Presented by:

REDBIRD FLIGHT SIMULATIONS

HARTZELL ENGINE TECHNOLOGIES
MONTGOMERY, ALABAMA USA

JEPPESEN
A Boeing Company

BUILT ON HONOR
HARTZELL
HARTZELL PROPELLER INC.
PIQUA, OHIO U.S.A.

BOSE
AVIATION

NATCA®

Supported by:

NATIONAL ASSOCIATION OF FLIGHT INSTRUCTORS
NAFI

COMMUNITY AVIATION

CloudAhoy
debriefing for pilots

SAFE
SOCIETY OF AVIATION AND FLIGHT EDUCATORS

MINDSTAR AVIATION

EAA Pilot Proficiency Center
CFI-to-CFI Clinic (Jul-2022)

Ground Hog/ Now What

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flyphil.INFO
phmand@gmail.com
Cell: 503-887-0889

Member AOPA, EAA, NAFI, SAFE

Objectives

- Develop instructional skills to prepare pilots for aborted takeoff decision making and success
- Develop instructional skills to impart the mentality of expecting a power loss on every flight and being prepared for it

Presenter

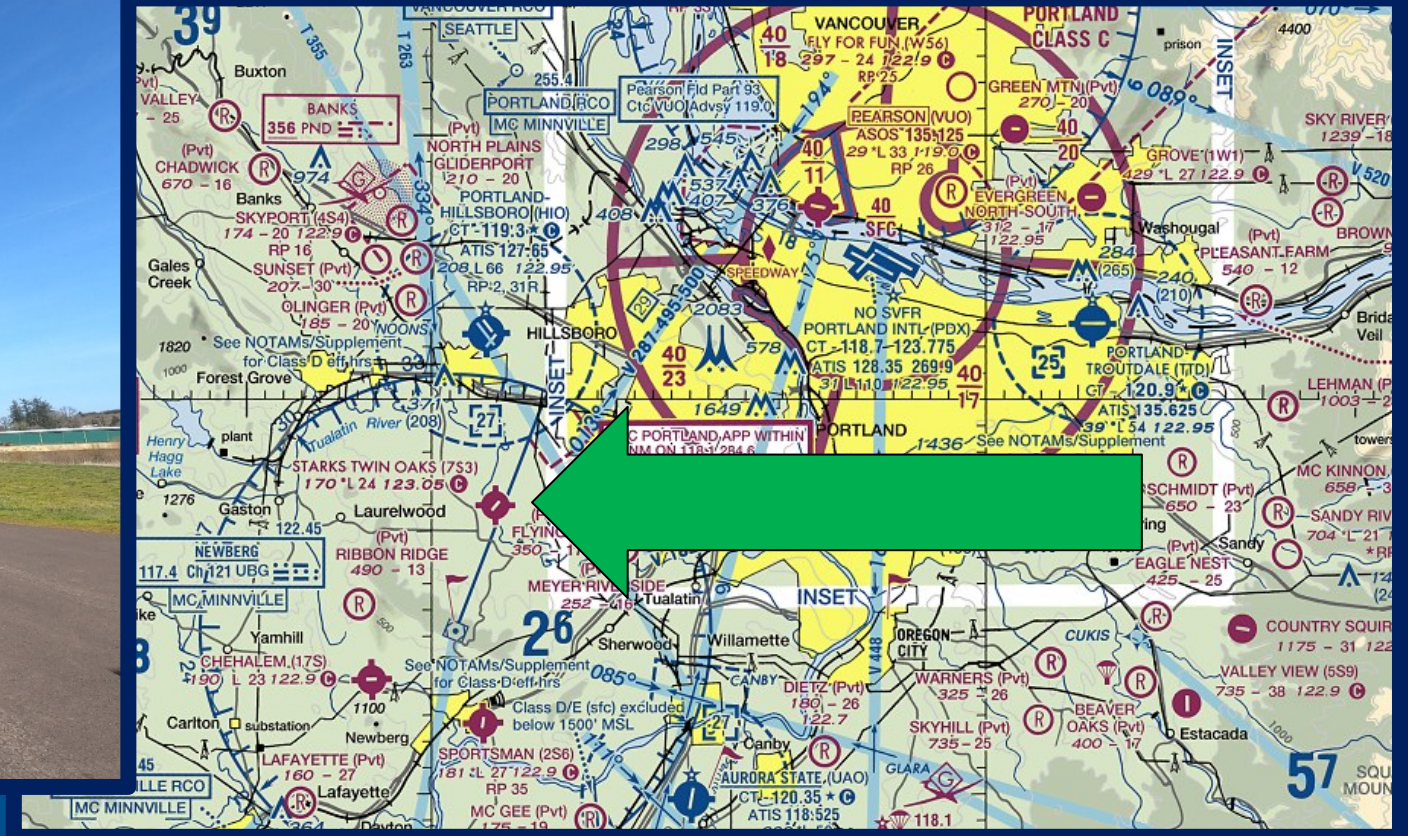
Philip Mandel
3800-plus TT
2400-plus as CFI
FAASteam Rep…

and a recovering engineer!

- C-172
- PA-28 (140)
- Christen Eagle II
- RV-4
- C-150
- T-18
- PA-23 (Apache)
- T-18
- AA-5A
- T-18

Thorp T-18 built by Bill Cordoza c. 1977
Rebuilt by Lee Walton in 2019
N118BC

Starks Twin Oaks Airpark (7S3), Hillsboro OR



Potential Reasons to Abort (Reject) a Takeoff

1.
2.
3.
4.
5.
6. …etc…

Before Starting Engine

- **Seats – Adjust**
  - ➢ **Question…**

Before Starting Engine

- **Seats – Adjust**
  - ➢ Question…What if the seat slides back during the takeoff roll?
  - ➢ …during initial climb?

Before Starting Engine

- Seats – Adjust
- Safety Belts – Tight, especially lap belt (don't end up two inches shorter in case you happen to flip over…)

Before Starting Engine

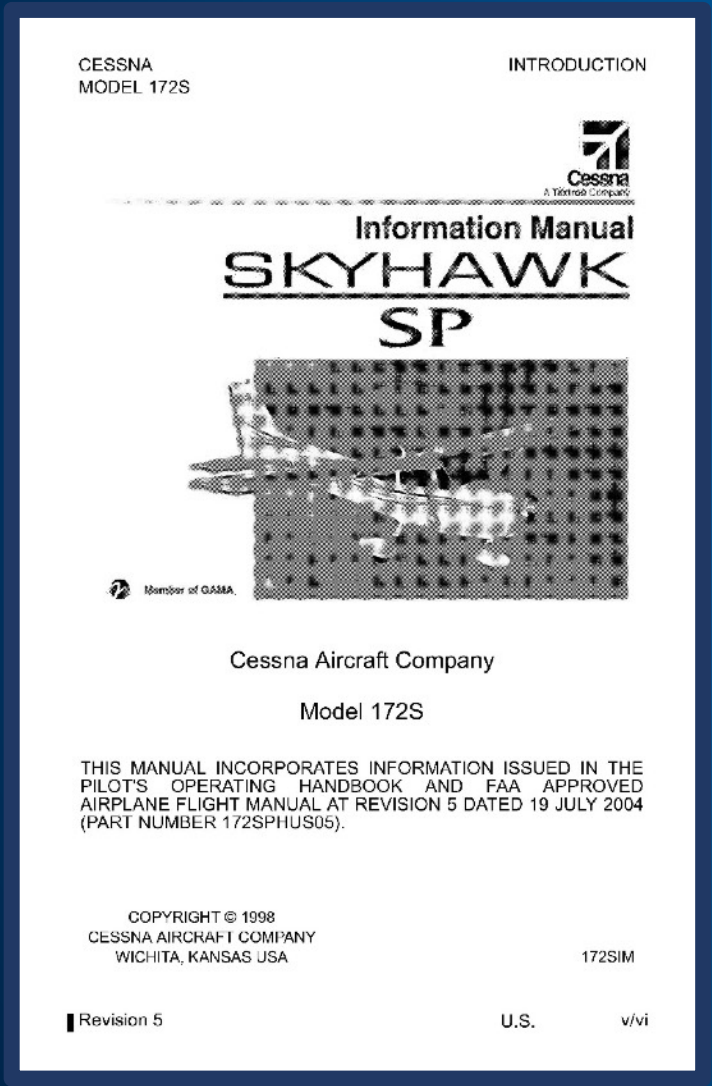
- Seats – Adjust
- Safety Belts – Tight, especially lap belt (don't end up two inches shorter in case you happen to flip over…)
- Verbalize the indications you will be looking for during takeoff
  - Oil pressure – "in the green" or similar
  - RPM – minimum static RPM if fixed pitch, redline(?) if CS
  - Manifold Pressure (if equipped) – what do you expect MP to be?
  - Airspeed alive -- But how alive? Stay tuned…
  - Other indications?
  - As always, fly the plane! Do not let these callouts distract you from maintaining centerline, etc.

Before Starting Engine

- Seats – Adjust
- Safety Belts – Tight, especially lap belt (don't end up two inches shorter in case you happen to flip over…)
- Verbalize the indications you will be looking for during takeoff (oil pressure, RPM, MP, airspeed alive, etc)
- Verbalize the specific Abort Point as it will be seen from the cockpit (intersecting taxiway, windsock, runway marking, etc.)

“Airspeed Alive” – but how alive…??

Before Starting Engine



CESSNA
MODEL 172S

INTRODUCTION

Cessna
A Textron Company

Information Manual

SKYHAWK
SP

Member of GAMA

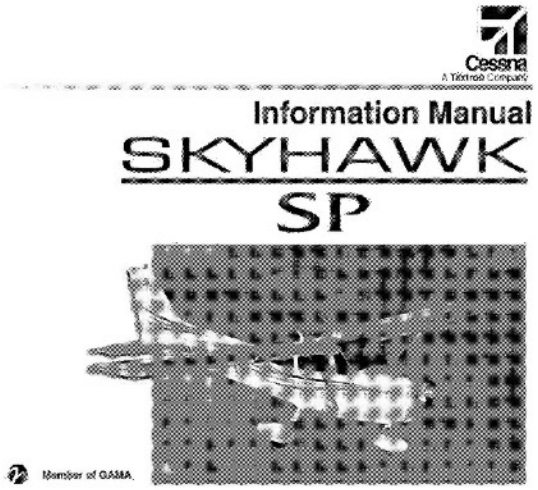
Cessna Aircraft Company

Model 172S

THIS MANUAL INCORPORATES INFORMATION ISSUED IN THE PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL AT REVISION 5 DATED 19 JULY 2004 (PART NUMBER 172SPHUS05).

172SIM

Before Starting Engine



Cessna Aircraft Company

Model 172S

THIS MANUAL INCORPORATES INFORMATION ISSUED IN THE PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL AT REVISION 5 DATED 19 JULY 2004 (PART NUMBER 172SPHUS05).

SHORT FIELD TAKEOFF DISTANCE AT 2200 POUNDS

(Max gross is 2550 lbs)

CONDITIONS:

Flaps 10°
Full Throttle Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift Off: 44 KIAS
Speed at 50 Ft: 50 KIAS

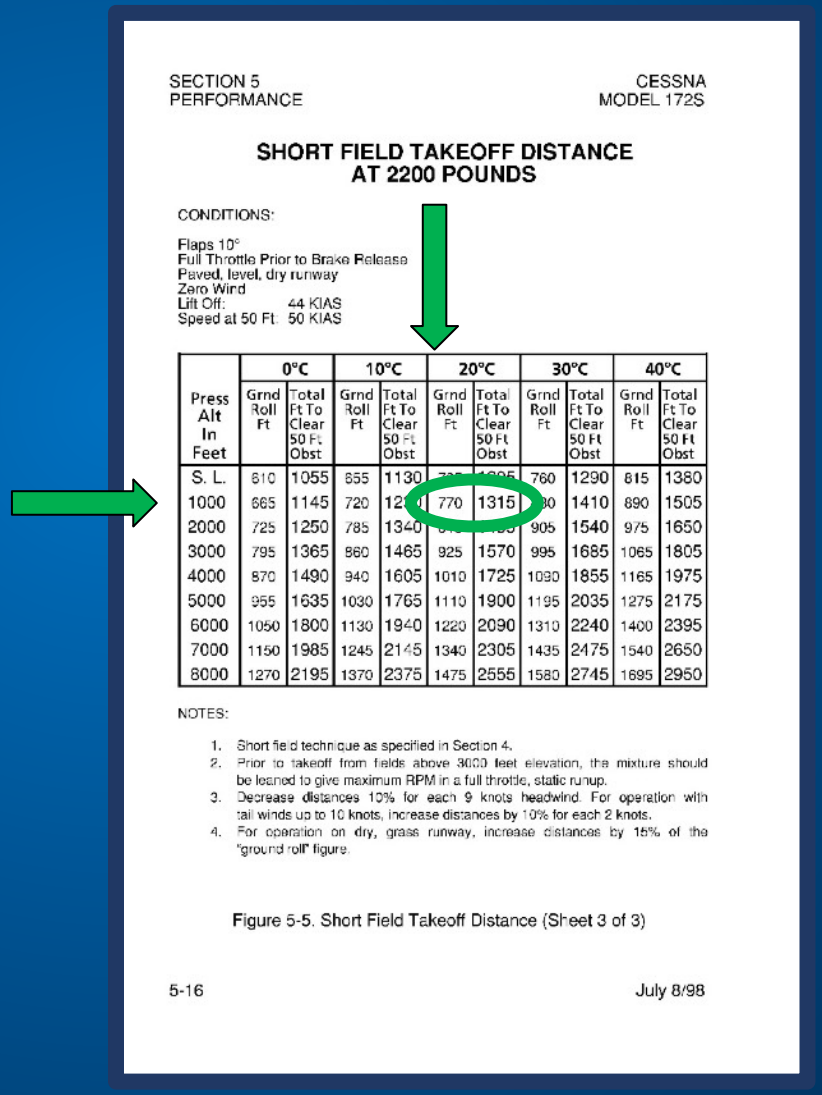
Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	610	1055	655	1130	705	1205	760	1290	815	1380
1000	665	1145	720	1230	770	1315	830	1410	890	1505
2000	725	1250	785	1340	845	1435	905	1540	975	1650
3000	795	1365	860	1465	925	1570	995	1685	1065	1805
4000	870	1490	940	1605	1010	1725	1090	1855	1165	1975
5000	955	1635	1030	1765	1110	1900	1195	2035	1275	2175
6000	1050	1800	1130	1940	1220	2090	1310	2240	1400	2395
7000	1150	1985	1245	2145	1340	2305	1435	2475	1540	2650
8000	1270	2195	1370	2375	1475	2555	1580	2745	1695	2950

NOTES:

1. Short field technique as specified in Section 4.
2. Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.
3. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
4. For operation on dry, grass runway, increase distances by 15% of the "ground roll" figure.

Figure 5-5. Short Field Takeoff Distance (Sheet 3 of 3)

Before Starting Engine



SECTION 5
PERFORMANCE

CESSNA
MODEL 172S

SHORT FIELD TAKEOFF DISTANCE AT 2200 POUNDS

CONDITIONS:

Flaps 10°
Full Throttle Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift Off: 44 KIAS
Speed at 50 Ft: 50 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
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1000	665	1145	720	12[illegible]	770	1315	[illegible]30	1410	890	1505
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Figure 5-5. Short Field Takeoff Distance (Sheet 3 of 3)

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July 8/98

Before Starting Engine

Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
705	1205
770	1315

SECTION 5
PERFORMANCE

CESSNA
MODEL 172S

SHORT FIELD TAKEOFF DISTANCE AT 2200 POUNDS

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Flaps 10°
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Paved, level, dry runway
Zero Wind
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Speed at 50 Ft: 50 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
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5-16

July 8/98

Before Starting Engine

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Paved, level, dry runway
Zero Wind
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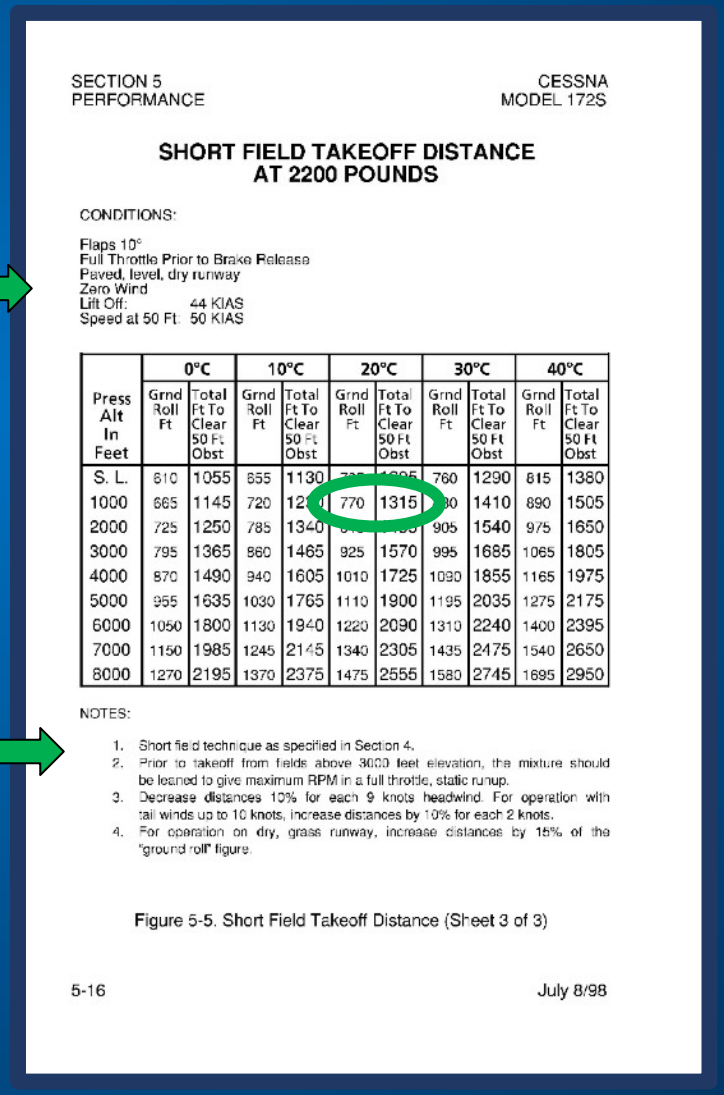

SECTION 5
PERFORMANCE

CESSNA
MODEL 172S

**SHORT FIELD TAKEOFF DISTANCE
AT 2200 POUNDS**

CONDITIONS:

Flaps 10°
Full Throttle Prior to Brake Release
Paved, level, dry runway
Zero Wind
Lift Off: 44 KIAS
Speed at 50 Ft: 50 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
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Figure 5-5. Short Field Takeoff Distance (Sheet 3 of 3)

5-16

July 8/98

Before Starting Engine

SHORT FIELD TAKEOFF

1. Wing Flaps -- 10°.
2. Brakes -- APPLY.
3. Throttle -- FULL OPEN.
4. Mixture -- RICH (above 3000 feet, LEAN to obtain maximum RPM).
5. Brakes -- RELEASE.
6. Elevator Control -- SLIGHTLY TAIL LOW.
7. Climb Speed -- 56 KIAS (until all obstacles are cleared).
8. Wing Flaps -- RETRACT slowly after reaching 60 KIAS.

NOTES:

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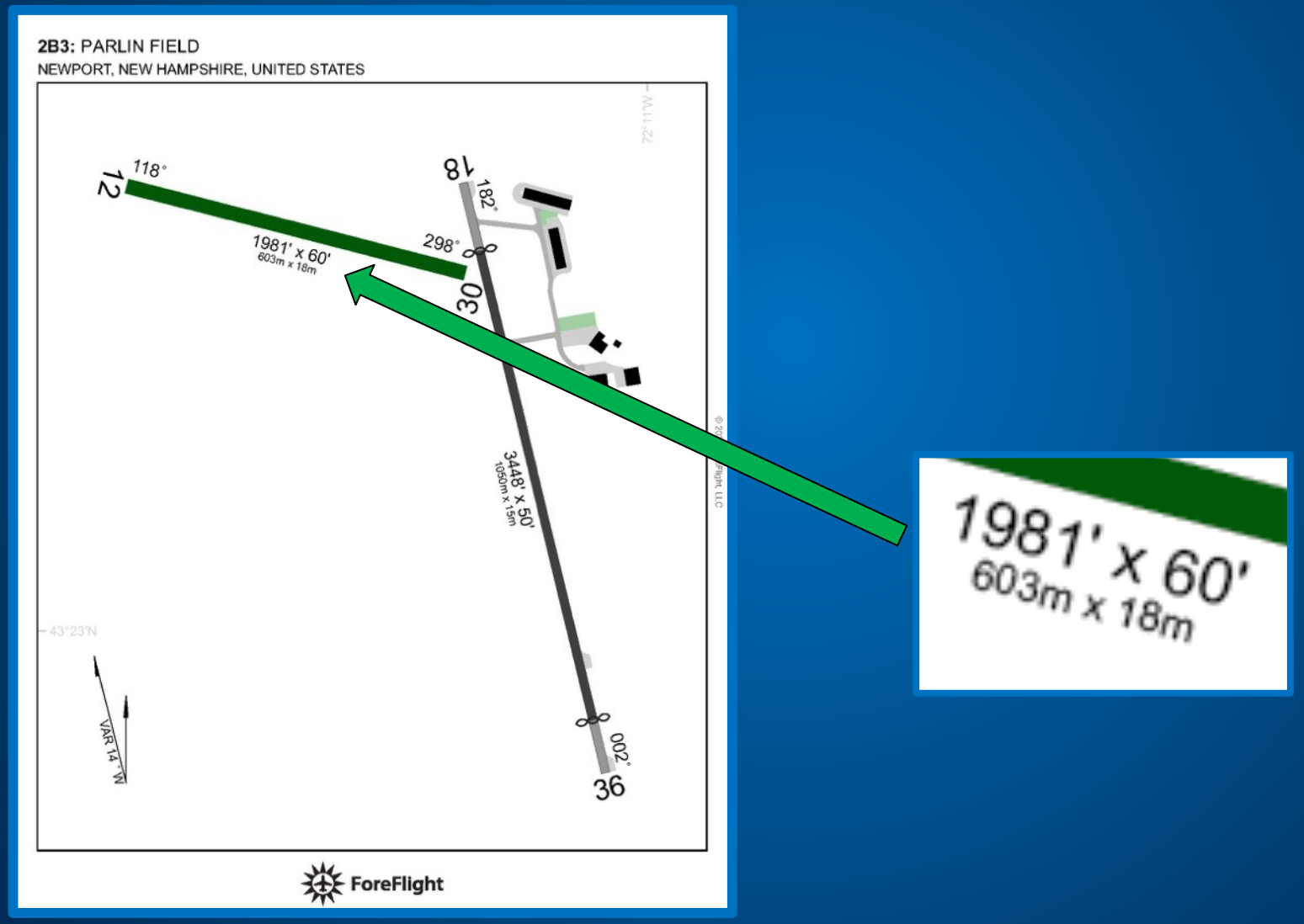
Ground Roll – Abort Point



Ground Roll – Abort Point

RWY 12–30: 1981X60 (TURF) 0.4% up SE

NEWPORT

PARLIN FLD (2B3) 2 N UTC–5(–4DT) N43°23.22′ W72°11.26′ — NEW YORK
785 B NOTAM FILE BGR — L–32G
RWY 18–36: H3448X50 (ASPH) S–12 LIRL 0.4% up N — IAP
RWY 18: Thld dsplcd 400′. Hill. Rgt tfc.
RWY 36: Thld dsplcd 300′. Trees.
RWY 12–30: 1981X60 (TURF) 0.4% up SE
RWY 12: Trees. Rgt tfc.
RWY 30: Trees.
SERVICE: S4 **FUEL** 100LL **OX** 1, 2, 3, 4 **LGT** Rotating bcn OTS indef.
NOISE: Noise abatement procedures in effect. Avoid noise sensitive area 3000′ northwest of arpt. Ctc arpt manager at 978–886–0854.
AIRPORT REMARKS: Attended irregularly. Wildlife on and invof arpt. Self svc fuel avbl 24 hrs with credit card. Rwy 12–30 CLOSED Nov 15 to May 1. P–line marked with orange balls at arpt boundary 900′ from AER 30. Rwy 18, mt 981′ MSL 2500′ from thld, 600′ rgt. Rwy 18–36 NSTD for spacing. Rwy 18 end indicators NSTD reflector bars.
AIRPORT MANAGER: (978) 886-0854
COMMUNICATIONS: CTAF/UNICOM 122.8
Ⓡ **BOSTON CENTER APP/DEP CON** 134.7
CLEARANCE DELIVERY PHONE: For CD ctc Boston ARTCC at 603-879-6859.
RADIO AIDS TO NAVIGATION: NOTAM FILE LEB.
LEBANON (L) DME 113.7 LEB Chan 84 N43°40.73′
W72°12.96′ 176° 17.5 NM to fld. 1443/0W.
DME unusable:
045°–075° byd 36 NM blo 10,000′
091°–119° byd 30 NM blo 7,500′
161°–304° byd 30 NM blo 6,300′

Ground Roll – Abort Point

Ground roll per chart (1000 feet PA, 20C, Flaps 10, paved, level, dry runway)….. 770 feet

Decrease 5% for the 5 kt headwind….. Nope!

Decrease "X" amount for the 0.4% downhill….. Nope!

INCREASE distance by 15% for grass….. Add 115 = 885 feet

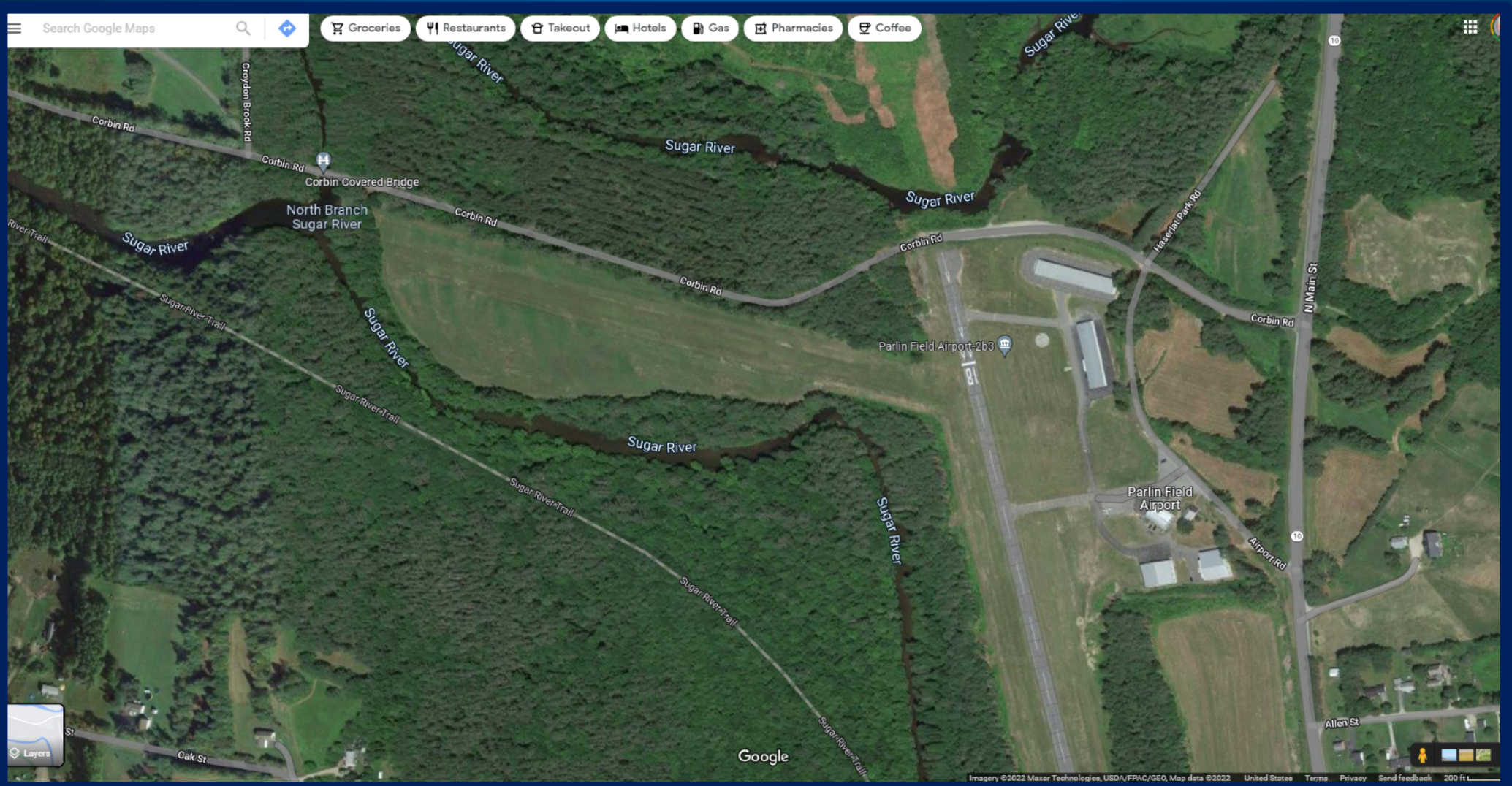
To clear 50 foot obstacle, before adjustments….. 1315 feet

INCREASE by 15% of the gr… 5 = 1430

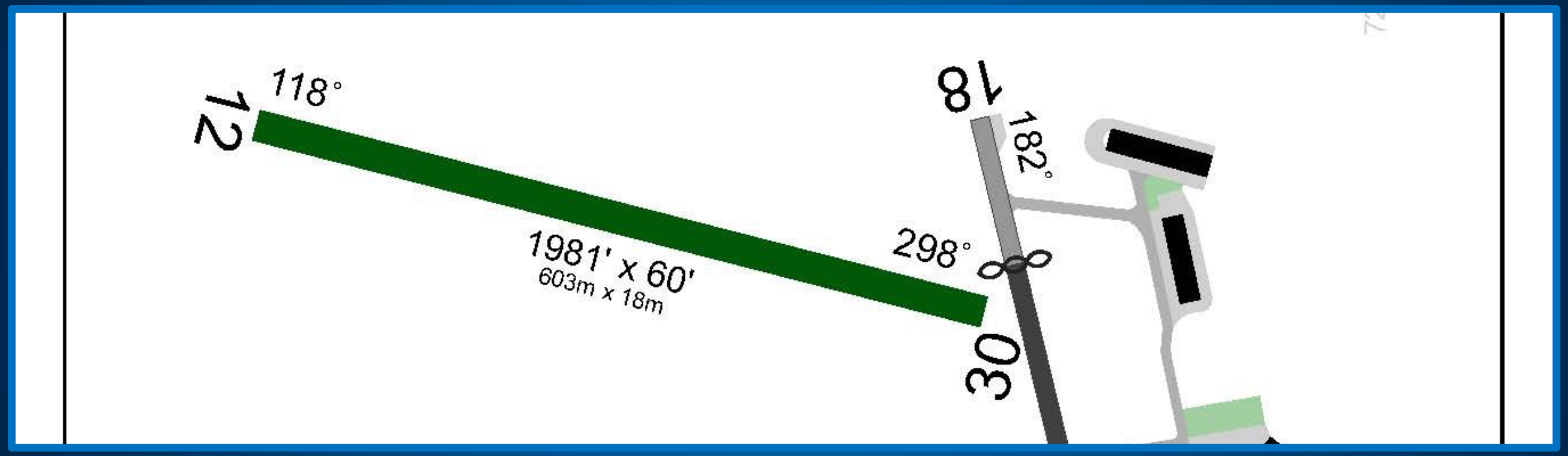
Estimate the next 50 feet: 14… 5 = 1,975
feet to cl…

How long is the runway?

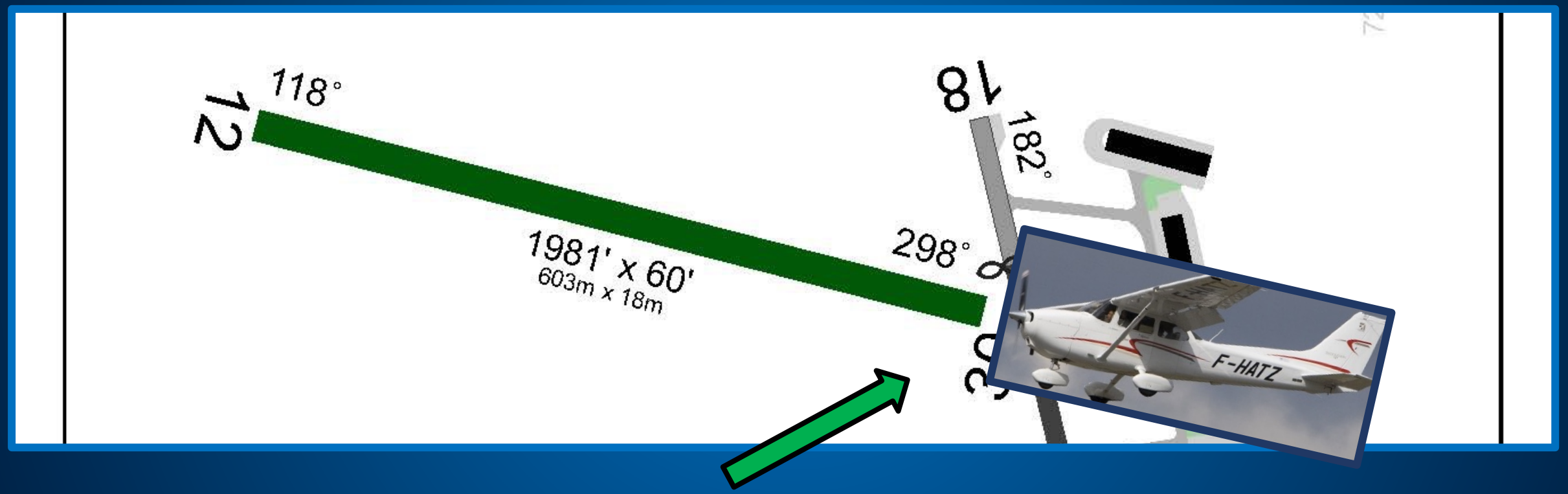
Ground Roll – 885 Feet from Start of Takeoff



Where will you position the airplane for Takeoff?



Where will you position the airplane for Takeoff?



Where will you position the airplane for Takeoff?

THOU SHALT NOT WASTE RUNWAY !!

3 things that are USELESS to a pilot:

- **Altitude above**
- **Fuel in the fuel farm**
- **Runway behind**

Ground Roll – Abort Point

Runway length…..1981 feet

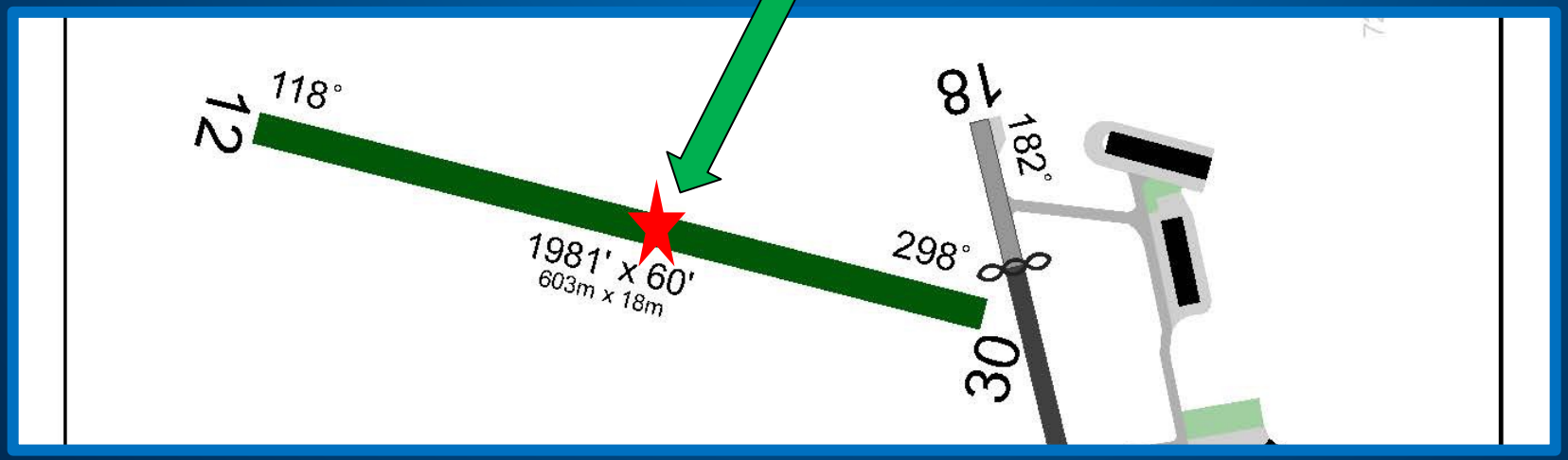
Calculated takeoff roll / ABORT POINT…..885 feet

What fraction of the runway is the Abort Point?

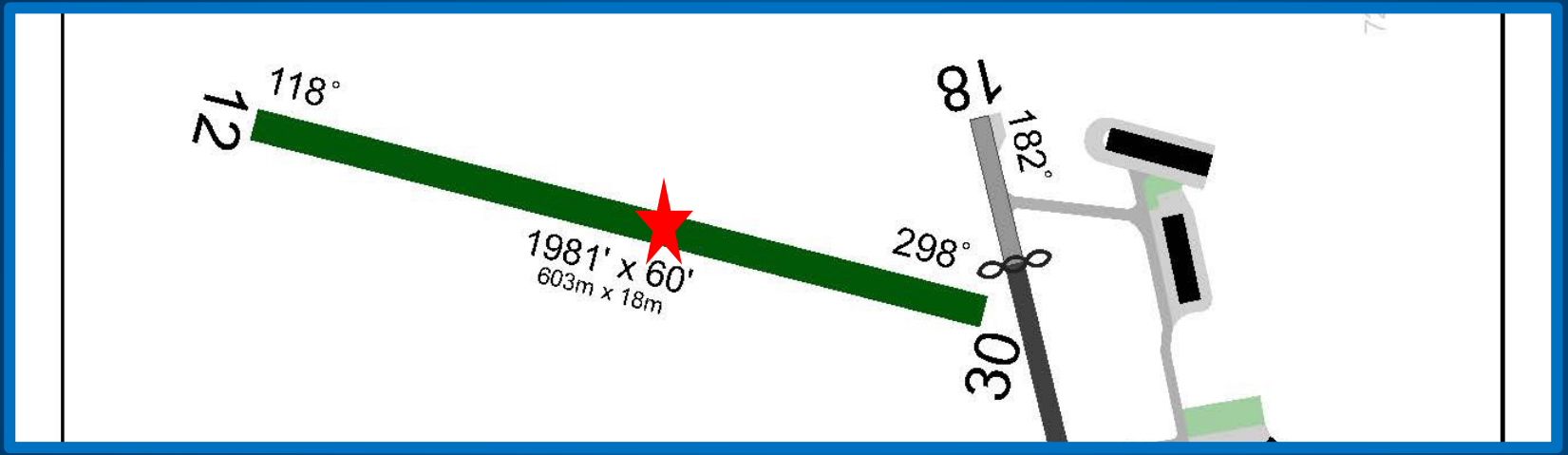
885 / 1981 = 0.4467 or roughly 45 percent of the runway length

Ground Roll – Abort Point

- Runway length…..1981 feet
- Calculated takeoff roll / ABORT POINT…..885 feet
- What fraction of the runway is the Abort Point?
- 885 / 1981 = 0.4467 or roughly 45% of the runway length



Ground Roll – Abort Point



So you decide to Reject – What is your Stopping Distance??

SHORT FIELD LANDING DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 61 KIAS

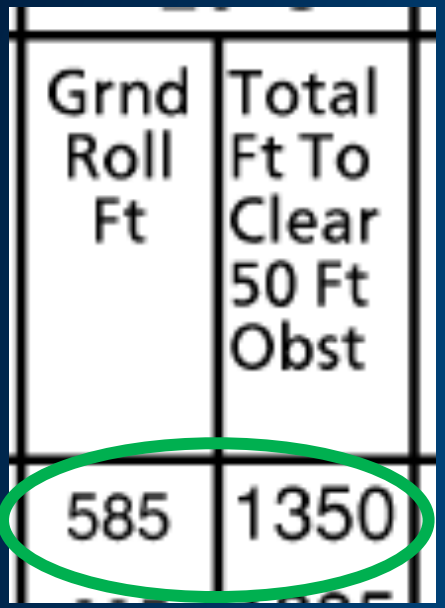
Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	545	1290	565	132[illegible]	585	1350	[illegible]05	1380	625	1415
1000	565	1320	585	1350	[illegible]	[illegible]	625	1420	650	1450
2000	585	1355	610	1385	630	1420	650	1455	670	1490
3000	610	1385	630	1425	655	1460	675	1495	695	1530
4000	630	1425	655	1460	675	1495	700	1535	725	1570
5000	655	1460	680	1500	705	1535	725	1575	750	1615
6000	680	1500	705	1540	730	1580	755	1620	780	1660
7000	705	1545	730	1585	760	1625	785	1665	810	1705
8000	735	1585	760	1630	790	1670	815	1715	840	1755

NOTES:

1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation on dry, grass runway, increase distances by 45% of the "ground roll" figure.
4. If landing with flaps up, increase the approach speed by 9 KIAS and allow for 35% longer distances.

Figure 5-11. Short Field Landing Distance

So you decide to Reject – What is your Stopping Distance??



CESSNA
MODEL 172S

SECTION 5
PERFORMANCE

SHORT FIELD LANDING DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 61 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
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2000	585	1355	610	1385	630	1420	650	1455	670	1490
3000	610	1385	630	1425	655	1460	675	1495	695	1530
4000	630	1425	655	1460	675	1495	700	1535	725	1570
5000	655	1460	680	1500	705	1535	725	1575	750	1615
6000	680	1500	705	1540	730	1580	755	1620	780	1660
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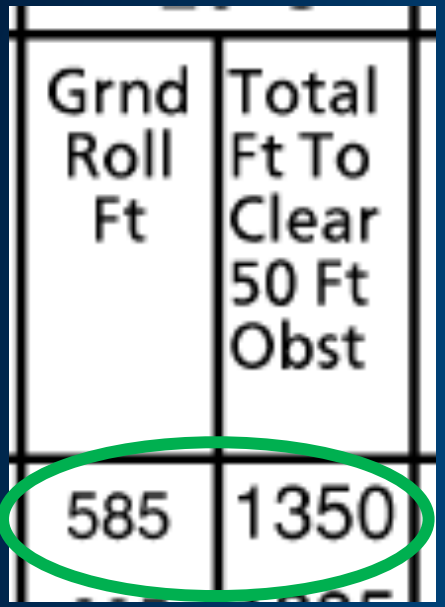
Figure 5-11. Short Field Landing Distance

Revision 4

5-23/5-24

So you decide to Reject – What is your Stopping Distance??



SHORT FIELD LANDING DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 61 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	545	1290	565	132[illegible]	585	1350	[illegible]05	1380	625	1415
1000	565	1320	585	1350	[illegible]	[illegible]	625	1420	650	1450
2000	585	1355	610	1385	630	1420	650	1455	670	1490
3000	610	1385	630	1425	655	1460	675	1495	695	1530
4000	630	1425	655	1460	675	1495	700	1535	725	1570
5000	655	1460	680	1500	705	1535	725	1575	750	1615
6000	680	1500	705	1540	730	1580	755	1620	780	1660
7000	705	1545	730	1585	760	1625	785	1665	810	1705
8000	735	1585	760	1630	790	1670	815	1715	840	1755

NOTES:

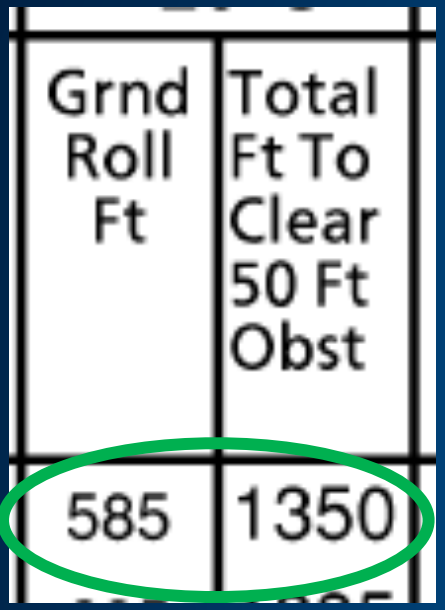
1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 knots.
3. For operation on dry, grass runway, increase distances by 45% of the "ground roll" figure.
4. If landing with flaps up, increase the approach speed by 9 KIAS and allow for 35% longer distances.

Figure 5-11. Short Field Landing Distance

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 61 KIAS

So you decide to Reject – What is your Stopping Distance??



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MODEL 172S

SECTION 5
PERFORMANCE

SHORT FIELD LANDING DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 61 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
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Figure 5-11. Short Field Landing Distance

Revision 4

5-23/5-24

NOTES:

1. Short field technique as specified in Section 4:

SHORT FIELD LANDING

1. Airspeed -- 65-75 KIAS (flaps UP).

2. Wing Flaps -- FULL DOWN (30°).

3. Airspeed -- 61 KIAS (until flare).

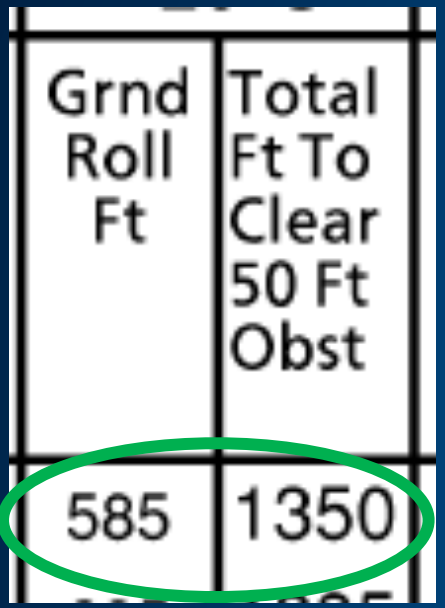
4. Power -- REDUCE to idle after clearing obstacle.

5. Touchdown -- MAIN WHEELS FIRST.

6. Brakes--APPLY HEAVILY.

7. Wing Flaps -- RETRACT.

So you decide to Reject – What is your Stopping Distance??



SHORT FIELD LANDING DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 61 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
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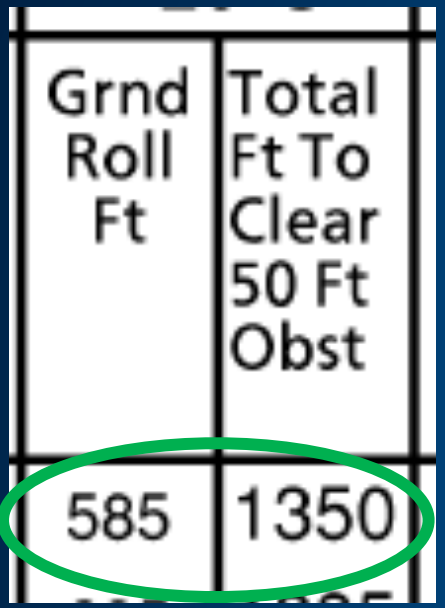
4. If landing with flaps up, increase the approach speed by 9 KIAS and allow for 35% longer distances.

Figure 5-11. Short Field Landing Distance

NOTES:

1. Short field technique as specified in Section 4.
2. Decrease distances 10% for each 9 knots headwind. For operation with tail winds up to 10 knots, increase distances by 10% for each 2 kts.
3.
4.

So you decide to Reject – What is your Stopping Distance??



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SECTION 5
PERFORMANCE

SHORT FIELD LANDING DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 61 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
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Figure 5-11. Short Field Landing Distance

Revision 4

5-23/5-24

NOTES:

1. Short field technique as specified in Section 4.

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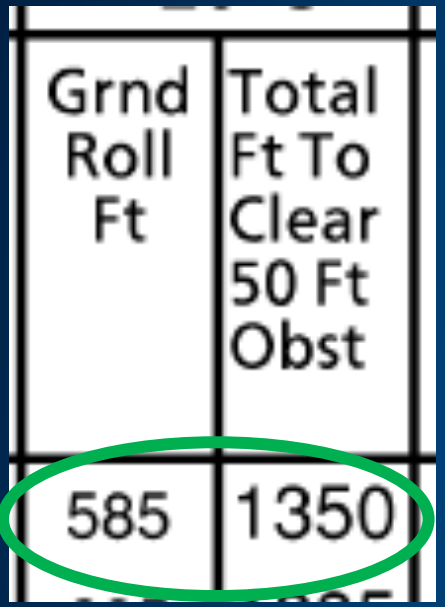

SHORT FIELD LANDING DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 61 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
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Figure 5-11. Short Field Landing Distance

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4. If landing with flaps up, increase the approach speed by 9 KIAS and allow for 35% longer distances.

NOW what's your Stopping Distance??

Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
585	1350

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SECTION 5
PERFORMANCE

SHORT FIELD LANDING DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 61 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	545	1290	565	132[illegible]	585	1350	[illegible]05	1380	625	1415
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Figure 5-11. Short Field Landing Distance

Revision 4

5-23/5-24

"Book" stopping distance ground roll	585 feet
Grass runway, increase by 45% (263')	848 feet
Flaps up, increase by 35% (297')	1,145 ft

Add it up:

Takeoff ground roll	885 feet
Decision/delay runway wasted: 2 seconds at 1NM/Minute or approx. 100 ft/sec	200 feet
Stopping distance:	1,145 ft

NOW what's your Stopping Distance??

Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
585	1350

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SECTION 5
PERFORMANCE

SHORT FIELD LANDING DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 30°
Power Off
Maximum Braking
Paved, level, dry runway
Zero Wind
Speed at 50 Ft: 61 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	545	1290	565	132	585	1350	05	1380	625	1415
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Figure 5-11. Short Field Landing Distance

Revision 4

5-23/5-24

"Book" stopping distance ground roll	585 feet
Grass runway, increase by 45% (263')	848 feet
Flaps up, increase by 35% (297')	1,145 ft

Add it up:

Takeoff ground roll	885 feet
Decision/delay runway wasted: 2 seconds at 1NM/Minute or approx. 100 ft/sec	200 feet
Stopping distance:	1,145 ft

TOTAL accelerate/stop distance:	2,230 ft
Reminder – runway length:	1,981 ft

DANGER, Will Robinson…

You CANNOT safely accelerate/stop on this runway in this airplane under these conditions!!

Ground Roll – Abort Point

- How will you identify the Abort Point while rolling for takeoff?
- Do you have ANY margin for error?

Ground Roll – Abort Point

Do you have any other options for takeoff?

Normal Procedures – Takeoff

LANDING LIGHTS

If landing lights are to be used to enhance the visibility of the airplane in the traffic pattern or enroute, it is recommended that only the taxi light be used. This will extend the service life of the landing light appreciably.

TAKEOFF

POWER CHECK

It is important to check full throttle engine operation early in the takeoff roll. Any sign of rough engine operation or sluggish engine acceleration is good cause for discontinuing the takeoff. If this occurs, you are justified in making a thorough full throttle static runup before another takeoff is attempted. The engine should run smoothly and turn approximately 2300 - 2400 RPM with mixture leaned to provide maximum RPM.

Full throttle run ups over loose gravel are especially harmful to propeller tips. When takeoffs must be made over a gravel surface, it is very important that the throttle be advanced slowly. This allows the airplane to start rolling before high RPM is developed, and the gravel will be blown back of the propeller rather than pulled into it. When unavoidable small dents appear in the propeller blades, they should be immediately corrected as described in Section 8 under Propeller Care.

Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.

After full throttle is applied, adjust the throttle friction lock clockwise to prevent the throttle from creeping back from a maximum power position. Similar friction lock adjustments should be made as required in other flight conditions to maintain a fixed throttle setting.

WING FLAP SETTINGS

Normal takeoffs are accomplished with wing flaps 0°-10°. Using 10° wing flaps reduces the ground roll and total distance over an obstacle by approximately 10 percent. **Flap deflections greater than 10° are not approved for takeoff.** If 10° wing flaps are used for takeoff, they should be left down until all obstacles are cleared and a safe flap retraction speed of 60 KIAS is reached. On a short field, 10° wing flaps and an obstacle clearance speed of 56 KIAS should be used.

Soft or rough field takeoffs are performed with 10° flaps by lifting the airplane off the ground as soon as practical in a slightly tail low attitude. If no obstacles are ahead, the airplane should be leveled off immediately to accelerate to a higher climb speed. When departing a soft field with an aft C.G. loading, the elevator trim should be adjusted towards the nose down direction to give comfortable control wheel forces during the initial climb.

CROSSWIND TAKEOFF

Takeoffs into strong crosswind conditions normally are performed with the minimum flap setting necessary for the field length, to minimize the drift angle immediately after takeoff. With the ailerons partially deflected into the wind, the airplane is accelerated to a speed slightly higher than normal, then pulled off briskly to prevent possible settling back to the runway while drifting. When clear of the ground, make a coordinated turn into the wind to correct for drift.

ENROUTE CLIMB

Normal enroute climbs are performed with flaps up and **full throttle** and at speeds 5 to 10 knots higher than best rate-of-climb speeds for the best combination of performance, visibility and engine cooling. The mixture should be **full rich** below 3000 feet and may be leaned above 3000 feet for smoother operation or to obtain maximum RPM. For maximum rate of climb, use the best rate-of-climb speeds showing in the Rate of Climb chart in Section 5. If an obstruction dictates the use of a steep climb angle, the best angle-of-climb speed should be used with flaps up and maximum power. Climbs at speeds lower than the best rate-of-climb speed should be of short duration to improve engine cooling.

Takeoff Power Check

LANDING LIGHTS

If landing lights are to be used to enhance the visibility of the airplane in the traffic pattern or enroute, it is recommended that only the taxi light be used. This will extend the service life of the landing light appreciably.

TAKEOFF

POWER CHECK

It is important to check full throttle engine operation early in the takeoff roll. Any sign of rough engine operation or sluggish engine acceleration is good cause for discontinuing the takeoff. If this occurs, you are justified in making a thorough full throttle static runup before another takeoff is attempted. The engine should run smoothly and turn approximately 2300 - 2400 RPM with mixture leaned to provide maximum RPM.

Full throttle run ups over loose gravel are especially harmful to propeller tips. When takeoffs must be made over a gravel surface, it is very important that the throttle be advanced slowly. This allows the airplane to start rolling before high RPM is developed, and the gravel will be blown back of the propeller rather than pulled into it. When unavoidable small dents appear in the propeller blades, they should be immediately corrected as described in Section 8 under Propeller Care.

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Takeoff Power Check (Static RPM)

LANDING LIGHTS

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TAKEOFF

POWER CHECK

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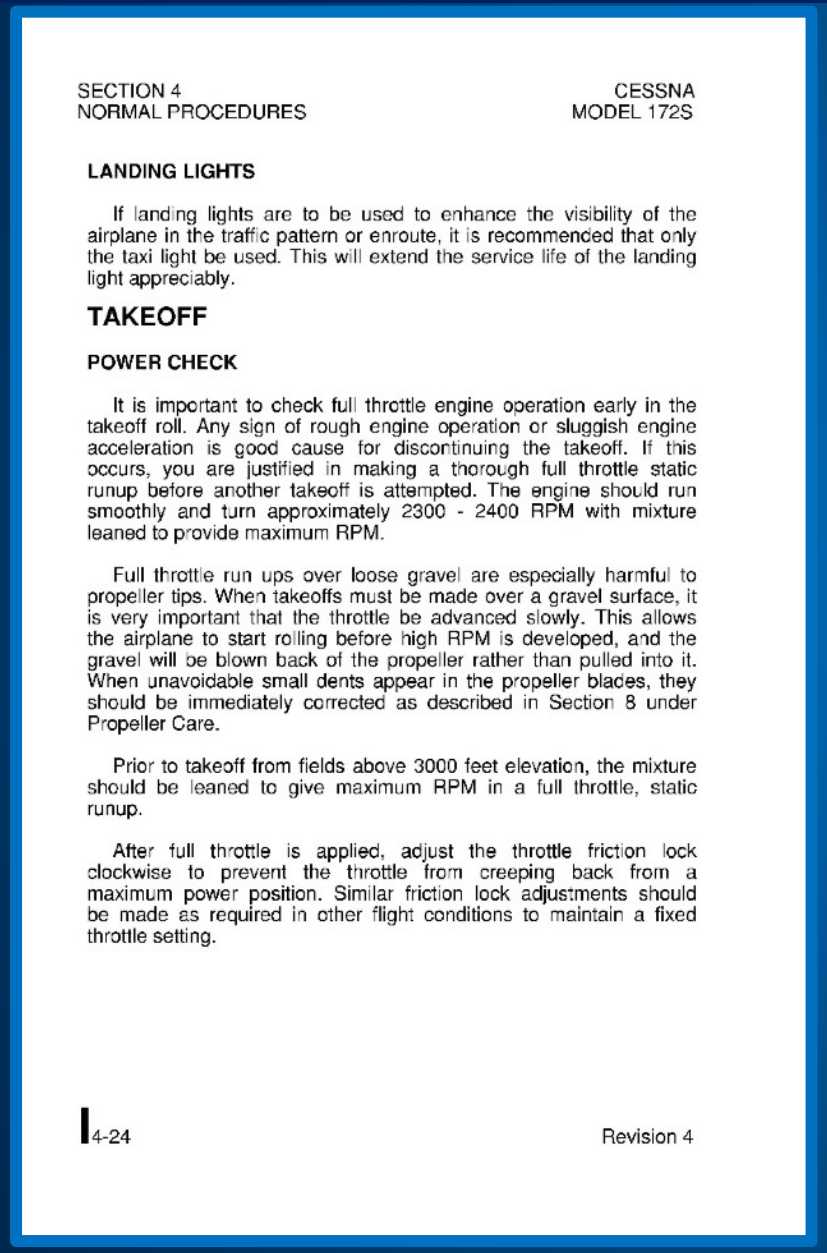
Takeoff Power Check (Static RPM)



SECTION 4
NORMAL PROCEDURES

CESSNA
MODEL 172S

LANDING LIGHTS

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TAKEOFF

POWER CHECK

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Revision 4

Full throttle run ups over loose gravel are especially harmful to propeller tips. When takeoffs must be made over a gravel surface, it is very important that the throttle be advanced slowly. This allows the airplane to start rolling before high RPM is developed, and the gravel will be blown back of the propeller rather than pulled into it….

- **Does this conflict with the Short Field takeoff technique?**

Takeoff Power Check (Static RPM)

LANDING LIGHTS

If landing lights are to be used to enhance the visibility of the airplane in the traffic pattern or enroute, it is recommended that only the taxi light be used. This will extend the service life of the landing light appreciably.

TAKEOFF

POWER CHECK

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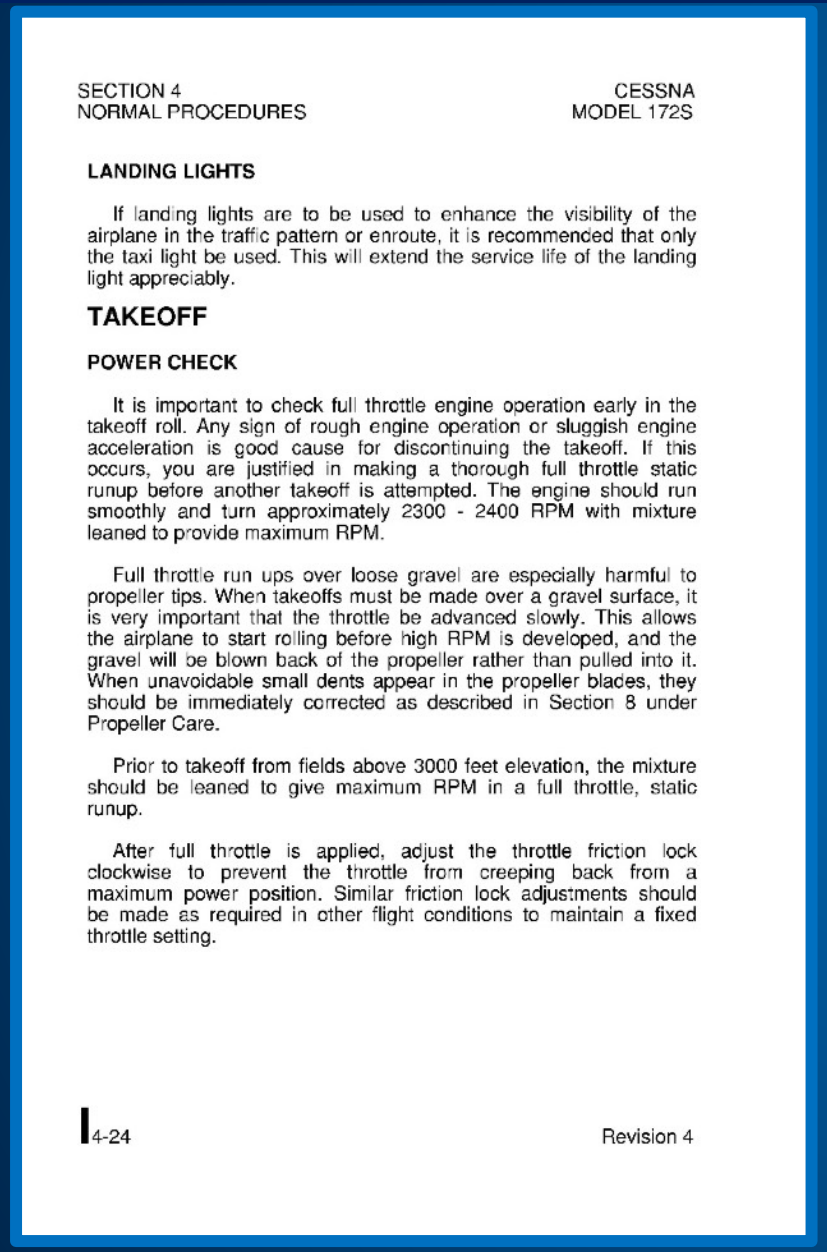
After full throttle is applied, adjust the throttle friction lock clockwise to prevent the throttle from creeping back from a maximum power position. Similar friction lock adjustments should be made as required in other flight conditions to maintain a fixed throttle setting.

Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static run up.

- **Is that 3000 feet FIELD elevation? Pressure altitude? Density altitude?**

Takeoff Power Check (Static RPM)



SECTION 4
NORMAL PROCEDURES

CESSNA
MODEL 172S

LANDING LIGHTS

If landing lights are to be used to enhance the visibility of the airplane in the traffic pattern or enroute, it is recommended that only the taxi light be used. This will extend the service life of the landing light appreciably.

TAKEOFF

POWER CHECK

It is important to check full throttle engine operation early in the takeoff roll. Any sign of rough engine operation or sluggish engine acceleration is good cause for discontinuing the takeoff. If this occurs, you are justified in making a thorough full throttle static runup before another takeoff is attempted. The engine should run smoothly and turn approximately 2300 - 2400 RPM with mixture leaned to provide maximum RPM.

Full throttle run ups over loose gravel are especially harmful to propeller tips. When takeoffs must be made over a gravel surface, it is very important that the throttle be advanced slowly. This allows the airplane to start rolling before high RPM is developed, and the gravel will be blown back of the propeller rather than pulled into it. When unavoidable small dents appear in the propeller blades, they should be immediately corrected as described in Section 8 under Propeller Care.

Prior to takeoff from fields above 3000 feet elevation, the mixture should be leaned to give maximum RPM in a full throttle, static runup.

After full throttle is applied, adjust the throttle friction lock clockwise to prevent the throttle from creeping back from a maximum power position. Similar friction lock adjustments should be made as required in other flight conditions to maintain a fixed throttle setting.

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Revision 4

After full throttle is applied, adjust the throttle friction lock clockwise to prevent the throttle from creeping back from a maximum power position…

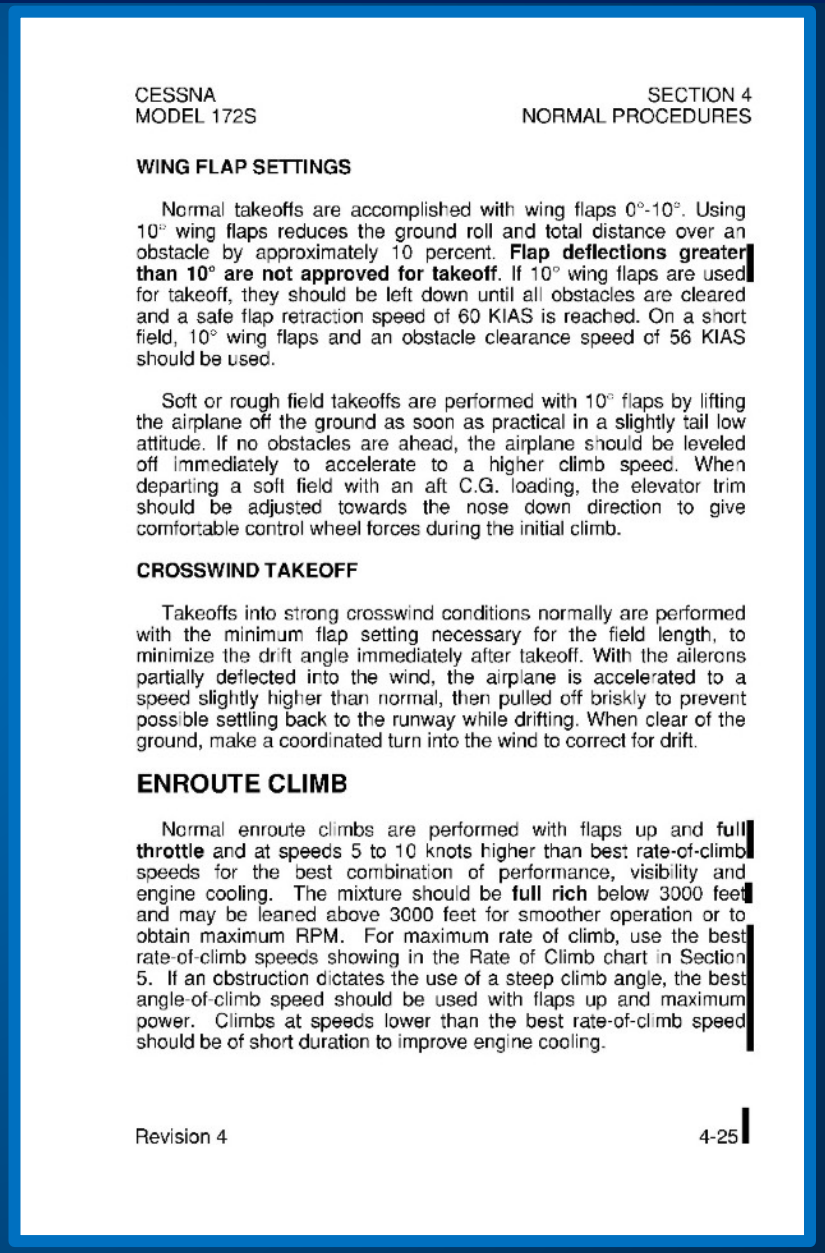
- **Could a tight friction lock cause problems if the pilot decides to reject the takeoff?**

Normal Procedures – Takeoff

Normal takeoffs are accomplished with wing flaps 0°-10°. Using 10° wing flaps reduces the ground roll and total distance over an obstacle by approximately 10 percent. Flap deflections greater than 10° are not approved for takeoff.

If 10° wing flaps are used for takeoff, they should be left down until all obstacles are cleared and a safe flap retraction speed of 60 KIAS is reached.

On a short field, 10° wing flaps and an obstacle clearance speed of 56 KIAS should be used.



CESSNA
MODEL 172S

SECTION 4
NORMAL PROCEDURES

WING FLAP SETTINGS

Normal takeoffs are accomplished with wing flaps 0°-10°. Using 10° wing flaps reduces the ground roll and total distance over an obstacle by approximately 10 percent. **Flap deflections greater than 10° are not approved for takeoff.** If 10° wing flaps are used for takeoff, they should be left down until all obstacles are cleared and a safe flap retraction speed of 60 KIAS is reached. On a short field, 10° wing flaps and an obstacle clearance speed of 56 KIAS should be used.

Soft or rough field takeoffs are performed with 10° flaps by lifting the airplane off the ground as soon as practical in a slightly tail low attitude. If no obstacles are ahead, the airplane should be leveled off immediately to accelerate to a higher climb speed. When departing a soft field with an aft C.G. loading, the elevator trim should be adjusted towards the nose down direction to give comfortable control wheel forces during the initial climb.

CROSSWIND TAKEOFF

Takeoffs into strong crosswind conditions normally are performed with the minimum flap setting necessary for the field length, to minimize the drift angle immediately after takeoff. With the ailerons partially deflected into the wind, the airplane is accelerated to a speed slightly higher than normal, then pulled off briskly to prevent possible settling back to the runway while drifting. When clear of the ground, make a coordinated turn into the wind to correct for drift.

ENROUTE CLIMB

Normal enroute climbs are performed with flaps up and **full throttle** and at speeds 5 to 10 knots higher than best rate-of-climb speeds for the best combination of performance, visibility and engine cooling. The mixture should be **full rich** below 3000 feet and may be leaned above 3000 feet for smoother operation or to obtain maximum RPM. For maximum rate of climb, use the best rate-of-climb speeds showing in the Rate of Climb chart in Section 5. If an obstruction dictates the use of a steep climb angle, the best angle-of-climb speed should be used with flaps up and maximum power. Climbs at speeds lower than the best rate-of-climb speed should be of short duration to improve engine cooling.

Revision 4

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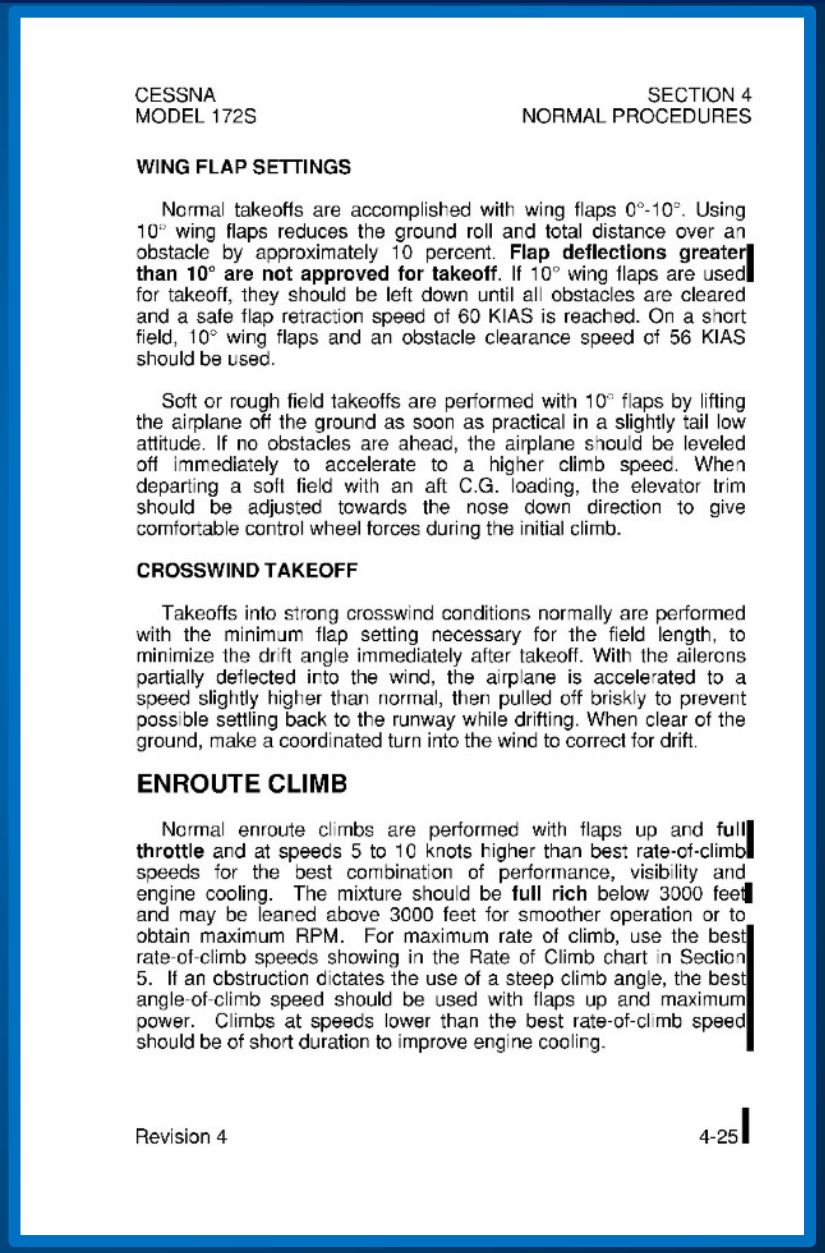
Normal Procedures – Soft/Rough Field

Soft or rough field takeoffs are performed with 10° flaps by lifting the airplane off the ground as soon as practical in a slightly tail low attitude.

- **In this case, the field is rough AND short AND with obstacles!**



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CROSSWIND TAKEOFF

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Normal Procedures – Soft/Rough Field

If no obstacles are ahead, the airplane should be leveled off immediately to accelerate to a higher climb speed.

- Note: That is NOT the case with this takeoff. This takeoff has obstacles!

WING FLAP SETTINGS

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Taking the Runway

- **Confirm (verbalize):**
  - Takeoff clearance or CTAF announcement
  - Verify correct runway (compass, H/I or HIS, other indicators)
  - Runway and flight path clear (check base, final, the runway itself, crossing runways, crossing taxiways, etc.)

Powering Up – Verbal Callouts:

- Oil pressure ..... CHECK
- Tachometer ..... > Minimum Static RPM
- Manifold Pressure (if equipped) ..... CHECK
- Airspeed Indicator ..... ALIVE
- Airspeed Indicator ..... > 70% of Rotation Speed by 50% of your predicted GROUND ROLL!!! (Not “runway length!!!”)
- Rotate ... Airspeed Vr and aircraft airborne NO LATER THAN Abort Point
- Airspeed ..... Vx, Vy, or other as appropriate
- Rate of Climb ..... Approximates your prediction
- Gear, Flaps, other lift devices ..... Retract as appropriate

Power Loss at 300 Feet:

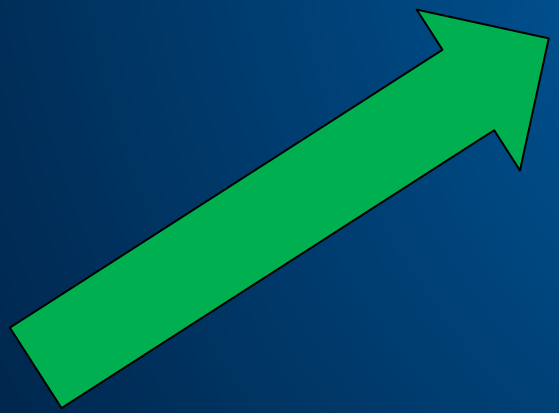
What Went Wrong, What Went Right

mentorlive.site/program/52.html

Thursday, July 28, 2022
11:30 AM – 12:45 PM
Power Loss at 300 Feet
Forum Stage 5: Scheme Designers

"Under pressure, you do not rise to the occasion, you sink to the level of your training"

"Under pressure, you do not rise to the occasion, you sink to the level of your training and recent practice"



Brain Freeze

"These factors [stress response] add up to the physiological definition of loss of situational awareness. When you are suffering from tunneled senses your situational awareness and big picture perception [are] pretty much

gone..."

BRAIN FREEZE: PART ONE

October 1, 2018 By Kenneth Stahl, MD, FACS, AOPA Pilot Protection Services

ANC/ANR Headsets

What can we do to be READY in case of low-altitude power loss?

1.
2.
3.
4.
5.
6. …etc…

YouTube channel:

bit.ly/training-videos-1

Discussion

Thank you for participating

You are vital members of our GA safety community!

Thank you for attending

Philip Mandel, CFI-I, MEI, AGI, IGI

flyphil.INFO
phmand@gmail.com
Cell: 503-887-0889

bit.ly/training-videos-1

mentorlive.site/program/52.html