

Using ADS-B data in accident investigations

Ian Petchenik | Director of Communications
Flightradar24 AB

What is ADS-B?

AUTOMATIC

Data sent without pilot input or action.

DEPENDENT

GNSS signal required for position updates.

SURVEILLANCE

Used by ANSPs and others to know the position of the aircraft.

BROADCAST

Signal constantly sent "in the blind".

What is Flightradar24?



- Global flight tracking
- 55,000 terrestrial receivers
- 200,000+ flights per day

How does Flightradar24 collect data?

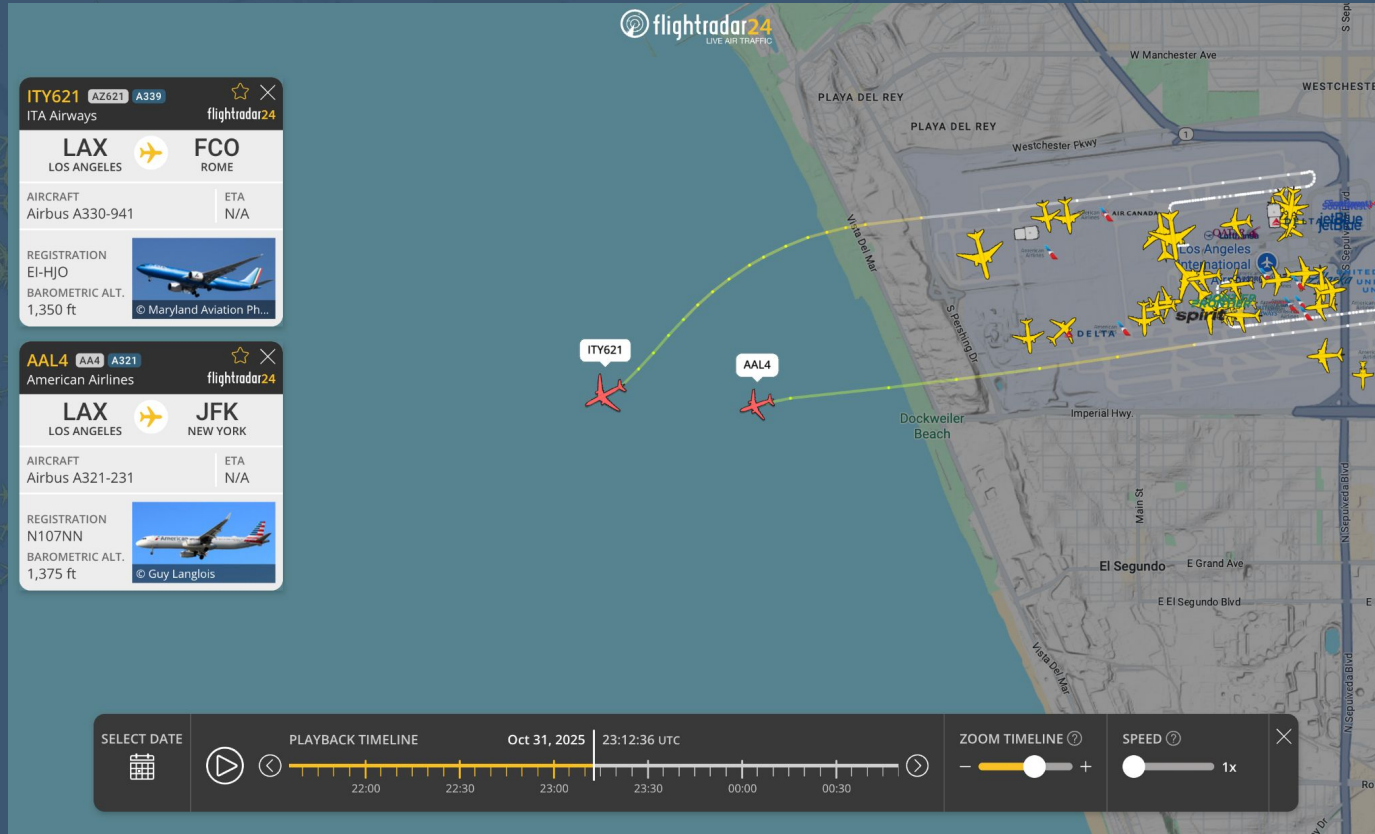


- Flightradar24's own receivers
- Home-built receivers
- Satellite-based sources
- External sources

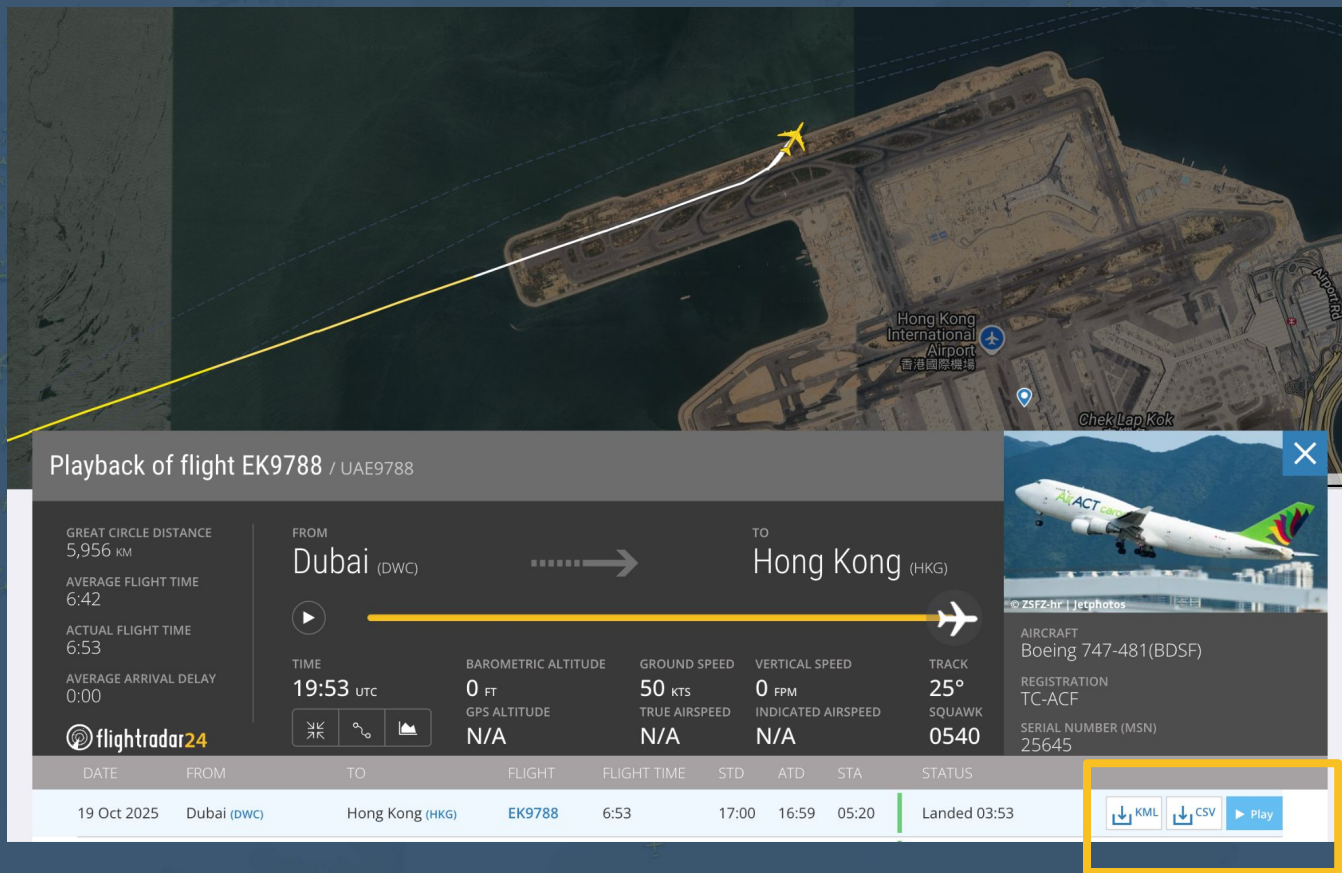
Playback—enhanced situational awareness



Playback—enhanced situational awareness



Self-service data



Standard CSV – full flights at a glance

A	B	C	D	E	F	G
Timestamp	UTC	Callsign	Position	Altitude	Speed	Direction
1760878523	2025-10-19T12:55:23Z	UAE9788	24.886311,55.167934	0	19	120
1760878532	2025-10-19T12:55:32Z	UAE9788	24.885767,55.168896	0	19	120
1760878615	2025-10-19T12:56:55Z	UAE9788	24.882008,55.175705	0	0	120
1760878631	2025-10-19T12:57:11Z	UAE9788	24.88155,55.176609	0	0	112
1760878806	2025-10-19T13:00:06Z	UAE9788	24.896805,55.16098	375	158	302
1760878813	2025-10-19T13:00:13Z	UAE9788	24.899551,55.1563	600	157	302
1760878822	2025-10-19T13:00:22Z	UAE9788	24.90312,55.15007	850	157	301
1760878830	2025-10-19T13:00:30Z	UAE9788	24.906332,55.144318	1125	158	301
1760878838	2025-10-19T13:00:38Z	UAE9788	24.909531,55.138653	1400	158	301
1760878846	2025-10-19T13:00:46Z	UAE9788	24.912756,55.132919	1650	162	301
1760878853	2025-10-19T13:00:53Z	UAE9788	24.91527,55.128513	1825	163	302
1760878861	2025-10-19T13:01:01Z	UAE9788	24.91864,55.122681	2125	163	302
1760878869	2025-10-19T13:01:09Z	UAE9788	24.921833,55.117062	2400	164	301
1760878878	2025-10-19T13:01:18Z	UAE9788	24.925415,55.110676	2650	167	301
1760878884	2025-10-19T13:01:24Z	UAE9788	24.927795,55.106403	2825	170	301

KML – useful for comparisons



Bulk historical data

Events

- List of historical flights meeting selected criteria

Positions

- Positions for all historical flights meeting selected criteria

Airline | Airport | Route | Aircraft type | Aircraft category |
Country | FIR | Other

Use case: information needed for pattern analysis

Granular data

- High-frequency data for one (1) particular flight
 - Raw ADS-D data collected by Flightradar24 receivers
 - Processed high-frequency, multi-source data
 - Flightradar24 ADS-B receivers
 - Software data sharers
 - MLAT
 - Selected other sources

Always available fields

- Timestamp
- ICAO 24-bit address
- Call sign
- Latitude/Longitude
- Altitude
- Squawk
- Track
- Vertical speed
- Air flag (ground/air)
- NIC
- Position source (ADS-B/MLAT/etc)

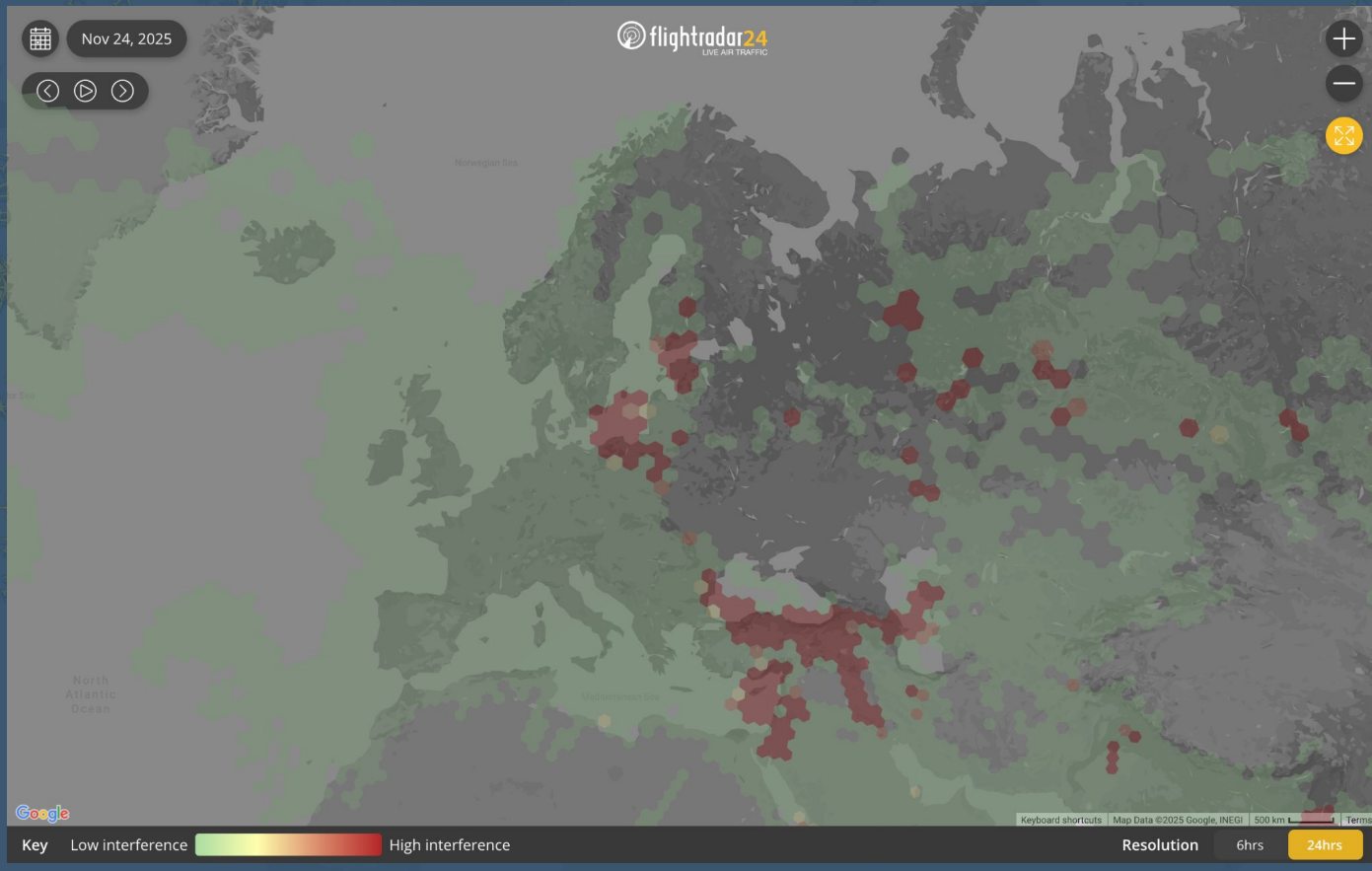
Dependent fields

- Emergency status
- MCP altitude
- FMS altitude
- GPS altitude
- TCAS status
- TAS/IAS/MACH
- Heading
- Roll
- AP heading / track
- OAT
- Wind
- QNH

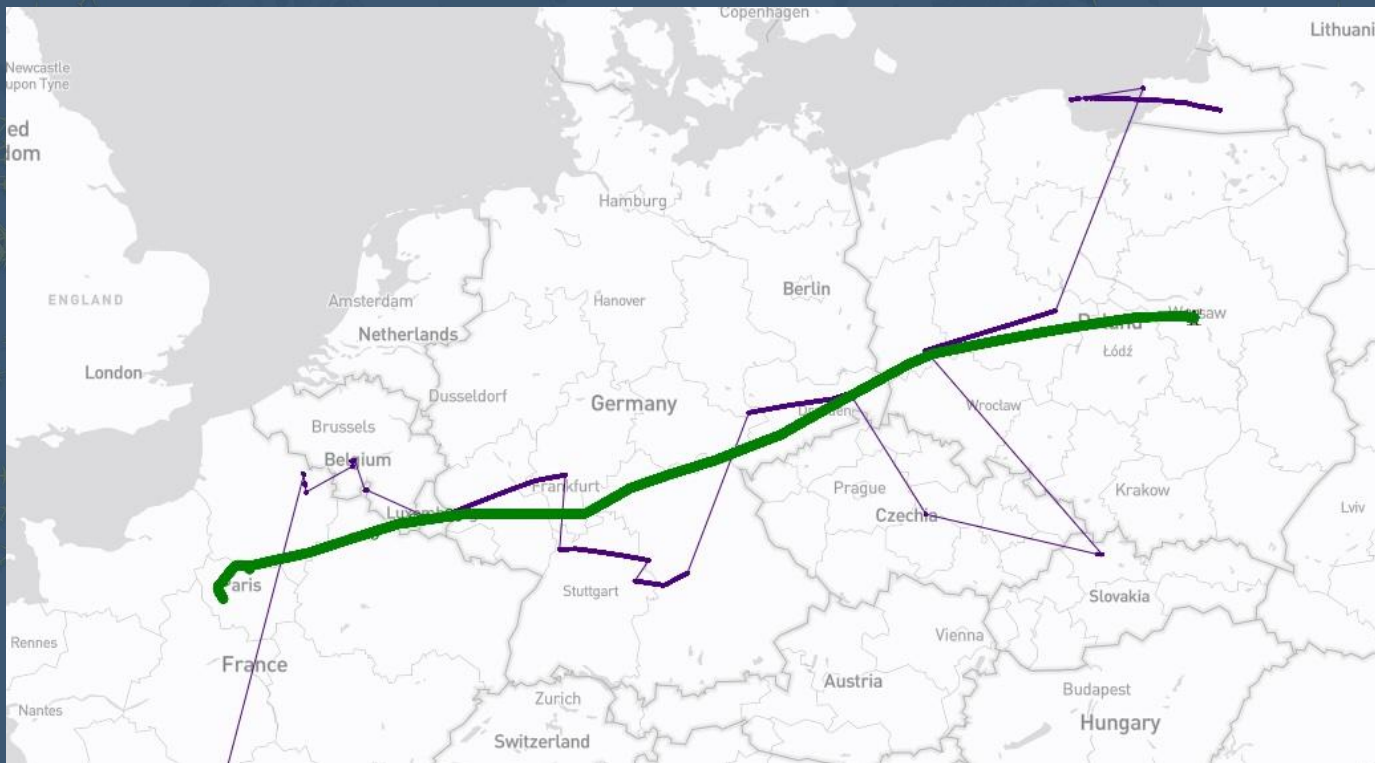
Working with granular data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	server_time	receiver	icao24	callsign	latitude	longitude	pos_flag	altitude	squawk	ground_speed	track	vertical_speed	air_flag	feed_id	radar_id	proto_flag	radar_type	origin	destination	icao_type	broadway	broadway_r
2826	1970-01-21 08:25:30	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.12448	-84.76045	P	35000	6172	547	32	A		49361	F-AER	0	OTHER					
2827	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.12576	-84.75952	P	35000	6172	546	32	0	A	19222	F-BDWY1	4	ADS-B				5	F-KCLW1;F-K
2828	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.12466	-84.76053	P	35000	6172	546	32	0	A	7742	T-MLAT1	4	MLAT				5	F-KCLW1;F-K
2829	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.12448	-84.76045	P	35000		546	32	0	A	57074	T-KAPF10	0	ADS-B					
2830	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.128	-84.75799	P	35000	6172	546	32	-128	A	19222	F-BDWY1	4	ADS-B				5	F-KMKY3;F-K
2831	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.12783	-84.75961	P	35000	6172	546	32	-128	A	7742	T-MLAT1	4	MLAT				5	F-KMKY3;F-K
2832	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.128	-84.75799	P	35025	6172	546	32	-128	A	45929	T-KFMY18	0	ADS-B					
2833	1970-01-21 08:25:30	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.128	-84.75799	P	35000	6172	546	32	-704	A	49361	F-AER	0	OTHER					
2834	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.12991	-84.75661	P	34975	6172	547	32	-1472	A	19222	F-BDWY1	4	ADS-B				4	F-KCLW1;F-K
2835	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.12856	-84.75774	P	34975	6172	547	32	-1472	A	7742	T-MLAT1	4	MLAT				4	F-KCLW1;F-K
2836	1970-01-21 08:25:30	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.13079	-84.75603	P	34925	6172	546	32	-704	A	49361	F-AER	0	OTHER					
2837	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.13263	-84.75475	P	34950	6172	546	32	-1792	A	19222	F-BDWY1	4	ADS-B				4	F-KMKY3;F-K
2838	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.13174	-84.75542	P	34950	6172	546	32	-1792	A	7742	T-MLAT1	4	MLAT				4	F-KMKY3;F-K
2839	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.13359	-84.75408	P	34950			32	0	A	13388	T-KCLW9	0	ADS-B					
2840	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.13466	-84.75334	P	34950	6172	547	32	-1152	A	19222	F-BDWY1	4	ADS-B				4	F-KCLW1;F-K
2841	1970-01-21 08:25:30	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.13466	-84.75334	P	34950	6172	547	32	-832	A	49361	F-AER	0	OTHER					
2842	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.13647	-84.75206	P	34925	6172	547	32	-704	A	19222	F-BDWY1	4	ADS-B				4	F-KCLW1;F-K
2843	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.137	-84.75178	P	34925	6172	547	32	-704	A	7742	T-MLAT1	4	MLAT				4	F-KCLW1;F-K
2844	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.13734	-84.75143	P	34925		547	32	-704	A	32943	T-KTPA31	0	ADS-B					
2845	1970-01-21 08:25:30	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.13817	-84.75087	P	34900	6172	547	32	-704	A	49361	F-AER	0	OTHER					
2846	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.13817	-84.75087	P	34900		547	32	-576	A	57074	T-KAPF10	0	ADS-B					
2847	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.1395	-84.74993	P	34900	6172	547	32	-448	A	19222	F-BDWY1	4	ADS-B				4	F-KCLW1;F-K
2848	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.13738	-84.75162	P	34900	6172	547	32	-448	A	7742	T-MLAT1	4	MLAT				4	F-KCLW1;F-K
2849	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.1395	-84.74993	P	34900	6172	547	32	-448	A	45929	T-KFMY18	0	ADS-B					
2850	1970-01-21 08:25:30	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.1395	-84.74993	P	34900	6172	547	32	-704	A	49361	F-AER	0	OTHER					
2851	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14078	-84.74905	P	34900	6172	546	32	-192	A	19222	F-BDWY1	4	ADS-B				4	F-KCLW1;F-K
2852	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14021	-84.75171	P	34900	6172	546	32	-192	A	7742	T-MLAT1	4	MLAT				4	F-KCLW1;F-K
2853	1970-01-21 08:25:30	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14078	-84.74905	P	34900	6172	547	32	-192	A	49361	F-AER	0	OTHER					
2854	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14293	-84.74755	P	34900		547	32	-320	A	13388	T-KCLW9	0	ADS-B					
2855	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14406	-84.74674	P	34900	6172	546	32	64	A	19222	F-BDWY1	4	ADS-B				4	F-KCLW1;F-K
2856	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.1425	-84.74789	P	34900	6172	546	32	64	A	7742	T-MLAT1	4	MLAT				4	F-KCLW1;F-K
2857	1970-01-21 08:25:30	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14293	-84.74755	P	34900	6172	546	32	64	A	49361	F-AER	0	OTHER					
2858	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.1462	-84.74526	P	34900	6172	545	32	320	A	19222	F-BDWY1	4	ADS-B				3	F-KCLW1;F-K
2859	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14408	-84.74886	P	34900	6172	545	32	320	A	7742	T-MLAT1	4	MLAT				3	F-KCLW1;F-K
2860	1970-01-21 08:25:30	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14513	-84.746	P	34900	6172	546	32	320	A	49361	F-AER	0	OTHER					
2861	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14847	-84.74371	P	34925	6172	545	32	576	A	19222	F-BDWY1	4	ADS-B				5	F-KMKY3;F-K
2862	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14719	-84.7475	P	34925	6172	545	32	576	A	7742	T-MLAT1	4	MLAT				5	F-KMKY3;F-K
2863	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14742	-84.74444	P	34900		545	32	448	A	57074	T-KAPF10	0	ADS-B					
2864	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14965	-84.74288	P	34925	6172	545	32	448	A	45929	T-KFMY18	0	ADS-B					
2865	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.15072	-84.74214	P	34925	6172	544	32	640	A	19222	F-BDWY1	4	ADS-B				6	F-KCLW1;F-K
2866	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14827	-84.74593	P	34925	6172	544	32	640	A	7742	T-MLAT1	4	MLAT				6	F-KCLW1;F-K
2867	1970-01-21 08:25:30	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.14965	-84.74288	P	34925	6172	545	32	640	A	49361	F-AER	0	OTHER					
2868	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.15295	-84.74055	P	34950	6172	544	32	640	A	19222	F-BDWY1	4	ADS-B				4	F-KCLW1;F-K
2869	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.15098	-84.74473	P	34950	6172	544	32	640	A	7742	T-MLAT1	4	MLAT				4	F-KCLW1;F-K
2870	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.15511	-84.73911	P	34950	6172	544	32	576	A	19222	F-BDWY1	4	ADS-B				4	F-KMKY3;F-K
2871	2025-10-30 10:30:00	2025-10-30 10:30:00	0xa7da9c	JBU1230	26.15524	-84.73748	P	34950	6172	544	32	576	A	7742	T-MLAT1	4	MLAT				4	F-KMKY3;F-K

GNSS interference



MLAT – Defense against GNSS interference



Limitations

- Data availability depends on coverage
 - Receivers in the area
- External interference can impact utility
- Design of ADS-B parameters limits precision in certain fields
 - E.g., altitude reporting in 25 foot increments

Requesting data from Flightradar24

- For **urgent inquiries**, use our press and media center
 - <https://www.flightradar24.com/blog/press-and-media-center/>
- Otherwise, email ian@fr24.com directly
- Please include as much detail as possible for all inquiries
 - Date/time in UTC
 - Aircraft registration/ICAO 24-bit address



Questions?