

 <b>Celltech</b> <small>Testing and Engineering Services Ltd</small>	Test Report Serial No.:	111115-T1336-E-15O	Report Issue Date:	2/4/2016	 <b>ILAC-MRA</b> <b>ACCREDITED</b>
	Measurement Date(s):	Nov 11-25, 2015	Report Revision No.:	Revision 1.1	
	FCC Rule Part(s):	47 CFR §2; §15.231	FCC Test Firm Reg. No.:	Accredited	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	

Compliance Test Report		RF MEASUREMENT REPORT		FCC & IC										
<b>Test Lab Information</b>		<b>Name</b>	<b>CELLTECH LABS INCORPORATED</b>											
		<b>Address</b>	21-364 Lougheed Road, Kelowna, British Columbia V1X 7R8 Canada											
<b>Test Lab Registration No.(s)</b>		<b>FCC</b>	Accredited (ISO 17025 - A2LA Test Lab Certificate No. 2470.01)											
		<b>IC</b>	3874A-1											
<b>Applicant Information</b>		<b>Name</b>	<b>Kramble Industries Inc.</b>											
		<b>Address</b>	102-2750 Faithfull Ave., Saskatoon, SK, S7K 6M6											
<b>Standard(s) &amp; Procedure(s)</b>		<b>FCC</b>	47 CFR Part 2; 15.231, 15B											
		<b>IC</b>	RSS-210 Issue 8; RSS-Gen Issue 4											
		<b>ANSI</b>	C63.4-2014											
<b>Device Classification(s)</b>		<b>FCC</b>	Part 15 Periodic Operational Devices (DSC)											
		<b>IC</b>	Low-power License-exempt Momentarily Operated Devices (Category 1)											
<b>Application Type</b>		<b>FCC/IC</b>	New Certification											
<b>Device Identifier(s)</b>		<b>FCC ID:</b>	2AHDO- FBSXLDR											
		<b>IC ID:</b>	21117- FBSXLDR											
<b>Device Under Test (DUT)</b>		Momentarily Operated Transmitter.												
<b>Device Model(s) Tested</b>		FBAr4												
<p>This wireless device has demonstrated compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in FCC 47 CFR Rule Part 2 and Rule Part 15.231; Industry Canada RSS-210, RSS-Gen; and ANSI C63.4-2014.</p>														
<p>I attest to the accuracy of data. All measurements were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.</p>														
<p>The results and statements contained in this report pertain only to the device(s) evaluated. This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Labs Inc.</p>														
<b>Test Report Approved By</b>			<b>Art Voss</b>	<b>Celltech Labs Inc.</b>										

<b>Applicant:</b>	<b>Kramble Industries Inc</b>		<b>FCC ID:</b>	<b>2AHDO-FBSXLDR</b>	<b>IC:</b>	<b>21117-FBSXLDR</b>	 <b>Force Command Systems</b>
<b>DUT Model:</b>	<b>FBAr4</b>		<b>DUT Type:</b>	<b>Transmitter Remote Control</b>		<b>Tx Freq.:</b>	<b>916 MHz</b>
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	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1



Test Lab Certificate No. 2470.01

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Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4		DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz
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## GENERAL REMARKS

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## SUMMARY

The device under test (DUT) fulfills the general approval requirements as identified in this test report.

## REVISION LOG

Revision	Description	Implemented By	Implementation Date
1.0	1st Release	Art Voss	2/4/2016

Test Report Prepared By	Date	QA Review By	Date
Art Voss	2/4/2016	Art Voss	2/4/2016

Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4	DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz	
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## 1.0 REFERENCES

### 1.1 Normative References

ANSI/ISO 17025:2005	General Requirements for competence of testing and calibration laboratories
IEEE/ANSI C63.4-2014	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
CFR Title 47 Part 15B/15C	Code of Federal Regulations Title 47: Telecommunication Part 15C: Intentional Radiators
IC Spectrum Management & Telecommunications Policy	Radio Standards Specification RSS-210 Issue 8 - Low-Power Licence-Exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment RSS-Gen Issue 4 - General Requirements and Information for the Certification of Radiocommunication Equipment

## 2.0 PASS/FAIL CRITERIA

Unless otherwise noted in the Appendices, the pass/fail criteria is the limit set forth in the reference standards. The DUT is considered to have passed the requirements if the data collected during the described measurement procedure is no greater than the specified limits as defined. The pass/fail statements made in this report only apply to the unit tested.

Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4		DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz
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### **3.0 FACILITIES AND ACCREDITATIONS**

The facilities used in collecting the test results outlined in this report are located at 21-364 Lougheed Road, Kelowna, British Columbia, Canada V1X 7R8. The radiated emissions site conforms to the requirements set forth in ANSI C63.4 and is filed and listed with Industry Canada under File Number IC 3874A-1. Celltech test site is listed with the FCC as an accredited test facility.

### **4.0 GENERAL INFORMATION**

#### **4.1 DUT Description & Specifications**

Device Type	Remote control 916 MHz low power transmitter.	
Device Model(s)	FBAr4	
Test Sample Serial No.	T/A Sample - Identical Prototype	
Device Identifier(s)	FCC ID:	2AHDO-FBSXLDR
	IC ID:	21117-FBSXLDR
Transmit Frequency Range	915.8 MHz	
No. of Channels	1	
Measured Field Strength	78.3 dBuV/m@3m	
Modulation	FM	
Antenna	External, Omni directional Whip	
TX Duty Cycle	100%, 50% and 10%, no duty cycle correct used	
Emission Designator	138KF1D	
DUT Power Source	9 VDC Battery, DC Cell	
Type of Equipment	DSC, Periodic operation device / Momentarily operated device.	
Deviation(s) from standard/procedure	None	
Modification of DUT	None	
Applicable Standards	FCC Part 15.231, IC RSS-210	

Notes:

- (1) This radio transmitter is intended for use with a dedicated receiver that is not part of this equipment authorization.
- (2) The receiver was tested and approved separately following the Declaration of Conformity procedure. As such the manufacturer will follow all DoC requirements for marketing this product.

Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4	DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz	
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	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	

## 5.0 GENERAL DESCRIPTION OF OPERATION, FCC PART 15.231(A)

Item	Description	Yes	No
1	Does this device transmit a signal that is only used to control another device?	X	
2	Does this device send data with this control signal?		X
3	Does this device send data? Data is, things like: temperature, wind direction, fluid amount, rate of flow, etc.		X
4	Does this device transmit continuously?		X
5	*If manually operated does this device stop transmitting within 5 seconds of releasing the button or deactivation?	X	
6	If automatically operated does it deactivate 5 seconds after activation?	N/A	
7	Does it transmit at regular predetermined intervals?		X
8	Does it poll or send supervisory information? If 'Yes', does it do a system integrity check? How often?		X
9	Is this a fire, security, or safety of life device? If 'Yes' does the device stop transmitting after the alarm condition is satisfied?		X
10	Modulation technique: Please specify the modulation of the test sample, FM or AFSK, or FSK, or On-Off Keying, or others?	FSK	

The device is suspended to the end of a manually operated grain chute used to fill a grain bin. During the fill process, the device hangs in a vertical orientation. When the grain reaches the level of the device, its orientation is no longer vertical and the transmitter is activated, notifying the operator that the bin is full. The operator discontinues the filling process pulling the fill chute from the bin. This deactivates the device which immediately deactivates the transmitter. The transmitter deactivates in less than 5 seconds.

Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4		DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz
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## 6.0 FIELD STRENGTH OF THE FUNDAMENTAL AND SPURIOUS EMISSIONS

### 6.1 References

Normative Reference Standard	FCC CFR 47 §15.231; §15.209; IC RSS-210 Issue 8
Procedure Reference	ANSI C63.4:2014

### 6.2 Limits

#### TX Emission Limits (FCC §15.231)

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emission (microvolts/meter)
40.66–40.70	2,250	225
70–130	1,250	125
130–174	1,250 to 3,750	125 to 375
174–260	3,750	375
260–470	3,750 to 12,500	375 to 1,250
Above 470	12,500	1,250

<sup>1</sup>Linear interpolations

#### TX Emission Limits (IC RSS-210 A1.1.1)

Fundamental Frequency (MHz), excluding restricted band frequencies of RSS-Gen	Field Strength of the Fundamental (microvolts/meter)	Field Strength of Unwanted Emissions (microvolts/meter)
40.66–40.70		See Section A2.7
70–130	1,250	125
130–174	1,250 to 3,750	125 to 375
174–260	3,750	375
260–470	3,750 to 12,500	375 to 1,250
Above 470	12,500	1,250

<sup>1</sup>Linear interpolations

### 6.3 Environmental conditions

Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

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DUT Model:	FBAr4	DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz	
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FCC Rule Part(s): 47 CFR §2; §15.231  
IC Standard(s): RSS-210 RSS-Gen

Report Issue Date: 2/4/2016  
Report Revision No.: Revision 1.1  
FCC Test Firm Reg. No.: Accredited  
IC Test Site No.: IC 3874A-1



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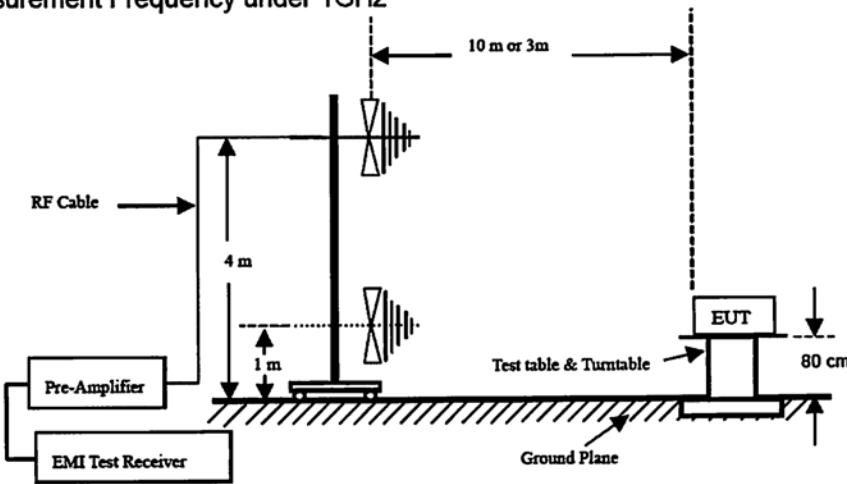
## 6.4 Equipment List

Asset Number	Manufacturer	Model Number	Description	Last Calibrated	Calibration Interval	Calibration Due
00051	HP	8566B	Spectrum Analyzer RF Section	30 Apr 2014	Biennial	30 Apr 2016
00049	HP	85650A	Quasi-peak Adapter	30 Apr 2014	Biennial	30 Apr 2016
00047	HP	85685A	RF Preselector	30 Apr 2014	Biennial	30 Apr 2016
00072	EMCO	2075	Mini-mast	n/a	n/a	n/a
00073	EMCO	2080	Turn Table	n/a	n/a	n/a
00071	EMCO	2090	Multi-Device Controller	n/a	n/a	n/a
00265	Miteq	JS32-00104000-58-5P	Microwave L/N Amplifier	COU	n/a	COU
00241	R&S	FSU40	Spectrum Analyzer	23 Apr 2015	Biennial	23 Apr 2017
00050	Chase	CBL-6111A	Bilog Antenna	25 Apr 2014	Biennial	25 Apr 2016
00275	Coaxis	LMR400	25m Cable	COU	n/a	COU
00276	Coaxis	LMR400	4m Cable	COU	n/a	COU
00278	TILE	34G3	TILE Test Software	NCR	n/a	NCR
00034	ETS	3115	Double Ridged Guide Horn	06 Dec 2012	Triennial	06 Dec 2015

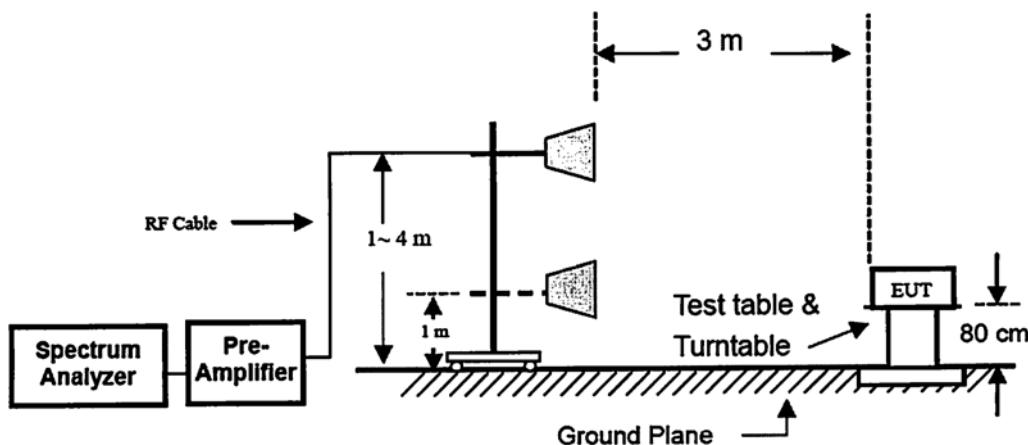
Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4		DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz
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## 6.5 Test Measurement Configuration.

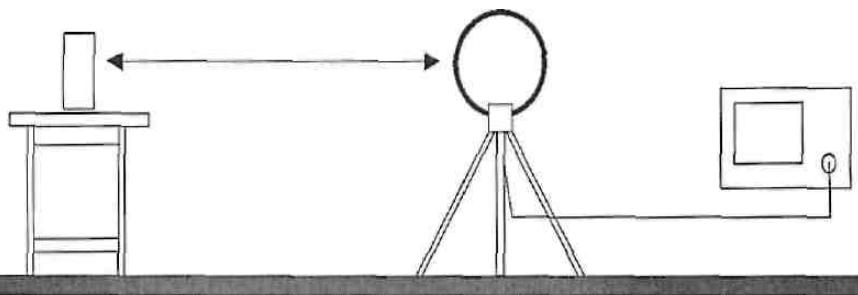
### Measurement Frequency under 1GHz



### Measurement Frequency above 1GHz



### Measurement Frequency under 30 MHz



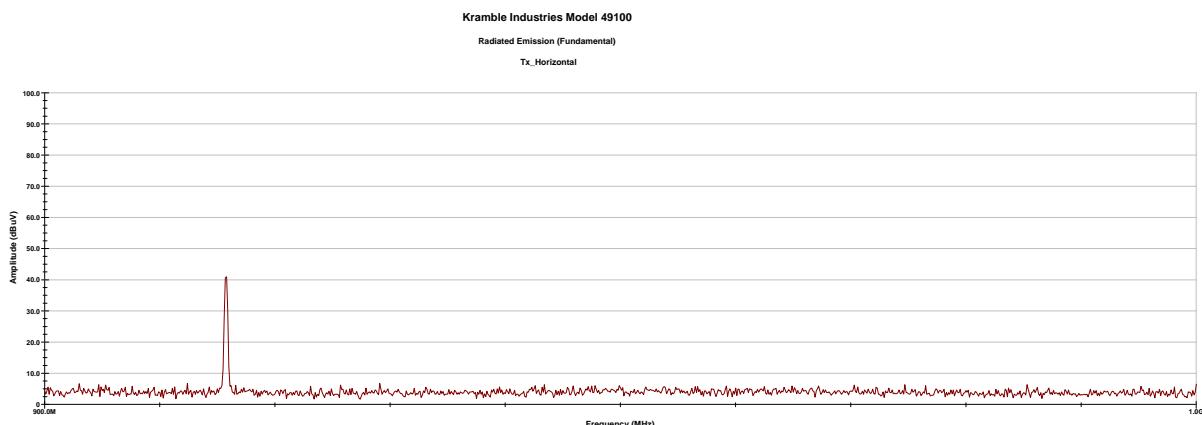


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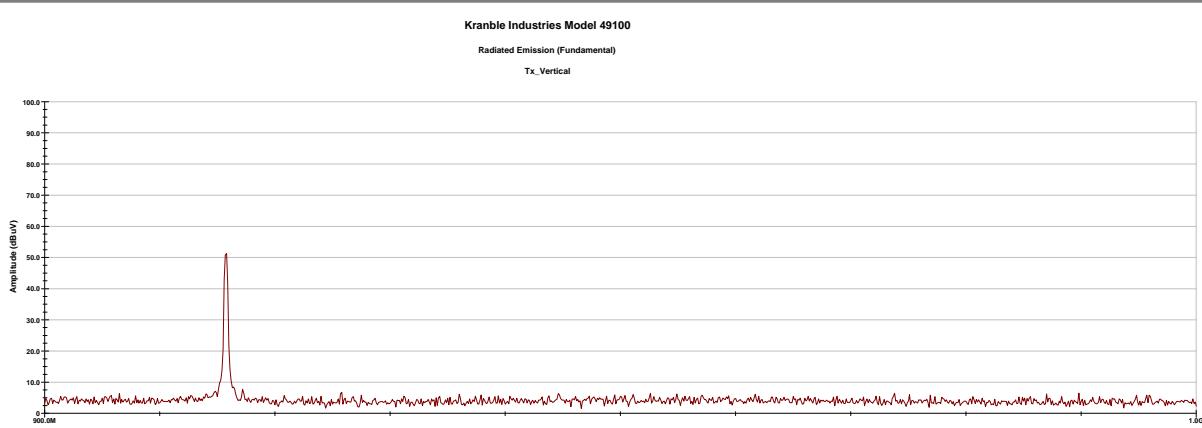


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## TX Radiated Emissions Scan, 900 MHz-1GHz, Horizontal



## TX Radiated Emissions Scan, 900 MHz-1GHz, Vertical



- Emissions for the transmitter and receiver were searched from the lowest frequency generated to the 10<sup>th</sup> harmonic of the fundamental frequency.
- All detected emissions are reported.
- Data reported was captured using a quasi-peak detector.
- The transmitter was tested with fully charged DC cells.
- N.D. = Not Detected.

Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4	DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz	
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## Fundamental Emission

$$E (\text{dBuV/m}) @ 3m = V(\text{dBuV}) @ 3m + AF_{\text{Bilog}} + CL_{\text{Total}} + CL_{4m}$$

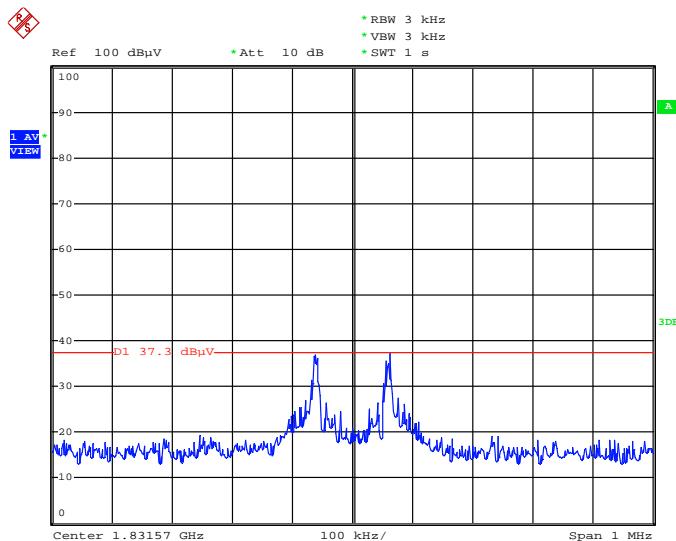
Where:

$AF_{\text{Bilog}}$  = Antenna Factor of Bilog Antenna

$CL_{\text{Total}}$  = Cable Loss of 25m Cable + Cable Loss of 4m Cable

Emission Frequency	Ant. Pol.	Maximized Level	Cable Loss	Ant. Factor	Duty Cycle Factor	Field Strength	Limit	Margin	Result
[MHz]		[dBuV]	[dB]	[dB]	[-dB]	[dBuV]	[dBuV]	[dB]	
915.8	H	40.9	3.6	23.6	0	68.1	82.0	-13.9	Pass
915.8	V	51.2	3.6	23.5	0	78.3	82.0	-3.7	Pass

## Spurious Emissions 1GHz to 10GHz



Date: 20.NOV.2015 14:36:14

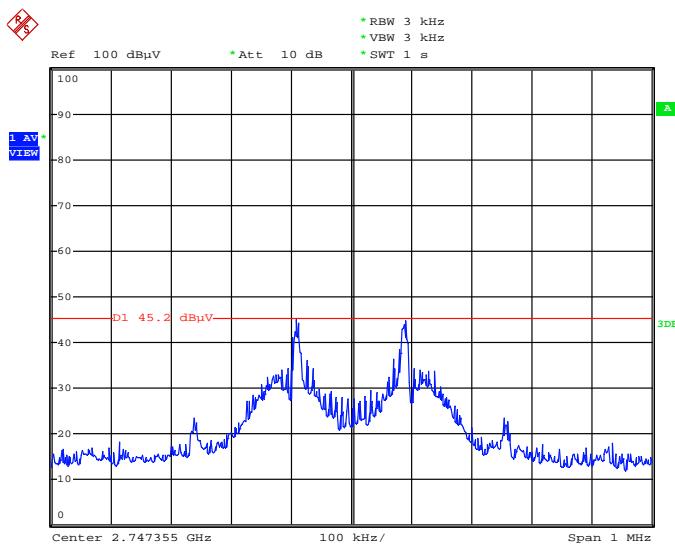
2<sup>nd</sup> Harmonic – 1.83GHz, Horizontal  
V @ 3m = 37.3dBuV

Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
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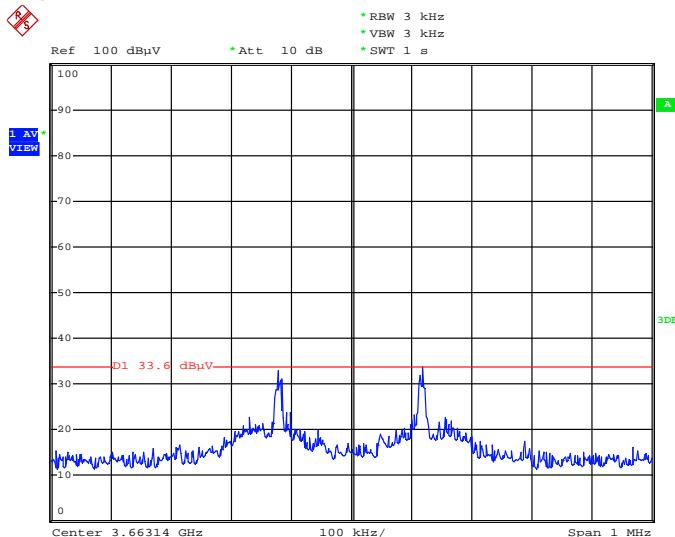


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Date: 20.NOV.2015 14:37:27

3<sup>rd</sup> Harmonic – 2.75GHz, Horizontal  
V @ 3m = 45.2dB $\mu$ V



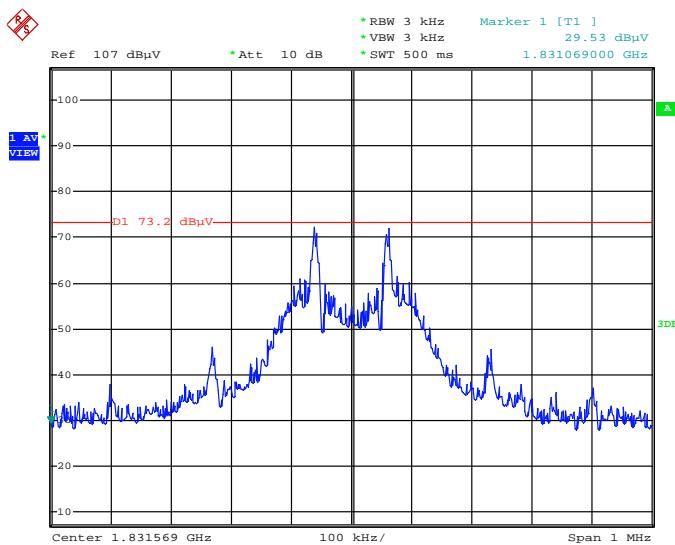
Date: 20.NOV.2015 14:38:36

4<sup>th</sup> Harmonic – 3.66GHz, Horizontal  
V @ 3m = 33.6dB $\mu$ V

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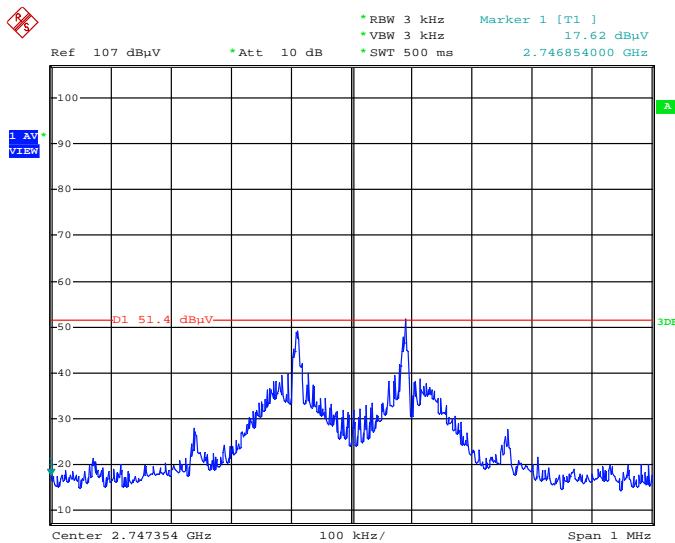


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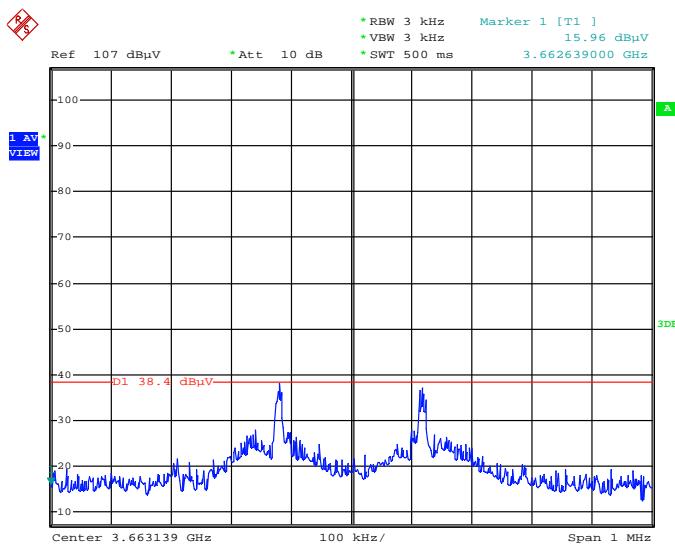
2<sup>nd</sup> Harmonic – 1.83GHz, Vertical  
V @ 3m = 73.2dBuV



Date: 20.NOV.2015 15:23:01

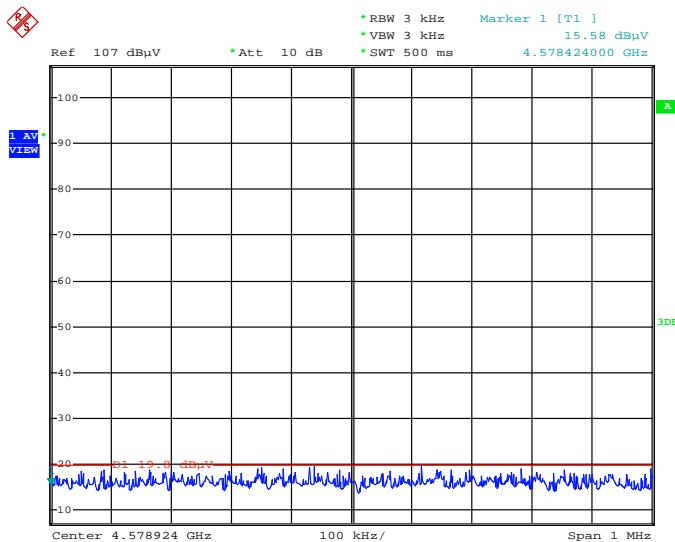
3<sup>rd</sup> Harmonic – 2.75GHz, Vertical  
V @ 3m = 51.4dBuV

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Date: 20.NOV.2015 15:23:35

4<sup>th</sup> Harmonic – 3.66GHz, Vertical  
V @ 3m = 38.4dBuV



Date: 20.NOV.2015 15:24:09

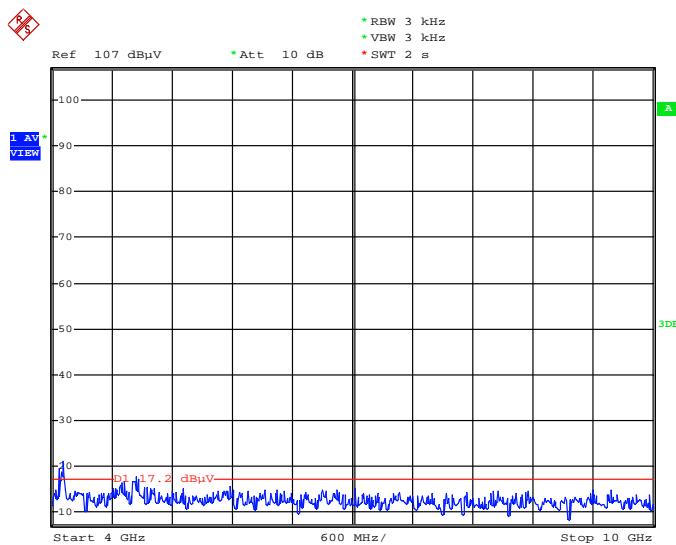
5<sup>th</sup> Harmonic –4.58GHz, Vertical  
V @ 3m = 19.8dBuV



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Date: 20.NOV.2015 15:27:27

Measurement Scan 4GHz to 10GHz, Vertical  
Max V @ 3m = 17.2dBuV

Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4	DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz	
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	Test Report Serial No.:	111115-T1336-E-15O	Report Issue Date:	2/4/2016	  Test Lab Certificate No. 2470.01
	Measurement Date(s):	Nov 11-25, 2015	Report Revision No.:	Revision 1.1	
	FCC Rule Part(s):	47 CFR §2; §15.231	FCC Test Firm Reg. No.:	Accredited	
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1	

$$E (\text{dBuV/m}) @ 3m = V(\text{dBuV}) @ 3m + AF_{\text{Horn}} + CL_{\text{Total}} + CL_{4m} + G_{\text{PreAmp}}$$

Where:

$AF_{\text{Horn}}$  = Antenna Factor of Horn Antenna (+dB)

$CL_{\text{Total}}$  = Cable Loss of 25m Cable (+dB) + Cable Loss of 4m Cable (+dB)

$G_{\text{PreAmp}}$  = Gain of PreAmp (-dB)

Emission Frequency	Antenna Pol.	Emission Level (dBuV/m) @3m	Antenna Factor	Cable Loss	PreAmp Gain	Emission Level (dBuV/m@3m)	Limit (avg)	Margin	Result
[MHz]		[dBuV]	[dB]	[dB]	[-dB]	[dBuV]	[dBuV]	[dB]	
1832.0	V	73.2	26.7	3.7	54.5	49.1	62.0	-12.9	Pass
1832.0	H	37.3	26.8	3.7	54.5	13.3	62.0	-48.7	Pass
* 2748.0	V	51.4	28.8	5.6	54.0	31.8	54.0	-22.2	Pass
* 2748.0	H	45.2	28.9	5.6	54.0	25.7	54.0	-28.3	Pass
* 3664.0	V	38.4	31.3	7.2	53.6	23.3	54.0	-30.7	Pass
* 3664.0	H	33.6	31.3	7.2	53.6	18.5	54.0	-35.5	Pass
* 4580.0	V	19.8	32.3	8.3	52.5	7.9	54.0	-46.1	Pass
* 4580.0	H	19.4	32.4	8.3	52.5	7.6	54.0	-46.4	Pass
5496.0	V	N.D. 17.2	34.1	9.2	52.0	8.5	62.0	-53.5	Pass
5496.0	H	N.D. 17.2	34.2	9.2	52.0	8.6	62.0	-53.4	Pass
6412.0	V	N.D. 17.2				---	62.0	---	Pass
6412.0	H	N.D. 17.2				---	62.0	---	Pass
* 7328.0	V	N.D. 17.2				---	54.0	---	Pass
* 7328.0	H	N.D. 17.2				---	54.0	---	Pass
* 8244.0	V	N.D. 17.2				---	54.0	---	Pass
* 8244.0	H	N.D. 17.2				---	54.0	---	Pass
9140.0	V	N.D. 17.2				---	62.0	---	Pass
9140.0	H	N.D. 17.2				---	62.0	---	Pass

\* denotes restricted band.

- Emissions for the transmitter and receiver were searched from the lowest frequency generated to the 10<sup>th</sup> harmonic of the fundamental frequency.
- All detected emissions are reported.
- Data reported was captured using a average detector.
- The transmitter was tested with fully charged DC cells.
- N.D. = Not Detected.

Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
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	Test Report Serial No.:	111115-T1336-E-15O	Report Issue Date:	2/4/2016
	Measurement Date(s):	Nov 11-25, 2015	Report Revision No.:	Revision 1.1
	FCC Rule Part(s):	47 CFR §2; §15.231	FCC Test Firm Reg. No.:	Accredited
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Test Lab Certificate No. 2470.01

### Sign-Off

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.



Art Voss  
Sr. Engineer

Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4		DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz
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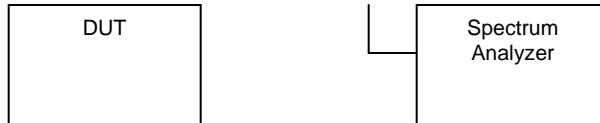


	Test Report Serial No.:	111115-T1336-E-15O	Report Issue Date:	2/4/2016
	Measurement Date(s):	Nov 11-25, 2015	Report Revision No.:	Revision 1.1
	FCC Rule Part(s):	47 CFR §2; §15.231	FCC Test Firm Reg. No.:	Accredited
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1



Test Lab Certificate No. 2470.01

## 7.5 Setup drawing

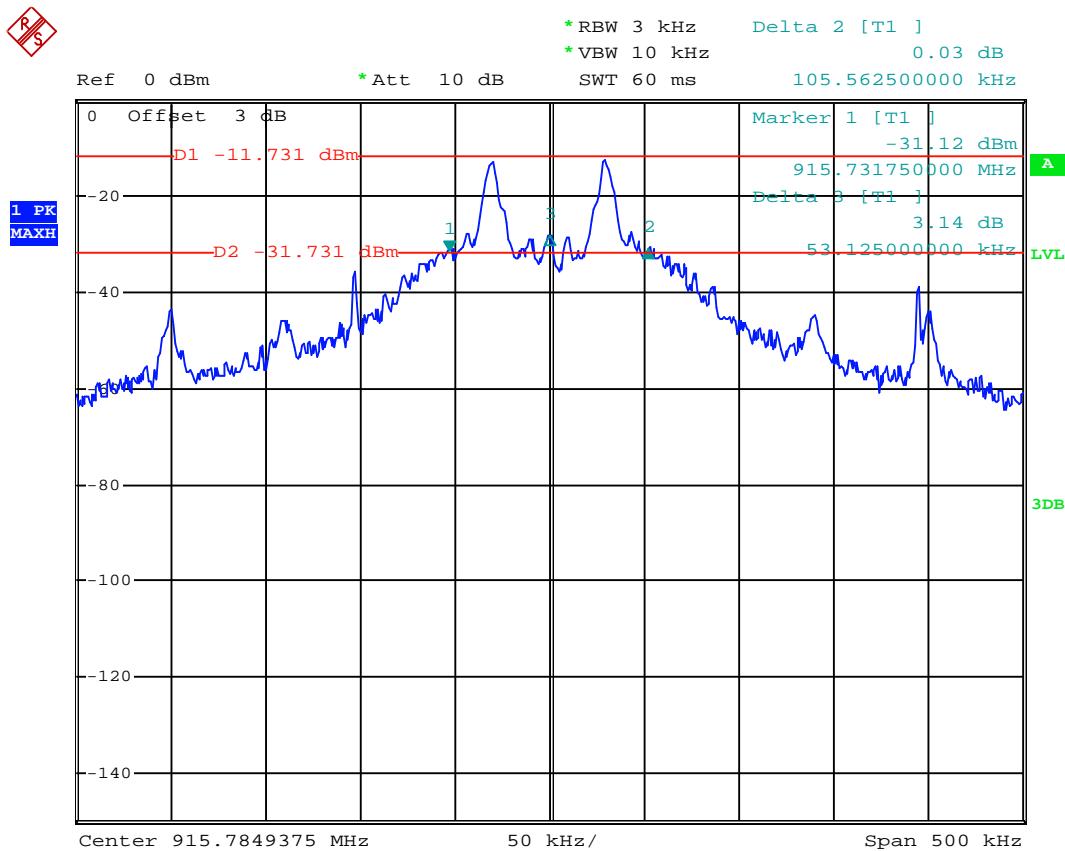


Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4	DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz	
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 <b>Celltech</b> <small>Testing and Engineering Services Ltd.</small>	Test Report Serial No.:	111115-T1336-E-15O	Report Issue Date:	2/4/2016	 
	Measurement Date(s):	Nov 11-25, 2015	Report Revision No.:	Revision 1.1	
	FCC Rule Part(s):	47 CFR §2; §15.231	FCC Test Firm Reg. No.:	Accredited	
	IC Standard(s):	RSS-210	RSS-Gen	IC Test Site No.:	IC 3874A-1

## 7.6 Test Data:

20dB Occupied Bandwidth		
TX Frequency	Measured 20dB bandwidth	Limit 20dB bandwidth
915.8 MHz	105.6 kHz	4.6 MHz



Date: 10.NOV.2015 09:43:59



Test Report Serial No.: 111115-T1336-E-15O  
Measurement Date(s): Nov 11-25, 2015  
FCC Rule Part(s): 47 CFR §2; §15.231  
IC Standard(s): RSS-210 RSS-Gen

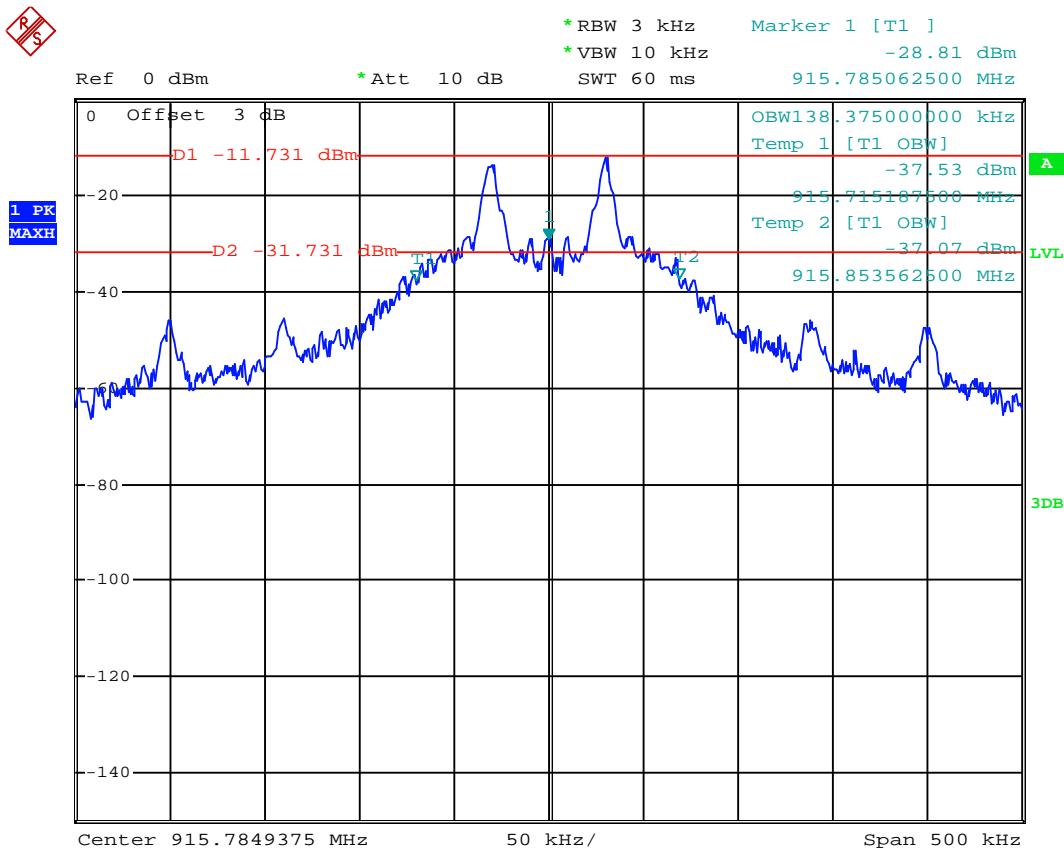
Report Issue Date: 2/4/2016  
Report Revision No.: Revision 1.1  
FCC Test Firm Reg. No.: Accredited  
IC Test Site No.: IC 3874A-1



Test Lab Certificate No. 2470.01

### 99% Occupied Bandwidth

TX Frequency	Measured 99% bandwidth	Limit 20dB bandwidth
916 MHz	138.4 kHz	4.6 MHz



Date: 10.NOV.2015 09:46:23

### Sign-Off

I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

Art Voss  
Sr. Engineer

Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4		DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz
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	Test Report Serial No.:	111115-T1336-E-15O	Report Issue Date:	2/4/2016
	Measurement Date(s):	Nov 11-25, 2015	Report Revision No.:	Revision 1.1
	FCC Rule Part(s):	47 CFR §2; §15.231	FCC Test Firm Reg. No.:	Accredited
	IC Standard(s):	RSS-210 RSS-Gen	IC Test Site No.:	IC 3874A-1



Test Lab Certificate No. 2470.01

## END OF DOCUMENT

Applicant:	Kramble Industries Inc		FCC ID:	2AHDO-FBSXLDR	IC:	21117-FBSXLDR	
DUT Model:	FBAr4	DUT Type:	Transmitter Remote Control		Tx Freq.:	916 MHz	
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