TABLE OF CONTENTS LIST

APPLICANT: RADIOSHACK CORPORATION
FCC ID: AAO4301128A

TEST REPORT:

EXHIBITS:

APPLICANT: RADIOSHACK CORPORATION
FCC ID: AAO4301128A

15.214(d) - THIS DEVICE COMPLIES WITH THE SECURITY CODE REQUIREMENTS OF 15.214(d)(1)(2) AND (3) BY MEANS OF THE FOLLOWING:

This cordless telephone system provides random digital security codes. It has 65000 Digital Security Codes.

APPLICANT: RADIOSHACK CORPORATION
FCCID : AAO4301128A

TEST EQUIPMENT LIST

1._X_Spectrum Analyzer: HP 8566B-Opt 462, S/N 3138A07786, w/ preselector HP 85685A, S/N 3221A01400, Quasi-Peak Adapter HP 8565OA, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02, S/N 3008A00372 Cal. 10/17/99
2._X_Biconnical Antenna: Eaton Model 94455-1, S/N 1057
3.___Biconnical Antenna: Electro-Metrics Model BIA-25, S/N 1171
4._X_Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
5.___Log-Periodic Antenna: Electro-Metrics Model LPA-30, S/N 409
6._X_Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180, 1-18 GHz, S/N 2319
7.___18-26.3GHz Systron Donner Standard Gain Horn #DBE-520-20
8.___Horn 40-60GHz: ATM Part #19-443-6R
9.___Line Impedance Stabilization Network: Electro-Metrics Model ANS-25/2, S/N 2604 Cal. 2/9/00
10.___Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
11.___Frequency Counter: HP Model 5385A, S/N 3242A07460 Cal 10/6/99
12.___Peak Power Meter: HP Model 8900C, S/N 2131A00545
13._X_Open Area Test Site #1-3meters Cal. 12/22/99
14.___Signal Generator: HP 8640B, S/N 2308A21464 Cal. 9/23/99
15.___Signal Generator: HP 8614A, S/N 2015A07428
16.___Passive Loop Antenna: EMCO Model 6512, 9KHz to 30MHz, S/N 9706-1211 Cal. 6/10/00
17._X_Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 153 Cal. 11/24/99
18.___AC Voltmeter: HP Model 400FL, S/N 2213A14499 Cal. 9/21/99
19.___Digital Multimeter: Fluke Model 8012A, S/N 4810047 Cal 9/21/99
20.___Digital Multimeter: Fluke Model 77, S/N 43850817 Cal 9/21/99
21.___Oscilloscope: Tektronix Model 2230, S/N 300572 Cal 9/23/99

TEST PROCEDURE

GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC. Shielded interface cables were used in all cases except for cables connecting to the telephone line and the power cords. A test program was run which simulated a normal data transmission on a network.

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.4-1992 using a 50uH LISN. Both lines were observed. The bandwidth of the spectrum analyzer was 10kHz with an appropriate sweep speed. The ambient temperature of the UUT was 74°F with a humidity of 44%.

BANDWIDTH 6.0dB: The measurements were made with the spectrum analyzer's resolution bandwidth(RBW)=100KHz and the video bandwidth(VBW) =300KHz and the span set as shown on plot.

TEST PROCEDURES CONTINUED

POWER OUTPUT: The RF power output was measured at the antenna feed point by removing the permanent antenna and connecting the UUT to a peak power meter, HP Model No. 8900C.

ANTENNA CONDUCTED EMISSIONS: The RBW=100KHz, VBW > or = RBW and the spectrum was scanned from 30MHz to the 10th Harmonic of the fundamental.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a prese-lector. The bandwidth(RBW) of the spectrum analyzer was 100kHz up to 1GHz and 1.0MHz above 1GHz with an appropriate sweep speed. The VBW above 1.0GHz was = 1.0MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the UUT was 74°F with a humidity of 44%.

15.247(d) POWER SPECTRAL DENSITY. The peak within the pass band was located with the RBW set to 30 kHz and a span slightly greater than the 6 dB bandwidth. The peak emission was centered on the display and the span and RBW reduced. With a 1.5 MHz span, 3 kHz RBW, and a sweep time set to 500 seconds the spectral line spacing could not be resolved, so the noise power density method was used. The response was then plotted. A correction factor of 35 dB and any attenuation used was added.

15.247(e): PROCESSING GAIN, This gain is supplied by the manufacturer of the UUT. See Pages 14A-14F.

2.1033(b)(4)

ANTENNA AND GROUND SYSTEM:
This unit uses a short, inductively loaded, antenna element for the base unit and the handset. The antenna is permanently attached to the unit and no provision is made for connection to an external antenna.

No ground connection is provided. The only ground in use is the ground plane on the printed circuit board.

APPLICANT: RADIOSHACK CORPORATION

FCC ID: AAO4301128A

NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE

RULES PART NUMBER: 15.207

MINIMUM REQUIREMENTS:	FREQUENCY MHz	LEVEL dBuV
	0.450-30	48 dBuV or 250 uV

TEST PROCEDURE: ANSI STANDARD C63.4-1992

THE HIGHEST EMISSION READ FOR LINE 1 WAS 10.20 uV @ 24.62 MHz.

THE HIGHEST EMISSION READ FOR LINE 2 WAS 21.40 uV @ 21.73 MHz.

THE GRAPHS IN THE NEXT PAGE REPRESENT THE EMISSIONS READ FOR POWERLINE CONDUCTED FOR THIS DEVICE.

TEST RESULTS: Both lines were observed with the UUT transmitting. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

PERFORMED BY: JOE SCOGLIO DATE: APRIL 4, 2001

APPLICANT: RADIOSHACK CORPORATION

FCC ID: AAO4301128A

NAME OF TEST: OCCUPIED BANDWIDTH

RULES PART NUMBER: 15.247

15.247(a)(2) 6dB bandwidth shall be at least 500 kHz.

The 6dB points for the base is 1.680 MHz and handset is 1.670 MHz as Shown n the accompanying plots. The bandwidth was measured at three places in the band and the narrowest is reported.

15.247(B) PEAK POWER OUTPUT

The maximum peak output power shall not exceed 1 watt (30 dBm). If directional transmitting antennas with a gain of more than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Both the base and handset have a maximum power output of less than +30 dBm. Power was measured by disconnecting the antennas and measuring across a 50 ohm load as recommended by the manufacturer using a HP peak power meter Model 8900C. The antennas are non directional and do not exceed 6 dBi gain. The power output was measured at three places in the band highest is reported below.

POWER OUTPUT - LIMIT +30 dBm

BASE PEAK POWER OUTPUT = +10.0 dBm or 0.0.010 Watts
HANDSET PEAK POWER OUTPUT = +8.0 dBm or 0.0065 Watts

APPLICANT: RADIOSHACK CORPORATION

FCC ID: AAO4301128A

NAME OF TEST: ANTENNA CONDUCTED SPURIOUS EMISSIONS

RULES PART NUMBER: 15.247(c) Spurious Emissions must be 20dBc.

HANDSET: BASE:

FREQUENCY MHz	ATTENUATION dBc		FREQUENCY MHz	ATTENUATION dBc
2411.50	0.0		2413.50	0.0
4823.00	75.4		4827.10	69.6
7234.50	72.5		7240.70	75.1
9646.00	79.7		9654.20	92.1
12057.60	94.4		12067.80	88.3
14469.10	99.5		14481.40	93.2
2442.20	0.0		2442.20	0.0
4884.40	77.2		4884.40	71.0
7326.70	72.5		7326.70	78.4
9768.90	78.7		9768.90	102.5
12211.20	79.1		12211.20	98.1
17095.60	95.7		17095.60	95.7
2472.90	0.0		2472.90	0.0
4945.90	75.3		4945.90	72.2
7418.80	71.9		7418.80	83.3
9891.80	81.6		9891.80	103.7
12364.80	89.0		12364.80	103.6
17310.70	100.6			

APPLICANT: RADIOSHACK CORPORATION

FCC ID: AAO4301128A

NAME OF TEST: RADIATED SPURIOUS EMISSIONS - HANDSET

RULES PART NUMBER: 15.247(c)

REQUIREMENTS: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m). Spurious not in a restricted band must be 20dBc.

Manufacturer supplied a CW test mode for radiated and power output measurements and included a peak to duty cycle/DSSS mode correction factor of -6.02 dB which was applied to the following values. Even without the correction factor the unit complies with current rules.

EMISSION FREQUENCY MHz	METER READING 3m dBuV	COAX LOSS dB	ACF dB	Correction Factor dB	FIELD STRENGTH dBuV/m	FCC LIMIT dBuV/m	MARGIN dB	ANT POL
2407.4	78.2	2	29.02	-6.02	103.2	127.34	24.14	**V**
4814.8	8.6	3.4	33.92	-6.02	39.9	54	14.1	H
7222.2	4.7	5	36.62	-6.02	40.3	83.2	42.9	V
2442.2	77.1	2	29.11	-6.02	102.19	127.34	25.15	V
4884.4	12.7	3.4	33.99	-6.02	44.07	54	9.93	V
7326.7	2.2	5	36.74	-6.02	37.92	54	16.08	H
2477	76.6	2	29.19	-6.02	101.77	127.34	25.57	V
4954.1	16.4	3.4	34.07	-6.02	47.85	54	6.15	V
7431.1	9	5	36.86	-6.02	44.84	54	9.16	H

APPLICANT: RADIOSHACK CORPORATION

FCC ID: AAO4301128A

NAME OF TEST: RADIATED SPURIOUS EMISSIONS - BASE

EMISSION FREQUENCY MHz	METER READING 3m dBuV	COAX LOSS dB	ACF dB	Correction Factor dB	FIELD STRENGTH dBuV/m	FCC LIMIT dBuv/m	MARGIN dB	ANT. POL.
2407.4	77	2	29.02	-6.02	102	127.34	25.34	**V**
4814.8	12.6	3.4	33.92	-6.02	43.9	54	10.1	V
7222.2	8.6	5	36.62	-6.02	44.2	82	37.8	V
9629.6	2.4	6.3	38.58	-6.02	41.26	82	40.74	V
2442.2	76.6	2	29.11	-6.02	101.69	127.34	25.65	H
4884.4	8.5	3.4	33.99	-6.02	39.87	54	14.13	V
7326.7	1.3	5	36.74	-6.02	37.02	54	16.98	V
2477	77.4	2	29.19	-6.02	102.57	127.34	24.77	V
4954.1	10.9	3.4	34.07	-6.02	42.35	54	11.65	V
7431.1	2.3	5	36.86	-6.02	38.14	54	15.86	V

SAMPLE CALCULATION: FSdBuV/m = MR(dBuV) + ACFdB + COAX+ C.F.

METHOD OF MEASUREMENT: The procedure used was ANSI STANDARD C63.4-1992. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The spectrum was scanned from 30 MHz to 10 GHz using a Hewlett Packard Model 8566B Spectrum Analyzer, Hewlett Packard Model 85685A Preselector, Hewlett Packard Model 85650A Quasi-Peak Adaptor, and an appropriate antenna. Low loss coax was used above 1 GHz. Measurements were made at Timco Engineering, Inc. 849 NW State Road 45 Newberry, Fl.

TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY: Joseph Scoglio DATE: APRIL 4, 2001

APPLICANT: RADIOSHACK CORPORATION

FCC ID: AAO4301128A

NAME OF TEST: RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND

REQUIREMENTS: Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500 uV/m (54 dBuV/m).

TEST PROCEDURE: An in band field strength measurement of the fundamental Emission using the RBW and detector function required by C63.4-2000 and FCC Rules. The procedure was repeated with an average detector and a plot made. The calculated field strength in the adjacent restricted band is presented below.

Handset		Base	
-107.3	dBm	-111.4	dBm
+ 29.21	dB	+ 29.21	dB
+ 1.1	dB	+ 1.1	dB
- 76.99	dBm	- 81.09	dBm
+107.00		+107.00	
30.01	dBuV	25.91	dBuV

APPLICANT: RADIOSHACK CORPORATION

FCC ID: AAO4301128A

NAME OF TEST: POWER SPECTRAL DENSITY

RULES PART NUMBER: 15.247(d)

REQUIREMENTS: The power spectral density averaged over any 1 second interval shall not be greater than 8 dBm in any 3 kHz bandwidth within these bands.

TEST DATA:

The spectrum line spacing could not be resolved so the noise power density was measured;

Measurement Method:

Starting from the settings that were used for the 6 dB bandwidth the peak signal was located and the span was reduced and the sweep time increased in a manner to maintain calibration and to keep the peak emission in the display, then once the sweep time reached 500seconds with a 1.5 MHz span the spectrum analyzer was put into the noise power mode and the plots made.

A value of -26.2 dBm was calculated for the handset.
A value of –24.2 dBm was calculated for the base.

Calculations:

BASE:

- 2.4 dBuV	– Level from Plot
+ 60.0 dB	– Attn.
+ 35.0 dB	- Correction Factor
+ 92.6 dBuV	
-107.0 dB	
- 14.4 dBm	

HANDSET:

- 6.2 dBuV	– Level from Plot
+ 60.0 dB	- Attn.
+ 35.0 dB	- Correction Factor
+ 88.8 dBuV	
-107.0 dB	
- 18.2 dBm	

See the following plots.

PROCESSING GAIN TEST

CHANNEL18(2442.240MHz)-Base station output to handset input

Jammer Freq. (MHz)	Transmitter Outputs (dBm)	Signal Level (dBm)	CW Level (dBm)	Mj J/S ratio (dB)	Processing Gain (dB)
2441.240	14.0	-36.0	-33.2	2.8	15.8
2441.290	14.0	-36.0	-33.6	2.4	15.4
2441.340	14.0	-36.0	-34.0	2.0	15.0
2441.390	14.0	-36.0	-34.6	1.4	14.4
2441.440	14.0	-36.0	-36.0	0.0	13.0
2441.490	14.0	-36.0	-36.9	-0.9	12.1
2441.540	14.0	-36.0	-36.2	-0.2	12.8
2441.590	14.0	-36.0	-36.9	-0.9	12.1
2441.640	14.0	-36.0	-36.9	-0.9	12.1
2441.690	14.0	-36.0	-36.4	-0.4	12.6
2441.740	14.0	-36.0	-35.3	0.7	13.7
2441.790	14.0	-36.0	-35.6	0.4	13.4
2441.840	14.0	-36.0	-36.4	-0.4	12.6
2441.890	14.0	-36.0	-36.4	-0.4	12.6
2441.940	14.0	-36.0	-36.6	-0.6	12.4
2441.990	14.0	-36.0	-36.8	-0.8	12.2
2442.040	14.0	-36.0	-36.9	-0.9	12.1
2442.090	14.0	-36.0	-37.0	-1.0	12.0
2442.140	14.0	-36.0	-37.0	-1.0	12.0
2442.190	14.0	-36.0	-36.7	-0.7	12.3
2442.240	14.0	-36.0	-37.4	-1.4	11.6
2442.290	14.0	-36.0	-37.2	-1.2	11.8
2442.340	14.0	-36.0	-37.3	-1.3	11.7
2442.390	14.0	-36.0	-37.5	-1.5	11.5
2442.440	14.0	-36.0	-37.2	-1.2	11.8
2442.490	14.0	-36.0	-36.4	-0.4	12.6
2442.540	14.0	-36.0	-36.3	-0.3	12.7
2442.590	14.0	-36.0	-36.4	-0.4	12.6
2442.640	14.0	-36.0	-35.3	0.7	13.7
2442.690	14.0	-36.0	-34.9	1.1	14.1
2442.740	14.0	-36.0	-34.4	1.6	14.6
2442.790	14.0	-36.0	-36.9	-0.9	12.1
2442.840	14.0	-36.0	-37.1	-1.1	11.9
2442.890	14.0	-36.0	-35.8	0.2	13.2
2442.940	14.0	-36.0	-36.2	-0.2	12.8
2442.990	14.0	-36.0	-35.8	0.2	13.2
2443.040	14.0	-36.0	-35.3	0.7	13.7
2443.090	14.0	-36.0	-34.4	1.6	14.6
2443.140	14.0	-36.0	-33.8	2.2	15.2
2443.190	14.0	-36.0	-33.3	2.7	15.7
2443.240	14.0	-36.0	-32.9	3.1	16.1

LOSSES(dB)	
Attenuation	50
System Loss	2
S/N ratio	11

Mj J/S ratio =
CW Noize-Sig.Level

ProcessingGain =
Mj J/S ratio + Sytem Loss
+ S/N ratio

PROCESSING GAIN TEST

CHANNEL18(2442.240MHz)-handset output to Base station input

Jammer Freq. (MHz)	Transmitter Outputs (dBm)	Signal Level (dBm)	CW Level (dBm)	Mj J/S ratio (dB)	Processing Gain (dB)
2441.240	14.0	-36.0	-34.0	2.0	15.0
2441.290	14.0	-36.0	-34.5	1.5	14.5
2441.340	14.0	-36.0	-34.7	1.3	14.3
2441.390	14.0	-36.0	-34.8	1.2	14.2
2441.440	14.0	-36.0	-36.3	-0.3	12.7
2441.490	14.0	-36.0	-37.0	-1.0	12.0
2441.540	14.0	-36.0	-36.2	-0.2	12.8
2441.590	14.0	-36.0	-37.1	-1.1	11.9
2441.640	14.0	-36.0	-37.1	-1.1	11.9
2441.690	14.0	-36.0	-36.7	-0.7	12.3
2441.740	14.0	-36.0	-36.1	-0.1	12.9
2441.790	14.0	-36.0	-36.4	-0.4	12.6
2441.840	14.0	-36.0	-36.6	-0.6	12.4
2441.890	14.0	-36.0	-36.9	-0.9	12.1
2441.940	14.0	-36.0	-37.0	-1.0	12.0
2441.990	14.0	-36.0	-37.1	-1.1	11.9
2442.040	14.0	-36.0	-37.2	-1.2	11.8
2442.090	14.0	-36.0	-37.2	-1.2	11.8
2442.140	14.0	-36.0	-37.3	-1.3	11.7
2442.190	14.0	-36.0	-37.0	-1.0	12.0
2442.240	14.0	-36.0	-37.1	-1.1	11.9
2442.290	14.0	-36.0	-37.1	-1.1	11.9
2442.340	14.0	-36.0	-37.1	-1.1	11.9
2442.390	14.0	-36.0	-37.3	-1.3	11.7
2442.440	14.0	-36.0	-37.1	-1.1	11.9
2442.490	14.0	-36.0	-36.6	-0.6	12.4
2442.540	14.0	-36.0	-36.7	-0.7	12.3
2442.590	14.0	-36.0	-36.5	-0.5	12.5
2442.640	14.0	-36.0	-35.8	0.2	13.2
2442.690	14.0	-36.0	-35.1	0.9	13.9
2442.740	14.0	-36.0	-34.8	1.2	14.2
2442.790	14.0	-36.0	-37.0	-1.0	12.0
2442.840	14.0	-36.0	-37.3	-1.3	11.7
2442.890	14.0	-36.0	-36.7	-0.7	12.3
2442.940	14.0	-36.0	-36.2	-0.2	12.8
2442.990	14.0	-36.0	-36.5	-0.5	12.5
2443.040	14.0	-36.0	-35.4	0.6	13.6
2443.090	14.0	-36.0	-34.4	1.6	14.6
2443.140	14.0	-36.0	-34.1	1.9	14.9
2443.190	14.0	-36.0	-33.9	2.1	15.1
2443.240	14.0	-36.0	-33.9	2.1	15.1

LOSSES(dB)

Attenuation	50
System Loss	2
S/N ratio	11

Mj J/S ratio =
CW Noize-Sig.Level

ProcessingGain =
Mj J/S ratio + Sytem Loss
+ S/N ratio

The Processing Gain is measured with using the CW jamming margin method. Figure 1 shows the test configuration. The test consists of stepping a signal generator in 50 kHz increments across the passband of the system (up to 1MHz away from the center frequency). At each point, the generator level required to be produced the recommended Bit Error Rate (BER) (Set at BER=1.0E-3) is recorded. This level is the jamming level. The output power of the transmitter unit is measured at the same point. The Jammer to Signal (J/S) ratio is then calculated. Discard the worst 20% of the J/S data point. The lowest remaining J/S ratio is used to calculate the processing gain. The maximum implementation loss a system can claim in calculating processing gain is 2dB. The equation to calculate the processing gain (Gp) is as follows:

$Gp = (S/N)o + Mj + Lsys$

Where (S/N)o = signal to noise ratio required for a FSK system with BER of 1.0E-3 = 11dB,
Mj = jamming margin (J/S) in dB,
Lsys = system implementation loss = 2dB.

[TEST PROCEDURE]

1. B/S output to H/S input

(1)The B/S is connected by its RF test connector to the fixed attenuator which is 50dB. The output of the fixed attenuator is combined with the output of the signal generator through a combiner. The output of the combiner is connected by the H/S RF test connector. The H/S is connected by the BB-ASIC(UC2575)'s test pins to the BER counter (RX data is pin32 and RX clock is pin41).

(2)TONE/PULSE SW set to PULSE. The B/S is powered by the adapter while pushing the page-key. The page-key shall be held at least for 3 seconds. Then the page-key is released and pushed shortly (within 500 mSec) 10 times. TONE/PULSE SW is set to TONE. Then the PAGE-KEY is pushed shortly (within 500 mSec) once. The H/S is powered by the battery while pushing the *-KEY and #-Key. Those keys are held at least for 2 seconds. Then those keys are released and the 'flash'-key is pushed once. And then "channel-key " is pushed once.

(3)BER counter is JRC NJZ-940 (Continuous mode, PN15, and the receive clock uses an external clock with its leading edge.).

(4)The signal generator is stepped in 50kHz increments. The required BER is 1.0e-3. When this error rate is achieved (displayed on the BER counter), the reading of signal generator is taken. This reading is then subtracted from the signal level of the B/S (while adding in the combiner loss and signal generator calibration factor) to obtain the J/S ratio. The J/S ratio is then combined with the system loss (2dB) and signal to noise ratio (11dB) of the unit to obtain the processing gain.

2. H/S output to B/S input

(1)The H/S is connected by its RF test connector to the fixed attenuator which is 50dB. The output of the fixed attenuator is combined with the output of the signal generator through a combiner. The output of the combiner is connected by the B/S RF test connector. The B/S is connected by the BB-ASIC(UC2575)'s test pins to the BER counter (RX data is pin32 and RX clock is pin41).

(2)TONE/PULSE SW set to PULSE. The B/S is powered by the adapter while pushing the PAGE-KEY. The PAGE-KEY shall be held at least for 3 seconds. Then the page-key is released and pushed shortly (within 500 mSec) 10 times. TONE/PULSE SW is set to TONE. Then the PAGE-KEY is pushed shortly (within 500 mSec) once. The H/S is powered by the battery washile pushing the *-KEY and #-Key. Those keys are held at least for 2 seconds. Then those keys are released and the 'FLASH'-KEY is pushed once. And then "channel-key " is pushed once.

(3)BER counter is JRC NJZ-940 (Continuous mode, PN15, and the receive clock uses an external clock with its leading edge.).

(4)The signal generator is stepped in 50kHz increments. The required BER is 1.0e-3. When this error rate is achieved (displayed on the BER counter), the reading of signal generator is taken. This reading is then subtracted from the signal level of the H/S (while adding in the combiner loss and signal generator calibration factor) to obtain the J/S ratio. The J/S ratio is then combined with the system loss (2dB) and signal to noise ratio (11dB) of the unit to obtain the processing gain.

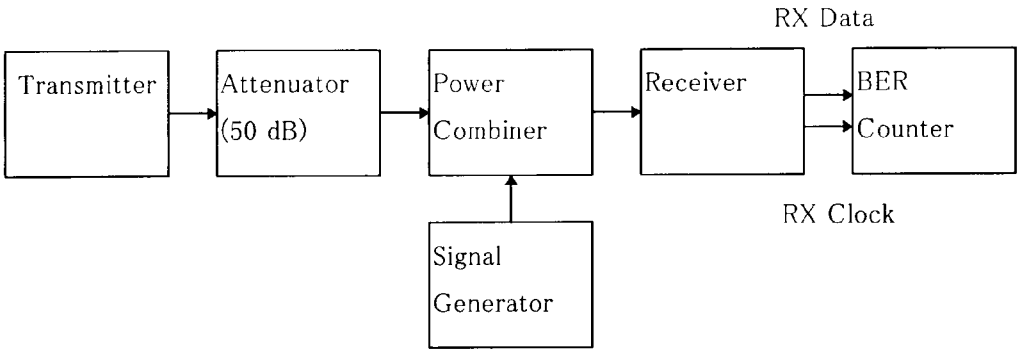

Fig. 5 The test configuration.

Processing Gain Test Equipment

	MANU-FACTURER	EQUIPMENT TYPE	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Variable Attenuator	Hewlett Packard	HP8496B	3308A71267	Aug. 11, 2000	Aug. 31, 2001
Variable Attenuator	Hewlett Packard	HP8494B	3308A37106	Aug. 11, 2000	Aug. 31, 2001
BER Counter	JRC	NJZ-940	ED24250	Nov. 08, 1999	JAN. 31, 2001
Signal Generator	Hewlett Packard	E4432B	US38441753	Aug. 24, 2000	Aug. 31, 2001
Combiner	Mini-Circuit	15542	942705	N/A	N/A

Other information

1. Actual frequencies for each channel:

CH	Frequency	CH	Frequency	CH	Frequency	CH	Frequency
1	2407.424MHz	11	2427.904MHz	21	2448.384MHz	31	2468.864MHz
2	2409.472MHz	12	2429.952MHz	22	2450.432MHz	32	2470.912MHz
3	2411.520MHz	13	2432.000MHz	23	2452.480MHz	33	2472.960MHz
4	2413.568MHz	14	2434.048MHz	24	2454.528MHz	34	2475.008MHz
5	2415.616MHz	15	2436.096MHz	25	2456.576MHz	35	2477.056MHz
6	2417.664MHz	16	2438.144MHz	26	2458.624MHz		
7	2419.712MHz	17	2440.192MHz	27	2460.672MHz		
8	2421.760MHz	18	2442.240MHz	28	2462.720MHz		
9	2423.808MHz	19	2444.288MHz	29	2464.768MHz		
10	2425.856MHz	20	2446.336MHz	30	2466.816MHz		

2. Chipping rate: 1.366 M cps

3. Antenna Gain for both the Base unit and Handset:

Gain respect to dipole
Base unit: + 3.16 dB
Handset : + 0.36 dB

Gain respect to isotropic
Base unit: + 5.3 dBi (=+3.16+2.14)
Handset : + 2.5 dBi (=+0.36+2.14)

Note that antenna gain measurement were conducted based on substitution method using with double ridged antenna.

4. Processing Gain: Please see attached documents.