

Description

The TR-220 Multi Function Test Set completely covers all your ramp testing needs in one small and easy to use package. Test capability for Traffic and Collision Avoidance Systems (TCAS), Distance Measuring Equipment (DME) and Transponders Modes A, C, Elementary, Enhanced Surveillance and now ADS-B Transmit and Receive capability including DO-260A/B requirements. The TR-220 features state of the art design. Microprocessor control and simple switch layout resulting in an easy-to-use single person operation requiring minimal training.



P/N 90 000 088

Features

- Transponder Mode A, C, S, Elementary, Enhanced (automatically determined)
- Performs all transponder Tests IAW FAR 43 Appendix F and Euro Control Mode S test criteria
- DF-17 Extended Squitter ADS-B compliant with DO-260 A/B and AMC 2-24
- Full control of TCAS I and II intruder tests and validation. Storable intruder/scenario simulations
- Provides complete DME validation and customizable simulations
- TIS-B (Traffic Information Broadcast) DF17/18 Air and Surface simulation with 4 intruder aircraft
- Hand- Held directional antenna included and Optional Antenna Coupler Cap available (TAP-200)
- Compliant with European CE requirements
- 2 year limited warranty; Extended warranties available

Transponder

- Test Set automatically determines capability of transponder being tested (ATCRBS or Mode S)
- Testing can be done over-the-air and in Direct Connect for better control and tolerance
- Test Set configured for automatic sequencing based on stored criteria or manual control of individual transponder tests
- Full display of test results decoded and measurements performed
- RS-232 connection for download of results to a PC

DME

- Allows testing on all channels (108.00 to 117.95 MHz)
- Measures DME power, frequency, and PRF. Hand-Held Antenna and Direct Connect methods available
- Transmits DME Morse-Code I.D.
- User selection and complete control of DME simulated scenarios

TCAS

- The TR-220 performs testing of TCAS I, TCAS II and Traffic Advisory Systems
- Allows simulation of ATCRBS or Mode S intruder aircraft
- permanent storage of 10 intruder scenarios, to simplify TCAS testing and local procedures
- User selection of velocity, starting distance, starting altitude, and vertical speed.
- Measures Relative UUT power and frequency
- Start, Stop and Hold selections allow technicians to perform bearing/relative heading tests with ease

Transponder Test Specifications *

The TR-220 performs the following tests based on the capabilities of the transponder:

- Mode A - 4096 code, IDENT, percent reply, pulse spacing, pulse width
 - Mode C - Altitude (feet and grey code), percent reply, pulse spacing, pulse width
 - Side-lobe suppression (SLS)
 - Mode A/S and C/S All Call - Mode S address, percent reply
 - Mode A Only and Mode C Only
 - Mode S Surveillance I.D. (DF5) – Mode S address, percent reply, flight status (Air, Ground, Alert, SPI), Mode S/Mode A 4096 code compare (automatic mode)
 - Mode S Surveillance Altitude (DF4) – Mode S altitude, percent reply, Mode S/Mode C altitude compare (automatic mode)
 - Mode S Surveillance Short (DF0) – Mode S address, vertical status (Air, ground), percent reply, decoded country code, decoded tail number (if applicable)
 - Mode S Comm. I.D. (UF5/DF21) – Mode S ID code, percent reply
 - Mode S Comm. Altitude (UF4DF20) – Mode S altitude, percent reply
 - Undesired replies (UF11) – Checks for reply to incorrect Mode S interrogation
 - Acquisition squitter – Pass/Fail indication of squitter duration, decoded Mode S address, interrogator code
 - Extended squitter – Pass/Fail indication of squitter duration, decoded Mode S address
 - Max Airspeed – Decodes and displays maximum airspeed
 - Diversity – Displays Pass/Fail indication and measured value of RF leakage through Mode S transponder antenna ports
 - Sensitivity (MTL) – Measures and displays MTL for Modes A, C, and S
 - Measures and displays transponder power (dBm or watts), frequency, and receiver sensitivity (dBm)
 - Decodes and displays Flight I.D.
- DO-260A/DO240(2) specific parameters tested but not limited too:**
- BDS 0,5
 - BDS 0,8
 - BDC 0,9 Subnet 1, 2, 3, 4
 - Velocity Hex
 - DF 17 MS Address
 - Interrogator Identifier
 - Latitude, Longitude
 - Airborne Squitter Status Bits – No Info, SPI, Alerts, Mode A 4096 Code
 - Squitter Period, Squitter Type (Ext Squitter Airborne Position Report)
 - TYPE 28 Report
 - BDS 6,1
 - TYPE 29 Report
 - BDS 6,2 Target State and Status
 - Type 31 Report (BDS 6,3)
 - Horizontal Position Integrity Information
- DO-260B specific parameters tested but not limited too:**
- Status Type 28, Type 1 Emergency Report & Type 2, Active RA
 - Type 29 – 6,2 Squitter TCAS/ACAS Operational Status, TCAS/ACAS RA, FMC/MPC/FCU Altitude, Pressure and Heading
 - Type 29 6,2 ME Field, Squitter type, Target State and Status
 - Type 31 6,3 Aircraft Operational Status
 - Horizontal Position Status (Nap) Navigation Integrity Category (NIC) for DO-260B
 - Latitude/Longitude Compare for position, velocity and system accuracy
 - ADS-B IN – Decode and display aircraft ADS-B RX capability in Type 31 Subtype 0
 - GPS Antenna Offset.

DO-260A/B General Tests Performed but not limited too:

- Decodes and displays Mode S address in Octal and Hex
- Mode S Enhanced Surveillance parameters, including Selected Altitude (BDS4); Roll Angle, True Track Angle, Ground Speed, Track Angle Rate, and True Airspeed (BDS5); Magnetic Heading, Indicated Airspeed, Mach #, Barometric Altitude Rate, and Inertial Vertical Velocity (BDS6)
- Receives and decodes 1090 MHz ADS-B data, including squitter type (airborne position, surface position, aircraft identification/category, and airborne velocity), latitude/longitude, N/S velocity, E/W velocity, Flight I.D., Mode S address, altitude (GNSS or barometric), and airspeed
- Transmits 1090 MHz ADS-B data for four intruder aircraft (airborne or surface position)
- Transmits TIS data for four intruder aircraft



Receiver	Frequency	Range	1086.5 to 1093.5 MHz
		Accuracy	± 200 kHz
	Power	Range	47 to 64 dBm
		Accuracy	± 2 dB (direct connect) ± 3 dB (radiated)
	Sensitivity	Range	-50 to -87 dBm
		Accuracy	± 2 dB (direct connect) ± 3 dB (radiated)
	Reply Percent	Range	0 to 100%
		Accuracy	± 1%

Transmitter	Frequency	1030 MHz ± 10 kHz
	Power	≥ 4 dBm
	Modes	A, C, S, EHS, ADS-B TX/RX and TIS



TCAS Test Specifications *

The TR-220 allows testing of TCAS I, TCAS II, and Traffic Advisory Systems by simulating either ATCRBS or Mode S intruders. The Setup menu allows operator to configure and store 10 TCAS scenarios, including Distance (1 to 50 NMI), Altitude (-1000 to +99,900 ft.), Vertical Speed (-7,500 to +7,500 fpm) and Velocity (100 to 1200 KTS.). The TR-220 provides a relative measurement of TCAS power and frequency.

Transmitter	Frequency	1090 MHz ± 100 KHz
	Power	≥ 4 dBm
	Modes	C, S

Receiver	Frequency	1026.5 to 1033.5 MHz
	Power	47 to 64 dBm

DME Test Specifications *

The TR-220 provides test capability for DME by allowing operator to select test parameters, including Channel (108.00 to 117.95 MHz) and Velocity (120 to 1200 KTS.).

The TR-220 measures and displays DME PRF (scan rate), power, and frequency. Also, the TR-220 transmits a Morse Code I.D.

Transmitter	Frequency	962 to 1213 MHz ± 100 KHz
	Power	≥ 4 dBm
Receiver	Freq. Range	Channel Freq. ± 3.5 MHz
	Freq. Accuracy	± 200 KHz
	Sensitivity Range	≤ -35 dBm

Antenna

- Directional antenna can be hand-held, Tripod Mounted or mounted on side of case
- Antenna gains marked on attached decal
- Range – 10 to 170 feet

Accessories

- Directional antenna (hand-held or mounted on side of case)
- AC Power Cord
- Direct Connect Cable
- Directional Antenna Cable
- Operators Manual (CD-Rom)
- TAP-200 Anti-Radiation Coupler (Optional)
- All Accessories Store in Transit case

Physical

- Packaging – MIL-PRF-28800, Style C
- Size – 14.5x9.4x6.5 in. (36.8x23.9x16.5 cm.)
- Weight: 20 lbs. (9.1 kg.)
- Operating Temperature: -28 to +55 C
- Battery Operation; 8 hours at 20% Duty Cycle – Front Panel Replaceable
- AC Operation/Charging: 100-240 VAC, 50-400 Hz

Capab Comm AB	EHS	Auto Transponder Detection Capability
AIR Press A/M	II:14	

M S Long Air	/	Decodes and Displays Binary, Hexadecimal and Octal parameters
20000' A07008	100%	

MS Ampl Var.	PASS	Displays PASS or FAIL based on Stored Criteria
MS Pulse Width	PASS	

M A 1234 IDENT	100%	Measures and Displays Pulse Width, spacing & timing intervals
0.45 – 20.35 – 0.45		

Velocity:	180 nmi/h	Numerous user variable parameters for TCAS and DME testing
Chg:Up/Dn	Cont: AUTO	

BDS5 True Trk Angle	Easy to understand and interpret Enhanced Surveillance results
An E120 D Rt + 8 D/s	

AC OPST BDS6,3 10.0s	Comprehensive and full DO-260 A/B Testing
F8220008002928 TYP31	

4 DF17 Targets	DF17/DF18 TIS Traffic Information System validation
A00001 Airborne	



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