

FCC Part 15B Compliance Test Report

Test Report no.:	FCC15B_RM-1045_21.docx	Date of Report:	02-May-2014
Number of pages:	14	Customer's Contact person:	Tia Melava
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FCC listing no.:	94436		
IC recognition no.:	661AK-1		
Tested devices/ accessories:	Phone RM-1045 / Charger AC-60E / USB Cable CA-190CD / Headset WH-208 / Laptop IBM T40 / Printer HP Deskjet 1600		
FCC ID:	PYARM-1045	IC:	661V-RM1045
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart B, ANSI C63.4 (2003), CISPR 22, RSS-GEN (Issue 3, December 2010), RSS-132 (Issue 2, September 2005). Deviations, modifications or clarifications (if any) to above mentioned documents are written in each section under "Test method and limit".		
Documentation:	The test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test Results:	The EUT complies with the requirements in respect of all parameters subject to the test. The test results relate only to devices specified in this document		
Date and signature for the contents:			

Timo Raiskio, Specialist, EMC & SAR

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	25-Apr-2014
Testing completed	27-Apr-2014
The customer's contact person	Tia Melava
Test Plan referred to	T:\Projects\RM-1045\TestPlan\RS_Testplan_RM-1045.xlsm
Notes	-
Document name	T:\Projects\RM-1045\EMC\FCC15B_RM-1045_21.docx

1.1. EUT and Accessory Information

The EUT is a mobile phone with following features:

GSM/WCDMA/WLAN/Bluetooth

The EUT is tested with maximum rated TX power.

Devices under tests

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-1045	004402478600780	1004		02061.00037.14145.00001	43160
Charger	AC-60E					43161
USB Cable	CA-190CD					43162
Headset	WH-208	-	-	-	-	43035
Laptop	T40	99ARTGD	2373-NG3	-	Windows XP sp3	41868
Printer	HP DeskJet 1600					40077
Phone	RM-1045	004402478608833	1004	-	02061.00037.14145.00001	43163

1.2. Summary of Test Results

GSM 850:

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	7.2.4	AC powerline conducted emissions	-
15.109, a	6.1	Radiated emissions	PASSED

LTE7:

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	7.2.4	AC powerline conducted emissions	-
15.109, a	6.1	Radiated emissions	PASSED

GSM 1900:

Section in CFR 47	Section in RSS-GEN	Name of the test	Result
15.107, a	7.2.4	AC powerline conducted emissions	PASSED
15.109, a	6.1	Radiated emissions	PASSED

PASSED

FAILED

NP

The EUT complies with the essential requirements in the standard.

The EUT does not comply with the essential requirements in the standard.

The test was not performed by the TCC Nokia Laboratory.

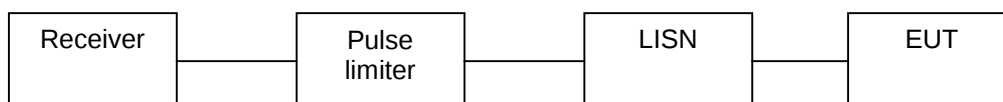
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2. AC powerline conducted emissions (FCC §15.107, a, RSS-GEN, section 7.2.4)

EUT with DUT number	RM-1045, DUT 43163
Accessories with DUT numbers	CA-190CD, DUT 43162 ; WH-208, DUT 43035 ; T40, DUT 41868 ; HP DeskJet 1600, DUT 40077
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	23 / 38 / 100.1
Date of measurements	27-huhti-2014
Measured by	Timo Raiskio

2.1. Test Setup



2.2. Test method and limit

The measurement is made according to ANSI C63.4-2003 as follows:

The EUT is placed on a wooden table 80 cm above the reference groundplane.

The EUT is connected via LISN to a test power supply.

The measurement results are obtained as described below:

$$U [dB\mu V] = U_{RX} + A_{TOT}$$

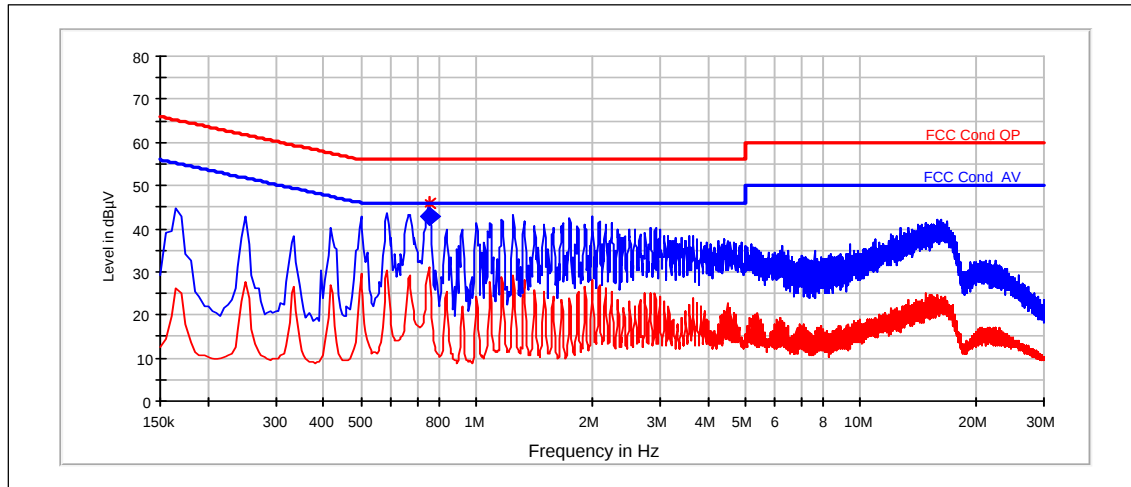
Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

CISPR 22 Class B limits

Frequency range [MHz]	Quasi peak limit [dBμV]	Average limit [dBμV]
0.15 - 0.5	66 - 56	56 - 46
0.5 - 5	56	46
5 - 30	60	50

2.3. GSM 1900 Test results

Channel 661 / 1880.0 MHz



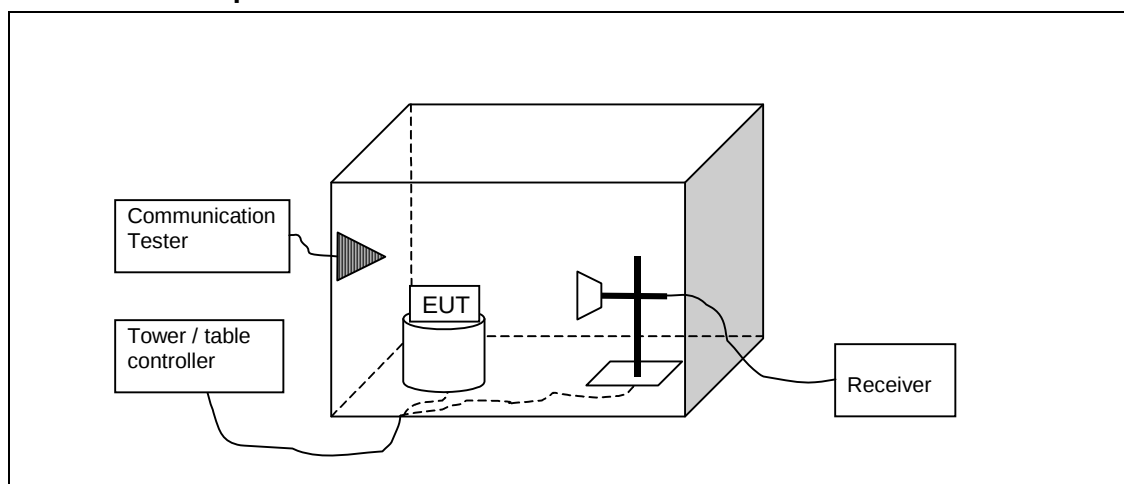
QuasiPeak (RBW: 9 kHz)

Frequency [MHz]	U [dBµV]	Line	Result
0.75	42.84	L1	PASSED

3. Radiated emissions (FCC 15.109, a, ??? 6.1)

EUT with DUT number	RM-1045, DUT 43160
Accessories with DUT numbers	AC-60E, DUT 43161 ; CA-190CD, DUT 43162 ; WH-208, DUT 43035; T40, DUT 41868 ; HP DeskJet 1600, DUT 40077
Operation Voltage [V] / [Hz]	Nominal
Results	PASSED
Remarks	-
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	21 / 35 / 101.1
Date of measurements	25-Apr-2014
Measured by	Timo Raiskio

3.1.1 Test setup



3.2. Test method and limit

The measurement is made according to ANSI C63.4-2003as follows:

The measurement is performed in the Semi-Anechoic Chamber with conducting metal floor.

The measurement distance is 3 m.

The EUT is placed on a nonconductive plate at 80 cm height.

For each suspected frequency, the turntable is rotated 360 degrees and antenna is scanned from 1 to 4 m. This is repeated for both horizontal and vertical receive antenna polarizations.

The emissions less than 20 dB below the permissible value are reported.

The measurement results are obtained as described below:

$$E [dB\mu V/m] = U_{RX} + A_{TOT}$$

Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable loss, antenna factor and preamplifier gain ($A_{TOT} = L_{CABLES} + A_F - G_{PREAMP}$).

CISPR 22 and FCC Part 15 Class B limits (3 m measurement distance)

Frequency range [MHz]	Quasi peak limit [dB μ V/m]	Average limit [dB μ V/m]	Peak limit [dB μ V/m]
30 - 230	40	-	-
230 – 1000	47	-	-
1000 - 3000	-	50	70
Above 3000	-	54	74

3.3. GSM 850 test results

RX mode, channel 128 / 869.2 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3477.7	37.43	74.388	45.83	-8.4	74	36.57	PASSED
6953.5	47.67	241.824	48.37	-0.7	74	26.33	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3477.7	24.11	16.051	32.51	-8.4	54	29.89	PASSED
6953.5	33.91	49.602	34.61	-0.7	54	20.09	PASSED

RX mode, channel 190 / 881.6 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
39.098	23.88	15.631	53.78	-29.9	40	16.12	PASSED
43.789	21.07	11.311	52.97	-31.9	40	18.93	PASSED
85.053	14.7	5.433	50.9	-36.2	40	25.3	PASSED

RX mode, channel 190 / 881.6 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
5835.669	42	125.893	46.2	-4.2	74	32	PASSED
5835.873	42.25	129.569	46.45	-4.2	74	31.75	PASSED
5839.48	41.76	122.462	45.96	-4.2	74	32.24	PASSED
5843.884	42.27	129.867	46.47	-4.2	74	31.73	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
5835.669	29.05	28.347	33.25	-4.2	54	24.95	PASSED
5835.873	29.02	28.249	33.22	-4.2	54	24.98	PASSED
5839.48	29.03	28.281	33.23	-4.2	54	24.97	PASSED
5843.884	29	28.184	33.2	-4.2	54	25	PASSED

RX mode, channel 251 / 893.8 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3576.1	37.09	71.532	45.59	-8.5	74	36.91	PASSED
7151.9	44.27	163.493	43.87	0.4	74	29.73	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3576.1	24.2	16.218	32.7	-8.5	54	29.8	PASSED
7151.9	31.53	37.714	31.13	0.4	54	22.47	PASSED

3.4. LTE7 test results

Channel 20775 / 2502. MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
5244.1	41.23	115.213	45.63	-4.4	74	32.77	PASSED
7866.5	46.55	212.569	43.55	3	74	27.45	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
5244.1	28.01	25.148	32.41	-4.4	54	25.99	PASSED
7866.5	33.2	45.709	30.2	3	54	20.8	PASSED

Channel 20775 / 2502. MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
2412.93	38.88	87.902	51.08	-12.2	70	31.12	PASSED
2419.435	38.97	88.818	51.27	-12.3	70	31.03	PASSED
2443.084	39.3	92.257	51.6	-12.3	70	30.7	PASSED
2447.391	38.69	86	50.99	-12.3	70	31.31	PASSED
2656.113	65.16	1811.34	75.76	-10.6	70	4.84	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
2426.955	25.71	19.297	38.01	-12.3	50	24.29	PASSED
2432.261	28.74	27.353	40.94	-12.2	50	21.26	PASSED
2437.173	25.79	19.476	37.99	-12.2	50	24.21	PASSED
2656.213	49.51	298.882	60.11	-10.6	50	0.49	PASSED

Channel 21100 / 2535.0 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
40.16	28.63	27.008	58.93	-30.3	40	11.37	PASSED
44.539	23.35	14.706	55.65	-32.3	40	16.65	PASSED
65.028	16.58	6.745	56.08	-39.5	40	23.42	PASSED
86.673	19.71	9.672	55.71	-36	40	20.29	PASSED

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
7818.738	46.22	204.644	43.42	2.8	74	27.78	PASSED
7843.59	45.9	197.242	43.1	2.8	74	28.1	PASSED
7846.592	46.2	204.174	43.4	2.8	74	27.8	PASSED
7864.826	46.69	216.023	43.69	3	74	27.31	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
7818.738	33.02	44.771	30.22	2.8	54	20.98	PASSED
7843.59	33.17	45.551	30.37	2.8	54	20.83	PASSED
7846.592	33.24	45.92	30.44	2.8	54	20.76	PASSED
7864.826	33.31	46.291	30.31	3	54	20.69	PASSED

Channel 21425 / 2567.6 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
5376.6	41.06	112.98	45.56	-4.5	74	32.94	PASSED
8062.7	47.13	227.248	43.43	3.7	74	26.87	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
5376.6	28.07	25.322	32.57	-4.5	54	25.93	PASSED
8062.7	34.15	50.992	30.45	3.7	54	19.85	PASSED

3.5. GSM 1900 test results, with pc accessories

RX mode, channel 512 / 1930.2 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3858	37.19	72.36	44.89	-7.7	74	36.81	PASSED
7721.8	45.36	185.353	43.16	2.2	74	28.64	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3858	24.63	17.041	32.33	-7.7	54	29.37	PASSED
7721.8	32.46	41.976	30.26	2.2	54	21.54	PASSED

RX mode, channel 661 / 1960.0 MHz

Quasi peak (RBW: 100 kHz, VBW: 100 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
85.931	30.32	32.81	66.42	-36.1	40	9.68	PASSED
114.559	26.91	22.156	61.71	-34.8	40	13.09	PASSED
140.607	21.5	11.885	56.6	-35.1	40	18.5	PASSED
143.186	29.18	28.774	64.38	-35.2	40	10.82	PASSED
171.203	26.07	20.114	62.47	-36.4	40	13.93	PASSED
205.883	31.35	36.94	68.75	-37.4	40	8.65	PASSED
221.026	12.04	3.999	48.84	-36.8	40	27.96	PASSED
226.092	17.79	7.754	54.39	-36.6	40	22.21	PASSED
229.059	16.36	6.577	52.86	-36.5	40	23.64	PASSED
786.403	35.45	59.224	61.55	-26.1	47	11.55	PASSED

RX mode, channel 661 / 1960.0 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
7843.087	45.9	197.242	43.1	2.8	74	28.1	PASSED
7851.802	46.61	214.042	43.71	2.9	74	27.39	PASSED
7858.614	46.38	208.449	43.48	2.9	74	27.62	PASSED
7862.422	46.68	215.774	43.78	2.9	74	27.32	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
7843.087	33.06	44.978	30.26	2.8	54	20.94	PASSED
7851.802	33.18	45.604	30.28	2.9	54	20.82	PASSED
7858.614	33.19	45.656	30.29	2.9	54	20.81	PASSED
7862.422	33.28	46.132	30.38	2.9	54	20.72	PASSED

RX mode, channel 810 / 1989.8 MHz

Peak (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3978.9	38.15	80.816	45.15	-7	74	35.85	PASSED
7960.9	45.86	196.336	42.66	3.2	74	28.14	PASSED

Average (RBW: 1 MHz, VBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Limit [dBμV/m]	Margin	Results
3978.9	25	17.783	32	-7	54	29	PASSED
7960.9	33.38	46.666	30.18	3.2	54	20.62	PASSED

4. Test Equipment

4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM38112	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM38114	Power supply	6632A	Agilent	22/24/27, 15C, 15E
TM37773	Communication Tester	CMU200	R&S	22/24/27, 15B
TM30600	Impulse limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM26491	LISN 50 µH	ESH3-Z5	R&S	15C, 15B
TM37610	Spectrum Analyzer	FSU26	R&S	22/24/27, 15C, 15E
TM23007	Oscilloscope	TDS684B	Tektronix	15E
TM22806	Battery	BAT 20/E	Fiskars	15C, 15B
TM22805	UPS	PS 20/1.2	Fiskars	15C, 15B
-	Temperature and humidity logger	175-H2	Testo	15C, 15B
-	Temperature and humidity logger	175-H2	Testo	22/24/27, 15C
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
-	Temperature test chamber	VT 4002	Vötsch	22/24/27
2001	Bluetooth tester	CBT	R&S	15C, 15B
2009	LISN 50 µH	ENV216	R&S	15C, 15B
2010	LISN 50 µH	ENV216	R&S	15C, 15B
2012	Power splitter	11667B	Agilent	22/24/27, 15C
2013	Attenuator	8493C	Agilent	22/24/27, 15C
2014	Attenuator	8493C	Agilent	22/24/27, 15C
2019	Power splitter	ZN2PD-9G-S+	Mini-Circuits	15E
2020	Power splitter	ZN2PD-9G-S+	Mini-Circuits	15E
2021	Communication Tester	CMW500	R&S	22/24/27
2022	Communication Tester	CMU200	R&S	22/24/27
2023	Spectrum Analyzer	ESMI-RF	R&S	15B/15C
2024	Analyzer display unit	ESAI-D	R&S	15B/15C
2026	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B

4.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
-	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C
TM37678	Communication Tester	CMU200	R&S	22/24/27, 15B
TM38845	Receiver	ESIB 26	R&S	22/24/27, 15C, 15E, 15B
-	Antenna	HL562	R&S	22/24/27, 15C, 15E, 15B
-	Turntable	2188	EMCO	22/24/27, 15C, 15E, 15B
-	Turntable controller	2090	EMCO	22/24/27, 15C, 15E, 15B
-	RF system panel	OSP130	R&S	22/24/27, 15C, 15E, 15B
-	Mini mast	2075-2	ETS Lindgren	22/24/27, 15C, 15B
TM38843	Mini mast	2075	Emco	22/24/27, 15C, 15B
TM38842	Antenna mast controller	2090	Emco	22/24/27, 15C, 15B
TM30643	LISN 50 µH	LISN-5-20-2	FCC	22/24/27, 15C, 15B
TM30644	LISN 50 µH	LISN-5-20-2	FCC	22/24/27, 15C, 15B
-	Temperature and humidity logger	175-H2	Testo	22/24/27, 15C, 15B

Eq. No	Equipment	Type	Manufacturer	Used in
-	Air pressure and temperature logger	635-2	Testo	22/24/27, 15C, 15B
-	Air pressure sensor	0638-1835	Testo	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	Miteq	22/24/27, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	Miteq	22/24/27, 15C, 15B
TM30599	Semi anechoic chamber	UNKNOWN	TDK	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	-	22/24/27, 15C, 15E, 15B
TM38066	High pass filter	WHKX3.0/18G-12SS	Wainwright	22/24/27, 15C, 15E, 15B
2028	High pass filter	WHKX 1.0/15G-12SS	Wainwright	22/24/27, 15C, 15E, 15B
TM37545	Tunable notch filter	800.0/960.0-0.2/40-8SSK	Wainwright	22
TM26512	Tunable notch filter	WRCD1850/1910-0.2/40-10SSK	Wainwright	24
-	Band reject filter	WRCG1877/1883-1870/1890-40/6EE	Wainwright	24
-	Band reject filter	WRCG1729.4/1735.4-1722.4/1742.4-40/6SS	Wainwright	27
TM23892	Controller	G-1000SDX	Yaesu	22/24/27, 15C, 15E
2001	Bluetooth tester	CBT	R&S	15C, 15B
6023	Antenna	VUBA 9117	Schwarzbeck	22/24/27
2021	Communication Tester	CMW500	R&S	22/24/27
2025	Antenna	HFH2-Z2	R&S	15C
2026	Signal Generator	SMF 100A	R&S	22/24/27, 15C, 15E, 15B
2052	Antenna	BBHA 9120 D	Schwarzbeck	22/24/27, 15C, 15B, 15E
-	Antenna	QSH18S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Antenna	QSH20S20	Q-Par	22/24/27, 15C, 15B, 15E
-	Antenna	QSH20S20	Q-Par	22/24/27, 15C, 15B, 15E