



MEMORANDUM FOR RECORD

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Senior Air Safety Investigator
Eastern Region Aviation

March 6, 2021

Subject: ERA21FA148
Who: Peter Basile – Textron Aviation – Air Safety Investigator

Mr. Basile completed the performance calculations for the above-mentioned accident. Below are the calculations:

At 1455 EST, the METAR at Leesburg Executive Airport (KJYO), Leesburg, VA, approximately 14 NM southeast of the accident site, was: wind, 310° at 24 knots gusting to 29 knots; visibility, 10 SM; sky condition, clear; temperature, 11°C; dew point, -2°C; altimeter setting, 29.90 inHg.

Wind component charts showed the reported wind at KJYO would have produced a 21 knot right crosswind (Note: The C23 demonstrated crosswind component was 17 knots) and a tailwind component of 12 knots gusting to 14 knots. As the aircraft turned left from a heading of 190° to 170°, the tailwind component increased to 18 knots gusting to 22 knots.

Per the Beechcraft C23 Sundowner Pilot's Operating Handbook (POH), the aircraft takeoff speeds for safe operation are 65 knots at "lift-off," and 74 knots at "50 ft." The "Take-off Distance – Grass Surface" performance chart was interpolated for the associated conditions of 11°C and 750'. The estimated ground roll with a 0 knot wind component was 1,236' and the distance to clear a 50' obstacle was 2,068'. Note: The takeoff distance performance chart did not include a tailwind component multiplier penalty.

A typical tailwind performance multiplier would be to increase the performance chart distance 10% for every 2 knots of tailwind. Thus, a tailwind of 12 knots would increase the ground roll by 60%. Therefore, $1,238' + 60\% (743') = 1,981'$ of ground roll. The distance to clear a 50' obstacle would be $2,072' + 60\% (1,243') = 3,315'$.

BEECHCRAFT Sundowner 180
C23 (M-1285 and After)

Section V
Performance

TAKE-OFF DISTANCE - GRASS SURFACE

ASSOCIATED CONDITIONS:

POWER FULL THROTTLE
 MIXTURE LEAN TO MAXIMUM RPM, THEN ENRICH SLIGHTLY
 FLAPS UP
 RUNWAY SHORT, DRY, LEVEL GRASS SURFACE
 WEIGHT 2450 LBS

TAKE-OFF SPEEDS:

LIFT OFF 65 KTS/75 MPH
 AT 50 FT 74 KTS/85 MPH

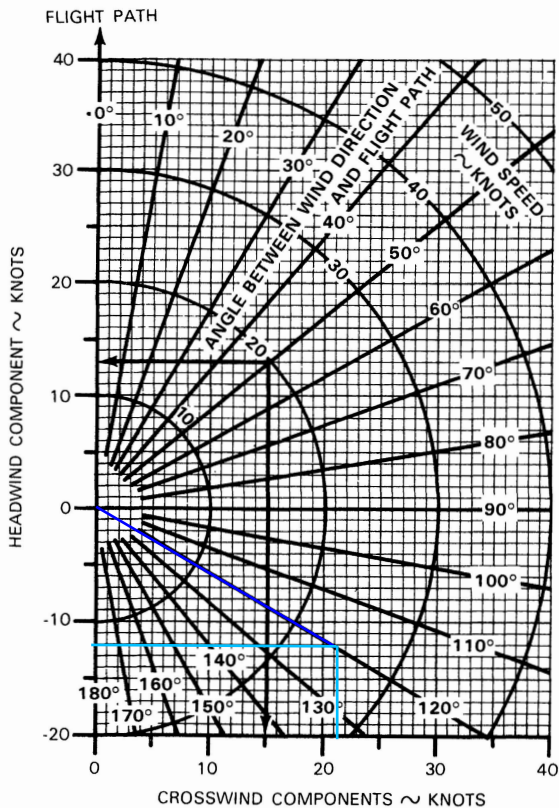
WIND COMPONENT DOWN RUNWAY KNOTS	SEA LEVEL				2000 FT				4000 FT				6000 FT				8000 FT			
	OAT °F	°C	ROLL FEET	TOTAL GROUND OVER 50 FT OAT FEET	OAT °F	°C	ROLL FEET	TOTAL GROUND OVER 50 FT OAT FEET	OAT °F	°C	ROLL FEET	TOTAL GROUND OVER 50 FT OAT FEET	OAT °F	°C	ROLL FEET	TOTAL GROUND OVER 50 FT OAT FEET	OAT °F	°C	ROLL FEET	TOTAL GROUND OVER 50 FT OAT FEET
0	23 -5	900	1665	16 -9	1129	1888	9 -13	1290	2146	2 -17	1477	2443	-6 -21	1683	2787	13 -11	1896	31 -1	2113	3467
	41 5	1101	1848	34 1	1258	2100	27 -3	1439	2391	20 -7	1650	2726	13 -11	1896	31 -1	2113	3467	31 -1	2113	3467
	59 15	1220	2045	52 11	1396	2327	45 7	1599	2653	38 3	1836	3030	56 13	2036	3354	49 9	2346	56 13	2036	3354
	77 25	1347	2255	70 21	1543	2569	63 17	1771	2933	56 13	2036	3354	74 23	2249	3701	67 19	2595	74 23	2249	3701
	95 35	1482	2478	88 31	1700	2827	81 27	1954	3231	74 23	2249	3701	95 35	1482	2478	88 31	1700	2827	81 27	1954
15	23 -5	786	1381	16 -9	902	1720	9 -13	1038	1960	2 -17	1196	2237	-6 -21	1381	2558	13 -11	1552	31 -1	2113	3467
	41 5	878	1582	34 1	1009	1917	27 -3	1163	2187	20 -7	1342	2501	13 -11	1552	2885	31 -1	2113	3467	31 -1	2113
	59 15	977	1785	52 11	1125	2128	45 7	1298	2432	38 3	1500	2786	56 13	1699	3088	49 9	1936	56 13	1699	3088
	77 25	1082	2060	70 21	1248	2353	63 17	1442	2683	56 13	1699	3088	74 23	1851	3413	67 19	2149	74 23	1851	3413
	95 35	1196	2268	88 31	1381	2594	81 27	1597	2972	74 23	1851	3413	95 35	1196	2268	88 31	1381	2594	81 27	1597
30	23 -5	603	1381	16 -9	699	1575	9 -13	811	1799	2 -17	943	2058	-6 -21	1098	2359	13 -11	1240	31 -1	1395	2957
	41 5	678	1540	34 1	786	1758	27 -3	914	2011	20 -7	1064	2305	13 -11	1240	2647	31 -1	1395	2957	31 -1	1395
	59 15	758	1710	52 11	881	1955	45 7	1025	2240	38 3	1195	2571	56 13	1336	2856	49 9	1562	56 13	1336	2856
	77 25	845	1892	70 21	983	2166	63 17	1145	2486	56 13	1336	2856	74 23	1488	3162	67 19	1741	74 23	1488	3162
	95 35	938	2086	88 31	1092	2392	81 27	1273	2747	74 23	1488	3162	95 35	938	2086	88 31	1092	2747	74 23	1488

WIND COMPONENTS

Demonstrated Crosswind Component is 17kts/20mph

EXAMPLE

WIND SPEED	20 KTS
ANGLE BETWEEN WIND DIRECTION AND FLIGHT PATH	50°
HEADWIND COMPONENT	13 KTS
CROSSWIND COMPONENT	15 KTS



The 1455 recorded weather observation at Leesburg Executive Airport (JYO), Leesburg, Virginia, located about 13 miles southeast of the accident location, included wind from 310° at 24 knots gusting to 29 knots.