# Avionics

## ALT-8000

### FMCW/Pulse Radio Altimeter Flightline Test Set

Versatile time saving portable test set for testing installed FMCW and Pulse Radio Altimeters

- Tests FMCW radio altimeters including analog CDF types
- Tests pulse radio altimeters (non-pulse compression types)
- Direct-connect to UUT T/R or to installed system via antenna couplers
- Ratio-metric RF loop test allows TX, RX, antenna or feeder faults to be identified
- Programmable multi-leg climb/descend profiles
- Large color touch-screen display with simple user interface
- Remote control interface (Ethernet)
- Lightweight and compact <10 lbs. (4.5 kg)
- Battery 4 hours plus duration

**ALT-8000**

The ALT-8000 Radio Altimeter Flightline Test Set may be quickly connected to the radio altimeter installation via two antenna couplers. RF simulation of radio altitude from -20 ft. to 5,500 ft (FMCM/CDF) or 50 ft. to 5,500 ft. (pulse, lower limit dependent on cable length), and altitude rate may be set to provide a smooth ramping altitude simulation to verify decision heights and altitude trips for auto-land systems and altitude data feed to EGPWS.

The ALT-8000 is designed to be software upgradable.

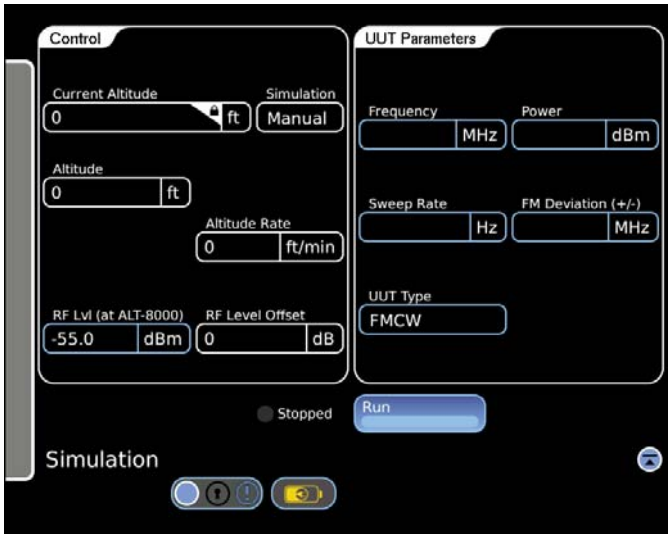
**General**

The graphical user interface provides various screens for control of the test set and display of parametric measurements including: TX power, TX frequency (center), sweep rate, FM deviation, TX pulse width, and PRF (pulse systems).

## Simulation

RF level may be set manually for specific receiver sensitivity measurement or auto RF level mode sets an RF level based on TX power – height path loss – scattering loss. This ensures that the test environment replicates the actual airborne conditions, verifying T/R loop gain and allowing antenna bonding issues (TX-RX cross leakage) to be identified. An additional level offset figure may be set to ensure an altitude sweep passes with a predetermined gain margin.

Simulated static altitude may be set by the user and manually incremented or decremented.



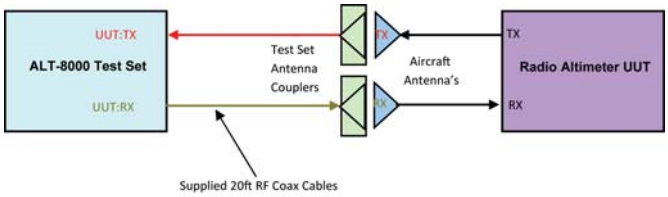

## Profiles

Profiles are used to control dynamic altitude simulations.

The profile screen allows the user to create, save, recall or delete named profiles. Each profile is comprised of individual legs. Start, stop altitudes and rates are definable for each leg. A profile can then be executed to simulate a complete landing approach including flare out or a take-off and departure.

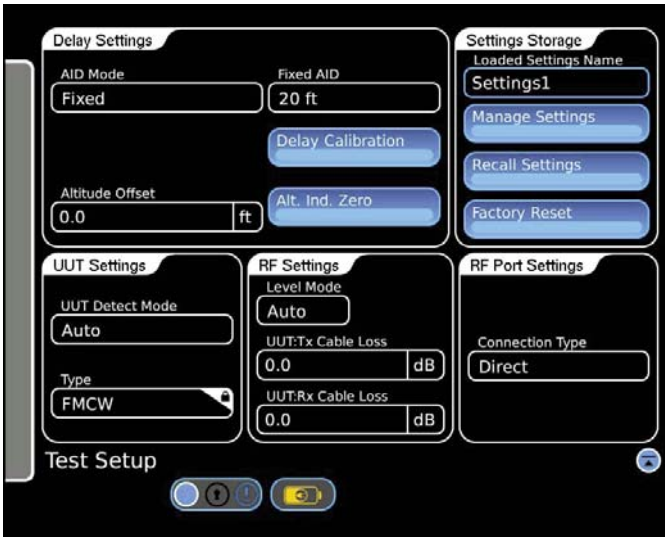

## RF Coupling

The supplied antenna couplers allow the radio altitude system to be quickly verified without access being required to test ports on the UUT LRU. Direct-connection to the T/R unit is also possible.




## Test Setup

The test setup screen allows system, user and RF connection parameters to be set by the user, including: type, UUT detect mode, level mode, connection type, AID, RF cable loss and altitude offset.



## GENERAL SPECIFICATIONS

## USER INTERFACE

**Display**

*12" Color LCD, sunlight readable with back light*

**Controls**

*Touch screen*

## ANTENNA COUPLER

**Antenna Couplers**

*TX and RX coupler*

**Loss Compensation**

*0 to 19.9 dB*

## TX/RX DIRECT CONNECTION PORTS

**Impedance**

*50 Ω*

**SWR**

| *Tx* | *Rx* |
|---|---|
| *2.5:1* | *3:1* |

**Connector**

*TNC x 2 (single TX/RX channel)*

## RECEIVER

**RF Input Frequency**

**Range**

*4.20 to 4.40 GHz (ITAR limited)*

**FMCW/CDF FMCW**

**Frequency Measurement**

**Range**

*4.20 to 4.40 GHz (ITAR limited)*

**Accuracy**

*±5 MHz*

**RF TX Power Input Tracking**

**Range**

*10 mW (+10 dBm) to 2 W (+33 dBm)*

**RF TX Power Measurement**

**Range**

*4 mW (+6 dBm) to 2 W (+33 dBm)*

**Accuracy**

*±2 dB*

**FM Sweep Rate Measurement**

**Range**

*50 to 400 Hz*

**Accuracy**

*±5 Hz*

**FM Deviation**

**Range**

*20 to 100 MHz*

**PULSE**

**Frequency Measurement**

**Range**

*4.20 to 4.40 GHz (ITAR limited)*

**Accuracy**

*±10 MHz*

**Power Measurement**

**Range**

*1 W (+30 dBm) to 300 W (+54 dBm) peak*

**Accuracy**

*±2 dB*

**TX Pulse Width Measurement**

**Range**

*20 ns to 400 ns*

**Accuracy**

*±10 ns*

**TX Pulse PRF Measurement**

**Range**

*2 to 30 KHz*

**Accuracy**

*±5 %*

## GENERATOR

**Linear Altitude Simulation**

**Range FM/CW**

*-20 to 5,500 ft.*

**Range Pulse**

*50 to 5500 ft.*

Note: Lower limit dependent on cable length

**Resolution**

*1 ft. increments*

**Accuracy**

*±1.5 ft. or 2% RMS (whichever is greater)*

**Linear Altitude Rate**

**Range**

*1 to 10,000 fpm*

**Resolution**

*1 fpm increments*

**Test Cable (Automatic Compensation)**

**Test Cable Length**

*1 to 100 ft.*

**Test Cable Loss**

*0 to 9.9 dB*

***AID (Direct Connect)***

***Fixed Selectable***

*0, 20, 40, 57 or 80 ft.*

***User Entered***

*0 to 99 ft.*

***Altitude Offset***

*-25 to 100 ft.*

***RF Level***

***Manual Mode (FM/CW)***

***Range***

*-84 to +9 dBm (varies with cable loss)*

***Accuracy***

*±4 dB*

***Manual Mode (Pulse)***

***Range***

*-76 to +17 dBm*

***Accuracy***

*±4 dB*

***Auto Mode***

*TX Power – Height path loss- Scattering loss- Offset*

***RF Level Offset (auto mode)***

*-20 to +20 dB*

***RF Path Loss Simulation***

*0 to 5,500 ft.*

***Frequency Stability***

*±1 ppm*

## ENVIRONMENTAL

***Operational Temperature***

*-20° ≤ T ≤ 55°C*

***Storage Temperature***

*-30° ≤ T ≤ 71°C*

***Altitude***

*≤10,000 meters*

## SUPPLEMENTAL INFORMATION

***Test Set Certification***

| | | |
|---|---|---|
| *Operational Humidity* | *MIL-PRF-28800F* | *Class 2* |
| *Storage Humidity* | *MIL-PRF-28800F* | *Class 2* |
| *Vibration Limits* | *MIL-PRF-28800F* | *Class 2* |
| *Shock, Functional* | *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* |
| *Salt* | *MIL-PRF-28800F* | *Class 2* |
| *Explosive Atmosphere* | *MIL-STD-810F* | *Method 511.4, Procedure 1* |
| *Safety Compliance* | *UL-61010:2001*<br>*CSA 22.2*<br>*WEEE* | *No 1010.1* |
| | *ROHS*<br>*EMC* | |
| *Emissions* | *MIL-PRF28800F*<br>*EN 61326:1998*<br>*EN 61000-3-2*<br>*EN 61000-3-3* | *Class 2*<br>*Class A* |
| *Immunity* | *MIL-PRF28800F*<br>*EN 61326:1998* | *Class 2*<br>*Class A* |

***External AC-DC Converter Certifications***

| | | |
|---|---|---|
| *Safety Compliance* | *UL 1950 DS*<br>*CSA 22.2 No. 234*<br>*VDE EN 60 950* | |
| *EMI/RFI Compliance* | *FCC Docket 20780 Curve "B"*<br>*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* |

## ENVIRONMENTAL (SUPPLIED EXTERNAL AC TO DC CONVERTER)

***Use***

*Indoors*

***Altitude***

*≤10,000 meters*

***Operating Temperature***

*5° to 40°C*

***Storage Temperature***

*-20° to 71°C*

## PHYSICAL CHARACTERISTICS

***DIMENSIONS***

***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)***

*<10 lbs. (4.5 kg)*

## *VERSIONS AND ACCESSORIES*

| Ordering Number | Description |
|---|---|
| 87340 | ALT-8000 Radio Altimeter Test Set<br>NSN: 6625-01-610-3549 |
| **Standard Accessories** | |
| 88494 | Transit case |
| 67374 | Power supply |
| 88590 | Antenna coupler (qty 2) |
| | Antenna pole assembly (qty 2) |
| 88511 | Low loss RF coax cable 20 ft. (qty 2) |
| 38353 | TNC-TNC adapter |
| 62401 | 1 ft. jumper coax |
| 64020 | Power cord, European |
| 62302 | Power cord, U.S |
| 88511 | Coax, RG400, TNC-TNC, yellow 20’ |
| 89527 | Coax, RG400, TNC-TNC, red 20’ |
| 88035 | Operation Manual (CD) |
| **Optional Accessories** | |
| 88500 | Low loss RF coax cable 100 ft. (qty 2) w/ soft-side case |
| 87040 | External battery charger |
| 86196 | Spare battery pack |
| 89022 | Maintenance Manual CD |
| 91253 | Coax RG400 TNC-TNC yellow 4’ |
| 91255 | Coax RG400 TNC-TNC red 4’ |

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