



XPDR/DME TCAS/ADS-B/TIS Test Set **IFR 6015** Getting Started Manual

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GETTING STARTED MANUAL

XPDR/TACAN/TCAS/ADS-B/TIS TEST SET

IFR 6015

PUBLISHED BY
Aeroflex

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IFR 6015

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GETTING STARTED MANUAL IFR 6015

Product Warranty

Refer to <http://ats.aeroflex.com/warranty> for the Product Warranty information.

Electromagnetic Compatibility

Double shielded and properly terminated external interface cables must be used with this equipment when interfacing with the REMOTE Connector. For continued EMC compliance, all external cables must be shielded and 3 meters or less in length.

Nomenclature Statement

In this manual, 6015, Test Set or Unit refers to the IFR 6015 XPDR/TACAN/TCAS/ADS-B/TIS Test Set.

Declaration of Conformity

The Declaration of Conformity Certificate included with the Unit should remain with the Unit. Aeroflex recommends the operator reproduce a copy of the Declaration of Conformity Certificate to be stored with the Operation Manual for future reference.

Software Version

Aeroflex updates Test Set software on a routine basis. As a result, examples may show images from earlier software versions. Images are updated when appropriate.

Complying with Instructions

The safety precautions in this manual must be observed during installation and operation. Aeroflex assumes no liability for failure to comply with any safety precaution outlined in this manual.



GETTING STARTED MANUAL
IFR 6015

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SAFETY FIRST: TO ALL OPERATIONS PERSONNEL

REFER ALL SERVICING OF UNIT TO QUALIFIED TECHNICAL PERSONNEL. THIS UNIT CONTAINS NO OPERATOR SERVICEABLE PARTS.

WARNING: USING THIS EQUIPMENT IN A MANNER NOT SPECIFIED BY THE ACCOMPANYING DOCUMENTATION MAY IMPAIR THE SAFETY PROTECTION PROVIDED BY THE EQUIPMENT.

CASE, COVER OR PANEL REMOVAL

Opening the Case Assembly exposes the operator to electrical hazards that can result in electrical shock or equipment damage. Do not operate the IFR 6015 with the Case Assembly open.

SAFETY IDENTIFICATION IN TECHNICAL MANUAL

This manual uses the following terms to draw attention to possible safety hazards that may exist when operating or servicing this equipment.

CAUTION: THIS TERM IDENTIFIES CONDITIONS OR ACTIVITIES THAT, IF IGNORED, CAN RESULT IN EQUIPMENT OR PROPERTY DAMAGE (E.G., FIRE).

WARNING: THIS TERM IDENTIFIES CONDITIONS OR ACTIVITIES THAT, IF IGNORED, CAN RESULT IN PERSONAL INJURY OR DEATH.

SAFETY SYMBOLS IN MANUALS AND ON UNITS



CAUTION: Refer to accompanying documents. (This symbol refers to specific CAUTIONS represented on the unit and clarified in the text.)



AC OR DC TERMINAL: Terminal that may supply or be supplied with AC or DC voltage.



DC TERMINAL: Terminal that may supply or be supplied with DC voltage.



AC TERMINAL: Terminal that may supply or be supplied with AC or alternating voltage.

EQUIPMENT GROUNDING PRECAUTION

Improper grounding of equipment can result in electrical shock.

USE OF PROBES

Check the specifications for the maximum voltage, current and power ratings of any connector on the IFR 6015 before connecting it with a probe from a terminal device. Be sure the terminal device performs within these specifications before using it for measurement, to prevent electrical shock or damage to the equipment.

POWER CORDS

Power cords must not be frayed, broken nor expose bare wiring when operating this equipment.



SAFETY FIRST: TO ALL OPERATIONS PERSONNEL (cont)

USE RECOMMENDED FUSES ONLY

Use only fuses specifically recommended for the equipment at the specified current and voltage ratings.

INTERNAL BATTERY

This unit contains a Lithium Ion Battery, serviceable only by a qualified technician.

CAUTION: SIGNAL GENERATORS CAN BE A SOURCE OF ELECTROMAGNETIC INTERFERENCE (EMI) TO COMMUNICATION RECEIVERS. SOME TRANSMITTED SIGNALS CAN CAUSE DISRUPTION AND INTERFERENCE TO COMMUNICATION SERVICES OUT TO A DISTANCE OF SEVERAL MILES. USERS OF THIS EQUIPMENT SHOULD SCRUTINIZE ANY OPERATION THAT RESULTS IN RADIATION OF A SIGNAL (DIRECTLY OR INDIRECTLY) AND SHOULD TAKE NECESSARY PRECAUTIONS TO AVOID POTENTIAL COMMUNICATION INTERFERENCE PROBLEMS.



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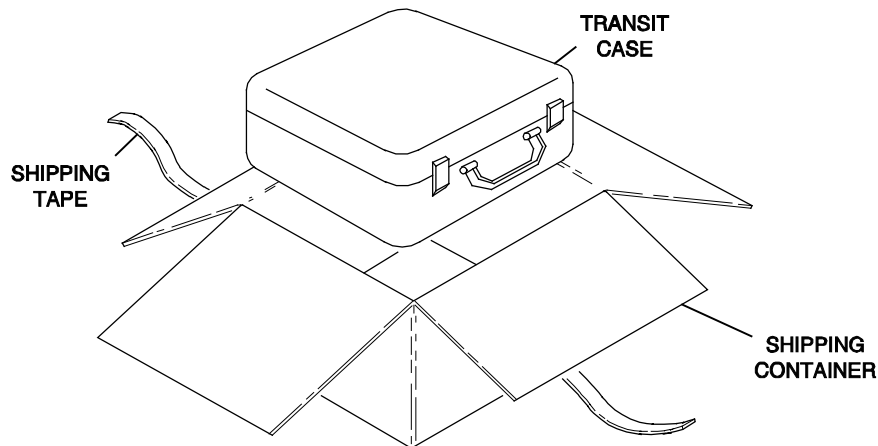


SERVICE UPON RECEIPT OF MATERIAL

UNPACKING

Special-design packing material inside this shipping carton provides maximum protection for the IFR 6015. Avoid damaging the carton and packing material during equipment unpacking. Use the following steps for unpacking the IFR 6015.

- I Cut and remove the sealing tape on the carton top and open the carton.
- I Grasp the IFR 6015 transit case firmly, while restraining the shipping carton, and lift the equipment and packing material vertically.
- I Place the IFR 6015 transit case and end cap packing on a suitable flat, clean and dry surface.
- I Remove the protective plastic bag from the IFR 6015 transit case. Place the desiccant bags back inside the protective plastic bag.
- I Place protective plastic bag and end cap packing material inside shipping carton.
- I Store the shipping carton for future use should the IFR 6015 need to be returned.



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SERVICE UPON RECEIPT OF MATERIAL (cont)

CHECKING UNPACKED EQUIPMENT

- I Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage to Aeroflex.
- I Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies to Aeroflex.

DESCRIPTION	PART NUMBER	QTY
IFR 6015	72424	1
POWER SUPPLY	67366	1
ANTENNA	91771	1
BREAKOUT BOX	64580	1
ANTENNA SHIELD	64749	1
12 IN. COAXIAL CABLE	62401	1
72 IN. COAXIAL CABLE	112830	1
5 A FUSE	56080	1
TRANSIT CASE	10241	1
POWER CORD (US ONLY)	62302	1
POWER CORD (EUROPEAN)	64020	1
OPERATION MANUAL (CD-ROM)	6097	1
GETTING STARTED MANUAL (PAPER)	6100	1



IFR 6015 with Standard Accessories

SERVICE UPON RECEIPT OF MATERIAL (cont)

CHECKING UNPACKED EQUIPMENT (cont)

OPTIONAL ACCESSORIES	PART NUMBER	QTY
Desk Top Stand	63656	1
Tripod	67474	1
Tripod, Dolly, Stand	82553	1
25 ft TNC/TNC COAXIAL CABLE	62462	1
50 ft TNC/TNC COAXIAL CABLE	86336	1
UC-584 Dual Antenna Coupler Kit	112349	1
UC-584 Single Antenna Coupler Kit	112350	1
12 IN. COAXIAL CABLE (GPS)	112831	1
72 IN. Coaxial CABLE (GPS)	112837	1
IFR-6000 Maintenance Manual-(CD-ROM)	6095	1



Antenna Coupler and Cable



SPECIFICATIONS

Input Power (IFR 6015):

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 (IFR 6015):

Use:	Pollution Degree 2
Altitude:	≤4800 m
Operating Temperature:	-20°C to 55°C
	(Battery charging temperature range is 5° to 40°C controlled by internal charger)
Storage Temperature:	-30°C to 71°C
	(Li Ion Battery must be removed below -20°C and above 60°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 m
Operating Temperature:	0°C to 40°C
Storage Temperature:	-20°C to 71°C



INSTALLATION

GENERAL

The IFR 6015 is powered by an internal Lithium Ion battery pack. The IFR 6015 is supplied with an external DC Power Supply that enables the operator to recharge the battery when connected to AC power.

NOTE: The IFR 6015 can operate continuously on AC power via the DC Power Supply, for servicing and/or bench tests.

BATTERY OPERATION

The internal battery is equipped to power the IFR 6015 for more than four hours of continuous use, after which time, the IFR 6015 battery needs recharging. Battery Operation Time Remaining (in Hours) is displayed on all screens.

The IFR 6015 contains an automatic time-out to conserve power. If a key is not pressed within a 5 to 20 minute time period, the IFR 6015 shuts Off (only when using battery power). The Power Down Time may be set in the Setup Screen.

BATTERY CHARGING

The battery charger operates whenever DC power (11 to 32 Vdc) is applied to the IFR 6015 with the supplied DC Power Supply or a suitable DC power source. When charging, the battery reaches a 100% charge in approximately four hours. The internal battery charger allows the battery to charge between a temperature range of 5° to 40°C. The IFR 6015 can operate, connected to an external DC source, outside the battery charging temperature range (5°C to 40°C).

The battery should be charged every three months (minimum) or disconnected for long term inactive storage periods of more than six months. The Battery must be removed when conditions surrounding the IFR 6015 are <-20°C and >60°C)

SAFETY PRECAUTIONS

The following safety precautions must be observed during installation and operation. Aeroflex assumes no liability for failure to comply with any safety precaution outlined in this manual.

Complying with Instructions

Installation/operating personnel should not attempt to install or operate the IFR 6015 without reading and complying with instructions contained in this manual. All procedures contained in this manual must be performed in exact sequence and manner described.

Grounding Power Cord

WARNING: DO NOT USE A THREE-PRONG TO TWO-PRONG ADAPTER PLUG. DOING SO CREATES A SHOCK HAZARD BETWEEN THE CHASSIS AND ELECTRICAL GROUND.

For AC operation, the AC Line Cable, connected to the DC Power Supply, is equipped with standard three-prong plug and must be connected to a properly grounded three-prong receptacle that is easily accessible. It is the customer's responsibility to:

- I Have a qualified electrician check receptacle(s) for proper grounding.
- I Replace any standard two-prong receptacle(s) with properly grounded three-prong receptacle(s).

INSTALLATION (cont)

Operating Safety

Due to potential for electrical shock within the IFR 6015, the Case Assembly must be closed when the IFR 6015 is connected to an external power source.

Battery replacement, fuse replacement and internal adjustments must only be performed by qualified service technicians.

AC POWER REQUIREMENTS

The DC Power Supply, supplied with the IFR 6015, operates over a voltage range of 100 to 250 VAC at 47 to 63 Hz.

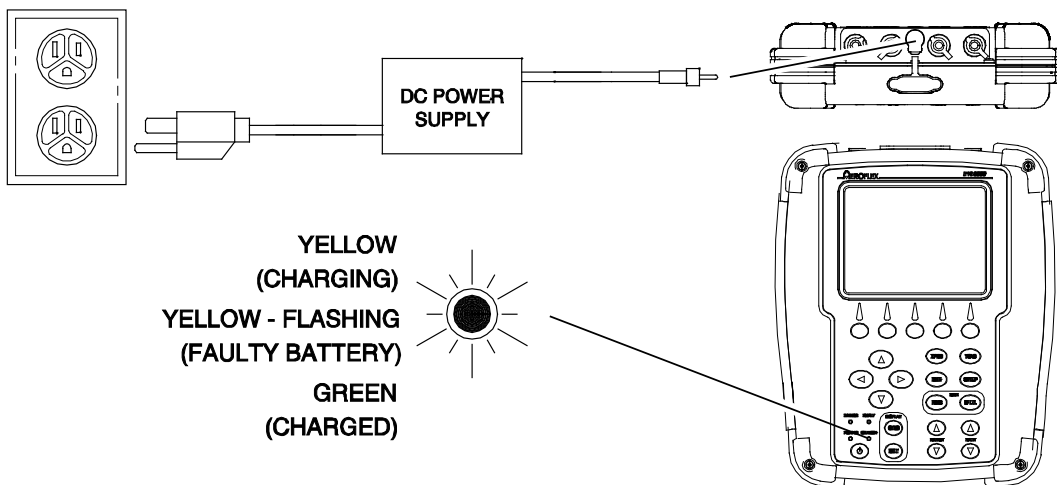
The battery charger operates whenever DC power (11 to 32 Vdc) is applied to the IFR 6015 with the supplied DC Power Supply or a suitable DC power source. When charging, the battery reaches an 100% charge in approximately four hours. The Battery Charging temperature range is 5°C to 40°C, controlled by an internal battery charger.

BATTERY RECHARGING

STEP	PROCEDURE
------	-----------

1. Connect AC Line Cable to either:
 - I AC PWR Connector on the DC Power Supply and an appropriate AC power source
 - I Suitable DC power source
2. Connect the DC Power Supply to the DC POWER Connector on the IFR 6015.
3. Verify the CHARGE Indicator illuminates yellow.
4. Allow four hours for battery charge or until the CHARGE Indicator illuminates green.

NOTE: If the CHARGE Indicator flashes yellow and/or the battery fails to accept a charge and the IFR 6015 does not operate on battery power, the battery, serviceable only by a qualified technician, requires replacement. Refer to Battery/Voltage Instructions.



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INSTALLATION (cont)

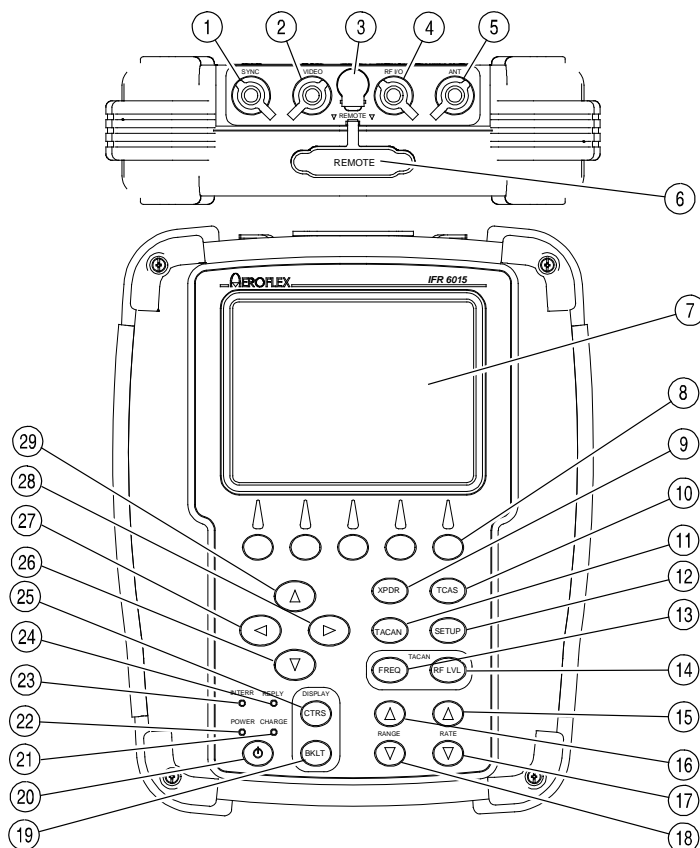
EXTERNAL CLEANING

The following procedure contains routine instructions for cleaning the outside of the IFR 6015.

CAUTION: DISCONNECT POWER FROM IFR 6015 TO AVOID POSSIBLE DAMAGE TO ELECTRONIC CIRCUITS.

STEP	PROCEDURE
1.	Clean front panel buttons and display face with soft lint-free cloth. If dirt is difficult to remove, dampen cloth with water and a mild liquid detergent.
2.	Remove grease, fungus and ground-in dirt from surfaces with soft lint-free cloth dampened (not soaked) with isopropyl alcohol.
3.	Remove dust and dirt from connectors with soft-bristled brush.
4.	Cover connectors, not in use, with suitable dust cover to prevent tarnishing of connector contacts.
5.	Clean cables with soft lint-free cloth.
6.	Paint exposed metal surface to avoid corrosion.

CONTROLS, CONNECTORS AND INDICATORS



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1. SYNC Connector
2. VIDEO Connector
3. DC POWER Connector
4. RF I/O Connector
5. ANT Connector
6. REMOTE Connector
7. Display
8. Multi-Function Soft Keys
9. XPDR Mode Select Key
10. TCAS Mode Select Key
11. TACAN Mode Select Key
12. SETUP Select Key
13. FREQ Select Key
14. RF LVL Key
15. RATE INCREMENT Key
16. RANGE INCREMENT Key
17. RATE DECREMENT Key
18. RANGE DECREMENT Key
19. BACKLIGHT Key
20. POWER Key
21. HARGE Indicator
22. POWER Indicator
23. INTERR Indicator
24. REPLY Indicator
25. CONTRAST Key
26. DECREMENT/SELECT Data Key
27. SELECT DATA UNIT MSB Key
28. SELECT DATA UNIT LSB Key
29. INCREMENT/SELECT Data Key
30. ANT Connector
31. AUX OUT Connector 1
32. AUX OUT Connector 2
33. AUX OUT Connector 3
34. AUX OUT Connector 4
35. USB HOST Connector
36. USB DEVICE Connector
37. Altitude Encoder Connector
38. AUX IN Connector
39. RS-232 Connector
40. REMOTE Connector



CONTROLS, CONNECTORS AND INDICATORS (cont)

ITEM	DESCRIPTION
1. SYNC Connector	BNC type connector provides oscilloscope SYNC pulse for each interrogation.
2. VIDEO Connector	BNC type connector provides interrogation and reply pulses.
3. DC POWER Connector	Circular Type Connector (2.5 mm center, 5.5 mm outer diameter, center positive) used for battery charging or operation of the IFR 6015.
4. RF I/O Connector	TNC Type connector used for direct connection to UUT antenna connector.
5. ANT Connector	TNC Type Connector used for connection to the IFR 6015 directional antenna for over the air testing.
6. REMOTE Connector	Type HD DB44 Connector used for remote operation and software upgrades. Contains RS-232, USB Host and USB Peripheral connections (altitude encoder inputs and SYNC outputs).
7. Display (LCD)	38 characters by 16 lines for main screen display with Soft Key boxes at the bottom of the screen.
8. Multi-Function Soft Keys	Five Application dependent keys provide test specific information and movement between test screens. The legends are displayed in boxes at the bottom of the Display.
9. XPDR MODE Select Key	Selects Transponder Auto Test Screen.
10. TCAS MODE Select Key	Selects TCAS Auto Test Screen.
11. TACAN MODE Select Key	Selects TACAN Test Screen.
12. SETUP Key	Displays the SETUP Menu.
13. FREQ Select Key	Selects DME Frequency as VOR Paired, TACAN Channel or MHz.
14. RF LVL Key	TACAN mode function only. Selects TACAN range reply and squitter RF level.
15. RATE INCREMENT Key	Increments TACAN or TCAS range rate.



CONTROLS, CONNECTORS AND INDICATORS (cont)

ITEM	DESCRIPTION
16. RANGE INCREMENT Key	Increments TACAN or TCAS range.
17. RATE DECREMENT Key	Decrements TACAN or TCAS range rate.
18. RANGE DECREMENT Key	Decrements TACAN or TCAS range.
19. BACKLIGHT Key	Displays/exits the Backlight Adjust Field.
20. POWER Key	Powers the IFR 6015 ON and OFF.
21. CHARGE Indicator	Illuminated when external DC power is applied for Bench Operation or Battery charging.
22. POWER Indicator	Illuminated when the IFR 6015 is operational.
23. INTERR Indicator	Illuminated when the IFR 6015 is generating an interrogation signal (XPDR Mode) or receives an Interrogation (TCAS Mode) signal.
24. REPLY Indicator	Illuminated when the IFR 6015 receives a valid reply signal (XPDR Mode) or generates a reply (TCAS Mode) signal.
25. CONTRAST Key	Displays/exits the Contrast Adjust Field.
26. DECREMENT SELECT Data Key	Decrements data in slewable fields, such as RF LVL. This Key also selects data in fields that have fixed functions, such as ECHO and SQUITTER.
27. SELECT DATA UNIT MSB Key	Moves the slew cursor toward the MSB (Most Significant Bit) of the data field.
28. SELECT DATA UNIT LSB Key	This Key moves the slew cursor toward the LSB (Least Significant Bit) of the data field.
29. INCREMENT/SELECT Data Key	Increments data in slewable fields, such as RF LVL. This Key also selects data in fields that have fixed functions, such as ECHO and SQUITTER.
30. ANT Connector	TNC Type Connector used for connection to the IFR 6015 for over the air testing.
31. AUX OUT Connector 1	ATCRBS interrogation trigger used for calibration.



CONTROLS, CONNECTORS AND INDICATORS (cont)

ITEM	DESCRIPTION
32. AUX OUT Connector 2	ATCRBS interrogation trigger used for calibration.
33. AUX OUT Connector 3	Not Used
34. AUX OUT Connector 4	Not Used
35. USB HOST Connector 4	USB Jump Drive interface for software update and test data dump (not active in first release).
36. USB DEVICE Connector	Remote Control Interface.
37. ALTITUDE ENCODER Connector	Interface for external encoding altimeter.
38. AUX IN Connector	Not Used
39. RS-232 Connector	Used for remote control interface, software update and test data dump.
40. REMOTE Connector	Used to interface with the IFR 6015.

AUXILIARY EQUIPMENT

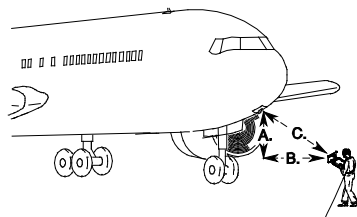
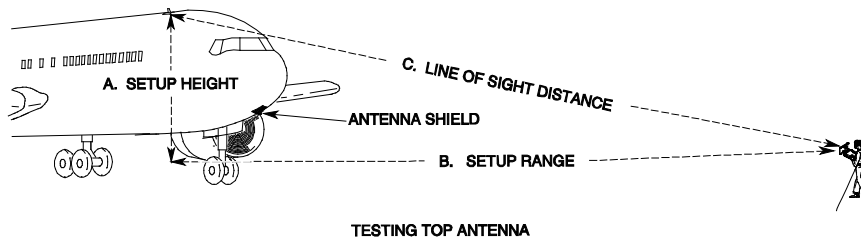
DIRECTIONAL ANTENNA

The Directional Antenna may be used mounted directly on the IFR 6015, hand held or mounted on a tripod.



Position Directional Antenna in direct sight of UUT antenna, avoiding close obstructions such as gantries, ladders and tool chests etc.

Distance for testing top UUT antenna should be sufficient so UUT antenna is visible. Distance for testing bottom UUT antenna should be close enough so that top UUT antenna is not visible. Supplied Antenna Shield should be mounted on bottom UUT antenna to avoid unwanted replies.



TESTING BOTTOM ANTENNA

**WHEN DESELECTING, TERMINATING
OR SHIELDING TOP ANTENNA IS
NOT POSSIBLE OR PRACTICAL,
USE SETUP POSITION THAT HAS
AIRCRAFT BLOCKING LINE OF
SIGHT TO TOP ANTENNA.**

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AUXILIARY EQUIPMENT (cont)

BREAKOUT BOX

The Breakout Box accessory provides access to individual user interfaces via standard connectors). The IFR 6015 Remote Connector provides the main user signal interface for the Breakout Box.



The Breakout Box attaches to the IFR 6015 via a remote connector located on the top of the IFR 6015 and thumb screws on the back.





SCREEN HIERARCHY

The XPDR AUTO TEST Screen always appears on Power-Up.

XPDR-AUTO TEST		PASS	BAT 2.5 Hr
CONFIG:MK12/S-M4		LEVEL=4	
ANTENNA: BOTTOM			
REPLIES =1,2,3A,C,S		FREQ =1090.12 MHZ	
TOP ERP =57.1 dBm		MTL =-74.0 dBm	
BOT ERP =56.0 dBm		MTL =-73.1 dBm	
3A CODE =1234		C ALT =35000 ft	
1 CODE =1234		2 CODE = 1234	
TAIL =N12345		DF17 DETECTED=NO	
FLT ID =AA-50		AA=AC3421(53032041)	
FS=5-NO ALERT		SPI IN AIR	
VS=IN AIR		COUNTRY=United States	
RUN TEST	TEST LIST	CONFIG	SELECT ANT

The SETUP Menu allows the operator to set various parameters used in testing, configuration and memory storage. Press the SETUP Key to display the XPDR Setup Screen, press again for the TACAN Setup Screen, again for General Setup Screen.

SETUP-XPDR		BAT 2.5 Hr	
ANTENNA: BOTTOM		RF PORT:ANTENNA	
ANT RANGE ANT HEIGHT			
TOP: 50.0 m 10.0 m			
BOTTOM: 50.0 m 0.0 m			
DIR CABLE LOSS:1.3 dB		ANT GAIN (dBi)	
ANT CABLE:6 FT		1.03 GHz: 7.1	
ANT CABLE LOSS:1.7 dB		1.09 GHz: 6.1	
UUT ADDRESS:AUTO			
MANUAL AA:123456		PWR LIM: FAR 43	
DIVERSITY TEST:ON		CHECK CAP: YES	
PREV PARAM	NEXT PARAM	DIAG	TEST DATA

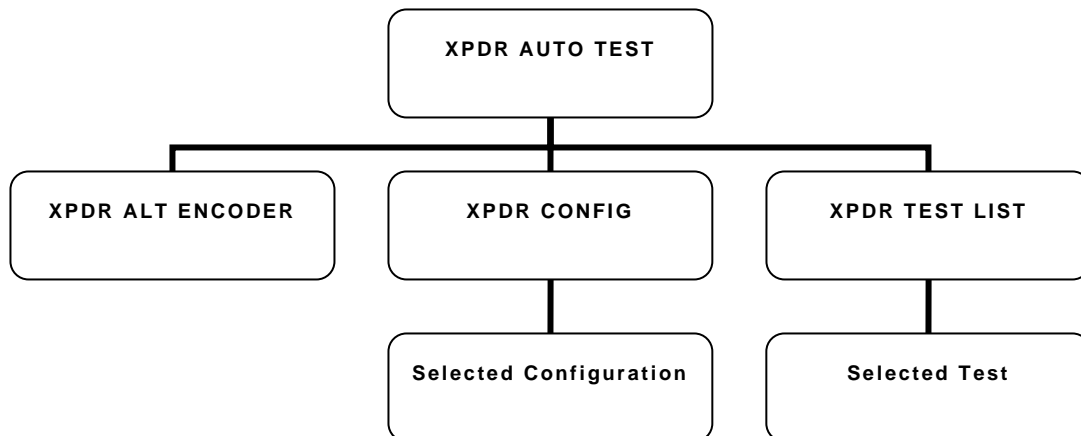
SETUP-TACAN		BAT 2.5 Hr	
RF PORT ANTENNA			
ANT RANGE : 10 ft			
IDENT TONE : AERO		ANT GAIN (dBi)	
		0.96 GHz :7.5	
DIR CABLE LOSS:1.2 dB		1.03 GHz :7.1	
ANT CABLE : 1 FT		1.09 GHz :6.1	
ANT CABLE LOSS :0.1 dB		1.15 GHz :5.0	
MAX RANGE: 400.00 nm		1.22 GHz :2.8	
TEST MODE: 5-VARIABLE			
SYNC:MRB			
PREV PARAM	NEXT PARAM	DIAG	

SETUP - GENERAL		BAT 2.5 Hr	
PWR DOWN : 10 mins			
ERP UNITS : dBm		UNITS : METERS	
REMOTE OPERATION : RS232			
PREV PARAM	NEXT PARAM	H/W TOOLS	INFO

SCREEN HIERARCHY (cont)

The XPDR AUTO TEST Screen is the opening screen. The screens are changed by pressing the XPDR Mode Key or an application specific Soft Key.

Screen Organization



The XPDR Auto Test Screen is the primary test screen. When a Mode S configuration is selected the test list is displayed over two screens and ATCRBS configurations display the test list on one screen.

XPDR-AUTO TEST		PASS		BAT 2.5 Hr	
CONFIG:GENERIC MODE S				LEVEL=4	
ANTENNA: BOTTOM					
REPLIES =3A,C,S		FREQ =1090.12 MHZ			
TOP ERP =57.1 dBm		MTL =-74.0 dBm			
BOT ERP =56.0 dBm		MTL =-73.1 dBm			
3A CODE =1234		C ALT =35000 ft			
S CODE =1234		S ALT =35000 ft			
TAIL =N12345		DF17 DETECTED=NO			
FLT ID =AA-50		AA=AC3421(53032041)			
FS=5-NO ALERT		SPI IN AIR			
VS=IN AIR		COUNTRY=United States			
RUN TEST		TEST LIST		CONFIG	
				SELECT ANT	



SCREEN HIERARCHY (cont)

Press the Test List Soft Key to access 17 additional XPDR Test Screens.

A/C Decoder/SLS Test Screen

XPDR-3A/C DECDR/SLS PASS BAT 2.5 Hr			
DECODER INNER LOW	3A=PASS	C=PASS	
DECODER INNER HIGH	3A=PASS	C=PASS	
DECODER OUTER LOW	3A=PASS	C=PASS	
DECODER OUTER HIGH	3A=PASS	C=PASS	
SLS 0 dB	3A=PASS	C=PASS	
SLS -9 dB	3A=PASS	C=PASS	
3A CODE = 2620 IDENT X-PULSE			
A4 A2 A1 B4 B2 B1 C4 C2 C1 D4 D2 D1 X			
C ALT = 100000 ft			
A4 A2 A1 B4 B2 B1 C4 C2 C1 D4 D2			
RUN TEST	PREV TEST	NEXT TEST	RETURN

S All Call Test Screen

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

A/C Spacing Width Test Screen

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%	
-81dBm REPLY RATIO	3A=0%	C=0%	
ATCRBS ALL-CALL 3A=PASS C=PASS			
PULSE AMP VAR 3A=0.0 dB C=0.0 dB			
RUN TEST	PREV TEST	NEXT TEST	RETURN

S Reply Timing Test Screen

XPDR-S RPLY TIMING FAIL BAT 2.5 Hr			
▶ REPLY DELAY =148.05 us			
▶ REPLY JITTER=0.950 us			
PULSE WIDTH=PASS			
▶ PULSE SPACING =FAIL			
RUN TEST	PREV TEST	NEXT TEST	RETURN

Power and Frequency Test Screen

XPDR - POWER/FREQ PASS BAT 2.5 Hr			
TX FREQ = 1090.12 MHz ANTENNA:TOP			
MEASURED VIA	TOP DIRECT	BOTTOM ANTENNA	INSTANT DIRECT
MTL (dBm)			
ATCRBS	-73.2	-73.1	-73.2
3A-C DIFF	0.2	-0.1	0.0
ALL CALL	-73.0	-73.2	-73.2
MODE S	-73.2	-72.9	-73.2
ERP (dBm)	57.1	57.0	57.0
RUN TEST	PREV TEST	NEXT TEST	RETURN

S Reply Test Screen

XPDR-S REPLY PASS BAT 2.5 Hr			
PULSE AMP VAR SHRT=0.1 dB LNG=0.1 dB			
SLS ON=NO REPLY OFF=REPLY			
SQTR DF11 PERIOD=1.00s			
DF17 DETECTED=YES			
REPLY RATIO =100%			
REPLY RATIO 81dBm =0%			
INVALID AA =PASS			
DIVERSITY ISOLATION=GREATER THAN 25dB			
RUN TEST	PREV TEST	NEXT TEST	RETURN



SCREEN HIERARCHY (cont)

UF0 Test 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		

UF11 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		

UF4 Test Screen

XPDR - UF4	PASS	BAT 2.5 Hr
DF = 4 FS = 3 - ALERT NO SPI ON GROUND DR = 0 - NO DOWNLINK REQUEST UM = 0 - (IDS = 0) (IIS = 0)		
AC = 03A0(01640) 10700 FT MODE C ALT COMPARE = PASS AA = AC3421(53032041) DF11 ADDRESS COMPARE = PASS		
RUN TEST	PREV TEST	NEXT TEST
RETURN		

UF16 Test Screen

XPDR-UF16	PASS	BAT 2.5 Hr
DF=16 VS=0 - IN AIR SL=0 RI=0-NO ON - BOARD TCAS MV=30010000000000		
AC=03A0(01640) 10700 ft MODE C ALT COMPARE=PASS AA=AC3421(53032041) DF11 ADDRESS COMPARE=PASS		
RUN TEST	PREV TEST	NEXT TEST
RETURN		

UF5 Test Screen

XPDR-UF5	PASS	BAT 2.5 Hr
DF=5 FS=0-NO ALERT NO SPI IN AIR DR=0-NO DOWNLINK REQUEST UM=0 - (IDS = 0) (IIS = 0)		
ID=020A(01012) OCTAL ID 2600 MODE 3A ID COMPARE=PASS AA=AC3421(53032041) DF11 ADDRESS COMPARE=PASS		
RUN TEST	PREV TEST	NEXT TEST
RETURN		

UF20 Test Screen

XPDR-UF20	PASS	BAT 2.5 Hr
DF=20 FS=3-ALERT NO SPI ON GROUND DR=0-NO DOWNLINK REQUEST UM=0 (IDS=0) (IIS = 0) MB=30010000000000		
AC=03A0(01640) 10700 ft MODE C ALT COMPARE=PASS AA=AC3421(53032041) DF11 ADDRESS COMPARE=PASS		
RUN TEST	PREV TEST	NEXT TEST
RETURN		



SCREEN HIERARCHY (cont)

UF21 Test Screen

XPDR-UF21	PASS	BAT 2.5 Hr
DF=21 FS=3-ALERT NO SPI ON GROUND DR=0-NO DOWNLINK REQUEST UM=0 (IDS=0) (IIS = 0) MB=30010000000000		
ID=03A0(01640) OCTAL ID 6140 MODE 3A ID COMPARE=PASS AA=AC3421(53032041) DF11 ADDRESS COMPARE=PASS		
RUN TEST	PREV TEST	NEXT TEST
RETURN		

Elementary Surveillance 2 Test Screen

XPDR-ELEMENT SURV2	PASS	BAT 2.5 Hr
BDS=1,7 :0,5 :0,6 :0,7 :0,8 :0,9 :0,A :2,0 :2,1 :4,0 :4,1 :4,2 :4,3 :4,4 :4,5 :4,8 :5,0 :5,1 :5,2 :5,3 :5,4 :5,5 :5,6 :5,F :6,0 BDS 1,8=00000000000000 BDS 1,9=00000000000000 BDS 1,A=00000000000000 BDS 1,B=00000000000000 BDS 1,C=00000000000000 BDS=2,0 FLIGHT ID=UA661 BDS=3,0 ARA=11101010000000 RAC=1010 RAT=0		
RUN TEST	PREV TEST	NEXT TEST
RETURN		

UF24 Test Screen

XPDR-UF24	PASS	BAT 2.5 Hr
RESERVATION UF 4 DF=20 IIS=15 IDS=2 AA=AC3421		
SEGMENTS UF24 DF=24 KE=1 ND=0 TAS=FFFF AA=AC3421		
CLOSEOUT UF 4 DF=20 IIS=15 IDS=2 AA=AC3421		
RUN TEST	PREV TEST	NEXT TEST
RETURN		

Enhanced Surveillance Test Screen

XPDR-ENHANCED SURV	PASS	BAT 2.5 Hr
BDS4,0 MCP/FCU SEL ALT =65520 ft BARO PRES SET = 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		

Elementary Surveillance 1 Test Screen

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		



SELF TEST

The IFR 6015 is equipped with a Self Test for quick performance evaluation. An abbreviated Self Test is run at Power-Up. The full Self Test is initiated manually.

Press the POWER Key on the IFR 6015 to display the Startup Screen.



After several seconds, the XPDR AUTO TEST Screen is displayed.

XPDR-AUTO TEST		PASS		BAT 2.5 Hr	
CONFIG: GENERIC MODE S				LEVEL=4	
ANTENNA: BOTTOM					
REPLIES =1,2,3A,C,S		FREQ =1090.12 MHZ			
TOP ERP =57.1 dBm		MTL =-74.0 dBm			
BOT ERP =56.0 dBm		MTL =-73.1 dBm			
3A CODE =1234		C ALT =35000 ft			
1 CODE =1234		2 CODE = 1234			
TAIL =N12345		DF17 DETECTED=NO			
FLT ID =AA-50		AA=AC3421(53032041)			
FS=5-NO ALERT		SPI IN AIR			
VS=IN AIR		COUNTRY=United States			
RUN TEST		TEST LIST		CONFIG	
				SELECT ANT	



SELF TEST (cont)

RUN SELF TEST

Press SETUP Key to display the Setup Menu.

SETUP – GENERAL		BAT 2.5 Hr	
PWR DOWN : 10 mins			
ERP UNITS : dBm		UNITS : METERS	
REMOTE OPERATION : RS232			
PREV PARAM	NEXT PARAM	H/W TOOLS	INFO

Press H/W TOOLS Soft Key to display the Hardware Tools Screen.

SETUP – HARDWARE TOOLS		BAT 2.5 Hr	
S/N 103009999			
MULTI-FUNCTION BOARD REV 0			
RF BOARD REV 1.00			
CPU BOARD REV 0			
AMBIENT TEMPERATURE = 78F 26C			
RF BLOCK TEMPERATURE = 78F 26C			
RS232	SELF TEST	CAL	RETURN



SELF TEST (cont)

Press SELF TEST Soft Key to display the Self Test Screen.

SETUP - SELF TEST		BAT 2.5 Hr	
CF RAM	-	PPC COM	-
CF FL	-	PPC RAM	-
CF CPLD	-	PPC FL	-
NVR BAT	-	PPC RMT	-
USB	-	KEYPAD	-
FPGA	-	BAT	-
CFPPC FL	-	RF LO	-
RTC	-	RF LOOP	-
EEPROM	-	RF VIDEO	-
DISCONNECT ALL CABLES BEFORE RUNNING			
RUN TEST		DUMP INFO	RETURN

Press RUN TEST Soft Key to initiate the Self Test.

Verify that all the modules/assemblies pass the Self Test. If the Self Test indicates a failure, contact Aeroflex for additional information.



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GETTING STARTED MANUAL
IFR 6015

FOR QUALIFIED SERVICE PERSONNEL ONLY

BATTERY/FUSE INSTRUCTIONS



GETTING STARTED MANUAL
IFR 6015

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SAFETY FIRST: TO ALL SERVICE PERSONNEL

REFER ALL SERVICING OF UNIT TO QUALIFIED TECHNICAL PERSONNEL.

WARNING: USING THIS EQUIPMENT IN A MANNER NOT SPECIFIED BY THE ACCOMPANYING DOCUMENTATION MAY IMPAIR THE SAFETY PROTECTION PROVIDED BY THE EQUIPMENT.

CASE, COVER OR PANEL REMOVAL

Opening the Case Assembly exposes the technician to electrical hazards that can result in electrical shock or equipment damage.

SAFETY IDENTIFICATION IN TECHNICAL MANUAL

This manual uses the following terms to draw attention to possible safety hazards, that may exist when operating or servicing this equipment.

CAUTION: THIS TERM IDENTIFIES CONDITIONS OR ACTIVITIES THAT, IF IGNORED, CAN RESULT IN EQUIPMENT OR PROPERTY DAMAGE (E.G., FIRE).

WARNING: THIS TERM IDENTIFIES CONDITIONS OR ACTIVITIES THAT, IF IGNORED, CAN RESULT IN PERSONAL INJURY OR DEATH.

SAFETY SYMBOLS IN MANUALS AND ON UNITS



CAUTION: Refer to accompanying documents. (This symbol refers to specific CAUTIONS represented on the unit and clarified in the text.)



AC OR DC TERMINAL: Terminal that may supply or be supplied with ac or dc voltage.



DC TERMINAL: Terminal that may supply or be supplied with dc voltage.



AC TERMINAL: Terminal that may supply or be supplied with ac or alternating voltage.

EQUIPMENT GROUNDING PRECAUTION

Improper grounding of equipment can result in electrical shock.

USE OF PROBES

Check specifications for the maximum voltage, current and power ratings of any connector on the IFR 6015 before connecting it with a probe from a terminal device. Be sure the terminal device performs within these specifications before using it for measurement, to prevent electrical shock or damage to the equipment.

POWER CORDS

Power cords must not be frayed, broken nor expose bare wiring when operating this equipment.

USE RECOMMENDED FUSES ONLY

Use only fuses specifically recommended for the equipment at the specified current and voltage ratings.



SAFETY FIRST: TO ALL SERVICE PERSONNEL (cont)

WARNING: THE IFR 6015 USES A LITHIUM ION BATTERY PACK. THE FOLLOWING WARNINGS CONCERNING LITHIUM ION BATTERIES MUST BE HEEDED:

- I DO NOT RECHARGE OUTSIDE THE IFR 6015.
- I DO NOT CRUSH, INCINERATE OR DISPOSE OF IN NORMAL WASTE.
- I DO NOT SHORT CIRCUIT OR FORCE DISCHARGE AS THIS MIGHT CAUSE THE BATTERY TO VENT, OVERHEAT OR EXPLODE.

CAUTION: INTEGRATED CIRCUITS AND SOLID STATE DEVICES SUCH AS MOS FETS, ESPECIALLY CMOS TYPES, ARE SUSCEPTIBLE TO DAMAGE BY ELECTROSTATIC DISCHARGES RECEIVED FROM IMPROPER HANDLING, THE USE OF UNGROUNDED TOOLS AND IMPROPER STORAGE AND PACKAGING. ANY MAINTENANCE TO THIS UNIT MUST BE PERFORMED WITH THE FOLLOWING PRECAUTIONS:

- I BEFORE USE IN A CIRCUIT, KEEP ALL LEADS SHORTED TOGETHER EITHER BY THE USE OF VENDOR-SUPPLIED SHORTING SPRINGS OR BY INSERTING LEADS INTO A CONDUCTIVE MATERIAL.
- I WHEN REMOVING DEVICES FROM THEIR CONTAINERS, GROUND THE HAND BEING USED WITH A CONDUCTIVE WRISTBAND.
- I TIPS OF SOLDERING IRONS AND/OR ANY TOOLS USED MUST BE GROUNDED.
- I DEVICES MUST NEVER BE INSERTED INTO NOR REMOVED FROM CIRCUITS WITH POWER ON.
- I PC BOARDS, WHEN TAKEN OUT OF THE SET, MUST BE LAID ON A GROUNDED CONDUCTIVE MAT OR STORED IN A CONDUCTIVE STORAGE BAG. REMOVE ANY BUILT-IN POWER SOURCE, SUCH AS A BATTERY, BEFORE LAYING PC BOARDS ON A CONDUCTIVE MAT OR STORING IN A CONDUCTIVE BAG.
- I PC BOARDS, IF BEING SHIPPED TO THE FACTORY FOR REPAIR, MUST BE PACKAGED IN A CONDUCTIVE BAG AND PLACED IN A WELL-CUSHIONED SHIPPING CONTAINER.



CAUTION: SIGNAL GENERATORS CAN BE A SOURCE OF ELECTROMAGNETIC INTERFERENCE (EMI) TO COMMUNICATION RECEIVERS. SOME TRANSMITTED SIGNALS CAN CAUSE DISRUPTION AND INTERFERENCE TO COMMUNICATION SERVICES OUT TO A DISTANCE OF SEVERAL MILES. USERS OF THIS EQUIPMENT SHOULD SCRUTINIZE ANY OPERATION THAT RESULTS IN RADIATION OF A SIGNAL (DIRECTLY OR INDIRECTLY) AND ENSURE COMPLIANCE WITH INSTRUCTIONS IN FAA CIRCULAR AC 170-6C, DATED FEBRUARY 19, 1981.



FOR QUALIFIED SERVICE PERSONNEL ONLY

FUSE REPLACEMENT

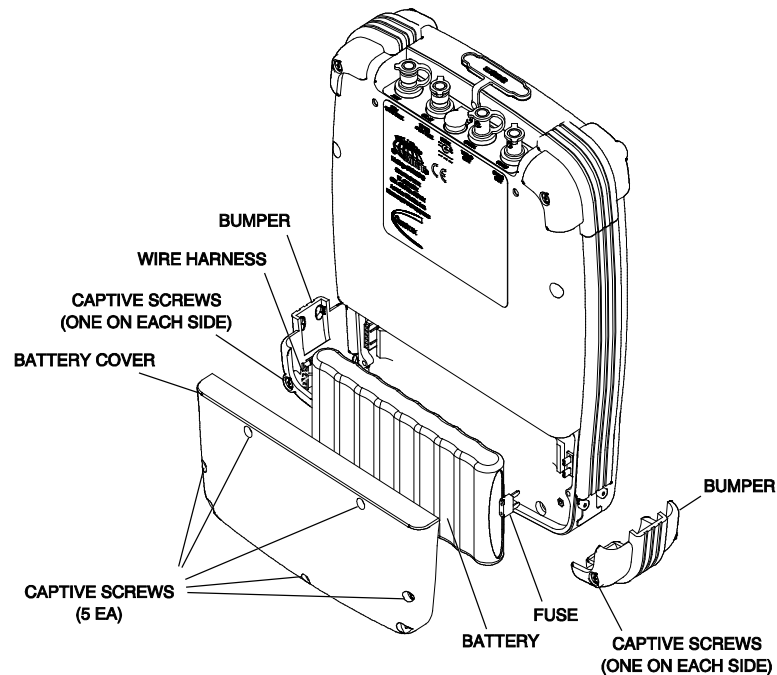
STEP	PROCEDURE
------	-----------

- | | |
|----|---|
| 1. | Verify the IFR 6015 is OFF and not connected to AC power. |
| 2. | Fully loosen two captive screws in the two lower bumpers and remove the bumpers. |
| 3. | Fully loosen five captive screws and lift the Battery Cover from the Case Assembly. |
| 4. | Replace fuse: |

5 A, 32 Vdc, Type F
(Mini Blade Fuse)
Aeroflex PN: 56080 (5106-0000-057)

CAUTION: FOR CONTINUOUS PROTECTION AGAINST FIRE, REPLACE ONLY WITH FUSES OF THE SPECIFIED VOLTAGE AND CURRENT RATINGS.

- | | |
|----|---|
| 5. | Install the Battery Cover on the Case Assembly and tighten the five captive screws (8 in/lbs.). |
| 6. | Install the two lower bumpers and tighten the two captive screws in each bumper (8 in/lbs.). |



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FOR QUALIFIED SERVICE PERSONNEL ONLY

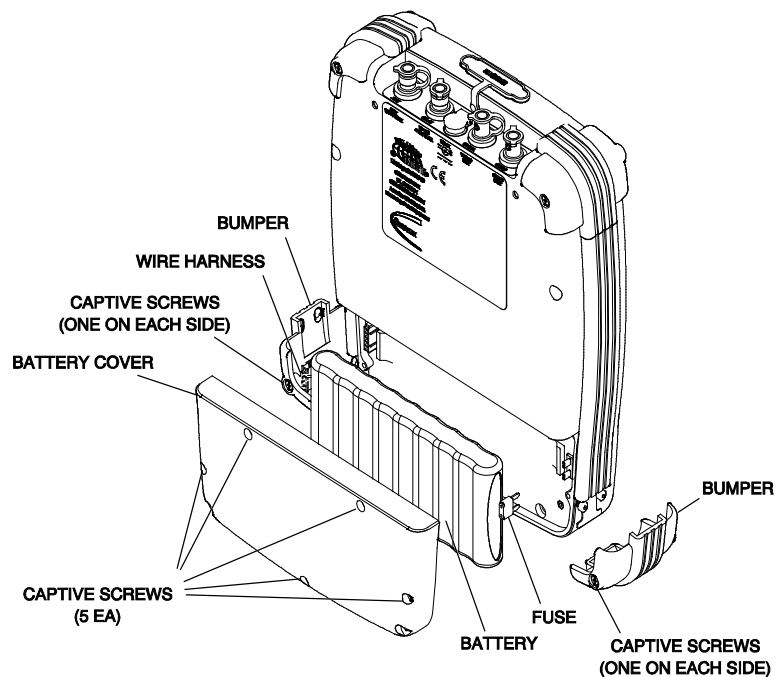
BATTERY REPLACEMENT

STEP	PROCEDURE
------	-----------

- | | |
|----|---|
| 1. | Verify the IFR 6015 is OFF and not connected to AC power. |
| 2. | Fully loosen two captive screws in the two lower bumpers and remove the bumpers. |
| 3. | Fully loosen five captive screws and lift the Battery Cover from the Case Assembly. |
| 4. | Disconnect the wire harness connecting the battery to the IFR 6015 and remove the battery. |
| 5. | Install new battery and reconnect the wire harness. |
| 6. | Install the Battery Cover on the Case Assembly and tighten the five captive screws (8 in/lbs.). |
| 7. | Install the two lower bumpers and tighten the two captive screws in each bumper (8 in/lbs.). |

WARNING: DISPOSE OF OLD BATTERY ACCORDING TO LOCAL STANDARD SAFETY PROCEDURES.

CAUTION: REPLACE ONLY WITH THE BATTERY SPECIFIED BY AEROFLEX. DO NOT ATTEMPT TO INSTALL A NON-RECHARGEABLE BATTERY.



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As we are always seeking to improve our products, the information in this document gives only a general indication of the product capacity, performance and suitability, none of which shall form part of any contract. We reserve the right to make design changes without notice.



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