

**Engineering Exhibit in Support of  
Certification  
FCC Form 731**

**for the**

**700MHz Power Amplifier  
for BDP3 Digital Base Station**

**FCC ID: EOTBDP3-AET  
Trade Name: AET Amplifier Module**

January 20, 2005

**AFFIDAVIT**

The technical data included in this report has been accumulated through tests that were performed by me or by engineers under my direction. To the best of my knowledge, all of the data is true and correct.



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Norman D Pearl  
Vice-president Engineering, Dataradio Inc.

Dataradio Inc.  
Montreal, Canada

**ENGINEERING STATEMENT  
OF CONSTANTIN PINTILEI**

The application consisting of the attached engineering exhibit and associated FCC form 731 has been prepared in support of a request for Certification for the PA module of the Dataradio BDP3 digital base station. The Power Amplifier will operate in the frequency range of 762-773 MHz in Transmit and will yield 50W RF power for 10dB of fixed amplification. Dataradio, Canada, will buy the OEM SSPA power module from Aethercomm, St Marcos, CA, with the part# SSPA0.7-0.9-50. Dataradio will install the SSPA module into the PA module of the base station and perform final assembly and tests. The PA module will be used with other 5W FCC approved exciters from Dataradio. The unit is identified by the Dataradio part number **BDP3-87S**-RB050SM (part number is detailed in page 6) and marketed under the Model name BDP3. The PA module will be identified by the FCC number EOTBDP3-AET. The Power Amplifier operates pursuant to Part(s) 90 and 27 of the Rules and Regulations. The RF power is adjustable in manufacturer's premises from 12.5-50 watts and its nominal power is 50W.

EXISTING CONDITIONS

The unit utilized for these Certification measurements was a prototype built from production grade OEM components with worst-case output filtration (closed half-wave shunt resonator). The PA is designed to operate in single carrier mode only. There are no active control/feedback loops within the amplifier module. The suppression of the harmonics is enhanced through the use of a filtration block which yields a margin of at least 20dB from the limit.

PROPOSED CONDITIONS

It is proposed to grant the Dataradio BDP3-AET 50W, 10dB Power Amplifier module for operation in the 762-773 MHz frequency range. The applicant anticipates marketing the device for use in wireless transmission of data.

PERFORMANCE MEASUREMENTS

All measurements were conducted in accordance with the code 47 CFR Section 2.1041 and 2.1049 rev.2-166, Sep 15, 2003, Section 90 Subpart R rev 90-65 Nov 25, 2003 and Section 27 Subpart C rev 27-17 Nov 6, 2002. Equipment performance measurements were made in the engineering laboratory of either Dataradio Inc, Montreal, Canada, and on the FCC certified Open Area Test Site at Aprel Laboratories located at 51 Spectrum Way in Nepean, Ontario, Canada. All measurements were made under my direction. The performance measurements were made between Oct 1<sup>st</sup> -Dec 23<sup>rd</sup>, 2004.

CONCLUSION

Given the results of the measurements contained herein, the applicant requests that Certification be granted for the Dataradio BDP3-AET, 50W 10dB Power Amplifier Module as tested for data communications.



01/06/2005

R&D Test Engineer, Dataradio Inc.

Constantin Pintilei, Eng

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Annex A (-701): Test reports section. General.

- A1- Transmitter Rated Power Output (2.1046, 90.541,27.50)
- A2- F1D Digital Modulation characteristics (2.1047, 90.535)
- A3 - Spurious Radiation (2.1051,2.1053 ,90.543(c) ,(e),27.53)
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- A5 - Emission Limitations (ACCP) (90.543 (a),(b),27.53)

Annex B (-702): Circuit Description and power calibration

Annex C (-703): Transistor, Diode and IC Functions

Annex D (-704): Schematics

- D1 – Assembly block diagrams and schematics
- D2 – 50W PA schematics

Annex E (-705): Pictures: Label, External Photographs, Internal Photographs

- E1- Label
- E2- Internal Pictures
- E3- External pictures

Annex F (-706): Instruction Manual (preliminary version)

**QUALIFICATIONS OF ENGINEERING PERSONNEL**

**NAME:** **Norman Pearl**

**TITLE:** Vice-president Engineering

**TECHNICAL EDUCATION:** Bachelor of Engineering (Electrical)  
(1979) McGill University, Montreal, Canada.

**TECHNICAL EXPERIENCE:** Professional engineer since 1979  
28 Years experience in radio communications

**NAME:** **Constantin Pintilei**

**TITLE:** R&D Test Engineer

**TECHNICAL EDUCATION:** Bachelor of Science Degree in Electrical Engineering, specialization Radioelectronics  
(1993) Technical University of Iasi, Romania.

**TECHNICAL EXPERIENCE:** Professional Engineer since 2001  
11 Years experience in radio frequency measurements.

**GENERAL INFORMATION ABOUT THE GRANTEE AND CERTIFICATED EQUIPMENT -2.1043 (b)(2)**  
 (as per Rule Part Number: 2.1033 (c).(1),(2),(5),(6),(7))

APPLICANT: Dataradio Inc.,  
 5500 Royalmount Ave, suite 200,  
 Town of Mount Royal, Quebec, Canada, H4P 1H7

MANUFACTURER: DATARADIO Inc., Town of Mount Royal, Quebec, Canada, H4P 1H7  
 OEM - Power Amplifier manufactured by Aethercomm

MODEL NUMBER: Dataradio BDP3-87S-170502A - AET option  
 SPPA 0.7-0.9-50 Aethercomm OEM PA

SERIAL NUMBER ( S ): Aethercomm SSPA – s/n 001,

FCC ID NUMBER: EOTBDP3-AET

FCC RULES AND REGS: FCC Part (s) 90 subpart R, 27 subpart C

FREQUENCY RANGE: 762.000 MHz - 773.000 MHz

MAXIMUM POWER RATING: 50 Watts, (50 Watts Nominal 50-12.5 W adjustable through the amplitude of RF input).

INPUT IMPEDANCE: 50 ohms, Nominal

VOLTAGE REQUIREMENTS: 11.0-13.5VDC (12.3 VDC Nominal)

EQUIPMENT IDENTIFICATION:

<u>TRADE NAME</u>	<u>DESCRIPTION</u>	<u>DRI PART NUMBER</u>
<b>Dataradio BDP3</b>	<b>Digital Base Station P3</b>	<b>BDP3-87S-RBPPPSM</b>
Modem Model	PowerPC Paragon/3 DSP, RF-shelf-mount (56-128kbit)	<b>P3</b>
Radio Combination	700 MHz T881 exciter / DRS3K SoftRadio dual receiver	<b>87S</b>
Range of operation	1 - 776 to 806 MHz RX, 746-776 MHz TX	R
Station Bandwidth	0 - 25 kHz (Guard Bands 746-747, 762-764 only)	B
	5 - 12.5 kHz (Guard Bands 746-747, 762-764 only)	
	7 - 50 kHz (762-763, 767-773)	
Transmitter	005 - 5 Watt transmitter (Tait T881-20-0020)	PPP
	050 - 50W PA (Aethercomm SPSA 0.7-0.9-0.5)	
Power source	0 - Delete power supply	S
	2 - Heavy Duty 120 VAC supply	
Modulation Type	A- 128kbps , 16FSK	M

**OTHER DATA- Rule Part Number: 2.1033 (c).(3),(8),(9),(10),(11),(12),(13),(15),(16), 1.1091, 15.209**

## INSTRUCTION BOOK

RULE PART NUMBER: 2.1033 (c) (3)

Annex F. The attached Service Manual for the BDLC III digital base station is a preliminary version.

## DC VOLTAGES AND CURRENTS INTO FINAL AMPLIFIER

RULE PART NUMBER 2.1033(c) (8)

refer to the Transmitted Rated Output Power test report in Annex A part A1

## TUNE UP PROCEDURE

RULE PART NUMBER: 2.1033 c (9)

There is no Tune-up procedure. The unit is based on an OEM PA and it comes already tuned for the band 700-900MHz. The output filter is also purchased from OEM suppliers and needs no tuning. If tests indicate that a AET module unit does not pass the qualification criteria it is checked by individual component, and the failed part returned to its original supplier.

## DESCRIPTION OF CIRCUITRY

RULE PART NUMBER: 2.1033 (c)(10)

Annex B

## TRANSISTOR, DIODE, AND IC FUNCTIONS (Active Parts)

RULE PART NUMBER: 2.1033 c (10)

Annex C

## SCHEMATICS

RULE PART NUMBER: 2.1033 (c)(10)

Annex D

## FCC LABEL:

RULE PART NUMBER: 2.1033 c (11)

Annex E, set E1

## PHOTOGRAPHS:

RULE PART NUMBER: 2.1033 c (12)

Annex E, sets E2, E3

## DIGITAL MODULATION TECHNIQUES

RULE PART NUMBER 2.1033(c).(13)

refer to Test results section Annex A, part A0, page3

## TRANSMITTER TESTS

RULE PART NUMBER: 2.1033 (c)(14), 2.1091

Annex A, test reports parts A1 to A4

Data addressing RULE PART NUMBER 2.1033(c) 15, 16: this unit is not designed for the mentioned purposes