Engineering Exhibit in Support of
Class II Permissive Change Request
FCC Form 731

for the

Tait's T83x 148-174 MHz base station

modulated with

digital modulation from Dataradio's Base Data Link Controller (BDLC)

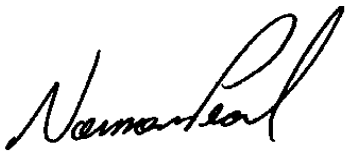
FCC ID: EOTBDD4T83-2

Trade Name: Paragon/PD

October 11, 2002

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.



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 which have prepared in support of a request for a Class II Permissive Change for EOTBDD4T83-2. All changes involved fall under a Class I or Class II Permissive Change types and they are entirely detailed within the current report.

The certificate CASTEL0002 has been granted on 10/29/1997 to Tait Electronics Ltd. for the transmitter (Exciter+PA modules) part of its VHF base station. A change in ID to EOTBDD4T83-2 was granted on 08/08/2002 to Dataradio Inc. Both modules belong to the T83M-XY (see page 6 for part# description) VHF MHz base station. Dataradio Inc. buys this base station and uses it to build Paragon/PD, a wireless data base station. Dataradio Inc. modifies the exciter for the proposed digital modulation scheme, does the final assembly and markets the Paragon/PD unit.

One Class II Permissive type of change is demonstrated with this filing. The original certificate has been granted for F3E type of modulations for a unit equipped with audio low-pass filtering as per 90.210. The change consists of adding a new digital modulation source that bypasses the audio low-pass filter, therefore compliance has been demonstrated for mask 90.210 C or D. Several F1D digital emission designators are included in the report for this modulation source. This Class II permissive change involves the modulation source only and it is completely described with the current report.

A second Class I Permissive change is detailed further in the circuit description Appendix B such that to clearly show all the changes related to this base station.

EXISTING CONDITIONS

The unit utilized for these occupied bandwidth and mask-compliance measurements was a prototype built from pilot EOTBDD4T83-2 (in itself being a change in ID from production CASTEL0002) with beta-level firmware used to create the modulation scheme. The exciter operates on frequencies ranging from 148.000 MHz to 174.000 MHz. The frequency tolerance of the exciter can be 2.5 or 1.5 parts per million and the output power of the PA is 100W variable down to 20-25% as granted in EOTBDD4T83-2.

PROPOSED CONDITIONS

It is proposed to accept the Class II permissive change request for the EOTBDD4T83-2 grant for operation in the band of frequencies previously outlined. The applicant anticipates marketing the device for use in wireless transmission of data.

PERFORMANCE MEASUREMENTS

All measurements for Occupied Bandwidth and mask compliance as per 2.1043 (b)(2) were conducted in accordance with the Rules and Regulations Section 2.1041and 2.1049 of Rules Service Co rev.2-162, Jul 15,2002. The measurements were made in the engineering laboratory located at 5500 Royalmount ave, Montreal, Canada. All measurements were made and recorded by myself or under my direction. The measurements were made in August 2002.

CONCLUSION

Given the results of the measurements contained herein, the applicant requests to be applied a Class II Permissive Change for the Certificate EOTBDD4T83-2 to add the following new emission designators: 9K17F1D, 14K9F1D, 8K25F1D, 7K67F1D,14K7F1D, 15K2F1D to the existing 11K0F3E.

09/19/02
Constantin Pintilei
R&D Test Engineer, Dataradio Inc.

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ANNEXES:

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 26 Years experience in radio communications

NAME:	**Constantin Pintilei**
TITLE:	R&D Test Engineer
TECHNICAL EDUCATION:	Bachelor of Science Degree in Radiotechnique Electronic Engineering (1993) Technical University of Iasi, Romania
TECHNICAL EXPERIENCE:	9 Years experience in radio frequency measurements.

NAME:	**Nicolas Savard**
TITLE:	R&D Technologist Junior
TECHNICAL EDUCATION:	College Diploma in Telecommunications (1994) from Technical College CEGEP of Chicoutimi, Quebec, Canada
TECHNICAL EXPERIENCE:	5 years experience in wireless data transmission, staff of R&D Validation team of Dataradio Inc since 1998.

Class II Permissive Change Information - Rule part 2.1043 (b)(2)

The certificate EOTBDD4T83-2 has been granted to Dataradio Inc. following an ID change request from CASTEL0002. The certificate CASTEL0002 has been granted to Tait Electronics Ltd. for its transmitter comprised of T837 Exciter module and T839 PA module. It belongs to the T83M-XY (see page bottom for part# description) VHF base station

The original certificate has been granted for 11K0F3E types of modulation for a unit equipped with audio low-pass filtering as per 90.210. The change consists of adding a new digital modulation source which bypasses the audio low-pass filter, therefore compliance has been demonstrated for mask 90.210 C and D. The compliance with the masks for this modulation source was tested for both generic digital modulation signal at least data rated allowed for the channel and with specifically Dataradio's protocol digital modulation DBA explained in Annex E. For the DBA the modulation scheme is 4-level FSK with various pulse-shaping filters and its emission designators are 8K25, 7K67, 14K7 and 15K2 F1D. All hardware-related changes as per 2.1033 (c) (10) are explained further in the Circuit Description Annex B. All modulator source signal-related issues as per 2.1033 (c) (4) and (13) are explained in the Test Report in Annex A and in Digital Modulation Source Description in Annex E.

The change above described involves the modulation source only therefore it fall under Class II Permissive Changes type as per 2.1043 (b)(2).

Another change consists in the addition of a flash ROM (EEPROM) memory module block powered from T857 9V power supply line. The memory module records settings related to the module for which values are found through calibration during production procedures. Its full description is provided in Circuit Description Annex B. This change fall under Class I Permissive Change type as per 2.1043 (b)(1).

No other changes occur elsewhere in the circuitry of the exciter module or of the PA module.

The characteristics affected by the first modification of above are:

Digital Modulation Techniques - part 2.1033.(c)(13)
Type of emission and Emission designators list - part 2.1033 (c)(4), 90.209
Occupied bandwidth and mask compliance requirement - part 2.1049,90.210(c),(d)

They are entirely documented with the current report.

Therefore all the original test results including those related compliance continue to be representative of and applicable to the exciter module. The compliance with Masks C and D is further confirmed in this report for digital modulation inputs.

All this Class II permissive change data as per 2.1043 are completely described with the current report. The Class I Permissive change data is also detailed in the circuit description Annex such that to clearly show all the changes related to this base station.

Part Number of the Tait VHF base station T83M-XY

M	Module Type	X	Freq Range	Y	Channel Bandwidth
7	Exciter (1W)	1	136-156 MHz	0	25 kHz
5	Receiver	2	148-174 MHz	5	12.5 kHz
9	Power Amplifier				

Part Number of the Paragon/PD UHF data base station BDD4 -83XY PPPS

X	Freq Range	Y	Channel Bandwidth	PPP	Transmitted Power	S	Supply
1	136-156 MHz	0	25 KHz	100	100W	0	12VDC external
2	148-174 MHz	5	12.5 KHz			2	dual 120V AC

EQUIPMENT IDENTIFICATION:

TRADE NAME	**DESCRIPTION**	**Dataradio Inc PART NUMBER**
T83x	VHF Base Station	T83M-XY
D212	Base Data Link Controller (BDLC)	050-03330-00x
Paragon/PD	Assembly	BDD4-83XY PPPS

General Information about the Grantee and Certified 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:	Tait Electronics Ltd., Burnside Christchurch 5, New Zealand (T83x UHF Base station) DATARADIO Inc., Town of Mount Royal, Quebec, Canada, H4P 1H7 (D212 BDLC and Paragon/PD- final assembly)
MODEL NUMBER:	Paragon/PD
PART NUMBER:	BDD4-83XY PPPS
SERIAL NUMBER (S):	D212 address 1.0 -prototype 4-level FSK BDLC T837-20-0020 s.n 706482 Exciter module T839-20-0020 s.n 422931 PA module
FCC ID NUMBER:	EOTBDD4T83-2 (following a change in ID request from CASTEL0002)
FCC RULES AND REGS:	FCC Part (s) 90
FREQUENCY RANGE:	148MHz -174 MHz as per EOTBDD4T83-2 certificate
MAXIMUM POWER RATING:	100Watts as per EOTBDD4T83-2 certificate.
NUMBER OF CHANNELS:	1 Channel selectable from 256 channels as per Tait's manual
OUTPUT IMPEDANCE:	50 ohms, Nominal
VOLTAGE REQUIREMENTS:	10.9-16.3VDC (13.6 VDC Nominal)

EQUIPMENT IDENTIFICATION:

TRADE NAME	DESCRIPTION	DRI PART NUMBER
T83x	VHF Base Station	T83M-XY
D212	Base Data Link Controller (BDLC)	050-03330-00x
Paragon/PD	Assembly	BDD4-83XY PPPS

Data And Characteristics Not Affected By The Change-Rule Part Number: 2.1033 (c)(8),(9),(11),(12),(15),(16)

DC Voltages And Currents Into Final Amplifier (T881)	2.1033(c).(8)
Transmitter Tune Up Procedure	2.1033 (c) (9)
FCC Label	2.1033 (C) (11)
External Photographs	2.1033 (C) (12)
Data addressing Rule Part Number	2.1033(c) (15),(16): this unit is not designed for the mentioned purposes
Test results not affected by the change	2.1033(c)(14), 2.1041

Test data according to:
Part 2: 2.1046, 2.1051, 2.1053, and 2.1055
Part 90, Subpart I: 90.213
as follows:

Transmitter Rated Power Output	2.1046
Transmitter Spurious and Harmonic Outputs	2.1051
Field Strength of Spurious Radiation	2.1053
Frequency Stability and Frequency Tolerance	2.1055,90.213

DATA AND CHARACTHERISTICS AFFECTED BY THE CHANGE - Rule Part Number: 2.1033(c) (3),(4),(10),(12),(13),(14)

INSTRUCTION BOOK 2.1033 (c) (3)
Annex A . The attached Technical Manual for the Paragon/PD data base station using SRRC4FSK is a preliminary version.

TYPE OF EMISSION: 2.1033(c)(4)

For Class II Permissive Change

F1D emission designator	25kHz BW (19200bps,DGMSK) **14K9F1D**
	12.5kHz BW (9600bps,DGMSK) **9K17F1D**
4levelFSK	25kHz BW (32.0 kbps,16000baud, 4 FSK) **15K2F1D**
	25kHz BW (25.6 kbps 12800baud, 4 FSK) **14K7F1D**
	12.5kHz BW (16.0 kbps 8000baud, 4 FSK) **7K67F1D**
	12.5kHz BW (14.4 kbps 7200baud, 4 FSK) **8K25F1D**

DESCRIPTION OF CIRCUITRY 2.1033 (c)(10)

SCHEMATICS 2.1033 (c)(10)

TRANSISTOR, DIODE, AND IC FUNCTIONS 2.1033 (c)(10)

Annex B. The attached Circuit Description details all the changes (both Class II and Class I permissive changes types) the Exciter T857 undergo.

Annex C. Attached Production Procedure nr 1640006-41_10 is a preliminary version.

INTERNAL PHOTOGRAPHS 2.1033 (c)(12)

Annex C. Attached Production Procedure shows internal pictures of the T837 Exciter and how the production procedures mentioned are applied.

DIGITAL MODULATION TECHNIQUES 2.1033 (c)(13)

Annex E. Explains DBA protocol and digital modulation technique used to create 4FSK modulator signal

SPECTRUM EFFICIENCY STANDARD DATA 90.203 (j)(3)

The unit transmits 32000 bps in 25 kHz channel bandwidth.
This is more than 4800*4=19200bps required for 6.25*4=25kHz channel bandwidth

TEST DATA Rule Part Number: 2.1033 (c)(14)

Annex A .All applicable test data according to:
-Part 2: 2.1043 (b)(2), 2.1049
-Part 90, Subpart I: 90.209 and 90.210

Modulation Characteristic Part 2.1047 (d), 90.209 (b), 90.210(c): Other types of equipment: this equipment is not provided with hardware audio low-pass filters, the filtering is entirely result of DSP firmware.

Unless otherwise noted, all of the measurements were conducted following the procedures set forth in the TIA/EIA-603 standards.