

# Avionics

## IFR 6015 Ramp Test Set

**AEROFLEX**  
A passion for performance.



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)

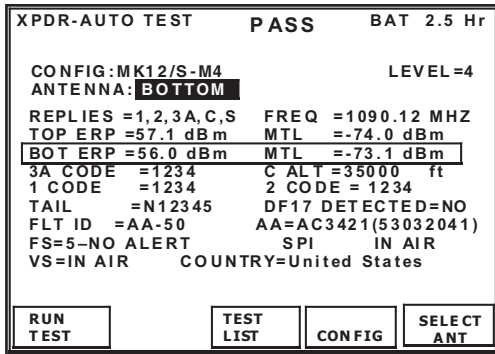
TACAN (Sub-Modes: T/R Norm, Inv, Range Only; A/A Beacon, Inv, Range Only)

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.

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



(IFF System Information in Public Domain)

## MK12/S Transponder

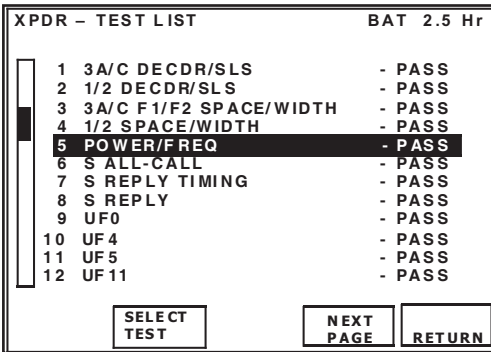
### Xpdr Auto-Test:

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.

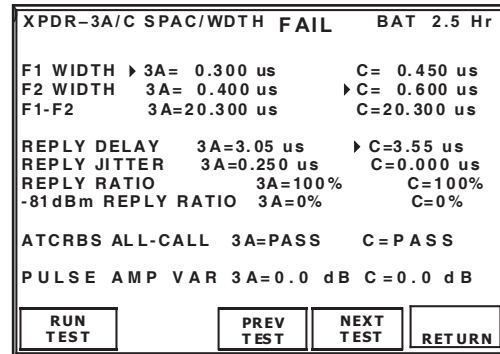
The Mode S tests are tailored automatically according to reported transponder level to avoid erroneous failures.



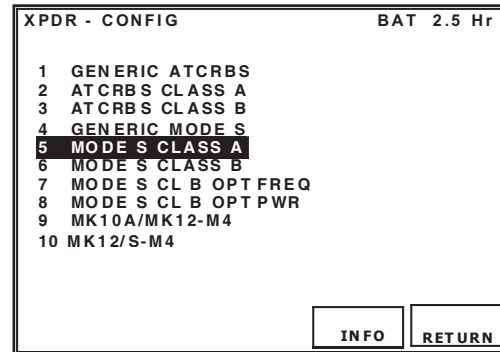
The test list is selected from the auto-test screen. This provides an easy means of selecting any of the individual tests that comprise the auto-test.

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.



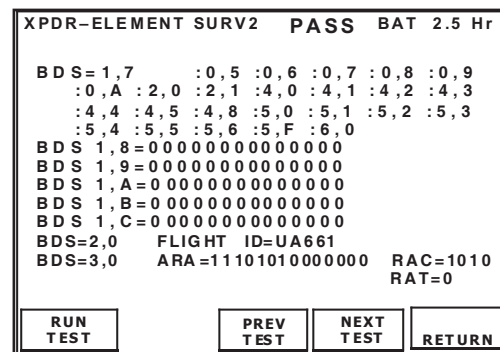
User selects config required for test.

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.



```

XPDR - ELEMENT SURV1 PASS BAT 2.5 Hr

BDS=1,0  SUBNETWORK VER =1
          ENH PROT IND   =LVL 2-4
          SPEC SERV CAP  =YES
          UELM CAPABILITY =16/1 s
          DELM CAPABILITY =16/500 ms
          AIRCRAFT ID CAP =YES
          SURV IDENT CAP  =YES
          COMM USE GICB REP=1
          DTE              =YES
          CONT FLAG        =YES
          SQUITTER CAP     =YES

RUN TEST  PREV TEST  NEXT TEST  RETURN

```

```

XPDR-S ALL-CALL PASS BAT 2.5 Hr

ITM REPLY
DELAY      3A=128.08 us  C=128.07 us
JITTER    3A=0.510 us   C=0.510 us
ADDRESS   3A=2AC421     C=2AC421
RATIO     3A=100%       C=100%
-81dBm    3A=0%         C=0%

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

RUN TEST  PREV TEST  NEXT TEST  RETURN

```

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

```

XPDR-ENHANCED SURV PASS BAT 2.5 Hr

DF=20
BDS4,0  MCP/FCU SEL ALT =65520 ft
BDS5,0  ROLL ANGLE      = 40.1 deg
          TRUE TRACK ANGLE= 90.3 deg
          GROUND SPEED   = 512 kts
          TRACK ANGLE RATE= 4.00 deg/s
          TRUE AIR SPEED  = 512 kts
BDS6,0  MAGNETIC HEADING= 180.3 deg
          IND AIR SPEED   = 512 kts
          MACH NO         = 0.300
          INERT VERT VEL  =-1400 ft/min
          BARO ALT RATE   =-1400 ft/min

RUN TEST  PREV TEST  NEXT TEST  RETURN

```

```

TACAN T/R NORM BAT 2.5 Hr

CHAN: 17X          RF LVL: - 42.0 dBm
FREQ: 978 MHz      RATE: 1000 kts   IN
                   RANGE: 100.00 nm

BRG:270.0 deg      IDENT: MORSE
% REPLY:100        SQTR :ON   ECHO:OFF

TX FREQ =1041.00 MHZ  ERP=250 WATTS
PRF=150 Hz
P1 WIDTH= 3.500 us   P2 WIDTH= 3.502 us
P1-P2   =12.0us(X)
UUT LVL = -78.2 dBm  SYNC=MRB

RUN TEST  PREV PARAM  NEXT PARAM  STOP RATE  IN/OUT

```

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

### 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

```

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)
DF 11 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= 1030.00 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.

```

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

```

### TCAS

TCAS types...

TCAS 1 MODE C

TCAS 2 A/TCRBS

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.

Comprehensive II/SI code and lockout timer test



```

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
                1      2      3      4      5
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 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

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### Notes

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

### TACAN/DME MODE SPECIFICATIONS

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#### SIGNAL GENERATOR

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

#### OUTPUT FREQUENCY

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##### 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

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##### 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

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##### 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

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##### P1/P2

3.5 μs ± 0.5 μs

#### ECHO REPLY

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##### Control

On/Off

##### Position

30 nmi ± 1 nmi

##### Amplitude

-11 dB ± 1 dB relative to reply level

#### REPLY PULSE RISE AND FALL TIMES

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##### 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

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##### 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

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##### X AND Y CHANNEL

###### Range

0 to 450.00 nmi

###### Resolution

0.01 nmi

###### Accuracy

± 0.01 nmi

#### PRESET RANGE DELAY

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##### 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

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### X AND Y CHANNEL

#### Rate

0 to 6500 kts

#### Resolution

1 kts

#### Accuracy

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

## PRESET RANGE RATE

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### 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

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

## SQUITTER

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### % PRF

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

2700 Hz

A/A RNG ONLY, BEACON, INVERSE

1350 Hz

#### Accuracy

$\pm 2\%$

#### Distribution

Per MIL STD 291C and ARINC 568

## REPLY EFFICIENCY

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### Range

0 to 100%

### Resolution

1% increments

### Accuracy

$\pm 0.5\%$

## % IDENT TONE PULSE PAIR

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

Selectable four letter code or tone

### Frequency

1350 Hz

### Accuracy

$\pm 2$  Hz

### Equalizer pulse pair

Spacing from Ident pair  $100 \mu\text{s} \pm 10 \mu\text{s}$

## % IDENT TONE SINGLE PULSE

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

Selectable four letter code or tone

### Frequency

1350 Hz

### Accuracy

$\pm 2$  Hz

## INVERSE MODE

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

Active Low North Reference Trigger Sync Output

## % A/A MODE INTERROGATION

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### P1 to P2

$12 \mu\text{s} \pm 0.1 \mu\text{s}$  (A/A X Channel) @ 50% peak

### P1 to P2

$24 \mu\text{s} \pm 0.1 \mu\text{s}$  (A/A Y Channel) @ 50% peak

### Interrogation Rate

150 PPS,  $\pm 5$  Hz

## % 15/135 HZ BEARING SIGNAL

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### Modulation Levels

15 Hz 21%  $\pm 2.5\%$

135 Hz 21%  $\pm 2.5\%$

### Frequency

15/135 Hz  $< \pm 0.2\%$

### Phase Accuracy

$< \pm 0.3^\circ$

### Distortion

$< 2.5\%$

## % BEARING

---

### Variable

0 to  $359.5^\circ$  in  $0.5^\circ$  increments

### Accuracy

$\pm 0.1^\circ$

### PRESET

#### Preset 1 (DoD) Range

$0^\circ, 45^\circ, 90^\circ, 135^\circ, 180^\circ, 225^\circ, 270^\circ, 315^\circ$

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

$0^\circ, 45^\circ, 180^\circ, 225^\circ$

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

$0^\circ, 90^\circ, 180^\circ, 337.5^\circ$

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

$90^\circ, 230^\circ, 320^\circ$

## INTERROGATION PULSE DECODING

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### Must Reply nominal code pair spacing

$< \pm 0.5 \mu\text{s}$

### Must Not Reply nominal code pair spacing

$> \pm 1.0 \mu\text{s}$

## % MRB T/R(X)

---

### Group

12 pairs of pulses

### Pulse Spacing

$12 \mu\text{s} \pm 0.1 \mu\text{s}$

### Pulse Pair Spacing

$12 \mu\text{s} \pm 0.1 \mu\text{s}$

## **% MRB T/R(Y)**

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### **Group**

13 single pulses

### **Pulse Spacing**

30  $\mu\text{s} \pm 0.1 \mu\text{s}$

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

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### **Group**

10 single pulses

### **Pulse Pair Spacing**

30  $\mu\text{s} \pm 0.1 \mu\text{s}$

## **% ARB T/ROO**

---

### **Group**

6 pairs of pulses

### **Pulse Spacing**

12  $\mu\text{s} \pm 0.1 \mu\text{s}$

### **Pulse Pair Spacing**

24  $\mu\text{s} \pm 0.1 \mu\text{s}$

## **% ARB T/R(Y)**

---

### **Group**

13 single pulses

### **Pulse Spacing**

15  $\mu\text{s} \pm 0.1 \mu\text{s}$

## **UUT MEASUREMENTS**

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### **ERP**

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#### **Range**

+47 to +66.1 dBm

#### **Resolution**

0.1 dB

#### **Accuracy**

$\pm 2$  dB

## **DIRECT CONNECTION PEAK PULSE POWER**

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#### **Range**

+47 to +66.1 dBm

#### **Resolution**

0.1 dB

#### **Accuracy**

$\pm 1$  dB

## **FREQUENCY**

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#### **Range**

1025.00 to 1150.00 MHz

#### **Resolution**

10 kHz

#### **Accuracy**

$\pm 20$  kHz

## **INTERROGATION PULSE WIDTH**

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### **P1 AND P2 PULSE WIDTHS**

#### **Range**

2.00 to 5.00  $\mu\text{s}$

#### **Resolution**

1 ns

#### **Accuracy**

$\pm 50$  ns

## **% INTERROGATION PULSE SPACING**

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### **P1 to P2 Spacing**

10 to 14  $\mu\text{s}$  (T/R X and A/A X Channel)

### **P1 to P2 Spacing**

22 to 26  $\mu\text{s}$  (A/A Y Channel)

### **P1 to P2 Spacing**

34 to 38  $\mu\text{s}$  (T/R Y Channel)

### **Resolution**

10 ns

### **Accuracy**

$\pm 20$  ns

## **INTERROGATION PRF**

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### **Range**

1 to 300 Hz

### **Resolution**

1 Hz

### **Accuracy**

$\pm 2$  Hz

## **% A/A REPLY DELAY**

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### **A/A(X)**

62  $\mu\text{s}$  (-2 +4  $\mu\text{s}$  accept)

### **A/A(Y)**

74  $\mu\text{s}$  (-2 +4  $\mu\text{s}$  accept)

### **Resolution**

10 ns

### **Accuracy**

$\pm 100$  ns

## **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**

$\pm 10$  kHz

## **RF OUTPUT LEVEL**

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### **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**

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



**Accuracy**

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

**ATCRBS/SIF/MODE S INTERROGATION PULSE SPACING**

---

**▲ MODE 1****P1 to P2**

2.00  $\mu$ s  $\pm 25$  ns

**P1 to P3**

3.00  $\mu$ s  $\pm 25$  ns

**▲ MODE 2****P1 to P2**

2.00  $\mu$ s  $\pm 25$  ns

**P1 to P3**

5.00  $\mu$ s  $\pm 25$  ns

**MODE 3A****P1 to P2**

2.00  $\mu$ s  $\pm 25$  ns

**P1 to P3**

8.00  $\mu$ s  $\pm 25$  ns

**MODE C****P1 to P2**

2.00  $\mu$ s  $\pm 25$  ns

**P1 to P3**

21.00  $\mu$ s  $\pm 25$  ns

**MODE S****P1 to P2**

2.00  $\mu$ s  $\pm 25$  ns

**P1 to P6**

3.50  $\mu$ s  $\pm 25$  ns

**P1 to SPR**

4.75  $\mu$ s  $\pm 25$  ns

**P5 to SPR**

0.40  $\mu$ s  $\pm 50$  ns

**INTERMODE INTERROGATION PULSE SPACING**

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**MODE A****P1 to P3**

8.00  $\mu$ s  $\pm 25$  ns

**P1 to P4**

10.00  $\mu$ s  $\pm 25$  ns

**MODE C****P1 to P3**

21.00  $\mu$ s  $\pm 25$  ns

**P1 to P4**

23.00  $\mu$ s  $\pm 25$  ns

**INTERROGATION PULSE WIDTHS**

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**MODE A,C,S,INTERMODE****P1,P2,P3**

0.80  $\mu$ s  $\pm 50$  ns

**MODE S****P6 (Short DPSK Block)**

16.25  $\mu$ s  $\pm 50$  ns

**P6 (Long DPSK Block)**

30.25  $\mu$ s  $\pm 50$  ns

**P5**

0.80  $\mu$ s  $\pm 50$  ns

**INTERMODE****P4 (Short)**

0.80  $\mu$ s  $\pm 50$  ns

**P4 (Long)**

1.60  $\mu$ 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°  $\pm 10$ °

**SLS LEVELS**

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**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**

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**MODE S****PRF**

50 Hz  $\pm 5$  Hz

**ATCRBS/SIF****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**

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### **Range**

1087.000 to 1093.000 MHz

### **Resolution**

10 kHz

### **Accuracy**

± 50 kHz

## **RECEIVER SENSITIVITY, RADIATED MTL**

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### **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 &gt;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 &lt;-95 dBm, ± 2 dB

**REPLY PULSE SPACING**

---

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

---

**MODE C****All Pulses**0.45  $\mu$ s ± 50 ns**MODE S****P1 through P4**0.50  $\mu$ s ± 50 ns**D1 through D112**0.50  $\mu$ s ± 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

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

## SUPPRESSION

---

### 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  $\Omega$  typical**Maximum Input Level**

4 kW peak

10 W average

**VSWR**

&lt; 1.3:1

**ANTENNA****Type**

Input/Output

**Impedance**50  $\Omega$  typical**Maximum Input Level**

10 kW peak

1/2 W average

**VIDEO****Type**

Output

**Impedance**50  $\Omega$  typical**Generate Video Level**1.1  $\pm$  0.4 V peak to peak into 50  $\Omega$ **Receive Video Level**

Proportional to IF level

**Baseline** $\pm$  0.5 V referenced to ground**TEST ANTENNA**

---

**VSWR**

&lt; 1.5:1

**Gain**

6 dB, Typical

**TIME BASE (TCXO)**

---

**Temperature Stability** $\pm$  1 ppm**Aging** $\pm$  1 ppm per year**Accuracy** $\pm$  1 ppm**Test Limit** $\pm$  0.3 ppm**BATTERY**

---

**Type**

Li Ion

**Duration**

&gt; 4 hrs continuous operation

&gt; 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** $\leq$  10% of the nominal voltage**Transient Overvoltages**

According to Installation Category II

**ENVIRONMENTAL (TEST SET)**

---

**Use**

Pollution Degree 2

**Altitude** $\leq$  4800 meters**Operating Temperature**<sup>NOTE 3</sup> -20°C to 55°C**Storage Temperature**<sup>NOTE 4</sup> -30°C to 71°C**Relative Humidity**95%  $\pm$  5% from 5° to 30°C75%  $\pm$  5% from 30° to 40°C45%  $\pm$  5% from 40° to 55°C**ENVIRONMENTAL (SUPPLIED EXTERNAL AC TO DC CONVERTER)**

---

**Use**

Indoors

**Altitude** $\leq$  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 1
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 5</sup>	MIL-PRF-28800F	Class 2
Temp, not operating <sup>NOTE 6</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 EN 61326	
EMC		

### 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

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

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

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

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

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

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

## VERSIONS AND ACCESSORIES

When ordering please quote the full ordering number information.

### Ordering

#### Numbers

72424

83411

#### Versions

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)

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

### EXPORT CONTROL:

This product is controlled for export under the International Traffic in Arms Regulations (ITAR). A license from the U.S. Department of State is required prior to the export of this product from the United States.

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