

Description of Kangaroo Products Company Receiver

Model RX600-840C

FCC ID OVPRX600-840C

Form 731 Confirmation Number EA96739

The receiver is a device used to control a motorized golf caddie, used exclusively on golf courses. A companion handheld transmitter is used by a golfer to send four commands to the caddie: stop, go, turn left, and turn right.

Please refer to the schematic and block diagram of the receiver. The receiver is controlled by a Microchip PIC series microprocessor running on a 3.58MHz ceramic resonator, U4 on the schematic. Radio reception is accomplished through the use of a Linx Technologies module, model number RXM-900-HP-II, U1 on the schematic. This module tunes eight channels, binary selectable using three digital logic inputs:

903.37MHz
906.37MHz
907.87MHz
909.37MHz
912.37MHz
915.37MHz
919.87MHz
921.37MHz

The microprocessor controls two of the three channel selection lines directly, with the third being set using a solder jumper on the circuit board.

The antenna used by the receiver is a 1/4 wave length of #18 gauge copper wire, and is not user accessible. It is soldered to the circuit board.

The golf caddie contains a 12V lead-acid battery for power and a motor controller for the main drive motor, this being connected to J3. The 12V power comes in on J3-5 (Vs) and is filtered and regulated down to five volts by U7 for use by the receiver.

The motor controller resides elsewhere on the golf caddie chassis and uses a DC voltage from the receiver to control the speed of the caddie. This voltage is supplied by analog multiplexer U3. This device selects one of three voltages under microprocessor control: zero volts (motor stopped), 12V (motor full speed), and an intermediate voltage coming from a potentiometer on the user controls connected to J7.

A motor on the front wheel allows steering of the caddie. The steering assembly contains a potentiometer whose shaft is connected to the turning front wheel, and this potentiometer is used by the receiver to sense the position of the front wheel. The steering motor and sense potentiometer are connected to J5. The H-bridge motor driver for the steering motor is comprised of IC U6 and its associated power MOSFET transistors. This bridge is used only to control the direction of travel of the steering motor; no pulse width modulation is used.

A potentiometer on the housing of the receiver itself is used to center the front wheel. This connects to J6. Comparator U8B is used to detect when the wheel is centered. The threshold of the comparator is varied by the microprocessor at a rate of approximately 30Hz.

Connector J4 is used for production test and configuration and is not connected in normal operation.

User controls include an on/off switch and a speed control potentiometer, and these controls are connected to J7. Comparator U8A senses the position of the on/off switch and sends that logic level to the microprocessor.

Device U2 is a serial EEPROM memory used to store device configuration parameters such as the radio channel and communications code.

The block diagram contains notations on several signals which have clock or repetitive signals. The highest frequency used (apart from the Linx Technologies module) is 3.58MHz, the resonator on the microprocessor. The next highest clock frequency is approximately 50KHz, used sporadically on the serial bus connected to the serial EEPROM memory. The next highest frequency signal is the communicated data stream, at about 2800 bits per second.

The Linx Technologies module uses a 24MHz reference crystal oscillator and a 868-886MHz VCO as part of its frequency synthesizer.