The IFF-45TS is an RF signal generator that provides support for AIMS Mark XIIA transponders and interrogators. It operates under remote control from a computer or ATE system and provides versatile signal generation and measurement capability of Mark XIIA system signals in bench and over-the-air applications. Typical applications include:

- Support for engineering development of Mark XIIA equipment (Mode 5)
- Manufacturing ATE for Mark XIIA equipment
- Support for DO-260B, AIMS 03-1000A and DO-181D certification testing
- Over-the-air testing of Mark XIIA equipment
- Test range to 3 km with appropriate antennas
- Ramp testing of installed equipment performance

**AUTOMATED TEST SOLUTION**

Aeroflex recommends the IFF-7300S as a solution for the automation of Transponder/Interrogator/TACAN Crypto testing using the IFF-45TS.

For additional information about the IFF-7300S IFF/TACAN Automated Test System, please visit our web site.
### GENERAL SPECIFICATIONS

#### USER INTERFACE

**Interfaces Supported**
- IEEE-488, RS232 and Ethernet (VXI-11)
- PC Windows based GUI provided.

#### MODES OF OPERATION

**Transponder Testing**
1, 2, 3/A, C, S, 4, 5

**Interrogator Testing**
1, 2, 3/A, C, S, 4, 5

**DME/TACAN Testing**
G/A, INV G/A, BG/A, BA/A, A/A, INV A/A

**ADS-B Transponder Out, GCIB Decode**

#### SIGNAL GENERATOR

**Frequency Range**
955 to 1223 MHz, 10 KHz resolution

**Output Amplitude**
- **Direct Port**
  - 0.0 dBm to -110.0 dBm
  - (into 50 Ω) in 0.1 dB increments
  - **Accuracy @ 25° ± 5°C**
    - 0.0 dBm to -80.0 dBm: ±0.5 dB
    - -80.0 dBm to -100 dBm: ±[0.5 dB + 0.05 dB per dB below -80 dBm]$^1$
    - -100.0 dBm: ±[1.5 dB + 0.35 dB per dB below -100 dBm]$^2$
  - **Accuracy over full temp**
    - 0.0 dBm to -80.0 dBm: ±1.0 dB
    - -80.0 dBm to -100 dBm: ±[1.0 dB + 0.10 dB per dB below -80 dBm]$^2$
    - -100.0 dBm: ±[3.0 dB + 0.70 dB per dB below -100 dBm]$^2$

**Antenna Port**
- 0.0 dBm to -60.0 dBm (into 50 Ω) in 0.1 dB increments
  - **Accuracy @ 25° ± 5°C**
    - Power ≥ -30.0 dBm: ±1.0 dB
    - Power < -30.0 dBm: ±[1.0 dB + 0.033 dB per dB below -30 dBm]$^2$
  - **Accuracy over full temp**
    - Power ≥ -30.0 dBm: ±2.0 dB
    - Power < -30.0 dBm: ±[2.0 dB + 0.066 dB per dB below -30 dBm]$^2$

**Pulse Formats**
- **Transponder/Interrogator**
  - 1, 2, 3/A, C, S
- **Secure Modes**
  - 4, 5
- **Modes 3/A, C, S** comply with RTCA/DO-181C; Modes 1, 2, 4, 5 comply with DOD AIMS 03-1000A

**DME/TACAN**
- G/A, A/A, INVERSE G/A, INVERSE A/A, BEACON G/A, BEACON A/A

**Pulse Position Deviations**
- **XPDR** ±1 μs
- **INT** ±1 μs
- **NT Mode 5** ±0.25 μs
- **Accuracy (XPDR/INT)** ±10 ns
- **TACAN** ±12.0 μs
- **Accuracy (TACAN)** ±50 ns

**Notes**
1. Hence, for a power setting of -85 dBm, the accuracy will be ±[0.5 + 0.05*5], or ±0.75 dB, and for a power setting of -95 dBm, the accuracy will be ±[0.5 + 0.05*15], or ±1.25 dB
2. As per example above
3. * Pulse overlap not allowed

**Pulse Width Deviations**
- **XPDR/INT** ±0.5 μs
- **Accuracy (XPDR/INT)** ±10 ns
- **TACAN** ±5.5 μs
- **Accuracy (TACAN)** ±50 ns

**Interference Pulse Characteristics (1 or 2 pulses)**
- **Position**
  - 1st pulse relative to reference pulse
- **Offset range**
  - XPDR: -44 μs to 400 μs
  - INT: -1 μs to 400 μs
  - **Accuracy** ±10 ns

**Interference Pulse Spacing (multiple pulse interference mode)**
- **Range**
  - DME/TACAN: -1 to 400.00 nm in 0.01 nm steps
  - INT: 0 to 400.00 nm
  - **Accuracy** ±0.02 nm ±0.00003% of simulated range

**Range Delay**
- **Range**
  - DME/TACAN: 30 nm, fixed
  - INT: +5 to -15 dB, relative to PI
  - **Accuracy** ±0.25 dB

**Channel Signal Assignment**
- **Transponder Test**
  - Top/Bottom
- **Interrogator Test**
  - Sum/Difference
- **TACAN**
  - Top/Bottom

**Interrogation Generator**
- **Independent/Unique Interrogations** 1-12
- **Fixed Mode**
  - SIF Mode: 1-10000 PRF
  - Mode 5: 1-1200 PRF
  - Mode S: 1-2500 PRF
  - Mode 4: 1-3500 PRF
- **Double/Supermode**
  - Spacing between interrogations (slaved delay): 0-400 μs
  - Pair generation rate: 1-400 PRF
  - Supermode interrogations: 2 interrogations

**Burst Mode**
- **Bursts/trigger**: 1-1000 or infinite
- **Interrogations/burst**: 1-2500
- **Interrogation rate (within a burst)**: 1-2500 PRF
- **Spacing between burst sequences**: 0.1-20 sec

**Interlaced Mode**
- **Interlace ratio**: 1:1 - 1:63
- **Group rate**: 1-400 PRF
**Reply Generator**
- Independent/Unique Replies: 1-12
- Data and Range: Individually configured
- Selectable Modes: 1,2,3,A,C,S,4,5
- Selectable Efficiency: 1-100%

**Spectral Purity Residual Level**
- Harmonics
  - Direct: <50 dBc
  - Antenna: <40 dBc
- Spurious (> modulation BW): <60 dBc, 350 - 1800 MHz
- Phase Noise: <80 dBc/Hz @ 100 kHz

**SIGNAL RECEIVER MEASUREMENTS**

**Frequency Range**
- 1020 to 1155 MHz

**Input Amplitude**
- Pulse Power Measurements
  - Direct +30 dBm to +66 dBm: ±0.5 dB
  - Antenna -40 to +30 dBm: ±1 dB
  - Resolution: 0.01 dB

  - -10° to 55° C
  - Direct +30 dBm to +66 dBm: ±1 dB
  - Antenna -40 to +30 dBm: ±2 dB
  - Resolution: 0.01 dB

**Pulse to Pulse Spacing**
- XPDR/INT
  - Non-Mode 5: ±0.3 μs
  - Mode 5: ±0.0625 μs
  - Accuracy: ±10 ns
  - TACAN: ±0.5 μs
  - Accuracy: ±50 ns

**Pulse Width**
- XPDR/INT: ±0.200 μs
  - Accuracy: ±10 ns
- TACAN: ±0.5 μs
  - Accuracy: ±50 ns

**Reply Delay**
- Accuracy: ±20 ns

**Reply Delay Jitter**
- Accuracy: ±20 ns

**Frequency**
- Accuracy: ±50 KHz

**% Reply**
- Range: 0-100% for each interrogation type
- Resolution: 0.0125% (for sample size = 8000)
- Sample Size: 1 - 8000 interrogations

**SPECIFIC APPLICATION**

**TACAN/DME**

**Pulse Width**
- Range: (50% to 50%) 3.5 μs to 9.0 μs
- Accuracy: ±0.1 μs

**Ident**
- Variable
  - 10 sec to 60 sec
  - Alphanumeric char.: 1 to 8 [A to Z]

**Bearing**
- Range: 0° to 359.9° in 0.01° steps
- Accuracy: ±0.05°
- Rate: 0° to 39° sec in 1° steps

**Velocity**
- Range: 0 to 9999 Kts in 1 Kt steps
- Accuracy: ±0.001%

**Squitter**
- Range: 10 to 8000 Hz
- Accuracy: 10 Hz or 2%, whichever is greater
  - Distribution: Compliant with ARINC 568 @ 2700 Hz

**Main Reference Burst**
- Adjustable Burst (all modes): +1, +2, -1 or -2
  - Selectable: On/Off
  - X Channel: 12 pulse pairs
  - Y Channel: 13 single pulses
  - A/A (all channels): 10 single pulses
  - Accuracy: ±100 ns

**Auxiliary Reference Burst**
- Adjustable Burst (all modes): +1, +2, -1, or -2
  - X Channel: 6 pulse pairs
  - Y Channel: 13 single pulses
  - Accuracy: ±100 ns

**TACAN Modulation**
- Range: 0% to 39% in 1 Hz steps
  - Accuracy: ±1%
  - Distortion: <5% of either tone
  - A/A Interrogation Rate: 0 to 3999 Hz in 1 Hz steps
  - Reply Efficiency: 0 to 100% in 1% steps

**Crypto Appliqué Compatibility**
- KIV-77 - AIMS Type B, Mode 4/5
- KIV-78 - AIMS Type A, Mode 4/5
- KIV-6 - Mode 4
- KT-1(A/C) / HIR-1(A/C) cables (external power cable)

**Built-in Crypto Appliqué Function**
- Mode 4 Internal Crypto Simulator (standard)
  - Word A/B, C1 - C16
- Mode 5 Internal Crypto Simulator (standard with options 1 and 3)
  - As defined by the U.S. Navy Mode 5 Program Office
**VERSIONS AND ACCESSORIES**

<table>
<thead>
<tr>
<th>Order Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>72438</td>
<td>IFF45TS Transponder Modes 1,2,3/A,4 (Internal Crypto), C,S (Mode 5 capable)</td>
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<tr>
<td>72439</td>
<td>IFF45TS-A Transponder Modes 1,2,3/A,4 (Internal Crypto), C,S</td>
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<td>83404</td>
<td>45TSOPT1 IFF Transponder Mode 5</td>
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<tr>
<td>83405</td>
<td>45TSOPT2 Interrogator Modes 1,2,3/A, C,S,4</td>
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<tr>
<td>83406</td>
<td>45TSOPT3 IFF Interrogator Mode 5 (requires option 2)</td>
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<tr>
<td>83407</td>
<td>45TSOPT4 DME/TACAN</td>
</tr>
<tr>
<td>91684</td>
<td>45TSOPT5 ADS-B Out</td>
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</tbody>
</table>

**Standard Accessories**
- PC Windows-based GUI
- Getting Started Manual
- Operation Manual (CD)
- AC power cord

**Optional Accessories**
- 88631 45TSOPT6 KIV 77 adapter
- 89879 45TSOPT8 KIT/KIR-1A/C adapter
- 86075 45TSOPT9 KIV 78/KIV 6 adapter
- 63975 AC45TS-CNTR Touchscreen monitor/ controller
- 86931 UC-584 Universal Transponder Antenna Coupler

**Extended Warranty**
- 84363 Extended standard warranty 36 months with scheduled calibration
- 84364 Extended standard warranty 60 months with scheduled calibration

**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.