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ENGINEERING STATEMENT

IN REGARD TO MEASUREMENTS ON

Alps Electric Co., Ltd.

FCC ID: NHVWBU43

A. INTRODUCTION

Hyak Laboratories Inc. has been authorized by Alps Electric Co., Ltd., to perform measurements on a transmitter to determine compliance with FCC Rules, Subpart C.

The device is a low powered, battery operated transmitter designed for remote control of automobile security systems. It operates at a nominal 315 MHz frequency. The transmitter, constructed on an etched circuit card, is powered from a 3 volt lithium battery. An integral, etched-circuit antenna is used.

The device meets the provisions of Para. 15.231(a)(1) since it is a manually operated device used for alarm system control, and automatically ceases transmission within 5 seconds of push-button switch release.

B. DESCRIPTION OF MEASUREMENT FACILITIES

A description of the Hyak Laboratories Inc. radiation test facility is a matter of record with the FCC. The facility was accepted for radiation measurements on October 1, 1976, and is currently listed as an acceptable site.

C. DESCRIPTION OF MEASUREMENT PROCEDURE: RADIATED MEASUREMENTS

Measurements of transmitter radiation field strength were made using ANSI C63.4 (1992) as the test procedure. Measurements were made with 3 meter spacing between the transmitter under test and the test equipment antenna.

The transmitter under test was placed on a rotatable table approximately 80 cm in height.

The power supply was a fresh battery.

EXHIBIT 4

USER INSTRUCTIONS

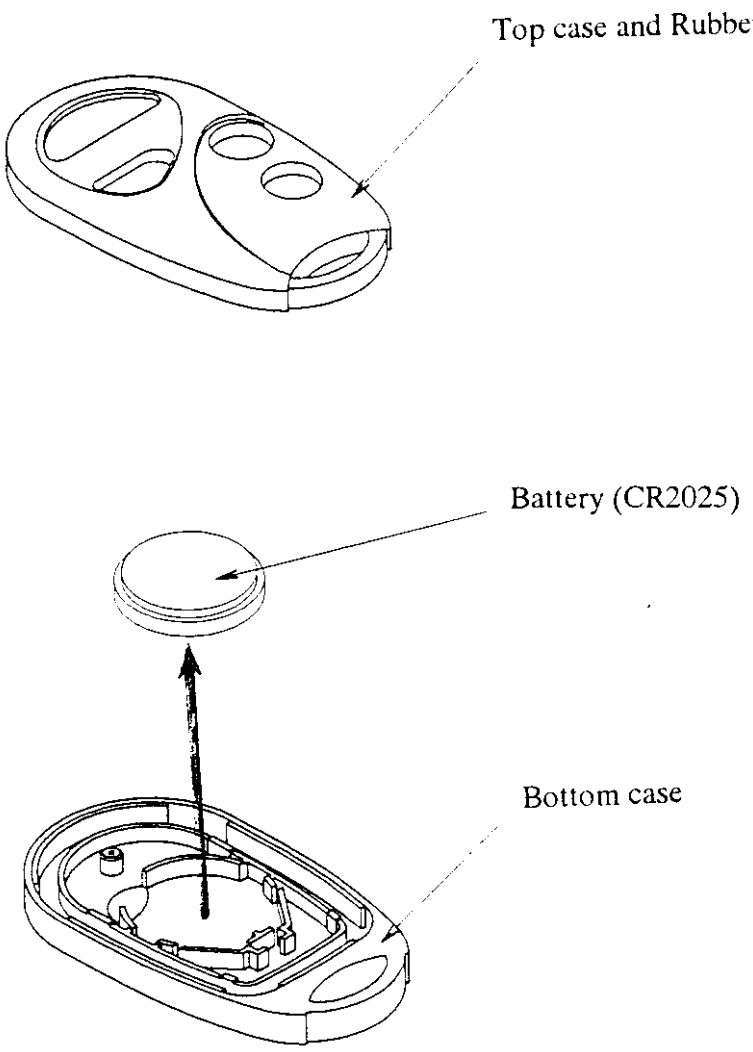
OPERATING INSTRUCTIONS FOLLOW THIS PAGE

USER INSTRUCTIONS
FCC ID: NHVWBU43

EXHIBIT 4

UNLOCK : Driver doors unlock by one p...

e) About exchange of the battery



When the Remote Keyless Entry Transmitter's Battery begins to get weak, replace the Battery as soon as possible.

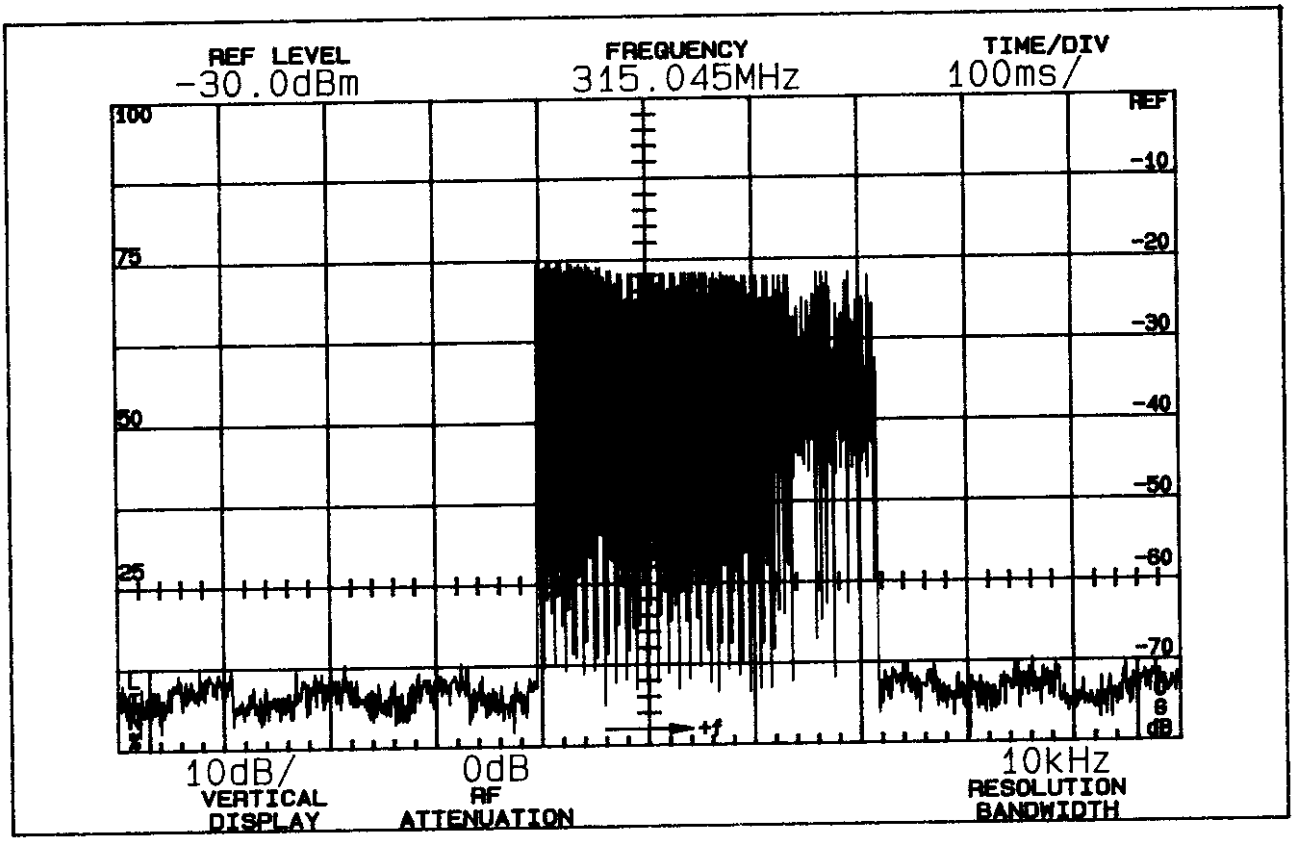
Battery type : CR2025

To replace the Battery, remove the cover .
Remove the old Battery and note the polarity.
Make sure the polarity of the new Battery is the same, then insert it in the Transmitter.

NOTE

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

A: \ALPBU100.GBW



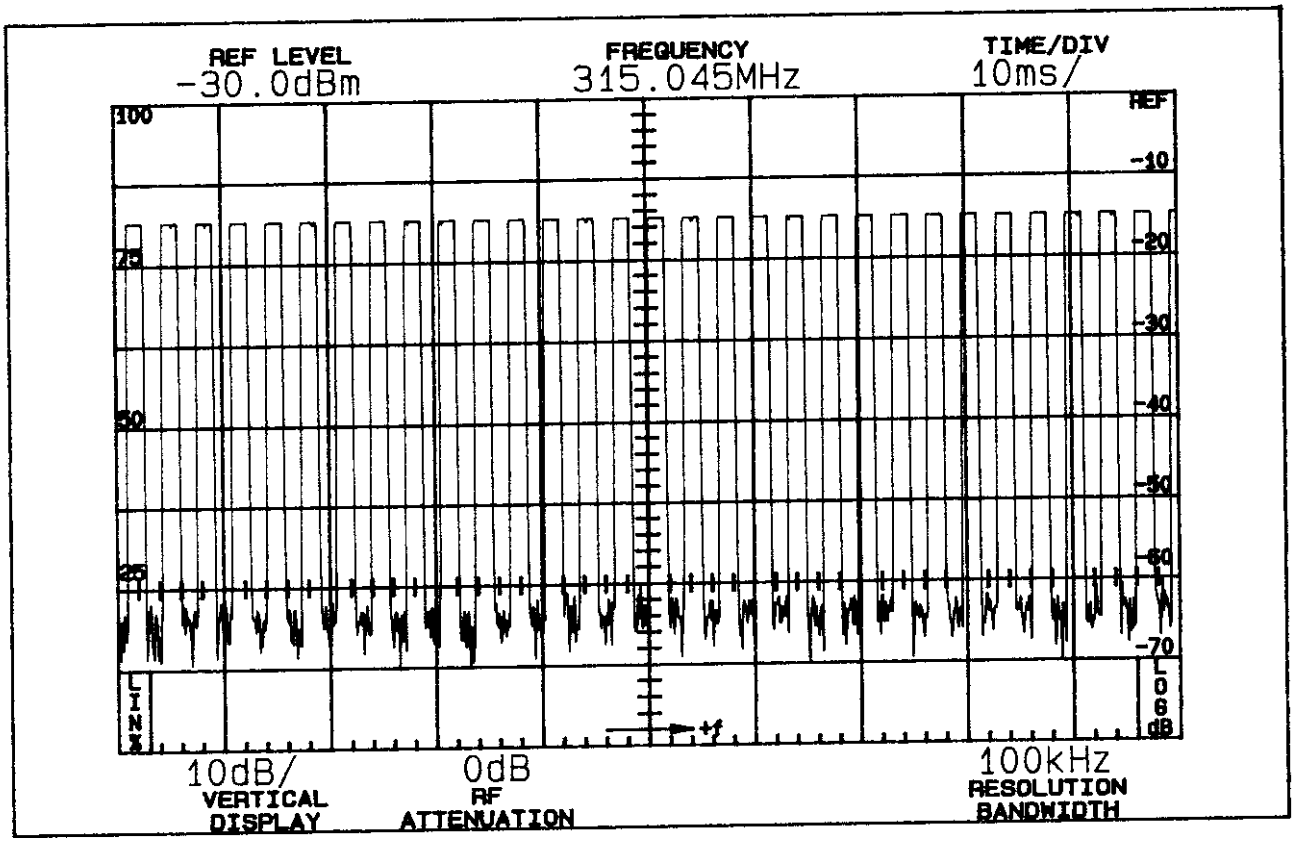
COMPLETE WORD TRANSMISSION

Horizontal: 100 milliseconds/Div
Vertical: 10 dB/Div.
Resolution: 10 kHz

(Time domain)

PULSE CHARACTERISTICS
FCC ID: NHVWBU43

FIGURE 1



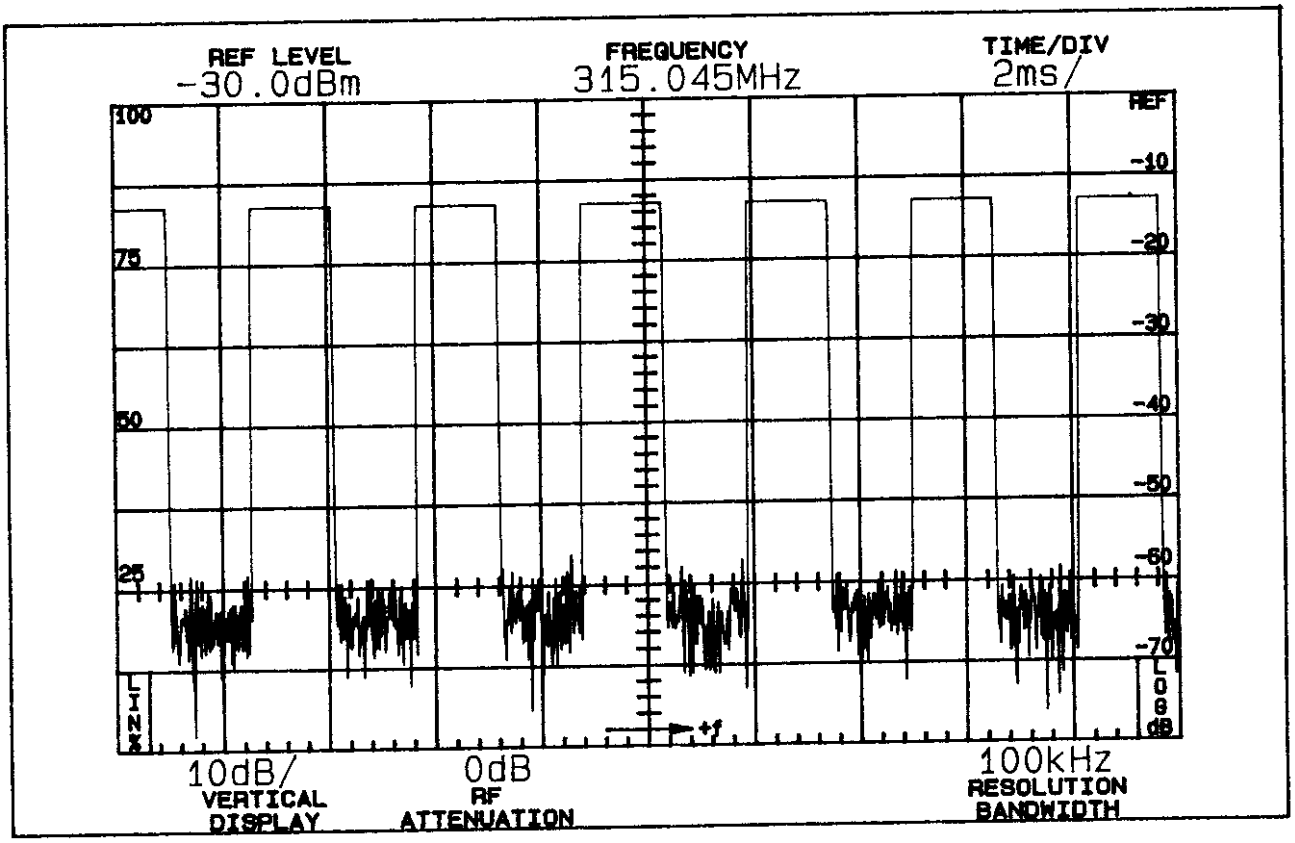
COMPLETE WORD DETAIL

Horizontal:	10 milliseconds/Div
Vertical:	10 dB/Div.
Resolution:	100 kHz

(Time domain)

PULSE CHARACTERISTICS
FCC ID: NHVWBU43

FIGURE 1



WORD BIT DETAIL

Horizontal: 2 milliseconds/Div
Vertical: 10 dB/Div.
Resolution: 100 kHz

(Time domain)

PULSE CHARACTERISTICS
FCC ID: NHVWBU43

FIGURE 1

SAMPLE COMPUTATIONS

Using the time domain plots of Figures 1 through 3, maximum "on" time over any 100 mS interval is:

Pulses (1.6mS) x 31 = 49.6

Duty Cycle: 49.6/100 = 0.50

20 Log 0.50 = 6 dB

SAMPLE COMPUTATIONS
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FIGURE 4

TABLE 1

RADIATED FIELD INTENSITY
Measured at 3 meters
15.231(b)

Frequency (MHz)	Meter[1] Reading (dBm)	Antenna Factor (dB)	Field[2] Intensity uV/m @ 3m	Calc. Field[3] Intensity uV/m @ 3m	FCC Limit uV/m @ 3m	dB to Limit
315.012	-50.8	14.2	3311.3	1659.6	6042.0	- 5.2
630.024	-78.4	19.1	242.7	121.6	604.2	-13.9
945.032	-85.2	23.5	184.1	92.3	604.2	-16.3
1260.041	-79.2	22.6	331.1	165.9	604.2	-11.2
1575.051	-74.0	23.6	676.1	338.9	500.0*	- 3.4
1890.060	-73.2	24.6	831.8	416.9	604.2	- 3.2
2205.069	-84.8	23.0	182.0	91.2	500.0*	-14.8
2520.079	-73.6	23.9	732.8	367.3	604.2	- 4.3
2835.090	-79.2	24.5	412.1	206.5	500.0*	- 7.7
3150.099	-84.0	25.0	251.2	125.9	604.2	-13.6

Note 1: Peak detector reading without averaging.

Note 2: $uV/m = \text{Log}^{-1}\frac{dBu/m}{20}$

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

Note 3: Field Intensity calculated from peak value and -6 dB peak/average factor.

*Forbidden Band

All other emissions to the tenth harmonic were below FCC limits.

(Unit was measured on 3 major planes)

RBW: 100 kHz to 1 GHz; 1 MHz if > 1GHz (Measured at 1 m extrapolated to 3 m). No video filtering. Peak responding, rms calibrated detector.

D. FORBIDDEN BAND MEASUREMENTS

Any spurious signals from the transmitter that fell in a forbidden band are identified in Table 1. All forbidden bands, per Paragraph 15.205, from 73 MHz to 4.4 GHz were searched and any applicable emissions above noise or interference levels are shown in Table 1.

E. OCCUPIED BANDWIDTH

A plot of occupied bandwidth is shown in Figure 5. The device meets bandwidth restriction of Paragraph 15.231(c); 26 dB points are less than 50 kHz with worst-case modulation. (Limit is 0.25% of 315 MHz or 790 kHz).

F. POWER LINE CONDUCTED MEASUREMENTS

AC line conducted spurious measurements were not made since the device does not use the public power supply system.

G. EXHIBITS

Label; Exhibit 1.
Photographs; Exhibit 2.
Schematic Diagrams; Exhibit 3.
User Instructions; Exhibit 4.
Block Diagram; Exhibit 5.
Circuit Description; Exhibit 6.

H. STATEMENT

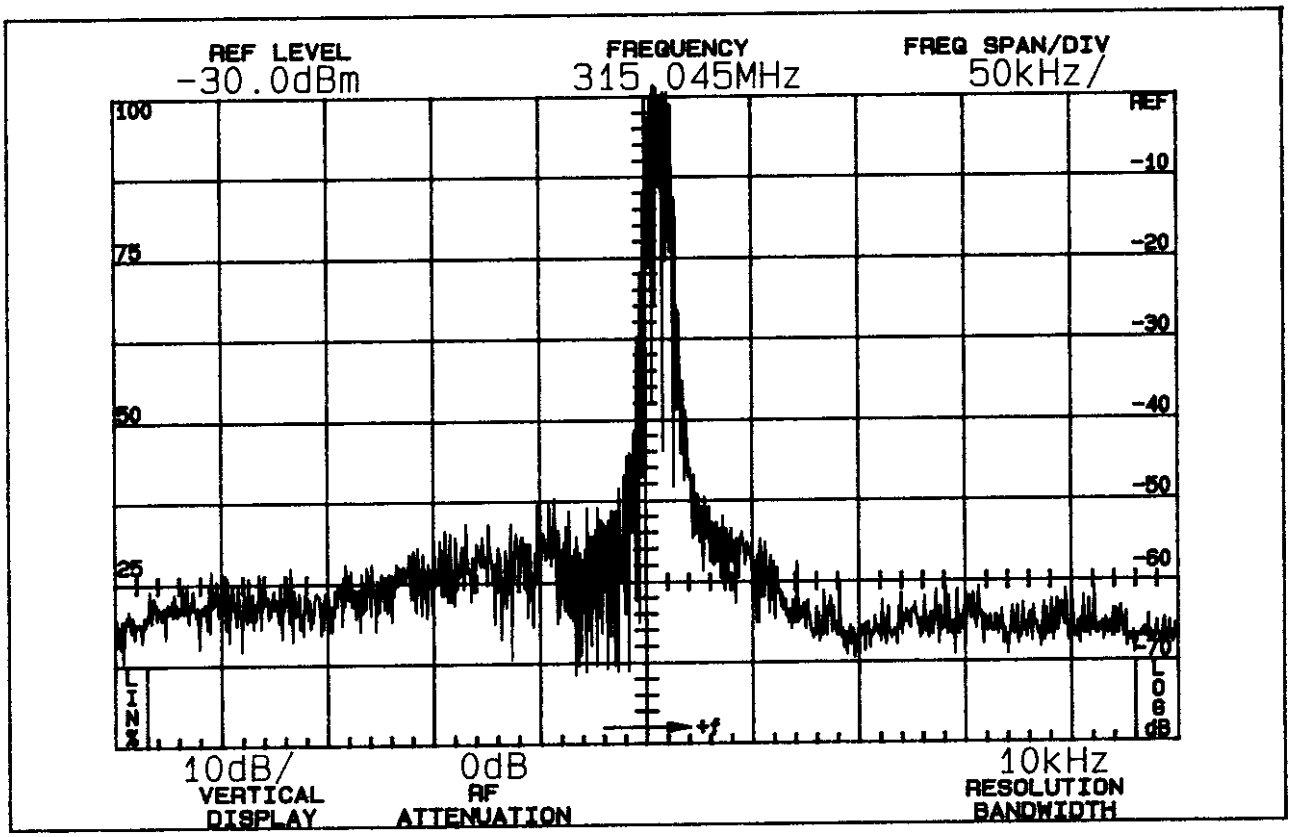
Technical test data are from tests performed by me or under my supervision. My qualifications are a matter of record with the Federal Communications Commission. I personally attest to the accuracy of the test data submitted as a part of this engineering statement.

RSJ

Rowland S. Johnson

Dated: December 2, 1998

A: \ALPBU431.DBW



Center Frequency 315 MHz

Horizontal: 50 kHz
Vertical: 10 dB/Div.
Resolution: 10 kHz (Max. Hold)

No video filtering.

OCCUPIED BANDWIDTH
FCC ID: NHVWBU43

FIGURE 5