

DCS-RC Watchdog Timer – ‘Perpetual Barking Watchdog’ (PBW)

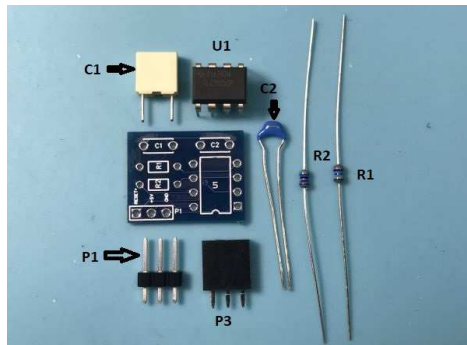
The PBW is meant to compliment the TIU by sending a constant 'Watchdog' signal to your sidings, spurs, yards or other unused (not normally powered) tracks where you store your DCS engines. This allows the engines start up in DCS mode when you power the sidings, spurs, yards, etc. To avoid any cross connections between TIU channels, Each TIU Channel being used for sidings, spurs, yards, etc. will need it's own separate PBW.

The PBW goes in the DCS Remote Commander Receiver pictured below.



Contents of the kit version using all through hole components for easier soldering. The 3 pin male header goes on the PBW circuit board shown below. For 3 pin female header (P3) location and installation of the PBW on the DCS-RC's receiver board, see pictures and instructions for the assembled version below. (Note: Press Fit header (P2) instructions do not apply to the kit version as the kit's 3 pin female header (P3) is soldered to the DCS-RC's receiver board.)

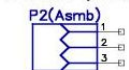
Verify values of R1 & R2 with an ohm meter before soldering in place, picture may not show accurate color bands.



Schematic and Parts List for the PBW project:

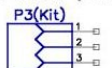
555 Timer Version (08-31-2019)

Included with Assembled Version
3-Pin Header (Press Fit)

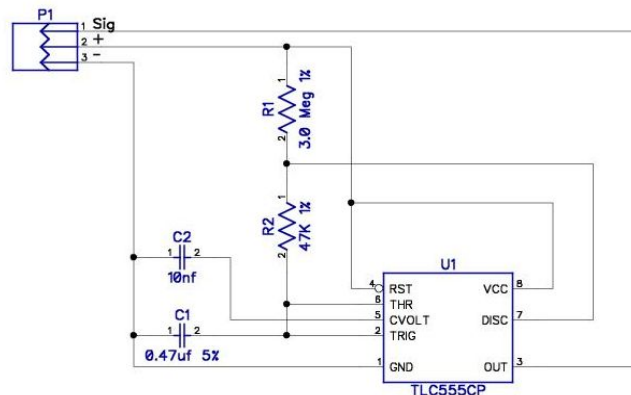


(Insert Pins into
DCS-RC Receiver
Circuit Board)

Included with Kit Version
3-Pin Header (Solder)



(Insert Pins into
DCS-RC Receiver
Circuit Board and
Solder All Pins)

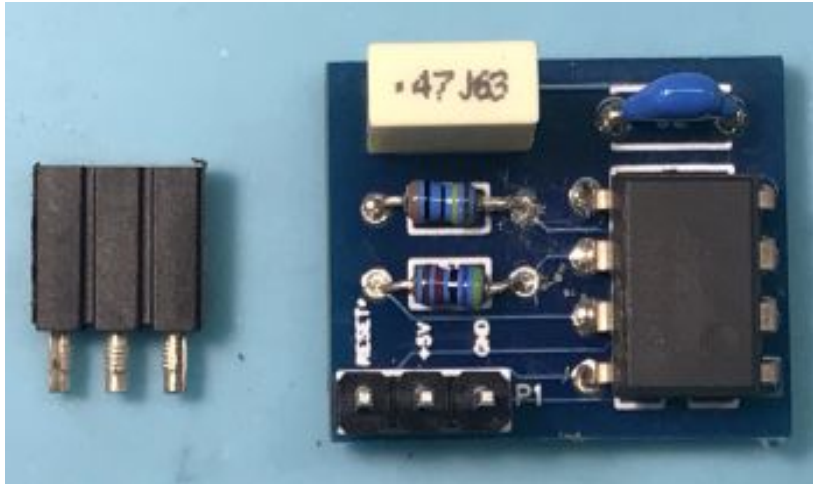


Materials List

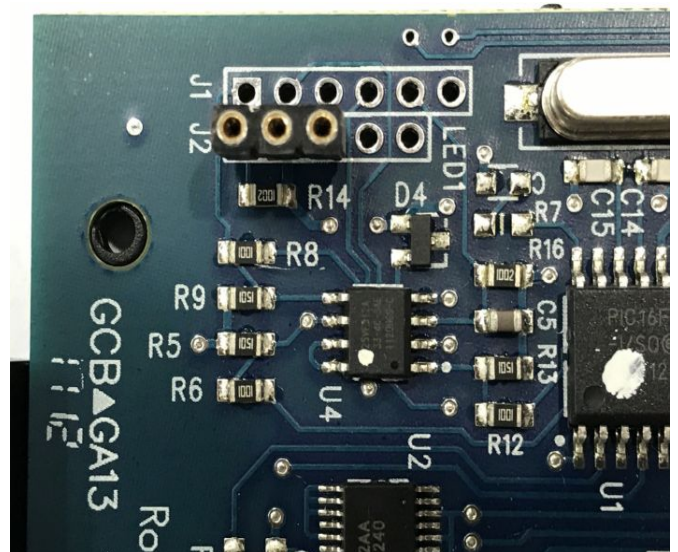
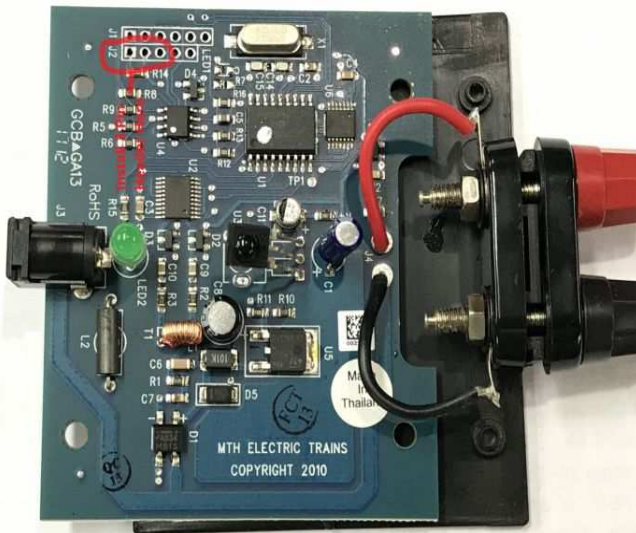
#	Quantity	RefDes	Value	Name	Supplier	Part Num
1	1	C1	0.47uf 5%	CAP	Digikey	399-8901-ND
2	1	C2	10nf	CAP	Digikey	445-175393-1-ND
3	1	P1	3 Pin Male	HRD-1x3	Digikey	S1012EC-03-ND
4	1	P2 (Asmb)	3 Pin Female	HDRF-1x3	Digikey	ED10250-03-ND
5	1	R1	3.0 Meg 1%	RES	Mouser	270-3.0M-RC
6	1	R2	47K 1%	RES	Mouser	270-47K-RC
7	1	U1		TLC555CP	Digikey	296-1857-5-ND
7 Total						

Kit Version Only - P3 = 1 - 3 Pin Female Header (Solder) - Digikey - S7001-ND

The fully assembled version shown with the included 3 Pin Press Fit header (P2):



Circuit board inside the DCS-RC Receiver, shown with top of case removed. These photos show the 3 holes in J2 of the circuit board where the Press-Fit 3 Pin Header is to be installed. (Kit version's 3 pin female header (P3) is soldered in place here.)



Before trying to install the Press Fit header carefully examine the 3 holes on the DCS-RC (J2 - circled in picture above) board where the 3 pin Press Fit header will be installed. It has been reported that a hole was found with some excess solder left in it causing installation problems and damage. These holes must be clear of any debris in order to allow the Press Fit header pins to be properly inserted with out damage to the DCS-RC board or Press Fit header. Any debris, excess solder etc. must be carefully removed before trying to insert the Press Fit header. Be very careful to not damage the silver coating surrounding the holes.

To install the 3 pin Press-Fit header, align the header pins with holes in J2 as shown above. Gently press into place until the pin header housing is tight against the DCS-RC Receiver circuit board. During testing here I used a pair of small flat nose hobby pliers to press the header in place, being very careful with the pliers to allow clearance for the pins on the back side of the board.



You could also drill an appropriate sized hole for the 3 header pins in a block of scrap wood. This will allow clearance for the pins to pass through the circuit board. Then using the block of wood and a small vice or other appropriate tool, carefully press the 3 pin header into place. These are just a couple of suggestions here, I'm sure there are also other methods for doing this to accomplish the same results. Just be very careful not to damage the circuit board, traces or header connections.

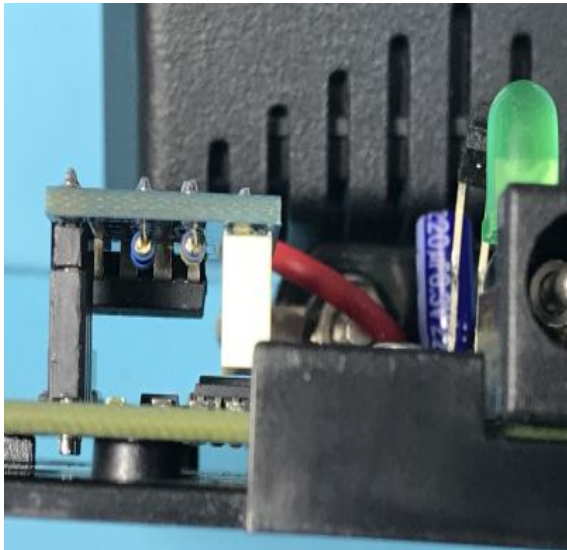
The assembled kit was intended to be a completely solderless installation. However, I only had one DCS-RC on which to test the Press-Fit header. Everything worked quite well here during initial testing, but others could possibly have different results. If you experience any conductivity or connection problems with the 3 Pin Press-Fit Header, soldering of the pins may be required.

If the need should arise, the 3 Pin Press Fit Header can be removed by gently pulling upward and slightly wiggling the header until it is free from the circuit board. However, in doing this, there is always a chance of damaging your DCS-RC circuit board so be very careful if attempting this. I did this twice during testing and each time the Press-Fit header was able to be re-installed with a nice tight fit and good working connections. Of course, your results could vary here so use caution if attempting this.

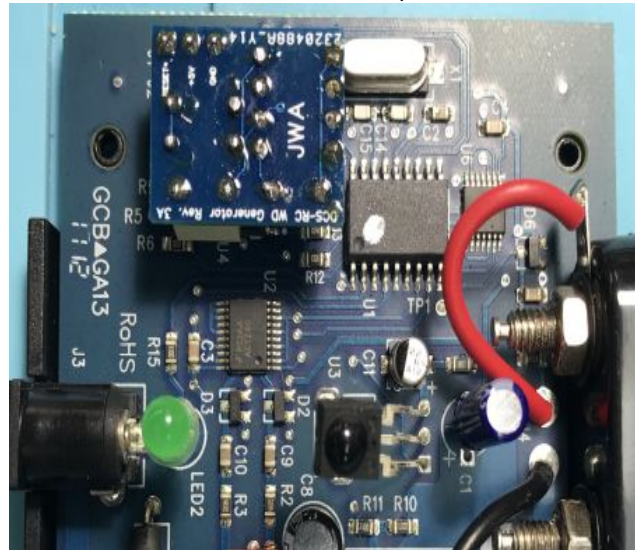
Once the Press-Fit header (or soldered header for the kit version) is in place, install the 3 pins of the male header on the PBW circuit board into the installed female header on the DCS-RC circuit board as shown below.

Your completed installation should look something like this:

From the side



From the Top



Reinstall the case on the DCS-RC receiver and connect it to your layout in passive mode. When connected to your track and the track is powered up, the green LED should blink about once per second providing a constant 'watchdog' signal to your yards, sidings, spurs or tracks.

I would like to extend sincere 'Thank You' to Stan2004 and GunRunnerJohn for doing all the thought, design, circuit board creation, heavy lifting etc. for this really neat project. (I am only the order taker and shipping clerk, just trying to learn more about electronics along the way...and this has helped).

If you would like to learn more about this project and have not read the original 'Project' threads on the OGR Forum, the thread Titles and their Links are listed below. I think it is well worth reading both of the threads. I found it all very interesting following along originally and I learned a lot from the project design team along the way.

The 'Perpetual Barking Watchdog' (PBW) was created in this thread by Stan2004 and GunRunnerJohn on the OGR Forum:

Proposed Solution to DCS Watchdog in Yard Tracks (DCS-RC WD Gerber Files Added to First Post)

Permalink: <https://ogrforum.ogaugerr.com/topic/proposed-solution-to-dcs-watchdog-in-yard-tracks>

The new design was discussed and updated in this thread:

PBW Needed

Permalink: <https://ogrforum.ogaugerr.com/topic/pbw-needed>

I think we should all be extremely thankful that we have such talented folks that are willing to share their knowledge and projects with us. Without GunRunnerJohn and Stan2004 we would not have this nifty device allowing us to add this great feature to our layouts! I think we should ALL give them both a BIG 'Thank You' for their time and effort put into this project! (And ALL the other projects they help us with in addition to this one!)