Avionics IFR 6000 Ramp Test Set

The IFR 6000 is a compact, lightweight and weatherproof unit designed for testing transponder modes A/C/S, 1090 MHz ADS-B and 978 MHz UAT, TCAS I and II, and 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
- Optional ADS-B capabilities are DO-260A/B compliant

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 (Modes A/C/S))

DME

TCAS I and II, TIS*

1090 MHz ADS-B (Monitor/Generate/GICB)*

978 MHz UAT (ADS-B/FIS-B/TIS/B)*

*Optional

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

Mode S and ATCRBS Transponder

XPDR Auto-Test

XPDR-AUTO TEST	PASS	BAT	2.5 Hr
CONFIG:MK12/5-M4 ANTENNA: BOTTOM		LEV	/EL=4
REPLIES =1,2,3A,C,S <u>TOP ERP =57.1 dBm</u> <u>BOT ERP =56.0 dBm</u> 3A CODE =1234 1 CODE =1234	FREQ MTL MTL C ALT 2 COD	=1090.12 =-74.0 di =-73.1 di =35000 E = 1234	MHZ Bm Bm ft
TAIL = N12345 FLT ID = AA-50 FS=5-NO ALERT VS=IN AIR COUN	DF17 AA=AC SPI TRY=Unit	DETECTED 3421(5303 IN AI ted States	D=NO 32041) R
RUN TE TEST LI	ST C	ONFIG	SELECT

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.

XPDR Test List



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

XPDR Individual Test



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

XPDR Config



User selects configuration 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.

XPDR Elementary Surveillance

AFUR - ELC	MENT SURV1	PASS	BAT	2.5 Hr
B D S = 1, 0	SUBNETWOR	K VER	= 1	
	ENH PROT	IND	=LVL	2-4
	IFIM CAPA	BUITY	-16/1	
	DELM CAPA	BILITY	=16/5	00 ms
	AIRCRAFT I	DCAP	=YES	00 1113
	SURV IDENT	CAP	=YES	
	COMM USE O	SICB REP	= 1	
	DTE		= Y E S	
	CONT FLAG		= Y E S	
	SQUITTER C	AP	= Y E S	
RUN	PRE	V NE	хт	
TEST	TEST		ST L	RETURN
YPDP-ELEN	ENT SUDVO	DACC	BAT	2.5 Hz
XPDR-ELEN	IENT SURV2	PASS	BAT	2.5 Hr
XPDR-ELEN	IENT SURV2	PASS	BAT	2.5 Hr
B D S = 1,7	1ENT SURV2	PASS	BAT	2.5 Hr
8 D S = 1,7 :0,A	:0,5 :0 :2,0 :2,1 :4	PASS 6 :0,7 0 :4,1	BAT : 0, 8 : 4, 2	2.5 Hr : 0,9 : 4,3
8 D S = 1,7 :0,A :5,4	:0,5:0, :2,0:2,1:4, 4,5:4,8:5, 5,5:5,6:5,	PASS 6 :0,7 0 :4,1 0 :5,1 F :6.0	BAT : 0,8 : 4,2 : 5,2	2.5 Hr : 0,9 : 4,3 : 5,3
XPDR-ELEN B D S = 1,7 :0,A :4,4 :5,4 B D S 1,8	ENT SURV2 :0,5:0 :2,0:2,1:4 4,5:4,8:5 5,5:5,6:5 0000000000	PASS ,6 :0,7 ,0 :4,1 0 :5,1 F :6,0 00000	BAT : 0, 8 : 4, 2 : 5, 2	2.5 Hr :0,9 :4,3 :5,3
XPDR-ELEN 8 D S = 1,7 :0,A :4,4 :5,4 8 D S 1,8 8 D S 1,9	ENT SURV2 : 0,5 : 0 : 2,0 : 2,1 : 4 4,5 : 4,8 : 5 5,5 : 5,6 : 5 = 0000000000	PASS ,6 :0,7 ,0 :4,1 0 :5,1 F :6,0 00000	BAT : 0,8 : 4,2 : 5,2	2.5 Hr : 0 , 9 : 4 , 3 : 5 , 3
XPDR-ELEN B D S = 1,7 :0,A :4,4: :5,4: B D S 1,8 B D S 1,9 B D S 1,A	ENT SURV2 : 0,5 : 0 : 2,0 : 2,1 : 4 4,5 : 4,8 : 5, 5,5 : 5,6 : 5, = 0 0 0 0 0 0 0 0 0 = 0 0 0 0 0 0 0 0 0 0	PASS ,6 :0,7 ,0 :4,1 0 :5,1 F :6,0 00000 00000 00000	BAT : 0, 8 : 4, 2 : 5, 2	2.5 Hr : 0 , 9 : 4 , 3 : 5 , 3
XPDR-ELEN B D S = 1,7 :0,A :4,4 :5,4 B D S 1,8 B D S 1,9 B D S 1,4 B D S 1,4 B D S 1,4	ENT SURV2 : 0,5 : 0 : 2,0 : 2,1 : 4 : 4,5 : 4,8 : 5 5,5 : 5,6 : 5 : 00 0 0 0 0 0 0 0 0 : 0 0 0 0 0 0 0 0 0 : 0 0 0 0 0 0 0 0 0 : 0 0 0 0 0 0 0 0 0 0 : 0 0 0 0 0 0 0 0 0 0	PASS ,6 :0,7 ,0 :4,1 0 :5,1 F :6,0 00000 00000 00000 00000	BAT : 0,8 : 4,2 : 5,2	2.5 Hr : 0 , 9 : 4 , 3 : 5 , 3
XPDR-ELEN B D S = 1, 7 : 0, A : 4, 4 : 5, 4 B D S 1, 8 B D S 1, 8 C S 1	ENT SURV2 : 0, 5 : 0, 2, 0 : 2, 1 : 4, 4, 5 : 4, 8 : 5, 5, 5 : 5, 6 : 5, 00 0 0 0 0 0 0 0 0 0 = 0 0 0 0 0 0 0 0 0 0 = 0 0 0 0 0 0 0 0 0 0 0 = 0 0 0 0 0 0 0 0 0 0 0 = 0 0 0 0 0 0 0 0 0 0 0 0	PASS ,6 : 0,7 ,0 : 4,1 0 : 5,1 F : 6,0 00000 00000 00000 00000 00000	BAT : 0, 8 : 4, 2 : 5, 2	2.5 Hr : 0, 9 : 4, 3 : 5, 3
XPDR-ELEM B D S = 1, 7 :0, A :4, 4 :5, 4 B D S 1, 8 B D S 1,	ENT SURV2 : 0,5 : 0, : 2,0 : 2,1 : 4, 4,5 : 4,8 : 5, : 5,5 : 5,6 : 5, : 0000000000 = 0000000000 = 0000000000 FLIGHT ID=1 #8 4-11000	PASS ,6 : 0,7 ,0 : 4,1 0 : 5,1 F : 6,0 000000	BAT : 0, 8 : 4, 2 : 5, 2	2.5 Hr : 0, 9 : 4, 3 : 5, 3
XPDR-ELEN B D S = 1, 7 : 0, A : 4, 4 : B D S 1, 8 B D S 1, 8 B D S	ENT SURV2 : 0,5 : 0, 2,0 : 2,1 : 4, 4,5 : 4,8 : 5, 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	PASS ,6 : 0,7 ,0 : 4,1 0 : 5,1 F : 6,0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	BAT : 0,8 : 4,2 : 5,2	2.5 Hr : 0, 9 : 4, 3 : 5, 3 C=1010
XPDR-ELEN B D S = 1, 7 :0, A :4, 4 :5, 4 B D S 1, 8 B D S 1,	ENT SURV2 :0,5:0, 2,0:2,1:4, 4,5:4,8:5, 5,5:5,6:5, 00000000000 =00000000000 =0000000000	PASS ,6 : 0,7 ,0 : 4,1 F : 6,0 0 0 0 0 0 0 0 0	BAT : 0, 8 : 4, 2 : 5, 2 RA(RA)	2.5 Hr : 0,9 : 4,3 : 5,3 C=1010 F=0
XPDR-ELEN B D S = 1, 7 : 0, A : 4, 4 : B D S 1, 8 B D S 1, 9 B D S 1, 8 B D S 1, 9 B D S	ENT SURV2 : 0,5 : 0, : 2,0 : 2,1 : 4, 4,5 : 4,8 : 5, : 5,5 : 5,6 : 5, : 0000000000 : 000000000 : 000000000 : 000000000 : 000000000 : 000000000 : 000000000 : 000000000 : 000000000 : 000000000 : 0000000000	PASS .6 : 0,7 .0 : 4,1 .7 : 6,0 0 0 0 0 0 0 0 0	BAT : 0,8 : 4,2 : 5,2 RA(RA)	2.5 Hr : 0,9 : 4,3 : 5,3 C=1010 F=0

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

XPDR Enhanced Surveillance

XPDR-E	NHANCED SURV PASS BAT 2.5 Hr
DF = 20	
B D S 4,0	MCP/FCUSELALT =65520 ft
B D S S, 0	ROLLANGLE = 40.1 deg
	TRUE TRACK ANGLE = 90.3 deg
	GROUND SPEED = 512 kts
1	TRACK ANGLE RATE = 4.00 deg/s
	TRUE AIR SPEED = 512 kts
BDS6,0	MAGNETIC HEADING = 180.3 deg
	IND AIR SPEED = 512 kts
1	MACH NO = 0.300
	INERT VERT VEL =-1400 ft/min
1	BARO ALT BATE =: 1400 ft/min
RUN	PREV NEXT

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.

XPDR-UF11	PASS	BAT	2.5 Hr
DF=11 CA=0-LEVEL 2 PI=02F08D AA=AC3421(63032 II LOCKOUT TIME II MATCH=PASS SI LOCKOUT TIME SI MATCH=PASS	CA MODE 041) R=185 R=185		
RUN TEST	PREV NEX TEST TES	(T	RETURN

Comprehensive II / SI code and lockout timer test

XPDR-S ALL-C	ALL PAS	S BAT 2.5 Hr
ITM REPLY DELAY JITTER ADDRESS RATIO	3 A = 1 2 8.08 us 3 A = 0.510 us 3 A = 2 A C 4 2 1 3 A = 100 %	C = 128.07 us C = 0.510 us C = 2 A C 4 2 1 C = 100 %
-81dBm MODE S ALL ADDRESS TAIL = N12345 COUNTRY = Un	3A=0% CALL = PASS = 2AC42 ited States	C = 0 %
RUN TEST	PREV TEST	NEXT TEST RETURN

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.

STATUS=	NON-THRE	EAT EN	NCOUNTER	R= 0:	00
RANGE=	21.00 nm	N	ALT= +1	000 ft	÷
FREQ= 10	30.000 MH	2 2	ERP= 5	57.0 d	Bm
ALT RATE	: 600	fpm C	ONVERG	E :01	FF
ALT STAR	T: +1000	ft	STOP:	0	ft
RANGE R.	ATE : 350	kts	0.0F.	0.00 h	
RANGE S	TART: 10	00.00	STOP	0.00 0	00
TCAS TYP	E: E-TCAS	5	%REF		100
SCENARIO	D: 0-CUST	OM			
ICAS			BA	1 2.5	111

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.

TIS

TIS				BAT	2.5 Hr
TARGETS	5	υu	THDG	180 de	
BRG(deg)	: 120	90	234	182	23
ALT(ft)	: 6.00	2000	3.00	2.00	1.00
ALT RATE HDG(deg)	:CLIMB : 234	178	S6	22	O
ADDD-34	: PROX	PROX		PROX	TRFC
TSCR= 5	TSDR	= 1	ALT =	126700	ft
	Ja-CONI		- INF	0-0000	
RUN TEST	PREV PARAM	PARA	м		

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

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

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
56,1 A/C STATUS ST1	- AVAIL
6 6,1 A/C STATUS ST2	- AVAIL
7 6,2 TSS SUBTYPE 0	NO SQTR
8 6,2 TSS SUBTYPE 1	 AVAIL
9 6,5 A/C OP STATUS AIR	- AVAIL
10 6,5 A/C OP STATUS SUR	 AVAIL
11 0 ,A TEST MSG	- AVAIL
RUN BDS	
TEST DATA	RETUR

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.

For the very latest specifications visit WWW.aeroflex.com



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

<u>ADS-B GEN</u>

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 S TATUS ST1	ENABLED
6 6,1 A/C STATUS ST2	ENABLED
7 6,2 TSS SUBTYPE 0	ENABLED
8 6,2 TSS SUBTYPE 1	ENABLED
9 6,5 A/C OP STATUS AIR	ENABLED
10 6,5 A/C OP STATUS SUR	- ENABLED
11 0,A TEST MSG	- ENABLED
TEST DATA	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 DF 19 AA:3AC421 (16542041) ME=490844AE8319EA PERI	COUN COUN	E: 9 T=10) s	00
LAT: 37 39 00 N LONG: POS: SAF:1 T:1 SURVEILLANCE STATUS : NO	97 25 4 N/UTC INFO	s w	
BARO PRES ALT: 126700 ft GNSS ALT: N/A			
TEST OFF PARAM PA	RAM	RETU	IRN

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.

<u>GICB</u>

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 BDS	
TEST DATA	RETURN

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 ACA DF20 AA=3AC4 MB=000000000	5 ARA 21 (16542041) 00000	
TIDA= 32000 ft ARA=11101010 RAC=1010 R	TIDR= 000000 TID=3 AT=1 MTE=3	1.00 nm 3A4518
TTI=2-ALT/RAN	IGE/BEARING DA	ТА
RUN TEST	PREV PRE TEST TES	V T RETURN

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

978 MHz UAT

The 978 MHz UAT Option allows the user to generate and monitor 978 MHz UAT tests.

ADS-B/GIC	B/UAT	MAIN	BAT	2.5 H r
	ADCR	CICR		HAT
MON	GEN	GICB	CIRC	UAT

UAT MON List



Monitors State and Auxilliary State Vectors, Mode Status and Target State, displaying field-relevant information broadcast from the UUT.

<u>UAT GEN</u>

UAT GEN LIST			BAT	2.5 Hr
			GPS	AVAIL
1 FIS-B	-			
2 T I S-B	-			
3 ADS-B	-			
SELECT			1	RETURN

Generates ADS-B, TIS-B and FIS-B details. The ADS-B and TIS-B pages generate up to 5 targets, with each target generating independent bearing, heading, ranges, altitudes and altitude rates. The FIS-B page allows teh user to confirm receipt of proper METER/TAF details.

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.



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
ANTENNA PORT	
Range	-67 to -2 dBm at Antenna port
Resolution	1 dB
Accuracy	±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, ± 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 (\pm 1 dB) relative to reply level
REPLY PULSE RISE AND FALL T	IMES
ALL PULSES	
Rise Time	$2.5~\mu s$ (±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	
	0 + 450.00 + 1
Range	U TO 450.00 nmi
Dooolution .	0.01 nm:
Resolution	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	

2700 Hz

Per ARINC 568

±2%

PRF Accuracy Distribution

REPLY EFFICIENCY

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

IDENT TONE

Selection	Selectable three letter code
Frequency	1350 Hz
Trequency	1330 112
Accuracy	±2 Hz

UUT MEASUREMENTS

ERP

Range	+47 to +64 dBm
Resolution	0.1 dB
Accuracy	$\pm 2 \ dB$

dBm

DIRECT CONNECTION PEAK PULSE POWER

Range	+47 to +64
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 SPECIFICATIONS

SIGNAL GENERATOR

RF OUTPUT FREQUENCY

Interrogation Frequency	1030 MHz
Accuracy	±10 kHz

RF OUTPUT LEVEL

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	$\pm 2 dB$
Distance to UUT antenna	6 to 200 ft with supplied antenna

RF I/O CONNECTOR

Range

Resolution

Accuracy

Accuracy

MTL + 6 dB typical, automatically controlled

-115 to -47 dBm 0.5 dB -95 to -47 dBm, ±1 dB -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

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)
Р5	0.80 μs (±50 ns)
INTERMODE	
P4 (Short)	0.80 μs (±50 ns)
P4 (Long)	1.60 μs (±50 ns)

INTERROGATION PULSE	E RISE AND FALL TIMES	REPLY DELAY	
ALL MODES		ATCRBS	
Rise Time	50 to 100 ns	Range	1.80 to 7.00 μs
Fall Time	50 to 200 ns	Resolution	10 ns
		Accuracy	±50 ns
PHASE MODULATION		REPLY DELAY, MODE S AND ATCR	3S MODE S ALL-CALL
ALL MODES		Range	125.00 to 131.00 μs
Transition Time	<u><</u> 80 ns	Resolution	10 ns
Phase Shift	180° (±10°)	Accuracy	±50 ns
SLS LEVELS		REPLV DELAV JITTER	
SIS Level (P2)		AICRES	0.00 to 0.00
-9 dB -1 to +0 dB rel	ative to P1 level	Range	0.00 to 2.30 μs
0 dB - 0 to + 1 dB relation	tive to P1 level	Resolution	1 //s + 20 nc
OFF			
MODE S		Banda	
SLS Level (P5)		Range	0.00 to 0.00 μs
-12 dB, -1 to +0 dB re	elative to P6 level	Acouracy	+ 20 nc
+3 dB -0 to +1 dB re	plative to P6 level	Accuracy	±20 //s
OFF		PULSE SPACING	
Note: SLS level is automat	ically controlled in the SLS LEVEL test.	F1 T0 F2	
		Range	19.70 to 21.60 μs
INTERROGATION TEST	SIGNALS	Resolution	1 ns
MODE S		Accuracy	±20 ns
PRF	50 Hz (±5 Hz)	MODE S PREAMBLE	
ATCRBS		Range, P1 to P2	0.8 to 1.2 μs
PRF	235 Hz (±5 Hz)	Range, P1 to P3	3.3 to 3.7 μs
		Range, P1 to P4	4.3 to 4.7 μs
		Resolution	1 ns
ERP (@ 1090 MHz)		Accuracy	±20 ns
Range	+45.5 to +59 dBm (35.5 to	PULSE WIDTHS	
	800 watts)	F1 AND F2	
Resolution	0.1 dB	Range	0.25 to 0.75 us
Accuracy	±2 dB	Resolution	1 ns
Direct Connection Peak Pu	lse Power (@ 1090 MHz)	Accuracy	±20 ns
Range	+46.5 to +59 dBm (45 to 800	MODE S PREAMBLE	
	watts	Range	0.25 to 0.75 us
Resolution	0.1 dB	Resolution	1 ns
Accuracy	±1 αB	Accuracy	±20 ns
TRANSMITTER FREQUE	νсу		
Range	1087.000 to 1093.000 MHz		
Resolution	10 kHz	Range, Mode S (Relative to P1)	-3 to +3 dB
Accuracy	±50 kHz	Range, AICRBS (Relative to F1)	-3 to +3 dB
		Resolution	
RECEIVER SENSITIVITY,	RADIATED MTL	Accuracy	±0.5 dB
Range	-79 to -67 dBm into 0 dBi antenna	DF 11 SQUITTER PERIOD	
Resolution	0.1 dB	Range	0.10 to 4.88 sec
Accuracy	± 2 dB, typical	Resolution	10 ms
		Accuracy	±10 IIIS
RECEIVER SENSITIVITY,		DIVERSITY ISOLATION	
Resolution	- / 9 LU - 0 / UBM 0 1 dB	Range	0 to >20 dB (Depending on Test
Λεουκου	0.1 UD +2 dB	Test Distance	D_{1} and D_{2} (6ff) to 20 06 m (05 ft)
Accuracy	±2 uD	Posolution	
		Accuracy	±3 UD

TCAS MODE SPECIFICATIONS

SIGNAL GENERATOR

OUTPUT FREQUENCY

REPLY FREQUENCY Accuracy

1090 MHz ±10 kHz

OUTPUT LEVEL (SIMULATED ERP)

ANTENNA CONNECTOR NOTE 1

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, ± 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 MODE S P1 through P4 D1 through D112

0.45 µs (±50 ns)

0.50 μs (±50 ns) 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

REPLY PULSE AMPLITUDES

ATCRBS	±1 dB relative to F1
Mode S	±1 dB relative to P1
REPLY PULSE RISE AND FAI	LL TIMES
ALL MODES	
Rise Time	50 to 100 ns
Fall Time	50 to 200 ns
PERCENT REPLV	
Rando	0 to 100%
Resolution	10%
Accuracy	±1%
AICRBS	$3.0 \ \mu s \ (\pm 50 \ ns)$
Mode S	128 µs (±50 ns)
RANGE DELAY	
Range	0 to 260 nmi
Resolution	0.1 nmi
Accuracy	±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
	นเรเทมนเษน
PULSE SPACING	
AICRES (MODE C All Call)	2.0
SI to PI	2.0 μs
Accepts	$\leq \pm 200$ ns
Rejects	$\geq \pm 1.0 \ \mu S$
P1 to P3	21.0 µs
Accepts	<u><</u> ±200 ns
Rejects (<10% Replies)	≥±1.0 μs
P1 to P4	23.0 μs
Accepts	≤±200 <i>n</i> s
Rejects (<10% Replies)	$\geq \pm 1.0 \ \mu s$

Mode S

P1 to P2	2.0 μs
Accepts	≤±200 ns
Rejects (<10% Replies)	≥±1.0 μs
P1 to SPR	4.75 μs
Accepts	$\leq \pm 200$ ns
Rejects (<10% Replies)	≥±1.5 μs

SUPPRESSION

ATCRBS (P2 or S1) >0.5 dB above level of P1

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	±2 dB

<10% Replies

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	±10 kHz

TCAS BROADCAST INTERVAL

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

UAT MODE SPECIFICATIONS

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 port
Resolution	0.5 dB
Accuracy	$\pm 2 \ dB$
Distance to UUT antenna	6 to 150 ft with supplied antenna
RF I/O PORT	
Automatic mode	-85 dBm
Accuracy	±1 dB
MODULATION	
Туре	BPFSK per RTCA DO-282B
Deviation	±312.5kHz typical

UUT MEASUREMENTS

ERP (@978MHZ)	
Range	+35 to +57 dBm (3.16 to 500
	watts)
Resolution	0.1 dB
Accuracy	$\pm 2 \ dB$
DIRECT CONNECTION POW	ER (@978 MHZ)
Range	+35 to +57 dBm (3.16 to 500
	watts)
Resolution	0.1 dB
Accuracy	$\pm 1 \ dB$
FREQUENCY	
Range	977.96 to 978.04MHz
Resolution	1 kHz
Accuracy	±10 kHz

MISC. INPUTS/OUTPUTS SPECIFICATIONS

RF I/O

•	
Туре	Input/Output
Impedance	50 Ω typical
Maximum Input Level	4 kW peak
	10 W average
VSWR	<1.3:1
ANTENNA	
Туре	Input/Output
Impedance	50 Ω typical
Maximum Input Level	10 W peak
	0.5 W average
VIDEO	
Туре	Output
Impedance	50 Ω typical
Generate Video Level	500 mV peak to peak typical into 50 Ω
Receive Video Level	Proportional to IF level
Baseline	± 0.5 V referenced to ground
GPS ANT	
Туре	Output
Impedance	50 Ω typical, DC short
TEST ANTENNA	

VSWR	<1.5:1
Gain	7.5 dB, Typical
TIME BASE (TCXO)	

Temperature	Stability
Aging	
Accuracy	

BATTERY

Туре	Li Ion
Duration	>4 hrs continuous operation
	>6 hrs, Typical

±1 ppm

±1 ppm

±1 ppm per year

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</p>

Transient Overvoltages

According to Installation Category II

ENVIRONMENTAL (TEST SET)

Use	Pollution Degree 2
Altitude	<u><</u> 4800 meters
Operating Temperature NOTE 2	-20°C to 55°C
Storage Temperature NOTE 3	-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	<u><</u> 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 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 NOTE 4	MIL-PRF-28800F	Class 2
Temp, not operating NOTE 5	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-SID-101C	Method 5019
Cimulated Deinfoll	ATA 300	Calegory I
Simulateu Raimaii	MIL-SID-SIOF	Procedure II of 4.1.2
	FED-STD-101C	Method 5009.1
		Sec 0.7.1
Immersion	MIL-STD-810F	Method 512.4

NOTES

- NOTE 1 Simulates a 50.5 dBm XPDR ERP at 10 nMi range.
- NOTE 2 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.

VERSIONS AND ACCESSORIES

<u>.</u>			
Order Number	Version		
72422	IFR 6000 Mode A/C/S Transponder and DME Ramp Test Set NSN: 6625-01-069-5582		
83410	60000PT2 TCAS (TIS)		
83411	60000PT3 ADS-B 1090 MHz		
112795	60000PT5 UAT 978 MHz		
Extended Standa	ard Warranties with Calibration		
84366	Extended standard warranty 36 months with scheduled calibration		
84368	Extended standard warranty 60 months with scheduled calibration		
Standard Accessories			
10241	Transit case		
62302	Power cord, 110 V		
64020	Power cord set, 220 V		
62401	TNC/TNC COAX, 72 in.		
62402	TNC/TNC COAX, 12 in.		
56080	Fuse, 5 Amp, 32 V		
91771	Antenna		
64749	Antenna shield		
64580	Breakout box		
67366	Power supply		
6096	Getting Started Manual		
6093	IFR 6000 Operation Manual - CD		
Optional Accessories			
63656	Desk Top Stand		
67474	Tripod		
82553	Tripod, Dolly, Stand		
62462	25 ft TNC/TNC COAX		
86336	50 ft TNC/TNC COAX		
86931	UC-584 Universal Transponder Antenna Coupler		
112349	UC-584 Coupler Kit, dual antenna		
112350	UC-584 Coupler Kit, single antenna		
6095	IFR 6000 Maintenance Manual - CD		

CHINA Beijing

Tel: [+86] (10) 6539 1166 Fax: [+86] (10) 6539 1778

CHINA Shanghai Tel: [+86] 21 2028 3588 Fax: [+86] 21 2028 3558

CHINA Shenzhen Tel: [+86] (755) 3301 9358 Fax: [+86] (755) 3301 9356

FINLAND Tel: [+358] (9) 2709 5541 Fax: [+358] (9) 804 2441

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Tel: [+33] 1 60 79 96 00

Fax: [+33] 1 60 77 69 22 GERMANY Tel: [+49] 89 99641 0 Fax: [+49] 89 99641 160 HONG KONG Tel: [+852] 2832 7988 Fax: [+852] 2834 5364

FRANCE

INDIA Tel: [+91] 80 [4] 115 4501 Fax: [+91] 80 [4] 115 4502

JAPAN

Tel: [+81] (3) 3500 5591 Fax: [+81] (3) 3500 5592 KOREA Tel: [+82] (2) 3424 2719 Fax: [+82] (2) 3424 8620 SCANDINAVIA Tel: [+45] 9614 0045 Fax: [+45] 9614 0047 SINGAPORE

Tel: [+65] 6873 0991 Fax: [+65] 6873 0992

www.aeroflex.com

info-test@aeroflex.com

TAIWAN

Tel: [+886] 2 2698 8058 Fax: [+886] 2 2698 8050 **UK Stevenage** Tel: [+44] (0) 1438 742200 Fax: [+44] (0) 1438 727601

Freephone: 0800 282388 USA Tel: [+1] (316) 522 4981

Fax: [+1] (316) 522 1360 Toll Free: 800 835 2352



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