

Avionics

IFF-7300S Series

IFF/CRYPTO/TACAN AUTOMATED TEST SYSTEM



Configurable Automated Test System for Military Transponders/Interrogators,
Crypto Appliqués and TACAN Receiver-Transmitters

The IFF-7300S Series is a powerful computer based system designed for the test and diagnosis of military avionics. The IFF-7300S contains all required resources and emulates all signals required to verify proper operation of the Unit Under Test (UUT).

Features

- Tests MARK XIIA IFF transponders and interrogators
- Tests TACAN receiver-transmitters
- Can be configured to test KIV-77 and KIV-78 crypto appliques
- Large Touch-screen color display
- Manual or automated testing
- Test reports are automatically generated
- Includes industry leading Aeroflex proprietary THORSi Test Executive

Benefits

- Ease of use - navigating between test modes is as easy as pushing a button.
- Affordable – no need to purchase multiple stations that take up valuable lab space; purchase only the Test Program Sets (TPS) you need today
- Expandable - to add test capability, simply purchase additional TPS's
- In-house test/repair capability allows you to eliminate long delays and reduce number of LRU spares needed

System Configurations



IFF-7300S-01/02/03/04 - The IFF-7300-01/02 Test Systems are designed to test IFF Mode 4 UUTs and TACAN receiver-transmitters. The IFF-7300S-03/04 Test Systems are designed to test IFF Mode 5 UUTs and TACAN receiver-transmitters. The 01 and 03 versions have the DC Power Supply (needed for testing the majority of UUTs) and the 02 and 04 versions have the AC/DC Power Supply which is needed only for the small number of UUTs that require AC power (i.e. APX-72). All versions (01/02/03/04) can be expanded to test crypto appliquéés by adding an additional IFF-45TS.



IFF-7300S-50 - This system configuration includes the test system with two each IFF-45TS's. Optional external UUT power supply is available to add IFF and TACAN UUT test capability.

The IFF-7300S-50 is a dedicated cryptographic appliqué tester for the KIV-77 and KIV-78 crypto appliquéés. Automatic UUT control guides the operator through the key load process. All possible errors are displayed simultaneously with red/green indication. Automated back to back testing offers significant time savings over manual testing.

The system can be expanded to test military IFF and TACAN radios by adding a power supply to the system. The power supply is located externally (outside the rack).

System Architecture

The IFF-7300S Series is comprised of a combination of three major components: ATB-7300S, IFF-45TS and Power Supply.

IFF-7300S-01/02/03/04

- ATB-7300S Control/Interface Unit
- IFF-45TS IFF/TACAN Test Set
- Power Supply (DC or AC/DC)
- Optional external IFF-45TS IFF/TACAN Test Set for adding crypto appliqué test capability

IFF-7300S-50

- ATB-7300S Control/Interface Unit
- IFF-45TS IFF/TACAN Test Set (qty 2)
- Optional external power supply (DC or AC/DC) for adding IFF/TACAN UUT test capability

ATB-7300S

The ATB-7300S provides control/monitor of the IFF-45TS and the UUT via a color touch screen display. The ATB-7300S internal architecture is modular and PXI based. Data bus emulation and test are provided, in addition to synchro/resolver, analog and digital I/O, a high performance front panel oscilloscope and Digital Multi-Meter (DMM). Functional characteristics are as follows:

- ARINC 429 - 4 Channels (transmit/receive)
- ARINC 561/568 - 1 Channel (transmit/receive)
- MIL-STD Standard 1553B Data Card (IFF-7300S OPT1)
- MIL-STD Parametric 1553B Data Card (IFF-7300S OPT2)
- 35 SPST Electromechanical Relays
- 32x4 Electro-Mechanical Matrix Switch
- 32 Digital Input Channels
- 19 Digital Output Channels

Automated control is facilitated via THORSi, a powerful, time-tested, reliable and industry leading test executive software package. The UUT control interface is provided via a Test Unit Adapter (TUA) cable set. Individual Test Program Sets (TPS) are available for each UUT. TPS test scripts provide return-to-service, depot-level repair, calibration and verification capability. Automatic and manual test modes are supported.

IFF-45TS

The IFF-45TS AIMS certified bench, lab, manufacturing and depot test instrument tests both transponders and interrogators.

Transponder - 1, 2, 3/A, C, S, 4, 5

Interrogator - 1, 2, 3/A, C, S, 4, 5

DME/TACAN

Crypto Support

- KIT-1C/KIR-1C
- KIT-1A/KIR-1A
- KIV-78
- KIV-6
- KIV-77

DC and AC/DC Power Supplies

Depending on the version, the IFF-7300S may include either a DC power supply or an AC/DC power supply to provide power to the UUT. Most UUTs require only a DC power supply. However, some UUTs require a 400 Hz AC power supply (for example: APX-72).

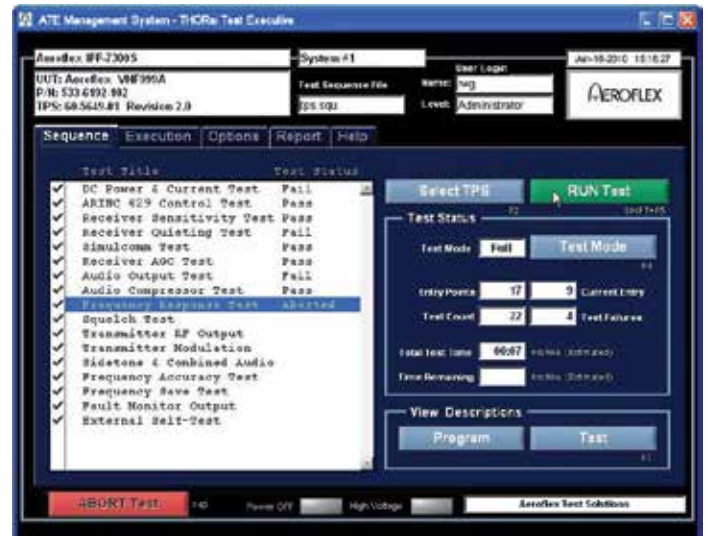
System Software

Aeroflex Proprietary Test Executive Software

THORsi was developed and tailored specifically for aerospace applications which allows for efficient scalability. It runs on Windows® OS and has an intuitive operator interface which reduces training time.

Unique THORsi Test Executive Features:

- Most structured and documented test executive in the industry which allows for efficiently adding new test capability – highly scalable
- Instrument driver and utility software updates without recompiling test programs
- Time-proven reliability in the aerospace industry
- Assigned operating authority by user level with password protection
- Easy retrieval of user test programs (by OEM, model, part number or category)
- All test programs provide the operator with UUT setup instructions prior to a test run
- Test mode selection options include full or partial testing which allows for:
 - * Test module looping
 - * Ability to pause on test steps
- Test results stored in ODBC compliant database which is compatible with many third party test data analysis programs
- Report printing capability (USB printer or network connection)
- Powerful capability for managing test results (concise summary reports, utilization records, etc.)
- Software development training available for the user that wants to develop TPSs



THORsi Test Executive Software Screen is the primary user interface. It controls sequence file operations, user login/logout, selection and execution of test program sets, and the display and printing of test results.

SPECIFICATION

GENERAL

Temp Range

0° C to 50° C

Altitude

3000 meters, max.

Warmup (for specified accuracy)

45 minutes

Size

19.25" wide, 17" high, 24.5" deep
(49 cm x 43.2 cm x 62.2 cm)

Weight

120 lbs. (54.4 kg) with DC power supply
150 lbs. (68 kg) with AC/DC power supply

Safety Compliance



ATB-7300S CONTROL/INTERFACE

DC POWER SUPPLY (FOR PXI CARDS)

DC Output Voltage

Channels	2
Range	0-40 VDC
Accuracy	±0.5% of programmed value ± 50mV

DC Output Current

Range	0 – 2.0 Amps (60 W Total programmable)
Accuracy	±0.5% ±50 mA

Output Readback

Voltage Accuracy	±0.2% of reading + 60 mV
Current Accuracy	±0.5% of reading + 10 mA

SYNCHRO/RESOLVER INTERFACE OPTIONS

Synchro/Resolver to Digital (RX) (IFF-7300S OPTION 4)

Channels	4
Frequency	380 Hz to 420 Hz
Accuracy	±1 arc-minute (0.016°)
Ref Input Voltage	2-28 Vrms

Digital to Synchro/Resolver (TX) (IFF-7300S OPTION 5)

Channels	3
Frequency	380 Hz to 420 Hz
Accuracy	±0.1°
Ref. Input Voltage	2-28 Vrms

On-Board Reference Supply (for TX) (part of OPT 5)

Output Voltage	2-28 Vrms
Resolution	0.1 Vrms
Accuracy	±2.0%

Output Frequency	380 Hz to 420 Hz
Resolution	1 Hz
Accuracy	±1.0%

OSCILLOSCOPE (DSO)

Channels	2
Bandwidth	All Scales > 5 mV per DIV DC to 125 MHz (-3dB, X1 Probe) Scales < 10mV per DIV DC to 100 MHz
Input Impedance	50 Ω and 1 MΩ 26Pf (typical)
Scales	(all in 1,2,5 Sequences) 1 mV to 1 V per DIV 50 Ω 1 mV to 5 V per DIV 1 MΩ (X1 Probe) 1 mV to 50 V per DIV 1 MΩ (X10 Probe)
Vertical Accuracy (Bandwidth DC -20MHz)	DC Coupling (OV offset) DC Waveform ±(1.5% of input +0.3% of FS + 200 μV) AC Waveform ±2.5% Full Scale AC Coupling Cutoff Frequency (-3dB) 12Hz 1MΩ
Internal Sample Clock Freq	250 MS/s sampling rate with decimation by n, 1 ≤n ≤65,535
Timebase Accuracy	±25 ppm (± 0.0025%)
Input Coupling	AC, DC, GND AC coupling on 1MΩ only
Memory per Channel	64 MB
Trigger Modes	Auto, Normal, Single Shot
Trigger Sources	CH1, CH2, External

DIGITAL MULTIMETER (DMM)

DC Functions	
Ranges	100 mV, 1 V, 10 V, 100 V, 300 V
Accuracy	±0.1% of full scale
Resolution	6 ½ digits
Resistance Functions	
Ranges	100 Ω, 1 kΩ, 10 kΩ, 100 kΩ, 1 MΩ, 10 MΩ, 100 MΩ
Accuracy	100 Ω thru 1 MΩ: ±0.05% of full scale 10 MΩ ±0.2% of full scale 100 MΩ: < 30 MΩ ± 1.0%, >30 MΩ ±1.5% of full scale
Resolution	6 ½ digits
AC Functions	
Ranges	500 mV, 5 V, 50 V, 300 V
Accuracy	500 mV scale: ±0.2% of full scale 5V, 50V, 300V scales: ±0.8% of full scale 10 Hz to 20 kHz
Resolution	6 ½ digits

ARBITRARY WAVEFORM GENERATOR (AWG)

Voltage Output

Impedance	50 Ω (typical)
Amplitude	100 mV to 8 V PK-PK
Accuracy	\pm (3% of programmed value)
Resolution	1 mV

Frequency Range

Sine Wave	10 Hz to 1 MHz
Square Wave	10 Hz to 1 MHz
Pulse Mode Rise Time	< 50 nS
Sample Rate	100 MS/s
Frequency Accuracy	1.0 %

External Input

Input Impedance	10 K Ω nominal
Threshold Level	TTL

DC Characteristics

DC Output Voltage	Hi: 0-400 VDC Low: 0-200 VDC
Max. Current	Hi: 3.25 Arms Low: 6.5 Arms
DC Max Power	500W
DC Accuracy	0.1% FS

IFF-45TS

See IFF-45TS data sheet for specifications.

POWER SUPPLY (FOR UNIT UNDER TEST)

DC SUPPLY (Standard in -01, -03 systems)

Format	1U Rack
Input Voltage	90 ~ 132 VAC or 180 ~ 264 VAC
Input Frequency	47 ~ 63 Hz, single phase
Output Power	600 W
Output Voltage	0 to 40 V DC
Maximum Current	15 A

AC/DC SUPPLY (Standard in -02, -04 systems)

Format	2U Rack
Input Voltage	115 Vrms \pm 10% or 230 Vrms \pm 10%
Current	<8.5 Arms @ 115 V <4.4 Arms @ 230 V
Frequency	47 to 63 Hz

AC Characteristics

AC Output Voltage	Hi: 0 - 300 Vrms Low: 0 - 150 Vrms
Accuracy	0.1% FS
Max. Current	Hi: 3.25 Arms Low: 6.5 Arms
Accuracy	0.5% FS
AC Max Power	750 VA
Phase Output	1
AC Frequency	16-1000 Hz

VERSIONS, OPTIONS AND ACCESSORIES

Base Systems

Order Number	Version
90973	IFF7300S-01 Test System with IFF45TS-A (Modes 1, 2, 3/A, 4, C, S) and DC UUT power supply
90974	IFF7300S-02 Test System with IFF45TS-A (Modes 1, 2, 3/A, 4, C, S) and AC/DC UUT power supply
90975	IFF7300S-03 Test System with IFF45TS (Modes 1, 2, 3/A, 4, 5, C, S) and DC UUT power supply. For NATO countries requiring Mode 5.
112402 *	IFF7300S-04 Test System w/o IFF45TS (Modes 1, 2, 3/A, 4, 5, C, S) and AC/DC UUT power supply. For NATO countries requiring Mode 5.
90976	IFF7300S-04 Test System with IFF45TS (Modes 1, 2, 3/A, 4, 5, C, S) and AC/DC UUT power supply. For NATO countries requiring Mode 5.
92717 *	IFF7300S-50 Test System with 1 IFF45TS (Modes 1,2,3/A, 4, 5, C, S). For NATO countries requiring Mode 5.
112285	IFF7300S-50 Test System with 2 IFF45TS's (Modes 1,2,3/A, 4, 5, C, S). For NATO countries requiring Mode 5.

*Note: This configuration requires customer supplied IFF-45TS

Optional Accessories

Order Number	Description
83404	45TSOPT1 IFF Xndr Mode 5 Option (Export License Req'd)
83407	45TSOPT4 DME/TACAN Option (Export License Req'd)
88631	45TSOPT6 KIV-77 Adapter
89879	45TSOPT8 KIT/KIR Adapter
66075	45TSOPT9 KIV-78 Adapter
90983	IFF7300S-OPT01 MIL-STD-1553 bus control
90984	IFF7300S-OPT02 MIL-STD-1553 bus control with parametric measurement
90986	IFF7300S-OPT04 Synchro/Resolver Receiver (Required for TACAN testing)
90987	IFF7300S-OPT05 Synchro/Resolver Transmitter (Required for TACAN and indicator testing)

91074	IFF7300S-OPT08 THORsi TPS Developer Training Program
72438	IFF45TS Transponder Modes 1,2,3/A,4 (Internal Crypto),C,S (Mode 5 capable)
83405	45TSOPT2 Interrogator Modes 1,2,3/A,C,S,4
83406	45TSOPT3 IFF Interrogator Mode 5 (requires option 2)
TBD	DC Power Supply Kit
TBD	AC/DC Power Supply Kit

Test Program Sets

Order Number	Source Document	UUT and Test Level
90977	TM11-5895-490-35	TPS, AN/APX-72 Transponders, Level 1 testing
91605	TM 11-5895-490-20	TPS, C-6280 Control Head (for APX-72 and APX-101)
88518	TM11-5895-1037-30&P	TPS, AN/APX-100 Transponders, panel mount variants, Level 1 testing
92014	TM11-5895-1037-30&P	TPS, AN/APX-100 Transponders, panel mount variants, Level 2 testing
90768	TM11-5895-1037-30&P	TPS, AN/APX-100 Transponders, remote mount variants, Level 1 testing
92015	TM11-5895-1037-30&P	TPS, AN/APX-100 Transponders, remote mount variants, Level 2 testing
90997	TM11-5895-1037-30&P	TPS, AN/APX-100 Transponders, 1553 bus variants, Level 1 testing
92891	TM11-5895-1037-30&P	TPS, AN/APX-100 Transponders, 1553 bus variants, Level 2
91604	TM11-5895-1037-30&P	TPS, AN/APX-100 Control Head, Level 1
90978	TO12P4-2APX101-7	TPS, AN/APX-101 Transponders, Level 1 testing
90981	523-0774760	TPS, ARN-153 TACAN, Level 1 (contact Rockwell Collins for quote)
92031	n/a	TPS, KIV-77 Crypto Appliqué Level 1
92716	n/a	TPS, KIV-78 Crypto Appliqué Level 1

Example Configurations

IFF-7300S for AN/APX-100 testing, panel mount and remote mount
Specify 90973 with 88518 and 90768

IFF-7300S for AN/APX-101 testing
Specify 90973 with 90983 and 90978

EXPORT CONTROL:

This product is controlled for export under the International Traffic in Arms Regulations (ITAR). A license from the U.S. Department of State is required prior to the export of this product from the United States.

EXPORT WARNING:

Aeroflex's military products are controlled for export under the International Traffic in Arms Regulations (ITAR) and may not be sold or proposed or offered for sale to certain countries including: Belarus, Burma, China, Cuba, Haiti, Iran, Liberia, Libya, North Korea, Somalia, Syria, Sudan, and Vietnam. See ITAR 126.1 for complete information.

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The Aeroflex logo features a stylized blue 'A' icon followed by the word 'AEROFLEX' in a bold, black, sans-serif typeface.

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