



What'sup?

**The Royal Astronomical Society of Canada
Belleville Centre Newsletter**

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Next Meeting

December 7th, 2018

Pioneer Building P13

Observing Night

TBD

The Night Sky

December 3rd – Crescent moon and Venus. Just before dawn, the moon will be within 5 degrees of Venus.

December 6/7 – Conjunction of Mars and Neptune. A good evening to enjoy these two planets in such close proximity.

December 13/14 - Geminids Meteor Shower peak. Usually the best meteor shower of the year with a waxing crescent moon setting early in the evening.

December 16 – Comet 46P/Wirtanen passes within 3 degrees of Pleiades star cluster and is only 11.5 million km away from earth.

Astronomy Facts

There are billions of galaxies in the universe. No one is quite sure exactly how many. The universe is more than 13.7 billion years old, and some older galaxies have been cannibalized by younger ones. The Whirlpool galaxy (also known as Messier 51 or M51) is a two-armed spiral that lies between 25 million and 37 million light-years away from the Milky Way. It can be observed with an amateur telescope, and appears to have been through one galaxy merger/cannibalization in its past.

The nearest galaxy is 2.5 million light-years away, and it looks as it did when the Australopithecus hominid ancestors walked the planet.

What'sup?

Build your own Dew Heater Controller

By Donald Town

You can build your own 5 channel Dew Heater Controller for less than \$30.00! As they say, "some assembly is required", but if you can solder electrical components, you can save a bundle by making your own.

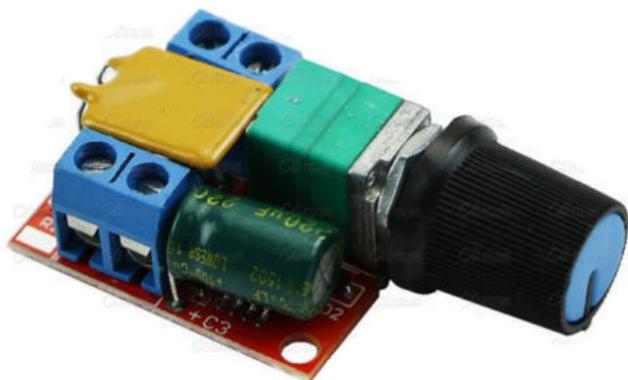


5 Channel Dew Heater Controller – Front View



5 Channel Dew Heater Controller – Back View

All too often I have been out observing and had to cut short my observing session because the 'scope fogged up. I looked at purchasing a commercial dew heater controller (prices vary in the \$150 range) but came across a number of articles on-line that describe how to build one yourself. I immediately thought of constructing a micro-computer based unit, but thought for my first venture into this field that I would take a more conservative approach and use some inexpensive Pulse Width Modulation controllers. When I say inexpensive, these units cost \$1.50 each and are good for 5 Amps at 12 Volts DC. They vary the output power by rapidly turning on and off the output so that you can go from 0 to 100% duty cycle through a build in potentiometer. A photo of the type that I used is shown below:



PWM Controller – Front View

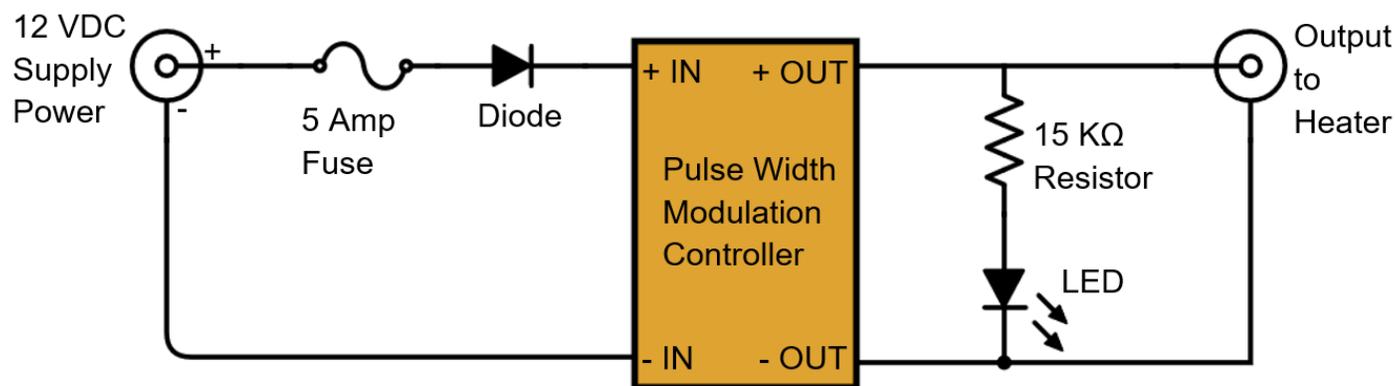


PWM Controller – Bottom View

What's up?

After doing a bit of research, I was able to determine that the power requirements of a large (16 in. Dia.) OTA heater was only about 25 Watts. These units are good for 5 Amps each, so at 12 Volts they can control up to 60 Watts of heat. I will not be discussing the construction of the actual heater strips in this article – see my next project write-up on how to build your own heaters.

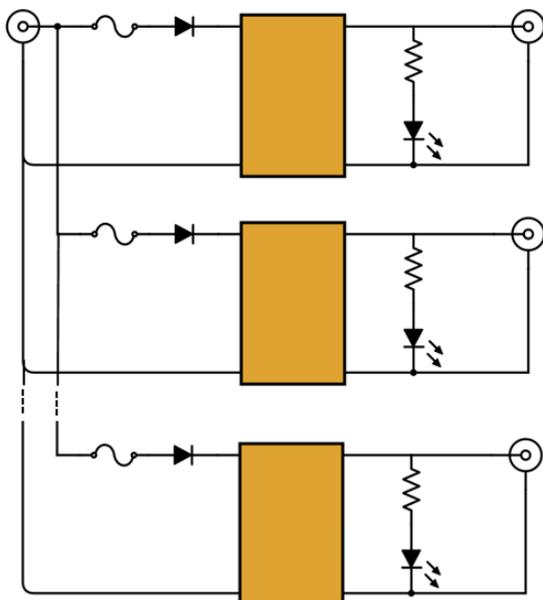
The basic circuit diagram for a single channel heat control zone is shown below.



Since the PWM controller does not have any overload or polarity protection, I added a 5 Amp fuse and diode on the input side to the controller. The 15 KΩ current limiting resistor for the LED on output side was sized to allow the LED to illuminate but not be too bright. A couple of coats of red nail polish on the LED lens also helped keep the LED from becoming too bright. The PWM controller potentiometer has a built in power switch, so any unused channels can be turned off. The PWM pot is also used to mount the controller in the case.

The basic circuit can be duplicated for as many heat zones that you want. I thought that 5 zones would be enough (OTA, eyepiece or camera, finder scope, Rigel Quick-finder, and guide scope). Additional channels can also be added if you want to add speed controls for cool-down fans (12 Volt DC) as the PWM controller was designed for small motor speed control.

What's up?



The basic circuit can be replicated for as many control zones that are required

I selected a plastic electronics project box so that it would fit on the bottom side of the OTA mounting plate. My case was 160 x 56 x 44 mm and I was just able to get all of the parts for the 5 channels in the box and soldered. I would recommend using a bit larger box for easier assembly and soldering. An interior photo shows the camped components.



Interior view

I ordered all of the parts through E-Bay, with most of the parts coming from China. Expect up to 8 weeks delivery times if you opt for the free or low cost shipping. All of my part orders were below \$20.00 CAD, so I didn't have to pay taxes or duty.

What'sup?

Dew Heater Parts

	Part	Description	Cost each	Quantity		Cost		
				Required	Ordered	Parts	Shipping	
	PWM Controllers	Mini, 5A, 1-100%, 3-35 VDC	\$1.50	5	5	\$7.50		\$7.50
	Enclosure	160x56x44mm Plastic Box	\$2.80	1	1	\$2.80	\$0.80	\$3.60
	Phono Jack (Male)	solder type	\$0.08	5	20	\$1.60		\$1.60
	Phono Recp. (Female)	solder type	\$0.12	7	40	\$3.20	\$0.99	\$4.19
	Fuse Holder	Panel Mount Fuse Holder	\$0.22	5	5	\$1.09		\$1.09
	Fuse	5 Amp, 5x20mm Glass (Order an assortment box)	\$0.03	5	100	\$2.98		\$2.98
	Diode	5 Amp Rectifier type	\$0.17	5	10	\$1.69		\$1.69
	Indicator Lights	Red Panel mount LEDs	\$0.37	5	5	\$1.87		\$1.87
	Resistor	15 K Ohm, 1/4 W	\$0.01	5	100	\$1.18		\$1.18
							Total	\$25.70

Assembling the components requires some basic hand tools and soldering skills, and I recommend using heat shrink insulation on all exposed live conductors based on the tight space in the enclosure.

I placed two phono jacks on either end for input power. Based on your 12 Volt DC power supply, you will need to fabricate your own supply cord to match the supply's connection.

I will describe in my next article how I made my own heaters using 33 Ohms/metre carbon fibre wire.

Interested in Astronomy?

Our club is always looking for new members to come out and enjoy the wonders of the night sky. If you are interested, please join us at one of our monthly meetings at Loyalist College. Meetings are held at 7:30 pm in the Pioneer Building, class room P13 on the first Friday of the month.



What'sup?

Club Minutes - November 2018

By Joanne B.

15 present; 2 new persons.

PRESENTERS:

David Cotterell: -- Okie-Tex Star Party Report

Greg Lisk -- review of movie "First Man" and 3D-printed "moons."

Don Town -- Taurids meteor shower

Dave Cotterell: -- **"What to See in November Sky":**

Nov. 6 -- Mercury after sunset

Nov. 9 -- Mercury and young moon over Antares

Nov. 11 -- Saturn and crescent moon early evening until 8:00 p.m.

Nov. 12 -- Northern Taurids Meteor Shower peaks

Nov. 12-- early evening -- moon near Pluto and asteroid Vesta

Nov. 13 -- Venus and Spica close encounter in pre-dawn morning

Nov. 15 -- variable star Algol (eclipsing binary) at minimum brightness. Algol ("The Demon Star") is in constellation Perseus

Nov. 15-- evening -- moon passes Mars

Nov. 17-- all night -- asteroid Juno at opposition (in binoculars);

Nov. 17-- pre-dawn -- Leonids meteor shower peaks. Leonids are associated with Comet 55P/Tempel-Tuttle. Waxing gibbous moon.

Nov. 23 -- 12:39 am. -- Full Beaver Moon (or Frost Moon)

Nov. 25 -- evening -- Neptune stands still at mag. 7.9 in binoculars from dark sites and travels through the stars of Aquarius.

Planet Uranus (mag 5.9) can be seen naked-eye if you know where to look and in a dark sky.

Dave Cotterell: -- constellation Taurus featuring the V-shaped open cluster, the Hyades, star Aldebaran, the Pleiades or Seven Sisters; M1 the Crab Nebula.

Outa This World Humour

After his first meal on the moon, the 22nd century astronaut said the food was good but the place lacked atmosphere.

Two atoms bump into each other. One says "I've lost an electron." "Are you sure?" "Yes, I'm positive."

Why couldn't the astronaut book a room on the moon?

Because it was full

First star I see tonight

I wish I may, I wish I might

Oh wait, it's just a satellite

Christmas Dinner 2018

Club members mark your calendars! This year's RASC Belleville's Christmas Dinner is slated for the 15th of December, at the Beaufort Pub.

