

Marstech Limited

11 Kelfield Street, Etobicoke, Ontario, Canada, M9W 5A1

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TEST REPORT

REPORT DATE: 28 January 1999

REPORT NO: 98540D

CONTENTS: See Table of Contents

SUBMITTOR: THOMSON CONSUMER ELECTRONICS, INC.
Audio & Communications Product Dev.
101 West 103rd Street
Indianapolis, IN
46290-1102 USA

SUBJECT: Model No: 26921XXX-M

FCC ID: G9H2-6920M

TEST SPECIFICATION: FCC CFR 47 15.233 AND 2.989
Sections: 15.35, 15.107, 15.109, 15.207 and 15.209
NOTE: Tests Conducted Are "Type" Tests.

DATE SAMPLE RECEIVED: 04 January 1999

DATE TESTED: 11 & 18 January 1999

RESULTS: Equipment tested complies with referenced specification.

ALTERATIONS: The following alterations are required for compliance with referenced specification:
Base Unit:
1. F1, 10 Ω 1/2W resistor was changed to Polyswitch (TR600-150) or 350mA slow blow fuse.
2. R33, 47 Ω 1/2W resistor was deleted and replaced by a jumper.
3. J21 was deleted.
4. R103, 33K Ω resistor was changed to 20K Ω .
5. R104, 22K Ω resistor was changed to 36K Ω .
6. R103 was connected to 5V instead of 9V.

Tested by:

Original signed by:
Jim Sims

Ed. Chang

Edward Chang

Approved by:

Robert G. Marshall

Robert G. Marshall, P. Eng.

Date: Feb 1/99

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Authorized by:
Professional Engineer
Ontario



Engineering &
Administrative



Testing For FCC
Submissions/Verifications

Approved Test Facility



TECHNICAL REPORT - FCC 2.1033(b)

Applicant

Thomson Consumer Electronics, Inc.
Audio & Communications Product Dev.
101 West 103rd Street
Indianapolis, IN
46290-1102 USA

FCC Identifier

G9H2-6920M

Manufacturer

Dongguan CCT Telecommunications Products Co. Ltd.
No. 13 - 16, Hong Yie Dong San Road
Hong Yie Economic Development Zone, Tang Xia Zhen
Dongguan, Guangdong Province, The PRC

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EXHIBIT D

[FCC Ref. 2.1033(b)(6)]

"Report of Measurements"

EXHIBIT D(1)

DEVICE MEASURED

(FCC Ref. 2.1033(b)(6))

APPLICANT:

Thomson Consumer Electronics, Inc.
Audio & Communications Product Dev.
101 West 103rd Street
Indianapolis, IN
46290-1102 USA

MANUFACTURER:

Dongguan CCT Telecommunications Products Co. Ltd.
No. 13 - 16, Hong Yie Dong San Road
Hong Yie Economic Development Zone, Tang Xia Zhen
Dongguan, Guangdong Province, The PRC

FCC IDENTIFIER:

G9H2-6920M

MODEL NUMBER:

26921XXX-M

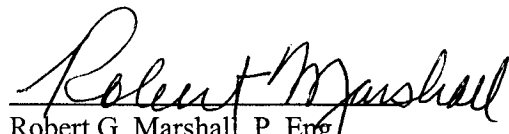
SERIAL NO.:

R&D9801447 & Handset # R&D9801448

Marstech Limited
11 Kelfield Street
Etobicoke, Ontario
M9W 5A1 CANADA

TECHNICIANS:

Jim Sims - Com-Serve Corp.
Edward Chang - Marstech Limited


Robert G. Marshall, P. Eng.

Date: Feb 1 / 99

EXHIBIT D(2)

TEST FACILITY AND EQUIPMENT LIST

FACILITIES

Radiated	ANSI C63.4 (FCC OET/55) open field 3 meter test range. This test range is protected from the cold and moisture by a non-conductive enclosure.
Conducted	2.5m Anechoic Chamber

EQUIPMENT

Anritsu 2601 A spectrum analyzer.
Hewlett-Packard RF generator # 8640 B with an 002 doubler
Hewlett-Packard 8449B Preamp. (30 dB) .. 1.0 MHz to 26.5 GHz
A.H. Systems biconical antenna; 20 MHz to 330 MHz
A.H. Systems log periodic antenna; 300 MHz to 1.8 GHz
A.H. Systems log periodic antenna; 1.0 GHz to 12.4 GHz
Eaton dipole antennas; T1, T2, T3 25 MHz to 1.0 GHz
Roberts dipole antennas; T1, T2, T3 & T4 25 MHz to 1.0 GHz
Compliance Design P950 Preamp (16 dB) ... 25 MHz to 1.0 GHz
Notch Filter; Model FIL01605001 30 dB at 920 MHz
M/A-COM High Frequency Cable Assembly; No. 2026-0600

NOTE:

The Anritsu 2601 A spectrum analyzer and the Advantest R3261A spectrum analyzer are calibrated annually, and that calibration is directly traceable to the National Research Council of Canada. (NRC)
This equipment is only used by qualified technicians and only for the purpose of EMI measurements.
The three metre test range has been carefully evaluated to the ANSI document C63.4 and will be remeasured for reflections and losses every three years.

FEDERAL COMMUNICATIONS COMMISSION

7435 Oakland Mills Road
Columbia, MD 21046
Telephone: 301-725-1585 (ext-218)
Facsimile: 301-344-2050

September 23, 1997

IN REPLY REFER TO
31040/SIT
1300F2

Electrohome Electronics Ltd
809 Wellington Street, North
Kitchener, Ontario N2G 4J6, Canada

Attention: Gerry Gallagher

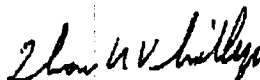
Re: Measurement facility located at Roseville
(3 meter site)

Gentlemen:

Your submission of the description of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC Rules. The description has, therefore, been placed on file and the name of your organization added to the Commission's list of facilities whose measurement data will be accepted in conjunction with applications for certification or notification under Parts 15 or 18 of the Commission's Rules. Our list will also indicate that the facility complies with the radiated and AC line conducted test site criteria in ANSI C63.4-1992. Please note that this filing must be updated for any changes made to the facility, and at least every three years the data on file must be certified as current.

Per your request, the above mentioned facility has been also added to our list of those who perform these measurement services for the public on a fee basis. This list is published periodically and is also available on the Laboratory's Public Access Link as described in the enclosed Public Notice.

Sincerely,



Thomas W. Phillips
Electronics Engineer
Customer Service Branch

EXHIBIT D(2)

LOAD -	BIRD 8164 S/N 2376, 100W/50 Ohm
SPECTRUM ANALYZER -	ANRITSU MS2601A S/N MT64544 - NEXT CALIBRATION APRIL 1999
MULTIMETER -	FLUKE 75
POWER SUPPLY -	IN HOUSE
OVEN -	IN HOUSE
FREEZER -	IN HOUSE

SUMMARY OF RESULTSCOMPLIANCE
(yes) (no)**FIELD STRENGTH OF THE CARRIER FREQUENCIES**

Handset:	Low Channel	(x)	()
Handset:	High Channel	(x)	()
Base Station:	Low Channel	(x)	()
Base Station:	High Channel	(x)	()

SPURIOUS RADIATED EMISSIONS (15.109)

Handset:	(x)	()
Base Station:	(x)	()

SPURIOUS RADIATED EMISSIONS (15.209/15.249)

Handset:	Low Channel	(x)	()
Handset:	High Channel	(x)	()
Base Station:	Low Channel	(x)	()
Base Station:	High Channel	(x)	()

LINE CONDUCTED SPURIOUS EMISSIONS

Base Station:	<u>Telephone Mode:</u>	(x)	()
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EQUIPMENT REQUIREMENTS AND IDENTIFICATION

a) Manufacturers or applicants name:	(x)	()
b) FCC ID:	(x)	()
c) Serial number:	(x)	()
d) Antenna:	(x)	()
e) Operator controls:	(x)	()
f) Security Coding	(x)	()
g) Equipment/Packaging Marking	(x)	()

CARRIER FIELD STRENGTH

Handset:

Low Channel: **Maximum field strength of 49,622 $\mu\text{V/M}$; at 925.893 MHz.**

High Channel: **Maximum field strength of 48,173 $\mu\text{V/M}$; at 927.200 MHz.**

Base Station:

Low Channel: **Maximum field strength of 28,858 $\mu\text{V/M}$; at 902.000 MHz.**

High Channel: **Maximum field strength of 31,471 $\mu\text{V/M}$; at 904.050 MHz.**

Note: *All other channels were checked for carrier frequency field strength levels.*

TEST CONDITIONS

Equipment Positioning:

Handset: vertical or upright

Base Station: standing vertically with the antenna extended in the vertical plane.

Antenna Polarization:

Handset: vertical

Base Station: vertical

Antenna Type: T.4; tuned half wave dipole

Measurement Bandwidth: 100 KHz

Supply Voltages:

Handset: 3.6 VDC from an internal battery

Base Station: 120 VAC/60 Hz to 09 VDC (adapter)

METHODS OF MEASUREMENT

The cordless phone components were placed in turn on a one metre high, non-metallic turntable and set at maximum output level. Measurements were made in a minimum of 3 positions for the handset and 2 for the base station. If adjustable, the whip antennas were fully extended.

For each of the above conditions the turntable was rotated through 360 degrees while the receiving antenna, at three (3) metres from the EUT, was varied in height from 1 to 4 metres and set in both planes of polarization to find the maximum signal strength. The level was measured using a spectrum analyzer. The measured level was converted to a field strength using the antenna correction factors and cable losses.

All base station measurements were made with the equipment under test connected to an artificial telephone line network, with 48 VDC applied.

SPURIOUS RADIATED EMISSIONS

RESULTS

The maximum field strength of any harmonic or spurious emission with respect to the applicable limit, while transmitting or receiving was:

Handset: **Maximum field strength of: 199.4 μ V/M at 445.71 MHz**
Maximum field strength of: NONE FOUND over 1000 MHz

Base Station: **Maximum field strength of: 199.5 μ V/M at 469.29 MHz**
Maximum field strength of: NONE FOUND over 1000 MHz

TEST CONDITIONS

Equipment Positioning:

Handset: laying on its side
Base Station: standing on its back with the antenna extended in the vertical plane.

Antenna Polarization:

Handset: horizontal
Base Station: horizontal
Base Station, Receive: horizontal

Measurement Bandwidth: 100/120 KHz(IF) & 1 MHz(IF) for frequencies above 1.0 GHz.

Supply Voltages:

Handset: 3.6 VDC from an internal battery
Base Station: 120 VAC/60 Hz to 09 VDC (adapter)

METHODS OF MEASUREMENT

The cordless phone components were placed in turn on a one metre high, non-metallic turntable. Measurements were made in a minimum of 3 positions for the handset and 2 for the base station. If adjustable, the whip antennas were fully extended.

For each of the above conditions the turntable was rotated through 360 degrees while the receiving antenna, at three (3) metres from the EUT, was varied in height from 1 to 4 metres and set in both planes of polarization to find the maximum signal strength. The level was measured using a spectrum analyzer. The measured level was converted to a field strength using the antenna correction factors and cable losses.

All base station measurements were made with the equipment under test connected to an artificial telephone line network, with 48 VDC applied.

RADIATED EMISSION RESULTS

BW: 100/120 KHz and 1.0 MHz

Span: 5 to 50 MHz

HANDSET

TEST #	MODE	FREQ MHz BAND	LEVEL μ V	ANT. TYPE (PZ)	ANT. FACT.	F.S. μ V/M	LIMIT μ V/M	DIFF. TO LIMIT; dB
CARRIER		925.893	1110.10	RT.4 V	44.7	49621.5	50,000	-0.07
CARRIER		927.200	1077.70	RT.4 V	44.7	48173.2	50,000	-0.32
01 TX		445.71	22.4	L/P H	8.9	199.4	200	-0.03
02 TX		462.97	10.0	L/P H	9.9	99.0	200	-6.11
03 TX		891.41	05.6	L/P H	34.0	190.4	200	-0.43
04 TX		936.64	02.5	L/P H	37.2	93.0	200	-6.65

BASE STATION

TEST #	MODE	FREQ MHz BAND	LEVEL μ V	ANT. TYPE (PZ)	ANT. FACT.	F.S. μ V/M	LIMIT μ V/M	DIFF. TO LIMIT; dB
CARRIER		902.000	668.0	RT.4 V	43.2	28857.6	50,000	-4.77
CARRIER		904.050	728.5	RT.4 V	43.2	31471.2	50,000	-4.02
01 RX		469.29	19.0	L/P H	10.5	199.5	200	-0.02
02 RX		937.86	04.0	L/P H	37.2	148.8	200	-2.57

POWER LINE CONDUCTED EMISSIONS

RESULTS

The largest RF voltages on the AC power lines, over the frequency range of 450 KHz to 30 MHz, was **13.27 μ V (22.46dB μ V) at 2.40MHz** from the base station while transmitting and/or receiving. (A side of the line in the telephone mode) Refer to the attached results.

TEST CONDITIONS

<u>Measurement Bandwidth:</u>	9 KHz Q.P. (IF)
<u>AC Test Voltage:</u>	120 VAC (filtered and stabilized)
<u>Mode of Operation:</u>	Telephone

METHODS OF MEASUREMENT

The base station portion of the cordless phone was placed on a wooden table directly above a 50 ohm line impedance stabilization network.(LISN) If adjustable, the whip antenna was fully extended vertically and the AC power attachment cord went directly down to the LISN. The LISN is grounded directly to the floor of the test facility. Excess AC cord was coiled in a figure eight pattern before connecting directly to the 50 micro-henry LISN.

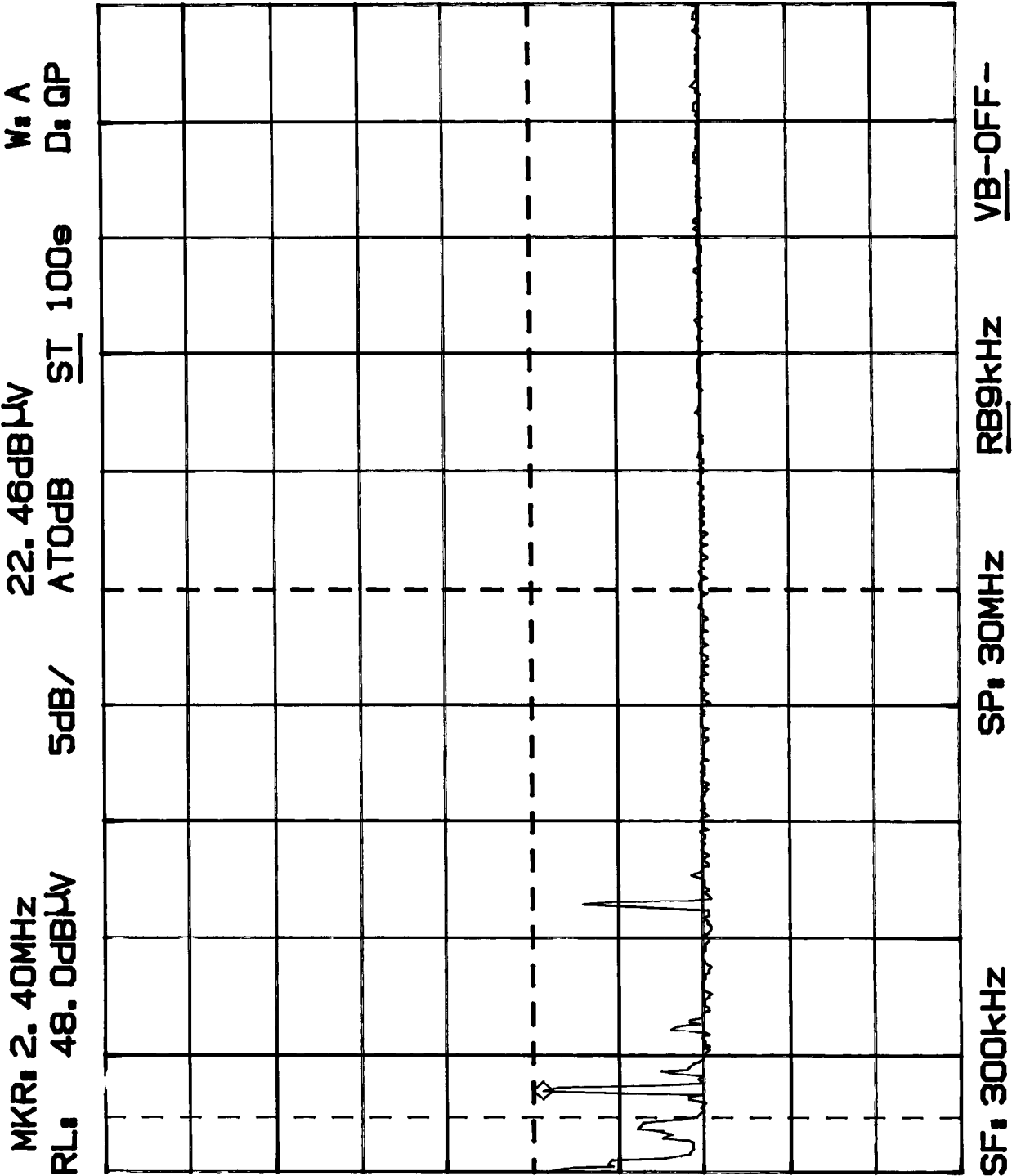
The base station was connected to a simulated 9,000 foot phone line and 48 VDC was applied. The 9,000 foot phone line network was grounded to the nearest AC outlet with a test lead.

A length of low loss RF foam cable was used to couple the RF voltages from the LISN to the spectrum analyzer. The base station transmitter was keyed on by the handset transmitting nearby. All of the RF voltages were recorded and are attached.

The base station was tested in all modes of operation which were applicable to the specific equipment under test. This included operating modes such as "calling/paging", quiescent or receive mode and standard telephone/transmit operation.

If the cordless phone contained an intercom mode of operation, then this test was repeated in that mode. The attached results represent the **worst case results** in each test condition.

POWER LINE CONDUCTED EMISSIONS
MODEL 26921XXX-M; SIDE: A



POWER LINE CONDUCTED EMISSIONS
MODEL 26921XXX-M; SIDE: B

