

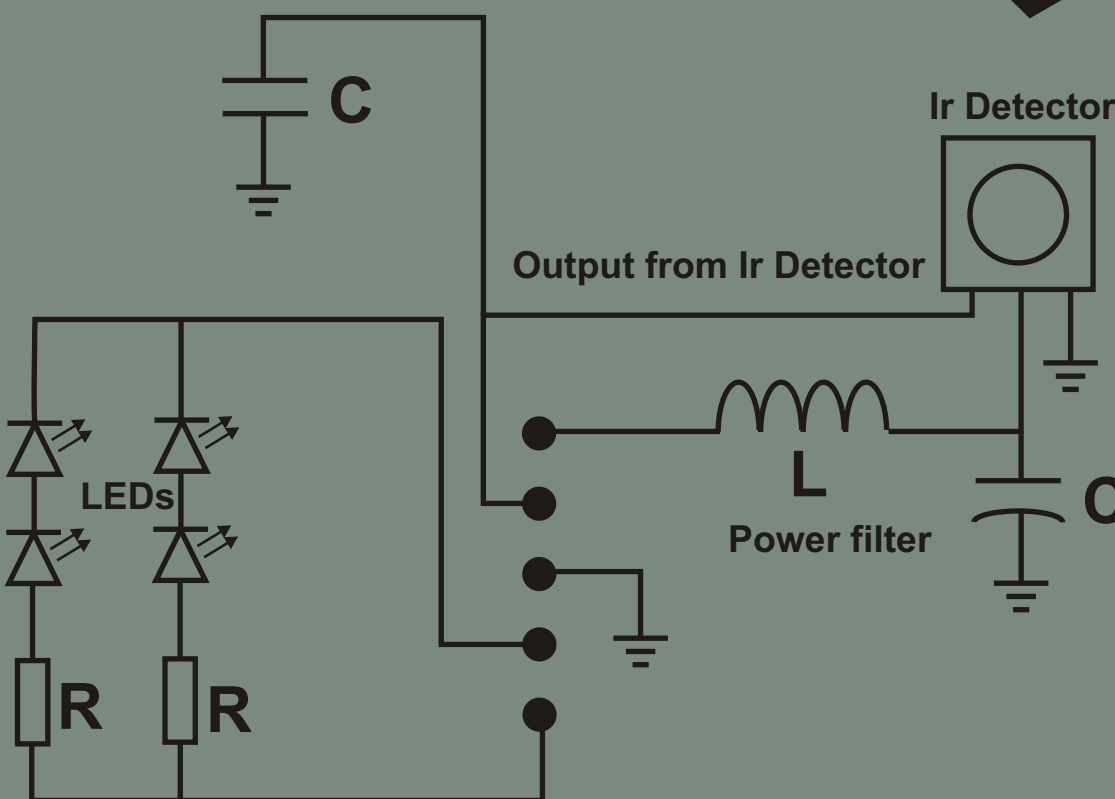
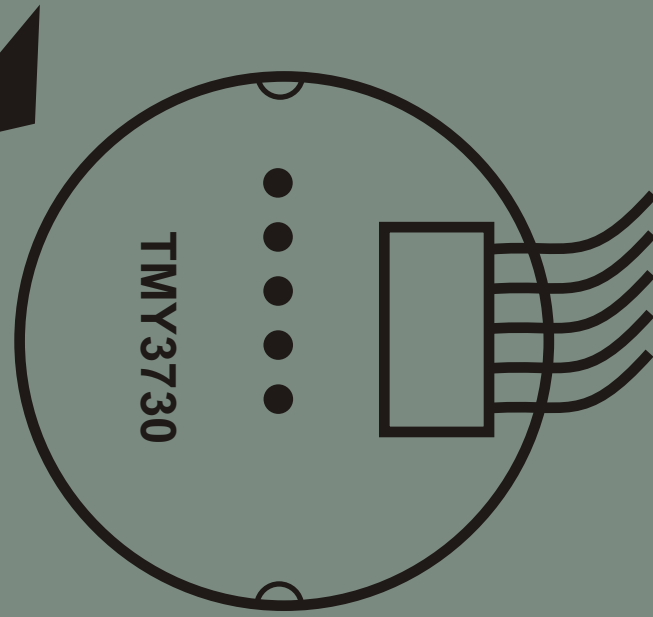
Here is some information on the Tamiya TBU (Tamiya Battle Unit).

It is a simple infrared detector with LEDs that illuminate when the tank receives a hit. The height of the TBU is necessary because they use only one detector. To make it so that one detector can measure infrared signals from 360 degrees a mirror is used (or reflector).

The top of the TBU plugs into the base. You can interface to this base using your own detectors and LEDs. What is nice is that if you do it right you can switch back and forth between your setup and the normal one in the event you attend an event where you need the stock Tamiya Battle System.

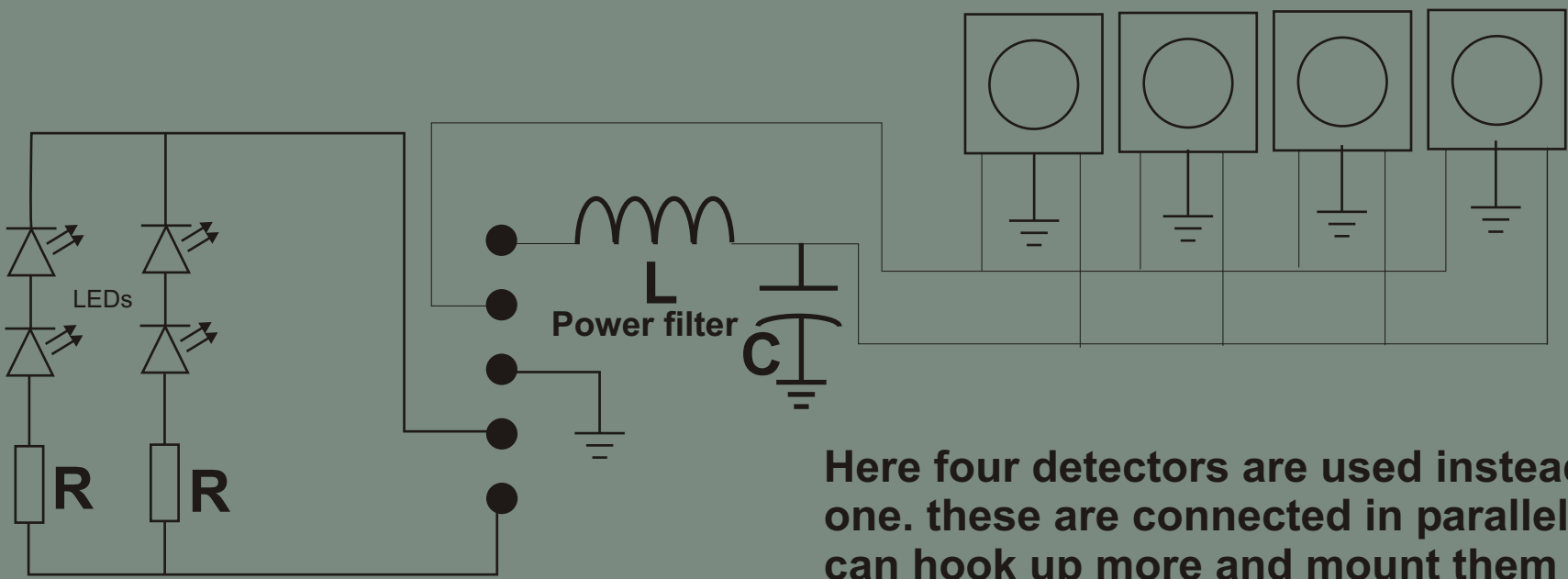
Note that this has been done already by many, I'm in no way the first. I'm just putting the information here for those that may want to experiment. If you come up with alternatives or really cool ways to mount new detectors or LEDs let me know.

Looking at the TBU the pins that plug into the base are offset from center. The schematic of the components is shown where the top pin is the power (positive) and the next one is the output from the Infrared detector. The middle pin is ground and the next two are for driving the LEDs. The LEDs are two sets, each set are two LEDs in series with resistors for current limiting. Each set in parallel.



Frequency - 38kHz
Power - 3 volts
Active low - output is high until a signal is detected.
NOTE: I'm confident that 36kHz or 40kHz units will work just as well if the 38kHz units are unavailable.

Below is a wiring example of a hookup where the four detectors can be mounted on the turret.



Here four detectors are used instead of one. these are connected in parallel. You can hook up more and mount them in various places on the tank. The benefit being they can be hidden so as to not to ruin the appearance of the tank. Well not too much anyway, they do need to be exposed so they will register any infrared signal.

Some points to keep in mind:

Make sure you connect the leads correctly. Different devices will have different pinouts. Use the datasheet!

I recommend using a two conductor wire with shield for connecting the detectors. A twisted pair at the least. The shield is the ground.

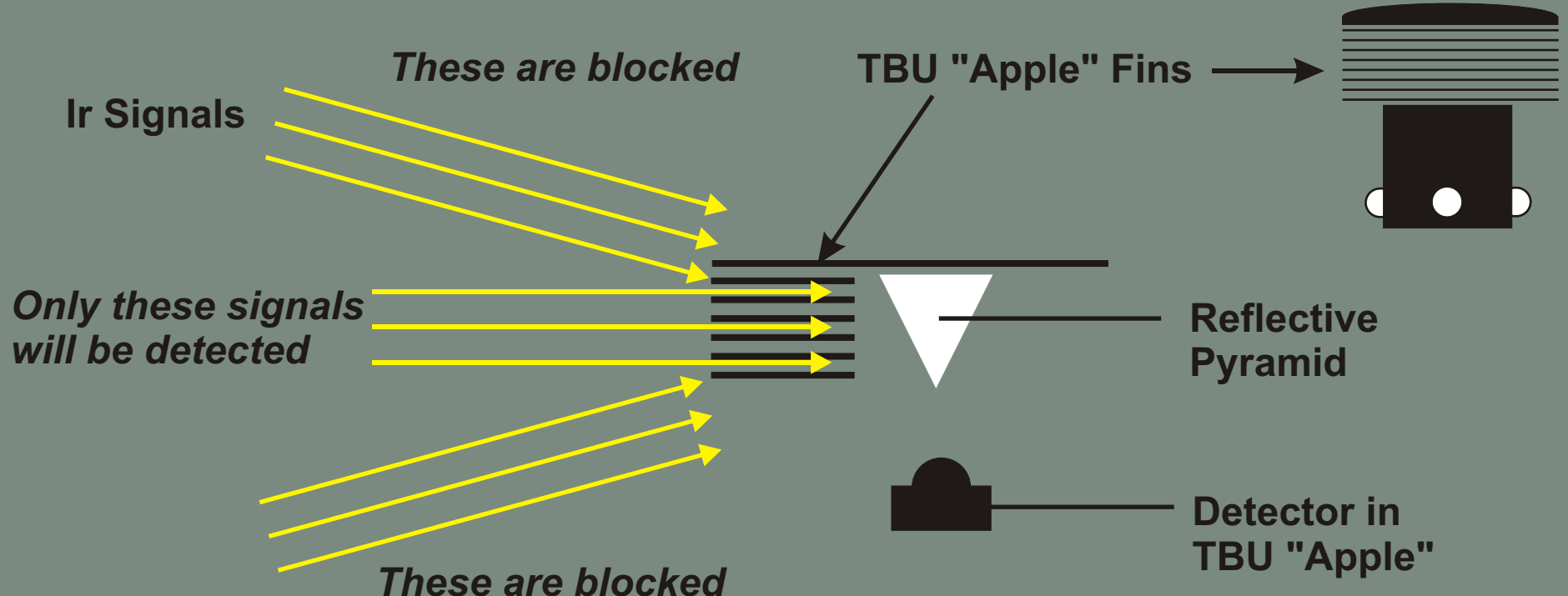
The detectors work at specific angles. Different devices have different angles, keep this in mind when mounting them. The bump on the device is what detects the infrared. Mounting it in a recess will reduce it's angle of detection.

These devices take power, so there is a limit as to how many you can connect. I don't know what that number is.

The LED circuit works great. I wouldn't mess with it unless you really had to.

Fins

The fins on the TBU are used to allow infrared signals from only one direction to hit the mirror (reflector) that is represented below by the white triangle. Any infrared from a higher or lower angle is blocked. This results in the TBU registering hits when the tank that is firing is properly aligned so the infrared signal will pass through the fins. This is why when the tanks are at different elevations, or one is tilted, hits don't register.



Here the signal passes through the fins, reflects off the reflection device (pyramid reflector inside the TBU) and is detected by the infrared detector.