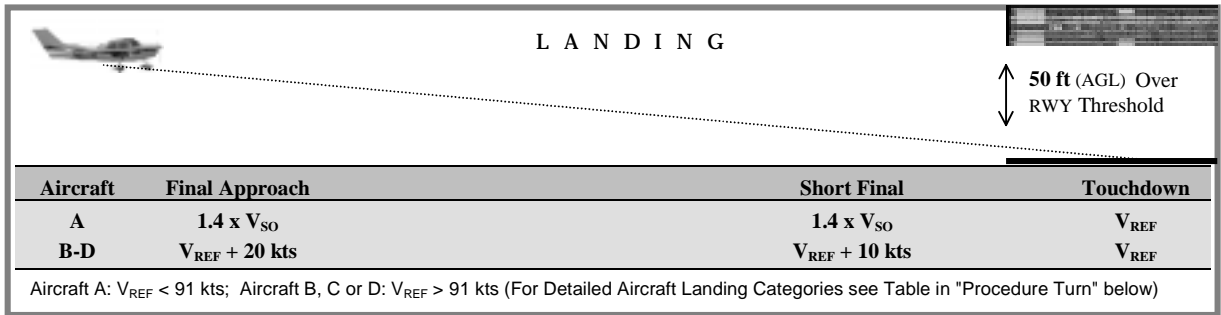


FREEWARE

Glide Slope	
NM	Feet
15	4780
14	4460
13	4140
12	3820
11	3500
10	3180
9	2870
8	2550
7	2230
6	1910
5	1590
4	1270
3	960
2	640
1	320
0.5	160
Thr	50
TD	0



Rules of Thumb

- (a) **TOD** (Top of Descent) = 3 x (Current Altitude - Airport Elevation) (e.g. 3 x 39,000ft - 1,500ft elev = 113nm from airport). Use (b) to set the appropriate vertical speed based on TAS. Add 10% for unexpected tail wind.
- (b) **Descent Rate** (for 3° glide slope) = 5 x TAS (e.g. 5 x 400KTAS = 1200ft/min).
- (c) **Descent Altitude Check** = glide slope angle x 100 x Distance from RWY in nm (e.g. 3 x 100ft x 10nm = 3,000ft). For 4°, 400 x Distance; for 5°, 500 x D etc.
- (d) **TAS** = [(IAS x 2%) x (ALT/1,000ft)] + IAS. So, if IAS=300 and ALT=20,000: 300 x 0.02 x 20 + 300 = 420 kts TAS.
- (e) **Bank Angle** for Std Turns (i.e. Props 3°/s or 360° in 2 min; Jets 1.5°/s or 360° in 4 min). Props: BA = (TAS / 10) + 7; Jets: BA = (TAS / 10) x 0.75. Airliners: plan BA to be max. 25° for passenger's comfort.
- (d) **Rollout Angle** = BA / 2. (e.g. current HDG = 090; desired HDG = 270; BA = 30; RA = 30 / 2 = 15; so start RA when HDG 285 (i.e. 15° before reaching HDG 270).

Main V Speeds (kts IAS)

- V₁ takeoff decision speed
- V_R rotate speed
- V₂ takeoff safety speed
- V_S stall speed (clean)
- V_{SO} stall speed (landing configuration)
- V_{REF} landing reference speed (1.3 x V_{SO})
- V_{MC} minimum control speed

N (+)
W (-) + E (+)
S (-)

GMT = Z = UTC

Reciprocal RWY Help

- 36 ↔ 18
- 01 ↔ 19
- 02 ↔ 20
- 03 ↔ 21
- 04 ↔ 22
- 05 ↔ 23
- 06 ↔ 24
- 07 ↔ 25
- 08 ↔ 26
- 09 ↔ 27
- 10 ↔ 28
- 11 ↔ 29
- 12 ↔ 30
- 13 ↔ 31
- 14 ↔ 32
- 15 ↔ 33
- 16 ↔ 34
- 17 ↔ 35
- 18 ↔ 36

GS = TAS - Headwind Comp. or GS = TAS + Tailwind Comp.

Set altimeter to 1013hPa/29.92inHg passing through transition level (USA 18,000ft; NZ 11,000up/13,000dwn)

MET reports' WINDS are in TRUE North; ATC reported WINDS are MAG North

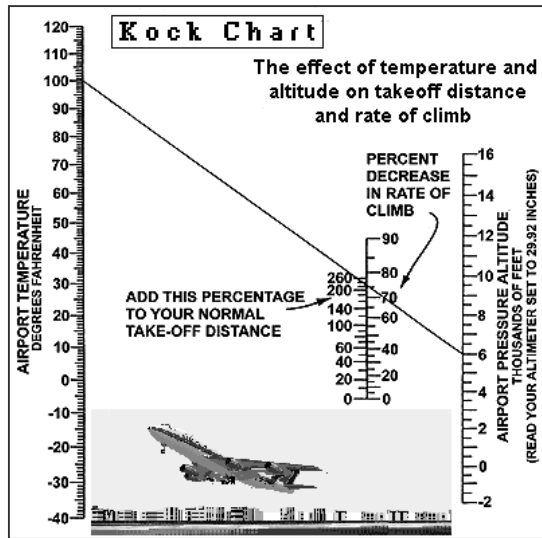
Standard 3° Glide Slope
Distance from RWY Threshold
Feet Above Ground Level

ANGLE BETWEEN WIND DIRECTION AND TRUE COURSE

Wind Speed	Angle									
	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
10	10	18	27	36	45	54	63	72	81	90
20	20	36	54	72	90	108	126	144	162	180
30	30	54	81	108	135	162	189	216	243	270
40	40	72	108	151	189	227	264	301	338	375
50	50	90	135	189	243	297	351	405	459	513
60	60	108	162	216	270	324	378	432	486	540
70	70	126	189	243	301	351	405	459	513	567

HEADWIND/TAILWIND AND CROSSWIND COMPONENTS

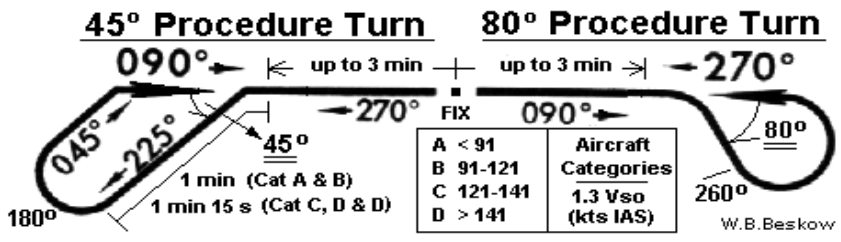
Triangles: Upper-left shows headwind or tailwind component depending on whether the wind is coming from ahead or behind. Lower-right shows left or right crosswind component also depending on wind direction.



Don't debug anything on final, GO AROUND!

°C	°F
-60	↔ -76
-50	↔ -58
-30	↔ -22
-25	↔ -13
-20	↔ -4
-15	↔ 5
-10	↔ 14
-5	↔ 23
0	↔ 32
5	↔ 41
10	↔ 50
15	↔ 59
20	↔ 68
25	↔ 77
30	↔ 86
35	↔ 95
40	↔ 104
50	↔ 122

- A ALPHA
- B BRAVO
- C CHARLIE
- D DELTA
- E ECHO
- F FOXTROT
- G GOLF
- H HOTEL
- I INDIA
- J JULIET
- K KILO
- L LIMA
- M MIKE
- N NOVEMBER
- O OSCAR
- P PAPA
- Q QUEBEC
- R ROMEO
- S SIERRA
- T TANGO
- U UNIFORM
- V VICTOR
- W WISKEY
- X XRAY
- Y YANKEE
- Z ZULU

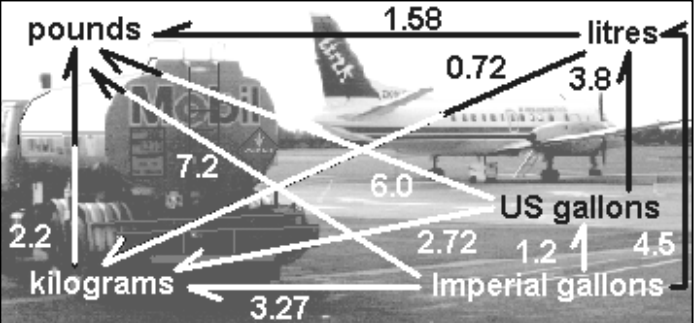


CONVERSIONS

1 ft = 0.305 m
1 kts = 1 NM / hour
1 NM = 1.1516 SM = 1.853 km
1 SM = 0.8683 NM = 1.609 km

Air Pressure
inHg → hPa
33.86

(follow multiply, back divide)



A small correction early is better than a big correction late