

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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REV	REASON OF EVOLUTION / CHANGE REASON	DATE AAAA-MM-JJ	REVISION DESCRIPTION
A0	Creation	1998/05/29	0. INITIAL
A0	Update for 199716-01-0000A-0000: Suppression of "click" when switching from 2500 to 8,320% and various improvements	1998/05/29	0. MODIFICATIONS
A0	Update for 199716-01-0000A-0000: Change of P/R test: improvement, speech synthesis, increase, video rate delay decrease	1998/11/07	0. MODIFICATIONS
A0	Update for production equipment 199705-11-0000A	1998/12/08	0. MODIFICATIONS
A1	Additional informations related to 199716-01-0000 version OH reference added	1999/01/04	0. MODIFICATIONS
A1	Modification of CH index (p. 4) and 00100 categories (p. 3)	1999/02/05	0. MODIFICATIONS
A1	Updating: revision of CH	1999/04/15	0. MODIFICATIONS
A1	JTSO C129 added in 5.1. Operations for 10.1.15.01. Change of specification agreement (MS references)	2000/05/16	0. MODIFICATIONS

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AIRCRAFT TYPE : DASH8-400
RESPONSIBLE PARTNER : SEXTANT

1 - NAME AND ADDRESS OF SUPPLIER

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

2 - REFERENCES

Type	Enhanced VHF Radio VLS transceiver
Part number	ENR716-11-0100A (for 2500W/8.33kHz) ENR716-11-0150A (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 ENR716 version operates according to the voice and data modes defined by the A010C 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 ENR716-11-0100A n° 5620620A for ENR716-11-0150A
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 ORGANIZATION CONTRACT NO.	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-20B 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 QAC :	NOP Ref. 40706610 Rev AA

4 - RATED PERFORMANCE OF THE ARTICLE

Technical specifications (SSS/SS00) :	n° 4689709A305 (AB)
Acceptance Test Procedure (ATP) :	n° 458970AD90 (AB)
Acceptance Test Report (ATR) :	n° 468970AD98 (AC)
Failure analysis (FMEA) :	n° 467550A530

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° 468970AD95 (AC)
Qualification Test Report (QTR) :	n° 468970AD97 (AD)
Software Accomplishment Summary :	n° 458135A555 (AC)

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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 +2.68Hz for 3.38Hz mode: < 1dB
- Selectivity at +7.38Hz for 8.38Hz mode: > 56dB

CHARACTERISTIC REQUIREMENT	COMPLIANT NO	COMPLIANT YES/NO	NUMERICAL DOCUMENT / DOCUMENT NUMBER	REV	PAGE
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Audio output frequency response		Within 6dB from 100 to 25000 Hz more than 25dB at 10500 Hz
Audio output harmonic distortion		Nd to exceed 7.5% for 150m signal modulated 30% at 10000 Hz
Unwanted response		> 30dB
Intermodulation (IM immunity)		as per ARINC 716 section 3.6.2.3.
Select/Data Output	Level	0.5 Vrms (min.) into (600±20%) ohm resistive load
	Frequency response	Select (mode 00) AH (mode 1A) -6dB from 100Hz to 10000 Hz -30dB from 300Hz to 50000 Hz
	Distortion	< 3% for a tested signal of 150m modulated 30% at 10000 Hz
ENVIRONMENTAL		
Output power		> 35W (nominal)
Humidity		H ₁ < -15 dB H ₂ < -20 dB
Audio frequency response		Within 6dB from 200Hz to 25000 Hz
Modulation level		> 35% for 0.25Wms at 10000 Hz
Spectrum mask (mode 00)		For an audio frequency from 200Hz to 10000 Hz and an audio level attenuated by 10dB (noise) from 8000V to 1000V, referred to 50% modulation level: < -5 dBc from 1.2kHz to 4500 Hz < -50 dBc from 4500 Hz to 15kHz < -70 dBc for frequency shift greater than 15kHz
Data Input	Modulation ratio	> 80% for a frequency of 10000 Hz at 150m
	Frequency response	Within 6dB from 8000V to 60000 Hz
	Distortion	< 10% for 80% modulation ratio over frequency range from 8000V to 60000 Hz

Note: "Nominal" relates to Standard Conditions.

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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 (PART NO.)	FORMAT SIZE	CODE ALPHABET PART CODE	NUMERICAL DOCUMENT NUMBER	REV	PAGE
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