

# Climbing and descending

## BASIC CONCEPTS

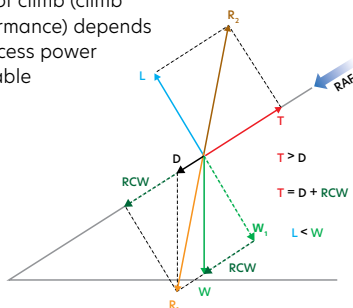
### Objectives

- To enter the climb and the descent from straight and level flight.
- To maintain a climb and a descent at a constant speed, constant rate, in a constant direction and in balance.
- To level off at specific altitudes.

### Principles of flight

#### Climbing

- Aeroplane is in equilibrium when climbing
- Lift is not increased
- **T must be greater than D**
- Rate of climb (climb performance) depends on excess power available



#### Climb performance

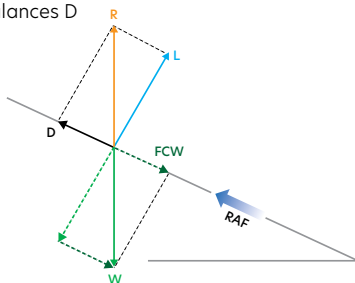
- Power** More power better climb performance
- Altitude** Limits the performance
- Weight** ↑ weight - ↓ rate of climb
- Flap** ↑ drag - ↓ rate of climb
- Wind** Affects climb angle and distance in climb

#### Climb configurations

Performance	Power	Attitude
Best RoC	full	_____ kt
Best AoC		_____ kt
Cruise		_____ kt
Recommended		_____ kt

#### Descending

- Aeroplane is in equilibrium when descending
- Flying speed maintained by lowering nose attitude
- FCW balances D



#### Descent performance

- Power** Controls rate of descent
- L/D ratio** Efficiency of wing, steepness of glide
- Weight** ↑ weight ↑ FCW - ↑ speed down slope
- Flap** Needs ↑ FCW to balance D - ↑ rate of descent
- Wind** Affects descent angle and range

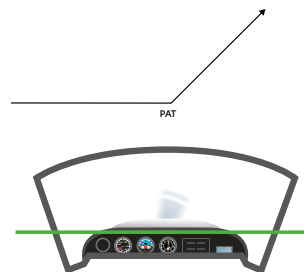
#### Descent configurations

Performance	Power	Attitude
Glide	idle	_____ kt
Powered		_____ kt
Cruise		_____ kt

### Air exercise

#### Climbing

##### Entry



- Power** mixt RICH, full power, balance
- Attitude** climb attitude, wings level, balance
- Trim** to maintain attitude

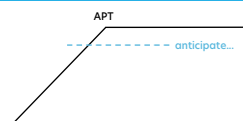
Airspeed = \_\_\_\_\_ RoC = \_\_\_\_\_

Airspeed controlled with attitude

#### Maintaining

- Lookout**
- Attitude** Change - check - hold - trim
- Instruments**

#### Exit



- Attitude** select and hold S+L attitude, adjust as speed increases, balance

- Power** wait for aeroplane to accelerate, then set cruise power, balance

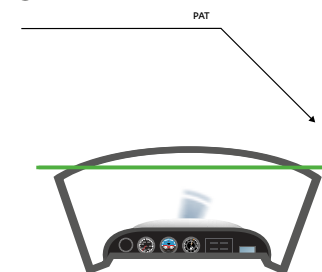
- Trim** to hold S+L attitude

### Airmanship

- Situational awareness - what was, is, and will be
- VFR Met minima
- Minimum and maximum heights
- Lookout - restrictions
- I'M SAFE

#### Descending

##### Entry



- Power** mixt RICH, carb heat HOT, close throttle, balance
- Attitude** hold S+L attitude until glide speed, then set glide attitude
- Trim** to maintain attitude

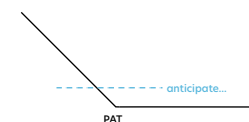
Airspeed = \_\_\_\_\_ RoD = \_\_\_\_\_

Airspeed controlled with attitude

#### Maintaining

- Lookout**
- Attitude** Change - check - hold - trim
- Instruments**

#### Exit



- Power** carb heat COLD, increase power to cruise, balance
- Attitude** simultaneously set to S+L, balance
- Trim** to hold S+L attitude

### Aeroplane management

- Smooth throttle movements
- Mixture RICH
- Carb heat HOT for descent
- Temperatures and pressures

### Human factors

- Trapped gases in ears
- Diving
- Empty sky myopia
- Noise