

Flight Crew: B & Z Flight times: 1930 – 2300Z or 2:30pm – 6:00pm central daylight savings time.

Data at: 1800 UTC 26 Mar 2021

**TAF for: KMSB (Minneapolis-St Paul, MN, US) issued at 1750 UTC 26 Mar 2021**

Text: KMSB 261750Z 2618/2724 14004KT P6SM BKN250  
 Forecast period: 1800 to 2300 UTC 26 March 2021  
 Forecast type: FROM: standard forecast or significant change  
 Winds: from the SE (140 degrees) at 5 MPH (4 knots; 2.1 m/s)  
 Visibility: 6 or more sm (10+ km)  
 Ceiling: 25000 feet AGL  
 Clouds: broken clouds at 25000 feet AGL

Flight Following (Outbound Test)

	Altitude (ft)							
	100	Slant Range	200	Slant Range	300	Slant Range	400	Slant Range
Min	946	951	950	971	870	920	850	939
Max	1200	1204	1200	1217	1000	1044	920	1003

Distance from home point (ft)

Hover Locate Test (Secs)

Distance from home point (ft)	Altitude (ft)	
	100	200
100	3 to 6	
200	4 to 7	
300	3 to 6	2 to 24
600		17 to 23
735	not able to locate	

Flight Crew: B & Z Flight times: 1630 – 2000Z or 11:30am – 3:00pm central daylight savings time.

Data at: 1204 UTC 05 Apr 2021

**TAF for: KMSB (Minneapolis-St Paul, MN, US) issued at 1120 UTC 05 Apr 2021**

Text: KMSB 051120Z 0512/0618 VRB04KT P6SM BKN150  
 Forecast period: 1200 to 1700 UTC 05 April 2021  
 Forecast type: FROM: standard forecast or significant change  
 Winds: variable direction winds at 5 MPH (4 knots; 2.1 m/s)  
 Visibility: 6 or more sm (10+ km)  
 Ceiling: 15000 feet AGL  
 Clouds: broken clouds at 15000 feet AGL

Text: FM051700 18012G19KT P6SM SCT250  
 Forecast period: 1700 UTC 05 April 2021 to 0200 UTC 06 April 2021  
 Forecast type: FROM: standard forecast or significant change  
 Winds: from the S (180 degrees) at 14 MPH (12 knots; 6.2 m/s) gusting to 22 MPH (19 knots; 9.8 m/s)  
 Visibility: 6 or more sm (10+ km)  
 Ceiling: at least 12,000 feet AGL  
 Clouds: scattered clouds at 25000 feet AGL

Flight Following (Outbound Test)

	Altitude (ft)			
	100	200	300	400
Min	780	1050	850	
Max	950	1070	1200	

Distance from home point (ft)

Zone of Uncertainty (Inbound Test)

	Altitude (ft)			
	100	200	300	400
Min	550	750	630	
Max	900	800	650	

Distance from home point (ft)

Flight Crew: B & Z Flight times: 0107 – 0215Z, Civil Twilight, 0107-0137Z 23 Apr 2021 or 8:07pm – 9:15pm central daylight savings time.

**TAF for: KMSP (Minneapolis-St Paul, MN, US) issued at 2100 UTC 22 Apr 2021**

Text: KMSP 222100Z 2221/2324 24012G25KT P6SM FEW090  
 Forecast period: 2100 UTC 22 April 2021 to 0100 UTC 23 April 2021  
 Forecast type: FROM: standard forecast or significant change  
 Winds: from the WSW (240 degrees) at 14 MPH (12 knots; 6.2 m/s) gusting to 29 MPH (25 knots; 12.9 m/s)  
 Visibility: 6 or more sm (10+ km)  
 Ceiling: at least 12,000 feet AGL  
 Clouds: few clouds at 9000 feet AGL

Text: FM230100 22009KT P6SM BKN120  
 Forecast period: 0100 to 1000 UTC 23 April 2021  
 Forecast type: FROM: standard forecast or significant change  
 Winds: from the SW (220 degrees) at 10 MPH (9 knots; 4.6 m/s)  
 Visibility: 6 or more sm (10+ km)  
 Ceiling: 12000 feet AGL  
 Clouds: broken clouds at 12000 feet AGL  
 Pilot Note: Winds at 0107Z, 0/0.

Loss of Orientation Test

Altitude (ft)	16	100	200
Distance from home point (ft)	300	466	533

ACL test during Civil Twilight; 1-mile lost eyes on with white strobe, green and red strobes were not as effective. The flight was into the sunset environment to simulate worst-case scenario.

ACL night test 0145-0215Z (8:45-9:15pm central time)

Strobes were visible 3 miles away. White and green strobes were most effective; red strobe, although visible, was not as bright.

Flight Crew: B & Z Flight times: 0117 – 0215Z, Civil Twilight, 0107-0137Z 23 Apr 2021 or 8:17pm – 9:15pm central daylight savings time.

**TAF for: KMSP (Minneapolis-St Paul, MN, US) issued at 2052 UTC 01 May 2021**

Text: KMSP 012052Z 0121/0224 24011KT P6SM BKN150  
 Forecast period: 2100 UTC 01 May 2021 to 0300 UTC 02 May 2021  
 Forecast type: FROM: standard forecast or significant change  
 Winds: from the WSW (240 degrees) at 13 MPH (11 knots; 5.7 m/s)  
 Visibility: 6 or more sm (10+ km)  
 Ceiling: 15000 feet AGL  
 Clouds: broken clouds at 15000 feet AGL  
 Pilot Note: Winds at 0117Z, 0/0.

Indicator Light Test

Altitude (ft)	Civil Twilight		Nighttime	
	Mavic 2	P3P	Mavic 2	P3P
50	454	600		
100	400	680		
200	400	900		
300	400	1000		
400	400	1000	2600	2600

Distance from home point (ft)

Power off Night Visibility Test

Can we see the aircraft?

Distance (ft)	Civil Twilight		Nighttime	
	Mavic 2	P3P	Mavic 2	P3P
75	Yes	Yes	No	Yes
150	No	Yes	No	Barely
225	No	Yes	No	No
300	No	Barely	No	No

Flight Crew: B & Z Flight times: 0121 – 0151Z, Civil Twilight, 23 Apr 2021 or 8:21pm – 8:51pm central daylight savings time.

**TAF for: KMSP (Minneapolis-St Paul, MN, US) issued at 1720 UTC 04 May 2021**

Text: KMSP 041720Z 0418/0524 34012G19KT P6SM BKN050  
 Forecast period: 1800 UTC 04 May 2021 to 0000 UTC 05 May 2021  
 Forecast type: FROM: standard forecast or significant change  
 Winds: from the NNW (340 degrees) at 14 MPH (12 knots; 6.2 m/s) gusting to 22 MPH (19 knots; 9.8 m/s)  
 Visibility: 6 or more sm (10+ km)  
 Ceiling: 5000 feet AGL  
 Clouds: broken clouds at 5000 feet AGL

Text: FM050000 35009KT P6SM SKC  
 Forecast period: 0000 to 0400 UTC 05 May 2021  
 Forecast type: FROM: standard forecast or significant change  
 Winds: from the N (350 degrees) at 10 MPH (9 knots; 4.6 m/s)  
 Visibility: 6 or more sm (10+ km)  
 Ceiling: at least 12,000 feet AGL  
 Clouds: clear skies

Flight Following, Civil Twilight,  
Outbound Test, new ACLs

	Altitude (ft)			
	100	200	300	400
Min	2000	2800	3300	6000
Max	2500	3200	4700	6000

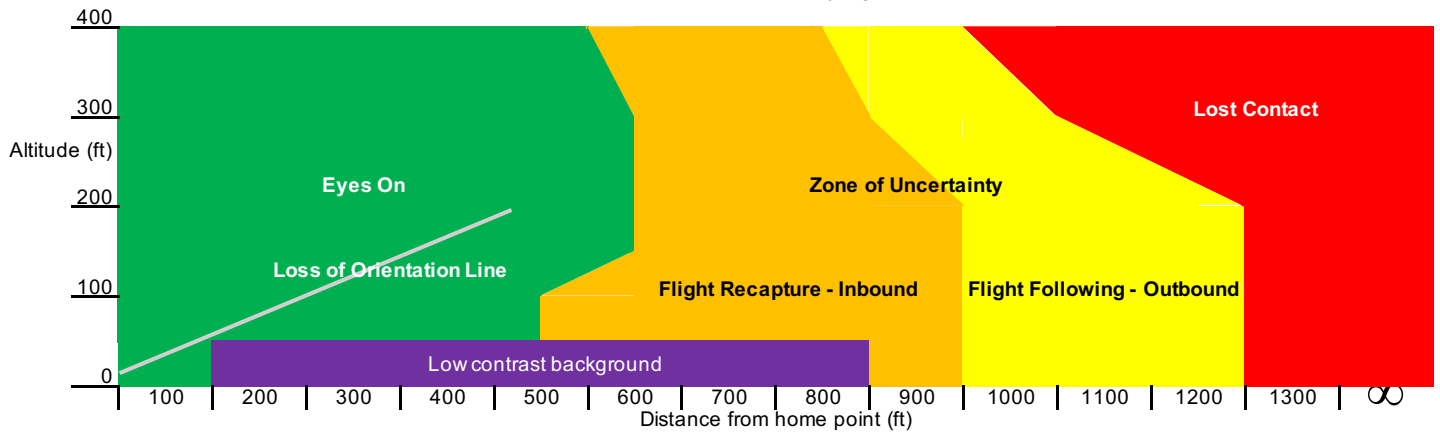
Distance from home point (ft)

Zone of Uncertainty, Civil Twilight,  
Inbound Test, new ACLs

	Altitude (ft)			
	100	200	300	400
Min	1950	2800	2600	6000
Max	2200	3100	4600	6000

Distance from home point (ft)

VLOS Profile - Day Light



Zone of Uncertainty records the disparity between tracking aircraft flight following outbound and inbound re-acquisition attempts.

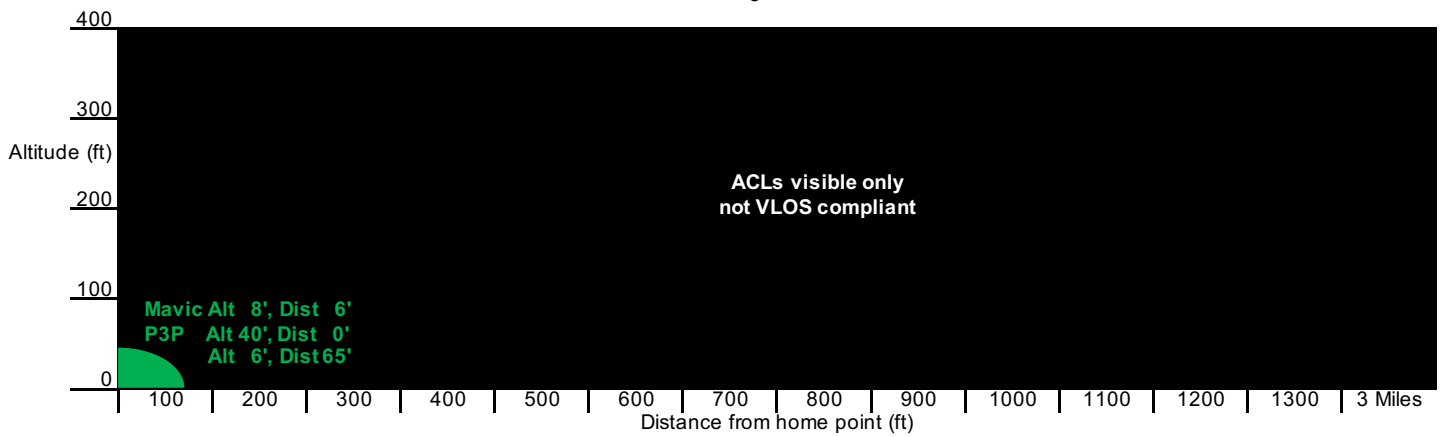
    Flight was tracked from takeoff outbound until lost contact.

    Flight was re-acquired inbound from lost contact area.

    Low contrast background altitudes will vary depending on proximity to structures, obstacles or landscape.

    Loss of orientation line subjectively shows where Phantom 3 heading (orientation) was not discernable during civil twilight without using new ACLs

VLOS Profile - Nighttime with new ACLs



    VLOS legal compliance region, altitude and distance from home point