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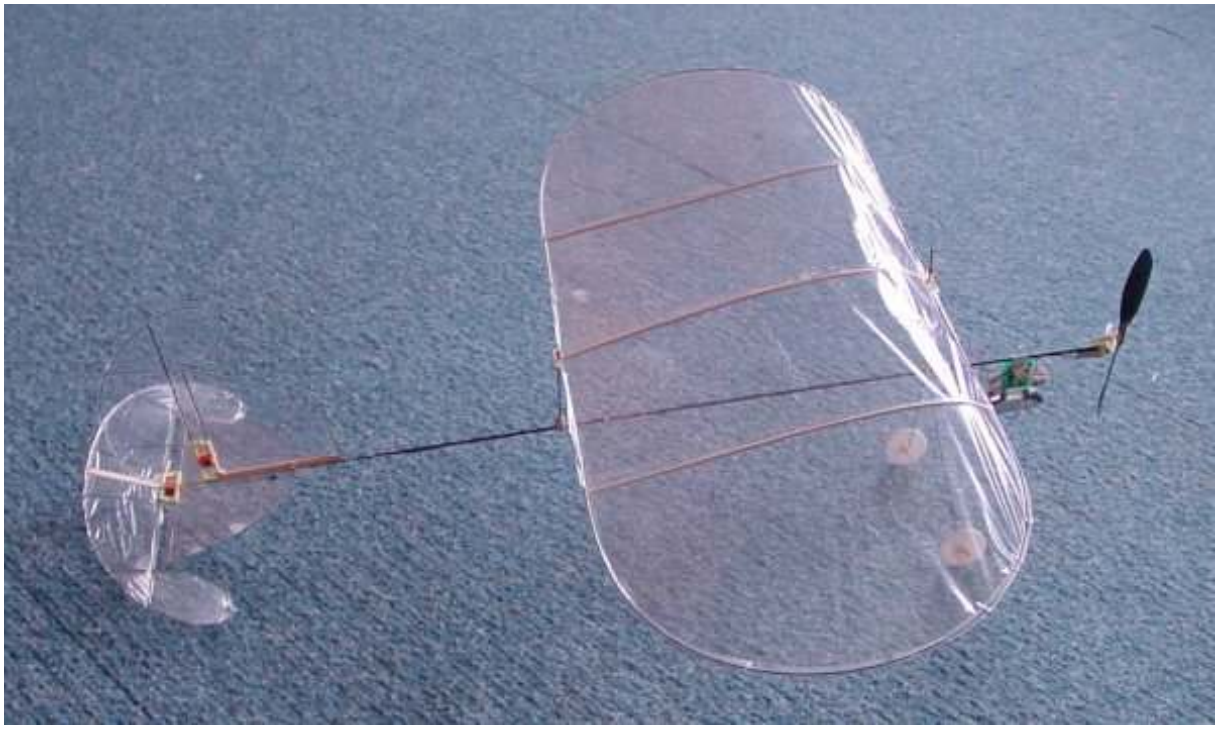
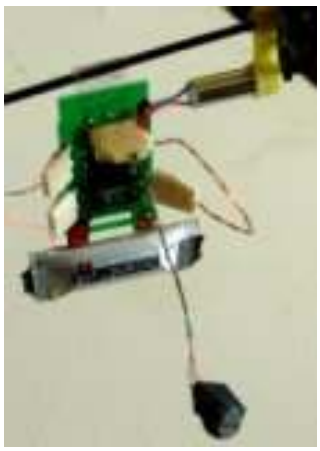
File www.didel.com/slow/celine/miniCeline.pdf

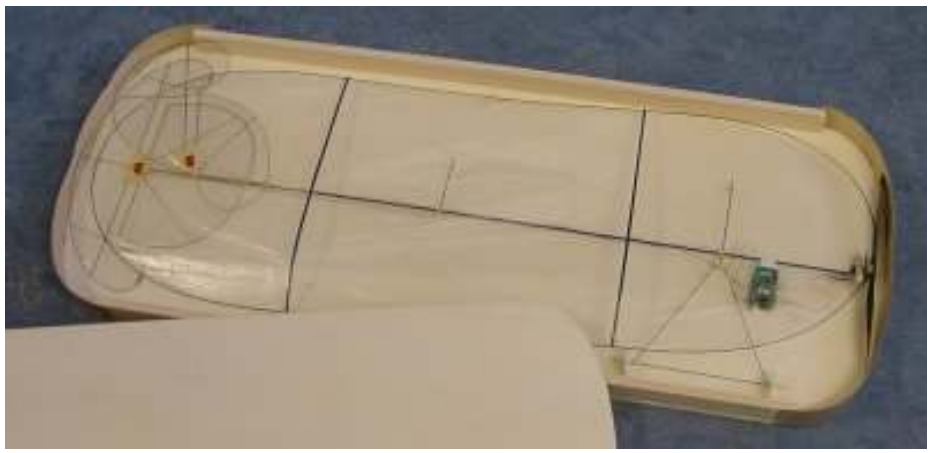
miniCeline – a 6 grams RTF home flying plane
Doc and comments for owners

Not available any more

The miniCeline has been in development since early 2004 as a successor of the Celine, with the objective to lower the weight for a better manoeuvrability at home. The new 20 mAh cells and mod 0.2 gears, in addition to a new concept for hinged magnetic actuators (that does not really save weight but makes for a clean low friction construction) are the major changes.
We kept the requirement for an easy transportation and fast assembly. The miniCelines have already travelled to Australia, US and Prague inside hand luggages.
End of December 2004, we have at least been able to finish the Emir transmitter, that was waiting for months for Plantraco parts. We still are waiting for the new Tricha circuits, the battery charger associated with the Radir adapter.







Packing list

1 wooden box with inside contents of 1 wing and 1 fuselage-landing gear-tail, RTF.
1 Emir transmitter (note that the joystick handles do not have the same bore)
1 plastic box with
  2 handles for the joysticks
  2 20mAh LiPoly, 1 60mAh LiPoly, both with Bahoma attachement
   spare rivets and jumpers

Assembling

Carefully open the box and remove the fuselage and gently open the tail. Usually it rotates by itself and the magnet automatically sticks the elevator in position.
Rotate the landing gear and adjust the position of the receiver according to the accumulator you will use (see gliding tests).
Hold the fuselage vertically and insert the wing (the most rounded profile toward the propeller). Magnets hold the wing when the carbon rod is fully inserted. It is a delicate moment, when you risk to tear the film. Do not do the assembly in a windy place.
The propeller is press-fitted on the gear. Only a light force is required if the teeth are well aligned; never force.
If the train turns too easily, remove it, put a thin coating of ultrathin CA, wait many hours to be sure its really dry. Use thin sand paper if the diameter has increased too much.
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Receiver test

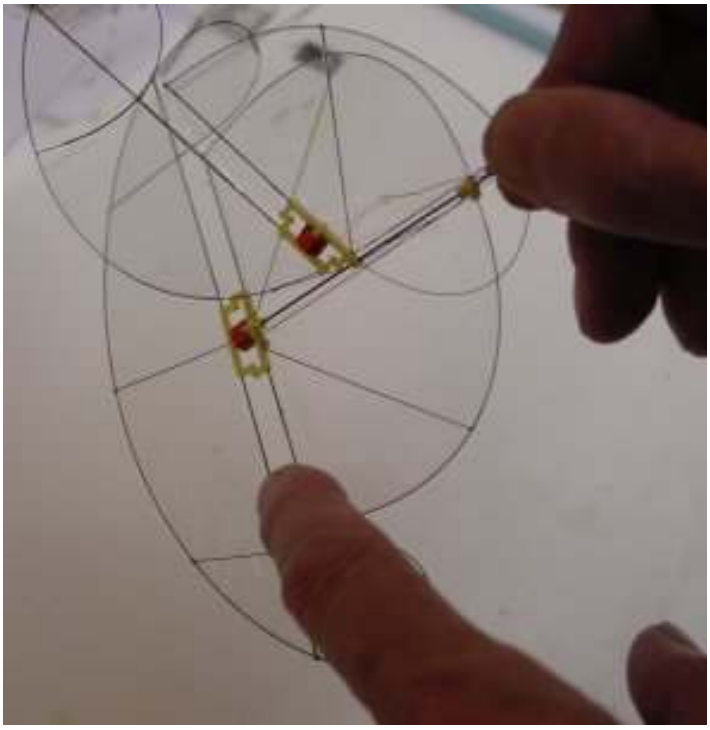
Put the battery in place. The LED blinks during a 1-second calibration if the transmitter is on. Test the action on the different channels.
The receiver before Nov 25 needs the Lipo to be placed behind the MIL circuit. The corrected circuits have the Lipo on top. These 0.1mm circuits do not like to be bent; the conductors break. Contact us in case of any problem,

Gliding test

The battery has a cellotape cover to protect against shorts. Keep the cellotape in place and put the battery against the receiver, so the weight is correct. You can also connect the battery on the processor side.
Adjust the position of the radio/Lipoly for a nice, slow speed gliding. With the 20 mAh the controller must be shifted close to the propeller. With the 60 mAh, close to the wing. The center of gravity must be at about 30% of the chord.

Packing

After the flights, remove the wing, and put it upside-down in the box. Fold the gear train, and the tail. Holding the fuselage at the front of the vertical fin with the right hand, the propeller pointing to your right arm, press on the tail. The deformation is rather important until the magnet gets loose.



Construction

Specially molded miniature pieces simplify the assembling and give the flexibility and strength to the all-carbon structure of the miniCeline.
The wing is covered with thin mylar. The tail is a delicate piece of engineering, with its foldable part to make the setup and packing a snap.

Fuselage and landing gear

The fuselage is a carbon tube on which the motor, the landing gear, the wing and the tail are attached. Minimum glue has been used. If anything gets loose, align correctly and transfer a small drop of thin CA (use a needle or thin wooden stick to transfer the almost invisible drop).

Gearbox

The gearbox has a gear factor of 10. In case of shock with the propeller at full power, it has happened that the gearbox beaks. We have reinforced the point and we hope it will not happen again. If it does, we will send a new replacement box asap.

Propeller

The carbon rod prop is unbreakable, but it has hapened that the prop connector breaks where the prop is glued. Use CA glue for repair.

Wing

The wing is maintained in place by magnets. Its flexibility is responsible for the miniCelines stability. In case the mylar is torn do not try to use glue: the capillarity will just open the slot! Cut small cellotape 5mm squares or 3mm by 20mm rectangles for a long slot, and apply with tweezers. Do not try to remove if not correctly positionned. If the slot is large after repair, put a minimum size cellotape or aliment film on the other side, so there is no sticky part.

Tail

The tail is a delicate part, but we have never had a damaged tail in our many crashes during developement.

Weights

Fuselage	**grams**	**Wing**	**grams**	**Tail**	grams
Tube, wing holder	0.58	Carbon rod	0.34	Carbon rods	0.27
Gearbox	0.23	Ribs	0.18	Covering	0.14
Motor	0.70	Covering + glue	0.17	Actuators	0.84
Propeller	0.36			Counterweights	0.04
Landing gear	0.24			Wires	0.21
Controller	0.50				
IR sensor	0.30				
Total	2.61	Total	0.69	Total	1.50
				Total (without accus)	**4.80**

Control

The infrared receiver is designed to be upgraded as a radio receiver. See www.didel.com/slow/mip/Ira.doc for our evolution path.
The Mil4x module with Md41 software has one unidirectional channel for the propeller and two bidirectional channels for the magnetic actuators.

Batteries

Do not remove the cellotape that protect the batteries against shorts. Fold it slightly when inserting the battery on the plane on or the charger. New batteries are not fully charged.
The miniCeline have the slowest flight with less than 1 gram batteries. The 20 mA Kokam (0.8 to 0.9grams) cells are not designed for the 150 to 200 mAh current the miniCeline uses. Only 2-3 minutes flights are possible, and the battery gets tired after several flights (to be tested more systematically).

The 60 mAh (1.9 to 2 grams) both have a better capacity and a better discharge factor. They are not overloaded, and last for about 15 minutes,
We should receive soon new 30 mAh cells that may be the best match.

Tricha charger

The Didel triple charger is not yet documented and is redesigned and will be available mis-January 2005. It is not required for those having the Emir.

Radir

The Radio to IR adapter is good for most radios. See documentation on www.didel.com/slow/mirted/Radir.doc

Emir

End of December 2004, thanks to the collaboration with Plantraco, the IR transmitter is at least available.. Emir includes the charger for two batteries.
Note that the switch has three positions: off, battery charger on, IR transmission and battery charger on. If no action for 2 minutes, Emir cut the IR transmission and play a decrescendo. Move the joystick to reactivate, or switch-off. More documentation on www.didel.com/slow/mirted/Emir.doc

The charger part has two places for batteries. Set the jumpers according to the battery. The 60 mAh must be put on the side. The 20 mAkh can be sqeezed inside. Plantraco designed the box for one single rectangular 90 mAh accumulator that fit inside.
At rest, the LEDs blinks. A discharged battery put the LED on. A charged battery set the LED off. About one hour is required to recharge the battery, if fully discharged, which usually does not happen, since the motor loose its thrust before the batteries are flat. Lipo voltage must never go below 3 volts, so you have better to recharge frequently.

Flight tests

Use full throttle only to climb. At full speed diving, the maneuvrability is bad and you may end up with a crash.
Sharp turns need a good coordinated control of the elevator and throttle. Reduce the power as soon the turn is engaged.
If the IR is not being received any more by the plane, reduce the distance or orient the transmitter in the good direction.

Reparing

The propeller holds too firmly and the rivet may bend after a heavy crash. You can make it straight again several times. With an earlier gearbox, the propeller was detachinging at every crash, and that was unaceptable. Now the props holds too firmly and the rivet absorb the effort. If we put a stronger shaft, maybe the gearbox will break. This is one of the problems that have delayed the commercialization of the miniCeline.
If the milar of the wing or tail is torn, use cellotape as explained before.
If a plastic part breaks, CA may fix it, but put a drop of CA in a plastic spoon, and move a droplet of glue at a time toward the part to be glued, using e.g. a needle or a chopstick. Pay attention where you put your fingers. CA will hold your skin 10 times better than the part you fix!.
Send us a picture of the broken part before trying to fix it yourself. We will do our best to help you, and we are concerned to improve any possible weakpoints that did not show up on our prototypes.
If the plane is badly damaged, we can provide replacement motors, wings, tails, landing gears. Such damages have never occurred after the many crashes with unexperienced users of the 6 protos and first customers. The only danger is persons and animals.