9. Protection and reliable connections to the ArdunioProMini board

The vibrations of the AR Drone and the landing shocks mean an important stress on the Ardunio board and its connections. The Ardunio board is thin and fragile; the RC receiver is not build for extreme shocks, too.

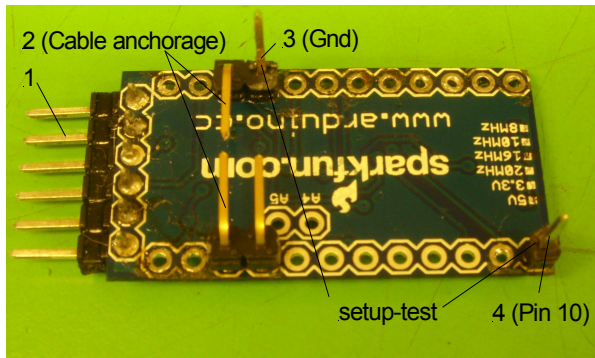Thus, it makes sense to take reasonable precautions.

Fig 10. Headers soldered to the board
1: 6x90 male header (programmer)
2: 2x2x90 male header (anchorage)
3: Gnd pin bent up (for Setup-test)
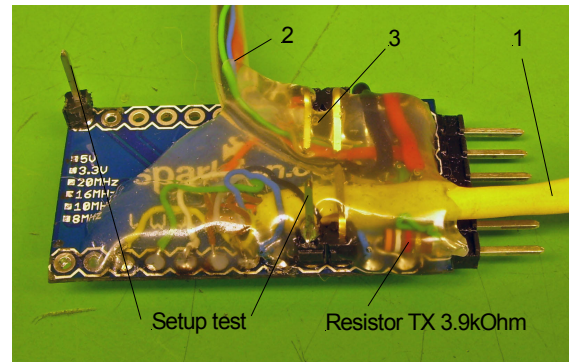4: 1x1 straight header for pin 10

Fig. 11. Ardunio board with cables
All cables soldered according to fig. 5
1: Cable to RC; 2: Cable to drone;
3: Hot glue protection (0.5 grams)
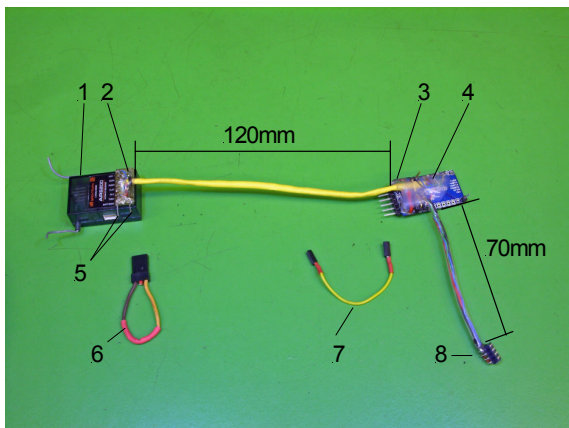Note resistor from TX to RX drone!

Fig. 12. Miru Mod ready for installation
1: Receiver AR6200
2: Connector for receiver
3: Resistor 3.9 kOhm at TX
4: ArdunioProMini 328 5V with hot glue
5: Binding contacts
6: Binding plug
7: Setup test cable
8: Drone connector
The drone cable should be < 100 mm,
the receiver cable < 250 mm

10. First test of the Miru mod on drone

Please make the following test before the final installation on the drone.
I had the bad luck to observe that Pitch and Roll was not working!

The reason for the malfunction was not the cables, but the old software FreeFlight 1.5.1 with the firmware 1.3.3!

IMPORTANT:
Make sure your drone is NOT 'paired' with your iPhone. Go to the FreeFlight settings and switch off 'pairing'. You also might have to press the 'Unpair' button on the drone to make that choice stick.
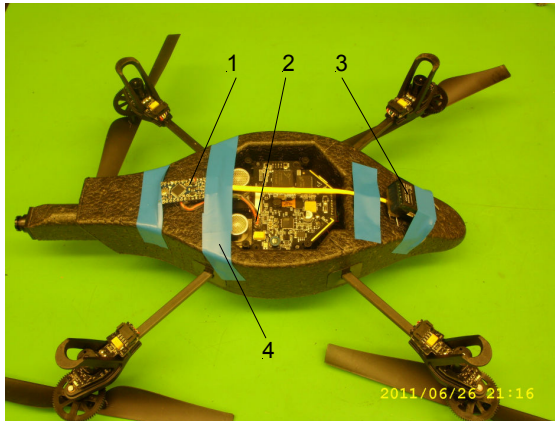

Fig. 13. First test Miru Mod on Drone
1: Ardunio Board, green LED visible
2: Drone connector; 3: RC Receiver
4: Miru components fixed with tape for ground test only (not suited for flying!)
Programming procedure:
- Switch on your Spektrum transmitter, make sure that you have "Gear Down"
- Connect the battery to your drone
- It takes about 40 seconds for the drone to boot and the Arduino program to upload/start the companion program.
- Finally the Ardunio LED will blink at 12.5Hz and the drone is ready to start.

Miru gave me an instructive start-up video and allowed me to show it to you:
http://ufo-doctor.ch/descriptions/Parrot%20Infos/Videomirumod006start.mpg
Depending on your PC/internet situation it could be that the link to the 9.6MB mpg video does not work properly or the video appears hidden behind this document. The safe way is to call www.ufo-doctor.ch, go to "descriptions", then to "parrot info". Right click "VideoMiruMod…", and choose "save target as" on your desktop.

Fig. 14. First functional test

WARNINGS:

Follow the instruction below!

The start of the drone is a dramatic event!

- Grip your drone firmly in your hand (I say it again: firmly!)
- Make sure that the ultrasonic sensors are free
- Keep the drone at about 1 m distance from ground
- Push the throttle in the center position
- Set "Gear-up", the motors will start (if not: manipulate throttle stick up and down)

- The drone starts with a lot of power; this cannot be controlled by the throttle stick within the next seconds!
- Check all functions: throttle, rudder, pitch, roll, all ok?
- Gear down: Do the motors reduce speed?
- Simulate a soft landing by tapping the bottom of the drone: do the motors turn off?

Congratulations: The Miru Mod is working properly on your drone!

11. Installation of the Miru components on your drone

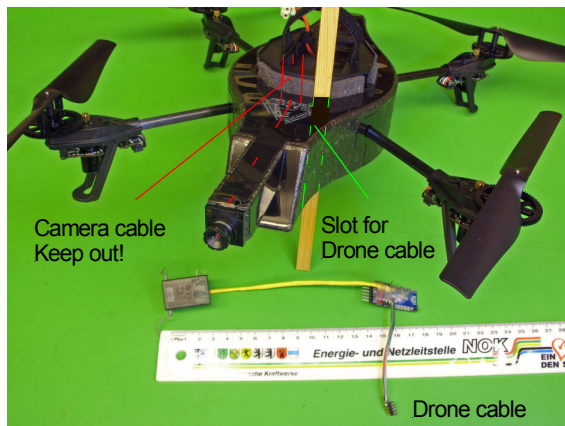Camera cable
Keep out!

Slot for
Drone cable

Drone cable

Fig. 15. Minimal surgery of your drone. It could be that the drone will show a failure after some flights without crash. There are many complaints in the forum!

So please do not transform your drone into a Swiss Cheese with visible holes! This allows you to ask for a replacement.

Please check first where the camera cable is situated, then cut a thin slot into the foam for the drone cable.

Please take into account, that the Miru components should withstand vibrations and hard landings. (I did not say that you are a poor pilot!).
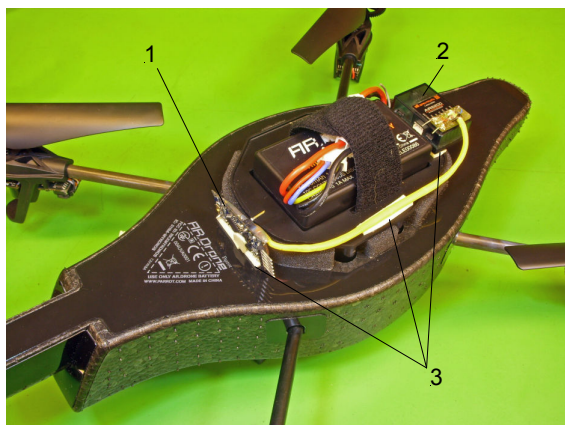Even a small piece of two-sided adhesive foam tape is a valuable shock protection

Fig. 16. Final installation to the drone
1: Ardunio; 2: Receiver
3: Both-sided adhesive foam tape
This set-up fits under the outdoor hull, but for the indoor hull you may cut some foam away for the RC-receiver
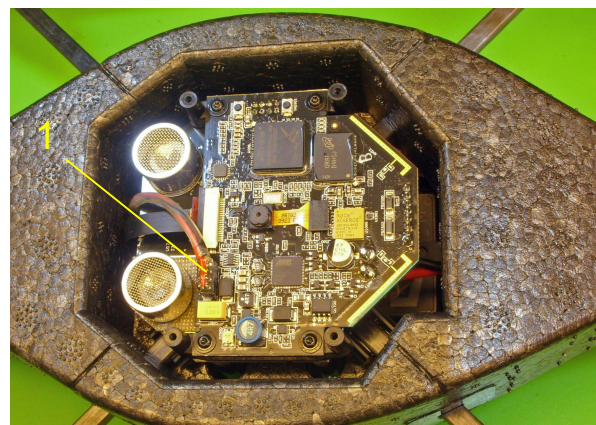
Fig. 17. Drone cable connected
1: Drone cable from Miru mod to drone
Note:
Make sure that the drone cable is flexible and not stretched, this is important for the survival of the drone electronics.

12. First test flight indoors

- Select FM1 "Flap 1" on your Spektrum Transmitter, select "Gear down"
- Start Spektrum transmitter,
- Connect the battery to your drone, check the 12.5 Hz flashing of the Ardunio board after about 40 seconds
- Install the indoor hull onto your drone for safety purpose
- Check video connection to your iPhone, record the video with app FlightRecord
- Start and try to keep the clearance to ground at 1 meter (3 feet)

Ok? Congratulations, you must now be very happy. Have some nice flights!