Operator’s Manual

Control Panel

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Important Safety Instructions:

Keep the control panel in room temperature and away from water and wet surfaces. Do not drop the control panel or stick hand in the outlets where the CD and DVD players are connected. Use common electrical device precautions.
Parts and Accessories:

The control panel setup consists of a control panel box with four jelly bean buttons and a transmitting antenna. The receiving end includes an Emerson CD player and a Coby DVD player, each of which have the remote control circuitry contained inside the enclosure. The pictures below illustrate some of these different components.

Figure 1: Control panel
Figure 2: Relays and voltage regulator within CD player
(same in DVD player)

Figure 3: Microcontroller

Figure 4: Inside of DVD player
Features:

The most unusual feature of this device is how the commercial CD and DVD players are modified to be remotely controlled using RF. This was accomplished through the use of Basic Stamp 2 microcontrollers, receivers and a transmitter, and relays.

Table of Contents:

Important Safety Instructions.................................................................2
Parts and Accessories...............................................................................3
Features.................................................................................................5
1 Introduction..........................................................................................6
2 Maintenance..........................................................................................13
3 Technical Specifications........................................................................14
4 Troubleshooting....................................................................................17
1 Introduction:

The remote setup is composed of a battery-powered control panel, which turns an Emerson CD player and Coby DVD player ON and OFF, using an RF signal. Figure 1 below describes this setup. Receiver Hubs 1 and 2 are shown as separate entities for clarity, but they are actually found within the CD player and DVD player, respectively.

The control panel runs on a single 9V battery, which may be replaced by unscrewing the battery compartment located in the base of the panel. To turn on the panel, flip the toggle switch toward the ON label. When you are not using the panel, remember to flip the switch OFF to save on battery power. The CD player and DVD player MUST be each run on the adapter supplied by the manufacturer, as the new wiring associated with the remote control, does not allow for the use of the batteries. Instructions for running the CD and DVD players may be found in the manufacturer’s manuals and any problems associated with those devices, outside of those related to remote control, may be addressed to the manufacturer.
2 Maintenance:

Keep the control panel and CD and DVD players in room temperature and away from water. If the range on the control panel diminishes or the quality of the system’s response decreases, you may need to replace the 9V battery. Dropping any component of the setup may cause permanent damage. Be careful to not hit or pull on the RF antennas protruding out from the top of the control panel and CD player and the side of the DVD player. If you damage any one of the antennas the setup will no longer work.

3 Technical Specifications:

Figures 2 and 3 below describe the transmitting and receiving ends of the remote setup described above. As Figure 2 indicates, the transmitting end of the setup includes a Basic Stamp 2 (BS2) microcontroller, which takes input from the four jelly bean buttons for the functions PLAY and STOP for both the CD and DVD players. The output of the BS2 goes to the transmitter which send out the corresponding RF Signal to the receiving end, depending on which button is pressed on the panel. The 9V battery is connected to the rest of the circuit, via the toggle switch, and regulated to 5V.
The receiving end of the setup includes a BS2 which takes in the RF signal from the transmitter. The whole circuit receives its power from the CD or DVD player’s own power source, which is then regulated to 5V. The BS2 outputs to two 5 vdc 0.5 amp DPST mini relays (R56-7D.5-6), one for PLAY and one for STOP. Each relay has one end of its coil attached to the output from a microcontroller pin and the other end of the coil is grounded. The two other pins of the relay (the switch) are connected across either the PLAY or STOP switch within the CD or DVD player.

If the range on the control panel diminishes or the quality of the system’s response decreases, you may need to replace the 9V battery. If this still does not correct the problem, check to see that the DVD and CD players are still functioning outside of remote control. If they will not turn on or are not receiving power, you may have a problem with the receiving devices. In that case, see the manufacturers’ manuals and instructions. If the devices are functioning properly, you can open up the control panel to
make sure there are no loose wires that need to resoldered. The same may be done for
the DVD and CD players. If all the wires are in place then the microcontroller chips or
the relays may be damaged and may need replacement.