

INTERTEK TESTING SERVICES

1.2 Related Submittal(s) Grants

This is an Application for Certification of a cordless telephone system. Two transmitters are included in this Application. This specific report details the emission characteristics of each transmitter. The receivers are subject to the verification authorization process, in accordance with 15.101(b). A verification report has been prepared for the receiver sections of each device. The device is also subject to Part 68 Registration.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at Garment Centre, 576 Castle Peak Road, Kowloon, Hong Kong. This test facility and site measurement data have been fully placed on file with the FCC.

EXHIBIT 2
SYSTEM TEST CONFIGURATION

INTERTEK TESTING SERVICES

2.0 System Test Configuration

2.1 Justification

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst case emissions. The handset was powered by a fully charged battery.

For the measurements, the EUT is attached to a cardboard box and placed on the wooden turntable. If the base unit attaches to peripherals, they are connected and operational (as typical as possible). The handset is remotely located as far from the antenna and the base as possible to ensure full power transmission from the base. Else, the base is wired to transmit full power without modulation.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Detector function is in peak mode. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater. All emissions greater than 20 dB μ V/m are recorded.

Radiated emission measurement were performed from 30 MHz to tenth harmonics.

2.2 EUT Exercising Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

For emissions testing, the units were setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

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2.3 Support Equipment List and Description

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system (included inserted cards, which have grants) are:

HARDWARE:

The unit was operated standalone. An AC adapter (provided with the unit) was used to power the device. Its description is listed below.

- (1) AC adapter with two meter unshielded power cord permanently affixed.

CABLES:

- (1) Telecommunication cable with RJ11C connectors (1m, unshielded), terminated

OTHERS:

There are no special accessories necessary for compliance of this product.

INTERTEK TESTING SERVICES

2.4 Equipment Modification

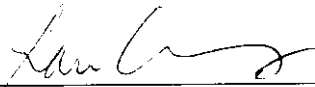
Any modifications installed previous to testing by May International Ltd. will be incorporated in each production model sold/leased in the United States.

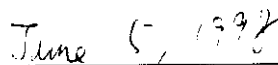
No modifications were installed by ETL Division, Intertek Testing Services Hong Kong Ltd.

All the items listed under section 2.0 of this report are confirmed by:

Confirmed by:

*C. K. Lam
Assistant Manager
Intertek Testing Services
Agent for May International Ltd.*

 Signature

 Date

INTERTEK TESTING SERVICES

EXHIBIT 3
EMISSION RESULTS

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3.0 **Emission Results**

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

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3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

where FS = Field Strength in $\text{dB}\mu\text{V/m}$
 RA = Receiver Amplitude (including preamplifier) in $\text{dB}\mu\text{V}$
 CF = Cable Attenuation Factor in dB
 AF = Antenna Factor in dB
 AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:-

$$FS = RR + LF$$

where FS = Field Strength in $\text{dB}\mu\text{V/m}$
 RR = $RA - AG$ in $\text{dB}\mu\text{V}$
 LF = $CF + AF$ in dB

Assume a receiver reading of $52.0 \text{ dB}\mu\text{V}$ is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of $32 \text{ dB}\mu\text{V/m}$. This value in $\text{dB}\mu\text{V/m}$ was converted to its corresponding level in $\mu\text{V/m}$.

$$\begin{aligned} RA &= 52.0 \text{ dB}\mu\text{V/m} \\ AF &= 7.4 \text{ dB} \\ CF &= 1.6 \text{ dB} \\ AG &= 29.0 \text{ dB} \\ FS &= RR + LF \\ FS &= 23 + 9 = 32 \text{ dB}\mu\text{V/m} \end{aligned} \qquad \begin{aligned} RR &= 23.0 \text{ dB}\mu\text{V} \\ LF &= 9.0 \text{ dB} \end{aligned}$$

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32 \text{ dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}$$

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3.3 Radiated Emission Data - Base Unit

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

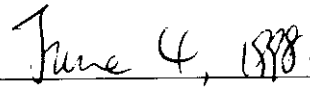
Judgement : Passed by 7.7 dB

TEST PERSONNEL:



Tester Signature

Kenneth H. M. Lam, Engineer
Typed/Printed Name



Date

INTERTEK TESTING SERVICES

Company: May International Ltd.
Model: Mato 915B
Mode : TX

Date of Test: 28 May, 1998

Table 1, Base unit

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
V	44.000	28.3	10	16	22.3	40	-17.7
V	48.000	26.3	11	16	21.3	40	-18.7
V	52.000	28.4	11	16	23.4	40	-16.6
V	60.000	28.1	10	16	22.1	40	-17.9
V	72.000	30.4	7	16	21.4	40	-18.6
H	80.000	33.4	6	16	23.4	40	-16.6
H	108.000	26.5	13	16	23.5	43.5	-20.0
H	120.000	27.1	13	16	24.1	43.5	-19.4
H	124.000	25.5	13	16	22.5	43.5	-21.0

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna and average detector are used for the emission over 1000MHz.

5. The above data is the worst case among the transmit, stand-by and charging.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Kenneth H. M. Lam

FCC ID: MS5192

INTERTEK TESTING SERVICES

Company: May International Ltd.
Model: Mato 915B
Mode : TX

Date of Test: 28 May, 1998

Table 2, Base unit

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
V	904.902	64.3	32.0	16	80.3	94	-13.7
V	1809.801	40.2	26.5	34	32.7	54	-21.3
V	*2714.714	48.1	29.1	34	43.2	54	-10.8

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Kenneth H. M. Lam

INTERTEK TESTING SERVICES

Company: May International Ltd.
Model: Mato 915B
Mode : TX

Date of Test: 28 May, 1998

Table 3, Base unit

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
V	905.601	65.4	32.0	16	81.4	94	-12.6
V	1811.204	42.0	26.5	34	34.5	54	-19.5
V	*2716.804	51.2	29.1	34	46.3	54	-7.7

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Kenneth H. M. Lam

INTERTEK TESTING SERVICES

Company: May International Ltd.
Model: Mato 915B
Mode : TX

Date of Test: 28 May, 1998

Table 4, Base unit

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
V	906.301	66.5	32.0	16	82.5	94	-11.5
V	1812.604	41.1	26.5	34	33.6	54	-20.4
V	*2718.906	50.6	29.1	34	45.7	54	-8.3

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Kenneth H. M. Lam

INTERTEK TESTING SERVICES

3.5 Radiated Emission Data - Handset

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

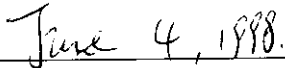
Judgement : Passed by 3.7 dB

TEST PERSONNEL:



Tester Signature

Kenneth H. M. Lam, Engineer
Typed/Printed Name



Date

INTERTEK TESTING SERVICES

Company: May International Ltd.
Model: Mato 915B
Mode : TX

Date of Test: 28 May, 1998

Table 5, Handset

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
V	925.603	61.2	33.0	16	78.2	94	-15.8
V	1851.206	39.8	26.5	34	32.3	54	-21.7
V	*2776.809	42.2	29.1	34	37.3	54	-16.7
H	*3702.411	50.9	32.8	34	49.7	54	-4.3
H	4628.016	39.2	34.0	34	39.2	54	-14.8

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna and average detector are used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Kenneth H. M. Lam

INTERTEK TESTING SERVICES

Company: May International Ltd.
Model: Mato 915B
Mode : TX

Date of Test: 28 May, 1998

Table 6, Handset

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
V	925.803	62.0	33.0	16	79.0	94	-15.0
V	1851.605	38.1	26.5	34	30.6	54	-23.4
V	*2777.408	44.3	29.1	34	39.4	54	-14.6
H	*3703.21	51.5	32.8	34	50.3	54	-3.7
H	4629.012	38.2	34.0	34	38.2	54	-15.8

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna and average detector are used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Kenneth H. M. Lam

INTERTEK TESTING SERVICES

Company: May International Ltd.
Model: Mato 915B
Mode : TX

Date of Test: 28 May, 1998

Table 7, Handset

Radiated Emissions

Polarity	Frequency (MHz)	Reading (dB μ V)	Antenna Factor (dB)	Pre-Amp Gain (dB)	Net at 3m (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
V	927.002	62.1	33.0	16	79.1	94	-14.9
V	1854.004	40.0	26.5	34	32.5	54	-21.5
V	*2781.002	43.5	29.1	34	38.6	54	-15.4
H	*3708.009	50.4	32.8	34	49.2	54	-4.8
H	4635.011	39.1	34.0	34	39.1	54	-14.9

NOTES: 1. Peak Detector data

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna and average detector are used for the emission over 1000MHz.
- * Emission within the restricted band meets the requirement of part 15.205. The corresponding limit as per 15.209 is based on Quasi peak detector data for frequencies below 1000 MHz and average detector data for frequencies over 1000 MHz.

Test Engineer: Kenneth H. M. Lam

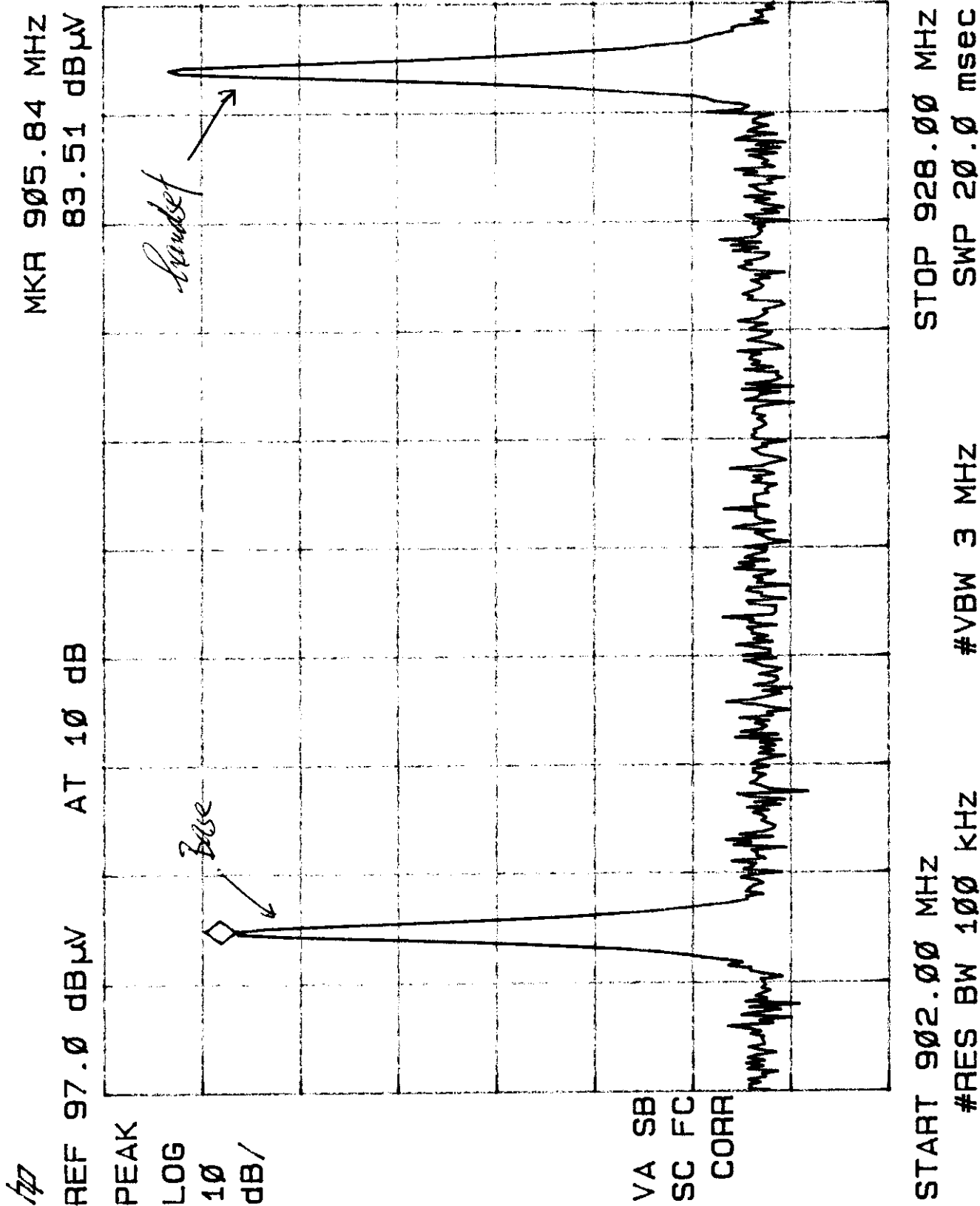
INTERTEK TESTING SERVICES

3.6 Radiated Emission on the bandedge

Form the following plot, it shows that the fundamental emission is confined in the specified band. And there are shows that the emissions are at least 50 dB below the carrier level at band edge (902 and 928 MHz). It meet the requirement of section 15.249(c).

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Emission Plot -Base



Emission Plot - Handset

hp

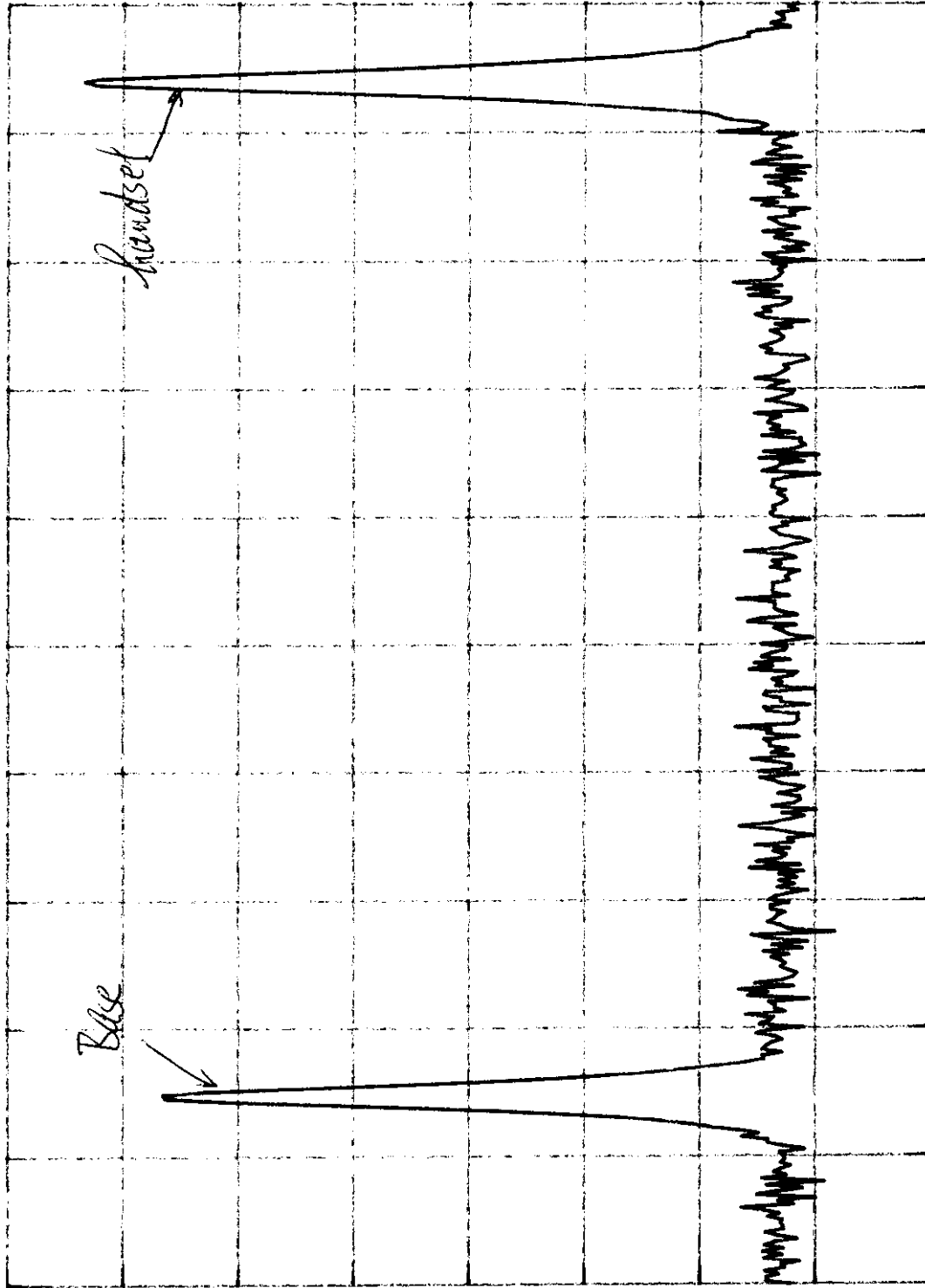
REF 97.0 dBμV AT 10 dB

PEAK

LOG

10

dB/



VA SB
SC FC
CORR

START 902.00 MHz STOP 928.00 MHz
#RES BW 100 KHz #VBW 3 MHz SWP 20.0 msec

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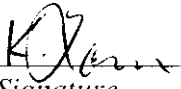
3.8 Line Conducted Emission Configuration Data

The data on the following pages list the significant emission frequencies, the limit, and the margin of compliance.

Judgement : Passed by 16.3 dB

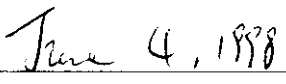
* All readings are peak unless stated otherwise.

TEST PERSONNEL:



Tester Signature

Kenneth H. M. Lam, Engineer
Typed/Printed Name



Date

INTERTEK TESTING SERVICES

Company: May International Ltd.
Model: Mato 915B
Mode : TX

Date of Test: 28 May, 1998

Graph 1, Base Unit

Conducted Emissions

Report No. 4802502

1x

Festival Hy/Hong, Report No. 106-122.

30.35 100% 100% 200%

$$E_{\text{eff}} = \frac{1}{2} \left(\frac{1}{\epsilon_0} + \frac{1}{\epsilon_0} \right) = \frac{1}{\epsilon_0} \quad \text{for } \epsilon_0 \gg 1 \quad (10)$$

Start	Stop	Step	IR PR	Detector	Me-Time	Atten	Preamp	Up/Grp
150K	30K	5K	K	PR	Time AUTO	IN OFF		60dB

$$\frac{d}{dt} \int_{\Omega} u^2 dx + \int_{\Gamma} u^2 d\sigma = - \int_{\Omega} u \Delta u dx + \int_{\Gamma} u \frac{\partial u}{\partial n} d\sigma.$$

2000 年 12 月 15 日 星期三 第 1000 号

$$Z(\Gamma) \cong \pi_1(\Gamma) = 1 \quad \text{if } \Gamma \text{ is a tree.}$$

2. *Journal of the American Statistical Association*, 93, 1998, 1239-1249.

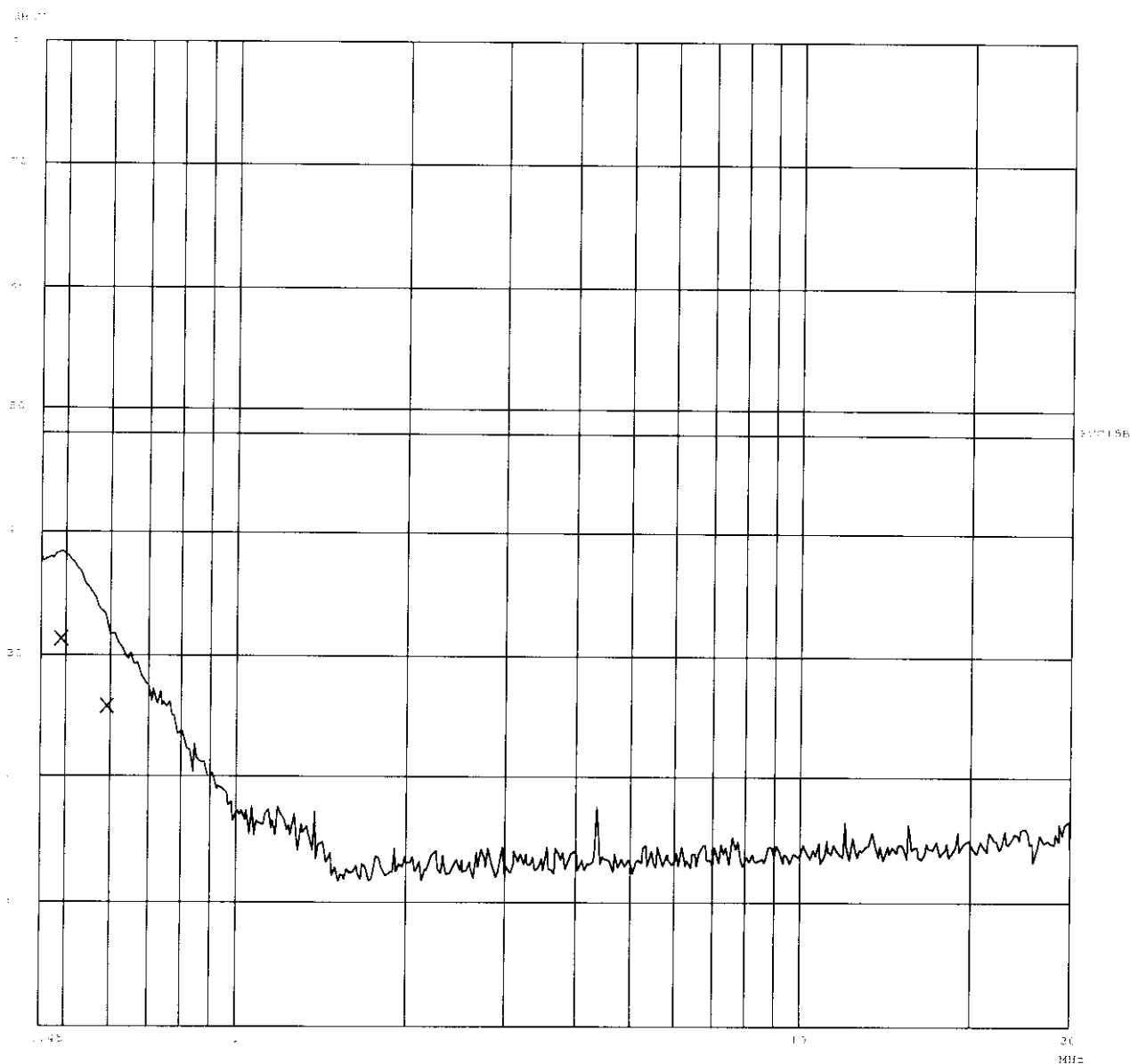
Transducer No. 17427

3 41:

 $\sigma^2 = 1.0$

Index

EIV'S



PAUSE :

Ctrl. No.: N/A

INTERTEK TESTING SERVICES

Company: May International Ltd
Model: Mato 915B
Mode : TX

Date of Test: 28 May, 1998

Table 8, Base Unit

Conducted Emissions

Report No.: 9802502

Tx

Tested By: Hong, Report No.: 9802502

Scan Settings (1 Range)

```
|----- Frequencies -----||----- Receiver Settings -----|
Start      Stop      Step      IF BW  Detector  M-Time Atten Preamp OpRge
450k       30M       5k        10k    PK        20ms AUTO LN OFF  60dB
```

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.49000	31.0	40.0
0.59000	25.7	40.0

* Limit exceeded

Ctrl. No.: N/A

INTERTEK TESTING SERVICES

Company: May International Ltd.

Date of Test: 28 May, 1998

Model: Mato 915B

Mode : Charging

Graph 2, Base Unit

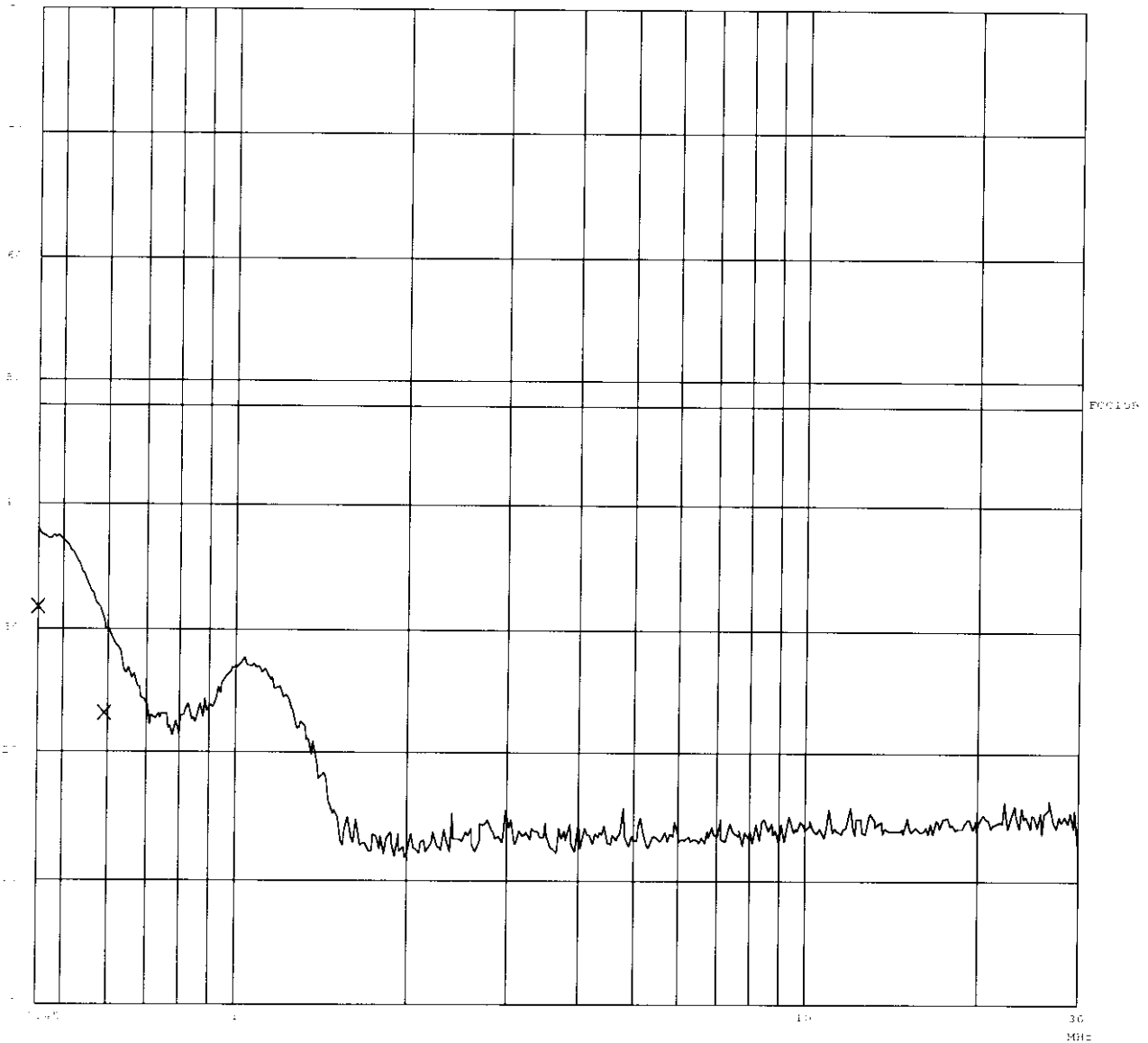
Conducted Emissions

Charging

Pumpdown		Receiver Settings					
Start	Stop	Stop	IF BW	Interfer	M Time	Allen Presamp	Spurge
4514	314	76	1.8	PR	0.00	Auto	LN OFF

Tumor Measurements: n = 439	
Mean Tumor:	1.4
Std. Deviation:	1.6
Sum of Squares:	77.49

Translator No.	Date	Drop	Name
1	26	30	ETOH



21602

Ctrl. No.: N/A

INTERTEK TESTING SERVICES

Company: May International Ltd.

Date of Test: 28 May, 1998

Model: Mato 915B

Mode : Charging

Table 9, Base Unit

Conducted Emissions

Report No.: 9802502

Charging

Tested By: Hong, Report No.: 9802502

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	30M	5k	10k	PK	20ms	AUTO	LN OFF	60dB

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.45000	31.7	48.0
0.59000	23.2	48.0

* limit exceeded

Ctrl. No.: N/A

INTERTEK TESTING SERVICES

Company: May International Ltd.
Model: Mato 915B
Mode : Stand by

Date of Test: 28 May, 1998

Graph 3, Base Unit

Conducted Emissions

Report No.: 9802502

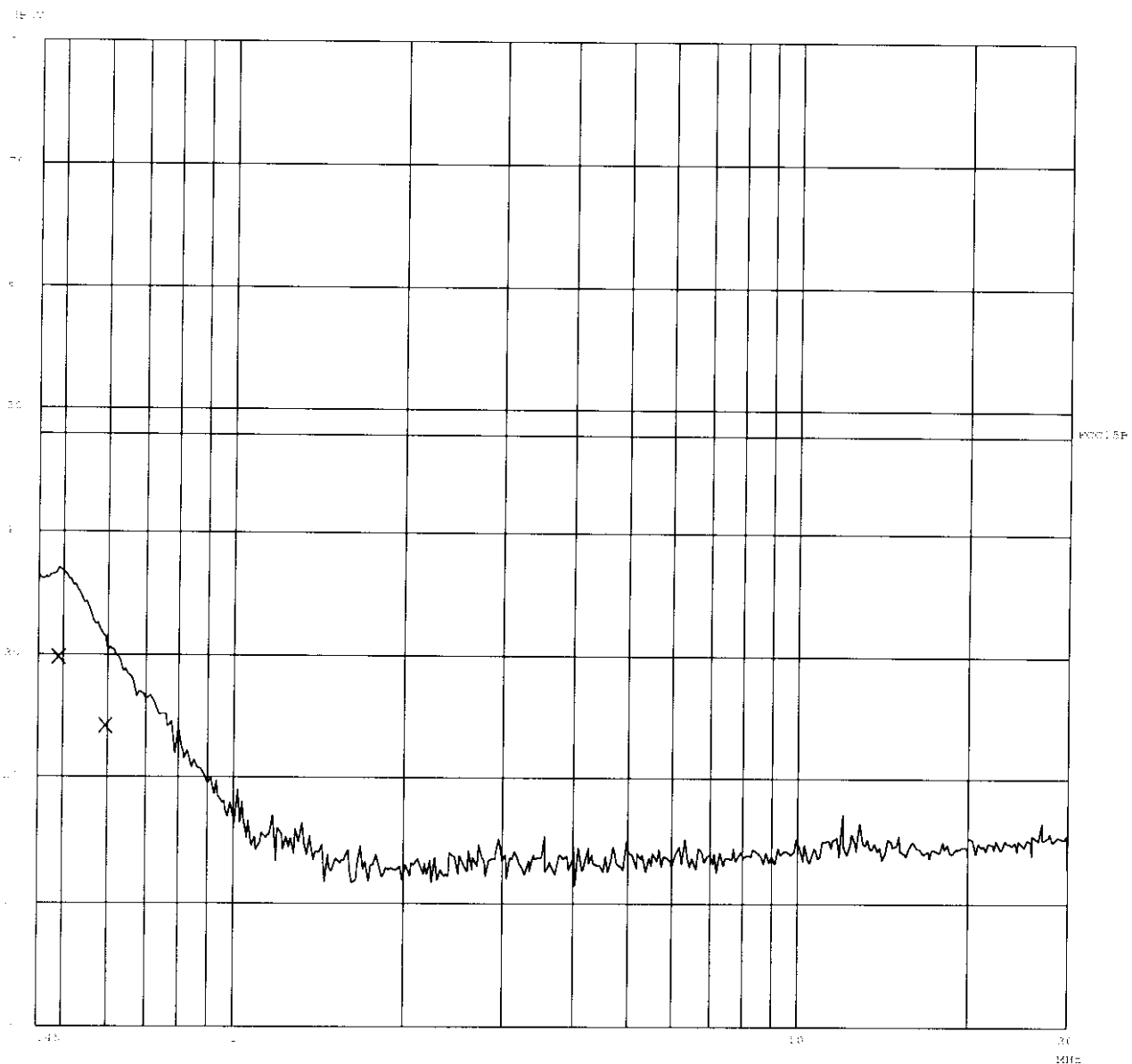
Stand-by

Tested by: Hong, Report No.: 98-111
 Date: 11/11/98 Range

[illegible]

Variable	Definition	Unit
Household Income	Household income	US\$
Food Expenditure	Food expenditure	US\$
Age	Age	years

Transfer No. 1001	Seq	Name
1002	100	10078



22. $\mathbb{Z}_2 \times \mathbb{Z}_2 \times \mathbb{Z}_2$

Ctrl. No.: N/A

INTERTEK TESTING SERVICES

Company: May International Ltd.

Date of Test: 28 May, 1998

Model: Mato 915B

Mode : Stand by

Table 10, Base Unit

Conducted Emissions

Stand-by

Report No.: *9802502*

Tested By: Hong, Report No.: 9802502

Scan Settings (1 Range)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
450k	30M	5k	10k	PK	20ms	AUTO	LN OFF	60dB

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.49000	29.7	48.0
0.59500	24.1	48.0

* limit exceeded

Ctrl. No.: *N/A*

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**EXHIBIT 4
EQUIPMENT PHOTOGRAPHS**

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4.0 **Equipment Photographs**

Photographs of the tested EUT are attached.

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EXHIBIT 8
SECURITY CODE INFORMATION

INTERTEK TESTING SERVICES

8.0 Security code information

The following page lists the security code information.

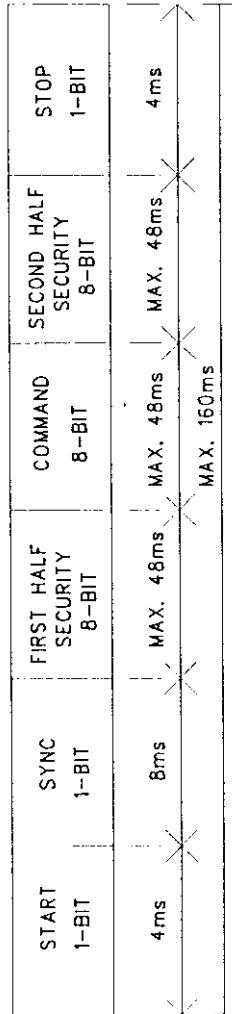
6 5 4 3 2 1

REVISION RECORD	
REV	DATE

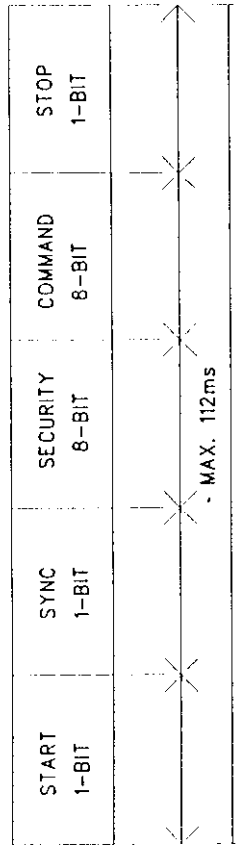
SECURITY CODE INFORMATION

CODE FORMAT

1. SECURITY AND COMMAND



2. SECURITY AND DIGIT



3. Automatic 16-bit Security Code

The cordless phone will generate 16-bit digital security coding to prohibit unauthorized use by the other cordless handset. The 16-bit security code altogether allows 64K possible combinations.

The security code is generated randomly and is transmitted to the receiving unit (either from handset to base or vice versa) along with every command code to eliminate virtually false ringing, false paging, etc. The command code will be ignored by the receiving unit if the received security code does not match with the current valid security code stored in the receiving unit.

Only 8-bit security code will be transmitted together with the digit codes, eg. 1,2,3,...,9,0.

COMPANY: MAY INTERNATIONAL LTD.

TITLE: MATO MV 900MHZ 15 CHANNEL CORDLESS PHONE

MODEL: MATO MV

DESIGN: ALAN KONG	DATE: 12/02/98
CHECKED: JONAS LEE	DATE: 12/02/98
QUALITY CONTROL:	DATE:
RELEASED:	DATE:

CODE: SC98

SCALE: 1:1