

# Avionics

## IFR 6000 Ramp Test Set

**AEROFLEX**  
A passion for performance.



The IFR 6000 is a compact, lightweight and weatherproof unit designed for testing transponder modes A/C/S, TCAS I and II as well as DME.

- 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

*The IFR 6000 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, 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.

DME mode is provided with dedicated keys for frequency/channel selection and RF level control. For frequently varied parameters in DME 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:

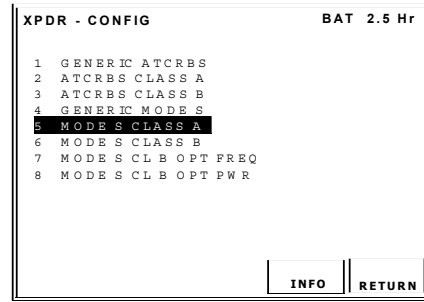
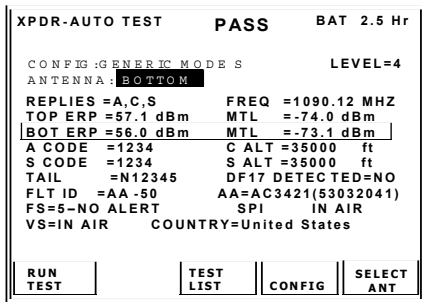
XPDR (Sub-Modes: ADS-B MON, ADS-B GEN & GICB)

DME

TCAS 1, 2 (Sub-Modes: TIS)

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

For the very latest specifications visit [www.aeroflex.com](http://www.aeroflex.com)



**Mode S and ATCRBS 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 tests are tailored automatically according to reported transponder level to avoid erroneous failures.

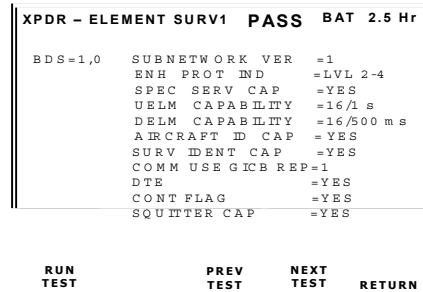
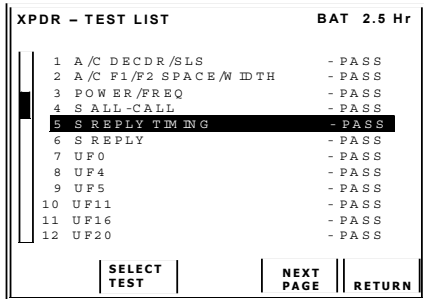
User selects config required for test.

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.

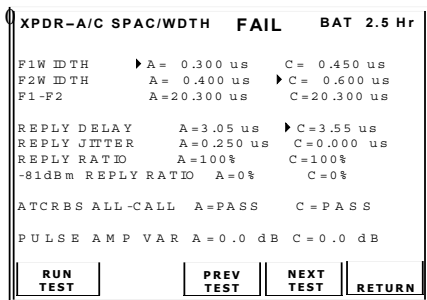
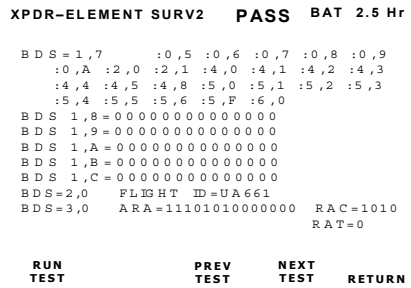
Eight predetermined configs are provided to meet the currently fielded transponder test needs.



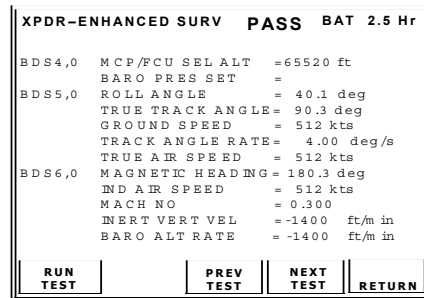
The test list is selected from the auto-test screen. This provides an easy means of selecting any of the individual tests that comprise the auto-test.

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

- 13 UF21
- 14 UF24
- 15 ELEMENTARY SURVEILLANCE 1
- 16 ELEMENTARY SURVEILLANCE 2
- 17 ENHANCED SURVEILLANCE



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



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

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

```

XPDR - UFO          PASS          BAT 2.5 Hr

DF = 0
VS = 0 - IN AIR
CC = 0 - NOT SUPPORTED
SL = 0 - NO TCAS SENS LEVEL REPORTED
RI = 12 - AIRSPEED 301 TO 600 KNOTS

AC = 03A0(01640) 10700 FT
MODE C ALT COMPARE = PASS
AA = AC3421(53032041)
DF11 ADDRESS COMPARE = PASS

RUN TEST  PREV TEST  NEXT TEST  RETURN

```

```

TCAS          BAT 2.5 Hr
SCENARIO: 0 -CUSTOM
TCAS TYPE:TCAS II          %REPLY: 100
INTRUDER TYPE:MODE S
RANGE START: 10.00 nm     STOP: 0.00 nm
RANGE RATE : 350 kts
ALT START: +1000 ft      STOP: 0 ft
ALT RATE : 600 fpm      CONVERGE :OFF
UUT ALT : 31200 ft      ALT DETECT: ON
FREQ= 1030.000 MHz      ERP= 57.0 dBm
RANGE= 21.00 nm IN      ALT= +1000 ft ↓
TCAS STATUS= TRACKING
STATUS= NON-THREAT      ENCOUNTER= 0: 00

RUN TEST  PREV PARAM  NEXT PARAM  MON  STORE/RECALL

```

No more HEX data field interpretation!

All Mode S Format tests display parameter in engineering units.

### TCAS

TCAS types...

TCAS 1 MODE C

TCAS 2 ATCRBS

TCAS 2 MODE S

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

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

```

XPDR-UF11          PASS          BAT 2.5 Hr

DF=11
CA=0-LEVEL 2 CA MODE
PI =02F08D
AA=AC3421(53032041)
II LOCKOUT TIMER=18S
II MATCH=PASS
SI LOCKOUT TIMER=18S
SI MATCH=PASS

RUN TEST  PREV TEST  NEXT TEST  RETURN

```

### 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).

Comprehensive II / SI code and lockout timer test

```

XPDR-S ALL-CALL    PASS          BAT 2.5 Hr

ITM REPLY
DELAY      A=128.08 us  C=128.07 us
JITTER     A=0.510 us   C=0.510 us
ADDRESS    A=2AC421    C=2AC421
RATIO      A=100%      C=100%
-81dBm     A=0%        C=0%

MODE S ALL-CALL= PASS
ADDRESS    = 2AC421
TAIL= N12345
COUNTRY= United States

RUN TEST  PREV TEST  NEXT TEST  RETURN

```

```

ADS-B MON DF17          BAT 2.5 Hr
1 0,5 AIRBORNE POS     - AVAIL
2 0,6 SURFACE POS      - NOT CAP
3 0,8 IDENT & CAT       - AVAIL
4 0,9 AIRBORNE VEL     - AVAIL
5 6,1 A/C STATUS       - AVAIL
6 6,2 TARG STATE       - AVAIL
7 6,3 A/C OP STATUS    - NO SQTR

RUN TEST  BDS DATA  RETURN

```

```

DME          BAT 2.5 Hr

VOR : 108.000 MHz      RFLVL: -2.0 dBm
FREQ : 978 MHz        RATE : 650 kts      IN
CHAN : 17X            RANGE : 450.00 nm

% REPLY: 100      ECHO :OFF
SQTR : ON         IDENT: OFF

TX FREQ = 1041.00 MHz      ERP=55.0 dBm
P1 WIDTH= 3.500 us        PRF=150 Hz
P2 WIDTH= 3.500 us
P1-P2 = 36.00 us(Y)
UUTLVL = -38.2 dBm

RUN TEST  PREV PARAM  NEXT PARAM  STOP RATE  IN/OUT

```

### 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.

### DME

All the user needs are on one screen.

- RF level control for track sensitivity tests
- Supports all DME/TACAN channels selectable in VOR paired channels
- Full UUT measured parameters are displayed.

```

ADS-B MON BDS 0,5    AVAIL    BAT 2.5 Hr
BDS=0,5 AIRBORNE POS    TYPE=14
DF17 AA=3AC421 (16542041)    COUNT=1000
ME=0000000000000    PERIOD=DEFAULT
LAT= 37 39 00 N    LONG= 97 25 48 W
POS=GLOBAL    SAF=1    T=N/UTC
SURVEILLANCE STATUS = NO INFO
BARO PRES ALT=131025 ft
GNSS ALT = N/A

RUN TEST    PREV TEST    NEXT TEST    RETURN

```

### ADS-B MON:

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

```

ADS-B GEN DF17    BAT 2.5 Hr
1 0,5 AIRBORNE POS    - DISABLED
2 0,6 SURFACE POS    - ENABLED
3 0,8 IDENT & CAT    - ENABLED
4 0,9 AIRBORNE VEL    - ENABLED
5 6,1 A/C STATUS    - ENABLED
6 6,2 TARG STATE    - ENABLED
7 6,3 A/C OP STATUS    = ENABLED

RUN TEST    BDS DATA    BDS ON    RETURN

```

The BDS ENABLE/DISABLE key enables or disables the selected BDS number for squittering via DF17 or DF18 extended squitters. The BDS DATA key displays the BDS DATA screen for the selected BDS number.

```

ADS-B GEN BDS 0,5    BAT 2.5 Hr
BDS=0,5 AIRBORNE POS    TYPE: 9
DF17 AA:3AC421 (16542041)    COUNT=1000
ME=490844AE8319EA    PERIOD: 1.00 s
LAT: 37 39 00 N    LONG: 97 25 48 W
POS:    SAF:1    T:N/UTC
SURVEILLANCE STATUS : NO INFO
BARO PRES ALT:126700 ft
GNSS ALT : N/A

RUN TEST    BDS OFF    PREV PARAM    NEXT PARAM    RETURN

```

### ADS-B GEN:

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

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

```

GICB DF20    BAT 2.5 Hr
1 0,5 AIRBORNE POS    - AVAIL
2 0,6 SURFACE POS    - NOT CAP
3 0,7 SQTR STATUS    - AVAIL
4 0,8 IDENT & CAT    - AVAIL
5 0,9 AIRBORNE VEL    - AVAIL
6 1,0 DATA LNK CAP    - AVAIL
7 1,7 COM GICB CAP    - AVAIL
8 1,8 SPEC SERV CAP #1    - AVAIL
9 1,9 SPEC SERV CAP #2    - AVAIL
10 1,A SPEC SERV CAP #3    - AVAIL
11 1,B SPEC SERV CAP #4    - AVAIL
12 1,C SPEC SERV CAP #5    - AVAIL

RUN TEST    BDS DATA    RETURN

```

### GICB:

The BDS LIST shows BDS formats supported.

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

```

GICB BDS 3,0    AVAIL    BAT 2.5 Hr
BDS=3,0 ACAS ARA
DF20 AA=3AC421 (16542041)
MB=00000000000000
TIDB= 70 deg
TIDA= 32000 ft    TIDR= 1.00 nm
ARA=11101010000000    TID=3A4518
RAC=1010    RAT=1    MTE=3
THREAT ADDRESS=N/A
TTI=2-ALT/RANGE/BEARING DATA

RUN TEST    PREV TEST    PREV TEST    RETURN

```

### 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    BAT 2.5 Hr
TARGETS:5    UUT HDG:180 deg
BRG(deg) : 120    90    234    182    23
RNG(nm) : 6.00    4.00    3.00    2.00    1.00
ALT(ft) : 3500    2000    1000    500    0
ALT RATE:CLIMB LEVEL LEVEL CLIMB LEVEL
HDG(deg) : 234    178    56    22    0
TRAFFIC : PROX PROX PROX PROX TRFC

ADDR=3AC421 (16542041) N12345
TSCR= 5    TSDR= 1    ALT =126700 ft
TIS STATUS=CONNECTING    INFO=0000

RUN TEST    PREV PARAM    NEXT PARAM

```

### TIS

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

### General

#### Radiated Testing:

The IFR 6000 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 6000 may be directly connected to the UUT via a supplied RF coax cable via the RF I/O port.



## Transit Case:

The IFR-6000 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

### 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

$\pm 10$  kHz

#### OUTPUT LEVEL

##### ANTENNA PORT

###### Range

-67 to -2 dBm at Antenna port

###### Resolution

1 dB

###### Accuracy

$\pm 2$  dB

###### Distance to UUT antenna

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  $\pm 1$  dB

###### Accuracy

-115 dBm to <-95 dBm  $\pm 2$  dB

### REPLY PULSE SPACING

#### P1 to P2

12  $\mu$ s ( $\pm 100$  ns) (X Channel) @ 50% peak

#### P1 to P2

30  $\mu$ s ( $\pm 100$  ns) (Y Channel) @ 50% peak

### REPLY PULSE WIDTH

#### P1/P2

3.5  $\mu$ s ( $\pm 0.5$   $\mu$ s)

### ECHO REPLY

#### Control

On/Off

#### Position

30 nmi ( $\pm 1$  nmi)

#### Amplitude

-11 dB ( $\pm 1$  dB) relative to reply level

### REPLY PULSE RISE AND FALL TIMES

#### ALL PULSES

##### Rise Time

2.5  $\mu$ s ( $\pm 0.25$   $\mu$ s) (10% to 90%)

##### Fall Time

2.5  $\mu$ s ( $\pm 0.25$   $\mu$ s) (90% to 10%)

### REPLY DELAY

#### X CHANNEL

##### Fixed Reply Delay

50  $\mu$ s ( $\pm 100$  ns)

#### Y CHANNEL

##### Fixed Reply Delay

56  $\mu$ s ( $\pm 100$  ns)

### RANGE DELAY

#### X AND Y CHANNEL

##### Range

0 to 450.00 nmi

##### Resolution

0.01 nmi

##### Accuracy

$\pm 0.01$  nmi

### RANGE RATE

#### X AND Y CHANNEL

##### Range

10 to 6500 kts

##### Resolution

1 kts

##### Accuracy

$\pm 0.01\%$  typical, tested to  $\pm 0.5\%$

### SQUITTER

#### PRF

2700 Hz

#### Accuracy

$\pm 2\%$

#### Distribution

Per ARINC 568

## REPLY EFFICIENCY

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### Range

0 to 100%

### Resolution

1% increments

### Accuracy

±0.5%

## IDENT TONE

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### Selection

Selectable three letter code

### Frequency

1350 Hz

### Accuracy

±2 Hz

## UUT MEASUREMENTS

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### ERP

---

### Range

+47 to +64 dBm

### Resolution

0.1 dB

### Accuracy

±2 dB

## 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  $\mu$ s

### Resolution

1 ns

### Accuracy

±50 ns

## INTERROGATION PULSE SPACING

---

### P1 to P2 Spacing

10 to 14  $\mu$ s (X Channel)

### P1 to P2 Spacing

34 to 38  $\mu$ s (Y Channel)

### Resolution

10 ns

### Accuracy

±20 ns

## INTERROGATION PRF

---

### Range

1 to 300 Hz

### Resolution

1 Hz

### Accuracy

±2 Hz

## TRANSPONDER MODE SPECIFICATIONS

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## SIGNAL GENERATOR

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## RF OUTPUT FREQUENCY

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### Interrogation Frequency

1030 MHz

### Accuracy

±10 kHz

## RF OUTPUT LEVEL

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### ANTENNA CONNECTOR

MTL + 6 dB typical, automatically controlled for a MTL range of -83 to -68 dBm

### Range

-67 to -2 dBm at antenna connector

### 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  $\mu$ s (±25 ns)

#### P1 to P3

8.00  $\mu$ s (±25 ns)

### MODE C

#### P1 to P2

2.00  $\mu$ s (±25 ns)

#### P1 to P3

21.00  $\mu$ s (±25 ns)

### MODE S

#### P1 to P2

2.00  $\mu$ s (±25 ns)

#### P1 to P6

3.50  $\mu$ s (±25 ns)

#### P1 to SPR

4.75  $\mu$ s (±25 ns)

#### P5 to SPR

0.40  $\mu$ s (±50 ns)

## INTERMODE INTERROGATION PULSE SPACING

---

### MODE A

#### P1 to P3

8.00  $\mu\text{s}$  ( $\pm 25$  ns)

#### P1 to P4

10.00  $\mu\text{s}$  ( $\pm 25$  ns)

### MODE C

#### P1 to P3

21.00  $\mu\text{s}$  ( $\pm 25$  ns)

#### P1 to P4

23.00  $\mu\text{s}$  ( $\pm 25$  ns)

## INTERROGATION PULSE WIDTHS

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### MODE A,C,S,INTERMODE

#### P1,P2,P3

0.80  $\mu\text{s}$  ( $\pm 50$  ns)

### MODE S

#### P6 (Short DPSK Block)

16.25  $\mu\text{s}$  ( $\pm 50$  ns)

#### P6 (Long DPSK Block)

30.25  $\mu\text{s}$  ( $\pm 50$  ns)

#### P5

0.80  $\mu\text{s}$  ( $\pm 50$  ns)

### INTERMODE

#### P4 (Short)

0.80  $\mu\text{s}$  ( $\pm 50$  ns)

#### P4 (Long)

1.60  $\mu\text{s}$  ( $\pm 50$  ns)

## INTERROGATION PULSE RISE AND FALL TIMES

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### ALL MODES

#### Rise Time

50 to 100 ns

#### Fall Time

50 to 200 ns

## PHASE MODULATION

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### ALL MODES

#### Transition Time

$\leq 80$  ns

#### Phase Shift

180° ( $\pm 10^\circ$ )

## SLS LEVELS

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### 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

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

## INTERROGATION TEST SIGNALS

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### MODE S

#### PRF

50 Hz ( $\pm 5$  Hz)

#### ATCRBS

#### PRF

235 Hz ( $\pm 5$  Hz)

## UUT MEASUREMENTS

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### ERP (@ 1090 MHz)

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#### Range

+45.5 to +59 dBm (35.5 to 800 watts)

#### Resolution

0.1 dB

#### Accuracy

$\pm 2$  dB

#### Direct Connection Peak Pulse Power (@ 1090 MHz)

#### Range

+46.5 to +59 dBm (45 to 800 watts)

#### Resolution

0.1 dB

#### Accuracy

$\pm 1$  dB

## TRANSMITTER FREQUENCY

---

#### Range

1087.000 to 1093.000 MHz

#### Resolution

10 kHz

#### Accuracy

$\pm 50$  kHz

## RECEIVER SENSITIVITY, RADIATED MTL

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#### Range

-79 to -67 dBm into 0 dBi antenna

#### Resolution

0.1 dB

#### Accuracy

$\pm 2$  dB, typical

## RECEIVER SENSITIVITY, DIRECT CONNECTION MTL

---

#### Range

-79 to -67 dBm

#### Resolution

0.1 dB

#### Accuracy

$\pm 2$  dB

## REPLY DELAY

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### ATCRBS

#### Range

1.80 to 7.00  $\mu\text{s}$

#### Resolution

10 ns

#### Accuracy

$\pm 50$  ns

## REPLY DELAY, MODE S AND ATCRBS MODE S ALL-CALL

### Range

125.00 to 131.00  $\mu$ s

### Resolution

10 ns

### Accuracy

$\pm 50$  ns

## REPLY DELAY JITTER

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### ATCRBS

### Range

0.00 to 2.30  $\mu$ s

### Resolution

1 ns

### Accuracy

$\pm 20$  ns

## MODE S AND ATCRBS MODE S ALL-CALL

### Range

0.00 to 6.00  $\mu$ s

### Resolution

1 ns

### Accuracy

$\pm 20$  ns

## PULSE SPACING

---

### F1 TO F2

### Range

19.70 to 21.60  $\mu$ s

### Resolution

1 ns

### Accuracy

$\pm 20$  ns

## MODE S PREAMBLE

### Range, P1 to P2

0.8 to 1.2  $\mu$ s

### Range, P1 to P3

3.3 to 3.7  $\mu$ s

### Range, P1 to P4

4.3 to 4.7  $\mu$ s

### Resolution

1 ns

### Accuracy

$\pm 20$  ns

## PULSE WIDTHS

---

### F1 AND F2

### Range

0.25 to 0.75  $\mu$ s

### Resolution

1 ns

### Accuracy

$\pm 20$  ns

## MODE S PREAMBLE

### Range

0.25 to 0.75  $\mu$ s

### Resolution

1 ns

### Accuracy

$\pm 20$  ns

## PULSE AMPLITUDE VARIATION

---

### Range, Mode S (Relative to P1)

-3 to +3 dB

### Range, ATCRBS (Relative to F1)

-3 to +3 dB

### Resolution

0.1 dB (0.01 dB via RCI)

### Accuracy

$\pm 0.5$  dB

## DF 11 SQUITTER PERIOD

---

### Range

0.10 to 4.88 sec

### Resolution

10 ms

### Accuracy

$\pm 10$  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

$\pm 3$  dB

## TCAS MODE SPECIFICATIONS

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## SIGNAL GENERATOR

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## OUTPUT FREQUENCY

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### REPLY FREQUENCY

1090 MHz

### Accuracy

$\pm 10$  kHz

## OUTPUT LEVEL (SIMULATED ERP)

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### ANTENNA CONNECTOR <sup>Note 1</sup>

#### Radiated power at 0dBi UUT antenna

-68 dBm typical @ 10 Nmi Range, automatically controlled

### Range

-67 to -2 dBm at Antenna connector

### Resolution

0.5 dB

### Accuracy

$\pm 2$  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,  $\pm 1$  dB

### Accuracy

-115 to <-95 dBm,  $\pm 2$  dB



## REPLY PULSE SPACING

---

### MODE C

#### F1 to F2

20.30  $\mu\text{s}$  ( $\pm 25$  ns)

#### F1 to C1

1.45  $\mu\text{s}$  ( $\pm 25$  ns)

#### F1 to A1

2.90  $\mu\text{s}$  ( $\pm 25$  ns)

#### F1 to C2

4.35  $\mu\text{s}$  ( $\pm 25$  ns)

#### F1 to A2

5.80  $\mu\text{s}$  ( $\pm 25$  ns)

#### F1 to C4

7.25  $\mu\text{s}$  ( $\pm 25$  ns)

#### F1 to A4

8.70  $\mu\text{s}$  ( $\pm 25$  ns)

#### F1 to B1

11.60  $\mu\text{s}$  ( $\pm 25$  ns)

#### F1 to D1

13.05  $\mu\text{s}$  ( $\pm 25$  ns)

#### F1 to B2

14.50  $\mu\text{s}$  ( $\pm 25$  ns)

#### F1 to D2

15.95  $\mu\text{s}$  ( $\pm 25$  ns)

#### F1 to B4

17.40  $\mu\text{s}$  ( $\pm 25$  ns)

#### F1 to D4

18.85  $\mu\text{s}$  ( $\pm 25$  ns)

### MODE S

#### P1 to P2

1.00  $\mu\text{s}$  ( $\pm 25$  ns)

#### P1 to P3

3.50  $\mu\text{s}$  ( $\pm 25$  ns)

#### P1 to P4

4.50  $\mu\text{s}$  ( $\pm 25$  ns)

#### P1 to D1

8.00  $\mu\text{s}$  ( $\pm 25$  ns)

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

1.00  $\mu\text{s}$  times (n-1) ( $\pm 25$  ns)

## REPLY PULSE WIDTHS

---

### MODE C

#### All Pulses

0.45  $\mu\text{s}$  ( $\pm 50$  ns)

### MODE S

#### P1 through P4

0.50  $\mu\text{s}$  ( $\pm 50$  ns)

#### D1 through D112

0.50  $\mu\text{s}$  ( $\pm 50$  ns), 1  $\mu\text{s}$  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

50 to 100 ns

#### Fall Time

50 to 200 ns

## PERCENT REPLY

---

### Range

0 to 100%

### Resolution

10%

### Accuracy

$\pm 1\%$

## REPLY DELAY

---

### ATCRBS

3.0  $\mu\text{s}$  ( $\pm 50$  ns)

### Mode S

128  $\mu\text{s}$  ( $\pm 50$  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	$\leq \pm 200$ ns
Rejects	$\geq \pm 1.0$ $\mu$ s
P1 to P3	21.0 $\mu$ s
Accepts	$\leq \pm 200$ ns
Rejects (<10% Replies)	$\geq \pm 1.0$ $\mu$ s
P1 to P4	23.0 $\mu$ s
Accepts	$\leq \pm 200$ ns
Rejects (<10% Replies)	$\geq \pm 1.0$ $\mu$ s

#### Mode S

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

## SUPPRESSION

---

#### ATCRBS (P2 or S1)

>0.5dB above level of P1 <10% Replies

## UIUT 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)

##### Resolution

0.1 dB

##### Accuracy

$\pm 1$  dB

#### MODE S

##### Range

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

##### Resolution

0.1 dB

##### Accuracy

$\pm 1$  dB

## FREQUENCY

---

##### Range

1029.900 to 1030.100 MHz

##### Resolution

1 kHz

##### Accuracy

$\pm 10$  kHz

## TCAS BROADCAST INTERVAL

---

##### Range

1.0 to 12.0 sec

##### Resolution

0.1 sec

##### Accuracy

$\pm 0.2$  sec

## MISCELLANEOUS INPUT/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

Input/Output

##### Impedance

50  $\Omega$  typical

##### Maximum Input Level

10 W peak  
0.5 W average

#### VIDEO

##### Type

Output

##### Impedance

50  $\Omega$  typical

##### Generate Video Level

1.1 Vpp ( $\pm 0.4$  V) into 50  $\Omega$

##### Receive Video Level

Proportional to IF level

##### Baseline

$\pm 0.5$  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**

&gt;4 hrs continuous operation

&gt;6 hrs, Typical

**INPUT POWER (TEST SET)****Input Range**

11 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 to 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**<sup>NOTE 2</sup> -20°C to 55°C**Storage Temperature**<sup>NOTE 3</sup> -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)**

&lt;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 <sup>NOTE 4</sup>	MIL-PRF-28800F	Class 2
Temp, not operating <sup>NOTE 5</sup>	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

## VERSIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

### Ordering Numbers

### Versions

6000-110	IFR 6000 Mode A/C/S Transponder and DME Ramp Test Set, with US Mains Leads
6000-220	IFR 6000 Mode A/C/S Transponder and DME Ramp Test Set, with European Mains Leads
6000OPT2	TCAS (TIS)
6000OPT3	ADS-B

### Extended Standard Warranties with Calibration for 6000

W6000/203C	Extended standard warranty 36 months with scheduled calibration
W6000/205C	Extended standard warranty 60 months with scheduled calibration

### Accessories for 6000

AC0820	Desk Top Stand
AC0826	Tripod
AC24006	Tripod, Dolly, Stand
AC0824CD	IFR 6000 Maintenance Manual - CD
AC0825CD	IFR 6000 Operation Manual - CD
AC0829	25ft TNC/TNC COAX
AC0830	50ft TNC/TNC COAX

### Notes

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

NOTE 2 Battery charging temperature range: 5°C to 40°C (controlled by internal charger).

NOTE 3 Li Ion Battery must be removed below -20°C and above 60°C.

NOTE 4 Temperature range extended to -20°C to 55°C.

NOTE 5 Temperature range reduced to -30°C to 71°C.

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Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.

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