

## CIRCUIT DESCRIPTION AND OPERATION OF MERLIN REMOTE CONTROL

The Merlin remote is a 9-button control module that provides 16 patterns of control to the Merlin 8-motor automotive seat massage system installed in the vehicle upholstery. Operation is explained as follows:

- 1) "Power" button – Press this button once to activate the Merlin Massager system. Press the button once more to turn off the Merlin system.
- 2) "Pattern" Buttons – The left-hand (arrow up) pattern button will increment (by one) of eight pre-programmed motor operation patterns each time it is pressed. These patterns vary the number and location of the motors running in each choice. The right-hand (arrow down) Pattern button will decrement (by one) each of the eight programmed motor operation patterns each time it is pressed.
- 3) "Zone" Buttons - The left-hand (arrow up) Zone button will increment (by one) of eight pre-programmed motor operation patterns each time it is pressed. These "Zones" are comprised of two motors each in 5 separate patterns, and 3 patterns comprising 4 motors each. The right-hand (arrow down) Pattern button will decrement (by one) each of the eight programmed Zone patterns each time it is pressed.
- 4) "Force" Buttons - The left-hand (arrow up) Force button will increment (by one) of five pre-programmed motor speed patterns each time it is pressed. Each button press will increment by 20% the current motor speed of the operating motor pattern. The lowest setting is 20% of motor speed. Highest speed is 100% of motor speed. The right-hand (arrow down) Pattern button will decrement (by one) each of the five programmed speed levels each time it is pressed.
- 5) "Time" Button – this single button allows the user to select one of three periods of Merlin operation: 10 minutes, 20 minutes, or 30 minutes. The default time is 10 minutes. Each press will cycle to the next highest period, or if set at 30 minutes, will reset back to 10 minutes timing on the next button press. At the end of any cycle the Merlin system will shut off until reactivated by the Remote.
- 6) "Speed" button – This is an incremental period of time between each "Pattern" variation. In a five-step pattern of operation the period of time of each step will be determined by the "Speed" selection. Each Speed selection is typically 5 seconds more than the previous step. This means that Level #1 of the "Speed" setting will put 5 seconds of time for each pattern to operate before changing to the next pattern, while incrementing the Speed to level #2 will put 10 seconds of time for each Pattern step to operate before changing. The shortest period is 5 seconds, while the longest period is 20 seconds. The selection will rotate back to 5 seconds if the Speed button is pressed on the 4<sup>th</sup> level (20 seconds)
- 7) The Red LED is an indicator that lights up each time any of the Transmitter buttons are pressed.
- 8) There is no battery saver feature incorporated into the transmitter.
- 9) Upon Pressing any of the nine buttons, three operations occur:
  - A) Power from the 23A-type 12v battery is supplied to the Encoder IC and 433 MHz RF oscillator and,
  - B) The Command code for the button function (Time, Force, Speed, etc...) is inputted to the Encoder IC.
  - C) The PWM signal is transmitted at 433 MHz.



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