

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
CERTIFICATION TO FCC PART 15 REQUIREMENTS**

for

INTENTIONAL RADIATOR

434 MHz CAR ALARM TRANSMITTER

MODEL NO: CA-RC4PET

FCC ID NO: ELVMT0B

REPORT NO: 00T0218-1

ISSUE DATE: MAY 05, 2000

Prepared for

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TEST DATA

- Maximum Modulation Percentage Plot
- Emission Bandwidth Plot
- Radiated Emission Worksheet for Peak Measurement
- Radiated Emission Worksheet for Average Measurement

1. VERIFICATION OF COMPLIANCE

COMPANY NAME: NUTЕК CORPORATION
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EUT DESCRIPTION: 434 MHz CAR ALARM TRANSMITTER

MODEL NAME/NUMBER: CA-RC4PET

FCC ID: ELVMT0B

DATE TESTED: MAY 05, 2000

REPORT NUMBER: 00T0218-1

| | |
|-----------------------|---|
| TYPE OF EQUIPMENT | SECURITY EQUIPMENT (INTENTIONAL RADIATOR) |
| EQUIPMENT TYPE | 434 MHz CAR ALARM TRANSMITTER |
| MEASUREMENT PROCEDURE | ANSI C63.4 / 1992 |
| LIMIT TYPE | CERTIFICATION |
| FCC RULE | CFR 47, PART 15 |

The above equipment was tested by Compliance Certification Services for compliance with the requirements set forth in the FCC CFR 47, PART 15. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties. **Warning** : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification will constitute fraud and shall nullify the document.

T. N. COKENIAS / ENGINEERING DIRECTOR
COMPLIANCE ENGINEERING SERVICES, INC.

2. Product Description

| | |
|-----------------------|---|
| Fundamental Frequency | 434 MHz |
| Power Source | 12V Battery |
| Transmitting Time | Periodic \leq 5 seconds |
| Associated Receiver | FCC ID: ELVAR8B |

3. Test Facility

The 3/10/30 meter open area test site and conducted measurement facility used to collect the radiated data is located at 561F Monterey Road, Morgan Hill, California, U.S.A. A detailed description of the test facility was submitted to the Commission on May 27,1994.

4. Measurement Standards

The site is constructed and calibrated in conformance with the requirements of ANSI C63.4/1992.

5. Test Methodology

For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 KHz, up to at least the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. (CFR 47 Section 15.33)

6. Measurement Equipment Used

| Manufacturer | Model Number | Description | Cal Due Date |
|--------------|--------------|------------------------------------|--------------|
| H.P. | 8568A | Spectrum Analyzer (100Hz – 1.5GHz) | 02/01 |
| H.P. | 8566B | Spectrum Analyzer (100Hz – 22GHz) | 09/00 |
| EMCO | 3146 | Antenna (200-1000 MHz) | 10/00 |
| H.P. | 8447D | Preamplifier (0.1 - 1300 MHz) | 09/00 |
| EMCO | 3115 | Antenna(1 - 18GHZ) | 11/00 |
| H.P. | 8449B | Preamplifier (1-26.5GHZ) | 03/01 |

7. POWERLINE RFI LIMIT

| | |
|--|--|
| CONNECTED TO AC POWER LINE | SECTION 15.207 |
| CARRIER CURRENT SYSTEM IN THE FREQUENCY RANGE OF 450 KHZ TO 30 MHz | SECTION 15.205 AND SECTION 15.209, 15.221, 15.223, 15.225 OR 15.227, AS APPROPRIATE. |
| BATTERY POWER | NO REQUIRED. |

8. RADIATED EMISSION LIMITS

| | |
|---|-----------------|
| GENERAL REQUIREMENTS | SECTION 15.209. |
| RESTRICTED BANDS OF OPERATION | SECTION 15.205 |
| PERIODIC OPERATION IN THE BAND 40.66 -40.70 MHz AND ABOVE 70 MHz. | SECTION 15.231 |

9. SYSTEM TEST CONFIGURATION

Use a block of foam and combined it with EUT wrapping rubber band around it. This way it can test X.Y, and Z axis. To activate continuous transmission, place a small plastic block between rubber band and EUT push button.



Radiated Open Site Test Set-up

10. Test Procedure

Radiated Emissions, 15.231(4)(b)

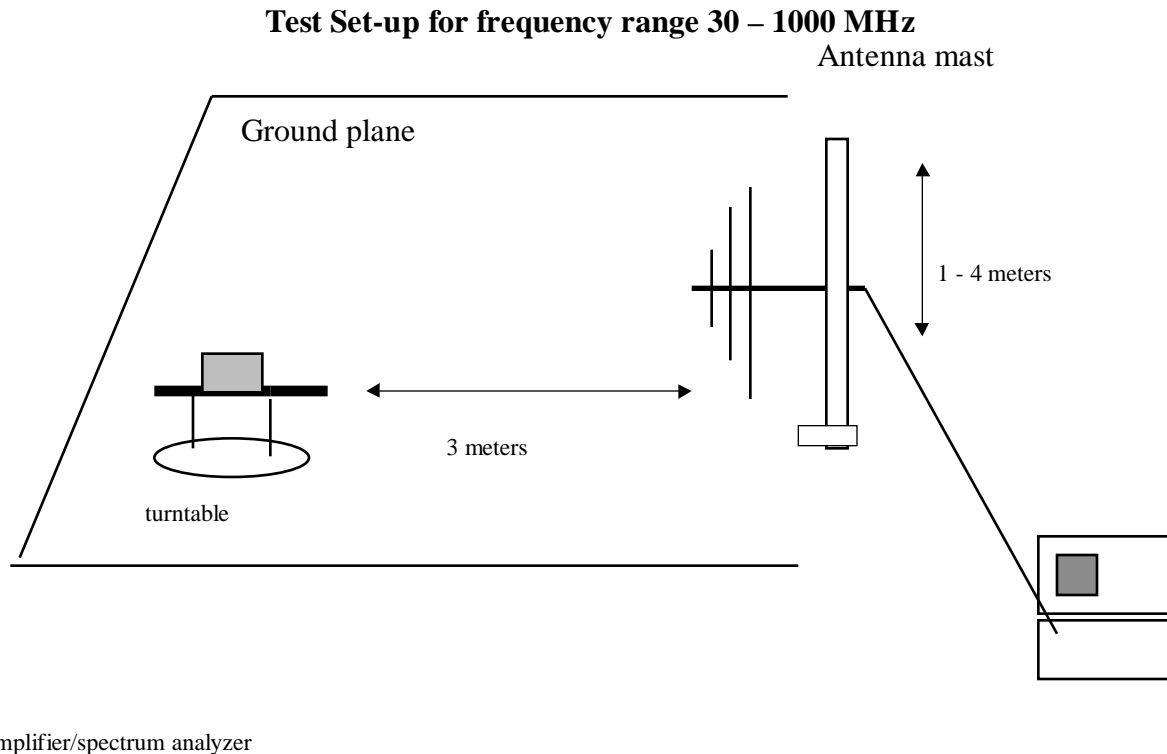


Fig. 1

1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 3-meters from the EUT.
2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205. The EUT was moved throughout the XY, XZ, and YZ planes to maximize emissions received by the search antenna.
3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

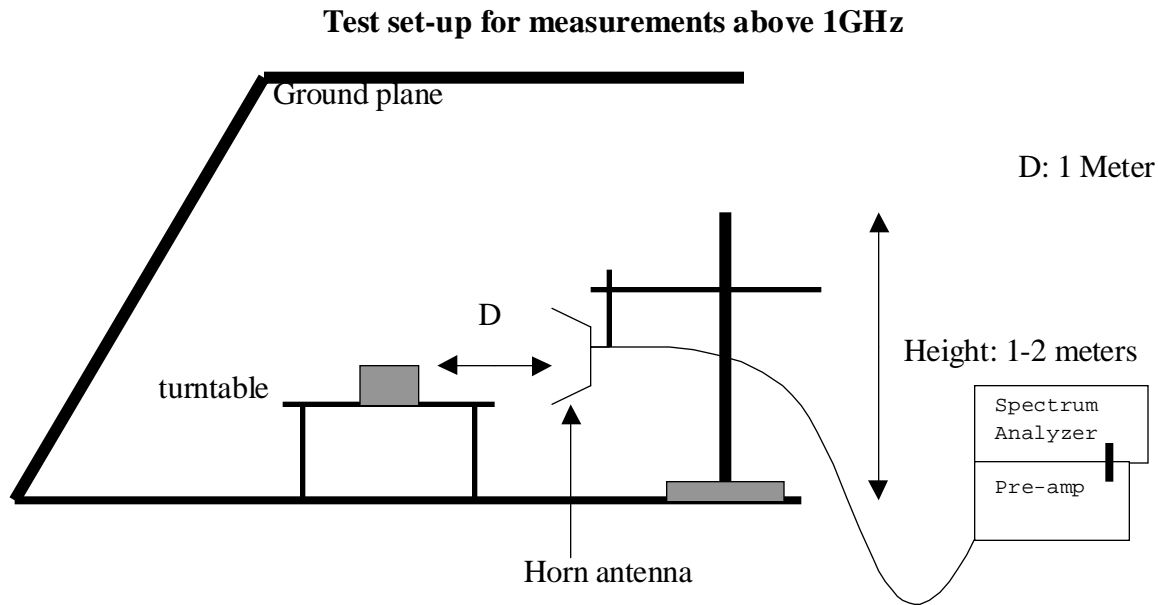


FIG. 2

1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 1-meters from the EUT. The EUT antenna was mounted vertically as per normal installation.
2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205. The EUT was moved throughout the XY, XZ, and YZ planes to maximize emissions received by the search antenna.
3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

11. Equipment Modifications

To achieve compliance to FCC Section 15.231 technical limits, the following change(s) were made during compliance testing:

NONE

12. TEST RESULT

| Powerline RFI Class B | Eut | Radiated Emission Limits | Eut |
|--|-----|--------------------------|-----|
| SECTION 15.207 | | SECTION 15.209 | X |
| SECTION 15.205, 15.209, 15.221, 15.223, x 15.225 OR 15.227 | | SECTION 15.205 | |
| BATTERY POWER | X | SECTION 15.231 (b) | X |
| | | SECTION 15.231 (e) | |

12.1 Maximum Modulation Percentage (M%)

CALCULATION:

Average Reading = Peak Reading (dBuV/m)+ 20log (Duty Cycle)

In order to determine possible Maximum Modulation percentage, alternations are made to the EUT. We measured:

WHERE 1 Period = 116.6.0 mS > 100mS. Use 100mS for calculation.
 Long pulse = 1350uSecond = 1.35mSecond
 Short pulse = 450uSecond = 0.45mSecond
 No of Long pulse = 27
 No of Short pulse = 10

Duty Cycle = (N1L1+N2L2+...+Nn-1Ln-1+NnLn)/100 or T

Duty Cycle = ((27x1.35)+(10x0.45))/100=0.4095=40.95%

For duty cycle refer to plot #1, 2, 3.

12.2 The Emissions Bandwidth

The bandwidth of the emissions were investigated per 15.231(c)

| Center Frequency | Measured | Limits |
|------------------|-----------------------------------|---------------------------|
| 434 MHz | 450 kHz (refer to plot) | 434X0.25%=1085 kHz |