THALES

COMMUNICATIONS

F0057

COMPONENT MAINTENANCE MANUAL WITH ILLUSTRATED PARTS LIST

RADAR ALTIMETER

AHV1600

P/N: 61778974AC

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REVISION No: 1

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RECORD OF REVISIONS

REV No.	ISSUE DATE	INSERTED		REV No.	ISSUE DATE	INSERTED	
		DATE	BY			DATE	BY
1	2009/07/09	2009/07					

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RECORD OF TEMPORARY REVISIONS

TEMP. REV. No.	ISSUE DATE	INSERTED		REMOVED		PAGE No.
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SERVICE BULLETIN LIST

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SERVICE INFORMATION LETTER LIST

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THALES

COMPONENT MAINTENANCE MANUAL
P/N 61778974AC

LIST OF EFFECTIVE PAGES

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	1032	2009/07/09
	1033	2009/07/09
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	3005	2009/07/09
	3006	2009/07/09
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Cleaning	4001	2009/07/09
	4002	Blank
Inspection/ Check	5001	2009/07/09
	5002	Blank
Repair	6001	2009/07/09
	6002	Blank
Assembly and Storage	7001	2009/07/09
	7002	2009/07/09
	7003	2009/07/09
	7004	2009/07/09
	7005	2009/07/09
	7006	2009/07/09
	7007	2009/07/09
	7008	2009/07/09
	7009	2009/07/09
	7010	2009/07/09
	7011	2009/07/09
	7012	Blank

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LIST OF EFFECTIVE PAGES (CONTINUED)

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THALES

COMPONENT MAINTENANCE MANUAL
P/N 61778974AC

TABLE OF CONTENTS

INTRODUCTION

TASK 34-42-61-871-801-A01

1. GENERAL

A. Purpose of the Manual

The Component Maintenance Manual (CMM) conforms to ATA Specification No. 2200.

The CMM provides shop verified procedures that enable a technician to restore the component to its serviceable condition in the overhaul shop.

The Abbreviated Component Maintenance Manual (ACMM) is a brief version of the CMM, for simple components, which require periodic maintenance and/or testing.

The Manufacturer prepares the ACMM/CMM for each Repairable or Overhaulable unit.

THALES Publications use both metric and non−metric system of measurement. The system used in the original reference documents is given first, followed by the conversion into the other system in brackets.

B. Manual Breakdown Arrangement

The information contained in the CMM, has been divided into three main categories:

- Description and Operation (DO),
- Maintenance Procedure (MP),
- Illustrated Parts List (IPL).

The table below gives the identifications (Pageblock) used for the three categories of data.

C. Page Block (PAGEBLOCK) Assignment

TABLE 34-42-61-992-001-A01

PAGEBLOCK Type	PAGEBLOCK Number	PAGEBLOCK Pagination
INTRODUCTION	0	1−99
DESCRIPTION AND OPERATION	1	1−999
TESTING AND FAULT ISOLATION	1000	1001−1999
SCHEMATIC AND WIRING DIAGRAMS	2000	2001−2999
DISASSEMBLY	3000	3001−3999
CLEANING	4000	4001−4999
CHECK	5000	5001−5999
REPAIR	6000	6001−6999
ASSEMBLY	7000	7001−7999
FITS AND CLEARANCES	8000	8001−8999
SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES	9000	9001−9999
SPECIAL PROCEDURES	11000	11001−11999
REMOVAL	12000	12001−12999
INSTALLATION	13000	13001−13999
SERVICING	14000	14001−14999
STORAGE (including TRANSPORTATION)	15000	15001−15999
REWORK (Service Bulletin accomplishment)	16000	16001−16999
ILLUSTRATED PARTS LIST	10000	10001−10999

(1) The Introduction explains the organization of the data in the CMM and the use of the data (DO and MP parts only)

For IPL part: see IPL INTRO (PAGEBLOCK 10000).

The introduction includes a glossary of non-standard abbreviations.

(2) Description and Operation

This pageblock gives general overall information.

It gives a mechanical and an electrical description.

It explains the configuration and the operation of the component.

It explains external connector interconnections in the component.

(3) Testing and Fault Isolation

This pageblock contains specific tests and procedures required to determine the condition of a component.

It includes fault isolation data.

(4) Schematic and Wiring Diagrams

This pageblock contains all schematic diagrams, wiring and interconnecting diagrams of cards, chassis wiring, modules, subassemblies.

(5) Disassembly

This pageblock gives step−by−step disassembly instructions in a logical sequence (in the order of IPL item numbers). It includes references to the figure item numbers from the IPL illustration(s) where applicable.

(6) Cleaning

This pageblock gives step−by−step description of the cleaning operations for the component and its parts.

(7) Check

This pageblock gives all the check procedures that are necessary during shop maintenance.

(8) Repair

This pageblock contains detailed repair procedures and specifications necessary to restore a worn or damaged part to serviceable condition.

(9) Assembly

This pageblock gives step−by−step assembly instructions in a logical sequence, references to the figure item numbers from the IPL illustration(s) where applicable.

(10) Fits and Clearances

This pageblock provides the fits and clearances data, in one or more tables, and torque tightening figures if applicable.

(11) Special Tools, Fixtures, Equipment and Consumables

This pageblock lists all special tools, fixtures, equipment and consumables necessary for maintenance actions given in the other pageblocks.

(12) Illustrated Parts List

This pageblock contains the complete list of all the parts of the component (For detailed description of the IPL, see IPL INTRO).

(13) Special Procedures

This pageblock contains tasks which are not part of the other pageblocks, but are necessary as a result of other maintenance tasks.

These tasks are self-contained repairs or preventive maintenance.

(14) Removal

Not applicable.

(15) Installation

Not applicable.

(16) Servicing

Not applicable.

(17) Storage

This pageblock contains requirements related to preparation for transportation, special handling, packaging, storage and preservation requirements of the component after assembly or test.

(18) Rework

Not applicable

TASK 34-42-61-879-801-A01

2. GENERAL ARRANGEMENT

A. PRELIMINARY PAGES AT THE BEGINNING OF THE CMM

(1) Title Page (TP)

(2) Record of Revisions (ROR)

(3) Transmittal Sheet (TS)

List page numbers of the revised pages and a brief description of the revision to affected pages.

Include insertion instruction for all supplied pages.

(4) Record of Temporary Revisions (RTR)

List the temporary revisions which shall be removed from the manual or which remain still effective.

(5) List of Service Bulletins (LSB)

List the Service Bulletins and the Service Information Letters which are applicable for the equipment.

(6) List of Effective Pages (LEP) (printed CMMs only)

List all effective pages for a given revision issue.

New pages are indicated by N, revised by R or deleted by D.

(7) Table of Contents (TOC)

List all major sub−divisions of each page block contained in the manual.

(8) List of Illustrations (LI)

List all illustrations contained in the manual.

B. INTRODUCTION (INTRO) STRUCTURE

(1) General

The introduction is broken down into Tasks.

This Task gives general information related to the CMM content.

(2) General arrangement

(3) Maintenance Task Oriented Support System (MTOSS) Task/Subtask numbering

This Task explains MTOSS Task/Subtask numbering system.

(4) Symbols and Definitions

(5) Glossary of Abbreviations

C. DESCRIPTION AND OPERATION (DO) STRUCTURE

(1) General

The Description and Operation is broken down into Tasks.

This Task gives general overall information.

(2) Description

This Task gives a mechanical and electrical description of the component.

(3) Operation

This Task explains the configuration and the operation of the component and its subassemblies.

D. MAINTENANCE PROCEDURE (MP) STRUCTURE

(1) General

The Maintenance Procedure is broken down into Tasks and Subtasks.

The MP is broken down into Tasks and Subtasks. Each Task is broken down into five Topics:

- Reason for the job,
- Job set-up information,
- Job set-up,
- Procedure,
- Close-up (if applicable).

(2) Reason for the job

This topic is used to explain the reason for the Task, but if the Task title gives sufficient information, then the statement "Self explanatory" is used.

(3) Job set-up information

This Topic is broken down into four tables:

- Fixtures, Tools and Support Equipment,
- Consumable Materials,
- Expendable Parts,
- Referenced Information.

(a) Fixtures, Tools and Support Equipment

This Table lists the fixtures, tools and support equipment required for the maintenance procedure. They can be of two types:

- Special Tools and equipment identified by their Part/Number.
- Standard Tools and Equipment identified by technical description. In this case the mention "No specific" is given in the reference column.

(b) Consumable Materials

This table lists all consumable materials used during the maintenance procedure.

(c) Expendable Parts

This table lists the IPC CSN (Catalogue Sequence Number) of all expendable parts used in the maintenance procedure.

The IPL gives the corresponding Part/Numbers.

(d) Referenced Information

This table lists all the cross−references to other documents.

(e) Job set-up

This topic gives all the instructions necessary to prepare for the procedure.

The instructions are broken down into Subtasks.

(f) Procedure

This Topic gives all the instructions necessary to do the maintenance procedure.

The instructions are broken down into Subtasks.

(g) Close-up

This topic gives all the instructions necessary to put the component back to its initial configuration.

The instructions are broken down into Subtasks.

TASK 34-42-61-879-802-A01

3. MAINTENANCE TASK ORIENTED SUPPORT SYSTEM TASK/SUBTASK NUMBERING

A. GENERAL

The functional arrangement of data and the numbering system form the basis for the assignment of maintenance Task/Subtask numbers to each maintenance operation (Task) described in the CMM. Task/Subtask numbers are mainly for the use of the Data management and have no significance for the reader of the CMM. The Introduction (INTRO) and the Description and Operation (DO) are broken down into Tasks. The Maintenance Procedures (MP) is broken down into Tasks and Subtasks.

(1) TASK

A TASK is defined as:

- A maintenance work procedure, which contains a sequence of work steps, which may be organised into Subtasks.
- A block of data e.g. Description and Operation.

A table, an illustration or a multi−sheet illustration e.g. Figure x Sheets 1 through to 4 will all be part of one Task.

(2) SUBTASK

A SUBTASK is a single−skill work step or group of work steps within a Task, which provides detail of a significant part of the procedure. The completion of a SUBTASK must be possible in one location at one time.

B. STRUCTURE OF TASK/SUBTASK NUMBERS

(1) Table of Task / Subtask numbers

TABLE 34-42-61-992-002-A01

Structure of Task / Subtask numbers

FORM	Tag name	−xx−xx−xx	−xxx	−xxx	−xxx	−xxx
ELEMENT	1	2	3	4	5	6

(2) Element 1

The tag name is the word TASK, SUBTASK or GRAPHIC.

(3) Element 2

ATA number (six digits).

(4) Element 3

MTOSS function code (three digits).

It is used to indicate the particular maintenance function involved.

For each tag name, this code is selected from numbers 000 through 999 as listed in the table Pageblock Assignment.

(5) Element 4

Sequential number of the function code (three digits).

It enables a unique identification number to be allocated for all Tasks/Subtasks which are similarly numbered throughout the preceding elements.

Tasks and Subtasks are numbered differently:

- Task idents begin at 801 and rise, sequentially, to 999 (maximum) within the procedure,
- Subtask idents begin at 001 and rise, sequentially, to 800 (maximum) within the procedure.

Illustrations and Tables are considered as Tasks. These Task idents begin at 001 and rise, sequentially, to 999 (maximum) within the procedure.

NOTE: If a particular Task or Subtask is deleted, the Task/Subtask number must not be re−used.

(6) Element 5

Alphanumeric indicator (three characters):

- the first character is a letter to indicate a different configuration due to different criteria configuration (modification, Service Bulletin(s), variations of work practices, ...),
- the second and third characters are digits to indicate alternative methods/techniques of maintenance.

(7) Element 6

Alphanumeric indicator (three characters).

It is to be assigned by an airline to highlight unique airline data.

(8) Example

TABLE 34-42-61-992-003-A01

Structure of Task

EXAMPLE	TASK	−xx−yy−zz	−000	−801	−A01
ELEMENT	Tag name	1	2	3	4

TABLE 34-42-61-992-004-A01

Structure of Task

ELEMENT	**DEFINITION**
1	ATA number of the equipment
2	MTOSS function code (ex: 000 = REMOVAL AND DISASSEMBLY)
3	Sequential number of the function code (ex: 801 = first Task of the REMOVAL AND DISASSEMBLY type)
4	A = first configuration, 01 = first method

C. MTOSS FUNCTION CODES

The first two digits of the numbering system fourth element are in accordance with the ATA Specification No. 2200, although in some instances there is variation by using a third digit for further breakdown of the basic function.

TABLE 34-42-61-992-005-A01

Removal and Disassembly

000	Removal and Disassembly
010	Removal of complete component from transportation/work stand
020	Disassembly of unit into modular units
030	Disassembly of modules into subassemblies
040	Disassembly of subassemblies into individual parts
050	Removal of accessories/components not part of subject unit/opening panels for access
060	Disassembly of accessories into subassemblies
070	Disassembly of accessory into subassemblies into individual parts
080	Remove test equipment
090	Disassemble support equipment

TABLE 34-42-61-992-006-A01

Cleaning

100	Cleaning
110	Chemical cleaning/power flushing
120	Wet or dry abrasive cleaning
130	Ultrasonic cleaning
140	Mechanical/hand cleaning
150	Unassigned
160	Compressed air/miscellaneous hand cleaning or combination of procedures
170	Foam/water wash
180	Electro−mechanical test of solutions to identify materials
190	Unassigned

TABLE 34-42-61-992-007-A01

Inspection

200	Inspection
210	Visual examination to determine serviceability/unserviceability of unit
220	Visual/dimensional comparison with specifications/acceptance
230	Fluorescent penetrant NDT
240	Magnetic particle NDT
250	Eddy current NDT
260	X−ray NDT
270	Ultrasonic NDT
280	Any special inspection
290	Unassigned

TABLE 34-42-61-992-008-A01

Repair

300	Repair
310	Welding, brazing and soldering
320	Machining
330	Metallic coating removal/application
340	Plasma/flame spraying of coating
350	Repairs using hand tools, including necessary disassembly/assembly
360	Bonding and moulding
370	Heat treating
380	Surface treatment −painting, aluminizing, etc., including masking
390	Machine riveting and flaring

TABLE 34-42-61-992-009-A01

Installation and Assembly

400	Installation and Assembly
410	Installation of complete component into transportation/work stand
420	Assembly of complete unit from modular units
430	Assembly of modules
440	Assembly of subassembly from parts
450	Installation of accessories/closing of panels, removed/opened for access
460	Assembly of accessory from subassemblies
470	Assembly of accessory subassembly from individual parts
480	Install test equipment
490	Assemble support equipment

TABLE 34-42-61-992-010-A01

Material Handling

500	Material Handling
510	Shipping
520	Receiving
530	Packing
540	Unpacking
550	Storage
560	Collecting parts required for task (s) inholding area prior to release (Marshalling)
570	Work before and after air transportation of a unit
580	Unassigned
590	Unassigned

TABLE 34-42-61-992-011-A01

Servicing/Preserving/Lubricating

600	Servicing/Preserving/Lubricating
610	Servicing
620	Preserving
630	De−preserving
640	Lubricating
650	Unassigned
660	Unassigned
670	Unassigned
680	Unassigned
690	Unassigned

TABLE 34-42-61-992-012-A01

Testing/Checking

700	Testing/Checking
710	Oil flow measurement
720	Air flow measurement
730	Fuel flow measurement/functional check
740	Water flow measurement/functional check
750	Electrical functional checks/measurement of parameters to determine serviceability, may include fault isolation
760	Functional test of systems/performance check
770	Functional test of an accessory carte
780	Pressure check of system/component normally pressurized
790	Leak check

TABLE 34-42-61-992-013-A01

Miscellaneous

800	Miscellaneous
810	Fault Isolation
820	Adjusting/aligning/calibration
830	Rigging/adjusting/component linkage
840	Service Bulletin incorporation
850	Part number change/application
860	Special procedure
870	Description and Operation
871	General
872	Description
873	Operation
874	Effectivity of cards and amendments
875	Unassigned
876	Unassigned
877	Unassigned
878	Location
879	How to use
880	Approved vendor processes
890	Airline maintenance program (customer use)

D. RELATIONSHIP BETWEEN PAGEBLOCKS AND TASK/SUBTASK NUMBERS

TABLE 34-42-61-992-014-A01

Miscellaneous

PAGEBLOCK	TASK number	SUBTASK number
Introduction	871, 879	None
Description and Operation	871, 872, 873	None
Testing and Fault Isolation	871, 700, 750	None
Schematic and Wiring Diagrams	878	None
Disassembly	000	020
Cleaning	100	160
Check	200	210, 220
Repair	300	350
Assembly	400	420
Fits and Clearances	NA	NA
Special Tools, Fixtures, Equipment and Consumables	940	None
Special Procedures	860, 300	None, 350
Removal	NA	NA
Installation	NA	NA
Servicing	NA	NA
Storage	550	530, 550
Rework	NA	NA
Illustrated Parts List	871, 874, 879, 950, 952	None

TASK 34-42-61-879-803-A01

4. SYMBOLS AND DEFINITIONS

A. UNITS AND MEASUREMENT

(1) Symbols

TABLE 34-42-61-992-015-A01

Symbols

SI System		US System	
Abbreviation	**Definition**	**Abbreviation**	**Definition**
bar	bar	psi	pound square inch
deg. C	degrees Celsius	deg. F	degrees Farhenheit
g	gram	oz	ounce
kg	kilogram	lb	pound
m	meter	ft	foot/feet
m.daN	meter.decaNewton	lbf.in, lbf.ft	pound force.inch, pound force.foot
mm	millimeter	in	inch

(2) Conversion table

TABLE 34-42-61-992-016-A01

Conversion

From SI system	To US system
1 bar	14.5037 psi
1 g	0.0353 oz
1 kg	2.2046 lb
1 m	3.2809 ft
1 m.daN	88.4956 lbf.in, 7.3801 lbf.ft
1 mm	0.0394 in

Temperature conversion from degrees Celsius (deg.C) to degrees Fahrenheit (deg.F):
deg.F = (1.8 x deg.C) + 32.

B. REFERENCE DESIGNATOR INDEX (RDI)

The designation of a component (RDI) consist of:

- a code letter according to the following table,
- a sequential number.

TABLE 34-42-61-992-017-A01

Reference Designator Index

Type of component (RDI)	Code letter
Battery	BT
Capacitor	C
Connector	J or P
Coil	L
Diode, zener diode,bridge diode	D or CR
Fuse	F

Type of component (RDI)	Code letter
Integrated circuit, microcircuit	IC
Jumper, strap	CV
Light Emitting Diode, light	DS
Quartz, Oscillator	Y
Relay	K
Resistor, potentiometer, resistor network	R
Switch, pushbutton switch	S
Test point	TP
Therminal resistor	RT
Transformer	T
Transistor, thyristor	Q
Varistor	RV

C. DEFINITION OF TERMS

The following terms are used in the CMM and are defined as follows:

WARNING: CALLS ATTENTION TO USE OF MATERIAL, PROCESSES, METHODS, PROCEDURES OR LIMITS WHICH MUST BE FOLLOWED PRECISELY TO AVOID INJURY OR DEATH TO PERSONS.

CAUTION: CALLS ATTENTION TO METHODS AND PROCEDURES WHICH MUST BE FOLLOWED TO AVOID DAMAGE TO EQUIPMENT.

The term "TIGHTEN" is generally used in locations where no torque value is specified in the text.

The term "TORQUE" is used in the text together with a given specific torque value.

NOTE: Calls attention to methods, which make the job easier or provide supplementary or explanatory information.

TASK 34-42-61-871-802-A01

5. LIST OF ABBREVIATIONS

A. GENERAL

Abbreviations are used in the manual to make the text and illustrations shorter. These abbreviations and their definitions are given in the list that follows.

B. ABBREVIATIONS

A/D:	Analog to Digital
AGC:	Automatic Gain Control
ARINC:	Aeronautical Radio INCorporated
BF:	Beat Frequency
BIT:	Built In Test
BITE:	Built-in Test Equipment
DMB:	Digital and Management Board
DSP:	Digital Signal Processor
FW/CW:	Frequency Modulated/Continuous Wave
GVA:	Gain variable with the height ("Gain Variable avec l'Altitude")
HF:	High Frequency
HIRF:	High Intensity Radiated Field
I/O:	Input/Output
LRU:	Line Replaceable Unit
MNV:	Non Volatile Memory (Mémoire Non Volatile)
MW:	MicroWave
PLL:	Phase Lock Loop
PS:	Power Supply
RF:	Radio Frequency
SRU:	Shop Replaceable Unit
SMD:	Surface Mount Device

C. SYMBOLS

Not applicable.

DESCRIPTION AND OPERATION

TASK 34-42-61-870-801-A01

1. DESCRIPTION

A. Principle

The purpose of a Radio Altimeter system is to provide the helicopter with accurate measurements of the minimal distance to the terrain (ground or sea). A Radio Altimeter is a kind of RADAR system, i.e. it uses the fact that the electromagnetic waves propagate through the air at a constant speed c , which is the speed of the light.

B. General

The AHV1600 Transceiver has 2 two mains sub-assembly:

- Digital Chassis,
- Radio Module.

The Digital Chassis:

- achieves the High Intensity Radiated Field (HIRF) protection, internal module interconnection, digital and management processor capacity and power supply distribution,
- provides the helicopter with the mechanical and electrical interfaces,
- provides the hardware support of the downloaded software's.

The Radio Module:

- achieves the Radio Frequency (RF) signal emission, the Radio Frequency (RF) signal reception and the Beat Frequency (BF) signal extraction.

C. Physical description

The AHV1600 Transceiver is a metallic housing in the form of a parallelepiped protected by a black polyurethane painting.

It is made of a chassis with a front panel equipped with:

- an identification label,
- an amendments label,
- a main connector,
- two coaxial connectors:
  - one receive connector "RX" (J1),
  - one transmit connector "TX" (J2).

The AHV1600 Transceiver has:

- a radio module (5),
- a digital chassis which has:
  - a digital management board (2),
  - a power supply stage (1),
  - a mother I/O stage (3),
  - a HIRF module (6),
  - a mechanical chassis (4).

All sockets are equipped with specials caps.

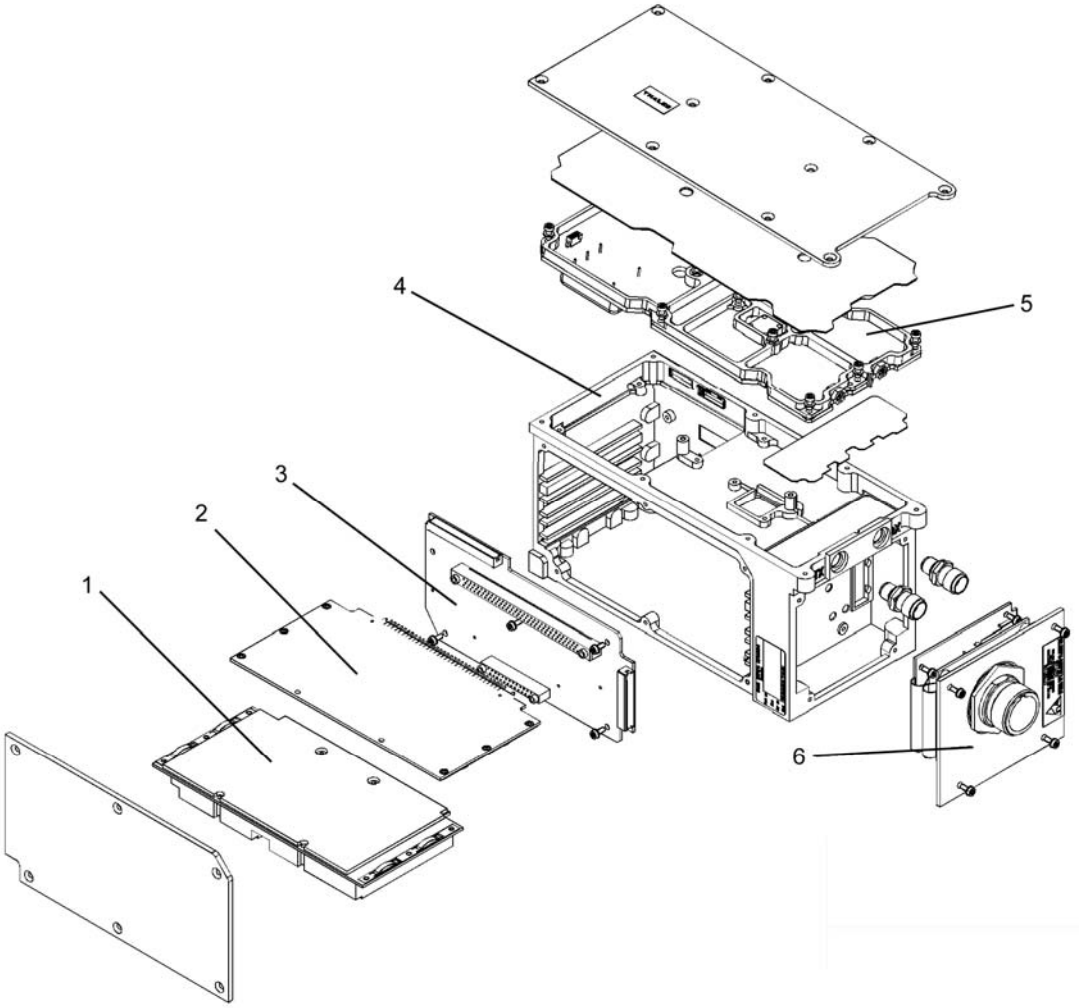

Figure 1 – AHV1600 Transceiver

GRAPHIC 34-42-61-991-001-A01

(1) Main connector

TABLE 34-42-61-992-018-A01

CONTACT N°	SIGNAL NAME
1	RA_EMIS_CMD
2	M_GND
3	TMS
4	CALIB_TEST
5	FCT_TST
6	TST_INH
7	CTZ_SEL2
8	TCK
9	TX429_HI_1
10	TX429_LO_1
11	SPP1
12	CTZ_SEL_P
13	TX429_HI_2
14	RX429_LO_2
15	MAINT
16	AID2
17	P28V_1
18	P28V_2
19	RET28V_2
20	AID_P
21	RS232_RX
22	RS232_TX
23	AID0
24	AID1
25	TDI
26	CTZ_SEL1
27	TDO

CONTACT N°	SIGNAL NAME
28	SEARCH_TRACK
29	EXTRAPOL_TEST
30	RET28V_1
31	FB_TEST
32	VALDDS_TEST
33	E_GND
34	SDI_SEL
35	DDS_TEST
36	CTZ_1
37	CTZ_2

(2) Identification

The identification label and the amendment label are stuck on the bottom of the transceiver.

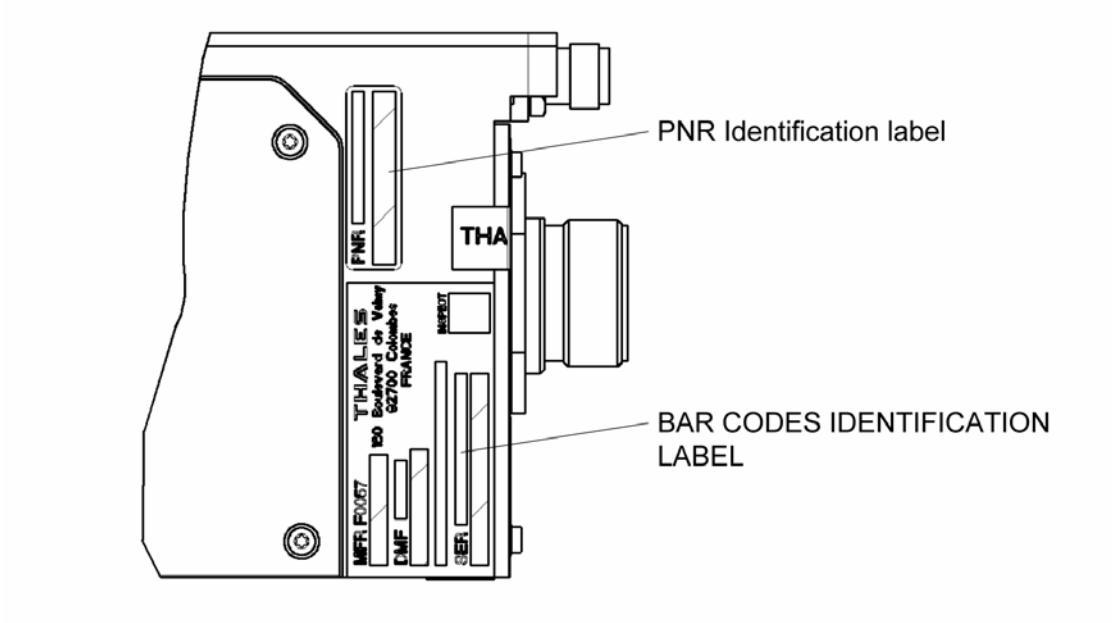

Figure 2 – Identification labels

GRAPHIC 34-42-61-991-002-A01

The specific label is stuck on the front panel.

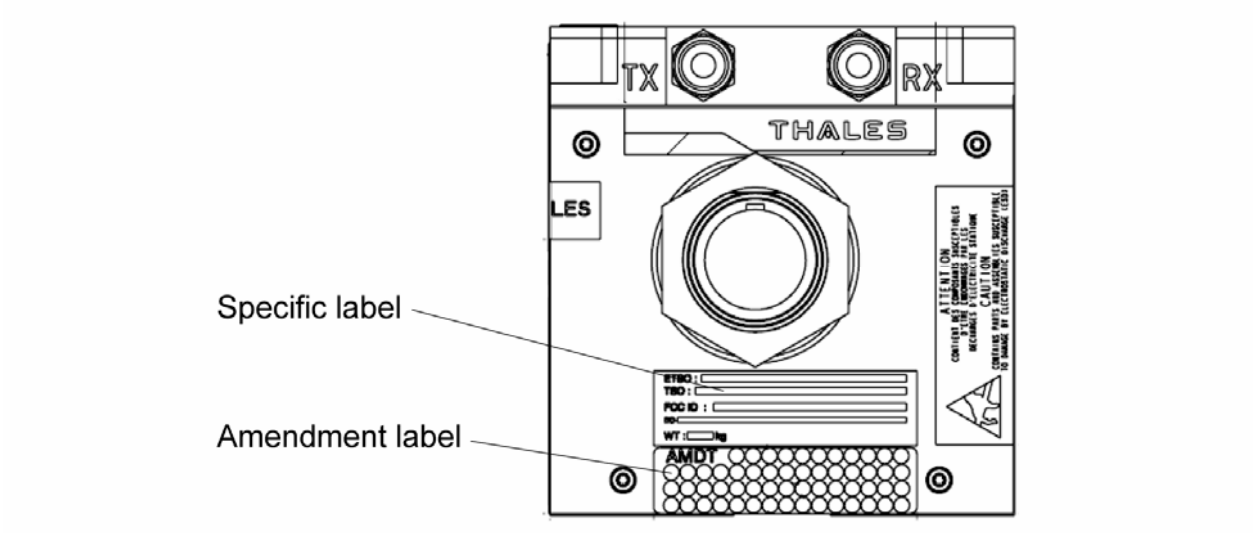

Figure 3 – Specific and amendment label

GRAPHIC 34-42-61-991-003-A01

The identification labels have the information that follows:

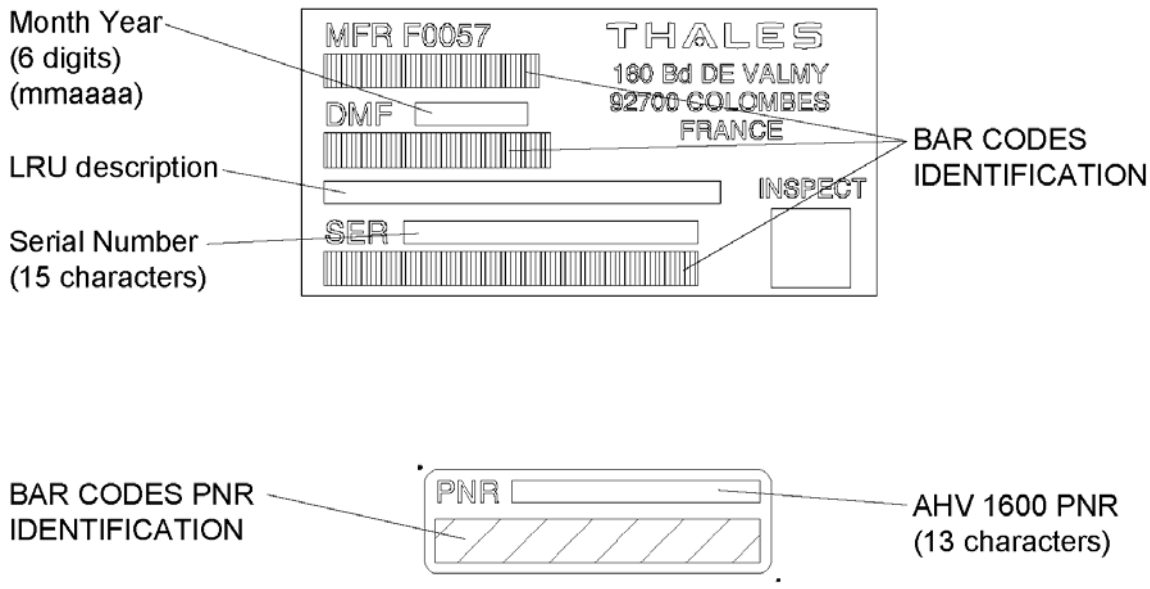

Figure 4 – Identification labels

GRAPHIC 34-42-61-991-004-A01

The amendment plate has the information that follows:

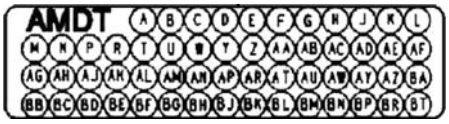

Figure 5 – Amendment label

GRAPHIC 34-42-61-991-005-A01

(3) Characteristics

(a) Physical characteristics

- Dimensions: 190 x 90 x 95 mm (7.48 x 3.54 x 3.74 in)
- Weight < 2 kg (4.4 lb)

(b) Functional characteristics

- Transmission: FM/CW
- Frequency range: 4.2 GHz to 4.4 GHz
- Frequency Deviation: 123 MHz typical
- Height accuracy: +/- [2 ft + 2%(h)] at 2 σ
- Transmitted Power: + 18 dBm max typical
- Power supply: 28 Vdc
- Power consumption: 20 W max (18 W typical)
- RS-232 maintenance line
- Interface: ARINC429 low speed

(4) Environmental conditions

The AHV1600 Transceiver is identified with the following necessary information regarding the appropriate category of each environmental test:

- **DO160E Cat. [(B4)X]BBB[RG]XWFDFSZZAZ[ZC][HF]M[(A4G33)(A3J33)]XXAX**

D0-160E requirement		*Documentary evidences or comments*
Section	***Environmental conditions***	
4	Temperature and altitude	
	§4.5.1 Ground Survival Low Temperature Test and Short-Time Operating Low Temperature Test	Equipment tested to category B4
	§4.5.2 Operating Low Temperature Test	Equipment tested to category B4. The AHV1600 is intended for use with full performances at temperature up to –40°C.
	§4.5.3 Ground Survival High Temperature Test and Short-time Operating High Temperature Test	Equipment tested to category B4.
	§4.5.4 Operating High Temperature	Equipment tested to category B4 The AHV1600 Transceiver is intended for use with full performances at temperature up to +70°C.
	§4.5.5 In-Flight Loss of Cooling Test	Equipment identified as Category X, no test performed. The AHV1600 Transceiver is intended for use with no cooling.
	§4.6.1 Altitude Test	Equipment tested to Category B4.

D0-160E requirement		*Documentary evidences or comments*
Section	***Environmental conditions***	
	§4.6.2 Decompression Test	Test not applicable according to the selected category
	§4.6.3 Overpressure Test	Test not applicable according to the selected category
5	Temperature variation	Equipment tested to Category B. The AHV1600 Transceiver is intended for use with full performances at temperature variations between -40°C and +70°C operating temperature extremes.
6	Humidity	Equipment tested to Category B.
7	Operational shocks and crash safety	
	§7.2 Operational shocks	Equipment tested to Category B.
	§7.3.1 Crash safety (impulse test)	Equipment tested to Category B.
	§7.3.1 Crash safety (sustained test)	Equipment tested to Category B.
8	Vibration	
	§8.5 Standard vibration test procedure fixed wing aircraft	No test performed
	§8.6 High level short duration vibration test procedure	No test performed
	§8.7 Robust vibration Test procedure fixed wing aircraft	No test performed
	§8.8 Vibration test for helicopters	Equipment tested to Category R, zone2, Curve G (Helicopters frequencies at f1=20.5 Hz, f2=41.5 Hz, f3=f4=0Hz)
9	Explosive atmosphere	Equipment identified as Category X, no test performed.
10	Waterproofness	
	§10.3.1 Condensing Water Proof Test	Test not applicable according to the selected category
	§10.3.2 Drip proof Test	Equipment tested to Category W.

D0-160E requirement		Documentary evidences or comments
Section	Environmental conditions	
	§10.3.3 Spray proof Test	Test not applicable according to the selected category.
	§10.3.3 Continuous stream proof Test	Test not applicable according to the selected category.
11	Fluids susceptibility	
	§11.4.1 Spray Test	Equipment compliant by similarity to Category F The compliance of the AHV1600 Transceiver with the spray test is demonstrated by similarity with the MIL-STD-810F method 504 for fluids. List of fluid contaminant used: Aviation turbine fuel JP-4, JP-5, JP-8, Mineral oil based, Phosphate ester based, lubricating oils (mineral based, ester based synthetic), solvents and cleaning fluid (isopropyl Alcohol, denatured Alcohol, cleaning compound for aircraft surfaces), DE-Icing fluid (ethylene Glycol), insecticides (dichloros), fire extinguishants (protein and fluoroprotein).
	§11.4.2 ImmersionTest	No test performed.
12	Sand and dust	
	§12.4 Dust test procedure	Equipment tested to Category D.
	§12.5 Sand test procedure	Test not applicable according to the selected category.
13	Fungus resistance	Equipment compliant to Category F.
14	Salt Fog	Equipment compliant to Category S.
15	Magnetic effect	Equipment tested to Category Z.
16	Power input	The AHV1600 Transceiver is intended for use with a standard electrical 28VDC power input
	§16.6.1.1 Normal operating conditions (dc): voltage (Average Value)	Equipment tested to Category Z.

D0-160E requirement		*Documentary evidences or comments*
Section	***Environmental conditions***	
	§16.6.1.2 Normal operating conditions (dc): Ripple Voltage	Equipment compliant to Category Z. Note: As the Ripple Voltage requirement is addressed by §18.3.1 Audio Frequency Conducted Susceptibility, the ripple voltage test has not been performed (see RTCA DO160E §16.6.1.2.b note)
	§16.6.1.3 Normal operating conditions (dc): Momentary Power Interruptions	Equipment tested to Category Z. TCF declares that the AHV1600 Transceiver is able to withstand momentary power interruption up to 2ms (Test condition 1 of table 16-3).
	§16.6.1.4 Normal operating condition (dc): Normal Surge Voltage	Equipment tested to Category Z.
	§16.6.1.5 Normal operating condition (dc): Engine Starting Under Voltage Operation	Equipment tested to Category Z.
	§16.6.2.1 Abnormal Operating Conditions (dc): Voltage Steady State	Equipment tested to Category Z.
	§16.6.2.2 Abnormal Operating Conditions (dc): Low Voltage Conditions	Test not applicable according to the selected category.
	§16.6.2.3 Abnormal Operating Conditions (dc): Momentary Undervoltage Operation	Equipment tested to Category Z.
	§16.6.2.4 Abnormal Operating Conditions (dc): Abnormal Surge Voltage	Equipment tested to Category Z.
17	Voltage spike	Equipment tested to Category A.
18	Audio frequency conducted susceptibility – power inputs	

D0-160E requirement		Documentary evidences or comments
Section	Environmental conditions	
	§18.3.1 DC Inputs Power Leads	Equipment tested to Category Z.
	§18.3.2 AC Inputs Power Leads	Test not applicable according to the selected category.
19	Induced signal susceptibility	
	§19.3.1 Magnetic fields induced into the equipment	Equipment tested to Category ZC.
	§19.3.2 Magnetic field induced into interconnecting cables	Equipment tested to Category ZC.
	§19.3.3 Electric field induced into interconnecting cables	Equipment tested to Category ZC.
	§19.3.4 Spikes induced into interconnecting cables	Equipment tested to Category ZC.
20	Radio frequency susceptibility (radiated and conducted)	
	§20.4 Conducted Susceptibility (CS) test	Equipment tested to Category H.
	§20.5 Radiated Susceptibility (RS) test	Equipment tested to Category F for SW and CW modulation.

D0-160E requirement		*Documentary evidences or comments*
Section	*Environmental conditions*	
	§20.6 Radiated Susceptibility (RS) test – alternate procedure reverberation chamber	Equipment tested to Category F for PM modulation. According to DO160E §20.3 d, TCF declares the following frequency exclusion bandwidths: - from 1.89GHz to 2.42GHz - from 3.78GHz to 4.84GHz - from 7.56GHz to 9.68GHz The required level to test these frequency bands is the level of category S (1V/m). Due to the test means used, the equipment has been subjected to 100V/m in these frequency bands with its full performances.
21	Emission of radio frequency energy	
	§21.3 Conducted RF emission	Equipment tested to Category M.
	§21.4 Radiated RF emission	Equipment tested to Category M.
22	Lightning induced transient susceptibility	
	§22.5.1 Pin Injection Tests	Equipment tested to Category (A4) for power lines and (A3) for interconnecting lines.
	§22.5.2 Cable Bundle Tests (cable induction and ground injection)	Equipment tested to Category (G33) for power lines and (J33) for interconnecting lines.
23	Lightning direct effects	Equipment identified as Category X, no test performed.
24	Icing	Equipment identified as Category X, no test performed.

D0-160E requirement		*Documentary evidences or comments*
Section	*Environmental conditions*	
25	Electrostatic discharge	Equipment tested to Category A.
26	Fire, Flammability	Equipment identified as Category X, no test performed.

TASK 34-42-61-870-802-A01

2. OPERATION

A. Functional architecture of the AHV1600

The general architecture of the AHV1600 is the following:

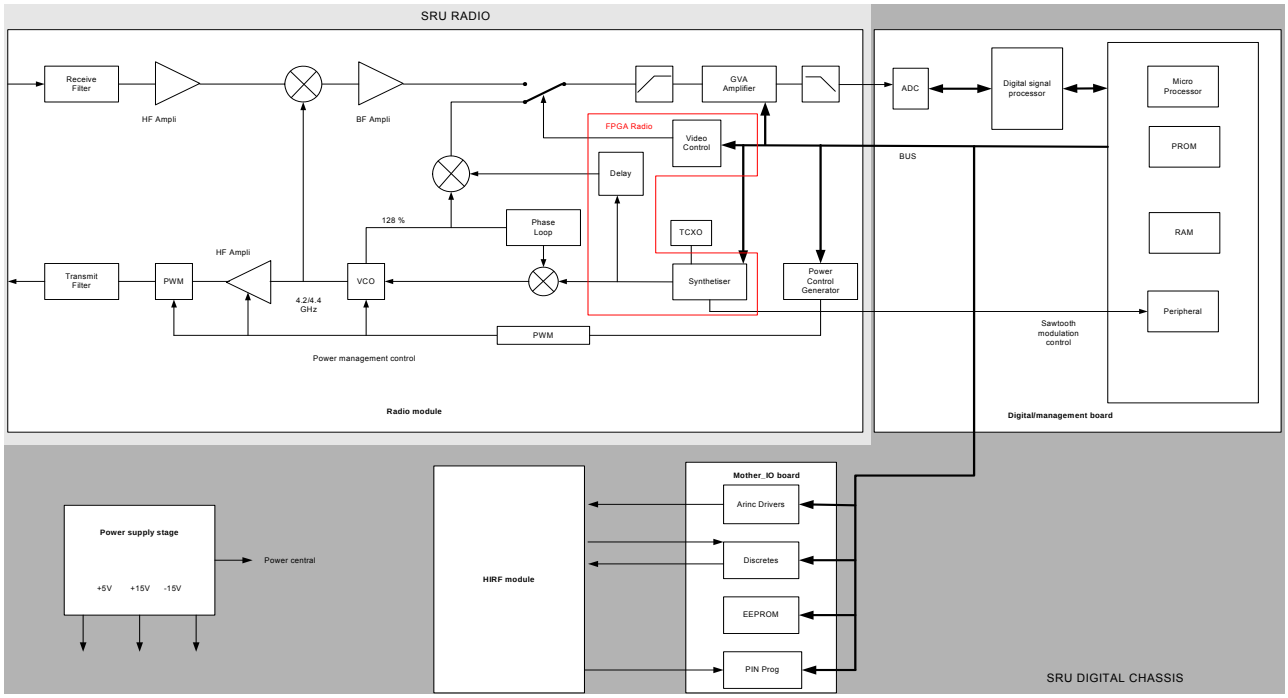

Figure 6 – General architecture of the AHV1600

GRAPHIC 34-42-61-991-006-A01

The AHV1600 transceiver has:

- Radio module: regroups the microwave transmitter and receiver, and the analog treatment of the beating frequency. The Digital Management board commands and monitors the radio module. It provides the Digital Management board with the beating frequency signal. It receives its power from the Power Supply (PS) stage. The Field Programmable Gate Array (FPGA) commands the radio module.
- Digital Management board: commands and monitors the transmission function of radio module and the height output function as well. It computes the height out of the beating frequency and the modulation shape of the effectively transmit frequency.
- Power Supply (PS) stage: provides the system with its needed power and Digital Management board with a status containing the results of power supply stage internal monitoring.

- Mother IO board: links the 4 other modules, the digital signals are adapted to their analog requirements and vice versa. It reads the discrete inputs and pin-programs status and communicates them to the Digital Management board. It also formats and sends the words on the height buses according to the information received from Digital Management functions.
- HIRF module: The HIRF part is not controlled (only passive components), protect the system from electromagnetic interferences and lightning.

B. Operation of the SRU Radio module

The SRU Radio module corresponds to the radio module controlled by a FPGA

(1) Radio module

The Radio module has the functions that follow:

(a) Reception filter provides protection from interferences received through the antennas by the unit.

(b) Transmission filters transmits the FM/CW (Frequency Modulated/Continuous Wave) signal.

(c) Demodulation: it is a mixer that provides the AHV1600 transceiver with the BF (Beat Frequency) from the received RF (Radio Frequency) signal and a part of the transmit signal.

(d) BF calibration is used during calibration. It filters and amplifies the BF signal.

(e) BF filter determines the BF observation bandwidth of the AHV1600 transceiver.

(f) GVA amplifier ("Gain Variable avec l'Altitude" variable gain with the height) is piloted by the management function according to the theoretically expected signal level at the current height. It is followed by an AGC (Automatic Gain Control) to adapt the signal level to the A/D (Analog to Digital) converter.

(g) BF filter is the FM/CW digital synthesizer that feeds the PLL (Phase Lock Loop) in the MW (MicroWave). The digital synthesis is performed according to the commands received from the management function. An external Digital to Analog Converter followed by a filter is used to effectively pilot the MW calibration function of the PLL.

(h) BF calibration is the FM/CW digital synthesiser that feeds the PLL of transmitter function in the MW. The digital synthesis is performed according to the commands received from the management function. An external Digital to Analog Converter followed by a filter is used to effectively pilot's the transmitter function's PLL.

(2) FPGA

The radio module FPGA is the core of the radio module.

The FPGA functions are time independent: operations are begun and ended by a clock front to enable a fully deterministic time analysis.

To avoid interferences with the FPGA control function no programmable cell is used as a memory.

The figure that follows presents the relationships between the FPGA and the others function of the radio module.

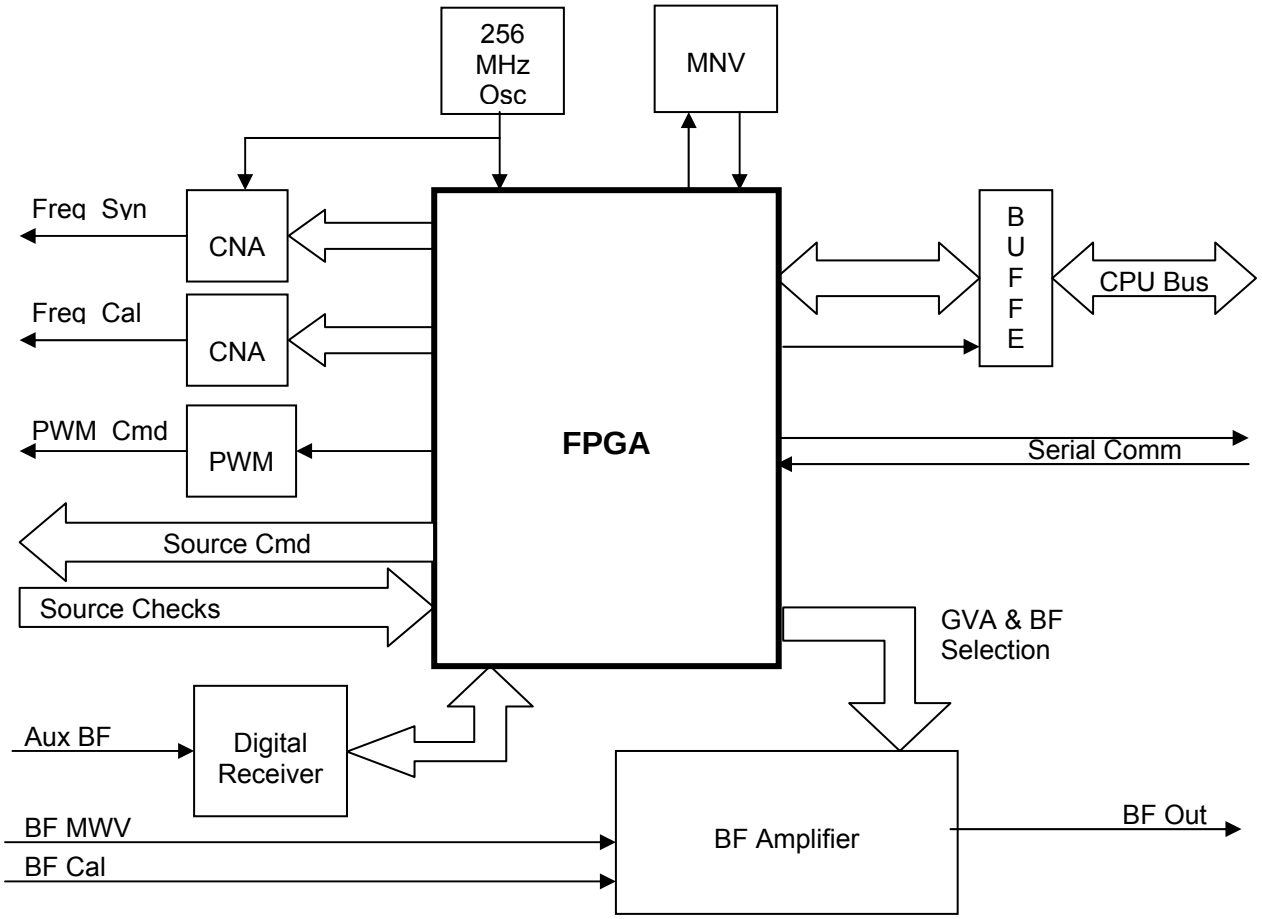

Figure 7 – General architecture of the FPGA

GRAPHIC 34-42-61-991-007-A01

The radio module FPGA has the functions that follow:

- Clock and Bus Control Unit allows the internal clock signals generation, the management of the both bidirectional buses, CPU bus and AD6620 bus.
- CPU decoding unit performs the addresses decoding for the registers accesses in read and write mode.
- FPGA Registers Unit contain all the internal registers and their various accesses.
- Debug and Monitoring Unit allows a stand alone control of the radio module by the mean of a terminal for debugging and set-up. When the radio module is controlled by the CPU, a monitoring mode is allowed.
- EEPROM Control Unit performs the NVM (Non Volatile Memory) control in read and write mode.

- Frequency Synthesis Unit includes:

  Reference frequency Freq_Syn samples generation

  Delayed frequency Freq_Cal samples generation

  Sawtooth modulation control providing the logical signals reflecting the modulation duration and BF samples validation

  Modulation duration computation

- Transmit and Receive Configuration Unit controls the transmission sequencing in the different modes, the signals to the microwave part.
- PWM Control Unit generates the Power Management voltage
- GVA Control Unit controls the GVA A/D convertor.

C. Operation of the SRU Digital chassis

The SRU Digital chassis has the modules that follow:

- Mechanical chassis,
- Mother I/O stage,
- HIRF module,
- Power Supply (PS) stage,
- Digital Management board.

(1) Mechanical chassis

It is the mechanical host of the AHV1600 transceiver.

(2) Mother I/O board

It has the functions that follow:

- Discrete inputs/outputs, pin programming
- Height buses.
- The I/O interface function reads the discrete inputs and pin-programs status and communicates them to the Digital Management board. It also formats and sends the words on the height buses according to the information received from Digital Management functions.

(3) HIRF module

It has the EMI (Electro Magnetic Interference) filter function.

The EMI filters protect the others modules, from all the specified EMI and especially vs. HIRF (High Intensity Radiated Field) and the indirect effects of lightning.

This module has only passive components.

(4) Power supply (PS) stage

It has the functions that follow:

- 28 V function: it is mainly an integrated converter, which supplies, on isolated wires, the other modules of the SRU with 5 V and 15 V voltage
- Power Supply control function: it controls the converter. The results of this monitoring are sent to the Digital Management board.

(5) Digital management board

It is the core of the AHV1600 transceiver and its processing channel.

It has one 68340 processor and one DSP 320C50 processor.

It has the functions that follow:

(a) Management function

It computes the height from the data received of the signal treatment function.

It realizes BIT (Built In Test) of the whole unit.

It manages the search/track stage of the AHV1600 transceiver.

It manages the operational/test/calibration modes of the AHV1600 transceiver.

It pilots the synthesiser and GVA (Gain variable with the height) functions.

(b) Signal treatment function

It performs the basic signal treatment on the BF samples, extracts from the obtained BF spectrum the relevant parameters and sends them to the management function.

It is mainly a software component embedded in DSP (Digital Signal Processor).

(c) A/D conversion function

It is an A/D converter. From the BF signal it obtains its samples and sends them to the signal treatment function.

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TESTING AND FAULT ISOLATION

TASK 34-42-61-871-803-A01

1. INTRODUCTION

A. GENERAL

This section contains instructions:

- To do a functional test procedure of the AHV1600 unit to determine the operational status of the AHV1600 unit during a repair procedure or to confirm the correct operation of the complete AHV1600 unit (cover closed) before return to service
- To detect the board(s) to replace, following the test in fault

CAUTION: THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. ALL MODULES CONTAINING ESDS DEVICES ARE FLAGGED. ALL ESDS DEVICES MUST BE HANDLED IN ACCORDANCE WITH PROCEDURES OUTLINED BELOW.

NOT LIMITED TO, C-MOS, J-ESDS DEVICES INCLUDE, BUT ARE MOS, PMOS, NMOS, SOCMOS, HMOS, MOS/FET, MICROWAVE MIXER DIODES, SOME BIPOLAR DEVICES, AND SOME METAL FILM RESISTORS.

MOST DAMAGE TO ESDS DEVICES RESULTS IN DEGRADED PERFORMANCE OR PREMATURE FAILURE, NOT IN CATASTROPHIC FAILURE AT THE TIME EXPERIENCED.

B. SAFETY INSTRUCTIONS / ELECTROSTATIC DISCHARGE PRECAUTIONS

This graphic symbol showing a hand on a dark background (to IEC 747-1 standard) means that the equipment on which it appears (assembly or subassembly) contains components sensitive to electrostatic discharges.

The following rules shall be complied with when carrying out any type of servicing on equipment bearing this symbol:

- The equipment shall be placed on a conducting or antistatic-working surface grounded through a resistance of between 250 kΩ and 1 MΩ.
- The operator shall wear a cotton smock and shall be linked with the working surface by a conducting wristband through a resistance of 1 MΩ.
- Soldering iron shall be grounded.

- The transport and storage of parts removed from the equipment (printed board assemblies, modules, hybrid circuits, etc.) shall be done with conductive or antistatic packaging.

2. MEASUREMENT TOOLS REQUIRED

Refer to the «Special Tools, Fixtures, and Equipment» section of this manual for information on the measurement tools.

3. PROCEDURE

SUBTASK 34-42-61-871-001-A01

A. General

The purpose of the functional test procedure is to determine the operational status of the AHV1600 unit.

AHV1600 unit requiring testing is:

- New unit received from the manufacturer,
- Unit received from line maintenance with a complaint of «doesn' t work»,
- Unit that has been repaired and must be checked before to return to service.

SUBTASK 34-42-61-871-002-A01

B. Test Set Up

The functional test procedure must be done with different Test Set Up (described in Figures 1001 to 1006):

- Figure 1001: Test set up for lightning protection of the power supply input signals and Arinc outputs; the AHV160 unit is not powered-on.
- Figure 1002: Test set up for lightning protection of the Radio Frequency inputs “RX”, “TX” and discretes inputs; the AHV160 unit is not powered-on.
- Figure 1003: Test set up of the AHV1600 unit powered-on; the different functions are measured.
- Figure 1004: table of configuration of the controls of the AHV1600 unit; the states of the controls used for the configuration are given in accordance with the Figure 1003.
- Figure 1005: Test set up to measure the In-rush current; this Test set up must be included in the Test set up of the Figure 1003 when necessary.
- Figure 1006: Test set up to measure the electrical characteristics of the Arinc 429 output signals; this Test set up must be included in the Test set up of the Figure 1003 when necessary.

This functional test procedure has information to produce the different test set up used to test the AHV1600 unit:

NOTE: Refer to the Special Tools, Fixtures and Equipment section for the list of the test equipment required.

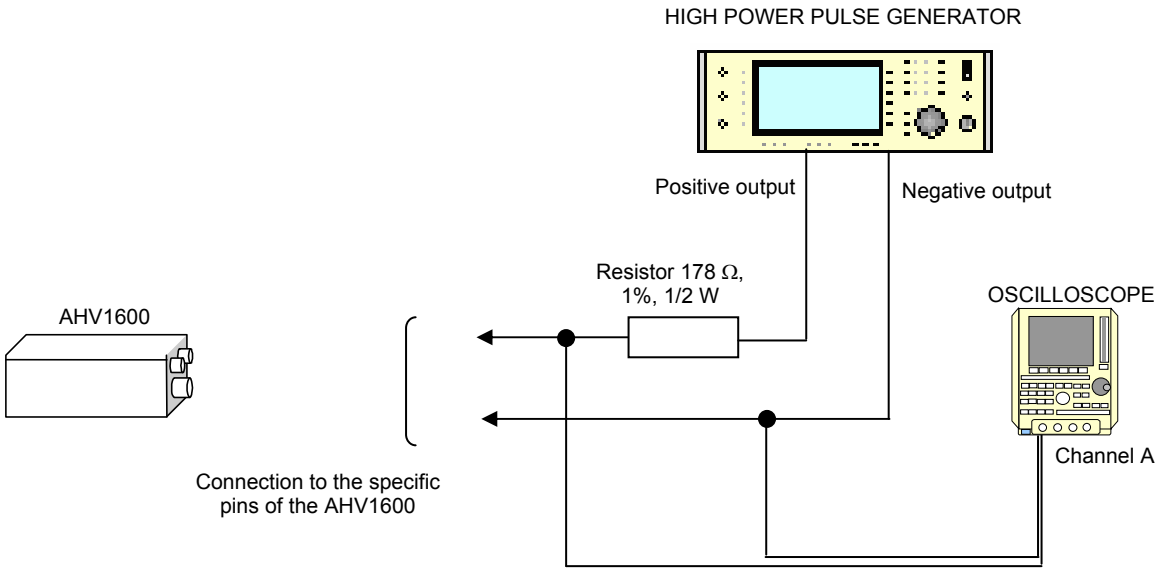

Figure 1001 – Test set-up for lightning protection of the power supply input signals and Arinc outputs

GRAPHIC 34-42-61-991-007-A01

NOTE: The AHV1600 unit is not powered.

NOTE: To do the different measurement, use connector and wires as defined in Special Tools, Fixtures and Equipment section.

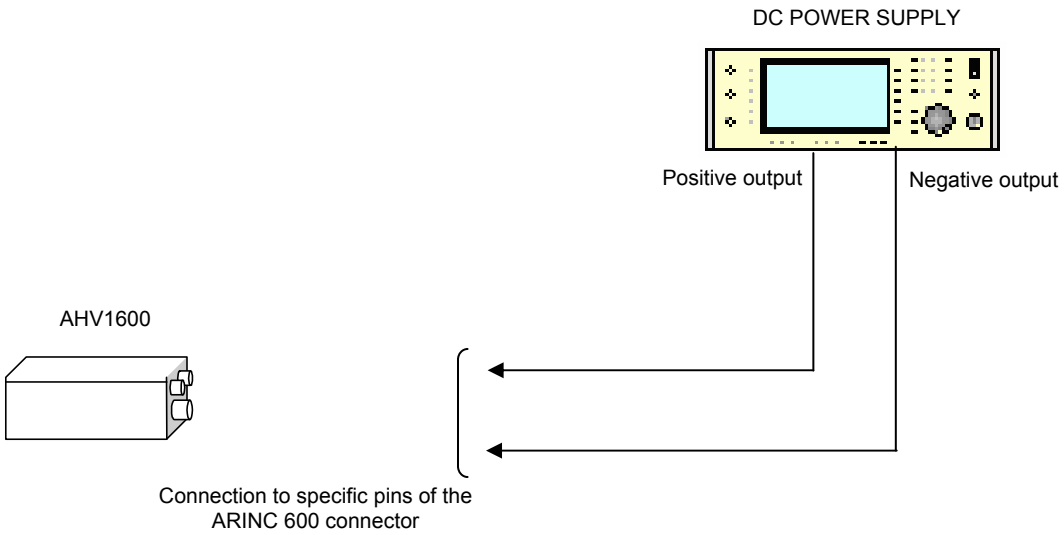

Figure 1002 – Test set-up for lightning protection of the Radio Frequency inputs “RX”, “TX” and discretes inputs

GRAPHIC 34-42-61-991-008-A01

NOTE: The AHV1600 unit is not powered.

NOTE: The positive and negative outputs of the power supply are directly connected to specific pins of the AHV1600 unit.

NOTE: To do the different measurement, use connectors (to connect to the rear connector, to “RX” access and to “TX” access of the AHV1600 unit) and wires as defined in Special Tools, Fixtures and Equipment section.

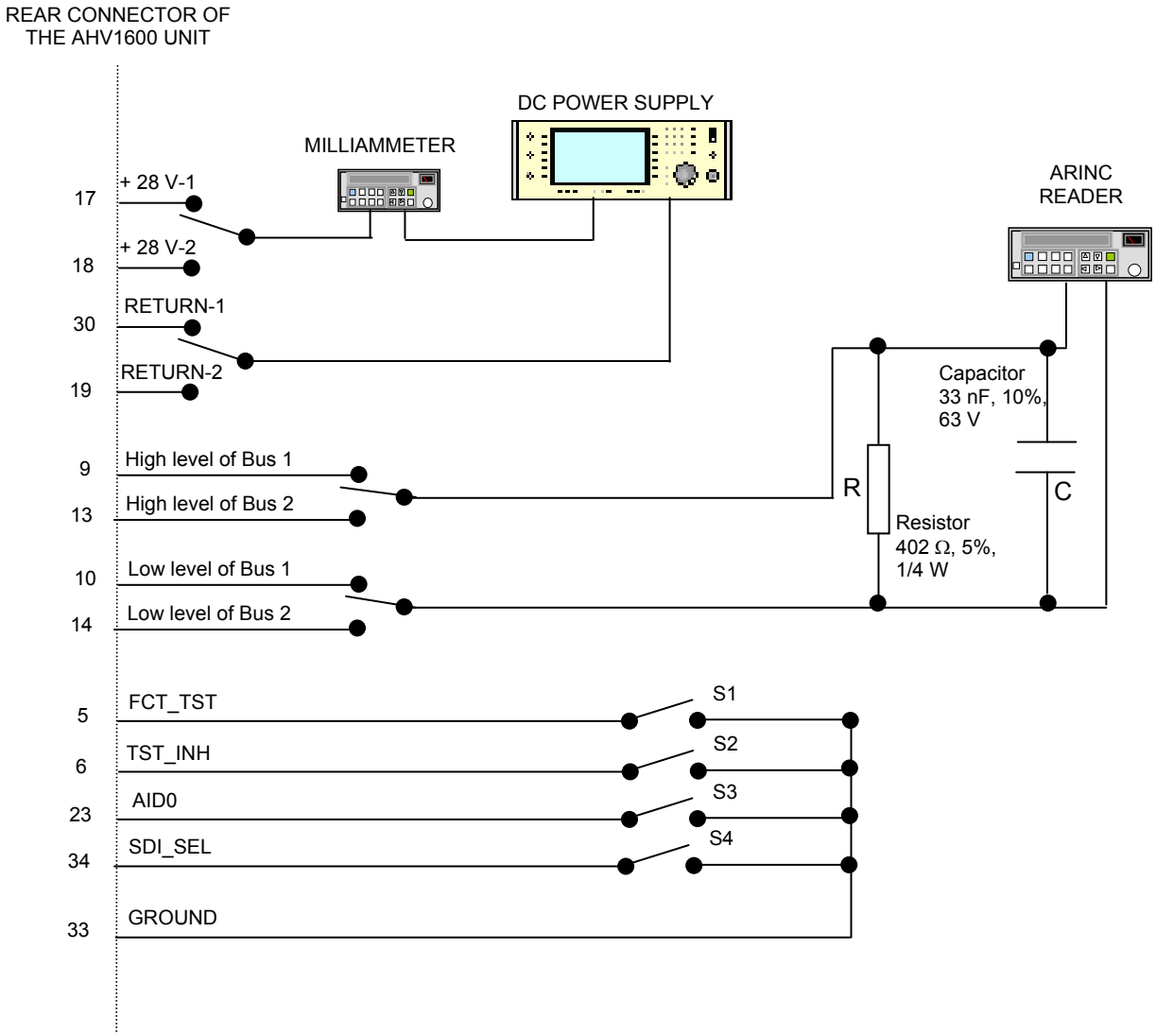

Figure 1003 (sheet 1 of 2) – Test set-up with AHV1600 unit powered-on

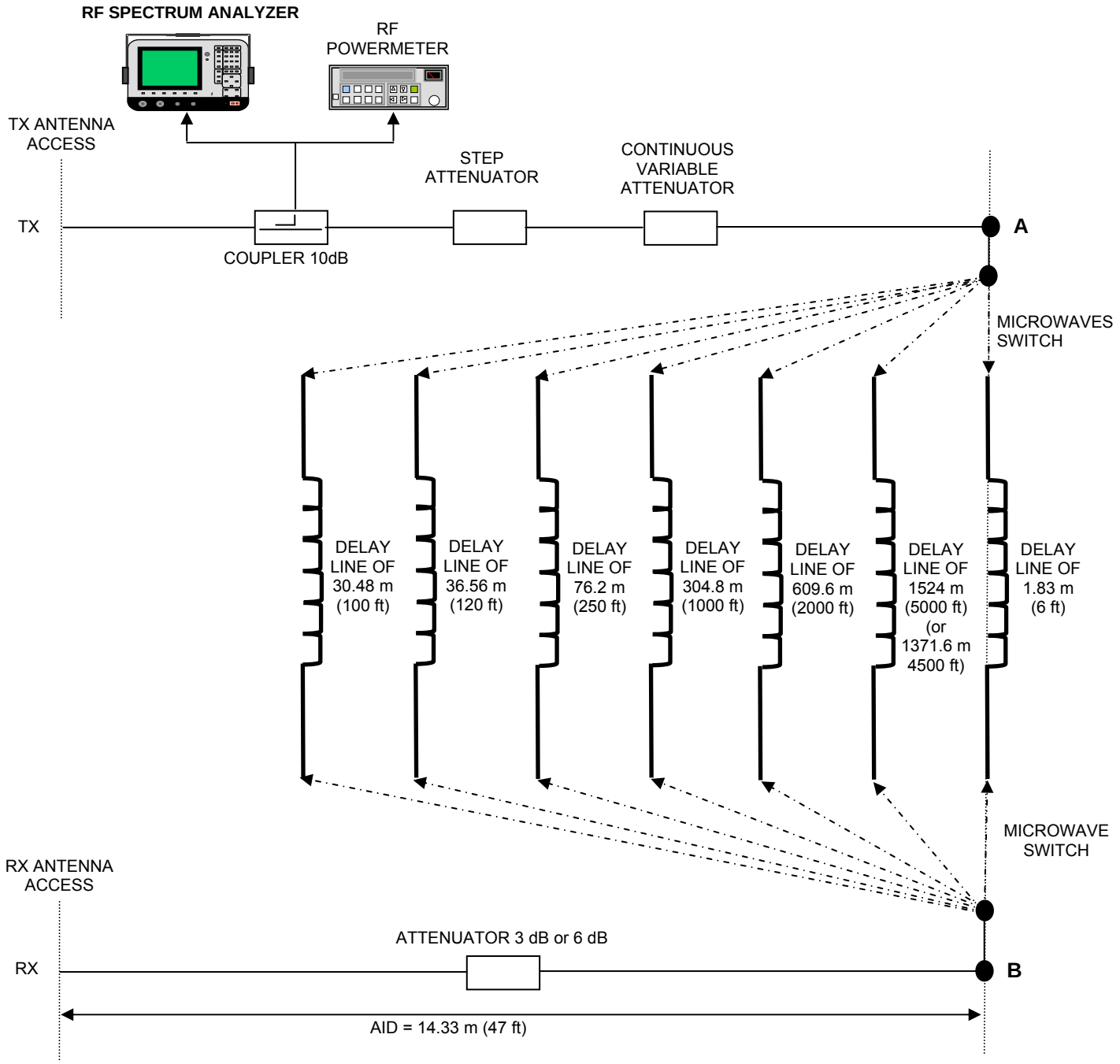

Figure 1003 (sheet 2 of 2) – Test set-up with AHV1600 unit powered-on

GRAPHIC 34-42-61-991-009-A01

NOTE: (in accordance with Figure 1003)
The electrical length existing between Tx and Rx connectors of the AHV1600 unit when points A and B are directly connected including the electrical length of the interface cables, adapters, variable attenuator, and couplers should correspond to the AID simulated height (14.33 m (47 ft)).

NOTE: (in accordance with Figure 1003)
All the delay lines used for the different measurements must be calibrated to know with accuracy their electrical length and their attenuation.

NOTE: (in accordance with Figure 1003)
The delay line of 1524 m (5000 ft) can be replaced by a delay line of 1371.6 m (4500 ft) (in the functional test procedure, are given the tolerances between brackets for this delay line).

NOTE: (in accordance with Figure 1003)
RF attenuation of each element (cables, delay line) must be known prior an acceptance tests in order to take into account consideration for sensitivity and RF transmitted power measurements.

NOTE: (in accordance with Figure 1003)
For the test “Response time performance during a height step”, it is necessary to use a microwave switch to reduce at maximum the commutation time between the delay line of 30.48 m (100 ft) and the delay line of 365.76 m (1200 ft).

NOTE: (in accordance with Figure 1003)
The different values of delay lines used in the Functional Test procedure must respect the applicable tolerance of 2% with the desired delay lines (refer to the table below).

TABLE 34-42-61-992-101-A01

HEIGHT				
Height (m (ft))	Height tol. (%)	Height tol. (m (ft))	Hsim min. (m (ft))	Hsim max. (m (ft))
1.83 (6)	2%	0.04 (0.12)	1.18 (3.88)	2.48 (8.12)
30.48 (100)	2%	0.61 (2)	29.26 (96)	31.70 (104)
76.2 (250)	2%	1.52 (5)	74.07 (243)	78.33 (257)
304.8 (1000)	2%	6.1 (20)	298.09 (978)	311.50 (1022)
609.6 (2000)	2%	12.19 (40)	596.80 (1958)	622.40 (2042)
1371.6 (4500)	2%	27.43 (90)	1343.56 (4408)	1399.64 (4592)
1524 (5000)	2%	30.48 (100)	1461.82 (4796)	1555.19 (5102)

TABLE 34-42-61-992-102-A01

Control	State	Configuration (refer to Figure 1003)
FCT_TST	OPEN	Contact 5 is not linked to contact 33 (S1 is open)
FCT_TST	GND	Contact 5 is linked to contact 33 (S1 is closed)
TST_INH	OPEN	Contact 6 is not linked to contact 33 (S2 is open)
TST_INH	GND	Contact 6 is linked to contact 33 (S2 is closed)
AID0	0	Contact 23 is linked to contact 33 (S3 is closed)
SDI_SEL	GND	Contact 34 is linked to contact 33 (S4 is closed)
SDI_SEL	OPEN	Contact 34 is not linked to contact 33 (S4 is open)

Figure 1004: Table of configuration of the controls of the AHV1600 unit

GRAPHIC 34-42-61-991-010-A01

NOTE: Contactors S1 to S4 are mentioned in accordance with the Test set up shown in Figure 1003 (other mean may be used to change the configuration of the controls).

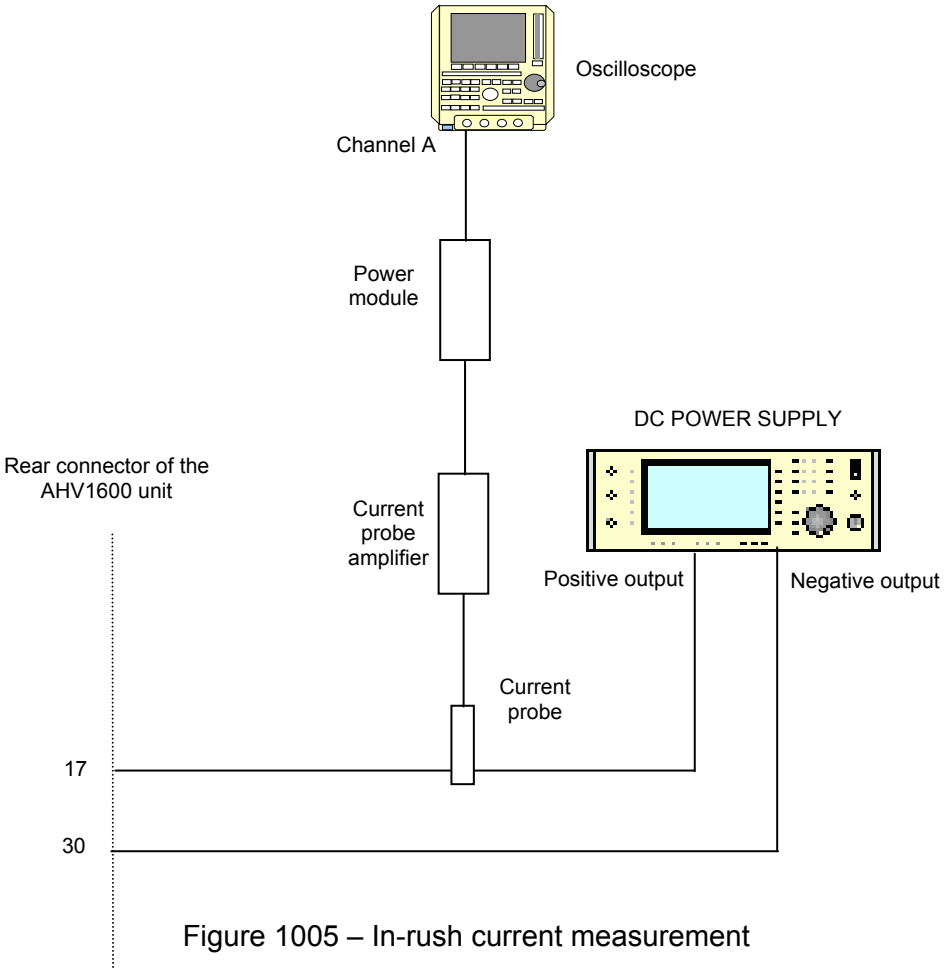

Figure 1005 – In-rush current measurement

GRAPHIC 34-42-61-991-011-A01

NOTE: This test set-up must be inserted in the test set-up shown on the Figure 1003

NOTE: To do the different connections to the rear connector of the AHV1600 unit, use a connector as defined in Special Tools, Fixtures and Equipment section.

NOTE: The same measurement must be done between pins 18 and 19 (the current probe must be put on the wire connected on the pin 18 of the test set-up shown on Figure 1003)

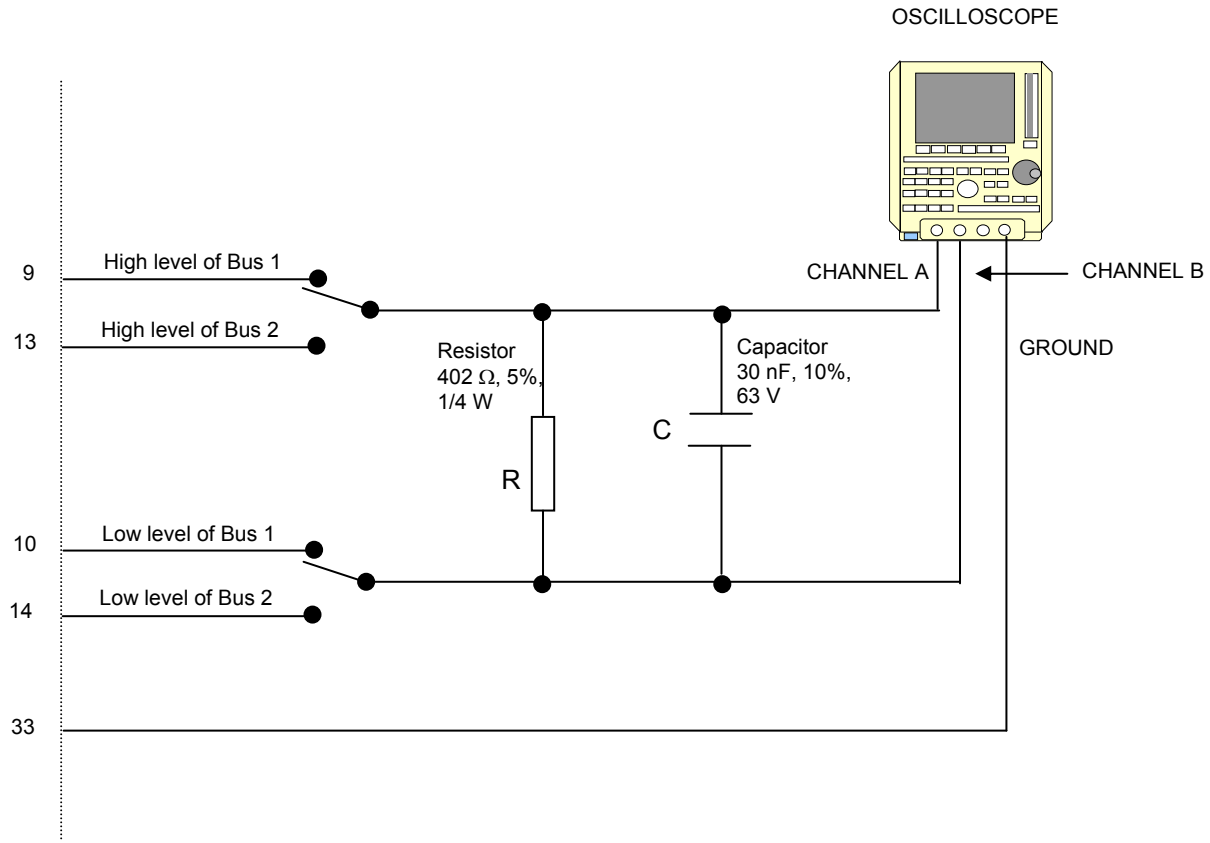

Figure 1006 – Measurement of the electrical characteristics of the Arinc 429 output signals

GRAPHIC 34-42-61-991-012-A01

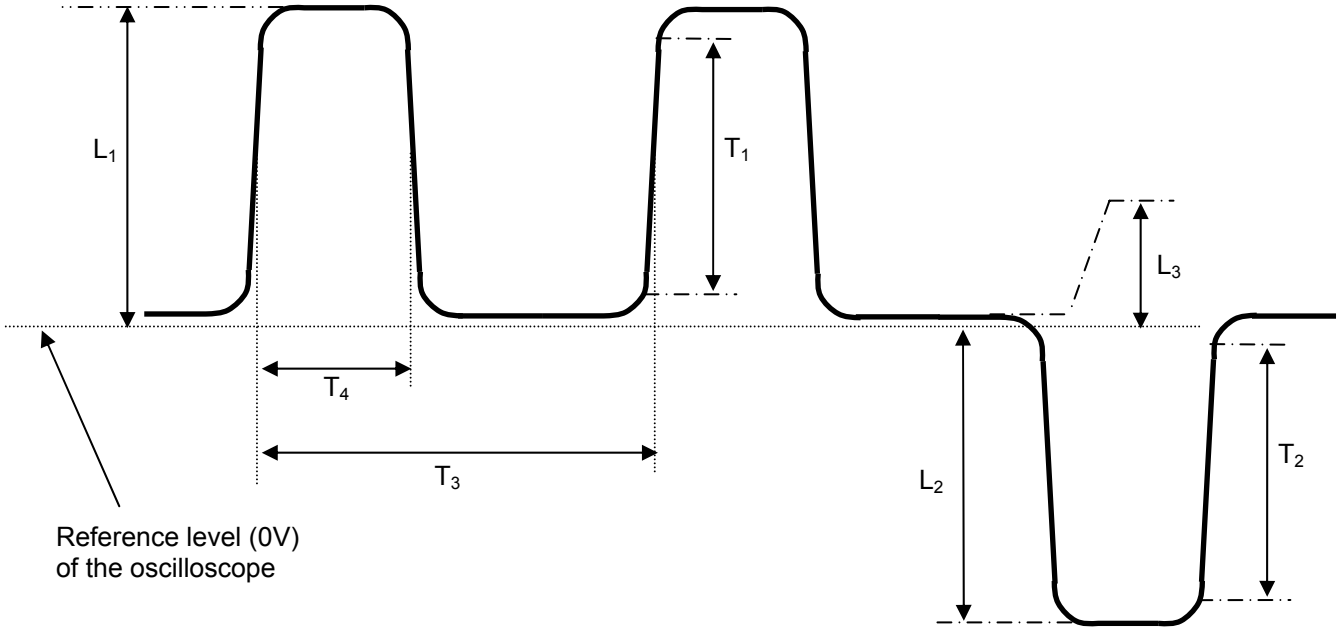

Figure 1007 – Levels L1, L2 and L3 to measure on the Arinc 429 output signals

GRAPHIC 34-42-61-991-013-A01

NOTE: Rise time T1 and fall time T2 are measured between the 10% and the 90% voltage amplitude of the pulse.

NOTE: T3 is the time between the 50% voltage amplitude of the rising edge and the 50% voltage amplitude of the rising edge of the next pulse.

NOTE: T4 is the time between the 50% voltage amplitude of the rising edge and the 50% voltage amplitude of the falling edge.

SUBTASK 34-42-61-871-003-A01

C. Sequence of the equipment identifier data word labels “371”

By decoding the equipment identifier data word labels “371”, it is possible to decode the position (following the SDI value), the part number and the serial number of the AHV1600 unit.

A complete sequence contains 9 equipment identifier data word labels “371” as described below.

The sequence is sent continuously and begins by the STX world and ends by the EOT world.

NOTE: To decode a sequence, it is necessary to use the ISO5 alphabet (refer to Figure 1005).

NOTE: To ease the decoding of a complete sequence, it is necessary to use an Arinc tool (software) which allows the recording of 17 (at least) equipment identifier data word labels “371”.

Example of a complete sequence:

Equipment identifier data:

- “Name”: RA1
- “Part Number”: 61778974AC
- “Serial Number”: 01025

TABLE 34-42-61-992-103-A01

Transmission of first word label “371”

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Parity	**STX**							Spare									MSB	Block Word Count					LSB	LSB	Label « 371 »						MSB
0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	1	1	1	1

TABLE 34-42-61-992-104-A01

Transmission of intermediate words label “371

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Parity	MSB	**1**					LSB	Spare	MSB	**A**					LSB	Spare	MSB	**R**					LSB	LSB	Label « 371 »						MSB
1	0	1	1	0	0	0	1	0	1	0	0	0	0	0	1	0	1	0	1	0	0	1	0	1	0	0	1	1	1	1	1

TABLE 34-42-61-992-105-A01

Transmission of intermediate words label “371 (continued)

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Parity	MSB			**1**			LSB	Spare	MSB			**6**			LSB	Spare	MSB			Carriage Return			LSB	LSB			Label « 371 »			MSB
1	0	1	1	0	0	0	1	0	0	1	1	0	1	1	0	0	0	0	0	1	1	0	1	1	0	0	1	1	1	1	1

TABLE 34-42-61-992-106-A01

Transmission of intermediate words label “371 (continued)

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Parity	MSB			**8**			LSB	Spare	MSB			**7**			LSB	Spare	MSB			**7**			LSB	LSB			Label « 371 »			MSB
0	0	1	1	1	0	0	0	0	0	1	1	0	1	1	1	0	0	1	1	0	1	1	1	1	0	0	1	1	1	1	1

TABLE 34-42-61-992-107-A01

Transmission of intermediate words label “371 (continued)

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Parity	MSB			**4**			LSB	Spare	MSB			**7**			LSB	Spare	MSB			**9**			LSB	LSB			Label « 371 »			MSB
1	0	1	1	0	1	0	0	0	0	1	1	0	1	1	1	0	0	1	1	1	0	0	1	1	0	0	1	1	1	1	1

TABLE 34-42-61-992-108-A01

Transmission of intermediate words label “371 (continued)

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Parity	MSB			**Carriage Return**			LSB	Spare	MSB			**A**			LSB	Spare	MSB			**A**			LSB	LSB			Label « 371 »			MSB
0	0	0	0	1	1	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0	1	1	1	1	1

TABLE 34-42-61-992-109-A01

Transmission of intermediate words label “371 (continued)

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Parity	MSB			**0**			LSB	Spare	MSB			**1**			LSB	Spare	MSB			**0**			LSB	LSB			Label « 371 »			MSB
0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	1	1	0	0	0	0	1	0	0	1	1	1	1	1

TABLE 34-42-61-992-110-A01

Transmission of intermediate words label “371 (end)

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Parity	MSB			**SP**			LSB	Spare	MSB			**5**			LSB	Spare	MSB			**2**			LSB	LSB			Label « 371 »				MSB
1	0	1	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	1	1	0	0	1	0	1	0	0	1	1	1	1	1

TABLE 34-42-61-992-111-A01

Transmission of last word label “371”

32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Parity				**EOT**				Spare																LSB				Label « 371 »				MSB
0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1	1

TABLE 34-42-61-992-112-A01

ISO5 alphabet

Bits 7 6 5					0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
4	3	2	1	Row ↓ / Column →	0	1	2	3	4	5	6	7
0	0	0	0	0	NUL		SP	0		P	MCDU MENU	SEL1
0	0	0	1	1	CNTRL	DC1	!	1	A	Q	SPECIAL FUNCTION	SEL2
0	0	1	0	2	STX	DC2	"	2	B	R	KEY 1 TO 13	SEL3
0	0	1	1	3	ETX	DC3	#	3	C	S		SEL4
0	1	0	0	4	EOT	DC4		4	D	T		SEL5
0	1	0	1	5	ENQ	NAK	%	5	E	U		SEL6
0	1	1	0	6	ACK	SYN	&	6	F	V		PREV PAGE
0	1	1	1	7			'	7	G	W		NEXT PAGE
1	0	0	0	8	CLR	LOGOFF	(	8	H	X		SER1
1	0	0	1	9			)	9	I	Y		SER2
1	0	1	0	10			*	:	J	Z		SER3
1	0	1	1	11			+	;	K	[		SER4
1	1	0	0	12		0	,	<	L	\		SER5
1	1	0	1	13	CARRIAGE RETURN		-	=	M	]		SER6
1	1	1	0	14		↓	.	>	N	↑	△	
1	1	1	1	15		→	/	?	O	←	↻ OR △	CLR/DEL

The highlighted characters correspond to the characters used by the equipment identifier data word label “371”.

Figure 1008 – Table of ISO5 alphabet

GRAPHIC 34-42-61-991-014-A01

TABLE 34-42-61-992-113-A01

Tests of the AHV1600

TEST PROCEDURE	DESCRIPTION
(1) Refer to SUBTASK 34-42-61-700-001-01	Lightning protection of the power supply inputs and Arinc outputs
(2) Refer to SUBTASK 34-42-61-700-002-01	Lightning protection of the Radio Frequency inputs “RX”, “TX” and discretes inputs
(4) Refer to SUBTASK 34-42-61-700-004-01	Power consumption
(5) Refer to SUBTASK 34-42-61-700-005-01	RF bandwidth
(6) Refer to SUBTASK 34-42-61-700-006-01	RF transmitted power
(7) Refer to SUBTASK 34-42-61-700-007-01	Electrical characteristics of the Arinc 429 output signals
(8) Refer to SUBTASK 34-42-61-700-008-01	Refresh rate of Arinc labels on Arinc bus N°1 and Arinc bus N°2
(9) Refer to SUBTASK 34-42-61-700-009-01	Checking of data word labels “271”, “272”, “371” and “377”
(10) Refer to SUBTASK 34-42-61-700-010-01	SDI selection discrete
(11) Refer to SUBTASK 34-42-61-700-011-01	Test Inhibit discrete
(12) Refer to SUBTASK 34-42-61-700-012-01	Functional Test discrete
(13) Refer to SUBTASK 34-42-61-700-013-01	Search mode and track mode
(14) Refer to SUBTASK 34-42-61-700-014-01	Antenna failure
(15) Refer to SUBTASK 34-42-61-700-015-01	Built In Test function
(16) Refer to SUBTASK 34-42-61-700-016-01	Sensitivity
(17) Refer to SUBTASK 34-42-61-700-017-01	Height accuracy
(18) Refer to SUBTASK 34-42-61-700-018-01	Response time performance during a height step
(19) Refer to SUBTASK 34-42-61-700-019-01	Operation at + 22 V and + 18 V
(20) Refer to SUBTASK 34-42-61-700-020-01	Operation at + 30.3 V

Figure 1009 – List of the tests of the functional test procedure
GRAPHIC 34-42-61-991-015-A01

TASK 34-42-61-700-801-A01

4. AHV1600 TRANSCEIVER - TESTING

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET−UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

Refer to Special Tools, Fixtures and Equipment section.

(2) CONSUMABLES

Not applicable.

(3) REFERENCE INFORMATION

Not applicable.

C. JOB SET−UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-700-001-01

(1) Lightning protection of the power supply inputs and Arinc outputs

NOTE: The test set-up is shown on Figure 1001.

(a) With an oscilloscope, calibrate the high pulse generator (or power supply) to generate a 1 ms / + 90 Vpeak pulse in manual triggered mode.

(b) Connect the positive output of the high power pulse generator through a 178 Ω, 1%, 1/2 W resistor to pin 17 (+ 28V_1 access) of the connector of the AHV1600 unit.

(c) Connect the negative output of the high power pulse generator to pin 2 (Ground) of the connector of the AHV1600 unit.

(d) Trig the pulse generator to provide a pulse and measure on the oscilloscope the clamping pulse value Vpeak (positive polarity).

- Result: +73.4 V ≤ Vpeak ≤ +81.2 V

(e) Reverse the outputs of the pulse generator.

(f) Trig the pulse generator to provide a pulse and measure on the oscilloscope the clamping pulse value Vpeak (negative polarity).

- Result: -81.2 V ≤ Vpeak ≤ -73.4 V

(g) Connect the positive output of the high power pulse generator through a 178 Ω, 1%, 1/2 W resistor to pin 30 (- 28V_1 access) of the connector of the AHV1600 unit.

(h) Connect the negative output of the high power pulse generator to pin 2 (Ground) of the connector of the AHV1600 unit.

(i) Repeat steps (d) to (f).

(j) Connect the positive output of the high power pulse generator through a 178 Ω, 1%, 1/2 W resistor to pin 18 (+ 28V_2 access) of the connector of the AHV1600 unit.

(k) Connect the negative output of the high power pulse generator to pin 2 (Ground) of the connector of the AHV1600 unit.

(l) Repeat steps (d) to (f).

(m) Connect the positive output of the high power pulse generator through a 178 Ω, 1%, 1/2 W resistor to pin 19 (- 28V_2 access) of the connector of the AHV1600 unit.

(n) Connect the negative output of the high power pulse generator to pin 2 (Ground) of the connector of the AHV1600 unit.

(o) Repeat steps (d) to (f).

(p) With an oscilloscope, calibrate the high pulse generator to generate a 1 ms / + 55 Vpeak pulse in manual triggered mode.

(q) Connect the positive output of the high power pulse generator through a 178 Ω, 1%, 1/2 W resistor to pin 9 (TX 429 High_1) of the connector of the AHV1600 unit.

(r) Connect the negative output of the high power pulse generator to pin 2 (Ground) of the connector of the AHV1600 unit.

(s) Trig the pulse generator to provide a pulse and measure on the oscilloscope the clamping pulse value Vpeak (positive polarity).

- Result: +10.4 V ≤ Vpeak ≤ +11.9 V

(t) Reverse the outputs of the pulse generator.

(u) Trig the pulse generator to provide a pulse and measure on the oscilloscope the clamping pulse value Vpeak (negative polarity).

- Result: -11.9 V ≤ Vpeak ≤ -10.4 V

(v) Connect the positive output of the high power pulse generator through a 178 Ω, 1%, 1/2 W resistor to pin 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(w) Connect the negative output of the high power pulse generator to pin 2 (Ground) of the connector of the AHV1600 unit.

(x) Repeat steps (s) to (u).

(y) Connect the positive output of the high power pulse generator through a 178 Ω, 1%, 1/2 W resistor to pin 13 (TX 429 High_2) of the connector of the AHV1600 unit.

(z) Connect the negative output of the high power pulse generator to pin 2 (Ground) of the connector of the AHV1600 unit.

(aa) Repeat steps (s) to (u).

(bb) Connect the positive output of the high power pulse generator through a 178 Ω, 1%, 1/2 W resistor to pin 14 (TX 429 Low_2) of the connector of the AHV1600 unit.

(cc) Connect the negative output of the high power pulse generator to pin 2 (Ground) of the connector of the AHV1600 unit.

(dd) Repeat steps (s) to (u).

(ee) Disconnect the high power pulse generator from the AHV1600 unit.

SUBTASK 34-42-61-700-002-01

(2) Lightning protection of the Radio Frequency inputs “RX”, “TX” and discretes inputs

NOTE: The test set-up is shown on Figure 1002.

(a) On the DC power supply, adjust the power supply current limit to: 10 mA ± 0.10 mA (if necessary, with a DC ammeter connected to the output of the DC power supply).

(b) Connect the positive output of the DC power supply to the central contact of the “RX” antenna access of the AHV1600 unit.

(c) Connect the negative output of the DC power supply to pin 2 (Ground) of the connector of the AHV1600 unit.

(d) Increase the DC power supply voltage until the clipping voltage Vlim is reached (positive polarity).

- Result: + 15.2 V ≤ Vlimit ≤ + 18.6 V

(e) Set to 0V the output voltage and reverse the outputs of the DC power supply.

(f) Increase the DC power supply voltage until the clipping voltage Vlim is reached (negative polarity).

- Result: - 14.3V ≤ Vlimit ≤ -10.3 V

(g) Connect the positive output of the DC power supply to the central contact of the “TX” antenna access of the AHV1600 unit.

(h) Connect the negative output of the DC power supply to pin 2 (Ground) of the connector of the AHV1600 unit.

(i) Repeat steps (d) to (f).

(j) Disconnect the DC power supply from the AHV1600 unit.

(k) On the DC power supply, adjust the power supply current limit to: 2 mA ± 0.10 mA (if necessary, with a DC ammeter connected to the output of the DC power supply).

(l) Connect the positive output of the DC power supply to pin 5 (Funct_Test) of the connector of the AHV1600 unit.

(m) Connect the negative output of the DC power supply to pin 2 (Ground) of the connector of the AHV1600 unit.

(n) Increase the DC power supply voltage until the clipping voltage Vlim is reached (positive polarity).

- Result: + 36.8 V ≤ Vlimit ≤ + 42.8 V

(o) Set to 0V the output voltage and reverse the outputs of the DC power supply.

(p) Increase the DC power supply voltage until the clipping voltage Vlim is reached (negative polarity).

- Result: - 5.3 V ≤ Vlimit ≤ - 1.3 V

(q) Connect the positive output of the DC power supply to pin 6 (Test_Inhib) of the rear connector of the AHV1600 unit.

(r) Connect the negative output of the DC power supply to pin 2 (Ground) of the rear connector of the AHV1600 unit.

(s) Repeat steps (n) to (p).

(t) Connect the positive output of the DC power supply to pin 23 (AID_0) of the rear connector of the AHV1600 unit.

(u) Connect the negative output of the DC power supply to pin 2 (Ground) of the rear connector of the AHV1600 unit.

(v) Repeat steps (n) to (p).

(w) Connect the positive output of the DC power supply to pin 24 (AID_1) of the rear connector of the AHV1600 unit.

(x) Connect the negative output of the DC power supply to pin 2 (Ground) of the rear connector of the AHV1600 unit.

(y) Repeat steps (n) to (p).

(z) Connect the positive output of the DC power supply to pin 16 (AID_2) of the rear connector of the AHV1600 unit.

(aa) Connect the negative output of the DC power supply to pin 2 (Ground) of the rear connector of the AHV1600 unit.

(bb) Repeat steps (n) to (p).

(cc) Connect the positive output of the DC power supply to pin 20 (AID_P) of the rear connector of the AHV1600 unit.

(dd) Connect the negative output of the DC power supply to pin 2 (Ground) of the rear connector of the AHV1600 unit.

(ee) Repeat steps (n) to (p).

(ff) Connect the positive output of the DC power supply to pin 34 (SDI_Sel) of the rear connector of the AHV1600 unit.

(gg) Connect the negative output of the DC power supply to pin 2 (Ground) of the rear connector of the AHV1600 unit.

(hh) Repeat steps (n) to (p).

(ii) Disconnect the DC power supply from the AHV1600 unit.

SUBTASK 34-42-61-700-003-01

(3) Configuration of the AHV1600

NOTE: The test set-up is shown on Figure 1003.

(a) Insert a delay line of 1.83 m (6 ft) between points A and B.

(b) Adjust the total loop attenuation to 76 dB ± 1 dB between “Tx” and “Rx” connectors of the AHV1600 unit.

(c) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004).

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

SUBTASK 34-42-61-700-004-01

(4) Power consumption

NOTE: The test set-up is shown on Figure 1003.

(a) Connect the DC power supply to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit with a miliammeter.

(b) Adjust the output voltage of the DC Power Supply to + 28 VDC ± 0.5 VDC.

(c) Power-on the AHV1600.

(d) Wait 10 seconds.

(e) Measure the value Ic of the DC current on the milliammeter.

- Result: Ic ≤ 0.727 A

(f) Power-off the AHV1600 unit (the DC Power Supply is stopped).

(g) Disconnect the ammeter (the positive output of the DC power supply is directly connected to the pin 17 (+ 28V_1 access) of the rear connector of the AHV1600 unit).

(h) Connect the current probe to the wire linked to the pin 17 (+ 28V_1 access) and do the test set-up shown on Figure 1005.

(i) Calibrate the digital oscilloscope in triggered single shot on the rising slope of the current probe.

(j) Power-on the AHV1600.

(k) On the digital oscilloscope, check the peak pulse current value I at power-up.

- Result: I < 22APeak

(l) On the digital oscilloscope, check the time duration Td for the in-rush current reaches 63% of the peak pulse value.

- Result: Td $\leq$ 750μs

(m) Power-off the AHV1600 unit.

(n) Connect the DC power supply to pins 18 (+ 28V_2 access) and 19 (- 28V_2 access) of the rear connector of the AHV1600 unit with a miliammeter.

(o) Adjust the output voltage of the DC Power Supply to + 28 VDC $\pm$ 0.5 VDC.

(p) Power-on the AHV1600.

(q) Repeat steps (d) and (e).

- Result: Ic $\leq$ 0.727 A

(r) Power-off the AHV1600 unit.

(s) Disconnect the ammeter (the positive output of the DC power supply is directly connected to the pin 18 of the rear connector of the AHV1600 unit).

(t) Connect the current probe to the wire linked to the pin 18 (+ 28V_2 access) and do the test set-up shown on Figure 1005.

(u) Calibrate the digital oscilloscope in triggered single shot on the rising slope of the current probe.

(v) Power-on the AHV1600.

(w) On the digital oscilloscope, check the peak pulse current value I at power-up.

- Result: I < 22 A Peak

(x) On the digital oscilloscope, check the time duration Td for the in-rush current reaches 63% of the peak pulse value.

- Result: Td $\leq$ 750 μs

(y) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-005-01

(5) RF bandwidth

NOTE: The test set-up is shown on Figure 1003.

(a) Adjust the total loop attenuation (with the variable attenuators) to obtain the maximum attenuation between “Tx” and “Rx” connectors of the AHV1600 unit.

(b) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(c) Wait 10 seconds.

(d) On the RF spectrum analyzer, measure the low transmitted Radio Frequency Fmin.

- Result: Fmin $\geq$ 4.2 GHz

(e) On the RF spectrum analyzer, measure the high transmitted Radio Frequency Fmax.

- Result: Fmax $\leq$ 4.4 GHz

(f) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-006-01

(6) RF transmitted power

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(c) Wait 10 seconds.

(d) On the RF Power meter, read the value P1 and calculate P according to the attenuation A (between “TX” connector of the ERT560 and the probe of the RF Power meter).

P(dBm) = P1(dBm) + A(dB).

- Result: P = 4 dBm $\pm$ 2 dB

(e) Between points A and B of the test set-up is shown on Figure 1003, insert a delay line of 30.48 m (100 ft).

(f) Adjust the total loop attenuation (with the variable attenuators) to obtain 100 dB ± 1 dB of attenuation between Tx and Rx connectors of the AHV1600 unit.

(g) On the RF Power meter, read the value P1 and calculate P according to the attenuation A (between TX connector of the ERT560 and the probe of the RF Power meter).

P(dBm) = P1(dBm) + A(dB).

- Result: P = 5 dBm ± 2 dB

(h) Repeat steps (e) to (g) with a delay line of 76.2 m (250 ft) and a total loop attenuation of 108 dB ± 1 dB.

- Result: P = 9 dBm ± 2 dB

(i) Repeat steps (e) to (g) with a delay line of 304.8 m (1000 ft) and a total loop attenuation of 118 dB ± 1 dB.

- Result: P = 15 dBm ± 2 dB

(j) Repeat steps (e) to (g) with a delay line of 609.6 m (2000 ft) and a total loop attenuation of 124 dB ± 1 dB.

- Result: P = 17 dBm ± 2 dB

(k) Repeat steps (e) to (g) with a delay line of 1524 m (5000 ft) (or 1372 m (4500 ft)) and a total loop attenuation of 132 dB ± 1 dB.

- Result: P = 17 dBm ± 2 dB

(l) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-007-01

(7) Electrical characteristics of the output signals Arinc 429

NOTE: The test set-up is shown on Figures 1003 and 1006.

The Arinc reader is replaced by a digital oscilloscope.

The resistor R and the capacitor C are used to simulate 20 Arinc loads.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004)

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Connect the oscilloscope to pins 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the rear connector of the AHV1600 unit.

(c) On the oscilloscope, select the function “channel A + channel B”.

(d) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(e) Wait 10 seconds.

(f) On the oscilloscope, measure the level L1 (refer to Figure 1007).

- Result: - 11 VDC ≤ L1 ≤ - 7.25 VDC

(g) On the oscilloscope, measure the level L2 (refer to Figure 1007).

- Result: + 7.25 VDC ≤ L2 ≤ + 11 VDC

(h) On the oscilloscope, measure the level L3 (refer to Figure 1007).

- Result: - 0.5 VDC ≤ L3 ≤ + 0.5 VDC

(i) Connect the oscilloscope to pins 13 (TX 429 High_2) and 14 (TX 429 Low_2) of the rear connector of the AHV1600 unit

(j) On the oscilloscope, measure the level L1 (refer to Figure 1007).

- Result: - 11 VDC ≤ L1 ≤ - 7.25 VDC

(k) On the oscilloscope, measure the level L2 (refer to Figure 1007).

- Result: + 7.25 VDC ≤ L2 ≤ + 11 VDC

(l) On the oscilloscope, measure the level L3 (refer to Figure 1007).

- Result: - 0.5 VDC ≤ L3 ≤ + 0.5 VDC

(m) Power-off the AHV1600 unit.

(n) Remove the resistor R and the capacitor C (refer to Figure 1006).

(o) Connect the oscilloscope to pins 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the rear connector of the AHV1600 unit.

(p) Power-on the AhV1600 unit.

(q) Wait 10 seconds.

(r) On the oscilloscope, measure the time T1 (refer to Figure 1007).

- Result: T1 = 10 μs ± 5 μs

(s) On the oscilloscope, measure the time T2 (refer to Figure 1007).

- Result: T2 = 10 μs ± 5 μs

(t) On the oscilloscope, measure the time T3 (refer to Figure 1007).

- Result: T3 = 80 μs ± 2 μs

(u) On the oscilloscope, measure the time T4 (refer to Figure 1007).

- Result: T4 = 40 μs ± 2 μs

(v) Connect the oscilloscope to pins 13 (TX 429 High_2) and 14 (TX 429 Low_2) of the rear connector of the AHV1600 unit.

(w) On the oscilloscope, measure the time T1 (refer to Figure 1007).

- Result: T1 = 10 μs ± 5 μs

(x) On the oscilloscope, measure the time T2 (refer to Figure 1007).

- Result: T2 = 10 μs ± 5 μs

(y) On the oscilloscope, measure the time T3 (refer to Figure 1007).

- Result: T3 = 80 μs ± 2 μs

(z) On the oscilloscope, measure the time T4 (refer to Figure 1007).

- Result: T4 = 40 μs ± 2 μs

(aa) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-008-01

(8) Refresh rate of Arinc labels on Arinc bus N°1 and Arinc bus N°2

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 103 and 104)

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(c) Wait 10 seconds.

(d) With the Arinc reader, check the refresh rate Tr of the Arinc label 164.

- Result: Tr = 40 ms ± 1 ms

(e) Repeat step (d) for Arinc labels 165, 271, 272, 371 and 377.

- Result: Tr = 40 ms ± 1 ms

(f) Connect the Arinc reader to pins 13 (TX 429 High_2) and 14 (TX 429 Low_2) of the connector of the AHV1600 unit.

(g) With the Arinc reader, check the refresh rate Tr of the Arinc label 164.

- Result: Tr = 40 ms ± 1 ms

(h) Repeat step (g) for Arinc labels 165, 271, 272, 371 and 377.

- Result: Tr = 40 ms ± 1 ms

(i) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-009-01

(9) Checking of data word labels “271”, “272”, “371” and “377”

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

For decoding of a complete sequence of data word labels “371”, refer to SUBTASK 34-42-61-871-003-A01.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(c) Wait 10 seconds.

(d) With the Arinc reader, check the bits 11 to 22 of the equipment identifier data word labels “377”.

- Result: data bits <22..11> = 007 (Hexadecimal)

(e) With the Arinc reader, record a sequence of the equipment identifier data word labels “371”.

(f) Check the information “name”.

- Result: the information “name” is set to “RA1”

(g) Check the information “part number” according to the identification label of the AHV1600 unit.

- Result: the information “part number” is in accordance with the identification label of the AHV1600 unit.

(h) Check the information “serial number” according to the identification label of the AHV1600 unit.

- Result: the information “serial number” is in accordance with the identification label of the AHV1600 unit.

(i) With the Arinc reader, check the bits 11 to 14 of the status words labels “271”.

- Result: bit 11 = 1 bit 12 = 0 bit 13 = 0 bit 14 = 0

(j) With the Arinc reader, check the bits 20and 21 of the status data word labels “272”.

- Result: bit 20 = 1 bit 21 = 0

(k) With the Arinc reader, check the bits 24 to 29 of the Status data words labels “272”.

- Result: bit 24 = 1 bit 25 = 1 bit 26 = 1 bit 27 = 1 bit 28 =1 bit 29 = 1

(l) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-010-01

(10) SDI selection discrete

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(c) Wait 10 seconds.

(d) With the Arinc reader, check the bits 9 and 10 of the height data word labels “164”.

- Result: bit 9 = 1 bit 10 = 0

(e) With the Arinc reader, check the bits 9 and 10 of the height data word labels “165”.

- Result: bit 9 = 1 bit 10 = 0

(f) With the Arinc reader, check the bits 9 and 10 of the status data word labels “271”.

- Result: bit 9 = 1 bit 10 = 0

(g) With the Arinc reader, check the bits 9 and 10 of the status data word labels “272”.

- Result: bit 9 = 1 bit 10 = 0

(h) With the Arinc reader, record a sequence of the equipment identifier data word labels “371”.

(i) Check the information “name”.

- Result: the information “name” is set to “RA1”

(j) With the Arinc reader, check the bits 9 and 10 of the equipment identifier data word labels “377”.

- Result: bit 9 = 1 bit 10 = 0

(k) Power-off the AHV1600 unit.

(l) Configure the AHV1600 unit as follows (refer to Figure 1004):

- SDI_SEL = OPEN

(m) Power-on the AHV1600 unit.

(n) Wait 10 seconds.

(o) With the Arinc reader, check the bits 9 and 10 of the height data word labels “164”.

- Result: bit 9 = 0 bit 10 = 1

(p) With the Arinc reader, check the bits 9 and 10 of the height data word labels “165”.

- Result: bit 9 = 0 bit 10 = 1

(q) With the Arinc reader, check the bits 9 and 10 of the status data word labels “271”.

- Result: bit 9 = 0 bit 10 = 1

(r) With the Arinc reader, check the bits 9 and 10 of the status data word labels “272”.

- Result: bit 9 = 0 bit 10 = 10

(s) With the Arinc reader, record a sequence of the equipment identifier data word labels “371”.

(t) Check the information “name”.

- Result: the information “name” is set to “RA2”

(u) With the Arinc reader, check the bits 9 and 10 of the equipment identifier data word labels “377”.

- Result: bit 9 = 0 bit 10 = 1

(v) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-011-01

(11) Test Inhibit discrete

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(c) Wait 10 seconds.

(d) With the Arinc reader, check the bit 11 of the height data worlds “164”.

- Result: bit 11 = 0

(e) With the Arinc reader, check the bit 18 of the height data worlds “271”.

- Result: bit 18 = 1

(f) Configure the AHV1600 unit as follows (refer to Figure 1004):

- TST_INH = GND

(g) Wait 10 seconds.

(h) With the Arinc reader, check the bit 11 of the height data worlds “164”.

- Result: bit 11 = 0

(i) With the Arinc reader, check the bit 18 of the height data worlds “271”.

- Result: bit 18 = 0

(j) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-012-01

(12) Functional Test discrete

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(c) Wait 10 seconds.

(d) With the Arinc reader, check the bit 19 of the status words labels “272”.

- Result: bit 19 = 1

(e) With the Arinc reader, check the bit 17 of the status words labels “271”.

- Result: bit 17 = 1

(f) Configure the AHV1600 unit as follows (refer to Figure 1004):

- TST_INH = GND

(g) With the Arinc reader, check the bit 19 of the status words labels “272”.

- Result: bit 17 = 0 in maximum time duration of 3 seconds

(h) With the Arinc reader, check the bit 17 of the status words labels “271”.

- Result: bit 17 = 0

(i) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-013-01

(13) Search mode and track mode

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(c) Wait 10 seconds.

(d) Adjust the total loop attenuation (with the variable attenuators) to obtain the maximum attenuation between Tx and Rx connectors of the AHV1600 unit.

(e) With the Arinc reader, check the “status matrix” information of the height data words labels “164” (NCD state).

- Result: bit 30 = 1 bit 31 = 0

(f) With the Arinc reader, check the “height data” information of the height data word labels “164”.

- Result: Height data information = 2496.883 m (8191.875 ft)

(g) With the Arinc reader, check the “status matrix” information of the height data word labels “165” (NCD state).

- Result: bit 30 = 1 bit 31 = 0

(h) With the Arinc reader, check the “height data” information of the height data words labels “165”.

- Result: Height data information = 2438.37 m (7999.9 ft)

(i) With the Arinc reader, check the “mode” information of the status data words labels “272” (SEARCH mode).

- Result: bit 17 = 0 bit 18 = 0

(j) Adjust the total loop attenuation (with the variable attenuators) to obtain 76 dB ± 1 dB of attenuation between “Tx” and “Rx” connectors of the AHV1600 unit.

(k) With the Arinc reader, check the “status matrix” information of the height data word labels “164” (NO state).

- Result: bit 30 = 1 bit 31 = 1

(l) With the Arinc reader, check the “height data” information of the height data word labels “164”.

- Result: Height data information = 1.83 m (6 ft) ± 0.61 m (2 ft)

(m) With the Arinc reader, check the “status matrix” information of the height data word labels “165” (NO state).

- Result: bit 30 = 0 bit 31 = 0

(n) With the Arinc reader, check the “height data” information of the height data word labels “165”.

- Result: Height data information = 1.83 m (6 ft) ± 0.61 m (2 ft)

(o) With the Arinc reader, check the “status matrix” information of the status data word labels “271” (NO state mode).

- Result: bit 30 = 0 bit 31 = 0

(p) With the Arinc reader, check the “status matrix” information of the status data word labels “272” (NO state).

- Result: bit 30 = 0 bit 31 = 0

(q) With the Arinc reader, check the “status matrix” information of the equipment identifier data word labels “377” (NO state).

- Result: bit 30 = 0 bit 31 = 0

(r) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-014-01

(14) Antenna failure

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(c) Wait 10 seconds.

(d) Disconnect the TX coaxial cable (TX antenna failure simulated).

(e) With the Arinc reader, check the “status matrix” information of the height data words labels “164” (FW state).

- Result: bit 30 = 0 bit 31 = 0

(f) With the Arinc reader, check the “height data” information of the height data words labels “164”.

- Result: Height data information = 2496.883 m (8191.875 ft)

(g) With the Arinc reader, check the “status matrix” information of the Status data words labels “271” (FW state).

- Result: bit 30 = 1 bit 31 = 1

(h) With the Arinc reader, check the bits 24 to 29 of the Status data words labels “272”.

- Result: bit 24 = 1 bit 25 = 1 bit 26 = 1 bit 27 = 1 bit 28 = 1 bit 29 = 0

(i) With the Arinc reader, check the “status matrix” information of the Status data words labels “272” (FW state).

- Result: bit 30 = 1 bit 31 = 1

(j) With the Arinc reader, check the “status matrix” information of the Equipment identifier data words labels “377” (FW state).

- Result: bit 30 = 1 bit 31 = 1

(k) With the Arinc reader, check the stop transmitting of the Height data words labels “165”.

- Result: stop transmitting of labels “165” = OK

(l) Disconnect the RX coaxial cable (RX antenna failure simulated).

(m) With the Arinc reader, check the bits 24 to 29 of the Status data words labels “272” (FW state).

- Result: bit 24 = 1 bit 25 = 1 bit 26 = 1 bit 27 = 1 bit 28 = 0 bit 29 = 0

(n) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-015-01

(15) Built In Test function

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(c) Wait 10 seconds.

(d) With the Arinc reader, check the bit 19 of the Status data words labels “272”.

- Result: bit 19 = 1

(e) Configure the AHV1600 unit as follows (refer to Figure 1004)

- FCT_TST = GND
- TST_INH = GND

(f) With the Arinc reader, check the bit 19 of the Status data words labels “272”

- Result: bit 19 = 1

(g) Configure the AHV1600 unit as follows (refer to Figure 1004)

- TST_INH = OPEN

(h) With the Arinc reader, check the bit 19 of the Status data words labels “272”

- Result: bit 19 = 0 (in maximum time duration of 3 seconds)

(i) With the Arinc reader, check the “status matrix” (FT state) and “height data” information of the height data words labels “164”

- Result: bit 30 = 0 bit 31 = 1 (in maximum time duration of 3 seconds)

- Height data information = 30.48 m (100 ft) (in maximum time duration of 3 seconds)

(j) With the Arinc reader, check the “status matrix” (FT state) and “height data” information of the height data words labels “165”

- Result: bit 30 = 0 bit 31 = 1 (in maximum time duration of 3 seconds)
- Height data = 30.48 m (100 ft) (in maximum time duration of 3 seconds)

(k) Configure the AHV1600 unit as follows (refer to Figure 1004)

- FCT_TST = OPEN

(l) Power-off the AHV1600 unit

SUBTASK 34-42-61-700-016-01

(16) Sensitivity

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(c) Wait 10 seconds.

(d) Adjust the total loop attenuation (with the variable attenuators) to obtain the maximum attenuation between Tx and Rx connectors of the AHV1600 unit.

(e) Slowly, decrease the total loop attenuation until the AHV1600 unit switchovers to “NO” state (on height data words labels “164”, bit 30 = 1 and bit 31 = 1).

(f) Calculate the total attenuation S between TX and RX connectors of the AHV1600 unit.

- Result: 77 dB $\leq$ S (at 1.83 m (6 ft)) $\leq$ 86 dB

(g) Between points A and B of the test set-up is shown on Figure 1003, insert a delay line of 30.48 m (100 ft).

(h) Adjust the total loop attenuation (with the variable attenuators) to obtain the maximum attenuation between Tx and Rx connectors of the AHV1600 unit.

(i) Slowly, decrease the total loop attenuation until the AHV1600 unit switchovers to “NO” state (on height data words labels “164”, bit 30 = 1 and bit 31 = 1).

(j) Calculate the total attenuation S between TX and RX connectors of the AHV1600 unit.

- Result: S (at 30.48 m (100 ft)) ≥ 100 dB

(k) Repeat steps (g) to (j) with a delay line of 76.2 m (250 ft).

- Result: S (at 76.20 m (250 ft)) ≥ 107 dB

(l) Repeat steps (g) to (j) with a delay line of 304.8 m (1000 ft).

- Result: S (at 1000 ft) ≥ 119 dB

(m) Repeat steps (g) to (j) with a delay line of 609.6 m (2000 ft).

- Result: S (at 2000 ft) ≥ 125 dB

(n) Repeat steps (g) to (j) with a delay line of 1524 m (5000 ft) (or 1372 m (4500 ft)).

- Result: S (at 1524 m (5000 ft)) ≥ 132 dB or S (at 1372 m (4500 ft)) ≥ 131 dB

(o) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-017-01

(17) Accuracy

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(c) Wait 10 seconds.

(d) With the Arinc reader, record 3000 height data words labels “164”.

(e) Measure the height accuracy defined as:

NOTE:
$$H_{mes} = \sqrt{\frac{\sum H_i}{3000}}$$

NOTE: Hi is the “height data” information of one word label “164”.

NOTE: Hsim is the value of the calibrated simulated height.

- Result: $|H_{mes} - H_{sim}| < 2ft$

(f) Check the percentage of “height data” information (among 3000) in the tolerance 1.83 m (6 ft) ± 0.61 m (2 ft).

- Result: Percentage ≥ 95.4%

(g) Measure the height standard deviation Sd defined as:

$$S_d = \sqrt{\frac{\sum (H_i - H_{mes})^2}{3000}}$$

- Result: Sd < 0.61 m (2 ft)

(h) Measure the height absolute deviation Sabs defined as:

$$S_{abs} = \sqrt{\frac{\sum |H_i - H_{mes}|}{3000}}$$

- Result: Sabs < 1.52 m (5 ft)

(i) Adjust the total loop attenuation (with the variable attenuators) to obtain 56 dB ± 1 dB of attenuation between Tx and Rx connectors of the AHV1600 unit.

(j) With the Arinc reader, record 3000 height data words labels “164”.

(k) Measure the height accuracy.

- Result: $|H_{mes} - H_{sim}| < 0.61\,m\,(2\,ft)$

(l) Between points A and B of the test set-up is shown on Figure 1003, insert a delay line of 30.48 m (100 ft).

(m) Adjust the total loop attenuation (with the variable attenuators) to obtain 100 dB ± 1 dB of attenuation between Tx and Rx connectors of the AHV1600 unit.

(n) With the Arinc reader, record 3000 height data words labels “164”.

(o) Measure the height accuracy.

- Result: $|H_{mes} - H_{sim}| < 1.22\,m\,(4\,ft)$

(p) Check the percentage of “height data” information (among 3000) in the tolerance 30.48 m (100 ft) ± 1.22 m (4 ft).

- Result: Percentage ≥ 95.4%

(q) Measure the height standard deviation Sd:

- Result: Sd < 0.61 m (2 ft)

(r) Measure the height absolute deviation Sabs:

- Result: Sabs < 1.52 m (5 ft)

(s) Adjust the total loop attenuation (with the variable attenuators) to obtain 80 dB ± 1 dB of attenuation between Tx and Rx connectors of the AHV1600 unit.

(t) With the Arinc reader, record 3000 height data words labels “164”.

(u) Measure the height accuracy.

- Result: $\left|H_{mes} - H_{sim}\right| < 1.22\,\text{m}\,(4\,\text{ft})$

(v) Repeat steps (l) to (o) with a delay line of 76.20 m (250 ft) and a total loop attenuation of 108 dB ± 1 dB.

- Result: $\left|H_{mes} - H_{sim}\right| < 2.13\,\text{m}\,(7\,\text{ft})$

(w) Repeat step (p) and take into account the tolerance 76.20 m (250 ft) ± 2.13 m (7 ft).

- Result: Percentage ≥ 95.4%

(x) Repeat step (q).

- Result: Sd < 0.37 m (1.2 ft)

(y) Repeat steps (s) to (u) with a total loop attenuation of 88 dB ± 1 dB.

- Result: $\left|H_{mes} - H_{sim}\right| < 2.13\,\text{m}\,(7\,\text{ft})$

(z) Repeat steps (l) to (o) with a delay line of 304.8 m (1000 ft) and a total loop attenuation of 118 dB ± 1 dB.

- Result: $\left|H_{mes} - H_{sim}\right| < 6.71\,\text{m}\,(22\,\text{ft})$

(aa) Repeat step (p) and take into account the tolerance 304.8 m (1000 ft) ± 6.71 m (22 ft).

- Result: Percentage ≥ 95.4%

(bb) Repeat step (q).

- Result: Sd < 1.52 m (5 ft)

(cc) Repeat steps (s) to (u) with a total loop attenuation of 98 dB ± 1 dB.

- Result: $\left|H_{mes} - H_{sim}\right| < 6.71\,\text{m}\,(22\,\text{ft})$

(dd) Repeat steps (l) to (o) with a delay line of 609.6 m (2000 ft) and a total loop attenuation of 124 dB ± 1 dB.

- Result: $\left|H_{mes} - H_{sim}\right| < 12.80\,\text{m}\,(42\,\text{ft})$

(ee) Repeat step (p) and take into account the tolerance 609.6 m (2000 ft) ± 12.80 m (42 ft).

- Result: Percentage ≥ 95.4%

(ff) Repeat step (q).

- Result: Sd < 3.05 m (10 ft)

(gg) Repeat steps (s) to (u) with a total loop attenuation of 104 dB ± 1 dB.

- Result: $|H_{mes} - H_{sim}| < 12.80\ m\ (42\ ft)$

(hh) Repeat steps (l) to (o) with a delay line of 1524 m (5000 ft) (or 1372 m (4500 ft)) and a total loop attenuation of 132 dB ± 1 dB.

- Result: $|H_{mes} - H_{sim}| < 31.09\ m\ (102\ ft)$ (or
  $|H_{mes} - H_{sim}| < 28.04\ m\ (92\ ft)$ for $1372\ m\ (4500\ ft)$)

(ii) Repeat step (p) and take into account the tolerance 1524 m (5000 ft) ± 31.09 m (102 ft) (or 1372 m (4500 ft) ± 28.04 m (92 ft)).

- Result: Percentage ≥ 95.4%

(jj) Repeat step (q).

- Result: Sd < 7.62 m (25 ft) (or Sd < 6.86 m (22.5 ft) for 1372 m (4500 ft))

(kk) Repeat steps (s) to (u) with a total loop attenuation of 112 dB ± 1 dB.

- Result: $|H_{mes} - H_{sim}| < 31.09\ m\ (102\ ft)$ (or
  $|H_{mes} - H_{sim}| < 28.04\ m\ (92\ ft)$ for $1372\ m\ (4500\ ft)$)

(ll) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-018-01

(18) Response time performance during a height step

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Between points A and B of the test set-up is shown on Figure 1003, insert a delay line of 30.48 m (100 ft).

(c) Adjust the total loop attenuation (with the variable attenuators) to obtain 100 dB ± 1 dB of attenuation between Tx and Rx connectors of the AHV1600 unit.

(d) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600unit.

(e) Wait 10 seconds.

(f) With the Arinc reader, start a recording of the height data words labels “164”.

(g) Wait 5 seconds and between points A and B of the test set-up is shown on Figure 1003, insert a delay line of 36.58 m (120 ft) to simulate a height step (the height step must be effective in a maximum time duration of 40ms).

(h) Wait 5 seconds.

(i) Stop the recording of the height data words labels “164”.

(j) Check the “height data” response time T to reach 63% of the height step.

NOTE: 63% of the height step is equal to 3.84 m (12.6 ft) (the height step is 6.10 m (20 ft)).

- Result: ($0.1s \leq T \leq 0.25s$)

(k) Check that the “status matrix” information of the height data words labels “164 doesn’t change during the height step and stays to “NO” state.

- Result: bit 30 = 1 bit 31 = 1

(l) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-019-01

(19) Operation at + 22 V and + 18 V

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Adjust the output voltage of the DC Power Supply to + 22 VDC $\pm$ 0.1 VDC.

(c) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(d) Wait 10 seconds.

(e) Measure the value Ic of the DC current on the milliammeter.

- Result: Ic $\leq$ 0.913A

(f) Power-off the AHV1600 unit.

(g) Disconnect the ammeter (the positive output of the DC power supply is directly connected to the pin 17 (+ 28V_1 access) of the rear connector of the AHV1600 unit).

(h) Connect the current probe to the wire linked to the pin 17 (+ 28V_1 access) and do the test set-up shown on Figure 1005.

(i) Calibrate the digital oscilloscope in triggered single shot on the rising slope of the current probe.

(j) Power-on the AHV1600.

(k) On the digital oscilloscope, check the peak pulse current value I at power-up.

- Result: I < 30APeak

(l) On the digital oscilloscope, check the time duration Td for the in-rush current reaches 63% of the peak pulse value.

- Result: $t \leq 500\mu s$

(m) Power-off the AHV1600 unit.

(n) Adjust the output voltage of the DC Power Supply to + 18 VDC $\pm$ 0.1 VDC.

(o) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 and 30 of the rear connector of the AHV1600 unit.

(p) Wait 10 seconds.

(q) Measure the value Ic of the DC current on the milliammeter.

- Result: Ic $\leq$ 1.117 A

(r) Adjust the total loop attenuation (with the variable attenuators) to obtain the maximum attenuation between Tx and Rx connectors of the AHV1600 unit.

(s) On the RF spectrum analyzer, measure the low transmitted Radio Frequency Fmin.

- Result: Fmin $\geq$ 4.2 GHz

(t) On the RF spectrum analyzer, measure the high transmitted Radio Frequency Fmax.

- Result: Fmax $\leq$ 4.4 GHz

(u) Slowly, decrease the total loop attenuation until the AHV1600 unit switchovers to “NO” state (on height data words labels “164”, bit 30 = 1 and bit 31 = 1).

(v) Calculate the total attenuation S between TX and RX connectors of the AHV1600 unit.

- Result: 77 dB $\leq$ S (at 1.83 m (6 ft)) $\leq$ 86 dB

(w) Adjust the total loop attenuation (with the variable attenuators) to obtain 76 dB $\pm$ 1 dB of attenuation between Tx and Rx connectors of the AHV1600 unit.

(x) With the Arinc reader, record 3000 height data words labels “164”.

(y) Measure the height accuracy defined as:

$$H_{mes} = \sqrt{\frac{\sum H_i}{3000}}$$

NOTE:

NOTE: Hi is the “height data” information of one word label “164”

NOTE: Hsim is the value of the calibrated simulated height

- Result: $\left|H_{mes} - H_{sim}\right| < 0.61\,m\,(2\,ft)$

(z) Check the percentage of “height data” information (among 3000) in the tolerance 1.83 m (6 ft) ± 0.61 m (2 ft).

- Result: Percentage ≥ 95.4%

(aa) Measure the height standard deviation Sd defined as:

$$S_d = \sqrt{\frac{\sum (H_i - H_{mes})^2}{3000}}$$

- Result: Sd < 0.61 m (2 ft)

(bb) Measure the height absolute deviation Sabs defined as:

$$S_{abs} = \sqrt{\frac{\sum \left|H_i - H_{mes}\right|}{3000}}$$

- Result: Sabs < 1.52 m (5 ft)

(cc) On the RF Power meter, read the value P1 and calculate P according to the attenuation A (between TX connector of the ERT560 and the probe of the RF Power meter). P(dBm) = P1(dBm) + A(dB).

- Result: P = 4 dBm ± 2 dB

(dd) Between points A and B of the test set-up is shown on Figure 1003, insert a delay line of 1524 m (5000 ft) (or 1372 m (4500 ft)).

(ee) Adjust the total loop attenuation (with the variable attenuators) to obtain the maximum attenuation between Tx and Rx connectors of the AHV1600 unit.

(ff) Slowly, decrease the total loop attenuation until the AHV1600 unit switchovers to “NO” state (on height data words labels “164”, bit 30 = 1 and bit 31 = 1).

(gg) Calculate the total attenuation S between TX and RX connectors of the AHV1600 unit.

- Result: S (at 1524 m (5000 ft)) ≥ 132 dB or S (at 1372 m (4500 ft)) ≥ 132 dB

(hh) Adjust the total loop attenuation (with the variable attenuators) to obtain 132 dB ± 1 dB of attenuation between Tx and Rx connectors of the AHV1600 unit.

(ii) With the Arinc reader, record 3000 height data words labels “164”.

(jj) Measure the height accuracy defined as:

NOTE: $$H_{mes} = \sqrt{\frac{\sum H_i}{3000}}$$

NOTE: Hi is the “height data” information of one word label “164”.

NOTE: Hsim is the value of the calibrated simulated height.

- Result: $\left|H_{mes} - H_{sim}\right| < 31.09\ m\ (102\ ft)$ (or
  $\left|H_{mes} - H_{sim}\right| < 28.04\ m\ (92\ ft)$ for $1372\ m\ (4500\ ft)$)

(kk) Check the percentage of “height data” information (among 3000) in the tolerance 1.83 m (6 ft) ± 0.61 m (2 ft)

- Result: Percentage ≥ 95.4%

(ll) Measure the height standard deviation Sd defined as:

$$S_d = \sqrt{\frac{\sum (H_i - H_{mes})^2}{3000}}$$

- Result: Sd < 7.62 m (25 ft) (or Sd < 6.86 m (22.5 ft) for 1372 m (4500 ft))

(mm) On the RF Power meter, read the value P1 and calculate P according to the attenuation A (between TX connector of the ERT560 and the probe of the RF Power meter). P(dBm) = P1(dBm) + A(dB).

- Result: P = 17 dBm ± 2 dB

(nn) Between points A and B of the test set-up is shown on Figure 1003, insert a delay line of 30.48 m (100 ft).

(oo) Adjust the total loop attenuation (with the variable attenuators) to obtain 100 dB ± 1 dB of attenuation between Tx and Rx connectors of the AHV1600 unit.

(pp) Wait 10 seconds.

(qq) With the Arinc reader, start a recording of the height data words labels “164”.

(rr) Wait 5 seconds and between points A and B of the test set-up is shown on Figure 1003, insert a delay line of 36.58 m (120 ft) to simulate a height step (the height step must be effective in a maximum time duration of 40ms).

(ss) Wait 5 seconds.

(tt) Stop the recording of the height data words labels “164”.

(uu) Check the “height data” response time T to reach 63% of the height step.

NOTE: 63% of the height step is equal to 3.84 m (12.6 ft) (the height step is 6.10 m (20 ft)).

- Result: (0.1s ≤ T ≤ 0.25s)

(vv) Check that the “status matrix” information of the height data words labels “164 doesn’t change during the height step and stays to “NO” state.

- Result: bit 30 = 1 bit 31 = 1

(ww) Power-off the AHV1600 unit.

SUBTASK 34-42-61-700-020-01

(20) Operation at + 30.3 V

NOTE: The test set-up is shown on Figure 1003.

The Arinc reader is connected to points 9 (TX 429 High_1) and 10 (TX 429 Low_1) of the connector of the AHV1600 unit.

(a) Configure the AHV1600 unit as follows (refer to Figures 1003 and 1004):

- FCT_TST = OPEN
- TST_INH = OPEN
- AID0 = 0
- SDI_SEL = GND

(b) Adjust the output voltage of the DC Power Supply to + 30.3 VDC ± 0.1 VDC.

(c) Power-on the AHV1600 unit with the DC Power Supply connected to pins 17 (+ 28V_1 access) and 30 (- 28V_1 access) of the rear connector of the AHV1600 unit.

(d) Wait 10 seconds.

(e) Measure the value Ic of the DC current on the milliammeter.

- Result: Ic ≤ 0.662A

(f) Power-off the AHV1600 unit.

(g) Disconnect the ammeter (the positive output of the DC power supply is directly connected to the pin 17 (+ 28V_1 access) of the rear connector of the AHV1600 unit).

(h) Connect the current probe to the wire linked to the pin 17 (+ 28V_1 access) and do the test set-up shown on Figure 1005.

(i) Calibrate the digital oscilloscope in triggered single shot on the rising slope of the current probe.

(j) Power-on the AHV1600.

(k) On the digital oscilloscope, check the peak pulse current value I at power-up.

- Result: I < 22APeak

(l) On the digital oscilloscope, check the time duration Td for the in-rush current reaches 63% of the peak pulse value.

- Result: $t \leq 750\mu s$

(m) Power-off the AHV1600 unit.

(n) Remove the current probe.

(o) Power-on the AHV1600 unit.

(p) Wait 10 seconds.

(q) Adjust the total loop attenuation (with the variable attenuators) to obtain the maximum attenuation between Tx and Rx connectors of the AHV1600 unit.

(r) On the RF spectrum analyzer, measure the low transmitted Radio Frequency Fmin.

- Result: Fmin ≥ 4.2 GHz

(s) On the RF spectrum analyzer, measure the high transmitted Radio Frequency Fmax.

- Result: Fmax ≤ 4.4 GHz

(t) Slowly, decrease the total loop attenuation until the AHV1600 unit switchovers to "NO" state (on height data words labels "164", bit 30 = 1 and bit 31 = 1).

(u) Calculate the total attenuation S between TX and RX connectors of the AHV1600 unit.

- Result: 74 dB ≤ S (at 1.83 m (6 ft)) ≤ 82 dB

(v) Adjust the total loop attenuation (with the variable attenuators) to obtain 76 dB ± 1 dB of attenuation between Tx and Rx connectors of the AHV1600 unit.

(w) With the Arinc reader, record 3000 height data words labels "164".

(x) Measure the height accuracy defined as:

NOTE: $$H_{mes} = \sqrt{\frac{\sum H_i}{3000}}$$

NOTE: Hi is the "height data" information of one word label "164".

NOTE: Hsim is the value of the calibrated simulated height.

- Result: $\left|H_{mes} - H_{sim}\right| < 0.61\,m\,(2\,ft)$

(y) Check the percentage of "height data" information (among 3000) in the tolerance 1.83 m (6 ft) ± 0.61 m (2 ft).

- Result: Percentage ≥ 95.4%

(z) Measure the height standard deviation Sd defined as:

$$S_d = \sqrt{\frac{\sum (H_i - H_{mes})^2}{3000}}$$

- Result: Sd < 0.61 m (2 ft)

(aa) Measure the height absolute deviation Sabs defined as:

$$S_{abs} = \sqrt{\frac{\sum |H_i - H_{mes}|}{3000}}$$

- Result: Sabs < 1.52 m (5 ft)

(bb) On the RF Power meter, read the value P1 and calculate P according to the attenuation A (between TX connector of the ERT560 and the probe of the RF Power meter). P(dBm) = P1(dBm) + A(dB).

- Result: P = 4 dBm ± 2 dB

(cc) Between points A and B of the test set-up is shown on Figure 1003, insert a delay line of 1524 m (5000 ft) (or 1372 m (4500 ft)).

(dd) Adjust the total loop attenuation (with the variable attenuators) to obtain the maximum attenuation between Tx and Rx connectors of the AHV1600 unit.

(ee) Slowly, decrease the total loop attenuation until the AHV1600 unit switchovers to “NO” state (on height data words labels “164”, bit 30 = 1 and bit 31 = 1).

(ff) Calculate the total attenuation S between TX and RX connectors of the AHV1600 unit.

- Result: S (at 1524 m (5000 ft)) ≥ 132 dB or S (at 1372 m (4500 ft)) ≥ 132 dB

(gg) Adjust the total loop attenuation (with the variable attenuators) to obtain 132 dB ± 1 dB of attenuation between Tx and Rx connectors of the AHV1600 unit.

(hh) With the Arinc reader, record 3000 height data words labels “164”.

(ii) Measure the height accuracy defined as:

NOTE:
$$H_{mes} = \sqrt{\frac{\sum H_i}{3000}}$$

NOTE: Hi is the “height data” information of one word label “164”

NOTE: Hsim is the value of the calibrated simulated height

- Result: $|H_{mes} - H_{sim}| < 31.09\,\text{m}\,(102\,\text{ft})$ (or
  $|H_{mes} - H_{sim}| < 28.04\,\text{m}\,(92\,\text{ft})$ for $1372\,\text{m}\,(4500\,\text{ft})$)

(jj) Check the percentage of “height data” information (among 3000) in the tolerance 1.83 m (6 ft) ± 0.61 m (2 ft)

- Result: Percentage ≥ 95.4%

(kk) Measure the height standard deviation Sd defined as:

$$S_d = \sqrt{\frac{\sum (H_i - H_{mes})^2}{3000}}$$

- Result: Sd < 7.62 m (25 ft) (or Sd < 6.86 m (22.5 ft) for 1372 m (4500 ft))

(ll) On the RF Power meter, read the value P1 and calculate P according to the attenuation A (between TX connector of the ERT560 and the probe of the RF Power meter). P(dBm) = P1(dBm) + A(dB).

- Result: P = 17 dBm ± 2 dB

(mm) Between points A and B of the test set-up is shown on Figure 1003, insert a delay line of 30.48 m (100 ft).

(nn) Adjust the total loop attenuation (with the variable attenuators) to obtain 100 dB ± 1 dB of attenuation between Tx and Rx connectors of the AHV1600 unit.

(oo) Wait 10 seconds.

(pp) With the Arinc reader, start a recording of the height data words labels “164”.

(qq) Wait 5 seconds and between points A and B of the test set-up is shown on Figure 1003, insert a delay line of 36.58 m (120 ft) to simulate a height step (the height step must be effective in a maximum time duration of 40ms).

(rr) Wait 5 seconds.

(ss) Stop the recording of the height data words labels “164”.

(tt) Check the “height data” response time T to reach 63% of the height step.

NOTE: 63% of the height step is equal to 3.84 m (12.6 ft) (the height step is 6.10 m (20 ft)).

- Result: (0.1s ≤ T < 0.25s)

(uu) Check that the “status matrix” information of the height data words labels “164 doesn’t change during the height step and stays to “NO” state.

- Result: bit 30 = 1 bit 31 = 1

(vv) Power-off the AHV1600 unit.

TASK 34-42-61-700-802-A01

5. TEST REPORT

A. INTRODUCTION

The test report below, is given as example.

B. TEST REPORT EXAMPLE

TABLE 34-42-61-992-114-A01

Lightning protection of the power supply inputs and Arinc outputs

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(1) refer to SUBTASK 34-42-61-700-001-01	- Between pins 17 and 2 (positive polarity)	+ 73.4 V ≤ Vpeak ≤ + 81.2 V	
	- Between pins 17 and 2 (negative polarity)	- 81.2 V ≤ Vpeak ≤ - 73.4 V	
	- Between pins 30 and 2 (positive polarity)	+ 73.4 V ≤ Vpeak ≤ + 81.2 V	
	- Between pins 30 and 2 (negative polarity)	- 81.2 V ≤ Vpeak ≤ - 73.4 V	
	- Between pins 18 and 2 (positive polarity)	+ 73.4 V ≤ Vpeak ≤ + 81.2 V	
	- Between pins 18 and 2 (negative polarity)	- 81.2 V ≤ Vpeak ≤ - 73.4 V	
	- Between pins 19 and 2 (positive polarity)	+ 73.4 V ≤ Vpeak ≤ + 81.2 V	
	- Between pins 19 and 2 (negative polarity)	- 81.2 V ≤ Vpeak ≤ - 73.4 V	
	- Between pins 9 and 2 (positive polarity)	+ 10.4 V ≤ Vpeak ≤ + 11.9 V	
	- Between pins 9 and 2 (negative polarity)	- 11.9 V ≤ Vpeak ≤ - 10.4 V	
	- Between pins 10 and 2 (positive polarity)	+ 10.4 V ≤ Vpeak ≤ + 11.9 V	
	- Between pins 10 and 2 (negative polarity)	- 11.9 V ≤ Vpeak ≤ - 10.4 V	
	- Between pins 13 and 2 (positive polarity)	+ 10.4 V ≤ Vpeak ≤ + 11.9 V	
	- Between pins 13 and 2 (negative polarity)	- 11.9 V ≤ Vpeak ≤ - 10.4 V	
	- Between pins 14 and 2 (positive polarity)	+ 10.4 V ≤ Vpeak ≤ + 11.9 V	
	- Between pins 14 and 2 (negative polarity)	- 11.9 V ≤ Vpeak ≤ - 10.4 V	

TABLE 34-42-61-992-115-A01

Lightning protection of the Radio Frequency inputs “RX”, “TX” and discretes inputs

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(2) refer to SUBTASK 34-42-61-700-002-01	- Between central contact of RX antenna access and pin 2 (positive polarity)	+ 15.2 V ≤ Vlimit ≤ + 18.6V	
	- Between central contact of RX antenna access and pin 2 (negative polarity)	- 14.3 V ≤ Vlimit ≤ - 10.3V	
	- Between central contact of TX antenna access and pin 2 (positive polarity)	+ 15.2 V ≤ Vlimit ≤ + 18.6 V	
	- Between central contact of TX antenna access and pin 2 (negative polarity)	- 14.3 V ≤ Vlimit ≤ - 10.3 V	
	- Between pins 5 and 2 (positive polarity)	+ 36.8 V ≤ Vlimit ≤ + 42.8 V	
	- Between pins 5 and 2 (negative polarity)	- 5.3 V ≤ Vlimit ≤ - 1.3 V	
	- Between pins 6 and 2 (positive polarity)	+ 36.8 V ≤ Vlimit ≤ + 42.8 V	
	- Between pins 6 and 2 (negative polarity)	- 5.3 V ≤ Vlimit ≤ - 1.3 V	
	- Between pins 23 and 2 (positive polarity)	+ 36.8 V ≤ Vlimit ≤ + 42.8 V	
	- Between pins 23 and 2 (negative polarity)	- 5.3 V ≤ Vlimit ≤ - 1.3 V	
	- Between pins 24 and 2 (positive polarity)	+ 36.8 V ≤ Vlimit ≤ + 42.8 V	
	- Between pins 24 and 2 (negative polarity)	- 5.3 V ≤ Vlimit ≤ - 1.3 V	
	- Between pins 16 and 2 (positive polarity)	+ 36.8 V ≤ Vlimit ≤ + 42.8 V	
	- Between pins 16 and 2 (negative polarity)	- 5.3 V ≤ Vlimit ≤ - 1.3 V	
	- Between pins 20 and 2 (positive polarity)	+ 36.8 V ≤ Vlimit ≤ + 42.8 V	
	- Between pins 20 and 2 (negative polarity)	- 5.3 V ≤ Vlimit ≤ - 1.3 V	
	- Between pins 34 and 2 (positive polarity)	+ 36.8 V ≤ Vlimit ≤ + 42.8 V	
	- Between pins 34 and 2 (negative polarity)	- 5.3 V ≤ Vlimit ≤ - 1.3 V	

TABLE 34-42-61-992-116-A01

Power consumption

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(4) refer to SUBTASK 34-42-61-700-004-01	Value of the current (pin 17)	Ic ≤ 0.727 A	
	In-rush current (pin 17)	I < 22 A_{Peak}	
	Time duration to reach 63% (pin 17)	Td ≤ 750 µs	
	Value of the current (pin 18)	Ic ≤ 0.727 A	
	In-rush current (pin 18)	I < 22 A_{Peak}	
	Time duration to reach 63% (pin 18)	Td ≤ 750 µs	

TABLE 34-42-61-992-117-A01

RF bandwidth

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(5) refer to SUBTASK 34-42-61-700-005-01	Low transmitted Radio Frequency	Fmin ≥ 4.2 GHz	
	High transmitted Radio Frequency	Fmax ≤ 4.4 GHz	

TABLE 34-42-61-992-118-A01

RF transmitted power

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(6) refer to SUBTASK 34-42-61-700-006-01	For 1.83 m (6 ft) simulated height	P = 4 dBm ± 2 dB	
	For 30.48 m (100 ft) simulated height	P = 5 dBm ± 2 dB	
	For 76.20 m (250 ft) simulated height	P = 9 dBm ± 2 dB	
	For 304.8 m (1000 ft) simulated height	P = 15 dBm ± 2 dB	
	For 609.6 m (2000 ft) simulated height	P = 17 dBm ± 2 dB	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height	P = 17 dBm ± 2 dB	

TABLE 34-42-61-992-119-A01

Electrical characteristics of the output signals Arinc 429

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(7) refer to SUBTASK 34-42-61-700-007-01	Level L_1 of Bus N°1 (circuit in load)	- 11 $V_{DC} \leq L_1 \leq$ - 7.25 V_{DC}	
	Level L_2 of Bus N°1 (circuit in load)	+ 7.25 $V_{DC} \leq L_2 \leq$ + 11 V_{DC}	
	Level L_3 of Bus N°1 (circuit in load)	- 0.5 $V_{DC} \leq L_3 \leq$ + 0.5 V_{DC}	
	Level L_1 of Bus N°2 (circuit in load)	- 11 $V_{DC} \leq L_1 \leq$ - 7.25 V_{DC}	
	Level L_2 of Bus N°2 (circuit in load)	+ 7.25 $V_{DC} \leq L_2 \leq$ + 11 V_{DC}	
	Level L_3 of Bus N°2 (circuit in load)	- 0.5 $V_{DC} \leq L_3 \leq$ + 0.5 V_{DC}	
	Time T_1 of Bus N°1 (open circuit)	T_1 = 10 µs ± 5 µs	
	Time T_2 of Bus N°1 (open circuit)	T_2 = 10 µs ± 5 µs	
	Time T_3 of Bus N°1 (open circuit)	T_3 = 80 µs ± 2 µs	
	Time T_4 of Bus N°1 (open circuit)	T_4 = 40 µs ± 2 µs	
	Time T_1 of Bus N°2 (open circuit)	T_1 = 10 µs ± 5 µs	
	Time T_2 of Bus N°2 (open circuit)	T_2 = 10 µs ± 5 µs	
	Time T_3 of Bus N°2 (open circuit)	T_3 = 80 µs ± 2 µs	
	Time T_4 of Bus N°2 (open circuit)	T_4 = 40 µs ± 2 µs	

TABLE 34-42-61-992-120-A01

Refresh rate of Arinc labels on Arinc bus N°1 and Arinc bus N°2

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(8) refer to SUBTASK 34-42-61-700-008-01	Arinc label 164 of Bus N°1	Tr = 40 ms ± 1 ms	
	Arinc label 165 of Bus N°1	Tr = 40 ms ± 1 ms	
	Arinc label 271 of Bus N°1	Tr = 40 ms ± 1 ms	
	Arinc label 272 of Bus N°1	Tr = 40 ms ± 1 ms	
	Arinc label 371 of Bus N°1	Tr = 40 ms ± 1 ms	
	Arinc label 377 of Bus N°1	Tr = 40 ms ± 1 ms	
	Arinc label 164 of Bus N°2	Tr = 40 ms ± 1 ms	
	Arinc label 165 of Bus N°2	Tr = 40 ms ± 1 ms	
	Arinc label 271 of Bus N°2	Tr = 40 ms ± 1 ms	
	Arinc label 272 of Bus N°2	Tr = 40 ms ± 1 ms	
	Arinc label 371 of Bus N°2	Tr = 40 ms ± 1 ms	
	Arinc label 377 of Bus N°2	Tr = 40 ms ± 1 ms	

TABLE 34-42-61-992-121-A01

Checking of data word labels “271”, “272”, “371” and “377”

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(9) refer to SUBTASK 34-42-61-700-009-01	bits 11 to 22 of labels “377”	data bits <22..11> = 007 (Hexadecimal)	
	Information “name” of labels “371”	the information “name” is “RA1”	
	Information “serial number” of labels “371”	serial number of the AHV1600 unit under test	
	Information “part number” of labels “371”	part number of the AHV1600 unit under test	
	bits 11 to 14 of labels “271”	bit 11 = 1, bit 12 = 0, bit 13 = 0, bit 14 = 0	
	bits 20 and 21 of labels “272”	bit 20 = 1, bit 21 = 0	
	bits 24 to 29 of labels “272”	bit 24 = 1, bit 25 = 1, bit 26 = 1, bit 27 = 1, bit 28 = 1, bit 29 = 1	

TABLE 34-42-61-992-122-A01

SDI selection discrete

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(10) refer to SUBTASK 34-42-61-700-010-01	bits 9 and 10 of labels “164”	bit 9 = 1, bit 10 = 0	
	bits 9 and 10 of labels “165”	bit 9 = 1, bit 10 = 0	
	bits 9 and 10 of labels “271”	bit 9 = 1, bit 10 = 0	
	bits 9 and 10 of labels “272”	bit 9 = 1, bit 10 = 0	
	Information “name” of labels “371”	the information “name” is “RA1”	
	bits 9 and 10 of labels “377”	bit 9 = 1, bit 10 = 0	
	For SDI_SEL = OPEN, bits 9 and 10 of labels “164”	bit 9 = 0, bit 10 = 1	
	For SDI_SEL = OPEN, bits 9 and 10 of labels “165”	bit 9 = 0, bit 10 = 1	
	For SDI_SEL = OPEN, bits 9 and 10 of labels “271”	bit 9 = 0, bit 10 = 1	
	For SDI_SEL = OPEN, bits 9 and 10 of labels “272”	bit 9 = 0, bit 10 = 1	
	For SDI_SEL = OPEN, information “name” of labels “371”	the information “name” is “RA2”	
	For SDI_SEL = OPEN, bits 9 and 10 of labels “377”	bit 9 = 0, bit 10 = 1	

TABLE 34-42-61-992-123-A01

Test Inhibit discrete

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(11) refer to SUBTASK 34-42-61-700-011-01	bit 11 of labels “164”	bit 11 = 0	
	bit 18 of labels “271”	bit 18 = 1	
	For TST_INH = GND, bit 11 of labels “164”	bit 11 = 1	
	For TST_INH = GND, bit 18 of labels “271”	bit 18 = 0	

TABLE 34-42-61-992-124-A01

Functional Test discrete

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(12) refer to SUBTASK 34-42-61-700-012-01	bit 19 of labels “272”	bit 19 = 1	
	bit 17 of labels “271”	bit 17 = 1	
	For FCT_TST = GND, bit 19 of labels “272”	bit 19 = 0 in maximum time duration of 3 seconds	
	For FCT_TST = GND, bit 17 of labels “271”	bit 17 = 0	

TABLE 34-42-61-992-125-A01

Search mode and track mode

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(13) refer to SUBTASK 34-42-61-700-013-01	For maximum attenuation, bits 30 and 31 of labels “164”	bit 30 = 1, bit 31 = 0	
	For maximum attenuation, information “height data” of labels “164”	Height data information = 2496.883 m (8191.875 ft)	
	For maximum attenuation, bits 30 and 31 of labels “165”	bit 30 = 1, bit 31 = 0	
	For maximum attenuation, information “height data” of labels “165”	Height data information = 2438.37 m (7999.9 ft)	
	For maximum attenuation, bits 17 and 18 of labels “272”	bit 17 = 0, bit 18 = 0	
	bits 30 and 31 of labels “164”	bit 30 = 1, bit 31 = 1	
	Information “height data” of labels “164”	Height data information = 1.83 m (6 ft) ± 0.61 m (2 ft)	
	bits 30 and 31 of labels “165”	bit 30 = 0, bit 31 = 0	

	Information “height data” of labels “165”	Height data information = 1.83 m (6 ft) ± 0.61 m (2 ft)	
	bits 30 and 31 of labels “271”	bit 30 = 0, bit 31 = 0	
	bits 30 and 31 of labels “272”	bit 30 = 0, bit 31 = 0	
	bits 30 and 31 of labels “377”	bit 30 = 0, bit 31 = 0	

TABLE 34-42-61-992-126-A01

Antenna failure

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(14) refer to SUBTASK 34-42-61-700-014-01	For TX antenna failure, bits 30 and 31 of labels “164”	bit 30 = 0, bit 31 = 0	
	For TX antenna failure, information “height data” of labels “164”	Height data information = 2496.883 m (8191.875 ft)	
	For TX antenna failure, bits 24 to 29 of labels “272”	bit 24 = 1, bit 25 = 1, bit 26 = 1, bit 27 = 1, bit 28 = 1, bit 29 = 0	
	For TX antenna failure, bits 30 and 31 of labels “272”	bit 30 = 1, bit 31 = 1	
	For TX antenna failure, bits 30 and 31 of labels “271”	bit 30 = 1, bit 31 = 1	
	For TX antenna failure, bits 30 and 31 of labels “377”	bit 30 = 1, bit 31 = 1	
	For TX antenna failure, stop transmitting of labels “165”	stop transmitting of labels “165” = OK	
	For TX and RX antenna failure, bits 24 to 29 of labels “272”	bit 24 = 1, bit 25 = 1, bit 26 = 1, bit 27 = 1, bit 28 = 0, bit 29 = 0	

TABLE 34-42-61-992-127-A01

Built In Test function

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(15) refer to SUBTASK 34-42-61-700-015-01	bit 19 of labels “272”	bit 19 = 1	
	For FCT_TST = GND and TST_INH = GND, bit 19 of labels “272”	bit 19 = 1	
	For FCT_TST = GND and TST_INH = OPEN, bit 19 of labels “272”	bit 19 = 0 (in maximum time duration of 3 seconds)	
	For FCT_TST = GND and TST_INH = OPEN, information “status matrix” and “height data” of labels “164”	bit 30 = 0, bit 31 = 1 Height data information = 30.48 m (100 ft) (in maximum time duration of 3 seconds)	
	For FCT_TST = GND and TST_INH = OPEN, information “status matrix” and “height data” of labels “165”	bit 30 = 0, bit 31 = 1 Height data information = 30.48 m (100 ft) (in maximum time duration of 3 seconds)	

TABLE 34-42-61-992-128-A01

Sensitivity

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(16) refer to SUBTASK 34-42-61-700-016-01	For 1.83 m (6 ft) simulated height	76 dB ≤ S (at 1.83 m (6 ft)) ≤ 84 dB	
	For 30.48 m (100 ft) simulated height	S (at 30.48 m (100 ft)) ≥ 100 dB	
	For 76.20 m (250 ft) simulated height	S (at 76.20 m (250 ft)) ≥ 107 dB	
	For 304.8 m (1000 ft) simulated height	S (at 304.8 m (1000 ft)) ≥ 119 dB	
	For 609.6 m (2000 ft) simulated height	S (at 609.6 m (2000 ft)) ≥ 125 dB	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height	S (at 1524 m (5000 ft)) ≥ 132 dB or S (at 1372 m (4500 ft)) ≥ 131 dB	

TABLE 34-42-61-992-129-A01

Height accuracy

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(17) refer to SUBTASK 34-42-61-700-017-01	For 1.83 m (6 ft) simulated height and $\sigma 0$ = - 20 dB	$\lvert H_{mes} - H_{sim} \rvert$ < 0.61 m (2 ft)	
	For 1.83 m (6 ft) simulated height and $\sigma 0$ = - 20 dB	Percentage > 95.4%	
	For 1.83 m (6 ft) simulated height and $\sigma 0$ = - 20 dB	S_d < 0.61 m (2 ft)	
	For 1.83 m (6 ft) simulated height and $\sigma 0$ = - 20 dB	S_{abs} < 1.52 m (5 ft)	
	For 1.83 m (6 ft) simulated height and $\sigma 0$ = 0 dB	$\lvert H_{mes} - H_{sim} \rvert$ < 0.61 m (2 ft)	
	For 30.48 m (100 ft) simulated height and $\sigma 0$ = - 20 dB	$\lvert H_{mes} - H_{sim} \rvert$ = < 1.22 m (4 ft)	
	For 30.48 m (100 ft) simulated height and $\sigma 0$ = - 20 dB	Percentage > 95.4%	
	For 30.48 m (100 ft) simulated height and $\sigma 0$ = - 20 dB	S_d < 0.61 m (2 ft)	
	For 30.48 m (100 ft) simulated height and $\sigma 0$ = - 20 dB	S_{abs} < 1.52 m (5 ft)	
	For 30.48 m (100 ft) simulated height and $\sigma 0$ = 0 dB	$\lvert H_{mes} - H_{sim} \rvert$ < 1.22 m (4 ft)	
	For 76.20 m (250 ft) simulated height and $\sigma 0$ = - 20 dB	$\lvert H_{mes} - H_{sim} \rvert$ < 2.13 m (7 ft)	
	For 76.20 m (250 ft) simulated height and $\sigma 0$ = - 20 dB	Percentage > 95.4%	
	For 76.20 m (250 ft) simulated height and $\sigma 0$ = - 20 dB	S_d < 0.37 m (1.2 ft)	
	For 76.20 m (250 ft) simulated height and $\sigma 0$ = 0 dB	$\lvert H_{mes} - H_{sim} \rvert$ < 2.13 m (7 ft)	
	For 304.8 m (1000 ft) simulated height and $\sigma 0$ = - 20 dB	$\lvert H_{mes} - H_{sim} \rvert$ < 6.71 m (22 ft)	
	For 304.8 m (1000 ft) simulated height and $\sigma 0$ = - 20 dB	Percentage > 95.4%	
	For 304.8 m (1000 ft) simulated height and $\sigma 0$ = - 20 dB	S_d < 1.52 m (5 ft)	
	For 304.8 m (1000 ft) simulated height and $\sigma 0$ = 0 dB	$\lvert H_{mes} - H_{sim} \rvert$ < 6.71 m (22 ft)	
	For 609.6 m (2000 ft) simulated height and $\sigma 0$ = - 20 dB	$\lvert H_{mes} - H_{sim} \rvert$ < 12.80 m (42 ft)	

	For 609.6 m (2000 ft) simulated height and $\sigma 0$ = - 20 dB	Percentage > 95.4%	
	For 609.6 m (2000 ft) simulated height and $\sigma 0$ = - 20 dB	S_d < 3.05 m (10 ft)	
	For 609.6 m (2000 ft) simulated height and $\sigma 0$ = 0 dB	$\lvert H_{mes} - H_{sim} \rvert$ < 12.80 m (42 ft)	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height and $\sigma 0$ = - 20 dB	$\lvert H_{mes} - H_{sim} \rvert$ < 31.09 m (102 ft) (or $\lvert H_{mes} - H_{sim} \rvert$ < 28.04 m (92 ft) for 1372 m (4500 ft))	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height and $\sigma 0$ = - 20 dB	Percentage > 95.4%	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height and $\sigma 0$ = - 20 dB	S_d < 7.62 m (25 ft) (or S_d < 6.86 m (22.5 ft) for 1372 m (4500 ft))	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height and $\sigma 0$ = 0 dB	$\lvert H_{mes} - H_{sim} \rvert$ < 31.09 m (102 ft) (or $\lvert H_{mes} - H_{sim} \rvert$ < 28.04 m (92 ft) for 1372 m (4500 ft))	

TABLE 34-42-61-992-130-A01

Response time performance during a height step

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(18) refer to SUBTASK 34-42-61-700-018-01	Height step is 6.10 m (20 ft)	(0.1 s ≤ T ≤ 0.25 s)	
	During height step, bits 30 and 31 of labels “164”	bit 30 = 1, bit 31 = 1	

TABLE 34-42-61-992-131-A01

Operation at +22V and +18V

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(19) refer to SUBTASK 34-42-61-700-019-01	Output voltage of the DC Power Supply (connected to pins 17 and 30) is adjusted to + 22 V_{DC} ± 0.1 V_{DC}	Ic ≤ 0.913 A	
	In-rush current on the pin 17 (output voltage of the DC Power Supply is adjusted to + 22 V_{DC} ± 0.1 V_{DC})	I < 30 A_{Peak}	
	Time duration to reach 63% of the peak pulse value (output voltage of the DC Power Supply is adjusted to + 22 V_{DC} ± 0.1 V_{DC})	t ≤ 500 µs	

	Output voltage of the DC Power Supply (connected to pins 17 and 30) is adjusted to + 18 V_{DC} ± 0.1 V_{DC}	Ic ≤ 1.117 A	
	Low transmitted Radio Frequency	Fmin ≥ 4.2 GHz	
	High transmitted Radio Frequency	Fmax ≤ 4.4 GHz	
	Sensitivity for 1.83 m (6 ft) simulated height	77 dB ≤ S (at 1.83 m (6 ft)) ≤ 86 dB	
	For 1.83 m (6 ft) simulated height and σ0 = - 20 dB	$\|H_{mes} - H_{sim}\|$ < 0.61 m (2 ft)	
	For 1.83 m (6 ft) simulated height and σ0 = - 20 dB	Percentage > 95.4%	
	For 1.83 m (6 ft) simulated height and σ0 = - 20 dB	S_d < 0.61 m (2 ft)	
	For 1.83 m (6 ft) simulated height and σ0 = - 20 dB	S_{abs} < 1.52 m (5 ft)	
	Output power at 1.83 m (6 ft) simulated height	P = 4 dBm ± 2 dB	
	Sensitivity for 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height	S (at 1524 m (5000 ft)) ≥ 132 dB or S (at 1372 m (4500 ft)) ≥ 132 dB	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height and σ0 = - 20 dB	$\|H_{mes} - H_{sim}\|$ < 31.09 m (102 ft) (or $\|H_{mes} - H_{sim}\|$ < 28.04 m (92 ft) for 1372 m (4500 ft))	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height and σ0 = - 20 dB	Percentage > 95.4%	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height and σ0 = - 20 dB	S_d < 7.62 m (25 ft) (or S_d < 6.86 m (22.5 ft) for 1372 m (4500 ft))	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height	P = 17 dBm ± 2 dB	
	Height step is 6.10 m (20 ft)	(0.1s ≤ T ≤ 0.25s)	
	During height step, bits 30 and 31 of labels “164”	bit 30 = 1, bit 31 = 1	

TABLE 34-42-61-992-132-A01

Operation at +30.3V

TEST PROCEDURE	CONDITIONS	TOLERANCE	RESULTS
(20) refer to SUBTASK 34-42-61-700-020-01	Output voltage of the DC Power Supply (connected to pins 17 and 30) is adjusted to + 30.3 V_{DC} ± 0.1V_{DC}	Ic ≤ 0.662 A	
	In-rush current on the pin 17	I < 22 A_{Peak}	
	Time duration to reach 63% of the peak pulse value	t ≤ 750 µs	
	Low transmitted Radio Frequency	Fmin ≥ 4.2 GHz	
	High transmitted Radio Frequency	Fmax ≤ 4.4 GHz	
	Sensitivity for 1.83 m (6 ft) simulated height	76 dB ≤ S (at 1.83 m (6 ft)) ≤ 84 dB	
	For 1.83 m (6 ft) simulated height and σ0 = - 20 dB	$\|H_{mes} - H_{sim}\|$ < 0.61 m (2 ft)	
	For 1.83 m (6 ft) simulated height and σ0 = - 20 dB	Percentage > 95.4%	
	For 1.83 m (6 ft) simulated height and σ0 = - 20 dB	S_d < 0.61 m (2 ft)	
	For 1.83 m (6 ft) simulated height and σ0 = - 20 dB	S_{abs} < 1.52 m (5 ft)	
	Output power at 1.83 m (6 ft) simulated height	P = 4 dBm ± 2 dB	
	Sensitivity for 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height	S (at 1524 m (5000 ft)) ≥ 132 dB or S (at 1372 m (4500 ft)) ≥ 131 dB	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height and σ0 = - 20 dB	$\|H_{mes} - H_{sim}\|$ < 31.09 m (102 ft) (or $\|H_{mes} - H_{sim}\|$ < 28.04 m (92 ft) for 1372 m (4500 ft))	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height and σ0 = - 20 dB	Percentage > 95.4%	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height and σ0 = - 20 dB	S_d < 7.62 m (25 ft) (or S_d < 6.86 m (22.5 ft) for 1372 m (4500 ft))	
	For 1524 m (5000 ft) (or 1372 m (4500 ft)) simulated height	P = 17 dBm ± 2 dB	
	Height step is 6.10 m (20 ft)	(0.1s ≤ T ≤ 0.25s)	
	During height step, bits 30 and 31 of labels “164”	bit 30 = 1, bit 31 = 1	

TASK 34-42-61-750-801-A01

6. FAULT ISOLATION

NOTE: Following the test(s) in fault, it is necessary to replace one board (or more) at level maintenance 2.
In the table below, for each test (of the functional test procedure), the different boards to replace are listed. The first board listed must be replaced firstly, and so on.

NOTE: After the replacement of a board, check the efficiency of the new board.

NOTE: For the removing and the installation of a new board, refer to the Disassembly section and Assemby sections.

TABLE 34-42-61-992-133-A01

TEST PROCEDURE	DESCRIPTION	ACTIONS	DISASSEMBLY PROCEDURE	ASSEMBLY PROCEDURE
(1) Refer to SUBTASK 34-42-61-700-001-01	Lightning protection of the power supply inputs and Arinc outputs	Replace HIRF module	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
(2) Refer to SUBTASK 34-42-61-700-002-01	Lightning protection of the Radio Frequency inputs “RX”, “TX” and discretes inputs	Replace HIRF module (for discretes inputs)	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
		Replace RF module (for “RX” and “TX” access)	Refer to TASK 34-42-61-803-001-A01	Refer to TASK 34-42-61-400-803-001-A01
(4) Refer to SUBTASK 34-42-61-700-004-01	Power consumption	Replace Power Supply stage	Refer to TASK 34-42-61-000-802-001-A01	Refer to TASK 34-42-61-400-802-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-400-801-001-A01
		And/or Mother - I/O stage	Refer to TASK 34-42-61-000-805-001-A01	Refer to TASK 34-42-61-400-805-001-A01
		And/or HIRF module	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
		And/or Radio module	Refer to TASK 34-42-61-000-803-001-A01	Refer to TASK 34-42-61-400-803-001-A01
(5) Refer to SUBTASK 34-42-61-700-005-01	RF bandwidth	Replace Radio module	Refer to TASK 34-42-61-000-803-001-A01	Refer to TASK 34-42-61-400-803-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-400-801-001-A01

TEST PROCEDURE	DESCRIPTION	ACTIONS	DISASSEMBLY PROCEDURE	ASSEMBLY PROCEDURE
(6) Refer to SUBTASK 34-42-61-700-006-01	RF transmitted power	Replace Radio module	Refer to TASK 34-42-61-000-803-001-A01	Refer to TASK 34-42-61-400-803-001-A01
		And/or Power Supply stage	Refer to TASK 34-42-61-000-802-001-A01	Refer to TASK 34-42-61-400-802-001-A01
(7) Refer to SUBTASK 34-42-61-700-007-01	Electrical characteristics of the Arinc 429 output signals	Replace Mother - I/O stage	Refer to TASK 34-42-61-000-805-001-A01	Refer to TASK 34-42-61-400-805-001-A01
(8) Refer to SUBTASK 34-42-61-700-008-01	Refresh rate of Arinc labels on Arinc bus N°1 and Arinc bus N°2	Replace HIRF module	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
		And/or Mother - I/O stage	Refer to TASK 34-42-61-000-805-001-A01	Refer to TASK 34-42-61-400-805-001-A01
Several test procedures	Height data word label “**164**”	Replace Mother - I/O stage	Refer to TASK 34-42-61-000-805-001-A01	Refer to TASK 34-42-61-400-805-001-A01
		And/or HIRF module	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-000-801-001-A01
Several test procedures	Height data word label “**165**”	Replace Mother - I/O stage	Refer to TASK 34-42-61-000-805-001-A01	Refer to TASK 34-42-61-400-805-001-A01
		And/or HIRF module	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-000-801-001-A01
Several test procedures	Height data words labels “**164**” and “**165**”	Replace Mother - I/O stage	Refer to TASK 34-42-61-000-805-001-A01	Refer to TASK 34-42-61-400-805-001-A01
		And/or HIRF module	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-000-801-001-A01

TEST PROCEDURE	DESCRIPTION	ACTIONS	DISASSEMBLY PROCEDURE	ASSEMBLY PROCEDURE
Several test procedures	Status data word label “**271**”	Replace Mother - I/O stage	Refer to TASK 34-42-61-000-805-001-A01	Refer to TASK 34-42-61-400-805-001-A01
		And/or HIRF module	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-000-801-001-A01
Several test procedures	Status data word label “**272**”	Replace Mother - I/O stage	Refer to TASK 34-42-61-000-805-001-A01	Refer to TASK 34-42-61-400-805-001-A01
		And/or HIRF module	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-000-801-001-A01
Several test procedures	Equipment identifier data word label “**371**”	Replace Mother - I/O stage	Refer to TASK 34-42-61-000-805-001-A01	Refer to TASK 34-42-61-400-805-001-A01
		And/or HIRF module	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-000-801-001-A01
Several test procedures	Equipment identifier data word label “**377**”	Replace Mother - I/O stage	Refer to TASK 34-42-61-000-805-001-A01	Refer to TASK 34-42-61-400-805-001-A01
		And/or HIRF module	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-000-801-001-A01

TEST PROCEDURE	DESCRIPTION	ACTIONS	DISASSEMBLY PROCEDURE	ASSEMBLY PROCEDURE
(14) Refer to SUBTASK 34-42-61-700-014-01	Simulation of TX antenna failure	Replace HIRF module	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
		And/or Mother - I/O stage	Refer to TASK 34-42-61-000-805-001-A01	Refer to TASK 34-42-61-400-805-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-000-801-001-A01
(15) Refer to SUBTASK 34-42-61-700-015-01	Built In Test function	Replace HIRF module	Refer to TASK 34-42-61-000-804-001-A01	Refer to TASK 34-42-61-400-804-001-A01
		And/or Mother - I/O stage	Refer to TASK 34-42-61-000-805-001-A01	Refer to TASK 34-42-61-400-805-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-000-801-001-A01
(16) Refer to SUBTASK 34-42-61-700-016-01	Sensitivity	Replace Radio module	Refer to TASK 34-42-61-000-803-001-A01	Refer to TASK 34-42-61-400-803-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-400-801-001-A01
(17) Refer to SUBTASK 34-42-61-700-017-01	Height accuracy	Replace Radio module	Refer to TASK 34-42-61-000-803-001-A01	Refer to TASK 34-42-61-400-803-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-400-801-001-A01
(18) Refer to SUBTASK 34-42-61-700-018-01	Response time performance during a height step	Replace Radio module	Refer to TASK 34-42-61-000-803-001-A01	Refer to TASK 34-42-61-400-803-001-A01
		And/or DMB board	Refer to TASK 34-42-61-000-801-001-A01	Refer to TASK 34-42-61-400-801-001-A01
(19) Refer to SUBTASK 34-42-61-700-019-01	Operation at +22V and +18V	Replace Power Supply stage	Refer to TASK 34-42-61-000-802-001-A01	Refer to TASK 34-42-61-400-802-001-A01
(20) Refer to SUBTASK 34-42-61-700-020-01	Operation at +30.3V	Replace Power Supply stage	Refer to TASK 34-42-61-000-802-001-A01	Refer to TASK 34-42-61-400-802-001-A01

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DISASSEMBLY

TASK 34-42-61-871-804-A01

1. GENERAL

Disassemble the AHV1600 unit only when repair is necessary.

Run the performance test given in the Testing chapter of this manual, and the Fault Isolation test given in the Fault Isolation section to determine if and what disassembly is required.

This section deals with the procedures for the removal and disassembly of the subassemblies of the AHV1600 unit.

A. PRECAUTIONS

WARNING: REMOVE ALL POWER CABLES BEFORE DISASSEMBLING ANY PORTION OF THE EQUIPMENT. DISASSEMBLING THE EQUIPMENT WITH THE POWER CABLES CONNECTED IS DANGEROUS TO LIFE AND ALSO MAY CAUSE VOLTAGE TRANSIENTS THAT CAN DAMAGE THE EQUIPMENT.

WARNING: REFER TO THE COMPONENT SEALED MATERIALS WARNING ON THE ADVISORIES PAGE IN THE INTRODUCTION SECTION.

CAUTION: SOLDERING EQUIPMENT MUST BE WELL GROUNDED. WHEN SOLDERING AND UNSOLDERING A SOLID-STATE DEVICE, USE A HEAT SINK ON THE LEADS TO PREVENT DAMAGE TO THE DEVICE.

CAUTION:

REFER TO ESDS HANDLING CAUTION IN THE INTRODUCTION SECTION OF TESTING AND FAULT ISOLATION OF THIS MANUAL.

B. PROCEDURES OF DISASSEMBLY

The instructions for disassembly are given step by step, in a logical order, referring to the Figure numbers and item numbers (in parentheses) of the corresponding illustrations in the Illustrated Parts List.

(1) GENERAL PRECAUTIONS TO BE OBSERVED

Job is to be performed in a clean room. Disassembly and cleaning of the equipment must be carried out with the recommended tools and products only. The parts must be protected as soon as they are disassembled. Most screws and nuts on the AHV1600 unit are secured with locking compound (example, LOCTITE SR 222). This varnish may be diluted, if required, with acetone or lacquer thinner.

(2) NECESSARY TOOLS

Refer to the I.P.L. part of this manual to know the different sort of screws used to maintain in position the boards; to unscrews the screws, use the dedicated screwdriver.

(3) LIST OF DISASSEMBLIES

Hereafter are listed the sub-assemblies which can be dismantled for NTI2 (level of maintenance 2)

- DMB board,
- Power Supply stage,
- Radio module,
- HIRF module,
- Mother - I/O stage,
- Chassis.

TASK 34-42-61-000-801-A01

2. DISASSEMBLY OF DMB BOARD

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

The table that follows gives the tools necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent tools as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-993-301-A01

REFERENCE	QTY	NAME
No specific	1	Screwdriver

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-020-001-A01

(1) DISASSEMBLY OF DMB BOARD (Figure 1, item 120)

(a) Unscrew the 6 screws (Figure 1, item 100) and remove the left cover (Figure 1, item 90).

(b) Remove carefully the DMB board (Figure 1, item 120) with the dedicated cord.

TASK 34-42-61-000-802-A01

3. DISASSEMBLY OF POWER SUPPLY STAGE

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

The table that follows gives the tools necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent tools as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-993-302-A01

REFERENCE	QTY	NAME
6100188A	1	Power Supply stage removal tool
No specific	1	Screwdriver

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-020-002-A01

(1) DISASSEMBLY OF POWER SUPPLY STAGE (Figure 1, item 110)

(a) Unscrew the 6 screws (Figure 1, item 100) and remove the left cover (Figure 1, item 90).

(b) Remove carefully the Power Supply stage (Figure 1, item 110) with the Power Supply stage removal tool (P/N 6100188A).

TASK 34-42-61-000-803-A01

4. DISASSEMBLY OF RADIO MODULE

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

The table that follows gives the tools necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent tools as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-993-303-A01

REFERENCE	QTY	NAME
No specific	1	Screwdriver

(2) REFERENCE INFORMATION

TABLE 34-42-61-996-304-A01

REFERENCE	DESIGNATION
TASK 34-42-61-000-801-A01	Disassembly of DMB board
TASK 34-42-61-000-802-A01	Disassembly of Power Supply stage

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-020-003-A01

(1) DISASSEMBLY OF RADIO MODULE (Figure 1, item 40)

CAUTION: BE CAREFUL TO THE COAXIAL CONNECTORS (Figure 1, item 210).

(a) Unscrew “TX” and “RX” connectors (Figure 1, item 200) from the front side of the AHV1600 unit.

(b) Unscrew the 10 screws (Figure 1, item 20) and remove the upper cover (Figure 1, item 10).

(c) Remove the foil (Figure 1, item 30).

(d) Remove the DMB board (refer to TASK 34-42-61-000-801-A01).

(e) Remove the Power Supply stage (refer to TASK 34-42-61-000-802-A01).

(f) Remove carefully the Radio module (Figure 1, item 40).

TASK 34-42-61-000-804-A01

5. DISASSEMBLY OF HIRF MODULE

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

The table that follows gives the tools necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent tools as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-993-305-A01

REFERENCE	QTY	NAME
No specific	1	Screwdriver

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-020-004-A01

(1) DISASSEMBLY OF HIRF MODULE (Figure 1, item 160)

(a) Unscrew the 4 screws and washers (Figure 1, items 170 and 180) on the front face of the AHV1600 unit.

(b) Take out slightly the front face (Figure 1, item 160) of the AHV unit.

(c) Unscrew carefully the 4 screws and washers (Figure 1, items 170 and 180) which maintain in position the second part of the HIRF module (Figure 1, item 160) in the chassis (Figure 1, item 190).

(d) Remove carefully the HIRF module (Figure 1, item 160).

TASK 34-42-61-000-805-A01

6. DISASSEMBLY OF MOTHER - I/O STAGE

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

The table that follows gives the tools necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent tools as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-993-306-A01

REFERENCE	QTY	NAME
No specific	1	Screwdriver

(2) REFERENCE INFORMATION

TABLE 34-42-61-996-307-A01

REFERENCE	DESIGNATION
TASK 34-42-61-000-803-A01	Disassembly of Radio module
TASK 34-42-61-000-804-A01	Disassembly of HIRF module

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-020-005-A01

(1) DISASSEMBLY OF MOTHER - I/O STAGE (Figure 1, item 130)

(a) Remove the Radio module (refer to TASK 34-42-61-000-803-A01).

(b) Remove the HIRF module (refer to TASK 34-42-61-000-804-A01).

(c) Unscrew the 5 screws and washers (Figure 1, items 140 and 150) which maintain the Mother - I/O stage (Figure 1, item 130) in position.

(d) Remove carefully the Mother - I/O stage (Figure 1, item 130).

TASK 34-42-61-000-806-A01

7. DISASSEMBLY OF CHASSIS

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

The table that follows gives the tools necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent tools as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-993-308-A01

REFERENCE	QTY	NAME
No specific	1	Screwdriver

(2) REFERENCE INFORMATION

TABLE 34-42-61-996-309-A01

REFERENCE	DESIGNATION
TASK 34-42-61-000-805-A01	Disassembly of Mother - I/O stage

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-020-006-A01

(1) DISASSEMBLY OF CHASSIS (Figure 1, item 190)

(a) Remove the Mother - I/O stage (refer to TASK 34-42-61-000-805-A01).

CLEANING

TASK 34-42-61-100-801-A01

1. CLEANING OF AHV1600 TRANSCEIVER

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET−UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

Not applicable.

(2) CONSUMABLES

The table that follows gives the consumables necessary to do the cleaning of the AHV1600 Transceiver.

NOTE: You can use equivalent products as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-994-401-A01

ITEM	REFERENCE	QTY	NAME
Item 1	Commercially available	-	White spirit

C. JOB SET−UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-160-001-A01

(1) ATTACHING PARTS

(a) Clean all attaching parts in a bath of cleaning compound (item1). Then full dry with compressed air.

SUBTASK 34-42-61-160-002-A01

(2) AHV1600 Transceiver

(a) Clean the AHV1600 Transceiver with a cloth soaked in water.

INSPECTION / CHECK

TASK 34-42-61-200-801-A01

1. INSPECTION / CHECK OF AHV1600 TRANSCEIVER

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET−UP INFORMATION

Not applicable.

C. JOB SET−UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-210-001-A01

(1) ATTACHING PARTS

(a) Visually examine the screw heads and the threads. Reject all defective attaching parts.

(b) Systematically reject the lock washers.

SUBTASK 34-42-61-210-002-A01

(2) MECHANICAL PARTS

(a) Examine the surface condition of the mechanical parts.

(b) Make sure that the mechanical parts are not damaged.

(c) Reject all defective parts.

SUBTASK 34-42-61-210-003-A01

(3) ELECTRICAL COMPONENTS

(a) Examine the condition of the wiring and solders, specially on the connectors, printed circuits, pushbuttons and switch assemblies.

(b) Examine the condition of the insulators of the electrical component and printed circuits.

(c) Reject systematically all defective parts.

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REPAIR

TASK 34-42-61-300-801-A01

1. REPAIR OF AHV1600 TRANSCEIVER

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET−UP INFORMATION

Not applicable.

C. JOB SET-UP

(1) GENERAL

NOTE: Refer to the "DESCRIPTION AND OPERATION" Figures for the Electrical Diagram, and the I.P.L Figures for the components location-layout.

The SMD can be replaced when the boards have to be repaired and when operators are used to this delicate and fine type of work. When operators can not do so, it is suggested to return such a repair to the Original Equipment Manufacturer.

D. PROCEDURE

SUBTASK 34-42-61-310-001-A01

(1) SURFACE MOUNT DEVICE

CAUTION: BEFORE TO START TO WORK ON THE PRINTED CIRCUIT BOARD, IT IS NECESSARY TO DO THE TEST GIVEN IN THE "TESTING AND FAULT ISOLATION" SECTION TO FIND AND ISOLATE POSSIBLE DEFECTS.

For unsoldering and soldering SMD:

(a) Use the special tools locally available and specifically dedicated to SMR (Surface Mounting Repair).

(b) Avoid burning the printed board.

(c) Avoid detaching the tracks on the board.

(d) Avoid re-use of SMD which have been unsoldered.

(e) Avoid overheating SMD and adjacent components.

(f) Avoid changing a same SMD on the same board more than three times, in order to maintain the good quality of the whole board.

ASSEMBLY

TASK 34-42-61-871-805-A01

1. GENERAL

This section provides information for the assembly of the AHV1600 unit.

The order of assembly starts with the lowest sub-assembly to the complete module.

Reassembly is to be performed in a clean, dust-free room.

All screws shall be secured by a drop of varnish.

A. PRECAUTIONS

CAUTION:

REFER TO ESDS HANDLING CAUTION IN THE INTRODUCTION SECTION OF TESTING AND FAULT ISOLATION OF THIS MANUAL.

CAUTION: WHEN REPLACING A SOLID-STATE COMPONENT, USE A HEAT SINK ATTACHED TO THE LEADS TO PREVENT DAMAGE TO THE DEVICE. THE SOLDERING IRON SHOULD BE GROUNDED PROPERLY WITH RESPECT TO BOARD OR CHASSIS WHEN REPLACING LOW-VOLTAGE DEVICES (DIODES,TRANSISTORS, INTEGRATED CIRCUITS, ETC).

B. PROCEDURES OF DISASSEMBLY

The reassembly instructions are given step by step in a logical order, referring of the Figure and item numbers of the corresponding illustrations in the Illustrated Parts List.

(1) NECESSARY TOOLS

Refer to the I.P.L. part of this manual to know the different sort of screws used to maintain in position the boards to be in accordance with the different tools listed in SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES.

(2) LIST OF RE-ASSEMBLIES

Hereafter are listed the sub-assemblies which can be re-assembled for NTI2 (level of maintenance 2)

- DMB board,
- Power Supply stage,
- Radio module,
- HIRF module,

- Mother - I/O stage,
- Chassis.

TASK 34-42-61-400-801-A01

2. ASSEMBLY OF DMB BOARD

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

The table that follows gives the tools necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent tools as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-993-701-A01

REFERENCE	QTY	NAME
No specific	1	Screwdriver

(2) CONSUMABLES

The table that follows gives the consumables necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent consumables as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-994-702-A01

REFERENCE	NAME
Loctite SR222	Thread locking compound

(3) REFERENCE INFORMATION

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-420-001-A01

(1) ASSEMBLY OF DMB BOARD (Figure 1, item 120)

NOTE: after the replacement of the DMB board, it may be necessary to run the software downloading procedure (refer to TESTING AND FAULT ISOLATION).

(a) Insert carefully the DMB board (Figure 1, item 120) in its dedicated housing in the chassis (Figure 1, item 190).

(b) Plug carefully the DMB board connector in the connector of the Mother - I/O stage (Figure 1, item 130).

(c) Replace the gasket (Figure 1, item 105) by a new one.

(d) Install carefully the left cover (Figure 1, item 90) on the chassis (Figure 1, item 190).

(e) Put locking compound (Loctite SR222) on the thread of the screws (Figure 1, item 100).

(f) Screw the 6 screws (Figure 1, item 100) with a torque of 0.8 N.m (0.59 lbf.in).

TASK 34-42-61-400-802-A01

3. ASSEMBLY OF POWER SUPPLY STAGE

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

The table that follows gives the tools necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent tools as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-993-703-A01

REFERENCE	QTY	NAME
No specific	1	Screwdriver

(2) CONSUMABLES

The table that follows gives the consumables necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent consumables as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-994-704-A01

REFERENCE	NAME
Loctite SR222	Thread locking compound

(3) REFERENCE INFORMATION

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-420-002-A01

(1) ASSEMBLY OF POWER SUPPLY STAGE (Figure 1, item 110)

(a) Insert carefully the Power Supply stage (Figure 1, item 110) in its dedicated housing in the chassis (Figure 1, item 190).

(b) Plug carefully the Power Supply stage connector in the connector of the Mother - I/O stage (Figure 1, item 130).

(c) Replace the gasket (Figure 1, item 105) by a new one.

(d) Install carefully the left cover (Figure 1, item 90) on the chassis (Figure 1, item 190).

(e) Put locking compound (Loctite SR222) on the thread of the screws (Figure 1, item 100).

(f) Screw the 6 screws (Figure 1, item 100) with a torque of 0.8 N.m (0.59 lbf.in).

TASK 34-42-61-400-803-A01

4. ASSEMBLY OF RADIO MODULE

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

The table that follows gives the tools necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent tools as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-993-705-A01

REFERENCE	QTY	NAME
No specific	1	Screwdriver

(2) CONSUMABLES

The table that follows gives the consumables necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent consumables as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-994-706-A01

REFERENCE	NAME
Loctite SR222	Thread locking compound

(3) REFERENCE INFORMATION

TABLE 34-42-61-996-707-A01

REFERENCE	DESIGNATION
TASK 34-42-61-400-801-A01	Assembly of DMB board

REFERENCE	DESIGNATION
TASK 34-42-61-400-802-A01	Assembly of Power Supply stage

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-420-003-A01

(1) ASSEMBLY OF RADIO MODULE (Figure 1, item 40)

NOTE: after the replacement of the Radio module, it may be necessary to run the software downloading procedure (refer to Testing and Fault isolation part).

(a) Check that the foil (Figure 1, item 70) is in position.

(b) Install carefully the Radio module (Figure 1, item 40) in its dedicated housing in the chassis (Figure 1, item 190).

(c) Plug carefully the Radio module connector in the connector of the Mother - I/O stage (Figure 1, item 130).

(d) Install carefully the foil (Figure 1, item 30) on the Radio module (Figure 1, item 40).

(e) Replace the gasket (Figure 1, item 25) by a new one.

(f) Install carefully the upper cover (Figure 1, item 10).

(g) Put locking compound (Loctite SR222) on the thread of the 10 screws (Figure 1, item 20).

(h) Screw the 10 screws (Figure 1, item 20) with a torque of 0.8 N.m (0.59 lbf.in).

(i) Put the coaxial connectors (Figure 1, item 210) in position.

(j) Screw the “TX” and “RX” connectors (Figure 1, item 200) in their dedicated housing with a torque of 4 N.m (2.95 lbf.in).

(k) Install the DMB board (refer to TASK 34-42-61-400-801-A01).

(l) Install the Power Supply stage (refer to TASK 34-42-61-400-802-A01).

TASK 34-42-61-400-804-A01

5. ASSEMBLY OF HIRF MODULE

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

The table that follows gives the tools necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent tools as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-993-708-A01

REFERENCE	QTY	NAME
No specific	1	Screwdriver

(2) CONSUMABLES

The table that follows gives the consumables necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent consumables as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-994-709-A01

REFERENCE	NAME
Loctite SR222	Thread locking compound

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-420-004-A01

(1) ASSEMBLY OF HIRF MODULE (Figure 1, item 160)

(a) Replace the gasket (Figure 1, item 185) by a new one.

(b) Install carefully the rear part of the HIRF module (Figure 1, item 160) in its dedicated housing in the chassis (Figure 1, item 190).

(c) Put locking compound (Loctite SR222) on the thread of the 4 screws (Figure 1, item 170).

(d) Screw the 4 screws and washers (Figure 1, item 170) with a torque of 0.8 N.m (0.59 lbf.in).

(e) Install carefully the front face of the HIRF module (Figure 1, item 160) on the chassis (Figure 1, item 190).

(f) Put locking compound (Loctite SR222) on the thread of the 4 screws (Figure 1, item 170).

(g) Attach the front part of the HIRF module (160) to the chassis (190) with the 4 screws (170) and the 4 washers (180).

(h) Screw the 4 screws and washers (Figure 1, items 170 and 180) with a torque of 0.8 N.m (0.59 lbf.in).

TASK 34-42-61-400-805-A01

6. ASSEMBLY OF MOTHER - I/O STAGE

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

The table that follows gives the tools necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent tools as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-993-710-A01

REFERENCE	QTY	NAME
No specific	1	Screwdriver

(2) CONSUMABLES

The table that follows gives the consumables necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent consumables as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-994-711-A01

REFERENCE	NAME
Loctite SR222	Thread locking compound

(3) REFERENCE INFORMATION

TABLE 34-42-61-996-712-A01

REFERENCE	DESIGNATION
TASK 34-42-61-400-803-A01	Assembly of Radio module
TASK 34-42-61-400-804-A01	Assembly of HIRF module

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-420-005-A01

(1) ASSEMBLY OF MOTHER - I/O STAGE (Figure 1, item 130)

NOTE: after the replacement of the Mother - I/O stage, it may be necessary to run the software downloading procedure (refer to TESTING AND FAULT ISOLATION).

(a) Install carefully the Mother - I/O stage (Figure 1, item 130) in its dedicated housing in the chassis (Figure 1, item 190).

(b) Put locking compound (Loctite SR222) on the thread of the 5 screws (Figure 1, item 140).

(c) Screw the 5 screws and washers (Figure 1, items 140 and 150) with a torque of 0.8 N.m (0.59 lbf.in).

(d) Install the Radio module (refer to TASK 34-42-61-400-803-A01).

(e) Install the HIRF module (refer to TASK 34-42-61-400-806-A01).

TASK 34-42-61-400-806-A01

7. ASSEMBLY OF CHASSIS

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

The table that follows gives the tools necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent tools as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-993-713-A01

REFERENCE	QTY	NAME
No specific	1	Screwdriver

(2) CONSUMABLES

The table that follows gives the consumables necessary to disassemble the AHV1600 Transceiver

NOTE: You can use equivalent consumables as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-994-714-A01

REFERENCE	NAME
Loctite SR222	Thread locking compound

(3) REFERENCE INFORMATION

TABLE 34-42-61-996-715-A01

REFERENCE	DESIGNATION
TASK 34-42-61-400-805-A01	Assembly of Mother - I/O stage

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-420-006-A01

(1) ASSEMBLY OF CHASSIS (Figure 1, item 190)

(a) Install the Mother - I/O stage (refer to TASK 34-42-61-400-805-A01).

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FITS AND CLEARANCES

TASK 34-42-61-820-801-A01

1. TIGHTENING TORQUES

A. TABLE OF TIGHTENING TORQUES

TABLE 34-42-61-992-801-A01

IPL ITEM	DESCRIPTION	TIGHTENING TORQUE daN.m and (lbf.in)
20	Screw	0.8 N.m (0.59 lbf.in)
100	Screw	0.8 N.m (0.59 lbf.in)
140	Screw	0.8 N.m (0.59 lbf.in)
170	Screw	0.8 N.m (0.59 lbf.in)
200	“TX” connector	4 N.m (2.95 lbf.in)
200	“RX” connector	4 N.m (2.95 lbf.in)

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SPECIAL TOOLS, FIXTURES, EQUIPMENT AND CONSUMABLES

TASK 34-42-61-940-901-A01

1. SPECIAL TOOL, FIXTURES AND EQUIPMENT

A. GENERAL

(1) GENERAL INSTRUCTIONS

This section contains information on special tools, fixtures and test equipment used to test, troubleshoot and repair the AHV1600 unit.

(2) Test Equipment/Resource Requirements

The table that follows gives the minimum use specifications (MUS) for the test equipment and resources required to perform test procedure for the AHV1600 unit.

The MUS are the generic technical description, by characteristic, of the test equipment/resource required independent of a specific, manufacturer's model, and are provided to aid in utilization of existing or alternate test resources.

NOTE: Equivalent substitutes may be used for listed test equipment required.

CAUTION: THE TEST EQUIPMENT LISTED IN THE TABLE THAT FOLLOWS GIVES MUST BE ACCURATELY CALIBRATED.

B. SPECIAL TOOL TABLE

TABLE 34-42-61-993-901-A01

PART NUMBER	DESCRIPTION	SUPPLIER CODE OR NAME AND ADDRESS	PAGE BLOCK WHERE USED	TID
PCR2000L	Power supply: - Modes: DC - Trigger mode - DC voltage range: 40V - DC current range: 30A - Pulse voltage range: 100 V - Pulse time range: 1ms	KIKUSUI	1000	

PART NUMBER	DESCRIPTION	SUPPLIER CODE OR NAME AND ADDRESS	PAGE BLOCK WHERE USED	TID
34401A	Multimeter: - DC current range: 1.5A - DC voltage range: 40V - Accuracy: 1%	AGILENT	1000	
TV06RW1535S	37 contacts connector	AMPHENOL	1000	
M81969/14-01	Installation and removal tool	AMPHENOL	1000	
809 801	Crimping tool	AMPHENOL	1000	
809 810	Positioner	AMPHENOL	1000	
R143004	Female connector TNC	RADIALL	1000	
M17/128-RG400	Coaxial cable: - Bandwidth: > 4.4 GHz - Attenuation: < 1.2 dB/m	AXON CABLE	1000	
KZ04-07 BLUE	Cable	NEXANS	1000	
KZ04-05 BLACK	Cable	NEXANS	1000	
ET2419 STK2 WHITE	Twisted cables	SUPPLIER AXON CABLE	1000	
KZ04-05 WHITE	Cable	NEXANS	1000	
AS1/4 178 F	Resistor: - 178 Ω - 1% - 0.25 W	WELWYN COMPONENTS	1000	
PNR 61556316AA	Automatic Lightning protection Test System (only at industrial level)	THALES COMMUNICATIONS	1000	
R143004	Female TNC connector	RADIALL	1000	
KZ04-07 BLUE	Cable	NEXANS	1000	

PART NUMBER	DESCRIPTION	SUPPLIER CODE OR NAME AND ADDRESS	PAGE BLOCK WHERE USED	TID
ET2419 STK2 WHITE	Twisted cables	AXON CABLE	1000	
A6302	Current probe: - I min > 50 A peak - Bandwidth: DC to 50 MHz	TEKTRONIX	1000	
AM503A	Current probe amplifier	TEKTRONIX	1000	
TM501	Power module	TEKTRONIX	1000	
DSO6012A	Digital oscilloscope: - DC to 50 MHz - 2 channels	AGILENT	1000	
-	ARINC tool	-	1000	
E4404B	Spectrum analyzer: - 4 GHz to 5 GHz -Input impedance: 50 Ω	AGILENT	1000	
E4418B	Power meter: - 4 GHz to 5 GHz	AGILENT	1000	
E4412A	Power meter Probe: - 4 GHz to 5 GHz - min. power: 20 dBm	AGILENT	1000	
791F	Continuous variable attenuator: - 4 GHz to 5 GHz - attenuation: 0 to 35 dBm - impedance: 50 Ω -RF input power: 20 dBm	NARDA	1000	

PART NUMBER	DESCRIPTION	SUPPLIER CODE OR NAME AND ADDRESS	PAGE BLOCK WHERE USED	TID
8495B	Step attenuator: - DC to 6 GHz - attenuation: 0 to 50 dBm - impedance: 50 Ω -RF input power: 20 dBm	AGILENT	1000	
3202B-10	Directional Coupler: - 4 GHz to 5 GHz - attenuation: 10 dBm - impedance: 50 Ω -RF input power: 20 dBm	NARDA	1000	
779-3	Fixed attenuator: - DC to 5 GHz - attenuation: 3 dBm - impedance: 50 Ω -RF input power: 20 dBm	NARDA	1000	
R591 302 400	Microwave switch: - 4 GHz to 5 GHz - impedance: 50 Ω -RF input power: 20 dBm - 6 positions	RADIALL	1000	
-	Delay line: - 1.83 m (6 ft) - 4 GHz to 5 GHz - impedance: 50 Ω	Made locally (REFER TO TASK 34-42-61-940-902-A01)	1000	
-	Delay line: - 30.48 m (100 ft) - 4 GHz to 5 GHz - impedance: 50 Ω	Made locally (REFER TO TASK 34-42-61-940-902-A01)	1000	

PART NUMBER	DESCRIPTION	SUPPLIER CODE OR NAME AND ADDRESS	PAGE BLOCK WHERE USED	TID
-	Delay line: - 36.58 m (120 ft) - 4 GHz to 5 GHz - impedance: 50 Ω	Made locally (REFER TO TASK 34-42-61-940-902-A01)	1000	
MBG-1014	Delay line: - Altitude simulated: 76.2 m (250 ft) - Delay: 508 ns - 4.2 GHz to 5 GHz - impedance: 50 Ω	TELEDYNE ELECTRONIC TECHNOLOGY	1000	
MBG-1025	Delay line: - Altitude simulated: 152.4 m (500 ft) - Delay: 1016 ns - 4.2 GHz to 4.4 GHz - impedance: 50 Ω	TELEDYNE ELECTRONIC TECHNOLOGY	1000	
MBG-1032	Delay line: - Altitude simulated: 304.8 m (1000 ft) - Delay: 2032 ns - 4.2 GHz to 4.4 GHz - impedance: 50 Ω	TELEDYNE ELECTRONIC TECHNOLOGY	1000	
MBG-1154	Delay line: - Altitude simulated: 609.6 m (2000 ft) - Delay: 4064 ns - 4.2 GHz to 4.4 GHz - impedance: 50 Ω	TELEDYNE ELECTRONIC TECHNOLOGY	1000	

PART NUMBER	DESCRIPTION	SUPPLIER CODE OR NAME AND ADDRESS	PAGE BLOCK WHERE USED	TID
MBG-1011	Delay line: - Altitude simulated: 1524 m (5000 ft) - Delay: 10160 ns - 4.2 GHz to 4.4 GHz - impedance: 50 Ω	TELEDYNE ELECTRONIC TECHNOLOGY	1000	
R414720	Fixed attenuator: - 4GHz to 4.6 GHz - attenuation: 20 dBm - impedance: 50 Ω	RADIALL	1000	
AS1/4 178 F	Resistor: - 402 Ω - 5% - 0.25 W	WELWYN COMPONENTS	1000	
KP1830-233-065	Capacitor: - 33 nF - 10% - 63 V	VISHAY	1000	
STAR07 (1)	Automatic system test		1000	
AZXR.1075	Screwdriver	FACOM	3000, 7000	
6100188A	Removing tool	THALES	3000	
31.12x13	Open-end spanner	FACOM	3000	
A.402	Spanner: - adjusted at 0.8 N.m (0.59 lbf.in)	FACOM	7000	
ECR	Tip for spanner	FACOM	7000	
EX.108	Tip	FACOM	7000	

PART NUMBER	DESCRIPTION	SUPPLIER CODE OR NAME AND ADDRESS	PAGE BLOCK WHERE USED	TID
R210	Lengthening piece	FACOM	7000	
A.404	Spanner: - adjusted at 4 N.m (2.95 lbf.in)	FACOM	7000	
R.12LA	Socket	FACOM	7000	

(1) Used at industrial level

2. CONSUMABLES MATERIALS

A. CONSUMABLES MATERIALS TABLE

NOTE: Equivalent substitutes can be used for listed items.

TABLE 34-42-61-994-902-A01

MATERIAL NUMBER	DESIGNATION AND/OR SPECIFICATION	SUPPLIER CODE OR NAME AND ADDRESS	PAGE BLOCK WHERE USED
-	WHITE SPIRIT	COMMERCIALY AVAILABLE	4000
-	LOCTITE 222SR	COMMERCIALY AVAILABLE	7000
-	DESICCANT BAG	COMMERCIALY AVAILABLE	15000

TASK 34-42-61-940-902-A01

3. 100 FEET AND 120 FEET DELAY LINE FABRICATION

A. Test Coaxial Cable Length

(1) Calculation of the length

To find the length cable needed, use the formula:

$$Lm = \frac{H \times 2 \times 0.3048}{K}$$

Lm = Length of cable in meter

K = Propagation factor of coaxial cable

(K = 1.51 for RG-223/U or RG-214/U, polyethylene dielectric)

H = Height to simulate

0.3048 = Proportionality rate feet/meter

CAUTION: K MAY VARY SLIGHTLY ACCORDING TO SUPPLIER.

(2) Example of length

For H = 100 feet

$$Lm = \frac{100 \times 2 \times 0.3048}{1.51} = 40.37 \text{ meters}$$

(3) Example of length

Delay line is made up of 40.37 meters length of coaxial cable (RG-214/U or RG-223/U) equipped with one TNC male or female connector on each end (RADIALL or equivalent).

TNC male, reference: R143008 (for coaxial = 5 mm diameter)

TNC female, reference: R143207 (for coaxial = 5 mm diameter)

B. Delay Line calibration

It is necessary to perform a fine calibration of the delay line to measure its delay and its attenuation. It is mandatory to proceed to the calibration of the delay line, before introducing it into service, by a department or company skilled in metrology.

Furthermore, an annual check of this attenuation is also highly recommended.

Furthermore, to simulate a height of 0 Foot, it is necessary to perform a fine calibration of the delay and attenuation values of the used AID (according to the tests = 12.19 m (40 ft), 17.37 m (57 ft) or 24.38 m (80 ft).

STORAGE (INCLUDING TRANSPORTATION)

TASK 34-42-61-550-801-A01

1. STORAGE

A. REASON FOR THE JOB

Self-explanatory.

B. JOB SET-UP INFORMATION

(1) TOOLS, FIXTURES AND TEST EQUIPMENT

Not applicable

(2) CONSUMABLES

The table that follows gives the consumables necessary to do the storage of the the AHV1600 Transceiver

NOTE: You can use equivalent consumables as an alternative to those given in the table.

NOTE: Refer to SPECIAL TOOLS, FIXTURES AND EQUIPMENT AND CONSUMABLES for more data.

TABLE 34-42-61-994-151-A01

REFERENCE	NAME
No specific	Desiccant bag

C. JOB SET-UP

Not applicable.

D. PROCEDURE

SUBTASK 34-42-61-550-001-A01

(1) Short-term Storage

(a) General

Short-term storage gives the specifications for the mechanical and weather protection (to keep the unit clean, dry, etc.) in a continental climate.

With these protections, the unit can be sent by road, rail, sea or air.

(b) Protection

Put a cap on each connector. These caps are supplied by the manufacturer.

(c) Packaging

The package has the components that follow:

- an unsealed primary Kraft paper envelope,
- one or more cardboard box(es), which is (are) put between the primary envelope and the external case,
- wedging material,
- if necessary, a sealed (water runoff) wooden case lined with Kraft paper, or a container (plastic or other material).

Put an identification label on each package to show the storage date and means.

If necessary, put the signed test report and the follow-up card in an envelope. Put this envelope on the package.

(d) Storage

Put the packaged component in a dry room. After a one-year period, examine the unit for damage.

If necessary, do an operation test with the test bench.

SUBTASK 34-42-61-550-002-A01

(2) Long-term Storage

(a) General

Long-term storage gives the specifications for the mechanical and weather protection for a long period of time.

With these protections, the unit can be sent by road, rail, sea and air.

(b) Protection

Put a cap on each connector. These caps are supplied by the manufacturer.

(c) Packaging

Put the unit in a case. Then, put the unit in a waterproof envelope containing a desiccant bag. Heat-seal this envelope.

(d) Storage

Keep the unit in a dry room. After removal from storage, make sure that the unit is serviceable (use the test bench in a workshop).

Make sure that:

- the performances are in the tolerances,
- the connectors and contacts are clean.

ILLUSTRATED PARTS LIST

TASK 34-42-61-879-804-A01

1. INTRODUCTION

A. General

The purpose of this Illustrated Parts List is the identification of equipment assemblies, sub-assemblies, and parts.

It is set up in conformance with the rules set forth in ATA 100.

From time to time, the Illustrated Parts List is revised so as to incorporate recent additions, cancellations and modifications in equipment. Revisions are indicated by an "R" on the right of each revised line, and apply solely to the date of revision.

B. Use of the Illustrated Parts List is revised so as to incorporate recent additions

(1) Publication Format

The IPL is arranged in the following order:

- Introduction,
- List of Manufacturers (VCI - Vendor Code Index),
- Index of circuit symbols (EDI - Equipment Designator Index),
- Alphabetical and Numerical index (NI),
- Illustrated nomenclature of spare parts.

(2) Designation Method

(a) List of manufacturers

The list of manufacturers is alphanumerically arranged according to the manufacturer's code. This list includes the names and addresses of all manufacturers cited in the detailed nomenclature.

(b) Index of circuit symbols

This index contains the relevant reference and diagrams for each circuit symbol, as well as the corresponding marker.

The circuit symbol designation is alphanumerical, and is arranged in the following order:

- dash,
- letters from A thru Z,
- numerals from 0 thru 9.

(c) Alphanumerical index

The manufacturer's reference designation (Part Number) is alphanumerical, and is arranged in the following order:

- dash,
- letters from A thru Z,
- numerals from 0 to 9.

(3) Manufacturer's Reference (PN)

The manufacturer's references (PN) are published in compliance with:

- standards and official specifications now in effect (AFNOR, BNAE, UTE, etc.),
- instructions from the different manufacturers,
- requirements as set forth in ATA 200.

For the non-specific components, the 8, 12 or 15-number reference has been added in the designation text, excluding nomenclatures furnished via computer.

(4) Identification of a Component Part

There are several different ways to identify a component part.

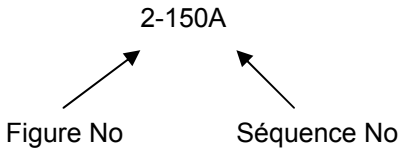
(a) Through the indexes:

1 Knowing the manufacturer's reference (Part Number)

The manufacturer's reference indexes contain the following information about the reference:

- the reference of the part specific to the airline (column left blank),
- the illustrated catalog sequence number (CSN)

Application:



- the quantity per CSN.

2 Knowing the circuit symbol

The circuit symbol index specifies the item reference and the CSN relevant to a given symbol. (See § 3.B for a breakdown of a circuit symbol).

(b) Through the illustrated nomenclature:

1 Knowing the Figure - Item No.

The text corresponding to the Figure number permits identification of the component part relevant to the Item.

2 Knowing the location of the component part

The Figure of the relevant sub-assembly gives the item applied to the part. The corresponding text enables its identification.

C. Abbreviations and Symbols Utilized

(a) Abbreviations

In the designation of the part, the following symbols are used in compliance with ATA 100 specification:

TABLE 34-42-61-992-020-A01

AR	:	As Request - (quantity),
FOR DET	:	for detail,
FOR NHA	:	for refer to Next Higher Assembly
NI	:	Alphanumerical Index,
NP	:	Not Procurable - (Item),
ORDER OVERLGTH	:	actual reference of an item of more than 15 characters listed in the nomenclature column (designation). Item is entered with this abbreviation,
PRE SB	:	Pre Service Bulletin,
POST SB	:	Post Service Bulletin,
PRE SIL	:	Pre Service Information Letter,
POST SIL	:	Post Service Information Letter,
PAS.	:	passivated,
RF	:	reminder - (sub-assembly already accounted for at the next highest level),
SEE FIG	:	see Figure,
SEL FROM	:	part or component requiring a selection,
SUPSD BY	:	Superseded by,
SUPSDS	:	Supersedes.

(b) Symbols

The following letters are used in the standard index:

TABLE 34-42-61-992-021-A01

T	tera	= 10^{12}
G	giga	= 10^{9}
M	mega	= 10^{6}
K	kilo	= 10^{3}
U	one	= 1
MY	milli	= 10^{-3}
MU	micro	= 10^{-6}
N	nano	= 10^{-9}
P	pico	= 10^{-12}

The following letters are used in the standard index to indicate tolerances on electronic components:

TABLE 34-42-61-992-022-A01

B	0.1 %	G	2 %
C	0.25 %	J	5 %
D	0.50 %	K	10 %
F	1 %	M	20 %

(c) Circuit Symbols

A circuit symbols is made up of:

- 1 or 2 letters specifying the nature of the component part (letter symbol),
- 1 to 3 numerals stating the order code of the component part in the relevant sub-assembly,

D. Pagination

The Illustrated Parts List is made up of sections. The pagination for each section is independent of every other section.

TABLE 34-42-61-992-023-A01

Introduction	INTRO	Page 1
Vendor Code Index	VCI	Page 1
Equipment Designator Index	EDI	Page 1
Alphanumerical index	NI	Page 1

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EQUIPMENT DESIGNATOR INDEX

VENDOR CODE	NAME – ADDRESS
F0110	AFNOR (ASSOCIATION FRANCAISE DE NORMALISATION) 11 AV FRANCIS DE PRESSENCE 93571 LA PLAINE ST DENIS CEDEX France
F8300	CIMD (CENTRE D'IDENTIFICATION DES MATERIELS DE LA DEFENSE) RTE DE LAILLE 35170 BRUZ FRANCE

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NUMERICAL INDEX

EQUIPMENT DESIGNATOR	FIG.	ITEM	EQUIPMENT DESIGNATOR	FIG.	ITEM
K3QIZH0252006A	1	140A			
	1	170A			
K3QIZH0253008A	1	50A			
R9ZT025A	1	60A			
	1	150A			
	1	180A			
UFQIZH025008A	1	20A			
	1	100A			
34MMBX-50-0-1/111 NE	1	-210A			
34MMBX-TNC-50-1	1	200A			
4679128B	1	-105A			
4679129B	1	-185A			
5616000B	1	110A			
61778312AA	1	-25A			
61778974AC	1	-01A			
61814651AA	1	-220A			
61935014AA	1	-80A			
61935016AA	1	160A			
61935017AA	1	130A			
61935018AA	1	120A			
62063831AA	1	40A			
62063836AA	1	190A			
62095541AA	1	10A			
62133420AA	1	90A			
62133857AA	1	30A			
62133858AA	1	70A			

EQUIPMENT DESIGNATOR	FIG. ITEM	EQUIPMENT DESIGNATOR	FIG. ITEM
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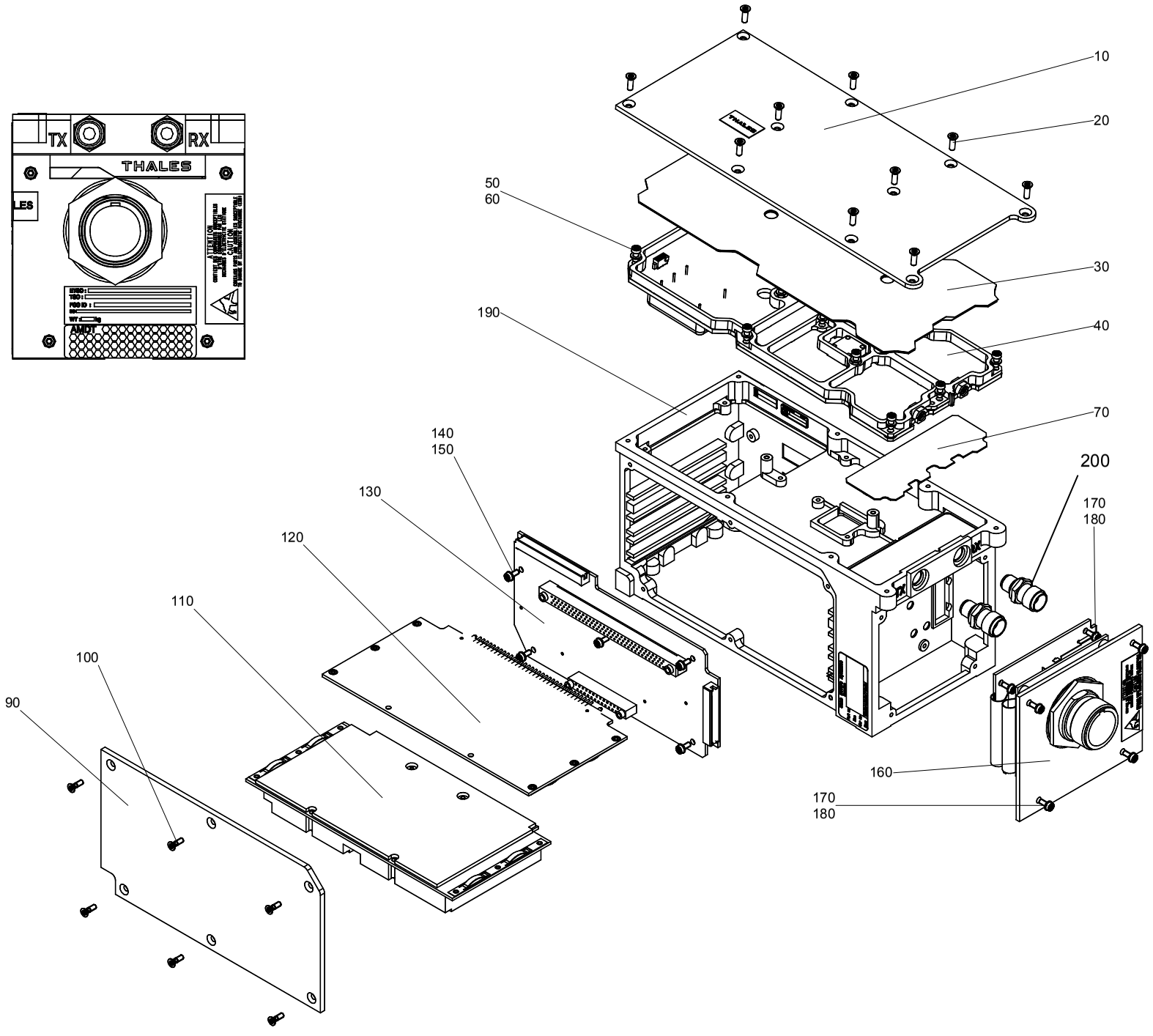
EQUIPMENT DESIGNATOR	FIG.	ITEM	EQUIPMENT DESIGNATOR	FIG.	ITEM

ILLUSTRATED PARTS CATALOG



TRANSCEIVER AHV1600
Figure 1

COMPONENT MAINTENANCE MANUAL
P/N 61778974AC

FIG.ITEM	PART NUMBER	AIRLINE STOCK NUMBER	NOMENCLATURE 1 2 3 4 5 6 7	USAGE CODE	UNIT PER ASSY
1 -001A	61778974AC		TRANSCEIVER AHV1600		RF
010A	62095541AA		. EQUIPPED COVER		1
			ATTACHING PARTS		
020A	UFQ1ZH025008A		. SCREW 99213726 VF0110		10
-025A	61778312AA		. GASKET		1
			* * *		
030A	62133857AA		. TINSEL		1
040A	62063831AA		. RADIO MODULE		1
			ATTACHING PARTS		
050A	K3Q1ZH0252008A		. SCREW 99215719 VF8300		10
060A	R9ZT025A		. WASHER,FLAT 99151680 VF0110		10
			* * *		
070A	62133858AA		. TINSEL		1
-080A	61935014AA		. EQUIPPED CHASSIS (NP)		1
090A	62133420AA		. . COVER ACCESS		1
			ATTACHING PARTS		
100A	UFQ1ZH025008A		. . SCREW 99213726 VF0110		6
-105A	4679128B		. GASKET		1
			* * *		
110A	5616000B		. . POWER SUPPLY STAGE		1
120A	61935018AA		. . DIGITAL AND MANAGEMENT BOARD (DMB BOARD)		1
130A	61935017AA		. . MOTHER INPUT/OUTPUT STAGE		1
			ATTACHING PARTS		
140A	K3Q1ZH0252006A		. . SCREW 99215718 VF8300		5
150A	R9ZT025A		. . WASHER,FLAT 99151680 VF0110		5
			* * *		
160A	61935016AA		. . HIRF MODULE		1
			ATTACHING PARTS		
170A	K3Q1ZH0252006A		. . SCREW 99215718 VF8300		8
180A	R9ZT025A		. . WASHER,FLAT 99151680 VF0110		8
-185A	4679129B		. GASKET		1
			* * *		
190A	62063836AA		. . CHASSIS		1
200A	34MMBX-TNC-50-1		INTERFACE CONNECTOR S4773 (91804520)		2
-210A	34MMBX-50-0-1/111 NE		COAXIAL CONNECTOR S4773 (99215300)		2
-220A	61814651AA		. CI DOWNLOADABLE (NP)		1

– ITEM NOT ILLUSTRATED

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