

FCC Part 15B Compliance Test Report

Test Report no.:	Tre_FCC_0820_14.doc	Date of Report:	16-May-2008
Number of pages:	13	Customer's Contact person:	Jyrki Juvani
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FCC listing no.:	94436		
IC recognition no.:	3608		
Tested devices/ accessories:	Phone RM-416 / Battery BL-5B, AC charger AC-8E, Audio adapter AD-54, Headset HS-45, Data cable CA-101, Laptop IBM Thinkpad T22, AC adapter 02K6543, Printer HP deskjet 1600CC3540A, Digital camera FUJI DS-7, Serial cable for camera, Parallel cable for printer		
FCC ID:	LJPRM-416	IC:	661E-RM416
Supplement reports:	-		
Testing has been carried out in accordance with:	CFR 47, FCC rules Part 15 Subpart B, ANSI C63.4 (2003), ICES-003, CISPR 22 and IC standards RSS-132 (Issue 2, September 2005), RSS-133 (Issue 4, February 2008), RSS-139 (Issue 1, February 2008) and RSS-210 (Issue 7, June 2007). 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:			

Jari Jantunen, Test System Manager

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	09-Apr-2008
Testing completed	29-Apr-2008
The customer's contact person	Jyrki Juvani
Test Plan referred to	T:\Projects\RM-409\TestPlan_RS\RS_Testplan_RM-409.xls
Notes	-
Document name	T:\Projects\RM-409\EMC\Results\FCC\Tre_FCC_0815_03.doc

1.1. EUT and Accessory Information

The EUT is a 4-band (GSM850/900/1800/1900) mobile phone with GPRS, EGPRS and Bluetooth. GSM bands are tested in idle mode. Bluetooth is tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
Phone	RM-409	004401100440433	0200	-	02.26	41456
Battery	BL-5B	-	-	-	-	41462
AC Charger	AC-8E	-	-	-	-	41458
Audio adapter	AD-54	-	-	-	-	41459
Headset	HS-45	-	-	-	-	41460
Data cable	CA-101	-	1.2	1.1	-	41244
Laptop	IBM Thinkpad T22	555V2PT	-	-	-	40201
AC Adapter	02K6543	-	-	-	-	40202
Printer	HP deskjet 1600CC3540A	USB8302546	-	-	-	40077
Digital camera	FUJI DS-7	7102516	-	-	-	40076
Serial cable for camera	-	-	-	-	-	40088
Data cable	CA-101	-	1.2	1.1	-	41244

1.2. Summary of Test Results

GSM 850:

Section in CFR 47	Section in ICES-003 (RSS-132)	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	PASSED
15.109, a	5.5 (4.6)	Radiated emissions	PASSED

GSM 1900:

Section in CFR 47	Section in ICES-003 (RSS-133)	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	NP
15.109, a	5.5 (6.6)	Radiated emissions	PASSED

Bluetooth:

Section in CFR 47	Section in ICES-003	Name of the test	Result
15.107, a	5.3	AC powerline conducted emissions	NP
15.109, a	5.5	Radiated emissions	PASSED

PASSED

The EUT complies with the essential requirements in the standard.

FAILED

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

NP

The test was not performed by the TCC Nokia Tampere Laboratory.

The test results of LJPRM-409 are re-used for certification of the LJPRM-416. The table above indicates the results, which will be re-used.

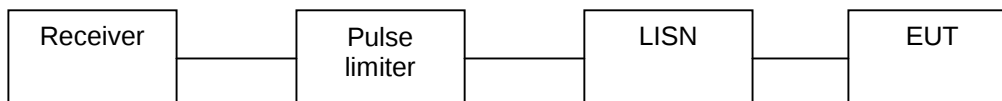
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2. AC powerline conducted emissions (FCC §15.107, ICES-003 section 5.3)

EUT with DUT number	RM-409 DUT 41456
Accessories with DUT numbers	BL-5B DUT 41462, AC-8E DUT 41458, CA-101 DUT 41244, IBM Thinkpad T22 DUT 40201, 02K6543 DUT 40202, HP deskjet 1600CC3540A DUT 40077, FUJI DS-7 DUT 40076, Serial cable for camera DUT 40088, Parallel cable for printer DUT 40087
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	Continuous data transfer was active between the phone and the computer during the test.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 40 / 100.6
Date of measurements	14-Apr-2008
Measured by	Jari Jantunen

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:

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

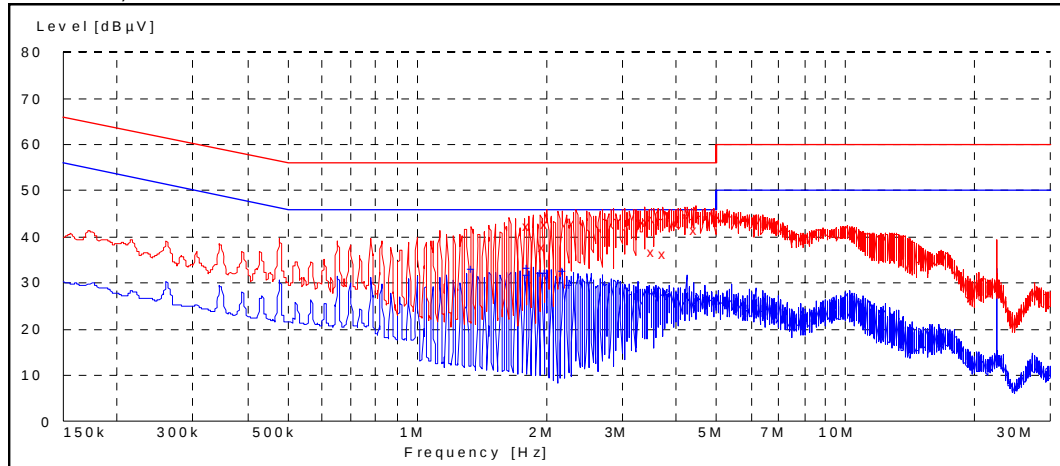
Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

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 850 Test results

RX mode, channel 190 / 881.6 MHz



Quasi peak (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
1.820000	42.10	L1	PASSED
1.990000	37.70	L1	PASSED
1.995000	42.70	L1	PASSED
3.410000	43.00	L1	PASSED
3.545000	36.70	N	PASSED
3.760000	36.30	N	PASSED
4.465000	41.50	L1	PASSED

Average (RBW: 9 kHz)

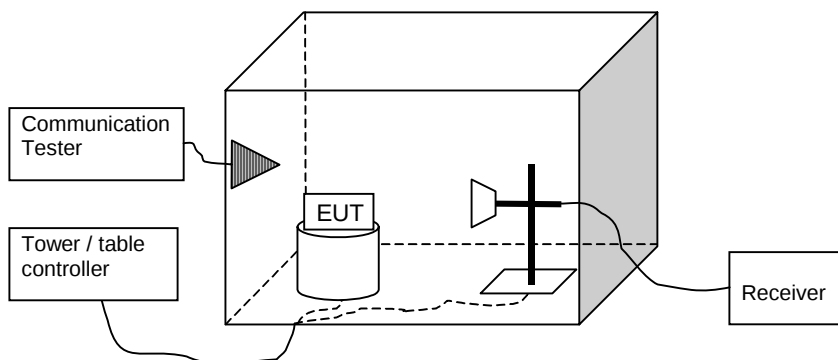
Frequency [MHz]	U [dBμV]	Line	Result
1.350000	32.80	L1	PASSED
1.825000	31.70	L1	PASSED
1.830000	33.10	L1	PASSED
1.960000	32.20	L1	PASSED
2.020000	32.00	L1	PASSED
2.200000	32.60	L1	PASSED
2.295000	29.50	N	PASSED

3. Radiated emissions

(FCC §15.109, ICES-003 section 5.5, RSS-132 4.6, RSS-133 6.6, RSS-139 6.6)

EUT with DUT number	RM-409 DUT 41456
Accessories with DUT numbers	BL-5B DUT 41462, AC-8E DUT 41458, AD-54 DUT 41459, HS-45 DUT 41460, CA-101 DUT 41244, IBM Thinkpad T22 DUT 40201, 02K6543 DUT 40202, HP deskjet 1600CC3540A DUT 40077, FUJI DS-7 DUT 40076, Serial cable for camera DUT 40088, Parallel cable for printer DUT 40087
Operation Voltage [V] / [Hz]	115 / 60
Result	PASSED
Remarks	GSM 850+FM receiver on GSM 1900 and Bluetooth:Continuous data transfer was active between the phone and the computer during the test.
Temp [°C] / Humidity [%RH] / Air Pressure [kPa]	20 / 50 / 101.8-102
Date of measurements	28...29-Apr-2008
Measured by	Jari Jantunen

3.1. 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:

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

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

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

Frequency range [MHz]	Quasi peak limit [dBμV/m]	Average limit [dBμV/m]	Peak limit [dBμV/m]
30 – 230	40	-	-
230 – 1000	47	-	-
Above 1000	-	54	74

3.3. GSM 850 + FM receiver on test results

RX mode, channel 128 / 869.2 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U_{RX} [dBμV]	A_{TOT} [dB]	Polarisation	Result
3476.800000	38.40	83.18	43.70	-5.3	HORIZONTAL	PASSED
6953.600000	44.20	162.18	42.60	1.6	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U_{RX} [dBμV]	A_{TOT} [dB]	Polarisation	Result
3476.800000	25.40	18.62	30.70	-5.3	HORIZONTAL	PASSED
6953.600000	31.10	35.89	29.50	1.6	VERTICAL	PASSED

RX mode, channel 190 / 881.6 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U_{RX} [dBμV]	A_{TOT} [dB]	Polarisation	Result
35.450100	24.20	16.22	46.30	-22.1	VERTICAL	PASSED
38.254910	20.30	10.35	43.60	-23.3	VERTICAL	PASSED
65.991182	12.60	4.27	45.80	-33.2	HORIZONTAL	PASSED
71.784168	22.20	12.88	54.80	-32.6	HORIZONTAL	PASSED
87.313026	11.70	3.85	42.10	-30.4	HORIZONTAL	PASSED
881.663527	55.70	609.54	71.80	-16.1	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U_{RX} [dBμV]	A_{TOT} [dB]	Polarisation	Result
3525.052104	38.50	84.14	43.60	-5.1	HORIZONTAL	PASSED
3528.056112	38.50	84.14	43.60	-5.1	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2978.959920	38.30	82.22	36.50	1.8	VERTICAL	PASSED
3526.552104	26.00	19.95	31.10	-5.1	HORIZONTAL	PASSED
3529.556112	25.70	19.28	30.80	-5.1	HORIZONTAL	PASSED

RX mode, channel 251 / 893.8 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3575.200000	40.00	100.00	44.90	-4.9	HORIZONTAL	PASSED
7150.400000	43.40	147.91	41.00	2.4	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3575.200000	26.20	20.42	31.10	-4.9	HORIZONTAL	PASSED
7150.400000	29.90	31.26	27.50	2.4	VERTICAL	PASSED

3.4. GSM 1900 + Computer peripherals test results

RX mode, channel 512 / 1930.2 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3860.000000	40.20	102.33	42.90	-2.7	VERTICAL	PASSED
7720.000000	43.30	146.22	39.60	3.7	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3860.000000	27.50	23.71	30.20	-2.7	VERTICAL	PASSED
7720.000000	30.60	33.88	26.90	3.7	VERTICAL	PASSED

RX mode, channel 661 / 1960.0 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
99.539479	37.30	73.28	66.70	-29.4	HORIZONTAL	PASSED
248.898998	14.50	5.31	42.90	-28.4	VERTICAL	PASSED
501.402004	39.50	94.41	61.50	-22.0	VERTICAL	PASSED
870.041483	21.60	12.02	38.30	-16.7	HORIZONTAL	PASSED
898.097595	30.20	32.36	46.20	-16.0	VERTICAL	PASSED
953.005812	23.50	14.96	39.20	-15.7	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
1959.921844	58.90	881.05	65.80	-6.9	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
1166.332665	32.10	40.27	45.80	-13.7	HORIZONTAL	PASSED
2976.459920	38.30	82.22	36.60	1.7	VERTICAL	PASSED

RX mode, channel 810 / 1989.8 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3980.000000	43.40	147.91	46.00	-2.6	HORIZONTAL	PASSED
7960.000000	44.50	167.88	40.30	4.2	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3980.000000	27.80	24.55	30.40	-2.6	VERTICAL	PASSED
7960.000000	31.30	36.73	27.10	4.2	VERTICAL	PASSED

3.5. Bluetooth + Computer peripherals test results

TX mode, channel 0 / 2402 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	39.10	90.16	40.90	-1.8	HORIZONTAL	PASSED
7206.000000	41.80	123.03	39.20	2.6	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	25.70	19.28	27.50	-1.8	HORIZONTAL	PASSED
7206.000000	29.00	28.18	26.40	2.6	HORIZONTAL	PASSED

Channel 40 / 2442 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
38.076353	17.20	7.24	32.10	-14.9	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4948.897796	39.50	94.41	40.90	-1.4	HORIZONTAL	PASSED
7283.563126	43.00	141.25	40.00	3.0	HORIZONTAL	PASSED
7312.129259	42.60	134.90	39.60	3.0	HORIZONTAL	PASSED
7417.333667	43.20	144.54	39.50	3.7	HORIZONTAL	PASSED
7417.841683	43.40	147.91	39.70	3.7	HORIZONTAL	PASSED
17906.309619	53.10	451.86	33.50	19.6	VERTICAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4944.897796	26.60	21.38	28.10	-1.5	HORIZONTAL	PASSED
7279.063126	30.10	31.99	27.10	3.0	HORIZONTAL	PASSED
7310.629259	30.00	31.62	27.00	3.0	HORIZONTAL	PASSED
7413.333667	30.40	33.11	26.70	3.7	HORIZONTAL	PASSED
7421.341683	30.60	33.88	26.90	3.7	HORIZONTAL	PASSED
17903.309619	40.40	104.71	20.70	19.7	VERTICAL	PASSED

Channel 78 / 2480 MHz

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	40.00	100.00	41.30	-1.3	VERTICAL	PASSED
7440.000000	43.70	153.11	40.10	3.6	HORIZONTAL	PASSED

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

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	26.80	21.88	28.10	-1.3	HORIZONTAL	PASSED
7440.000000	30.20	32.36	26.60	3.6	HORIZONTAL	PASSED

4. Test Equipment

4.1. Conducted measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30597	Power splitter	11667A	Agilent	22/24/27, 15C
TM37499	Power splitter	11667A	Agilent	22/24/27, 15C
TM38111	Multimeter	34401A	Agilent	22/24/27, 15C
TM38112	DC power supply	6632A	Agilent	22/24/27, 15C
TM22901	Attenuator	8496A	Agilent	22/24/27, 15C
TM30636	Artificial mains net	L2-16	PMM	15C, 15B
TM37678	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM37773	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM30600	Pulse Limiter	ESH3-Z2	R&S	15C, 15B
TM26490	LISN 50 μ H	ESH3-Z5	R&S	15C, 15B
TM37610	Spectrum analyzer	FSU	R&S	22/24/27, 15C
TM22835	Multimeter	87	Fluke	15C, 15B
TM37500	Microwave switch system	7116-MSW	Keithley	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Transmatic	22/24/27, 15C, 15B
	Temperature chamber	VT4002	Vötsch	22/24/27, 15C
2058	EMI Test receiver	ESPC	R&S	15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B

4.2. Radiated measurements

Eq. No	Equipment	Type	Manufacturer	Used in
TM30599	3m semi-anechoic chamber		TDK	22/24/27, 15C, 15B
TM38845	EMI receiver	ESI 40	R&S	22/24/27, 15C, 15B
TM37498	Preamplifier	AMF-5D-020180-26-10P	MITEQ	22/24/27, 15C, 15B
TM37523	Preamplifier	AMF-4D-10M-3G-25-20P	MITEQ	22/24/27, 15C, 15B
TM37516	Biconilog antenna	HL562	R&S	22/24/27, 15C, 15B
TM26496	Double ridged waveguide antenna	3115	EMCO	22/24/27, 15C, 15B
TM39158	Horn antenna	3116	EMCO	22/24/27, 15C, 15B
TM26492	Reference dipole set	UHAP/VHAP	Schwarzbeck	22/24/27, 15C, 15B
TM37501	Dipole antenna	3125-870	EMCO	22/24/27
TM37502	Dipole antenna	3125-1880	EMCO	22/24/27
TM37773	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM38631	Signal generator	83640L	Agilent	22/24/27, 15C, 15B
TM38066	High pass filter	4HC3000/18000-3-KK	Trilithic	22/24/27, 15C, 15B
TM26511	Tunable notch filter	WRCA870	Wainwright	22/24/27
TM38215	Tunable notch filter	WRCD1850/1910-0.2/40	Wainwright	22/24/27
TM38214	Band reject filter	WRCT 2402/2480-2400/2483.5-30	Wainwright	15C
TM30642	Mast/Turntable controller	HD-100	Deisel	22/24/27, 15C, 15B
TM26500	Turntable	DS412	Deisel	22/24/27, 15C, 15B
TM38842	Antenna mast controller	2090	EMCO	22/24/27, 15C, 15B
TM38843	Antenna mast	2075	EMCO	22/24/27, 15C, 15B
TM38114	DC power supply	6632A	Agilent	22/24/27, 15C, 15B
TM38323	Preamplifier	PA-02 18-26 GHz	EMC Automation	22/24/27, 15C, 15B
TM37678	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B
TM22638	Power supply	OL63743-901	Transmatic	22/24/27, 15C, 15B
TM23892	Yaesu controller	G-1000SDX	Yaesu	22/24/27, 15C, 15B
2001	Bluetooth tester	CBT	R&S	22/24/27, 15C, 15B

Eq. No	Equipment	Type	Manufacturer	Used in
2002	Radio communication tester	CMU-200	R&S	22/24/27, 15C, 15B