

FCC Part 15B Compliance Test Report

Test Report no.:	Tre_FCC_0831_05.doc	Date of Report:	08-Aug-2008
Number of pages:	13	Customer's Contact person:	Tia Melava
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FCC listing no.:	94436		
IC recognition no.:	3608		
Tested devices/ accessories:	GSM-phone RM-494 / AC-Charger AC-5E, Battery BL-4U, Headset HS-47, 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:	PYARM-494	IC:	661V-RM494
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 3, June 2005) 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, System Manager

1. Summary for FCC Part 15B Compliance Test Report

Date of receipt	9.1.2008
Testing completed	25.1.2008
The customer's contact person	Tia Melava
Test Plan referred to	T:\Projects\RM-343\TestPlan_RS
Notes	-
Document name	T:\Projects\RM-343\EMC\Results\FCC\Tre_FCC_0802_02.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 and WLAN are tested with maximum rated TX power.

Product	Type	SN	HW	MV	SW	DUT
GSM-Phone	RM-343	004401014372565	0303	-	07.45.3	41357
Battery	BL-4U	-	-	-	-	41364
Headset	HS-47	-	-	-	-	41367
AC-Charger	AC-5E	-	-	-	-	41365
Data cable	CA-101	-	-	-	-	41370
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
Parallel cable for printer	-	-	-	-	-	40087

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 (6.6)	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 (9)	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 PYARM-343 are re-used for certification of the PYARM-494. The table above indicates the results, which will be re-used

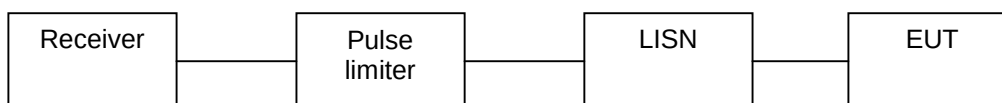
CONTENTS

1. Summary for FCC Part 15B Compliance Test Report.....	2
1.1. EUT and Accessory Information	2
1.2. Summary of Test Results	2
2. AC powerline conducted emissions (FCC §15.107, ICES-003 section 5.3)	5
2.1. Test setup	5
2.2. Test method and limit	5
2.3. GSM 850 Test results	6
3. Radiated emissions (FCC §15.109, ICES-003 section 5.5, RSS-132 6.6, RSS-133 9)	7
3.1. Test setup	7
3.2. Test method and limit	7
3.3. GSM 850 Test results	8
3.4. GSM 1900 Test results	9
3.5. Bluetooth Test results	10
4. Test Equipment.....	12
4.1. Conducted measurements	12
4.2. Radiated measurements	12

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

EUT with DUT number	RM-343 DUT 41357
Accessories with DUT numbers	AC-5E DUT 41365 / BL-4U DUT 41364 / HS-47 DUT 41367, CA-101 DUT 41370, 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 / 49 / 99.5
Date of measurements	25.1.2008
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:

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

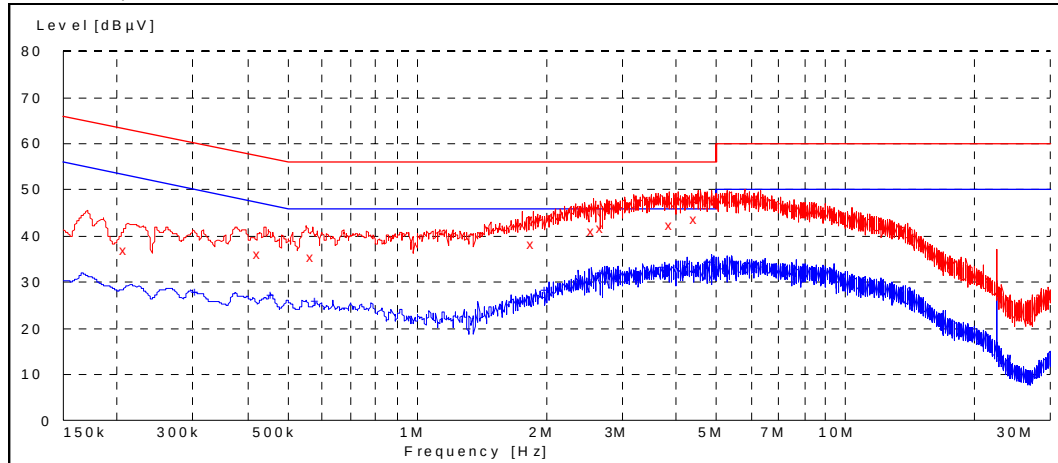
Where U_{RX} is receiver reading and A_{TOT} is total correction factor including cable and pulse limiter attenuations.

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
0.210000	37.00	L1	PASSED
0.430000	36.10	L1	PASSED
0.570000	35.40	L1	PASSED
1.870000	38.20	L1	PASSED
2.580000	41.10	L1	PASSED
2.715000	41.70	L1	PASSED
3.910000	42.40	L1	PASSED
4.510000	43.50	L1	PASSED

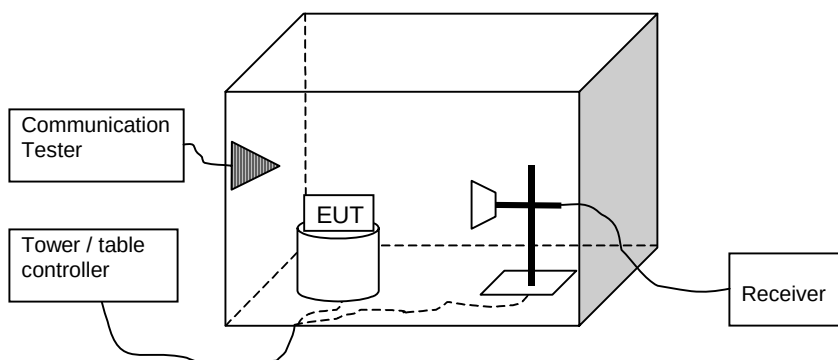
Average (RBW: 9 kHz)

Frequency [MHz]	U [dBμV]	Line	Result
0.305000	27.70	L1	PASSED
0.460000	27.20	L1	PASSED
0.585000	25.80	L1	PASSED
2.000000	28.40	L1	PASSED
2.715000	32.00	L1	PASSED
3.800000	33.20	L1	PASSED
4.835000	34.40	L1	PASSED
4.925000	34.20	L1	PASSED

3. Radiated emissions (FCC §15.109, ICES-003 section 5.5, RSS-132 6.6, RSS-133 9)

EUT with DUT number	RM-343 DUT 41357
Accessories with DUT numbers	AC-5E DUT 41365 / BL-4U DUT 41364 / HS-47 DUT 41367, CA-101 DUT 41370, 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]	22 / 49 / 99.5
Date of measurements	25.1.2008
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 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	38.50	84.14	43.80	-5.3	HORIZONTAL	PASSED
6953.600000	43.10	142.89	41.50	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	30.70	34.28	29.10	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
99.298998	32.30	41.21	67.80	-35.5	HORIZONTAL	PASSED
697.494790	27.10	22.65	51.60	-24.5	VERTICAL	PASSED
915.029659	20.40	10.47	42.10	-21.7	HORIZONTAL	PASSED
934.667735	29.10	28.51	50.70	-21.6	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
1166.832665	29.40	29.51	49.10	-19.7	HORIZONTAL	PASSED
1230.966934	20.90	11.09	40.10	-19.2	VERTICAL	PASSED
1260.021042	34.40	52.48	53.30	-18.9	VERTICAL	PASSED
1295.089178	30.20	32.36	48.50	-18.3	VERTICAL	PASSED
1993.983968	35.30	58.21	47.50	-12.2	VERTICAL	PASSED
2991.975952	32.60	42.66	36.80	-4.2	VERTICAL	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	38.40	83.18	43.30	-4.9	HORIZONTAL	PASSED
7150.400000	42.50	133.35	40.10	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	25.50	18.84	30.40	-4.9	HORIZONTAL	PASSED
7150.400000	29.10	28.51	26.70	2.4	VERTICAL	PASSED

3.4. GSM 1900 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	39.40	93.33	42.10	-2.7	HORIZONTAL	PASSED
7720.000000	43.30	146.22	39.60	3.7	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3860.000000	26.90	22.13	29.60	-2.7	HORIZONTAL	PASSED
7720.000000	30.30	32.73	26.60	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
31.083367	36.20	64.57	62.30	-26.1	VERTICAL	PASSED
62.505411	23.90	15.67	63.20	-39.3	VERTICAL	PASSED
85.189178	19.90	9.89	56.40	-36.5	VERTICAL	PASSED
111.744489	18.10	8.04	52.70	-34.6	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
7840.179359	46.70	216.27	43.10	3.6	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
2982.459920	32.10	40.27	36.30	-4.2	HORIZONTAL	PASSED
7840.179359	19.30	9.23	15.70	3.6	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	40.30	103.51	42.90	-2.6	VERTICAL	PASSED
7960.000000	44.00	158.49	39.80	4.2	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
3980.000000	27.40	23.44	30.00	-2.6	HORIZONTAL	PASSED
7960.000000	31.10	35.89	26.90	4.2	HORIZONTAL	PASSED

3.5. Bluetooth Test results

TX mode, channel 0 / 2402 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	39.00	89.13	40.80	-1.8	HORIZONTAL	PASSED
7206.000000	42.30	130.32	39.70	2.6	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4804.000000	26.00	19.95	27.80	-1.8	HORIZONTAL	PASSED
7206.000000	29.30	29.17	26.70	2.6	HORIZONTAL	PASSED

TX mode, channel 40 / 2442 MHz

Quasi peak (RBW: 120 kHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
245.791784	30.90	35.08	53.10	-22.2	HORIZONTAL	PASSED
270.039880	30.70	34.28	52.10	-21.4	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
4928.863727	39.40	93.33	41.10	-1.7	HORIZONTAL	PASSED
7260.517034	42.50	133.35	39.70	2.8	HORIZONTAL	PASSED
7285.573146	43.00	141.25	40.00	3.0	HORIZONTAL	PASSED
7368.235471	43.20	144.54	39.90	3.3	VERTICAL	PASSED
7414.837675	43.70	153.11	40.00	3.7	HORIZONTAL	PASSED
17890.287575	53.30	462.38	33.80	19.5	VERTICAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4930.863727	26.70	21.63	28.40	-1.7	HORIZONTAL	PASSED
7258.017034	29.80	30.90	27.10	2.7	HORIZONTAL	PASSED
7284.573146	30.40	33.11	27.40	3.0	HORIZONTAL	PASSED
7364.235471	30.30	32.73	27.00	3.3	VERTICAL	PASSED
7418.337675	30.70	34.28	27.00	3.7	HORIZONTAL	PASSED
17892.787575	40.50	105.93	20.90	19.6	VERTICAL	PASSED

TX mode, channel 78 / 2480 MHz

Peak (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	39.80	97.72	41.10	-1.3	HORIZONTAL	PASSED
7440.000000	43.50	149.62	39.90	3.6	HORIZONTAL	PASSED

Average (RBW: 1 MHz)

Frequency [MHz]	E [dBμV/m]	E [μV/m]	U _{RX} [dBμV]	A _{TOT} [dB]	Polarisation	Result
4960.000000	27.00	22.39	28.30	-1.3	HORIZONTAL	PASSED
7440.000000	30.50	33.50	26.90	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 µH	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

Eq. No	Equipment	Type	Manufacturer	Used in
TM23892	Yaesu controller	G-1000SDX	Yaesu	22/24/27, 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