

## TEST DATA for H25RCT1

### I. INTRODUCTION

These tests were conducted on a sample of the H25RCT1 remote control transmitter, for the purpose of demonstrating compliance with the requirements of Part 15.249 Certification and tested to Part 2 of Title 47 of the CFR. The H25RCT1 transmitter is a frequency shift keyed (FSK) low power intentional radiator with a rated output power of less than 1 mW. This device operates on 8 channels in the 902-928 MHz band. This transmitter is marketed only to the police radio service and government agencies for short-term surveillance applications in concert with a switch receiver, also marketed by DTC Communications, Inc.

All testing was conducted at DTC Communications, Inc.; 75 Northeastern Blvd., Nashua, NH 03062 with the exception of the radiated spurious testing and the band edge testing, which was, performed at the OAT site at Retlif Laboratories Goffstown, NH facility. Retlif Testing Laboratories is listed by the FCC as a facility available to do measurement work for others on a contract basis.

### II. INFORMATION REQUIRED FOR CERTIFICATION

Para.

2.10033(a) This Application for Certification is filed on form 731 with all questions answered. Confidentiality is being requested for the schematic. An application fee of \$940 and a request for confidentiality of \$135 is attached.

2.10033(b)(1) The full name and address of the applicant and manufacturer for certification is:

DTC Communications Inc.  
75 Northeastern Blvd.  
Nashua, NH 03062

- (2) The FCC Identifier of the device is H25RCT1
- (3) A copy of the operating instructions is included in the EXHIBITS.
- (4) Circuit Functions and Operation

The H25RCT1 is designed to operate as a handheld remote control encoder in the 902-928 MHz band. The antenna is an integral quarter wave whip, attached to the enclosure. This unit is battery powered. A description of the circuit functions follows:

The H25RCT1 has a power output of less than 1mW to an integral quarter wave whip antenna that meets the requirements of Part 15.203. The transmitter is based on the *Linx* HP Series-II /III Module.

Several activation commands are supported such as VIDEO ON and VIDEO OFF. These commands are coded into a binary bitstream by a data encryption device with 8 user selectable address bits and 4 command bits. Unit power is controlled with an external switch. RF is transmitted only during the actual command switch actuation. Transmissions are manual and cease immediately when the actuation of the switch ceases. Internal shielding for the RF module has been incorporated into this device.

*Linx* is a trademark of Linx Technologies, Inc.

## 2.10033(b)(4) Continued

The H25RCT1 is a portable hand held device; DC powered by a single 9V battery, which is regulated to 5.0VDC with a micropower regulator. All critical circuits are regulated.

- (5) A block diagram of the device is included in the EXHIBITS.
- (6) This Test Report includes tabular data and plots.
- (7) Internal and external photographs of this device are included in the EXHIBITS.
- (8) No peripherals were involved in this evaluation.
- (9) Certification under the transition provisions of Paragraph 15.37 is not being requested for this device.

**III. TEST LIMITS**

Section 15.249 Operation within the bands 902 – 928 MHz, 2400 – 2483.5 MHz, 5725 – 5875 MHz, and 24 – 24.25 GHz.

- (a) The field strength of emissions from intentional radiators operated within the frequency band 902 – 928 MHz shall comply with the following:

Fundamental Freq.	Field Strength of Fundamental	Field Strength of Harmonics
902 – 928 MHz	50 mV/meter	500 uV/meter

- (b) Field strength limits are specified at a distance of 3 meters.
- (c) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in section 15.209, whichever is the lesser attenuation.
- (d) As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

#### IV. TEST RESULTS

The following data were taken at Retlif Testing Laboratories.



## Retlif Testing Laboratories

101 New Boston Road, Goffstown, NH 03045  
603-497-4600 - Fax: 603-497-5281

CORPORATE OFFICE  
735 Marzoni Avenue  
Ranboken, NY 11779  
831-737-1500 Fax: 831-737-1487  
(A NY Corporation)

WASHINGTON  
REGULATORY OFFICE  
703-533-1614 Fax: 703-533-1612

December 19, 2001

DTC Communications  
77 Northeastern Boulevard  
Nashua, NH 03062

Attention: Mr. Mike Murphy

Dear Sir:

Enclosed you will find Data Package R-3880N covering the testing of the Remote Control Transmitter, Model Number: RTC-1, Serial Number: ENG-1 to the requirements of FCC Part 15, Subpart C, Paragraph: 15.249. This testing was performed against Purchase Order Number 49978.

Test setup photographs and drawings, equipment lists, and test data are included for each test method performed on the above test sample.

Thank you for this opportunity to be of service to you. Should you have any questions concerning this data or the actual testing of your unit, please do not hesitate to contact us.

Sincerely,

RETLIF TESTING LABORATORIES

Jamie Ramsey  
Publications

Enc. (as stated)



## Retlif Testing Laboratories

101 New Boston Road, Goffstown, NH 03045  
603-497-4600 - Fax: 603-497-5281

CORPORATE OFFICE  
731 Marsom Avenue  
Roslindale, MA 01968  
631-737-1800 Fax 631-737-1497  
(A NY Corporation)  
WASHINGTON  
REGULATORY OFFICE  
703-533-1614 Fax 703-533-1612

### DATA PACKAGE FOR

### Remote Control Transmitter

Model No. RTC-1  
Serial No. ENG-1

#### SHOWING COMPLIANCE WITH FCC Part 15

Customer Name:	DTC Communications
Customer P.O.:	49978
Data Package No.:	R-3880N
Package Date:	December 18, 2001
Test Start Date:	November 9, 2001
Test Finish Date:	November 30, 2001
Test Technician(s):	Tim Firkowski, Aaron Damboise
Test Engineer:	Scott Wentworth
Data Prepared By:	Jamie Ramsey
Supervisor:	Scott Wentworth

Our letters and reports are for the exclusive use of the customer to whom they are addressed, and their communication to any other or the use of the name of RETLIF TESTING LABORATORIES must receive our prior written approval. Our letters and reports apply only to the sample tested and are not necessarily indicative of the qualities of apparently identical or similar products. The reports and letters and the name of RETLIF TESTING LABORATORIES or insignia are not to be used under any circumstances in advertising to the general public. This test report shall not be reproduced, except in full, without the written approval of RETLIF TESTING LABORATORIES.

NVLAP  
ACCREDITED BY N.J.S.T.

A New York State Corporation  
<http://www.relif.com>

MEMBER  
AC II

## Modifications

Initial sweep testing at Retlif, revealed that the EUT failed for third harmonic energy. It was found that the Linx module located on the EUT radiated third harmonic energy, which was slightly above the limits of Part 15 irrespective to the antenna or power output attenuation. This was corrected by installing a shield around the module at DTC. The EUT was then completely re-tested at Retlif. The shield has been incorporated into the production unit design.

### MODIFICATION TO THE EUT MADE DURING THE TEST PROGRAM

**Test Method:**

Harmonics

**Reason for Modification:**

The 3<sup>rd</sup> Harmonic was over the limit.

**Description of Modification:**

Installed shielding case over transmit module.

**Result of Modification:**

The 3<sup>rd</sup> Harmonic was within limit.


---

THE VALIDITY OF THE EUT COMPLIANCE AND OF THIS REPORT  
IS BASED, IN PART, ON THE PRESENCE OF THE ABOVE MODIFICATION.

---

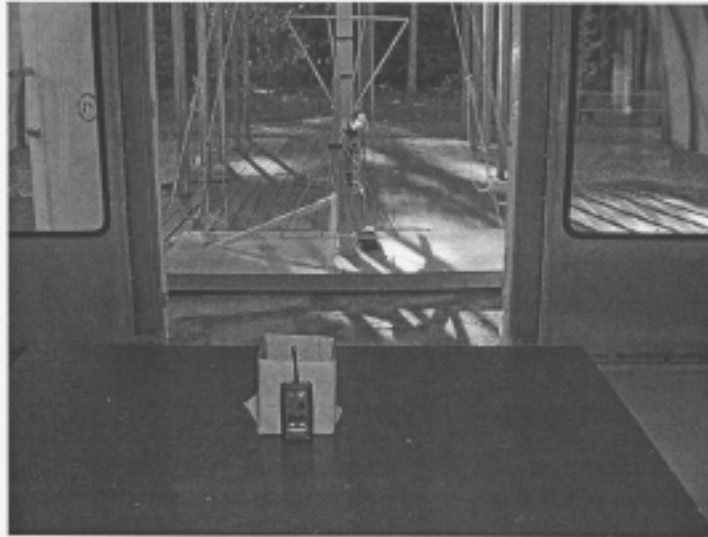
At the time of the modification installation, and at the conclusion of the test program, the EUT manufacturer was made aware of the need to have the above modification incorporated in all future productions of the EUT.


Test methods administered subsequent to the listed modification included the above modification.

	<b>Retlif Testing Laboratories</b>
	DATA PACKAGE No. R-3880N

**Fundamental Field Strength (Retlif Labs)**

**TEST SETUP PHOTOGRAPH-  
Fundamental Field Strength**



	<b>Retlif Testing Laboratories</b>
	DATA PACKAGE No. R-3880N



**EQUIPMENT LIST-  
Fundamental Field Strength**

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due Date</b>
4202	Biconilog	EMCO	26 MHz - 2 GHz	3142	7/16/01	7/16/02
713	EMI Test Receiver	Rohde & Schwarz	20 Hz - 26.5 GHz	ES126	6/9/01	6/9/02

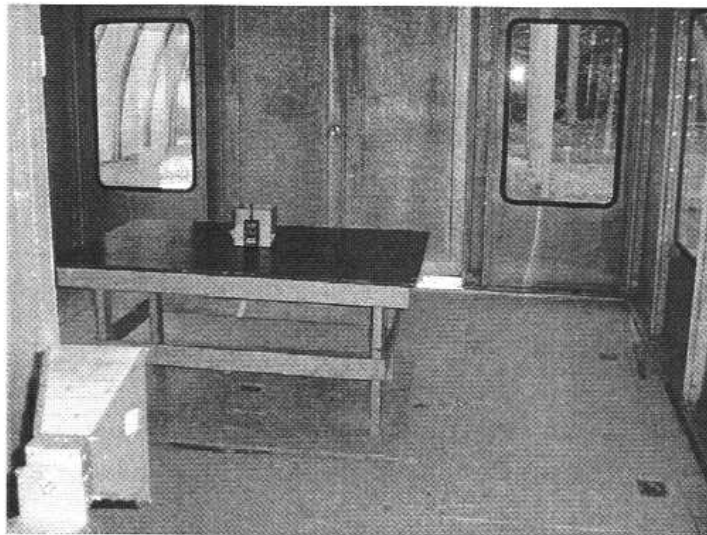
**Retlif Testing Laboratories**

DATA PACKAGE No. R-3880N



Out Of Band Emissions (Retlif Labs.)

TEST SETUP PHOTOGRAPH-  
Out of Band Emissions



Retlif Testing Laboratories

DATA PACKAGE No. R-3880N

# RETLIF TESTING LABORATORIES

## TABULAR DATA SHEET

Test Method:	Out of Band Emissions 30 MHz to 9.3 GHz	
Customer:	DTC Communications	Job No: R-3880N
Test Sample:	Remote Control Transmitter	
Model No:	RTC-1	Serial No: ENG1
Test Specification:	FCC Part 15, Subpart C Paragraph: 15.249(c)	
Operating Mode:	Transmitting	
Technician:	T. Firkowski	Date: 11/28/01
Notes:	Detector: < 1000 MHz - Quasi-Peak, > 1000 MHz - Average Transmit Frequencies: 903.37, 912.37 & 921.37 MHz	

Test Frequency	Antenna Position	Tunable Position	Uncorrected Reading	Correction Factor	Corrected Reading			Converted Reading	Limit at 3 Meters
MHz	(H/V) - Height	Degree	dBμV	dB	dBμV/m			μV/m	μV/m
30.00	-	-	-	-	-			-	100.00
	-	-	-	-	-			-	
88.00	-	-	-	-	-			-	100.00
88.00	-	-	-	-	-			-	150.00
	-	-	-	-	-			-	
216.00	-	-	-	-	-			-	150.00
216.00	-	-	-	-	-			-	200.00
	-	-	-	-	-			-	
960.00	-	-	-	-	-			-	200.00
960.00	-	-	-	-	-			-	500.00
	-	-	-	-	-			-	
9300.00	-	-	-	-	-			-	900.00

No EUT emissions other than Fundamental & Harmonics were observed at the specified test distance throughout the given frequency spectrum.

**EQUIPMENT LIST-  
Out of Band Emissions**

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due Date</b>
3258	Double Ridge Guide	EMCO	1 - 18 GHz	3115	5/6/01	5/6/02
4202	Biconilog	EMCO	26 MHz - 2 GHz	3142	7/16/01	7/16/02
543	Preamplifier	Hewlett Packard	1.0 GHz - 26.5 GHz	8449B	6/16/01	6/16/02
713	EMI Test Receiver	Rohde & Schwarz	20 Hz - 26.5 GHz	FS126	6/9/01	6/9/02

**Retlif Testing Laboratories**

DATA PACKAGE No. R-3880N

Harmonic Emissions (Retlif Labs.)

TEST SETUP PHOTOGRAPH-  
Harmonics



**Retlif Testing Laboratories**

DATA PACKAGE No. R-3880N

<b>RETLIF TESTING LABORATORIES</b>									
<b>TABULAR DATA SHEET</b>									
Test Method:	Harmonics								
Customer:	DTC Communications				Job No:	R-3880N			
Test Sample:	Remote Control Transmitter								
Model No:	RTC-1				Serial No:	ENG1			
Test Specification:	FCC Part 15, Subpart C								
	Paragraph: 15.249(a)								
Operating Mode:	Transmitting								
Technician:	T. Firkowski				Date:	12/14/01			
Notes:	Detector: Average Transmit Frequency: 903.37 MHz								
Harmonic Frequency	Antenna/EUT Position	Uncorrected Reading	Correction Factor	Corrected Reading				Corrected Reading	Limit at 3 Meters
MHz	Polarization/Axis	dBV	dB	dBW/m				uW/m	uV/m
1809.74	H/Z	60.85	-9.64	41.21				114.91	500.00
2710.11	H/Z	45.82	-6.86	38.96				88.75	1
3613.48	H/X	36.68	-4.67	32.11				40.30	1
4516.85	H/Y	38.93	-3.42	35.51				69.63	1
5420.22	H/Z	35.19	-2.26	32.93				44.29	1
6323.59	H/Y	36.44	-0.23	36.21				64.65	1
7226.96	V/X	35.89	2.86	38.75				86.60	1
8130.33	H/Y	33.76	7.23	41.01				112.39	1
9033.70	-	-	-	-				-	500.00
Data Sheet 1 of 3								R-3880N	





**EQUIPMENT LIST-  
Harmonics**

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due Date</b>
3116	Pre-Amplifier	Miteq	0.1 GHz - 18 GHz	AFS42-35	7/19/01	7/19/02
3258	Double Ridge Guide	EMCO	1 - 18 GHz	3115	5/6/01	5/6/02
713	EMI Test Receiver	Rohde & Schwarz	20 Hz - 26.5 GHz	ESL26	6/9/01	6/9/02

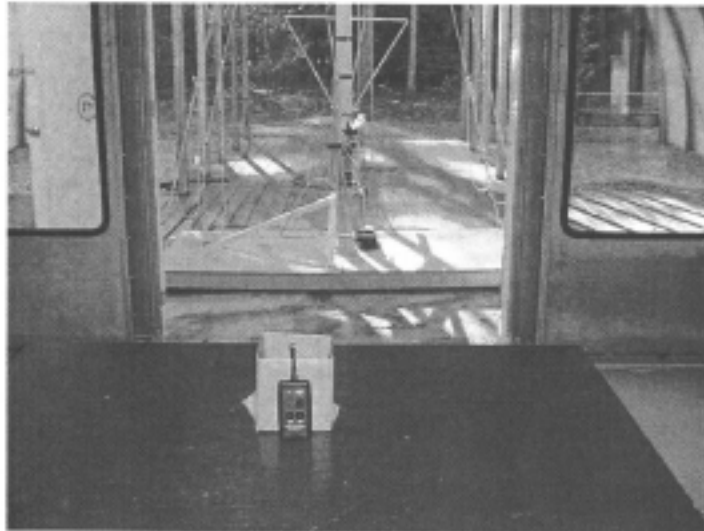
**Retlif Testing Laboratories**


DATA PACKAGE No. R-3880N



**Band Edge Emissions (Retlif Labs.)**

**TEST SETUP PHOTOGRAPH-  
Band Edge Emissions**

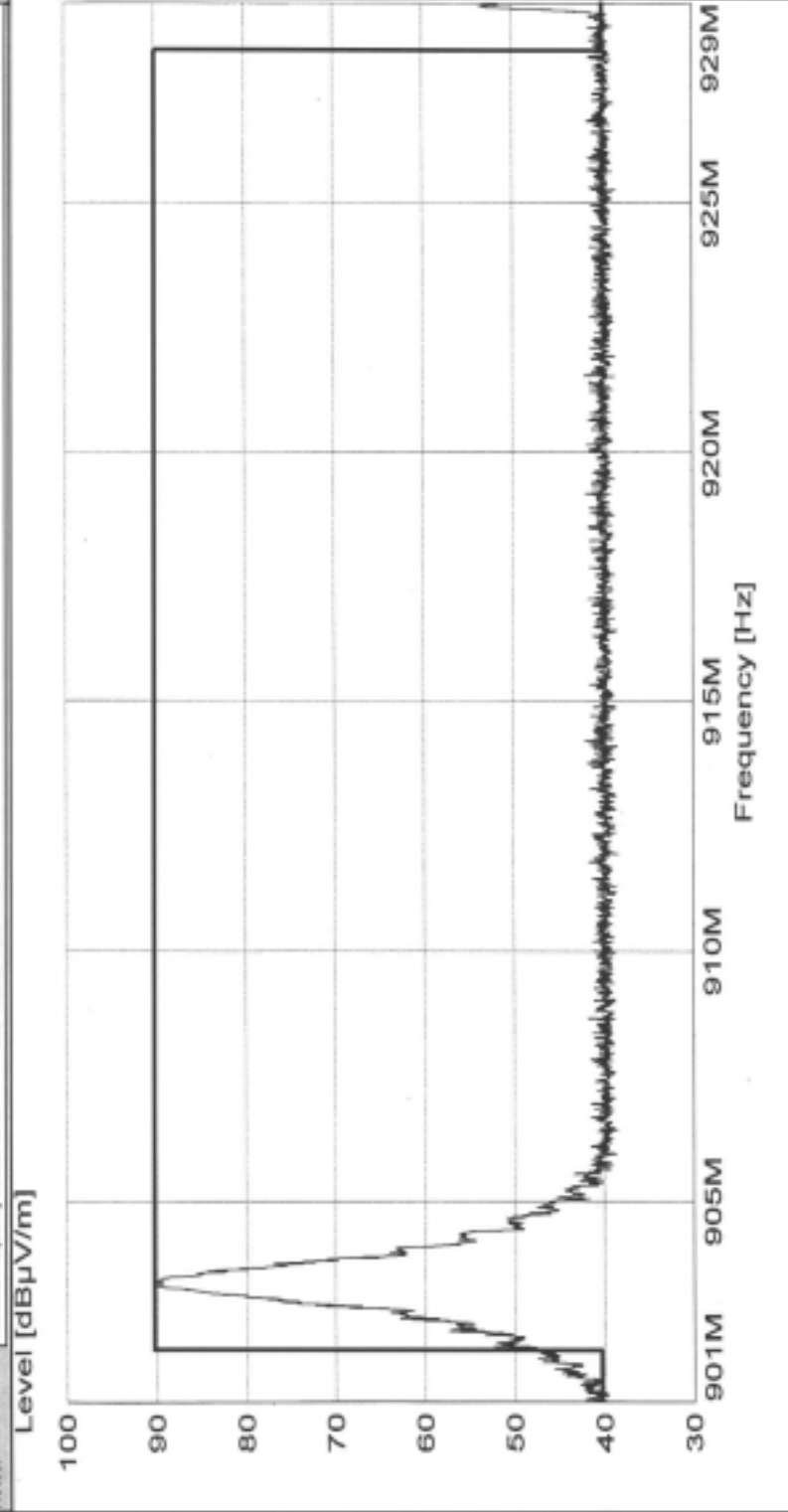


	<b>Retlif Testing Laboratories</b>
	DATA PACKAGE No. R-3880N

# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

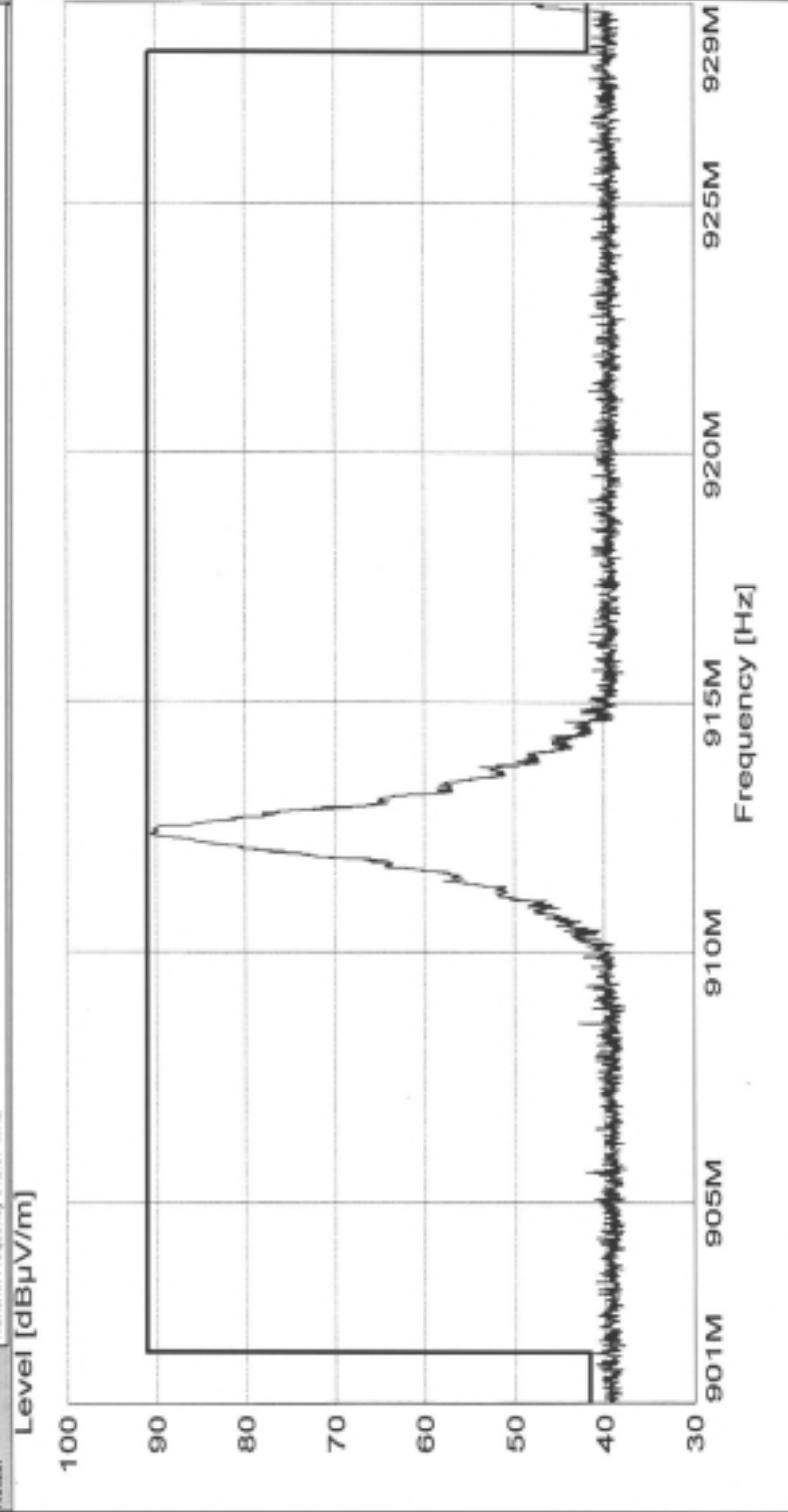
Test Method:	Band Edge Emissions, 962 - 920 MHz	Job No:	R-3880N
Customer:	DTC Communications	Test Sample:	Remote Control Transmitter
Model No:	RTC-1	Serial No:	ENG1
Test Specification:	Transmitting	Technician:	T. Firkowski
Operating Mode:	Transmitting	Date:	12/14/01
Notes:	Transmit Frequency 903.37 MHz ** See Tabular Data Sheet **		

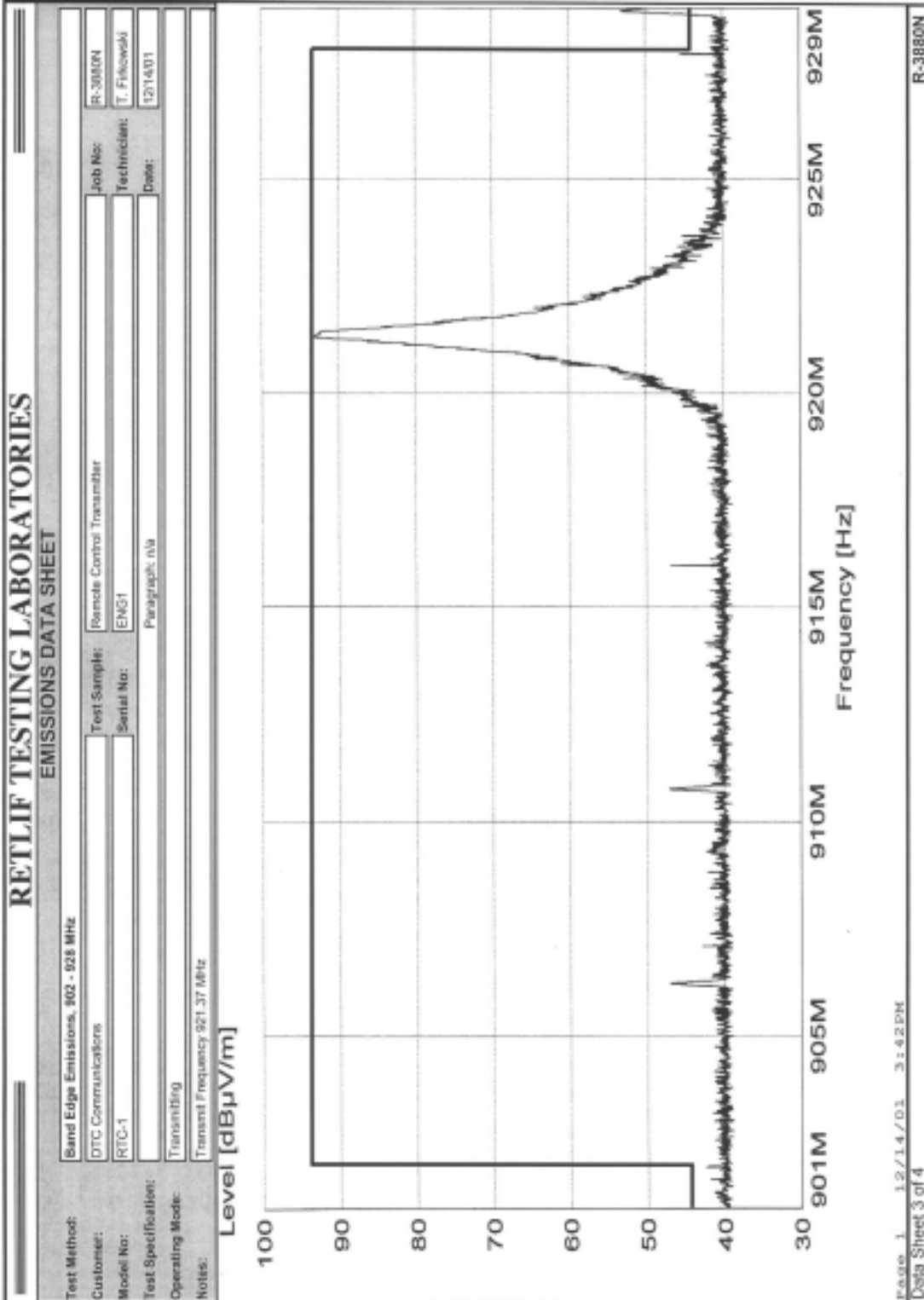


# RETLIF TESTING LABORATORIES

## EMISSIONS DATA SHEET

Test Method:	Band Edge Emissions, 902 - 928 MHz	Job No:	R-3880N
Customer:	DTC Communications	Test Sample:	Remote Control Transmitter
Model No:	RTC-1	Serial No:	ENG1
Test Specification:	Transmitting	Technician:	T. Fikowski
Operating Mode:	Transmitting	Date:	12/14/01
Notes:	Transmit Frequency 912.37 MHz		





RETLIF TESTING LABORATORIES										
EMISSIONS DATA SHEET										
Test Method:	Band Edge Data 902 MHz to 928 MHz									
Customer:	DTC Communications				Job No:	R-3880N				
Test Sample:	Remote Control Transmitter									
Model No:	RTC-1				Serial No:	ENG1				
Test Specification:	FCC Part 15									
	Paragraph: 15.209									
Operating Mode:	Transmitting									
Technician:	T. Firkowski				Date:	12/14/01				
Notes:	Peak readings at 3 meters									
Band Edge Frequency	Antenna/EUT Position	Meter Reading	Site Correction	Corrected Readings	Converted Reading					Limit @ 3 meters
MHz	Polarization/Axis	dBuV	dB	dBuV/m	uV/m					uV/m
Transmit Frequency: 903.37 MHz										
902.00	VIX	8.09	37.26	45.37	185.57					200.00
928.00	VIX	2.05	37.39	39.44	93.76					200.00
The EUT is compliant at the band edges with 15.209 radiated emissions limits.										
Data Sheet 4 of 4										R-388

**EQUIPMENT LIST-  
Band Edge Emissions**

<b>EN</b>	<b>Type</b>	<b>Manufacturer</b>	<b>Description</b>	<b>Model No.</b>	<b>Cal Date</b>	<b>Due Date</b>
4202	Bisonilog	EMCO	26 MHz - 2 GHz	3142	7/16/01	7/16/02
713	EMI Test Receiver	Rohde & Schwarz	20 Hz - 26.5 GHz	FS126	6/9/01	6/9/02



**Retlif Testing Laboratories**

DATA PACKAGE No. R-3880N