# 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	Field Strength
	of Fundamental	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.

737-1497

## **IV. TEST RESULTS**

The following data were taken at Retlif Testing Laboratories.



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)

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# **Retlif Testing Laboratories**

101 New Boston Road, Goffstown, NH 03045 503-497-4600 - Fax: 603-497-5281 CORPORATE OFFICE 735 Marconi Avanue Rontenuora, AV 11775 61-737-1600 Fax 51-737-1497 (A NY Cerpenilion) WASHINGTON REGULATORY OFFICE 703-533-1614 Fay 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 upparently identical or similar products. The reports and letters and the name of RETLIF TESTING LABORATORIES must receive our prior written approval. The reports and letters and the name of RETLIF TESTING LABORATORIES in the used in the task 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.

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## 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.



# Fundamental Field Strength (Retlif Labs)



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# EQUIPMENT LIST-Fundamental Field Strength

EN Type 4202 Biconilog 713 EMI Test Receiver

Manufacturer EMCO Rohde & Schwarz

Description Model No. 3142 26 MHz - 2 GHz 20 Hz - 26.5 GHz ESI26

Cal Date Due Date 7/16/01 7/16/02 6/9/01 6/9/02

**Retlif Testing Laboratories** DATA PACKAGE No. R-3880N Page 4 Οİ 79

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# Out Of Band Emissions (Retlif Labs.)



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est Sample:		Remote Contr	ol Transmitter							
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est Specific	ation:	FCC Pat 15	Subpart C			Internal sec.	CIAOL		_	-
	-					Paragraph	15.249(c)			
peniting Ma	ode:	Transmitting								
echnician:		T. Firkowski			. 81	) Date:	11/28/01			
iotes:		Detector: < 10 Transmit Freq	00 MHz - Qua uencies: 903.	si-Peak, > 100 37, 912 37 & 9	00 MHz - Ave 221.37 MHz	rage				
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# EQUIPMENT LIST-Out of Band Emissions

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EN	Туре	Manufacturer	Description	Model No.	Cal Date	Due Date
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	ES126	6/9/01	6/9/02

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	<b>r:</b>	DATA PACKAGE No. R-3880N
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# Harmonic Emissions (Retlif Labs.)



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feat Sample:	Remote Contro	ol Transmitter									
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est Specification:	FCC Part 15, 8	Subpart C			Paramanh	15.249/a)					
Operating Mode:	Transmitting				1 1100 001						
echnician:	T. Firkowski Date: 12/14/01										
lotes;	Detector: Aver	100	and the second				and the second second				
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1808.74	HIZ	50.85	-9.64	41.21				114.91	500		
2710.11	HIZ	45.82	-6.86	38.96				88.75	1		
3613.48	HOC	35.58	-4.57	32.11				40.30	1		
4516.85	H/Y	38.93	-3.42	35.51				59.63	1		
5420.22	HIZ	35.19	-2.26	32.93				44.29	1		
6323.59	H/Y	36.44	-0.23	36.21				64.65	1		
7228.96	V0X	35.89	2.86	38.75				86.60	1		
8130.33	HIY	33.78	7.23	41.01				112.39	1		
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1824.74       H4Z       44.40       -9.57       34.83       55.14         2737.11       H4Z       42.52       -6.60       36.12       64.00         3849.45       V0X       38.04       -4.48       33.06       47.85         5469.45       HY       40.62       -3.41       37.21       72.53         5474.22       -       -       -       -       -         6386.99       HY       35.52       0.03       35.55       59.89         547.422       -       -       -       -       -       -         6386.99       HY       35.52       0.03       35.55       98.74       83.74         8211.33       HY       34.66       7.57       42.23       129.22       -         9123.70       -	Polarization/Axia dBu/V	uHz	d8	dBulkim				u\/in	L/W				
2777.11       H/Z       42.92       -6.60       36.12       64.00         3840.48       V/X       38.04       -4.48       33.96       47.65         4561.85       HY       40.62       -3.41       37.21       72.83         6348.59       HY       35.52       0.03       35.55       56.89         728.56       HY       35.52       0.03       35.55       56.89         728.56       HY       35.52       0.03       35.55       56.89         728.56       HY       35.64       3.22       38.46       33.74         8211.33       HY       34.66       7.57       42.23       129.22         9123.70       -       -       -       -       -         1       -       -       -       -       -       -         1       -       -       -       -       -       -       -       -         1       -	H/Z 44.40	24.74	9.57	34.83				55.14	500				
3899.46       V/X       38.04       -4.48       33.56       47.65         4561.85       H'Y       40.02       -5.41       37.21       72.53         5474.22       -       -       -       -       -         5385.59       HY       35.52       0.03       35.55       58.59         7285.96       HY       35.62       0.03       35.55       88.74         8211.33       HY       34.66       7.57       42.23       -       -         9123.70       -       -       -       -       -       -         9123.70       -       -       -       -       -       -       -         9123.70       -       -       -       -       -       -       -       -         9123.70       - <td>H/Z 42.92</td> <td>37.11</td> <td>6.80</td> <td>36.12</td> <td></td> <td></td> <td></td> <td>64.00</td> <td>1</td>	H/Z 42.92	37.11	6.80	36.12				64.00	1				
4591.85       HY       40.62       -3.41       37.21        72.83         5474.22                6336.59       HY       35.52       0.00       35.55            6336.59       HY       35.52       0.00       35.55            6336.59       HY       35.24       0.22       38.46 <td< td=""><td>V/X 38.04</td><td>49.48</td><td>4.48</td><td>33.55</td><td></td><td></td><td></td><td>47.65</td><td>1</td></td<>	V/X 38.04	49.48	4.48	33.55				47.65	1				
5474.22       -       -       -       -       -       -       -       545       -       548.9         6386.59       HY       35.52       0.00       35.55       -       59.89       59.89         7286.96       HY       35.24       3.22       38.46       -       83.74         8211.33       HY       34.66       7.57       42.23       -       129.22         9123.70       -       -       -       -       -       -       -       -       -       129.22         9123.70       -	H/Y 40.62	61.85	3.41	37.21				72.53	1				
6385.99       HY       35.52       0.00       35.55       9       50.89         7298.96       HY       35.24       3.22       38.46       9       83.74         8211.33       HY       34.66       7.57       42.23       9       129.22         9123.70       Image: State Stat		74.22							1				
7286.96       HY       35.24       3.22       38.46       Image: state sta	H/Y 35.52	86.59	0.03	35.55				59.89	1				
8211.33       HY       34.66       7.57       42.23       Image: Section of the sectin of the section of the section of the section of the s	H/Y 35.24	98.96	3.22	38.46				83.74	1				
9123.70       . </td <td>H/Y 34.66</td> <td>11.33</td> <td>7.57</td> <td>42.23</td> <td></td> <td></td> <td></td> <td>129.22</td> <td>1</td>	H/Y 34.66	11.33	7.57	42.23				129.22	1				
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			TABUL/	AR DATA	SHEET				
est Method:	Harmonics								
Sustomer:	DTC Commun	ications			Job No:	R-3880N			
est Sample:	Remote Contro	ol Transmitter				-			
Instel No:	RTC.4				Terretation	(marca)			
est Specification:	FCC Part 15.1	Subpart C			isenal No.	ENGI			
	-		1		Paragraph	15.249(a)			
Operating Mode:	Transmitting								
echnician:	T. Firkowski				Date:	12/14/01			
foten:	Detector: Aver	age							
	Transmit Freq	sency: 921.37	MHz						
Harmonic	Antenna/EUT	Uncorrected	Correction	Corrected				Converted	Lim
Frequency	Position	Reading	Fector	Reading				Reading	#3 M
MHz	Pelarization/luce	dBu//	dB	(B,///m				U/VPm	104
1842.74	VXX	54.36	-9.50	44.86				175.02	500.
2764.11	H/Z	47.81	-6.73	41.08				113.18	1
3685.48	VOK	35.99	-4.38	31.61				38.05	1
4606.85	V0X	43.96	-3.40	40.56				106.68	1
5528.22	HIY	35.99	-1.94	34.05				50.38	1
6449.59									1
7370.96	VOK	33.51	3.58	37.09				71.50	1
8292.33	HIY	32.65	7.90	40.55				106.52	1
9213.70									500.
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# EQUIPMENT LIST-Harmonics

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EN	Туре	Manufacturer	Description	Model No.	Cal Date	Due Date
3116	Pre-Amplifier	Miteq	0.1 GHz - 18 GHz	AFS42-35	7/19/01	7/19/02
3258	Double Ridge Guide	EMCO	1 - 18 GH2	3115	5/6/01	5/6/02
713	EMI Tost Receiver	Rohde & Schwarz	20 Hz - 26.5 GHz	ESI26	6/9/01	6/9/02



Band Edge Emissions (Retlif Labs.)



929M R-3880N T. Firkowski R-3690N 12/14/01 Technician: I Job No: 925M Datec 920M RETLIF TESTING LABORATORIES Trast Bample: Remote Centrol Transmitter Sental Ne: ENG1 Frequency [Hz] EMISSIONS DATA SHEET Paragraph: n/a 915M والمالية والمتعالية والمستروم والمرامع المراجع المترافع المرامي والمحالية والمح \*\* See Tabular Data Sheet \*\* 910M Band Edge Emissions, 902 - 923 Metz Transmit Frequency 903.37 MHz Level [dBµV/m] 905M 4 1 0 4 PM **Fransmitting** DTC Com Date 1 12/14/01 Data Sheet 1 of 4 RTC-1 901M et Specification: perating Mode: 100 20 50 40 30 80 80 60 init Method: stomer: odel No: stos:



H25RCT1



H25RCT1

1	L'internation	2320 3360		EMISSIO	NS DAT	ASUEET		States and		C.C.C.S.S.S.
T	1233	Read Edge 7	ale 602 Miles	EMISSIC	NS DAT	ASHEET		An Para all	124364.20	
Customer		Dand Loge D	alla suz wirtz u	0 910 MULT		Los Mar	D 3500M			
Customer:		DTC Commu	lications			JOD NO:	R-3680N			
Test Sample:		Remote Contr	ol Transmitter							
Model No:		RTC-1				Serial No:	ENG1			
Test Specific	ation:	FCC Part 15				Paragraph:	15.209			
Operating Mo	ode:	Transmitting								
Technician		T. Firkowski				Date:	12/14/01			
Notes:		Peak reading	s at 3 meters							
Band Edge	Antenna/EUT	Moter	Site	Corrected	Converted	1	1			Linit
Frequency	Position	Reading	Correction	Readings	Reading					3 ma
MHz	Palarization/Axia	dBuV	dB	dBu/Wm	uWm					N/A
002.00	1000	0.00		Transmit	Frequency: 6	03.37 MHz		_		0.00
902.00	VOX	9.08	37.28	40.37	180.57			+		200
9450-00	V/A	4.00	37.39	20.44	99.10					
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	-	1	he EUT is com	pliant at the ba	ind edges with	15.209 radia	ted emissions	limita.		
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# EQUIPMENT LIST-Band Edge Emissions

 EN
 Type

 4202
 Biconilog

 713
 EMI Test Receiver

Manufacturer EMCO Robde & Schwarz 
 Description
 Model No.

 26 MI/z - 2 GHz
 3142

 20 Hz - 26.5 GILz
 ES126

 Cal Date
 Due Date

 7/16/01
 7/16/02

 6/9/01
 6/9/112

