

## Specification Sheet

# VIAMI

## IFF-45TS

### MK XIIA/TACAN Bench Test Set

### 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] <sup>1</sup>
< -100.0 dBm	± [1.5 dB + 0.35 dB per dB below -100 dBm] <sup>2</sup>
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] <sup>2</sup>
< -100.0 dBm	±[3.0 dB + 0.70 dB per dB below -100 dBm] <sup>2</sup>

### Antenna Port

+30.0 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] <sup>2</sup>
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] <sup>2</sup>

### 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	/A, A/A, INVERSE G/A, INVERSE A/A, BEACON G/A, BEACON A/A

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

## Signal Generator (continued)

Pulse Position Deviations	
XPDR	±1 µs
INT Non-Mode 5	±1 µs
INT Mode5	±0.25 µs
Accuracy [XPDR/INT]	±10 ns
TACAN <sup>3</sup>	12 ± 0.1 µs
Accuracy [TACAN]	±100 ns
Pulse Width Deviations	
Transponder <sup>4</sup>	Nominal ±0.6 µs (fixed in Mode S-SPR)
Accuracy	±10 ns
Interrogator <sup>4</sup>	Nominal ±0.5 µs
Accuracy	±10 ns
TACAN	3.5 µs to 9.0 µs
Accuracy	±0.1 µs
Pulse Amplitude	
XPDR/INT	+5 to -15 dB
TACAN	±5 to -15 dB
Interference Pulse Characteristics (1 or 2 pulses)	
Position	-1 µs to +400 relative to reference
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	-1 µs to +400 relative to 1st pulse
Max 2nd pulse position	400 µs - 1st pulse position
Accuracy	±10 ns
Range Delay	
DME/TACAN	1 to 400.00 nmi in 0.01 nm steps
Accuracy	0.02 nm or 0.0003% of simulated range
INT	0 to 400.00 nmi
Accuracy	±0.01 nmi
Diversity	
Timing (either channel)	0 to ±1 µs, ±10 ns accuracy
Echo	
DME/TACAN	
Amplitude Variation	
Accuracy	
Channel Signal Assignment	
Transponder Test	Top/Bottom
Interrogator Test	Sum/Difference
TACAN	Top/Bottom

<sup>3</sup> - Pulse overlap not allowed

<sup>4</sup> - Minimum pulse width is 200 ns

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 (internal) 1-2500 PRF (external)
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)	1-400 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)	<60dBc, 350 - 1800 MHz
Phase Noise	<80 dBc/Hz @ 100 kHz
Signal Receiver Measurements	
Frequency Range	
1020 to 1155	
Input Amplitude	
Pulse Power Measurements	
25 ±5 ° C	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

## Signal Receiver Measurements (continued)

Pulse to Pulse Spacing	
XPDR/INT	
Non-Mode 5	±0.3 µs
Mode 5	±0.0625 µs
Accuracy	±10 ns
TACAN	
Accuracy	±50 ns
Pulse Width	
XPDR/INT	
Accuracy	±0.200 µs
Accuracy	±10 ns
TACAN	
Accuracy	2.5 to 4.5 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	
Ident	
Variable	10 sec to 60 sec
Alphanumeric Character	1 to 8 [A to Z]
Bearing	
Range	0° to 359.9° in 0.1° steps
Accuracy	±0.05°
Rate	0° to 39° sec in 0.01° 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 (15 Hz and 135 Hz separately adjustable)
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	
KIT-1(A/C) / KIR-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	

## Interface Signals

Analog Signal Ports (programmable output)	
2 Ports	
Programmable Sources	Various
Level	±1 V into 50 Ω
Trigger Out (front panel)	
Programmable Source	TX timing ref, RX detection
Level	3.3 V logic
Trigger In (front panel)	
Functions	Interrogation Trigger Reply Trigger
Level	3.3 or 5 V logic
Suppression Out	
Amplitude into 2 KΩ	12 V to 80 V
Variable Pulse Width	0.25 µs - 300 µs
Suppression In	
Amplitude	10 V to 80 V
Impedance	2.2 KΩ
Action	Inhibits response to incoming signal

## General

Frequency/Time Reference	2.5 ppm composed of 1 ppm/year aging and 1 ppm accuracy over temp
External Reference Input	2.5 ppm composed of 1 ppm/year aging and 1 ppm accuracy over temp
VSWR	Direct = 1.2:1 over frequency range
	Antenna = 2.5:1 over frequency range
Input Power	100-240 VAC, 50-60 Hz, 3 Amp fuse

## Environmental

Temperature Range	-10° to 55° C (14° to 131° F)
Warm-up (for specified accuracy)	45 minutes

## Physical Characteristics

Dimensions (w/o controller)	17.75" W x 4" H x 21" D (45 cm x 10 cm x 53 cm)
Weight	24 lbs (10 kg)

## Test Set Certifications

UL
CE
DoD AIMS MK XIIA Level 1 and Level 2