

EXHIBIT D :



ENHANCED VHF RADIO

EVR716-11-0300A

EVR716-11-0350A

DECLARATION OF DESIGN AND PERFORMANCE

APPROVED BY :
THOMSON-CSF

DRAWN / WRITTEN J. BOUDARIAS	DATE 19990506				
VERIFIED / CHECKED M. SWARTNIK	DATE 19990506	EVR 716			
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 REPRODUCTION, IL DOIT ÊTRE PRÉCISÉ QU'IL S'AGIT D'UNE REPRODUCTION NON OFFICIELLE. IL NE DOIT ÊTRE COMMUNIQUÉ À AUCUNE TROISIÈME PARTIE SANS AUTORISATION ÉCRITE.

KVJEVR718

REV	REASON OF EVOLUTION / CHANGE REASON	DATE AAAA-MM-JJ	APPROVE APPROVED
A0	Creation	1998/05/29	D. BOURGAIN
A1	Updating for 199716-11-0000A-0000: Suppression of "click" when switching from 2500 to 8,320% and various improvement	1998/05/29	D. BOURGAIN
A2	Updating for 199716-11-0000A-0000: Change of P/R test: improvement, speech, busbar, to reduce vibration delay decrease	1998/11/27	D. BOURGAIN
A3	Updating for production equipment 199716-11-0000A	1998/12/28	D. BOURGAIN
A4	Additional informations related to 199716-11-0000 version OH reference added	1999/01/04	D. BOURGAIN
A5	Modification of CH index (p. 4) and 00100 categories (p. 3)	1999/02/26	D. BOURGAIN
A6	Updating: revision of CH	1999/04/15	D. BOURGAIN
A7	JTSO C129 added in 5.1. Operations for 14.1.15.81 Change of specification agreement (MS reference)	2000/05/16	D. BOURGAIN

CLASSIFICATION: SOURCE CLASSIFICATION	FORMAL REV	DATE: PRESENT DATE DATE	NOMERO DOCUMENT / DOCUMENT NUMBER	REV	PAGE
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REVISION NUMBER CURRENT VERSION	A4	F0057	4689709A656	AH	3/10

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KVJEVR71B

AIRCRAFT TYPE : DASH8-400
RESPONSIBLE PARTNER : SEXTANT

1 - NAME AND ADDRESS OF SUPPLIER

THORSON-CSF COMMUNICATIONS
110, boulevard de Valmy B.P. 82
92081 Colombes Cedex France

2 - REFERENCES

Type	Enhanced VHF Radio VLS transceiver
Part number	ENR71B-11-0100A (for 2500W/8.33kHz) ENR71B-11-0150A (for 2500w only)
Hardware record reference	n°5611200A
Configuration Index Document	n° 4689709021 IAGI
Short description	The CW transceiver ensures, on board Air Transport Aircraft, the transmission and reception of voice and data, in the aeronautical VHF band (118 to 130MHz). The ENR71B version operates according to the voice and data modes defined by the RTTC VLS characteristics, i.e. for voice modes : Double Side Bands Amplitude Modulation, with 25 kHz or 8.33kHz channel spacing ; and for data mode, ACARS mode with an external RSK modem.
Weight	less than 9.3 lb
Overall dimensions	(200 x 91.4 x 307.5)mm (max) "3 RU"
Classification of the equipment	Essential
Software record reference	n° 5611200C for ENR71B-11-0100A n° 5620620A for ENR71B-11-0150A
Software level	complete software includes : - CSC1 MAIN (CW/RS/16) software According to DO-178B/Level C - CSC1 DPS (CW/16) software According to DO-178B/Level C - CSC1 Maintenance software According to DO178-B/Level B
CW Reference	: n° 36/10381-AA CATM n° 23-21-02)

CONTRACTING ORIGIN ORIGINARY UNIT	FORMAT SW	CONFIDENTIALITY CLASS CODE	NUMEROUSNESS / DOCUMENT NUMBER	REV	PAGE
airbus a320neo airbus a320neo	A4	F0057	4689709A556	AH	4/10

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3 - APPLICABLE SPECIFICATION REFERENCE

Specification reference :	JTSD 2037e JTSD 2038e JTSD 2017b ISO 1304 ISO 1304 ISO 1306 RTCA DO-160E / EUROCAE ED-14C RTCA DO-160A / EUROCAE ED-22B RTCA DO-307 / EUROCAE ED-67 RTCA DO-178B / EUROCAE ED-12B GTR 8-001 GTR 8-010 ESP 87
Quality assurance manual :	Ref. PQ 011
Specification Agreement (SC) :	ROP Ref. 40706610 Rev AA

4 - RATED PERFORMANCE OF THE ARTICLE

Technical specifications (SSS/SS00) :	n° 4689709A305 (AS)
Acceptance Test Procedure (ATP) :	n° 458970A090 (AR)
Acceptance Test Report (ATR) :	n° 468970A098 (AC)
Failure analysis (FMEA) :	n° 467550A050

5 - PARTICULARS OF APPROVALS HELD FOR THE EQUIPMENT

Not applicable as account of it is a new equipment.

6 - REFERENCE TO QUALIFICATION TESTS REPORTS AND SOFTWARE ACCOMPLISHMENT SUMMARY

Qualification Test Procedure (QTP) :	n° 468970A095 (AT)
Qualification Test Report (QTR) :	n° 468970A029 (AQ)
Software Accomplishment Summary :	n° 4581335A556 (AC)

DOCUMENT IDENTIFICATION	FORMALITY	CODE PARTIALITY	NOMINAL DOCUMENT IDENTIFICATION NUMBER	REV	PAGE
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7 - SERVICE AND INSTRUCTION MANUAL REFERENCE NUMBER

Operation and Installation Manual

n°1089709A108

8 - DEVIATIONS

For 00-160C environmental conditions

Equipment is full compliant with the electrical specifications given in § 9.1. for environmental conditions defined in § 9.2 (00-160C) : No deviation

For 0e Havilland environmental conditions

Equipment is full compliant from -25°C to +70°C: No deviation.

Deviations at -40°C:

- Frequency accuracy: < 5.5 ppm
- Rx bandwidth at +84Hz for 254Hz mode: < 7dB
- Rx bandwidth at +2.18kHz for 3.32kHz mode: < 1dB
- Selectivity at +7.36kHz for 8.33kHz mode: > 56dB

DESIGNATION / CODE REVISION / REV	FORMAT REV	CODE / SIGNANT REV / Code	NOMINER DOCUMENT / DOCUMENT NUMBER	R/R	PAGE
REVISE / REVISÉ 000000 / 000000	A4	F0057	4089709A556	AH	6/10

CE DOCUMENT EST LA PROPRIÉTÉ DE L'ARMÉE DE L'AIR. IL EST À RENDRE À L'ARMÉE DE L'AIR À LA DEMANDE. IL NE DOIT ÊTRE REPRODUIT NI PARTI À DES TERTIERS SANS L'AUTORISATION ÉCRITE DE L'ARMÉE DE L'AIR.

9 - STATEMENT OF CONFORMANCE WITH APPROPRIATE SPECIFICATIONS AND REQUIREMENTS

9.1 - ELECTRICAL CHARACTERISTICS

CHARACTERISTIC	SPECIFICATION
GENERAL	
Operational modes	Voice/2500z (BA) Voice/8,1300z (BB) Data 2500z (BB) (with external modem)
Equipment classes (ED-238/00-186A)	- Reception: Class C and Class E - Transmission: Class 3 and Class 5
Power Requirements	28VDC
Power Consumption (28V)	< 100 mW (Transmission) < 35 mW (Reception)
Power drop-out transparency	> 50ms (Reception)
Form factor	28VDC, J4810C, specification 600
Operating Temperature	-40°C to +60°C
Storage Temperature	-55°C to +85°C
Frequency control	Serial Digital in accordance with J4810C 429
Frequency range	117,375 MHz to 137,000 MHz
Channel spacing	25 kHz and 4.73 kHz for 18615, 11-0300A 25 kHz only for 18616-11-0353A
Frequency stability	<25 ppm
Duty cycle	Data cycle of 20% (the/4ms) with external connection.
Channel Switching time	Less than 50ms
Transmit to receive switching time	Less than 50ms
Receive to transmit switching time	Less than 50ms
RECEIVER	
Sensitivity (modes BA & BB)	For a wanted signal of -101dBm, modulated (3000/500), (S/N) is greater than 6dB (Nominal)
Selectivity (mode BA/BB)	< -60dB at 500 bandwidth < -60dB at 500 bandwidth < -60dB at 500 bandwidth
Selectivity (mode BB)	> -2.5dB at 500 bandwidth < -2.5dB at 500 bandwidth
Cross Modulation	Unwanted signal level (-101dB/500) to obtain -10dB referred to a wanted signal of -100dB (3000/500): - at < 2500z: > -35 dBm - at < 5000z: > -27 dBm - at < 10000z: > -17.5 dBm
CHARACTERISTIC	
SPECIFICATION	
AGC regulation	Within 2dB (-90dB to -130dB input); not more than 5dB (-101dB to -100dB)
Audio output Level	10mW (adjustable up to 40mW) into (600/200) ohm resistive load for -53dBm signal modulated 300 at 1000Hz

IDENTIFICATION SYMBOL (CLASSIFICATION CODE)	FORMAT SW	CODE FABRICANT CASE CODE	NUMBER DOCUMENT / DOCUMENT AGENCY	REV	DATE
ALBERT MOULI CONTRACT 7110/02	A4	F0057	4809709A556	AH	7/10

ORIGINANT EST LE PROPRIÉTAIRE DE TOUTES LES DROITS DE BREVET ET DE TOUTES LES AUTRES DROITS DE PROPRIÉTÉ INTELLECTUELLE.
TOUT DOCUMENT DE PROPOSITION D'ACHAT DE DROITS DE BREVET EST SOUS-ENTENDU ET NE DOIT PAS ÊTRE PRIS EN CONSIDÉRATION.

Audio output frequency response		Within 6dB from 200 to 2500Hz more than 23 dB at 3500Hz.
Audio output harmonic distortion		Not to exceed 7.5% for -5dBm signal modulated 200 Hz at 1000Hz.
Unloaded responses		> 38dB.
Intermodulation (SPL immunity)		as per AES17-2010 sections 3.6.2.3.
Select/Data Output	Tone1	0.5 Vrms (min.) into (600±20%) ohm resistive load
	Frequency response	Select (mode 00) ≤ 0dB from 350Hz to 1000Hz DR POC (mode 1A) ≤ 0dB from 300Hz to 6000Hz
	Distortion	< 3% for a tested signal of -5dBm modulated 200 Hz at 1000Hz
ISOPERATION		
Output power		> 38W (nominal)
Humidity		H ₁ < -16 dBS H ₂ < -26 dBS
Audio frequency response		Within 6dB from 200Hz to 2500Hz
Modulation level		> 95% for 0.25Wms at 1000Hz
Spectrum mask (mode 00)		For an audio frequency from 200Hz to 1000Hz and an audio level attenuated by 10dB relative from 000Hz to 100Hz, referred to J9B modulation level: ≤ -45 dBc from +1.8kHz to +50Hz ≤ -50 dBc from +50Hz to +50Hz ≤ -70 dBc for frequency shift greater than ±50Hz
Data Input	Modulation ratio	> 95% for a frequency of 1000Hz at -10dBm
	Frequency response	Within 6dB from 800Hz to 6400Hz
	Distortion	< 10% for 80% modulation ratio over frequency range from 800Hz to 6400Hz

Scale: "Nominal" relates to Standard Conditions.

COMPONENT IDENTIFICATION CODE	FORMAT	COLLATERAL DATA CODE	UNIT IDENTIFICATION NUMBER	REV	PAGE
UNIT IDENTIFICATION CODE	A4	F0057	4889709A556	AH	8/10

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9.2 - ENVIRONMENTAL CHARACTERISTICS

ENVIRONMENT	DO-160C		DE HWELLAND Specific Conformance
	Section	Category	
Temperature & Altitude	4	A2/B1	DO160C Cat. A2/B1 Extension to -40°C
In-Flight loss of cooling	4	Y	-
Temperature Variations	5	B	B
Humidity	6	B	B
Operational Shocks	7	6g/11ms	-
Crash Safety Shocks	7	15g/11ms 1gv/3s	-
Vibrations	8	BBFC	DO160C Cat. H
Explosion	9	E2	DO160C Cat. I2
Waterproofness	10	3	3
Fuels	11	3	3
Sand and Dust	12	3	3
Fungus Resistance	13	3	3
Salt Spray	14	3	3
Magnetic Effect	15	A	DO160C Cat. A
Power Input	16	B	MIL-STD-704C
Voltage Spikes (Susceptibility)	17	A	DO160C Cat. A
Voltage Spikes (Immunity)	-	-	MIL-STD-461 Class 4
RF Conducted Susceptibility	18	2	DO160C Cat. 2
Induced Signal Susceptibility	19	2	DO160C Cat. 2
Radio Frequency Susceptibility (RHF)	20	U	ESD 81 (Level A & C)
Radio Frequency Emission	21	2	DO160C Cat. 2
Lightning Induced Effects	22	A212	ESD 89
Lightning Direct Effects	23	X	X
Iceing	24	X	X
Electrostatic Discharge	-	X	ESD 89 S.1.1.7.4

MANUFACTURE MODEL (PARTIAL ONLY)	FORMAT JOB	CODE ALPHABET PART CODE	NUMERICAL DOCUMENT / DOCUMENT NUMBER	REV	PAGE
MANUFACTURE MODEL (PARTIAL ONLY)	A4	F0057	4689709A556	AH	9/10

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