

Data Sheet

# VIavi AVX-10K

## Flight Line Test Set

This document defines the performance specifications for the AVX-10K Flight Line Test Set. A 5 minute warm-up period is required for full compliance to all specifications.

### DME Mode Specifications

#### Signal Generator

A 5-minute warm-up period is required for all specifications.

#### Output Frequency

Reply Frequency	
Range	962 to 1213 MHz
Accuracy	±10 kHz

#### Output Level

Antenna Port	
Range	-67 to -2 dBm at Antenna port
Resolution	1 dB
Accuracy	±2 dB
Distance to UUT antenna (ref only)	6 to 300 ft with supplied antenna

#### RF I/O Port

Range	-115 to -47 dBm
Resolution	1 dB
Accuracy, -95 dBm to -47 dBm	±1 dB
Accuracy, -115 dBm to <-95 dBm	±2 dB

#### Reply Pulse Spacing

P1 to P2	12 μs ±100 ns (X Channel) @ 50% peak
P1 to P2	30 μs ±100 ns (Y Channel) @ 50% peak

#### Reply Pulse Width

P1/P2	3.5 μs ±0.5 μs
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#### Echo Reply

Control	On/Off
Position	30 nmi ±1 nmi
Amplitude	±11 dB ±1 dB relative to reply level

#### Reply Pulse Rise and Fall Times

All Pulses	
Rise Time	2.5 μs ±0.25 μs (10% to 90%)
Fall Time	2.5 μs ±0.25 μs (90% to 10%)

#### Reply Delay

X Channel	
Fixed Reply Delay	50 μs ±100 ns
Y Channel	
Fixed Reply Delay	56 μs ±100 ns

#### Range Delay

X and Y Channel	
Range	0 to 450.00 nmi
Resolution	0.01 nmi
Accuracy	±0.01 nmi

#### Range Rate

X and Y Channel	
Range	10 to 6500 kts
Resolution	1 kts
Accuracy	±0.01 % typical, tested to ±0.5%

#### Squitter

PRF	2700 Hz
Accuracy	±2%
Distribution	Per ARINC 568

#### Reply Efficiency

Range	0 to 100%
Resolution	1% increments
Accuracy	±0.5%

#### Ident Tone

Selection	Selectable three letter code
Frequency	1350 Hz
Accuracy	±2 Hz

#### UUT Measurements

ERP	
Range	+47 to +64 dBm
Resolution	0.1 dB
Accuracy	±2 dB



## DME Mode Specifications continued

### Direct Connection Peak Pulse Power

Range	+47 to +64 dBm
Resolution	0.1 dB
Accuracy	±1 dB

### Frequency

Range	1025.00 to 1150.00 MHz
Resolution	10 kHz
Accuracy	±20 kHz

### Interrogation Pulse Width

#### P1 and P2 Pulse Widths

Range	2.00 to 5.00 µs
Resolution	1 ns
Accuracy	±50 ns

### Interrogation Pulse Spacing

P1 to P2 Spacing	10 to 14 µs (X Channel)
P1 to P2 Spacing	34 to 38 µs (Y Channel)
Resolution	10 ns
Accuracy	±20 ns

### Interrogation PRF

Range	1 to 300 Hz
Resolution	1 Hz
Accuracy	±2 Hz

## Transponder Mode

### Signal Generator

A 5-minute warm-up period is required for all specifications.

### RF Output Frequency

Interrogation Frequency	1030 MHz
Accuracy	±10 kHz

### RF Output Level

Antenna Port	MTL + 6 dB typical, automatically controlled for a MTL range of -83 to -68 dBm
Range	-67 to -2 dBm at antenna port
Resolution	0.5 dB
Accuracy	±2 dB
Distance to UUT Antenna	6 to 200 ft with supplied antenna
RF I/O Connector	MTL + 6 dB typical, automatically controlled
Range	-115 to -47 dBm
Resolution	0.5 dB
Accuracy	-95 to -47 dBm (±1 dB)
Accuracy	-115 to <-95 dBm (±2 dB)

### ATCRBS/MODE S Interrogation Pulse Spacing

Mode A	
P1 to P2	2.00 µs (±25 ns)
P1 to P3	8.00 µs (±25 ns)
Mode C	
P1 to P2	2.00 µs (±25 ns)
P1 to P3	21.00 µs (±25 ns)
Mode S	
P1 to P2	2.00 µs (±25 ns)
P1 to P6	3.50 µs (±25 ns)
P1 to SPR	4.75 µs (±25 ns)
P5 to SPR	0.40 µs (±50 ns)

### Intermode Interrogation Pulse Spacing

Mode A	
P1 to P3	8.00 µs (±25 ns)
P1 to P4	10.00 µs (±25 ns)
Mode C	
P1 to P3	21.00 µs (±25 ns)
P1 to P4	23.00 µs (±25 ns)

### Interrogation Pulse Widths

Modes A, C, S, Intermode	
P1, P2, P3	0.80 µs (±50 ns)
Mode S	
P6 (Short DPSK Block)	16.25 µs (±50 ns)
P6 (Long DPSK Block)	30.25 µs (±50 ns)
P5	0.80 µs (±50 ns)
Intermode	
P4 (Short)	0.80 µs (±50 ns)
P4 (Long)	1.60 µs (±50 ns)

### Interrogation Pulse Rise and Fall Times (All Modes)

Rise Time	50 to 100 ns
Fall Time	50 to 200 ns

### Phase Modulation (All Modes)

Transition Time	<80 ns
Phase Shift	180° ±10°

### SLS Levels (Automatically controlled in the SLS LEVEL test)

ATCRBS	
SLS Level (P2)	-9 dB, -1 to +0 dB relative to P1 level
	0 dB, -0 to +1 dB relative to P1 level
	OFF
Mode S	
SLS Level (P5)	-12 dB, -1 to +0 dB relative to P6 level
	+3 dB, -0 to +1 dB relative to P6 level
	OFF

### Interrogation Test Signals

Mode S	PRF: 50 Hz (±5 Hz)
ATCRBS	PRF: 235 Hz (±5 Hz)

## Transponder Mode continued

UUT Measurements	
<b>ERP (@ 1090 MHz)</b>	
Range	+45.5 to +59 dBm (35.5 to 800 watts)
Resolution	0.1 dB
Accuracy	±2 dB
<b>Direct Connection Peak Pulse Power (@ 1090 MHz)</b>	
Range	+46.5 to +59 dBm (45 to 800 Watts)
Resolution	0.1 dB
Accuracy	±1 dB
<b>Transmitter Frequency</b>	
Range	1087.000 to 1093.000 MHz
Resolution	10 kHz
Accuracy	±50 kHz
<b>Receiver Sensitivity, Radiated MTL</b>	
Range	-79 to -67 dBm into 0 dBi antenna
Resolution	0.1 dB
Accuracy	±2 dB, typical
<b>Receiver Sensitivity, Direct Connection MTL</b>	
Range	-79 to -67 dBm
Resolution	0.1 dB
Accuracy	±2 dB
<b>Reply Delay</b>	
ATCRBS	
Range	1.80 to 7.00 µs
Resolution	10 ns
Accuracy	±50 ns
Reply Delay, Mode S and ATCRBS Mode S ALL-CALL	
Range	125.00 to 131.00 µs
Resolution	10 ns
Accuracy	±50 ns
<b>Reply Delay Jitter</b>	
ATCRBS	
Range	0.00 to 2.30 µs
Resolution	1 ns
Accuracy	±20 ns
Mode S and ATCRBS Mode S ALL-CALL	
Range	0.00 to 6.00 µs
Resolution	1 ns
Accuracy	±20 ns
<b>Pulse Spacing</b>	
F1 to F2	
Range	19.70 to 21.60 µs
Resolution	1 ns
Accuracy	±20 ns
Mode S Preamble	
Range, P1 to P2	0.8 to 1.2 µs
Range, P1 to P3	3.3 to 3.7 µs
Range, P1 to P4	4.3 to 4.7 µs

Resolution	1 ns
Accuracy	±20 ns
<b>Pulse Widths</b>	
F1 to F2	
Range	0.25 to 0.75 µs
Resolution	1 ns
Accuracy	±20 ns
Mode S Preamble	
Range	0.25 to 0.75 µs
Resolution	1 ns
Accuracy	±20 ns
<b>PULSE Amplitude Variation</b>	
Range	
Mode S (Relative to P1)	-3 to +3 dB
ATCRBS (Relative to F1)	-3 to +3 dB
Resolution	0.1 dB (0.01 dB via RCI)
Accuracy	±0.5 dB
<b>DF 11 Squitter Period</b>	
Range	0.10 to 4.88 sec
Resolution	10 ms
Accuracy	±10 ms
<b>Diversity Isolation</b>	
Range	0 to >20 dB (depending on test distance)
Test Distance	1.83 m (6ft) to 28.96 m (95 ft)
Resolution	0.1 dB
Accuracy	±3 dB
<b>TCAS Mode</b>	
<b>Signal Generator</b>	
<b>Output Frequency</b>	
Reply Frequency	1090 MHz
Accuracy	±10 kHz
<b>Output Level (simulated ERP)</b>	
Antenna Port <sup>12</sup>	
Radiated power at 0 dBi UUT antenna	-68 dBm typical @ 10 nmi (range, automatically controlled)
Range	-67 to -2 dBm at antenna connector
Resolution	0.5 dB
Accuracy	±2 dB
Distance to UUT antenna	6 to 300 ft. with supplied antenna
<b>RF I/O Connector</b>	
Automatic Mode	-68 dBm @ 10 nmi (range automatically controlled)
Manual Mode Range	-115 to -47 dBm
Resolution	0.5 dB
Accuracy	-95 to -47 dBm (±1 dB)
Accuracy	-115 to <-95 dBm (±2 dB)

## TCAS Mode continued

### Reply Pulse Spacing

Mode C	
F1 to F2	20.30 $\mu$ s $\pm$ 25 ns
F1 to C1	1.45 $\mu$ s $\pm$ 25 ns
F1 to A1	2.90 $\mu$ s $\pm$ 25 ns
F1 to C2	4.35 $\mu$ s $\pm$ 25 ns
F1 to A2	5.80 $\mu$ s $\pm$ 25 ns
F1 to C4	7.25 $\mu$ s $\pm$ 25 ns
F1 to A4	8.70 $\mu$ s $\pm$ 25 ns
F1 to B1	11.60 $\mu$ s $\pm$ 25 ns
F1 to D1	13.05 $\mu$ s $\pm$ 25 ns
F1 to B2	14.50 $\mu$ s $\pm$ 25 ns
F1 to D2	15.95 $\mu$ s $\pm$ 25 ns
F1 to B4	17.40 $\mu$ s $\pm$ 25 ns
F1 to D4	18.85 $\mu$ s $\pm$ 25 ns
Mode S	
P1 to P2	1.00 $\mu$ s $\pm$ 25 ns
P1 to P3	3.50 $\mu$ s $\pm$ 25 ns
P1 to P4	4.50 $\mu$ s $\pm$ 25 ns
P1 to D1	8.00 $\mu$ s $\pm$ 25 ns
D1 to Dn (n=2 to 112)	1.00 $\mu$ s times (n-1) $\pm$ 25 ns

### Reply Pulse Widths

Mode C	
All pulses	0.45 $\mu$ s $\pm$ 50 ns
Mode S	
P1 through P4	0.50 $\mu$ s $\pm$ 50 ns
D1 through D112	0.50 $\mu$ s ( $\pm$ 50 ns), 1 $\mu$ s chip width
Reply Modes	TCAS I / II Mode C (with altitude reporting) TCAS II Mode S formats 0, 11, 16

### Reply Pulse Amplitudes

ATCRBS	$\pm$ 1 dB relative to F1
Mode S	$\pm$ 1 dB relative to P1

### Reply Pulse Rise and Fall Times (All Modes)

Rise Time	30 to 100 ns
Fall Time	30 to 200 ns

### Percent Reply

Range	0 to 100%
Resolution	1%
Accuracy	$\pm$ 1%

### Reply Delay

ATCRBS	3.0 $\mu$ s $\pm$ 50 ns
Mode S	128 $\mu$ s $\pm$ 50 ns

### Range Delay

Range	0 to 260 nmi
Resolution	0.1 nmi
Accuracy	$\pm$ 0.02 nmi

### Range Rate

Range	-1200 to +1200 kts
Resolution	10 kts
Accuracy	10%

### Altitude Range

Range	-1000 to 126,000 ft.
Resolution, Mode C	100 ft.
Resolution, Mode S	25 ft.

### Altitude Rate

Range	-10,000 to +10,000 fpm
Resolution	100 fpm
Accuracy	10%

### Squitter

Control	On/Off
Rate	0.8 to 1.2 seconds, randomly distributed

### Receiver

Pulse Spacing (ATCRBS, Mode C ALL CALL)	
S1 to P1	2.0 $\mu$ s
Accepts	< $\pm$ 200 ns
Rejects	> $\pm$ 1.0 $\mu$ s
P1 to P3	21.0 $\mu$ s
Accepts	< $\pm$ 200 ns
Rejects	(<10% Replies) > $\pm$ 1.0 $\mu$ s
P1 to P4	23.0 $\mu$ s
Accepts	< $\pm$ 200 ns
Rejects	(<10% Replies) > $\pm$ 1.0 $\mu$ s

Mode S	
P1 to P2	2.0 $\mu$ s
Accepts	< $\pm$ 200 ns
Rejects	(<10% Replies) > $\pm$ 1.0 $\mu$ s
P1 to SPR	4.75 $\mu$ s
Accepts	< $\pm$ 200 ns
Rejects	(<10% Replies) > $\pm$ 1.5 $\mu$ s

### Suppression

ATCRBS (P2 or S1)	
>0.5 dB above level of P1	<10% Replies

### UUT Measurements

ERP (@ 1030 MHz)	
ATCRBS	
Range	+43 to +58 dBm (20 to 631 watts)
Resolution	0.1 dB
Accuracy	$\pm$ 2 dB
Mode S	
Range	+43 to +58 dBm (20 to 631 watts)
Resolution	0.1 dB
Accuracy	$\pm$ 2 dB

### Direct Connection Peak Pulse Power (@ 1030 MHz)

ATCRBS	
Range	+43 to +58 dBm (20 to 631 watts)

## TCAS Mode continued

Resolution	0.1 dB
Accuracy	±1 dB

### Mode S

Range	+43 to +58 dBm (20 to 631 watts)
Resolution	0.1 dB
Accuracy	±1 dB

### Frequency

Range	1029.900 to 1030.100 MHz
Resolution	1 kHz
Accuracy	±10 kHz

### TCAS Broadcast Interval

Range	1.0 to 12.0 sec
Resolution	0.1 sec
Accuracy	±0.2 sec

## UAT Mode

### Signal Generator

#### RF Output Frequency

Transmit Frequency	978 MHz
Accuracy	±10 kHz

#### Output Level

Antenna Port	
Radiated power at 0 dbi UUT antenna	-85 dBm, automatically controlled
Range	-67 to -2 dBm at antenna connector
Resolution	0.5 dB
Accuracy	±2 dB
Distance to UUT antenna	6 to 150 ft. with supplied antenna
RF I/O Port	
Automatic mode	-85 dBm
Accuracy	±1 dB
Modulation	
Type	BPFSK per RTCA DO-282B
Deviation	±312.5kHz typical

### UUT Measurements

#### ERP (@ 978 MHz)

Range	+35 to +57 dBm (3.16 to 500 watts)
Resolution	0.1 dB
Accuracy	±2 dB
Test distance	6 to 150 ft with supplied antenna

#### Direct Connection Peak Pulse Power (@978 MHz)

Range	+35 to +57 dBm (3.16 to 500 watts)
Resolution	0.1 dB
Accuracy	±1 dB

### Frequency

Range	977.96 to 978.04 MHz
Resolution	1 kHz
Accuracy	±10 kHz

## NAV/COMM

### RF Output Frequency

Mode: Single	10.0 MHz to 400.0 MHz in 100 kHz steps
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### ILS and VOR Mode

Marker Beacon Channel	72.0 MHz to 78.0 MHz in 25 kHz steps
Marker Beacon Preset	74.5 MHz, 75.0 MHz, 75.5 MHz
Marker Beacon Variable	72.0 MHz to 78.0 MHz in 1 kHz steps
VOR Channel	108.0 MHz to 117.95 MHz in 50 kHz steps
VOR Preset	108.0 MHz, 108.05 MHz, 117.95 MHz
VOR Variable	107.0 MHz to 118.0 MHz in 1 kHz steps
LOC Channel	108.1 MHz to 111.95 MHz in 50 kHz steps
LOC Preset	108.1 MHz, 108.15 MHz, 110.15 MHz
LOC Variable	107.0 MHz to 113.0 MHz in 1 kHz steps
G/S Channel	329.15 MHz to 335.0 MHz in 50 kHz steps
G/S Preset	334.25 MHz, 334.55 MHz, 334.70 MHz
G/S Variable	327.0 MHz to 337.0 MHz in 1 kHz steps
Comm AM Channel	10.0 MHz to 400.0 MHz in 25 kHz steps (8.33 kHz steps available 118.0 to 156.0 MHz)
Comm AM Preset	118.0 MHz, 137.0 MHz, 156 MHz 225.0 MHz, 312.0 MHz, 400 MHz
Comm AM Variable	10.0 MHz to 400.0 MHz in 1 kHz steps
Comm FM Channel	136.0 MHz to 400.0 MHz in 12.5 or 25 kHz steps
Comm FM Preset	156.0 MHz, 165.0 MHz, 174.0 MHz
Comm FM Variable	136.0 MHz to 400.0 MHz in 1 kHz steps
Comm SSB Variable	10.0 MHz to 30.0 MHz in 100 Hz steps
SELCAL Channel	10.0 MHz to 30.0 MHz, 118.0 MHz to 156.0 MHz in 25 kHz steps
SELCAL Preset	10.045 MHz, 21.0 MHz, 30 MHz, 118.0 MHz, 137.0 MHz, 156 MHz
SELCAL Variable	10.0 MHz to 30.0 MHz, 118.0 MHz to 157.0 MHz in 1 kHz steps

### Output Level

#### Antenna Port (75 MHz to 400 MHz)

Single Carrier	+13 dBm to -67 dBm in 0.5 dB steps
Accuracy	±3 dB
Dual Mode LOC	0 dBm fixed
Accuracy	±2.5 dB
Dual Mode G/S	0 dBm to -76 dBm in 0.5 dB steps
Accuracy	±3 dB (0 to -67 dBm)
Tri-Mode Marker	+13 dBm fixed
Accuracy	±2 dB
Tri-Mode LOC	-9 dBm fixed
Accuracy	±2 dB
Tri-Mode G/S	-9 dBm to -83 dBm in 0.5 dB steps
Accuracy	±3 dB (±9 to -74dBm)

#### Antenna Port (10 MHz to 75 MHz)

Single Carrier	±17 dBm to -67 dBm in 0.5 dB steps
Accuracy	±3 dB

## NAV/COMM continued

RF I/O Port (75 MHz to 400 MHz)	
Single Carrier	±12 dBm to -130 dBm in 0.5 dB steps
Accuracy	-12 dBm to -39.5 dBm (±2.5 dB)
	-40 dBm to -94.5 dBm (±2.0 dB)
	-95 dBm to -120 dBm (±3 dB)
Dual Mode LOC	-25 dBm fixed
Accuracy	±2 dB
Dual Mode G/S	-22 dBm to -101 dBm in 0.5 dB steps
Accuracy	±2.5 dB
RF I/O Port (10 MHz to 75 MHz)	
Single Carrier	-40 dBm to -130 dBm in 0.5 dB steps
Accuracy	-40 dBm to -94.5 dBm (±2.0 dB)
	-95 dBm to -120 dBm (±3.0 dB)

## VOR Mode

### VOR Tone Frequency Accuracy

30 Hz Reference	±0.02%
30 Hz Variable	±0.02%
1020 Hz	±0.02%
9960 Hz	±0.02%

### AM Modulation

CAL	
30 and 9960 Hz Tones	30% AM, each tone
Accuracy	1% modulation
1020 Hz Tone	30% AM
1020 Hz Morse Code	10% AM
Accuracy	±2% modulation
Variable Range	0 to 55% AM
	30, 9960, and 1020 Hz Tones
Distortion	<2.0% in CAL position
FM Modulation	30 Hz reference at ±480 Hz peak deviation on 9960 Hz sub-carrier
Accuracy	±25 Hz peak deviation
Bearing	To – From Selectable
Preset Bearing	0°, 30°, 60°, 90°, 120°, 150°, 180°, 210°, 240°, 270°, 300° and 330°
Variable Bearing	3600 digitally derived courses in 0.1° increments.
Accuracy	±0.1°

## LOC Mode

### LOC Tone Frequency Accuracy

90 Hz	±0.02%
150 Hz	±0.02%
1020 Hz	±0.02%

### Modulation

CAL	
90 and 150 Hz tones	20% AM, each tone
1020 Hz Audio tone	30% AM
1020 Hz Morse code	10% AM
Accuracy	±2% modulation
Variable Range	0 to 28% AM, 90 and 150 Hz tones
	0 to 42% AM, 1020 Hz tone
Distortion	<2.5% in CAL position

### LOC DDM

Fixed Range	±0, 0.093, 0.155, 0.200 DDM and Tone Delete
Accuracy	±0.0015 DDM (±1.5 µA) ±3% of setting
	(≤+10 dBm Output Level)
Variable Range	±0.4 in 0.001 DDM steps
Accuracy	±0.0025 DDM (±2.5 µA) ±3% of setting
	(≤+10 dBm Output Level)

### Variable Sweep (Available only in dual and tri-modes)

Range	0 to ±30 µA
Sweep Rates	5 to 40 sec.
Step Size	5 sec.
Accuracy	±0.5 sec./sweep

### Phase Shift

Range	0 to 120 degrees in 5 degree increments (150 Hz phase relative to 90 Hz)
Accuracy	±0.5°

## G/S Mode

### G/S Tone Frequency Accuracy

90 Hz	±0.02%
150 Hz	±0.02%

### Modulation

CAL	
90 and 150 Hz tones	40% AM, each tone
Accuracy	±2% modulation
Variable Range	0 to 50% AM
	90 and 150 Hz tones
Distortion	<2.5% in CAL position

### G/S DDM

Fixed Range	±0, 0.091, 0.175, 0.400 DDM and Tone Delete
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## G/S Mode continued

Accuracy	$\pm 0.003$ DDM ( $\pm 2.5 \mu\text{A}$ ) $\pm 3\%$ of setting ( $\leq +10$ dBm Output Level)
Variable Range	$\pm 0.8$ DDM in 0.001 DDM steps
Accuracy	$\pm 0.0048$ DDM ( $\pm 4.0 \mu\text{A}$ ) $\pm 3\%$ of setting ( $\leq +10$ dBm Output Level)
<b>Phase Shift</b>	
Range	0 to 120 degrees in 5 degree increments (150 Hz phase relative to 90 Hz)
Accuracy	$\pm 0.5^\circ$

## Marker Mode

### Marker Tone Frequency Accuracy

400 Hz	$\pm 0.02\%$
1300 Hz	$\pm 0.02\%$
3000 Hz	$\pm 0.02\%$

### Modulation

CAL	
Setting	95% AM
Accuracy	$\pm 5\%$ modulation

### Variable (Single Carrier Only)

Range	0 to 95% AM
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### Distortion

Single Carrier	0 to 95% AM
Tri-Mode	< 2.5% in CAL position, -67 to +10dBm < 5% in CAL position

## COMM Mode (AM)

### COMM Tone Frequency Accuracy

1020 Hz	$\pm 0.02\%$
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### Modulation

CAL	
1020 Hz Tone	30% AM
Accuracy	$\pm 2\%$ modulation
Variable	
Range	0 to 95% AM
Distortion	< 2.5% in CAL position

## COMM Mode (FM)

### COMM Tone Frequency Accuracy

1000 Hz	$\pm 0.02\%$
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### Modulation

CAL	
1000 Hz Tone	5 kHz deviation
Accuracy	$\pm 5\%$
Variable	
Deviation Range	1 kHz to 80 kHz
Distortion	< 5% in CAL position

## COMM Mode ( SSB )

### COMM Tone Frequency Accuracy

1000 Hz	$\pm 6.25\text{Hz}$ referenced to carrier
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### Modulation

Variable	
Range Upper or Lower SB	25 Hz to 3000 Hz in 25 Hz steps

## COMM Mode (SELCAL)

Provides amplitude modulation with SELCAL (SElective CALLing) tones per DO-093A standard.

SELCAL Tone Frequency Accuracy	$\pm 0.02\%$
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### Transmit Modes

Single	Single transmission
Continuous	7.5 sec. interval (typical)

### Modulation

CAL	
Per SELCAL tone	40% AM
Accuracy	$\pm 2\%$ modulation

### Variable

Range	0 to 55% AM
Distortion	< 2.5% in CAL position

### SELCAL Tone Frequencies

Designator	Audio Frequency (Hz)
A	312.6
B	346.7
C	384.6
D	426.6
E	473.2
F	524.8
G	582.1
H	645.7
J	716.1
K	794.3
L	881.0
M	977.2
P	1083.9
Q	1202.3
R	1335.5
S	1479.1
T	329.2
U	365.2
V	405.0
W	449.3
X	498.3
Y	552.7
Z	613.1
1	680.0
2	754.2

## SELCAL Tone Frequencies continued

3	836.6
4	927.9
5	1029.2
6	1141.6
7	1266.2
8	1404.4
9	1557.8

## Meter Functions

### Power Meter (RF I/O Port)

Frequency Range	10.0 MHz to 400 MHz
Power Range	0.1 to <1 W Resolution: 0.01W
	1 to <100 W Resolution: 0.1W <sup>3</sup>
	100 to 1999 W Resolution: 1W <sup>3</sup>
Accuracy	±8% of reading ±1 count (100 to 400 MHz) <sup>4</sup>
	±12% of reading ±1 count (<100 MHz) CW only <sup>4</sup>
Duty Cycle	
≤10 W	Continuous
>10 W to ≤20 W	3 minutes on, 2 minutes off
>20 W to ≤30 W	1 minute on, 2 minutes off

### Frequency Measurement (COMM mode)

Antenna and RF I/O Port	
Range	10 MHz to 400 MHz (depending on Mode)
Resolution	100 Hz
Accuracy	Same as time base ±1 count
Sensitivity	
Antenna Port	≥ -35 dBm
RF I/O Port	≥ 0 dBm

### AM Meter

Audio Range	50 Hz to 3000 Hz
Percent Modulation Range	10 to 99%
Accuracy	±10% of reading
Sensitivity	
Antenna Port	≥ -20 dBm
RF I/O Port	≥ +15 dBm

### FM Meter

RF Frequency Range	136 to 512 MHz
Audio Range	50 Hz to 3000 Hz
Deviation Range	1 to 15 kHz
Accuracy	±(0.4 kHz + 8% of reading)
Sensitivity	
Antenna Port	≥ -35 dBm
RF I/O Port	≥ 0 dBm

## ELT

### 121.5/243 Beacon Monitor

Swept Audio Tone Range	100 Hz to 3000 Hz
Accuracy	±10% of reading
Sensitivity	
Antenna Port	≥ -30 dBm
RF I/O Port	≥ +10 dBm

### 406 MHz Beacon Monitor

Sensitivity	
Antenna Port	≥ -35 dBm
RF I/O Port	≥ 0 dBm

## SWR/DTF (SWR Port)

### SWR Meter

Frequency Range	10.0 MHz to 1250.0 MHz
Measurement Range	1 to 7 for SWR
Accuracy	
SWR < 3:1	±0.2 ±20% of reading
SWR ≥ 3:1	±0.3 ±20% of reading

### Distance to Fault (DTF)

Measurement Range	3 to 300 ft, 1 to 100 M
Accuracy	±1.5 ft + 1% of distance



## Misc. Inputs/Outputs

### RF I/O

Type	Input/Output
Impedance	50 $\Omega$ typical
Maximum Input Level	4 kW peak, 10 W average
VSWR	<1.3:1

### Antenna

Type	TNC, Input/Output
Impedance	50 $\Omega$ typical
Maximum Input Level	10 W peak, 0.5 W average
VSWR (30 to 1213MHz)	<1.7:1

### SWR

Type	TNC, Input/Output
Impedance	50 W typical
Maximum Input Level	20 mW max, 0V DC
VSWR	<1.5:1

### Test Antenna

VSWR	<1.5:1
Gain	8 dB, Typical

### Time Base (TCXO)

Temperature Stability	$\pm 1$ ppm
Aging	$\pm 1$ ppm per year
Accuracy	$\pm 1$ ppm

### Battery

Type	Li Ion
Duration	>4 hrs continuous operation >8 hrs, Typical

### Input Power (Test Set)

Input Range	11VDC-16VDC
Power Consumption	<60W Max

### Input Power (Supplied External AC to DC Converter)

Input Range	100 to 250 V AC, 1.5 A Max, 47 to 63 Hz
Mains Supply Voltage Fluctuations	<10% of the nominal voltage
Transient Over-voltages	According to Installation, Category II

<sup>1</sup> Simulates a 50.5dBm XPDR ERP at 10nMi range.

<sup>2</sup> Level automatically controlled based on actual distance to UUT antenna.

<sup>3</sup> External attenuator required for input power greater than 30W.

<sup>4</sup> Accuracy specification excluding external attenuator

<sup>5</sup> Temperature range extended to -20°C to 55°C.

<sup>6</sup> Temperature range reduced to -30°C to 71°C.

<sup>7</sup> Li Ion Battery must be removed below -20°C and above 60°C.

## Environmental

### Test Set

Use	Pollution Degree 2
Altitude	$\leq 4800$ meters
Operating Temp.	-20°C to 45°C (-4° to 113°F) Continuous Use $\geq 45^\circ\text{C}$ to 55°C (113° to 131°F) Intermittent Use (protected by automatic shutdown)
Battery Charging Temp. Range	5°C to 40°C (controlled by internal charger)
Storage Temp.	-30°C to 71°C (-22° to 159.8°F)
Relative Humidity	95% ( $\pm 5\%$ ) from 5° to 30°C (41° to 86°F) 75% ( $\pm 5\%$ ) from 30° to 40°C (86° to 104°F) 45% ( $\pm 5\%$ ) from 40° to 55°C (104° to 131°F)

### Supplied External AC to DC Converter

Use	Indoors
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## Physical Characteristics

### Dimensions

Height	12 in. (30.48 cm)
Width	5.3 in. (13.5 cm)
Depth	4 inches (10.2 cm)

### Weight (Test set only)

	6.5 lb (2.94 kg)
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## Certifications

### Test Set

Altitude, operating	MIL-PRF-28800F, Class 2
Altitude, not operating	MIL-PRF-28800F, Class 2
Bench Handling	MIL-PRF-28800F, Class 2
Blowing Dust	MIL-STD-810F, Method 510.4, Procedure 1
Drip-proof	MIL-PRF-28800F, Class 2
Explosive Atmosphere	MIL-STD-810F Method 511.4, Procedure 1
Safety Compliance	UL-61010B-1, EN 61010-1, CSA 22.2 No 61010-1
EMC	EN 61326
Relative Humidity	MIL-PRF-28800F, Class 2
Shock, Functional	MIL-PRF-28800F, Class 2
Vibration Limits	MIL-PRF-28800F, Class 2
Temp, operating	MIL-PRF-28800F, Class 2 <sup>5</sup>
Temp, not operating	MIL-PRF-28800F, Class 2 (with battery removed) <sup>6,7</sup>
Transit Drop	MIL-PRF-28800F, Class 2

### External AC-DC Converter

Safety Compliance	IEC 60950-1:2006 UL/EN 62368-1:2014
EMI/RFI Compliance	FCC PART 15 CLASS B ISED ICES-003 Issue 6 CISPR32: 2012 EN55032: 2012 VCCI LEVEL II
RoHS Compliance	2011/65/EU