



## **RCIC-2 Two Channel Radio Control Interface Circuit with mixing**

The RCIC-2 (Radio Control Interface Chip) is a preprogrammed PIC. It will accept a standard 1 to 2 ms RC pulse from each of 2 channels and send the proper control signals for speed and direction to each of 2 MC6s. It will enable you to have full control of the direction and continuously variable speed of each controller. This gives you a 30 amp dual channel radio controlled Electronic Speed Control with full mixing for left/right and forward/reverse.

What this means is this. Without any programming on your part, you can control the direction of your robot with the single dual axis joystick found on your standard RC transmitter. If you push the stick straightforward, both motors will go forward at the same speed. If you pull it straight back, both motors will go in reverse at the same speed. If you put the joystick straight to the right the left motor will go forward and the right motor will go reverse at the same speed causing your robot to turn on center to the right. If you put the joystick straight to the left, the left motor will go reverse and the right motor will go forward at the same speed causing your robot to turn on center to the left. If you are going straight forward, and you move the stick a little to the right (for example), the left wheel maintains whatever speed it was at while the right wheel slows down by an amount determined by how far you pushed the joystick to the right. This gives you the ability to make slow, wide turns or sharp turns right up to spinning on center. You always have full control of speed and direction.

Attached, is a schematic diagram of how it is wired and a data sheet explaining each pin.

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### **Some important points to remember when inter-connecting systems together :**

(1) Grounds: I can't stress this enough! The ground connection of each sub system (RC receiver, the RCIC-2, and each motor control card) MUST be tied together. If they are not, you are doomed to failure (not to mention a lot of crying, cursing, and gnashing of teeth). If you have a problem you can't solve, and your grounds seem to be OK, have someone else double-check them for you. I can't tell you how many calls I get from people reporting strange things happening. When I ask them if they've checked their grounding, the answer is always yes. We work on their problems by e-mail and/or phone for a couple of days until one day I get a call telling me that their problem is solved-they found something that wasn't grounded as they thought. So, pleeeeaasse, check your grounds. This is very important on single channel applications also.

(2) The RC receiver gets its power from one of the MC6's. The PWM chip on the MC6 has an internal 5 volt regulator. So, no external battery pack is needed for the receiver as long as no servos are also connected to the receiver.

(3) RC receiver servo lead connections: The +5V lead on most RC receivers is usually red or red striped. Some Airtronic receivers use a brown wire for the +5V. Most RC receivers servo leads use a black wire for the negative battery terminal (ground). Some Airtronics receivers may use blue and the JR receiver uses brown.

(4) Make sure the polarity to the PICs is correct. If you get it backwards, it will blow the PIC and that is not covered under warranty.

(5) Most signal leads from RC receivers are white. The Cirrus & JR receivers use orange, the Hitec receiver uses yellow, KO receivers use blue and Sanwa receivers use black (?).

(6) The right and left "Center" LED's are useful in making sure that your servo channels are properly trimmed. They are programmed to light when the PIC sees a 1.5 ms pulse (+/- a programmed deadband) on that channel.

(7) The "Received Pulse" LED will light when a pulse is received by the RCIC-2 on either the left or right channel. It is useful to be sure the RCIC-2 is actually seeing the RC Pulses

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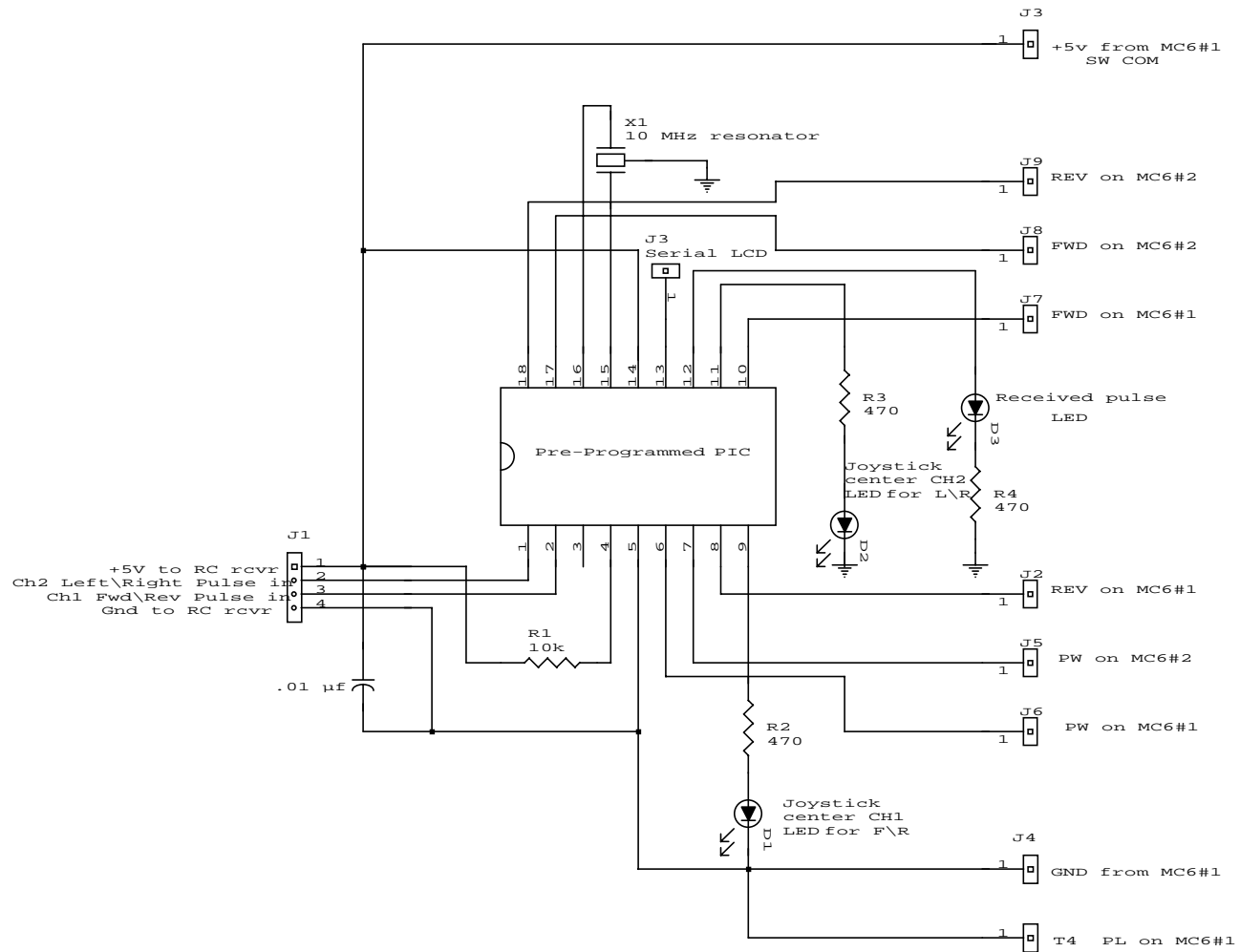
### Connecting to Your Receiver

As I mentioned above, recognizing that different brands of RC receivers have different connectors, I am including 4 universal leads (one red for the +5V connection, one black for the negative connection, and 1 white & 1 yellow lead for the receiver channel 1 and channel 2 outputs) with the kit. These will enable you to connect to your receiver regardless of what brand you own. One end of the lead gets soldered to the RCIC-2 board and the other pushes on to the proper pin. **YOU ARE RESPONSIBLE FOR BEING FAMILIAR WITH YOUR RECEIVER PIN CONNECTIONS AND CONNECTING THESE WIRES TO THE PROPER POINTS.** The easiest thing to do is inspect the leads of the servos that came with your receiver. The color of the wires on the servo should tell you which pin is which on your receiver according to the "important points" I've stated above. If you have any doubts, ask someone who is familiar with your receiver.

Table 1

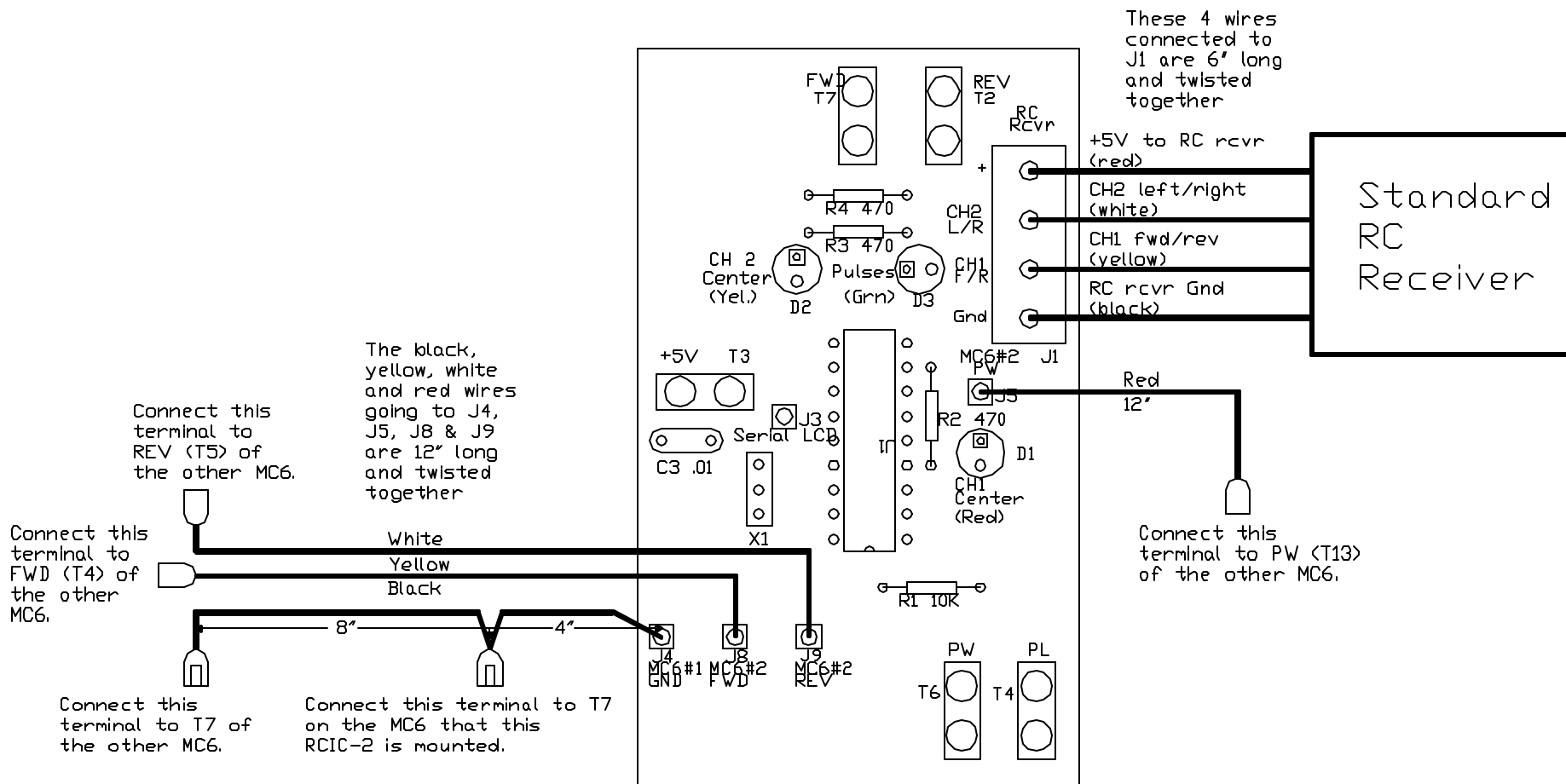
RCIC-2 RC Control Chip Pinout Description

Pin Number	Pin Name	Purpose	Connection
1	RA2	Accepts CH2 pulse widths from 1 to 2 ms	From RC receiver CH2 (Left-Right)
2	RA3	Accepts CH1 pulse widths from 1 to 2 ms	From RC receiver CH1 (Forward-Reverse)
3	RA4	Not used	No Connection
4	MCLR	10K resistor connected to this pin	Other side of 10K resistor connected to +5V.
5	VSS	Ground lead	Connected to ground
6	RB0	PWM output port for the MC6 board #1	Connected to the PW tab of the MC6 board #1
7	RB1	PWM output port for the MC6 board #2	Connected to the PW tab of the MC6 board #2
8	RB2	Outputs a logic level 1 (+5V) when the CH1 input pulse is less than 1.5 ms.	Connected to the REV tab on the MC6 board #1
9	RB3	Outputs a logic 1 (+5V) when the CH1 input pulse is 1.5 ms +/- dead band	Connected to an LED & resistor which lights to show when received pulse is 1.5 ms
10	RB4	Outputs a logic 1 (+5V) when the CH1 input pulse is more than 1.5 ms	Connect to the FWD tab on the MC6 board #1
11	RB5	Outputs a logic 1 (+5V) when the CH2 input pulse is 1.5 ms +/- dead band	Connected to an LED & resistor which lights to show when received pulse is 1.5 ms
12	RB6	Outputs a logic 1 (+5V) when receiving RC pulses	Connected to an LED & resistor which lights to show when receiving pulses
13	RB7	Not used	No connection
14	VDD	+5V	Connect to SW COM on the MC6 board #1 for a 5V source.
15	OSC2	Connection for external frequency element	Connect to supplied 10 MHz ceramic resonator.
16	OSC1	Connection for external frequency element	Connect to supplied 10 MHz ceramic resonator
17	RA0	Outputs a logic 1 (+5V) when the CH2 input pulse is more than 1.5 ms	Connect to the FWD tab on the MC6 board #2
18	RA1	Outputs a logic 1 (+5V) when the CH2 input pulse is less than 1.5 ms.	Connected to the REV tab on the MC6 board #2

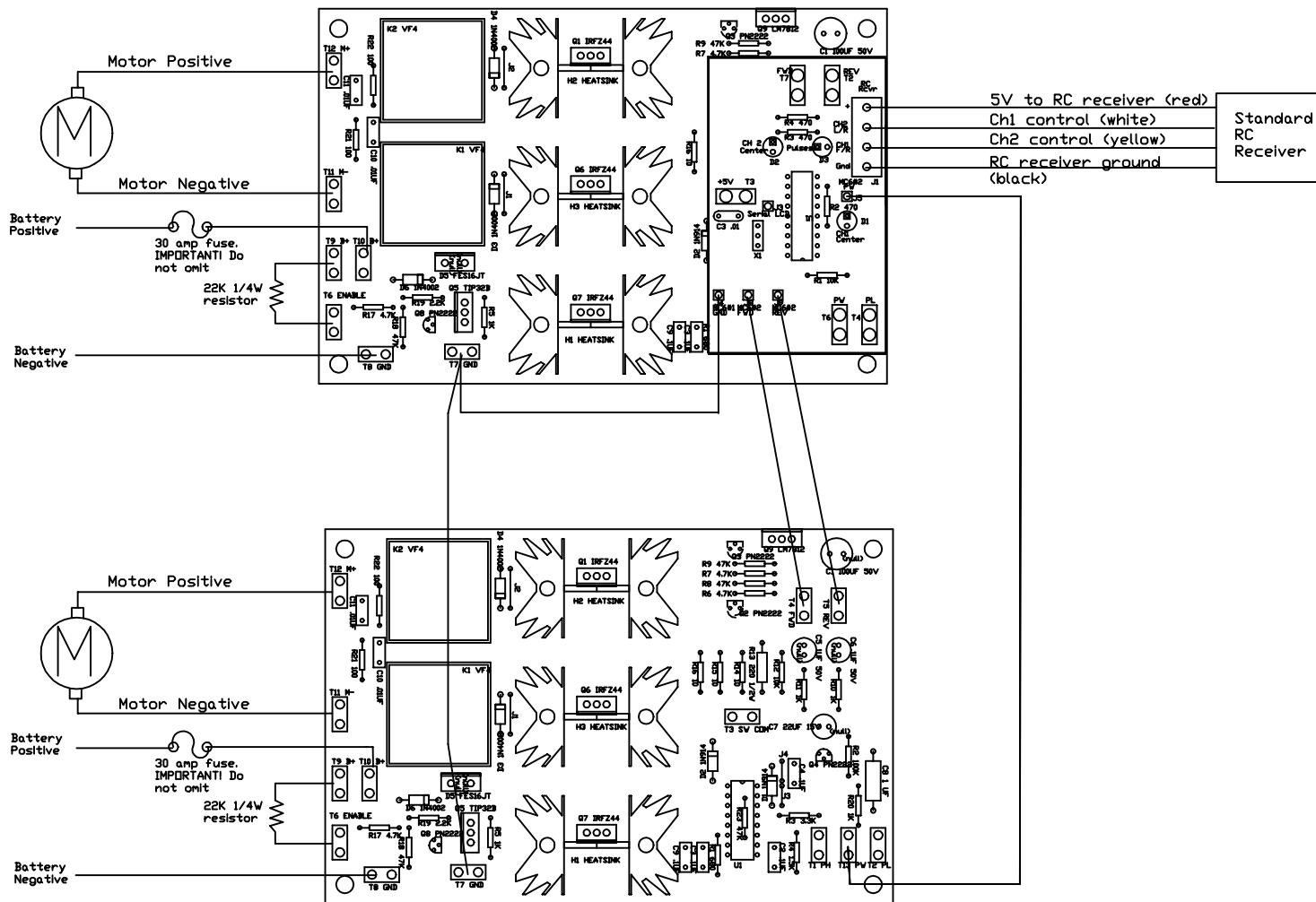


**RC Interface Circuit RCIC-2**  
**2 Channel with Fwd/Rev Left/Right mixing**

# RCIC-2 connections



Carefully, mount this RCIC-2 on one of the MC6s. Be sure all male and female terminals are properly mated.



RCIC-2 Controlling 2 Motor Controllers (w/mixing)