



Useful Recovery Equipment for Stratospheric Ballooning Teams

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TRACKING

A StratoTrack APRS transmitter provides altitude and position updates in one-minute intervals. Requiring only a AA battery, each transmitter is extremely lightweight and energy efficient. Data packets are received by HAM radio i-gates and uploaded to the internet.

Our team compares the data received with flight predictions made before the launch and adjusts the anticipated landing zone as necessary. In addition, our team uses handheld HAM radios where internet connectivity is unreliable to continually track the balloon's progress.

Once the balloon has landed, our team uses a satellite tracking device called a SPOT Trace to receive a precise GPS update from the payload every five minutes. The data packets sent by the device are accessible via the internet.

Our team prefers the SPOT Trace to other satellite trackers due to lower cost and lower mass. The SPOT Trace is used for asset tracking so it does not include features such as an SOS button like a SPOT Gen3. Such "extras" would not be of use on a balloon flight anyway.



RECOVERY

Often, the most difficult phase of a payload "chase" is the final recovery; that is, retrieving the payload stack after it has landed. Even with accurate tracking, this can be quite challenging. In Minnesota, a state boasting few topographical features and natural obstacles, payloads land in tall trees and dense crops, requiring the use of extendable poles and audio sirens once recovery teams arrive at the landing site. It is even possible that payloads land in open water. In other states, balloonists must be prepared to navigate mountains or even retrieve a payload at sea.

On any recovery, no matter how routine, we carry specialized equipment suited to overcome various seasonal and geographical challenges that may impede a retrieval effort. In the winter, for example, rural roads can be inaccessible due to the buildup of slush and ice. The payloads themselves may be buried in snow, or hard to reach due to deep snow. Springtime presents perhaps the best recovery conditions, due to the lack of snow and yet-to-mature crops. Even so, our team must regularly cross muddy fields and wetlands, requiring boots and waders. In the summer, Minnesota's farmland becomes home to thick growths of soybeans, corn, and other crops. Even with reliable GPS tracking and audio sirens, a payload stack can be hard to find in dense crops like tall corn due to severely-limited visibility. With autumn comes hunting season, causing a potentially dangerous recovery if proper precautions are not taken.

Independent of Minnesota's seasonal challenges are various geographical obstacles. Our state is famously known as the "land of 10,000 lakes," though the actual figure is upwards of 14,000. Because of this, our team is prepared for water recovery if necessary. We carry an inflatable boat and set of oars in case a splashed-down payload does not float back to shore. Luckily, our ballooning team has not yet resorted to such measures, but all of the equipment is taken on every flight in preparation for virtually any recovery scenario.

EQUIPMENT



- APRS TRACKER
- HANDHELD GARMIN GPS
- SPOT TRACE
- AUDIO SIREN



- HANDSAW
- TREE PRUNER
- ARBORIST SLINGSHOT



- FIBERGLASS POLE
- FIBERGLASS POLE WITH HOOK



- PVC BOAT
- OARS
- LIFE JACKETS
- WADERS
- AIR PUMP

VENDOR LINKS

STRATOTRACK APRS TRACKING HAM RADIO
<http://www.stratogear.com/strato-track>

SPOT TRACE
www.findmespot.com/en-us/products-services/spot-trace

GARMIN HANDHELD GPS
<https://www.garmin.com/en-US/p/156873>

18 METER TELESCOPING FIBERGLASS POLE
<https://vibroplex.com/contents/en-us/p3534.html>

ARBORIST SLINGSHOT
http://www.amazon.com/gp/product/B075VYX31B/ref=ox_sc_act_title_s2smi_d=ATVPDKIKX0DER&psc=1

3-PERSON INFLATABLE BOAT
<https://www.amazon.com/Intex-Seahawk-3-Person-Inflatable-Aluminum>