Antenna Trackers – which type

ANTENNA TRACKERS AND THEIR PROS & CONS

VirtualPilot

AAT high level comparison

	Goggles / manually aimed	Non magnetic pan tracker / fixed servo	Magnetic pan tracker / continuous servo
Ease of set-up	Fastest	Typically 2 minutes to set up – connect battery, video cable and set direction	Typically 1 minute to set up – connect battery and video cable
Heatracker use	Not suitable	Suitable	Suitable
360 degree coverage	Have to keep re-aiming with narrow beam antenna	Small signal glitch at servo crossover point	No issues
Portability	Least equipment to carry	Requires carrying tripod / tracker	Requires carrying tripod / tracker
Accuracy	Requires continual effort to maintain aim. Uncomfortable for long flights.	Most accurate	Less accurate than non magnetic trackers due to magnetic variations. Consider implications if using ultra high gain narrow beam width antennas
Smoothness of pan operation	Depends upon the operator	Less smooth than continuous rotation servos used in magnetic pan	Typically the smoothest. Generally best for larger and heavy antenna

Continuous vs non continuous rotation trackers.

Fixed rotation trackers can generate a small glitch in the video signal when the AAT passes its end point however in real operation it is far less impacting than imagined. It is similar to a typical analog glitch for less than a second. Glitch can be non-existent at close range and when used with a diversity rx.

Fixed rotation trackers are however typically more accurate in pan positioning than magnetic compass-based trackers driving 360 continuous rotation servos.

AAT tracking methods comparison

Most UAV using antenna trackers are used with a FC that has RTH capabilities so the failure of the tracker is not usually a concern for the loss of signal and aircraft, however impact in video quality from reliability and loss of flight time is one of the most frustrating elements.

The following table highlights some of the considerations and pro's / cons for the various methods most commonly used within trackers in use with iNav/Ardupilot/Betaflight etc firmware. It is not a fully exhaustive list.

Special note: Consideration in the use of WiFi / Bluetooth for driving an AAT.
If you are in the proximity of either 2.4G video or 2.4G RC transmitters, these have a detrimental impact causing the wifi connections to become very unreliable and can drop completely. Proximity to other high-powered devices such as 900Mhz / UHF RC tx can cause a similar effect. A working setup that works fine for a solo flier may be unusable when flying with others.

	Sentinel AAT	Video / Audio telemetry	WiFi / Bluetooth via tx telemetry	Modem link	RSSI based
2.4G interference	No issue	No issue	Consider carefully for anyone using 2.4G video or flying with others using video or RC TX on 2.4	No issue	Can be an issue at range due to other RF sources.
Performance at distance	Typically works up to point of non-flyable video	Typically works up to point of non-flyable video	Typically works up to loss of telemetry.	Depends upon quality of data link	Performance at low signal quality is unreliable.
Refresh rate	Up to 30 hz	1-5hz	1-2hz	1-2hz	Continuous signal monitoring
UAV / AAT Complexity	Firmware update only for supported systems	Requires specific OSD / module in each UAV	Typically requires Bluetooth / wifi adapter converter	Requires additional hardware modem in each UAV	Simple, no UAV hardware or firmware required
RC TX support	Supports all	Supports all	Not all RC TX supported. May require HW mod	Supports all	Supports all