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April 5, 2001

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

Re: Request for Class II Permissive Change

Enclosed is an application fee in the amount of \$50 and exhibits for a Class II Permissive Change of Remote Control Transmitter Model TC1. The original Date of Grant, HBW1420, was July 21, 2000.

To improve and stabilize the harmonic emissions, capacitor C5 was changed from 100pF to 82pF. Enclosed are the standard attachments, including the new schematic and the new test report data. Report R-8859 from Retlif Testing Laboratories covers the 300MHz frequency and Report No. 23304 from Elite Electronic Engineering covers the 310MHz frequency and preliminary testing of the 300MHz frequency.

We would appreciate your prompt attention to the submittal.

Sincerely,
THE CHAMBERLAIN GROUP, INC.

A handwritten signature in cursive script that reads "Barbara P. Kelkhoff". The signature is written in dark ink and is enclosed within a rectangular box defined by dotted lines.

Barbara P. Kelkhoff
Manager, Regulatory Affairs

LIST OF EXHIBITS
REMOTE CONTROL TRANSMITTER
MODEL TC1

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

**EXPOSITORY STATEMENT
REMOE CONTROL TRANSMITTER
MODEL TC1**

1. Labeling is in accordance with the Commission's labeling requirements, Parts 2 and 15, Section 15.19.
2. This transmitter is intended for use with the certified receivers of our manufacture only.
3. The transmitter is equipped with an automatically releasing push-button switch. Transmission is terminated upon release of the push-button.
4. The TC1 is factory set to $300 \pm 0.1\%$ MHz and $310 \pm 0.1\%$ MHz. It is not intended to be readjusted in the field, and specific instruction prohibiting tampering is provided to the user.
5. Test data for the Model TC1 is part of this submission. Report R-8859 covers the 300MHz frequency and Report 23304 covers the 310MHz frequency.
6. No emissions were detected in the forbidden bands below 1.0 GHz.

Certified by:



Barbara P. Kelkhoff
Manager, Regulatory Affairs

Theory of Operation and Circuit Description

TriCode TC1, TC2, & TC4 Transmitters

(Please refer to the enclosed schematic assembly drawing: 195D1420)

Overview

The TriCode transmitters TC1, TC2 & TC4 are designed to accept 1, 2, & 4 pushbutton inputs respectively, and transmit on either a 300 MHz fixed frequency antenna or 310 MHz fixed frequency antenna. The circuit has two sets of user-settable switches. Each set is comprised of a configuration switch and a DIPswitch. The output of the transmitter is determined by the pushbutton pressed, configuration switch settings, and DIP switch settings. TC1 and TC2 are subsets of the TC4 transmitter, and thus, TC4 will be described here in order to include the full circuit.

Power supply circuitry

Power is supplied to the circuit by a 9V battery. The battery is connected to the circuit board via wires soldered into holes E1 & E2. Power is supplied to the transmitter circuitry through the pushbutton switches S1, S2, S3, and S4/S7. Power is only supplied to the transmitter circuitry when one or more of the pushbuttons are pressed. R7, C16, & D4 provide regulation of the power supply circuit to the transmitter circuit. R8 & D5 provide visual indication that power has been supplied to the transmitter circuit.

Pushbutton circuitry

Pushbuttons S1, S2, S3, and S4/S7 are the primary components of the pushbutton circuitry. D1, D2, and D3 are used to provide isolation between the pushbutton inputs to the microprocessor, U1. R9, R10, R11, R12, R13, and R14 are used to bias the pushbutton inputs to the microprocessor.

Configuration switch circuitry

Three-position slide switches S8 & S9 are the primary components of the configuration switch circuit. R20, R21, & R37 are used to bias the configuration switch inputs to the microprocessor.

DIP switch circuitry

DIP switches S5 & S6 are the primary components of the DIPswitch circuit. R22, R23, R24, R25, R26, R32, R33, R34, R35, R36, R15, R16, R17, R18, R19, R27, R28, R29, R30, R31, C17, C18, C19, C20, C21, C22, C23, C24, C25, and C26 are used to bias and provide timing for the inputs to the microprocessor

RF circuitry

TriCode transmitters have two fixed antenna outputs – 300 MHz & 310 MHz.

C1, C4, C7 & C9 are the primary components of the 300 MHz antenna circuit. R4, R1, C8, Q1, R5, & C11 are the means by which a coded message from the microprocessor, U1, may be transmitted on the 300 MHz antenna.

C2, C3, C5, & C10 are the primary components of the 310 MHz antenna circuit. R2, R3, C6, Q2, R6, & C12 are the means by which a coded message from the microprocessor, U1, may be transmitted on the 310 MHz antenna.

Microprocessor

The microprocessor, U1, performs two main functions: Input recognition and coded message construction. Input recognition is accomplished by monitoring the input pins for the pushbutton

switches, polling and reading the configuration switches, and polling and reading the DIP switches. The combination of inputs determines the makeup of the coded messages. Each coded message directly correlates to a specific antenna output. This combination of coded message and antenna output forms the transmission of the TriCode transmitter. If an error is detected while reading the inputs, no coded message is generated, and the transmitter does not transmit a signal.

3. SCHEMATIC

4. PHOTOGRAPHS

5. FCC LABEL DRAWING

6. OPERATING INSTRUCTIONS

7. TEST REPORTS