TCAS-201 TCAS Ramp Test Set

The TCAS-201 simulates the airborne environment necessary for verification/certification of TCAS installations

- ***Programmable intruder simulation parameters***
- ***Surveillance monitor displays ATCRBS or Mode S interrogations***
- ***10 selectable programmable scenarios***
- ***Measures interrogator power and frequency***
- ***Built-in self test***
- ***LCD display with automatic backlight***
- ***1.5 hour battery operation***
- ***Two-year limited warranty***

IFR is a leader in the design, manufacture and marketing of Avionics test systems.

The TCAS-201 allows verification and certification of an aircraft's TCAS installation, performing many of the required tests for Supplemental Type Certification (STC) during initial installation and subsequent routine maintenance.

The TCAS-201 includes the capability to monitor TCAS interrogations (displaying decoded information/communication data) and generating ATCRBS or Mode S replies that simulate threat aircraft for bearing accuracy checks.

Programming flexibility of the TCAS-201 allows the operator to exercise and generate Traffic Advisory (TA) and Resolution Advisory (RA) alerts. The TCAS-201 is environmentally packaged to operate in all weather conditions and is protected against the shock and vibration encountered during ramp use.

Operation

The TCAS-201 uses four basic test functions. Power and frequency, monitor, reply, scenario and one configuration function. Setup is for the gathering and verification of TCAS system data.

The Setup Menu is used to program parameters for Scenario Tests and additional control of test set functions.

The Power and Frequency screen displays interrogator Effective Radiated Power (ERP) and Frequency.

The Surveillance and Broadcast Monitor screen displays the contents of the major interrogation fields incorporated in UF0 and UF16 and verifies the TCAS Broadcast is transmitted in UF16 approximately every ten seconds.

In the ATCRBS Reply Test the TCAS-201 simulates a Mode C transponder with programmable percentage reply, altitude and range parameters.

Scenario Test

Running the Scenario Test enables the user to simulate an approaching intruder with constant closing rate and constant altitude change rate. Up to 10 user programmed scenarios can be stored and later recalled. Scenario test time and total elapsed test time enable the user to monitor times for TCAS Traffic and Resolution Advisories.

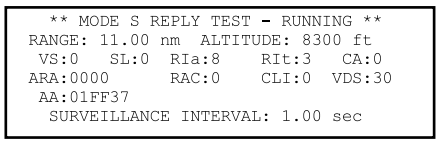
```
     ** SCENARIO TEST - RUNNING **
INTRUDER TYPE: MODE-S    TIME: 0:23;1:02
   RANGE: 3.49 nm        RATE: +540 kt
     ALT: 9552 ft        RATE: +1500 fpm
 STATUS: RESOLUTION
    SURVEILLANCE INTERVAL: 1.00 sec
```

```
     ** SCENARIO TEST - RUNNING **
INTRUDER TYPE: ATCRBS    TIME: 0:23;1:02
   RANGE: 3.95 nm        RATE: +350 kt
     ALT: 10,000 ft      RATE: +0 fpm
 STATUS: PROXIMITY
    W-S SEQUENCE INTERVAL: 1.00 sec
```

Mode S Reply Test

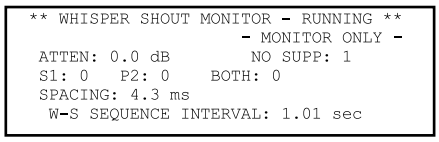
The Mode S Reply Test can be used to evaluate the ability of the TCAS

interrogator to receive, decode and respond to Mode S replies. In this mode the TCAS-201 simulates a Mode S transponder replying with formats DF0, DF11 and DF16. The message fields allow the user to program capability information and various advisories into the replies.



Whisper-Shout Monitor

The Whisper-Shout Monitor screen provides information used to verify whisper-shout steps and Side Lobe Suppression (SLS). By conducting several tests from different points around the aircraft, the TCAS coverage (directional and/or omni-directional), whisper-shout sequence operation and interrogation timing may be evaluated.



Specification

Reply Generator

Output

1090 MHz DCXO controlled (±10 kHz)

Level

Set for operation over an antenna to antenna distance of 5 to 500 feet (1.5 to 152.4 meters)

Test Antenna

Remote antenna

VSWR <1.5:1, 9.5 gain typical

Output Test Signals

Reply Modes

Mode C (with altitude reporting), Mode S (Formats 0, 11, 16)

Pulse Spacing

Accuracy ±50 ns

Pulse Widths

Accuracy ±50 ns

Pulse Characteristics

All Pulses

±1 dB relative to P_1

Percent Reply

Range	*0% to 100%*
Resolution	*10%*
Accuracy	*±1%*

Range Delay

Range	*0.3 to 30 nautical miles*
Resolution	*50 ns steps*
Accuracy	*±0.02 nautical miles*

Altitude

Range	*-1000 to +126,000 feet*
Resolution	*100 feet*

Mode S Address

Selectable

Reply Delay

ATCRBS	*3.0 µs (±50 ns)*
Mode S	*128.0 µs (±50 ns)*

Range Rate

Range	*-1200 to +1200 kts*
Resolution	*10 kts*
Accuracy	*±10%*

Altitude Rate

Range	*-10,000 to +10,000 fpm*
Resolution	*100 fpm*
Accuracy	*±10%*

Squitter

Control	*ON/OFF*
Rate	*1.0 seconds (±10 ms)*

UUT Measurements

Effective Radiated Power (Mode S Interrogations)

Range	*+43 to +57 dBm (20 to 500 W)*
Accuracy	*±2 dBm*

Frequency

Range	*1029.9 to 1030.1 MHz*
Accuracy	*±10 kHz*
Resolution	*1 kHz*

Detectable Modes

ATCRBS only All Call (Mode C)

Mode S Downlink (Formats 0, 11, 16)

General

Calibration Interval

1 Year

Battery Operation

Duration: 1.5 hours before recharge at 25°C

Automatic shut off after 10 minutes of non-use

AC Supply

103.5 to 129 VAC, 207 to 253 VAC, 47.5 to 420 Hz, 45 W (used to recharge battery)

ENVIRONMENTAL

Temperature

-20° to +55°C

Relative Humidity

≤80% for temperatures up to 31°C, decreasing linearly to 50% at 40°C (Non-condensing)

Altitude

≤4000 m (13,124 ft.)

Dimensions

284 mm wide; 361 mm deep; 279 mm high

11.2 in. wide; 14.2 in. deep; 11 in. high

Weight

13.7 kg (30 lbs.)

Electromagnetic Compatibility

Complies with the limits in the following standards:

EN 55011 Class B

EN 50082-1

Safety

Complies with EN 61010-1 for class 1 portable equipment and is for use in a pollution degree 2 environment. The instrument is designed to operate from an installation category 1 or 2 supply.

AC-201B TCAS ANTENNA COUPLER

The AC-201B provides an alternate means of testing Allied Signal TCAS installations.

When used with the TCAS-201, the coupler eliminates errors due to multipath or reflected signals, allowing the TCAS system to be tested within the hangar environment.

Features

- *Provides isolation by attenuating TCAS interrogations and airborne transponder replies, reducing the number of airborne targets displayed. This allows the operator to easily identify and control the TCAS-201 generated target.*
- *Absorbs TCAS interrogation RF power, without presenting an excessive VSWR mismatch.*
- *Target bearing angles can be varied in 30° increments by rotating the bearing selector on the coupler.*
- *Supplied with carrying case complete with coaxial cable and multi-section gas spring monopole allowing the coupler to be mounted over the bottom TCAS antenna.*

Versions and Accessories

When ordering please quote the full ordering number information.

Ordering Numbers

Versions

201-110	TCAS-201 Traffic Alert & Collision Avoidance, 110 VAC operation
201-220	TCAS-201 Traffic Alert & Collision Avoidance, 220 VAC operation

Accessories

201B	AC-201B TCAS Coupler B (Bendix TCAS II)

Accessories (Supplied)

Line Cord

RF Coaxial Cable

Antenna Shield

Operation Manual

Operator's Guide

Directional Antenna

Tripod

Omni-Directional Antenna

All IFR Avionics products delivered with Factory Certificate Of Calibration

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