# Avionics

## IFR 6015 Ramp Test Set

The IFR 6015 is a compact, lightweight and weatherproof unit designed for testing transponder modes 1,2,3A/C/S, TCAS I, II and Military E-TCAS as well as TACAN.

- One main user screen for each test mode
- Detachable antenna
- Large display
- Simple user interface
- Lightweight and compact <8 lbs. (3.6 kg)
- Battery 6 hours plus duration
- Fully FAR Part 43 Appendix F compliant
- European Elementary and Enhanced Surveillance
- TACAN and IFF Modes 1 & 2
- Emulates preset modes of TACAN Test Sets Generic DoD, AN/ASM-663, AN/ARM-184, Bradley 2650 & 2655

*The IFR 6015 features an extremely easy to use interface where every parameter the user commonly needs to view is displayed on screen.*


### Controls

Dedicated Mode keys for XPDR, TACAN/DME and TCAS allow quick selection of the operational mode.

The application dependant softkeys and data select/slew keys provide an intuitive man-machine interface.

TACAN mode is provided with dedicated keys for frequency/channel selection and RF level control. For frequently varied parameters in TACAN and TCAS modes, such as Range and Rate, dedicated keys are provided.

### Operational Modes

Each operational mode has one main user screen. The operational modes are:

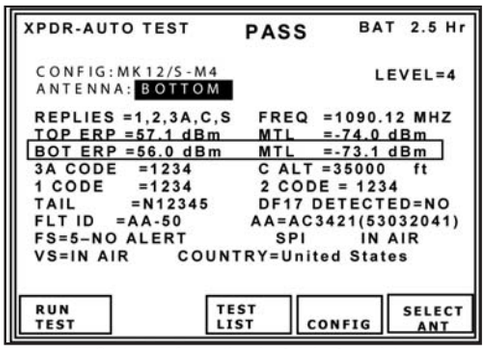
XPDR (Sub-Modes: ADS-B MON, ADS-B GEN & GICB)

TACAN (Sub-Modes: T/R Norm, Inv, Range Only; A/A Beacon, Inv, Range Only)

TCAS 1, 2 (Sub-Mode: TIS)

E-TCAS

Most tests can be completed without leaving the main user screens. This simplifies the line technician's testing task.




(IFF System Information in Public Domain)

### MK12/S Transponder

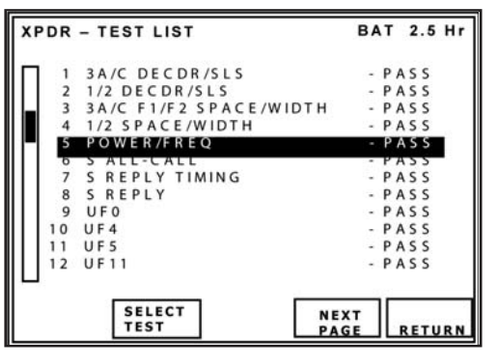
**Xpdr Auto-Test:**

Every parameter the user commonly needs to view is displayed on one screen.

The auto-test performs all tests defined by FAR Part 43 Appendix F, including the proposed Eurocontrol additional tests.

The specific modes tested are determined by the selected config.

The Mode S tests are tailored automatically according to reported transponder level to avoid erroneous failures.




The test list is selected from the auto-test screen. This provides an easy means of selecting any of the individual tests that comprise the auto-test.

Tests on the 2nd screen (not shown) include:

13 UF16

14 UF20

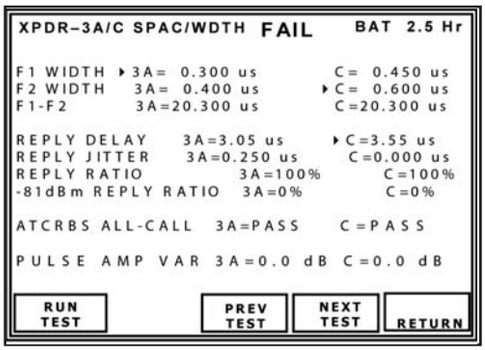
15 UF21

16 UF24

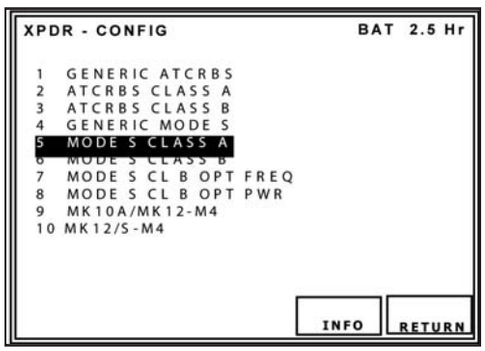
17 ELEMENTARY SURVEILLANCE 1

18 ELEMENTARY SURVEILLANCE 2

19 ENHANCED SURVEILLANCE




Individual tests may be reviewed for failures which are identified by an arrow symbol.



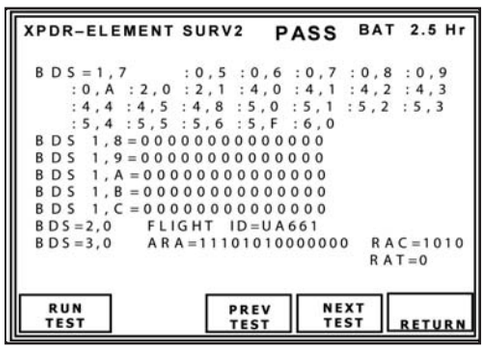

User selects config required for test.

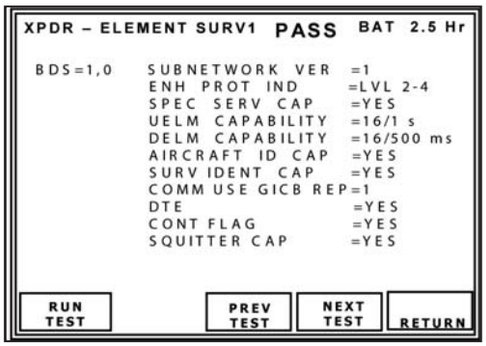
For ATCRBS and Mode S Transponders if the class of the transponder is unknown, the generic config may be selected which applies to the widest limits.

The test set will automatically determine the Mode S transponder level.

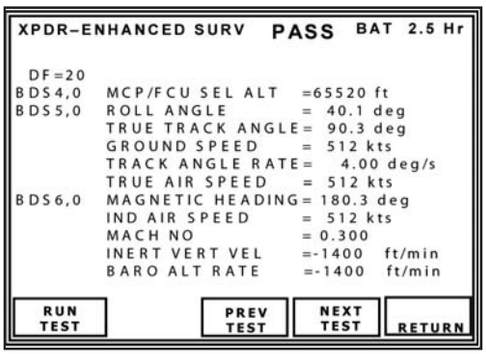
The selected config parameters may be displayed by pressing the INFO softkey.

Ten predetermined configs are provided to meet ATCRBS, Mode S, MK10, MK12, MK12/S transponder test needs.

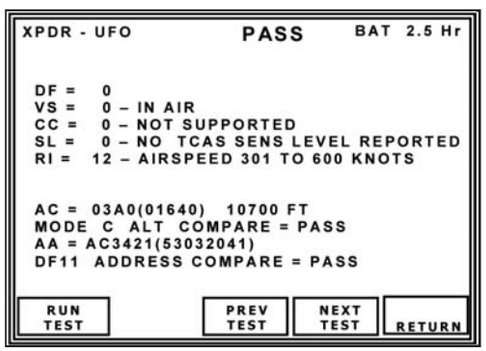





The Eurocontrol Elementary Surveillance DAP's (Downlink Aircraft Parameters) are displayed on two screens

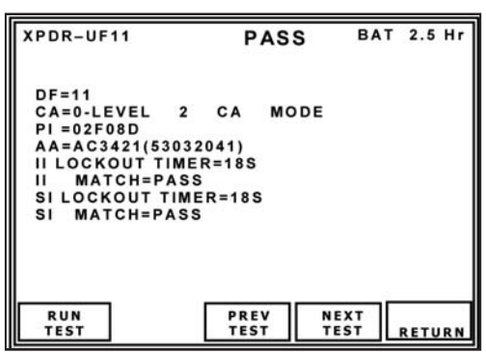



Eurocontrol Enhanced Surveillance DAP's are displayed on one screen.

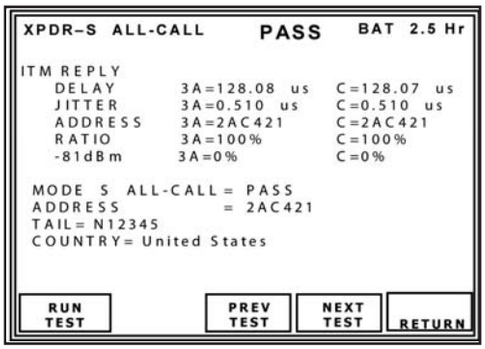


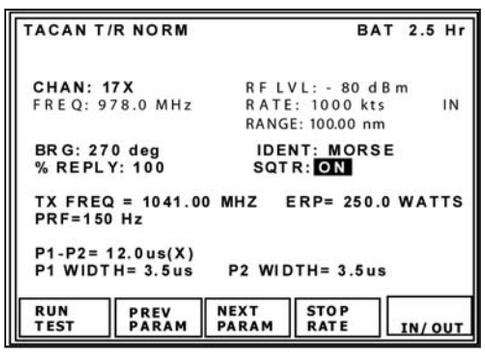

No more HEX data field interpretation!

All Mode S Format tests display parameter in engineering units.




Comprehensive II/SI code and lockout timer test

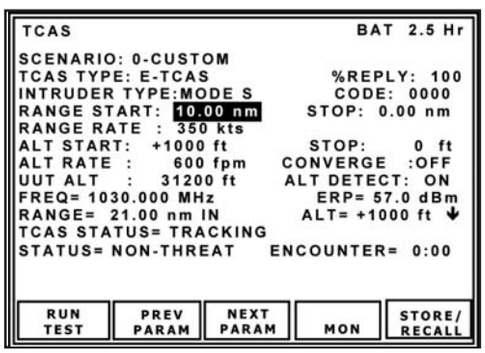



## TACAN

All the user needs are on one screen.

- RF level control for track sensitivity tests
- Supports all TACAN channels
- Full UUT measured parameters are displayed
- TACAN test modes; T/R Norm, T/R Range Only, T/R Inverse, A/A Beacon, A/A Range Only and A/A Inverse




## TCAS

TCAS types…

TCAS 1 MODE C

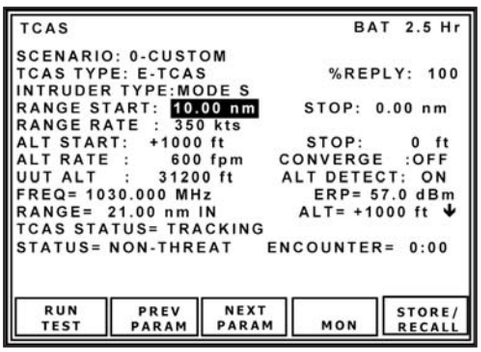
TCAS 2 ATCRBS

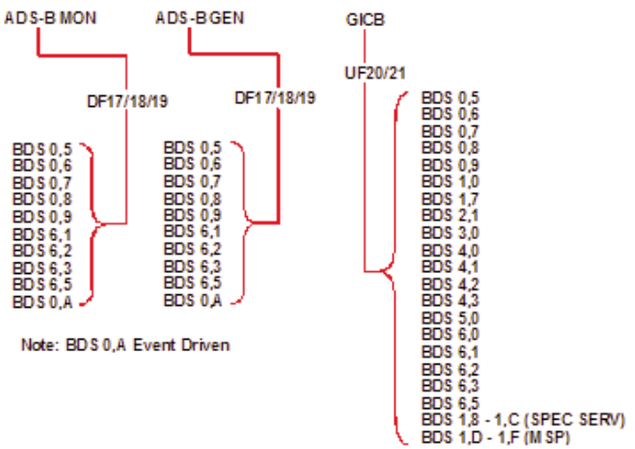
TCAS 2 MODE S

E-TCAS

The Auto-Altitude feature interrogates Mode S XPDR of aircraft under test to obtain current altitude.

Select pre-stored named scenarios directly from the auto-test screen.



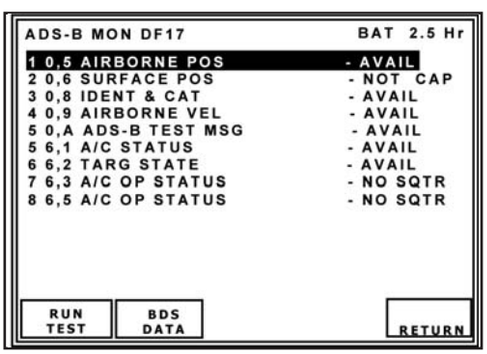




### ADS-B and GICB

ADS-B MON: Used to monitor DF17 extended squitter from transponders and DF18 extended squitter from 1090 MHz ADS-B emitters.

ADS-B GEN: Used to generate DF17/DF18 extended squitter, simulating transponders and 1090 MHz ADS-B emitters.

GICB: Used to monitor DAP's (all fields).

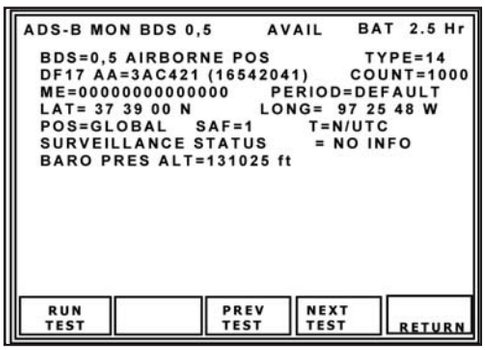



### ADS-B MON:

The ADS-B MON LIST shows BDS formats supported.

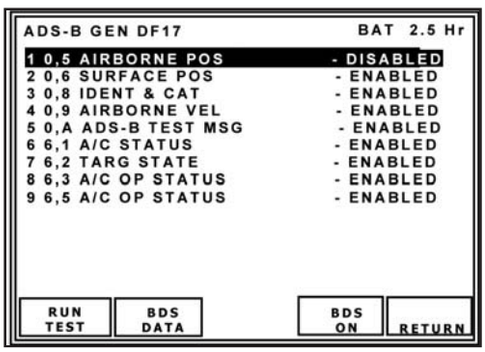
The BDS status is annunciated to indicate if the squitter has been captured, not available or not seen.

The BDS DATA key displays the BDS DATA screen for the selected BDS number.



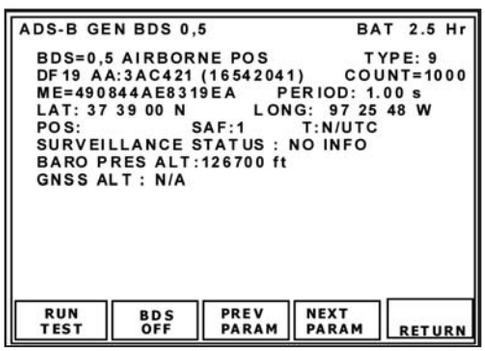

### ADS-B MON:

The BDS DATA screen displays full content of selected BDS format being received via DF17, DF18 or DF19 extended squitters.




### ADS-B GEN:

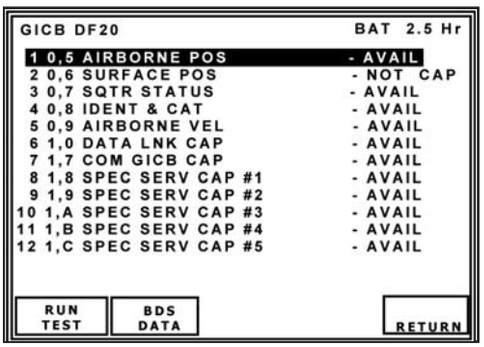
The BDS LIST shows BDS formats supported. The BDS SELECT key selects individual BDS numbers. The BDS ENABLE/DISABLE key enables or disables the selected BDS number for squittering via DF17 or DF18 extended squitter. The BDS DATA key displays the BDS DATA screen for the selected BDS number.




### ADS-B GEN:

BDS DATA screens display full content of the selected BDS format in RTCA/ICAO engineering units.

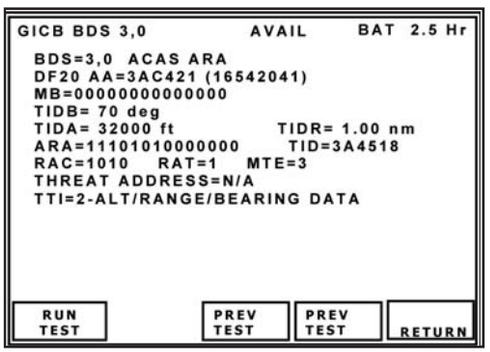
The NEXT PARAM and PREV PARAM keys select data fields for editing via the data slew keys.




### GICB:

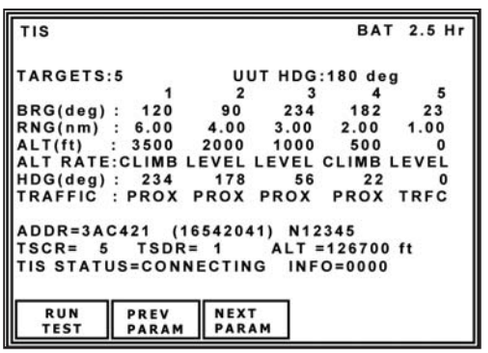
The BDS LIST shows BDS formats supported.

The BDS DATA key displays the BDS DATA screen for the selected BDS number.




### GICB:

BDS DATA screens display full content of the selected BDS format being received via GICB DF20 or DF21 in RTCA/ICAO engineering units.




### TIS

Up to 5 static intruders may be simulated relative to the A/C (UUT).

### General

**Radiated Testing:**

The IFR 6015 is supplied with a lightweight, fully sealed, directional antenna that may be test set mounted, hand held or tripod mounted.

**Direct Connect Testing:**

The IFR 6015 may be directly connected to the UUT via a supplied RF coax cable via the RF I/O port.

**Transit Case:**

The IFR 6015 is supplied in a rugged plastic transit case which provides stowage for the test set, directional antenna, RF coax cable, antenna shield, breakout box, and power supply/charger.

# SPECIFICATION

## Notes

▲ - IFF System Information in Public Domain

% - TACAN System Information in Public Domain (Ref. MIL STD 291C)

## TACAN/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*

% ***Variable Channel Selection 1 to 126 (X & Y)***

***Preset Channel Selection***

% ***Preset 1 (DoD)***

*T/R Mode 17X, 18X*

*A/A Mode 17X, 17Y*

*Inverse A/A Mode 80X, 80Y*

% ***Preset 2 (AN/ASM-663)***

*5X, 5Y, 47X, 47Y, 89X, 89Y*

*Preset 3 (AN/ARM-184) No Preset*

*Preset 4 (2650/2655)*

*18X, 18Y, 47X, 47Y, 100X, 100Y, 123X, 123Y*

## OUTPUT LEVEL

**ANTENNA PORT**

***Range***

*-67 to -5 dBm (T/R Norm, T/R Inv, A/A Beacon, A/A Inv)*

*-67 to -2 dBm (T/R Rng Only, A/A Rng Only)*

***Resolution***

*0.5 dB*

***Accuracy***

*± 2 dB*

***Distance to UUT antenna***

*6 to 250 ft with supplied antenna*

**RF I/O PORT**

***Range***

*-115 to -50 dBm (T/R Norm, T/R Inv, A/A Beacon, A/A Inv)*

*-115 to -47 dBm (T/R Rng Only, A/A Rng Only)*

***Resolution***

*0.5 dB*

***Accuracy***

*-95 dBm to –50 dBm ± 1 dB*

***Accuracy***

*-115 dBm to <-95 dBm ± 2 dB*

## REPLY PULSE SPACING

***P1 to P2***

*12 μs ± 0.1 μs (T/R X Channel) @ 50% peak*

***P1 to P2***

*30 μs ± 0.1 μs (T/R 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***

*2.0 μs ± 0.25 μs (10% to 90%)*

***Fall Time***

*2.5 μs ± 0.25 μs (90% to 10%)*

## REPLY DELAY

**T/R X CHANNEL**

***Fixed Reply Delay***

*50 μs ± 100 ns*

**T/R Y CHANNEL**

***Fixed Reply Delay***

*56 μs ± 100 ns*

% **A/A X CHANNEL**

***Fixed Reply Delay***

*62 μs ± 100 ns*

% **A/A Y CHANNEL**

***Fixed Reply Delay***

*74 μs ± 100 ns*

## VARIABLE RANGE DELAY

**X AND Y CHANNEL**

***Range***

*0 to 450.00 nmi*

***Resolution***

*0.01 nmi*

***Accuracy***

*± 0.01 nmi*

## PRESET RANGE DELAY

**X AND Y CHANNEL**

***Preset 1 (DoD) Range***

*0, 3, 10, 30, 100, 200, 300, 400 nmi*

***Preset 2 (AN/ASM-663) Range***

*0, 10, 150, 297 nmi*

***Preset 3 (AN/ARM-184) Range***

*0, 50, 100, 150, 200, 250, 300, 350, 400 nmi*

***Preset 4 (2650/2655) Range***

*0, 5, 125, 283 nmi*

***Resolution***

*0.01 nmi*

***Accuracy***

*± 0.01 nmi*

## VARIABLE RANGE RATE

**X AND Y CHANNEL**

***Rate***

*0 to 6500 kts*

***Resolution***

*1 kts*

***Accuracy***

*± 0.01% typical, tested to ± 0.5%*

## PRESET RANGE RATE

**X AND Y CHANNEL**

***Preset 1 (DoD) Rate***

*0, 250 kts (1000 kts in A/A modes)*

***Preset 2 (AN/ASM-663) Rate***

*No Rate*

***Preset 3 (AN/ARM-184) Rate***

*0, 2400 kts*

***Preset 4 (2650/2655) Rate***

*No Rate*

***Resolution***

*1 kts*

***Accuracy***

*± 0.01% typical, tested to ± 0.5%*

## SQUITTER

% **PRF**

***T/R(X) & T/R(Y) NORM, INVERSE, RNG ONLY***

*2700 Hz*

***A/A RNG ONLY, BEACON, INVERSE***

*1350 Hz*

***Accuracy***

*± 2%*

***Distribution***

*Per MIL STD 291C and ARINC 568*

## REPLY EFFICIENCY

***Range***

*0 to 100%*

***Resolution***

*1% increments*

***Accuracy***

*± 0.5%*

## % IDENT TONE PULSE PAIR

***T/R(X) & T/R(Y) Modes Selection***

*Selectable four letter code or tone*

***Frequency***

*1350 Hz*

***Accuracy***

*± 2 Hz*

***Equalizer pulse pair***

*Spacing from Ident pair 100 µs ± 10 µs*

## % IDENT TONE SINGLE PULSE

***A/A(X) & A/A(Y) Modes Selection***

*Selectable four letter code or tone*

***Frequency***

*1350 Hz*

***Accuracy***

*± 2 Hz*

## INVERSE MODE

**A/A(X), A/A(Y), T/R(X), T/R(Y)**

*Active Low North Reference Trigger Sync Output*

## % A/A MODE INTERROGATION

***P1 to P2***

*12 µs ± 0.1 µs (A/A X Channel) @ 50% peak*

***P1 to P2***

*24 µs ± 0.1 µs (A/A Y Channel) @ 50% peak*

***Interrogation Rate***

*150 PPS, ± 5 Hz*

## % 15/135 HZ BEARING SIGNAL

***Modulation Levels***

*15 Hz 21% ± 2.5%*

*135 Hz 21% ± 2.5%*

***Frequency***

*15/135 Hz <± 0.2%*

***Phase Accuracy***

*<± 0.3°*

***Distortion***

*<2.5%*

## % BEARING

***Variable***

*0 to 359.5° in 0.5° increments*

***Accuracy***

*± 0.1°*

**PRESET**

***Preset 1 (DoD) Range***

*0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°*

***Preset 2 (AN/ASM-663) Range***

*0°, 45°, 180°, 225°*

***Preset 3 (AN/ARM-184) Range***

*0°, 90°, 180°, 337.5°*

***Preset 4 (2650/2655) Range***

*90°, 230°, 320°*

## INTERROGATION PULSE DECODING

***Must Reply nominal code pair spacing***

*< ± 0.5 µs*

***Must Not Reply nominal code pair spacing***

*> ± 1.0 µs*

## % MRB T/R(X)

***Group***

*12 pairs of pulses*

***Pulse Spacing***

*12 µs ± 0.1 µs*

***Pulse Pair Spacing***

*12 µs ± 0.1 µs*

### % MRB T/R(Y)

**Group**

13 single pulses

**Pulse Spacing**

30 μs ± 0.1 μs

### % MRB A/A BEACON (X & Y)

**Group**

10 single pulses

**Pulse Pair Spacing**

30 μs ± 0.1 μs

### % ARB T/R(X)

**Group**

6 pairs of pulses

**Pulse Spacing**

12 μs ± 0.1 μs

**Pulse Pair Spacing**

24 μs ± 0.1 μs

### % ARB T/R(Y)

**Group**

13 single pulses

**Pulse Spacing**

15 μs ± 0.1 μs

## UUT MEASUREMENTS

### ERP

**Range**

+47 to +66.1 dBm

**Resolution**

0.1 dB

**Accuracy**

± 2 dB

### DIRECT CONNECTION PEAK PULSE POWER

**Range**

+47 to +66.1 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 (T/R X and A/A X Channel)

**P1 to P2 Spacing**

22 to 26 μs (A/A Y Channel)

**P1 to P2 Spacing**

34 to 38 μs (T/R Y Channel)

**Resolution**

10 ns

**Accuracy**

± 20 ns

### INTERROGATION PRF

**Range**

1 to 300 Hz

**Resolution**

1 Hz

**Accuracy**

± 2 Hz

### % A/A REPLY DELAY

**A/A(X)**

62 μs (-2 +4 μs accept)

**A/A(Y)**

74 μs (-2 +4 μs accept)

**Resolution**

10 ns

**Accuracy**

± 100 ns

## TRANSPONDER MODE SPECIFICATIONS

## SIGNAL GENERATOR

### 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 PORT**

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/SIF/MODE S INTERROGATION PULSE SPACING

**▲MODE 1**

***P1 to P2***

*2.00 µs ± 25 ns*

***P1 to P3***

*3.00 µs ± 25 ns*

**▲MODE 2**

***P1 to P2***

*2.00 µs ± 25 ns*

***P1 to P3***

*5.00 µs ± 25 ns*

**MODE 3A**

***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

**MODE 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

**ATCRBS/SIF**

***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*

*Note: SLS level is automatically controlled in the SLS LEVEL test.*

## INTERROGATION TEST SIGNALS

**MODE S**

***PRF***

*50 Hz ± 5 Hz*

**ATCRBS/SIF**

***PRF***

*235 Hz ± 5 Hz*

## 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***

*-67 to -79 dBm into 0 dBi antenna*

***Resolution***

*0.1 dB*

***Accuracy***

*± 2 dB, typical*

## RECEIVER SENSITIVITY, DIRECT CONNECTION MTL

***Range***

*-67 to -79 dBm*

***Resolution***

*0.1 dB*

***Accuracy***

*± 2 dB*

## REPLY DELAY

**ATCRBS/SIF**

***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/SIF**

***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 DECODER

***Modes 1,2,3/A***

*4096 code & binary equivalent displayed, including X pulse.*

*Ident & Emergency Replies displayed.*

***Mode C***

*Altitude*

## PULSE WIDTHS

***F1 AND 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*

***Range, ATCRBS/SIF (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***

*1.83m (6ft) to 28.96m (95ft)*

***Resolution***

*0.1 dB*

***Accuracy***

*± 3 dB*

## TCAS/E-TCAS MODE SPECIFICATIONS

## SIGNAL GENERATOR

## OUTPUT FREQUENCY

**REPLY FREQUENCY**

*1090 MHz*

***Accuracy***

*± 10 kHz*

## OUTPUT LEVEL (SIMULATED ERP)

***ANTENNA PORT*** [Note 1]

***Radiated power at 0 dBi UUT antenna***

*-68 dBm typical @ 10 Nmi Range, automatically controlled*

***Range***

*-67 to -2 dBm at Antenna port*

***Resolution***

*0.5 dB*

***Accuracy***

*± 2 dB*

***Distance to UUT antenna***

*6 to 300 ft with supplied antenna*

**RF I/O PORT**

***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*

## REPLY PULSE SPACING

**MODE C**

***F1 to F2***

*20.30 µs ± 25 ns*

***F1 to C1***

*1.45 µs ± 25 ns*

***F1 to A1***

*2.90 µs ± 25 ns*

***F1 to C2***

*4.35 µs ± 25 ns*

***F1 to A2***

*5.80 µs ± 25 ns*

***F1 to C4***

*7.25 µs ± 25 ns*

***F1 to A4***

*8.70 µs ± 25 ns*

***F1 to B1***

*11.60 µs ± 25 ns*

***F1 to D1***

*13.05 µs ± 25 ns*

***F1 to B2***

*14.50 µs ± 25 ns*

***F1 to D2***

*15.95 µs ± 25 ns*

***F1 to B4***

*17.40 µs ± 25 ns*

***F1 to D4***

*18.85 µs ± 25 ns*

**MODE S**

***P1 to P2***

*1.00 µs ± 25 ns*

***P1 to P3***

*3.50 µs ± 25 ns*

***P1 to P4***

*4.50 µs ± 25 ns*

***P1 to D1***

*8.00 µs ± 25 ns*

***D1 to Dn (n=2 to 112)***

*1.00 µs times (n-1) ± 25 ns*

## REPLY PULSE WIDTHS

**MODE C**

***All Pulses***

*0.45 µs ± 50 ns*

**MODE S**

***P1 through P4***

*0.50 µs ± 50 ns*

***D1 through D112***

*0.50 µs ± 50 ns, 1 µs chip width*

***Reply Modes***

*TCAS I/II Mode C (with altitude reporting)*

*TCAS II Mode S formats 0, 11, 16*

*E-TCAS Modes formats 0, 4, 5, 11, 16, 20, 21*

## REPLY PULSE AMPLITUDES

***ATCRBS***

*± 1 dB relative to F1*

***Mode S***

*± 1 dB relative to P1*

## REPLY PULSE RISE AND FALL TIMES

**ALL MODES**

***Rise Time***

*50 to 100 ns*

***Fall Time***

*50 to 200 ns*

## PERCENT REPLY

**Range**

*0 to 100%*

**Resolution**

*10%*

**Accuracy**

*± 1%*

## 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 us |
| Accepts | ≤ ±200 ns |
| Rejects | ≥ ±1.0 us |
| P1 to P3 | 21.0 us |
| Accepts | ≤ ±200 ns |
| Rejects (<10% Replies) | ≥ ±1.0 us |
| P1 to P4 | 23.0 us |
| Accepts | ≤ ±200 ns |
| Rejects (<10% Replies) | ≥ ±1.0 us |

**Mode S**

| | |
|---|---|
| P1 to P2 | 2.0 us |
| Accepts | ≤ ±200 ns |
| Rejects (<10% Replies) | ≥ ±1.0 us |
| P1 to SPR | 4.75 us |
| Accepts | ≤ ±200 ns |
| Rejects (<10% Replies) | ≥ ±1.5 us |

## SUPPRESION

**ATCRBS (P2 or S1)**

*>0.5 dB above level of P1  <10% Replies*

## UUT MEASUREMENTS

### ERP (@1030MHZ)

**ATCRBS**

**Range**

*+43 to +58 dBm (20 to 631 watts)*

**Resolution**

*0.1 dB*

**Accuracy**

*± 2 dB*

**MODE S**

**Range**

*+43 to +58 dBm (20 to 631 watts)*

**Resolution**

*0.1 dB*

**Accuracy**

*± 2 dB*

## DIRECT CONNECTION PEAK PULSE POWER (@1030MHZ)

**ATCRBS**

**Range**

*+43 to +58 dBm (20 to 631 watts)*

**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*

## MISCELLANEOUS INPUT/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***

*Input/Output*

***Impedance***

*50 Ω typical*

***Maximum Input Level***

*10 kW peak*

*1/2 W average*

***VIDEO***

***Type***

*Output*

***Impedance***

*50 Ω typical*

***Generate Video Level***

*0.2 V to 1.5 V peak to peak into 50 Ω*

***Receive Video Level***

*Proportional to IF level*

***Baseline***

*± 0.5 V referenced to ground*

## TEST ANTENNA

***VSWR***

*< 1.5:1*

***Gain***

*6 dB, Typical*

## TIME BASE (TCXO)

***Temperature Stability***

*± 1 ppm*

***Aging***

*± 1 ppm per year*

***Accuracy***

*± 1 ppm*

***Test Limit***

*± 0.3 ppm*

## BATTERY

***Type***

*Li Ion*

***Duration***

*> 4 hrs continuous operation*

*> 6 hrs, Typical*

## INPUT POWER (TEST SET)

***Input Range***

*11 VDC to 32 VDC*

***Power Consumption***

*55 W Maximum*

*16 W Nominal at 18 VDC with charged battery*

***Fuse Requirements***

*5 A, 32 VDC, Type F*

## INPUT POWER (SUPPLIED EXTERNAL AC TO DC CONVERTER)

***Input Range***

*100 to 250 VAC, 1.5 A Max, 47-63 Hz*

***Mains Supply Voltage Fluctuations***

*≤ 10% of the nominal voltage*

***Transient Overvoltages***

*According to Installation Category II*

## ENVIRONMENTAL (TEST SET)

***Use***

*Pollution Degree 2*

***Altitude***

*≤ 4800 meters*

***Operating Temperature***

NOTE 3 *-20°C to 55°C*

***Storage Temperature***

NOTE 4 *-30°C to 71°C*

***Relative Humidity***

*95% ±5% from 5° to 30°C*

*75% ±5% from 30° to 40°C*

*45% ±5% from 40° to 55°C*

## ENVIRONMENTAL (SUPPLIED EXTERNAL AC TO DC CONVERTER

***Use***

*Indoors*

***Altitude***

*≤ 10,000 meters*

***Operating Temperature***

*0° to 40°C*

***Storage Temperature***

*-20°C to 71°C*

## PHYSICAL CHARACTERISTICS

**DIMENSIONS**

***Height***

*11.2 inches (28.5 cm)*

***Width***

*9.1 inches (23.1 cm)*

***Depth***

*2.7 inches (6.9 cm)*

***Weight (Test set only)***

*< 8 lbs. (3.6 kg)*

## SUPPLEMENTAL INFORMATION

**Test Set Certifications**

| | | |
|---|---|---|
| *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 I* |
| *Drip-proof* | *MIL-PRF-28800F* | *Class 2* |
| *Explosive Atmosphere* | *MIL-STD-810F* | *Method 511.4, Procedure 1* |
| *Relative Humidity* | *MIL-PRF-28800F* | *Class 2* |
| *Shock, Functional* | *MIL-PRF-28800F* | *Class 2* |
| *Vibration Limits* | *MIL-PRF-28800F* | *Class 2* |
| *Temp, operating* NOTE 5 | *MIL-PRF-28800F* | *Class 2* |
| *Temp, not operating* NOTE 6 | *MIL-PRF-28800F* | *Class 2* |
| *Transit Drop* | *MIL-PRF-28800F* | *Class 2* |
| *Safety Compliance* | *UL-61010B-1* | |
| | *EN 61010-1* | |
| | *CSA 22.2 No 61010-1* | |
| *EMC* | *EN 61326* | |

## EXTERNAL AC-DC CONVERTER CERTIFICATIONS

| | | |
|---|---|---|
| *Safety Compliance* | *UL 1950 DS* | |
| | *CSA 22.2 No. 234* | |
| | *VDE EN 60 950* | |
| *EMI/RFI Compliance* | *FCC Docket 20780* | *Curve "B"* |
| *EMC* | *EN 61326* | |

## TRANSIT CASE CERTIFICATIONS

| | | |
|---|---|---|
| *Drop Test* | *FED-STD-101C* | *Method 5007.1 Paragraph 6.3, Procedure A, Level A* |
| *Falling Dart Impact* | *ATA 300* | *Category I* |
| *Vibration, Loose Cargo* | *FED-STD-101C* | *Method 5019* |
| *Vibration, Sweep* | *ATA 300* | *Category I* |
| *Simulated Rainfall* | *MIL-STD-810F* | *Method 506.4 Procedure II of 4.1.2* |
| | *FED-STD-101C* | *Method 5009.1 Sec 6.7.1* |
| *Immersion* | *MIL-STD-810F* | *Method 512.4* |

### Notes

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

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

NOTE 3 Battery charging temperature range: 5°C to 40°C (controlled by internal charger).

NOTE 4 Li Ion Battery must be removed below -20°C and above 60°C.

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

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

# VERSIONS AND ACCESSORIES

*When ordering please quote the full ordering number information.*

| Ordering Numbers | Versions |
|---|---|
| 72424 | IFR 6015 Mode 1,2,3A/C/S Transponder, TACAN/DME, TCAS I,II,E-TCAS, TIS Ramp Test Set (specify 110 V or 220 V)<br>NSN: 6625-01-574-2423 |
| 83411 | 6015OPT3 ADS-B Option |

### Extended Standard Warranties with Calibration for 6015

| | |
|---|---|
| 84373 | Extended standard warranty 36 months with scheduled calibration |
| 84374 | Extended standard warranty 60 months with scheduled calibration |

### Accessories for 6015

| | |
|---|---|
| 63656 | Desk Top Stand (AC0820) |
| 67474 | Tripod (AC0826) |
| 6674 | IFR 6015 Operation Manual - CD (AC0825CD) |
| 6676 | IFR 6015 Maintenance Manual - CD |
| 82553 | Tripod, Dolly, Stand (AC24006) |
| 86931 | UC-584 Universal Transponder Antenna Coupler |

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