Making The Bluefly Vario Louder

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These notes relate to the use of a Bluefly module. They are my best shot at the time of writing. I cannot guarantee they are correct or represent ideal solutions but will correct and update them as and when I can. Please inform me of any errors or better solutions you may find. The index for other Bluefly and Kobo/XCSoar notes can be found at:

http://www.50k-or-bust.com/Kobo XCSoar/Kobo XCSoar.htm

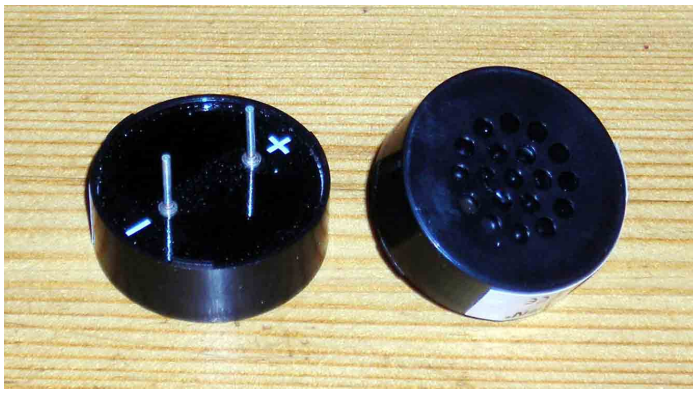
How loud we need our vario is a very personal thing. I need a fairly loud one as do some other pilots and also prefer to use lower frequency audio tones too. The on board speaker in the Bluefly module is very small. It works quite well at high frequencies but at low frequencies it is a bit poor. I could get around this to come extent by using a helmet mounted vario but I really want a single instrument on my flight deck with no extra wires or bits and pieces.

Removing The Onboard Speaker

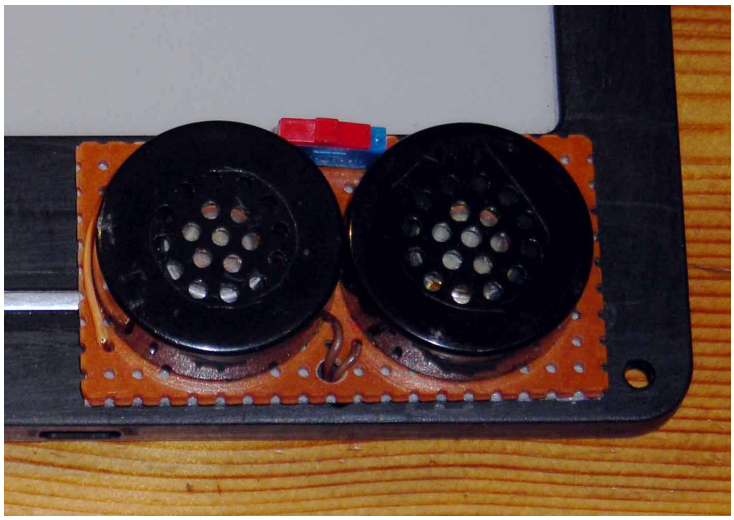
Early Bluefly modules had a pair of pads to connect an external speaker as well as a link to disable the onboard speaker. Later modules do not have the link so to use an external speaker it is necessary to remove the onboard one. This is best done using a hot air gun from underneath the board. I have not done this myself but I am assured it is easy enough!

What Speaker To Use

The onboard speaker has an impedance (resistance) of about 20 ohms but any speaker of 16 ohms or more is fine. I originally used two Visaton K 23 PC 8 ohm speakers in series (to make 16 ohms total) which are in housings convenient to mount on stripboard.

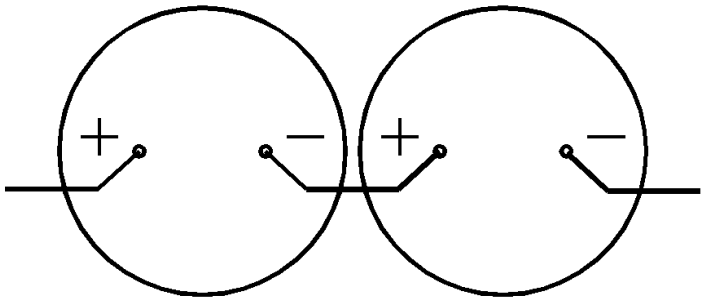


These are quite expensive but cheaper versions are available such as the Ekulit AL-23P. They are both 23mm in diameter and inside the housing is a 19mm diameter speaker.



On this Kobo the speakers are mounted on a piece of stripboard fixed with double sided foam tape. There is also a small pcb slide switch visible at the top to switch the audio on and off.

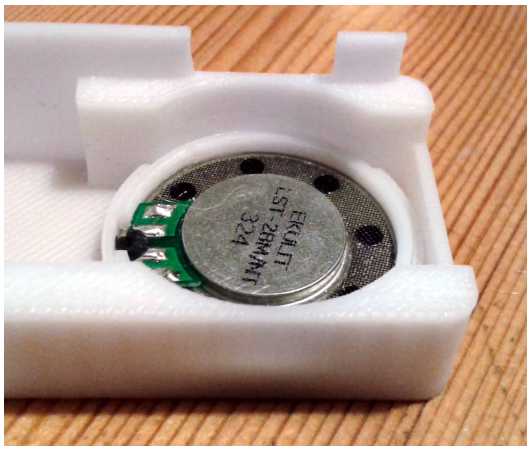
When using two speakers in series we have to make sure they are connected properly in phase.



If connect them wrongly (+ to + or - to -) we will lose much of the benefit of having two speakers.

The other speaker I have tried which works well is a single Ekulit LSF23M/N/G. This has a diameter of 28mm and an impedance of 16 ohms.

This has to be mounted in some kind of casing such as this 3D printed one.



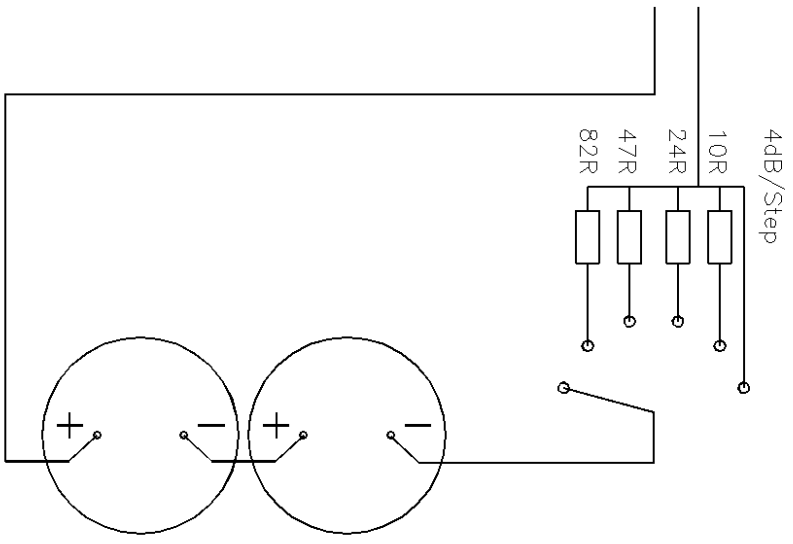
It produces about the same volume as two of the previously mentioned speakers together.

How Loud Does It Need To Be? - Reducing The Volume

Now, of course, it may be too loud. We can reduce the volume using the volume control in the Bluefly settings but this will affect the tone quality. A better way to reduce the volume is to put a resistor of between 8 to about 70 ohms in series with the speaker. If using the Visaton speakers most pilots will find the volume of just one speaker in series with a resistor of 8 or 10 ohms (to make a total of 16 or 18 ohms) adequate.

Switched Volume Control

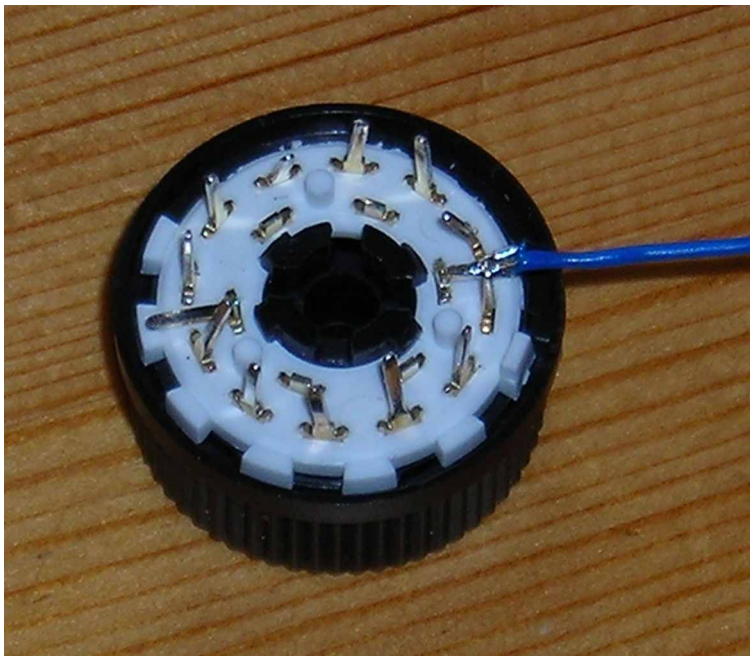
Adjusting the volume with a potentiometer (variable resistor) would be difficult because of the low impedance of the speakers. As an alternative for adjusting the volume in flight we can use a rotary switch with fixed resistors.



Speakers 2 x 8ohm

The resistors shown give settings of 4dB of volume per step and I use a TT

electronics AB 417 2 pole 6 way switch (Order No. 705683-89 from Conrad) which is PCB mounting.



By careful bending of the legs and with a wire soldered to the selector connection it can be fitted to normal stripboard. It is large enough to be operated by a thickly gloved hand and the position felt as it clicks, and small enough to be stuck on the front of a Kobo.

This type of switched volume control also works well for radio speakers. I have one taped to a helmet I use with radio.

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