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TIMCO ENGINEERING, Inc.

An IIA Company

RF Exposure Evaluation Report

APPLICANT	TERMA A/S
ADDRESS	HOVMARKEN 4 LYSTRUP DK-8520
FCC ID	N9MSC5000
MODEL NUMBER	SCANTER 5602, SCANTER 5202, SCANTER 6002
PRODUCT DESCRIPTION	RADIODETERMINATION RADAR
DATE SAMPLE RECEIVED	07/15/2019
FINAL TEST DATE	07/18/2019
PREPARED BY	Franklin Rose

Report Number	Report Version	Description	Issue Date
1830AUT19 MPE_TestReport_	Rev1	Initial Issue	08/19/2019

TABLE OF CONTENTS

GENERAL REMARKS

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
Designation #: US1070

Prepared by:

Name and Title	Franklin Rose, EMC Project Manager / EMC Specialist
Date	08/20/2019

GENERAL INFORMATION

EUT Description	RADIODETERMINATION RADAR		
Model Number	SCANTER 5602, SCANTER 5202, SCANTER 6002		
EUT Power Source	☒110–120 VAC	☐ DC Power (12 V)	☐ Battery Operated
Test Item	☐ Prototype	☐ Pre-Production	☒ Production
Type of Equipment	☒ Fixed	☐ Mobile	☐ Portable
Antenna Connector	WR-90 Waveguide		
Test Conditions	The temperature was 26ºC Relative humidity of 50%.		
Modification to the EUT	No Modification to EUT.		
Applicable Standards	FCC CFR 47 Part 2.1091, RSS-102		
Test Facility	Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA. Designation #: US1070		

NOTES:

At present, the radar is manufactured as a separate enclosure from the antenna and antenna pedestal.

In all cases, the radar equipment is intended for controlled/occupational use and access only. General population MPE distances have also been provided, for reference.

The diagrams in this report visually represent the calculated MPE standoffs for a) each antenna type, and b) the equipment itself, outside the antenna's line of sight.

ANTENNA INFORMATION

This information was provided by the client:

	Antenna 1	Antenna 2
Name	21' HG-HP-C-37	21' HG-HP-I-37
Primary Use	Air Surveillance	SMR
Size (HxLxD) (meters)	1.11 x 6.56 x 1.0	1.11 x 6.56 x 1.0
Type	Linear Array	Linear Array
Gain	≥ 37 dBi	≥ 37 dBi
-3 dB Beamwidth (h)	≤ 0.36 °	≤ 0.36 °
-3 dB Beamwidth (v)	≤ 11 °	≤ 11 °
Tilt Angle	0.6 °	-0.6 °
Sidelobe Suppression	1.5 - 5° ≥ 28 dB 5 - 10° ≥ 30 dB ≥ 10° ≥ 35 dB	1.5 - 5° ≥ 28 dB 5 - 10° ≥ 30 dB ≥ 10° ≥ 35 dB
Backlobe Suppression	≥ 35 dB	≥ 35 dB

Manufacturer-Provided Antenna	Type	Typical Gain (dBi)
Typical use: Air Surveillance	Linear Array 21' HG-HP-C-37	**37.0**
Typical use: SMR	Linear Array 21' HG-HP-I-37	**37.0**

Note: All parameters which effect MPE distance are identical in both antenna systems. One MPE calculation will be done which is valid for both systems, noting of course the difference in tilt angle from the antenna, which does not have any bearing on MPE distances.

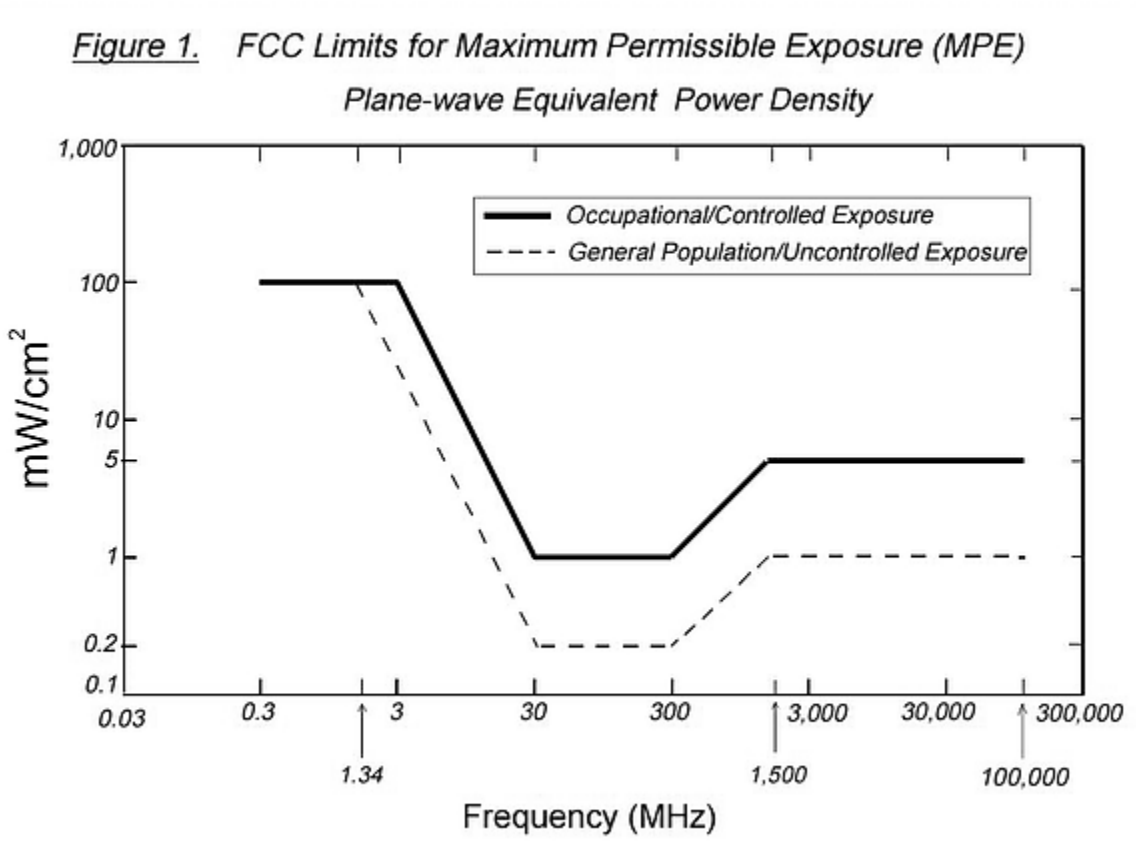
MPE CALCULATION

The minimum separation distance is calculated as follows:

$$E(V/m) = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power density: } P_d(mW/cm^2) = \frac{E^2}{3770}$$

MPE LIMITS

Figure 1. FCC Limits for Maximum Permissible Exposure (MPE)



MPE DATA

FCC MPE Calculation: Linear Array 21' HG-HP-C-37 & 21' HG-HP-I-37 Antennas

Inside Beam (≤ 0.36° Horizontal Polarity, ≤ 11° Vertical Polarity)

1. **General <u>Uncontrolled</u> Exposure Environment**: The limit for general uncontrolled exposure environment is shown in FCC rule Part 1.1310, Table 1B.

Variable	Value
Max Power	202.85 W
Duty Cycle (at full power)	20.00%
Nominal Antenna Gain	37 dBi
Losses	0 dB
Nominal Transmit Frequency	9100 MHz
Power Density	1.00 mW/cm^2
Minimum Separation Distance	4022.51 cm

2. **General <u>Controlled</u> Exposure Environment**: The limit for controlled exposure environment is shown in FCC rule Part 1.1310, Table 1A.

Variable	Value
Max Power	202.85 W
Duty Cycle (at full power)	20.00%
Max Antenna Gain	37 dBi
Losses	0 dB
Maximum Transmit Frequency	9100 MHz
Power Density	5.00 mW/cm^2
Minimum Separation Distance	1798.92 cm

MPE CALCULATION

Outside Beam (> 10° Horizontal Polarity, > 11° Vertical Polarity)

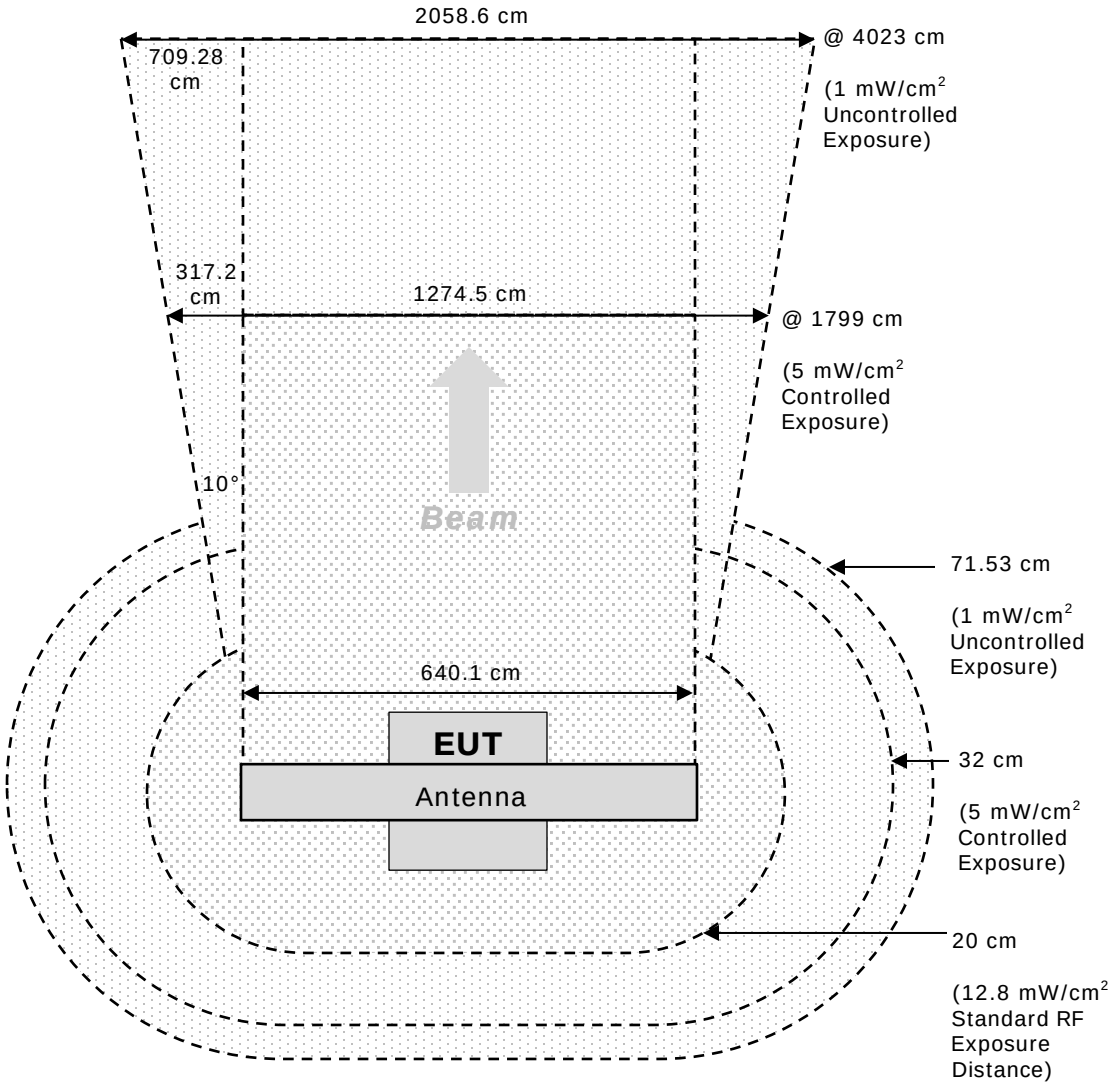
3. **General <u>Uncontrolled</u> Exposure Environment**: The limit for general uncontrolled exposure environment is shown in FCC rule Part 1.1310, Table 1B.

Variable	Value
Max Power	202.85 W
Duty Cycle (at full power)	20.00%
Max Antenna Gain	37 dBi
Losses	35 dB
Transmit Frequency	9100 MHz
Power Density	1 mW/cm^2
Minimum Separation Distance	71.53 cm

4. **General <u>Controlled</u> Exposure Environment**: The limit for controlled exposure environment is shown in FCC rule Part 1.1310, Table 1A.

Variable	Value
Max Power	202.85 W
Duty Cycle (at full power)	20.00%
Max Antenna Gain	37 dBi
Losses	35 dB
Maximum Transmit Frequency	9100 MHz
Power Density	1.09 mW/cm^2
Minimum Separation Distance	31.99 cm

FCC MPE Diagram, 21' HG-HP-C-37 & 21' HG-HP-I-37 Antennas, Top View



FCC MPE Diagram, 21' HG-HP-C-37 & 21' HG-HP-I-37 Antennas, Side View