# IGC secure flight data trackers.

Projected financial and management plan

## Preamble.

During recent FAI/IGC contests the glider proximity/collision avoidance warning system has been used by organizers to provide public displayed live race coverage. This has resulted in a number of undesirable sporting issues which have changed the nature of our contests. It is desired that the proximity warning devices be used solely for their intended purpose, “proximity warning”. It is proposed that IGC provide a secure recording and transmitting telemetry device that provides secure data to the organizer for time delayed public transmission.

**This proposal outlines the cost and usage of the IGC tracker system until 2024**.

**The IGC secure telemetry and tracker unit.**

The unit is based on the Flarm concept of recognition and communication between gliders. It is small enough to be mounted conveniently in the cockpit. It uses an internal GPS ceramic antenna. It works with an internal battery or an external power source. See phots at the end of this document. The unit has been designed by a cooperation project between OGN and IGC an specially designed for gliding competitions.

## Data transfer

The data will be gathered via the OGN network and transferred to the FAI server. The data will be decrypted and rebroadcast with a defined delay.
Access to the real time data will be restricted to an approved person within the organization
The organizers can follow the race in real time on a secure platform provided by the FAI, public re-broadcasting will be with an appropriate time DELAY.

## What is the organizers responsibility?

- The organizers will provide a dedicated person to control the distribution, collection and charging of the units.
- The charging is thru a 10 port USB charger which will be provided complete with USB type A to USB micro type cables, in order to recharge the units.
- A web based display of the races with a person to manage this and a social media channel to update followers with news etc.
- For 2D broadcasting of the race, the standard application like: live.glidernet.org or glidertracker.org can be used.
- Broadcasting the race in 3D format, requires an Intel based PC with Windows 10, with a good graphics card (NVIDIA type) in order to collect the data from internet, do the rendering of the images and pass that information to a YouTube channel.

*If the organizer decides to broadcast the races in 3D using Silent Wings Studio (SWS), they need to acquire the SWS license (€300-€500)*

**Management of the units**

Maintenance in year one is covered by their guarantee
A further 3 year guarantee can be purchased to cover the four year period (€10 per tracker per year).
The units will be held by a project partner who will dispatch and receive the units between each event.

**Financial alternative**s: (Capital expenses €35000 investment)

- A.- Rent the trackers to the organizers for €30 each per unit per competition, the IGC recovers the capital expenses in 4 years.
- B.- Rent the trackers to the organizers after year 2021, as this year 2020 we will testing the units and fixing the possible design flaws, for €30 per device per competition, the IGC recovers the capital expenses in 5 years.
- C.- The IGC charge nothing to the organizers and get some residual value after 4 years.

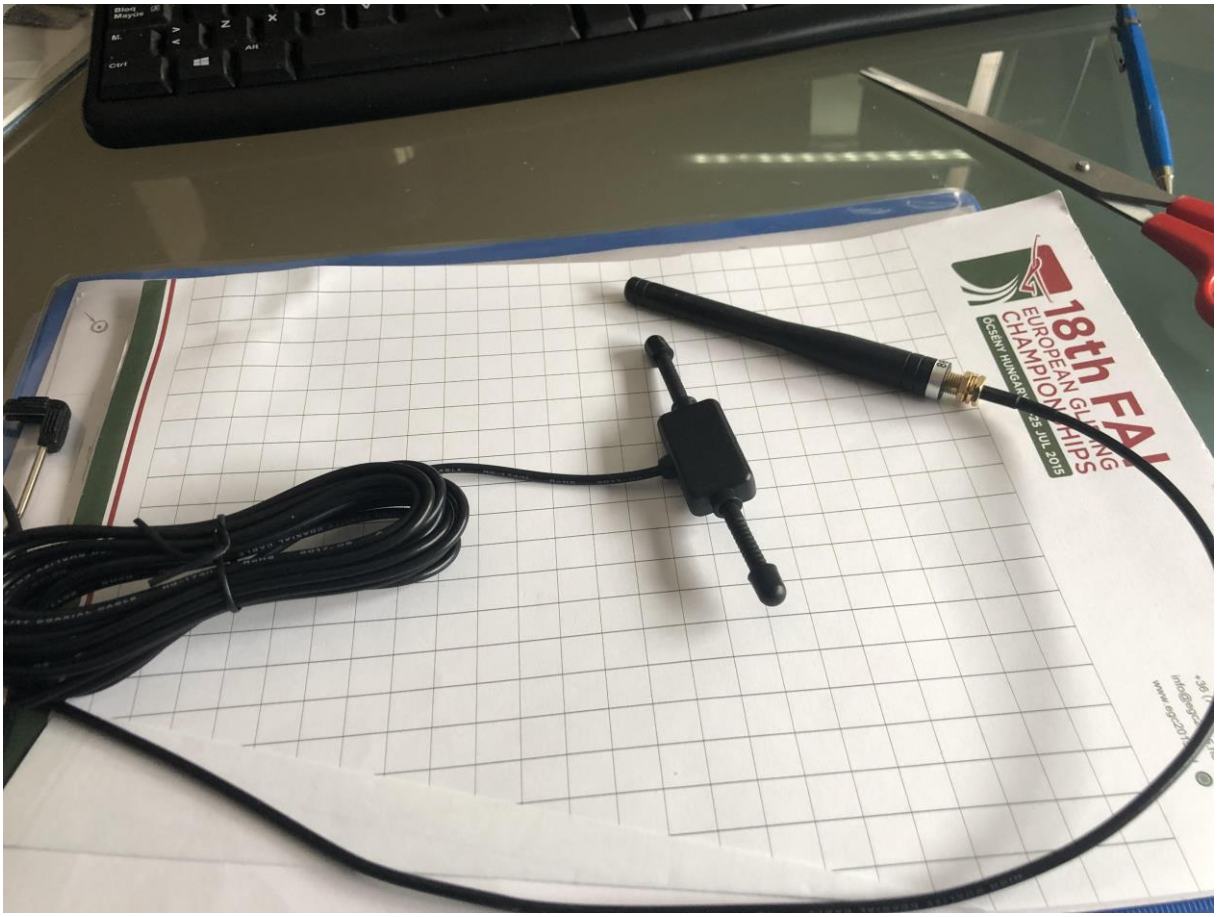
# Organizer involvement:

**Before the competition.** The organizers will request to the IGC the encryption keys to be used during the contest. Those keys needs to be loaded into the trackers with a special program provided by the IGC.
The organizers will receive all the trackers from the IGC logistic partner on a special designed box.
The organizers will arrange with Silent Wings for the license and install the program on their PC.

**Initial routine.** During the official training days and especially during the scrutiny process, the organizers will find the best position to install the tracker and the antenna. In most of the cases is behind the pilots, but in some other cases inside the instrument box, etc.
The organizers will identify the trackers assigned to the glider and it will input that on the registration database provided by the IGC

**Daily routine.** At the beginning of each day, the competitors will go to the collect their assigned tracker, which has been charged overnight and connect it to their glider. Before flight check that the tracker is on and working properly (just look to the little OLED screen and check that is receiving the GPS signals). There is also a possibility that the tracker is powered by the glider battery, in which case the tracker can be left installed for the whole competition.
At the end of the flight the competitors will bring the tracker to the competition office, so the tracker will be placed on charge thru the USB chargers (picture attached). In case of a problem with the primary flight recorder (FR), the tracker SD card can be used as a secondary (backup) record of the flight, if the tracker gets approved by the GFAC under the current rules.

**Final routine.** The organizers will collect all the trackers, all the cables and antennas, check they are OK and place them on the special designed box, with a record of any problem units. These are then sent to the logistic partner to be used on the next event. The Logistic partner will acknowledge the receipt of the trackers.
The shipping costs will be covered by the organizers.




Two kind of antennas rubber and dipole. It has to be optimized for the frequency used, 868 MHz in the EU and Africa and 915 MHz for the Americas and ANZ.
If the glider has a spare external antenna, that is the first choice, if not they can use one of those antennas.
In most of the cases we will use the dipole antenna, otherwise the rubber antenna (3dBi) can be used



The unit boxes

Picture of tracker showing the external power plug 5-13V 5mm, the connector to the external antenna and the USB micro connector (used to charge the unit as well)

Picture of the unit showing the little OLED screen used to check the well-functioning of the unit and the unit setup.