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November 12, 1999

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

Re: Request for Certification

Enclosed is an application, fee in the amount of \$895, and exhibits for Certification of a Remote Control Transmitter, Model TCTX120.

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 HBWTCTX120.

We would appreciate your prompt attention to the submittal.

Sincerely,
THE CHAMBERLAIN GROUP, INC.

A handwritten signature in black ink that reads "Barbara P. Kelkhoff". The signature is written in a cursive, flowing style.

Barbara P. Kelkhoff
Manager, Product Safety

LIST OF EXHIBITS
2 FUNCTION, REMOTE CONTROL TRANSMITTER
MODEL TCTX120

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

EXPOSITORY STATEMENT
3 FUNCTION, REMOTE CONTROL TRANSMITTER
MODEL TCTX120

1. Since the final instruction sheet is not available at this time, a marked-up typical 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 transmitter is intended for use with the certified receivers of our manufacture only.
4. The transmitter is equipped with an automatically releasing push-button switch. Transmission is terminated upon release of the push-button.
5. The TCTX120 is factory set to $390 \pm 0.1\%$ MHz. It is not intended to be readjusted in the field, and specific instructions prohibiting tampering are provided to the user.
6. Test data for the Model TCTX120 is part of this submission. No emissions were detected in the forbidden bands below 1.0GHz.

Certified by:

Barbara P. Kelkhoff

Barbara P. Kelkhoff
Manager, Product Safety

**THEORY OF OPERATION AND
CIRCUIT DESCRIPTION
MODEL TCTX120
2 FUNCTION, REMOTE CONTROL TRANSMITTER**

(Please refer to enclosed schematic drawing)

The TCTX120 transmitter consists of a low power RF oscillator which doubles as a square-law detector (Q2 and associated components), a digital encoder (U1 and associated components), a switch-mode boost voltage converter (L1, Q1, and associated components), and on/off switches.

The RF oscillator, Q2, is of the grounded base type. C6, C7, C8, C9, and the copper loop set the center frequency of the oscillator at 390 MHz. C4 and C5, along with the internal capacitance of Q2, establish feedback levels and harmonic suppression. R5 and R6 establish dc operating conditions. U1 and related components generate a digital code. This code is used in the companion receiver to identify a particular transmitter or function.

When transmitting a radio code, the unit generates a 9 volt power supply for the RF circuit from its 3V source through the switching voltage converter formed by L1, Q1, and associated components. Q1 is periodically switched on, causing current to flow through L1 at a rate, which increases linearly. When Q1 is switched off, a high voltage is generated across L1 due to the instantaneous change in inductor current. This voltage is transferred across D1 and stored in C2.

1. EXPOSITORY STATEMENT

2. THEORY OF OPERATION

3. SCHEMATIC

4. PHOTOGRAPHS

5. FCC LABEL DRAWING

6. OPERATING INSTRUCTIONS

7. TEST REPORT