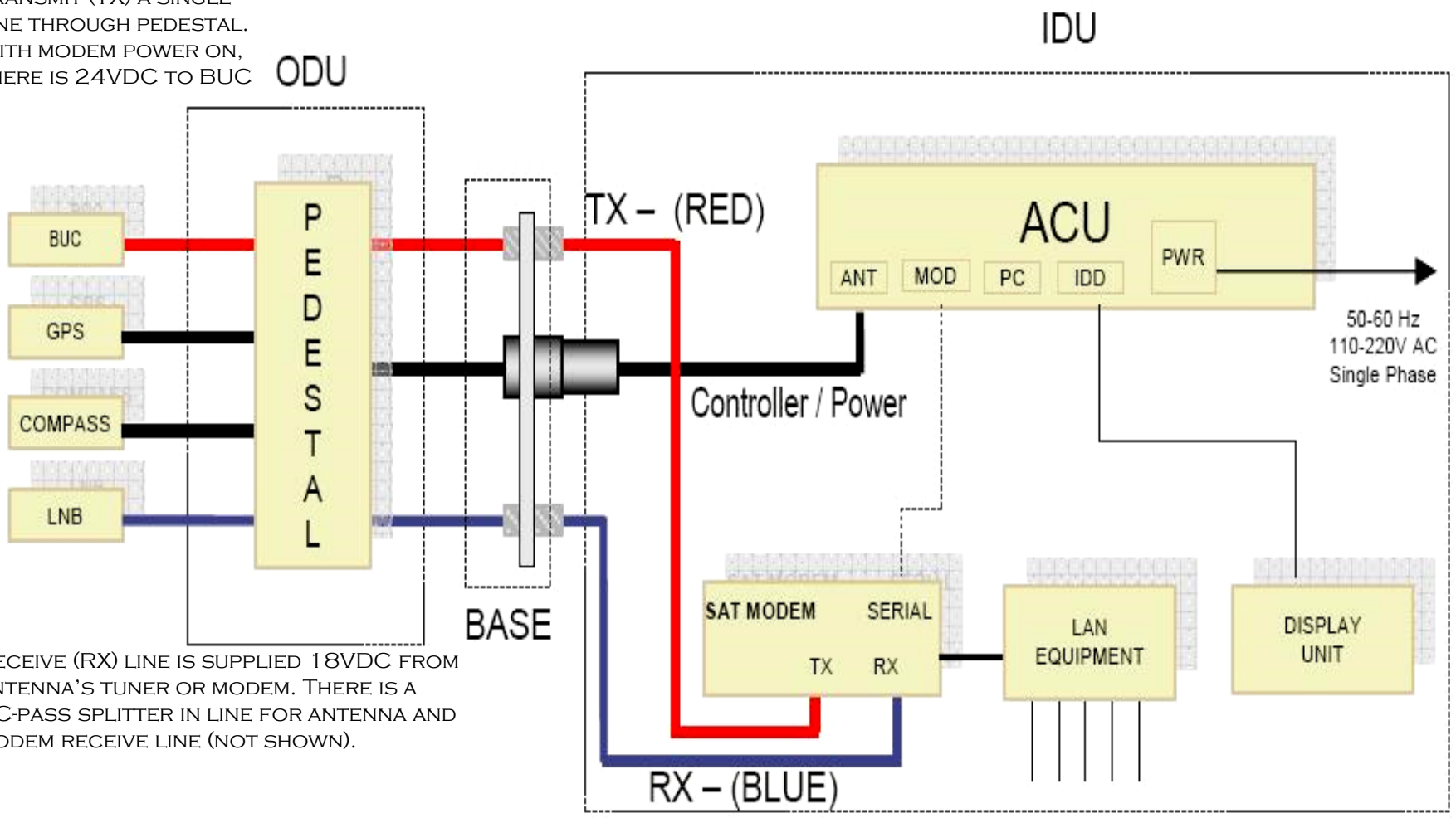


Questions?

Logical Configuration

MVS Series Antennas

Transmit (TX) a single line through pedestal. With modem power on, there is 24VDC to BUC



Receive (RX) line is supplied 18VDC from antenna's tuner or modem. There is a DC-pass splitter in line for antenna and modem receive line (not shown).

Connection Information

- Cable paths for antenna and modem as shown above, is logical diagram solely intended to show discrete connections (*Note: the MOD-SERIAL cable is only required to use serial to Ethernet interface for SnR feedback from modems that are capable; i.e. DirecPoint Mode. Refer to User Manual for more details).

- Power is supplied to the antenna from the tabletop power supply or the 1U rack mount power supply, which ever applies.

- Communications (ACU Display or IDD with table-top ACU, MOD-Serial and PC ports) are relayed back to ACU/ Power supply along Control Cable for further interface to auxiliary equipment, if applicable.

- The TracStar control system is mounted on the antenna. No data is stored in the 'controller' interface (ACU), which is universally interchangeable within the TracStar Systems MVS model series.

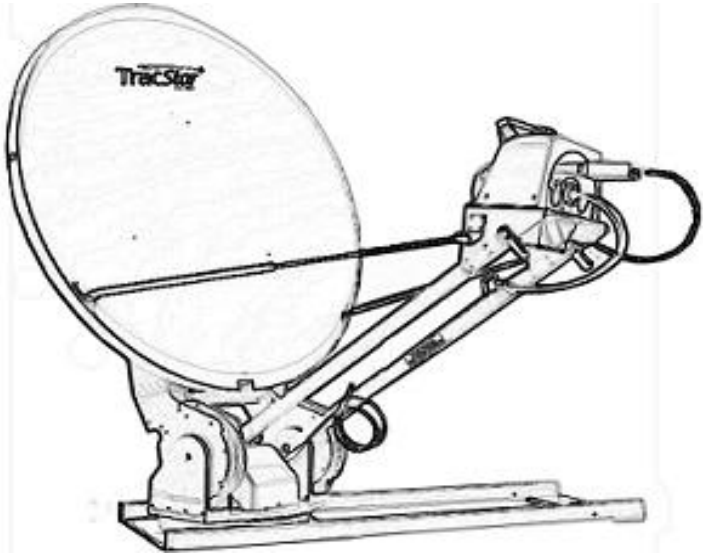
NOTE THE FOLLOWING WARNING:

Do NOT connect or disconnect the RG6 Coaxial cables or antenna controller cable while power is applied to any connected equipment.

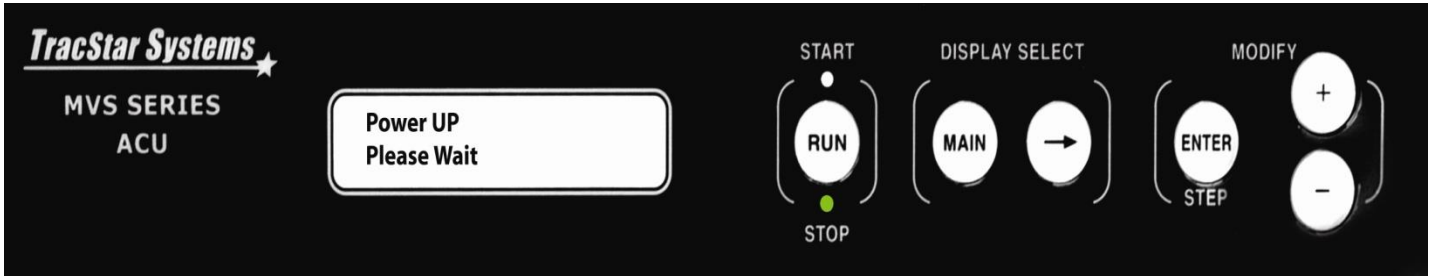
DOING SO MAY CAUSE DAMAGE TO THE SYSTEM.

Questions?

Control System configuration



ACU Display



Rack Mount ACU With Display built in

START/ STOP

Places the antenna in **operational mode** (green LED on top) or **standby** (green LED on bottom)

Handheld Remote comes with tabletop ACU

DISPLAY SELECT

Main steps through the menu vertically

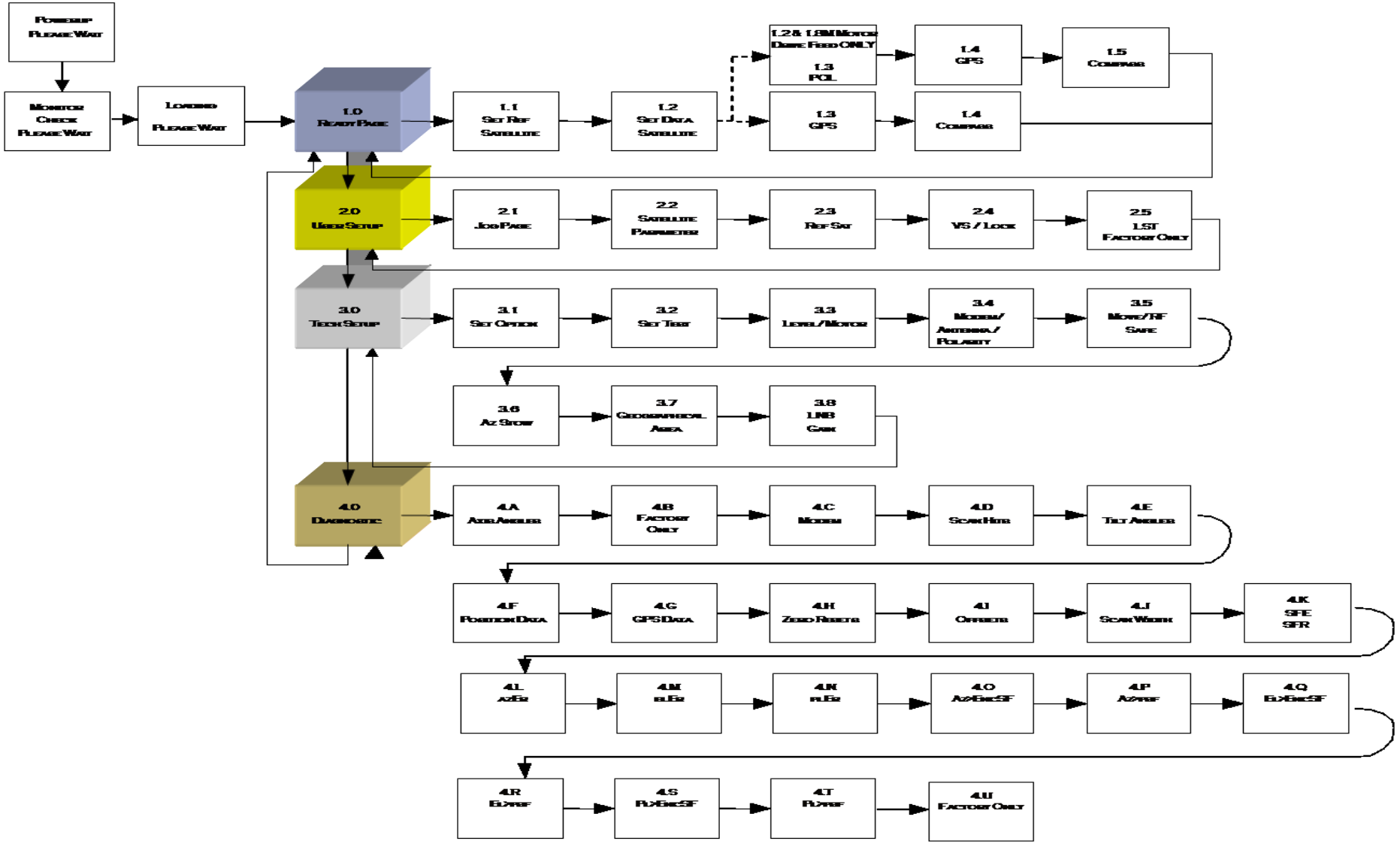
Enter steps across the menu Horizontally

Enter to select or step through page

MODIFY

+ or – to modify selection

TracStar Systems Software Menu Grid



Basic setup for U.S. Customers

Step	Function	Action	Display Page
1.	Locate the antenna so that it has a view of the orbital arc.		
2.	Power up antenna	Turn on power at ACU	Power up...READY
3.	Set Code 13 (enables editing)	From READY page Main key 2x + to code 13, Enter key	READY TECH SETUP Tech Setup CODE 13
4.	Run USA Ref Setup (Default).	From READY page Main key 2x Arrow key 2x + or – keys to Enter key + or – keys to Enter key	READY TECH SETUP SET TEST USA Ref Setup CANCEL RUN NOW Idle Sat a/b @ xxx

Basic setup Continued

Step	Function	Action	Display Page
5.	Input data satellite parameters. Toggle between SatA and SatB Input orbital position for SatA Input orbital position for SatB	From READY page Arrow 2x + or – + or - Enter key (save)	READY SELECT DATA [SatA] or [SatB] XXX.X
6.	Set Polarity of Receive	From READY page Arrow key 3x + or - keys + or - keys Enter key (save)	READY Pol HorzDN or VertDN
7.	Start Acquisition	From any page Main key + key for 2 seconds	Idle Sat A @ xx.0 Startup Sat A @ xx.0

Questions?

Operation

Basic Operation Quick sheet

Turning the System ON:

- Connect antenna as shown above.
- Apply power from the tabletop power supply or the 1U rack mount power supply, which ever applies.
- When the control panel interface displays "READY", press "+" and hold for 2 seconds.
- When the ACU Display shows "Locked @ xx.0", the antenna's acquisition sequence is completed.
- When the Modem's Rx and network status LED's are solid, the customer should have connectivity.

Note: Acquisition times vary according to Geographic Location and System configuration.

Message Displayed	Description
POWER UP PLEASE WAIT	Power is being applied to the system
MONITOR CHECK PLEASE WAIT	The system is initiating its internal monitor software
LOADING PLEASE WAIT	The system is going through the software loading stage (3-5 seconds)
READY: (+ up – down)	The system is in standby mode waiting for instructions (green LED is on bottom): (a) Press + to initiate an acquisition (b) Press – to stow the antenna
RUN: (+/- stop) Startup @ XX	The system is active and has started an acquisition (green LED on top). NOTE: any time the system is active press + or – to place the system in standby.
RUN: (+/- stop) Compass XXX	The system is reading the compass and aligning. Shows relative compass sensor reading.
RUN: (+/- stop) Wait GPS 118	The system is acquiring GPS signals Last digit shows number of GPS satellites acquired, +100 if locked
RUN: (+/- stop) SCAN XXX YYYY	The system is scanning a reference satellite XXX is orbital position; YYY shows signal strength
RUN: (+/- stop) PEAK XXX YYY	The system is scanning the selected communications satellite
RUN: (+/- stop) Locked XXX YYY	The antenna is locked on the selected satellite
	To place the system is standby, press + or -, READY page will appear

Basic Operation Quick sheet

Turning the System OFF:

- Press the MAIN button until the display reads "READY", from any other menu screen.
- Press the "-" button and hold for 2 seconds to stow the antenna (Note: antennas will stow from any position, including re-stowing from the stowed position).
- Remove power from the antenna with the Table top power supply or the 1U rack mount panel, which ever applies.
- Once power is removed, disconnect any cables necessary for transporting the antenna.

NOTE THE FOLLOWING WARNING:

Do NOT connect or disconnect the RG6 Coaxial cables or antenna control cable while power is applied to any connected equipment. Turn off all power before connecting or removing cables. Failure to do so may cause damage to the system.

Acquisition Sequence

Explanation

- Compass aligns the antenna with south (if in the northern hemisphere, to the north if in the southern hemisphere after GPS is acquired for the first time below the equator)
- Antenna acquires GPS for high precision geographic location information
- Antenna precisely sets elevation angle and sweeps through a selected reference satellite, monitoring signal characteristics of the reference satellite
- Antenna peaks on reference satellite until the center of the RF beam is located as a Point of Aim calibration
- Antenna then peaks on the satellite of interest and performs a high precision alignment to the satellite

Acquisition Sequence

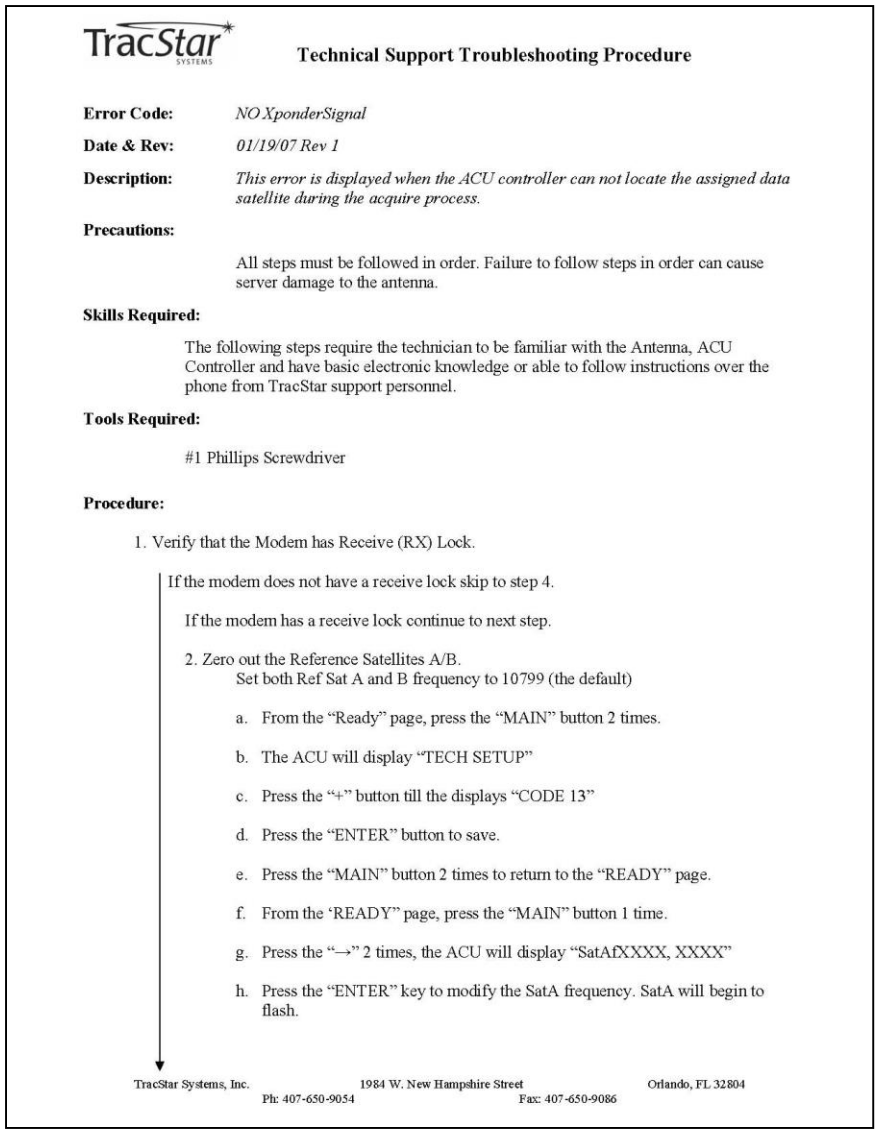
Explanation Continued

- Alternately to above, antenna receives Signal to Noise ratio (Eb/No) information from satellite modem (if applicable)
- Antenna then peaks on the satellite of interest and performs a high precision alignment to the satellite
- Satellite modem initiates contact with network operations
- Satellite modem completes logon process and antenna ceases movement in a peaked orientation

Questions?

Technical Support

Technical Support Procedures



TracStar SYSTEMS

Technical Support Troubleshooting Procedure

Error Code: *NO XponderSignal*

Date & Rev: *01/19/07 Rev 1*

Description: *This error is displayed when the ACU controller can not locate the assigned data satellite during the acquire process.*

Precautions:

All steps must be followed in order. Failure to follow steps in order can cause server damage to the antenna.

Skills Required:

The following steps require the technician to be familiar with the Antenna, ACU Controller and have basic electronic knowledge or able to follow instructions over the phone from TracStar support personnel.

Tools Required:

#1 Phillips Screwdriver

Procedure:

1. Verify that the Modem has Receive (RX) Lock.

   If the modem does not have a receive lock skip to step 4.

   If the modem has a receive lock continue to next step.

   2. Zero out the Reference Satellites A/B.
      Set both Ref Sat A and B frequency to 10799 (the default)

      a. From the "Ready" page, press the "MAIN" button 2 times.

      b. The ACU will display "TECH SETUP"

      c. Press the "+" button till the displays "CODE 13"

      d. Press the "ENTER" button to save.

      e. Press the "MAIN" button 2 times to return to the "READY" page.

      f. From the 'READY" page, press the "MAIN" button 1 time.

      g. Press the "→" 2 times, the ACU will display "SatAfXXXX, XXXX"

      h. Press the "ENTER" key to modify the SatA frequency. SatA will begin to flash.

TracStar Systems, Inc. 1984 W. New Hampshire Street Orlando, FL 32804
Ph: 407-650-9054 Fax: 407-650-9086

Separate Advanced Step by Step Troubleshooting procedures will be provided to assist with troubleshooting a specific error code in addition to this training document.

Technical Support Procedures

Detailed step by step procedures to assist field repair of antenna systems can be obtained from TracStar Systems Support personnel.

TracStar SYSTEMS

Field Repair Procedure

Title: *Tuner Board Replacement*

Date & Rev: *01/09/07 Rev 1*

Purpose: *This Field Repair Procedure will outline the steps needed to replace the Tuner Board of the TracStar Antenna Controller.*

Precautions:

Anti Static Precautions
When working with electronics you need to maintain a ground. In this case verify that the ACU controller is ***CONNECTED TO POWER*** but the power switch on the ACU is ***TURNED OFF***. Also verify that the antenna is connected to the ACU controller. This will maintain a proper ground.

Before handling boards you should discharge yourself by touching the pedestal and use an anti static bracelet. The Antenna frame is grounded and metal frame can be used as a discharge point.

Skills Required:

The Tuner Board should be replaced by personnel familiar with the Antenna, ACU Controller and has basic electronic knowledge or is able to follow instructions over the phone from TracStar support personnel.

Tools Required:

1/8" Hex Key
#1 Phillips Screwdriver

Parts Required:

1 – Tuner Board

Procedure:

1. Verify that all required Anti-Static Precautions have been taken.

ΔWARNINGΔ
Not following Anti-Static Procedures can cause severe damage to electrical parts of the controller.

2. Locate Plastic Protective Cover on rear of Reflector Support Arms.

Fig 2

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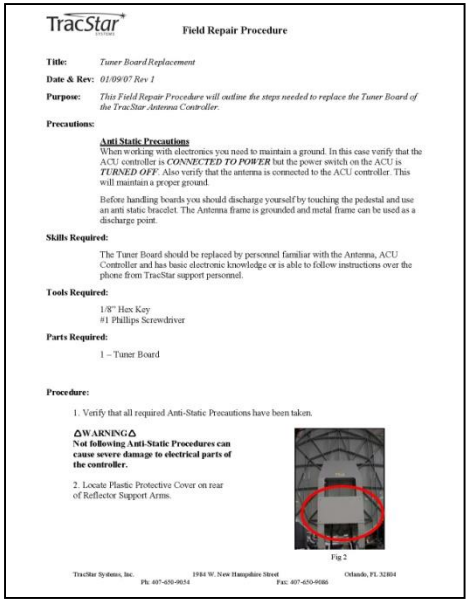
Ph: 407-650-9054 Fax: 407-650-9086



TracStar

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Tools Required:

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Parts Required:

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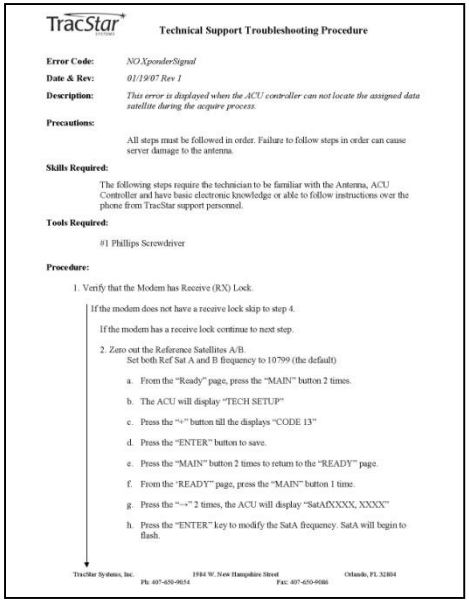

TracStar

Technical Support Troubleshooting Procedure

Error Code: *NOXponderSignal*

Date & Rev: *01/19/07 Rev 1*

Description: *This error is displayed when the ACU controller can not locate the assigned data satellite during the acquire process.*

Precautions:

All steps must be followed in order. Failure to follow steps in order can cause server damage to the antenna.

Skills Required:

The following steps require the technician to be familiar with the Antenna, ACU Controller and have basic electronic knowledge or able to follow instructions over the phone from TracStar support personnel.

Tools Required:

#1 Phillips Screwdriver

Procedure:

1. Verify that the Modem has Receive (RX) Lock.

If the modem does not have a receive lock skip to step 4.

If the modem has a receive lock continue to next step.

2. Zero out the Reference Satellites A/B.
Set both Ref Sat A and B frequency to 10799 (the default)

a. From the "Ready" page, press the "MAIN" button 2 times.
b. The ACU will display "TECH SETUP"
c. Press the "→" button till the displays "CODE 13"
d. Press the "ENTER" button to save.
e. Press the "MAIN" button 2 times to return to the "READY" page.
f. From the "READY" page, press the "MAIN" button 1 time.
g. Press the "→" 2 times, the ACU will display "SatAXXXX, XXXX"
h. Press the "ENTER" key to modify the SatA frequency. SatA will begin to flash.

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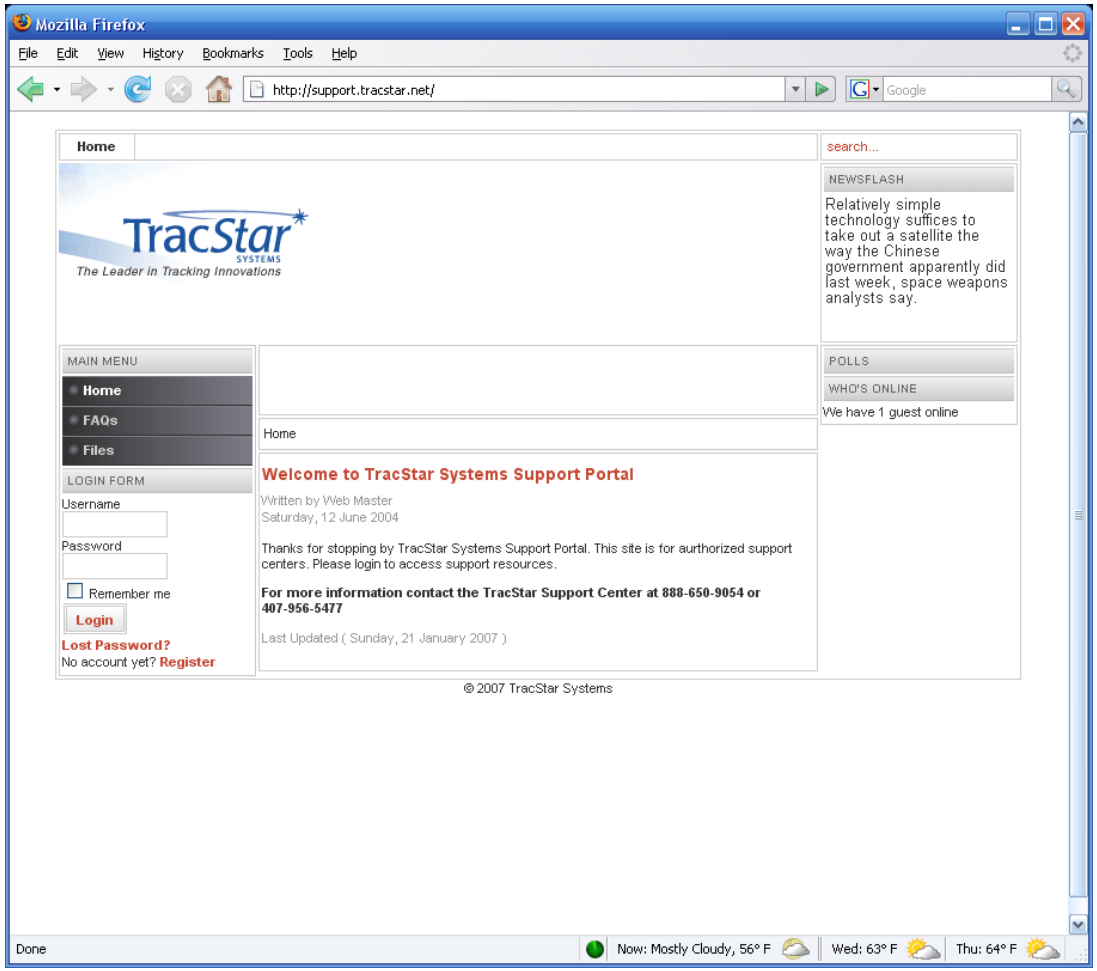

SUPPORT DOCUMENTATION LOCATED @ WWW.MYTRACSTAR.COM/ESUPPORT/

Questions?

Error Messages & Recovery Summary

Error Messages & Recovery Summary

Common Error Messages – Field Repairable

- NO XPONDER SIGNAL – the transponder the system has retained from last acquisition is no longer valid or Antenna can't find the data satellite. Verify the antenna has clear exposure to the southern sky, Does modem have receive lock? See "TSTP No xponder" for more details. if problem continues Escalate to TSS.

- BASE ANGLE LIMIT – Antenna base angle exceeds 10°. Level the antenna and re-start acquisition . if problem continues Escalate to TSS.

- BASE TILT ERROR – Antenna has been shifted enough to trigger level movement safety after locking on. re-start acquisition. This has an editable threshold, or can be disabled (Default from factory is disabled). if problem continues Escalate to TSS.

- SAT ERROR – No satellite information is programmed into the antenna or has been cleared. Re-program satellite data.

Error Messages & Recovery Summary

Minor Error Messages – FIELD REPAIRABLE

- Compass/Dish error Error – Not reading the compass; In cased systems verify compass quick disconnect. follow the manual compass procedure to bypass in non cased systems. if problem continues Escalate to TSS , or see "TSTP Compass/Dish error" procedure for field troubleshooting.

- Wait GPS x– No GPS signal provided to the CPU or the required number of GPS Satellites (Minimum=3) to triangulate the location are not seen. – Check for blockages or Follow the manual GPS procedure to bypass. if problem continues Escalate to TSS, or see "TSTP Wait GPS" procedure for field troubleshooting.

- NO REF SAT FOUND or Bad Ref Sat– Antenna can't see reference satellite. Verify the antenna has clear exposure to the southern sky, and that system is seeing satellite signal. if problem continues Escalate to TSS.

Error Messages & Recovery Summary

Major Error Messages– Potentially Recoverable

- AZ MAJOR OT – System is not reading Azimuth Potentiometer. Error may be recoverable by stowing several times, or inspecting under the az-el cover for a disconnected pot. if problem continues Escalate to TSS.

- AZ OVER TRAVEL – Antenna has reached the electrical or Mechanical limit. Error may be recoverable by stowing several times. if problem continues Escalate to TSS.

- PL OVER TRAVEL – Antenna has reached the electrical or Mechanical limit. Error may be recoverable by stowing several times. if problem continues Escalate to TSS.

- PL MAJOR OT – System is not reading Polarity Potentiometer. Error may be recoverable by stowing several times. if problem continues Escalate to TSS.

- EL OVER TRAVEL – Antenna has reached the electrical or Mechanical limit. Error may be recoverable by stowing several times. if problem continues Escalate to TSS.

Error Messages & Recovery Summary

Major Error Messages– Potentially Fatal Errors

- POWER UP PLEASE WAIT – No communications between the ACU and the antenna. This message is the only one resident in the memory of the display itself.
  A) Incorrectly Connected Control Cable
  B) ACU malfunction
  C) Control cable malfunction
  D) Control System malfunction

- AZ FAULT – Azimuth motor movement invalid or movement was Jammed
  A) Check antenna for movement blockage from trees, wifi masts, etc.
  B) Motor malfunction
  C) circuit board malfunction

- PL FAULT – Polarization motor movement invalid or movement was Jammed
  A) Check antenna for movement blockage from trees, wifi masts, etc.
  B) Motor malfunction
  C) circuit board malfunction

Error Messages & Recovery Summary

Major Error Messages– Potentially Fatal Errors Continued

- EL LOW LIMIT – Antenna is reporting lower than safe elevation

  A) System was cranked down instead of stowed, in which case the system will recover after a normal stow cycle

  B) improper jogging

  C) faulty sensor

- EL FAULT – elevation motor movement invalid or movement was Jammed

  A) Check antenna for movement blockage from tree limbs, wifi masts, etc.

  B) Motor Failure

  C) circuit board failure

TracStar Systems
Escalation of Customer Support Procedure

In the event of a trouble call and having attempted resolution with no success, TracStar Systems Technical Support is always willing to be contacted for further assistance. In order to serve you better we ask that you have the following information available for our technicians in order to get you up and running:

- The TracStar Systems Serial number or Site-ID in order that we may better understand the type of system you have as well as determine warranty status.

- Contact information for the person on-site in order that we may discuss the problem with them directly if possible. Working through relayed instructions is time consuming and can be frustrating to all involved.

- Ticket or case number information if any for the support call initiator in order that we can follow up at a later date to ensure that the problem has been resolved fully.

TracStar Systems Escalation of Customer Support Policy

It is the custom at our company and our pride to provide the best support we can to our customers and theirs in as timely a manner as our Commitments allow.

Questions?

Installation Guidelines

This presentation is a representative sampling of installation Do's and Don'ts for TracStar Systems MVS Series

!! CAUTION !! Antennas are designed both light in weight and durable for long life spans. These system are **NOT** designed to be used on vehicles ***in motion***. This system **CAN** be damaged by improper installation particularly in relation though not limited to:

- clearance of the antenna to move during acquisition
- on vehicles without sufficient shock dampening
- overhead clearance on vehicles in transit
- Antenna Should be mounted facing the rear of the vehicle in the stowed position for safest airflow characteristics
- If an antenna must face other than to the rear, there may be an air-dam of some type installed to prevent damage to the antenna

Mounting Examples

TracStar MVS Series Antenna Systems are available with several mounting options Including:

- Pods
- L-Brackets mounted on the load frame
- Thule roof-mounting systems

Following are examples of each. Through-bolting with stainless steel mounting hardware is recommended for maximum strength and durability

Pod mounting

- Helps prevent wind born damage to antenna

- Attached to the roof independently of antenna for stability (for 960 and 1200)

L-Bracket Mounting
available standard

- Pivoting allowing for mounting to a curved surface

- Independently secured so a failure in one leaves your antenna right where you left it

- Compatible with Pod and Thule mounting systems

Thule Mounting Systems

- Compatible with most Luggage racks or can be Installed as one allows Versatility and portability

- Available in removable Or lockable semi-permanent Versions

- Compatible with L-Brackets

Questions?