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**FCC PART 15.209, IC RSS 210
 LOW POWER TRANSMITTER
 TEST REPORT**

Applicant	ELECTRX, INC.
Address	107 SW 140th TERRACE SUITE 1 NEWBERRY FL 32669 USA
FCC ID	2AL2U-ET2000150
IC	22807-ET2000150
Models	ET20001.50, ET20001.51
Product Description	CAPSULE WITH RFID
Date Sample Received	12/18/2017
Date Tested	12/19/2017
Tested By	Tim Royer
Approved By	Franklin Rose
Test Results	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL

Report Number	Version Number	Description	Issue Date
2172AUT17TestReport	Rev1	Initial Issue	01/18/2018
	Rev2	Revised Report	02/14/2018
	Rev3	Revised Report	03/20/2018
	Rev4	Revised Report	03/29/2018

THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.

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GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

Summary

The device under test does:

- Fulfill the general approval requirements as identified in this test report and was selected by the customer.
- Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669



Sr. EMC Engineer
EMC-003838-NE



Tested by:

Name and Title: Tim Royer, Project Manager/Testing Engineer

Date: 1/5/2018



Reviewed and approved by:

Name and Title: Franklin Rose, Project Manager/Testing Technician

Date: 01/18/2018

Applicant: ETECTRX, INC.
FCC ID: 2AL2U-ET2000150
IC: 22807-ET2000150
Report: 2172AUT17TestReport_Rev4

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REPORT SUMMARY

Disclaimer	The test results only relate to the item tested.
Applicable Rule(s)	Pt 15.209, ANSI C63.4: 2014, RSS 210 , Issue 8 Amendment 1 February 2015 & RSS – 222 Issue 1 February 2015
Related Report	None

TEST ENVIRONMENT

Test Facility	Timco Engineering, Inc. 849 NW State Road 45 Newberry, FL 32669 USA. Designation #: US1070
Test Condition in the laboratory	Temperature: 26°C Relative humidity: 50%

TEST SETUP SUMMARY

Test Setup Diagram/Description	The DUT was placed on the turntable per setup per ANSI C63.4. A test set up photo is provided for clarification.
Deviation from the standard/procedure	No deviation
Modification of DUT	No modification

DUT SPECIFICATION

DUT Description	CAPSULE WITH RFID
FCC ID	2AL2U-ET2000150
IC	22807-ET2000150
Models	ET20001.50, ET20001.51
DUT Power Source	<input type="checkbox"/> 110–120Vac/50– 60Hz
	<input type="checkbox"/> DC Power
	<input checked="" type="checkbox"/> Battery Operated Exclusively
Test Item	<input type="checkbox"/> Prototype
	<input checked="" type="checkbox"/> Pre-Production
	<input type="checkbox"/> Production
Type of Equipment	<input type="checkbox"/> Fixed
	<input type="checkbox"/> Mobile
	<input checked="" type="checkbox"/> Portable
Laboratory Test Conditions	Temperature: 26°C Humidity: 55%
Modifications to DUT:	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes (explanation below)

TEST EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Antenna: Biconical 1096	Eaton	94455-1	1096	08/01/17	08/01/19
Antenna: Log-Periodic 1122	Electro-Metrics	LPA-25	1122	07/26/17	07/26/19
CHAMBER	Panashield	3M	N/A	04/25/16	03/31/18
Antenna: Double-Ridged Horn/ETS Horn 2	ETS-Lindgren	3117	00041534	03/01/17	03/01/19
Software: Field Strength Program	Timco	N/A	Version 4.10.7.0	N/A	N/A
EMI Test Receiver R & S ESU 40 Chamber	Rohde & Schwarz	ESU 40	100320	04/01/16	04/01/18
Coaxial Cable - Chamber 3 cable set (Primary)	Micro-Coax	Chamber 3 cable set (Primary)	KMKM-0244-01; KMKM-0670-00; KFKF-0198-01	08/09/16	08/09/18
Bore-sight Antenna Positioning Tower	Sunol Sciences	TLT2	N/A	N/A	N/A
Pre-amp	RF-LAMBDA	RLNA00M45GA	N/A	01/04/16	01/04/18

*EMI RECEIVER SOFTWARE VERSION

The receiver firmware used was version 4.43 Service Pack 3

TEST PROCEDURES

Radiation Interference: The test procedure used was ANSI C63.4 using a spectrum analyzer with a preselector. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The video bandwidth was always greater than or equal to the RBW.

The frequency was scanned from 30 MHz to 1.0 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. The DUT was measured in three (3) orthogonal planes when necessary.

Formula of Conversion Factors: The field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBμV) to the antenna correction factor supplied by the antenna manufacturer plus the coax loss. The antenna correction factors are stated in terms of dB. The gain of the preselector was accounted for in the spectrum analyzer meter reading.

Example:

Freq (MHz)	Meter Reading	+ ACF	+CL	= FS
33	20 dBμV	+ 10.36 dB/m	+0.40 dB	= 30.76 dBμV/m @ 3m

ANSI C63.4 Measurement Procedures: The EUT was placed on a non-conducting table 80 cm above the ground plane with the EUT located in the center of the table. With the antenna vertical a preliminary scan was done at 1 meters distance, the EUT was moved to a 3.0-meter distance and the antenna height varied and also placed in a horizontal position.

RADIATED SPURIOUS EMISSIONS

Rules Part No.: 15.109(a) and 15.209, RSS-GEN, RSS-210

Requirements: CARRIER FREQUENCY WILL NOT EXCEED 2400/F (kHz) $\mu\text{V}/\text{m}$ AT 300 METERS

OUT-OF-BAND EMISSIONS SHALL NOT EXCEED THE LEVEL OF THE FUNDAMENTAL.

15.209 Limit

Frequency MHz	Limits
9 – 490 kHz	2400/F (kHz) $\mu\text{V}/\text{m}$ @ 300 meters
490 – 1705 kHz	24000/F (kHz) $\mu\text{V}/\text{m}$ @ 30 meters
1705 – 30 MHz	29.54 dB $\mu\text{V}/\text{m}$ measured @ 30 meters
30 – 88	40.0 dB $\mu\text{V}/\text{m}$ measured @ 3 meters
88 – 216	43.5 dB $\mu\text{V}/\text{m}$ measured @ 3 meters
216 – 960	46.0 dB $\mu\text{V}/\text{m}$ measured @ 3 meters
Above 960	54.0 dB $\mu\text{V}/\text{m}$ measured @ 3 meters

RSS-GEN Limit

Table 4 – General Field Strength Limits for Licence-Exempt Transmitters at Frequencies Above 30 MHz	
Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$ at 3 metres)
30-88	100
88-216	150
216-960	200
Above 960*	500

RADIATED SPURIOUS EMISSIONS

TEST DATA: CUT TAG MODEL ET20001.51 DATA

Tuned Freq MHz	Emission Frequency MHz	Detector		Meter Reading dBu V	Antenna Polarity	Coax Loss Db	Correction Factor dB/M	Field Strength dBu V/M
315	103.6	PK		5.900	V	1.17	10.80	17.87
315	103.6	PK		4.650	H	1.17	10.80	16.62
315	316.0	QP		1.300	V	2.09	13.80	17.19
315	316.0	QP		-1.100	H	2.09	13.80	14.79
315	4653.8	PK	*	9.380	V	8.16	34.23	51.77
315	4758.0	PK	*	9.660	H	8.23	34.05	51.94

299	103.6	PK		7.280	V	1.17	10.80	19.25
299	103.6	PK		2.080	H	1.17	10.80	14.05
299	300.0	QP		2.800	V	2.08	13.80	18.68
299	300.0	QP		3.500	H	2.08	13.80	19.38
299	843.6	PK		4.980	H	3.46	22.42	30.86
299	843.6	QP		-4.000	H	3.46	22.42	21.88
299	3833.3	PK	*	0.560	H	7.39	33.53	41.48
299	4025.6	PK	*	-0.860	V	7.58	33.42	40.14

306	103.8	PK		7.510	V	1.18	10.52	19.21
306	103.8	QP		1.920	V	1.18	10.52	13.62
306	306.0	QP		8.200	V	2.08	13.70	23.98
306	306.0	QP		4.400	H	2.08	13.70	20.18
306	926.9	PK		15.360	V	3.58	23.51	42.45
306	926.9	PK		-3.900	V	3.58	23.51	23.19
306	1717.9	PK	*	10.490	V	4.78	29.33	44.60
306	2448.7	PK	*	10.610	H	5.92	32.63	49.16

*- denotes ambient measurement

RADIATED SPURIOUS EMISSIONS

TEST DATA: UN-CUT TAG MODEL ET20001.50 DATA

Tuned Freq MHz	Emission Frequency MHz	Detector		Meter Reading dBu V	Antenna Polarity	Coax Loss Db	Correction Factor dB/M	Field Strength dBu V/M	Margin
305	103.0	PK		6.23	V	1.17	10.80	18.20	35.80
305	103.0	PK		8.10	H	1.17	10.80	20.07	33.93
305	305.1	QP		11.50	V	2.08	13.79	27.37	26.63
305	305.1	QP		5.40	H	2.08	13.79	21.27	32.73
305	914.0	PK		13.68	V	3.56	23.00	40.24	13.76
305	915.0	PK		5.18	H	3.57	23.10	31.85	22.15
305	915.1	QP		-2.40	H	3.57	23.12	24.29	29.71
305	915.1	QP		-1.90	V	3.57	23.12	24.79	29.21
305	2256.0	PK	*	13.67	V	5.69	31.97	51.33	2.67
305	2256.0	PK	*	11.75	H	5.69	31.97	49.41	4.59
305	4134.0	PK	*	8.70	V	7.68	33.48	49.86	4.14
305	4237.0	PK	*	11.01	H	7.77	33.59	52.37	1.63

*- denotes ambient measurement

RADIATED SPURIOUS EMISSIONS

TEST DATA: UNCUT TAG DATA, Con't.

Tuned Freq MHz	Emission Frequency MHz		Detector	Meter Reading dBu V	Antenna Polarity	Coax Loss Db	Correction Factor dB/M	Field Strength dBu V/M	Margin
314	103.5		PK	6.18	V	1.17	10.80	18.15	25.37
314	103.5		PK	4.92	H	1.17	10.80	16.89	26.63
314	314.1		QP	2.30	H	2.08	13.71	18.09	27.93
314	314.1		QP	9.20	V	2.08	13.71	24.99	21.03
314	938.0		PK	7.27	V	3.59	23.50	34.36	11.66
314	938.0		PK	8.40	V	3.59	23.50	35.49	10.53
314	938.1		QP	-3.30	V	3.59	23.51	23.80	22.22
314	3849.6	*	PK	9.31	H	7.41	33.57	50.29	3.69
314	4762.8	*	PK	8.24	V	8.23	34.06	50.53	3.45
310	33.8		PK	8.53	V	0.66	13.28	22.47	17.53
310	33.8		PK	3.40	V	0.66	13.28	17.34	22.66
310	103.0		QP	6.72	V	1.17	10.60	18.49	25.03
310	103.0		PK	8.97	H	1.17	10.60	20.74	22.78
310	103.0		QP	-0.30	H	1.17	10.60	11.47	32.05
310	310.1		QP	6.10	V	2.08	13.70	21.88	24.14
310	310.1		QP	5.40	H	2.08	13.70	21.18	24.84
310	836.2		PK	4.28	H	3.43	21.90	29.61	16.41
310	836.2		QP	-4.10	H	3.43	21.90	21.23	24.79
310	3769.0	*	PK	8.58	H	7.30	33.59	49.47	4.51
310	3929.0	*	PK	8.32	V	7.50	33.44	49.26	4.72
310	4551.2	*	PK	7.76	H	8.09	33.91	49.76	4.22

*- denotes ambient measurement

OCCUPIED BANDWIDTH

Rules Part No.: FCC 2.1049

FCC Requirements: Reporting only

Test Method: ANSI C63.10 § 6.9.3 Occupied bandwidth-99% procedure

Setup:



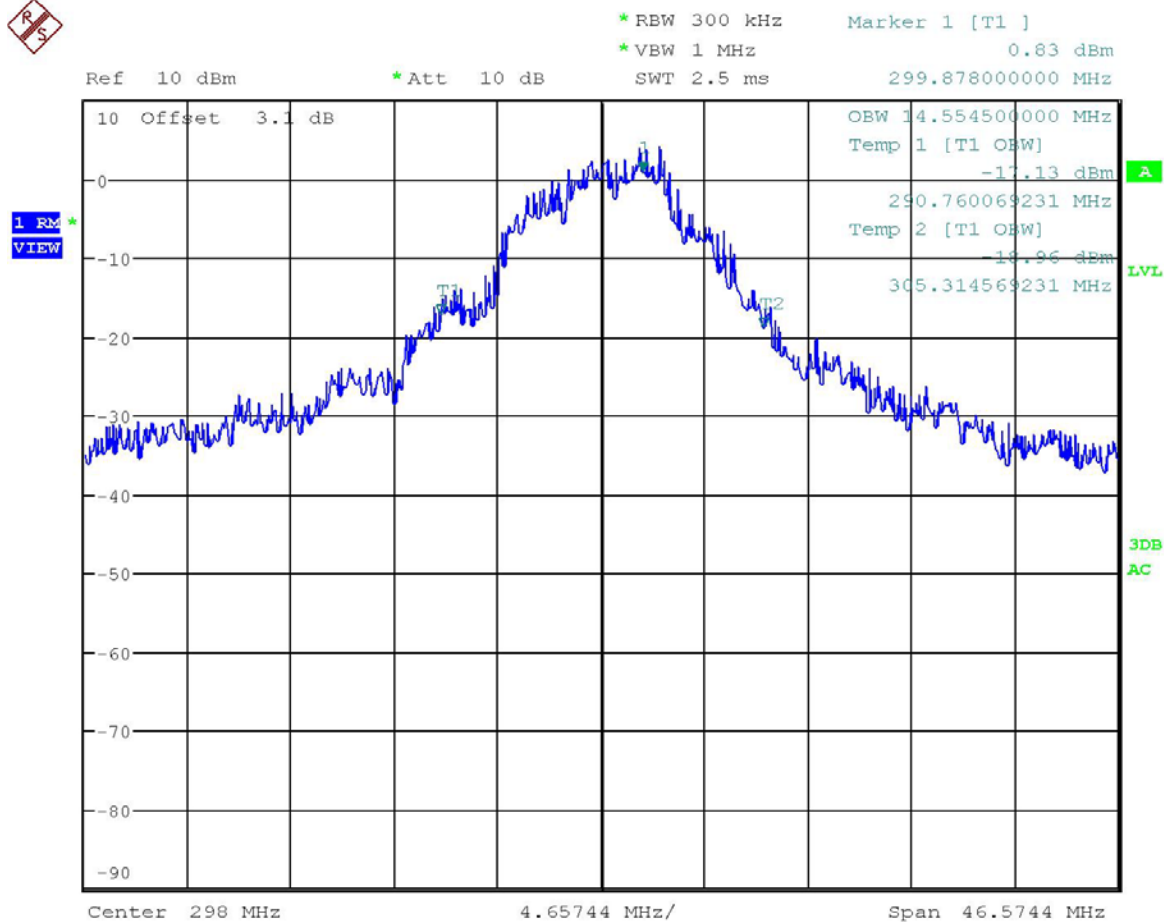
TEST DATA: 99% OCCUPIED BANDWIDTH MEASUREMENT TABLE

Tuned Frequency (MHz)	BW (MHz)
298	14.55
303	17.9
310	18.2

RESULTS: Meets Requirements

OCCUPIED BANDWIDTH

TEST DATA: 99% OBW: LOW END OF BAND PLOT



Date: 19.DEC.2017 09:43:27

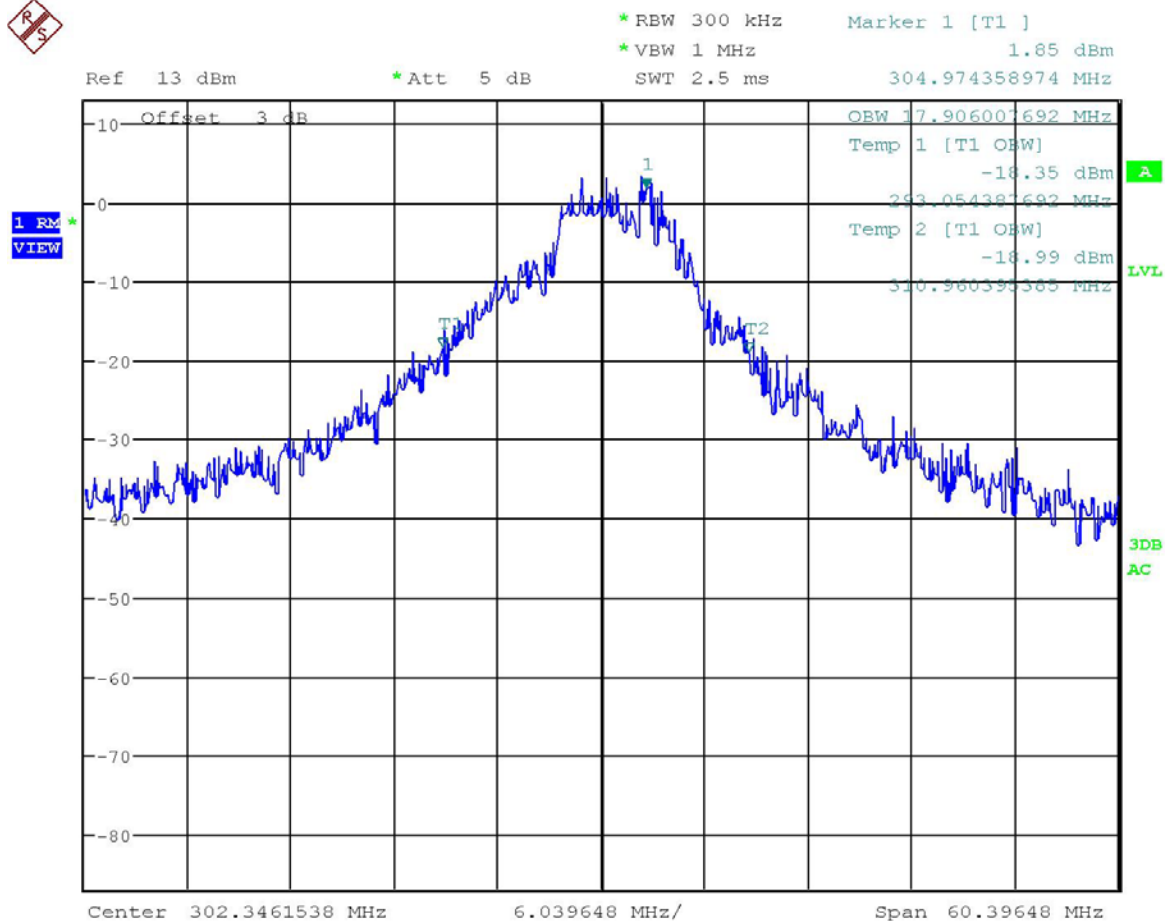
RESULTS: Meets Requirements

Applicant: ETECTRX, INC.
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OCCUPIED BANDWIDTH

TEST DATA: 99% OBW MIDDLE OF BAND PLOT



Date: 19.DEC.2017 10:17:16

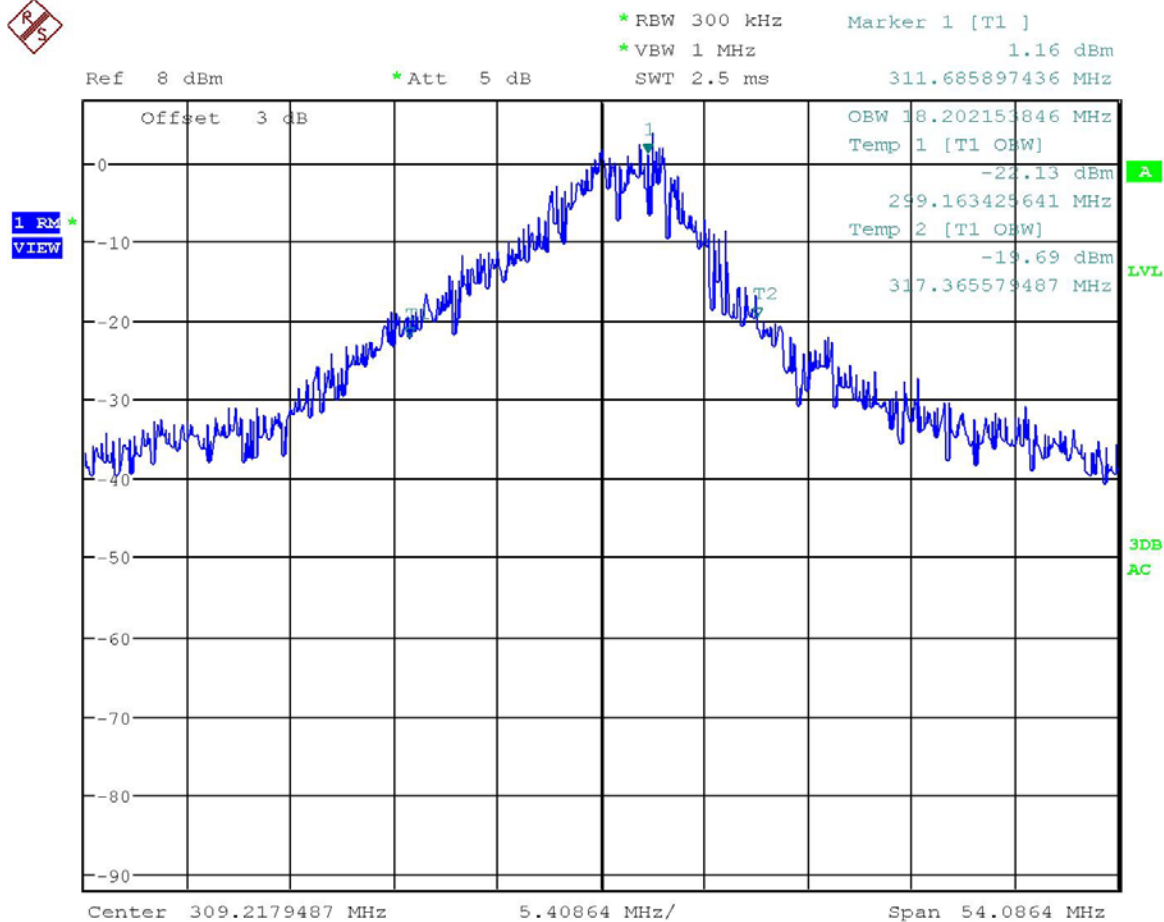
RESULTS: Meets Requirements

Applicant: ETECTRX, INC.
 FCC ID: 2AL2U-ET2000150
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OCCUPIED BANDWIDTH

TEST DATA: 99% OBW HIGH END OF BAND PLOT



Date: 19.DEC.2017 10:06:06

RESULTS: Meets Requirements

END OF TEST REPORT

Applicant: ETECTRX, INC.
 FCC ID: 2AL2U-ET2000150
 IC: 22807-ET2000150
 Report: 2172AUT17TestReport_Rev4

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