

FCC PART 15, SUBPART C
TEST METHOD: ANSI C63.4-1992

for

2-LINE 900 MHZ
 CORDLESS TELEPHONE

Model: TC-945

Prepared for

CASIO PHONEMATE, INC.
 P.O. BOX 2914
 TORRANCE, CALIFORNIA 90509-2914

Prepared by:_____

KYLE FUJIMOTO

Approved by:_____

SCOTT McCUTCHAN

COMPATIBLE ELECTRONICS INC.
 114 OLINDA DRIVE
 BREA, CALIFORNIA 92823
 (714) 579-0500

DATE: SEPTEMBER 10, 1998

	REPORT BODY	APPENDICES				TOTAL
		A	B	C	D	
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GENERAL REPORT SUMMARY

This electromagnetic emission and immunity test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full with the written permission of Compatible Electronics.

This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested: 2-Line 900 MHz Cordless Telephone
Model: TC-945
S/N: N/A

Product Description: The EUT is an analog 900 MHz cordless telephone with 2 lines and digital answering machine..

Modifications: The EUT was not modified during the testing.

Manufacturer: Casio Phonemate, Inc.
P.O. Box 2914
Torrance, California 90509-2914

Test Dates: September 3 and 4, 1998

Test Specifications: EMI requirements
FCC Title 47, Part 15 Subpart C, Sections 15.205, 15.207 and 15.249

Test Procedure: ANSI C63.4: 1992

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 450 kHz - 30 MHz	Complies with the limits of FCC Title 47, Part 15 Subpart C, section 15.207
2	Radiated RF Emissions, 10 kHz - 9300 MHz	Complies with the of FCC Title 47, Part 15 Subpart C, sections 15.205 and 15.249



1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the 2-Line 900 MHz Cordless Telephone Model: TC-945. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 1992. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the specification limits defined by FCC Title 47, Part 15, Subpart C, sections 15.205, 15.207, and 15.249.



2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI/EMC tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California 92823.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Casio Phonemate, Inc.

Lananh T. Tran Compliance Engineer

Compatible Electronics Inc.

Kyle Fujimoto Test Engineer

Scott McCutchan Lab Manager

2.4 Date Test Sample was Received

The test sample was received on September 3, 1998

2.5 Disposition of the Test Sample

The test sample was returned to Casio Phonemate, Inc. on September 10, 1998.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network



3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
FCC Title 47, Subpart C.	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators.
ANSI C63.4 1992	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz.



4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

Setup and operation of the equipment under test.

The components of the EUT were tested separately.

Specifics of the EUT and Peripherals Tested

Handset being tested: The 2-Line 900 MHz Cordless Telephone -- Handset Model: TC-945 (EUT) was placed on the wooden table and tested in three orthogonal axis. The low, middle, and high channels were tested. The handset was transmitting to and receiving from the 2-Line 900 MHz Cordless Telephone -- Base. The EUT was investigated for emissions while off hook. The radiated data was taken in this mode of operation. All initial investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the photographs in Appendix C.

Base being tested: The 2-Line 900 MHz Cordless Telephone -- Base Model: TC-945 (EUT) was placed on the wooden table. The low, middle, and high channels were tested. The base was connected to two line simulators and an AC adapter via its line 1, line 2; and power ports, respectively. Both line simulators were also connected to Conair telephones. The base was transmitting and receiving from the 2-Line 900 MHz Cordless Telephone -- Handset. The 2-Line 900 MHz Cordless Telephone -- Handset was also used to dial out a number on the simulator that caused the Comdial telephone to ring. During the initial investigation, both lines 1 and 2 were used to dial out, with line 2 being the worst case scenario. The conducted as well as radiated data was taken in this mode of operation. All initial investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the photographs in Appendix C.



4.1.1 Cable Construction and Termination

HANDSET BEING TESTED

There are no cables when the handset is being tested

BASE BEING TESTED

Cable 1

This is a 7 foot unshielded cable connecting phone #1 to test line simulator #2. It has an RJ-11 connector at each end. The cable was bundled to a length of 1 meter.

Cable 2

This is a 6 foot unshielded cable connecting the base to test line simulator #1. It has an RJ-11 connector at the test line simulator #1 end and is hard wired into the base.

Cable 3

This is a 6 foot unshielded cable connecting the base to test line simulator #2. It has an RJ-11 connector at each end. The cable was bundled to a length of 1 meter.

Cable 4

This is a 7 foot unshielded cable connecting the test line simulator #1 to phone #2. It has an RJ-11 connector at each end. The cable was bundled to a length of 1 meter.

Cable 5

This is a 6 foot unshielded cable connecting the base to the AC power adapter. It has a 1/8 inch power connector at the base end and is hard wired into the AC power adapter.



5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
2-LINE 900 MHZ CORDLESS TELEPHONE	CASIO PHONEMATE, INC.	TC-945	N/A	AAL-TC-945
PHONE	CONAIR CORPORATION	SW2502	N/A	N/A
TEST LINE SIMULATOR	TELTONE	TLS 3	ASSET NUMBER: 1152	N/A
TEST LINE SIMULATOR	TELETONE	TLS 3	ASSET NUMBER: 1153	N/A
PHONE	CASIO PHONEMATE, INC.	SW2502	N/A	N/A
AC ADAPTER	CASIO PHONEMATE, INC.	M/N-80	N/A	N/A



5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Spectrum Analyzer	Hewlett Packard	8566B	3701A22262	Dec. 9, 1997	Dec. 9, 1998
Preamplifier	Com Power	PA-102	1017	Feb. 16, 1998	Feb. 16, 1999
Quasi-Peak Adapter	Hewlett Packard	85650A	3303A01688	June 23, 1998	June 23, 1999
RF Attenuator	Com-Power	A-410	1602	Nov. 25, 1998	Nov. 25, 1999
LISN	Com Power	LI-200	1764	Jan. 3, 1998	Jan. 3, 1999
LISN	Com Power	LI-200	1771	Jan. 3, 1998	Jan. 3, 1999
LISN	Com Power	LI-200	1775	Jan. 3, 1998	Jan. 3, 1999
LISN	Com Power	LI-200	1780	Jan. 3, 1998	Jan. 3, 1999
Biconical Antenna	Com Power	AB-100	1548	Mar. 24, 1998	Mar. 24, 1999
Log Periodic Antenna	Com Power	AL-100	1117	Dec. 11, 1997	Dec. 11, 1998
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
Turntable	Com Power	TT-100	N/A	N/A	N/A
Computer	Hewlett Packard	HP98561A	2522A05178	N/A	N/A
Printer	Hewlett Packard	2225A	2925S33268	N/A	N/A
Plotter	Hewlett Packard	7440A	8726K38417	N/A	N/A
Microwave Amplifier	Com-Power	PA-122	001	Mar. 31, 1998	Mar. 31, 1999
Horn Antenna	Antenna Research	DRG-118/A	1053	Dec. 8, 1995	N/A



6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1.2 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.



7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

7.1 RF Emissions

7.1.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak detector was used only where indicated in the data sheets. A 10 dB attenuation pad was used for the protection of the spectrum analyzer input stage, and the spectrum analyzer offset was adjusted accordingly to read the actual data measured. The LISN output was read by the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for the conducted emissions test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 1992. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The initial test data was taken in manual mode while scanning the frequencies ranges of 0.45 MHz to 1.6 MHz, 1.6 MHz to 5 MHz and 5 MHz to 30 MHz. The conducted emissions from the EUT were maximized for operating mode as well as cable placement. Once a predominant frequency (within 12 dB of the limit) was found, it was more closely examined with the spectrum analyzer span adjusted to 1 MHz.

The final data was collected under program control by the HP 9000/300 in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave.

Conducted Data Sheets



7.1.2 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz, and the Com Power Microwave Amplifier Model: PA-122 was used for frequencies above 1 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps. The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets. The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 9.26 GHz	1 MHz	Horn Antenna

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 1992. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance to obtain final test data. Click on the link below to see the radiated data sheets.

[Radiated Data Sheets](#)



8. CONCLUSIONS

The 2-Line 900 MHz Cordless Telephone Model: TC-945 meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.207, and 15.249.





APPENDIX A

MODIFICATIONS TO THE EUT



MODIFICATIONS TO THE EUT

No modifications were made to the EUT





APPENDIX B

***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***



ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

2-LINE 900 MHZ CORDLESS TELEPHONE

Model: TC-945

S/N: N/A

There were no additional models covered under this report.





APPENDIX C

DIAGRAMS, CHARTS AND PHOTOS



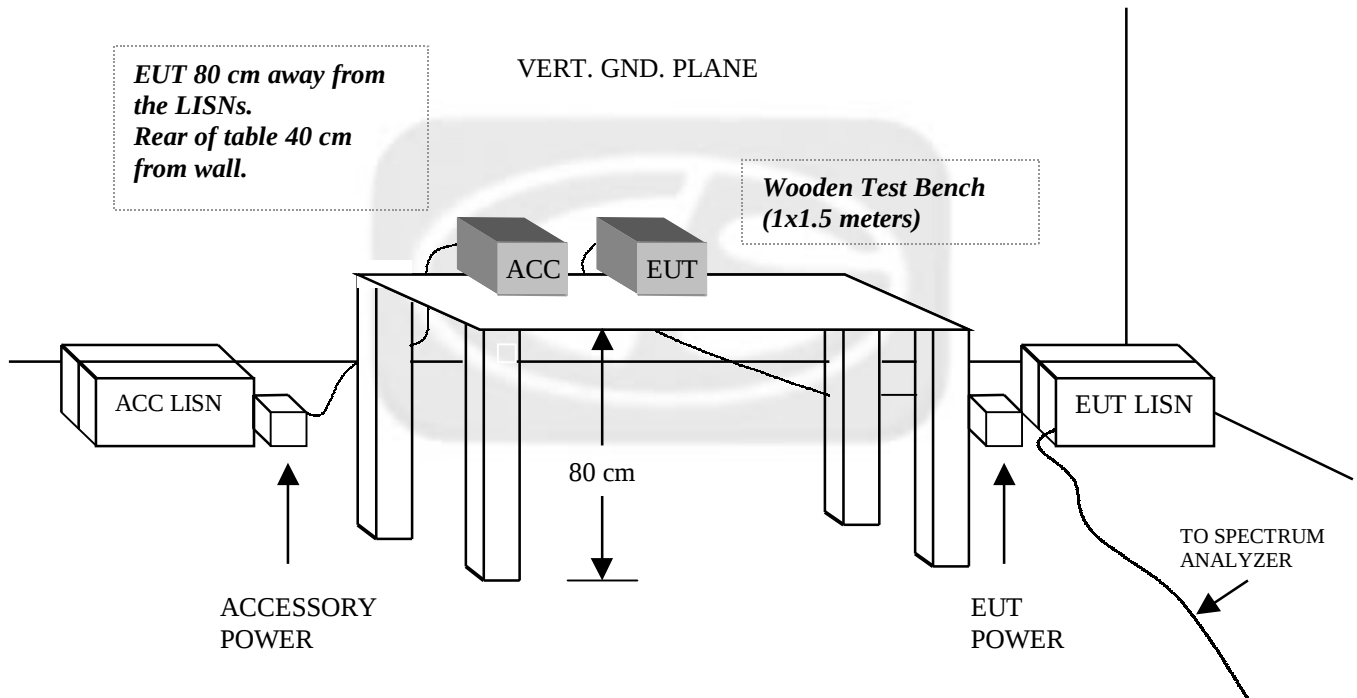
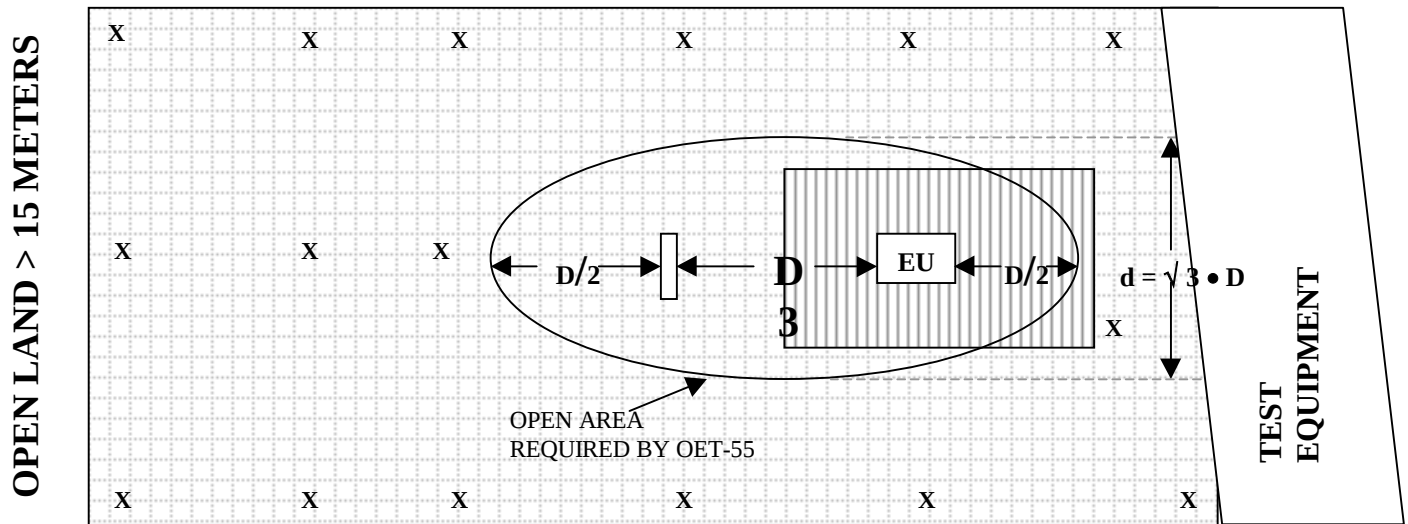
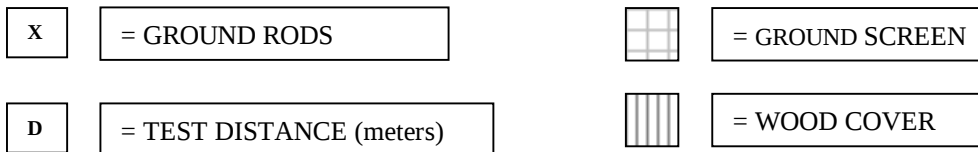
FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS











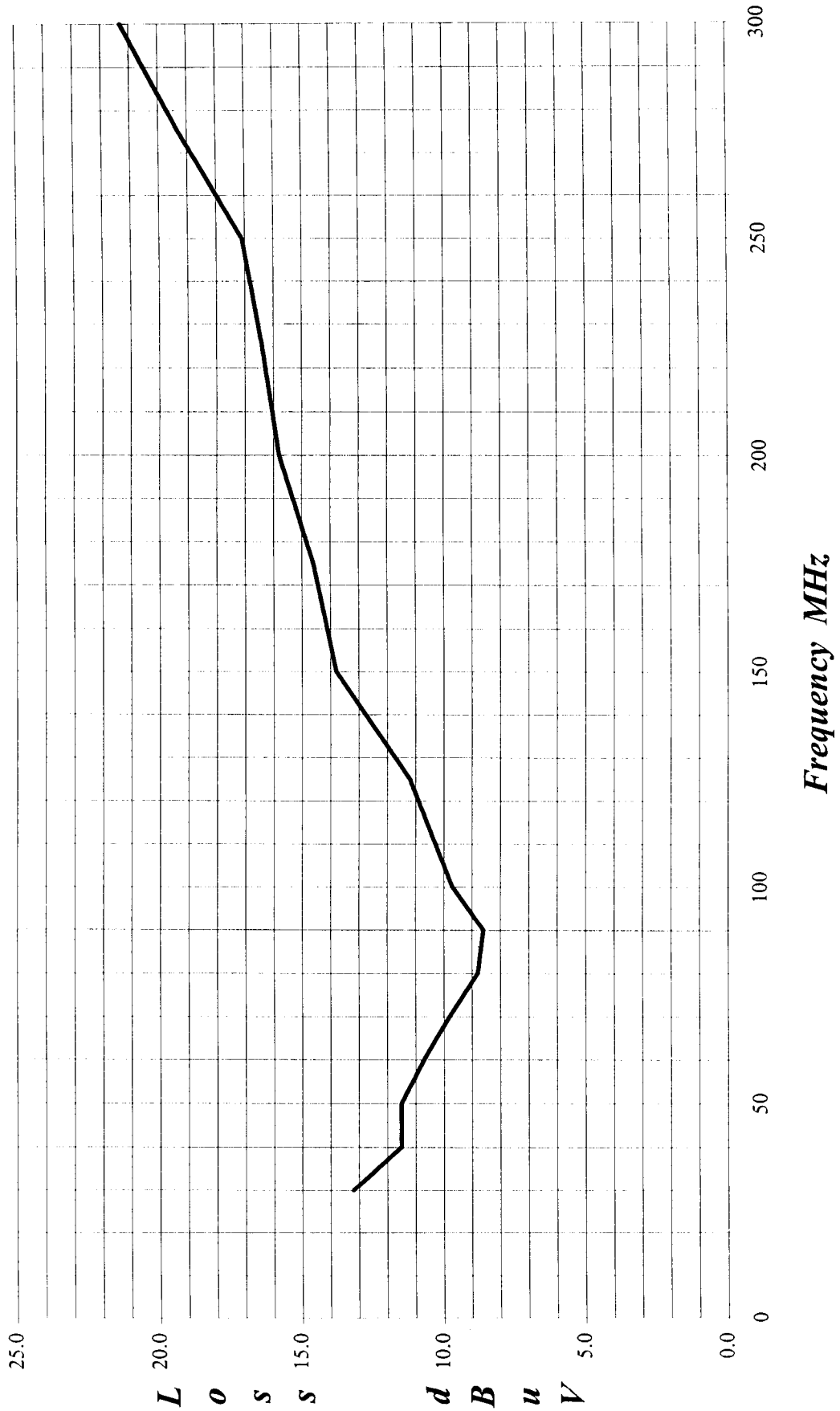






Cal: 3/24/98

LAB "D" BICONICAL ANTENNA AB-100 S/N 01548





Cal: 12/11/97

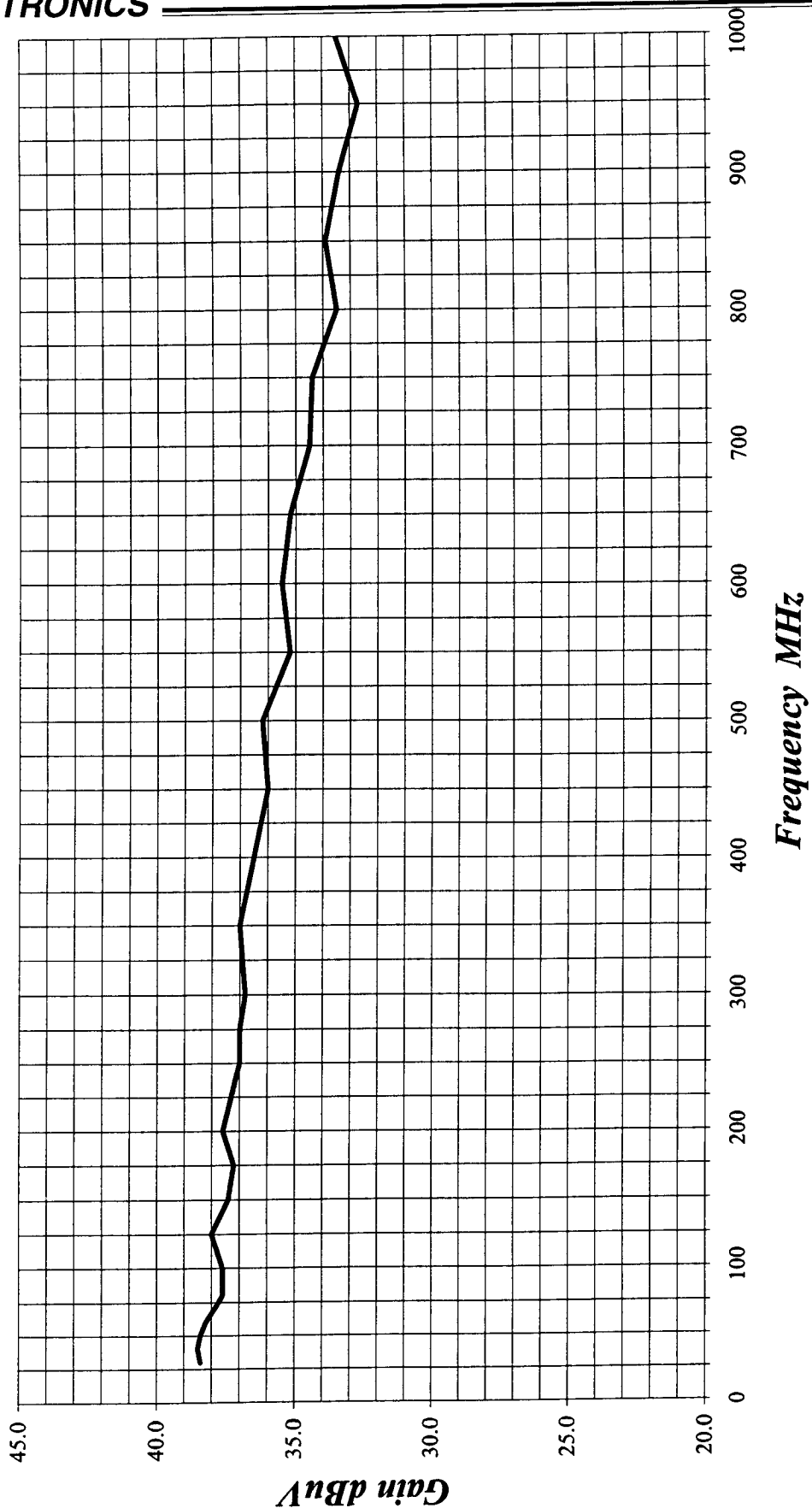
LAB "D" LOG PERIODIC ANTENNA AL-100 S/N 011117





Lab "D" Effective: 2/16/98 Effective Gain = Preamplifier Gain - Cable Loss

**PREAMPLIFIER EFFECTIVE GAIN AT 3 METERS S/N:
1017**



COM-POWER PA-122
MICROWAVE PREAMPLIFIER

S/N: 001

CALIBRATION DATE: MARCH 31, 1998

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	33.0	8.0	31.4
1.1	33.0	8.5	30.5
1.2	32.9	9.0	31.4
1.3	32.9	9.5	32.6
1.4	32.8	10.0	33.1
1.5	32.7	10.5	32.1
1.6	33.0	11.0	31.0
1.7	33.0	11.5	31.0
1.8	33.1	12.0	30.9
1.9	32.9	12.5	30.9
2.0	33.1	13.0	30.4
2.5	32.7	13.5	31.0
3.0	32.4	14.0	29.3
3.5	32.1	14.5	28.5
4.0	31.8	15.0	27.6
4.5	31.5	15.5	27.6
5.0	31.6	16.0	27.3
5.5	32.0	16.5	29.3
6.0	31.6	17.0	30.4
6.5	32.0	17.5	31.1
7.0	31.4	18.0	29.7
7.5	32.0	18.5	29.3

E-FIELD ANTENNA FACTOR CALIBRATION

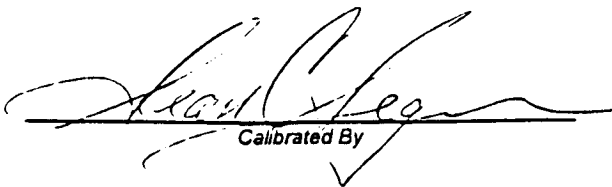
$$E(\text{dB V/m}) = V_o(\text{dB V}) + AFE(\text{dB/m})$$

Model number : DRG-118/A

Frequency GHz	AFE dB/m	Gain dBi
1	22.3	8.0
2	26.7	9.5
3	29.7	10.1
4	29.5	12.8
5	32.3	12.0
6	32.4	13.4
7	36.1	11.0
8	37.4	10.9
9	36.8	12.5
10	39.5	10.7
11	39.6	11.5
12	39.8	12.0
13	39.7	12.8
14	41.8	11.3
15	41.9	11.9
16	38.1	16.3
17	41.0	13.9
18	46.5	8.9

Serial number : 1053
Job number : 96-092
Remarks : 3 meter calibration
Standards : LPD-118/A, TE-1000

Temperature : 72° F
Humidity : 56 %
Traceability : A01887
Date : December 08, 1995


Calibrated By

Com-Power Corporation

(714) 587-9800

Antenna Calibration

Antenna Type:

Loop Antenna

Model:

AL-130

Serial Number:

25309

Calibration Date:

2/5/98

Frequency MHz	Magnetic (dB/m)	Electric dB/m
0.01	-40.5	11.0
0.02	-41.6	9.9
0.03	-40.0	11.5
0.04	-40.3	11.2
0.05	-41.6	9.9
0.06	-41.1	10.4
0.07	-41.3	10.2
0.08	-41.6	9.9
0.09	-41.7	9.8
0.1	-41.8	9.7
0.2	-44.0	7.5
0.3	-41.6	9.9
0.4	-41.7	9.8
0.5	-41.7	9.8
0.6	-41.5	10.0
0.7	-41.5	10.0
0.8	-41.6	9.9
0.9	-41.6	9.9
1	-41.1	10.4
2	-40.7	10.8
3	-40.7	10.8
4	-40.9	10.6
5	-40.1	11.4
6	-40.0	11.5
7	-40.3	11.2
8	-39.8	11.7
9	-38.8	12.7
10	-40.8	10.7
12	-41.4	10.1
14	-41.4	10.1
15	-40.9	10.6
16	-40.8	10.7
18	-41.5	10.0
20	-41.5	10.0
25	-41.2	10.3
30	-41.4	10.1

Trans. Antenna Height

2 meter

Receiving Antenna Height

2 meter

APPENDIX D
DATA SHEETS





RADIATED EMISSIONS

COMPANY NAME: CASIO PHONEMATE, INC. DATE: 9-3-98

EUT: 2-LINE 900 MHZ CORDLESS TELEPHONE EUT S/N: N/A

EUT MODEL: TC-945 LOCATION: ☒ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.249 CLASS: _____ TEST DISTANCE: 3m LAB: D

ANTENNA: ☒ LOOP ☐ BICONICAL ☐ LOG ☐ HORN **POLARIZATION:** ☐ VERT ☐ HORIZ

■ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: Kyle F.

NOTES: BASE - SPURIOUS EMISSIONS

[illegible]

• **CORRECTED READING = METER READING - DISTANCE FACTOR - ANTENNA GAIN**

**** DELTA = CORRECTED READING - SPECIFICATION LIMIT**

BREA (714) 579-0500

SILVERADO (714) 589-0700

AGOURA (818) 597-0600

RADIATED EMISSIONS

COMPANY NAME: CASIO PHONEMATE, INC. DATE: 9-3-98

EUT: 2-LINE 900 MHZ CORDLESS TELEPHONE EUT S/N: N/A

EUT MODEL: TC-945 LOCATION: ☒ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.249 CLASS: TEST DISTANCE: 3M LAB: D

ANTENNA: ☒ LOOP ☐ BICONICAL ☐ LOG ☐ HORN POLARIZATION: ☐ VERT ☐ HORIZ

☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: KYLE F.

NOTES: HANDSET - SPURIOUS EMISSIONS

Frequency (kHz)	Peak Reading (dBuV)	Avg. ☐ Q.P. ☐ (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Distance Factor (dB)	Antenna Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
		No EMISSIONS FOUND FROM					10kHz-30MHz		
		FOR THE HANDSET							

* CORRECTED READING = METER READING - DISTANCE FACTOR - ANTENNA GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT

BREA (714) 579-0500

SILVERADO (714) 589-0700

AGOURA (818) 597-0600



RADIATED EMISSIONS

COMPANY NAME: CASIO PHONEMATE, INC. DATE: 9-3-98
EUT: 2-LINE 900 MHZ CORDLESS TELEPHONE EUT S/N: N/A
EUT MODEL: TC-945 LOCATION: ☒ BREA ☐ SILVERADO ☐ AGOURA
SPECIFICATION: FCC 15.249 CLASS: TEST DISTANCE: 3M LAB: D
ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN POLARIZATION: ☒ VERT ☐ HORIZ
☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: KYLE F.
NOTES: BASE - LOW CHANNEL

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.90218	91.8	-	1.0	180	20.2	4.1	37.5	78.6	-15.4	94.0
1.804	50.2	-	1.5	0	24.5	5.9	33.1	47.5	-6.5	54.0
2.706	39.1	-	1.0	0	28.2	5.5	32.7	40.1	-13.9	54.0

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT



COMPANY NAME: CASIO PHONEMATE, INC. DATE: 9-3-98
EUT: 2-LINE 900 MHZ CORDLESS TELEPHONE EUT S/N: N/A
EUT MODEL: TC-945 LOCATION: ☒ BREA ☐ SILVERADO ☐ AGOURA
SPECIFICATION: FCC 15.249 CLASS: TEST DISTANCE: 3 M LAB: D
ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN POLARIZATION: ☒ VERT ☐ HORIZ
☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: KYLE F.
NOTES: BASE - MIDDLE CHANNEL

[illegible]

*** CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN**

**** DELTA = CORRECTED READING - SPECIFICATION LIMIT**

BREA (714) 579-0500

SILVERADO (714) 589-0700

AGOURA (818) 597-0600



COMPANY NAME: CRSIO PHONEMATE, INC. **DATE:** 9-3-98

EUT: 2-LINE 900 MHZ CORDLESS TELEPHONE **EUT S/N:** N/A

EUT MODEL: TC-945 **LOCATION:** ☒ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.249 **CLASS:** **TEST DISTANCE:** 3M **LAB:** D

ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN **POLARIZATION:** ☒ VERT ☐ HORIZ

QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT **ENGINEER:** Kyle F.

NOTES: BASE- HIGH CHANNEL

[illegible]

**** DELTA = CORRECTED READING - SPECIFICATION LIMIT**

AGOURA (818) 597-0600

RADIATED EMISSIONS

COMPANY NAME: CRSTO PHONEMATE, INC. DATE: 9-3-98
 EUT: 2-LINE 900 MHZ CORDLESS TELEPHONE EUT S/N: N/A
 EUT MODEL: TC-945 LOCATION: ☒ BREA ☐ SILVERADO ☐ AGOURA
 SPECIFICATION: FCC 15.249 CLASS: _____ TEST DISTANCE: 3M LAB: D
 ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN POLARIZATION: ☐ VERT ☒ HORIZ
☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: KYLE F.
 NOTES: BASE - LOW CHANNEL

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.90218	86.3	-	1.5	180	20.2	4.1	37.5	73.1	-20.9	94.0
1.804	48.5	-	2.0	180	24.5	5.9	33.1	45.8	-8.2	54.0
2.706	39.7	-	1.0	180	28.2	5.5	32.7	40.7	-13.3	54.0

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT

BREA (714) 579-0500

SILVERADO (714) 589-0700

AGOURA (818) 597-0600



COMPANY NAME: CASIO PHONEMATE, INC. DATE: 9-3-98
EUT: 2-LINE 900 MHZ CORDLESS TELEPHONE EUT S/N: N/A
EUT MODEL: TC-945 LOCATION: ☒ BREA ☐ SILVERADO ☐ AGOURA
SPECIFICATION: FCC 15.249 CLASS: TEST DISTANCE: 3 M LAB: D
ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN POLARIZATION: ☐ VERT ☒ HORIZ
☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: Kyle F.

NOTES: BASE-MIDDLE CHANNEL

[illegible]

**** DELTA = CORRECTED READING - SPECIFICATION LIMIT**

AGOURA (818) 597-0600



RADIATED EMISSIONS

COMPANY NAME: CASIO PHONEMATE, INC. DATE: 9-3-98

EUT: 2-LINE 900 MHz Cordless Telephone EUT S/N: N/A

EUT MODEL: TC-945 LOCATION: ☒ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.249 CLASS: TEST DISTANCE: 3M LAB: D

ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN POLARIZATION: ☐ VERT ☒ HORIZ

☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: KYLE F.

NOTES: BASE - HIGH CHANNEL

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
0.90357	87.9	-	1.5	180	20.2	4.1	37.5	74.7	-19.3	94.0
1.807	49.3	-	1.0	180	24.5	5.9	33.1	46.6	-7.4	54.0
2.711	40.5	-	1.0	180	28.2	5.5	32.7	41.5	-12.5	54.0

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT

BREA (714) 579-0500

SILVERADO (714) 589-0700

AGOURA (818) 597-0600

**RADIATED EMISSIONS**COMPANY NAME: CASIO PHONEMATE, INC. DATE: 9-3-98EUT: 2-LINE 900 MHZ CORDLESS TELEPHONE EUT S/N: N/AEUT MODEL: TC-945 LOCATION: ☒ BREA ☐ SILVERADO ☐ AGOURASPECIFICATION: FCC 15.249 CLASS: TEST DISTANCE: 3M LAB: DANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN POLARIZATION: ☒ VERT ☐ HORIZ☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: KYLE F.NOTES: LOW CHANNEL - HANDSET

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.92617	93.4	-	1.0	180	19.9	4.2	37.2	80.3	-13.7	94.0
1.852	48.7	-	3.0	90	24.5	5.7	32.9	46.0	-8.0	54.0
2.778	37.1	-	1.0	180	29.7	6.4	32.4	40.8	-13.2	54.0

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT



COMPANY NAME: CASIO PHONEMATE, INC. DATE: 9-3-98

EUT: 2-LINE 900 MHZ CORDLESS TELEPHONE EUT S/N: N/A

EUT MODEL: TC-945 LOCATION: ☒ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.249 CLASS: TEST DISTANCE: 3M LAB: D

ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN POLARIZATION: ☒ VERT ☐ HORIZ

☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: KYLE F.

NOTES: MIDDLE CHANNEL - HANDSET

[illegible]

**** DELTA = CORRECTED READING - SPECIFICATION LIMIT**

AGOURA (818) 597-0600



COMPANY NAME: CASIO PHONEMATE, INC. DATE: 9-3-98
EUT: 2-LINE 900 MHZ CORDLESS TELEPHONE EUT S/N: N/A
EUT MODEL: TC-945 LOCATION: ☒ BREA ☐ SILVERADO ☐ AGOURA
SPECIFICATION: FCC 15.249 CLASS: TEST DISTANCE: 3M LAB: D
ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN POLARIZATION: ☒ VERT ☐ HORIZ
☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: Kyle F.
NOTES: HANDSET - HIGH CHANNEL

[illegible]

*** CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN**

**** DELTA = CORRECTED READING - SPECIFICATION LIMIT**

BREA (714) 579-0500

SILVERADO (714) 589-0700

AGOURA (818) 597-0600

**RADIATED EMISSIONS**COMPANY NAME: CASIO PHONEMATE, INC. DATE: 9-3-98EUT: 2-LINE 900 MHz Cordless Telephone EUT S/N: N/AEUT MODEL: TC-945 LOCATION: ☒ BREA ☐ SILVERADO ☐ AGOURASPECIFICATION: FCC 15.249 CLASS: TEST DISTANCE: 3M LAB: DANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN POLARIZATION: ☐ VERT ☒ HORIZ☒ QUALIFICATION ☐ ENGINEERING ☐ MFG. AUDIT ENGINEER: KYLE F.NOTES: HANDSET - LOW CHANNEL

Frequency (GHz)	Peak Reading (dBuV)	Average Reading (dBuV)	Antenna Height (meters)	Azimuth (degrees)	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	* Corrected Reading (dBuV)	Delta ** (dB)	Spec Limit (dBuV)
.92616	84.4	-	2.5	180	19.9	4.2	37.2	71.3	-22.7	94.0
1.852	44.5	-	1.0	180	24.5	5.7	32.9	41.8	-12.2	54.0
2.778	37.4	-	1.0	180	29.7	6.4	32.4	41.1	-12.9	54.0

* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

** DELTA = CORRECTED READING - SPECIFICATION LIMIT



COMPANY NAME: CASIO PHOTOMAT, INC. **DATE:** 9-3-98

EUT: 2-LINE 900 MHZ CORDLESS TELEPHONE **EUT S/N:** N/A

EUT MODEL: TC-945 **LOCATION:** ☒ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.249 **CLASS:** **TEST DISTANCE:** 3M **LAB:** D

ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN **POLARIZATION:** ☐ VERT ☒ HORIZ

☒ **QUALIFICATION** ☐ **ENGINEERING** ☐ **MFG. AUDIT** **ENGINEER:** KYLE F.

NOTES: HANDSET - MIDDLE CHANNEL

[illegible]

* **CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN**

**** DELTA = CORRECTED READING - SPECIFICATION LIMIT**

BREA (714) 579-0500

SILVERADO (714) 589-0700

AGOURA (818) 597-0600



COMPANY NAME: CASIO PHONEMATE, INC. **DATE:** 9-3-98

EUT: 2-LINE 900 MHZ CORDLESS TELEPHONE **EUT S/N:** N/A

EUT MODEL: TC-945 **LOCATION:** ☒ BREA ☐ SILVERADO ☐ AGOURA

SPECIFICATION: FCC 15.249 **CLASS:** _____ **TEST DISTANCE:** 3 M **LAB:** D

ANTENNA: ☐ LOOP ☐ BICONICAL ☒ LOG ☒ HORN **POLARIZATION:** ☐ VERT ☒ HORIZ

☒ **QUALIFICATION** ☐ **ENGINEERING** ☐ **MFG. AUDIT** **ENGINEER:** KYLE F.

NOTES: HANDSET - HIGH CHANNEL

[illegible]

* **CORRECTED READING** = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

**** DELTA = CORRECTED READING - SPECIFICATION LIMIT**

BREA (714) 579-0500

SILVERADO (714) 589-0700

AGOURA (818) 597-0600

Page: 1 of 4

Test location: Compatible Electronics
 Customer : CASIO PHONEMATE, INC. Date : 9/ 3/1998
 Manufacturer : CASIO PHONEMATE, INC. Time : 14.42
 EUT name : 2-LINE 900 MHZ CORDLESS TELEPHONE Model: TC-945
 Specification: Fcc_B Test distance: 3.0 mtrs Lab: D
 Distance correction factor($20 \times \log(\text{test}/\text{spec})$) : 0.00
 Test Mode :
 HANDSET UNIT - SPURIOUS EMISSIONS
 TEMPERATURE 105 DEGREES F.
 RELATIVE HUMIDITY 45%
 TEST ENGINEER: KYLE FUJIMOTO

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1V	30.09	49.40	0.50	13.18	38.90	24.18	40.00	-15.82
2V	31.01	42.50	0.50	13.03	38.91	17.12	40.00	-22.88
3V	32.05	45.50	0.50	12.85	38.92	19.93	40.00	-20.07
4V	34.02	43.30	0.50	12.52	38.94	17.38	40.00	-22.62
5V	36.05	53.90	0.50	12.17	38.96	27.61	40.00	-12.39
6V	36.06	55.20	0.50	12.17	38.96	28.91	40.00	-11.09
7V	38.06	50.50	0.50	11.83	38.98	23.85	40.00	-16.15
8V	42.09	47.70	0.52	11.50	39.00	20.72	40.00	-19.28
9V	48.05	49.60	0.58	11.50	39.00	22.68	40.00	-17.32
10V	56.01	47.80	0.66	11.02	38.94	20.54	40.00	-19.46
11V	63.94	46.10	0.70	10.35	38.78	18.36	40.00	-21.64
12V	445.89	56.00	2.18	16.13	38.22	36.09	46.00	-9.91
13V	463.24	57.90	2.28	16.23	38.33	38.07	46.00	-7.93
14V	509.90	49.60	2.58	16.48	38.58	30.08	46.00	-15.92

Page: 2 of 4

Test location: Compatible Electronics

Customer : CASIO PHONEMATE, INC.

Date : 9/ 3/1998

Manufacturer : CASIO PHONEMATE, INC.

Time : 15.01

EUT name : 2-LINE 900 MHZ CORDLESS TELEPHONE Model: TC-945

Specification: Fcc_B Test distance: 3.0 mtrs Lab: D

Distance correction factor($20 \cdot \log(\text{test}/\text{spec})$) : 0.00

Test Mode :

HANDSET UNIT - SPURIOUS EMISSIONS

TEMPERATURE 105 DEGREES F.

RELATIVE HUMIDITY 45%

TEST ENGINEER: KYLE FUJIMOTO

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1H	30.04	43.10	0.50	13.19	38.90	17.89	40.00	-22.11
2H	31.05	42.20	0.50	13.02	38.91	16.81	40.00	-23.19
3H	35.02	47.30	0.50	12.35	38.95	21.20	40.00	-18.80
4H	36.06	52.90	0.50	12.17	38.96	26.61	40.00	-13.39
5H	56.01	44.50	0.66	11.02	38.94	17.24	40.00	-22.76
6H	63.95	39.40	0.70	10.34	38.78	11.66	40.00	-28.34
7H	120.95	44.40	0.98	10.96	38.92	17.42	43.50	-26.08
8H	445.90	46.70	2.18	16.13	38.22	26.79	46.00	-19.21
9H	463.25	45.90	2.28	16.23	38.33	26.07	46.00	-19.93
10H	509.91	52.30	2.58	16.48	38.58	32.78	46.00	-13.22

Test location: Compatible Electronics

Customer : CASIO PHONEMATE, INC.

Date : 9/ 4/1998

Manufacturer : CASIO PHONEMATE, INC.

Time : 9.11

EUT name : 2-LINE 900 MHZ CORDLESS TELEPHONE Model: TC-945

Specification: Fcc_B Test distance: 3.0 mtrs Lab: D

Distance correction factor($20 \cdot \log(\text{test}/\text{spec})$) : 0.00

Test Mode :

BASE UNIT - SPURIOUS EMISSIONS

TEMPERATURE 77 DEGREES F.

RELATIVE HUMIDITY 75%

TEST ENGINEER: KYLE FUJIMOTO

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1V	32.01	56.20	0.50	12.86	38.92	30.64	40.00	-9.36
2V	32.84	50.70	0.50	12.72	38.93	24.99	40.00	-15.01
3V	33.20	53.50	0.50	12.66	38.93	27.72	40.00	-12.28
4V	36.11	55.80	0.50	12.16	38.96	29.50	40.00	-10.50
5V	39.98	60.30	0.50	11.50	39.00	33.30	40.00	-6.70
6V	43.96	55.50	0.54	11.50	39.00	28.54	40.00	-11.46
7V	48.01	59.10	0.58	11.50	39.00	32.18	40.00	-7.82
8V	52.00	50.60	0.62	11.34	38.98	23.58	40.00	-16.42
9V	55.99	51.70	0.66	11.02	38.94	24.44	40.00	-15.56
10V	58.27	45.90	0.68	10.84	38.92	18.50	40.00	-21.50
11V	60.11	51.80	0.70	10.69	38.90	24.29	40.00	-15.71
12V	63.65	56.80	0.70	10.37	38.79	29.08	40.00	-10.92
13V	65.64	62.70	0.70	10.19	38.73	34.86	40.00	-5.14
14V	82.02	59.30	0.72	8.76	38.32	30.46	40.00	-9.54
15V	98.39	67.50	0.88	9.52	38.48	39.42	43.50	-4.08
16V	114.61	53.10	0.96	10.58	38.79	25.84	43.50	-17.66
17V	164.01	52.70	1.31	14.25	38.60	29.66	43.50	-13.84
18V	196.84	41.80	1.40	15.65	38.95	19.90	43.50	-23.60
19V	229.57	42.50	1.44	16.53	38.68	21.78	46.00	-24.22
20V	262.37	42.90	1.65	18.19	38.65	24.09	46.00	-21.91
21V	311.30	48.10	1.82	15.49	38.67	26.74	46.00	-19.26
22V	328.00	50.60	1.86	15.32	38.77	29.01	46.00	-16.99
23V	344.36	49.90	1.89	15.16	38.87	28.08	46.00	-17.92
24V	393.54	49.80	1.99	15.36	38.53	28.62	46.00	-17.38
25V	524.62	46.60	2.70	16.74	38.40	27.64	46.00	-18.36
26V	721.26	46.60	3.63	21.77	38.09	33.91	46.00	-12.09

Test location: Compatible Electronics

Customer : CASIO PHONEMATE, INC.

Date : 9/ 4/1998

Manufacturer : CASIO PHONEMATE, INC.

Time : 10.05

EUT name : 2-LINE 900 MHZ CORDLESS TELEPHONE Model: TC-945

Specification: Fcc_B Test distance: 3.0 mtrs Lab: D

Distance correction factor($20 \times \log(\text{test}/\text{spec})$) : 0.00

Test Mode :

BASE UNIT - SPURIOUS EMISSIONS

TEMPERATURE 77 DEGREES F.

RELATIVE HUMIDITY 75%

TEST ENGINEER: KYLE FUJIMOTO

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor'd rdg = R dBuV	limit = L dBuV/m	Delta R-L dB
1H	32.01	47.90	0.50	12.86	38.92	22.34	40.00	-17.66
2H	32.84	45.70	0.50	12.72	38.93	19.99	40.00	-20.01
3H	33.20	49.10	0.50	12.66	38.93	23.32	40.00	-16.68
4H	36.09	50.10	0.50	12.16	38.96	23.80	40.00	-16.20
5H	39.99	59.30	0.50	11.50	39.00	32.30	40.00	-7.70
6H	43.98	51.30	0.54	11.50	39.00	24.34	40.00	-15.66
7H	60.98	52.80	0.70	10.61	38.87	25.24	40.00	-14.76
8H	63.67	57.50	0.70	10.37	38.79	29.78	40.00	-10.22
9H	65.61	63.80	0.70	10.19	38.73	35.96	40.00	-4.04
10H	82.03	50.70	0.72	8.76	38.32	21.86	40.00	-18.14
11H	98.31	56.50	0.88	9.51	38.48	28.41	43.50	-15.09
12H	114.71	49.70	0.96	10.58	38.79	22.45	43.50	-21.05
13H	121.86	48.40	0.99	11.01	38.94	21.46	43.50	-22.04
14H	131.23	53.40	1.05	11.85	38.90	27.40	43.50	-16.10
15H	393.57	45.60	1.99	15.36	38.53	24.42	46.00	-21.58
16H	590.37	43.10	2.98	17.85	38.42	25.50	46.00	-20.50

MEASUREMENT NOTES:

PAGE D20

CASIO PHONEMATE, INC.
2-LINE 900 MHZ CORDLESS TELEPHONE
MODEL: TC-945
FCC C - BLACK LEAD - 4 SEP 1998 11:24:31

12 highest Peaks above -50 dB of Limit Line #2
peak criteria = .1 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.5367	39.5	-8.5
2	.4654	39.4	-8.6
3	.4713	39.2	-8.8
4	.4538	39.1	-8.9
5	.4833	38.8	-9.2
6	.6401	38.7	-9.3
7	.4935	38.6	-9.4
8	.5644	38.5	-9.5
9	.7109	38.5	-9.5
10	.53	38.4	-9.6
11	.4576	38.3	-9.7
12	.5168	38.3	-9.7

MEASUREMENT NOTES:

CASIO PHONEMATE, INC.
2-LINE 900 MHZ CORDLESS TELEPHONE
MODEL: TC-945
FCC C - WHITE LEAD - 4 SEP 1998 11:37:43

12 highest Peaks above -50 dB of Limit Line #2
peak criteria = .1 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.6428	41	-7.0
2	.7383	36.6	-11.4
3	20.74	36.6	-11.4
4	4.618	36.2	-11.8
5	13.29	36.2	-11.8
6	1.216	36.1	-11.9
7	6.851	36.1	-11.9
8	17.91	36.1	-11.9
9	8.485	36	-12.0
10	23.42	36	-12.0
11	27.13	36	-12.0
12	.504	35.9	-12.1

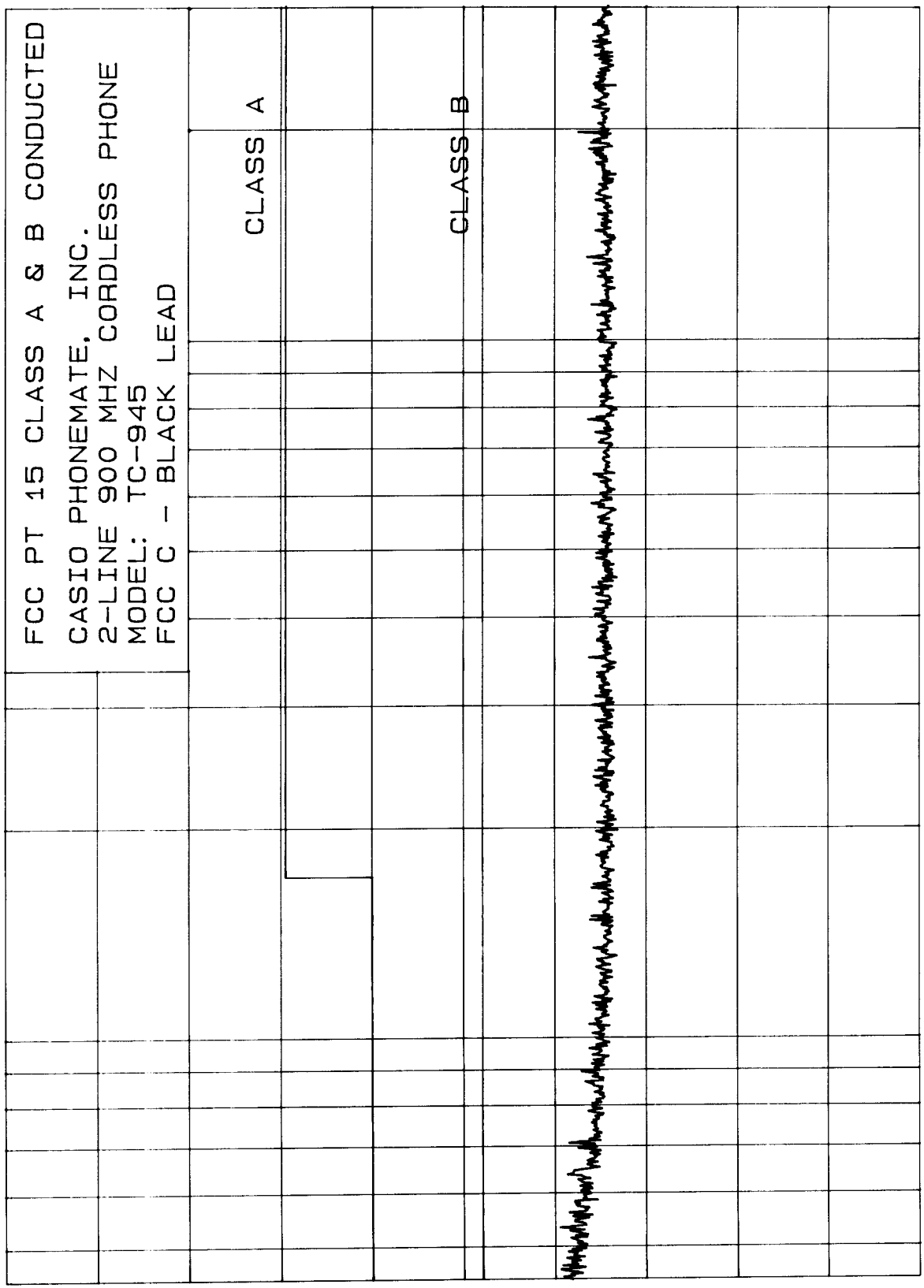
MEASUREMENT NOTES:

TEST ENGINEER:

Kyle Fujimoto
KYLE FUJIMOTO

COMPATIBLE ELECTRONICS INC. 4 Sep 1998 11: 24: 31
EMISSION LEVEL [dBuV] PEAK

hp
100



FREQUENCY [MHz]

COMPATIBLE ELECTRONICS INC. 4 Sep 1998 11: 37: 43
EMISSION LEVEL [dBuV] PEAK

hp
100

FCC PT 15 CLASS A & B CONDUCTED
CASIO PHONEMATE, INC.
2-LINE 900 MHZ CORDLESS PHONE
MODEL: TC-945
FCC C - WHITE LEAD

80

CLASS A

60

CLASS B

40

20

.45

1

10

30

FREQUENCY [MHz]

