

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

for the

**800MHz 26dBm Exciter
for BDP4 Digital Base Station**

**FCC ID: EOTBDP4-EXT800
Trade Name: SDR-T-001-80 Exciter Module**

November 23, 2007

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 Exciter module of the Dataradio BDP4 digital base station. The unit will operate in the frequency range of 851-869 MHz in Transmit and will yield 400mW RF power. Dataradio will install the Exciter module to the base station and perform final assembly and tests of the whole basestation assembly. The basestation assembly comprises one BSC (base station controller), one Receiver module, one RF Power Amplifier module, and one DC power supply module. Since there could be several suppliers for the module, Dataradio requires standalone certification for each module that needs it. The Exciter module is identified by the Dataradio part number **BDP4-SDR-T-001-80** (part number is detailed in page 5). The basestation assembly is marketed under the model name BDP4. The Exciter module will be identified by the FCC number EOTBDP4-EXT8. The Exciter operates pursuant to Part(s) 2 and 90 of the Rules and Regulations. The RF power is adjustable in manufacturer's premises from 4mW to 400mW (6 to 26dBm) and its nominal power is 200mW.

EXISTING CONDITIONS

The unit utilized for these Certification measurements was a pilot sample. The Exciter is designed to operate in single carrier FM modulation mode only in 800MHz band. It requires a differential modulation input and a 13.8V/2A DC power supply. Pilot samples of the modules of the P4 basestation were used as part of the set-up to demonstrate its compliance to the rules. Nonetheless, the Exciter could function in standalone mode provided that generic devices supply the required inputs of DC and modulation.

PROPOSED CONDITIONS

It is proposed to grant the certificate to Dataradio's BDP4-SDR-T-001/ 80 exciter module for operation in the 851-869 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.2-180 of July 15,2007, and Section 90 (Subpart I) rev. 90-82 Sept. 15, 2007. 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 Dataradio COR Ltd., 299 Johnson Ave, Suite 110 Waseca, MN 56093. All measurements were made under my direction. The performance measurements were made between Aug 1st and Oct 30th, 2007.

CONCLUSION

Given the results of the measurements contained herein, the applicant requests that Certification be granted for the Exciter module, model BDP4-SDR-T-001/80, with the FCC ID EOTBDP4-SDRT80, for data communications.



11/23/2007

Constantin Pintilei, Eng
R&D Test Engineer, Dataradio Inc.

TABLE OF CONTENTS

ENGINEERING STATEMENT.....	2
TABLE OF CONTENTS.....	3
QUALIFICATIONS OF ENGINEERING PERSONNEL.....	4
GENERAL INFORMATION ABOUT THE GRANTEE AND CERTIFICATED EQUIPMENT -2.1033(1),(2),(5),(6),(7)	5
OTHER DATA- Rule Part Number: 2.1033 (c).(3),(4),(8),(9),(10),(11),(12),(13),(15),(16), 1.1091	6

ANNEXES(-document index):

Annex A (-901): Test report 4/2007 - Dataradio Montreal Test reports section.

Transmitter Rated Power Output (2.1046)

Frequency Stability over temperature and supply voltage (90.213)

Annex B (-903) Test report 5/2007 - Dataradio Montreal Test reports section

Occupied Bandwidth and Emission Limitations (compliance with Masks G,H,D) (90.209, 90.210 (g),(h))

Annex C (-902): Test Report 3/2007 - Dataradio Waseca Test reports section

Spurious Radiation (2.1051,2.1053 ,90.210(g) ,(h))

Spurious Emissions at Antenna Terminals (2.1051,2.1053 ,90.210(g) ,(h))

Annex D : Schematics , shown as two files identified by D1 and D2.

Annex E: Circuit Description and power calibration. It includes the assembly block diagrams.

Annex F: Pictures: Label, External Photographs, Internal Photographs

F1- Label

F2-Internal Pictures

F3- External pictures

Annex G: Instruction Manual (preliminary version). The manual has its own document number 120_20195_100 and it is incorporated by reference to the submission report.

Annex H (-904): F1D Digital Modulation characteristics (2.1047, 90.207)

QUALIFICATIONS OF ENGINEERING PERSONNEL

NAME: **Constantin Pintilei**

TITLE: R&D Test Engineer (Dataradio Inc., Montreal, Canada)

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

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

NAME: **Bharat Devrajani**

TITLE: Electrical Engineer I (Dataradio COR Ltd., Mn)

TECHNICAL EDUCATION: Bachelor of Science Degree in Electrical Engineering (2004) from Minnesota State University, Mankato

TECHNICAL EXPERIENCE: 3 year experience in RF design.

GENERAL INFORMATION ABOUT THE GRANTEE AND CERTIFICATED EQUIPMENT -2.1033(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
 Dataradio COR Ltd., 299 Johnson Ave, Suite 110 Waseca, MN 56093 – RF PCB

MODEL NUMBER: BDP4- Dataradio's Basestation P4 assembly with options
 SDR-T-001/80 OEM exciter provided by Dataradio COR, 800MHz band

SERIAL NUMBER (S): SDR-T-001– s/n 00000,

FCC ID NUMBER: EOTBDP4-EXT8

FCC RULES AND REGS: FCC Part (s) 90 subpart I

FREQUENCY RANGE: 851.000 MHz - 869.000 MHz

POWER RATING: Maximum 400 mW (26dBm). Nominal 100mW (20dBm). Adjustable 4mW-400mW (6-26dBm) on the manufacturing premises. The power output is not user adjustable.

OUTPUT 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> <u>Component</u>
Dataradio BDP4	Digital Base Station P4	BDP4-xxx-B-PPP-S-M
BSC Model	PowerPC Paragon/4 DSP, RF-shelf-mount (56-128kbit)	P4
xxx: Frrequency Band and ranges	800 MHz SDR-T exciter / SDR-R SoftRadio dual receiver	800
B: Channel Bandwidth	4xx- 406-512MHz in 8 ranges, 700- 700MHz, 800- 800MHz 25 kHz (Mask G) and 12.5 kHz (Mask H)	F
PPP: Transmitter Power	W- 50kHz, F-25kHz, N- 12.5kHz NPSPAC, H-12,5kHz	070
S:Power source	070 - 70W PA (Crescend Technologies model P9-R1K1)	2
M:Modulation Type	0 - Delete power supply 2 - Heavy Duty 120 VAC supply 8 - Up-to 16FSK	8

OTHER DATA- Rule Part Number: 2.1033 (c).(3),(4),(8),(9),(10),(11),(12),(13),(15),(16), 1.1091**INSTRUCTION BOOK**

RULE PART NUMBER: 2.1033 (c) (3)

Annex F. The attached Service Manual for the BDP4 digital base station is a preliminary version.

TYPE OF EMISSION

RULE PART NUMBER: 2.1033 (c) (4)

F1D – Digital 16 – level frequency shift keying with SRRC pulse shaping. Full description of the modulation scheme is provided in the Annex G.

DC VOLTAGES AND CURRENTS INTO FINAL AMPLIFIER

RULE PART NUMBER 2.1033(c) (8)

The DC voltages and the current consumption are provided in the Transmitted Rated Output Power test report in the Annex B

TUNE UP PROCEDURE

RULE PART NUMBER: 2.1033 c (9)

The tuning procedure implies the properly programming by the DSP of the AD9857 (14-Bit Quadrature Digital Upconverter) and its related circuitry. Power setting is controlled by a variable gain amplifier (VGA), which is also controlled by the DSP. Please refer to Annex E for further details.

SCHEMATIC DIAGRAMS AND THE DESCRIPTION OF THE CIRCUITRY

RULE PART NUMBER: 2.1033 (c)(10)

Annexes D and E. Schematic Diagrams are provided in the Annex D. Circuit description is provided in the Annex E.

FCC LABEL:

RULE PART NUMBER: 2.1033 c (11)

Annex F, set F1

PHOTOGRAPHS:

RULE PART NUMBER: 2.1033 c (12)

Annex F, sets F2, F3

DIGITAL MODULATION TECHNIQUES

RULE PART NUMBER 2.1033(c).(13)

The digital modulation techniques are provided in the Annex H.

TRANSMITTER TESTS

RULE PART NUMBER: 2.1033 (c)(14), 2.1091(b), FCC part 90 subpart I

Annexes A, B and C.

Annex A is comprised of the Test Report #3/2007 for the tests ran at Dataradio COR – spurious emissions.

Annex B is comprised of the Test Report #4/2007 for the tests ran at Dataradio Inc- rated power output and frequency stability.

Annex C is comprised of the Test Report #5/2007 for the tests ran at Dataradio Inc – authorised channel restrictions.

Data addressing

RULE PART NUMBER 2.1033(c) 15, 16, 17 and 18

This unit is not designed for the mentioned purposes

ENVIRONMENTAL ASSESSMENT

RULE PART NUMBER 1.1307 (b)

The module is part of a fixed basestation for which the environmental assessment is run during the site licensing.