

Description

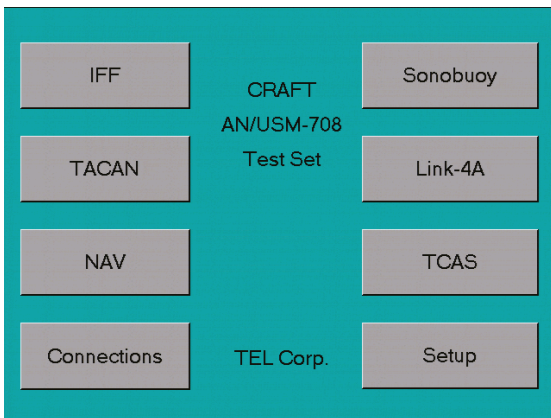
The AN/USM-708 is the next generation in ground support test equipment. Based on entirely new up-to-date technology and digital architecture; the AN/USM-708 is a leap forward in precision testing of the following systems:

- Transponder: Modes 1, 2, 3/A, C, 4 Mode S, EHS (Enhanced Surveillance) and Mode 5
- Interrogator: Modes 1, 2, 3/A, C, 4, Mode S, Mode 5, TCAS & ETCAS, Shipboard Processor
- ADS-B (Automatic Dependent Surveillance Broadcast) TX & RX
- **Navigation: VOR, ILS, LOC, GS, MB, TACAN, VSWR**
- Sonobuoy
- Link-4
- ADF (Automatic Direction Finder)



NOTICE
This commodity is intended for use subject to the International Traffic in Arms Regulations and may not be exported or transferred to a foreign party, either in their original form or after being incorporated into other end-items, without the prior written consent of the U.S. Department of State

The AN/USM-708 Multi-Function Test Set provides unsurpassed reliability and ruggedness designed by an established and well recognized company with 50 years in the design and manufacture of aviation ground support and bench test equipment.



The AN/USM-708 large 4.75" x 3.5" color LCD (NVG compatible) screen and surrounding soft-keys and keyboard provides easy and quick access to a multiple of test screens menus, and display options affording single man operation, instant results, and a host of pre-programmed and manually variable parameters to meet the most demanding requirement's for testing of airborne avionic and communication equipment.

Additional features include:

- Over-the-Air and Direct Connect methods
- Rugged and durable MIL-PRF-28800F, Class 1 package
- Remote Firmware upgrades via the internet/CD-Rom
- Extensive Built in Diagnostics
- Expandable capabilities (HAVEQUICK, Link-11, 16, 22 , SINCARS and communications planned)

Features

The AN/USM-708 is designed in a compact, waterproof and durable case. Instant one button GO/NO test can be performed based on stored parameters. The user also has the capability to manually select and vary parameters individualized for each system. All accessories are neatly stored in the Test Set cover and the battery charger is included.

Mode 4 and Mode 5 U.S. Department of Defense (DoD) AIMS International Program Office Approved

Utilizes the KIV-78 appliqué for Mode 5 Interrogator and Transponder tests (not included).

Ideally suited for any temperature or region due to its self calibrating software.

Built-in battery charger and three (3) front panel replaceable "Lithium-Ion" batteries (included).

Transponder Mode Specification

Transponder testing can be performed in an "AUTO" mode based on stored criteria or "Manual" Mode offering individually selected tests and detailed results.

Modes Tested:

- Mode 1
- Mode 2
- Mode 3A
- Mode C
- Mode S
- ELS (Elementary Surveillance)
- EHS (Enhanced Surveillance)
- ADS-B TX and RX
- Mode 4
- Mode 5
- EOR (End of Runway)

*Direct Connect and hand held antenna options.

Link-4 Data Link System

Provides testing to verify the performance of Link-4A aircraft V-Series and R-Series Messages in support of:

- Aircraft Carrier Landing System (ACLS)
- Air Traffic Control (ATC)
- Carries Inertial Navigation System (CAINS)

TACAN Mode Specification

TACAN Receiver/Transmitter Tests covering all 126 X/Y channels in modes:

- Ground to Air (G/A)
- Air to Air (A/A)
- Air to Air Beacon (A/A BCN)

Direct Connect and hand held antenna options.

Interrogator/TCAS Mode Specification

Interrogator testing can be performed in an "AUTO" mode based on stored criteria or "Manual" Mode offering individually selected tests and detailed results.

Modes Tested:

- Mode 1
- Mode 2
- Mode 3A
- Mode C
- Mode S
- Mode 4
- Mode 5
- TCAS/ETCAS
- Shipboard Processor Test
- OMNI/TAPER
- VSWR (Voltage Standing Wave Ratio)

*Direct Connect and hand held antenna options.

Navigation Testing

Thorough testing and transmission of simulated navigation signals for:

- VOR, LOC, GS, ILS, and Marker Beacon
- UHF - ADF (Automatic Direction Finder) 225-400MHz
- VSWR (Voltage Standing Wave Ratio)

Accessories

- Standard 2-year Warranty
- Operators Manual
- Direct Connect Cable
- Neck Strap
- AC and DC Power Cord
- Omni Antenna
- Telescoping Antenna
- Antenna Handle
- Calibrated Directional Antenna
- Antenna Extension Cable

Sonobuoy

Observe listen and verify Sonobuoy signals received from Command Signal Generator (CSG) and Command Function Selection (CFS) format information.

Modes Tested:

- OMNI/45 Hz
- Noise
- BT-TEMP
- LOFAR
- DIFAR
- VLAD
- DICASS

Monitor received tones via the built-in head set jack.

Accessories

Packaging.....	MIL-PRF-28800F, Class 1
Size.....	16.25 W x 11.5 H x 11.0 D
Weight.....	20 lbs. (operating)
	29.5 lbs (accessories and Lid)
Operating.....	Temperature -40° to +55° C
Battery Type.....	Lithium Ion (3)
Battery Life.....	8 Hours at 20% Duty Cycle
Battery Charger.....	Supplied
Power requirements.....	110-240 VAC, 50/60 Hz
	28 VDC ±20%, 20W
	(No Crypto)
Antenna Configuration.....	Case Mountable
	Tripod Mounted
	Hand-Held
Color.....	White

Description

The AN/USM-719 is the next generation in ground support test equipment. Based on entirely new up-to-date technology and digital architecture; the AN/USM-719 is a leap forward in precision testing of the following systems:

- Transponder: Modes 1, 2, 3/A, C, 4 Mode S, EHS (Enhanced Surveillance) and Mode 5
- Interrogator: Modes 1, 2, 3/A, C, 4, Mode S, Mode 5, TCAS & ETCAS, Shipboard Processor
- ADS-B (Automatic Dependent Surveillance Broadcast) TX & RX
- TACAN (A/A, G/A and A/A Beacon
- VSWR
- Built in powered KIV-78 Bay
- Available Accessory Package Option



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The AN/USM-719 Multi-Function Test Set provides unsurpassed reliability and ruggedness designed by an established and well recognized company with 50 years in the design and manufacture of aviation ground support and bench test equipment.



The AN/USM-719 large 6.0 in. color LCD (NVG compatible) screen and surrounding soft-keys and keyboard provides easy and quick access to a multiple of test screens menus, and display options affording single man operation, instant results, and a host of pre-programmed and manually variable parameters to meet the most demanding requirement's for testing of airborne avionic and communication equipment.

General Specifications

Packaging.....	MIL-PRF-28800F, Class 1
Size.....	14.5 x 9.4 x 6.5 inches
Weight.....	18 lbs. (operating) 24 lbs (accessories and Lid)
Operating.....	Temperature -40° to +55° C
Battery Type.....	Lithium Ion (3)
Battery Life.....	8 Hours at 20% Duty Cycle
Battery Charger.....	Built-in
Power requirements.....	115 VAC, 50 to 400 Hz/12 to 40 VDC

Features

The AN/USM-719 is designed in a compact, waterproof and durable case. Instant one button GO/NO test can be performed based on stored parameters. The user also has the capability to manually select and vary parameters individualized for each system. All accessories are neatly stored in the Test Set cover and the battery charger is included.

Mode 4 and Mode 5 U.S. Department of Defense (DoD) AIMS International Program Office Approved

Utilizes the KIV-78 appliqué for Mode 5 Interrogator and Transponder tests (not included).

Ideally suited for any temperature or region due to its self calibrating software.

Built-in battery charger and three (3) front panel replaceable "Lithium-Ion" batteries (included).

Transponder Mode Specification

Transponder testing can be performed in an "AUTO" mode based on stored criteria or "Manual" Mode offering individually selected tests and detailed results.

Modes Tested:

- Mode 1
- Mode 2
- Mode 3A
- Mode C
- Mode S
- ELS (Elementary Surveillance)
- EHS (Enhanced Surveillance)
- ADS-B TX and RX
- Mode 4
- Mode 5
- EOR (End of Runway)

*Direct Connect (DC) and hand held antenna (Ant) options.

Interrogator/TCAS Mode Specification

Transponder testing can be performed in an "AUTO" mode based on stored criteria or "Manual" Mode offering individually selected tests and detailed results.

Modes Tested:

- Mode 1
- Mode 2
- Mode 3A
- Mode C
- Mode S
- Mode 4
- Mode 5
- TCAS/ETCAS
- Shipboard Processor Test
- OMNI/TAPER
- VSWR (Voltage Standing Wave Ratio)

*Direct Connect (DC) and hand held antenna (Ant) options.

Transponder Test Specifications

Test Set Transmitter

Output Frequency 1030 MHz / ± 10 KHz
 Output Power -20 to -100 / ± 1 dBm (DC)
 0 to -100 dBm / ± 1 dBm (Ant)

Interrogation PRF

Direct Connect
 SIF 450 \pm 5 Hz
 Mode S short word 45-50 Hz
 Mode S long word 13-16 Hz
 Mode 5 200-225 Hz

Antenna Connect

SIF 235 \pm 5 Hz
 Mode S short word 45-50 Hz
 Mode S long word 13-16 Hz
 Mode 5 200-225 Hz

Test Set Receiver

Measurement Range 1086.5 to 1093.5 MHz
 Measurement Accuracy ± 200 KHz

Power

Measurement Range 47 to 64 dBm
 Measurement Accuracy ± 2 dB (DC)
 ± 2 dB (Ant)

Sensitivity

Measurement Range -45 to -87 dBm (DC)
 -49 to -81 dBm (Ant)

Measurement Accuracy

± 2 dB (DC)
 ± 3 dB (Ant)

Reply Efficiency

Measurement Range 0 to 100%

Interrogator Test Specifications

Output Frequency 1090 MHz / ± 10 KHz
 Output Power -20 to -100 / ± 1 dBm (DC)
 0 to -100 dBm / ± 2 dBm (Ant)

Test Set Receiver

Measurement Range 1029.7 to 1030.3 MHz
 Measurement Accuracy ± 200 KHz

Power

Measurement Range 47 to 64 dBm
 Measurement Accuracy ± 2 dB (DC)
 ± 2 dB (Ant-to-Ant)

Sensitivity

Measurement Range -45 to -87 dBm (DC)
 -55 to -87 dBm (Ant)
 Measurement Accuracy ± 2 dB (DC)
 ± 3 dB (Ant-to-Ant)

TACAN

Modes A/A, G/A, A/A BCN
 Frequency Range 962 to 1213 MHz, 126 X/Y
 Frequency Accuracy ± 10 kHz
 Power Out -20 to -100 ± 1 dBm (DC)
 0 to -100 dBm ± 1 dBm (Ant)
 Bearing Accuracy $\pm 1^\circ$ (G/A & A/A BCN)
 Range Accuracy ± 0.5 nmi Typical, ± 1.0 nmi
 Velocity Accuracy $\pm 3\%$

Direct Connect and Antenna to Antenna Testing capability.

VSWR – Capability to conduct a sweep of a user specified frequency range and record results as a Pass/Fail.

Description

The T-47/M5 – Tel-instrument Electronics Corp. newest IFF Test Set. The T-47/M5 capabilities allow full testing, simulation and analysis of the following systems: Interrogator/Transponder Test set for Modes 1, 2, 3A, C, S, EHS, ADS-B TX and RX (compliant) with 4 and Mode 5, TCAS I, II and E-TCAS. Comprehensive testing of TACAN Receiver Transmitters in A/A, G/A, and A/A BCN. Direct Connect and over the Air options. Utilizing the KIV-77 Crypto appliqué (not included) for Mode 4 & Mode 5 testing and built in USB connection available for remote diagnostic testing and download of test results to a PC.



Full color display and easy to use front panel navigation utilizing a simple Joy-stick – The user friendly interface allows for fast and simple verification of aircraft installed systems.

Main Features

- Comprehensive Interrogator and Transponder tests Modes 1, 2, 3A, C, S, EHS, Mode 4 and Mode 5 (L1 & L2)
- Full TACAN testing of A/A, G/A and A/A BCN on all 252 TACAN channels X and Y
- TCAS I, TCAS II and E-TCAS airborne systems intruder simulations
- Modes 4 and 5 testing with a built in powered bay for the KIV-77 Crypto Appliqué
- Full Testing of ADS-B in compliance with RTCA DO-260 A and B requirements
- Light Weight compact package in a MILSPEC Class 1 Container
- Long Lasting Battery
- Supports Remote Client testing utilizing USB connection to any laptop or desktop computer
- Large Full Color Display with User Friendly easy to navigate interface

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.

Transponder

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)

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
- Navigation Accuracy Category, Velocity and Position NACv and NACp, Special Design Assurance SDA.
- 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

Modes 4 and 5:

- Complete Comprehensive testing of Mode 4
- Mode 4A/4B - Verifies valid Mode 4A/4B bit and tests to verify valid and invalid properties
- Mode 1 and 2 - Verifies Modes 1 (4 digits) and 2 code and reply efficiency
- Level 1 and Level 2 testing formats
- Figure of Merit (FOM)
- Lat/Lon
- National Org
- Pulse Spacing and Width verification
- Altitude
- Emergency, X Pulse and IP

Interrogator

- Fully tests Mode's 1, 2, 3A, C, and 4 (IFF) and Mode 5 Targets
- Built in Powered KIF-77 bay for ease of use when testing Interrogators
- Easy to use menus and setup features
- Direct Connect and Antenna-to-Antenna capabilities
- Manual and Automatic test modes
- Measures the received pulses and displays pulse width and separation
- Adjustable range and preset velocity
- Full Level 1 and Level 2 simulation

TACAN

- Covers entire frequency range for Channels 1 – 126, X and Y
- Ground to Air (G/A), Air to Air (A/A), and Air to Air Beacon (A/A BCN) Modes
- Complete control over Heading, Bearing, and Range selections
- Accurate Power and Frequency measuring capability
- Adjustable Reply Rate
- Direct Connect and Antenna to Antenna testing
- IDENT tone
- Pulse Spacing & Width, power and frequency measurements
- Delete 135 Hz and 15 Hz components

TCAS

- Fully Automated built in TCAS Intruder simulations for TCAS I, TCAS II, and E-TCAS
- Simulates both ATRCBS and MODE S Intruder types
- Automatic MODE C altitude acquired (with transponder on and operating)
- Antenna-to-Antenna Operation permitting complete system verification tests
- Manually adjustable offset allowing ascending or descending intercept scenarios

Additional Features

- Rugged and durable MIL-PRF-28800, Class 1 package
- Extensive built-in diagnostics
- Long Lasting Lithium-Ion battery for extended tests
- Reduced unit weight
- Remote download capability
- Bench Utility capability
- Multiple stored user presets
- Simple easy to use intuitive operator interface.

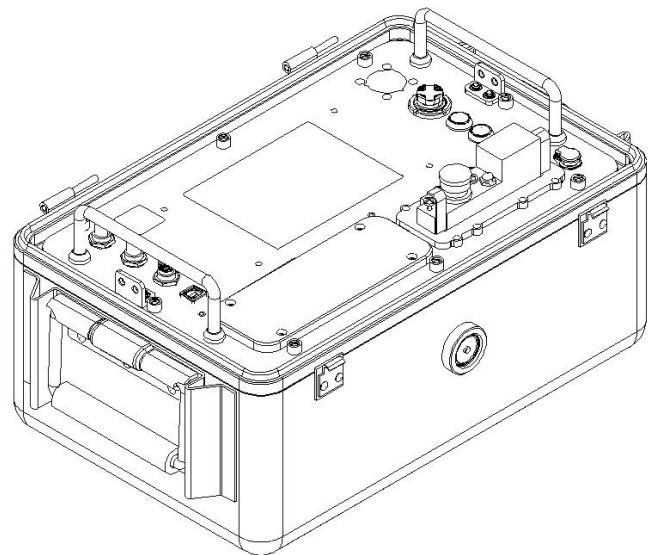
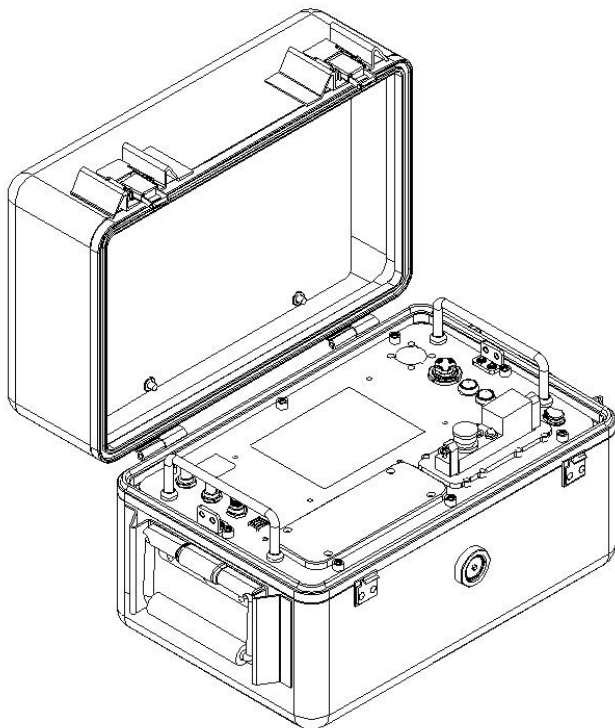
STANDARD ACCESSORIES

- Standard 2-year Warranty
- Direct Connect Cable
- Battery Charger
- Neck Strap
- Directional Antenna Assembly
- Antenna Extender Cable
- Antenna Handle
- Operational Manual

PHYSICAL CHARACTERISTICS

- MIL-PRF-28800 Class 1
- Size 14.5 x 9.4 x 6.5 inches
- Weight – 18 Lbs. (operating)
- Operating -40° to +55°C
- Power – 115 to 240 VAC/50 to 400 Hz
- Rechargeable batteries included
- Battery Life – 8 Hrs @ 20% Duty Cycle

NOTE: KIV-77 Crypto Appliqué is NOT INCLUDED



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Description

The TS-4530A, which has been upgraded and manufactured by Tel-Instrument, is the latest version of the respected AN/APM-424 and TS-4530 test set. The TS-4530A, developed under a U.S. Army contract now tests IFF including Mode 5, EHS, TCAS as well as ADS-B Transmit and Receive and now TACAN. Based on a new, highly integrated digital architecture; the TS-4530A performs the following tests:

- Transponder: Modes 1, 2, 3/A, C, 4 Mode S, EHS (Enhanced Surveillance) and Mode 5 (Levels 1 & 2)
- Complete TACAN Testing for A/A, G/A and A/A BCN
- ADS-B In and Out (transmit and receive) testing
- Interrogator: Modes 1, 2, 3/A, C, 4, Mode S, Mode 5 (Levels 1 & 2), TCAS & ETCAS
- Built-in KIV-77 CCI housing enclosure
- Built in GPS with integrated GPS antenna provides accurate Date, TOD and LAT/LONG for positioning
- Simple to use "GO/NO-GO" operation
- Selected Mode S BDS register information



NSN – 6625-01-562-0715
P/N - 90000125

The TS-4530A includes a large 2.8 inch, color OLED display and a new 3-button switch assembly that adds a 4-way directional toggle action with push-in to select capability for user friendly fast operation.

Additional features include:

- Over-the-Air and Direct Connect test methods
- Rugged and durable MIL-PRF-28800, Class 1 package
- Extensive built-in diagnostics
- Improved power management for extended test set operation
- Reduced unit weight
- Remote download capability
- Bench Utility capability
- Multiple stored user presets

Auto Test 1/2		ACCEPT>	
Mode 1	Pass	Mode 4	Pass
Mode 2	Pass	Mode 5	Pass
Mode 3A	Pass	Mode S	Pass
Mode C	Pass		
More Details			

Additional

The TS-4530A is lighter than previous versions of the Test Set. Advanced power management extends battery operation time. The KIV-77 crypto housing blends into the unit and the crypto is readily visible with the same viewing line as the display in the unit. Rapid one button GO/NO-GO test can be performed based on stored parameters and criteria.

Signal Generator

Generator Frequency	1030 or 1090 MHz
Generator Power	
Antenna	+4 to -44 dBm with 1 dB resolution, 1.5 dB accuracy at antenna connector (2 dB accuracy for radiated field strength)
Direct	-40 to -95 dBm with 1 dB resolution, 1.5 dB accuracy
Waveforms	IFF Modes 1, 2, 3/A, C, 4, S & 5 comply DoD AIMS 03-1000A. IFF Mode S / TCAS / EHS complies with RTCA/DO-181C
ISLS Amplitude	Equal to P1 on difference or sum ports when ISLS suppression enabled. Provides ISLS pulse on difference antenna during Mode S P6
Interrogation Rate	Mode 1, 2, 3/A, C, 4 A/A mode - 235 Hz \pm 5 Hz Direct Connect 450 Hz \pm 5 Hz
Short	45 - 50 Hz
Long	13-16 Hz
Mode 5	200 - 225 Hz
Harmonics & Spurious	Complies with MIL-STD-461E (see EMC/RFI section)
Spectral Mask	Complies with DoD AIMS 03-1000A

Physical Characteristics

Packaging	MIL-T-28800, Class 1
Size	Length 14.1" Width 11.5" Height 7.5"
Weight Test Set Only	< 9 lbs. (with battery, without KIV77)
Weight with Transit case	37 lbs (without KIV-77)
Op Temperature	-40° C to +55° C
Battery Type	(2)7.2V NiCad provided
Battery Life	12 Hours at 20% DC
Battery Charger	Internal and External
Power requirements	100-240 VAC, 50-400 Hz 12 to 36 VDC
Antenna Configuration	Case Mounted
Integrated GPS	Mounted in crypto cover Antenna

Measurement Receiver

Frequency Range	1030 or 1090 MHz
Amplitude Range	+68 to +20 dBm at direct port, +24 to -24 dBm at antenna port
Input Protection	Antenna Ports: +40 dBm peak 30 μ s max @ 1% DC, +27 dBm average Direct Port: + 68 dBm peak 30 μ s max, 1% DC, +43 dBm average
Receiver Measurements	
Power	0.1 dB resolution 1.5 dB accuracy direct, 2 dB over the air
Frequency	10 kHz resolution Accuracy for IFF Modes 1, 2, 3/A, C, 4, S 0.1 MHz Transponder 0.05 MHz Interrogator
Pulse Spacing	Accuracy within 25 ns for pulses with rise times <100ns
Pulse Width	Accuracy within 25 ns for pulses with rise time <100ns and fall time <200ns
Receiver Bandwidth	>10 MHz at -3dB response

COMSEC Interface

KIV-77	Appliqué plugs directly into Test Set
KIT-1C / KIR-1C	Accessory cable connects to 37 pin circular connector on Test Set

Accessories

Standard 2-year TIC Warranty
 External Battery Charger
 AC Adapter, Power Cord
 DC Power Cable
 Direct Connect Cable TNC
 Transit Case
 Cable, KIT/KIR-1C Interface
 USB Cable, RS-232 Cable, 9-Pin
 RF Adapter TNC to N
 CD-ROM, Operation Manual