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June 1, 1995

Our File: 05238/002001

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Mr. Edward Gibbons
Equipment Authorization Branch
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DRAFT

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EXHIBIT U
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ANSI C63.4 Test Procedures for
Universal Garage Door Opener

Dear Ed:

This is to follow up our telephone conversation on May 12, 1995, regarding the appropriate test procedures for a "universal" garage door opener (UGDO) currently under development by Prince Corporation of Holland, Michigan. Like the earlier version of the UGDO (see my letters to you of July 20, 1992 and April 13, 1993), Prince's new model is designed solely for installation in motor vehicles.

By way of background, the UGDO is capable of learning the frequency and coding scheme (duty cycle) of most garage door openers on the market. The new model is designed to operate between 220 and 440 MHz and uses a single variable oscillator to learn/receive as well as to transmit.[1/] The frequency and duty cycle information are stored in one of three "memory banks." The UGDO is programmed to "ignore" door openers in the restricted bands per Section 15.205 of the Commission's rules.

1/ A VCO used to transmit is also used to learn/receive via a mixing circuit when a manual switch is held by the user. The device is programmed to search first for known door opener frequencies before going through the band on a single step basis. Ordinarily, it takes approximately 20 seconds to "lock in" and record the frequency. Under worst case conditions, however, the device could require 90 seconds to learn. All transmissions cease immediately as soon as the manual switch is released.

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The UGDO is designed to adjust its power output dynamically, based on the duty cycle and frequency of the "learned" device. First, the UGDO detects the duty cycle of the learned device in the same "worst case" manner as prescribed under Commission rules. This duty cycle is then sorted into one of 32 ranges and a digital attenuator adjusts the output power of the device accordingly. If the UGDO detects a device with a duty cycle above 75%, the UGDO will not operate.

For each range, the output power of the UGDO is adjusted, based on the highest duty cycle in the range. Thus, for example, a transmitter whose duty cycle is in the middle of a range would have its power adjusted as if it were operating at the top of the range. In this way, the UGDO will always be trained to operate at power levels that are below the limits prescribed in the Commission rules. A second output power adjustment is then performed by the UGDO, based on the frequency of the learned unit. This adjustment is to correspond with the interpolated field strength limits set forth in Section 15.231 of the rules.

During our discussion, you agreed that the test procedures for the new UGDO would follow the same "3 sample" scheme which we had devised for the initial UGDO, as follows:

1. Sample 1, preset to transmit (CW) at 220 MHz, 330 MHz and 440 MHz, all set to operate at the highest duty cycle (estimated to be 72%);

2. Sample 2, preset to transmit (CW) at 220 MHz at the lowest duty cycle, 330 MHz at a 50% duty cycle and 440 MHz also at the lowest duty cycle; and

3. Sample 3, preset at the highest duty cycle and supplied with door opener using a low duty cycle for the purpose of demonstrating the UGDO's learn capability and dynamic output adjustment.

We also discussed a needed modification in the original test procedures. Specifically, you agreed that it would be permissible for Prince to use a 2 wire "harness" connected to the device, with the UGDO located in the center of the turntable. The wiring harness would be run approximately 1/2 meter to the longest edge of the turntable and then straight down to the battery. This test configuration will simplify testing for

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Prince by providing repeatable results that reflect actual operating conditions.

I trust the foregoing accurately sets forth the elements of our discussion. Prince would appreciate it, therefore, if you could indicate your agreement by written response. Thank you in advance for your prompt attention to these issues.

Very truly yours,

Terry G. Mahn

/bab

cc: Prince Corporation

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FEDERAL COMMUNICATIONS COMMISSION

Customer Service Branch
7435 Oakland Mills Road, Columbia, MD 21046
Phone: (301) 725-1585,ext 229 Fax: (301) 344-2050
FROM: Ed Gibbons DATE: June 13, 1995
TO: Mr. Terry G. Mahn / Fish & Richardson
PAGES: One
REFERENCE: Your fax dated 6/9/95
FAX NUMBER: 202-783-2331

Dear Terry,

I have reviewed the information in your fax regarding the proposed test procedure for the new universal garage door opener (UGDO) currently under development by Prince Corporation. The "three sample" test scheme you describe is satisfactory with the following caveat. The proposal to place the UGDO in the center of the test table, and to drape the 2-wire harness across the table and down to the power supply (without cable manipulation) is acceptable as long as the harness does not contain an antenna.

As stated in Section 13.1.4.1 of measurement procedure C63.4-1992, "If the EUT is equipped with or uses an adjustable antenna, the EUT antenna shall be manipulated through typical positions and lengths during preliminary testing to maximize emission levels." Applying this requirement to the subject device, if the harness contains an antenna, it will be necessary to manipulate the harness position to maximize the radiated emission levels. Such manipulation may be performed with the power supply (battery) placed below the test table. No tests will be required with the battery on the table.

If the selected harness length is not sufficient to permit cable manipulation with the UGDO placed in the center of the table, the harness length should be increased for this test. Alternatively, the UGDO may be moved around on the table, i.e., moved toward the edge of the table to provide enough slack in the cable for "some" manipulation. We can discuss this issue further if you desire.

If you have any additional questions, please do not hesitate to contact me.

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BTB
JUN 13 1995