CHAMBERLAIN

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Federal Communications Commission
EQUIPMENT APPROVAL SERVICES
PO Box 358315
Pittsburgh, PA 15251-5315

Re: Request for Certification

Enclosed is an application and exhibits for certification of Super-regenerative receiver Model 535-315LM which is manufactured by Chamberlain.

The final instruction sheet is not available at this time, so I have included a typical instruction sheet indicating the FCC statement and important information.

The FCC ID of this model, upon certification, will be HBW1615.

We would appreciate your prompt attention to the submittal.

Sincerely,
THE CHAMBERLAIN GROUP, INC.

Barbara P. Kelkhoff

Barbara P. Kelkhoff
Manager, Regulatory Affairs

LIST OF EXHIBITS
Super-regenerative Receiver
Model 535-315LM

1. Expository Statement
2. Theory of Operation
3. Schematic
4. Photographs
5. FCC Label Drawing
6. Operating Instructions
7. Test Report

EXPOSITORY STATEMENT
Super-regenerative Receiver
Model 535-315LM

1. Since the final instruction sheet is not available at this time, a typical draft version has been included. The instructions include statements required to assure compliance with the Commission's Rules; Part 15.

2. Labeling is in accordance with the Commission's labeling requirements, Parts 2 and 15, Section 15.19.

3. This receiver is intended for use with certified transmitters of our manufacture only.

4. The 535-315LM receiver is factory set to 315 ± 0.1% MHz. It is not intended to be readjusted in the field, and specific instructions prohibiting tampering are provided to the user.

5. Test data for Model 535-315LM is part of this submission. No emissions were detected in the forbidden bands below 1.0 GHz.

Certified by: Barbara P. Kelkhoff

Barbara P. Kelkhoff
Manager, Regulatory Affairs

THEORY OF OPERATION AND CIRCUIT DESCRIPTION
MODEL 535-315LM
REMOTE CONTROL RADIO RECEIVER

Please refer to enclosed schematic 195D1615

The radio uses the analog input into an external comparator, which converts the signal to digital for input to digital radio in. The radio signal comes in at any signal level from 10mV to approximately 3V of swing with a D.C. point of 2.5V. This input is avg. detected by R20 and C17 which is fed into one side of the comparator while the undetected signal is fed into the other. Diode D1 is used for overload protection of the comparator.
R21 is used to compensate for the change in duty cycle of the radio signal due to different pulse widths.

MOSFET Q3 provides extra noise immunity during the radio blank periods. Normally, the active clamp on the micro-controller turns on Q3, causing the MOSFET to appear as a small resistor to the rest of the circuit. When a valid radio code word is detected, the active clamp is set low, turning the MOSFET off. This causes the MOSFET to appear as an open circuit, and holds the voltage across C17 at a constant level. This ensures that the reference voltage does not drift toward the noise floor during a radio reception. The MOSFET is again turned on at the end of the radio word, when a radio error occurs, or when 500ms have passed without any radio signal.

The learn switch is used to place the unit into learn mode by monitoring pin 6. When the switch is pressed, learn mode is set and the LED on pin 18 is turned on. If the switch is held active for more then 6 seconds the memory will be erased and the learn mode will be cleared. If while the unit is in learn mode a radio code is properly received twice then that code is placed in memory (if not already there), and the learn mode is cleared. If within 30 seconds the learn mode is not cleared the learn mode will time out and be cleared. The switch on pin 6 is the command input and acts like a radio code being received as long as the switch is held. This switch is debounced with a debounce time of 80mS±10mS.

The switches are read by the micro-controller (U2) setting the input pins 6 and 8 into the input mode. R29 and R30 are needed to limit the current when S1 or S2 is active. R38 is for limiting the LED current. R31 and R32 are for limiting the ESD current.

The active clamp signal is generated on pin 9. Upon receiving a valid Chamberlain code, the circuit “clamps” down on the signal, doing an average detection of the incoming signal. This improves the range of the radio reception, and allows better “filtering” of noise spikes to improve radio performance.

The oscillator pins 15 and 16 are used for the main clock generation. These pins will have a ceramic resonator connected between them to generate the 4.0 MHz main clock frequency.

1. EXPOSITORY STATEMENT

2. THEORY OF OPERATION

3. SCHEMATIC

4. PHOTOGRAPHS

5. FCC LABEL DRAWING

6. OPERATING INSTRUCTIONS

7. TEST REPORT