EXHIBIT F

FCC ID: OYAJETSAT
THOMSON-CSF DETEXIS

System User Manual

JETSAT

SATCOM AERO I AES

NOTE

IF ANY UNUSUAL OR SPECIAL SERVICE PROBLEMS ARISE, CONTACT THOMSON-CSF DETEXIS.

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PROPRIETARY NOTICE

RECORD OF REVISIONS

REV. NO.	REVISION DATE	DATE INSERTED	BY	REV. NO.	REVISION DATE	DATE INSERTED	BY

SERVICE BULLETIN LIST

The Service Bulletin listed below have been incorporated in this manual.

ATA NO. (D.E. NO.)	MANUAL REVISION NUMBER	MANUAL REVISION DATE	COVERAGE

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GENERAL TABLE OF CONTENTS

INTRODUCTION

1. General

A. AES Interfaces

This documents describes all the system interfaces from the user point of view.

The other interfaces between AES LRUs e.g. SDU to HLD and HLD to IGA are define in the installation manual.

System interfaces are described by sections

- AES A/C avionics interfaces
- AES cabin interfaces
- AES cockpit interfaces
- AES maintenance interfaces

B. Initialization

Telecommunication systems providing access to Public Switched Telecommunication Network (PSTN) with a high level of availability, security and sharing common resources require a very reliable organization, in INMARSAT AERO systems a part of this organization takes place in the AES configuration.

As some AES configuration parameters impact the AES use (such as Log_on policy, prefered GES, etc), AES configuration is made available to the AES user during the initialization process.

The JETSAT AES needs initialization before to be able to successfully log_on and access to the private or public telecommunication networks via the INMARSAT satellite constellation and the associated Ground Earth Stations connected to these networks.

JETSAT initialization is made using SDU tables describing the user's choices and/or by using SDU's strap option pins programmed in accordance with the user's choices.

(1) SDU Tables

JET initialization includes to provide accurate data to correctly fill the following SDU tables with:

- System Configuration Table / Module (SCM), see note 1
- AES tables
  - System table (ST)
  - Owner/Operator Requirements Table (ORT)
  - Owner/Operator Requirement Table Phone Book (ORTPB)
- MCDU pages table, see note 2.

Note 1: System configuration can alternatively be done using the strap option pin programming (see next paragraph). It is the user choice.

Note 2: MCDU SATCOM pages have only to be filled if the use of MCDU(s) with SATCOM is requested by the user. MCDU SATCOM pages can alternatively be initialized via the MCDU, in this case the user should refer to MCDU user manual.

This JETSAT user manual provides the user with all the information requested to correctly initialize all these tables.

SDU tables can be accessed and modified by several means:

- Airborne Data Loader connected to the SDU rear connector ADL port.
- Portable Data Loader connected to the SDU PDL front panel port.
- Maintenance Terminal (PC based) connected to one of the two SDU
- maintenance ports (serial RS232 link).

SDU ports are defined in the inter-wiring section of the JETSAT Installation Manual.

(2) Pin programming/strap option definition:

If the user selects the pin programming or strap option, he has to wire the pin programming SDU pins in accordance with his choices for JETSAT initialization. Pin programming definitions are given in this manual.

C. (M)CTU/Handsets user instructions

This manual provides detailed instructions to use JETSAT CTU or MCTU/digital handsets package.

D. Basic maintenance user guide

While not a maintenance manual, the present document provides the JETSAT user with a description of all the maintenance messages displayed on the SDU front panel screen and on the maintenance terminal when connected to one of the two SDU maintenance ports

E. Other requirements to operate JETSAT

Obviously other items are requested to successfully operate JETSAT, JETSAT installation is not described in this document, so the installer/user must refer to JETSAT Installation Manual for detailed installation instructions , the list below briefly indicates the minimum items requested to operate JETSAT:

Power supply: could be 28 DC or 115 v 400 Hz, both type of units are available from DETEXIS. P/N and characteristics of both types are defined in the JETSAT Installation Manual. Type selection has to be made before ordering JETSAT in accordance with the aircraft primary power network to be used. It is not recommended to mixed the two type of units.

It is requested that all the SATCOM LRUs are connected to the A/C primary power network through a unique breaker, this will avoid erroneous failure declarations when other JETSAT LRUs are powered after the SDU finished the JETSAT system self tests.

A/C primary power network must comply with power supply applicable chapters of DO160 D / ED14D specifications. Environmental conditions JETSAT LRUs comply with are defined in the JETSAT Installation Manual

Cooling: JETSAT LRUs require air cooling . Air flows for each JETSAT LRU are defined in JETSAT Installation Manual.

Navigation Data: To steer the antenna beam in the satellite direction JETSAT requires Navigation Data from at least one A/C Inertial Navigation System (JETSAT offers two INS ARINC 429 inputs). This (these) A/C Inertial Navigation System(s) must comply with ARINC 704-6 specification. If no ARINC 704-6 Inertial Navigation System is available, one can use the JETSAT NRF option by ordering the JETSAT SDU with the NRU option and the JETSAT NRU-F external antenna module. SDU/NRU LRU and NRU-F module P/Ns and characteristics are defined in JETSAT Installation Manual . JETSAT Navigation Data capabilities and NRF functionality's are described in the JETSAT product description manual, while INS and NRU-F wiring and installation are available in the JETSAT Installation Manual.

ICAO address: The user must provide the ICAO address to the SDU and the external CTU . The ICAO address is used by SATCOM to identify the A/C “telephone number”. The ICAO address could be provided using the dedicated 25 SDU discrete inputs socalled “ICAO add. Interfaces” or via the SDU dedicated ARINC 429 “AES ID serial input”. Both possibilities are described in this manual. The choice is from the user. The CTU has only discrete inputs/pin strapping capability.

2. Presentation of the manual

This manual is divided into separate sections and sub-sections as follows:

PRELIMINARY PAGES

- Title page
- Proprietary notice
- Record of revisions
- Service Bulletin list
- List of effective pages
- General table of contents
- Introduction
- Glossary

SYSTEM INTERFACES

SYSTEM CONFIGURATION INITIALIZATION

(M)CTU, HANDSETS USER INSTRUCTIONS

BASIC MAINTENANCE USER GUIDE

SDU INTEGRATED MAINTENANCE TERMINAL MENU

3. Glossary

:

SYSTEM INTERFACES

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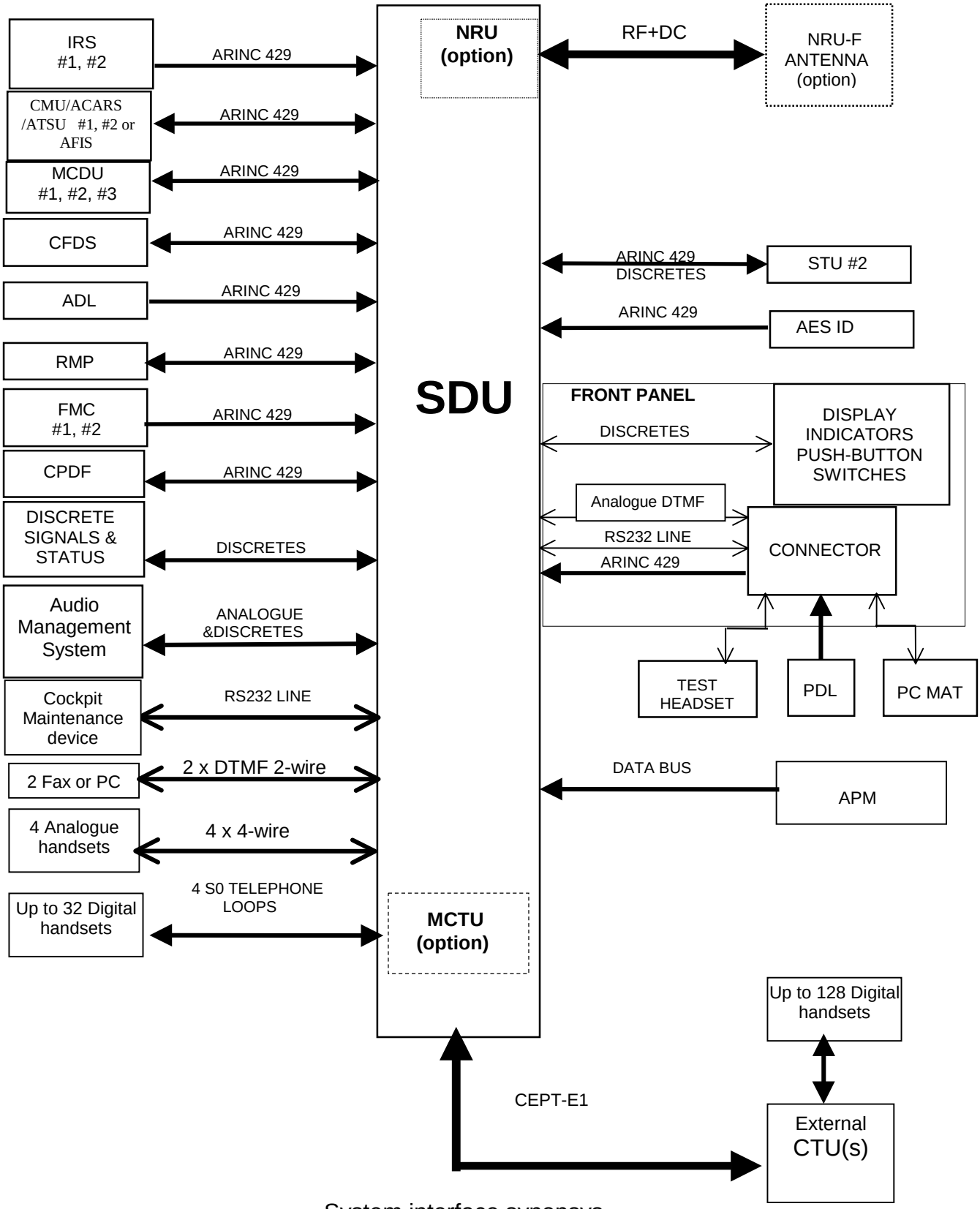
SYSTEM INTERFACES

1. Overall System Interfaces

   All JETSAT user interfaces are located in the SDU.

   SDU/HLD/IGA interfaces are described in the JETSAT installation manual.



System interface synopsys

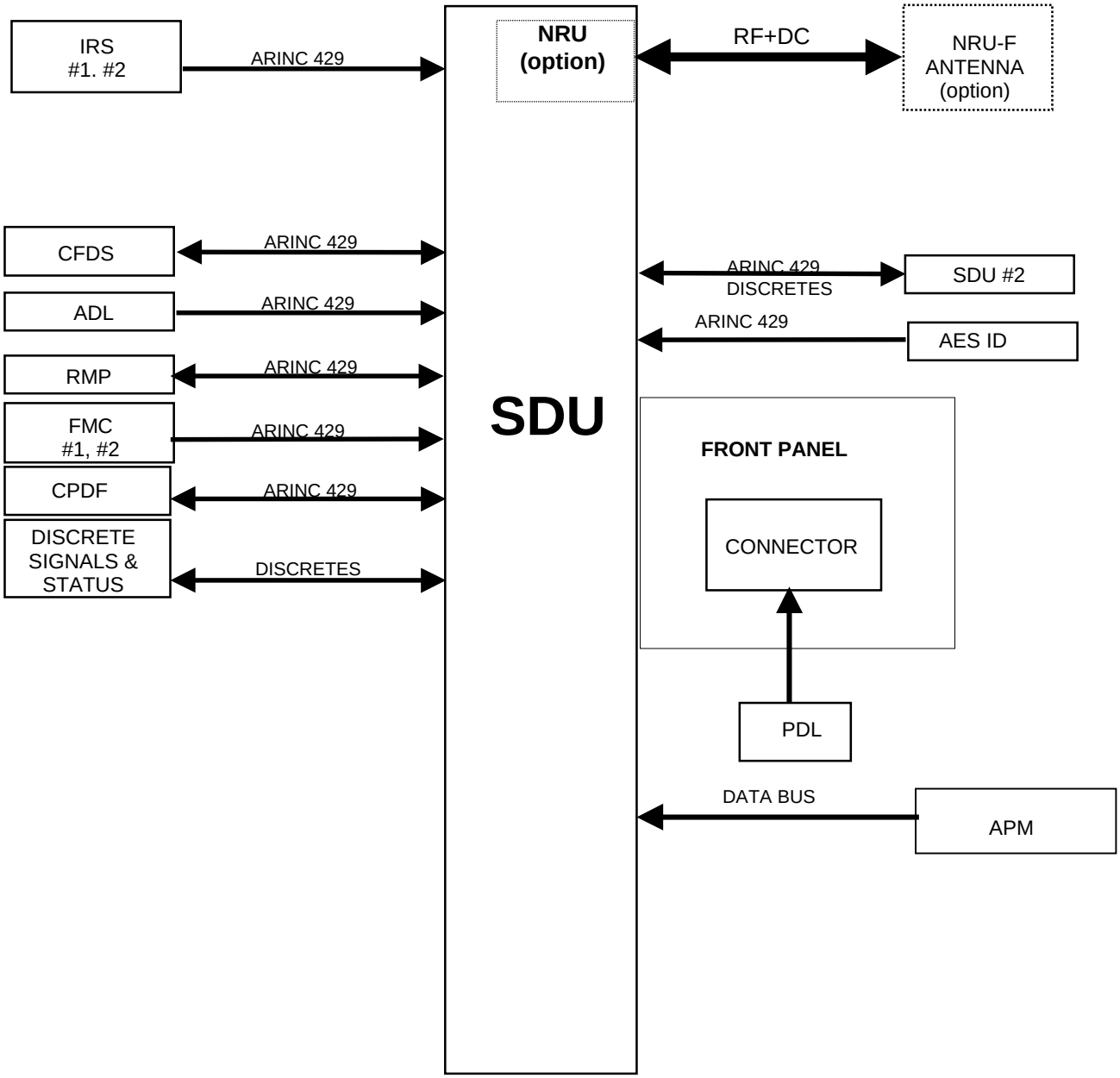
Figure 1

Note 1 : The use of MCTU or External CTU is mutually exclusive.

Note 2 : The use of Analogue or Digital Handsets is mutually exclusive.

2. AES A/C avionics interfaces synopsys

A. Synopsys



AES A/C avionics interfaces synopsys

Figure 2

B. AES A/C avionics interfaces summary

DESIGNATION	**I/F TYPE**	**INPUT**	**OUTPUT**	**REFERENCE**
IRS (Inertial Reference system)	ARINC 429 (HI speed)	2		ARINC 704
NRU-F	RF	1		TT-NRUF2a
CFDS/CMC (Centralized Fault Display System/Central Maintenance Computer)	ARINC 429 (LO speed)	1	1	ARINC 604 ARINC624 ABD 048
ADL (Airborne Data Loader)	ARINC 429 (HI speed)	1	1	ARINC 615
Data Loader Link A and B	Discrete	2		ARINC 615
APM (Aircraft personality Module)	Discrete	1	8	ARINC 761
FMC (Flight Management Computer)	ARINC 429 (LO speed)	2		ARINC 702
AES ID	ARINC 429 (HIorLO speed)	1		TBD
WOW (Weight On Wheels)	Discrete	3		ARINC 761
Motion Sensor (Motion Sensor/Sensor Program Select)	Discrete	2		ARINC 741
ICAO Addresses	Discrete	24+1		ARINC 761
Status (Fail warning, Cockpit voice unavailable, Cabin voice unavailable, Packet data unavailable, Packet data low speed available, Link not ready, SATCOM Inoperable)	Discrete		7	ARINC 761
Strap option	Discrete	39		ARINC 761
• Multi Control	ARINC 429 (HI speed)		1	
• BITE/Status	ARINC 429 (LO speed)	1		
SDU Cross-talk	ARINC 429 (HI speed)	1	1	ARINC 761
DSS (Dual System Selection Dual System Disable)	Discrete	1	1	ARINC 761

C. EAS A/C avionics interfaces detailed

(1) IRS interfaces

(a) Physical interfaces

Two high speed ARINC 429 input interfaces are available to connect up to two IRS.

The Strap option pins or the System Configuration Module (SCM) define which IRS (#1 and/or #2) is connected to the SDU.

(b) Function

Data sent by the IRS's (in conformance with the ARINC 704 characteristics) is used by the SDU to :

- determine aircraft position and attitude in order to calculate the pointing angles in elevation and azimuth towards the satellite to be used by the HLD to drive the antenna.

- determine the aircraft velocity and the true heading, to calculate the theoretical frequency Doppler shift between aircraft and satellite in order to compensate RX and TX frequencies of the AES transceiver.

If both primary and secondary IRS are connected to the SDU, data from primary IRS are used, but the SDU will automatically use data from secondary IRS if those from primary IRS are detected failed.

IRS labels are :

LABEL NUMBER	**DESIGNATION**
310	Present position Latitude
311	Present position Longitude
312	Ground speed
313	Track angle
314	True heading
324	Pitch angle
325	Roll angle
361	Inertial altitude

(2) NRU-F Interfaces

(a) Physical interfaces

The NRU-F interface consists in a single RF link which permits to connect a NRU-F antenna, if the NRU module option is installed.

(b) Function

The NRU-F comprises a GPS antenna including input filter/LNA and a three axes magnetometer.

The data received from the NRU-F allows to determine the aircraft velocity, attitude and position (with the same accuracy as the one provided by the IRS) when no IRS is available on the aircraft.

If both IRS's and NRU-F are connected to the SDU, the IRS's information are priority share.

(3) CFDS/CMC Interfaces

(a) Physical interfaces

Two low speed ARINC 429 interfaces (one input and one output) permit to connect one CFDIU/CMC (Type 1 system as defined in ABD 048).

The Strap option pins or the System Configuration Module (SCM) define if a CFDIU/CMC is connected to the SDU.

(b) Function

CFDS function purpose is to analyze all BIT in order to detect, to store in non-volatile memory and to report to CFDUI/CMC LRU failures.

The system operates in two modes, normal mode and interactive mode as specified in ABD 048 :

- In normal mode, the SDU continuously sends to the CFDIU/CMC fault messages that indicates identity of a in-flight failed LRU to be replaced, or identities of in-flight suspect LRU's.
- In interactive mode, an operator can ask SDU :
  - More failed LRU's : failed LRU detected during the last 63 legs and failed LRU detected on ground

- Details about a failure : aircraft, date, time, trouble shooting data,…
- To start a system test to detect all current failures.

The SDU BITE format conforms with the ARINC 604 characteristics.

Related labels are :

LABEL NUMBER	**DESIGNATION**
350-356, 377	Fault Summary Words
227	Command Summary Word
125, 126, 155, 301-303	Status word

(4) ADL interfaces

(a) Physical interfaces

Two high speed ARINC 429 interfaces (one input and one output) and two discrete signals permit to connect one ADL unit.

(b) Function

The ADL allows the operator to modify the operational software of the SDU, the AES Tables (ORT) or the SCM by uploading the required version from a 3-1/2 inch floppy diskette.

The SDU address label is : 307

The data transfer protocol complies with the ARINC 615 characteristics.

Data transfer is authorized only when the SDU detects both discrete strapped together.

(5) APM interfaces

(a) Physical interfaces

Provision for nine discrete signals (one input and height outputs) and associated circuitry is available in the SDU, in conformance with the ARINC 607 characteristics supplement 2.

(b) Function

Due to lack of definition in A 761 specification the related software function is not implemented at time of issue.

(6) FMC interfaces

(a) Physical interfaces

Provision for two low speed ARINC 429 interfaces (two inputs) are available in the SDU.

(b) Function

Due to lack of definition the related software function is not implemented at time of issue.

(7) AES ID interfaces

(a) Physical interfaces

One high or low speed ARINC 429 input interface permits to connect one source of ICAO address

(MODE S, ...).

The Strap option pins or the System Configuration Module (SCM) define the availability of ICAO Address from an ARINC 429 bus, and the ARINC 429 bus speed.

(b) Function

The ICAO address is acquired at the SDU power up and stored to non volatile memory. The acquired ICAO address has not to be changed till next SDU power up.

The SDU selects the means of receiving the ICAO Address information, in order of decreasing precedence, as follows :

- From CMU #1
- From CMU #2
- From AES ID

- From the APM
- From 25 ICAO Address discrete

Related labels are :

LABEL NUMBER	**DESIGNATION**
275, 276	ICAO Address

(8) WOW interfaces

(a) Physical interfaces

Three discrete inputs are available to enable the SDU to determine whether or not the aircraft is on-ground.

(b) Function

- Input #1 and input #2 indicate the aircraft situation (in-flight or on-ground), to authorize maintenance operations on the ground only (such as data loading), and to inhibit power up self tests during flight to shorter the JETSAT “warmer time” when JETSAT is powered lately during flight and calls have to be made urgently.
- “ Program Select ” input defines the “ true ” or “ false ” state of inputs #1 and #2 (“ false ” state in open circuit and “ True ” state when strapped with pin MP15K “ Common Address ”).

INPUT #1, #2	**PROGRAM SELECT**	**AIRCRAFT SITUATION**	**SELF TEST at Power up**	**Maintenance operations authorized**
DC ground	DC ground	IN-FLIGHT	No	No
Open circuit	DC ground	ON-GROUND	Yes	Yes
DC ground	Open circuit	ON-GROUND	Yes	Yes
Open circuit	Open circuit	IN-FLIGHT	No	No

(9) Motion Sensor interfaces

(a) Physical interfaces

Two discrete inputs are available to enable the SDU to determine whether or not the aircraft is in motion.

(b) Function

- One input " Motion Sensor " defines the aircraft position, not used by the application
- One input " Sensor Program Select " defines the " true " or " false " state of " Motion Sensor " input (" True " state in open circuit and " false " state when strapped with pin MP15K " Common Address ")

These discrete are not used in the application software. They comply with the ARINC 761 characteristics.

MOTION SENSOR	**SENSOR PROGRAM SELECT**	**AIRCRAFT POSITION**
DC ground	DC ground	IN MOTION
Open circuit	DC ground	STOPPED
DC ground	Open circuit	STOPPED
Open circuit	Open circuit	IN MOTION

(10) ICAO Address interfaces

(a) Physical interfaces

Twenty five discrete inputs permit the SDU to acquire the ICAO address :

- Twenty four inputs for the address bits " bit #1 (MSB) to bit #24 (LSB) "
- One input " Common Address "

(b) Physical interfaces

The acquired ICAO address is used to identify the AES.

Address bits left open circuit are on the binary " one " state and address bits strapped with the " common Address " input are on the binary " zero " state.

The ICAO address is acquired at the SDU power up and stored to non volatile memory. The acquired ICAO address has not to be changed till next SDU power up.

These discrete comply with the ARINC 761 characteristics.

PIN number	Interpretation	Signal name
MP13C	ICAO address MSB	I_ICAO_1
MP13D		
MP13E		
MP13F		
MP13G		
MP13H		
MP13J		
MP13K		
MP14D		
MP14E		
MP14F		
MP14G		
MP14H		
MP14J		
MP14K		
MP15A		
MP15B		
MP15C		
MP15D		
MP15E		

PIN number	Interpretation	Signal name
MP15F		
MP15G		
MP15H		
MP15J	ICAO address LSB	I_ICAO_24
MP15K	A/C Address common	ICAOCOM

(11) Status interfaces

(a) Physical interfaces

Seven discrete outputs (0-28V) define the SDU or AES status :

(b) Function

- SATCOM fail warning : This discrete indicates that the SDU has detected a **JETSAT** essential default, from the CBIT.
- Cockpit voice unavailable : This discrete indicates the AES is not logged on and/or a failed PBIT result (Cockpit CODEC failed) and/or no AMS is wired.
- Cabin voice unavailable : This discrete indicates the AES is not logged on and/or a link loss with the MCTU or external CTU.
- Packet data unavailable : This discrete indicates the AES cannot support such functionality (AES class 1 or 2 identified during logon process).
- Packet data low speed only available : This discrete indicates the AES cannot support such functionality (AES class 1 or 2 identified during logon process).
- SATCOM inoperable : This discrete indicates that the SDU has detected a **JETSAT** fatal error
- Link not ready : This discrete indicates that **JETSAT** is not logged

These discrete, when grounded, indicate a fail or unavailable situation. At power up they all indicate a fail or unavailable situation.

They comply with the ARINC 761 characteristics.

(12) SDU Cross-talk interfaces

(a) Physical interfaces

Two high or low speed ARINC 429 interfaces (one input and one output) and two input/output discrete (Dual System Select and Dual System Disable) permit to support a dual SATCOM installation.

The Strap option pins or the System Configuration Module (SCM) define whether two SATCOM systems are installed, and the cross-talk bus data speed (High or Low).

(b) Function

Dual SATCOM is an optional configuration where two single systems are installed on board an aircraft. Each system has all the necessary equipment's (SDU, HLD and IGA). Dual system installation may be used to provide backup redundancy for safety voice and or data services.

The design proposed is applicable for a redundancy between JETSAT and any other SATCOM (AERO-I or AERO-H). In that case, the two ARINC 429 cross-talk bus which are manufacturer dependant are not used.

Master/Slave definition

The Master system is defined as the system in control while the Slave system has no radio transmission capability.

Configuration items

Two configuration items are involved in the SDU cross-talk management :

- First is the stand alone / dual mode selection

  0 = dual mode, 1 = stand alone mode

- The second one is applicable only if dual mode is selected, is defining the SDU number

  0 = System #2, 1 = System #1

Stand alone mode

When the configuration state is stand alone mode, all the interfaces relative to the cross-talk management have no impact on the operations. The SDU is reacting as a master.

Any information coming from ARINC 429 cross-talk bus are cancelled.

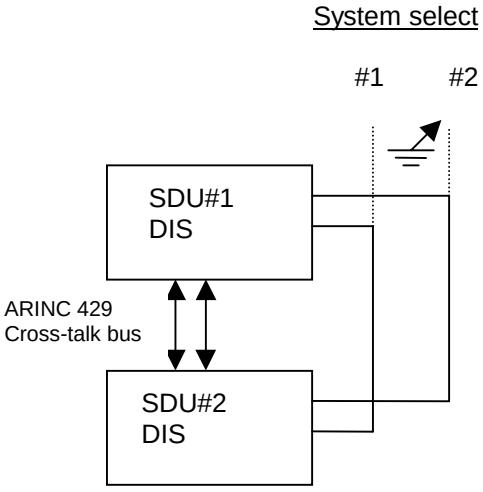
The “Dual System Select Disable” input state is not read.

In the opposite case, when the configuration state is dual mode, one system can be selected manually or automatically as the master, as described hereafter.

Dual mode – manual selection

The “Dual System Select” discrete can be pulled low by an external source to select one system and disable the other one. In that case, the selected system is the sole master while the other one is the slave.

Manual selection principle :



While a system is selected, the other one is automatically de-selected through the cross relation SEL/DIS. The DIS input is read after power on, if it is active, the SDU will react as a slave, otherwise as a master.

A system should react to a change on the DIS input while power is already on. If such a change is detected, within a real time delay of 5 seconds, a restart will be automatically generated to allow to reach a master/slave state compliant with the disable discrete value.

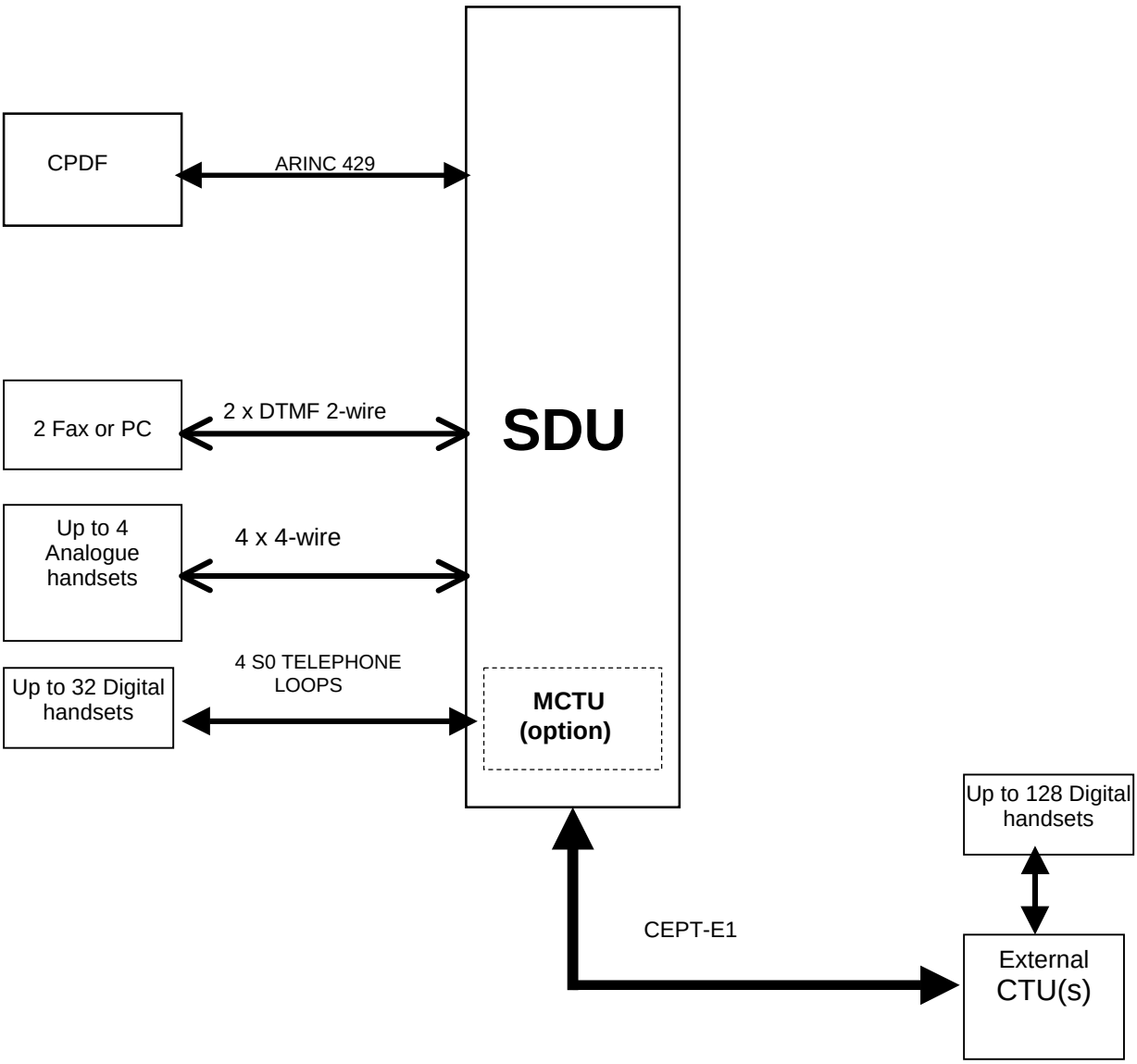
Any messages on the cross-talk bus are ignored.

Dual mode – automatic selection

This function is not defined, and related software is not implemented.

3. Cabin interfaces

A. Overall cabin interfaces (synopsys)



Cabin interfaces synopsys

Figure 3

B. Cabin interfaces summary

DESIGNATION	I/F TYPE	INPUT	OUTPUT	REFERENCE
CTU	CEPT-E1	1	1	CCITT G.703 & G704 ARINC 746
CTU	RS422	1		
CTU	Discrete	1		
Digital handset	S0 loop	8	8	CCITT I.430
Modem equipped devices	Analogue 2-wire	2		SLIC/DTMF
CPDF (Cabin Packet-mode Data Function)	ARINC 429 (LO speed)	1	1	ARINC 758
Analogue handset	Analogue 4-wire			

C. Cabin interfaces detailed

(1) External CTU interfaces

(a) Physical interfaces

One CEPT-E1 bus, one RS422 serial line and one discrete signal are available to connect an external CTU, when the internal MCTU module option is not installed.

The use of internal (M)CTU excludes the use of the external CTU and vice versa.

CEPT-E1 link complies with ARINC 746.

(b) Function :

Connection to external CTU (1): A serial communication data bus (2 Mbits/second) allows to sequentially multiplex four voice channels and two signaling channels, they comply with ARINC 746 recommendations. A RS 422 line is also available to acquire BITE from CTU or perform data loading.

(2) Digital handset interfaces (when MCTU option is installed)

(a) Physical interfaces :

When the MCTU module option is installed, 4 S0 loops permit to connect up to 32 digital handsets directly to the SDU.

The Strap option pins or the System Configuration Module (SCM) define if this option is installed.

(b) Function :

Digital handsets provide the crew or cabin passengers with air to ground or ground to air telephone communications.

Each S0 interface can support up to height handsets and provides two voice channels, and one Link Access Protocol D-Channel (LAPD).

The handsets are power supplied by a phantom feed method.

Number of wires : 4 for each S0 interface

Note: only two handsets can be active simultaneously per S0 loop.

(3) Modem equipped devices

(a) Physical interfaces :

Two analogue 2-wires standard DTMF interfaces permit to connect up to two devices equipped with a Modem (fax machine, Personal Computer, ...).

(b) Function :

These interfaces provide data transmission in circuit mode, from air to ground or ground to air.

Data rate : 1200 or 2400 Bauds

(4) CPDF interfaces

(a) Physical interfaces :

Two low speed ARINC 429 interfaces (one input and one output) permit to connect one CPDF system.

The Strap option pins or the System Configuration Module (SCM) define if a NSU or a CPD oriented unit is connected to the SDU.

(b) Function :

These interfaces provide DATA 3 communications between the SATCOM system and the CPDF, in conformance with the ARINC 429 and 741 recommendations. They support data services such as news, weather, financial reports, reservation for airlines, rental cars and hotel and other passenger services. These data services are provided simultaneously in parallel with those provided for the CMU or the CTU.

Status/maintenance messages are exchanged via these interfaces for system monitoring.

(5) Analogue handset interfaces

(a) Physical interfaces :

Four analogue 4 wire interfaces permit to connect WH10 type analogue handsets directly to the SDU.

Note: Analog and digital handsets (via MCTU or CTU) connections are mutually exclusive.

(b) Function :

Analogue handsets provide the crew or cabin passengers with air to ground or ground to air telephone communications.

Note: PABX functions specific to (M)CTU such as call transfert, confcall, redial, etc, are not available using analogue handsets

The 4-wire interfaces fully comply with ARINC 761 standard.

4. Maintenance Interfaces

A. Maintenance interfaces summary

DESIGNATION	**I/F TYPE**	**INPUT**	**OUTPUT**	**REFERENCE**
• Serial line	RS232	1	1	EIA/TIA-232-E
• AC power indicator	Discrete		1	
• Status indicator	Discrete		1	
• TEST (push-button switch)	Discrete	1		
• + (push-button switch)	Discrete	1		
• - (push-button switch)	Discrete	1		
• Enter (push-button switch)	Discrete	1		
• Display	Data bus			
• Test headset				
Audio	Audio	2	2	
Cockpit Voice Micro-on	Discrete	1		
Cockpit Voice Call Light	Discrete	1		
Place end/call	Discrete	1		
• PDL • (Portable Data Loader)	ARINC 429 (HI speed)	1	1	ARINC 615
• Portable Data Loader • Link A and B	Discrete	2		ARINC 615
• Op/TEST	Discrete	1		

B. Maintenance interfaces detailed

(1) RS232 Serial Line interfaces

(a) Physical interfaces

One RS232 serial line enable connection of a Maintenance Terminal based on a PC architecture running in terminal mode. This serial line can be accessed via two different SDU ports, one located on the SDU front panel maintenance connector the other one located at the SDU rear connector can be routed through the A/C.

(b) Function

1 One line (pins 40, 4 and 48 of the SDU front face connector) is assumed to be connected to a portable maintenance device (PC based), for system status display and data loading purposes :

- Data loading of the SDU application software
- Data loading of JETSAT configuration tables
- Data loading of any test applications

This same line is also available on the SDU rear connector (pins TP14A, TP14B and TP14C) and can be wired up to the cockpit of business aircraft, for the same purposes.

Caution : Never connect two PC's at the same time on these two **connectors.**

2 The other line (pins 33 and 34 of the SDU front face connector) is for manufacturer use only (enabling access to the radio module for debug purposes).

This maintenance line is compliant with EIA/TIA-232-E.

(2) Indicator interfaces

(a) Physical interfaces

Two indicators (LED) are located at the SDU front face to annunciate " DC Power on " and " SDU Status ".

(b) Function

DC Power : when the SDU is energized " DC Power " green LED is on (steady).

Status : " Status " red LED is on when a SDU or system failure is detected, and maintained lighted up to next SDU power on. This LED flashes during power on self test or during activated self tests (front panel " TEST " push-button).

Status LED on	Status LED flashing	Status LED off
During start up sequence When Fatal default is detected by PBIT or CBIT ?	During PBIT sequence During Dataload sequence	When no fatal default is detected by PBIT or CBIT

(3) Push-buttons interfaces

(a) Physical interfaces

Four push-buttons are located at the SDU front face : " TEST ", "SELECT", " + ", " - " and " EXIT ".

(b) Function

- " TEST " push-button first generates a general reset of the SDU and then runs a complete self test of the equipment, including a BITE verification of the HLD and IGA (via the HLD). " Status " led is flashing during the test : If some failure is detected " Status " led is maintained permanently lighted, otherwise this led becomes off. Result of the test is also displayed on the LCD Display device.
- "SELECT" : see table page 305.
- " + " and " - ": see table page 305
- " EXIT " : see table page 305.

(4) LCD Display interfaces

(a) Physical interfaces

A two lines 12 alphanumeric characters LCD Display device is located at the SDU front face.

(b) Function

This device permits to display maintenance, engineering and manufacturer information.

The LCD display comprises a back-light to improve readability, this back-light is automatically switched off when no push-button is pressed during half a minute. Pressing one of push-buttons will reactivate the back-light.

See table page 306.

(5) Test headset interfaces

(a) Physical interfaces

A test headset can be connected on the SDU front face connector.

(b) Function

This test headset is a Cockpit-type headset used for maintenance or installation purposes.

It acts as a third cockpit voice channel.

Connections requested:

- One Audio input and one Audio output
- One discrete input Cockpit Voice Micro-on
- One discrete input Cockpit Voice Call Light
- One discrete input Place end/call

(6) PDL interfaces

(a) Physical interfaces

Two low speed ARINC 429 interfaces (one input and one output) and two discrete permit to connect one PDL unit on the SDU front face connector.

(b) Function

The PDL allows the operator to modify the AES Tables, the SCM or the operational software of the SDU by uploading the desired version from a 3-1/2 inch floppy diskette.

The SDU address label is : 307

The data transfer protocol complies with the ARINC 615 characteristics.

Data transfer is authorized only when the SDU detects both discrete strapped together.

(7) Op/Test interfaces

(a) Physical interfaces

One discrete input permits to connect a maintenance or acceptance test equipment.

(b) Function

When open this input indicates the SDU is in the operational mode.

When grounded the SDU is set in the “test” mode, allowing manufacturer debugging (the watchdog is deactivated) or test operations.

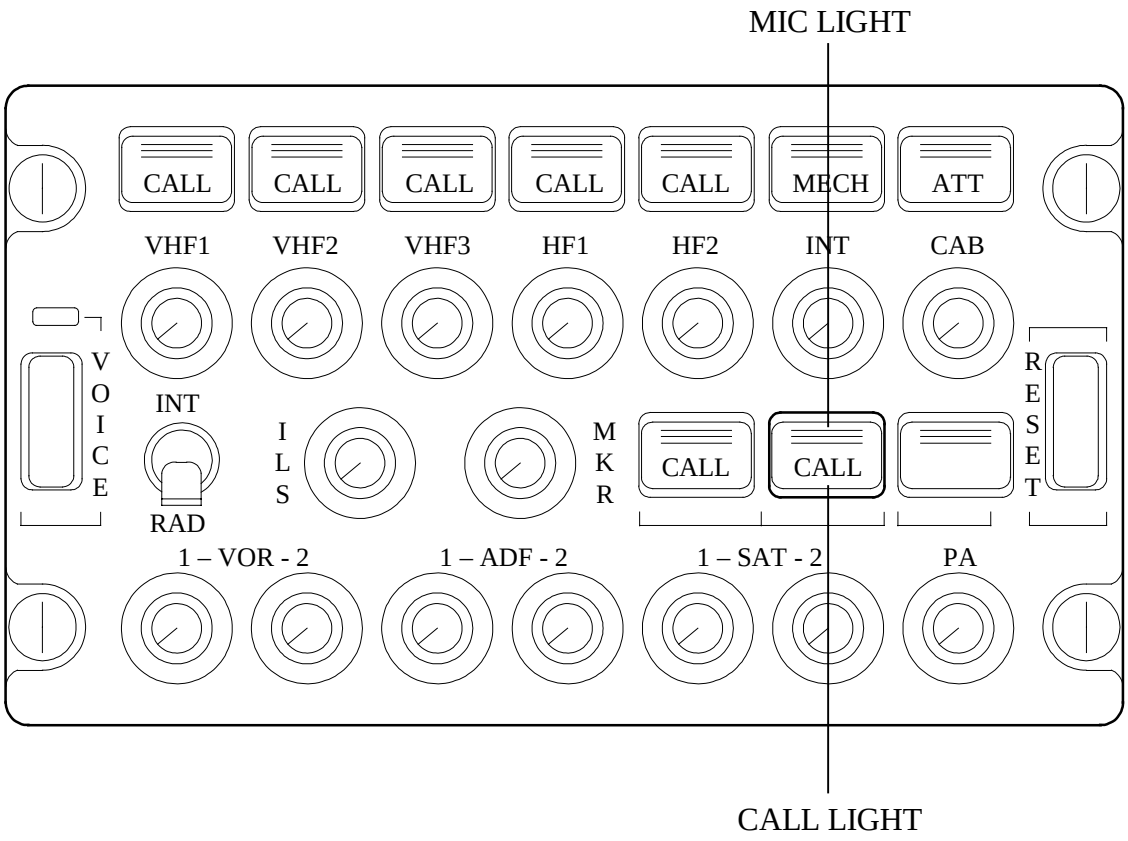
5. Cockpit Interfaces

A. Overall cockpit interfaces

The Satcom cockpit voice interface consists in interfacing the Satcom Satellite Data Unit (SDU) with the Audio Management Unit (AMU) and associated Audio Control Panels (ACPs) for initiation/termination of the cockpit calls.

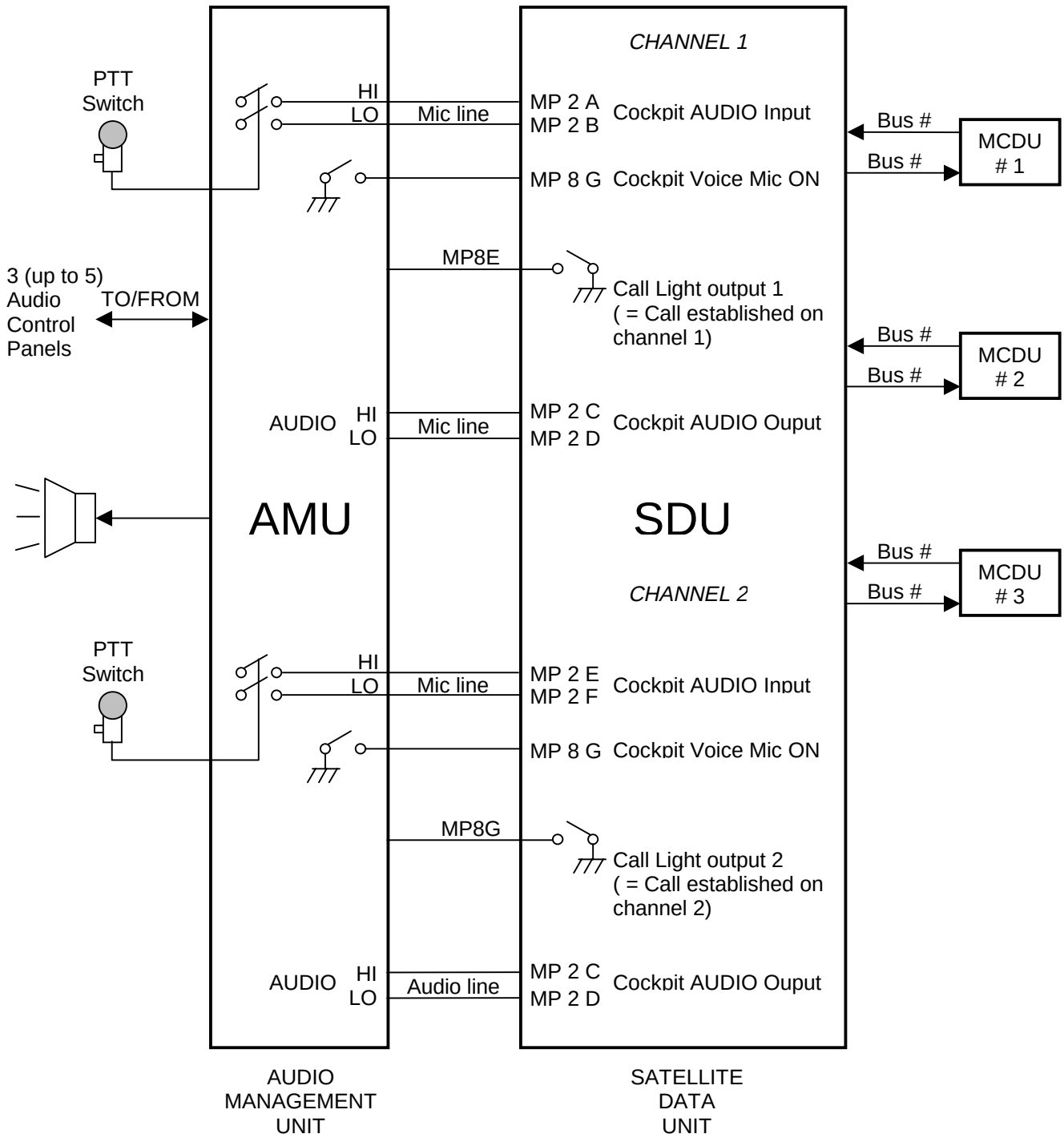
Specific cockpit voice pages are activated in the MCDU Satcom Menu in order to allow phone numbers to be selected.

Note: see figure 4 for the Audio Control Panel description and figure 5 for the SATCOM/AMU interface description.



Audio Control Panel

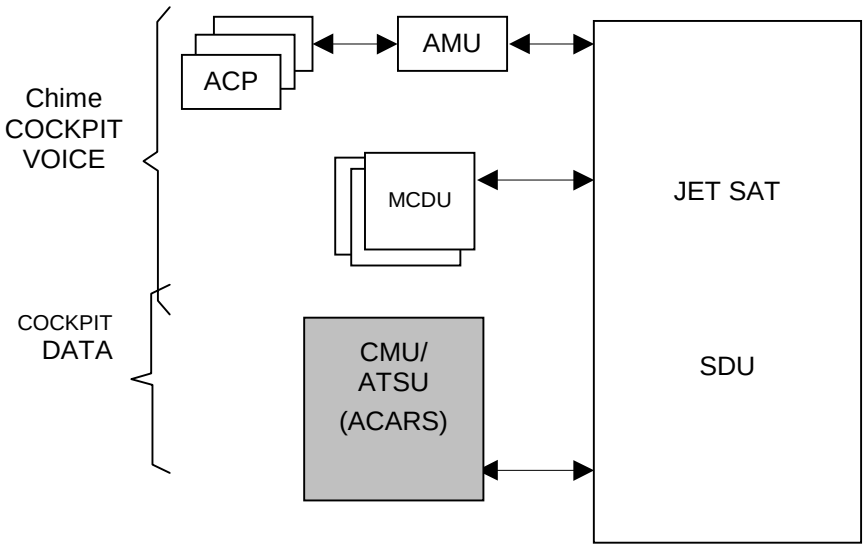
Figure 4



AMU/SDU Interface

Figure 5

JETSAT provides up to 5 simultaneous channels, one for data transmissions (ACARS or CPDF), and 4 for voice transmissions. All these channels can be either shared by cockpit and cabin or dedicated to cabin or cockpit only depends on the user choice.



Cockpit interfaces synopsys

Figure 6

For commercial aviation cockpit data are transmitted in packet mode to and from the A/C router so-called ACARS/CMU or ATSU, while business jets transfer data via AFIS.

B. Cockpit data transmission interfaces

(1) Summary

DESIGNATION	I/F TYPE	INPUT	OUTPUT	REFERENCE
CMU/ACARS ATSU or AFIS (Communication Management Unit)	ARINC 429 (HI&LO speed)	2	1	ARINC 748/758/741 ARINC 724 ISO 8208

(2) Detail

(a) Physical interfaces

Three high/low speed ARINC 429 interfaces (two inputs and one output) allow to connect up to two CMU/ACARS/ATSU/AFIS.

The Strap option pins or the System Configuration Module (SCM) define which CMU/ACARS/ATSU/AFIS (#1 and/or #2) is connected to the SDU and the data speed (High or Low).

(b) Function

The CMU/ACARS/ATSU/AFIS provides a path to enable on-board systems to communicate with ground-based systems. It achieves the ground to air and air to ground digital reliable communication link by interfacing with the SDU. Digital data packet is transmitted using the ISO 8208 sub-network layer protocol (Data 2 and Data 3), in conformance with the ARINC 429 and 741 recommendations.

DATA 2 protocol permits point to point data packet transmission while DATA 3 protocol allows multi-points type transmission.

A label status word (270) is exchanged every second.

C. Voice transmissions

Cockpit voice interfaces provide to the cockpit crew air to ground or ground to air communications, using the existing cockpit audio network headsets, with call procedures similar to other communication procedures on board the aircraft.

JETSAT is designed to provide four priority levels of air to ground and ground to air voice communications:

Priority 1 (Emergency): Reserved for emergency and distress calls only. This priority activates alarms in

Ground Earth Stations all around the world.

Priority 2 (Safety): Reserved for regulatory and flight safety calls.

Priority 3 (Non-safety): Reserved for non safety operational calls.

Priority 4 (Public): Reserved for passengers correspondence calls.

Routing of incoming calls versus priority level is given on figure 1 page 111.

JETSAT is flexible enough to cope with different cockpit SATCOM installations, SATCOM cockpit voice installations vary from one A/C manufacturer to the other, while they also vary from one A/C type to the other (long range two aisles versus short haul single aisle).

The present document describes a typical installation where cockpit voice interface is controlled by :

– the Audio Control Panels (ACPs) for call set-up and call termination,

– the MCDU for the call number selection

Note: This chapter describes SATCOM cockpit voice implementation for AOC applications only.

(1) Summary

DESIGNATION	I/F TYPE	INPUT	OUTPUT	REFERENCE
Audio Inputs	Audio	2		
Audio Outputs	Audio		2	
Cockpit Voice Go-Ahead Chime Signal Reset	Discrete	1		
Signal Contacts : Current from Chime, Current to Chime	Discrete	1	1	
Chime Lamp Inhibit	Discrete	1		
Cockpit Voice Micro-on	Discrete	2		
Cockpit Voice Call Light	Discrete		2	
Place/end call	Discrete	2		
RMP	ARINC 429	1	1	ARINC 761

D. MCDU interfaces

(1) Physical interfaces

Four ARINC 429 interfaces (three low speed inputs and one low or high speed output) are available to connect up to 3 MCDU.

The Strap option pins or the System Configuration Module (SCM) define which MCDU (#1, #2 and/or 3) is connected to the SDU.

(2) Function

The MCDU allows the crew to control **JETSAT** :

- For cockpit voice calls
- To select operating options of **JETSAT**

The main capabilities offered to the crew are the following :

- Selection of a specific GES for establishing a call link
- Listing of telephone numbers and associated names (to be selected)
- Select a phone number for an air to ground cockpit call
- Follow the call proceeding of a ground to air cockpit call

E. Analogue voice interfaces

(1) Physical interfaces

Cockpit analogue voice interfaces allow connection to the AMS (Audio Management System, comprising the Audio Management Unit (AMU) and several Audio Control Panel (ACP).

These interfaces comprise :

- Two analogue audio inputs

  These inputs comply with ARINC 535A and 538A. The input circuit provides the following characteristics :

  - - Microphone excitation voltage : 16 VDC open circuit
  - - Excitation voltage source impedance : 400 Ohms
  - - Input impedance : 150 Ohms

- Two analogue audio outputs :

  The audio output level is adjusted to 10 mV into a 600 Ohms resistive load at 1000 Hz. The output voltage does not change more than 2dBv when the load is varying between 450 Ohms and 20,000 Ohms. The audio output circuit presents less than 20 Ohms impedance to the load circuit. These outputs are isolated from the ground.

- One discrete input " Cockpit Voice Go-Ahead Chime Signal Reset "

  This input senses an external switch which , if closed, reset the Voice Go-Ahead Chime outputs (" Signal Contacts : Current from Chime, Current to Chime ").

- Two discrete outputs " Signal Contacts : Current from Chime, Current to Chime "

  The SDU closes a circuit between these two outputs (relay contacts, 1A) when the Chime has to be activated.

The SDU Configuration defines whether the chime is to be single or multi-stroke. If multi-stroke, the period is to be .5 to 1 second.

- One discrete input " Chime Lamp Inhibit "

  This input is grounded during takeoff and landing flight phases, indicating to the SDU to inhibit SATCOM activation of the Chime and call light.

- Two discrete inputs " Cockpit Voice Micro-on "

  These inputs sense external switches which , when closed, indicate that cockpit microphone(s) are in-use with the SDU. In that case these inputs are wired to either the SATCOM-selected PTT switch or to an ACP SATCOM mic. transmit key switch, as specified in the SDU Configuration Module. If external switches are open this indicates there is no cockpit microphone(s) in-use.

- Two discrete outputs " Cockpit Voice Call Light "

  These outputs provide SDU internal switches closure to ground. These switches have to be closed to annunciate cockpit voice call(s). The SDU Configuration defines whether the call annunciation is to be steady or flashing. If flashing the duty cycle should be 50% and the period .5 to 1 second.

- Two discrete inputs " Place/end call "

  These inputs sense external switches which, when momentary closed to ground (< 100 ms), indicate end call for any on-going call on the respective channel or, if there is no on-going call, to indicate Place ATC Call if there is a telephone number in the ATC Call Register.

F. RMP interfaces

(1) Physical interfaces

Provision for two low speed ARINC 429 interfaces (one input and one output) are available in the SDU.

6. SATCOM Pages

A. General presentation

(1) SATCOM MCDU MAIN MENU page

The Satcom Main Menu page is used to display call status information, and to provide access to lower level pages.

					S	A	T	C	O	M		M	A	I	N		M	E	N	U				
1L																							1R
		S	A	T		1		C	O	N	N	E	C	T	E	D							
2L		O	A	K	L	A	N	D															2R
3L																							3R
		S	A	T		2		R	E	A	D	Y		T	O		C	O	N	N	E	C	T
4L		E	U	R	O	C	O	N	T	R	O	L											4R
5L													M	A	N	U	A	L		D	I	A	L >	5R
		S	A	T	C	O	M																
6L	<	S	T	A	T	U	S							D	I	R	E	C	T	O	R	Y	>	6R

2L Label line(4L label line) is the Satcom cockpit channel n° 1 (n° 2), followed by the Satcom channel status:

READY TO CONNECT: The system is ready to support a call on this channel

NOT AVAILABLE: Either the Satcom system is not logged on using the High Gain Antenna, or equipment failures exist which prevent the channel from being used for a cockpit call.

DIALING: cockpit call in progress. When connected, the status changes to CONNECTED

CONNECTED: The circuit is connected.

CALL FAILED: A call is terminated abnormally.

The following CALL FAIL are displayed when appropriate:

GRND FAILURE: GES equipment failure

GRND CONGEST: No ground circuits available

INVAL NUMBER: invalid number dialed.

SERVICE N/A: Service not available.

2L Data line(4L Data line): This is data about the Channel 1 (or channel 2) directly above. For Air to ground calls, the mnemonic of the selected phone number is displayed unless it is a MANUAL DIAL number, in which case the manual dialed number is displayed. Mnemonics are in small font when the status is ready to connect, and large font when the call is connected.

An incoming Ground to Air call that is setup, ringing, and waiting to be answered or rejected will result in the channel status of "GROUND-AIR CALL" to be displayed in the 2L or 4L label line, with the priority (i.e. EMERGENCY, SAFETY, etc.) displayed below in the 2L or 4L data line.

					S	A	T	C	O	M		M	A	I	N		M	E	N	U			
1L																						1R
		S	A	T		1		C	O	N	N	E	C	T	E	D						
2L		O	A	K	L	A	N	D														2R
3L																						3R
		S	A	T		2		N	O	N	-	S	A	F	E	T	Y					
4L		G	R	N	D	-	A	I	R		C	A	L	L								4R
5L													M	A	N	U	A	L		D	I	A	L	>	5R
		S	A	T	C	O	M															
6L	<	S	T	A	T	U	S							D	I	R	E	C	T	O	R	Y	>	6R

5R data line < MANUAL DIAL provides access to the Manual Dial page described later in this document.

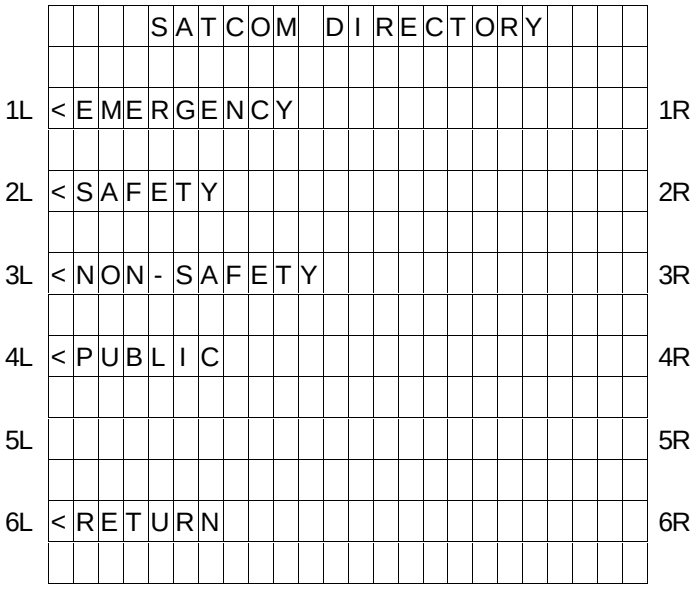
Nota: The manual dialing function can be inhibited if requested in the ORT.

In this case, < MANUAL DIAL is not displayed any more on the Satcom Main Menu.

6L < Satcom STATUS provides access to the Satcom STATUS page which contains LOG-ON information and channel status information.

6R < DIRECTORY provides access to the Directory page described later in this document.

(2) SATCOM DIRECTORY Page



This page provides access to 4 phone numbers list where some phone numbers have been memorized, according to their priority.

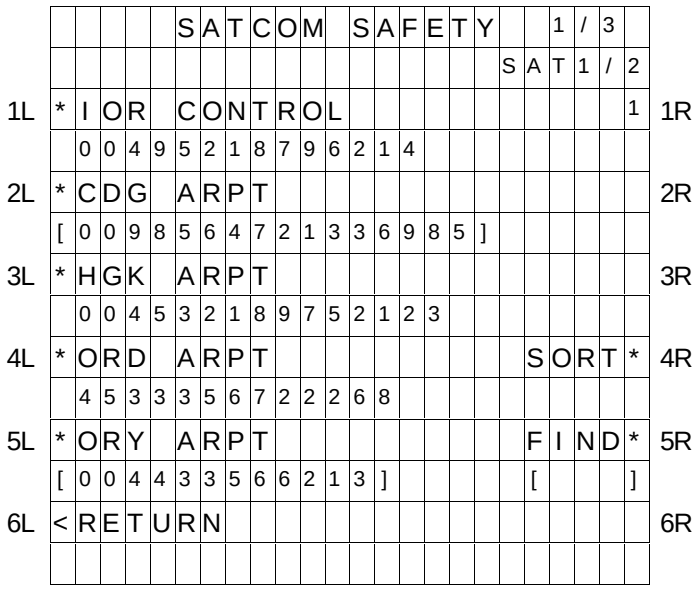
EMERGENCY for priority 1 - Reserved for Emergency and distress phone numbers only SAFETY for priority 2 - Reserved for regulatory and flight safety phone numbers only. NON-SAFETY for priority 3 - Reserved for non-safety phone numbers.

PUBLIC for priority 4 - Reserved for personal phone numbers.

1L, 2L, 3L, 4L Pressing these keys causes the display to go to the different categories of number pages.

6R <RETURN: The display returns to the SATCOM MAIN MENU page

(3) CATEGORY NUMBERS Pages



The CATEGORY NUMBER page enable selection of a phone number from a list similar to a phone book. These pages also allow modification of the SATCOM channel, and provides means of searching, adding, and sorting phone numbers within the category.

1L, 2L, 3L, 4L, : 1L, 5L, 6L :* MNEMOMC ID: The phone numbers for the category as contained in the ORT are displayed (cockpit phone numbers).

The phone number is displayed in the label line while the mnemonic is displayed in the data line above the number.

There are two types of numbers: protected and unprotected.

Protected numbers (green), including the mnemonic, are not modifiable.

Phone numbers that are unprotected are indicated by brackets surrounding the mnemonic (cyan).

When unprotected numbers and mnemonic are modified, they are also modified in the ORT.

An unprotected mnemonic is modifiable by entering any character set, containing at least one alpha

character, in the scratchpad and pressing the lett line select key associated with the desired mnemonic to be modified.

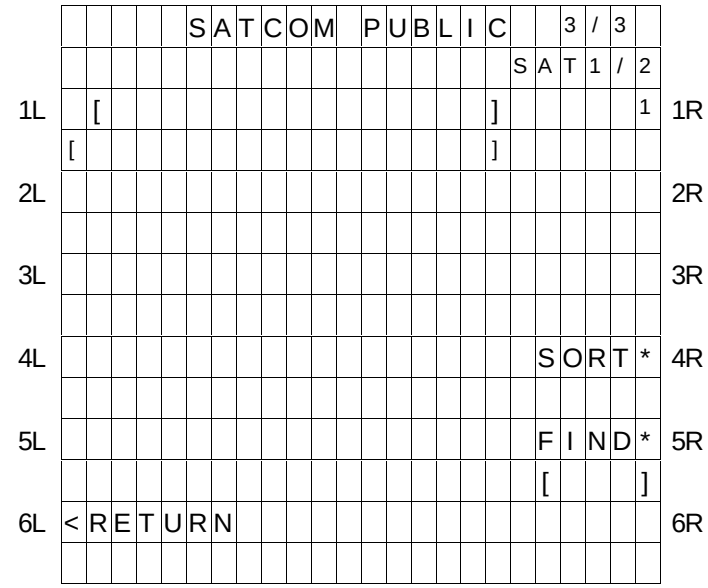
An unprotected number is deletable by pressing CLR function key when the scratchpad is empty and then

pressing the left LSK next to the phone number.

When an unprotected number is deleted, the phone number and the associated mnemonic are both deleted.

The unprotected number is also deleted from the ORT.

In the last position in the phone list on the last page of the "Category" of numbers is displayed brackets prompting entry for a new phone number, including mnemonic to indicate that manual entry of a new number is permitted:



The pilot may enter the number or the mnemonic in any order in the scratchpad.

A manually entered number is treated as unprotected and therefore modifiable and / or deletable through normal scratchpad usage.

This possibility may be inhibited through the ORT.

If a left line select key associated with a phone number is pressed, and the scratchpad empty, the system pre-selects the phone number and the page display then automatically reverts to the SATCOM Main Menu page.

1R SAT1/2: The currently selected SATCOM channel

MCDU2 will default (on power-up and each landing) to channel 2, to let the right seat pilot habitually use

the same channel, without having to make any explicit selection.

MCDU1 and MCDU3 will default to SAT 1 on each power-up and landing.

The default: value is written in blue and small font.

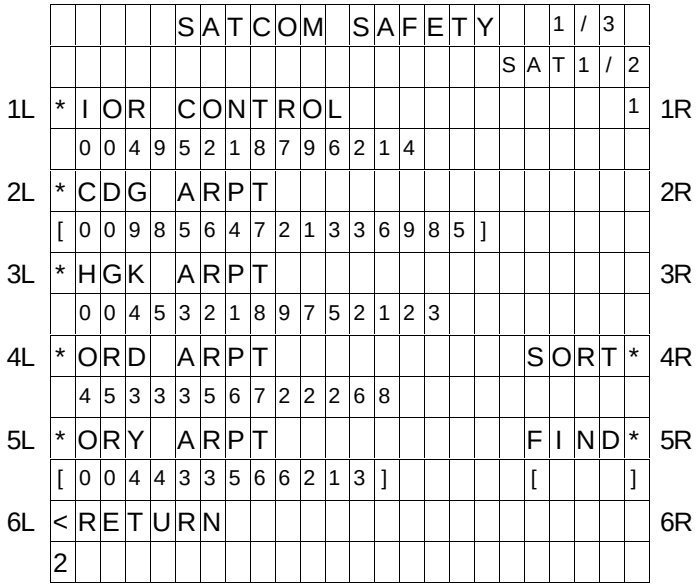
On MCDU1, to override this default value (1), enter 2 in the scratchpad and then press 1R .

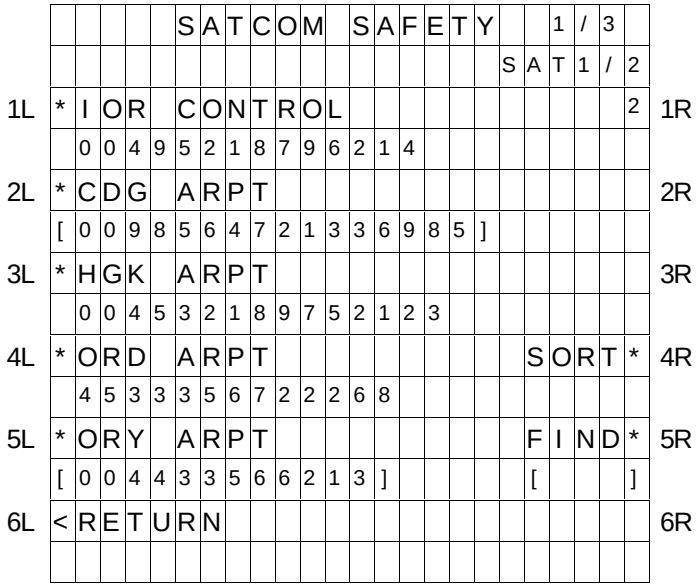
2 appears in blue and large font on 1R line.

To return to the default value (1), press CLEAR on the MCDU keyboard (CLEAR is displayed in the

scratchpad) and then press 1R select Key.

Then the scratchpad line is cleared and the default value (1) selected.





4R *SORT: The phone numbers are sorted within the category in Alphabetical order by their mnemonic.

5R *FIND: This function allows an automatic research of a phone number from the beginning of this category, by entering up to the three first letters of the number mnemonic into the scratchpad and by pressing 5R.

This string is then copied into the label line of 5R ,and if the id of the number is found, the page is changed to that page, otherwise, NOT FOUND is displayed in the scratchpad. The search string of all MCDUs shall reverts to the default Null valué (displayed as three spaces) on each power-up and landing.

6R <RETURN: The display returns to the DIRECTORY page.

(4) SATCOM MANUAL DIAL Page

				S	A	T	C	O	M		M	A	N	U	A	L		D	I	A	L			
1L																							1R
	P	H	O	N	E		N	U	M	B	E	R											
2L	[	0	0	3	3	5	4	6	4	5	4	3	7	3	4	3	2	]					2R
3L																							3R
	S	A	T	1	/	2																	
4L	2																						4R
	P	R	I	O	R	I	T	Y	↑	↓													
5L	N	O	N	-	S	A	F	E	T	Y													5R
6L	<	R	E	T	U	R	N						P	R	E	-	S	E	L	E	C	T	*	6R

This page allows to pre-select a manual dial phone.

This function may be inhibited in the ORT.

2L PHONE NUMBER: The data line will have brackets displayed. Pressing the LSK with a valid phone number in the scratchpad will cause the entered number to be displayed inside the brackets on the data line in the color cyan in small font.

4L The 4L line will display the currently selected SATCOM channel.

The SAT channel selection feature is changed so that the default channel for MCDU1 and MCDU3 is SAT 1, while the default for MCDU2 is SAT 2. These defaults can be overridden by entering the wanted number in the scratchpad, and pressing the LSK, or toggled from the current value by pressing the LSK with the scratchpad empty. When the value is at its default, it will be in small font, when different from its default, it will be displayed in large font. The default value for an MCDU is re-established on each SDU Restart (selftest or power-up) and also on landing.

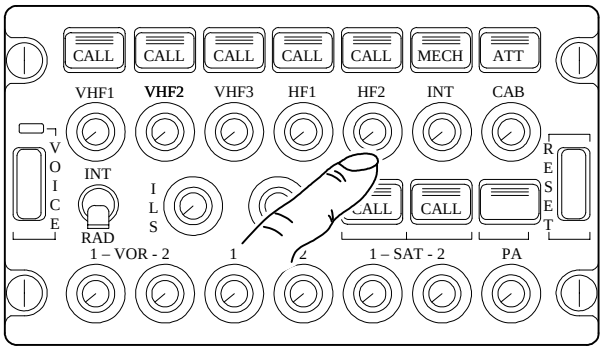
5L The 5L line will display the priority for the manual dial phone number. This field will be modifiable by pressing the slew up or slew down keys, on the MCDU keyboard.

The default priority (after landing and power-up) is NON-SAFETY.

6L <RETURN The display returns to the SATCOM MAIN MENU page.

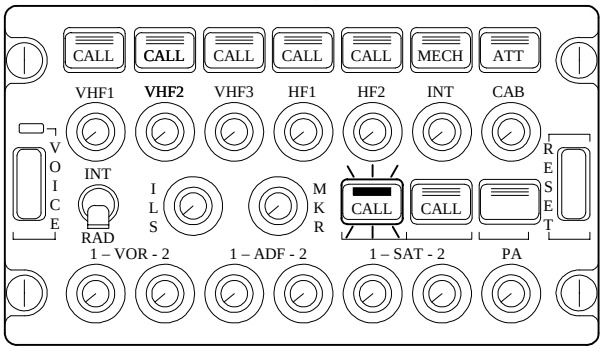
6R *PRE-SELECT: Pressing this LSK will cause the phone number entered on 2L to be acknowledged and the page to return to the MAIN MENU page.

				S	A	T	C	O	M		M	A	I	N		M	E	N	U					
1L																								1R
		S	A	T		1		R	E	A	D	Y		T	O		C	O	N	N	E	C	T	
2L		I	O	R		C	O	N	T	R	O	L													2R
3L																								3R
		S	A	T		2		R	E	A	D	Y		T	O		C	O	N	N	E	C	T	
4L		E	U	R	O	C	O	N	T	R	O	L													4R
5L													M	A	N	U	A	L		D	I	A	L	>	5R
		S	A	T	C	O	M																		
6L	<	S	T	A	T	U	S								D	I	R	E	C	T	O	R	Y	>	6R



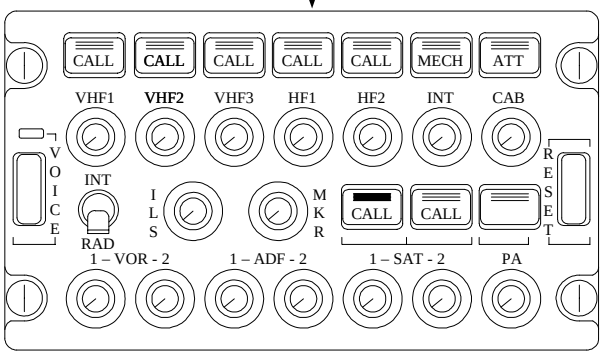
SELECTION OF THE SATCOM CHANNEL

				S	A	T	C	O	M		M	A	I	N		M	E	N	U					
1L																								1R
		S	A	T		1		D	I	A	L	I	N	G										
2L		I	O	R		C	O	N	T	R	O	L													2R
3L																								3R
		S	A	T		2		R	E	A	D	Y		T	O		C	O	N	N	E	C	T	
4L		E	U	R	O	C	O	N	T	R	O	L													4R
5L													M	A	N	U	A	L		D	I	A	L	>	5R
		S	A	T	C	O	M																		
6L	<	S	T	A	T	U	S								D	I	R	E	C	T	O	R	Y	>	6R



MIC LIGHT FLASHING

				S	A	T	C	O	M		M	A	I	N		M	E	N	U					
1L																								1R
		S	A	T		1		C	O	N	N	E	C	T	E	D								
2L		I	O	R		C	O	N	T	R	O	L													2R
3L																								3R
		S	A	T		2		R	E	A	D	Y		T	O		C	O	N	N	E	C	T	
4L		E	U	R	O	C	O	N	T	R	O	L													4R
5L													M	A	N	U	A	L		D	I	A	L	>	5R
		S	A	T	C	O	M																		
6L	<	S	T	A	T	U	S								D	I	R	E	C	T	O	R	Y	>	6R



Call initiation on ACP

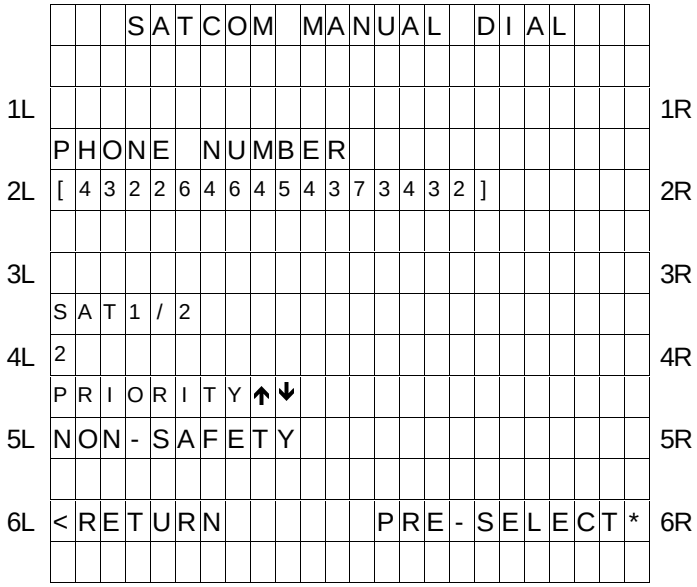
Figure 7

B. Placing an Air to Ground Call

(1) Cockpit calls by manual dialing

This manual dialing function can be inhibited if requested in the ORT (Owner Requirement Table) of the Satellite Data Unit (SDU)

The basic sequence is as follow:



1/ Select Satcom Menu from the MCDU: line 5L

2/ Select DIRECTORY on the Satcom Main Menu Page: line key 6R

3I To change the default priority, press the slew-up key (or slew down), on the MCDU keyboard

3/ To change the default channel, by entering the wanted number in the scratchpad, and pressing the 4L

4/ Type the phone number in the scratchpad (international prefLx:00, followed by country code, area code, phone number) and press 2L

5/ Select 6R to pre-select the number.

Then the manual dial page returns to the Satcom Main Menu Page. The phone number just entered appears

on 2L data line if channel 1, or on 4L data line if channel 2.

Nota: Once a number is entered, it cannot be cleared but may be replaced by entering a new number.

6/ Initiate the call by selecting the associated Satcom channel transmission push button switch SAT1 (SAT2) on the Audio Control Panel.

7/ On this pushbutton switch, green lines flash during the call establishment. When the call is established, these green lines become steady.

On the MCDU Satcom Main Menu, CONNECTED indication replaces DIALING indication in front SAT1 (SAT2).

(2) Cockpit call with pre-selected numbers (numbers from the svstem Directories).

The basic sequence is as follow:

(a) Select SATCOM MENU from the MCDU: line key 5L

	SATCOM MAIN MENU	
1L		1R
	SAT 1 CONNECTED	
2L	OAKLAND	2R
3L		3R
	SAT 2 NON-SAFETY	
4L	GRND-AIR CALL	4R
5L	MANUAL DIAL>	5R
	SATCOM	
6L	<STATUS DIRECTORY>	6R

(b) Select <DIRECTORY on the SATCOM MAIN MENU page: line key 6R

```
                SATCOM DIRECTORY
1L  <EMERGENCY                          1R
2L  <SAFETY                             2R
3L  <NON-SAFETY                         3R
4L  <PUBLIC                             4R
5L                                      5R
6L  <RETURN                             6R
```

(c) On the DIRECTORY page, pick the category subdirectory where the phone number has been stored according to its priority by pushing line key 1L, 2L, 3L, or 4L

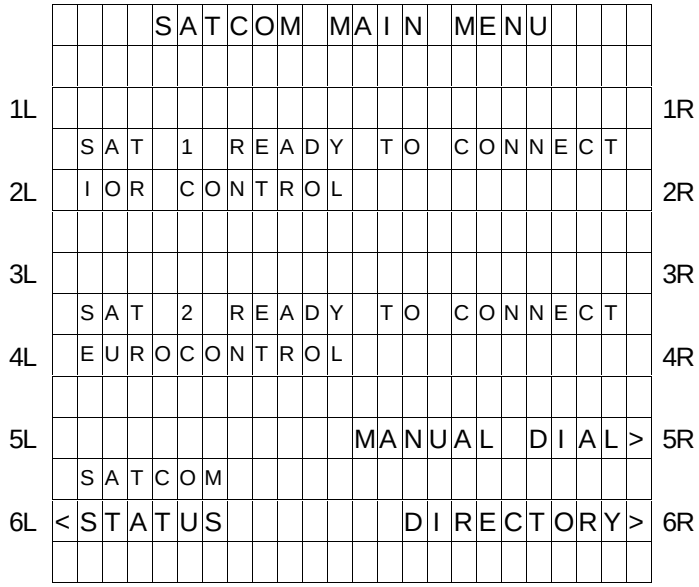
```
                SATCOM SAFETY      1/3
                                   SAT1/2
1L  *IOR  CONTROL                       1R
    0049521879621414
2L  *CDG  ARPT                          2R
    [0098564721336985]
3L  *HGK  ARPT                          3R
    0046321897521234
4L  *ORD  ARPT          SORT*           4R
    4533356722268
5L  *ORY  ARPT          FIND*           5R
    [0044335662134]     [              ]
6L  <RETURN                             6R
```

(d) On the CATEGORY NUMBER page, select the phone number by pushing the line key adjacent to desired called party (ex: IOR CONTROL). Related phone number is automatically selected and page returns to the SATCOM MAIN MENU page where the mnemonic of the number selected is displayed in small font with the mention "READY TO CONNECT".

Nota: There is possibility to change the default value of the channel number, for instance, on MCDU1, to override the default value (1), enter 2 in the scratchpad and then press 1R

2 appears in blue and large font on 1R 1ine.

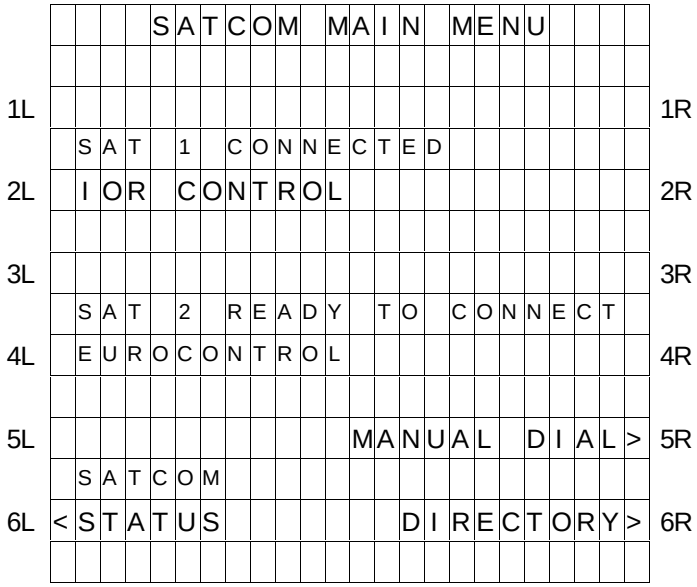
To return to the default value (1), press CLEAR on the MCDU keyboard (CLEAR is displayed in the scratchpad) and then press 1R select Key.



(e) Initiate the Call by selecting the associated Satcom channel transmission push button switch SAT1(SAT2) on the Audio Control Panel.

(f) On this push button switch, green line flashes during call establishment. When the call is established, the green lines become steady.

(g) On the MCDU SATCOM MAIN MENU, the phone number selected appears in large font with the mention "CONNECTED".



(3) Adding a phone number in the Directory

(a) Select Satcom menu from the MCDU.

(b) Select <DIRECTORY on the Satcom Main Menu Page: line key 6R

(c) Select the Category list where you want to store the number

(d) Go in the phone list on the last page of the category, where is displayed brackets prompting entry for a new phone number, including mnemonic

(e) Enter the phone number in the scratchpad.

Press the LSK in front of the brackets.

(f) Enter the number mnemonic and press the LSK in front of the brackets.

Nota 1: The pilot may enter the number and the number first or the mnemonic first .

Nota 2: a manually entered number is treated as unprotected and therefore modifiable and/or deletable through normal scratchpad usage.

C. Ground to Air Call Set-up (Figure 8)

Incoming calls to the flight crew are annusciated by the SELCAL chime (except if flight phase inhibition)

and on the ACP, by flashing of the CALL legend on SAT1 (SAT2) transmission pushbutton switch-on (steady).

Note: Pushing RESET pushbutton switch on ACP can stop chime and switch-off CALL legend.

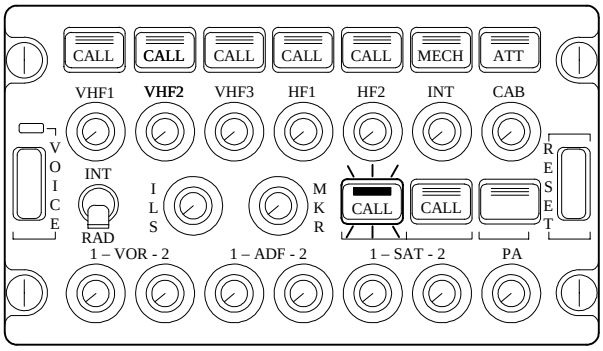
If the priority of the call is higher than 4, SATCOM ALERT is simultaneously displayed on the ECAM

(green memo)

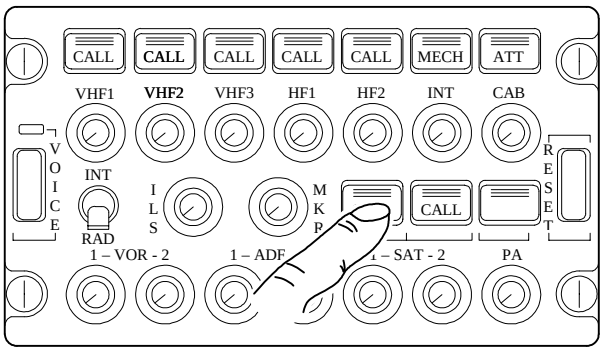
In addition on the SATCOM Main Menu GROUND TO AIR CALL is displayed

under the concerned channel (SAT1 or SAT2), with the associated priority.

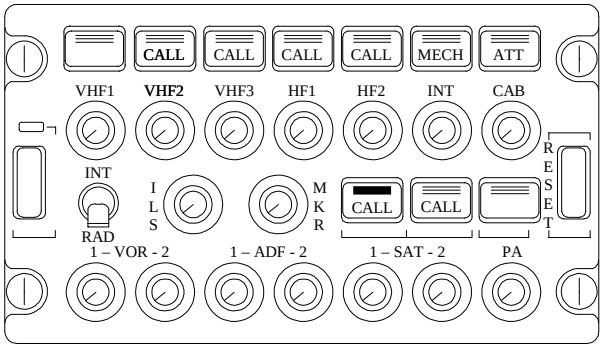
To answer the call, select the Satcom channel on the SAT1 (SAT2) on the ACP: The green line on SAT1 (SAT2) reception pushbutton switch on (steady).



CALL LIGHT FLASHING



SELECTION OF THE SATCOM CHANNEL



MIC LIGHT STEADY
(WHEN CALL IS ESTABLISHED)

Ground to AIR Call

Figure 8

D. HOLD function (Figure 9)

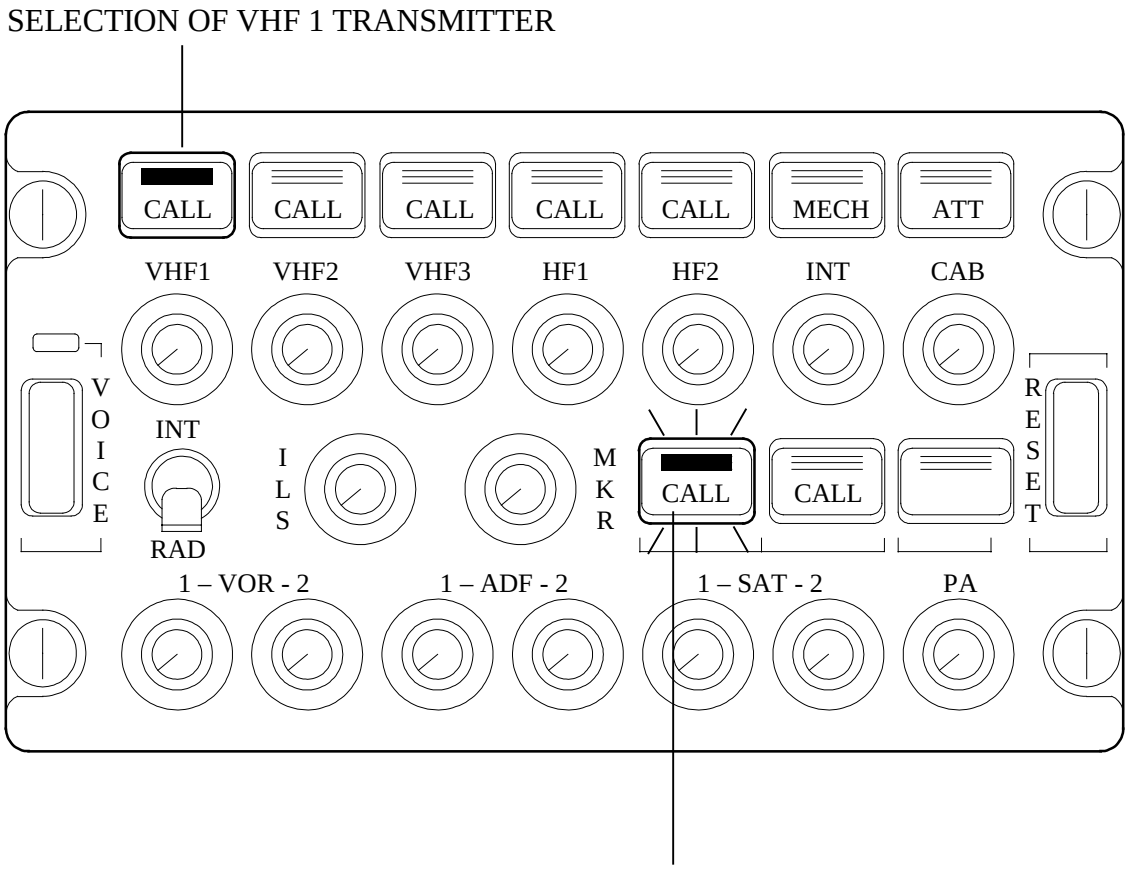
When a SATCOM Call is established (after air to ground call or ground to air call setup) on SAT1 (SAT2),the selection of another radio communication (HF or VHF) will cause the Audio Management Unit to switch audio transmission from the SDU to another radio (HF or VHF). On the ACP, the green lines on SAT1(SAT2) transmission pushbutton switch flashes and the green lines of the selected radio (HF or V~) switch on.

To return to the SATCOM call, reselect the SATCOM channel or deselect the same radio (HF or VHF) on the ACP.

Then the green lines ofthe selected radio (HF or VHF) transmission peshbutton switch off and the green

lines of SAT1 (SAT2) transmission pushbutton switch on (steady).

The AMU enables audio transmission to SDU.



HOLD Function

Figure 9

E. Call termination (Figure 10)

Air to ground call termination:

Two cases are possible:

Satcom call is established (not on HOLD)

Satcom call is established (on HOLD)

(1) Satcom call is established (not on HOLD) Reselect the Satcom channel on the ACP to stop the Satcom call: Satcom Mic light switches off

AMU disables audio transmission to SDU after 3 seconds.

The call is terminated.

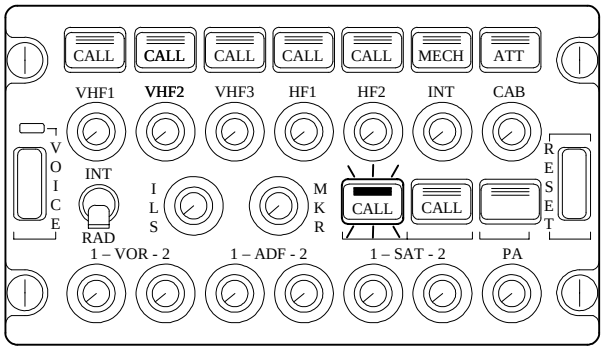
(2) Satcom call is established (on HOLD)

Two reselections of the Satcom channel on the ACP are necessary to stop the Satcom call. The first reselection brings back to case where SATCOM call is established, not on hold. The second selection of the Satcom channel on the ACP terminates the call.

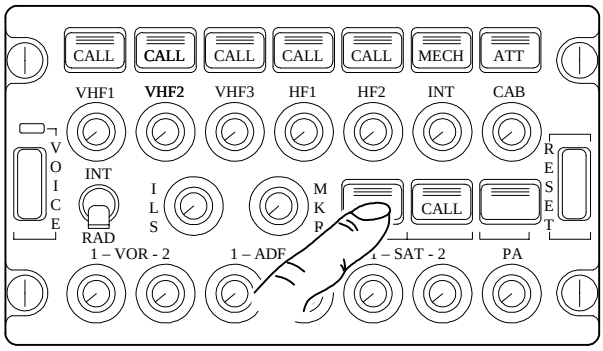
Ground to air call termination

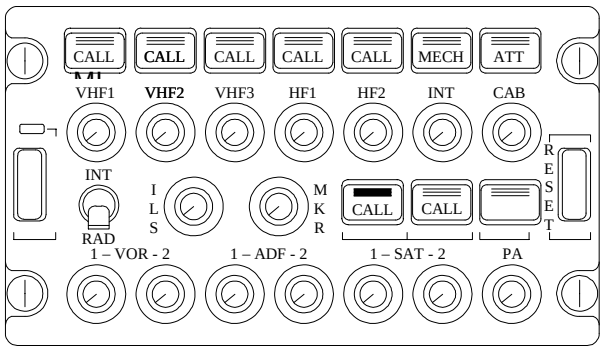
Satcom call is established (on HOLD or not on HOLD)

The call termination is initiated from the ground, the Satcom ACP Mic light (green bars) switch off.



MIC LIGHT STEADY





MIC LIGHT OFF

Call Termination

Figure 10

SYSTEM CONFIGURATION/INITIALIZATION

TABLE OF CONTENTS

LIST OF FIGURES

SYSTEM CONFIGURATION/INITIALIZATION

1. General

The system configuration is made either by a “stap option” configuration or by a SDU software configuration filling the SDU System Configuration Module / Table (SCM) see SCM paragraph.

The choice is made by the user, the “strap option” is the default method.

2. Strap option interface description

A. Physical interface

Forty discrete inputs define the system Configuration when the configuration origin (second Byte of System Configuration Module is written to the 0 logical state by the AES user, see chapter SDU tables, SCM section).

B. Function

(1) Availability of ICAO 24-bit Aircraft Address (AES ID) from ARINC 429 Ports Coding

Pin TP10A	Interpretation
1	ICAO 24-bit Aircraft Address (AES ID) not available from CMU #1 nor CMU #2 nor AES ID input
0	ICAO 24-bit Aircraft Address (AES ID) is available from CMU #1 or CMU #2 or AES ID input

(2) FMC Connection to SDU Coding

Pin		Interpretation
TP10B	TP10C	
0	0	FMC #1 connected, FMC #2 connected
0	1	FMC #1 connected, FMC #2 not connected
1	0	FMC #1 not connected, FMC #2 connected
1	1	Neither FMC connected

(3) ARINC 429 bus speed to/from CMU #1#2 Coding

Pin	Interpretation
TP10D	
0	High speed ARINC 429 bus
1	Low speed ARINC 429 bus

(4) Cabin Packet Data Function (CPDF)

Pin	Interpretation
TP10E	
0	CPDF installed
1	CPDF not installed

(5) ARINC 429 bus speed of AES ID Input Coding

Pin	Interpretation
TP10F	
0	High speed ARINC 429 bus
1	Low speed ARINC 429 bus

(6) Call Light Activation Coding

Pin TP10K	Interpretation
0	Call light On at call activation (for air/ground calls)
1	Call light On at call Connection (for air/ground calls)

(7) Strap parity (Odd)

Pin TP11A	Interpretation
0	Sum of all other straps set to 1 is Odd
1	Sum of all other straps set to 1 is Even

The Parity Pin is programmed to a zero or one to yield an odd number of strap bits set to the one state, including the Parity Pin itself.

(8) Cabin Communication System (CCS) Coding

Pin TP11B	Interpretation
0	CCS installed
1	CCS not installed

(9) IRS configuration Coding

Pin		Interpretation
TP11C	TP11D	
0	0	Primary IRS installed, Secondary IRS installed
0	1	Primary IRS installed, Secondary IRS not installed
1	0	Primary IRS not installed, Secondary IRS installed
1	1	Primary IRS not installed, Secondary IRS not installed

(10) HPA/Antenna subsystem Configuration

Pins TP11E to TP11K : Reserved for future application

(11) CFDS Type Coding

Pin			Interpretation
TP12A	TP12B	TP12C	
0	0	0	Undefined
0	0	1	McDonnell-Douglas Type CFDS
0	1	0	Airbus type CFDS
0	1	1	Honeywell CAIMS
1	0	0	Boeing Type CFDS
1	0	1	Undefined
1	1	0	Undefined
1	1	1	CFDS not installed

(12) SDU Configuration Coding

Pin	Interpretation
TP12E	
0	Second SDU installed
1	Second SDU not installed

(13) SDU number Coding

Pin	Interpretation
TP12F	
0	SDU #2
1	SDU #1

The state of this strap is “Don’t care” for a single SDU configuration

(14) CMU #1 Installed Coding

Pin TP12G	Interpretation
0	CMU #1 installed
1	CMU #1 not installed

(15) CMU #2 Installed Coding

Pin TP12H	Interpretation
0	CMU #2 installed
1	CMU #2 not installed

(16) MCDU #1 Installed Coding

Pin TP12J	Interpretation
0	MCDU #1 installed
1	MCDU #1 not installed

(17) MCDU #2 Installed Coding

Pin TP12K	Interpretation
0	MCDU #2 installed
1	MCDU #2 not installed

(18) Priority 4 Calls to/from cockpit

Pin TP13A	Interpretation
0	Allow Priority 4 Calls to/from cockpit
1	Inhibit Priority 4 Calls to/from cockpit

(19) ARINC 429 bus speed to MCDU #1#2#3

Pin TP13B	Interpretation
0	Low speed ARINC 429 bus
1	High speed ARINC 429 bus

(20) Cockpit voice call light/chime option Coding

Pin		Interpretation
TP13C	TP13D	
0	0	Spare
0	1	Steady lights & multi stroke chime
1	0	Flashing lights & single stroke chime
1	1	Steady lights & single stroke chime

The steady vs. flashing light option applies to the call annunciation phase only. The light remains on (steady) for the duration of the call after the acknowledgment of the annunciation with either the STEADY or FLASHING option.

(21) MCDU #3 Installed Coding

Pin TP13E	Interpretation
0	MCDU #3 installed
1	MCDU #3 not installed

(22) SDU CODEC 1 wiring Coding

Pin		Interpretation
TP13F	TP13G	
0	0	AMS wired, Cabin Audio wired
0	1	AMS wired, Cabin Audio not wired
1	0	AMS not wired, Cabin Audio wired
1	1	AMS not wired, Cabin Audio not wired

(23) SDU CODEC 2 wiring Coding

Pin		Interpretation
TP13H	TP13J	
0	0	AMS wired, Cabin Audio wired
0	1	AMS wired, Cabin Audio not wired
1	0	AMS not wired, Cabin Audio wired
1	1	AMS not wired, Cabin Audio not wired

(24) Cockpit hookswitch signaling method Coding

Pin	Interpretation
TP13K	
0	Switched PTT and/or SCDU line select switch
1	Latched audio control panel SATCOM Mic switch

3. SDU tables

A. System Configuration Module (SCM)

The aim of SCM is to define the system configuration only when Strap option pins are not wired on the SDU rack connector.

The SCM is configurable by means of :

– ADL if installed on the aircraft (ARINC 429)

– PDL if available, via the SDU front panel connector (ARINC 429)

– Portable maintenance device, via the SDU front panel connector (RS232)

Item	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Interpretation**
Version (*)	x	x	x	x	x	x	x	x	version identifier (6 bytes in ASCII format padded with blanks)
configuration origin (*)	0	0	0	0	0	0	0	0	**from this table**
	0	0	0	0	0	0	0	1	from discrete inputs (only for items with no asterisk)
External CTU presence	0	0	0	0	0	0	0	0	CTU connected
	0	0	0	0	0	0	0	1	**not connected**
Internal CTU presence (*)	0	0	0	0	0	0	0	0	Internal CTU connected
	0	0	0	0	0	0	0	1	**not connected**
IRS configuration	0	0	0	0	0	0	0	0	IRS 1 & 2 connected
	0	0	0	0	0	0	0	1	IRS 1 only connected
	0	0	0	0	0	0	1	0	IRS 2 only connected
	0	0	0	0	0	0	1	1	**no IRS connected**
MCDU configuration	0	0	0	0	0	x	x	0	MCDU 1 connected
	0	0	0	0	0	x	x	1	MCDU 1 not connected
	0	0	0	0	0	x	0	x	MCDU 2 connected
	0	0	0	0	0	x	1	x	MCDU 2 not connected
	0	0	0	0	0	0	x	x	MCDU 3 connected
	0	0	0	0	0	1	x	x	MCDU 3 not connected
MCDU bus speed	0	0	0	0	0	0	0	0	**High speed**
for output only	0	0	0	0	0	0	0	1	Low speed
CMU configuration	0	0	0	0	0	0	0	0	CMU 1 & 2 connected
	0	0	0	0	0	0	0	1	**CMU 1 only connected**
	0	0	0	0	0	0	1	0	CMU 2 only connected
	0	0	0	0	0	0	1	1	no CMU connected
CMU bus speed	0	0	0	0	0	0	0	0	**High speed**
	0	0	0	0	0	0	0	1	Low speed

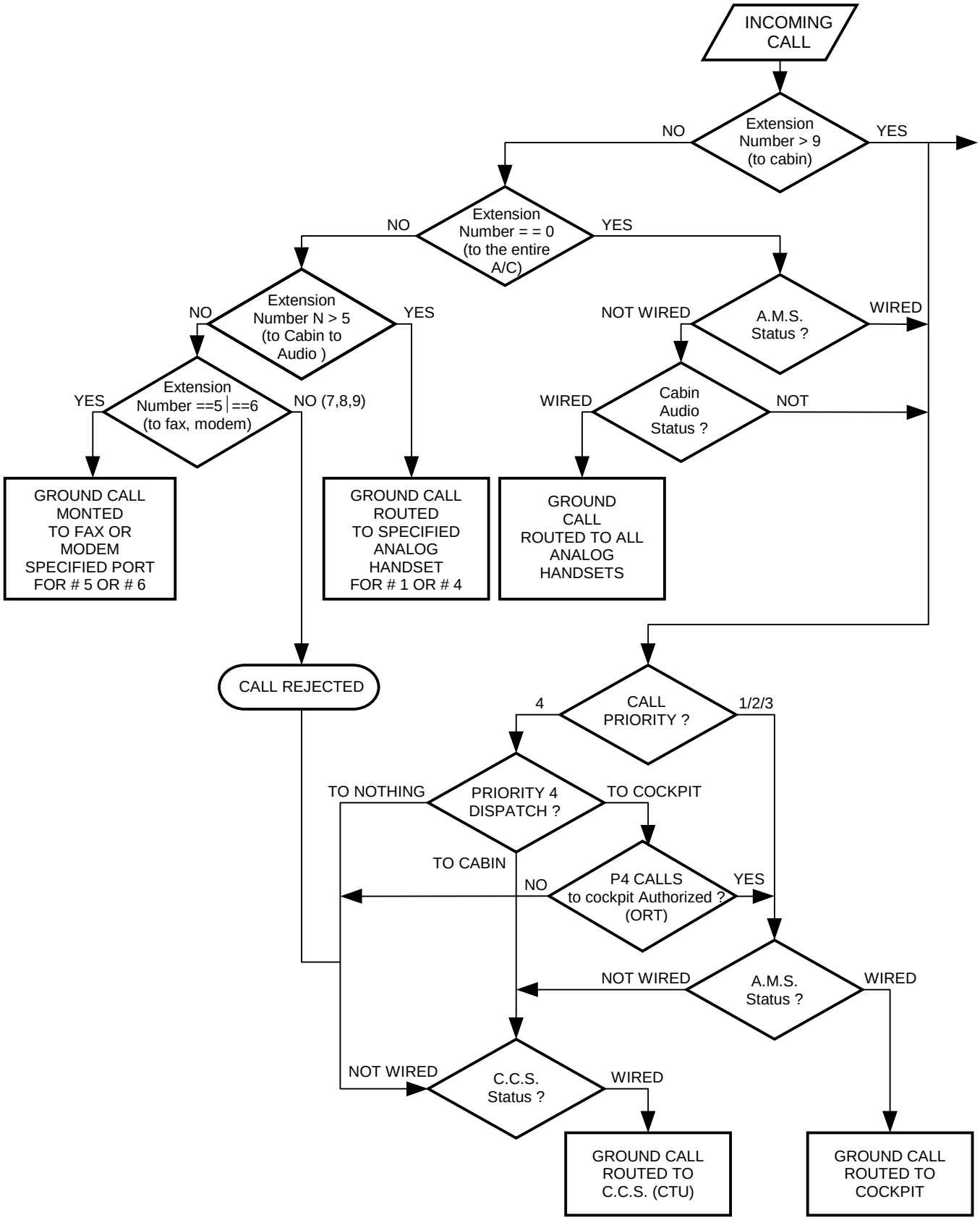
Item	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Interpretation**
CFDS configuration	0	0	0	0	0	0	0	0	undefined
	0	0	0	0	0	0	0	1	McDonnell-Douglas CFDS
	0	0	0	0	0	0	1	0	Airbus CFDS
	0	0	0	0	0	0	1	1	undefined
	0	0	0	0	0	1	0	0	Boeing CFDS
	0	0	0	0	0	1	0	1	undefined
	0	0	0	0	0	1	1	0	undefined
	0	0	0	0	0	1	1	1	**no CFDS connected**
CPDF configuration	0	0	0	0	0	0	0	0	CPDF connected
	0	0	0	0	0	0	0	1	**no CPDF connected**
FMC configuration	0	0	0	0	0	0	0	0	FMC 1 & 2 connected
	0	0	0	0	0	0	0	1	FMC 1 only connected
	0	0	0	0	0	0	1	0	FMC 2 only connected
	0	0	0	0	0	0	1	1	**no FMC connected**
RMP configuration (*)	0	0	0	0	0	0	0	0	RMP connected
	0	0	0	0	0	0	0	1	**no RMP connected**
APM configuration (*)	0	0	0	0	0	0	0	0	APM connected
	0	0	0	0	0	0	0	1	**no APM connected**
SDU configuration	0	0	0	0	0	0	0	0	second SDU installed
	0	0	0	0	0	0	0	1	**no second SDU**
SDU number	0	0	0	0	0	0	1	0	SDU 2
	0	0	0	0	0	0	1	1	**SDU 1**
Call light activation	0	0	0	0	0	0	0	0	at call initiation
	0	0	0	0	0	0	0	1	**at call connection**
Cockpit Voice Call Light/Chime option	0	0	0	0	0	0	0	0	flashing/multi stroke
	0	0	0	0	0	0	0	1	steady /multi stroke
	0	0	0	0	0	0	1	0	flashing/single stroke
	0	0	0	0	0	0	1	1	steady/single stroke
Cockpit Hook Switch Signalling option	0	0	0	0	0	0	0	1	switched PTT
	0	0	0	0	0	0	0	0	**Latch ACP SATCOM mic switch**
Priority 4 calls from cockpit option	0	0	0	0	0	0	0	0	inhibit priority 4 call from cockpit.
	0	0	0	0	0	0	0	1	**allow priority 4 call from cockpit.**
Telephony channel 1 wiring	0	0	0	0	0	0	0	1	**AMS wired**
	0	0	0	0	0	0	1	1	AMS not wired
Telephony channel 2 wiring	0	0	0	0	0	0	0	1	**AMS wired**
	0	0	0	0	0	0	1	1	AMS not wired
AES ID from ARINC 429	0	0	0	0	0	0	0	0	available
	0	0	0	0	0	0	0	1	**not available**
Fax/Data #1 directly connected to SDU (*)	0	0	0	0	0	0	0	0	**not available**
	0	0	0	0	0	0	0	1	connected for Fax mode
	0	0	0	0	0	0	1	0	connected for Data mode

Item	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Interpretation**
Fax/Data #2 directly connected to SDU (*)	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 1	0 1 0	**not available** connected for Fax mode connected for Data mode
WOW discrete input (*)	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 1	available **not available**
DLNA to antenna cable loss (*)	x	x	x	x	x	x	x	x	value in tenth dB (0 to 250)
HPA to DLNA cable loss (*)	x	x	x	x	x	x	x	x	value in tenth dB (0 to 250)
SDU to HPA cable loss (*)	x	x	x	x	x	x	x	x	value in tenth dB (0 to 250)
DLNA to SDU cable loss (*)	x	x	x	x	x	x	x	x	value in tenth dB (0 to 250)
Antenna TX gain threshold (*)	x	x	x	x	x	x	x	x	value in tenth dB (0 to 70)
HPA to DLNA cable loss (*)	x	x	x	x	x	x	x	x	value in tenth dB (0 to 250)

Note 1: Asterisk '*' beside any field name indicates that a pin programming (strap option) is not possible with that item.

Note 2 : Greased words correspond to basic configuration.

Note 3 : Routing of incoming calls is given hereafter.



Incoming calls routing

Figure 1

B. AES tables

AES includes 3 tables.

- The System Table
- The Owner/operator Requirements Table
- The Owner/operator Requirements phonebook

These tables can be modified in the same manner as the SCM.

(1) System Table (ST)

The system table contains data needed for the AES to establish initial communication and to perform the log-on procedure. The currency of the data in the ST is maintained by checking its version number and updating the table if there is a new current version. The update is automatically performed by the AES.

Each satellite region maintains its own ST and revision number. The AES cannot log-on in that region unless its ST is current. The content of the initial search data is the same for all regions.

Item	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Interpretation**
Version	x	x	x	x	x	x	x	x	version identifier (6 bytes in ASCII format padded with blanks)
Number of satellites	x	x	x	x	x	x	x	x	Number of satellite in this table (maximum value is 8)
for satellite id #0 :									information for AOR-W satellite
Satellite ident.	x	x	x	x	x	x	x	x	Satellite identifier
Satellite Name	x	x	x	x	x	x	x	x	Satellite name in ASCII on 8 bytes ended by a 0 termination field.
P-channel frequency #1	x	x	x	x	x	x	x	x	2 bytes (MSB first). value 0 if not provided.
P-channel frequency #2	x	x	x	x	x	x	x	x	2 bytes (MSB first) . value 0 if not provided.
Satellite longitude	x	x	x	x	x	x	x	x	2 bytes (MSB first) . value 0 if not provided.
for satellite id #1 :									information for AOR-E satellite
Satellite ident.	x	x	x	x	x	x	x	x	Satellite identifier

Item	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Interpretation**
Satellite Name	x	x	x	x	x	x	x	x	Satellite name in ASCII on 8 bytes ended by a 0 termination field.
P-channel frequency #1	x	x	x	x	x	x	x	x	2 bytes (MSB first). value 0 if not provided.
P-channel frequency #2	x	x	x	x	x	x	x	x	2 bytes (MSB first) . value 0 if not provided.
Satellite longitude	x	x	x	x	x	x	x	x	2 bytes (MSB first) . value 0 if not provided.
for satellite id #2 :									information for POR satellite
Satellite ident.	x	x	x	x	x	x	x	x	Satellite identifier
Satellite Name	x	x	x	x	x	x	x	x	Satellite name in ASCII on 8 bytes ended by a 0 termination field.
P-channel frequency #1	x	x	x	x	x	x	x	x	2 bytes (MSB first). value 0 if not provided.
P-channel frequency #2	x	x	x	x	x	x	x	x	2 bytes (MSB first) . value 0 if not provided.
Satellite longitude	x	x	x	x	x	x	x	x	2 bytes (MSB first) . value 0 if not provided.
for satellite id #3 :									information for IOR satellite
Satellite ident.	x	x	x	x	x	x	x	x	Satellite identifier
Satellite Name	x	x	x	x	x	x	x	x	Satellite name in ASCII on 8 bytes ended by a 0 termination field.
P-channel frequency #1	x	x	x	x	x	x	x	x	2 bytes (MSB first). value 0 if not provided.
P-channel frequency #2	x	x	x	x	x	x	x	x	2 bytes (MSB first) . value 0 if not provided.
Satellite longitude	x	x	x	x	x	x	x	x	2 bytes (MSB first) . value 0 if not provided.

When the AES leaves one region to enter another, the ST data of the region it has left is not discarded, but kept in reserve. On entering a new satellite region the stored ST segments are scanned to determine if the table data for that region is already present, and if so it is used. If not, the table data that has not been used for the longest time is discarded if necessary to accommodate the new table.

(2) Owner/operation Requirement Table (ORT)T

The ORT contains:

Item	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**	**Interpretation**
Version	x	x	x	x	x	x	x	x	version identifier (6 bytes in ASCII format padded with blanks)
Log-on policy	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 1	**automatic** manual (with MCDU)
order of preference of GES for log-on	x	x	x	x	x	x	x	x	Description in note 1 (next page)
Priority 4 (Public) calls dispatch.	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 1	0 1 0	**to cockpit** to cabin to nothing
ATC call register option	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 1	available **not available**
ATC call number	x	x	x	x	x	x	x	x	19 bytes in ASCII format beginning with ‘00’ ending with 0.
TEST call register option	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 1	**available** not available
TEST headset call number	x	x	x	x	x	x	x	x	19 bytes in ASCII format beginning with ‘00’ ending with 0.
New predefined number entry inhibition (in the phonebook)	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 1	**available** not available (inhibited)
Manual dial inhibition	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 1	**available** not available (inhibited)

Note 1: the preferred GES are stored as below :

Item	7	6	5	4	3	2	1	0	Interpretation
Number of preferred choices (a couple SAT/GES)									from 0 to 20
Satellite identifier #1	x	x	x	x	x	x	x	x	from 0 to 3 in the system table
GES identifier #1	x	x	x	x	x	x	x	x	from 0 to 255
GES name #1	x	x	x	x	x	x	x	x	in ASCII format on 12 bytes maximum, ended by a 0 termination field.
Satellite identifier #2	x	x	x	x	x	x	x	x	from 0 to 3 in the system table
GES identifier #2	x	x	x	x	x	x	x	x	from 0 to 255
GES name #2	x	x	x	x	x	x	x	x	in ASCII format on 12 bytes maximum, ended by a 0 termination field.

(3) Owner /operator Requirement Table Phonebook (ORTP)

The ORTP contains :

Item	7	6	5	4	3	2	1	0	Interpretation
Number of entries	x	x	x	x	x	x	x	x	The size of this table allows storage of 100 predefined numbers.
Priority of call number #1	0	0	0	0	0	0	0	0	end of table
	0	0	0	0	0	0	0	1	EMERGENCY number
	0	0	0	0	0	0	1	0	SAFETY number
	0	0	0	0	0	0	1	1	NON SAFETY number
	0	0	0	0	0	1	0	0	PUBLIC number
Protection of call number #1	0	0	0	0	0	0	0	0	**protected**
	0	0	0	0	0	0	0	1	not protected
Identification or acronym of call number #1	x	x	x	x	x	x	x	x	12 bytes in ASCII format ending with 0.
Call number #1	x	x	x	x	x	x	x	x	19 bytes in binary ASCII format beginning with ‘00’ 00 and ending with -10.

(M)CTU HANDSETS USER INSTRUCTIONS

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(M)CTU HANDSETS USER INSTRUCTIONS

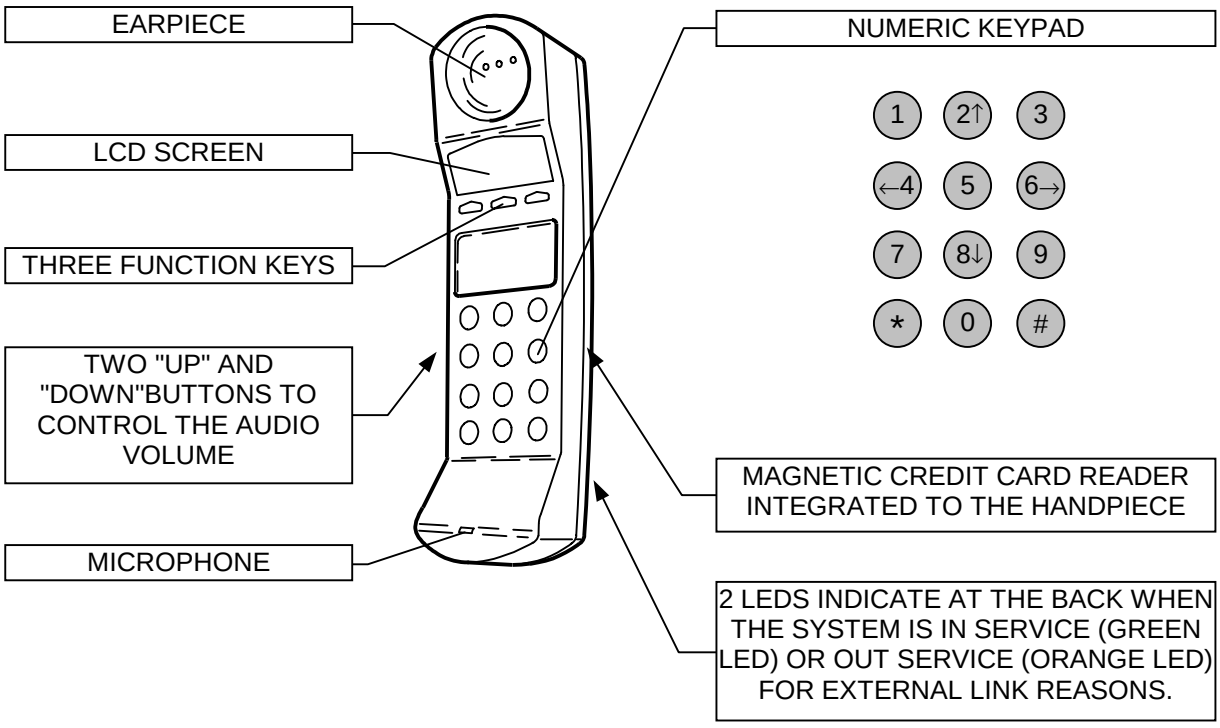
The MCTU (Mini CTU) integrated into the JETSAT SDU can handle up to until 32 digital handsets, while external CTU(s) can provide connection for up to 128 digital handsets per CTU.

MCTU and CTU installations are mutually exclusive.

CTU's can be chained to provide the number of handset connections requested by the user.

Only one MCTU can be installed in the SDU.

1. Handset Presentation



The following services are provided:

International calls (Direct Outward Dialling),

Seat-to-seat calls,

SATCOM incoming calls (Direct Inward Dialling),

Call Hold, Call Conference and Transfer,

Credit Card Calling (with possible registration),

Credit Card Validation,

Two languages: English and French,

Last Number Redial ("bis" function key),

Call Queuing,

Call Reattempt (automatic call retry),

Secondary Dialling,

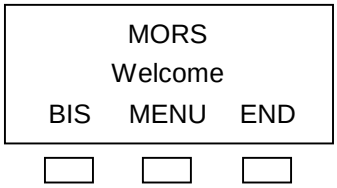
Administrator configuration with any handset.

2. User Functions

The functionalities and logic screenflows are the same for each language with only the text message being changed. For the purposes of this document, all screen messages are shown in English.

A. FUNCTION KEY LABELS

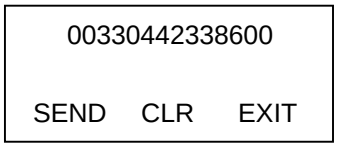
Labels for the three function keys located directly below the screen are provided on the last line on each screen message displayed. These labels vary depending on the functions carried out by the keys for each screen message.



B. ENTER CHARACTERS

To enter a character, the numeric keypad is used.

The CLR function key allows the passenger to clear the last digit of the number entered. The # key aliows e.g. the passenger to erase all the digits of the number entered.

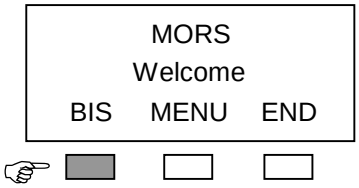


C. COMMON FUNCTIONS

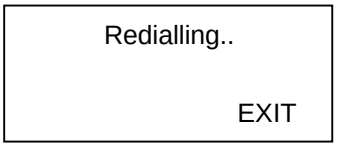
Some of the functions carried out by the keys for each screen message will always return the user the same message when the key is pressed. These functions are as follows:

(1) The BIS key (Last Number Redial)

The LCTU04 stores the last number dialled, as well as some payment card details to enable the caller to redial the same number.



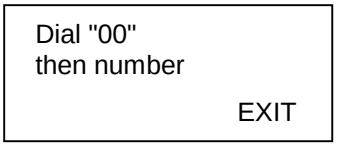
The last number is redialled by pressing the BIS function key.



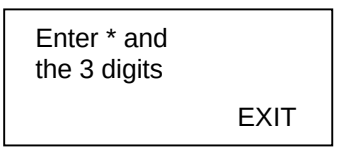
(2) The HELP key (Dialling help)

The HELP key gives dialling information to the user.

When the user is entering an international number, he has to dial first the international prefix « 00 », the country code (e.g. 33 for France), area code minus the leading 0 and the destination number.

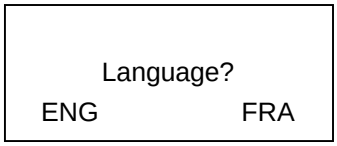


When the user is entering a seat-to-seat number, he has to dial first the « * » character, then the 3 digits of the extension number.



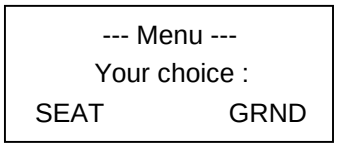
(3) The MENU key

The MENU key always return the user to the languages menu screen.



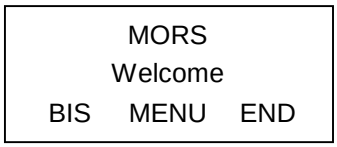
(4) The NEW key

If the NEW function key is pressed, the passenger ends his call and the possibility to dial again without swiping his card is given to him. The menu screen is displayed.



(5) The EXIT key

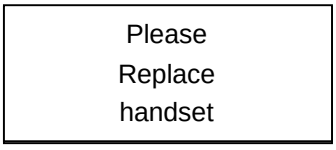
The EXIT key always returns the user to the welcome screen.



(6) The END key (End session)

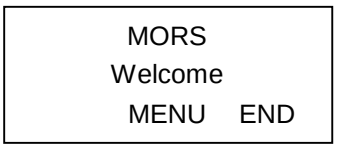
This function allows the passenger to end his session at any time, including whilst in the queue, by pressing the END key on the handset. The END key will discontinue current system processes, clear payment card data, clear the last number entered.

If the handset is hanged up without using this key, then the act of placing the handset into the holster will activate this function. Otherwise the following screen is displayed, inviting the passenger to hang up.



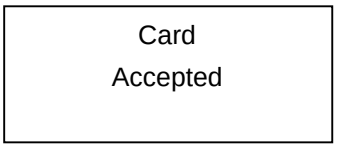
D. THE WELCOME SCREEN

When the system is available, all the handsets display the following welcome screen.

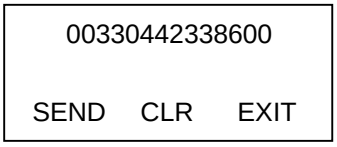


From the welcome screen, the passenger has the following possibilities:

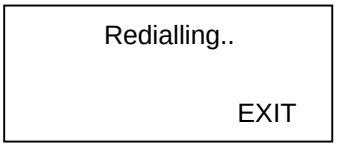
The passenger can swipe his payment card, and if accepted, will not have to swipe it again. Otherwise the payment card will be asked by the system to the user if the current call requires it.



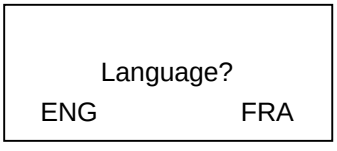
If the passenger presses the « 0 » button (to dial an international number) or the « * » button (to dial a seat-to-seat number), the screen will change to the following dial screen with the value of the pressed key displayed on the screen.



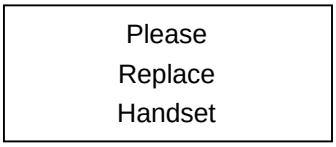
If the BIS function key is available, by pressing it, the last number is redialled.



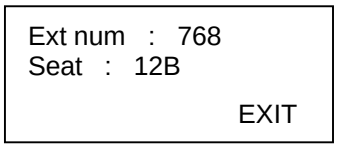
If the MENU function key is pressed, the screen will change into this language menu screen.



If the END function key is pressed, the screen will change and the passenger will end his session.

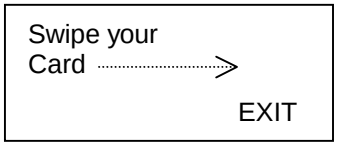


If the «# » key is pressed, user's informations are displayed on the screen (extension number and seat number).

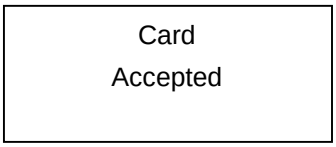


E. PAYMENT CARD ACCEPTANCE

During the same session, the payment card has to be swiped once.

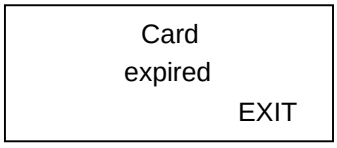


From the welcome screen, if the passenger swipes his card, the "card accepted" screen is displayed for a period of two seconds and then it returns to the previous screen.

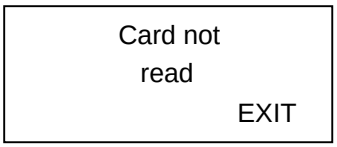


Otherwise an error screen is displayed. Some cases exist where a payment card may be rejected. In these cases the following screens are displayed:

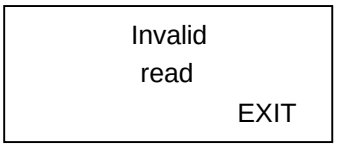
For expired cards:



If card swipe is detected but data is not read (e.g. swiped too fast):



For cards rejected for reasons other than those above the following default message is displayed:



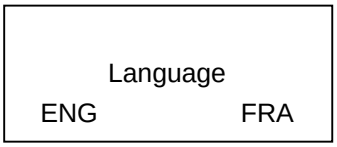
Note: Payment card informations can be recorded by the Administrator Configuration for any handset.

F. CHOOSE A LANGUAGE

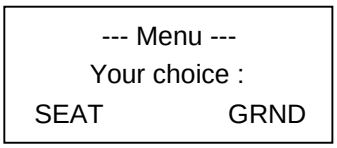
Two languages are available:

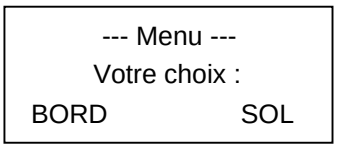
English by pressing the ENG function key,

French by pressing the FRA function key.



After having chosen the language, the usere's menu screen is displayed.





All screen messages will be shown in the chosen language.

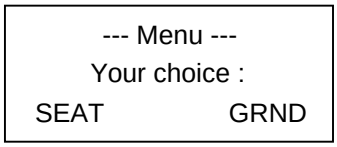
Note: The default language used for the screen messages is configurable by the administrator.

G. CHOOSE A COMMUNICATION

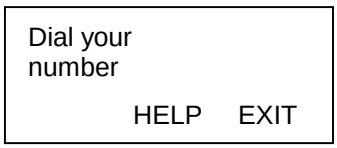
Two types of communication are available:

The seat-to-seat call with the SEAT function key,

The outcoming call to the ground with the GRND function key.



In the both cases the screen below is displayed, inviting the passenger to dial.

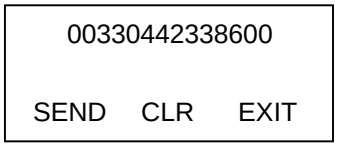


H. CALL ESTABLISHMENT

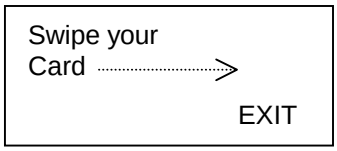
(1) Initiation of a call

The passenger can swipe his payment card from the welcome screen. He can also begin to dial from this screen, pressing "0" or "*" on the keypad. Otherwise, he can select the menu function and follow the instructions.

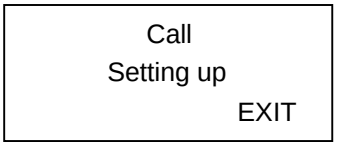
At the end of dialling, the SEND function key has to be pressed.



If the payment card has not yet been swiped and is required for the call, the following screen is displayed.



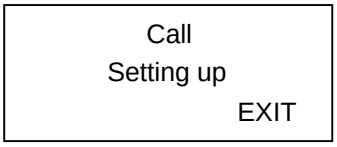
Otherwise the present message is displayed on the screen informing the passenger that the call is setting up.



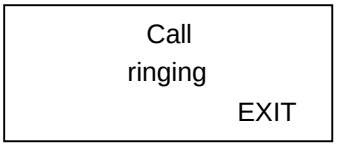
Note: Seat-to-seat calls do not need any payment card.

(2) Call establishment

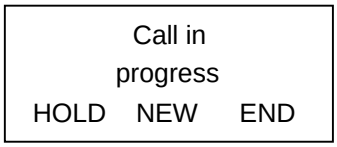
The call is setting up.



The following screen is displayed when the partner's phone is ringing.



When the call has been established, the following screen is displayed on the handset's screen.



The HOLD function key allows when pressed to hold the present call without disconnection, in order to call another caller.

If the NEW function key is pressed, the passenger ends the present call and the possibility to dial again is given to him.

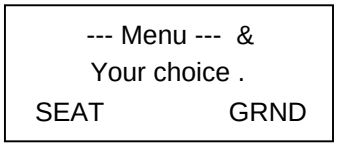
If the END function key is pressed, the passenger ends his session.

I. CALL HOLD, CALL CONFERENCE AND TRANSFER

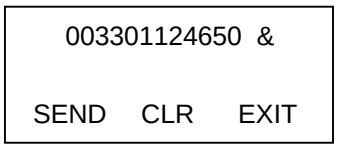
(1) Call Hold

The Call Hold functionality allows to hold a call without disconnecting it, in order to make another call.

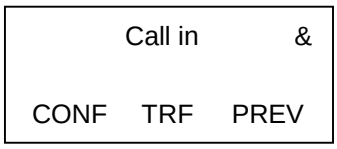
The menu screen is displayed, with the item "&" on the top right hand corner, signalling the user that a call is being held.



The second call is placed as the first one with the item "&" in the top right hand corner of each displayed screen.



When the second call is in progress, the screen below is displayed:



The CONF function key allows to enter in Call Conference (cf. next paragraph).

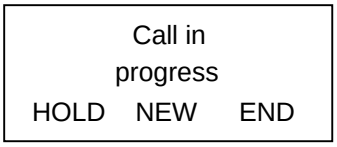
If the TRF function key is pressed, the passenger ends his calls and transfer the first call with the second one.

If the PREV function key is pressed, the second call is ended and the first connection is resumed.

Note: In case where the passenger loses one of the two connections, the remaining communication will be resumed (the "&" item will disappear and the function keys CONF/TRF/PREV replaced by HOLD/NEW/END).

(2) Call Conference

By pressing a first time on the CONF function key, the passenger creates a Call Conference with three partners. The "call in progress" message is yet displayed on the screen below:

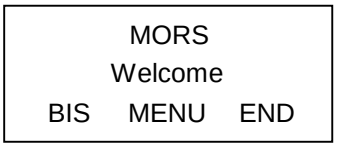


The user can perform this several times by proceeding as before to enable multi-person calls (up to five partners by conference). The LCTU04 can support up to 10 different conferences simultaneously and manage until 32 callers.

Note: If the user then hangs up, the other callers keep on talking via the Satcom/TFTS system.

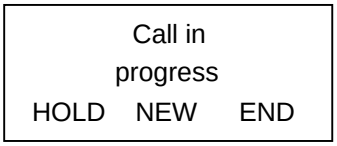
(3) Transfer

If the TRF function key is pressed, the passenger ends his call. The welcome screen is then displayed on his handset's screen. At the same time his two partners are both transferred and connected together. The welcome message is also displayed on the screen below:



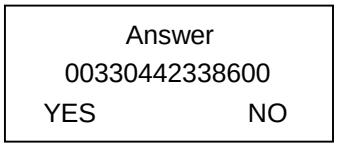
(4) Return to the previous call

If the PREV function key is pressed, the passenger ends his second call and is connected with the first caller back. The message displayed on the screen is:

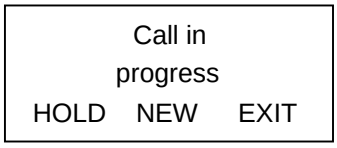


J. SATCOM INCOMING CALLS

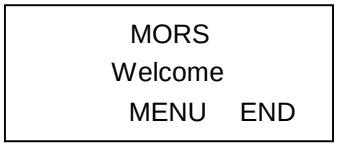
When a Satcom incoming call arrives, the following screen is displayed, with the handset ringing at the same time.



If the YES function key is pressed, the passenger accepts the call. The connection is made.



If the NO function key is pressed, the passenger refused the call. The welcome screen is then displayed.



K. SECONDARY DIALLING

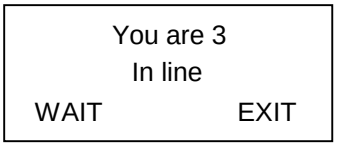
Passengers can generate touch tones from the handset keypad whilst a call is in progress (e.g. to access a mailbox or voice processing systems).

L. CALL QUEUING

In the case where the passenger's call is setting up and all available radio channels are occupied, the call attempt is placed on a call queue. Once on queue, calls are placed in the order in which they are placed in the queue (first in, first out) as radio channels become available.

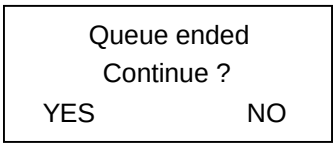
A queuing screen is displayed with the position in the queue.

When a radio channel becomes available, the new position in the queue is displayed on this screan:



When the call queues out, the passenger is advised by the ringing of his handset, and an informative screen is displayed.

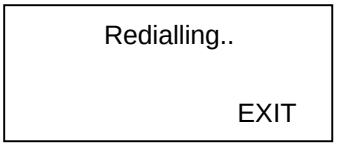
The passenger will be offered the option to proceed with or to terminate the call. When YES function key is pressed the call is set up, when NO function key is pressed, the welcome screen is displayed.



Note: If the passenger does nol answer within one minute, the call will be removed from the queue.

M. AUTOMATIC CALL REATTEMPT

In the event of a call attempt being disconnected by the system, the LCTU04 makes two repeat call attempts, with 30 seconds between each attempt.



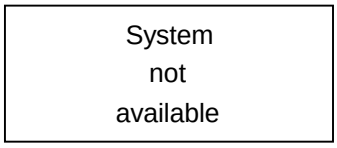
The following screen is then displayed.

3. System Failure Screen Messages

A. SYSTEM FAILURE SCREEN MESSAGES

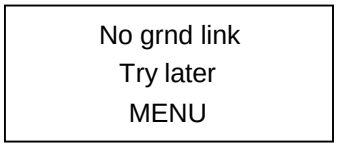
System failure

In the case of a system failure the following screen is displayed.



SATCOM/TFTS unavailable

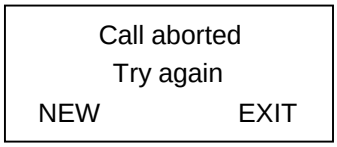
In the case where Satcom or TFTS is unavailable a "No ground link" screen is displayed.



The MENU function key allows to reach the user’s menu.

Call aborted

In the case where a call attempt fails or a call in progress is disconnected this message is displayed on the screen



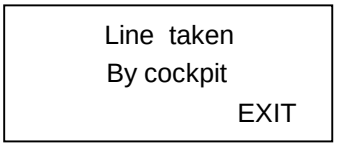
The NEW function key allows to reach the user’s menu.

The EXIT function key allows to return to the welcome screen.

B. SERVICE ANOMALY SCREEN MESSAGES

System disable

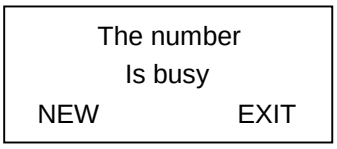
In the case where the system has been disabled by the cabin crew the following screen is displayed.



The EXIT function key allows to return to the welcome screen.

Number busy

In the case where the dialled number is busy, the following message is displayed.

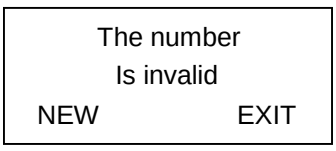


The NEW function key allows to reach the user's menu.

The EXIT function key allows to return to the welcome screen.

Invalid number

In the case where an invalid number has been dialled by the passenger and it has been rejected by either the LCTU04 or the ground network the following message is displayed on the screen.



The NEW function key allows to reach the user's menu.

The EXIT function key allows to return to the welcome screen.

4. Administrator Interface

The administrator interface provides a configurable database including the following:

For each handset:

Extension numbers,

Seat numbers,

Payment card informations,

Default language.

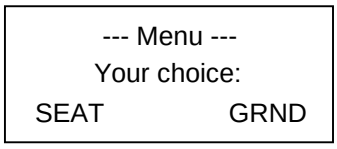
For the whole:

ATEI number (TFTS only),

Service Provider number.

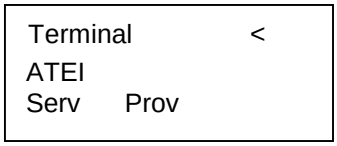
A. HOW TO ACCESS THE ADMINISTRATOR MENU

To access the administrator menu, it is necessary at first to stand in the user menu.



Then pressing the "1" and "3" buttons on the keypad together, followed by "0000" will be used as the administrator PIN code. The user will not be prompted to enter the "0000" PIN number.

Then the administrator menu is displayed as followed:

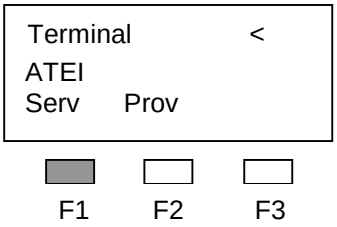


Note: Only one handset can access the menu administrator at the same time.

B. HOW TO USE THE ADMINISTRATOR INTERFACE

To make a choice

By pressing the keys "2" and "8", the cursor "<" on the screen will point at the previous or the next line respectively. To select the line's choice the F1 function key has to be pressed.



To select a handset

In the terminal menu, by pressing at each time on the "6" button, the selected handset is displayed on the screen.

To accept a choice

The acceptance of a choice is done by pressing the F1 function key.

To cancel a choice / Exit

The cancelling of a choice and the exit out of the administrator menu are done by pressing the F3 function key.

To clear the last digit

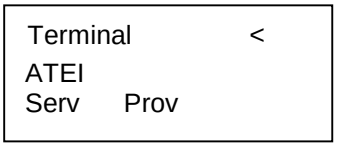
Press the "*" key.

To clear all the digits

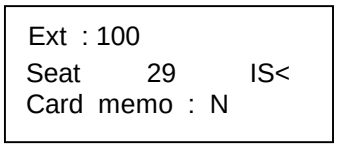
Press the "#" key.

C. TERMINAL MENU

In the administrator menu, when the cursor "<" points at the "Terminal" choice as below, press the F1 function key.



The terminal menu is then displayed on the screen:



The terminal menu includes the following choices of configuration:

Extension number configuration,

Seat number configuration,

Payment card registration,

Default language configuration.

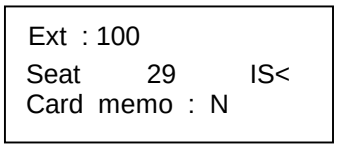
The last choice is displayed by scrolling the menu: the cursor has to reach the bottom of the screen.

NOTE: If the extension number has to be modified, it must be done before the seat number, the payment card registration or the default language, otherwise the current modifications will be lost.

(1) Extension number configuration

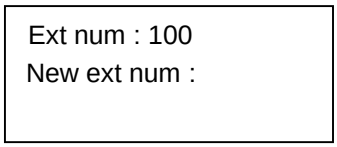
Select the terminal with the "6" key.

Select the choice "Ext" in the terminal menu.



The following screen is displayed:

Enter the new extension number and press F1.



"#" key to clear all digits

"*" key to clear the last digit

F3 function key to exit without saving

(2) Seat number configuration

Select the terminal with the "6" key.

```
Ext  : 100
Seat        29        IS<
Card  memo  :  N
```

The selected terminal can be "IS" (In Service) or "OS" (Out Service).

(a) Terminal In Service

Select the choice "Seat" in the terminal menu.

```
Ext  : 100
Seat        29        IS<
Card  memo  :  N
```

The following screen is displayed:

```
Seat        29        IS
New seat nb :
```

Enter the new seat number and press F1.

"#" key to clear all digits

"*" key to clear the last digit

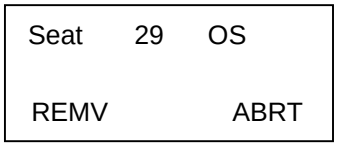
F3 function key to exit without saving

(b) Terminal Out Service

Select the choice "Seat" in the terminal menu.

```
Ext  : 100
Seat        29        OS<
Card  memo  :  N
```

The following screen is displayed:



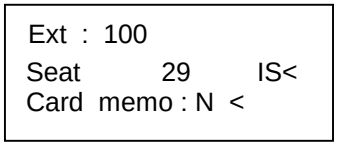
To remove the terminal'from the configuration, press the REMV function key.

To return to the previous screen without any modification, press the ABRT function key.

(3) Payment card registration

The choice of recording the payment card informations for a given terminal handset is also available.

Select the terminal with the "6" key.



The "card memo" states of a selected terminal are the following:

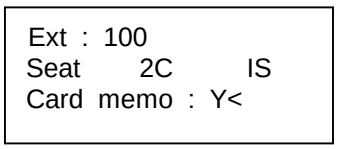
"Y" (Yes) if a payment card is already used for the selected terminal handset.

"N" (No) if no payment card is used.

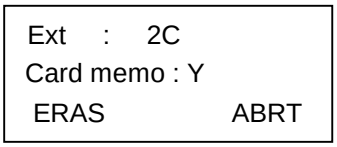
"!" (test) for maintenance mode (do not use).

(a) To erase the payment card informations

Select the choice "Card memo" in the terminal menu.



The following screen is so displayed:

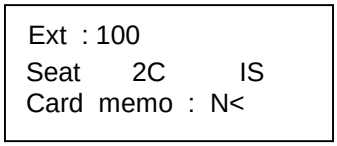


To erase the payment card informations, press the ERAS function [key.

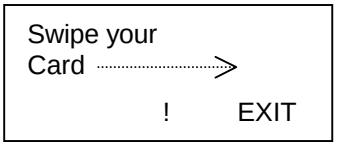
To return to the previous screen without any modification, press the ABRT function key.

(b) To record a payment card

Select the choice "Card memo" in the terminal menu.



The following screen is displayed:



The administrator can swipe the payment card for the selected terminal

If accepted the payment card informations are recorded and always available for the given terminal

If refused an error message screen is displayed and a new try is possible

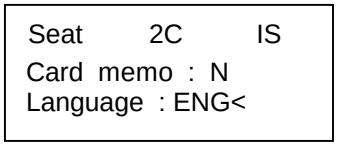
To return to the previous screen without any modification, press the EXIT function key.

To enter in maintenance mode press "!" function key (do not use).

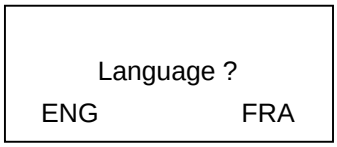
(4) Default language configuration

Select the terminal with the "6" key.

Select the choice "Language" in the terminal menu by scrolling.



The following screen is so displayed:

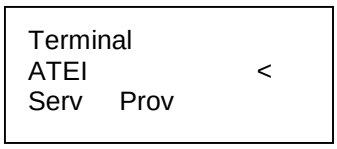


Select the default language by pressing one of the two ENG or FRA functions keys (ENG for English or FRA for Francais).

D. ATEI NUMBER CONFIGURATION (TFTS ONLY)

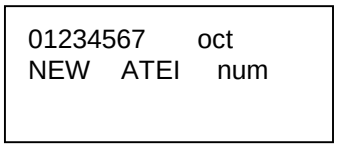
This configuration is available in TFTS mode only.

Select the choice "ATEI" in the administrator menu.



The following screen is displayed:

Enter the new ATEI number (octal) and press F1.



"#" key to clear all digits

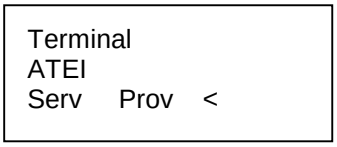
"*" key to clear the last digit

F3 function key to exit without saving

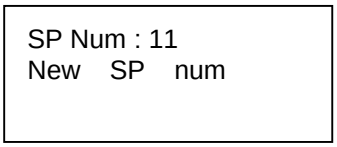
E. SERVICE PROVIDER CONFIGURATION

Select the choice "Serv Prov" in the administrator menu.

The following screen is displayed:



Enter the new Service Provider number and press F1.



"#" key to clear all digits

"*" key to clear the last digit

F3 function key to exit without saving

BASIC MAINTENANCE USER GUIDE

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BASIC MAINTENANCE USER GUIDE

1. Built In Test Equipment (BITE) policy

JETSAT BITE policy is as follow:

All JETSAT LRUs BITE status are available on the SDU front panel and at the SDU /CFDS output port.

HLD, IGA have no display and report their BITE status to the SDU.

The SDU performs it own self test (including Power up BIT and Continous BIT), commands the HLD and IGA PBIT and control the HLD and IGA CBIT.

The SDU performs the time stamping and the recording of all the JETSAT LRU failures.

A level is attributed to each failure or error, depending on the impact of the failed function on the system behavior and the type of error (permanent or temporary). Error levels are displayed on the SDU front panel screen, there are three levels of error :

- FATAL :**JETSAT** is inoperable
- ESSENTIAL :**JETSAT** is operable but a function may be not available
- NO ESSENTIAL :**JETSAT** is operable with all the functions (only a temporary default has been detected)

Note : The field “NO ERROR” is not an error indication

Time stamping of each error is done, including power up errors, thanks to a backup calendar clock (with a battery backup device).

A. Power on BIT (PBIT)

The PBIT process begins performing internal tests of the SDU.

It tests items such as :

- Memory resources
- All hardware interfaces : the hardware provides capabilities to isolate most of the external links (ARINC 429, CEPT-E1 links, …) from the external word and to connect outputs with inputs, allowing loop-back tests.

– Power supply

Note : the serial lines and the discrete inputs/outputs are not tested during PBIT. The connections with other LRUs or items through serial lines are dynamically monitored by CBIT.

The PBIT process collects the PBIT results of the other units of **JETSAT** (HLD, IGA, …). This procedure permits to control the links and to perform the synchronization with these units.

B. Continuous BIT (CBIT)

The SDU CBIT status is updated every 10 seconds. For SDU optional interfaces (eg. IRS #2 or MCDU #3), only those declared active in the system configuration table are checked. The CBIT of the other ones is declared UNKNOWN.

The CBIT process also collects, every 10 seconds, the CBIT results of the other units of **JETSAT**. This procedure permits to control both the units and their connections with the SDU.

Principle is : The SDU sends a core CBIT request and waits for the responses. In case of no response the operation is repeated.

If no response is received after two attempts, the connection is declared inactive and a fault is declared in the CBIT report.

C. BIT recording

In volatile memory : the last PBIT or CBIT report is available for consultation.

In non volatile memory : a PBIT event is generated each time a failure is detected. This event includes:

– unit/item identifier,

– the status and the cause associated.

A CBIT event is generated each time a change is detected (failure appearance or disappearance, …).

This event includes:

– the LRU/SRU identifier,

– the status and the cause associated.

D. Fault annunciation

(1) PBIT fault annunciation

During PBIT computation the SDU status LED is flashing. All the failures are sent on the maintenance RS232 serial lines if the SDU is in test mode.

The front panel display also allows to consult the PBIT results and the system information.

SATCOM PBIT Status	System information : SATCOM operability	system information : SATCOM fail warning	discrete output STATUS : SATCOM inoperable	discrete output STATUS : SATCOM fail warning	STATUS LED
FATAL and at least one item status set to ESSENTIAL	INOPERABLE	YES	TRUE	TRUE	steady
FATAL and no item status set to ESSENTIAL	INOPERABLE	NO	TRUE	FALSE	steady
ESSENTIAL	OPERABLE	YES	FALSE	TRUE	switched off
NO ESSENTIAL	OPERABLE	NO	FALSE	FALSE	switched off
NO ERROR	OPERABLE	NO	FALSE	FALSE	switched off

(2) CBIT fault annunciation

All the changes in CBIT status are sent on the maintenance RS 232 line if the SDU is in the test mode. In case of change in the **JETSAT** status, this one is displayed on the front panel screen.

Even if the **JETSAT** status is set to FATAL, the application is not stopped because this status may change. A lost link may be re-established with an external system.

SATCOM CBIT Status	System information : SATCOM operability	system information : SATCOM fail warning	discrete output STATUS : SATCOM inoperable	discrete output STATUS : SATCOM fail warning	STATUS LED
FATAL and at least one item status set to ESSENTIAL	INOPERABLE	YES	TRUE	TRUE	steady
FATAL and no item status set to ESSENTIAL	INOPERABLE	NO	TRUE	FALSE	steady
ESSENTIAL	OPERABLE	YES	FALSE	TRUE	switched off
NO ESSENTIAL	OPERABLE	NO	FALSE	FALSE	switched off
NO ERROR	OPERABLE	NO	FALSE	FALSE	switched off

E. Front panel display system

The front panel display system forms the main interactive interface with the maintenance operator.

It is used to display operational parameters and permits easy in-line maintenance diagnostics. The mnemonics used (12 alpha numeric characters) are easily understandable.

The display is organized in different menu levels.

(1) Display / Menu operations

The menu operation is of the rolling type.

The display back light is switched of when not used so to access the menu functions when the LCD display is not lighted, the operator must press any SDU front panel push-button.

This automatically active the back light and selects the item displayed in relation with the button which has been pushed.

From a random display status, the operator has to push the ” EXIT” button three times to be sure to access one of the first level menus. To access other first level menus the operator must then press either the + or - push-button (this rolls forth and back all the first level menus available).

There are six first level menus so called “main menus”:

- MAINTENANCE
- CBIT
- PBIT
- VERSIONS
- CONFIG (stands for configuration)
- LRU P/N S/N

The selected main menu is the one which the name is currently displayed.

To access the second level menus (so called sub-menus) or the items stored in the selected main menu, the operator must press the “SELECT“ push-button.

When the operator has reached this second level menu or the item level, he may select one of them by pressing the + or – push-buttons.

To go back to the higher level menu, the operator must press the “EXIT” push-button.

Push button name	Action when pushed
SELECT	Quit the current menu level to access the lover menu level.
+	Display the next item in the current menu
-	Display the previous item in the current menu
EXIT	Quit the current menu level to access the greater menu level.

(2) Display format

The name of a menu is displayed on the top line of the screen, while an optional information can be displayed on the second line. The menu name is preceded by an asterisk (*) on the display top line to identify it as a menu name versus an item name.

An item name is displayed on the display first line but without asterisk , while its associated value (if any) is displayed on the second line.

All the wording is in English language.

Column nb	1	2	3	4	5	6	7	8	9	10	11	12
Top line	*	M	A	I	N	.	M	E	N	U		
Bottom line	V	A	L	U	E							

(3) Menus description

First level or mains menus

Menu names (display top line)	Information (second line)	Description or possible value
* MAINTENANCE	Log-on status	LOGGED ON NOT LOGGED ON LOGON REJECTED
* CBIT	BITE status	CBIT results.
* PBIT	BITE status	PBIT results.
* VERSIONS	none	software version of all the SRU of the system..
* CONFIG	none	Configuration tables, including versions.
* LRU PN/SN	none	LRUs part and serial numbers.

(a) List of items in the MAINTENANCE menu

Item name (display top line)	value (display second line)	description
SATCOM Opera.	OPERABLE INOPERABLE	SATCOM Operability.
SATCOM Fail	FAILURE NO FAILURE	SATCOM Fail Warning.
SATCOM Statu	CHANNEL AVAILABLE NO CHANNEL AVAILABLE	SATCOM Status.
Cabin Voice	AVAILABLE NOT AVAILABLE	Cabin Voice Availability.
Cockp. Voice	AVAILABLE NOT AVAILABLE	Cockpit Voice Availability.
Packet Data	AVAILABLE NOT AVAILABLE	Packet Data Availability.
Packet Data LS	AVAILABLE NOT AVAILABLE	Packet Data Low Speed Only Availability.
PMD Tx rate	from 0 to 4800 bit/s	Packet Mode Data transmit bit rate.
PMD Rx rate	from 0 to 4800 bit/s	Packet Mode Data receive bit rate.
Link ready	READY NOT READY UNKNOWN	System information SATCOM Link Status.

Item name (display top line)	value (display second line)	description
LOG-ON reject cause	Not rejected or Code of rejection cause	See log-on rejection cause code table hereafter
AES Class	number (1 to 4) or UNKNOWN	system information AES Class.
Satellite id	AOR-W, AOR-E, IOR, POR or UNKNOWN	Identification of one of the four satellites the AES is linked with.
Ges id	GES ident.number or UNKNOWN	Identification of the GES where the AES is logged
Spot beam id	Spot beam ident. Number or UNKNOWN	Identification of the spot beam where the AES is logged
Aircraft id	ICAO address or UNKNOWN	Aircraft ID. (ICAO address)
AES Longitud	AES Longitude in degree and minute	
AES Latitude	AES Latitude in degree and minute	
WOW	TRUE FALSE UNKNOWN	A/C Weight On Wheel information.
MOTION SENSOR	ON OFF UNKNOWN	A/C MOTION SENSOR information.
Cumulative Hours	Number in hour (max 1,000,000)	Cumulative SDU Functional Hours.

Log-on rejection cause code table

CODE	Meaning
0	Log on table full
1	Req. Voice channel Char. Not available
2	Invalid log on parameters
3	Fixed network congestion/failure
4	Spare
5	Invalid satellite ID
6	Invalid GES ID
7	P-/R-/T Channels not available
8	Packet-mode data service not available
9	AERO-I global C-channel service not enabled
10	Req. VCC and data services not available
11-13	Spare
14	Other unspecified reason
15	AES not authorized
80 H	No signal received from satellite
81H	No signal received from GES
82H	Loss of global beam P-channel
83H 84H 85H	Loss of spot beam P-channel AES outside coverage of selected GES Selected GES not present in system table

CODE	Meaning
86H	No satellite initial search data available
87H	User commanded log off
88H	AES class changed
89H	GES not accepted by AES

(b) List of CBIT submenus

The CBIT menu includes five sub menus which allow the user to consult the CBIT status of the SDU SRUs and from the other system LRUs.

SRU/LRU ID (display top line)	Information (second line)	description
* HIN	status	SDU HINAV board CBIT Status.
* CM	status	SDU Core Module CBIT Status.
* HLD	status	HLD CBIT Status.
* IGA	status	IGA CBIT Status.
* CTU	status	CTU CBIT Status.

The operator may select an element, and enter a new sub menu, to consult the CBIT status of all its items.

Item name (display top line)	Information (second line)	description
XXXXXX	status	The selected item CBIT Status.

List of items in CBIT HIN sub menu

Item name	Comments / description
Power supply	HINAV BOARD power supply voltage
E1 CTU link	HINAV to / from CTU CEPT E1 link test
E1 TX ERROR	Error detected in HINAV to CTU CEPT E1 link
E1 RX ERROR	Error detected in CTU to HINAV CEPT E1 link
RS FPD LINK	RS 232 serial link test TBC
CM LINK	Core module / HINAV RS232 link test
CM TX ERROR	Error detected in HINAV to Core Module RS link
CM RX ERROR	Error detected in Core Module to HINAV RS link
RS CTU LINK	HINAV / CTU RS232 Serial link test
RS CTU TX ERROR	Error detected in HINAV to CTU RS232 Serial link
RS CTU RX ERROR	Error detected in CTU to HINAV RS232 Serial link

List of items in CBIT CM submenu

Item name	Comments / description
013	
016	
030	
031	
032	

List of items in CBIT HLD submenu

Item name	Comments / description
ACU TEMP	HLD Antenna Command Unit Temperature
ACU INT ROM	HLD ACU internal ROM
ACU INT RAM	HLD ACU internal RAM
IGA LINK	HLD/IGA link test
PSU VOLTAGE	HLD PSU output voltages test
PSU TEMP	HLD PSU temperature test
HLD BITE	HLD BITE status
RF POWER IN	HLD HPA RF input level test
VSWR OUT	HLD RF IGA output port VSWR test.
LNA BITE	HLD Low Noise Amplifier BITE
011	
012	

List of Items in CBIT IGA submenu

Item name	Comments / description
NUM DATA LINK	IGA/HLD DATA LINK test
TEMP	IGA Temperature test
CPU INT ROM	IGA CPU internal RAM
CPU INT RAM	IGA CPU internal ROM
STEERING FCT	IGA Beam steering function test

List of Items in CBIT CTU submenu

Item name	Comments / description
E1 SAT LINK	SDU/ CTU CEPT E1 serial link test

(c) List of PBIT submenus

The PBIT menu includes five sub menus which allow to consult the PBIT status of the SDU SRUs and the other system LRUs.

Title (display top line)	Information (second line)	description
* HIN	status	SDU HINAV board PBIT Status.
* CM	status	SDU Core Module PBIT Status.
* HLD	status	HLD PBIT Status.
* IGA	status	IGA PBIT Status.
* NRS	status	NRS PBIT Status.

The operator may select an element, and enter a new sub menu, to consult the CBIT status of all its items.

Item name (display top line)	Information (second line)	description
XXXXXX	status	The selected item CBIT Status.

List of items in PBIT HIN submenu

Item name	Comments / description
CM RX ERROR	HINAV/Core module link RX test

List of items in PBIT CM submenu

Item name	Comments / description
005	
006	
007	
027	
028	
029	
030	
031	
032	
043	
063	

List of items in PBIT HLD submenu

Item name	Comments / description
ACU TEMP	HLD Antenna Command Unit Temperature
ACU INT ROM	HLD ACU internal ROM
ACU INT RAM	HLD ACU internal RAM
IGA LINK	HLD/IGA link test
PSU VOLTAGE	HLD PSU output voltages test
PSU TEMP	HLD PSU temperature test
HPA TEMP	HLD BITE temperature test
HPA BITE	HPA BITE
RF POWER IN	HLD HPA RF input level test
VSWR OUT	HLD RF IGA output port VSWR test.
LNA BITE	HLD Low Noise Amplifier BITE
011	
012	

List of Items in PBIT IGA submenu

Item name	Comments / description
TEMP	IGA Temperature test
CPU INT ROM	IGA CPU internal RAM
CPU INT RAM	IGA CPU internal ROM
STEERING FCT	IGA Beam steering function test
005	

List of Items in PBIT NRS submenu

Item name	Comments / description
UNKNOWN	

(d) List of items in VERSIONS menu

The VERSIONS menu includes five items.

LRU name (display first line)	Information (second line)	description
HIN	Version ID	
CM	Version ID	
HLD	Version ID	
IGA	Version ID	
NRS	Version ID	

(e) List of CONFIG submenus

The CONFIGURATION menu includes two sub menus which allow to consult the version of the tables.

Title (display top line)	Information (second line)	description
* SCM	Version if any, or MISSING (if no SCM in PROM)	SDU Configuration Module SCM table identifier (6 digits)
* ORT	Version if any, or MISSING (if no ORT in PROM)	AES Owner/operator Configuration Table SCM table identifier (6 digits)

The operator may select a table, and enter a new sub menu, to consult its parameters.

Item name (display top line)	Information (second line)	description
name of configuration parameter	text associated to value of parameter	

List of items in CONFIG. SCM submenu

Item	**Comments/ description**
Conf. origin	from table or strap opt
Internal CCS	Internal or External
CCS presence	connected not connected
IRS 1 config	Connected or Not connect.
IRS 2 config	Connected or Not connect.
MCDU1 config	Connected or not connect.
MCDU2 config	Connected or not connect.
MCDU3 config	Connected or not connect.
MCDU speed	High speed Low speed
CMU 1 config	Connected or not connect.
CMU 2 config	Connected or not connect.
CMU speed	High speed Low speed
CFDS config	no CFDS conn or TBD

Item	**Comments/ description**
CPDF config	connected no connect.
FMC 1 config	Used or Unused
FMC 2 config	Used or Unused
RMP config	Used or Unused
APM config	Used or Unused
STU config	2nd STU no 2nd SDU
STU number	STU 2 STU 1
Call light	initiation connection
Light option	Flashing steady
Chime option	Multi stoke Single stroke
Switch option	switched PTT Latch ACP
Priority 4	inhibit allow
Tel chann. 1	Only AMS No AMS
Tel chann. 2	Only AMS No AMS
AES id	Available or from discret
Fax/Data #1	not available
Fax/Data #2	not available
WOW discrete	Connected Not connect.
HLD-Ant C.L.	value in tenth dB (0 to 250)
HLD-HLD	0
SDU-HLD	value in tenth dB (0 to 250)
HLD-SDU	value in tenth dB (0 to 250)
Ant Tx gain	0
Ckp Rx gain	value in tenth dB (0 to 250)
Ckp Tx gain	value in tenth dB (0 to 250)
Ckp SD gain	Off On
Hanset-CFDS	Yes No

List of items in CONFIG. ORT submenu

Item	**Comments/ description**
Logon policy	automatic manual
order of preference of GES for log-on	Description in note 1 (next page)
P.4 Dispatch.	to cockpit to CCS to nothing
ATC reg opt	Used Unused
ATC number	19 bytes in ASCII format beginning with '00' ending with 0.
TEST register Opt	available not available
TEST number	19 bytes in ASCII format beginning with '00' ending with 0.
Pred nb inhi	Available not available
Manual dial	available not available
Answer delay	XX secondes
AES pos rep	Yes NO
Sat id #00	Number
Ges id #00	Number
Ges name #00	Name of GES
Priority #00	Number
Sat id #01	Number
Ges id #01	Number
Ges name #01	Name of GES
Priority #01	Number
Sat id #n	Number
Ges id #n	Number
Ges name #n	Name of GES
Priority #n	Number

(f) List of LRU PN/SN submenus

The LRU PN/SN menu is organized in 3 sub menus

LRU type (display top line)	Information (second line)	description
*SDU	None	
*HLD	None	
*ANTENNA	None	

List of items in LRU PN/SN SDU submenu

Item (display top line)	Information (second line)	description
Software P/N		
Hardware P/N		
Hardware S/N		

List of items in LRU PN/SN HLD submenu

Item (display top line)	Information (second line)	description
Software P/N		
Hardware P/N		
Hardware S/N		

List of items in LRU PN/SN IGA submenu

Item (display top line)	Information (second line)	description
Software P/N		
Hardware P/N		
Hardware S/N		

F. Automatic display mode

This paragraph describes what is displayed on the SDU front panel screen in automatic display mode that means when there is no action from the operator.

Note: The sequence described hereafter occurs only when no failures or errors are detected, the sequence is different when failures or errors are detected and the messages displayed in this case are different and in accordance with the failures or errors detected.

Standard display sequence at system power up

During start up system automatic internal tests a vendor or manufacturer message of the following type is displayed (text can vary from one vendor to an other):

THOMSON CSF
DETEXIS

After functional tests are performed the PBIT status is automatically displayed.

*PBIT
NO ERROR

Then the system automatically switches to the maintenance menu and displays:

*MAINTENANCE
Tuning GES

Then the system automatically switches to the CBIT menu and displays:

*CBIT
NO ERROR

Then the system automatically switches to the maintenance menu and displays:

*MAINTENANCE
LOGGED ON

Once JETSAT is in the normal operation mode, if there is a failure or error detected the corresponding error or failure CBIT message is displayed.

Note : After roughly half a minute of no operator action the display back light is switched off.

SDU INTEGRATED MAINTENANCE TERMINAL MENU

TABLE OF CONTENTS

SDU INTEGRATED MAINTENANCE TERMINAL MENU

1. Scope

This section provides a description of the SDU maintenance interface available on the RS232 line.

This description applies to the menues displayed on the Maintenance Terminal when connected to the RS232 maintenance serial line on either the front panel or the rear part.

The Maintenance Terminal is PC based (Terminal mode).

2. SDU main menu description

The following is the SDU main menu display:

```
HINAV Main Menu
    ===============
  1  display BIT report
  2  display events and modify options
  3  display statistics
  4  display system data
  5  display C channels state
  6  display configuration
  7  display calls state
  8  display discrete inputs state
  c  enter transparent mode with CTU
  f  cfds menu
  d  display debug data
  t  Specific Test Menu (!!! for test only)
  u  upload software or configuration tables
?
```

The following paragraphs describe each of the items of the SDU main menu.

A. Display report

The following sub-menu is displayed:

```
BIT consultation menu
     ----------------------
  a : PBIT consultation only elements status
  b : PBIT consultation all items
  c : PBIT consultation all items page by page
  d : CBIT consultation only elements status
  e : CBIT consultation all items
  f : CBIT consultation all items page by page
 <RETURN> : to quit
?
```

The following paragraphs describe each of the items of the BIT menu.

(1) PBIT consultation only elements status

```
PBIT System Status : FATAL
==========================

PBIT Elem HIN  Status : FATAL         Soft Release : V2.b   Nb items : 41
-------------

PBIT Elem CM   Status : UNKNOWN       Soft Release :  Nb items :  0
-------------

PBIT Elem HLD  Status : UNKNOWN       Soft Release :  Nb items :  0
-------------

PBIT Elem IGA  Status : UNKNOWN       Soft Release :  Nb items :  0
-------------

PBIT Elem NRS  Status : UNKNOWN       Soft Release :  Nb items :  0
-------------

PBIT Elem CTU  Status : NO ERROR      Soft Release : 3.3    Nb items :  5
-------------
```

(2) PBIT consultation all items

```
PBIT System Status : FATAL
==========================

PBIT Elem HIN  Status : FATAL          Soft Release : V2.b   Nb items : 41
-------------
  Item CONFIG SCM     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item CONFIG ST      Status : NO ERROR      Cause :      0 (0000)    0   0
  Item CONFIG ORT     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item SDU PN/SN      Status : NO ERROR      Cause :      0 (0000)    0   0
  Item PHONE BOOK     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item POWER SUPPLY   Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR TX CMU      Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX CMU1     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX CMU2     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR TX CROSS    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX CROSS    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX UNUS1    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR TX MCDU     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX MCDU1    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX MCDU2    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR TX CPDF     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX MCDU3    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX CPDF     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR TX CFDS     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX FMC1     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX CFDS     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR TX APDL     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX ADL      Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX PDL      Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR TX RMP      Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX FMC2     Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX RMP      Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR TX UNUS1    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX UNUS2    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item AR RX UNUS3    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item E1 TX ERROR    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item E1 RX ERROR    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item CODEC CKPIT1   Status : NO ERROR      Cause :      0 (0000)    0   0
  Item CODEC CKPIT2   Status : NO ERROR      Cause :      0 (0000)    0   0
  Item CODEC TSTHDS   Status : NO ERROR      Cause :      0 (0000)    0   0
  Item CM TX ERROR    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item CM RX ERROR    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item CM LINK        Status : FATAL         Cause :      1 (0001)    0   1

  Item RS CTU TX ER   Status : NO ERROR      Cause :      0 (0000)    0   0
  Item RS CTU RX ER   Status : NO ERROR      Cause :      0 (0000)    0   0
  Item RS CTU LINK    Status : NO ERROR      Cause :      0 (0000)    0   0

PBIT Elem CM   Status : UNKNOWN        Soft Release :  Nb items :  0
-------------

PBIT Elem HLD  Status : UNKNOWN        Soft Release :  Nb items :  0
-------------

PBIT Elem IGA  Status : UNKNOWN        Soft Release :  Nb items :  0
-------------

PBIT Elem NRS  Status : UNKNOWN        Soft Release :  Nb items :  0
-------------

PBIT Elem CTU  Status : NO ERROR       Soft Release : 3.3    Nb items :  5
-------------
  Item E1 SAT LINK    Status : NO ERROR      Cause :      0 (0000)    0   0
  Item S0 1 LINK      Status : NO ERROR      Cause :      0 (0000)    0   0
  Item S0 2 LINK      Status : NO ERROR      Cause :      0 (0000)    0   0
  Item S0 3 LINK      Status : NO ERROR      Cause :      0 (0000)    0   0
  Item S0 4 LINK      Status : NO ERROR      Cause :      0 (0000)    0   0
```

(3) PBIT consultation all items page by page

Idem as for all items, with a prompt at each page change:

```
...Press q to quit, or any key to continue ?
```

(4) CBIT consultation only elements status

```
CBIT System Status : UNKNOWN
====================

CBIT Elem HIN  Status : UNKNOWN       Nb items :  0
-------------

CBIT Elem CM   Status : UNKNOWN       Nb items :  0
-------------

CBIT Elem HLD  Status : UNKNOWN       Nb items :  0
-------------

CBIT Elem IGA  Status : UNKNOWN       Nb items :  0
-------------

CBIT Elem NRS  Status : UNKNOWN       Nb items :  0
-------------

CBIT Elem CTU  Status : UNKNOWN       Nb items :  0
-------------
```

(5) CBIT consultation all items

```
CBIT System Status : UNKNOWN
====================

CBIT Elem HIN  Status : UNKNOWN       Nb items :  0
-------------

CBIT Elem CM   Status : UNKNOWN       Nb items :  0
-------------

CBIT Elem HLD  Status : UNKNOWN       Nb items :  0
-------------

CBIT Elem IGA  Status : UNKNOWN       Nb items :  0
-------------

CBIT Elem NRS  Status : UNKNOWN       Nb items :  0
-------------

CBIT Elem CTU  Status : UNKNOWN       Nb items :  0
-------------
```

(6) CBIT consultation all items page by page

```
..Press q to quit, or any key to continue ?
```

B. Display events and modify options

The following sub-menu is displayed:

```
Events consultation menu
     ------------------------
  a : non volatile events consultation by page
  b : non volatile events consultation all at a time
  c : clear non volatile events
  d : volatile events consultation by page
  e : volatile events consultation all at a time
  f : clear volatile events
  g : modify automatic display options of volatile events
  h : modify event log options of volatile events
  i : invalid all volatile events log
  j : restart all volatile events log
  k : toggle date display option (complete <-> only hours)
 <RETURN> : to quit
?
```

The following paragraphs describe each of the “event’s option” menu.

(1) Non volatile events consultation by page

```
02s333  EVT END of INIT with PBIT status : FATAL
( 236) 00h01m02s157  EVT PBIT :
  Elem : HIN Item : CM LINK       Status : FATAL        Cause :      1 (0001)
( 235) 00h00m00s000  EVT START application
( 234) 17h26m49s514  EVT STOP application RESET OR WATCH-DOG  info : 0
 --> Last running task -->
( 233) 17h24m17s334  EVT CBIT :
  Elem : HIN Item : RS FPD LINK   Status : NO ESSENTIAL Cause :      3 (0003)
( 232) 17h24m17s334  EVT CBIT :
  Elem : HIN Item : AR CFDS  LNK  Status : ESSENTIAL    Cause : 65535 (ffff)
( 231) 17h24m17s334  EVT CBIT :
  Elem : HIN Item : AR MCDU2 LNK  Status : ESSENTIAL    Cause : 65535 (ffff)
( 230) 17h24m17s334  EVT CBIT :
  Elem : HIN Item : AR MCDU1 LNK  Status : ESSENTIAL    Cause : 65535 (ffff)
( 229) 17h24m07s334  EVT END of INIT with PBIT status : NO ERROR
( 228) 17h24m07s248  EVT WOW UNAVAILABLE  latit : UNKNOWN  longit : UNKNOWN
...Press q to quit, p for previous, n for next, or any key to continue ?
```

(2) Non volatile events consultation all at a time

Idem at the previous bu without any prompting.

(3) Clear non volatile events

The following warning is displayed:

```
Are you sure you want to clear non volatile events (y/n) ?
```

(4) Volatile events consultation by page

Idem as for non-volatile events.

(5) Volatile events consultation all at a time

Idem as for non-volatile events.

(6) Clear volatile events

Idem as for non-volatile events.

(7) Modify automatic display options of volatile events

The following bus-menu allows to toggle the options (ON/OFF).

```
Automatic Display Options
     --------------------------
  a : E1 : Messages (with CTU)      OFF
  b : E1 : Errors in dialog         OFF
  c : CTU : CCL Messages            OFF
  d : CTU : ECL Messages            OFF
  e : CATS Automaton                OFF
  f : CATS Errors                   OFF
  g : CATS Call Trace               OFF
  h : COTS Automaton                OFF
  i : COTS Automaton Errors         OFF
  j : COTS Call Trace               OFF
  k : STBUS connections             OFF
  l : CM : CALL Messages            OFF
  m : CM : SYSTEM Messages          ON
  n : CM : BITE Messages            OFF
  o : CM : DATA Messages            OFF
  p : CM : Erroneous Messages       OFF
  q : Omnitel messages              OFF
  r : RS422 CTU : Messages          OFF
  s : RS422 CTU : Errors            OFF
  t : CFDS                          OFF
  u : MCDU                          OFF
  v : ARINC Transmit                OFF
  w : ARINC Receive                 OFF
  x : EDX tasking (send / receive) OFF
  y : Global Error Messages         ON
 <RETURN> : to quit
```

(8) Modify event log options of volatile events

The following bus-menu allows to toggle the options (ON/OFF).

```
Event Log Options
     ------------------
  a : E1 : Messages (with CTU)      OFF
  b : E1 : Errors in dialog         OFF
  c : CTU : CCL Messages            OFF
  d : CTU : ECL Messages            OFF
  e : CATS Automaton                OFF
  f : CATS Errors                   OFF
  g : CATS Call Trace               OFF
  h : COTS Automaton                OFF
  i : COTS Automaton Errors         OFF
  j : COTS Call Trace               OFF
  k : STBUS connections             OFF
  l : CM : CALL Messages            OFF
  m : CM : SYSTEM Messages          OFF
  n : CM : BITE Messages            OFF
  o : CM : DATA Messages            OFF
  p : CM : Erroneous Messages       OFF
  q : Omnitel messages              OFF
  r : RS422 CTU : Messages          OFF
  s : RS422 CTU : Errors            OFF
  t : CFDS                          OFF
  u : MCDU                          OFF
  v : ARINC Transmit                OFF
  w : ARINC Receive                 OFF
  x : EDX tasking (send / receive)  OFF
  y : Global Error Messages         OFF
 <RETURN> : to quit
```

(9) Invalid all volatile events log

Re-display the “events consultation menu”.

(10) Restart all volatile events log

Re-display the “events consultation menu”.

(11) Toggle date display option (complete <-> only hours)

Re-display the “events consultation menu”.

C. Display statistics

The following bus-menu is displayed:

```
Statistics consultation menu
     ----------------------------
  a : E1 CTU link statistics
  b : ARINC links statistics
  c : RS232 Core Module link statistics
  d : RS422 CTU link statistics
  e : RS232 FPD link statistics
 <RETURN> : to quit
?
```

(1) E1 CTU link statistics

```
E1 link statistics
 Transmit :
  Tries       : 0
  OK          : 0  with 0 FIFO loading under interrupt
  Underrun    : 0
 Receive :
  OK          : 0
  Overflow    : 0
  Bad Packet  : 0
  Length      : 0
  Alignment   : 0
  Lost        : 0
```

(2) ARINC link statistics

```
ARINC link with CMU
 Transmit        :   OK  :        0  Lost        :        0
 Receive CMU 1   :   OK  :        0  Overflow    :        0  Parity err :        0
 Receive CMU 2   :   OK  :        0  Overflow    :        0  Parity err :        0
ARINC link with CPDF
 Transmit        :   OK  :        0  Lost        :        0
 Receive         :   OK  :        0  Overflow    :        0  Parity err :        0
ARINC link with MCDU
 Transmit        :   OK  :        0  Lost        :        0
 Receive MCDU 1  :   OK  :        0  Overflow    :        0  Parity err :        0
 Receive MCDU 2  :   OK  :        0  Overflow    :        0  Parity err :        0
 Receive MCDU 3  :   OK  :        0  Overflow    :        0  Parity err :        0
ARINC link with CFDS
 Transmit        :   OK  :    65668  Lost        :        0
 Receive         :   OK  :        0  Overflow    :        0  Parity err :        0
```

(3) RS232 Core Module link statistics

```
RS232 CM link statistics
 Transmit :
  OK          : 51
  lost        : 0
 Receive :
  OK          : 0
  Lost by DV  : 0
  Phys Error  : 0
  Prot Error  : 0
  Lost by CML : 0
```

(4) RS422 CTU link statistics

```
RS422 CTU link statistics
 Transmit :
  OK          : 1
  lost        : 0
 Receive :
  OK          : 0
  Lost by DV  : 0
  Phys Error  : 0
  Prot Error  : 0
```

(5) RS232 FPD link statistics

```
RS232 FPD link statistics
 Transmit :
  OK          : 0
  NOK (no IT) : 3
  lost        : 0
 Receive :
  OK          : 0
  Lost by DV  : 0
  Phys Error  : 0
```

D. Display system data

```
System Data :
=============
LOGON status :   NOT LOGGED   -  SATCOM Opera :   INOPERABLE
SATCOM Fail  :   NO FAILURE   -  SATCOM Statu : NO CH. AVAIL
Cabin Voice  :  UNAVAILABLE   -  Cockp. Voice :  UNAVAILABLE
Packet Data  :  UNAVAILABLE   -  Pack Data LS :  UNAVAILABLE
PMD Tx rate  :      UNKNOWN   -  PMD Rx rate  :      UNKNOWN
Link ready   :    NOT READY   -  Reject cause : NOT REJECTED
AES Class    :      UNKNOWN   -  Satellite id :      UNKNOWN
Ges id       :      UNKNOWN   -  Spot Beam id :      UNKNOWN
Aircraft id  :      UNKNOWN   -  AES longitud :      UNKNOWN
AES latitude :      UNKNOWN   -  WOW          :      UNKNOWN
Motion Sens. :          OFF   -  Cumul. Hours :          108
```

E. Display C channels state

```
C channels state :
==================
Channel  Status  BER  Use
   0       NOK    0
   2       NOK    0
   4       NOK    0
   6       NOK    0
```

F. Display configuration

```
Configuration tables consultation menu
      ---------------------------------------
  a : display SCM table
  b : display ST  table
  c : display ORT table
  d : display ORT Phone Book and Cockpit selected numbers
  e : LRU part number and serial number
 <RETURN> : to quit
?
```

(1) Display SCM table

```
SCM table :
===========
 Name : WITH MCDU AND CTU AND
Version      :                -   Conf. origin :   FROM TABLE
Internal CCS :     INTERNAL   -   CCS presence :     CONNECTED
IRS 1 config : NOT CONNECT.   -   IRS 2 config : NOT CONNECT.
MCDU1 config :    CONNECTED   -   MCDU2 config :    CONNECTED
MCDU3 config : NOT CONNECT.   -   MCDU speed   :    LOW SPEED
CMU 1 config : NOT CONNECT.   -   CMU 2 config : NOT CONNECT.
CMU 1 config : NOT CONNECT.   -   CMU 2 config : NOT CONNECT.
CPDF config  : NOT CONNECT.   -   FMC 1 config :       UNUSED
FMC 2 config :       UNUSED   -   RMP config   :       UNUSED
APM config   :       UNUSED   -   STU config   :   NO 2nd STU
STU number   :        STU 1   -   Call light   :   INITIATION
Light option :       STEADY   -   Chime option : SINGL STROKE
Switch optio :    LATCH ACP   -   Priority 4   :        ALLOW
Tel chann. 1 :  AMS & CABIN   -   Tel chann. 2 :   ONLY CABIN
ARS id       :   FROM ARINC   -   Fax/data #1  :  UNAVAILABLE
Fax/data #2  :  UNAVAILABLE   -   WOW discrete : NOT CONNECT.
HLD-Ant C.L. :            0   -   HLD-HLD C.L. :            0
SDU-HLD C.L. :            0   -   HLD-SDU C.L. :            0
Ant Tx gain  :            0   -   Ckp Rx gain  :         -6dB
Ckp Tx gain  :         6dB    -   Ckp SD gain  :          OFF
Handset-CFDS :          NO
```

(2) Display ST table

```
ST table :
==========
 Name : ST FROM TOOL           Version : V0.0
ident     Name     Freq 1   Freq 2   Longitude
  0      AOR_W      1000     2000      160
```

(3) Display ORT table

```
ORT table :
===========
 Name : ORT NEW
Version       :        1.0       -   Logon Policy :     AUTOMATIC
P.4 Dispatch :       UNUSED     -   ATC reg opti :       UNUSED
ATC number    :           00     -   TEST reg opt :     AVAILABLE
TEST number   :    123456789     -   Pred Nb Inhi :     AVAILABLE
Manual Dial   :    AVAILABLE     -   Answer Delay :            10
AES pos rep   :          YES

     Prefered GES list
Sat Id    GES Id        GES Name    Priority
   0       1 (001)    TICULE             2
   1       2 (002)    TATION             3
   2       3 (003)    PERE BIEN          1
   3       4 (004)    TICULE             0
```

(4) Display ORT Phone Book and Cockpit selected numbers

Redaction of this clause is delayed.

(5) LRU part number and serial number

```
LRU configuration :
===================
LRU            Software P/N     Hardware P/N     Hardware S/N
SDU            1501             HIN-012-58       2563
HLD            UNKNOWN          UNKNOWN          UNKNOWN
ANTENNA        UNKNOWN          UNKNOWN          UNKNOWN
```

G. Display calls state

```
Cockpit Calls state
-------------------
ckp :  1  state : (null)
ckp :  2  state : (null)
ckp :  3  state : NO PDL     :  ident :153  C channel :255  priority : 171

Cabin Calls state
-----------------
ref : 41  state : INIT
ref : 97  state : (null)                    ident :  5  C channel : 47
ref :190  state : CTU_OK                    ident :125  C channel :219
ref :126  state : `__ù                      ident :254  C channel :253
```

H. Display discrete inputs state

```
Discrete Inputs state
---------------------
MIC ON 1    : 0  END CALL 1 : 0  MIC ON 2    : 0  END CALL 2 : 0
MIC ON TH   : 1  END CAL TH : 0  RELAI E1    : 0  GND        : 0
CHIM INHIB : 0  CHIM RESET : 0  DUAL DIS    : 0  MOT. SENSOR: 0
DUAL SEL    : 0  NO ADL     : 1  NO PDL      : 1  OPTEST     : 0

STRAP Inputs state
----------------------
 TP10A  TP10B  TP10C  TP10D  TP10E  TP10F  TP10G  TP10H  TP10J  TP10K
   0      0      1      0      0      1      0      1      0      1
 TP11A  TP11B  TP11C  TP11D  TP11E  TP11F  TP11G  TP11H  TP11J  TP11K
   0      1      0      1      0      1      0      1      0      1
 TP12A  TP12B  TP12C  TP12D  TP12E  TP12F  TP12G  TP12H  TP12J  TP12K
   0      1      0      1      1      0      1      0      1      0
 TP13A  TP13B  TP13C  TP13D  TP13E  TP13F  TP13G  TP13H  TP13J  TP13K
   1      0      1      0      1      0      1      0      1      0
 MP11B (Motion Sensor Program Select) = 0
```

I. Enter transparent mode with CTU

If no CTU is connected, the following message is displayed:

```
!!! RS422 LCTU link not established
```

Otherwise the transparent mode is entered.

J. CFDS menu

```
CFDS menu
     ----------------------------
  a : display flight failure table
  b : display class 3 failure table
  c : display ground failure table
  d : display information received from CFDS
  e : erase all failure tables
 <RETURN> : to quit
?
```

(1) Display flight failure table

```
Flight Failure Table :
======================
Failure  : 228212 MCDU2(2CA2)/SDU(105RV1)
Date     : --- --    UTC    : ----
Leg  :  0    Class : 1      Aicraft ID : --------
Consolidated Still present
TSD  : 44E3 0000 0000 030F 0000 0000 1030

Failure  : 313234 CFDIU1(1TW)/SDU(105RV1)
Date     : --- --    UTC    : ----
Leg  :  0    Class : 3      Aicraft ID : --------
Consolidated Still present
TSD  : 44E3 0000 0000 030F 0000 0000 1010

Failure  : 228212 MCDU1(2CA1)/SDU(105RV1)
Date     : MAR 01    UTC    : 1140
Leg  :  0    Class : 1      Aicraft ID : ABCDEFG
Consolidated Still present
TSD  : 44A3 0000 0000 0301 0000 0000 0010

Failure  : 324900 WRG:CONFIG PIN PROG/SDU(105RV1)
Date     : FEB 18    UTC    : 1201
Leg  :  6    Class : 1      Aicraft ID : ABCDEFG
Consolidated No more present
TSD  : 1462 0200 8000 0001 0000 0000 0000
```

(2) Display class 3 failure table

```
Class 3 Failure Table :
=======================
Failure  : 313234 CFDIU1(1TW)/SDU(105RV1)
Date     : --- --    UTC    : ----
Leg  :  0    Class : 3      Aicraft ID : --------
Consolidated Still present
TSD  : 44E3 0000 0000 030F 0000 0000 1010
```

(3) Display ground failure table

```
Ground Failure Table :
======================
No failure
```

(4) Display information received from CFDS

```
Information received from CFDS :
================================
Storage command              = INVALID
Current Date                 = --- --
Current Time                 = ----
Flight Phase                 = 15
Aircraft ID                  = --------
Aircraft type                = Invalid
ATSU 1                       = Not Installed
ATSU 2                       = Not Installed
Start of current or last leg = --- 00
End of last leg              = --- 00
```

(5) Erase all failure tables

The following warning is displayed before to perform the action:

```
Are you sure you want to erase all failures (y/n) ?
```

K. Display debug data

The following sub-menu is displayed:

```
Debug data consultation menu
     ----------------------------
  a : display tasks state
  b : display partitions state
  c : display delays used
  d : display tasks stacks
  e : display CPU performances
  f : display Interrupts and Tasks duration
  g : dump memory
 <RETURN> : to quit
?
```

(1) Display tasks state

```
Tasks state :
=============
TID     Name              Current state
 0   TA_TIMER              CREATED
 1   TA_CML                NOT CREATED
 2   TA_COTS               NOT CREATED
 3   TA_CATS               NOT CREATED
 4   TA_FPD                CREATED
 5   TA_CBIT               NOT CREATED
 6   TA_SYS                NOT CREATED
 7   MCDU_CONNEXION        NOT CREATED
 8   MCDU_MANAGER          NOT CREATED
 9   TA_DIAL               CREATED
10   OMN_INIT              NOT CREATED
11   OMN_SM_SERVER         NOT CREATED
12   OMN_PH_SERVER         NOT CREATED
13   OMN_DL_SERVER         NOT CREATED
14   OMN_NS_SERVER         NOT CREATED
15   OMN_DATA_SERVER_A     NOT CREATED
16   OMN_DATA_SERVER_B     NOT CREATED
17   OMN_DATA_SERVER_C     NOT CREATED
18   TA_CTUL               NOT CREATED
19   TA_CFDS_FAILURES      CREATED
20   TA_CFDS_PROTOCOL      CREATED
```

(2) Display partitions state

```
Partitions state :
==================
PID  Block size  Block nb   Allocated  Max allocated
 0       1664         6       0 (  0%)      0 (  0%)
 1       1200        50       0 (  0%)      0 (  0%)
 2       1024        30       0 (  0%)      0 (  0%)
 3        600        30       0 (  0%)      0 (  0%)
 4        256        20       0 (  0%)      0 (  0%)
 5        128        50       0 (  0%)      0 (  0%)
 6         96       300       0 (  0%)      0 (  0%)
 7         64       100       0 (  0%)      0 (  0%)
 8         32       100       3 (  3%)      3 (  3%)
 9          8       400       0 (  0%)      0 (  0%)
VL          1     10240       0 (  0%)      0 (  0%)
```

(3) Display delays used

```
Delays use :
============
Current delays running :   1   Max delays simultaneously runing :   1
```

(4) Display tasks stacks

```
Current Task Running : TA_DIAL
Tid          Name           Initial SP  Current SP  Percent used   Lg used
  0   TA_TIMER              0021FAEC    0021FA90         5%        00000134
  1   TA_CML                002212EC    002212EC       100%        00001800
  2   TA_COTS               00222AEC    00222AEC       100%        00001800
  3   TA_CATS               002242EC    002242EC       100%        00001800
  4   TA_FPD                00225AEC    0022580C        18%        00000474
  5   TA_CBIT               002272EC    002272EC       100%        00001800
  6   TA_SYS                00228AEC    00228AEC       100%        00001800
  7   MCDU_CONNEXION        0022A2EC    0022A2EC       100%        00001800
  8   MCDU_MANAGER          0022BAEC    0022BAEC       100%        00001800
  9   TA_DIAL               0022D2EC    0022D1E0        36%        000008D8
 10   OMN_INIT              0022EAEC    0022EAEC       100%        00001800
 11   OMN_SM_SERVER         002302EC    002302EC       100%        00001800
 12   OMN_PH_SERVER         00231AEC    00231AEC       100%        00001800
 13   OMN_DL_SERVER         002332EC    002332EC       100%        00001800
 14   OMN_NS_SERVER         00234AEC    00234AEC       100%        00001800
 15   OMN_DATA_SERVER_A     002362EC    002362EC       100%        00001800
 16   OMN_DATA_SERVER_B     00237AEC    00237AEC       100%        00001800
 17   OMN_DATA_SERVER_C     002392EC    002392EC       100%        00001800
 18   TA_CTUL               0023AAEC    0023AAEC       100%        00001800
 19   TA_CFDS_FAILURES      0023C2EC    0023C268         2%        000000B4
 20   TA_CFDS_PROTOCOL      0023DAEC    0023DA7C        23%        000005B0
```

(5) Display CPU performances

```
CPU use display
     ===============
  each time you press a key (except <RETURN>) CPU use is displayed
 <RETURN> : to quit
? Performances for last 6634.810 sec
COUNTERS  SLICE 10  ms : min =       0  max =    652  AVERAGE :    643
          SLICE 100 ms : min =       0  max =   6480
FREE CPU  SLICE 10  ms : min =    0%    max = 100%    AVERAGE :  98%
          SLICE 100 ms : min =    0%    max =  99%
```

(6) Display Interrupts and Tasks duration

```
Interrupts and Tasks duration
=============================================================
   name                      min        max      average     cumul (ms)    nb exec
IT TIMER                       0         91         81      53941.496ms     663491
IT TOR                         0          0          0          0.000ms          0
IT E1     RX                   0          0          0          0.000ms          0
IT E1     TX                   0          0          0          0.000ms          0
IT E1     remain               0          0          0          0.000ms          0
IT SCMA   RX                   0        146        138         12.055ms         87
IT SCMA   TX                   0         79         70        162.886ms       2302
IT SCMA   remain               0         74         62        148.774ms       2389
IT SCCM   RX                   0          0          0          0.000ms          0
IT SCCM   TX                   0          0          0          0.000ms          0
IT SCCM   remain               0          0          0          0.000ms          0
IT SCFPD RX                    0          0          0          0.000ms          0
IT SCFPD TX                    0          0          0          0.000ms          0
IT SCFPD remain                0          0          0          0.000ms          0
IT SCCTU RX                    0          0          0          0.000ms          0
IT SCCTU TX                    0          0          0          0.000ms          0
IT SCCTU remain                0          0          0          0.000ms          0
IT ARINC RX CMU                0          0          0          0.000ms          0
IT ARINC RX MCDU/CPDF          0          0          0          0.000ms          0
IT ARINC RX CFDS               0          0          0          0.000ms          0
IT ARINC RX RMP                0          0          0          0.000ms          0
IT ARINC TX CMU                0          0          0          0.000ms          0
IT ARINC TX MCDU/CPDF          0          0          0          0.000ms          0
IT ARINC TX CFDS               0         87         51       8579.605ms     165844
IT ARINC TX RMP                0          0          0          0.000ms          0
TA_TIMER                       0        207        134      89205.680ms     663477
TA_CML                         0          0          0          0.000ms          0
TA_COTS                        0          0          0          0.000ms          0
TA_CATS                        0          0          0          0.000ms          0
TA_FPD                         0          0          0          0.000ms          0
TA_CBIT                        0          0          0          0.000ms          0
TA_SYS                         0          0          0          0.000ms          0
MCDU_CONNEXION                 0          0          0          0.000ms          0
MCDU_MANAGER                   0          0          0          0.000ms          0
TA_DIAL                        0     423386      16586       1443.038ms         87
OMN_INIT                       0          0          0          0.000ms          0
OMN_SM_SERVER                  0          0          0          0.000ms          0
OMN_PH_SERVER                  0          0          0          0.000ms          0
OMN_DL_SERVER                  0          0          0          0.000ms          0
OMN_NS_SERVER                  0          0          0          0.000ms          0
OMN_DATA_SERVER_A              0          0          0          0.000ms          0
OMN_DATA_SERVER_B              0          0          0          0.000ms          0
OMN_DATA_SERVER_C              0          0          0          0.000ms          0
TA_CTUL                        0          0          0          0.000ms          0
TA_CFDS_FAILURES               0       2032       2032          2.032ms          1
TA_CFDS_PROTOCOL               0       1456        353      39105.144ms     110563
          period :  6634.910sec  cumul :192600.720ms   FREE CPU :  97.10%
```

(7) Dump memory

A simple human interface allows to enter what memory to dump:

```
Address (in hexadecimal) ? 0
Length  (in hexadecimal) ? 10

00000000 05 00 04 00 00 00 04 00 00 00 0A 46 00 00 0A D4 ...........F....
...Press q to quit, or any key to continue ?
```

L. Specific test menu (!!! For test only)

The following sub-menu is displayed:

```
Test Menu
    =========
  a  modify cockpit codecs gains
  b  Test STBUS
  c  valid/invalid CBIT with CM
  d  Test CM messages
  e  Test exception
  f  Simulate Cockpit Discrete inputs
  h  make error/no error in ORT Phone table
  j  modify ARINC trace options
 <RETURN> : to quit
?
```

(1) Modify cockpit codecs gains

A simple user interface allows to modify dynamically the gains (normal configurations are located in configuration table):

```
Cockpit Codecs gains menu
     ------------------------
 Values in hexadecimal :
 Receive gain    : 0->7 = -6db to -13db, 8->F =     0db to   -7db
 Transmit gain   : 0->7 =  6db to  13db, 8->F =  15.3db to 22.3db
 Side_tone gain : 0    =  OFF          , 1->7 = -9.96db to 9.96db
  a : modify Receive gain    (current = 0)
  b : modify Transmit gain   (current = 0)
  c : modify Side Tone gain (current = 0)
 <RETURN> : to quit
?
```

(2) Test STBUS

The following test sub-menu is displayed:

```
Menu test STBUS connection
  0  clear connection matrix
  1  start/stop CODEC 1
  2  start/stop CODEC 2
  3  start/stop CODEC 3
  4  connect next CTU call to CODEC 1
  5  connect next CTU call to CODEC 2
  6  connect next CTU call to CODEC 3
  a  connect CODEC 1 to CODEC 2
  b  disconnect previous
  c  connect CODEC 1 to CODEC 3
  d  disconnect previous
  e  connect CODEC 2 to CODEC 3
  f  disconnect previous
  g  connect CODEC 1 to STBUS CM channel 0
  h  disconnect previous
  i  connect CODEC 2 to STBUS CM channel 1
  j  disconnect previous
  k  connect CODEC 3 to STBUS CM channel 2
  l  disconnect previous
  m  connect CODEC 1 to CODEC 2 via STBUS CM channel 4
  n  disconnect previous
  o  connect CODEC 2 to CODEC 1 via STBUS CM channel 6
  p  disconnect previous
 <RETURN> : to quit
?
```

(3) Valid/invalid CBIT with CM

The test menu is re-displayed.

(4) Test CM messages

The following sub-menu is displayed:

```
Menu test CM messages
    ----------------------
  1  send LOGON request to CM
  2  send LOGOFF request to CM
  3  send LOGON STATUS request to CM
  4  simulate LOGON STATUS indication from CM
  5  simulate LOGOFF STATUS indication from CM
  6  simulate TUNING STATUS indication from CM
  7  simulate LOGON REJECTED STATUS indication from CM
  8  simulate NOT_LOGGED_ON STATUS indication from CM
  a  simulate first  GTA cockpit call on C channel 0
  b  simulate second GTA cockpit call on C channel 2
 <RETURN> : to quit
?
```

(5) Test exception

```
e01/01/1970 01h59m40s711*** BUS ERROR ***
 IT level :   7  SR = 2704  PC = 0004A0F2 FAULT ADDRESS = 00100000***

 D0: 0000004C  D1: 00000003  D2: 00000000  D3: FFFFFFFF
 D4: 00000000  D5: 0000000C  D6: 00000002  D7: 0001E74E

 A0: 0004A0BB  A1: 05000430  A2: 0022D174  A3: 55555555
 A4: 55555555  A5: 55555555  A6: 0022D0CC  A7: 0022D090

 Stack content at address 0022D0A0
 0022D0A0 : 2704 0004 A0F2 C008 0010 0000 0000 0000
 0022D0B0 : 0004 A0F2 0006 0205 0000 0000 0022 D174
 0022D0C0 : 0001 6500 0000 0014 0022 D0E6 0022 D0FC

... start DIALOG under masked interrupts
```

(6) Simulate Cockpit Discrete inputs

The following sub-menu is displayed:

```
Simulate Cockpit Mic On entries
     ------------------------------
  1 : Cockpit 1 OFF HOOK
  2 : Cockpit 2 OFF HOOK
  3 : Cockpit 3 OFF HOOK
  4 : Cockpit 1 ON HOOK
  5 : Cockpit 2 ON HOOK
  6 : Cockpit 3 ON HOOK
 <RETURN> : to quit
?
```

(7) Make error/no error in ORT Phone table

No dedicated message, the test menu is re-displayed.

(8) Modify ARINC trace options

The following sub-menu is displayed:

```
ARINC trace Menu
    =========
  1 : TX CMU   (1 & 2)      ON
  2 : TX MCDU  (1, 2 & 3)   OFF
  3 : TX CPDF               ON
  4 : TX CFDS               OFF
  a : RX CMU   1            OFF
  b : RX CMU   2            OFF
  c : RX MCDU  1            OFF
  d : RX MCDU  2            OFF
  e : RX MCDU  3            OFF
  f : RX CPDF               OFF
  g : RX CFDS               OFF
 <RETURN> : to quit
?
```

M. Upload software or configuration tables

```
Are you sure you want to stop current application (y/n) ?
```

If the response is no, the main menu is displayed. If the response is yes, the application software is re-started, leading to the following kind of layout:

```
01/01/1970 02h03m06s126  EVT STOP application FOR UPLOAD  info : 0
 --- Last running task --> TA_DIAL
BOOT HINAV  V2.b  12/04/1999
Test RAM part of the NOVRAM : OK
Application in FLASH PROM :
HINAV APP 12/02/99    V2.b
... You have 5 seconds to press a key to stay in maintenance
HINAV >
```