Rules of thumb

(errors at most 5% unless stated)

Units used

- Horizontal distances in nautical miles.
- Horizontal speed in knots.
- Angles in degrees.
- Pressure in hectopascals.
- Altitude/height in feet.
- Vertical speed in feet per minute.
- Gradients in percent.
- Temperature in degree Celsius.

Altitude and airspeed

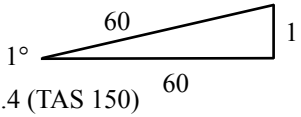
true altitude correction ≈ 4 × ISA deviation × height above datum/1000
(> 5% error but this is the generally accepted rule of thumb)
pressure altitude correction ≈ 27 × pressure deviation [× 3 – 10%]
density altitude correction ≈ 1000 × ISA deviation/8 (≈ +10% error)
(118.8 × ISA deviation is better, < 5% error)

TAS ≈ CAS increased by 1% × density altitude/700 (disregarding compressibility)

Navigation

sin x ≈ x/60 (up to 40°)
sin 30° = 0.5, sin 45° ≈ 0.7, sin 60° ≈ 0.9

1 in 60-rule



wca ≈ x-wind × 2/3 (TAS 90), × 1/2 (TAS 120), × 0.4 (TAS 150)

Turns

Diameter of rate 1 turn: TAS/100 (–6% error) or 40 seconds
Bank for rate 1 turn: TAS/7+1 or 14° (TAS 90), 18° (TAS 120), 22° (TAS 150)

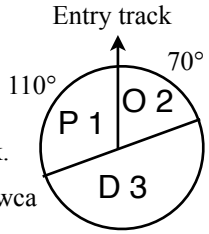
Gradients

height ≈ 100 × angle × distance (–6% error)
VS ≈ gradient × GS
5 % gradient ≈ 3° angle

Descent planning

Start descent at distance = altitude to descend / 1000 × factor:
500 fpm: ×3 (FPA 3.1° at GS 90), ×4 (FPA 2.4° at GS 120) , ×5 (FPA 1.9° at GS 150)
700 fpm: ×3 (FPA 3.3° at GS 120), ×4 (FPA 2.6° at GS 150, +12% error)

Holding / Racetrack



Relative position of *outbound* track while on *entry* track determines entry type. For left turns, use mirror image.

On direct entry, at 90° from inbound track, fly straight for 2 seconds per 10° entry track offset from inbound track.

Outbound (dead reckoning) wca ≈ 2 × inbound (tracking) wca

Outbound timing correction:
add/subtract (in seconds) ≈ the head/tailwind × the nominal time (in minutes).

Semicircular levels < (180°M - 359°M) EVEN ODD (000°M - 179°M) >

Phonetic and morse codes (English/Swedish)

Alpha	Adam	· –	Papa	Petter	· – – ·
Bravo	Bertil	– · · ·	Quebec	Qvintus	– – · –
Charlie	Cesar	– · – ·	Romeo	Rudolf	· – ·
Delta	David	– · ·	Sierra	Sigurd	· · ·
Echo	Erik	·	Tango	Tore	–
Foxtrot	Filip	· · – ·	Uniform	Urban	· · –
Golf	Gustav	– – ·	Victor	Viktor	· · · –
Hotel	Helge	· · · ·	Whiskey	Wilhelm	· – –
India	Ivar	· ·	X-ray	Xerxes	– · · –
Juliett	Johan	· – – –	Yankee	Yngve	– · – –
Kilo	Kalle	– · –	Zulu	Zäta	– – · ·
Lima	Ludvig	· – · ·		Åke	· – – · –
Mike	Martin	– –		Ärlig	· – · –
November	Niklas	– ·		Östen	– – – ·
Oscar	Olle	– – –			

Unit conversions

1 NM = 1.852 km [× 2 – 10%]
1 foot = 0.3048 m
1 inch = 25.4 mm

Cat A approach speeds (KIAS)

Initial: 90–150 (110 reversal/racetrack)
Final: 70–100 Circling: ≤ 100
Intermediate missed: ≤ 100
Final missed: ≤ 110

1 kt = 1.852 km/h [× 2 – 10%] ≈ 0.5 m/s ≈ 100 fpm
1 m/s ≈ 200 fpm

1 lbs ≈ 0.454 kg

1 US gal ≈ 3.79 l [× 4 – 5%]

True/magnetic/compass course conversion

Compass course
+ (E) / – (W) Deviation
= Magnetic course
+ (E) / – (W) Variation
= True course

AVGAS mass

1 l ≈ 0.71 kg ≈ 1.6 lbs
1 US gal ≈ 2.7 kg ≈ 5.9 lbs

Flight plan codes

Y: IFR then VFR
Z: VFR then IFR