AVIATOR 700S

User Manual

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Revision : A

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REVISION HISTORY

Revision	Author	Date	Section	Description of Change
Draft-A1	AER	Jul 2023	All	Draft-A1 for internal review.
Draft-A2	AER	Aug 2023	All	Inclusion of peer review comments.
Draft-A3	AER	Nov 2023	10	Added of section 10.1.3 PIMBIT. Template updated.
A	AER	Nov 2023	-	Release of revision A as per Draft-A3.

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1 INTRODUCTION

1.1 GENERAL

1.1.1 Purpose

This document provides a guide for users intending to make voice calls or data connections via the AVIATOR 700S SATCOM System.

The use of voice and data services as well as the use of advanced data features is demonstrated by means of examples.

An installed and configured Aeronautical Earth Station (AES) is assumed throughout.

1.1.2 Scope

This document is scoped to the items defined in Table 1-1.

Table 1-1: Document Scope

Equipment	Part Number	Description
SDU-5045	405045-0100x	Compact Satellite Data Unit
HPA-5015	405015-0100x	High Power Amplifier
SCM-5055	405055-0100x	SDU Configuration Module
DLNA	173628-101 677-A0193 405013A	ARINC 781 Type F Diplexer/LNA
HGA	804-10-0015 822-2236-501 4141-89-99 677-A0173 405017A	ARINC 781 High Gain Antenna

1.2 GLOSSARY

1.2.1 Acronyms

Table 1-2: List of Acronyms

Acronym	Description
A2G	Air-to-Ground
AAC	Airline Administrative Control
ACARS	Aircraft Communications, Addressing and Reporting System
ACD	Aircraft Control Domain
ACP	Audio Control Panel
ADL	Airborne Data Loader
AES	Aircraft Earth Station
AISD	Airline Information and Services Domain
AMER	Americas
AOC	Aeronautical Operational Control

Table 1-2: List of Acronyms	
Acronym	**Description**
APAC	Asia-Pacific
APN	Access Point Name
ATA	Air Transport Association
ATC	Air Traffic Control
AUTO	Automatically
CDU	Control & Display Unit
CFDS	Central Fault Display System
CHAP	Challenge Handshake Authentication Protocol
CID	Context ID
CMU	Communication Management Unit
CSDU	Compact Satellite Data Unit
CSP	Communication Service Provider
CSR	Certificate Signing Request
CTTIC	China Transport Telecommunications & Information Centre
dB	Decibels
DL	Downlink
DLNA	Diplexer/Low Noise Amplifier
EFB	Electronic Flight Bag
EMEA	Europe, Middle East and Africa
FDS	Fault Display Specification
FWS	Flight Warning System
G2A	Ground-to-Air
GES	Ground Earth Station
HDR	High Data Rate
HGA	High Gain Antenna
HLD	HPA/LNA/Duplexer
HMI	Human Machine Interface
HPA	High Power Amplifier
Hz	Hertz
IANA	Internet Assigned Numbers Authority
ICAO	International Civil Aviation Organisation
ID	Identity
IFE	In-Flight Entertainment
IM	Installation Manual
IMSI	International Mobile Subscriber Identity
INOP	Inoperable

Table 1-2: List of Acronyms	
Acronym	**Description**
IP	Internet Protocol
IPCP	Internet Protocol Control Protocol
LNA	Low Noise Amplifier
LRU	Line Replaceable Unit
LSK	Line Select Key
MB	Megabyte
MCDU	Multi-purpose Control and Display Unit
MEAS	Middle East and Asia
MIB	Management Information Base
NAT	Network Address Translation
ORC	Ocean Region Change
OID	Object ID
OPS	Operational Program Software
ORT	Owner Requirements Table
PAP	Password Authentication Protocol
PDL	Portable Data Loader
PDP	Packet Data Protocol
PIMBIT	Passive Intermodulation Built In Test
PKI	Public Key Infrastructure
QoS	Quality of Service
SAT	Satellite
SATCOM	Satellite Communication
SB / SBB	SwiftBroadband
SB-S	SwiftBroadband-Safety
SCM	SDU Configuration Module
SDU	Satellite Data Unit
SNMP	Simple Network Management Protocol
SPI	Security Parameter Index
TFT	Traffic Flow Template
UHF	Ultra High Frequency
UL	Uplink
UM	User Manual
UMTS	Universal Mobile Telecommunications System
VHF	Very High Frequency
VPN	Virtual Private Network

1.3 REFERENCES

1.3.1 External References

Table 1-3: List of External References			
Reference Tag	**Document**	**Revision**	**Document Title**
[3GPP_TS27]	3GPP TS 27.007	10.3.0	Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); AT command set for User Equipment (UE)
[A781]	ARINC 781	7	ARINC Characteristic 781 - Mark 3 Aviation Satellite Communication Systems
[ITU-T_V.250]	ITU-T	V.250	Serial asynchronous automatic dialing and control
[PKI_CON]	PKI CONOPS	0.3	SwiftBroadband Safety 2.0 Overview and PKI Concept of Operations
[PKI_OPS]	PKI INMARSAT	0.9	Inmarsat SB-S Service - Airline Ops Handbook
[GOLD]	ICAO GOLD	Second Edition	International Civil Aviation Organization (ICAO) - Global Operational Data Link Document (GOLD)
[SVGM]	ICAO SVGM	First Edition	International Civil Aviation Organization (ICAO) - Satellite Voice Guidance Material (SVGM)
[A739]	ARINC 739	1	ARINC Characteristic 739 - Multi-purpose Control and Display Unit
[A739A]	ARINC 739A	1	ARINC Characteristic 739A - Multi-purpose Control and Display Unit
[A615]	ARINC 615	4	Airborne Computer High Speed Data Loader
[A615A]	ARINC 615A	2	Software Data Loader Using Ethernet Interface
[A665]	ARINC 665	2	Loadable Software Standards

1.3.2 Internal References

Table 1-4: List of Internal References			
Reference Tag	**Document**	**Revision**	**Document Title**
[700S_IM]	98-158751	Latest	AVIATOR 700S Installation Manual
[SORT_UG]	99-181291	Latest	AVIATOR 700S ORT Tool - Secure & User Guide
[UORT_UG]	99-181292	Latest	AVIATOR 700S ORT Tool - User Guide
[LET]	99-178150	Latest	AVIATOR S Log Extraction Tool User Guide

2 REGULATORY INFORMATION

2.1 RADIOFREQUENCY RADIATION EXPOSURE INFORMATION

2.1.1 AVIATOR 700S

This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 235 cm between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un

environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de

235 cm de distance entre la source de rayonnement et votre corps.

Ce transmetteur ne doit pas etre place au meme endroit ou utilise simultanement avec un autre transmetteur ou antenne.

2.2 FEDERAL COMMUNICATIONS COMMISSION (FCC)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

NOTICE:

Changes or modifications made to this equipment not expressly approved by Cobham may void the FCC authorization to operate this equipment.

NOTICE:

This device complies with Part 15 of the FCC Rules and with Industry Canada license-exempt RSS standard(s).

Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

2.3 JAPANESE RADIO LAW AND JAPANESE TELECOMMUNICATIONS BUSINESS LAW COMPLIANCE

This device is granted pursuant to the Japanese Radio Law (電波法)
and the Japanese Telecommunications Business Law (電気通信事業法).

This device should not be modified (otherwise the granted designation number will become invalid).

2.4 INNOVATION, SCIENCE AND ECONOMIC DEVELOPMENT CANADA (ISED)

NOTICE:

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1. L'appareil ne doit pas produire de brouillage.
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

NOTICE:

Changes or modifications made to this equipment not expressly approved by Cobham may void the FCC authorization to operate this equipment

3 SWIFTBROADBAND SAFETY SYSTEM OVERVIEW

3.1 INMARSAT SATELLITE NETWORK

3.1.1 SwiftBroadband-Safety (SB-S) for the Cockpit

SB-S is a comprehensive upgrade of the Classic Aero service, which is a voice and data safety service, used by more than 200 major airlines, jet operators and government agencies, onboard over 13,000 aircraft, processing over 50 million position reports annually.

Classic Aero has been the gold standard for aviation safety communications for the past three decades. However, technology has evolved and SB-S promises to revolutionize the safe flight of airplanes through the skies.

SB-S has global coverage, abundant capacity, full redundancy, unrivalled cybersecurity, and over 99.9% availability worldwide, meeting International Civil Aviation Organization (ICAO) GOLD communications and surveillance performance requirements.

Refer to the INMARSAT website for further information: https://www.inmarsat.com/

3.1.2 SwiftBroadband (SBB) for the Cabin

SwiftBroadband enables passengers to access online services from anywhere in the sky and provides flight crews with real-time information to improve flight operations.

SwiftBroadband is secure, functional and compatible with government-grade encryption standards. Delivering up to 432 kbps (AVIATOR 700S configuration), it's always on to meet the needs of its customers.

SwiftBroadband solutions provide IP data communication capability to the crew and passengers - from full access to on-board router, email, media streaming services to in-seat mobile phone and text services.

Refer to the INMARSAT website for further information: https://www.inmarsat.com/

3.1.3 SwiftBroadband Satellites and Coverage Map

The INMARSAT Satellite Network provides near-global coverage between +/-76 degrees latitude from satellites in geostationary orbit. The SwiftBroadband satellites are a combination of 4th and 6th generation (I-4, I-6) Inmarsat satellites, nominally located at the following longitudes:

- Europe, Middle East and Africa (EMEA) 25 degrees East
- Indian Ocean East (IOR) 83.7 degrees East
- Asia-Pacific (APAC) 143.5 degrees East
- Americas (AMER) 98 degrees West

Each satellite provides a large number of overlapping beams (similar to cells) on the earth for users to access the network, similar in operation to terrestrial cellular networks.

The part of the earth's surface covered by each satellite is termed its "footprint".

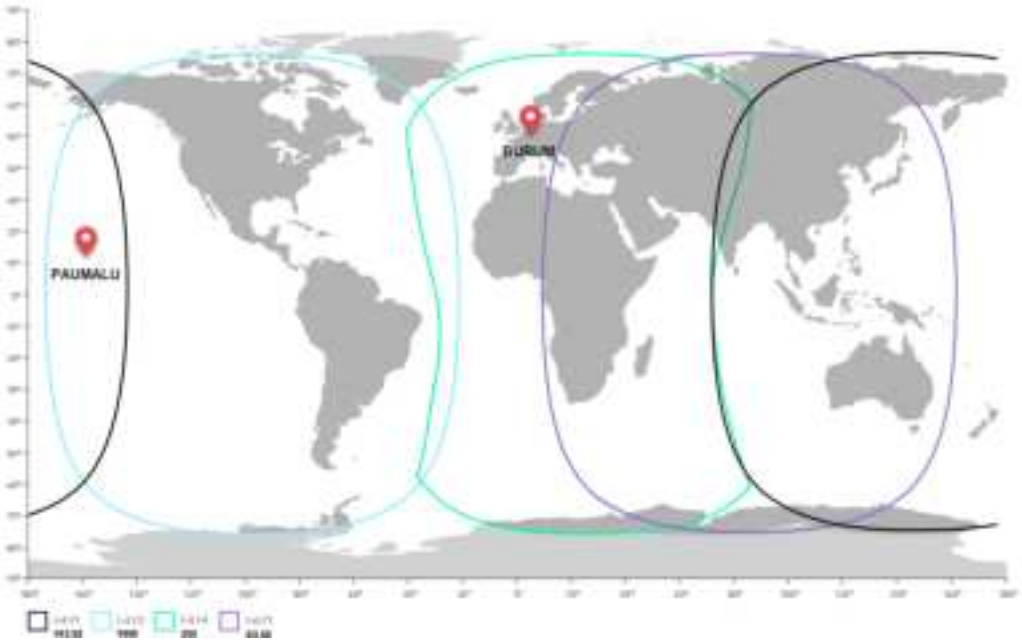

Figure 3-1: INMARSAT SwiftBroadband Coverage

3.2 AVIATOR S SATCOM SYSTEM FUNCTIONS AND FEATURES

3.2.1 System Overview – AVIATOR 700S

The AVIATOR 700S System services the Cockpit by providing SB-S (refer to section 3.1.1) voice and data connectivity to keep the aircraft connected, even in areas with a high concentration of aircraft. In addition there is a dedicated Cabin Data connection (refer to section 3.1.2) through a separate channel card:

- Two simultaneous voice calls supported by multiple aircraft audio configurations.
- Aircraft Communications, Addressing and Reporting System (ACARS) and Aeronautical Telecommunication Network Open System Interconnection (ATN/OSI) Data capability for secure message exchanges between Air Traffic Control (ATC), Aeronautical Operational Control (AOC) and Airline Administrative Control (AAC).
- Cockpit Data connectivity (up to 432 kbps) for Electronic Flight Bag (EFB) applications keeping the crew informed and up-to-date at all times.
- Cabin Data connectivity (up to 432 kbps) for Cabin Router or In-Flight Entertainment (IFE) applications.

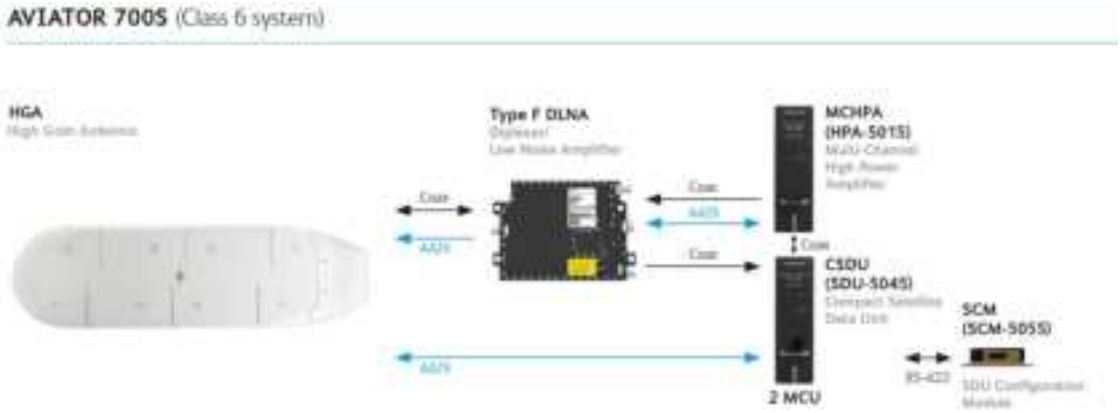

Figure 3-2: AVIATOR 700S SATCOM System

3.2.2 Configuration

The AVIATOR S SATCOM System configuration is managed by loading Owner Requirement Tables (ORT) via the Airborne Data Loader (ADL) or Portable Dataloader (PDL).

The configuration is made up of two parts (separate ARINC 665 **[A665]** Media):

- Secure ORT
- User ORT

The Secure ORT is typically managed by the aircraft manufacturer and forms part of the certified installation. The Secure ORT configures the AVIATOR S SATCOM System for a specific aircraft configuration.

The User ORT is typically managed by the airline or aircraft operator. The User ORT does not form part of the certified aircraft configuration, but is often important in ensuring the system operates in the desired way. Changes to the User ORT may be frequent, potentially based on aircraft route or charter.

The User ORT also defines the phonebook/directory available to the crew with a list of pre-programmed numbers with associated call priority (refer to section 3.3.1).

A laptop computer with an installation of the ORT Tool may be used to modify and create ARINC 665 **[A665]** media for use with the ADL/PDL. Refer to the ORT Tool User Guides **[SORT_UG][UORT_UG]** for further guidance.

3.3 SAFETY VOICE SERVICES

3.3.1 Call Priorities - Ground-to-Air (G2A)

In order to keep communication towards the aircraft (including voice calls) controlled and secure, a particular Aircraft (identified by its ICAO address) may be reached by placing a call through a 'two-stage dialer' managed by SITA or ARINC (CSP). In order to access these services, the caller (or organization) must be registered (for billing purposes) with the selected Communication Service Provider (CSP) in order to be granted access in the form of a unique pin code(s).

Calls placed over the SB-S network require a call priority[1] and is selected by the calling parting at the time of dialing. In some cases, a unique pin code may be linked to a particular call priority.

Table 3-1: Call Priorities

Description	Priority Level	Priority Number
Emergency / Distress	Highest	P1/Q15
High / Safety		P2/Q12
Low / Company / Non-Safety		P3/Q10
Public	Lowest	P4/Q9

Public priority calls may not be permitted to reach the cockpit and may be disabled through User ORT configuration (refer to section 3.2.2).

[1] Refer to the ICAO document **[SVGM]** for further clarification of the call priority definition.

3.3.2 Call Priorities - Air-to-Ground (A2G)

Calls initiated by the crew on-board the aircraft are assigned a call priority (refer to Table 3-1), typically selected on the CDU before initiating the call. The default call priority is configured by Secure ORT configuration.

Outgoing Public priority calls may not be permitted and may be disabled through User ORT configuration (refer to section 3.2.2).

3.3.3 Pre-emption

Four levels of call priority (described in section 3.3.1) allows for call pre-emption[2], where an incoming call may only reach and alert the crew when all the available channels are in-use and the incoming call priority is higher than the current active calls. When a lower priority call is pre-empted, the CDU will display the updated incoming call information.

3.4 SAFETY DATA SERVICES

3.4.1 ACARS Data

One of the fundamental communication systems in the aircraft is the Aircraft Communications, Addressing and Reporting System (ACARS). This messaging system, managed by the Communication Management Unit (CMU), is key to the efficient and safe operation of the aircraft on the ground as well as in the air.

The CMU may select between various communication systems on-board in order to send ACARS messages, one of those being the AVIATOR S SATCOM System.

The benefit of the INMARSAT SB-S network is the improved speed, availability and reliability over the legacy VHF, UHF and Classic Aero systems.

The ACARS data connection is connected to the AVIATOR S Aircraft Control Domain (ACD) which segregates this and all other secure data streams from the AISD (EFB) data traffic. All ACARS data exchanged with the ground network is secured via a Virtual Private Network (VPN).

Refer to **[GOLD]** for further information regarding data link operations and capabilities.

3.5 NON-SAFETY DATA SERVICES

3.5.1 Electronic Flight Bag (EFB)

The EFB data connection is connected to the AVIATOR S Airline Information and Services Domain (AISD) Ethernet port, which segregates AISD (EFB) data traffic from the secure data streams (ACD).

AISD Clients are required to have a known static IPv4 configuration (defined by User ORT) for its Ethernet interface in order to access a routed and network address translated (NAT) Background Class data connection.

A Simple Network Management Protocol (SNMP) interface provides the capability for retrieving AVIATOR S SATCOM System and operational status information as well as link status and history (refer to Appendix A).

[2] Refer to the ICAO document **[SVGM]** for further clarification on call pre-emption.

3.5.2 Cabin Data

The cabin data connection is connected to the AVIATOR S Passenger Information and Entertainment Services Domain (PIESD) Ethernet port which segregates PIESD (cabin) data traffic from all other data streams (ACD, AISD).

A Point-to-Point Protocol over Ethernet (PPPoE) capable client is required to access the PIESD channel card. The cabin router is responsible for managing the data connection availability and Quality of Service (QoS).

A Simple Network Management Protocol (SNMP) interface provides the capability for retrieving AVIATOR S SATCOM System and operational status information as well as link status and history (refer to Appendix B).

An out-of-band control interface provides status monitoring of established SB packet data connections as well as connection control using AT-commands over a Telnet/TCPIP/Ethernet connection (refer to section 9.2.4). "Out-of-band" refers to the control session being independent of the PPPoE session carrying the user data. Refer to Appendix D for the list of supported AT-commands.

The PIESD Ethernet port and related services may be configured through the User ORT (see section 3.2.2).

3.5.2.1 Service Class

The INMARSAT non-safety SwiftBroadband (SBB) network provides two classes (types) of data connections:

- Background Class
  - A "pay per usage" service where the user is charged per Megabyte (MB) for the combined amount of data transferred (both the upload/download directions).
  - The maximum data rate (speed) is determined by the class of system installed:
    - AVIATOR 700S | Class 6 | Up to 432 kbps
  - Background Class is a 'contended service' where a number of users (aircraft) may share network resources. The network manages the available resources to ensure best effort for all users within the same region.
- Streaming Class
  - A "pay per minute" service where the user is charged for the time duration of the connection.
  - The available data rates (speed) are class specific:
    - AVIATOR 700S | Class 6
      - 8/16/32/64/128 kbps
      - X-Stream/Half-HDR/Full-HDR [3]
  - Data rates for the download/upload (forward/return) direction may be 'symmetric' (identical) or 'asymmetric' (different).

3.5.2.2 Service Class Selection

The default[4] PPPoE service class may be configured through the User ORT (refer to section 3.2.2).

If preferred, the user may select a specific service class when creating the PPPoE (refer to section 9.2.3).

[3] If required, check with your selected CSP for activation of these high data rate services.
[4] The User ORT configured default is used when a PPPoE connection is created using a blank (empty) service name field.

4 SERVICE ACTIVATION

In order to access the INMARSAT SB-S/SBB Network, an active service agreement is required between the aircraft owner/operator and a Communication Service Provider (CSP):

- SwiftBroadband-Safety (SB-S) | Flight Deck Services:
  - Primary
    - ARINC DIRECT
      - https://www.arincdirect.com
    - SITA
      - https://www.sita.aero
  - Regional
    - China Transport Telecommunications & Information Centre (CTTIC)

- SwiftBroadband (SBB) | Passenger Services
  - Primary
    - ARINC DIRECT
      - https://www.arincdirect.com
    - SITA
      - https://www.sita.aero
  - Regional
    - China Transport Telecommunications & Information Centre (CTTIC)

The CSP and the appointed Airline Designator/Device Sponsor (See section 4.2) will require the following information during the activation process:

- AVIATOR S Information
  - System Type
    - AVIATOR 700S (Class 6)
  - SIM Card Information
    - International Mobile Subscriber Identity (IMSI)
      - IMSI 0 is for Cockpit Voice and Data | ACD + AISD
      - IMSI 1 is for Cabin Data | PIESD
      - IMSI 2 is reserved for future use
      - IMSI 3 is reserved for future use
  - Smart Card Information
    - The smart card serial number for the PKI Security Certificate | ACD
- Aircraft or Owner Information
  - International Civil Aviation Organization (ICAO) Address
  - Registered Aircraft Identity | Tail Number
  - Billing information

As an outcome of the activation process, the CSP must provide the permitted Access Point Name (APN) for the AVIATOR S EFB (AISD) connection. The APN provided by the CSP must be configured in the User ORT (refer to section 3.2.2).

4.1 IMSI AND SMART CARD INFORMATION

The IMSI and smart card information is typically available through the following methods:

- Documentation included with the Satellite Data Unit (SDU) Configuration Module (SCM)
- Label information on the SCM itself (see Figure 4-1)
- SATCOM->CDU Screens reflecting the IMSI and Smart Card information

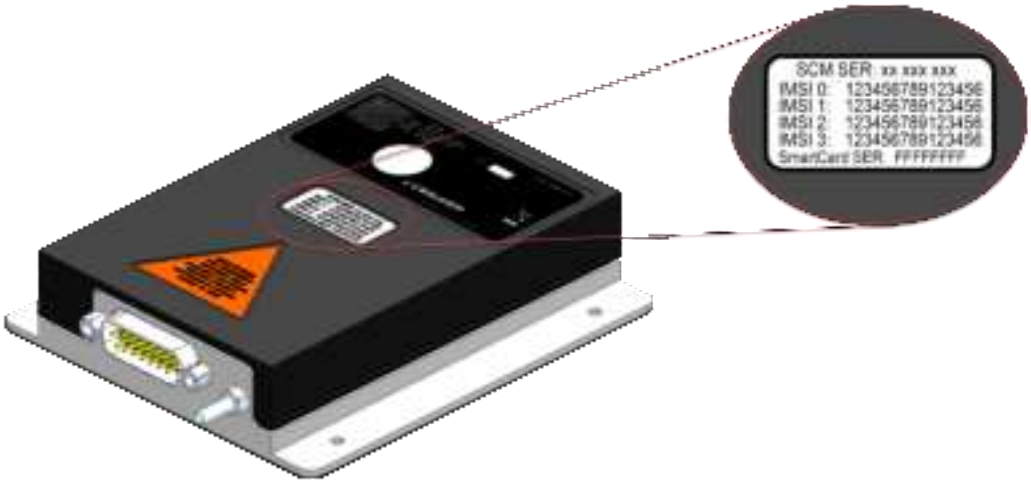

Figure 4-1: AVIATOR S SCM | IMSI & Smart Card Identification

4.2 PUBLIC KEY INFRASTRUCTURE (PKI) SECURITY CERTIFICATE

SwiftBroadband Safety security measures include a smart card inserted into each SCM, used to authenticate the AVIATOR S SATCOM System when connecting to the INMARSAT SB-S network.

A valid digital public key infrastructure (PKI) security certificate is required before SB-S connectivity is available. The User ORT configured "Airline Designator" (See section 3.2.2) will receive a certificate signing request (CSR) when the AVIATOR S SATCOM System has successfully acquired the satellite and attempts to authenticate SB-S services.

The Airline Designator will appoint a "Device Sponsor" who is responsible for the issuing of the PKI certificate.

Once the Device Sponsor has issued the certificate, the AVIATOR S SATCOM System will automatically retrieve the certificate, allowing SB-S services to proceed.

Refer to the INMARSAT PKI - Airline Ops Handbook **[PKI_OPS]** and the INMARSAT PKI Concept of Operations **[PKI_CON]** for more details regarding PKI activation and usage.

5 INTERPRETING THE SYSTEM STATUS

This User Manual provides operational descriptions to allow flight crew to manage the AVIATOR S SATCOM System. Depending on the aircraft configuration, the control & display unit installed may be slightly different to the representations provided in this section.

Multi-purpose Control and Display Unit

Figure 5-1: ARINC 739A MCDU

The SAT-PHONE pages are accessed by pressing the <SAT prompt from the MCDU main menu (Figure 5-1). Depending on the Aircraft configuration a different LSK location may be used.

Refer to Figure 5-2 for the MCDU display unit menu tree.

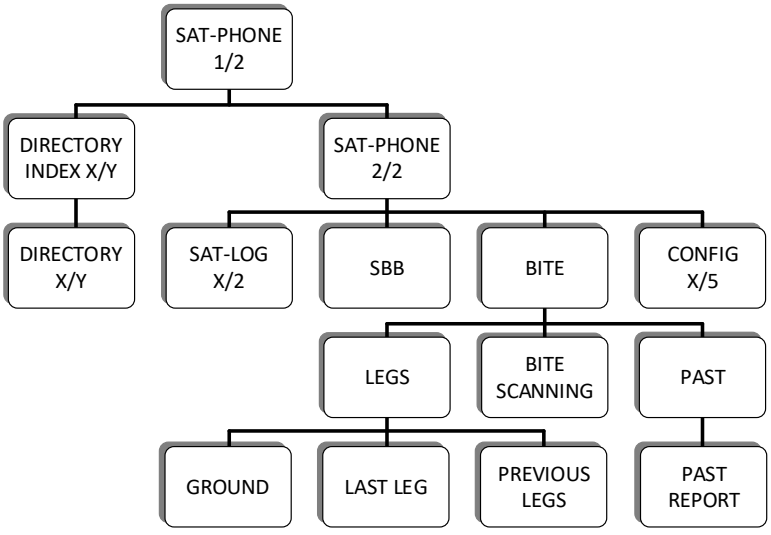

Figure 5-2: SATCOM Page Layout

5.1 VOICE AVAILABILITY

The AVIATOR S voice availability status indicates when the system is able to initiate a voice call. The availability status is associated to the voice channel number:

MCDU: SAT-PHONE page 1 of 2, SAT-1 for the first[5] voice channel, and SAT-2 for the second voice channel.

5.1.1 Not Ready

When the AVIATOR S SATCOM System and/or other aircraft systems (e.g. navigation data) are initializing or unable to provide service:

MCDU: SAT-PHONE page 1 of 2, SAT-1 and SAT-2 status indicates NOT READY (See Figure 5-3).

Figure 5-3: MCDU - SAT-PHONE 1/2 - NOT READY

To establish a cause for the NOT READY state, navigate to the pages described further in the following sections:

MCDU: Press NEXT/PREV PAGE key on the MCDU to display the SAT-PHONE page 2 of 2 (See Figure 5-4).

Figure 5-4: MCDU - SAT-PHONE 2/2

[5] The preferred Cockpit Audio Channel is Secure ORT configurable. Refer to **[SORT_UG]** for further configuration guidance.

5.1.2 Safety Voice Services - Ready

When the AVIATOR S SATCOM System has successfully acquired and registered on the INMARSAT network:

MCDU: SAT-PHONE page 1 of 2 SAT-1 and SAT-2 status indicates READY (See Figure 5-5).

The AVIATOR S SATCOM System is now able to make or receive safety voice calls.

Figure 5-5: MCDU - SAT-PHONE - Ready

5.1.3 Safety Data Services - Available

When the AVIATOR S SATCOM System has created the virtual private network (VPN) (described in section 3.4.1), the Ground Earth Station (GES) assigned[6] by the INMARSAT network is displayed on the:

MCDU: Press LSK-L2 on SAT-PHONE page 2 of 2 (Figure 5-4)→SAT-LOG page 1 of 2 at position LSK-L4 (Figure 5-6).

Refer to section 8.1 for further information.

Figure 5-6: MCDU - SAT-LOG 1/2 - Safety Data Available

[6] The SwiftBroadband GES is not user selectable as in Classic Aero systems.

5.2 SWIFTBROADBAND (SBB) SERVICE AVALABILITY

When the AVIATOR S SATCOM System has successfully acquired and registered on the INMARSAT network the current status and SwiftBroadband services may be reviewed by navigating to the:

MCDU: SAT-PHONE page 2 of 2→SBB page (See Figure 5-7) by pressing LSK-L3 (see Figure 5-4).

Figure 5-7: MCDU - SBB - Service Availability

- **CS Voice:**
  - NOT AVAILABLE — Circuit Switched voice service is currently not available. Ensure the system is Logged On to the Satellite. Refer to the SATCOM Log page, section 5.3.
  - AVAILABLE — Circuit Switched voice service is available.

- **PS Voice:**
  - NOT AVAILABLE — Packet Switched voice service is currently not available. Ensure the system is Logged On to the Satellite and the SEC GW is LOGGED ON. Refer to the SATCOM Log page, section 5.3.
  - AVAILABLE — Packet Switched voice service is available.

- **ACARS:**
  - IDLE — ACARS service is not active. Ensure the system is Logged On to the Satellite. Refer to the SATCOM Log page, section 5.3.
  - WAITING CMU — No CMU is detected. For further troubleshooting, refer to BITE, section 10.1.
  - WAITING VPN — A logon request has been sent. Waiting for the response from ground.
  - LOGGED OFF — ACARS Data service is currently not available. Ensure the system is Logged On to the Satellite. Refer to the SATCOM Log page, section 5.3.
  - LOGGED ON — ACARS data service is available.

- **SEC GW:**
  - LOGGED OFF — Security Gateway service is currently not available. Ensure the system is Logged On to the Satellite. Refer to the SATCOM Log page, section 5.3.
  - ENROLLING — Security Gateway has initiated a request for the initial PKI certificate. Refer to section 4.2, Public Key Infrastructure (PKI) Security Certificate.
  - LOGGING ON — Security Gateway service is establishing the connection.
  - LOGGED ON — Security Gateway service is available.

5.3 SATCOM LOG

Navigate to the SATCOM LOG page for further satellite network status and management functions:

MCDU: SAT-PHONE page 2 of 2→SAT-LOG page by pressing LSK-L2 (Figure 5-4).

5.3.1 Logging On/Logged On/Logged Off/Standby/Rejected

View the status of the connection to the INMARSAT satellite shown at LSK-L2 on the MCDU. The system will perform an automatic (AUTO) log on after initial power on (Figure 5-8, Figure 5-9).

By pressing LOG-OFF (LSK-R6 on MCDU), the AVIATOR S SATCOM system will disconnect from the INMARSAT network, and all services are unavailable (Figure 5-10). This is termed a "manual log off".

Press AUTO LOG-ON (LSK-R5 on MCDU) to reconnect to the INMARSAT network. The system status will indicate LOGGING ON while reconnecting, followed by the LOGGED ON status when complete.

Refer to section 6 for additional guidance relating to a "manual log on" procedure.

If the IMSI is not activated with a Communication Service Provider (CSP), the SATCOM is unable to register on the satellite network. The status REJECTED is displayed (Figure 5-11).

Figure 5-8: MCDU - SAT-LOG 1/2 - Status - Logging On

Figure 5-9: MCDU - SAT-LOG 1/2 - Status - Logged On

Figure 5-10: MCDU - SAT-LOG 1/2 - Status - Logged Off

Figure 5-11: MCDU - SAT-LOG 1/2 - Status - Rejected

5.3.2 SATCOM INOP

When the AVIATOR S SATCOM System has an error and unable to provide service, the voice channel status will indicate that calls are not possible (refer to section 5.1.1).

By accessing the SATCOM Log page, the system will indicate if it is attempting to log on or has declared a fault condition with the status "SATCOM INOP" (See Figure 5-12).

Further troubleshooting to determine the failure related to the SATCOM INOP state may be performed via the BITE pages as per section 10.1.

Figure 5-12: MCDU - SAT-LOG 1/2 - Status - SATCOM INOP

5.3.3 ICAO

The SATCOM Log page 2 of 2 provides the active ICAO address for activation or troubleshooting purposes (See Figure 5-13):

MCDU: Press NEXT/PREV PAGE key on the MCDU to display the SAT-LOG page 2 of 2 (See Figure 5-13).

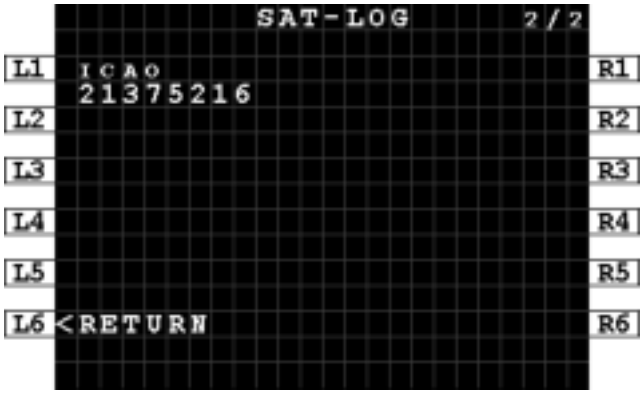

Figure 5-13: MCDU - SAT-LOG 2/2 - ICAO

6 SATELLITE SELECTION

6.1.1 Log Off & Auto/Manual Log On

The INMARSAT satellite used by the AVIATOR S SATCOM system can be automatically or manually selected through the SATCOM Log page. Typical system configuration is to perform automatic (AUTO) logon.

When the aircraft is operating in a region where more than one satellite may be used, a situation may arise where the current satellite is not the preferred satellite. An example of this would be a known flight path where a particular satellite's footprint does not provide full coverage, and switching to an alternate satellite may provide extended coverage without the need for changing satellites, termed an ocean region change (ORC), mid-flight or at an inconvenient time or position.

The selected satellite may be modified through the following sequence:

1. LOG-OFF from the SAT-LOG 1/2 page by pressing LSK-R6 on the MCDU (Figure 5-9).
2. Once in the LOGGED OFF state, modify the selected satellite page by pressing LSK-L3 on the MCDU.
3. Once the desired satellite is displayed, the decision must be made to perform an AUTO or MANUAL LOG-ON on by one of the following:
    a. Pressing AUTO LOG-ON from the SAT-LOG 1/2 page for MCDU (Figure 5-10).
        i. The AVIATOR S SATCOM System will select the INMARSAT satellite.
    b. Pressing MANUAL LOG-ON from the SAT-LOG 1/2 page for MCDU (Figure 5-10).
        i. The crew must select the desired INMARSAT satellite.

6.1.2 Ocean Region Change (ORC)

An ocean region change (ORC) occurs when the AVIATOR S SATCOM System transitions from one satellite coverage area into another. This action may be performed manually or automatically as described in section 6.1.1.

In both cases, voice and data services are disconnected for the duration of time the AVIATOR S SATCOM System requires to complete the ORC.

When the aircraft flight path or position has left the coverage area of the current satellite, the system will experience a loss of signal scenario and automatically search for alternate satellites that may be in view, or attempt to re-acquire the satellite that was 'lost' in order to resume communications. When the AVIATOR S SATCOM System experiences loss of coverage (no signal), the MCDU display will indicate "NOT READY" as described in section 5.1.1. In a typical ORC scenario, voice and data services may be restored in under 5 minutes.

7 SAFETY VOICE SERVICES

The AVIATOR S SATCOM System supports up to two simultaneous voice calls (incoming/outgoing/mixed) and various aircraft audio configurations:

1) Audio via the Audio Control Panel (ACP) and call management functions performed via the Multi-purpose Control and Display Unit (MCDU). Refer to section 7.1.

7.1 MCDU INTERFACE

7.1.1 Outgoing Calls - Air-to-Ground (A2G)

In order to place an outgoing call, often referred to as an Air-to-Ground call, the crew can choose between:

- Manual Entry - a phone number[7] or short code[8] may be entered via the MCDU (Figure 7-1, Figure 7-2),
- Directory Dial - select the identity from the directory list defined by User ORT (see section 3.2.2 for ORT Configuration).

7.1.1.1 Manual Entry

1. From the SAT-PHONE page 1 of 2 enter the destination number into the scratchpad (max 18 digits) and press LSK-L1 to pre-select the number to SAT-1 or LSK-L4 to SAT-2:
    a) International number - must begin with the prefix "00" followed by the country code (Figure 7-1). The "+" character is not accepted.
    b) Short code - must be 2 to 6 digits in length (Figure 7-2)
2. The default call priority is applied each time a new manual entry is performed. To modify the call priority, press LSK-R1/R4 to toggle through the available[9] call priorities.
    a) The default call priority is configurable by Secure ORT.

Refer to section 7.1.1.3 for guidance on dialing/initiating the call.

Figure 7-1: MCDU - SAT-PHONE 1/2 - Manual Entry - International Number - Scratchpad

Figure 7-2: MCDU - SAT-PHONE - Manual Entry - Short Code - Pre-selected

[7] User ORT configuration may limit manual dialing to short codes only.
[8] A short code number is defined as between 2 and 6 digits.
[9] Outgoing Public priority calls may be disabled by User ORT configuration.

7.1.1.2 Directory Dial

NOTE: The directory group names and entries are User ORT configurable and may differ from the examples.

1. From the SAT-PHONE page 1 of 2, press LSK-R3 to enter the SAT DIRECTORY INDEX page 1 of 2 (Figure 5-5).
2. Press the LSK matching the group name to be accessed.
    a. For example, press LSK-L2 to access the HIGH group (Figure 7-3).
3. Browse the directory using the NEXT/PREV PAGE keys to display the various pages of the directory.
    a. The current page / total page count is shown in the top right corner of the display.
4. Once the desired entry name is displayed on the screen press the corresponding LSK-L to pre-select the entry to SAT-1, or LSK-R to SAT-2.
    a. For example, press LSK-L3 to pre-select the third entry in the list to SAT-1 (Figure 7-4).

Refer to section 7.1.1.3 for guidance on dialing/initiating the call.

Figure 7-3: MCDU - SAT DIRECTORY INDEX 1/2

Figure 7-4: MCDU - SAT DIRECTORY X/Y

7.1.1.3 Initiating an Outgoing Call

Once the outgoing calling information has been pre-selected (Figure 7-5) as described in sections 7.1.1.1 the call can be initiated by pressing the associated audio channel MAKE CALL button on the MCDU, LSK-L1 for SAT-1 or LSK-L4 for SAT-2.

In order to hear the SATCOM audio, the appropriate SAT audio channel must also be selected on the ACP.

Once the call has been initiated, the SAT-PHONE page 1 of 2 will display the call progress:

- DIALING (Figure 7-6)
  - The number has been dialed and a connection to the called party is being attempted.
- RINGING (Figure 7-7)
  - Ringing may be heard by the crew before the call is answered.
  - The call may be cancelled by pressing the associated audio channel END CALL button on the MCDU, LSK-L1 for SAT-1 or LSK-L4 for SAT-2.
- ANSWERED (Figure 7-8)
  - The connection to the called party has been established.
  - Voice communication between the two parties is now possible using the ACP to control the audio path and volume functions.

Figure 7-5: MCDU - SAT-PHONE 1/2 - Outgoing Call - Make Call

Figure 7-6: MCDU - SAT-PHONE 1/2 - Outgoing Call - Dialing

Figure 7-7: MCDU - SAT-PHONE 1/2 - Outgoing Call - Ringing

Figure 7-8: MCDU - SAT-PHONE 1/2 - Outgoing Call - Answered

In some instances, the call may not be connected and the SAT-PHONE page 1 of 2 SAT channel will display CALL FAILED (Figure 7-9). Ensure the number entered is correct and press MAKE CALL to redial.

Figure 7-9: MCDU - SAT-PHONE 1/2 - Outgoing Call - Call Failed

7.1.1.4 Ending an Outgoing Call

Calls may be ended (terminated) by either the calling party (airborne side) or the called party (ground side):

- To release the call from the airborne side using the MCDU press the associated audio channel (SAT-1/2) END CALL button on the MCDU, LSK-L1 for SAT-1 or LSK-L4 for SAT-2 (Figure 7-10).
  - Call ended side tone may be heard by the crew.
  - The SAT-PHONE page 1 of 2 SAT channel will return to READY, with an additional status line indicating CALL ENDED. This status will automatically clear after 20 seconds, but may also be cleared by pressing CLR STATUS at LSK-L1 for SAT-1 or LSK-L4 for SAT-2 (Figure 7-11).

- To release the call from the airborne side using the ACP press the END CALL button on the ACP[10].
  - Call ended side tone may be heard by the crew.
  - The SAT-PHONE page 1 of 2 SAT channel will return to READY, with an additional status line indicating CALL ENDED. This status will automatically clear after 20 seconds, but may also be cleared by pressing CLR STATUS at LSK-L1 for SAT-1 or LSK-L4 for SAT-2 (Figure 7-11).

- When released from the ground side:
  - Call ended side tone may be heard by the crew.
  - The SAT-PHONE page 1 of 2 SAT channel will return to READY, with an additional status line indicating CALL ENDED. This status will automatically clear after 20 seconds, but may also be cleared by pressing CLR STATUS at LSK-L1 for SAT-1 or LSK-L4 for SAT-2 (Figure 7-11).

Figure 7-10: MCDU - SAT-PHONE - Ending a call

Figure 7-11: MCDU - SAT-PHONE - Call ended

[10] Secure ORT Configuration Option. Refer to the **[SORT_UG]** for additional configuration guidance.

7.1.2 Incoming Calls - Ground-to-Air (G2A)

7.1.2.1 Cockpit Alerting

As described in section 3.3.1, calls towards the aircraft may only be placed through controlled access measures. When a call reaches the aircraft, it may alert the crew:

1. Audibly - though a single stroke chime[11]
2. Visually - Call information displayed on the SATCOM->MCDU page (Figure 7-12).
   - The audio channel (SAT-1/2) call indication on the ACP.
   - Aircraft fitted with an Engine Indication and Crew Alerting System (EICAS), Flight Warning System (FWS) or similar function will receive notification relevant to the call priority.

7.1.2.2 Identifying the calling party and priority

When an incoming call (G2A) is in the alerting (ringing) phase, the SAT-PHONE page 1 of 2 will display the incoming call priority and the identity of the calling party:

- Call Priority
  - Refer to section 3.3.1, Table 3-1.

- Caller Identity
  - The calling parties' phone number is displayed when the number does not exist in the directory.
  - When the calling parties' number is in the directory, the associated identity is displayed in place of the number.
  - If the calling party has disabled their phone number presentation, the caller identity line is blank.

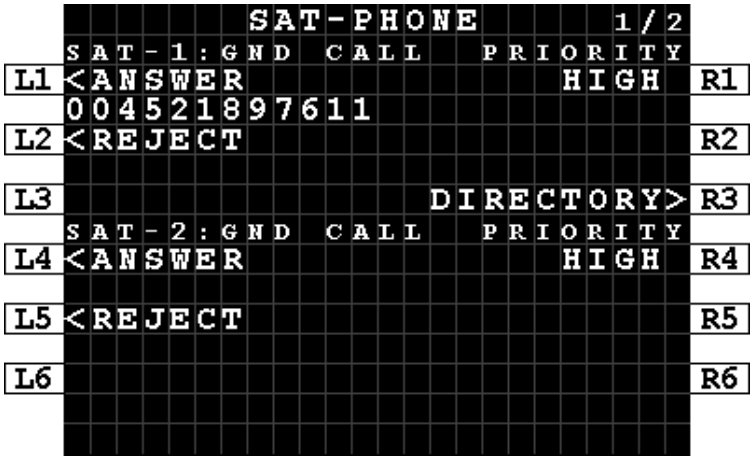

Figure 7-12: MCDU - SAT-PHONE - Incoming Call - Caller Identity

[11] In some aircraft, the chime alert (managed external to the AVIATOR S system) may be inhibited during critical phases of flight.

7.1.2.3 Answering an Incoming Call

An incoming call may be answered in multiple ways:

1. To answer the call, press the associated audio channel (SAT-1/2) ANSWER button on the MCDU, LSK-L1 for SAT-1 or LSK-L4 for SAT-2 (Figure 7-13).
   - In order for the calling party (ground side) to hear the SATCOM audio, the appropriate SAT audio channel must also be selected on the ACP.
   - Voice communication between the two parties is now possible using the ACP to control the audio path and volume functions.
   - The SAT-PHONE page 1 of 2 status will show ANSWERED (Figure 7-14).

2. Press the associated audio channel (SAT-1/2) on the ACP.
   - The ACP SAT call button will stop flashing and show steady state indicating the SAT channel is active and connected.
   - Voice communication between the two parties is now possible using the ACP to control the audio path and volume functions.
   - The SAT-PHONE page 1 of 2 status will show ANSWERED (Figure 7-14).

3. If the SAT-1/2 channel that is being alerted (as per 7.1.2.1) is already selected on the ACP, the incoming call is automatically answered[12].
   - Voice communication between the two parties is now possible using the ACP to control the audio path and volume functions.
   - The SAT-PHONE page 1 of 2 status will show ANSWERED (Figure 7-14).

Figure 7-13: MCDU - SAT-PHONE - Incoming Call - Answer

Figure 7-14: MCDU - SAT-PHONE - Incoming Call - Answered

[12] Secure ORT Configuration Option. Refer to the **[SORT_UG]** for additional configuration guidance.

7.1.2.4 Rejecting an Incoming Call

An incoming call may be rejected by pressing the associated audio channel (SAT-1/2) REJECT button on the MCDU, LSK-L2 for SAT-1 or LSK-L5 for SAT-2 (Figure 7-13).

- The SAT-PHONE page 1 of 2 SAT channel will return to READY, with an additional status line indicating CALL ENDED. This status will automatically clear after 20 seconds, but may also be cleared by pressing CLR STATUS at LSK-L1 for SAT-1 or LSK-L4 for SAT-2.

Figure 7-15: MCDU - SAT-PHONE - Incoming Call - Rejected

7.1.2.5 Ending an Incoming Call

Refer to section 7.1.1.4, Ending an Outgoing Call.

7.1.2.6 Preemption

When pre-emption occurs (see section 3.3.3), one of the active calls is disconnected and the SAT-PHONE page 1 of 2 SAT-1/2 channel status will briefly show PREEMPTED (Figure 7-16) followed by presentation of the caller identity (Figure 7-17).

Answering a preempted call is as per section 7.1.2.3, Answering an Incoming Call.

Figure 7-16: MCDU - SAT-PHONE - Incoming Call - Preempted

Figure 7-17: MCDU - SAT-PHONE - Incoming Call - Preemption Caller ID

8 SAFETY DATA SERVICES

8.1 ACARS DATA

This messaging system is automatically managed by the Communication Management Unit (CMU) and requires no crew interaction through the CDU SATCOM pages[13] provided that:

1. The system is Logged On (Auto or Manual) as described in section 6.1.1,
2. The Ground Earth Station (GES) assigned by the INMARSAT network is displayed on the SATCOM LOG page at position LSK-L4 for MCDU (Figure 8-1):
   a. XXX-BRM (BURUM)
   b. XXX-PMLU (PAUMALU)
   c. XXX-LNDN (LONDON[14])

NOTE: XXX is the octal GES ID number (e.g. 274).

Figure 8-1: MCDU - SAT-LOG - ACARS Data Available

[13] The CMU may be accessed by its own dedicated MCDU pages or HMI.
[14] The London site is restricted for test purposes only. Operational aircraft will use Burum and Paumalu.

9 NON-SAFETY DATA SERVICES

9.1 ELECTRONIC FLIGHT BAG (EFB) CONNECTIVITY

The AVIATOR S Airline Information and Services Domain (AISD) provides a routed Ethernet interface with access to a Background Class connection that is managed by the Aircraft Control Domain (ACD).

When enabled by Secure ORT (see section 3.2.2), this domain provides segregated data capability to the cockpit for EFB applications via a dedicated Ethernet interface.

ACD Voice and data traffic has a higher priority than AISD data traffic, ensuring that all SB-S functions are not impacted by AISD data requests.

The AISD/EFB data connection availability is linked to the ACD connectivity state:

- When the AVIATOR S ACD is "logged on" the AISD data connection is active.
- Similarly, when the AVIATOR S ACD is "logged off" the AISD data connection is inactive.

Refer to section 6.1.1 for further guidance regarding logging off/on.

The AISD/EFB Ethernet interface provides read only access to a Simple Network Management Protocol (SNMP) for retrieving AVIATOR S SATCOM System and operational status information as well as link status and history. Refer to Appendix A for the list of available Object Identifiers (OID's).

For further guidance, refer to the **[UORT_UG]** for configuration of the AISD/EFB data connection.

9.2 CABIN DATA CONNECTIVITY

The cabin data connection, connected to the AVIATOR S Passenger Information and Entertainment Services Domain (PIESD) Ethernet port, segregates PIESD (cabin) data traffic from all other data streams through a separate channel card, only available in the AVIATOR 700S system configuration.

The Cabin Data connection availability is however linked to the ACD connectivity state:

- When the AVIATOR S ACD is "logged on" the PIESD data connection will be active.
- Similarly, when the AVIATOR S ACD is "logged off" the PIESD data connection will be inactive.

Refer to section 6.1.1 for further guidance regarding logging off/on.

Additionally, cabin audio communication can be enabled/disabled through the SAT-LOG page by:

MCDU: Pressing LSK-R4 to toggle the Cabin Comm state (Figure 9-1 & Figure 9-2)[15].

The PIESD Ethernet interface provides read only access to a Simple Network Management Protocol (SNMP) for retrieving AVIATOR S SATCOM System and operational status information as well as link status and history. Refer to Appendix B for the list of available Object Identifiers (OID's).

[15] Cabin Comm enable/disable functionality is only visible in the AVIATOR-700S system configuration when PIESD is enabled by Secure ORT configuration.

Figure 9-1: MCDU - SAT-LOG- Cabin Comm enabled

Figure 9-2: MCDU - SAT-LOG - Cabin Comm disabled

9.2.1 PPPoE Connections

A Point-to-Point Protocol over Ethernet (PPPoE) capable client is required to access the PIESD channel card. The cabin router is responsible for managing the data connection availability and Quality of Service (QoS).

PPPoE Access allows a Client to obtain one or more dedicated data connections, not shared by other users on the aircraft, with direct control over the key characteristics of each connection:

- Choose the Class (Background or Streaming Class) of every connection, and the required bit rate for each Streaming Class Packet Data Protocol (PDP) context.
- Associate and direct the data for a particular application to go over a specific connection. Individual connections may then be optimised for their intended use, for example by setting up one Background Class connection for browsing and e-mail and another simultaneous Streaming Class connection for audio or video applications.
- Select a specific network Access Point Name (APN) specified by the Communication Service Provider (CSP), as opposed to the default configured by the System Administrator. (APNs are the gateways available to access the Internet, and a CSP may allocate these depending on specific service or performance requirements.)
- Access services which require authentication by the CSP.
- Change or modify the connection type and bandwidths mid-stream as required.
- Create secondary PDP contexts and Traffic Flow Templates (TFT).

It is assumed that the user is familiar with the concepts outlined in **[3GPP_TS27]**, and has a working knowledge of the Hayes AT command set.

There is a one-to-one mapping between each PPPoE connection and each primary PDP context activated by the AVIATOR S SATCOM system. A maximum of 11 PDP contexts is supported, comprising of both primary and secondary contexts.

9.2.2 Connection Authentication

User Authentication may be required for some connections. In such cases, a user name and password may be supplied in the PPPoE connection instance. Before attempting such connections, the user should verify with their Communication Service Provider (CSP) whether authentication is required for a particular service or type of IP address.

The AVIATOR S SATCOM System supports the exchange of a username and password during the PPPoE/PPP negotiation (IPCP Phase) using PAP/CHAP authentication.

9.2.3 PPPoE Service Name

A PPPoE service name may be used to customize the connection type, properties and quality-of-service (QoS) by specifying a series of AT strings or parameters in the Service Name field of by the PPPoE client connection properties (the connecting device).

When the service name is left blank/empty, User ORT configured defaults are used in order to create the PDP context with known properties.

Refer to Table 9-1 for the list of supported service name options.

As an alternative to a predefined service name option, the PPPoE client may define the full AT string. The letters "AT" must be present and the command string needs to specify both the CGEQREQ and CGEQMIN to ensure the desired QoS is provided. See **[A781]** section 3.3.11.3.1.

Example:

SBB:AT+CGDCONT=1,"bgan.inmarsat.com";+CGEQREQ=1,1,64,64,64,64;+CGEQMIN=1,1,64,64,64,64

Table 9-1: PPPoE Service Name Options		
IP Service	**Service Name Option**	**Description**
IP Background	SBB:BACKGROUND	Places a Primary Background PDP Context
8 kbps Streaming	SBB:STREAM8K	Places a Primary Streaming class PDP Context at the data rate of 8 kbps.
16 kbps Streaming	SBB:STREAM16K	Places a Primary Streaming class PDP Context at the data rate of 16 kbps.
32 kbps Streaming	SBB:STREAM32K	Places a Primary Streaming class PDP Context at the data rate of 32 kbps.
64 kbps Streaming	SBB:STREAM64K	Places a Primary Streaming class PDP Context at the data rate of 64 kbps.
128 kbps Streaming	SBB:STREAM128K	Places a Primary Streaming class PDP Context at the data rate of 128 kbps.
BGAN X-Stream	SBB:XSTREAM	Places a Primary Streaming class PDP Context with a dedicated 200 kHz bearer. Elevation angle dependant, with max data rate of 512 kbps.
HDR Half symmetric	N/A	No SBB Option Name defined. Use AT-Commands.
HDR Full symmetric	N/A	No SBB Option Name defined. Use AT-Commands.
HDR Half asymmetric	N/A	No SBB Option Name defined. Use AT-Commands.
HDR Full asymmetric	N/A	No SBB Option Name defined. Use AT-Commands.

9.2.4 Connection Control using TELNET

9.2.4.1 Primary PDP Contexts

Primary PDP contexts **must** be created through the establishment of a PPPoE connection between the AVIATOR S SATCOM System and the Client.

9.2.4.2 Secondary PDP Contexts

Secondary PDP contexts are used if differentiated QoS characteristics are desired for different traffic types. Although they share the APN and IP address of the primary PDP context to which they have been associated, each secondary PDP context may be specified to have a different QoS. A Traffic Flow Template (TFT) must be specified for each secondary PDP context to inform both the network and the AVIATOR S SATCOM System about the different types of traffic filter to each PDP context. All traffic that is not explicitly filtered (tied) into a secondary PDP context is sent via the associated primary PDP context by default. Different traffic types are typically identified by application (strictly protocol type), although filtering by IP address and TCP/UDP port numbers is also possible.

Secondary PDP Contexts and associated Traffic Flow Template (TFT) may be created, modified, activated and de-activated using the out-of-band control interface.

9.2.4.3 Out-of-band Control Port Connection and Configuration

The out-of-band control port is User ORT configurable (refer to section 3.2.2). The following parameters must have a known configuration to connect to the interface:

- AVIATOR S PIESD Ethernet interface IPv4 IP address | 192.168.0.200 (Default Value)
- AVIATOR S PIESD Ethernet interface IPv4 subnet mask | 255.255.255.0 (Default Value)
- AVIATOR S PIESD Out-of-band control/TELNET port number | 22222 (Default Value)

A TELNET client/application is required to connect to the out-of-band control port at the configured IP address and port number.

The client/application must be connected to the PIESD Ethernet interface with static IPv4 configuration in the defined subnet.

9.2.4.4 List of Supported AT-Commands

The out-of-band control interface provides status monitoring as well as connection control using 3G/INMARSAT AT-commands over a Telnet/TCPIP/Ethernet connection. "Out-of-band" refers to independent of the PPPoE session carrying the user data.

Table 9-2 lists the AT-commands supported by the AVIATOR S PIESD out-of-band control interface.

Refer to Appendix D for the detailed definition of each AT-command.

Table 9-2: AVIATOR S Supported AT-Commands

AT-Command	Description
+CLAC	List all available AT-commands
E	Local Echo
+CGMI	Request Manufacturer Identification
+CGMM	Request Model Identification
+CGMR	Request Revision Identification
+CGSN	Request Product Serial Number Identification
+CIMI	Request International Mobile Subscriber Identity
_IPDPS	Binding Telnet session to PPPoE context
+CGDCONT	Define PDP Context (Read only)
+CGDSCONT	Define Secondary PDP Context
+CGTFT	Traffic Flow Template
+CGEQREQ	3G Quality of Service Profile, Requested
+CGQREQ	2G Quality of Service Profile, Requested
+CGEQMIN	3G Quality of Service Profile, Minimum
+CGEQNEG	3G Quality of Service Profile, Negotiated
+CGACT	PDP Context Activate or Deactivate
+CGCMOD	PDP Context Modify
+CGPADDR	Show PDP Address

9.2.4.5 Binding to an active Primary PDP context

Before being able to modify, control or add a secondary PDP to a primary PDP context, the TELNET session needs to be linked to a primary PDP through the use of the AT_IPDS AT-command. This indicates that all subsequent AT commands are related to the chosen PPPoE session and related PDP contexts.

A connection to the out-of-band control interface must be established as described in section 9.2.4.3.

Refer to Appendix D.3.11 for further guidance regarding the AT_IPDPS AT-command.

9.2.4.6 Adding a Secondary PDP Context

As described in section 9.2.1, a secondary PDP context and Traffic Flow Template (TFT) may be used to isolate specific traffic types or data that require a different QoS.

Example: A 16 kbps streaming class PDP context for UDP type traffic in the port range 50000 to 50005.

Method 1
The AT-commands may be sent separately:

- `AT+CGDSCONT=2,1` Attached a secondary CID to the primary CID number 1.
- `AT+CGEQREQ=2,1,16,16,16,16` Defines the PDP context type and the requested maximum and guaranteed QoS.
- `AT+CGEQMIN=2,1,16,16,16,16` Defines the requested minimum QoS.
- `AT+CGTFT=2,1,0,,17,50000.50005` Defines the downlink TFT (UDP port range 50000 to 50005).
- `AT+CGACT=1,2` Activates the secondary PDP context.

Method 2
The AT commands may be sent together, separated by a "`;`":

- `AT+CGDSCONT=2,1;+CGEQREQ=2,1,16,16,16,16;+CGEQMIN=2,1,16,16,16,16;+CGTFT=2,1,0,,17,50000.50005;+CGACT=1,2`

9.2.4.7 Traffic Flow Templates

A Traffic Flow Template (TFT) is used in conjunction with a secondary PDP context. Multiple TFT's may be linked to the same secondary PDP context, however each must be uniquely identified by:

`<packet_filter_identifier>`

- TFT identifier between 1 & 8.
- Multiple (max 8) TFTs may be applied to a single secondary.
- Starts with '1'.
- Does not indicate TFT precedence, only identifier.
- Multiple TFTs may be added to a single secondary context by incrementing the <packet_filter_identifier> allowing multiple 'groups' of traffic to be routed to the secondary context.

`<evaluation_precedence_index>`

- The index must be a unique number within all TFTs associated with the same primary PDP.
- The evaluation precedence index defines the precedence given to a filter when routing traffic.
- The filter with the precedence index of 0 is the first to be applied; the filter with the precedence index of 1 is next and so on. The lowest possible evaluation precedence index is 255. Traffic that may be applicable to more than one TFT will be routed over the TFT with the highest precedence i.e. whichever TFT is evaluated first.

Refer to Appendix D.3.9 for further guidance reading the +CGTFT AT-command.

9.2.4.8 Modifying/Scaling of Streaming Class PDP Contexts

The requested bit rates of an active Streaming Class PDP context may be re-negotiated, while the context remains active.

The Context Identifier (CID) for the connection must be known in order to modify the correct PDP context.

To renegotiate a specific PDP context the following AT-command is used:

AT-command: `AT+CGEQREQ=<CID#>, <Connection_Class>, <Max_Bitrate_Up>, <Max_Bitrate_Down>,<Guaranteed_Bitrate_Up>, <Guaranteed_Bitrate_Down>`

AT-response:
```
<echo response of command>
OK
```

Where:
`<Connection_Class>` is defined by:

1 = Streaming Class,
3 = Background Class

`<Max_Bitrate_Up>` and `<Max_Bitrate_Down>` specify the requested Maximum Bitrate (the preferred bitrate).

`<Guaranteed_Bitrate_Up>` and `<Guaranteed_Bitrate_Down>` specify the requested Guaranteed Bitrate (acceptable bitrate).

After the `AT+CGEQREQ` command has been sent, the context will not immediately use the rates requested. An additional command is required to modify the context.

To action the modification the following AT-command must be used:

AT-command: `AT+CGCMOD=<CID#>`
AT-response:
```
<echo response of command>
OK
```

At this point, the renegotiation will take place and if successful, the new bitrate request will be applied.

Verify that the re-negotiation was successful using the `AT+CGEQNEG=<CID#>` command.

9.2.4.9 Deactivating PDP contexts

Deactivation of a PDP context may be performed using AT-commands.

The CID for the connection **must** be known in order to deactivate the correct primary or secondary PDP context, primary or secondary.

To deactivate a specific PDP context the following AT-command may be used:

AT-command: `AT+CGACT=0,<CID#>`
AT-response:
```
<echo response of command>
OK
```

10 TROUBLESHOOTING

10.1 BITE

In order to troubleshoot the AVIATOR S SATCOM system, navigate to the BITE pages:

MCDU: SAT-PHONE page 2 of 2, LSK-R2 (Figure 10-1)

Figure 10-1: MCDU - SAT-PHONE 2/2

Review the BITE summary status displayed on row 2 & 3 (Figure 10-2, Figure 10-3):

- **CURRENT BITE:**
  - OK — No active BITE faults are present. See Figure 10-2.
  - FAIL — There is an active fault in the BITE SCANNING page. See Figure 10-3. Refer to section 10.1.1 for further detail on BITE SCANNING and troubleshooting.

- **STRAPPING PARITY:**
  - OK — Parity check is OK (ODD)
  - FAIL — Parity check is FAIL and a wiring fault is present. (EVEN)

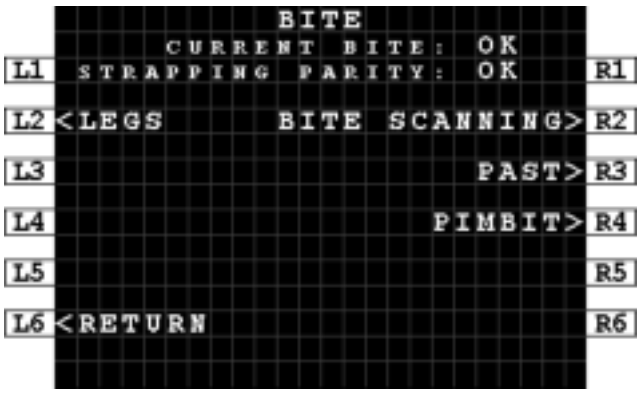

Figure 10-2: MCDU - BITE – OK

Figure 10-3: MCDU - BITE - FAIL

10.1.1 BITE Scanning - Troubleshooting Code

Access BITE SCANNING by pressing LSK-R2 to review active faults:

- The ATA code, failure description (accused LRU or Wiring) and severity is shown for each failure (Figure 10-4).
    - The Air Transport Association (ATA) code identifies the Line Replaceable Unit (LRU) or wiring (WRG) that is affected by the fault condition. Refer to Appendix E.1 for the list of ATA codes and fault descriptions.
- Use the NEXT/PREV PAGE keys to navigate multiple pages.
- View the BITE SCANNING DETAILS page for each fault by pressing LSK-R2 or LSK-R4 (Figure 10-4).
    - Note the UTC date and time information as well as troubleshooting code (Figure 10-5).

Figure 10-4: MCDU - BITE - BITE SCANNING

Figure 10-5: MCDU - BITE - BITE SCANNING DETAILS

10.1.2 PAST

To initiate a Person Activated Self-Test (PAST) from the BITE page (Figure 10-2), navigate to the PAST page by pressing LSK-R3:

- Press START to initiate the test (Figure 10-6).

- The PAST STARTED page indicates that the test is now in progress (Figure 10-7).
  - If the test could not be activated a page indicating "TEST NOT POSSIBLE" and a reason is displayed (Figure 10-12).

- The AVIATOR S SATCOM system will reboot as part of the test sequence. Once the SATCOM is available on the MCDU return to the PAST page to access the PAST REPORT.
  - If PAST has not been executed in the current power cycle, the PAST REPORT page will indicate that the self-test has not been run (Figure 10-8).
  - If PAST is still executing, the "TEST IN PROGRESS" page is presented (Figure 10-9).
  - When the PAST is completed the PAST REPORT will either state "TEST PASSED" (Figure 10-10) or "TEST FAILED" (Figure 10-11), and present the PAST REPORT failure information.

Figure 10-6: MCDU - BITE - PAST

Figure 10-7: MCDU - BITE - PAST STARTED

Figure 10-8: MCDU - BITE - PAST REPORT - Not Run

Figure 10-9: MCDU - BITE - PAST IN PROGRESS

Figure 10-10: MCDU - BITE - PAST REPORT - Passed

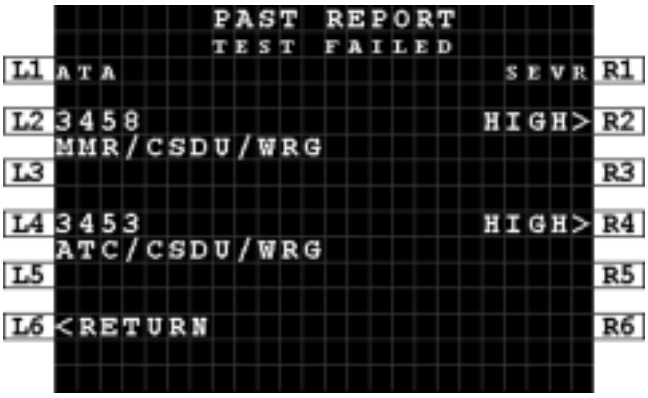

Figure 10-11: MCDU - BITE - PAST REPORT - Failed

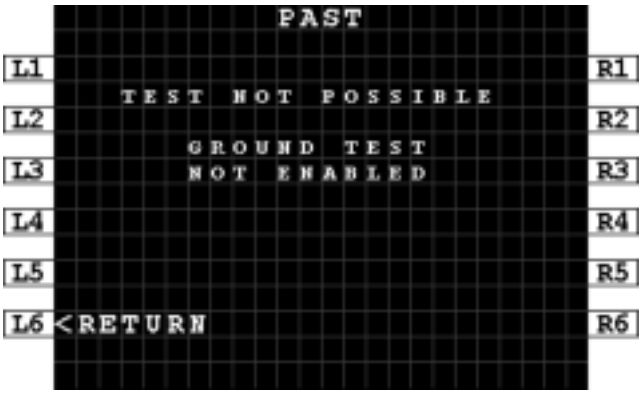

Figure 10-12: MCDU - BITE - PAST - Not Possible

10.1.3 PIMBIT

To initiate a passive intermodulation built-in test (PIMBIT) from the BITE page (Figure 10-2, Figure 10-3), navigate to the PIMBIT TEST page by pressing LSK-R4:

- Ensure that the aircraft position is at least 200 meters away from the nearest building and orientation/heading is north facing if in the northern hemisphere or south facing if in the southern hemisphere of the globe.
- Press START at LSK-R6 to initiate the PIMBIT Test (Figure 10-13). The AVIATOR S SATCOM system will automatically restart as part of the test process (Figure 10-14).

Figure 10-13: MCDU - BITE - PIMBIT

Figure 10-14: MCDU - BITE - PIMBIT - PIMBIT TEST STARTED

- Each MCDU will indicate that the PIMBIT Test is in progress (Figure 10-15).
- When the PIMBIT TEST is completed the PIMBIT TEST RESULT will either state "TEST PASSED" (Figure 10-16) or "TEST FAILED" (Figure 10-17), and present the TEST DATA (Figure 10-18).

Figure 10-15: MCDU - BITE - PIMBIT - PIMBIT TEST PROGRESS

Figure 10-16: MCDU - BITE - PIMBIT - PIMBIT TEST RESULT - TEST PASSED

Figure 10-17: MCDU - BITE - PIMBIT - PIMBIT TEST RESULT - TEST FAILED

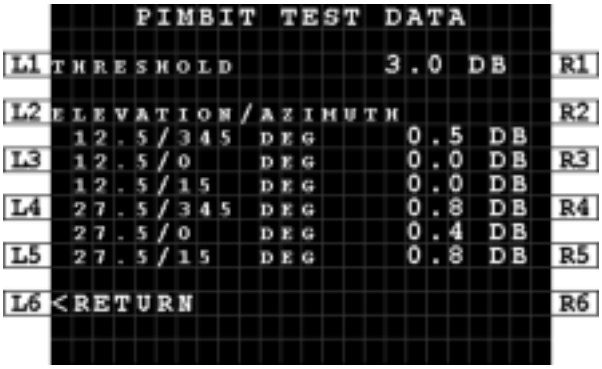

Figure 10-18: MCDU - BITE - PIMBIT - PIMBIT TEST RESULT - PIMBIT TEST DATA

- The TEST FAILED result page (Figure 10-17) will include a reason for the test failure at LSK-L3:

- ANTENNA NOT AVAILABLE	Failure to communicate with the Antenna. Refer to the BITE SCANNING pages for further troubleshooting (section 10.1.1). Correct the fault and repeat the PIMBIT Test.
- CSDU INTERNAL ERROR	An internal CSDU fault has occurred which prohibits the test. Refer to the BITE SCANNING pages for further troubleshooting (section 10.1.1). Replace the CSDU if persistent.
- DATE/TIME NOT AVAILABLE	Verify the aircraft interface operation. Refer to the BITE SCANNING pages for further troubleshooting (section 10.1.1). Correct the fault and repeat the PIMBIT Test.
- HPA NOT AVAILABLE	Failure to communicate with the High Power Amplifier. Refer to the BITE SCANNING pages for further troubleshooting (section 10.1.1). Correct the fault and repeat the PIMBIT Test.
- INMARSAT PARAM NOT AVAIL	Ensure the AVIATOR S SATCOM system is able to acquire the satellite in order to receive the Inmarsat PIMBIT test parameters before initiating the PIMBIT Test.
- NAV DATA NOT AVAILABLE	Verify the aircraft interface operation. Refer to the BITE SCANNING pages for further troubleshooting (section 10.1.1). Correct the fault and repeat the PIMBIT Test.
- TEST DATA LIMIT EXCEEDED	The measured PIMBIT Test Data exceeds the defined threshold. Ensure the PIMBIT test is performed where the aircraft is not located close to any buildings (>200 meters) or other reflective surfaces. Repeat the test for additional data evaluation. Degraded SATCOM performance may occur. Perform antenna sub-system inspections to remove or correct potential passive inter-modulation source(s).
- TEST DATA INVALID	The PIMBIT Test Data is determined to be invalid. Ensure the PIMBIT test is performed where the aircraft is not located close to any buildings (>200 meters) or other reflective surfaces. Repeat the test for additional data evaluation.

- To EXIT the PIMBIT TEST press LSK-L6 on the PIMBIT TEST RESULT page (Figure 10-16, Figure 10-17).
- To CONFIRM press LSK-R6 on the PIMBIT TEST EXIT page (Figure 10-19) to initiate an AVIATOR S SATCOM System restart to restore normal operation.

Figure 10-19: MCDU - BITE - PIMBIT - PIMBIT TEST RESULT - PIMBIT TEST EXIT

10.1.4 LEGS

Access the LEGS page (**Error! Reference source not found.**) by pressing LSK-L2 from the BITE page (Figure 10-2 or Figure 10-3) to review historical data:

- GROUND — All AVIATOR S SATCOM System internal BITE events that are active or have occurred for the current "on ground" state (**Error! Reference source not found.**).
- LAST LEG — All BITE events that occurred in the most recent flight leg (**Error! Reference source not found.**).
- PREVIOUS LEG — Review the High Severity (Class 1) events that occurred in previous legs (**Error! Reference source not found.**).

NOTE: A complete flight leg is the transition from "on ground" to "in air" and back to "on ground". The transition from "in air" to "on ground" initiates a new flight leg.

Figure 10-20: MCDU - BITE - LEGS

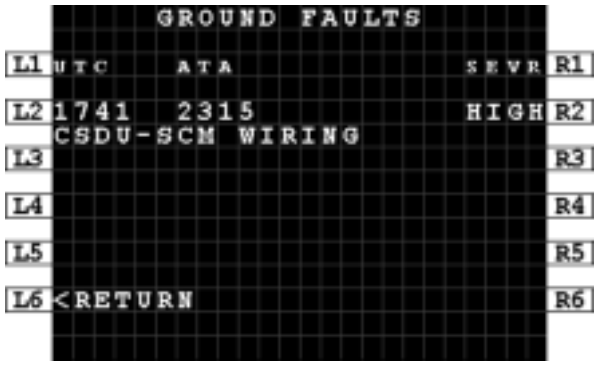

Figure 10-21: MCDU - BITE - LEGS - GROUND FAULTS

Figure 10-22: MCDU - BITE - LEGS - LAST LEG

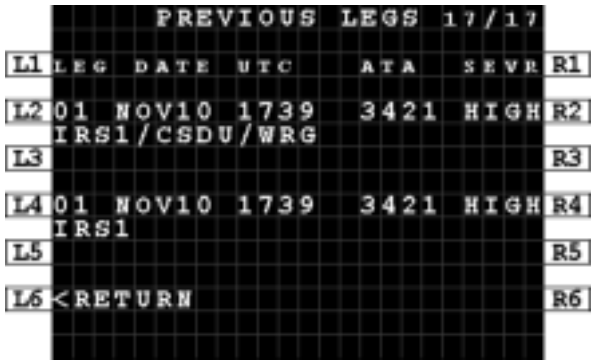

Figure 10-23: MCDU - BITE - LEGS - PREVIOUS LEGS

10.2 SATCOM CONFIG

In order to review the AVIATOR S SATCOM system configuration, navigate to the CONFIG pages:

MCDU: SAT-PHONE page 2 of 2, LSK-R3 (Figure 10-1)

- **Page 1/5** (Figure 10-24):
  - SW LOCATION — SAT-L or SAT-R determined by the SDU Config Strapping
  - SW LOCATION ID — SW Location Identity determined by the SDU Config Strapping
  - SW P/N OPS — Part Number of the SDU Operational Program Software (OPS)

- **Page 2/5** (Figure 10-25):
  - SW SDU SORT — Part Number of the SDU Secure Owner Requirements Table (SORT)
  - SD SDU UORT — Part Number of the SDU User Owner Requirements Table (UORT)

- **Page 3/5** (Figure 10-26):
  - SDU P/N — Part Number of the SDU hardware
  - SDU S/N — Serial Number of the SDU hardware
  - SCM P/N — Part Number of the SDU Configuration Module (SCM) hardware
  - SCM S/N — Serial Number of the SDU Configuration Module (SCM) hardware

- **Page 4/5** (Figure 10-27):
  - ANT P/N — Part Number of the Antenna hardware
  - ANT S/N — Serial Number of the Antenna hardware
  - ANT SW — Part Number of the Antenna Operational Program Software

- **Page 5/5** (Figure 10-28):
  - IMSI — International Mobile Subscriber Identity number.
  - SMART CARD S/N — Serial Number of the Smart Card.

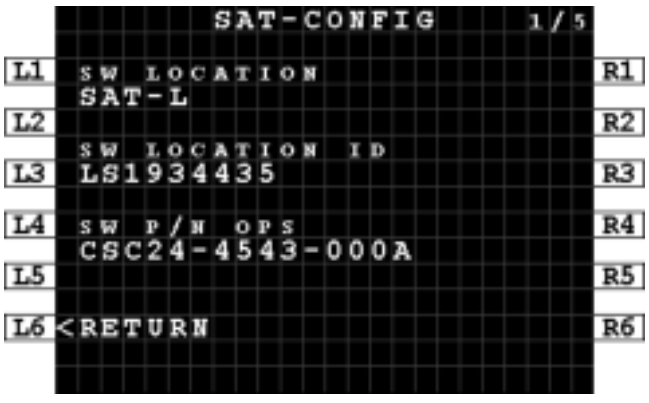

Figure 10-24: MCDU - SAT-CONFIG 1/5

Figure 10-25: MCDU - SAT-CONFIG 2/5

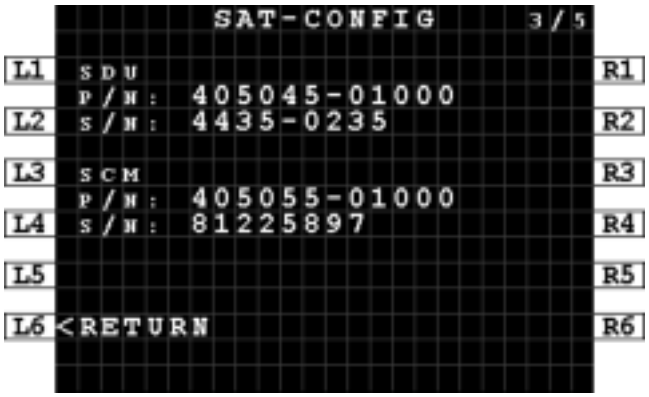

Figure 10-26: MCDU - SAT-CONFIG 3/5

Figure 10-27: MCDU - SAT-CONFIG 4/5

Figure 10-28: MCDU - SAT-CONFIG 5/5

10.3 LOG FILE EXTRACTION VIA THE ETHERNET DATALOADER INTERFACE

The AVIATOR S log files may be retrieved via the Ethernet dataloader interface using the ARINC 615A **[A615A]** Operator Defined Download Protocol.

Log file extraction via the Ethernet dataloader interface is only permitted when Data Load mode has been activated.

Further guidance with respect to aircraft maintenance system functions and operation is beyond the scope of this document.

10.4 LOG FILE EXTRACTION VIA THE MAINTENANCE USB

For AVIATOR S log file extraction via the front USB interface, refer to **[LET]**.

10.5 SYSTEM TEST - FLASHING CALL LIGHTS

While performing an AVIATOR S SATCOM System Test, the call lights are 'flashed'. When the test has completed, additional crew action may be required to clear the call lights before the system can return to the operational state:

Clear the ACP call lights by pressing the SAT-1 and SAT-2 call buttons.

Appendix A. AISD SNMP Interface

Table 10-1: AISD SNMP MIB OID Support

Level 1	Level 2	Level 3	Level 4	Level 5	Description
.asLinks(2)	.aslServices(1)	.aslsNumbers(1)			The number of data services types available. Integer = 1
		.aslsTable(2)	.aslsIndex(1)		Index number to each service. Integer = 1
			.aslsName(2)		Name for each index. Index 1 = "SBB:BACKGROUND"
			.aslsInUse(3)		Number of instances of this service currently in use. Integer [0..1]
			.aslsAvailable(4)		Number of instances of this service currently available. Integer [0..1]
			.aslsMaxChannels(5)		Max number of instances of this service available. Integer = 1
	.aslInfos(2)	.asliSatState(1)			This object shows, if the satellite is locked or not. The type is an enumerated integer value. 1 = Connected to Sat, 2 = Not connected.
		.asliSatID(2)			This object shows, which satellite is connected by the AVIATOR S SATCOM system: “” “EMEA” “MEAS” “AMER” “APAC” String [0..32]

		.asliSatIDNum(3)			Unique numeric identifier for the connected satellite: 3 (MEAS) 6 (EMEA) 5 (APAC) 7 (AMER) Integer [0..63]
		.asliActLinkEntryNumbers(4)			Indicates the number of the entries in the first table and has a range from 0 to 50. Integer [0..50]
		.asliActLinkTable(5)	.asliActLinkIndex(1)		This object is a unique identifier for the current link entry and can be considered a handle for the session. With each new link, this number is to be incremented by one, wrapping around (but avoiding conflicts). Integer [1..32767]
			.asliActLinkReleaseType(2)		This object shows the release type of the current link as numeric codes as described in **[A781]** Attachment 5, Section 6. Integer [1..32767]
			.asliActLinkReleaseReason(3)		Variable string based on asliActLinkReleaseType String [0..128]
			.asliActLinkStatus(4)		This object shows if the current link is up or not. Because entries are only removed 30 seconds after going down, it is important to check this field while reading the active link table.
			.asliActLinkChanNo(5)		This object shows which channel is being used by the current link: Integer = 1 (AISD)
			.asliActLinkContextID(6)		Virtual context ID specific to that user session (tied to a primary PDP). Integer [0..255]

			.asliActLinkActualContextID(7)		The NSAPI used over the air. This ID is unique per channel card in the system while it is active. The association between a ContextID and the ActualContextID remains for the duration of the primary PDP. Integer [0..255]
			.asliActLinkConnectionID(8)		Variable string used when creating the PPPoE session. String [0..128]
			.asliActLinkNegotiatedBW(9)		Integer = 0 (Best effort connection)
			.asliActLinkIpAddress(10)		This object contains the IP-Address of the current link. E.g. aaa.bbb.ccc.ddd.
			.asliActLinkTxTrafficVol(11)		This object contains the information about the total transmitted bytes over this link in kBytes
			.asliActLinkRXTrafficVol(12)		This object contains the information about the total received bytes over this link in kBytes
			.asliActLinkBeamID(13)		This object shows, which beam ID is connected by the current link. Integer [0..255]
			.asliActLinkSigQual(14)		This object shows the Quality in dBHz*10 of the current link. Integer [0..32767]
			.asliActLinkMaxSigQual(15)		Expected maximum values for Link Signal Quality in dBHz*10. 64 dBHz BGAN Global Beam 68 dBHz BGAN Regional Beam 80 dBHz BGAN Narrow Beam Integer [0..32767]
			.asliActLinkMainIndex(16)		Integer = 0 (No secondary PDP contexts)
			.asliActLinkStartTime(20)		UTC Time at which the link was brought up. AS_Datetime [RFC3339]

			.asliActLinkEndTime(21)		UTC Time at which the link was brought down. AS_Datetime [RFC3339]
			.asliActLinkPPPoEID(22)		PPPoE Session ID which started the call. Integer [0..32767]
			.asliActLinkNegotiatedBWUp(25)		Integer = 0 (Best effort connection)
			.asliActLinkNegotiatedBWDown(26)		Integer = 0 (Best effort connection)
			.asliActLinkPeerIP(27)		This object contains the IP-Address of the current link. E.g. aaa.bbb.ccc.ddd.
			.asliActLinkDNS1(28)		This object contains the IP-Address of the first DNS Server. E.g. aaa.bbb.ccc.ddd.
			.asliActLinkDNS2(29)		This object contains the IP-Address of the second DNS Server. E.g. aaa.bbb.ccc.ddd.
			.asliActLinkRequestSource(30)		The manner and interface through which this link was brought up. E.g. NAT, AISD
		.asliHistLinkEntryNumbers(6)			Indicates the number of the entries in the second table. Integer [0..250]
		.asliHistLinkTable(7)	.asliHistLinkIndex(1)		This object is a unique identifier for the link entry and can be considered a handle for the session. With each new link, this number is to be incremented by one, wrapping around (but avoiding conflicts). Integer [0..32767]
			.asliHistLinkReleaseType(2)		This object shows the release type of the link as numeric codes as described in **[A781]** Attachment 5, Section 6. Integer [1..32767]
			.asliHistLinkReleaseReason(3)		Variable string based on asliHisLinkReleaseType String [0..128]
			.asliHistLinkStatus(4)		This object shows if the link is up or not.

			.asliHistLinkChanNo(5)		This object shows which channel is being used by the link: Integer = 2 (AISD)
			.asliHistLinkContextID(6)		Virtual context ID specific to that user session (tied to a primary PDP). Integer [0..255]
			.asliHistLinkActualContextID(7)		The NSAPI used over the air. This ID is unique per channel card in the system while it was active. The association between a ContextID and the ActualContextID remains for the duration of the primary PDP. Integer [0..255]
			.asliHistLinkConnectionID(8)		Variable string used when creating the PPPoE session. String [0..128]
			.asliHistLinkNegotiatedBW(9)		Integer = 0 (Best effort connection)
			.asliHistLinkIpAddress(10)		This object contains the IP-Address of the link. E.g. aaa.bbb.ccc.ddd.
			.asliHistLinkTxTrafficVol(11)		This object contains the information about the total transmitted bytes over this link in kBytes
			.asliHistLinkRXTrafficVol(12)		This object contains the information about the total received bytes over this link in kBytes
			.asliHistLinkBeamID(13)		This object shows, which beam ID is connected by the link. Integer [0..255]
			.asliHistLinkSigQual(14)		This object shows the Quality in dBHz*10 of the link. Integer [0..32767]
			.asliHistLinkMaxSigQual(15)		Expected maximum values for Link Signal Quality in dBHz*10. 64 dBHz BGAN Global Beam 68 dBHz BGAN Regional Beam 80 dBHz BGAN Narrow Beam

					Integer [0..32767]
			.asliHistLinkMainIndex(16)		Integer = 0 (No secondary PDP contexts)
			.asliHistLinkStartTime(20)		UTC Time at which the link was brought up. AS_Datetime [RFC3339]
			.asliHistLinkEndTime(21)		UTC Time at which the link was brought down. AS_Datetime [RFC3339]
			.asliHistLinkPPPoEID(22)		PPPoE Session ID which started the call. Integer [0..32767]
			.asliHistLinkNegotiatedBWUp(25)		Integer = 0 (Best effort connection)
			.asliHistLinkNegotiatedBWDown(26)		Integer = 0 (Best effort connection)
			.asliHistLinkPeerIP(27)		This object contains the IP-Address of the historic link. E.g. aaa.bbb.ccc.ddd.
			.asliHistLinkDNS1(28)		This object contains the IP-Address of the first DNS Server. E.g. aaa.bbb.ccc.ddd.
			.asliHistLinkDNS2(29)		This object contains the IP-Address of the second DNS Server. E.g. aaa.bbb.ccc.ddd.
			.asliHistLinkRequestSource(30)		The manner and interface through which this link was brought up. E.g. NAT, AISD
		.asliSatHandoverPending(8)			Set if the system believes it will need to do a handover soon: 1 ~ True 2 ~ False
		.asliSatNetworkName (9)			Indicates to which satellite network the SDU is connected. E.g. SBB
.asSystem(3)	. assInfos(2)	assiHealthStatus(1)			System Overall Status: 1 ~ Passed 2 ~ Failed 3 ~ Absent (Initial)
.asUnits(4)	.asuSDU(2)	.asuSduInfo(1)	.asuSduInfoTableNumbers(1)		Indicates the number of entries in the table. Integer [1]

			.asuSduInfoTable(2)	.asuSduInfoIndex(1)	This object describes the unique identifier for the current unit. Integer [1..2]
				.asuSduInfoOverallStatus(8)	CSDU Overall Status: 1 ~ Passed 2 ~ Failed 3 ~ Absent (Initial)
				.asuSduInfoFailureCode(11)	CSDU overall status failure code - see Appendix C. Integer [0..32767]
				.asuSduInfoFailureReason(12)	CSDU overall status failure group based on the failure code - see Appendix C. String [0..255]
				.asuSduInfoCC1Status(15)	Cockpit Channel Card overall status: 1 ~ Passed 2 ~ Failed 3 ~ Absent (initial value)
				.asuSduInfoCC2Status(16)	Cabin Channel Card overall status: Integer [3] (Absent)
				.asuSduInfoUTCDateTime(35)	Current UTC date and time in RFC3339 format.
	.asuAntenna(8)	.asuAntInfo(1)	.asuAntInfoTableNumbers(1)		Indicates the number of entries in the table. Integer [1]
			.asuAntInfoTable(2)	.asuAntInfoIndex(1)	This object describes the unique identifier for the current antenna. Integer [1]
				.asuAntInfoOverallStatus(8)	Overall Antenna status 1 ~ Passed 2 ~ Failed 3 ~ Absent (initial value)
				.asuAntInfoGain(10)	The antenna gain (dB/10) currently utilized from 0.0 to 31.5 dB. ("-1" indicates invalid data). Integer [-1..315]

Appendix B. PIESD SNMP Interface

Table 10-2: PIESD SNMP MIB OID Support

Level 1	Level 2	Level 3	Level 4	Level 5	Description
.asLinks(2)	.aslServices(1)	.aslsNumbers(1)			The number of data services types available. Integer [7]
		.aslsTable(2)	.aslsIndex(1)		Index number to each service. Integer [1..7]
			.aslsName(2)		Name for each index. Index 1 = "SBB:BACKGROUND" Index 2 = "SBB:STREAM8K" Index 3 = "SBB:STREAM16K" Index 4 = "SBB:STREAM32K" Index 5 = "SBB:STREAM64K" Index 6 = "SBB:STREAM128K" Index 7 = "SBB:XSTREAM"
			.aslsInUse(3)		Number of instances of this service currently in use. Integer [0..127]
	.aslInfos(2)	.asliSatState(1)			This object shows, if the satellite is locked or not. The type is an enumerated integer value. 1 = Connected to Sat, 2 = Not connected.
		.asliSatID(2)			This object shows, which satellite is connected by the AVIATOR S SATCOM system: "" "EMEA" "MEAS" "AMER" "APAC" String [0..32]
		.asliSatIDNum(3)			Unique numeric identifier for the connected satellite: 3 (MEAS)

Level 1	Level 2	Level 3	Level 4	Level 5	Description
					6 (EMEA) 5 (APAC) 7 (AMER) Integer [0..63]
		.asliActLinkEntryNumbers(4)			Indicates the number of the entries in the first table and has a range from 0 to 50. Integer [0..50]
		.asliActLinkTable(5)	.asliActLinkIndex(1)		This object is a unique identifier for the current link entry and can be considered a handle for the session. With each new link, this number is to be incremented by one, wrapping around (but avoiding conflicts). Integer [1..32767]
			.asliActLinkReleaseType(2)		This object shows the release type of the current link as numeric codes as described in **[A781]** Attachment 5, Section 6. Integer [1..32767]
			.asliActLinkReleaseReason(3)		Variable string based on asliActLinkReleaseType String [0..128]
			.asliActLinkStatus(4)		This object shows if the current link is up or not. Because entries are only removed 30 seconds after going down, it is important to check this field while reading the active link table.
			.asliActLinkChanNo(5)		This object shows which channel is being used by the current link: Integer = 2 (PIESD)
			.asliActLinkContextID(6)		Virtual context ID specific to that user session (tied to a primary PDP). Integer [0..255]
			.asliActLinkActualContextID(7)		The NSAPI used over the air. This ID is unique per channel card in the system while it is active.

Level 1	Level 2	Level 3	Level 4	Level 5	Description
					The association between a ContextID and the ActualContextID remains for the duration of the primary PDP. Integer [0..255]
			.asliActLinkConnectionID(8)		Variable string used when creating the PPPoE session. String [0..128]
			.asliActLinkNegotiatedBW(9)		This object shows the currently negotiated bandwidth of the link in this table entry. Integer [0..2048] 0 ~ Background Class / Best effort connection
			.asliActLinkIpAddress(10)		This object contains the IP-Address of the current link. E.g. aaa.bbb.ccc.ddd.
			.asliActLinkTxTrafficVol(11)		This object contains the information about the total transmitted bytes over this link in kBytes
			.asliActLinkRxTrafficVol(12)		This object contains the information about the total received bytes over this link in kBytes
			.asliActLinkBeamID(13)		This object shows, which beam ID is connected by the current link. Integer [0..255]
			.asliActLinkSigQual(14)		This object shows the Quality in dBHz*10 of the current link. Integer [0..32767]
			.asliActLinkMaxSigQual(15)		Expected maximum values for Link Signal Quality in dBHz*10. 64 dBHz BGAN Global Beam 68 dBHz BGAN Regional Beam 80 dBHz BGAN Narrow Beam Integer [0..32767]
			.asliActLinkMainIndex(16)		If this link entry is part of bundle (e.g., a secondary context), this object refers the main entry (e.g., the primary context) in this table to

Level 1	Level 2	Level 3	Level 4	Level 5	Description
					which this subentry is related. Integer [0..32767]
			.asliActLinkServiceIndex(17)		This object is a link to the aslsIndex by referring the used Service. Integer [0..100]
			.asliActLinkStartTime(20)		UTC Time at which the link was brought up. AS_Datetime [RFC3339]
			.asliActLinkEndTime(21)		UTC Time at which the link was brought down. AS_Datetime [RFC3339]
			.asliActLinkPPPoEID(22)		PPPoE Session ID which started the call. Integer [0..32767]
		.asliHistLinkEntryNumbers(6)			This object is a unique identifier for the link entry and can be considered a handle for the session. With each new link, this number is to be incremented by one, wrapping around (but avoiding conflicts). Integer [1..250]
		.asliHistLinkTable(7)	.asliHistLinkIndex(1)		This object is a unique identifier for the link entry and can be considered a handle for the session. With each new link, this number is to be incremented by one, wrapping around (but avoiding conflicts). Integer [1..32767]
			.asliHistLinkReleaseType(2)		This object shows the release type of the link as numeric codes as described in **[A781]** Attachment 5, Section 6. Integer [1..32767]
			.asliHistLinkReleaseReason(3)		Variable string based on asliHisLinkReleaseType String [0..128]
			.asliHistLinkStatus(4)		This object shows if the link is up or not.

Level 1	Level 2	Level 3	Level 4	Level 5	Description
			.asliHistLinkChanNo(5)		This object shows which channel is being used by the link: Integer = 2 (PIESD)
			.asliHistLinkContextID(6)		Virtual context ID specific to that user session (tied to a primary PDP). Integer [0..255]
			.asliHistLinkActualContextID(7)		The NSAPI used over the air. This ID is unique per channel card in the system while it was active. The association between a ContextID and the ActualContextID remains for the duration of the primary PDP. Integer [0..255]
			.asliHistLinkConnectionID(8)		Variable string used when creating the PPPoE session. String [0..128]
			.asliHistLinkNegotiatedBW(9)		This object shows the negotiated bandwidth of the link in this table entry. Integer [0..2048] 0 ~ Background Class / Best effort connection
			.asliHistLinkIpAddress(10)		This object contains the IP-Address of the link. E.g. aaa.bbb.ccc.ddd.
			.asliHistLinkTxTrafficVol(11)		This object contains the information about the total transmitted bytes over this link in kBytes
			.asliHistLinkRxTrafficVol(12)		This object contains the information about the total received bytes over this link in kBytes
			.asliHistLinkBeamID(13)		This object shows, which beam ID is connected by the link. Integer [0..255]
			.asliHistLinkSigQual(14)		This object shows the Quality in dBHz*10 of the link. Integer [0..32767]

Level 1	Level 2	Level 3	Level 4	Level 5	Description
			.asliHistLinkMaxSigQual(15)		Expected maximum values for Link Signal Quality in dBHz*10. 64 dBHz BGAN Global Beam 68 dBHz BGAN Regional Beam 80 dBHz BGAN Narrow Beam Integer [0..32767]
			.asliHistLinkMainIndex(16)		If this link entry is part of bundle (e.g., a secondary context), this object refers the main entry (e.g., the primary context) in this table to which this subentry is related. Integer [0..32767]
			.asliHistLinkServiceIndex(17)		This object is a link to the aslsIndex by referring the used Service. Integer [0..100]
			.asliHistLinkStartTime(20)		UTC Time at which the link was brought up. AS_Datetime [RFC3339]
			.asliHistLinkEndTime(21)		UTC Time at which the link was brought down. AS_Datetime [RFC3339]
			.asliHistLinkPPPoEID(22)		PPPoE Session ID which started the call. Integer [0..32767]
.asUnits(4)	.asuSDU(2)	.asuSduInfo(1)	.asuSduInfoTableNumbers(1)		Indicates the number of entries in the table. Integer [1]
			.asuSduInfoTable(2)	.asuSduInfoIndex(1)	This object describes the unique identifier for the current unit. Integer [1..2]
				.asuSduInfoVendor(2)	Short Name of the LRU supplier. String [0..22] = "Cobham Aerospace"
				.asuSduInfoOverallStatus(8)	CSDU Overall Status: 1 ~ Passed 2 ~ Failed 3 ~ Absent (Initial)
				.asuSduInfoFailureCode(11)	CSDU overall status failure code - see Appendix C.

Level 1	Level 2	Level 3	Level 4	Level 5	Description
					Integer [0..32767]
				.asuSduInfoFailureReason(12)	CSDU overall status failure group based on the failure code - see Appendix C. String [0..255]
				.asuSduInfoCC1Status(15)	Cockpit Channel Card overall status: Integer [3] (Absent)
				.asuSduInfoCC2Status(16)	Cabin Channel Card overall status: 1 ~ Passed 2 ~ Failed 3 ~ Absent (initial value)
				.asuSduInfoUTCDateTime(35)	Current UTC date and time in RFC3339 format.
	.asuAntenna(8)	.asuAntInfo(1)	.asuAntInfoTableNumbers(1)		Indicates the number of entries in the table. Integer [1]
			.asuAntInfoTable(2)	.asuAntInfoIndex(1)	This object describes the unique identifier for the current antenna. Integer [1]
				.asuAntInfoOverallStatus(8)	Overall Antenna status Integer [3] (Absent)
				.asuAntInfoGain(10)	The antenna gain (dB/10) currently utilized from 0.0 to 31.5 dB. ("-1" indicates invalid data). Integer [-1..315]

Appendix C. SNMP Object ID Definitions

Appendix C.1. asliActLinkStatus(4)

asliActLinkStatus shows if the current link is up or not. The values are:

- Up(1)
- Down(2)
- Unconnected(3)

Appendix C.2. asliHistLinkEntryNumbers(6)

asliHistLinkEntryNumbers(6) indicates the number of the entries in the second table and has an open range. The value is maximum 250.

Appendix C.3. asuSduInfoVendor(2)

asuSduInfoVendor is the name of the AVIATOR S supplier and has the value "Cobham Aerospace".

Appendix C.4. asuSduInfoFailureCode(11)

asuSduInfoFailureCode indicates a unique failure code. The failure code consists of a fault group and a fault bit to indicate individual faults. The value range of the failure code determines the fault group as listed in Table 10-3.

Table 10-3: Failure group of asuSduInfoFailureCode

Failure Code	Fault Group (in prioritized order)
1000 - 1999	No Power
2000 - 2999	Critical Temperature
3000 - 3999	No SATCOM
4000 - 4999	External Interface Failed
5000 - 5999	No ACARS
6000 - 6999	No Cockpit Voice
7000 - 7999	No Cockpit Data
8000 - 8999	Reserved for future use

For the "*No Power*" fault group the following fault bits are defined:

- DegradedPowerHoldUp (Bit 0)

For the "*Critical Temperature*" fault group the following fault bits are defined:

- DegradedACDTemperatureCriticalHigh (Bit 0)
- DegradedACDTemperatureShutdownHigh (Bit 1)
- DegradedCockpitRMTempCriticalHigh (Bit 2)
- DegradedPSMTemperatureCriticalHigh (Bit 3)
- DegradedAISDTemperatureCriticalHigh (Bit 4)
- Reserved for future use (Bit 5)
  DegradedHPATemperatureCriticalHigh (Bit 6)

For the "*No SATCOM*" fault group the following fault bits are defined:

- DegradedNoSATCOM (Bit 0)
- DegradedPosLost (Bit 1)
- DegradedNO_ORT (Bit 2)

For the "*External Interface Failed*" fault group the following fault bits are defined:

- DegradedNo615-3 (Bit 0)
- Degraded615-3Lost (Bit 1)
- DegradedCMULost (Bit 2)
- DegradedMCDULost (Bit 3)
- DegradedCFDSLost (Bit 4)
- DegradedFWSLost (Bit 5)
- DegradedMCDUFailure (Bit 6)

For the "*No ACARS*" fault group the following fault bits are defined:

- DegradedNoACARS (Bit 0)

For the "*No Cockpit Voice*" fault group the following fault bits are defined:

- DegradedCockpitVoiceFailure (Bit 0)

For the "*No Cockpit Data*" fault group the following fault bits are defined:

- DegradedAISDNotWorking (Bit 0)
- DegradedAISDFailure (Bit 1)
- DegradedNoCockpitData (Bit 2)

As an example:

If the CMU and MCDU are lost, it will set the fault bits "2" and "3" in the "External Interface Failed" fault group to combine into failure code "400C".

Appendix C.5. asuSduInfoFailureReason(12)

asuSduInfoFailureReason is a failure message equal to the failure code in asuSduInfoFailureCode(11).

Appendix D. AT-Commands

Appendix D.1. General Commands

Appendix D.1.1 List all Available AT Commands

List all available AT commands. Ref : **[3GPP_TS27]**

Command	Possible response(s)
+CLAC	<AT Command1> [<CR> <LF> <AT Command2>[...]] +CME ERROR: <err>
+CLAC=?	

Defined Values:

<AT Command >:

Defines the AT command including the prefix AT. Text shall not contain the sequence 0<CR> or OK<CR>

Appendix D.1.2 Command Echo

Command Echo. Ref : **[ITU-T_V.250]**

Command	Possible response(s)
ATE[<value>]	OK

Defined Values:

<value>

0 DCE does not echo characters during command state and online command state.

1 DCE echoes characters during command state and online command state.

Recommended default setting :

1 DCE echoes characters during command state and online command state

Supported Values:

(0,1)

Appendix D.2 System Information

Appendix D.2.1 Request Manufacturer Identification

Request Manufacturer Identification. Ref : **[3GPP_TS27]**

Command	Possible response(s)
+CGMI	<manufacturer> +CME ERROR: <err>
+CGMI=?	

Defined Values:

<manufacturer>

the total number of characters, including line terminators, in the information text shall not exceed 2048 characters.

Text shall not contain the sequence 0<CR> or OK<CR>

Appendix D.2.2 Request Model Identification

Request Model Identification. Ref : **[3GPP_TS27]**

Command	Possible response(s)
+CGMM	<model> +CME ERROR: <err>
+CGMM=?	

Defined Values:

<model>

The total number of characters, including line terminators, in the information text shall not exceed 2048 characters.

Text shall not contain the sequence 0<CR> or OK<CR>

Appendix D.2.3 Request Revision Identification

Request Revision Identification. Ref : **[3GPP_TS27]**

Command	Possible response(s)
+CGMR	<revision> +CME ERROR: <err>
+CGMR=?	

Defined Values:

<revision>

The total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR>.

Appendix D.2.4 Request Serial Number Identification

Request Product Serial Number Identification. Ref : **[3GPP_TS27]**

Command	Possible response(s)
+CGSN	<sn> +CME ERROR: <err>
+CGSN=?	

Defined Values:

<sn>

the total number of characters, including line terminators, in the information text shall not exceed 2048 characters. Text shall not contain the sequence 0<CR> or OK<CR>

Appendix D.2.5 Request International Mobile Subscriber Identity

Request International Mobile Subscriber Identity. Ref : **[3GPP_TS27]**

Command	Possible response(s)
+CIMI	<IMSI> +CME ERROR: <err>
+CIMI=?	

Defined Values:

<IMSI>

International Mobile Subscriber Identity (string without double quotes)

Appendix D.3 Packet Data Connections

Appendix D.3.1 Define Primary PDP Context

Define PDP Context. **[3GPP_TS27]**

Command	Possible response(s)
+CGDCONT=[<cid> [,<PDP_type>[, <APN> [,<PDP_addr> [, <d_comp> [,<h_comp> [, <pd1> [,…[,pdN]]]]]]]]	OK ERROR
+CGDCONT?	+CGDCONT: <cid>, <PDP_type>, <APN>, <PDP_addr>, <data_comp>, <head_comp>[,<pd1>[,…[,pdN]]]
+CGDCONT=?	+CGDCONT: (range of supported <cid>s), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s)[, (list of supported <pd1>s)[,…[, (list of supported <pdN>s)]]]

Defined Values:

<cid>

(PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.

<PDP_type>

(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol

IP Internet Protocol (IETF STD 5)

IPV6[16] Internet Protocol, version 6 (IETF RFC 2460)

PPP Point to Point Protocol (IETF STD 51)

<APN>

(Access Point Name) a string parameter which is a logical name that is used to select the GGSN or the external packet data network. If the value is null or omitted, then the subscription value will be requested.

<PDP_address>

a string parameter that identifies the MT in the address space applicable to the PDP. If the value is null or omitted, then a value may be provided by the TE during the PDP startup procedure or, failing that, a

[16] IPv6 is not supported by the Inmarsat network.

dynamic address will be requested. The read form of the command will continue to return the null string even if an address has been allocated during the PDP startup procedure. The allocated address may be read using the +CGPADDR command.

<d_comp>

a numeric parameter that controls PDP data compression

0 off (default if value is omitted)

1 on

Other values are reserved.

<h_comp>

a numeric parameter that controls PDP header compression

0 off (default if value is omitted)

1 on

Other values are reserved.

NOTE: At present only one data compression algorithm (V.42bis) is provided in SNDCP. If and when other algorithms become available, a command will be provided to select one or more of these.

<pd1>, … <pdN>

zero to N string parameters whose meanings are specific to the <PDP_type>

For PDP type OSP:IHOSS the following parameters are defined:

<pd1> = <host>

the fully formed domain name extended hostname of the Internet host

<pd2> = <port >

the TCP or UDP port on the Internet host

<pd3> = <protocol>

the protocol to be used over IP on the Internet - "TCP" or "UDP

Supported Values:

<cid>

(1-11)

<PDP_type>

"IP"

<APN>

<PDP_address>

<d_comp>

0 off (default if value is omitted)

<h_comp>

0 off (default if value is omitted)

1 on

Appendix D.3.2 3G Quality of Service Profile (Requested)

3G Quality of Service Profile (Requested). Ref : **[3GPP_TS27]**

Command	**Possible response(s)**
+CGEQREQ=[<cid> [, <Traffic class>[, <Maximum bitrate UL>[, <Maximum bitrate DL>[, <Guaranteed bitrate UL>[, <Guaranteed bitrate DL>[, <Delivery order>[, <Maximum SDU size>[, <SDU error ratio>[, <Residual bit error ratio>[, <Delivery of erroneous SDUs>[, <Transfer delay>[, <Traffic handling priority>]]]]]]]]]]]]	OK ERROR
+CGEQREQ?	+CGEQREQ: <cid>, <Traffic class> , <Maximum bitrate UL> , <Maximum bitrate DL> , <Guaranteed bitrate UL> , <Guaranteed bitrate DL> , <Delivery order> , <Maximum SDU size> , <SDU error ratio> , <Residual bit error ratio> , <Delivery of erroneous SDUs> , <Transfer delay> , <Traffic handling priority>
+CGEQREQ=?	+CGEQREQ: <PDP_type>, (list of supported <Traffic class>s) , (list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s), (list of supported <Delivery order>s) , (list of supported <Maximum SDU size>s) , (list of supported <SDU error ratio>s) , (list of supported <Residual bit error ratio>s) , (list of supported <Delivery of erroneous SDUs>s) , (list of supported <Transfer delay>s) , (list of supported <Traffic handling priority>s)

Defined Values:

<cid>

a numeric parameter which specifies a particular PDP context definition (see+CGDCONT and +CGDSCONT commands).

The following parameters are defined in 3GPP TS 23.107 -

<Traffic class>

a numeric parameter that indicates the type of application for which the UMTS bearer service is optimised.

0 conversational

1 streaming

2 interactive

3 background

4 subscribed value

Other values are reserved.

<Maximum bitrate UL>

a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQREQ=…,32, …).

<Maximum bitrate DL>

a numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQREQ=…,32, …). If the parameter is set to '0' the subscribed value will be requested.

<Guaranteed bitrate UL>

a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQREQ=…,32, …). If the parameter is set to '0' the subscribed value will be requested.

<Guaranteed bitrate DL>

a numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQREQ=…,32, …). If the parameter is set to '0' the subscribed value will be requested.

<Delivery order>

a numeric parameter that indicates whether the UMTS bearer shall provide in- sequence SDU delivery or not.

0 no

1 yes

2 subscribed value.

Other values are reserved.

<Maximum SDU size>

a numeric parameter (1,2,3,…) that indicates the maximum allowed SDU size in octets. If the parameter is set to '0' the subscribed value will be requested.

<SDU error ratio>

a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of 5o10-3 would be specified as '5E3' (e.g. AT+CGEQREQ=…,"5E3",…).
'0E0' means subscribed value.

<Residual bit error ratio>

a string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of 5o10-3 would be specified as '5E3' (e.g. AT+CGEQREQ=…,"5E3",…). '0E0' means subscribed value.

<Delivery of erroneous SDUs>

a numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.

0 no

1 yes

2 no detect

3 subscribed value

Other values are reserved.

<Transfer delay>

a numeric parameter (0,1,2,…) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. If the parameter is set to '0' the subscribed value will be requested.

<Traffic handling priority>

a numeric parameter (1,2,3,…) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers. If the parameter is set to '0' the subscribed value will be requested.

<PDP_type> (see +CGDCONT and +CGDSCONT commands).

If a value is omitted for a particular class then the value is considered to be unspecified.

Supported Values:

<cid>

(1-11)

<Traffic class>

(0-4)

<Maximum bitrate UL>

(0-8640)

<Maximum bitrate DL>

(0-8640)

<Guaranteed bitrate UL>

(0-8640)

<Guaranteed bitrate DL>

(0-8640)

<Delivery order>

(0-2)

<Maximum SDU size>

(0-1520)

<SDU error ratio>

("1E6"-"1E1","0E0").

<Residual bit error ratio>

("6E8"-"5E2","0E0")

<Delivery of erroneous SDUs>

(0-3)

<Transfer delay>

(0-4000)

<Traffic handling priority>

(0-3)

<PDP_type>

"IP"

Appendix D.3.3 2G Quality of Service Profile (Requested)

2G Quality of Service Profile (Requested). Ref : **[3GPP_TS27]**

Command	Possible response(s)
+CGQREQ=[<cid> [, <Traffic class>[, <Maximum bitrate UL>[, <Maximum bitrate DL>[, <Guaranteed bitrate UL>[, <Guaranteed bitrate DL>[, <Delivery order>[, <Maximum SDU size>[, <SDU error ratio>[, <Residual bit error ratio>[, <Delivery of erroneous SDUs>[, <Transfer delay>[, <Traffic handling priority>]]]]]]]]]]]]	OK ERROR
+CGQREQ?	+CGQREQ: <cid>, <Traffic class> , <Maximum bitrate UL> , <Maximum bitrate DL> , <Guaranteed bitrate UL> , <Guaranteed bitrate DL> , <Delivery order> , <Maximum SDU size> , <SDU error ratio> , <Residual bit error ratio> , <Delivery of erroneous SDUs> , <Transfer delay> , <Traffic handling priority>
+CGQREQ=?	+CGQREQ: <PDP_type>, (list of supported <Traffic class>s) , (list of supported <Maximum bitrate UL>s), (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s), (list of supported <Delivery order>s) , (list of supported <Maximum SDU size>s) , (list of supported <SDU error ratio>s) , (list of supported <Residual bit error ratio>s) , (list of supported <Delivery of erroneous SDUs>s) , (list of supported <Transfer delay>s) , (list of supported <Traffic handling priority>s)

Defined Values:

<cid>

a numeric parameter which specifies a particular PDP context definition (see+CGDCONT and +CGDSCONT commands).

The following parameters are defined in 3GPP TS 23.107 -

<Traffic class>

a numeric parameter that indicates the type of application for which the UMTS bearer service is optimised.

0 conversational

1 streaming

2 interactive

3 background

4 subscribed value

Other values are reserved.

<Maximum bitrate UL>

a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGQREQ=…,32, …).

<Maximum bitrate DL>

a numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGQREQ=…,32, …). If the parameter is set to '0' the subscribed value will be requested.

<Guaranteed bitrate UL>

a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGQREQ=…,32, …). If the parameter is set to '0' the subscribed value will be requested.

<Guaranteed bitrate DL>

a numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGQREQ=…,32, …). If the parameter is set to '0' the subscribed value will be requested.

<Delivery order>

a numeric parameter that indicates whether the UMTS bearer shall provide in- sequence SDU delivery or not.

0 no

1 yes

2 subscribed value.

Other values are reserved.

<Maximum SDU size>

a numeric parameter (1,2,3,…) that indicates the maximum allowed SDU size in octets. If the parameter is set to '0' the subscribed value will be requested.

<SDU error ratio>

a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of 5o10-3 would be specified as '5E3' (e.g. AT+CGQREQ=…,"5E3",…).
'0E0' means subscribed value.

<Residual bit error ratio>

a string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of 5o10-3 would be specified as '5E3' (e.g. AT+CGQREQ=…,"5E3",…). '0E0' means subscribed value.

<Delivery of erroneous SDUs>

a numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.

0 no

1 yes

2 no detect

3 subscribed value

Other values are reserved.

<Transfer delay>

a numeric parameter (0,1,2,…) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds. If the parameter is set to '0' the subscribed value will be requested.

<Traffic handling priority>

a numeric parameter (1,2,3,…) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers. If the parameter is set to '0' the subscribed value will be requested.

<PDP_type> (see +CGDCONT and +CGDSCONT commands).

If a value is omitted for a particular class then the value is considered to be unspecified.

Supported Values:

<cid>

(1-11)

<Traffic class>

(0-4)

<Maximum bitrate UL>

(0-8640)

<Maximum bitrate DL>

(0-8640)

<Guaranteed bitrate UL>

(0-8640)

<Guaranteed bitrate DL>

(0-8640)

<Delivery order>

(0-2)

<Maximum SDU size>

(0-1520)

<SDU error ratio>

("1E6"-"1E1","0E0").

<Residual bit error ratio>

("6E8"-"5E2","0E0")

<Delivery of erroneous SDUs>

(0-3)

<Transfer delay>

(0-4000)

<Traffic handling priority>

(0-3)

<PDP_type>

"IP"

Appendix D.3.4 3G Quality of Service Profile (Negotiated)

3G Quality of Service Profile (Negotiated) Ref : **[3GPP_TS27]**

Command	Possible response(s)
+CGEQNEG =[<cid>[,<cid>[,…]]]	+CGEQNEG: <cid>, <Traffic class> , <Maximum bitrate UL>, <Maximum bitrate DL> , <Guaranteed bitrate UL>, <Guaranteed bitrate DL> , <Delivery order> , <Maximum SDU size> , <SDU error ratio> , <Residual bit error ratio> , <Delivery of erroneous SDUs> , <Transfer delay> , <Traffic handling priority>
+CGEQNEG=?	+CGEQNEG: (list of <cid>s associated with active contexts)

Defined Values:

<cid>

a numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands).

The following parameters are defined in 3GPP TS 23.107 -

<Traffic class>

a numeric parameter that indicates the type of application for which the UMTS bearer service is optimised.

0 conversational

1 streaming

2 interactive

3 background

Other values are reserved.

<Maximum bitrate UL>

a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. +CGEQNEG:…,32, …).

<Maximum bitrate DL>

a numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP As an example a bitrate of 32kbit/s would be specified as '32' (e.g. +CGEQNEG:…,32, …).

<Guaranteed bitrate UL>

a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. +CGEQNEG:…,32, …).

<Guaranteed bitrate DL>

a numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. +CGEQNEG:…,32, …).

<Delivery order>

a numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.

0 no

1 yes

Other values are reserved.

<Maximum SDU size>

a numeric parameter that (1,2,3,…) indicates the maximum allowed SDU size in octets.

<SDU error ratio>

a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of 5o10-3 would be specified as '5E3' (e.g. +CGEQNEG:…,"5E3",…).

<Residual bit error ratio>

a string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of 5o10-3 would be specified as '5E3' (e.g. +CGEQNEG:…,"5E3",…).

<Delivery of erroneous SDUs>

a numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.

0 - no

1 - yes

2 - no detect

Other values are reserved.

<Transfer delay>

a numeric parameter (0,1,2,…) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds.

<Traffic handling priority>

a numeric parameter (1,2,3,…) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers. If a value is omitted for a particular class then the value is considered to be unspecified.

Supported Values:

<cid>

(1-11)

Appendix D.3.5 3G Quality of Service Profile (Minimum Acceptable)

3G Quality of Service Profile (Minimum acceptable). Ref : **[3GPP_TS27]**

Command	Possible response(s)
+CGEQMIN=[<cid> [, <Traffic class> [, <Maximum bitrate UL>[, <Maximum bitrate DL>[, <Guaranteed bitrate UL>[, <Guaranteed bitrate DL>[, <Delivery order>[, <Maximum SDU size>[, <SDU error ratio> [, <Residual bit error ratio> [, <Delivery of erroneous SDUs> [, <Transfer delay> [, <Traffic handling priority>]]]]]]]]]]]]]	
+CGEQMIN?	+CGEQMIN: <cid>, <Traffic class> , <Maximum bitrate UL>, <Maximum bitrate DL> , <Guaranteed bitrate UL> , <Guaranteed bitrate DL>, <Delivery order> , <Maximum SDU size> , <SDU error ratio> , <Residual bit error ratio> , <Delivery of erroneous SDUs> , <Transfer delay> , <Traffic handling priority> [<CR><LF>+CGEQMIN: <cid>, <Traffic class> , <Maximum bitrate UL> , <Maximum bitrate DL> , <Guaranteed bitrate UL> , <Guaranteed bitrate DL>, <Delivery order> , <Maximum SDU size> , <SDU error ratio> , <Residual bit error ratio> , <Delivery of erroneous SDUs> , <Transfer delay> , <Traffic handling priority> […]]
+CGEQMIN=?	+CGEQMIN: <PDP_type>, (list of supported <Traffic class>s) , (list of supported <Maximum bitrate UL>s) , (list of supported <Maximum bitrate DL>s), (list of supported <Guaranteed bitrate UL>s), (list of supported <Guaranteed bitrate DL>s) , (list of supported <Delivery order>s) , (list of supported <Maximum SDU size>s) , (list of supported <SDU error ratio>s) , (list of supported <Residual bit error ratio>s) , (list of supported <Delivery of erroneous SDUs>s) , (list of supported <Transfer delay>s) , (list of supported <Traffic handling priority>s)

Defined Values:

<cid>

a numeric parameter which specifies a particular PDP context definition (see +CGDCONT and +CGDSCONT commands).

The following parameters are defined in 3GPP TS 23.107 -

<Traffic class>

a numeric parameter that indicates the type of application for which the UMTS bearer service is optimised.

0 conversational

1 streaming

2 interactive

3 background

Other values are reserved.

<Maximum bitrate UL>

a numeric parameter that indicates the maximum number of kbits/s delivered to UMTS (up-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=…,32, …).

<Maximum bitrate DL>

a numeric parameter that indicates the maximum number of kbits/s delivered by UMTS (down-link traffic) at a SAP. As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=…,32, …).

<Guaranteed bitrate UL>

a numeric parameter that indicates the guaranteed number of kbits/s delivered to UMTS (up-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=…,32, …).

<Guaranteed bitrate DL>

a numeric parameter that indicates the guaranteed number of kbits/s delivered by UMTS (down-link traffic) at a SAP (provided that there is data to deliver). As an example a bitrate of 32kbit/s would be specified as '32' (e.g. AT+CGEQMIN=…,32, …).

<Delivery order>

a numeric parameter that indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.

0 no

1 yes

Other values are reserved.

<Maximum SDU size>

a numeric parameter (1,2,3,…) that indicates the maximum allowed SDU size in octets.

<SDU error ratio>

a string parameter that indicates the target value for the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. The value is specified as 'mEe'. As an example a target SDU error ratio of 5o10-3 would be specified as '5E3' (e.g. AT+CGEQMIN=…,"5E3",…).

<Residual bit error ratio>

a string parameter that indicates the target value for the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs. The value is specified as 'mEe'. As an example a target residual bit error ratio of 5o10-3 would be specified as '5E3' (e.g. AT+CGEQMIN=…,"5E3",…).

<Delivery of erroneous SDUs>

a numeric parameter that indicates whether SDUs detected as erroneous shall be delivered or not.

0 no

1 yes

2 no detect

Other values are reserved.

<Transfer delay>

a numeric parameter (0,1,2,…) that indicates the targeted time between request to transfer an SDU at one SAP to its delivery at the other SAP, in milliseconds.

<Traffic handling priority>

a numeric parameter (1,2,3,…) that specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers.

<PDP_type>

(see +CGDCONT and +CGDSCONT commands). If a value is omitted for a particular class then the value is considered to be unspecified.

Supported Values:

<cid>

(1-11)

<Traffic class>

(0-3)

<Maximum bitrate UL>

(1-8640)

<Maximum bitrate DL>

(1-8640)

<Guaranteed bitrate UL>

(1-8640)

<Guaranteed bitrate DL>

(1-8640)

<Delivery order>

(0,1)

<Maximum SDU size>

(1-1520)

<SDU error ratio>

("1E6"-"1E1").

<Residual bit error ratio>

("6E8"-"5E2")

<Delivery of erroneous SDUs>

(0,1,2)

<Transfer delay>

(1-4000)

<Traffic handling priority>

(1-3)

<PDP_type>

"IP"

Appendix D.3.6 PDP Context Activation

PDP context activate or deactivate. Ref : **[3GPP_TS27]**

Command	Possible response(s)
+CGACT=[<state> [,<cid>[, <cid>[,.]]]]	OK ERROR
+CGACT?	+CGACT: <cid>, <state> [<CR><LF>+CGACT: <cid>,<state>[...]]
+CGACT=?	+CGACT: (list of supported <state>s)

Defined Values:

<state>

indicates the state of PDP context activation

0 deactivated

1 activated

Other values are reserved and will result in an ERROR response to the execution command.

<cid>

a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

Appendix D.3.7 Show PDP IP Address

Show PDP address. Ref : **[3GPP_TS27]** section 10.1.14

Command	Possible response(s)
+CGPADDR=[<cid> [,<cid> [,…]]]	+CGPADDR: <cid>,<PDP_addr> [...]
+CGPADDR=?	+CGPADDR: (list of defined <cid>s)

Defined Values:

<cid>

a numeric parameter which specifies a particular PDP context definition

(see the +CGDCONT and +CGDSCONT commands). If no <cid> is specified, the addresses for all defined contexts are returned.

<PDP_address>

a string that identifies the MT in the address space applicable to the PDP.

The address may be static or dynamic. For a static address, it will be the one set by the +CGDCONT and +CGDSCONT commands when the context was defined.

For a dynamic address it will be the one assigned during the last PDP context activation that used the context definition referred to by <cid>.

<PDP_address> is omitted if none is available.

Supported Values

<cid>

(1-11)

<PDP_address>

(0.0.0.0-255.255.255.255)

Appendix D.3.8 Define Secondary PDP Context

Define Secondary PDP Context. Ref : TS 27.007 - 460 section 10.1.2

Command	Possible response(s)
+CGDSCONT=[<cid> ,<p_cid> [, <d_comp> [,<h_comp>]]]	OK ERROR
+CGDSCONT?	+CGDSCONT: <cid>, <p_cid>, <data_comp>, <head_comp>
+CGDSCONT=?	+CGDSCONT: (range of supported <cid>s), (list of <cid>s for active primary contexts), <PDP_type>,,,(list of supported <d_comp>s), (list of supported <h_comp>s)

Defined Values:

<cid>

(PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition. The parameter is local to the TE-MT interface and is used in other PDP context-related commands. The range of permitted values (minimum value = 1) is returned by the test form of the command.

<p_cid>

(Primary PDP Context Identifier) a numeric parameter which specifies a particular PDP context definition which has been specified by use of the +CGDCONT command. The parameter is local to the TE-MT interface. The list of permitted values is returned by the test form of the command.

<PDP_type>

(Packet Data Protocol type) a string parameter which specifies the type of packet data protocol

IP Internet Protocol (IETF STD 5)

IPV6[17] Internet Protocol, version 6 (IETF RFC 2460)

PPP Point to Point Protocol (IETF STD 51)

<d_comp>

a numeric parameter that controls PDP data compression (applicable to GPRS only)

0 off (default if value is omitted)

1 on

Other values are reserved.

<h_comp>

a numeric parameter that controls PDP header compression

0 off (default if value is omitted)

1 on

Other values are reserved.

NOTE. At present only one data compression algorithm (V.42bis) is provided in SNDCP. If and when other algorithms become available, a command will be provided to select one or more of these. (GPRS only)

Supported Values:

<cid>

(1-11)

<p_cid>

(1-11)

<PDP_type>

PPP Point to Point Protocol (IETF STD 51)

<d_comp>

0 off (default if value is omitted)

<h_comp>

0 off (default if value is omitted)

1 on

[17] IPv6 is not supported by the Inmarsat network.

Appendix D.3.9 Define Traffic Flow Template

Define Traffic Flow Template. Ref : **[3GPP_TS27]**

NOTE: source and destination fields are from the networks perspective.

Command	Possible response(s)
+CGTFT=[<cid>, [<packet filter identifier>, <evaluation precedence index> [,<source address and subnet mask> [,<protocol number (ipv4) / next header (ipv6)> [,<destination port range> [,<source port range> [,<ipsec security parameter index (spi)> [,<type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask> [,<flow label (ipv6)>]]]]]]]]]	OK ERROR
+CGTFT?	+CGTFT: <cid>, <packet filter identifier>, <evaluation precedence index>, <source address and subnet mask>, <protocol number (ipv4) / next header (ipv6)>, <destination port range>, <source port range>, <ipsec security parameter index (spi)>, <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>, <flow label (ipv6)>
+CGTFT=?	+CGTFT: <PDP_type>, (list of supported <packet filter identifier>s), (list of supported <evaluation precedence index>s), (list of supported <source address and subnet mask>s), (list of supported <protocol number (ipv4) / next header (ipv6)>s), (list of supported <destination port range>s), (list of supported <source port range>s), (list of supported <ipsec security parameter index (spi)>s), (list of supported <type of service (tos) (ipv4) and mask / traffic class (ipv6) and mask>s), (list of supported <flow label (ipv6)>s)

Defined Values:

<cid>: a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

<packet filter identifier>: Numeric parameter, value range from 1 to 8.

<source address and subnet mask>: Consists of dot-separated numeric (0-255) parameters on the form 'a1.a2.a3.a4.m1.m2.m3.m4', for IPv4 and
'a1.a2.a3.a4.a5.a6.a7.a8.a9.a10.a11.a12.a13.a14.a15.a16.
m1.m2.m3.m4.m5.m6.m7.m8.m9.m10.m11.m12.m13.m14.m15.m16', for IPv6[18].

<protocol number (ipv4) / next header (ipv6)[18]>: Numeric parameter, value range from 0 to 255.
Refer to the Assigned Internet Protocol Number as defined by the Internet Assigned Numbers Authority (IANA).
http://www.iana.org/assignments/protocol-numbers/protocol-numbers.xhtml
<destination port range>: Consists of dot-separated numeric (0-65535) parameters on the form 'f.t'.

<source port range>:Consists of dot-separated numeric (0-65535) parameters on the form 'f.t'.
<ipsec security parameter index (spi)>: Hexadecimal parameter,
value range from 00000000 to FFFFFFFF.

<type of service (tos) (ipv4) and mask / traffic class (ipv6)[18] and mask>:
Dot-separated numeric (0-255) parameters on the form 't.m'.

<flow label (ipv6)>: Hexadecimal parameter, value range from 00000 to FFFFF. Valid for IPv6 only.

<evaluation precedence index>: Numeric parameter, value range from 0 to 255.

In addition to the Packet Filter and Evaluation Precedence Index, each TFT must contain at least one of the following parameters. Some parameters are mutually exclusive; the table below shows which parameters can be used together.

[18] IPv6 is not supported by the Inmarsat network.

For example, if you want to define a "Source address and subnet mask", and an "IPSec SPI", the only combination that allows the use of these two parameters together is combination 2.

Combination 2 also gives you the option to define "Protocol number" and "Type of service", if required, but no other parameter is available in this combination.

Table 10-4: TFT Parameter Combinations

Parameter	Combination 1	Combination 2	Combination 3
Destination/Source address and subnet mask	✓	✓	✓
Protocol number	✓	✓	
Destination port range	✓		
Source port range	✓		
IPSec SPI		✓	
Type of service	✓	✓	✓
Flow level			✓

Appendix D.3.10 Modify PDP Context

PDP Context Modify. Ref : **[3GPP_TS27]**

Command	Possible response(s)
+CGCMOD=[<cid>[,<cid>[,…]]]	OK ERROR
+CGCMOD=?	+CGCMOD: (list of <cid>s associated with active contexts)

Defined Values:

<cid>

a numeric parameter which specifies a particular PDP context definition (see the +CGDCONT and +CGDSCONT commands).

Supported Values:

<cid>

(1-11)

Appendix D.3.11 Binding a TCP Session to a Primary PDP Context

The AT command for binding between a TCP Session and one or more PPPoE Sessions is "_IPDPS."

- "_I" means it is part of the Inmarsat BGAN AT command extension.
- "PDPS" means Primary PDP Context Select.

The purpose of this select command is to select a particular PPPoE Session from one or more PPPoE Sessions established with the Server.

This AT command/response shall be used over a TCP session; it shall not be available via PPPoE.

Command	Possible response(s)
_IPDPS=<IP_addr> _IPDPS=PPPoE_Session_ID	OK ERROR
_IPDPS?	_IPDPS: <PPPoE_Session_ID>,<IP_addr>
_IPDPS=?	ERROR

The set command can select the primary PDP using either:

- The PPPoE Session ID.
- The IPv4 address obtained by the PPPoE client in the IPCP phase of the PPP set up.

All subsequent PDP Context related AT commands from the TCP Session are applicable to the specified PPPoE Session.

AT commands that are unrelated to PDP Context are not affected by the set command.

Returns ERROR if the primary PDP does not exist.

If the primary PDP is already in use, the previous owner of the primary PDP is notified of the loss of ownership through at spontaneous _IPDPS:0,0.0.0.0 message.

The same _IPDPS:0,0.0.0.0 is also used when the call is torn down (as it is not possible to send further commands to a call which no longer exists).

The read command returns the currently selected primary PDP by the TCP Session that sends the read command. If no PPPoE Session selected, 0, 0.0.0.0 is returned.

Defined Values

<PDP_addr>: a string parameter that identifies the PPPoE by the address of the Primary PDP Context.

Two values are possible, the PPPoE session ID or the IP address associated with that primary PDP. The two are recognized by their format. The PPPoE session ID is a simple number, while the IP address is an IPv4 address in the form aaa.bbb.ccc.ddd.

Appendix E. Troubleshooting & Maintenance Actions

Each fault detected by the AVIATOR S SATCOM System is identified by a unique troubleshooting code (Figure 10-29). Refer to section 10.1.1, BITE Scanning - Troubleshooting Code for guidance in obtaining the troubleshooting code for events detected and listed in the BITE Scanning page.

Figure 10-29: MCDU - BITE - Troubleshooting Code

Using the troubleshooting code as a reference, refer to Table 10-5 in Appendix E.1 to determine the recommended maintenance action.

Identification	Reported to CMS			Recommended maintenance action		
Troubleshooting Code	Maintenance Message			First step	Second Step	Third Step
	List of Accused Elements (LRU/WRG)	Severity	ATA			
5140	MCDU3/CSDU/WRG	LOW	3461	Replace CSDU	Replace MCDU 2	Check Wiring

Figure 10-30: BITE - FDS - Troubleshooting Code Example

Appendix E.1. Fault Display System (FDS)

Table 10-5: Troubleshooting codes and recommended maintenance actions						
Identification	**Reported to CMS**			**Recommended maintenance action**		
Troubleshooting Code	**Maintenance Message**			**First step**	**Second Step**	**Third Step**
	List of Accused Elements (LRU/WRG)	**Severity**	**ATA**			
5101	CSDU FAULT	HIGH	2315	Reload CSDU SW	Replace CSDU	
5107	CSDU FAULT	HIGH	2315	Reload CSDU SW	Replace CSDU	
5108	CSDU FAULT	HIGH	2315	Reload CSDU SW	Replace CSDU	
510D	CSDU FAULT	HIGH	2315	Reload CSDU SW	Replace CSDU	
510E	SCM SORT INTEG	HIGH	2315	Reload Secure ORT	Replace SCM	
510F	SCM UORT INTEG	LOW	2315	Reload USER ORT	Replace SCM	
511A	CSDU FAULT	LOW	2315	Replace CSDU		
511B	CSDU FAULT	LOW	2315	Replace CSDU		
5130	IRS1/CSDU/WRG	HIGH	3421	Replace CSDU	Replace IRS 1	Check Wiring
5134	IRS2/CSDU/WRG	HIGH	3421	Replace CSDU	Replace IRS 2	Check Wiring
5138	MCDU1/CSDU/WRG	LOW	3461	Replace CSDU	Replace MCDU 1	Check Wiring
513C	MCDU2/CSDU/WRG	LOW	3461	Replace CSDU	Replace MCDU 2	Check Wiring
5140	MCDU3/CSDU/WRG	LOW	3461	Replace CSDU	Replace MCDU 3	Check Wiring
5154	CMU1/CSDU/WRG	HIGH	2327	Replace CSDU	Replace CMU1	Check Wiring
5158	CMU2/CSDU/WRG	HIGH	2327	Replace CSDU	Replace CMU2	Check Wiring
5160	ATC	HIGH	3453	Replace AESID		
5163	CSDU OVER TEMP	LOW	2315	Replace CSDU		
5164	CSDU OVER TEMP	LOW	2315	Replace CSDU		
5165	CSDU OVER TEMP	LOW	2315	Replace CSDU		
5166	CSDU OVER TEMP	LOW	2315	Replace CSDU		
5170	SCM ACTIVATION	HIGH	2315	Replace SCM		
5171	POWER SUPPLY INTERRUPT	HIGH	2315	N\A		
5172	MANUAL RESET	HIGH	2315	N\A		
5173	AUTO RESET	HIGH	2315	N\A		
517A	CMU1	LOW	2327	Replace CMU1		
517B	CMU1	LOW	2327	Replace CMU1		
517C	CMU1	LOW	2327	Replace CMU1		
517D	CMU2	LOW	2327	Replace CMU2		
517E	CMU2	LOW	2327	Replace CMU2		
517F	CMU2	LOW	2327	Replace CMU2		
5501	CSDU FAULT	LOW	2315	Reload CSDU SW	Replace CSDU	
5506	CSDU FAULT	LOW	2315	Replace CSDU		
590B	SCM FAULT	HIGH	2315	Replace SCM		

Table 10-5: Troubleshooting codes and recommended maintenance actions						
Identification	**Reported to CMS**			**Recommended maintenance action**		
Troubleshooting Code	**Maintenance Message**			**First step**	**Second Step**	**Third Step**
	List of Accused Elements (LRU/WRG)	**Severity**	**ATA**			
5A06	CSDU FAULT	LOW	2315	Replace CSDU		
6002	CSDU/SCM/WRG	HIGH	2315	Replace CSDU	Replace SCM	Check Wiring
6003	SCM OVER TEMP	HIGH	2315	Replace SCM		
6101	SCM FAULT	HIGH	2315	Replace SCM		
6103	SCM FAULT	LOW	2315	Replace SCM		
6104	SCM FAULT	HIGH	2315	Replace SCM		
6105	SCM ACTIVATION	HIGH	2315	Replace SCM		
7101	DLNA FAULT	HIGH	2315	Replace DLNA	Replace HGA	Check Wiring
7301	POWER SUPPLY INTERRUPT	HIGH	2315	N\A		
7303	HPA OVER TEMP	HIGH	2315	Replace HPA		
7304	HPA FAULT	HIGH	2315	Replace HPA		
7305	HPA FAULT	HIGH	2315	Replace HPA		
7306	HPA FAULT	HIGH	2315	Replace HPA		
7307	HPA FAULT	HIGH	2315	Replace HPA		
7308	HPA FAULT	HIGH	2315	Replace HPA		
7309	HPA FAULT	HIGH	2315	Replace HPA		
730A	HPA/DLNA/WRG	HIGH	2315	Replace HPA	Check Wiring	
7401	HGA FAULT	HIGH	2315	Replace HGA	Replace HPA	
7402	HGA FAULT	HIGH	2315	Replace HGA		
7403	HGA FAULT	HIGH	2315	Replace HGA		
7404	HGA FAULT	HIGH	2315	Replace HGA		
7405	HGA FAULT	HIGH	2315	Replace HGA		
7407	HGA FAULT	HIGH	2315	Replace CSDU	Replace HGA	Check Wiring
7408	HGA FAULT	LOW	2315	Replace HGA		
7409	HGA/CSDU/WRG	HIGH	2315	Replace CSDU	Replace HGA	Check wiring
8101	CSDU/SCM/WRG	HIGH	2315	Replace CSDU	Replace SCM	Check Wiring
8103	CSDU/HPA/WRG	HIGH	2315	Replace CSDU	Replace HPA	Check Wiring
9001	MMR	HIGH	3458	Replace GNSS		
9002	MMR/CSDU/WRG	HIGH	3458	Replace CSDU	Replace GNSS	Check Wiring
9102	ETH2/CSDU/WRG	LOW	2315	Replace CSDU	Replace PIESD/Cabin Interface Device	Check wiring
9103	ETH3/CSDU/WRG	LOW	2315	Replace CSDU	Replace Ethernet Dataloader	Check wiring