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How Flightradar24 Tracks Flights in Real Time

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Why Real-Time Flight Maps Matter

Flight-tracking maps turn a busy airport day into something readable: a dot, a route line, and a timestamp that refreshes again and again. For travelers and aviation fans, those updates answer basic questions like whether a plane has taken off, climbed, or started its descent.

Behind the scenes, “real time” is really a stream of short radio messages, timestamps, and quality checks, stitched into a single track. Knowing the basics helps explain why some flights look smooth while others briefly disappear or jump.

From Transponder Ping to Map Dot

Most modern tracking starts with an aircraft broadcasting small bursts of data, which are received, timestamped, and forwarded to aggregation servers. Real-time dashboards exist in many domains, for example, a [live sports odds current matches](#) page is another example of information that refreshes as events develop. For flight tracking, the goal is turning many short updates into one clear story.

Flightradar24 then combines position reports with schedules and status data so the map can label a dot with a flight number and destination. It also filters out corrupted messages so a single bad update does not redraw the path wildly.

ADS-B: The Primary Broadcast Behind Most Live Tracking

Automatic Dependent Surveillance–Broadcast (ADS-B) is the simplest case: the aircraft reports its own GPS-based position and other details, and a receiver decodes it. Flightradar24 relies on a large network of ground receivers, plus satellite ADS-B in some regions, to collect these messages at scale.

What ADS-B Sends

An ADS-B “Out” message can include an aircraft’s identification, position, altitude, and velocity, broadcast automatically without a radar interrogation. When reception is strong, frequent updates can make the track appear almost continuous.

Why Coverage Depends on Line of Sight

ADS-B is received on specific frequencies, such as 1090 MHz for many aircraft, and the signal travels mostly line of sight. Terrain, buildings, and the curvature of the Earth can block reception at low altitude, while higher flights can be received much farther away.

That is why a flight may be visible over one region and then fade when it descends behind obstacles or leaves receiver coverage. Coverage can also change quickly when new receivers come online near busy airports.

MLAT and Radar Data: Filling the Gaps

Not every aircraft broadcasts full ADS-B position, and reception is not perfect everywhere. To extend coverage, Flightradar24 can calculate positions using multilateration (MLAT), which compares the time a transponder signal reaches several receivers.

- MLAT: Estimates position from timing differences when multiple receivers hear the same Mode S signal.
- Radar Feeds: Adds coverage in certain regions, including parts of North America and Australia.
- Satellite ADS-B: Improves tracking over oceans and remote areas beyond ground receivers.
- Schedule Data: Helps match a track to the correct flight number and route.

These methods are useful, but they can behave differently than pure ADS-B. MLAT tracks may update less often and can “snap” as the calculation improves with better receiver geometry.

Why Updates Lag or Look Wrong

“Live” does not always mean instant: each message must be received, sent over the internet, processed, and displayed in an app or browser. Congestion, long distances to a receiver, or switching between data sources can add a noticeable delay.

Quality checks can also create gaps that look like a plane vanished, when the system is really discarding low-confidence points. In other cases the path looks smoother than real life because the display interpolates between points to avoid a jagged route line.

When a track suddenly jumps, it often means the best available source changed—such as moving from MLAT back to ADS-B, or from one receiver cluster to another. Checking the last update time and the altitude trend usually shows whether the flight is truly moving fast or the data is catching up.

What To Remember When Reading Any Live Flight Map

Flightradar24’s “real-time” view is a blend of radio reception, math, and data matching, not a single magic feed. When the aircraft is broadcasting ADS-B clearly and receivers have a clean line of sight, the track can be very close to real time.

When coverage is thin, alternatives like MLAT, radar feeds, or satellite data can keep a flight visible, but with different refresh patterns and occasional quirks. A practical habit is to check the update timestamp and treat the map as an informative display rather than an air traffic control tool.

Photo: DC Studio via Freepik.

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