



ALT-8000

Radio Altimeter

Getting Started Manual





ALT-8000

Radio Altimeter Flight Line Test Set

Getting Started Manual

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ALT-8000 Getting Started Manual

This manual contains essential information relating to initial use of the unit. VIAVI recommends the operator become familiar with the Operation Manual contained on the accompanying CD-ROM

VIAVI updates Test Set software on a routine basis. As a result, examples may show images from earlier software versions. Images are updated when appropriate.

ALT-8000 Getting Started Manual

Electromagnetic Compatibility

Double shielded and properly terminated external interface cables must be used with this equipment when interfacing with the RS-232 and Ethernet.

For continued EMC compliance, all external data bus cables must be shielded and 3 meters or less in length.

Nomenclature Statement

In this manual, ALT-8000, Simulator, Test Set or Unit refers to the ALT-8000 Radio Altimeter FlightLine Test Set.

Declaration of Conformity

The Declaration of Conformity Certificate included with the Unit should remain with the Unit.

VIAVI recommends the operator reproduce a copy of the Declaration of Conformity Certificate to be stored with the Operation Manual for future reference.

Contact Information

Contact Customer Service for technical support or with any questions regarding this or another VIAVI products.

VIAVI Solutions

Customer Service Department

10200 West York Street

Wichita, KS 67215

Telephone: 800-835-2350

Fax: 316-529-5330

email: AvComm.Service@viavisolutions.com

Precautions
SAFETY FIRST - TO ALL OPERATIONS PERSONNEL

General Conditions of Use

This product is designed and tested to comply with the requirements of IEC/EN61010-1 'Safety requirements for electrical equipment for measurement, control and laboratory use' for Class I portable equipment and is for use in a pollution degree 2 environment. The equipment is designed to operate from installation supply Category II.

Equipment should be protected from liquids such as spills, leaks, etc. and precipitation such as rain, snow, etc. When moving the equipment from a cold to hot environment, allow the temperature of the equipment to stabilize before the equipment is connected to the supply to avoid condensation forming. The equipment must only be operated within the environmental conditions specified in the performance data. This product is not approved for use in hazardous atmospheres or medical applications. If the equipment is to be used in a safety-related application, such as avionics or military applications, the suitability of the product must be assessed and approved for use by a competent person. Refer all servicing of unit to Qualified Technical Personnel. This unit contains no operator serviceable parts.

Case, Cover or Panel Removal





Opening the Case Assembly exposes the operator to electrical hazards that may result in electrical shock or equipment damage. Do not operate this Test Set with the Case Assembly open.

Safety Identification in Technical Manual

This manual uses the following terms to draw attention to possible safety hazards that may exist when operating or servicing this equipment:

CAUTION	IDENTIFIES CONDITIONS OR ACTIVITIES THAT, IF IGNORED, CAN RESULT IN EQUIPMENT OR PROPERTY DAMAGE, E.G. FIRE.
WARNING	IDENTIFIES CONDITIONS OR ACTIVITIES THAT, IF IGNORED, CAN RESULT IN PERSONAL INJURY OR DEATH.

Safety Symbols in Manuals and on Units

	CAUTION: Refer to accompanying documents. This symbol refers to specific CAUTIONS represented on the unit and clarified in the text.
	Indicates a Toxic hazard.
	Indicates item is static sensitive.
	AC TERMINAL: Terminal that may supply or be supplied with AC or alternating voltage.

Equipment Grounding Protection

Improper grounding of equipment can result in electrical shock.

Use of Probes

Refer to Performance Specifications for the maximum voltage, current and power ratings of any connector on the Test Set before connecting a probe from a terminal device. Be sure the terminal device performs within these specifications before using the probe for measurement, to prevent electrical shock or damage to the equipment.

Power Cords

Power cords must not be frayed or broken, nor expose bare wiring when operating this equipment.

Internal Battery

This unit contains a Lithium Ion Battery, serviceable only by a qualified technician.

EMI (Electromagnetic Interference)

CAUTION	<p>SIGNAL GENERATORS CAN BE A SOURCE OF ELECTROMAGNETIC INTERFERENCE (EMI) TO COMMUNICATION RECEIVERS. SOME TRANSMITTED SIGNALS CAN CAUSE DISRUPTION AND INTERFERENCE TO COMMUNICATION SERVICE OUT TO A DISTANCE OF SEVERAL MILES. USER OF THIS EQUIPMENT SHOULD SCRUTINIZE ANY OPERATION THAT RESULTS IN RADIATION OF A SIGNAL (DIRECTLY OR INDIRECTLY) AND SHOULD TAKE NECESSARY PRECAUTIONS TO AVOID POTENTIAL COMMUNICATION INTERFERENCE PROBLEMS.</p>
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Fire Hazards

WARNING	<p>MAKE SURE THAT ONLY FUSES OF THE CORRECT RATING AND TYPE ARE USED FOR REPLACEMENT. IF AN INTEGRALLY FUSED PLUG IS USED ON THE SUPPLY LEAD, ENSURE THAT THE FUSE RATING IS COMMENSURATE WITH THE CURRENT REQUIREMENTS OF THIS EQUIPMENT.</p>
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Toxic Hazards

WARNING	<p>SOME OF THE COMPONENTS USED IN THIS EQUIPMENT MAY INCLUDE RESINS AND OTHER MATERIALS WHICH GIVE OFF TOXIC FUMES IF INCINERATED. TAKE APPROPRIATE PRECAUTIONS IN THE DISPOSAL OF THESE ITEMS.</p>
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BERYLLIA

WARNING

BERYLLIA (BERYLLIUM OXIDE) IS USED IN THE CONSTRUCTION OF SOME OF THE COMPONENTS IN THIS EQUIPMENT. THIS MATERIAL, WHEN IN THE FORM OF FINE DUST OR VAPOR AND INHALED INTO THE LUNGS, CAN CAUSE A RESPIRATORY DISEASE. IN ITS SOLID FORM, AS USED HERE, IT CAN BE HANDLED SAFELY, HOWEVER, AVOID HANDLING CONDITIONS WHICH PROMOTE DUST FORMATION BY SURFACE ABRASION.

USE CARE WHEN REMOVING AND DISPOSING OF THESE COMPONENTS. DO NOT PUT THEM IN THE GENERAL INDUSTRIAL OR DOMESTIC WASTE OR DISPATCH THEM BY POST. THEY SHOULD BE SEPARATELY AND SECURELY PACKED AND CLEARLY IDENTIFIED TO SHOW THE NATURE OF THE HAZARD AND THEN DISPOSED OF IN A SAFE MANNER BY AN AUTHORIZED TOXIC WASTE CONTRACTOR.

Toxic Hazards (cont)



BERYLLIUM COPPER

WARNING

SOME MECHANICAL COMPONENTS WITHIN THIS INSTRUMENT ARE MANUFACTURED FROM BERYLLIUM COPPER. THIS IS AN ALLOY WITH A BERYLLIUM CONTENT OF APPROXIMATELY 5%. IT REPRESENTS NO RISK IN NORMAL USE.

THE MATERIAL SHOULD NOT BE MACHINED, WELDED OR SUBJECTED TO ANY PROCESS WHERE HEAT IS INVOLVED.

IT MUST BE DISPOSED OF AS "SPECIAL WASTE".

IT MUST NOT BE DISPOSED OF BY INCINERATION.



LITHIUM

WARNING

A LITHIUM BATTERY IS USED IN THIS EQUIPMENT.

LITHIUM IS A TOXIC SUBSTANCE SO THE BATTERY SHOULD IN NO CIRCUMSTANCES BE CRUSHED, INCINERATED OR DISPOSED OF IN NORMAL WASTE.

DO NOT ATTEMPT TO RECHARGE THIS TYPE OF BATTERY. DO NOT SHORT CIRCUIT OR FORCE DISCHARGE SINCE THIS MIGHT CAUSE THE BATTERY TO VENT, OVERHEAT OR EXPLODE.

INPUT OVERLOAD LEVELS

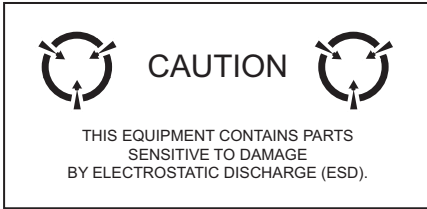
CAUTION


UUT:RX MAXIMUM REVERSE POWER
100 mW

CAUTION

UUT:TX MAXIMUM POWER 300 W PEAK,
5 W AVERAGE

Static Sensitive Components



	<p>This equipment contains components sensitive to damage by Electrostatic Discharge (ESD). All personnel performing maintenance or calibration procedures should have knowledge of accepted ESD practices and/or be ESD certified.</p>
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A red-bordered rectangular box containing a warning symbol on the left and a text block on the right. The warning symbol is a yellow triangle with a black border, featuring a black lightning bolt striking a stylized human figure. The text block contains a paragraph of safety instructions.

Table of Contents

Service Upon Receipt of Material 10
Specifications 12
Installation 13
External Cleaning 14
Controls and Connectors 15
User Interface Components 17
Defining Parameters 19
Setup 22
Linear Altitude Ramp Test 26
Power Requirements 28

1 SERVICE UPON RECEIPT OF MATERIAL

1.1 Unpacking

Special design packing material inside this shipping container provide maximum protection for the Test Set. Avoid damaging the shipping container and packaging material when unpacking equipment; if necessary the shipping container and packaging material can be reused to ship the Test Set.

Use the following steps to unpack the Test Set:

STEP	PROCEDURE
1.	Cut and remove sealing tape on top of the shipping container. Open shipping container and remove top packing mold.
2.	Grasp the Test Set firmly while restraining the shipping container. Lift the equipment and packing material vertically out of the shipping container.
3.	Place Test Set and end cap packing on a flat, clean and dry surface.
4.	Remove protective plastic bag from the Test Set.
5.	Place protective plastic bag and end cap packing materials inside shipping container.
6.	Store shipping container for possible future use.

1.2 Warranty Information

Warranty information for this product is available on the VIAVI website at

<https://www.viavisolutions.com/en-us/support/warranty-quality-compliance-policies>.

1.3 Checking Unpacked Equipment

Inspect equipment for possible damage incurred during shipment. If Test Set has been damaged, report the damage to VIAVI Customer Service.

Review packing slip to verify shipment is complete. Packing slip identifies the standard items as well as purchased options. Report all discrepancies to VIAVI

Contact: VIAVI
Attn: Customer Service
10200 West York Street
Wichita, Kansas 67215
Telephone: 800-835-2350
FAX: 316-529-5330
email: AvComm.Service@viavisolutions.com

ALT-8000 Getting Started Manual

Standard Items

ITEM	PART NUMBER	QTY
ALT-8000 Test Set	87340	1
Transit Case	88494	1
Power Supply	67374	1
Cable, TNC M/TNC 1 ft	62401	1
Connector, TNC	38353	2
Antenna Coupler	139139	2
Antenna Coupler Pole Kit	139152	2
Antenna Coupler Labels	111838	1
Coax Cable, Yellow, 20 ft	88511	1
Coax Cable, Red, 20 ft	89527	1
Attenuator, fixed 20 dB	112036	1
Power Cord, US	62302	1
Power Cord, European	64020	1
Operation Manual (CD)	88035	1
Getting Started (paper)	88036	1

Optional Items

ITEM	PART NUMBER	QTY
Battery Pack	86196	1
Soft Case and Low Loss RF Cable (100 ft)	88500	1
Coax Cable, RG400 TNC-TNC, yellow (4 ft)	91253	1
Coax Cable, RG400 TNC-TNC, red(4 ft)	91255	1
Maintenance Manual	89022	1

2 SPECIFICATIONS

Physical Characteristics

Height:

- 10.63 inches (27.0 cm)

Width:

- 13.97 inches (35.5 cm)

Depth:

- 3.425 inches (8.7 cm)

Weight (Test set only):

- <15 lbs. (6.82 kg)

Test Set Certifications

Operational Temperature:

- $-20^{\circ} \leq T \leq 55^{\circ} \text{ C}$

Storage Temperature:

- $-30^{\circ} \leq T \leq 71^{\circ} \text{ C}$

Operational Humidity:

- MIL-PRF-28800F Class 2

Storage Humidity:

- MIL-PRF-28800F Class 2

Altitude:

- $\leq 10,000$ meters

Vibration Limits:

- MIL-PRF-28800F Class 2

Shock, Function:

- MIL-PRF-28800F Class 2

Transit Drop:

- MIL-PRF-28800F Class 2

Drip Proof:

- MIL-PRF-28800F Class 2

Dust:

- MIL-PRF-28800F Class 2

Explosive Atmosphere:

- MIL-STD-810F Method 511.4, Procedure 1

Safety Compliance:

- UL-61010:2001
- CSA 22.2 No 1010.1

WEEE:

ROHS:

EMC

Emissions:

- MIL-PRF28800F Class 2
- EN 61326:1998 Class A
- EN 61000-3-2
- EN 61000-3-3

Immunity:

- MIL-PRF28800F Class 2
- EN 61326:1998 Class A

EXTERNAL AC-DC CONVERTER CERTIFICATIONS

Safety Compliance:

- UL 1950 DS
- CSA 22.2 No. 234
- VDE EN 60 950

EMI/RFI Compliance:

- FCC Docket 20780 Curve "B"

EMC:

- EN 61326

TRANSIT CASE Certifications

Drop Test:

- FED-STD-101C Method 5007.1 Paragraph 6.3, Procedure A, Level A

Falling Dart Impact:

- ATA 300 Category I

Vibration, Loose Cargo:

- FED-STD-101C Method 5019

Vibration, Sweep:

- ATA 300 Category I

Simulated Rainfall:

- MIL-STD-810F Method 506.4 Procedure II of 4.1.2

FED-STD-101C:

- Method 5009.1 Sec 6.7.1

Immersion:

- MIL-STD-810F Method 512.4

3 INSTALLATION

The ALT-8000 Test Set is a Safety Class 1 instrument that must be grounded before use when connected to an external power supply. The Test Set should only be connected to a grounded AC supply outlet.

3.1 Safety Precautions

The following safety precautions must be observed during installation and operation. VIAVI assumes no liability for failure to comply with any safety precaution outlined in this manual.

3.1.A Complying with Instructions

Installation/operating personnel should not attempt to install or operate the Test Set without reading and complying with instructions contained in this manual. All procedures contained in this manual must be performed in exact sequence and manner described.

3.1.B Grounding Power Cord

WARNING

DO NOT USE A THREE-PRONG TO TWO-PRONG ADAPTER PLUG. DOING SO CREATES A SHOCK HAZARD BETWEEN THE CHASSIS AND ELECTRICAL GROUND.

For AC operation, the AC Line Cable, connected to the External DC Power Supply, is equipped with a standard three-prong plug and must be connected to a properly grounded three-prong receptacle. It is the customer's responsibility to:

- Have a qualified electrician check receptacle(s) for proper grounding.
- Replace any standard two-prong receptacle(s) with properly grounded three-prong receptacle(s).

3.1.C Operating Safety

Due to potential for electrical shock within the Test Set, the Case Assembly must be closed when the Test Set is connected to an external power source.

4 EXTERNAL CLEANING

The following procedure contains routine instructions for cleaning the outside of the Test Set.

CAUTION

DISCONNECT POWER FROM TEST SET TO AVOID POSSIBLE DAMAGE TO ELECTRONIC CIRCUITS.

STEP	PROCEDURE
1.	Clean front panel buttons and display face with soft lint-free cloth. If dirt is difficult to remove, dampen cloth with water and a mild liquid detergent.
2.	Remove grease, fungus and ground-in dirt from surfaces with soft lint-free cloth dampened (not soaked) with isopropyl alcohol.
3.	Remove dust and dirt from connectors with soft-bristled brush.
4.	Cover connectors, not in use, with suitable dust cover to prevent tarnishing of connector contacts.
5.	Clean cables with soft lint-free cloth.

5 CONTROLS AND CONNECTORS

5.1 Front Panel Controls and Connectors

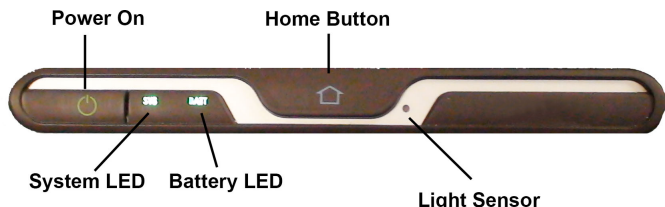


Fig. 1 Front Panel Controls

Control	Description
Power On	The Power On/Off Button is used to power the Test Set on and off.
Home Button	Pressing and holding the Home Button for 5 sec sets the backlight to maximum brightness.
Magnetic Sensor	Detects if the display cover is open or closed and used to turn off the display as part of power management.

Control	Description
System LED	<p>Powered On (green) Indicates the unit is in operational status.</p> <p>Failure (red) Some form of failure has occurred which precludes using the display to indicate the problem (e.g. main processor failure, power supply fault, etc.).</p> <p>Boot (blinking blue) Unit is booting and is not yet able to indicate status on the display (during initial OS and application load).</p> <p>Off/Standby (orange) Unit is off, but power is supplied to the power supply from the AC power source.</p> <p>Off w/o External Supply (off) Unit is off, no external power supplied.</p>

Control	Description
Battery LED	<p>Battery Voltage Low (red) The unit will turn off within one minute without charger.</p> <p>Battery Pre-Charging (flashing yellow) Trickle charge during extremely low voltage on the battery.</p> <p>Battery Charging (flashing green) Charge in progress.</p> <p>Battery Fully Charged (green)</p> <p>Battery Temperature Extreme (blue) Temperature <0° C or >45° C. Can't charge battery.</p> <p>Battery Error (red) Problem with the battery or charging system.</p> <p>Battery Missing (off) AC applied without battery in place.</p> <p>Battery Suspended Charge (flashing red) AC applied with battery charging suspended.</p>

5.2 Rear Panel Controls and Connectors

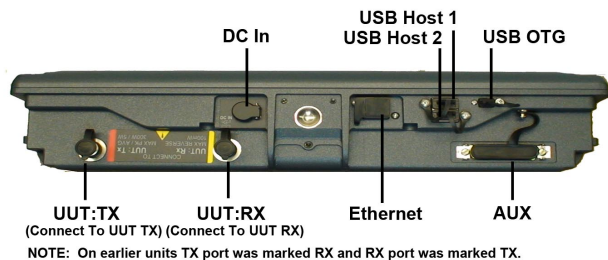


Fig. 2 Test Set Rear Panel Controls and Connectors

Connector	Description
USB Host 1	USB standard connection that allows connection of USB devices (e.g. a USB memory stick). Recommended USB memory device is VIAVI PN 67327.
USB Host 2	USB standard connection that allows connection of USB devices (e.g. a USB memory stick). Recommended USB memory device is VIAVI PN 67327.

Connector	Description
USB OTG	Reserved for future development.
UUT:RX 100 mW Max Reverse	RF output for direct connection or antenna coupler. Connects to RX port of the radio altimeter under test.
UUT:TX 300 W PK 5 W AVG	RF input for direct connection or antenna coupler. Connects to the TX port of the radio altimeter under test.
Ethernet	Standard Base T RJ45 connection. This connection can be used for software upgrades and for remote operation.
DC IN	11 to 32 Vdc external power and battery charge.
AUX	Reserved for future development.

6 USER INTERFACE COMPONENTS

The Test Set User Interface (UI) is a touch screen control panel that provides a flexible working environment for all users. The UI uses maximized Function Windows. One Function Window occupies the whole screen area. The Test Set User Interface (UI) is navigated locally using the Front Panel Touch Screen.

6.1 Launch Bar

The Launch Bar is a vertical scrolling menu located at the left side of the User Interface. The Launch Bar provides access to the Function Icons. The menu must be opened to access the Function Icons. The Launch Bar is opened and closed by touching the light gray bar on the menu.

When opened, the Launch Bar appears in front of any Function Windows currently occupying that area of the display. The Launch Bar can be closed to view the complete Function Window.

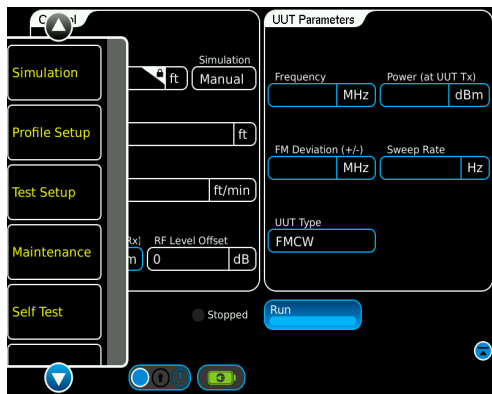


Fig. 3 Launch Bar and Function Window

6.2 Launch Bar Navigation

The arrows on the top and bottom of the Launch Bar are used to move the Launch Bar up and down.

6.3 Simulation Function Window

Simulation Function Window provide visual access to the Test Set's operating parameters and measurement data.

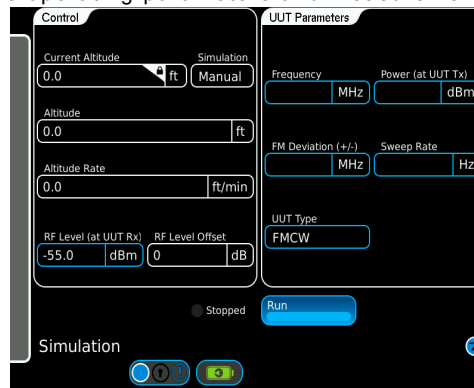



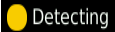
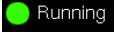




Fig. 4 Simulation Function Window.

Function	How to
Opening/ Closing Function Windows	Function Windows are opened by selecting the Function Icon from the Launch Bar. Function Windows are closed by selecting the blue circle icon at the bottom of the window.

6.4 Function Window Icons

Function Windows use the following icons to indicate various functions or states:

Icon	Description
	Closes the Function Window.
	Maximizes Function Window or opens Status Bars.
	Minimizes Function Window or closes Status Bars.
 Detecting	Displays Detecting and a yellow circle when detecting the type of radio altimeter under test.
 Running	Displays Running and a green circle when the simulation is running.
 Stopped	Displays Stopped and a gray circle when the simulation is stopped.
 100%	Displays remaining battery capacity in %.

7 DEFINING PARAMETERS

7.1 Numeric Values

When a numeric data field is selected for editing, a group of data entry pop-up windows is launched which provides the following three methods for defining the value:

- Numeric Keypad
- Rotary Knob
- Single/Double Slider Bar

7.1.A Numeric Keypad

The Numeric Keypad allows the user to enter a specific numeric value. A value is entered by pressing the numbers on the keypad. The value is enabled pressing the unit of measurement on the Numeric Keypad window.

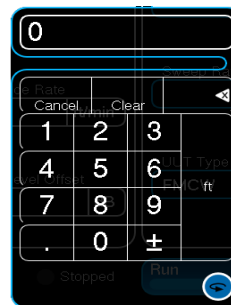






Fig. 5 Numeric Keypad

Icon	Description
	<p>Pressing Cancel voids any un-entered changes and closes the group of data entry pop-up windows. Pressing Cancel does not “undo” a changed value that was set using the Rotary Knob or Slide Bar.</p>
	<p>Pressing Clear resets a numeric value to 0”.</p>
	<p>Pressing Backspace deletes the last digit in the numeric value.</p>
	<p>Pressing Next Value Selection replaces the Numeric Keypad with the Rotary Knob. Press the Next Value Selection again and the Rotary Knob is replaced with the Slew Data Bar. Press again and the Numeric Keypad appears.</p>

7.1.B Data Slew Bar

The Data Slew Bar incrementally selects specific data values by spinning the wheel. Selecting x10 increases the step increment by a factor of 10. Selecting /10 decreases the step increment by a factor of 10. Selecting Enter closes the Data Slew Bar.

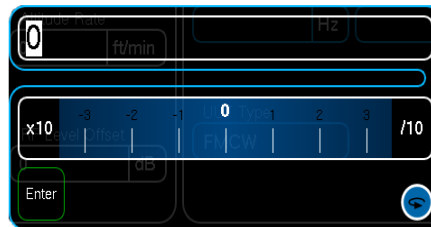


Fig. 6 Data Slew Bar

7.1.C Rotary Knob

The Rotary Knob is used to slew values up or down. Selecting x10 will increase the step increment by a factor of 10. Selecting /10 will decrease the step increment by a factor of 10. Selecting Enter closes the Rotary Knob.

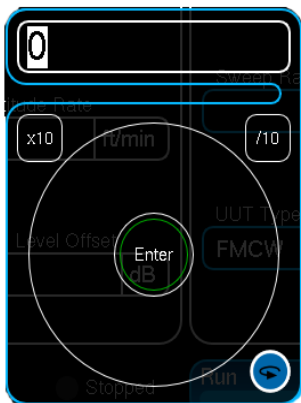


Fig. 7 Rotary Knob

7.1.D Drop-down Menus

Drop-down Menus are used to list pre-defined variables. Selecting a Drop-down Menu opens the list of variables available for that field. The variable currently selected is displayed on the menu in bold. Drop-down Menus can be dragged up and down on the display in order to view long lists.



Fig. 8 Drop-down Menu

7.1.E Selectable Units

Some fields may have selectable units. For those fields identified, select the units field and a drop-down menu is displayed.

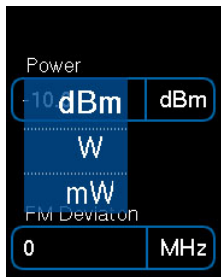


Fig. 9 Selectable Units

7.1.F Locked Fields

A small padlock symbol may be displayed against certain fields indicating that the field is locked and may not be edited or accessed (Fig. 10). Altitude field is locked and can only be modified when a manual simulation is running, then paused.

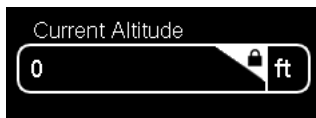


Fig. 10 Locked Field

8 SETUP

Perform the following steps to complete Setup:

STEP	PROCEDURE
------	-----------

1. Press **Power On/Off Key** for a minimum of 1 second to power up test set.
2. Select **Test Setup** function key to display Test Setup Window.
3. Confirm the following settings and change as necessary.



Fig. 11 Test Setup General Tab Screen

STEP	PROCEDURE	STEP	PROCEDURE
------	-----------	------	-----------

Test Setup General Tab

RF Port:

Connection Type = Coupler (if using antenna couplers) or Direct (connecting directly to LRU)

UUT Settings:

UUT Detection Mode = Auto

RF Settings:

Level Mode = Auto

Delay Settings:

AID Mode = Fixed

Fixed AID = Installation AID 0, 20, 40, 57 or 80 ft.

NOTE:

AID Only displayed when Connection Type is set to Direct.



Fig. 12 Test Setup Loss Tab Screen

Test Setup Loss Tab

Cable Loss:

UUT:TX Cable Loss = Figure in dB marked on TX cable.

UUT:RX Cable Loss = Figure in dB marked on RX cable.

STEP	PROCEDURE
------	-----------

Coupler Loss:

UUT:TX Coupler Loss = Figure in dB marked on UUT:TX Antenna Coupler (for Coupler mode only).

UUT:RX Coupler Loss = Figure in dB marked on UUT:RX Antenna Coupler (for Coupler mode only).

External Attenuation:

UUT:TX Ext Attenuation = Figure in dB marked on Attenuator.

UUT:RX Ext Attenuation = Figure in dB marked on Attenuator.

CAUTION

**UUT:TX PORT MAXIMUM POWER:
300 W, 5 W AVERAGE.**

4. From the General tab, select **Delay Calibration** to display the Delay Calibration Info screen. This screen starts the calibration procedure for Test Set/RF coaxial cable delay.

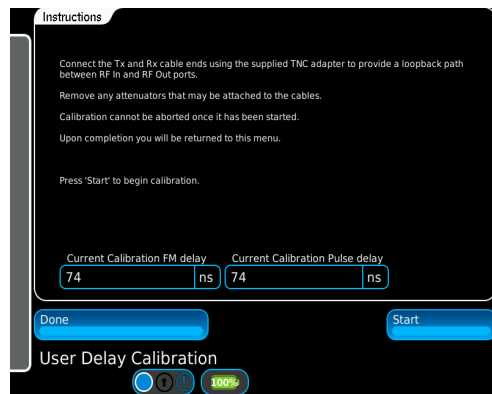


Fig. 13 Delay Calibration Info Screen

STEP	PROCEDURE
------	-----------

5. Connect the ends of the UUT:RX and UUT:TX cables together using the supplied TNC Connector.
6. Select **Start** to start delay calibration. The calibration process is automatic. When delay calibration is complete the Display Calibration Info screen is displayed, showing the newly measured delay values. To return to the Test Setup screen, press Done.

NOTE:

Delay calibration may not be aborted once started.

ALT-8000 Getting Started Manual

STEP	PROCEDURE
7.	Disconnect the TNC Connector from the UUT:RX and UUT:TX cables.
8.	Perform appropriate installation and/or connection procedure required for altimeter testing. Refer to Operation Manual for specific altimeter test setup configurations.
NOTE: If the aircraft antenna height at touchdown is known, enter this value in the Altitude Offset field. If height at touchdown is not known, and the radio is a FMCW or CDF type, steps 9 through 11 can be used to zero the indicator.	
9.	From the General tab, select Altitude Indicator Zero key to display Altitude Indicator Zero screen.

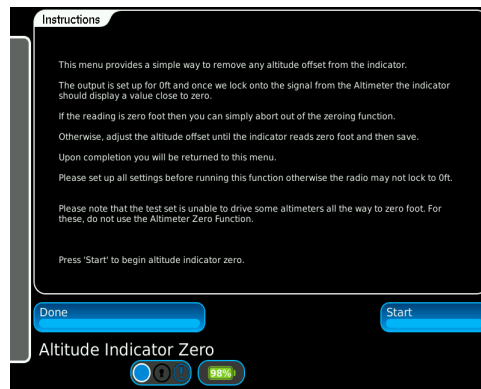


Fig. 14 Altitude Indicator Zero Info Screen

STEP	PROCEDURE
10.	Press start to start the Altitude Indicator Zero procedure. Wait until the test set indicates it has a valid signal.
11.	The test set is now simulating 0 ft at the end of the ALT-8000 RF coaxial cables.

To compensate for the aircraft antenna height at touch down, select the **Altitude Offset** field. Using the +/- key or numeric pad, adjust the **Altitude Offset** field until 0 ft is displayed on the aircraft altitude indicator.

ALT-8000 Getting Started Manual

STEP	PROCEDURE
12.	Select Save & Return to store value and return to the Info Screen window. Select the Done key to return to Test Setup (General Tab). The test set is now ready to perform the Linear Altitude Ramp Test.

9 LINEAR ALTITUDE RAMP TEST

The Linear Altitude Ramp Test performs a linear up and down altitude ramp, verifying adequate UUT loop gain. This is the lowest level of flight-line testing recommended to confirm reported problems, or to verify system operation after LRU replacement.

Perform the following steps to complete the Linear Altitude Ramp Test:

STEP	PROCEDURE
1.	Confirm the following settings and change as necessary. Control Start Altitude = 0 ft (50 to 75 ft for pulse type) Stop Altitude = 2,500 ft (or maximum for system under test) Altitude Rate = 1,000 ft/min (2.5 mins duration)

NOTE:

Altitude Rate is selected 1 to 120,000 ft/min. If trip operation is to be verified, a recommended rate of <1000 ft/min should be entered.

ALT-8000 Getting Started Manual

STEP	PROCEDURE	STEP	PROCEDURE
------	-----------	------	-----------

2. Select **Run** Key to start simulation. Altitude Pause key is displayed (Fig. 16).

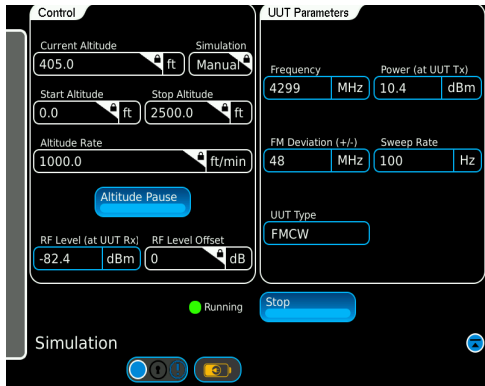


Fig. 15 Altitude Pause Key

3. Confirm Aircraft altitude indicator tracks altitude smoothly from Start Altitude to Stop Altitude, and that no indicator flag is in view.

NOTE:

Sudden indicator display of a ground height is indicative of an aircraft antenna ground plane bonding problem or RF feeder cable termination problem, resulting in leakage between TX and RX antennas. This usually manifests at higher altitude when the reflected TX power seen by the receiver falls below the level of leakage.

Control

Current Altitude = displays current test set simulated altitude

4. To pause altitude at any point select **Altitude Pause** key.
Altitude may now be manual slewed using Data/Slew Bar or Rotary Knob.
5. Select **Altitude Resume** key to resume simulation from current altitude.

STEP

PROCEDURE

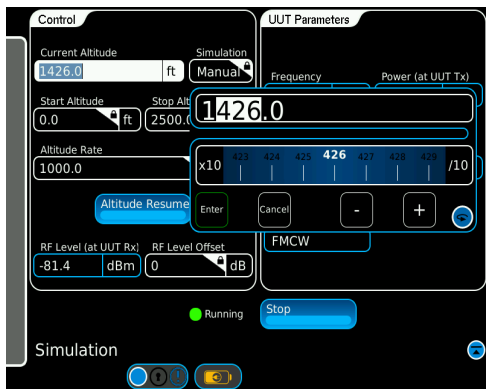


Fig. 16 Paused Altitude Rate / Manual Altitude Slew

NOTE:

To use the + and - buttons on the Slew Bar, buttons must be pressed and held for a few seconds.

10 POWER REQUIREMENTS

The ALT-8000 is powered by a removable 14.8 v 6.6 Ah Lithium Ion Battery. The battery charging circuit enables the operator to recharge the battery anytime the unit is connected to the AC Adapter. The ALT-8000 can operate continuously utilizing the AC Adapter.

The internal battery is equipped to power the ALT-8000 for four continuous hours of use. When the battery needs charging the charge indicator illuminates a fast blinking yellow. Closing the screen cover powers down the display. The battery should be charged every three months (minimum) or removed for long term inactive storage periods of more than six months.

10.1 AC Power

The AC Adapter, supplied with the ALT-8000, operates over a voltage range of 100 to 250 VAC at 47 to 63 Hz. The battery charger operates whenever DC power (11 to 32 Vdc) is applied to the Test Set with the supplied AC Adapter or a suitable DC power source.

If the supply voltage is <11 V, the unit switches to internal battery. If the voltage is >32 V, a 7 Amp resettable fuse on the DC input port opens, protecting the test set. Reset fuse by disconnecting and reconnecting the power cord to the unit.

When charging, the battery reaches an 100% charge in approximately four hours. The Battery Charging temperature range is 0° to 45° C, controlled by an internal battery charger.

10.2 BATTERY RECHARGING USING EXTERNAL POWER SUPPLY

Perform the following steps to recharge the battery using and external power supply:

STEP	PROCEDURE
1.	Connect AC Line Cable to AC PWR Connector on the AC Adapter and an appropriate AC power source.
2.	Connect the AC Adapter DC output to the DC POWER Connector on the ALT-8000.
3.	Verify the BATTERY indicator displays blinking green.
4.	Allow four hours for battery charge or until the BATTERY Indicator displays a steady green.

BATTERY LED INDICATORS

Battery Voltage Low (red)

The unit will turn off within one minute w/o charger.

Battery Pre-Charging (flashing yellow)

Trickle charge during extremely low voltage on the battery.

Battery Charging (flashing green)

Charge in progress.

STEP

PROCEDURE

BATTERY LED INDICATORS (cont)

Battery Fully Charged (green)

Battery Temperature Extreme (blue)

Temperature $<0^{\circ}$ C or $>45^{\circ}$ C can't charge battery.

Battery Error (red)

The unit has a problem with the battery or charging system.

Battery Missing (off)

AC applied w/o battery in place.

Battery Suspended Charge (flashing red)

AC applied with battery charging suspended.



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