

## INTRODUCTION

An NRD-545 programmable scanning receiver was tested to determine compliance with FCC Part 15 certification limits under provisions of Para. 15.107 and 15.109. Measurements were made at 18 frequencies corresponding to successive frequency band switching ranges (See Exhibit 6).

The NRD-545 is an AC line operated programmable scanning receiver which operates under the control of an internal computer or external PC. The receiver is supplied with an external UHF and N style connectors.

Overall frequency range is <0.1 to 2000 MHz.

(A Declaration of Conformity a Class B personal computer peripheral has been completed. See Exhibit 7.)

## TELEPHONE DISCLOSURE AND DISPUTE RESOLUTION ACT COMPLIANCE

It is our professional judgement that this device complies with TDDRA Pub. L 102-556.

1) Frequencies in the 824-849 and 869-894 MHz bands cannot be entered into the channelization input by either front panel or external PC; 2) There are no provisions for readily modifying the circuitry; such as clipping leads, adding diodes/resistors, replacing a plug-in chip, programming a chip using special access codes, or any port to an external device such as a computer.

If an attempt is made to enter a frequency in the 824-849/869-894 MHz range, the entry is rejected.

## PROCEDURE - SPURIOUS RADIATION

The procedures of ANSI 63.4 - 1992 were followed.

Spurious radiations were measured at 3 meters on an FCC accepted open-field radiation test site. The receiver was placed on a rotatable test stand 80 cm above the ground plane.

The search antenna(s) were Emco tuned dipoles or Polarad horn antennae mounted on a 4-meter wooden mast. During the measurements, the search antenna height and polarization was varied to maximize signal pickup, as was orientation of the system and cables.

A Tektronix 494P spectrum analyzer was used as the signal measuring device. The spectrum analyzer is a peak-responding instrument. A 100 kHz resolution bandwidth was used, below 1 GHz, and 1 MHz > 1 GHz.

## PROCEDURE - SPURIOUS RADIATION (Continued)

Verification of spurious signal was accomplished by remotely turning the receiver on and off. The ac line supply was used throughout the tests.

Data were recorded on all signals 20 dB or more above the FCC minimum reporting limits for 15.109 unintentional radiators from 30-2000 MHz.

Measurement data were computed incorporating both antenna and coaxial line correction factors. System accuracy is estimated at  $\pm 3$ dB.

## DATA - RADIATED SPURIOUS

Data are compiled in Table 1.

Radiated spurious data and FCC limits are in microvolts per meter at 3 meters.

The test sample met FCC criteria for receiver radiation limits under Paragraph 15.109.

## PROCEDURE - AC LINE CONDUCTED SPURIOUS

The ac line conducted spurious were measured using the procedures of ANSI 63.4 - 1992. A HP 8640B signal generator was used as a signal source and an Advantest R3361A spectrum analyzer in CISPR quasi-peak mode as the detector.

The receiver was tuned to receiving frequencies at the lower, middle and upper limits. At each frequency an input of 100 uV was applied while the left and right ports of the IEEE-213 line impedance stabilization network were observed with the spectrum analyzer.

Data to determine compliance with Part 15, Class "B" computing device limits were taken with a IEEE-STD-213 LISN modified for the 50 microhenry inductances specified for. Since the 250 microvolt limit for a Class "B" computing device is more restrictive than 15.63, the limit of 15.107 was applied.

A 9 kHz resolution bandwidth was used with a 120 second scan time.

TABLE 1

RADIATED SPURIOUS EMISSIONS  
Measured at 3 meters  
PART 15(B) PARA. 15.109

Frequency To Which Tuned (MHz)	Frequency of Emission (MHz)	Meter Reading (dBm)	Antenna Factor (dB)	Field <sup>1</sup> Intensity uV/m @ 3m	FCC Limit uV/m @ 3m	dB to Limit
30.100	836.201	-98.0	20.9	31	200	-16
69.000	875.100	-98.4	23.0	38	200	-14
107.900	914.000	-99.6	23.2	34	200	-15
108.900	915.000	-98.0	23.2	41	200	-14
194.000	1000.100	-100.4	24.4	36*	500	-23
194.000	2000.201	-106.4	28.3	28*	500	-25
279.900	1086.001	-104.4	24.6	23*	500	-27
281.000	1087.101	-92.4	24.6	91	500	-15
423.700	1229.800	-90.4	25.0	120	500	-12
423.700	2459.600	-97.6	29.5	88	500	-15
567.000	1372.100	-89.2	25.4	145	500	-11
567.000	2744.200	-92.4	30.2	174	500	-9
568.000	836.702	-99.6	20.9	26	200	-18
823.900	1092.600	-98.0	24.6	48*	500	-20
823.900	2185.200	-96.8	28.8	89	500	-15
1104.000	1372.700	-92.8	25.4	96	500	-14
1104.000	2745.400	-92.4	30.2	174	500	-9
1105.000	836.300	-98.7	20.9	29	200	-17
1105.000	1672.602	-92.8	26.6	110	500	-13
1172.000	903.300	-96.8	23.3	47	200	-13
1239.000	970.300	-99.6	22.6	32*	500	-24
1241.000	972.300	-97.2	22.5	41*	500	-22
1241.000	1944.600	-103.2	28.0	39*	500	-22
1620.000	1351.300	-88.0	25.3	164	500	-10
1620.000	2702.600	-93.6	30.1	150	500	-11
1998.000	1191.900	-92.8	24.9	90	500	-15
1998.000	2383.800	-94.0	29.3	130	500	-12
L.O. HIx3	2386.199	-99.6	29.3	68	500	-17
L.O. LOx2	516.000	-103.2	18.6	13*	200	-24
L.O. LOx3	774.000	-102.8	20.9	18*	200	-21

Note 1:  $uV/m = \text{Log}^{-1} \frac{dBu/m}{20}$

$dBu = dBm + \text{antenna factor} + 107$

\*Reference data, 20 dB or more below FCC limit.

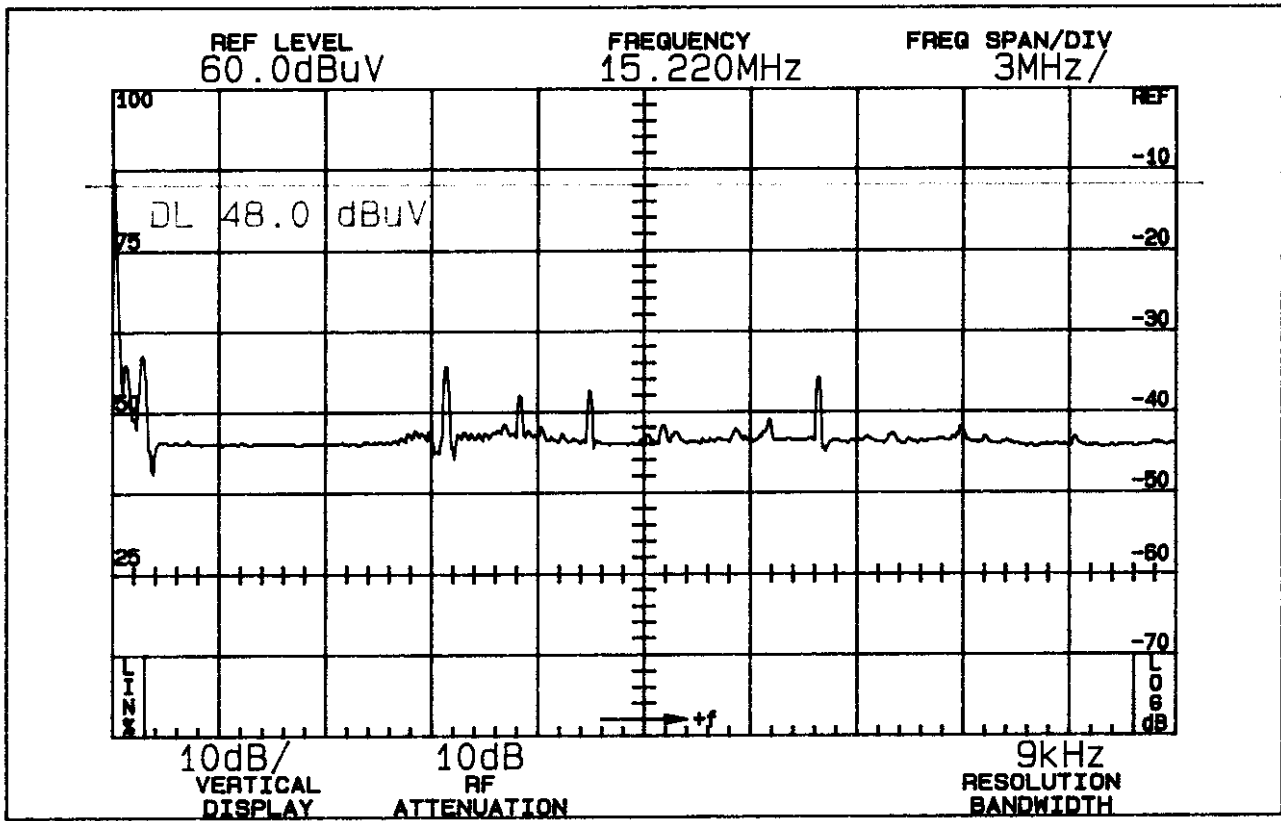
RADIATED SPURIOUS EMISSIONS  
FCC ID: CKENRD-545

TABLE 1

## DATA - AC LINE CONDUCTED

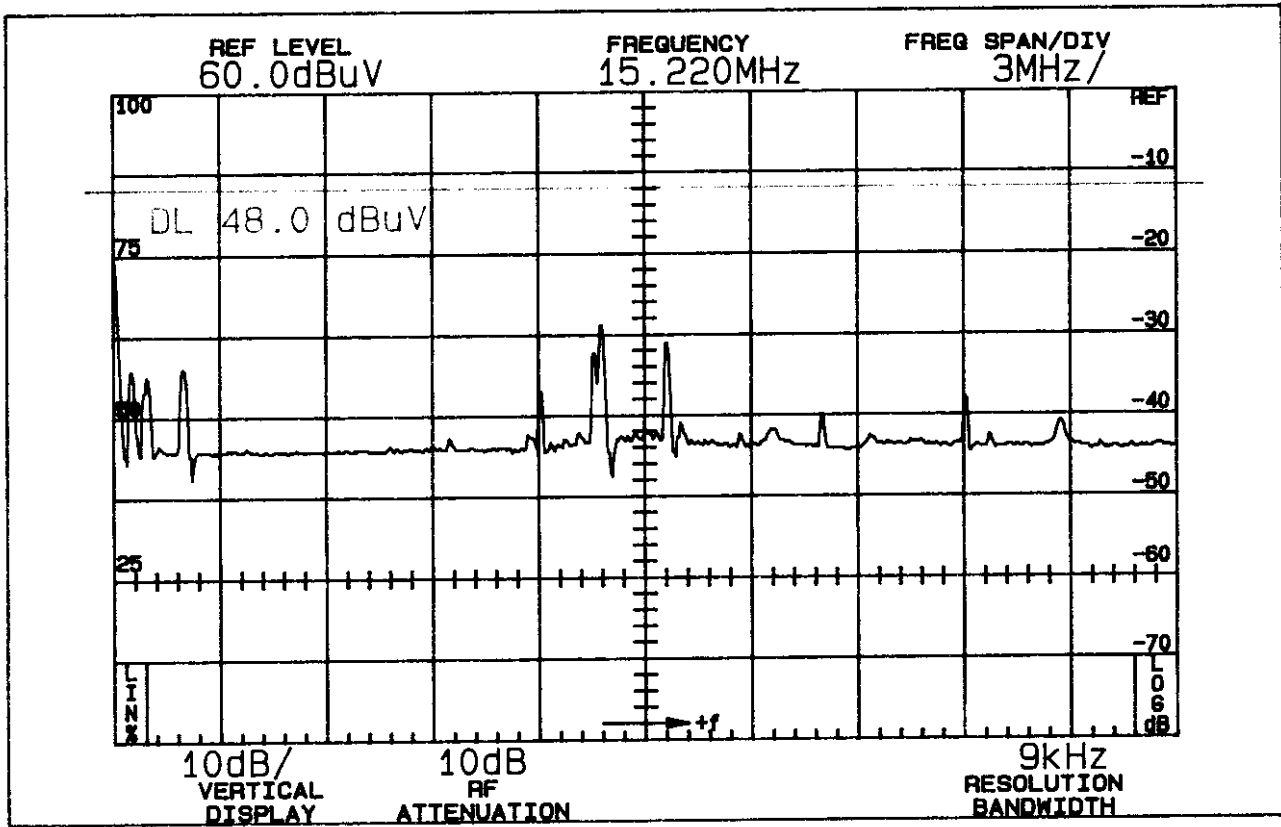
All ac line conducted spurious from .45 to 30 MHz were within the FCC limits of Paragraph 15.107.

Plots of both left and right output ports of the LISN are shown in Figures 1 and 2. The scale of the plots are 10 dB/division vertical referenced to 60 dBuV (top of graticule) and 0.45 MHz left, 15.22 MHz center, and 30 MHz right. The 250 uV limit (48 dBuV) is shown in green.



AC LINE CONDUCTED SPURIOUS  
FCC ID: CKENRD-545

Figure 1 (Left LISN Port)



AC LINE CONDUCTED SPURIOUS  
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Figure 2 (Right LISN Port)