Acoustic finder for model aircraft

(Elektor Labs)

As long as you are in control and it's not too windy then flying model aircraft can be great fun. What happens though when, for some reason the model stops responding to you signals and sets off on its own into the wild blue yonder? Panic breaks out, one thing you can be sure of is that it will eventually come down, the only question is where? (and in how many pieces?) A minor technical glitch can mean that you spend the next few hours scrabbling through hedges, wading across bogs, being chased by dogs and climbing trees in search of the model. Who said that flying model aircraft was a sedentary pastime? Maybe you should be using more of your other senses rather than just relying on your eyes to track down the wayward model. This circuit may be of some assistance...

When you think of all the time, money and energy that you have invested in building your model it would be almost negligent not to take the precaution of adding this very simple circuit to the model's electrics. The operating principle is very simple; as long as the receiver is picking up a signal from the transmitter the circuit remains quiet but when the signal disappears for whatever reason it starts to make a loud beeping sound. The loss of signal may be due to the model flying beyond the transmitter range, a temporary electrical fault or the receiver battery voltage dropping too low. When the search is underway an acoustic signal has the advantage that it can be heard from a great distance and is very easy to locate even if the model has come down behind a bush or in a tree.

The circuit is simpler than it looks. input signal is provided by one of the servo outputs on the receiver.
When the servo impulses stop IC1.A no longer charges C2 via D1 and R2. After a short while IC1.B begins to oscillate on and off at a low frequency turning the piezo beeper Bz1 rhythmically on and That really is all there is to it. The inputs of unused gates IC1.C and IC1.D are tied ground to ensure that they do not oscillate and draw unnecessary current. (Both outputs of these gates will therefore be 'high').

The circuit can be powered from the receiver battery pack; it only takes a few µA in normal use when the beeper is not sounding. If the model flies off because the battery pack voltage has sunk too low it will not pose a problem for this circuit. It consumes very little current and will carry on beeping for a long time after the receiver stops working, until the batteries are almost completely flat. It is possible to power the circuit from its own battery pack but you would also need a double-pole on/off switch to switch the receiver and alarm together. Otherwise with separate on/off switches you may forget to turn the alarm back on again the next time you fly.

The circuit is so simple and small that it can be built on a small piece of perforated prototyping board. Once it has been constructed, wired-up to the receiver and switched on it can be tested simply by checking that the beeping starts shortly after the transmitter is turned off. For peace of mind it makes sense to perform this check before the model is released. Next time you visit the flying field you can relax a bit more knowing that if your model does head off on its own you stand a better chance of recovering it, unless of course it's taken a dive into a lake...