

How to find a lost drone

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Abstract

How to find a lost drone by flight logs recorded on the remote controller ST10 or ST16. The procedure is valid for Blade Chroma, Yuneec Q500, Typhoon H, H Plus and H3.

Preparations

The tools

(1) Download analysis tool „Q500log2kml“ and unzip downloaded file. It's available for LINUX or Windows 64bit. Read the manual to get an overview about the capabilities and settings of the tool.

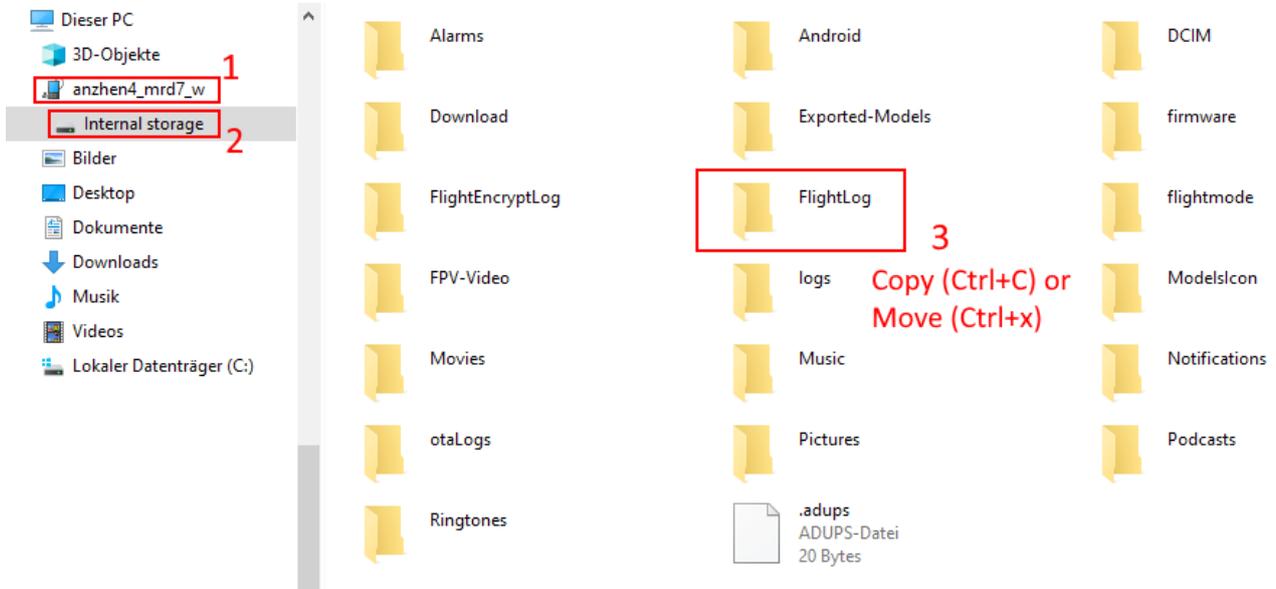


Windows64bit: http://h-elsner.moood.com/downloads/q500log2kml_en.zip
LINUX 64bit: http://h-elsner.moood.com/downloads/q500log2kml_en.tar.gz
Manual: http://h-elsner.moood.com/pdf/Q500log2kml_en.pdf

(2) Install GoogleEarth if not have done yet.

Download flight logs from the remote controller

Switch on and wait until the controller is fully booted up. Then connect it to the PC via micro USB data cable. You will get access to the open part of the Android file system (1, 2). Copy or move (3) the complete folder 'FlightLog' or 'Flight2Log' to you PC.



Find drone

Data

Start Q500log2kml and open the downloaded folder (not a single file). Select the last flight in 'Overview' table.

Files: 19	Date	from	to	Duration	Ceiling	Distance	Length of trip	Top speed	Umax	Umin
00008	2020-07-01	20:18:20	20:19:31	01:11					15.1V	
00009	2020-07-01	20:21:03	20:23:29	02:25					15.1V	
00010	2020-08-21	19:14:18	19:20:06	05:48					15.2V	
00011	2020-09-06	16:44:21	16:44:39	00:18	31.2m	Simulator flight		35.5km/h	16.7V	16.5V
00012	2020-09-06	17:27:09	17:27:41	00:32	19.2m	Simulator flight		32.6km/h	16.7V	16.5V
00013	2020-09-08	13:28:55	13:30:53	01:59	32.2m	Simulator flight		18.3km/h	16.7V	16.3V
00014	2020-09-09	17:14:48	17:15:17	00:29	0.5m	Simulator flight		9.2km/h	16.7V	16.6V
00015	2020-09-09	19:29:49	19:30:45	00:56		Simulator flight			16.7V	
00016	2020-09-09	19:37:58	19:38:14	00:16		Simulator flight			16.7V	
00018	2020-09-09	19:44:27	19:44:57	00:29		Simulator flight			16.7V	
00019	2020-09-09	19:46:40	19:47:48	01:08	4.4m	Simulator flight		9.6km/h	16.7V	16.5V
00020	2020-09-09	19:51:32	19:52:00	00:13	0.0m	Simulator flight		0.0km/h	16.7V	16.7V
00022	2020-09-28	10:37:51	10:41:32	03:41					15.2V	
00023	2020-09-30	15:26:49	15:28:10	00:59	0.4m	4.2m	13.6m	9.2km/h	16.6V	16.5V
00024	2020-09-30	15:53:57	16:17:56	20:14	49.0m	81.3m	2546.3m	49.4km/h	16.5V	14.3V!
Summary	Tracks: 11			00:26:38			2.56km	Ø 5.77km/h		

You can browse through the raw data and look for error flags, voltage drops and whatever may be the reason for the crash. To see details go to 'Display files'.

The screenshot shows a flight log analysis application. At the top, the 'FlightLog' path is 'D:\Flight_Log_data\Eigene\YTH\3\FlightLog2020-09-30' with a '7' in a red box. The 'Convert' button is also highlighted with a red box and the number '6'. The 'Display files' tab is active, showing a table of telemetry data. The table has columns: Date/time, fsk_rssi, voltage, current, altitude 2, latitude 5, longitude, tas 3, gps_used, fix_type, satellites_num, roll, and yaw 4. The last row of the table is highlighted in blue, and its 'altitude 2', 'latitude 5', and 'longitude' columns are also highlighted with red boxes and the number '1'. The status bar at the bottom shows 'Files: 19', '22184', '.kml', and the file path 'D:\Flight_Log_data\Eigene\YTH\3\FlightLog2020-09-30\Telemetry\Telemetry_00024.csv'.

Date/time	fsk_rssi	voltage	current	altitude 2	latitude 5	longitude	tas 3	gps_used	fix_type	satellites_num	roll	yaw 4
20200930 15:52:13:141	-41	16.6	0.0	1.9466814E7	2.3068671	137.57849	1.0102475	false	0	16	-0.88	172.12
20200930 15:52:13:181	-37	16.6	0.0	-0.05	48.237404	10.094113	0.037416574	false	0	16	-0.88	172.12
20200930 15:52:13:224	-41	16.6	0.0	-0.05	48.237404	10.094113	0.037416574	false	0	16	-0.88	172.12
20200930 15:52:13:262	-41	16.6	0.0	-0.05	48.237404	10.094113	0.037416574	false	0	16	-0.88	172.12
20200930 15:52:13:303	-37	16.6	0.0	-0.05	48.237404	10.094113	0.037416574	false	0	16	-0.88	172.12
20200930 15:52:13:470	-40	16.6	0.0	-0.05	48.237404	10.094114	0.024494898	false	0	16	-0.88	172.12
20200930 15:52:13:508	-40	16.6	0.0	-0.06	48.237404	10.094114	0.022360679	false	0	16	-0.88	172.12
20200930 15:52:13:784	-40	16.6	0.0	-0.05	48.237404	10.094114	0.03316625	false	0	16	-0.88	172.12
20200930 15:52:13:824	-40	16.6	0.0	-0.05	48.237404	10.094114	0.03316625	false	0	16	-0.88	172.12
20200930 15:52:13:864	-40	16.6	0.0	-0.04	48.237404	10.094114	0.03316625	false	0	16	-0.88	172.12
20200930 15:52:13:903	-39	16.6	0.0	-0.05	48.237404	10.094114	2.55049	false	0	16	-0.88	172.12
20200930 15:52:13:944	-39	16.6	0.0	-0.05	48.237404	10.094113	0.058309518	false	0	16	-0.88	172.12
20200930 15:52:14:050	-36	16.6	0.0	-0.05	48.237404	10.094113	0.058309518	false	0	16	-0.88	172.12
20200930 15:52:14:104	-39	16.6	0.0	-0.04	48.237404	10.094113	2.5310273	false	0	16	-0.88	172.12
20200930 15:52:14:182	-35	16.6	0.0	-0.05	48.237404	10.094114	0.0728011	false	0	16	-0.88	172.12

Scroll down to the last line in the table and double click at the last coordinates (1). GoogleMaps will show the this location.

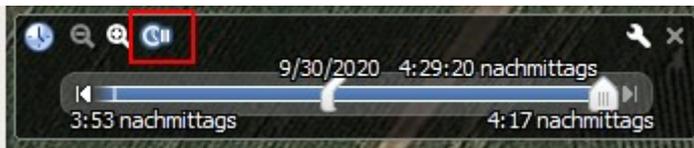
If the drone was still flying and you lost communication it will be good to check the altitude (2), speed (3) and heading (4). Double click on the related header of the 'Display files' table to get additional charts. You can also get a chart with distance to the controller (5).

Flight trajectory

To visualize the flight create a KML file that can be animated in GoogleEarth. This gives you overview what happened last when the drone was lost. Click on button 'Convert' (6). Double click on the address field to open file manager (7). Here you will see the created KML files. Double click on the related KML file to open GoogleEarth.



To give you a better idea what happened animate the flight in GoogleEarth.



To avoid location errors due to perspective you can also create a KML file that is clamped to the ground in GoogleEarth. Go to 'Settings' > 'Data conversion' to select your preferences.



Find methods

To get a fast location use coordinates in the Data table.

To predict the flight behavior use the KML file.

- If you lost communication the drone may fly back to last known position of the controller. Controller location is the black line in GoogleEarth. It is always clamped to the ground.
- If you have had a fly-away the drone may be gone with speed and heading of the last part of the flight.

For both scenarios check the area where you lost the drone for obstacles, trees, buildings. Compare with last altitude.

Example:

Three possible crash locations were proposed from telemetry data. In the very last telemetry data sets the drone seems to be going back to start position.

The drone was in a tree at position 2.



Good luck!