

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 |
|-------|----------------|

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 | |
|--|--------------------------------------|
| ERP (@ 1090 MHz) | |
| Range | +45.5 to +59 dBm (35.5 to 800 watts) |
| Resolution | 0.1 dB |
| Accuracy | ±2 dB |
| Direct Connection Peak Pulse Power (@ 1090 MHz) | |
| Range | +46.5 to +59 dBm (45 to 800 Watts) |
| Resolution | 0.1 dB |
| Accuracy | ±1 dB |
| Transmitter Frequency | |
| Range | 1087.000 to 1093.000 MHz |
| Resolution | 10 kHz |
| Accuracy | ±50 kHz |
| Receiver Sensitivity, Radiated MTL | |
| Range | -79 to -67 dBm into 0 dBi antenna |
| Resolution | 0.1 dB |
| Accuracy | ±2 dB, typical |
| Receiver Sensitivity, Direct Connection MTL | |
| Range | -79 to -67 dBm |
| Resolution | 0.1 dB |
| Accuracy | ±2 dB |
| Reply Delay | |
| 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 |
| Reply Delay Jitter | |
| 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 |
| Pulse Spacing | |
| 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 |
| Pulse Widths | |
| 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 |
| PULSE Amplitude Variation | |
| 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 |
| DF 11 Squitter Period | |
| Range | 0.10 to 4.88 sec |
| Resolution | 10 ms |
| Accuracy | ±10 ms |
| Diversity Isolation | |
| 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 |
| TCAS Mode | |
| Signal Generator | |
| Output Frequency | |
| Reply Frequency | 1090 MHz |
| Accuracy | ±10 kHz |
| Output Level (simulated ERP) | |
| Antenna Port ¹² | |
| 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 |
| RF I/O Connector | |
| 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 μ s \pm 25 ns |
| F1 to C1 | 1.45 μ s \pm 25 ns |
| F1 to A1 | 2.90 μ s \pm 25 ns |
| F1 to C2 | 4.35 μ s \pm 25 ns |
| F1 to A2 | 5.80 μ s \pm 25 ns |
| F1 to C4 | 7.25 μ s \pm 25 ns |
| F1 to A4 | 8.70 μ s \pm 25 ns |
| F1 to B1 | 11.60 μ s \pm 25 ns |
| F1 to D1 | 13.05 μ s \pm 25 ns |
| F1 to B2 | 14.50 μ s \pm 25 ns |
| F1 to D2 | 15.95 μ s \pm 25 ns |
| F1 to B4 | 17.40 μ s \pm 25 ns |
| F1 to D4 | 18.85 μ s \pm 25 ns |
| Mode S | |
| P1 to P2 | 1.00 μ s \pm 25 ns |
| P1 to P3 | 3.50 μ s \pm 25 ns |
| P1 to P4 | 4.50 μ s \pm 25 ns |
| P1 to D1 | 8.00 μ s \pm 25 ns |
| D1 to Dn (n=2 to 112) | 1.00 μ s times (n-1) \pm 25 ns |

Reply Pulse Widths

| Mode C | |
|-----------------|--|
| All pulses | 0.45 μ s \pm 50 ns |
| Mode S | |
| P1 through P4 | 0.50 μ s \pm 50 ns |
| D1 through D112 | 0.50 μ s (\pm 50 ns), 1 μ 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 μ s \pm 50 ns |
| Mode S | 128 μ 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 μ s |
| Accepts | < \pm 200 ns |
| Rejects | > \pm 1.0 μ s |
| P1 to P3 | 21.0 μ s |
| Accepts | < \pm 200 ns |
| Rejects | (<10% Replies) > \pm 1.0 μ s |
| P1 to P4 | 23.0 μ s |
| Accepts | < \pm 200 ns |
| Rejects | (<10% Replies) > \pm 1.0 μ s |

Mode S

| | |
|-----------|------------------------------------|
| P1 to P2 | 2.0 μ s |
| Accepts | < \pm 200 ns |
| Rejects | (<10% Replies) > \pm 1.0 μ s |
| P1 to SPR | 4.75 μ s |
| Accepts | < \pm 200 ns |
| Rejects | (<10% Replies) > \pm 1.5 μ 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 |
|--------------|--|

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 |
|-------------|---|

G/S Mode continued

| | |
|--------------------|--|
| Accuracy | ± 0.003 DDM ($\pm 2.5 \mu\text{A}$) $\pm 3\%$ of setting ($\leq +10$ dBm Output Level) |
| Variable Range | ± 0.8 DDM in 0.001 DDM steps |
| Accuracy | ± 0.0048 DDM ($\pm 4.0 \mu\text{A}$) $\pm 3\%$ of setting ($\leq +10$ dBm Output Level) |
| Phase Shift | |
| 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 |
|-------|-------------|

Distortion

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

COMM Mode (AM)

COMM Tone Frequency Accuracy

| | |
|---------|--------------|
| 1020 Hz | $\pm 0.02\%$ |
|---------|--------------|

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 | $\pm 0.02\%$ |
|---------|--------------|

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 | ± 6.25 Hz referenced to carrier |
|---------|-------------------------------------|

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 | $\pm 0.02\%$ |
|--------------------------------|--------------|

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 ³ |
| | 100 to 1999 W Resolution: 1W ³ |
| Accuracy | ±8% of reading ±1 count (100 to 400 MHz) ⁴ |
| | ±12% of reading ±1 count (<100 MHz) CW only ⁴ |
| 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 Ω typical |
| Maximum Input Level | 4 kW peak, 10 W average |
| VSWR | <1.3:1 |

Antenna

| | |
|----------------------|--------------------------|
| Type | TNC, Input/Output |
| Impedance | 50 Ω 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 | ± 1 ppm |
| Aging | ± 1 ppm per year |
| Accuracy | ± 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 |

¹ Simulates a 50.5dBm XPDR ERP at 10nMi range.

² Level automatically controlled based on actual distance to UUT antenna.

³ External attenuator required for input power greater than 30W.

⁴ Accuracy specification excluding external attenuator

⁵ Temperature range extended to -20°C to 55°C.

⁶ Temperature range reduced to -30°C to 71°C.

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

Environmental

Test Set

| | |
|------------------------------|--|
| Use | Pollution Degree 2 |
| Altitude | ≤ 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 |
|-----|---------|

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) |
|--|------------------|

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 ⁵ |
| Temp, not operating | MIL-PRF-28800F, Class 2 (with battery removed) ^{6,7} |
| 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 |