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

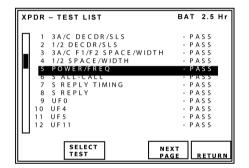
XPDR-AUTO TEST	PASS	BAT	2.5 Hr
CONFIG:MK12/S-M4 ANTENNA: BOTTOM		LE	VEL=4
REPLIES =1,2,3A,C,S TOP ERP =57.1 dBm BOT ERP =56.0 dBm 3A CODE =1234 1 CODE =1234 1 CODE =1234 TAIL =N12345 FLT ID =AA-50 FS=5-NO ALERT VS=IN AIR COUNT	MTL C ALT 2 COE DF17 AA=AC SPI	DETECTE 3421(530 IN A	Bm ft D=NO 32041) IR
RUN TE TEST LIS		ONFIG	SELECT ANT

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

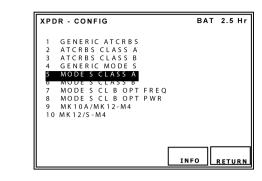
17 ENHANCED SURVEILLANCE

XPDR Individual Test

XPDR-3A/C SPAC/WDTH FAIL BAT 2.5 Hr
F1 WIDTH → 3A= 0.300 us C= 0.450 us F2 WIDTH 3A= 0.400 us C= 0.600 us F1-F2 3A=20.300 us C=20.300 us
REPLY DELAY 3A=3.05 us ► C=3.55 us REPLY JITTER 3A=0.250 us C=0.000 us REPLY RATIO 3A=100% C=100% C=100% C=100% -81dBm REPLY RATIO 3A=0% C=0% C=0% C=0%
ATCRBSALL-CALL 3A=PASS C=PASS
PULSE AMP VAR 3A=0.0 dB C=0.0 dB RUN PREV NEXT TEST TEST RETURN

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

XPDR Config



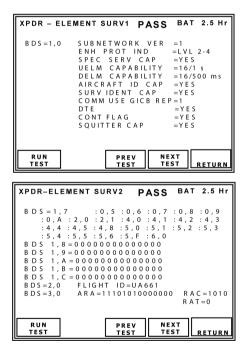
User selects configuration required for test. If the class of the transponder is unknown, the generic config may be selected which applies to the widest limits.

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

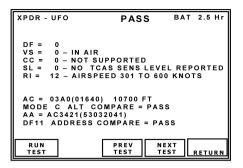


The Eurocontrol Elementary Surveillance DAP's (Downlink Aircraft Parameters) are displayed on two screens.

XPDR Enhanced Surveillance

	NHANCED SURV PASS BAT 2.5 Hr
D F = 2 0	
B D S 4,0	MCP/FCU SEL ALT =65520 ft
B D S 5,0	ROLLANGLE = 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
B D S 6,0	MAGNETIC HEADING = 180.3 deg
	IND AIR SPEED = 512 kts
	MACH NO = 0.300
	INERT VERT VEL =-1400 ft/min
	BAROALT RATE =-1400 ft/min
RUN	PREV NEXT
TEST	TEST TEST RETURN

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



No more HEX data field interpretation!

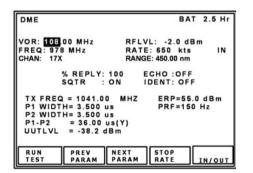
All Mode S Format tests display parameter in engineering units.

XPDR-UF11	PASS	BAT 2.5 Hr
DF=11 CA=0-LEVEL 2 PI=02F08D AA=AC3421(5303 II LOCKOUT TIM II MATCH=PAS SI LOCKOUT TIM SI MATCH=PAS	2041) ER=18S S ER=18S	
RUN TEST		XT ST RETURN

Comprehensive II / SI code and lockout timer test

XPDR-S ALL-CALL	PASS	BAT	2.5 Hr
ADDRESS 3A	= 0.510 us = 2 A C 4 2 1 = 100%		0 us 421
MODE S ALL-CALL = PASS ADDRESS = 2AC421 TAIL = N12345 COUNTRY = United States			
RUN 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.

TCAS			BA	T 2.5 Hr
SCENARIC): 0-CUST	ом		
TCAS TYP	E: E-TCAS	5	%REP	LY: 100
INTRUDER	TYPE:MO	DES	CODE	: 0000
RANGE ST	ART: 10.	00 nm	STOP: 0	0.00 nm
RANGE RA	TE : 350	0 kts		
ALT STAR	T: +1000) ft	STOP:	0 ft
ALT RATE	: 600	fpm C	ONVERGE	:OFF
UUT ALT	: 3120	0 ft A	LT DETE	CT: ON
FREQ= 10	30.000 MH	z	ERP= 5	7.0 dBm
RANGE=	21.00 nm	IN	ALT= +10	000 ft 🔸
TCAS STA	TUS= TRA	CKING		
STATUS=	NON-THR	EAT EN	ICOUNTER	8 = 0:00
RUN	PREV	NEXT		STORE/
TEST	PARAM	PARAM	MON	RECALL

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	UUT 2	HDG	180 deg 4	9 5
BRG(deg)		90	234	182	23
RNG(nm) ALT(ft)					
ALT RÁTE	CLIMB L	EVEL L	EVEL	CLIMB	LEVEL
HDG(deg) TRAFFIC					
ADDR=3A TSCR= 5					ft
TIS STATU	JS=CONN	ECTING	INF	O = 0 0 0 0	
RUN TEST	PREV PARAM	NEXT			
1631	PARAM	FARAP			

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

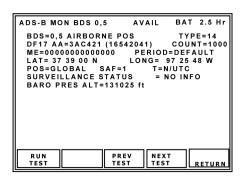
ADS-B MON DF17	BAT 2.5 H
1 0,5 AIRBORNE POS	- AVAIL
2 0,6 SURFACE POS	- NOT CAP
3 0,8 IDENT & CAT	- AVAIL
4 0,9 AIRBORNE VEL	- AVAIL
56,1 A/C STATUS ST1	- AVAIL
6 6,1 A/C STATUS ST2	- AVAIL
7 6,2 TSS SUBTYPE 0	 NO SQTR
8 6,2 TSS SUBTYPE 1	- AVAIL
9 6,5 A/C OP STATUS AIR	- AVAIL
10 6,5 A/C OP STATUS SUR	- 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.

ADS-B GEN

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	
RUN BDS	BDS	
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 GE	N BDS 0,	5	BA	2.5 Hr
BDS=0, DF 19 A ME=490 LAT: 37 POS: SURVEI BARO P	AIRBOR 3 A C 4 2 1 8 4 4 A E 8 3 1	NE POS (1654204 9EA P LON AF:1 TATUS:	TY 1) COU ERIOD: 1.0 IG: 9725 T:N/UTC	PE:9 NT=1000)0 s
RUN TEST	BD S OFF	PRE V PARAM	NEXT PARAM	RETURN

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 ACAS A DF20 AA=3AC421 MB=000000000000 TIDB= 70 deg	(16542041)	
TIDA= 32000 ft ARA=11101010000		
RAC=1010 RAT= THREAT ADDRESS	1 MTE=3	
TTI=2-ALT/RANGE	BEARING DA	ТА
RUN TEST	PREV PR	

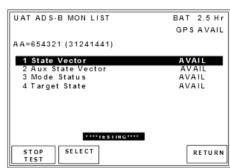
BDS DATA screens display full content of the selected BDS format being received via GICB DF20 or DF21 in RTCA/ICAO engineering units.

978 MHz UAT

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

ADS-B/GICB/UAT	T MAIN	BAT	2.5 Hr
ADSB ADSE MON GEN		ADV 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		E	3 A T	2.5 Hr
			GPS	AVAIL
1 FIS-B	-			
2 T I S-B	-			
3 ADS-B	-			
SELECT			Γ.	
Sector			_ '	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
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, ± 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)
Position Amplitude	30 nmi (±1 nmi) -11 dB (±1 dB) relative to reply level
Amplitude	-11 dB (±1 dB) relative to reply level
Amplitude	-11 dB (±1 dB) relative to reply level
Amplitude REPLY PULSE RISE AND FA	-11 dB (±1 dB) relative to reply level
Amplitude REPLY PULSE RISE AND FA ALL PULSES	-11 dB (±1 dB) relative to reply level ALL TIMES 2.5 μs (±0.25 μs) (10% to 90%)
Amplitude REPLY PULSE RISE AND FA ALL PULSES Rise Time Fall Time	-11 dB (±1 dB) relative to reply level ALL TIMES 2.5 μs (±0.25 μs) (10% to 90%)
Amplitude REPLY PULSE RISE AND FA ALL PULSES Rise Time	-11 dB (±1 dB) relative to reply level ALL TIMES 2.5 μs (±0.25 μs) (10% to 90%)
Amplitude REPLY PULSE RISE AND FA ALL PULSES Rise Time Fall Time REPLY DELAY	-11 dB (±1 dB) relative to reply level ALL TIMES 2.5 μs (±0.25 μs) (10% to 90%)
Amplitude REPLY PULSE RISE AND FA ALL PULSES Rise Time Fall Time REPLY DELAY X CHANNEL Fixed Reply Delay	-11 dB (±1 dB) relative to reply level ALL TIMES 2.5 μs (±0.25 μs) (10% to 90%) 2.5 μs (±0.25 μs) (90% to 10%)
Amplitude REPLY PULSE RISE AND FA ALL PULSES Rise Time Fall Time REPLY DELAY X CHANNEL Fixed Reply Delay	-11 dB (±1 dB) relative to reply level ALL TIMES 2.5 μs (±0.25 μs) (10% to 90%) 2.5 μs (±0.25 μs) (90% to 10%)
Amplitude REPLY PULSE RISE AND FA ALL PULSES Rise Time Fall Time REPLY DELAY X CHANNEL Fixed Reply Delay Y CHANNEL Fixed Reply Delay	-11 dB (±1 dB) relative to reply level ALL TIMES 2.5 μs (±0.25 μs) (10% to 90%) 2.5 μs (±0.25 μs) (90% to 10%) 50 μs (±100 ns)
Amplitude REPLY PULSE RISE AND FA ALL PULSES Rise Time Fall Time REPLY DELAY X CHANNEL Fixed Reply Delay Y CHANNEL	-11 dB (±1 dB) relative to reply level ALL TIMES 2.5 μs (±0.25 μs) (10% to 90%) 2.5 μs (±0.25 μs) (90% to 10%) 50 μs (±100 ns)
Amplitude REPLY PULSE RISE AND FA ALL PULSES Rise Time Fall Time REPLY DELAY X CHANNEL Fixed Reply Delay Y CHANNEL Fixed Reply Delay RANGE DELAY	-11 dB (±1 dB) relative to reply level ALL TIMES 2.5 μs (±0.25 μs) (10% to 90%) 2.5 μs (±0.25 μs) (90% to 10%) 50 μs (±100 ns)
Amplitude REPLY PULSE RISE AND FA ALL PULSES Rise Time Fall Time REPLY DELAY X CHANNEL Fixed Reply Delay Y CHANNEL Fixed Reply Delay RANGE DELAY X AND Y CHANNEL	-11 dB (±1 dB) relative to reply level ALL TIMES 2.5 μs (±0.25 μs) (10% to 90%) 2.5 μs (±0.25 μs) (90% to 10%) 50 μs (±100 ns) 56 μs (±100 ns)

RANGE RATE

X AND Y CHANNEL	
Range	10 to 6500 kts
Resolution	1 kts
Accuracy	$\pm 0.01\%$ typical, tested to $\pm 0.5\%$
COLUTTER	

2700 Hz

Per ARINC 568

±2%

SQUITTER

PRF	
Accuracy	
Distribution	

REPLY EFFICIENCY

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

IDENT TONE

Selectable three letter code
1350 Hz
±2 Hz

UUT MEASUREMENTS

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 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

MTL + 6 dB typical, automatically controlled

····= · - ··= 9/-····· ····· ···· ·····	
-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)
P5	0.80 µs (±50 ns)
INTERMODE	
P4 (Short)	0.80 µs (±50 ns)
P4 (Long)	1.60 µs (±50 ns)

	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
PHASE MODULATION		Accuracy	±50 ns
		REPLY DELAY, MODE S AND ATCRE	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		REPLY DELAY JITTER	
ATCRBS		ATCRBS	
SLS Level (P2)		Range	0.00 to 2.30 μs
-9 dB, -1 to +0 dB rela	ative to P1 level	Resolution	1 ns
0 dB, -0 to +1 dB rela	tive to P1 level	Accuracy	±20 ns
OFF		MODE S AND ATCRBS MODE S ALI	
MODE S		Range	0.00 to 6.00 μs
SLS Level (P5)		Resolution	1 ns
-12 dB, -1 to +0 dB re	elative to P6 level		±20 ns
+3 dB, -0 to +1 dB re		Accuracy	±20 113
OFF		PULSE SPACING	
Note: SLS level is automati	ically controlled in the SLS LEVEL test.	F1 TO F2	
		Range	19.70 to 21.60 μs
INTERROGATION TEST S	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
UUT MEASUREMENTS		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 μs
Accuracy	$\pm 2 \ dB$	Resolution	1 ns
Direct Connection Peak Pu	lse Power (@ 1090 MHz)		±20 ns
Range	+46.5 to +59 dBm (45 to 800	Accuracy	±20 //s
		MODE S PREAMBLE	
	watts		
Resolution	watts 0.1 dB	Range	0.25 to 0.75 μs
Resolution Accuracy		Resolution	1 ns
Accuracy	0.1 dB ±1 dB	•	•
Accuracy	0.1 dB ±1 dB	Resolution Accuracy PULSE AMPLITUDE VARIATION	1 ns ±20 ns
Accuracy TRANSMITTER FREQUEN Range	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz	Resolution Accuracy	1 ns ±20 ns
Accuracy TRANSMITTER FREQUEN Range Resolution	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz 10 kHz	Resolution Accuracy PULSE AMPLITUDE VARIATION	1 ns ±20 ns •-3 to +3 dB
Accuracy TRANSMITTER FREQUEN Range	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz	Resolution Accuracy PULSE AMPLITUDE VARIATION Range, Mode S (Relative to P1)	1 ns ±20 ns •-3 to +3 dB
Accuracy TRANSMITTER FREQUEN Range Resolution Accuracy	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz 10 kHz ±50 kHz	Resolution Accuracy PULSE AMPLITUDE VARIATION Range, Mode S (Relative to P1) Range, ATCRBS (Relative to F1)	1 ns ±20 ns -3 to +3 dB -3 to +3 dB
Accuracy TRANSMITTER FREQUEN Range Resolution Accuracy	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz 10 kHz ±50 kHz RADIATED MTL -79 to -67 dBm into 0 dBi	Resolution Accuracy PULSE AMPLITUDE VARIATION Range, Mode S (Relative to P1) Range, ATCRBS (Relative to F1) Resolution	1 ns ±20 ns -3 to +3 dB -3 to +3 dB 0.1 dB (0.01 dB via RCl) ±0.5 dB
Accuracy TRANSMITTER FREQUEN Range Resolution Accuracy RECEIVER SENSITIVITY, Range	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz 10 kHz ±50 kHz RADIATED MTL -79 to -67 dBm into 0 dBi antenna	Resolution Accuracy PULSE AMPLITUDE VARIATION Range, Mode S (Relative to P1) Range, ATCRBS (Relative to F1) Resolution Accuracy	1 ns ±20 ns -3 to +3 dB -3 to +3 dB 0.1 dB (0.01 dB via RCI)
Accuracy TRANSMITTER FREQUEN Range Resolution Accuracy RECEIVER SENSITIVITY, Range Resolution	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz 10 kHz ±50 kHz RADIATED MTL -79 to -67 dBm into 0 dBi antenna 0.1 dB	Resolution Accuracy PULSE AMPLITUDE VARIATION Range, Mode S (Relative to P1) Range, ATCRBS (Relative to F1) Resolution Accuracy DF 11 SQUITTER PERIOD	1 ns ±20 ns -3 to +3 dB -3 to +3 dB 0.1 dB (0.01 dB via RCl) ±0.5 dB
Accuracy TRANSMITTER FREQUEN Range Resolution Accuracy RECEIVER SENSITIVITY, Range	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz 10 kHz ±50 kHz RADIATED MTL -79 to -67 dBm into 0 dBi antenna	Resolution Accuracy PULSE AMPLITUDE VARIATION Range, Mode S (Relative to P1) Range, ATCRBS (Relative to F1) Resolution Accuracy DF 11 SQUITTER PERIOD Range	1 ns ± 20 ns -3 to +3 dB -3 to +3 dB 0.1 dB (0.01 dB via RCl) ± 0.5 dB 0.10 to 4.88 sec
Accuracy TRANSMITTER FREQUEN Range Resolution Accuracy RECEIVER SENSITIVITY, Range Resolution Accuracy RECEIVER SENSITIVITY,	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz 10 kHz ±50 kHz RADIATED MTL -79 to -67 dBm into 0 dBi antenna 0.1 dB ±2 dB, typical DIRECT CONNECTION MTL	Resolution Accuracy PULSE AMPLITUDE VARIATION Range, Mode S (Relative to P1) Range, ATCRBS (Relative to F1) Resolution Accuracy DF 11 SQUITTER PERIOD Range Resolution	1 ns ± 20 ns -3 to +3 dB -3 to +3 dB 0.1 dB (0.01 dB via RCl) ± 0.5 dB 0.10 to 4.88 sec 10 ms
Accuracy TRANSMITTER FREQUEN Range Resolution Accuracy RECEIVER SENSITIVITY, Range Resolution Accuracy RECEIVER SENSITIVITY, Range	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz 10 kHz ±50 kHz RADIATED MTL -79 to -67 dBm into 0 dBi antenna 0.1 dB ±2 dB, typical DIRECT CONNECTION MTL -79 to -67 dBm	Resolution Accuracy PULSE AMPLITUDE VARIATION Range, Mode S (Relative to P1) Range, ATCRBS (Relative to F1) Resolution Accuracy DF 11 SQUITTER PERIOD Range Resolution Accuracy	1 ns ± 20 ns -3 to +3 dB -3 to +3 dB 0.1 dB (0.01 dB via RCl) ± 0.5 dB 0.10 to 4.88 sec 10 ms ± 10 ms ± 10 ms
Accuracy TRANSMITTER FREQUEN Range Resolution Accuracy RECEIVER SENSITIVITY, Range Resolution Accuracy RECEIVER SENSITIVITY,	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz 10 kHz ±50 kHz RADIATED MTL -79 to -67 dBm into 0 dBi antenna 0.1 dB ±2 dB, typical DIRECT CONNECTION MTL -79 to -67 dBm 0.1 dB	Resolution Accuracy PULSE AMPLITUDE VARIATION Range, Mode S (Relative to P1) Range, ATCRBS (Relative to F1) Resolution Accuracy DF 11 SQUITTER PERIOD Range Resolution Accuracy DIVERSITY ISOLATION Range	1 ns ± 20 ns -3 to +3 dB -3 to +3 dB 0.1 dB (0.01 dB via RCl) ± 0.5 dB 0.10 to 4.88 sec 10 ms ± 10 ms
Accuracy TRANSMITTER FREQUEN Range Resolution Accuracy RECEIVER SENSITIVITY, Range Resolution Accuracy RECEIVER SENSITIVITY, Range	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz 10 kHz ±50 kHz RADIATED MTL -79 to -67 dBm into 0 dBi antenna 0.1 dB ±2 dB, typical DIRECT CONNECTION MTL -79 to -67 dBm	Resolution Accuracy PULSE AMPLITUDE VARIATION Range, Mode S (Relative to P1) Range, ATCRBS (Relative to F1) Resolution Accuracy DF 11 SQUITTER PERIOD Range Resolution Accuracy DIVERSITY ISOLATION	1 ns ± 20 ns -3 to +3 dB -3 to +3 dB 0.1 dB (0.01 dB via RCl) ± 0.5 dB 0.10 to 4.88 sec 10 ms ± 10 ms ± 10 ms
Accuracy TRANSMITTER FREQUEN Range Resolution Accuracy RECEIVER SENSITIVITY, Range Resolution Accuracy RECEIVER SENSITIVITY, Range Resolution	0.1 dB ±1 dB NCY 1087.000 to 1093.000 MHz 10 kHz ±50 kHz RADIATED MTL -79 to -67 dBm into 0 dBi antenna 0.1 dB ±2 dB, typical DIRECT CONNECTION MTL -79 to -67 dBm 0.1 dB	Resolution Accuracy PULSE AMPLITUDE VARIATION Range, Mode S (Relative to P1) Range, ATCRBS (Relative to F1) Resolution Accuracy DF 11 SQUITTER PERIOD Range Resolution Accuracy DIVERSITY ISOLATION Range	1 ns ± 20 ns -3 to +3 dB -3 to +3 dB 0.1 dB (0.01 dB via RCI) ± 0.5 dB 0.10 to 4.88 sec 10 ms ± 10 ms ± 10 ms 0 to >20 dB (Depending on Tess Distance)

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 FAL	L 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 μs (±50 ns)
Mode S	128 μs (±50 ns)
ANGE DELAY	
Range	0 to 260 nmi
Resolution	0.1 nmi
Accuracy	±0.02 nmi
ANGE 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%
QUITTER	
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 μs
Accepts	≤±200 ns
Rejects	≥±1.0 μs
P1 to P3	21.0 µs
Accepts	<u><</u> ±200 ns
Rejects (<10% Replies)	$\geq \pm 1.0 \ \mu s$
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	$\leq \pm 200 \text{ ns}$
Rejects (<10% Replies)	\geq ±1.0 μ s
P1 to SPR	4.75 μs
Accepts	$\leq \pm 200 \text{ ns}$
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	$\pm 2 dB$

<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	±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 POWE	R (@978 MHZ)
Range	+35 to +57 dBm (3.16 to 500
Resolution	watts) 0.1 dB
Accuracy	$\pm 1 dB$
Accuracy	
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 $^{\text{NOTE 5}}$	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 Vibration, Loose Cargo Vibration, Sweep Simulated Rainfall	ATA 300 FED-STD-101C ATA 300 MIL-STD-810F	Category I Method 5019 Category I 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 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

Order Number	Version			
72422	IFR 6000 Mode A/C/S Transponder and DME Ramp Test Set			
83410	60000PT2 TCAS (TIS)			
83411	6000OPT3 ADS-B			
112795	60000PT5 UAT 978 MHz			
Extended Standard 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			

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