FIGURE 2

Photograph(s) for Spurious and Fundamental Emissions

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Photograph(s) for Spurious and Fundamental Emissions

FIGURE 2

Photograph(s) for Conducted Emissions

EUT and Peripherals

PERIPHERAL MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
Dog Fence Transmitter Radio Systems Corporation (EUT)	TC-100	None	KE3TC100 (Pending)	300' U

TABLE 2
TEST INSTRUMENTS

TYPE	MANUFACTURER	MODEL	SN.
SPECTRUM ANALYZER	HEWLETT-PACKARD	8593E	3205A00124
SPECTRUM ANALYZER	HEWLETT-PACKARD	8558B	2332A09900
S A DISPLAY	HEWLETT-PACKARD	853A	2404A02387
COMB GENERATOR	HEWLETT-PACKARD	8406A	1632A01519
RF PREAMP	HEWLETT-PACKARD	8447D	1937A03355
RF PREAMP	HEWLETT-PACKARD	8449B	3008A00480
HORN ANTENNA	EMCO	3115	3723
BICONICAL ANTENNA	EMCO	3110	9307-1431
LOOP ANTENNA	AH SYSTEMS	SAS200/562	142
LOG PERIODIC ANTENNA	EMCO	3146	9110-3600
LISN	SOLAR ELE.	8028	N/A
THERMOMETER	FLUKE	52	5215250
MULTIMETER	FLUKE	85	53710469
FUNCTION GENERATOR	TEKTRONIX	CFG250	CFG250TW15059
PLOTTER	HEWLETT-PACKARD	7475A	2325A65394
BILOG	CHASE	CBL6112A	2238

Field Strength of Fundamental Emission (47 CFR 15.209)

Measurements were made using a peak detector. Field strength of the peak fundamental emission is shown in Tables 3 and 4.

Duty Cycle Correction During 100 msec:

Each setting sends a different series of characters, but the worse case transmit cycle consists of 20.5 ms of transmit time every 35.5 ms (57.7 % Duty Cycle). Figure 3 shows the characteristics of the pulse train for one of the various functions.

Duty Cycle Correction = 20 log (0.577) = -4.8 dB

Figure 3

Attention: Tim Johnson
From: Brandon Lee
Radio Systems Corp.

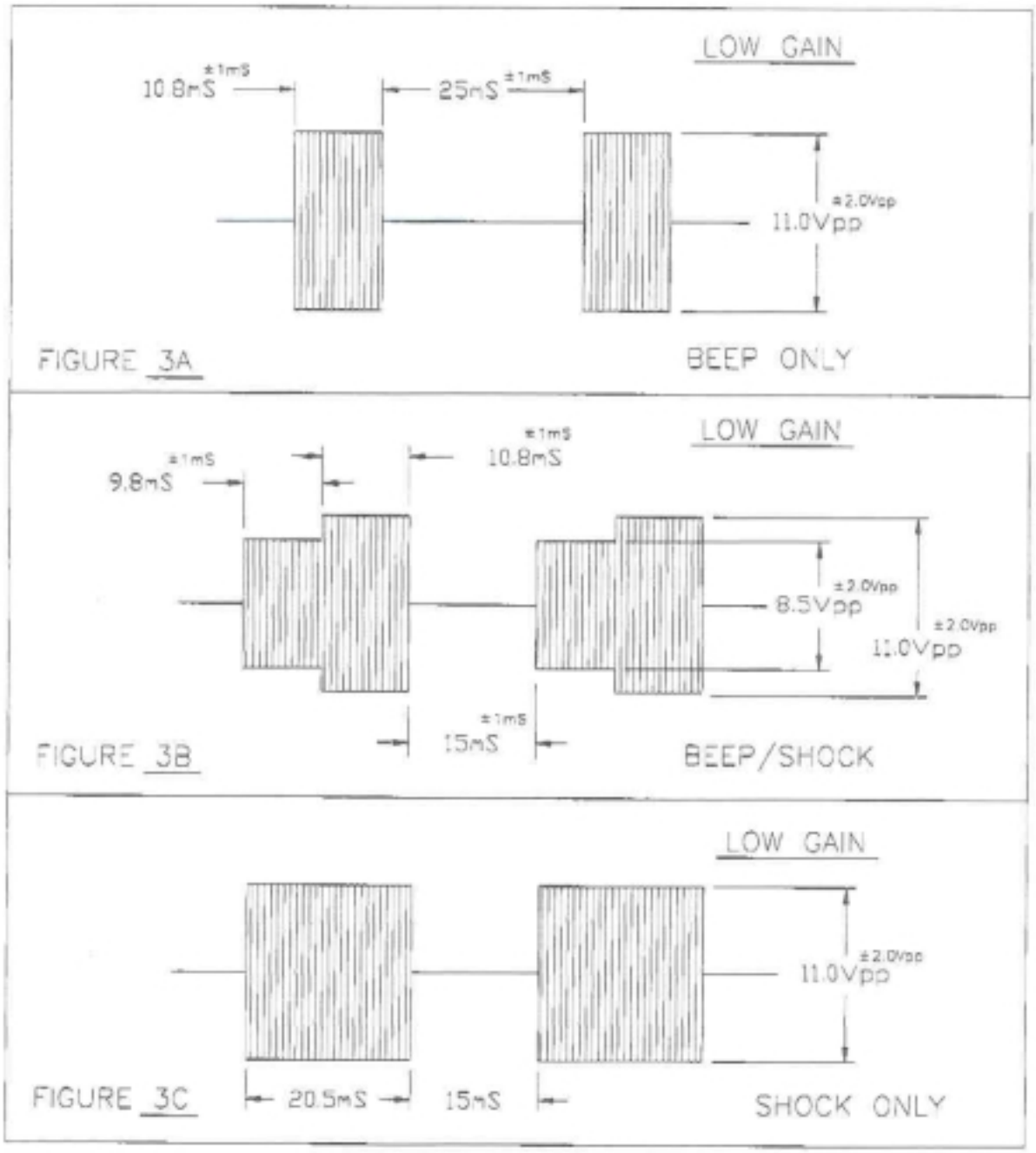

TABLE 3a

FIELD STRENGTH OF FUNDAMENTAL EMISSION

Test Date: **August 21, 1999**
UST Project: **99-623**
Customer: **Radio Systems Corporation**
Model: **TC-100**

FREQ. (kHz)	TEST DATA (dBm) @ 10m	ANTENNA FACTOR + CABLE ATTENUATION	PEAK RESULTS (uV/m) @ 300m	PEAK FCC LIMITS (uV/m) @ 300m
10.7	-67.5	77.8	27.1	2243.0

SAMPLE CALCULATIONS:

RESULTS uV/m @ 3m = Antilog ((-67.5 + 77.8 + 107 – 88.6)/20) = 27.1
CONVERSION FROM dBm TO dBuV = 107 dB
CORRECTION FROM 10m TO 300m = -88.6 dB

Test Results
Reviewed By: _____ Name: Tim R. Johnson _____

TABLE 3b

FIELD STRENGTH OF FUNDAMENTAL EMISSION

Test Date: August 21, 1999
UST Project: 99-623
Customer: Radio Systems Corporation
Model: TC-100

FREQ. (kHz)	TEST DATA* (dBm) @ 10m	ANTENNA FACTOR + CABLE ATTENUATION	AVERAGE RESULTS (uV/m) @ 300m	AVERAGE FCC LIMITS (uV/m) @ 300m
10.7	-72.3	77.8	15.6	224.3

*** = Corrected for worse case duty cycle, 20 log (0.577) = -4.8 dB**

SAMPLE CALCULATIONS:

RESULTS uV/m @ 3m = Antilog ((-72.3 + 77.8 + 107 – 88.6)/20) = 15.6
CONVERSION FROM dBm TO dBuV = 107 dB
CORRECTION FROM 10m TO 300m = -88.6 dB

Test Results
Reviewed By: _____ Name: Tim R. Johnson_____

Field Strength Of Spurious Emissions (47 CFR 15.209)

Measurements were made using a peak detector. Field strength of Spurious Emissions are shown in Table 4. For all emission measurements made the limits given in 15.209 were applied.

TABLE 4a

FIELD STRENGTH OF SPURIOUS EMISSIONS

Test Date: **August 21, 1999**
UST Project: **99-623**
Customer: **Radio Systems Corporation**
Model: **TC-100**

Peak Reading (<30 MHz)

FREQ. (kHz.)	TEST DATA (dBm) @ 10m	ANTENNA FACTOR + CABLE ATTENUATION	PEAK RESULTS (uV/m) @ 300m	PEAK FCC LIMITS (uV/m) @ 300m
21.4	-98.5	71.9	0.38	1121.4
31.9	-104.0**	70.1	0.17	752.3
53.2	-103.0	64.5	0.10	451.1

**** = Ground Floor**

SAMPLE CALCULATIONS:

RESULTS uV/m @ 3m = Antilog ((-98.5 + 71.9 + 107 – 88.6)/20) = 0.38
CONVERSION FROM dBm TO dBuV = 107 dB
CORRECTION FROM 10m TO 300m = -88.6 dB

Test Results
Reviewed By: _____ Name: Tim R. Johnson_____

TABLE 4b

FIELD STRENGTH OF SPURIOUS EMISSIONS

Test Date: August 21, 1999
UST Project: 99-623
Customer: Radio Systems Corporation
Model: TC-100

Average Reading (<30 MHz)

FREQ. (kHz.)	TEST DATA* (dBm) @ 10m	ANTENNA FACTOR + CABLE ATTENUATION	AVERAGE RESULTS (uV/m) @ 300m	AVERAGE FCC LIMITS (uV/m) @ 300m
21.4	-103.3	71.9	0.22	112.1
31.9	-108.8	70.1	0.10	75.3
53.2	-105.8	64.5	0.26	45.1

*** = Corrected for worse case duty cycle, 20 log (0.577) = -4.8 dB**

SAMPLE CALCULATIONS:

RESULTS uV/m @ 3m = Antilog ((-103.3 + 71.9 + 107 – 88.6)/20) = 0.22
CONVERSION FROM dBm TO dBuV = 107 dB
CORRECTION FROM 10m TO 300m = -88.6 dB

Test Results
Reviewed By: _____ **Name:** Tim R. Johnson

TABLE 5

FIELD STRENGTH OF SPURIOUS EMISSIONS (47 CFR 15.209)

CLASS B

Test Date: **August 13, 1999**
UST Project: **99-623**
Customer: **Radio Systems Corporation**
Model: **Model TC-100**

TX Mode Tested 30 MHz – 1 GHz

Frequency (MHz)	Test Data (dBm) @3m	Ant. Factor + Cable Atten. - Amp Gain	Results (uV/m)	FCC Limits (uV/m) @3m	Margin Below FCC Limit (dB)
No signals were seen from the EUT between the range of 30 MHz to 1 GHz					

Test Results
Reviewed By: _____ **Name:** **Tim R. Johnson**

Power Line Conducted Emissions (47 CFR 15.107a)

Conducted Emissions were evaluated from 450 kHz to 30 MHz. Measurements were made with the analyzer's bandwidth set to 9 kHz, emissions are shown in Table 6. The EUT was checked with a 300' fence length.

TABLE 6 CONDUCTED EMISSIONS DATA

CLASS B

Test Date: August 13, 1999
UST Project: 99-623
Customer: Radio Systems Corporation
Model: TC-100

FREQUENCY (MHz)	TEST DATA (dBm)		RESULTS (uV)		FCC LIMITS (uV)
	PHASE	NEUTRAL	PHASE	NEUTRAL	
.47	-73.0	-70.0	50.1	70.8	250
.97	-74.0	-75.0	44.7	39.8	250
1.26	-74.0	-76.0	44.7	35.5	250
9.55	-84.0	-88.0	14.1	8.9	250
9.99	-81.0	-87.0	20.0	10.0	250
11.76	-78.0	-83.0	28.2	15.8	250

SAMPLE CALCULATIONS:

RESULTS uV = Antilog ((-73.0 + 107)/20) = 50.1
CONVERSION FROM dBm TO dBuV = 107 dB

Test Results
Reviewed By: _____ Name: Tim R. Johnson