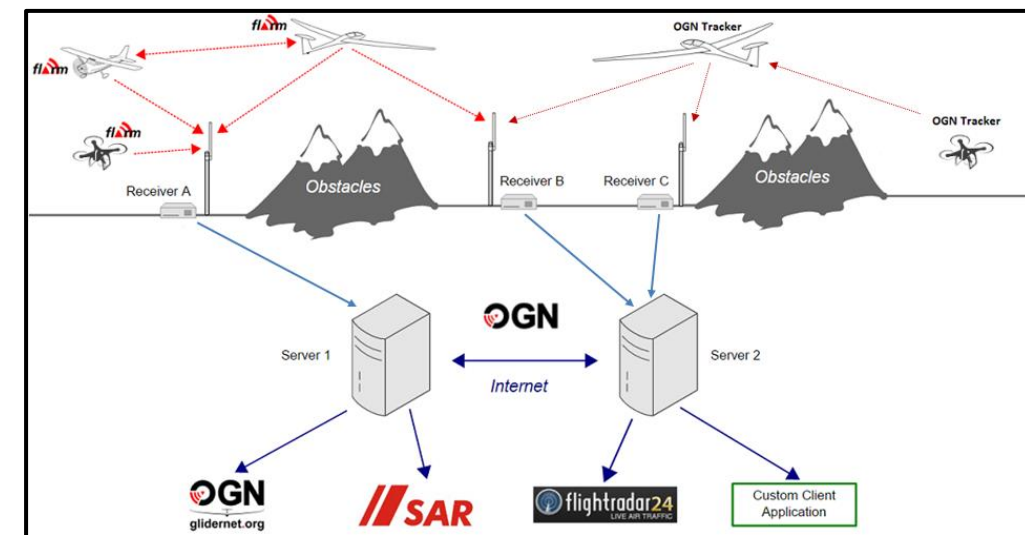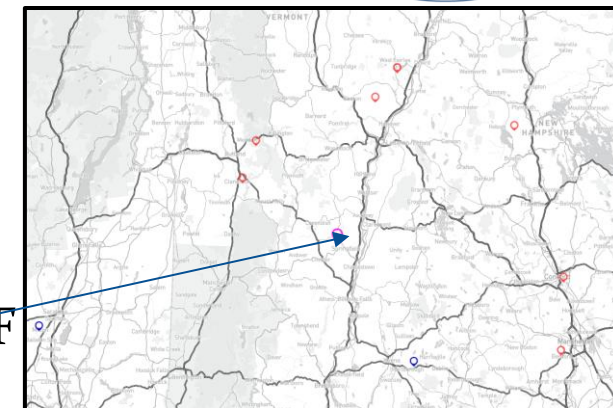# Glider Tracking & Collision Avoidance

New England Soaring Association
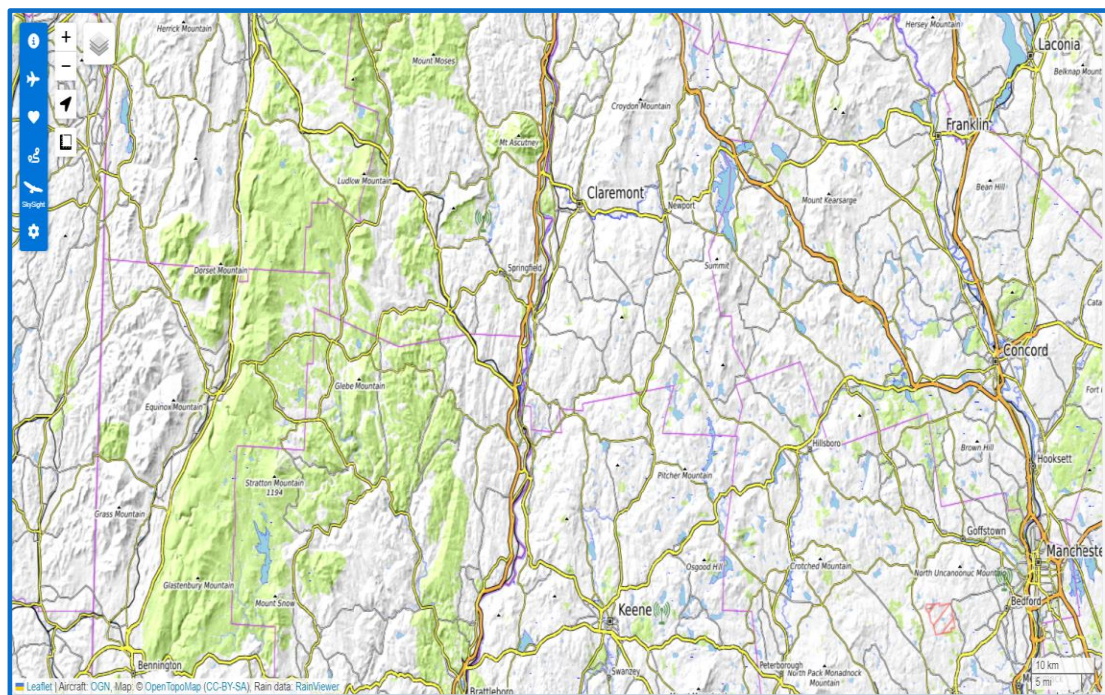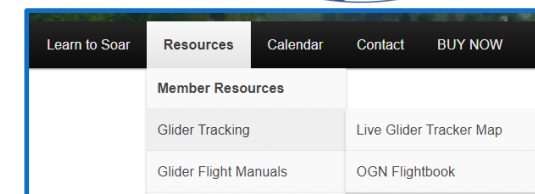
Glider Tracking

- **Open Glider Network (OGN) Glider tracking**
  - SSA ran a project over last couple of years to put in place a network of OGN Ground tracking receivers.
  - **Several installed in the northeast including one here in the KVSF terminal**.
- OGN can track gliders equipped with
  - FLARM
    - Uses proprietary transmission protocols
  - OGN Trackers
    - Uses open transmission protocols
  - ADSB Out
  - Other Devices registered though Glidertracker.org
    - Spot, Garmin InReach
    - Cell phone based

OGN Tracking: Viewing & Usage

- From NESA Website *"Resources"*

Learn to Soar	Resources	Calendar	Contact	BUY NOW

Member Resources

Glider Tracking	Live Glider Tracker Map
Glider Flight Manuals	OGN Flightbook

Home | About

Hartness State Airport (KVSF) 🇺🇸

Alt: 597 ft | 🌐 19:35

‹ Sun 2023-05-28 ›

☑ Imperial Units

Tow Detect ⬤ — Glider Only ◯ — CN ⬤ — Device ID ◯ — QFU ◯ — QFE ⬤

Flight							Associated Tow					
Registration	CN	Aircraft	Start ▽	Stop ▽	Dur △	SAR	Registration	CN	Aircraft	Stop	Height(QFE)	Duration
N55DQ	5E	Ventus 3T	12h34	13h28	00:54	✚						
ZS-GVT	2R	ASW-27	12h45			✚						

- Good for following glider flights live
- **Helpful to get last known location for overdue gliders at end of day**
- Note: Tracks are only stored/available for 2 days post-flight. Intended as a tracking system not a logging or flight analysis system.

https://flightbook.glidernet.org/logbook/KVSF/2023-05-28

OGN Tracking: Glider and Tows!

Hartness State Airport (KVSF) 🇺🇸

Alt: 597 ft | 🌐 19:33

‹ Sun 2023-05-21 ›

☑ Imperial Units

⬤ Tow Detect ○ Glider Only ⬤ CN ○ Device ID ○ QFU ⬤ QFE

Flight							Associated Tow					
Registration	CN	Aircraft	Start ▼	Stop ▼	Dur ▲	SAR	Registration	CN	Aircraft	Stop	Height(QFE)	Duration
N7729V	29V	CallAir A-9	11h11	11h18	00:07	✛					1991 ft	00:07:02 (12 cent)
N8829A	B9	ASG-29	11h27	12h18	00:51	✛	N7729V	29V	CallAir A-9	11h34	1644 ft	00:06:49 (11 cent)
ZS-GVT	2R	ASW-27	11h40	12h42	01:02	✛	N7729V	29V	CallAir A-9	11h47	1834 ft	00:06:25 (11 cent)
N7729V	29V	CallAir A-9	11h58	12h05	00:07	✛					1762 ft	00:06:35 (11 cent)
N7729V	29V	CallAir A-9	13h31	13h39	00:08	✛					2451 ft	00:07:50 (13 cent)
N7729V	29V	CallAir A-9	14h27	14h34	00:07	✛					2051 ft	00:06:50 (11 cent)
N7729V	29V	CallAir A-9	15h38	15h45	00:08	✛					2543 ft	00:07:32 (13 cent)
N7729V	29V	CallAir A-9	16h06	16h15	00:10	✛					3163 ft	00:09:44 (16 cent)

Device(s) and Tracking

- Different Devices have different Pro's and Con's

Type	Data Interval	Reception range	Range	Disadvantage
OGN	1s	Good > 1000m GND Very weak below	The higher the better	Bad near ground
ADS-B	5s	Good > 500m GND weak below	The higher the better	Bad near ground
Mobile Phone	1 .. 60s	Good < 500m GND weak above	The lower the better	Need cell phone network
SPOT	5 .. 15 min	Perfect	infinite	Very Slow additional cost

'F' means Flarm ID
'I' means ICAO Address
'O' means OGN ID

You can register multiple devices for OGN Tracking:

- Flarm ,OGN Trackers orADSB Out - OGN Devices Database (glidernet.org) - https://ddb.glidernet.org/

- Others Spot / InReach, Cell phone App (LK8OOO) etc – via Glidertracker.org - Tracking HUB (glidertracker.org)
  - Registering multiple devices via Glidertracker.org can combine your different sources into one OGN tracking feed for maximum coverage.

Registering Devices with OGN

Flarm and/or OGN for Collision Avoidance?

- FLARM
  - Very well established within glider community, but *expensive;*
  - *Proprietary commercial protocols**
  - *Some newer (Powerflarm) units have integrated ADSB-IN receivers*
- OGN Trackers
  - Less well established but very <u>inexpensive;</u>
  - *Open Protocols*
  - Can emulate rudimentary FLARM protocol to be seen by/see FLARM devices*
  - None have integrated ADSB-IN
- <mark>Either helps: GLIDER to GLIDER visibility</mark> /collision warnings
  - So, if you can't afford a Flarm get an OGN Tracker
- <mark>Neither helps: GLIDER to anything else visibility</mark> / collision warnings
  - Flarm & OGN Trackers are both Peer-to-Peer devices for visibility/warning between gliders
  - Some Poweflarms have ADSB in but beware limintations if you do not have ADSB-Out

* FLARM periodically updates their protocol which sometimes then requires OGN to reverse engineers to try to keep all visible to each other.

Can connect devices to WeGlide also

Flarm & OGN Options

Flarm	Portable Fusion LX Powerflarm Eagle II LX Powerflarm Eagle Mobile	$2,290 $1,990 + Display (min $150) $919 + Display (min $150) $1,620	
OGN/ SoftRF	Lilyo T-Echo Lilygo T-Beam (Self Build)	**<$100**	 Home · lyusupov/SoftRF Wiki · GitHub

Flarm & OGN Displays

Device	Stand Alone Displays	Feed to PDA/Flight computer
FLARM		Both are seen by software In the same manner Both work with XC Soar, LK8000, SeeYou Mobile
OGN/SoftRF		

Collision Avoidance

- Glider to Glider: Flarm &/or OGN Trackers 'help'
- Glider / Other traffic
  - **ATC**
    - **Separation services focused on (i) Airliners and (ii) <mark>IFR aircraft</mark>, i.e. not VFR to VFR**
    - **Tools : Airspace types / Transponder & <u>ADSB-Out</u> requirements / Cloud clearance requirements.**
      - **But.. Gliders (no electrical system) are exempt from Transponder & ADSB though some installed voluntarily.**
  - **VFR to VFR**
    - **Big Sky Theory – Is "see and avoid" adequate?**
    - **Gliders: often large number in same area (gaggles), thermaling (blind spots), too close proximity to clouds (don't cut your see & avoid margin) etc.**

ADSB

- ADSB: OUT
  - EU vs. USA
    - EU: Allows for 'electronic conspicuancy' devices for gliders etc.
      - ADSB Out without requiring a matched transponder
      - GPS position source that is not necessarily IFR certified
    - USA
      - Need either (i) UAT w/matched Mode C Transponder or (ii) Mode S (ES) tranponder
      - Both need a certified GPS position source
- ADSB: IN
  - TIS-B: Traffic Information service
    - Client based service that provides ADSB-**In/Out** equipped aircraft with info about known traffic.
    - **Note well**: If you only have ADSB-IN you may not be seeing a full traffic picture – some info is only broadcast when an ADSB tower is pinged by an ADSB out equipped aircraft (client), i.e. don't assume because you have an ADSB-In receiver that you are seeing the full picture.

SAR

- **OGN/Flarm Trackers**
  - Tracking site can give last know (detected) location for overdue
- **ELT's**
  - 406 ELT's can transmit location if you interface to GPS NMEA data. If you still have only a 121.5 ELT consider upgrading
- **OTHER DEVICES**
  - Spot Trackers, Garmin inReach
- **AirFlare** (on your phone)
  - Location sharing

Summary

- Tracking:
  - Multiple options – add what you can.
- Collision Avoidance
  - VFR: Primary collision avoidance = "See and Avoid"
    - Whatever devices you have – keep your eyes outside!
    - Don't get too close to the cloud base: respect the regs;
- Glider to Glider:
  - Add whatever Peer-to-Peer system you can justify/afford (Flarm/OGN Tracker)
- ADSB-IN:
  - Good to have – but remember the limitations if you don't have ADSB-Out
- Transponders & ADSB-OUT:
  - Not cheap but the way to help make you visible to ATC and therefore to IFR aircraft.

Learn More

SSA Webinar

April 19, 2024, 7:00 PM Mountain Time

Flight Tracking

Presenter: Dave Rolley

Description: Satellite based (SPOT, InReach), Smart Phone based, FLARM based, Transponder based (ADSB-Out)

For FAA Wings Credit, register with the e-mail you use with the FAA Wings program. After registering, you will receive a confirmation email containing information about joining the webinar.

Registration Link:

https://us06web.zoom.us/webinar/register/WN_32HAtwMiTzOXX8zawrCP9A

Space is limited, so register today!