HADECS 3



Site Calibration Certificate

M60-9172A-004

Motorway: M60

Site Location: 9172A

HADECS 3 Equipment

Camera Head Enclosure Serial No			816097006
Control Unit Serial No			816149007
Radar Assembly Serial No			8541570003
Radar Serial No			101334-0004
Radar Calibration Date	16/02/2021	until	16/02/2022

HADECS 3 Software

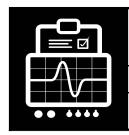
Camera Head Enclosure Version No	0.3.13
Control Unit Version No	0.3.3
Radar Version No	MI-146-5 5C57811F
Instation ERCU Version No	3.0.0.0

Valid until

Date Next Calibration Due:	16/02/2022

I certify that the HADECS equipment identified above complies with the terms of the specification for Type Approval and has passed all necessary calibration checks on the date recorded below.

Signed:		24/03/2021
Technica	al Manager	DATE



ENVIRONMENTAL DATA

Programmable Power Supply

TEST **EQUIPMENT:**

HYPERION[™]

PRODUCT TEST:

342 CERTIFICATE OF CALIBRATION

AGD Systems Limited ADDRESS:

White Lion House, Gloucester Road, Staverton Cheltenham, Gloucestershire, GL51 0TF, UK

T: +44 (0) 1452 854212 W: agd-systems.com



PRODUCT IDENTIFICATION	
CERTIFICATE NUMBER	34200224
MODEL	AGD342-100-000
SERIAL NUMBER	101334-0004
SECURITY ID	0D440344,6279574C,99F299F2,40304030
SOFTWARE VERSION	APPLICATION CODE MI-146-5 CSUM 5C57811F
DATE OF CALIBRATION	16 February 2021
CALIBRATION PROCEDURE REFERENCE	CAL-022 Issue 1
COMMENTS / TYPE	ОЕМ

PASS

08/07/2022

TEMPERATURE (°C):	19.1	RELATIVE HUMIDITY (%):	45.5	
CALIBRATION STANDARDS				
INSTRUMENT DESCRIPTION	SERIAL NUMBER	CALIBRATION CERTIFICATE NUMBER	NEXT CALIBRATION DUE DATE	
TE0320: Rohde and Schwarz FSP40 Spectrum Analyser	100395/040	475958	21/08/2021	
TE0401: Pendulum/Spectracom CNT- 90XL Frequency Counter	187934	1-10004369473	14/06/2021	
TE0366: Tektronix AFG3022B Arbitrary/Function Generator	C034314	TERISO_656276	12/07/2021	
TE0429: Comet T3610 Temperature/Humidity Meter	14960950	TE0429-CAL005	08/01/2022	
TE0383: AGD Systems TRTS True Ranging Target Simulator	TE0383	TE0383-CAL008	24/03/2021	
TE0432: Kikusui PCR500M AC/DC	UG001557	239441-03-002	08/07/2022	

This unit has been calibrated to standards whose accuracies are traceable to National Standards except where none exist, and the units of measurement realised at the National Physical Laboratory (NPL) or other national standards laboratories.

239441-03-002

The unit was calibrated in accordance with our Quality Management System which complies with BS EN ISO 9001:2008.

UG001557

This certificate of calibration shall not be reproduced except in full, without written approval of AGD Systems Limited.

CALIBRATION BY: NEXT CALIBRATION DUE: 16/02/2022

Form AP324 Issue 3 Page 1 of 3 VISUAL INSPECTION No observations

OPERATING VOLTAGES (DC)									
	SPEED ((30mph)	RANGE	RANGE (53.4m)		CURRENT (mA)			
VOLTAGE	MEASURED	LIMITS	MEASURED	LIMITS	MEASURED	LIMITS	PASS/FAIL		
10	30.0	29.7 - 30.3	52.5	50.0 - 55.0	303	280 - 330	PASS		
12	30.0	29.7 - 30.3	52.4	50.0 - 55.0	251	230 - 280	PASS		
16	30.0	29.7 - 30.3	52.3	50.0 - 55.0	191	170 - 220	PASS		
9.5	UNI	DER VOLTAGE (<	10V)		SOLID LED		PASS		
16.5	OV	ER VOLTAGE (>1	6V)		FLASHING LED)	PASS		
RADAR M	ODULE								
			MEASURED		LIMITS	;	PASS/FAIL		
TX FREQUENCY LOW (GHz) 24.096					PASS				
TX FREQUE	TX FREQUENCY HIGH (GHz) 24.1040 24.100 - 24.110				PASS				
TX FREQUE	(FREQUENCY CENTRE (GHz) 24.1000 24.098 - 24.102				PASS				
TX BANDW	8.800 8.0 - 10.0				PASS				
DIGITISING	FREQUENCY (H	z)	50001.5	49995.0 - 50005.0			PASS		
			MEASURED		LIMITS (Ambient +20°C)				
BOARD TEN	1PERATURE (°C)	27.3		19.1 - 39.1				
SIMULAT	ED RADAR O	JTPUT							
		SF	PEED (mph)		RANGE (m)			
TARGET	DIRECTION	MEASURED	LIMITS	MEA	MEASURED LIM		PASS/FAIL		
*TS=1,A	Х	50.0	49.8 - 50	.2 1	6.0 1	5.5 - 16.5	PASS		
*TS=1,R	Y	50.0	49.8 - 50	.2 1	5.9 1	5.5 - 16.5	PASS		
*TS=12,A	Х	189.9	189.5 - 19	0.5 6	4.0	3.5 - 64.5	PASS		
*TS=12,R	Υ	190.1	189.5 - 19	0.5 6	4.0	3.5 - 64.5	PASS		

COUNTER BANDWIDTH = 8.3MHz (for reference only) PRODUCT PARAMATERS (BAUD 460800) - Pass

Limits specified during calibration have taken into account the measurement uncertainties of the instruments used.

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CHECK OPERATIONAL SETTINGS

	Doppler	Simulated	Simulated	Advancing Receding		g	Limits			D/5-11			
1999 5.4 30.0 5.4 30.0 87.4 5.5 30.0 87.2 3.4-7.4 297-30.3 82.0-90.0 Pass 3332 5.4 40.0 5.5 40.0 87.0 5.4 40.0 87.2 3.4-7.4 497-50.3 82.0-90.0 Pass 3998 5.4 60.0 5.4 60.0 87.2 3.4-7.4 497-50.3 82.0-90.0 Pass 4665 5.4 60.0 5.4 80.0 87.2 5.4 80.7 87.7 97-70.3 82.0-90.0 Pass 5331 5.4 80.0 5.4 80.0 87.2 5.4 90.0 87.3 3.4-7.4 97-70.3 82.0-90.0 Pass 5998 5.4 100.0 5.5 100.0 86.9 5.4 100.0 89.7 25.4 90.0 87.3 3.4-7.4 99.7-10.0 28.2 29.9 10.0 25.5 90.0 83.1 25.5 90.0 83.1 25.5 90.0	Frequency	Range	Speed	Range	Speed	Power	Range	Speed	Power	Range	Speed	Power	Pass/Fail
2666 5.4 40.0 5.5 40.0 87.0 54.4 40.0 87.0 34.74 39.7-40.3 82.0-90.0 Pass 3332 5.4 50.0 5.5 50.0 87.2 54.4 50.0 87.2 34.74 49.7-50.3 82.0-90.0 Pass 3998 5.4 60.0 57.4 60.0 87.2 34.74 97.7-60.3 82.0-90.0 Pass 6365 5.4 80.0 5.4 80.0 87.2 5.5 80.0 87.2 34.74 97.7-80.3 82.0-90.0 Pass 6998 5.4 90.0 5.5 90.0 87.2 5.4 90.0 87.3 34.74 97.7-80.3 82.0-90.0 Pass 1333 25.9 20.0 25.5 20.0 83.1 25.5 20.0 83.0 23.9-27.9 97.7-0.03 78.0-80.0 Pass 1999 25.9 30.0 25.5 80.0 83.1 25.5 90.0 83.2 25	1333	5.4	20.0	5.4	20.0	87.2	5.5	20.0	87.1	3.4-7.4	19.7-20.3	82.0-90.0	Pass
3332 5.4 50.0 6.5 50.0 87.2 5.4 60.0 87.2 3.4 4.00 7.5 50.0 87.2 5.4 60.0 87.2 3.4 4.0 57.6 3.0 87.2 3.4 4.0 57.6 3.0 86.9 5.4 70.0 86.9 3.4 7.0 86.9 5.4 70.0 86.9 3.4 7.0 87.2 5.5 80.0 87.2 3.4 7.7 79.7 80.3 82.0 90.0 87.2 5.4 90.0 87.3 3.4 7.0 80.0 90.0 87.3 3.4 7.0 80.0 80.0 25.7 90.0 90.0 90.0 87.3 3.4 7.0 97.7 90.0 82.0 90.0 83.0 23.7 27.7 97.7 90.3 82.0 90.0 90.0 83.0 23.7 27.7 97.7 90.0 80.0 83.0 23.7 27.7 97.7 90.0 80.0 83.0 23.7<	1999	5.4	30.0	5.4	30.0	87.4	5.5	30.0	87.2	3.4-7.4	29.7-30.3	82.0-90.0	Pass
3998 5.4 60.0 5.4 60.0 87.3 5.4 60.0 87.2 3.4.7.4 597.60.3 82.0-90.0 Pass 4665 5.4 70.0 6.6 70.0 86.9 5.4 70.0 86.9 3.4.7.4 69.7.70.3 82.0-90.0 Pass 5331 5.4 80.0 5.4 80.0 87.2 5.5 80.0 87.2 3.4.7.4 797.80.3 82.0-90.0 Pass 5998 5.4 90.0 5.5 100.0 86.9 5.4 100.0 86.9 3.4.7.4 89.7.90.3 82.0-90.0 Pass 1333 25.9 20.0 25.5 20.0 83.1 25.5 20.0 83.0 23.2-27.9 197.90.3 78.0-86.0 Pass 2666 25.9 40.0 25.6 40.0 83.0 25.7 99.7-60.3 78.0-86.0 Pass 3332 25.9 60.0 25.5 60.0 83.3 <t>25.6 60.0 83.2 <t< td=""><td>2666</td><td>5.4</td><td>40.0</td><td>5.5</td><td>40.0</td><td>87.0</td><td>5.4</td><td>40.0</td><td>87.0</td><td>3.4-7.4</td><td>39.7-40.3</td><td>82.0-90.0</td><td>Pass</td></t<></t>	2666	5.4	40.0	5.5	40.0	87.0	5.4	40.0	87.0	3.4-7.4	39.7-40.3	82.0-90.0	Pass
4665 5.4 70.0 5.6 70.0 86.9 5.4 70.0 86.9 3.4-7.4 69.7-70.3 82.0-90.0 Pass 5331 5.4 80.0 5.4 80.0 87.2 5.5 80.0 87.2 3.4-7.4 79.7-80.3 82.0-90.0 Pass 5998 5.4 90.0 5.4 90.0 87.2 5.4 90.0 87.3 3.4-7.4 89.7-90.3 82.0-90.0 Pass 6664 5.4 100.0 5.5 100.0 86.9 5.4 100.0 86.9 3.4-7.4 99.7-100.3 82.0-90.0 Pass 1333 25.9 20.0 25.5 20.0 83.1 25.5 20.0 83.2 23.9-27.9 19.7-20.3 78.0-86.0 Pass 2666 25.9 40.0 25.5 80.0 83.2 23.9-27.9 49.7-50.3 78.0-86.0 Pass 3938 25.9 60.0 25.5 80.0 83.2 23.9-27.9 49.7-70.3 <th< td=""><td>3332</td><td>5.4</td><td>50.0</td><td>5.5</td><td>50.0</td><td>87.2</td><td>5.4</td><td>50.0</td><td>87.2</td><td>3.4-7.4</td><td>49.7-50.3</td><td>82.0-90.0</td><td>Pass</td></th<>	3332	5.4	50.0	5.5	50.0	87.2	5.4	50.0	87.2	3.4-7.4	49.7-50.3	82.0-90.0	Pass
5331 5.4 80.0 5.4 80.0 87.2 5.5 80.0 87.2 3.4-7.4 79.7-80.3 82.0-90.0 Pass 5998 5.4 90.0 5.4 90.0 87.2 5.4 90.0 87.3 3.4-7.4 89.7-90.3 82.0-90.0 Pass 6664 5.4 100.0 5.5 100.0 86.9 5.4 100.0 86.9 3.4-7.4 89.7-90.3 82.0-90.0 Pass 1333 25.9 20.0 25.5 20.0 83.1 25.5 20.0 83.2 22.5-2 20.0 83.0 23.9-27.9 19.7-20.3 78.0-86.0 Pass 1999 25.9 30.0 25.6 40.0 83.0 25.5 30.0 33.2 25.5 30.0 83.2 23.9-27.9 97.7-3.3 78.0-86.0 Pass 3332 25.9 60.0 25.5 60.0 83.1 25.6 60.0 83.2 23.9-27.9 97.7-60.3 78.0-86.0 Pass	3998	5.4	60.0	5.4	60.0	87.3	5.4	60.0	87.2	3.4-7.4	59.7-60.3	82.0-90.0	Pass
5998 5.4 90.0 5.4 90.0 87.2 5.4 90.0 87.3 3.4-7.4 89.7-90.3 82.0-90.0 Pass 6664 5.4 100.0 5.5 100.0 86.9 5.4 100.0 86.9 3.4-7.4 89.7-90.3 82.0-90.0 Pass 1333 25.9 20.0 25.5 20.0 83.1 25.5 20.0 83.0 23.9-27.9 19.7-20.3 78.0-86.0 Pass 2666 25.9 40.0 25.6 40.0 83.0 25.4 40.0 83.0 23.9-27.9 29.7-30.3 78.0-86.0 Pass 3332 25.9 50.0 25.4 50.0 83.1 25.4 50.0 83.2 23.9-27.9 49.7-50.3 78.0-86.0 Pass 3998 25.9 60.0 25.5 80.0 83.3 25.7 80.0 83.1 23.9-27.9 97.7-80.3 78.0-86.0 Pass 5331 25.9 80.0 25.5 80.0	4665	5.4	70.0	5.6	70.0	86.9	5.4	70.0	86.9	3.4-7.4	69.7-70.3	82.0-90.0	Pass
6664 5.4 100.0 5.5 100.0 86.9 5.4 100.0 86.9 3.4-7.4 99.7-100.3 82.0-90.0 Pass 1333 25.9 20.0 25.5 20.0 83.1 25.5 20.0 83.0 23.9-27.9 19.7-20.3 78.0-86.0 Pass 1999 25.9 30.0 25.5 30.0 83.2 25.5 30.0 83.2 23.9-27.9 29.7-30.3 78.0-86.0 Pass 2666 25.9 40.0 25.6 40.0 83.0 25.4 40.0 83.0 23.9-27.9 39.7-40.3 78.0-86.0 Pass 3998 25.9 60.0 25.5 60.0 83.2 25.4 70.0 82.8 23.9-27.9 99.7-0.3 78.0-86.0 Pass 6665 25.9 70.0 25.6 70.0 82.8 25.4 70.0 82.8 23.9-27.9 99.7-0.3 78.0-86.0 Pass 6998 25.9 90.0 25.4 90.0	5331	5.4	80.0	5.4	80.0	87.2	5.5	80.0	87.2	3.4-7.4	79.7-80.3	82.0-90.0	Pass
1333 25.9 20.0 25.5 20.0 83.1 25.5 20.0 83.0 23.9-27.9 19.7-20.3 78.0-86.0 Pass 1999 25.9 30.0 25.5 30.0 83.2 25.5 30.0 83.2 23.9-27.9 29.7-30.3 78.0-86.0 Pass 2666 25.9 40.0 25.6 40.0 83.0 25.4 40.0 83.0 23.9-27.9 39.7-40.3 78.0-86.0 Pass 3332 25.9 50.0 25.5 60.0 83.3 25.6 60.0 83.2 23.9-27.9 59.7-60.3 78.0-86.0 Pass 4665 25.9 70.0 25.6 70.0 82.8 25.4 70.0 82.8 23.9-27.9 97.7-03.3 78.0-86.0 Pass 6998 25.9 90.0 25.4 90.0 83.1 25.5 90.0 83.3 23.9-27.9 97.7-03.3 78.0-86.0 Pass 6664 25.9 100.0 25.6 100.0	5998	5.4	90.0	5.4	90.0	87.2	5.4	90.0	87.3	3.4-7.4	89.7-90.3	82.0-90.0	Pass
1999 25.9 30.0 25.5 30.0 83.2 25.5 30.0 83.2 25.5 30.0 83.2 23.7-27.9 29.7-30.3 78.0-86.0 Pass 3332 25.9 50.0 25.4 50.0 83.1 25.4 50.0 83.0 23.7-27.9 49.7-50.3 78.0-86.0 Pass 3998 25.9 60.0 25.5 60.0 83.3 25.6 60.0 83.2 23.9-27.9 59.7-60.3 78.0-86.0 Pass 4665 25.9 70.0 25.6 70.0 82.8 25.4 70.0 82.8 23.9-27.9 59.7-60.3 78.0-86.0 Pass 5331 25.9 80.0 25.5 80.0 83.1 25.5 90.0 83.1 23.9-27.9 97.7-03.3 78.0-86.0 Pass 5998 25.9 100.0 25.6 100.0 82.8 25.5 100.0 82.8 23.9-27.9 97.7-10.3 78.0-86.0 Pass 1333 53.4	6664	5.4	100.0	5.5	100.0	86.9	5.4	100.0	86.9	3.4-7.4	99.7-100.3	82.0-90.0	Pass
2666 25.9 40.0 25.6 40.0 83.0 25.4 40.0 83.0 23.9-27.9 39.7-40.3 78.0-86.0 Pass 3332 25.9 50.0 25.4 50.0 83.1 25.4 50.0 83.0 23.9-27.9 49.7-50.3 78.0-86.0 Pass 3998 25.9 60.0 25.5 60.0 83.3 25.6 60.0 83.2 23.9-27.9 59.7-60.3 78.0-86.0 Pass 5331 25.9 80.0 25.5 80.0 83.0 25.7 80.0 83.1 23.9-27.9 97.7-03.3 78.0-86.0 Pass 5998 25.9 90.0 25.4 90.0 83.1 25.5 90.0 83.3 23.9-27.9 97.7-03.3 78.0-86.0 Pass 6664 25.9 100.0 25.6 100.0 82.8 25.5 100.0 82.8 23.9-27.9 97.7-103.3 78.0-86.0 Pass 1333 53.4 20.0 52.2 20.0	1333	25.9	20.0	25.5	20.0	83.1	25.5	20.0	83.0	23.9-27.9	19.7-20.3	78.0-86.0	Pass
3332 25.9 50.0 25.4 50.0 83.1 25.4 60.0 83.0 23.9-27.9 49.7-50.3 78.0-84.0 Pass 3998 25.9 60.0 25.5 60.0 83.2 23.9-27.9 59.7-60.3 78.0-84.0 Pass 4665 25.9 70.0 25.6 70.0 82.8 25.4 70.0 82.8 23.9-27.9 69.7-70.3 78.0-84.0 Pass 5331 25.9 80.0 25.5 80.0 83.1 25.5 90.0 83.3 23.9-27.9 79.7-80.3 78.0-86.0 Pass 5998 25.9 90.0 25.4 90.0 82.8 25.5 100.0 82.8 29.9-27.9 79.7-90.3 78.0-86.0 Pass 1333 53.4 20.0 52.2 20.0 77.6 52.4 19.9 77.4 51.4-55.4 19.7-20.3 73.0-81.0 Pass 1999 53.4 40.0 52.4 40.0 77.4 52.4 40.0	1999	25.9	30.0	25.5	30.0	83.2	25.5	30.0	83.2	23.9-27.9	29.7-30.3	78.0-86.0	Pass
3998 25.9 60.0 25.5 60.0 83.3 25.6 60.0 83.2 23.9-27.9 59.7-60.3 78.0-86.0 Pass 4665 25.9 70.0 25.6 70.0 82.8 25.4 70.0 82.8 23.9-27.9 69.7-70.3 78.0-86.0 Pass 5331 25.9 80.0 25.5 80.0 83.1 25.5 90.0 83.1 23.9-27.9 79.7-80.3 78.0-86.0 Pass 5998 25.9 100.0 25.6 100.0 82.8 25.5 100.0 82.8 23.9-27.9 89.7-90.3 78.0-86.0 Pass 1333 53.4 20.0 52.2 20.0 77.6 52.4 19.9 77.4 51.4-55.4 19.7-20.3 73.0-81.0 Pass 1999 53.4 30.0 52.4 40.0 77.4 52.4 40.0 77.4 51.4-55.4 29.7-30.3 73.0-81.0 Pass 3332 53.4 50.0 52.5 60.0	2666	25.9	40.0	25.6	40.0	83.0	25.4	40.0	83.0	23.9-27.9	39.7-40.3	78.0-86.0	Pass
4665 25.9 70.0 25.6 70.0 82.8 25.4 70.0 82.8 23.9-27.9 69.7-70.3 78.0-86.0 Pass 5331 25.9 80.0 25.5 80.0 83.0 25.7 80.0 83.1 23.9-27.9 79.7-80.3 78.0-86.0 Pass 5998 25.9 100.0 25.4 90.0 83.1 25.5 90.0 83.3 23.9-27.9 89.7-90.3 78.0-86.0 Pass 1333 53.4 20.0 52.2 20.0 77.6 52.4 19.9 77.4 51.4-55.4 19.7-20.3 73.0-81.0 Pass 1999 53.4 30.0 52.4 30.0 77.5 52.5 30.1 77.7 51.4-55.4 29.7-30.3 73.0-81.0 Pass 2666 53.4 40.0 52.4 40.0 77.4 52.5 50.0 77.4 51.4-55.4 49.7-50.3 73.0-81.0 Pass 33998 53.4 60.0 52.5 60.0	3332	25.9	50.0	25.4	50.0	83.1	25.4	50.0	83.0	23.9-27.9	49.7-50.3	78.0-86.0	Pass
5331 25.9 80.0 25.5 80.0 83.0 25.7 80.0 83.1 23.9-27.9 79.7-80.3 78.0-86.0 Pass 5998 25.9 90.0 25.4 90.0 83.1 25.5 90.0 83.3 23.9-27.9 89.7-90.3 78.0-86.0 Pass 6664 25.9 100.0 25.6 100.0 82.8 25.5 100.0 82.8 23.9-27.9 99.7-100.3 78.0-86.0 Pass 1333 53.4 20.0 52.2 20.0 77.6 52.4 19.9 77.4 51.4-55.4 19.7-20.3 73.0-81.0 Pass 1999 53.4 30.0 52.4 30.0 77.4 52.4 40.0 77.4 51.4-55.4 29.7-30.3 73.0-81.0 Pass 2666 53.4 40.0 52.5 50.0 77.4 51.4-55.4 49.7-50.3 73.0-81.0 Pass 33998 53.4 60.0 52.5 60.0 77.4 52.5 50.0	3998	25.9	60.0	25.5	60.0	83.3	25.6	60.0	83.2	23.9-27.9	59.7-60.3	78.0-86.0	Pass
5998 25.9 90.0 25.4 90.0 83.1 25.5 90.0 83.3 23.9-27.9 89.7-90.3 78.0-86.0 Pass 6664 25.9 100.0 25.6 100.0 82.8 25.5 100.0 82.8 23.9-27.9 99.7-100.3 78.0-86.0 Pass 1333 53.4 20.0 52.2 20.0 77.6 52.4 19.9 77.4 51.4-55.4 19.7-20.3 73.0-81.0 Pass 1999 53.4 30.0 52.4 40.0 77.4 51.4-55.4 29.7-30.3 73.0-81.0 Pass 2666 53.4 40.0 52.4 40.0 77.4 52.4 40.0 77.4 51.4-55.4 29.7-30.3 73.0-81.0 Pass 3332 53.4 50.0 52.5 50.0 77.7 52.5 60.0 77.6 51.4-55.4 49.7-50.3 73.0-81.0 Pass 3998 53.4 70.0 52.4 70.0 77.4 52.5 80.0	4665	25.9	70.0	25.6	70.0	82.8	25.4	70.0	82.8	23.9-27.9	69.7-70.3	78.0-86.0	Pass
6664 25.9 100.0 25.6 100.0 82.8 25.5 100.0 82.8 23.9-27.9 99.7-100.3 78.0-86.0 Pass 1333 53.4 20.0 52.2 20.0 77.6 52.4 19.9 77.4 51.4-55.4 19.7-20.3 73.0-81.0 Pass 1999 53.4 30.0 52.4 40.0 77.4 52.4 40.0 77.4 51.4-55.4 29.7-30.3 73.0-81.0 Pass 2666 53.4 40.0 52.5 50.0 77.4 51.4-55.4 49.7-50.3 73.0-81.0 Pass 3332 53.4 50.0 52.5 50.0 77.4 52.5 40.0 77.4 51.4-55.4 49.7-50.3 73.0-81.0 Pass 3998 53.4 60.0 52.5 60.0 77.7 52.5 80.0 77.6 51.4-55.4 49.7-50.3 73.0-81.0 Pass 5331 53.4 70.0 52.4 80.0 77.7 52.5 80.0	5331	25.9	80.0	25.5	80.0	83.0	25.7	80.0	83.1	23.9-27.9	79.7-80.3	78.0-86.0	Pass
1333 53.4 20.0 52.2 20.0 77.6 52.4 19.9 77.4 51.4-55.4 19.7-20.3 73.0-81.0 Pass 1999 53.4 30.0 52.4 30.0 77.5 52.5 30.1 77.7 51.4-55.4 29.7-30.3 73.0-81.0 Pass 2666 53.4 40.0 52.4 40.0 77.4 52.4 40.0 77.4 51.4-55.4 39.7-40.3 73.0-81.0 Pass 3332 53.4 50.0 52.5 50.0 77.4 52.5 60.0 77.6 51.4-55.4 49.7-50.3 73.0-81.0 Pass 3998 53.4 60.0 52.5 60.0 77.7 52.5 60.0 77.6 51.4-55.4 69.7-70.3 73.0-81.0 Pass 5331 53.4 80.0 52.4 80.0 77.5 52.5 80.0 77.6 51.4-55.4 69.7-70.3 73.0-81.0 Pass 5998 53.4 90.0 52.5 100.0	5998	25.9	90.0	25.4	90.0	83.1	25.5	90.0	83.3	23.9-27.9	89.7-90.3	78.0-86.0	Pass
1999 53.4 30.0 52.4 30.0 77.5 52.5 30.1 77.7 51.4-55.4 29.7-30.3 73.0-81.0 Pass 2666 53.4 40.0 52.4 40.0 77.4 52.4 40.0 77.4 51.4-55.4 29.7-30.3 73.0-81.0 Pass 3332 53.4 50.0 52.5 50.0 77.7 52.5 60.0 77.6 51.4-55.4 49.7-50.3 73.0-81.0 Pass 3998 53.4 60.0 52.5 60.0 77.7 52.5 60.0 77.6 51.4-55.4 49.7-50.3 73.0-81.0 Pass 4665 53.4 70.0 52.4 70.0 77.4 52.3 70.0 77.2 51.4-55.4 69.7-70.3 73.0-81.0 Pass 5331 53.4 80.0 52.4 80.0 77.7 52.5 80.0 77.6 51.4-55.4 69.7-70.3 73.0-81.0 Pass 5998 53.4 90.0 52.3 90.0	6664	25.9	100.0	25.6	100.0	82.8	25.5	100.0	82.8	23.9-27.9	99.7-100.3	78.0-86.0	Pass
2666 53.4 40.0 52.4 40.0 77.4 52.4 40.0 77.4 51.4-55.4 39.7-40.3 73.0-81.0 Pass 3332 53.4 50.0 52.5 50.0 77.4 52.5 50.0 77.4 51.4-55.4 49.7-50.3 73.0-81.0 Pass 3998 53.4 60.0 52.5 60.0 77.7 52.5 60.0 77.6 51.4-55.4 49.7-50.3 73.0-81.0 Pass 4665 53.4 70.0 52.4 70.0 77.4 52.3 70.0 77.2 51.4-55.4 69.7-70.3 73.0-81.0 Pass 5331 53.4 80.0 52.4 80.0 77.7 52.5 80.0 77.6 51.4-55.4 69.7-70.3 73.0-81.0 Pass 5998 53.4 90.0 52.3 90.0 77.5 52.2 90.0 77.6 51.4-55.4 89.7-90.3 73.0-81.0 Pass 7330 53.4 100.0 52.4 110.0	1333	53.4	20.0	52.2	20.0	77.6	52.4	19.9	77.4	51.4-55.4	19.7-20.3	73.0-81.0	Pass
3332 53.4 50.0 52.5 50.0 77.4 52.5 50.0 77.4 51.4-55.4 49.7-50.3 73.0-81.0 Pass 3998 53.4 60.0 52.5 60.0 77.7 52.5 60.0 77.6 51.4-55.4 59.7-60.3 73.0-81.0 Pass 4665 53.4 70.0 52.4 70.0 77.4 52.3 70.0 77.2 51.4-55.4 69.7-70.3 73.0-81.0 Pass 5331 53.4 80.0 52.4 80.0 77.7 52.5 80.0 77.6 51.4-55.4 69.7-70.3 73.0-81.0 Pass 5998 53.4 90.0 52.3 90.0 77.5 52.2 90.0 77.6 51.4-55.4 89.7-90.3 73.0-81.0 Pass 6664 53.4 100.0 52.5 100.0 77.2 52.5 100.0 77.7 51.4-55.4 199.7-100.3 73.0-81.0 Pass 7997 53.4 120.0 52.3 120.0 <td>1999</td> <td>53.4</td> <td>30.0</td> <td>52.4</td> <td>30.0</td> <td>77.5</td> <td>52.5</td> <td>30.1</td> <td>77.7</td> <td>51.4-55.4</td> <td>29.7-30.3</td> <td>73.0-81.0</td> <td>Pass</td>	1999	53.4	30.0	52.4	30.0	77.5	52.5	30.1	77.7	51.4-55.4	29.7-30.3	73.0-81.0	Pass
3998 53.4 60.0 52.5 60.0 77.7 52.5 60.0 77.6 51.4-55.4 59.7-60.3 73.0-81.0 Pass 4665 53.4 70.0 52.4 70.0 77.4 52.3 70.0 77.2 51.4-55.4 69.7-70.3 73.0-81.0 Pass 5331 53.4 80.0 52.4 80.0 77.7 52.5 80.0 77.6 51.4-55.4 69.7-70.3 73.0-81.0 Pass 5998 53.4 90.0 52.3 90.0 77.5 52.2 90.0 77.6 51.4-55.4 89.7-90.3 73.0-81.0 Pass 6664 53.4 100.0 52.5 100.0 77.2 52.5 100.0 77.3 51.4-55.4 89.7-90.3 73.0-81.0 Pass 7330 53.4 110.0 52.4 110.0 77.6 52.5 110.0 77.7 51.4-55.4 109.7-110.3 73.0-81.0 Pass 7997 53.4 120.0 52.3 120.0<	2666	53.4	40.0	52.4	40.0	77.4	52.4	40.0	77.4	51.4-55.4	39.7-40.3	73.0-81.0	Pass
4665 53.4 70.0 52.4 70.0 77.4 52.3 70.0 77.2 51.4-55.4 69.7-70.3 73.0-81.0 Pass 5331 53.4 80.0 52.4 80.0 77.7 52.5 80.0 77.6 51.4-55.4 79.7-80.3 73.0-81.0 Pass 5998 53.4 90.0 52.3 90.0 77.5 52.2 90.0 77.6 51.4-55.4 89.7-90.3 73.0-81.0 Pass 6664 53.4 100.0 52.5 100.0 77.2 52.5 100.0 77.3 51.4-55.4 89.7-90.3 73.0-81.0 Pass 7330 53.4 110.0 52.4 110.0 77.6 52.5 110.0 77.7 51.4-55.4 109.7-110.3 73.0-81.0 Pass 7997 53.4 120.0 52.5 130.0 77.5 52.4 120.0 77.6 51.4-55.4 119.7-120.3 73.0-81.0 Pass 9330 53.4 140.0 52.5 1	3332	53.4	50.0	52.5	50.0	77.4	52.5	50.0	77.4	51.4-55.4	49.7-50.3	73.0-81.0	Pass
5331 53.4 80.0 52.4 80.0 77.7 52.5 80.0 77.6 51.4-55.4 79.7-80.3 73.0-81.0 Pass 5998 53.4 90.0 52.3 90.0 77.5 52.2 90.0 77.6 51.4-55.4 89.7-90.3 73.0-81.0 Pass 6664 53.4 100.0 52.5 100.0 77.2 52.5 100.0 77.7 51.4-55.4 89.7-90.3 73.0-81.0 Pass 7330 53.4 110.0 52.4 110.0 77.6 52.5 110.0 77.7 51.4-55.4 109.7-110.3 73.0-81.0 Pass 7997 53.4 120.0 52.3 120.0 77.5 52.4 120.0 77.6 51.4-55.4 119.7-120.3 73.0-81.0 Pass 8663 53.4 130.0 52.5 130.0 77.3 52.5 130.0 77.4 51.4-55.4 129.7-130.3 73.0-81.0 Pass 9930 53.4 150.0 52.6	3998	53.4	60.0	52.5	60.0	77.7	52.5	60.0	77.6	51.4-55.4	59.7-60.3	73.0-81.0	Pass
5998 53.4 90.0 52.3 90.0 77.5 52.2 90.0 77.6 51.4-55.4 89.7-90.3 73.0-81.0 Pass 6664 53.4 100.0 52.5 100.0 77.2 52.5 100.0 77.3 51.4-55.4 99.7-100.3 73.0-81.0 Pass 7330 53.4 110.0 52.4 110.0 77.6 52.5 110.0 77.7 51.4-55.4 109.7-110.3 73.0-81.0 Pass 7997 53.4 120.0 52.3 120.0 77.5 52.4 120.0 77.6 51.4-55.4 119.7-120.3 73.0-81.0 Pass 8663 53.4 130.0 52.5 130.0 77.3 52.5 130.0 77.4 51.4-55.4 129.7-130.3 73.0-81.0 Pass 9930 53.4 140.0 52.5 140.0 77.6 51.4-55.4 139.7-140.3 73.0-81.0 Pass 10663 53.4 160.0 52.4 160.0 77.4 52.1	4665	53.4	70.0	52.4	70.0	77.4	52.3	70.0	77.2	51.4-55.4	69.7-70.3	73.0-81.0	Pass
6664 53.4 100.0 52.5 100.0 77.2 52.5 100.0 77.3 51.4-55.4 99.7-100.3 73.0-81.0 Pass 7330 53.4 110.0 52.4 110.0 77.6 52.5 110.0 77.7 51.4-55.4 109.7-110.3 73.0-81.0 Pass 7997 53.4 120.0 52.3 120.0 77.5 52.4 120.0 77.6 51.4-55.4 119.7-120.3 73.0-81.0 Pass 8663 53.4 130.0 52.5 130.0 77.3 52.5 130.0 77.4 51.4-55.4 129.7-130.3 73.0-81.0 Pass 9330 53.4 140.0 52.5 140.0 77.6 52.5 140.0 77.6 51.4-55.4 139.7-140.3 73.0-81.0 Pass 9996 53.4 150.0 52.6 150.0 77.5 52.4 150.0 77.6 51.4-55.4 149.7-150.3 73.0-81.0 Pass 10663 53.4 160.0 52.4 </td <td>5331</td> <td>53.4</td> <td>80.0</td> <td>52.4</td> <td>80.0</td> <td>77.7</td> <td>52.5</td> <td>80.0</td> <td>77.6</td> <td>51.4-55.4</td> <td>79.7-80.3</td> <td>73.0-81.0</td> <td>Pass</td>	5331	53.4	80.0	52.4	80.0	77.7	52.5	80.0	77.6	51.4-55.4	79.7-80.3	73.0-81.0	Pass
7330 53.4 110.0 52.4 110.0 77.6 52.5 110.0 77.7 51.4-55.4 109.7-110.3 73.0-81.0 Pass 7997 53.4 120.0 52.3 120.0 77.5 52.4 120.0 77.6 51.4-55.4 119.7-120.3 73.0-81.0 Pass 8663 53.4 130.0 52.5 130.0 77.3 52.5 130.0 77.4 51.4-55.4 129.7-130.3 73.0-81.0 Pass 9330 53.4 140.0 52.5 140.0 77.6 52.5 140.0 77.6 51.4-55.4 129.7-130.3 73.0-81.0 Pass 9996 53.4 150.0 52.6 150.0 77.5 52.4 150.0 77.6 51.4-55.4 149.7-150.3 73.0-81.0 Pass 10663 53.4 160.0 52.4 160.0 77.4 52.1 160.0 77.4 51.4-55.4 159.7-160.3 73.0-81.0 Pass 11329 53.4 170.0 52.4	5998	53.4	90.0	52.3	90.0	77.5	52.2	90.0	77.6	51.4-55.4	89.7-90.3	73.0-81.0	Pass
7997 53.4 120.0 52.3 120.0 77.5 52.4 120.0 77.6 51.4-55.4 119.7-120.3 73.0-81.0 Pass 8663 53.4 130.0 52.5 130.0 77.3 52.5 130.0 77.4 51.4-55.4 129.7-130.3 73.0-81.0 Pass 9330 53.4 140.0 52.5 140.0 77.6 52.5 140.0 77.6 51.4-55.4 139.7-140.3 73.0-81.0 Pass 9996 53.4 150.0 52.6 150.0 77.5 52.4 150.0 77.6 51.4-55.4 149.7-150.3 73.0-81.0 Pass 10663 53.4 160.0 52.4 160.0 77.4 52.1 160.0 77.4 51.4-55.4 159.7-160.3 73.0-81.0 Pass 11329 53.4 170.0 52.4 170.0 77.6 52.3 170.0 77.6 51.4-55.4 169.7-170.3 73.0-81.0 Pass 11995 53.4 180.0 52.	6664	53.4	100.0	52.5	100.0	77.2	52.5	100.0	77.3	51.4-55.4	99.7-100.3	73.0-81.0	Pass
8663 53.4 130.0 52.5 130.0 77.3 52.5 130.0 77.4 51.4-55.4 129.7-130.3 73.0-81.0 Pass 9330 53.4 140.0 52.5 140.0 77.6 52.5 140.0 77.6 51.4-55.4 139.7-140.3 73.0-81.0 Pass 9996 53.4 150.0 52.6 150.0 77.5 52.4 150.0 77.6 51.4-55.4 149.7-150.3 73.0-81.0 Pass 10663 53.4 160.0 52.4 160.0 77.4 52.1 160.0 77.4 51.4-55.4 159.7-160.3 73.0-81.0 Pass 11329 53.4 170.0 52.4 170.0 77.6 52.3 170.0 77.6 51.4-55.4 169.7-170.3 73.0-81.0 Pass 11995 53.4 180.0 52.4 180.0 77.6 52.2 180.0 77.5 51.4-55.4 179.7-180.3 73.0-81.0 Pass	7330	53.4	110.0	52.4	110.0	77.6	52.5	110.0	77.7	51.4-55.4	109.7-110.3	73.0-81.0	Pass
9330 53.4 140.0 52.5 140.0 77.6 52.5 140.0 77.6 51.4-55.4 139.7-140.3 73.0-81.0 Pass 9996 53.4 150.0 52.6 150.0 77.5 52.4 150.0 77.6 51.4-55.4 149.7-150.3 73.0-81.0 Pass 10663 53.4 160.0 52.4 160.0 77.4 52.1 160.0 77.4 51.4-55.4 159.7-160.3 73.0-81.0 Pass 11329 53.4 170.0 52.4 170.0 77.6 52.3 170.0 77.6 51.4-55.4 169.7-170.3 73.0-81.0 Pass 11995 53.4 180.0 52.4 180.0 77.6 52.2 180.0 77.5 51.4-55.4 179.7-180.3 73.0-81.0 Pass	7997	53.4	120.0	52.3	120.0	77.5	52.4	120.0	77.6	51.4-55.4	119.7-120.3	73.0-81.0	Pass
9996 53.4 150.0 52.6 150.0 77.5 52.4 150.0 77.6 51.4-55.4 149.7-150.3 73.0-81.0 Pass 10663 53.4 160.0 52.4 160.0 77.4 52.1 160.0 77.4 51.4-55.4 159.7-160.3 73.0-81.0 Pass 11329 53.4 170.0 52.4 170.0 77.6 52.3 170.0 77.6 51.4-55.4 169.7-170.3 73.0-81.0 Pass 11995 53.4 180.0 52.4 180.0 77.6 52.2 180.0 77.5 51.4-55.4 179.7-180.3 73.0-81.0 Pass	8663	53.4	130.0	52.5	130.0	77.3	52.5	130.0	77.4	51.4-55.4	129.7-130.3	73.0-81.0	Pass
10663 53.4 160.0 52.4 160.0 77.4 52.1 160.0 77.4 51.4-55.4 159.7-160.3 73.0-81.0 Pass 11329 53.4 170.0 52.4 170.0 77.6 52.3 170.0 77.6 51.4-55.4 169.7-170.3 73.0-81.0 Pass 11995 53.4 180.0 52.4 180.0 77.6 52.2 180.0 77.5 51.4-55.4 179.7-180.3 73.0-81.0 Pass	9330	53.4	140.0	52.5	140.0	77.6	52.5	140.0	77.6	51.4-55.4	139.7-140.3	73.0-81.0	Pass
11329 53.4 170.0 52.4 170.0 77.6 52.3 170.0 77.6 51.4-55.4 169.7-170.3 73.0-81.0 <i>Pass</i> 11995 53.4 180.0 52.4 180.0 77.6 52.2 180.0 77.5 51.4-55.4 179.7-180.3 73.0-81.0 <i>Pass</i>	9996	53.4	150.0	52.6	150.0	77.5	52.4	150.0	77.6	51.4-55.4	149.7-150.3	73.0-81.0	Pass
11995 53.4 180.0 52.4 180.0 77.6 52.2 180.0 77.5 51.4-55.4 179.7-180.3 73.0-81.0 <i>Pass</i>	10663	53.4	160.0	52.4	160.0	77.4	52.1	160.0	77.4	51.4-55.4	159.7-160.3	73.0-81.0	Pass
	11329	53.4	170.0	52.4	170.0	77.6	52.3	170.0	77.6	51.4-55.4	169.7-170.3	73.0-81.0	Pass
12662 53.4 190.0 52.5 190.0 77.5 52.5 190.0 77.6 51.4-55.4 189.7-190.3 73.0-81.0 <i>Pass</i>	11995	53.4	180.0	52.4	180.0	77.6	52.2	180.0	77.5	51.4-55.4	179.7-180.3	73.0-81.0	Pass
	12662	53.4	190.0	52.5	190.0	77.5	52.5	190.0	77.6	51.4-55.4	189.7-190.3	73.0-81.0	Pass

NOTE: Simulation at 24.100GHz, 22° , ± 0.5 m (Units: range = m, speed = mph, power = dB, frequency = Hz)

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