

Ex. 17 – The Circuit



What you will learn:

- ✓ Circuit patterns used for take-offs and landings at controlled and uncontrolled aerodromes
- ✓ Procedures for joining, following and leaving the circuit pattern.

Why learn this:

- ✓ The skies are most congested around airports
- ✓ It's imperative that everyone follows the same rules for predictability and safety.

Links:

- ✓ You have already practiced:
 - climbs at a variety of airspeeds
 - descents in a variety of configurations
 - straight-and-level flight
 - slips and slipping turns
 - radio work

- ✓ You have learned to recognize and compensate for:
 - effects of wind on airplane track as well as climb and descent performance
 - illusions created by drift

- ✓ You have always looked out for traffic and used your eyes and ears (radio) to be aware of where other planes are.

Let's see how much you already know:

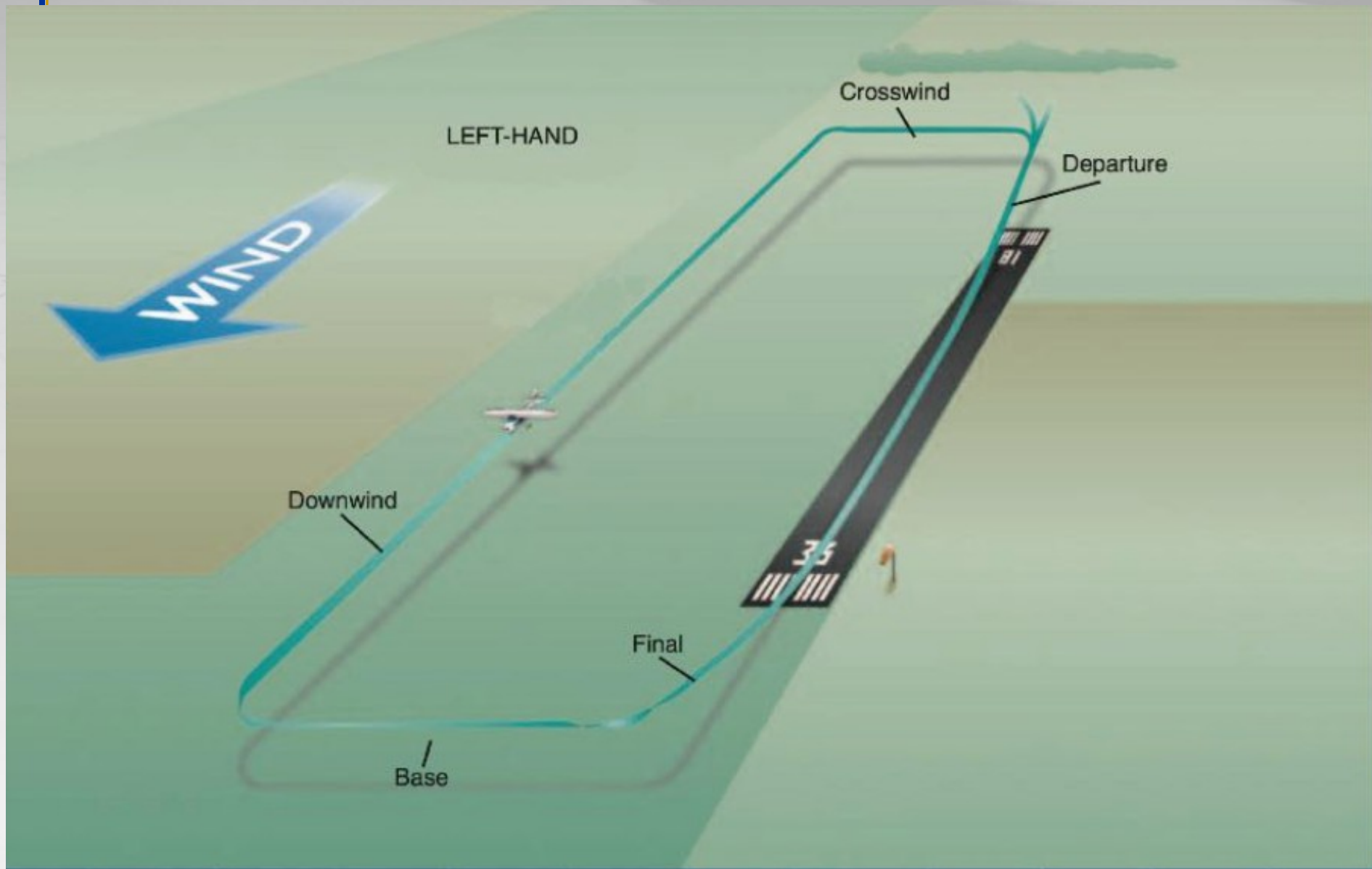
- Q When turning from downwind, what illusion might you experience?
- Q What about turning from into wind?
- Q What items are in the downwind check?
- Q What is wake turbulence and how can it be avoided?
- Q What is the primary consideration when deciding which runway to use for take-offs and landings?

Theories and Definitions:

- ✓ The Circuit Pattern

- ✓ Leaving the Circuit
 - controlled aerodromes
 - uncontrolled aerodromes

- ✓ Joining the Circuit
 - controlled aerodromes
 - uncontrolled aerodromes



The Circuit Pattern

Take-off

Normally done @ 500' AAE

In which direction would you take off?

Final approach

Why is this plane's nose not aligned with the track it's supposed to fly?

What publication will list special circuit procedures for particular aerodromes?

The wind just changed, introducing a crosswind component. How will the plane's heading change on each circuit leg?

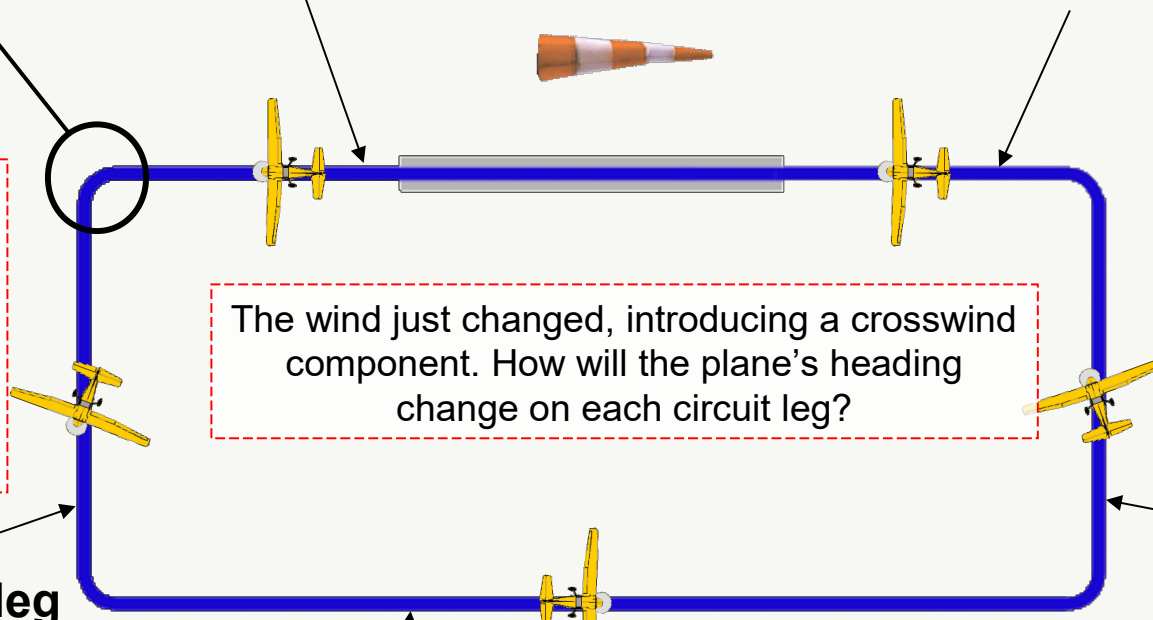
Base leg

Can you think of an exception?

- ✓ Circuits normally flown at 1000' AAE
- ✓ Circuits are typically to the left, though there are exceptions
- ✓ It's important to maintain the plane's TRACK (not heading) to ensure a rectangular pattern

Downwind leg

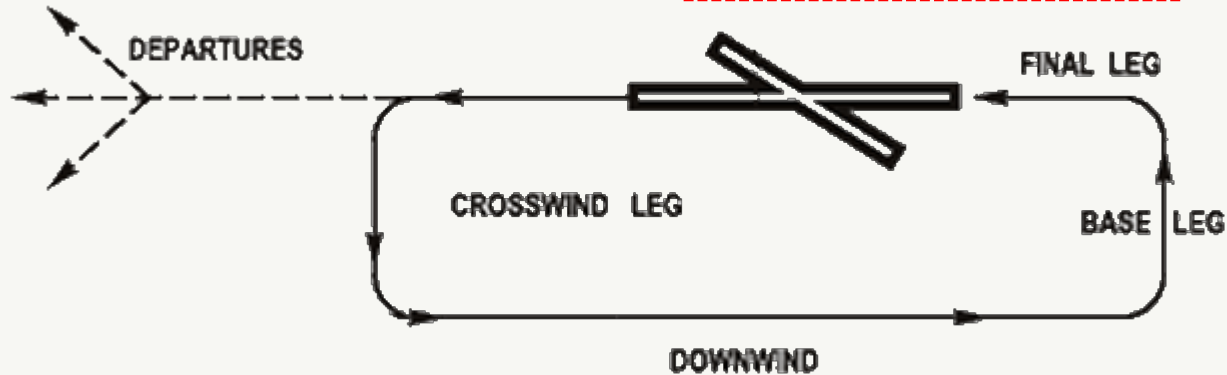
Crosswind leg



Leaving The Circuit Pattern

Controlled Aerodromes

What is the definition of a controlled aerodrome?



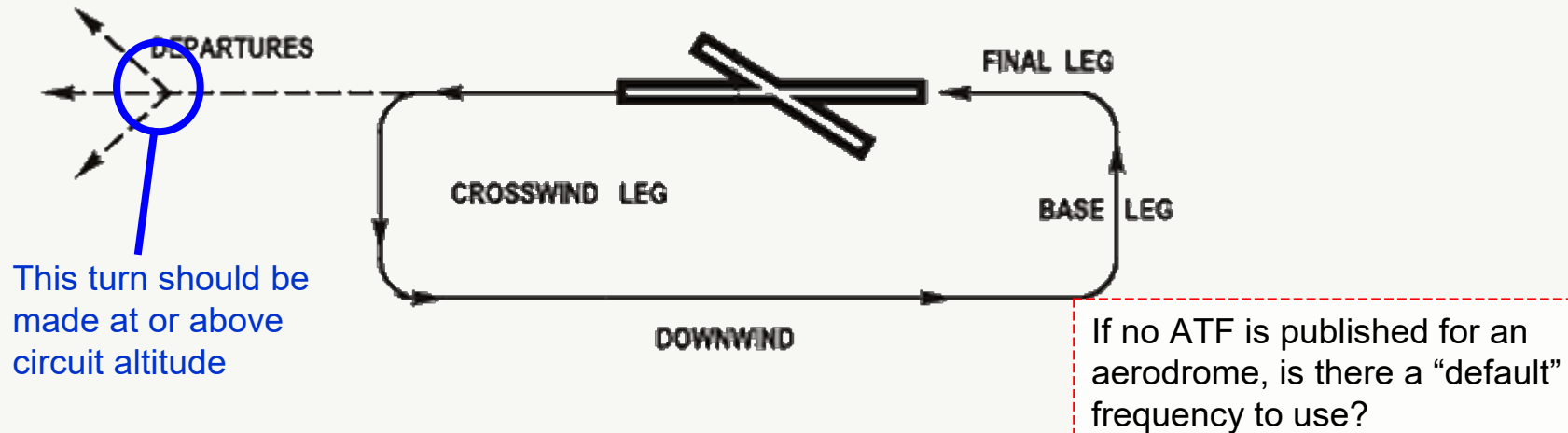
Tower can issue a variety of instructions, e.g.:

- ✓ Left/right turn-out
- ✓ Not above/below xxxx feet
- ✓ Pass north/south of certain landmark

What if you are not familiar with the area/landmark?

Leaving The Circuit Pattern

Uncontrolled Aerodromes



- ✓ You decide on turn-out direction, taking into account:

- geographical features
- airspace structure, noise abatement areas etc.
- other traffic
- your destination

What is the difference between these two frequencies?

- ✓ You state your intentions on Mandatory Frequency (MF) or Aerodrome Traffic Frequency (ATF)

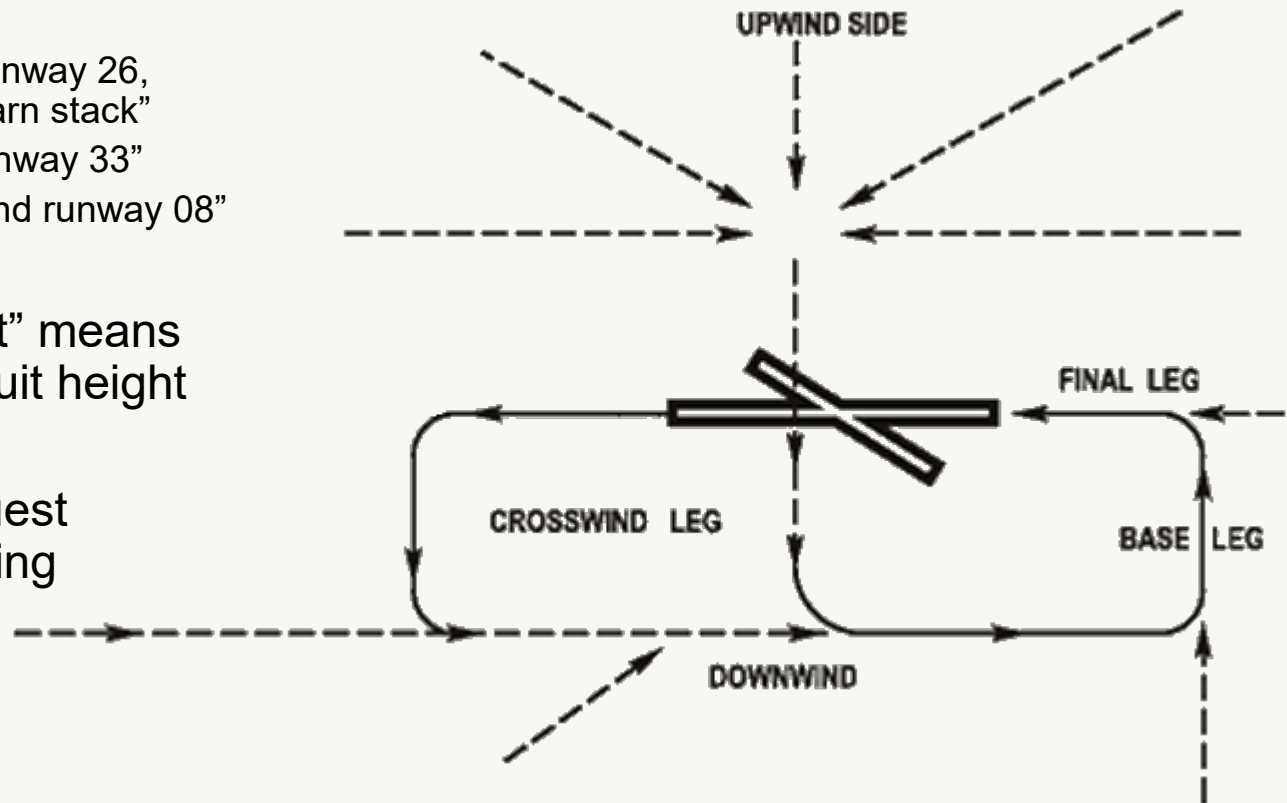
Joining the Circuit Pattern

Controlled Aerodromes

- ✓ Tower will issue instructions on joining the circuit
 - “Cleared straight in, runway 26, report north of the Hearn stack”
 - “Cleared right base runway 33”
 - “Cleared right downwind runway 08”

- ✓ “Cleared to the circuit” means join downwind at circuit height

- ✓ Pilot can always request different runway, joining procedure etc.

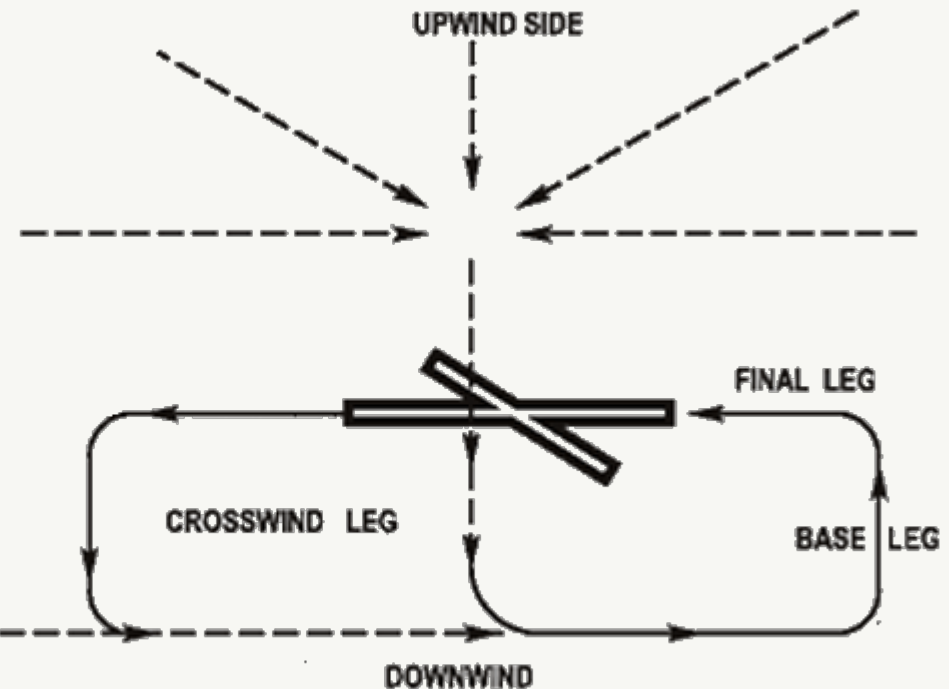


Joining the Circuit Pattern

Uncontrolled Aerodromes

Why the difference between controlled and uncontrolled aerodromes?

- ✓ You decide on how to join the circuit (taking into account wind, your position and other traffic)
- ✓ If no wind information available, overfly the runway at 500' over circuit altitude to look at windsock
- ✓ You state your intentions on the MF or ATF.

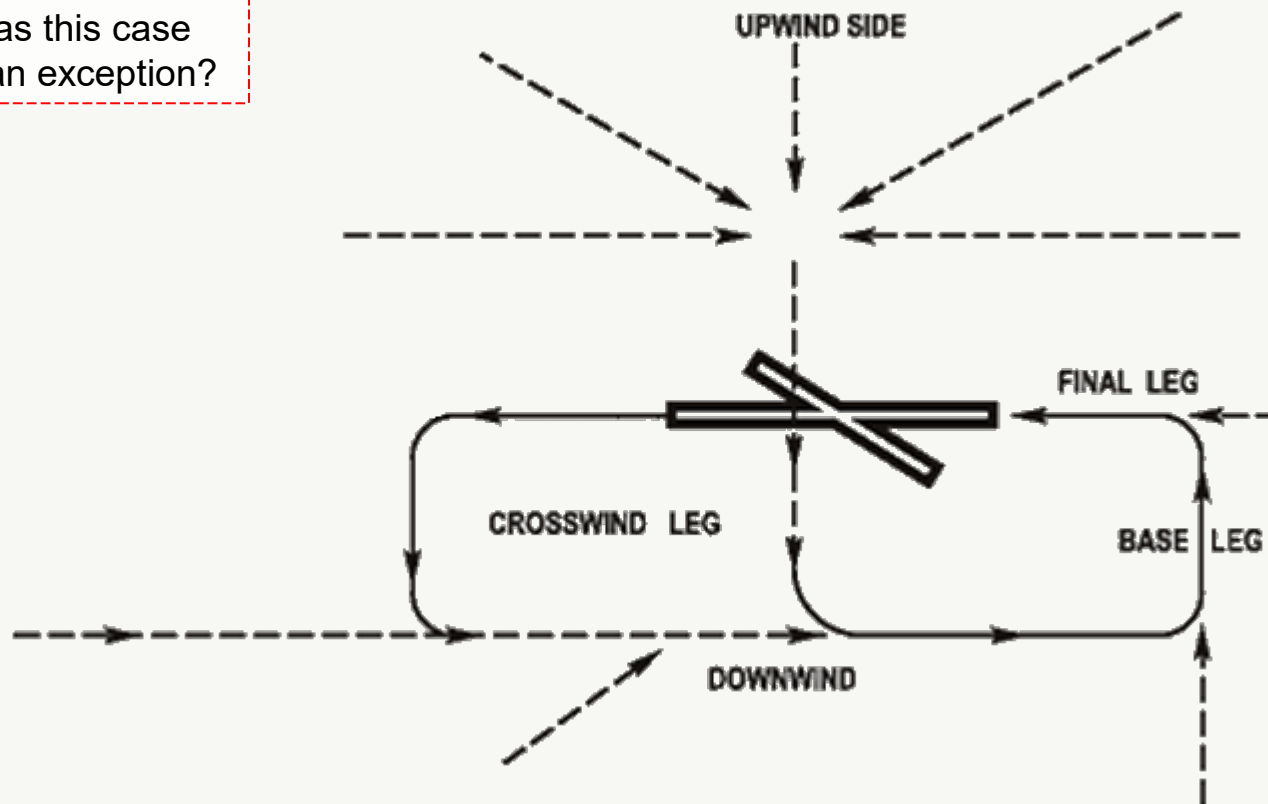


It is often stated that aircraft may only join downwind only if no conflict exists... does it mean it's okay to join from the upwind side if a conflict exists?

Joining the Circuit Pattern

Uncontrolled Aerodromes, Mandatory Frequency, Airport Advisory Information Available

Why was this case made an exception?



Procedures

- ✓ Leaving the Circuit

- ✓ Joining the Circuit
 - controlled aerodrome
 - uncontrolled aerodrome

- ✓ Flying the Circuit.

Leaving the Circuit

- ✓ Keep good **LOOKOUT** at all times!
- ✓ Follow extended runway centerline until at circuit altitude
- ✓ Turn to desired heading
- ✓ No turns back towards the aerodrome/circuit until 500' above circuit altitude
- ✓ At a controlled airport, tower may issue different/additional instructions – follow them.

Joining the Circuit

Controlled Aerodrome

- ✓ **Keep good **LOOKOUT** at all times!**
- ✓ **Obtain ATIS, if available, before entering the control zone**
- ✓ **A few minutes before entering control zone, establish initial contact with the tower** (“City Tower, this is FKWM with information Charlie”)
- ✓ **After tower gets back to you, state:**
 - Who you are
 - Where you are (position and altitude)
 - What you want
- ✓ **Follow tower’s instruction on entering the control zone and joining the circuit.**

Joining the Circuit

Uncontrolled Aerodrome

- ✓ **Keep good **LOOKOUT** at all times!**
- ✓ **Obtain ATIS, AWOS, or weather advisory from ground station (FSS, RCO or UNICOM), if available**
- ✓ **Make updates on frequency**
 - **see handout**
- ✓ **If no wind advisory available, fly over aerodrome at 500' above circuit height to check windsock**
- ✓ **Descend on upwind side, cross overhead the field and join mid-downwind (exception: MF + airport advisory available).**

Are you talking to the ground station or to the other traffic?

Flying the Circuit

- ✓ **After take-off, climb out at V_y , follow extended runway centerline until 500' AAE**
- ✓ **At 500' AAE, turn crosswind**
- ✓ **At 1000' AAE, turn downwind (no climbing or descending on downwind)**
- ✓ **Downwind check**
- ✓ **Reduce power to 1500-1900 rpm (varies due to wind conditions, spacing etc.) and turn base at 45° past threshold**
- ✓ **Extend flaps on base**
- ✓ **Turn final and adjust descent profile to arrive at desired touchdown point**

What type of turns (gentle, medium, steep) should be used in a circuit?

Why not?

How do you control altitude? Airspeed? How do you judge where the plane will touch down?

Considerations

- ✓ Control Zones

- ✓ Different Classes of Airspace
 - equipment required
 - communications required

- ✓ Communication Failure Procedures
 - outside of a control zone
 - in a control zone

Control Zones

- ✓ **Controlled airspace extending upwards from the surface of the earth up to 3,000' AAE (military up to 6,000')**
- ✓ **May be of varying sizes and shapes**
- ✓ **May be of Class B, C, D, E or (rarely) F**
- ✓ **Not always operating with a tower! (so you can have an uncontrolled airport with a control zone)** Can you think of an example?
- ✓ **VFR weather minima for control zones must be met:**
 - 3 statute miles visibility; 500' from cloud vertically, 1 mile from cloud horizontally; at least 500' above surface
- ✓ **Special VFR may be requested by pilot**
 - 1 mile visibility, clear of cloud
 - at night, only authorized for entering the zone to land.

Different Classes of Airspace

Pull out your VNC!

	Who can enter	Communications equipment required	Communications required	Examples
A	IFR only	-	-	Airspace between 18,000' and 60,000' inclusive
B	IFR and VFR	Two-way radio Mode C transponder	Clearance required to enter and operate	Controlled airspace between 12,500' and 18,000'
C	IFR and VFR	Two-way radio Mode C transponder	Clearance required to enter and operate	Control zone of busy airport
D	IFR and VFR	Two-way radio	Two-way communication must be established	CYTZ control zone
E	IFR and VFR	-	-	CYTZ control zone "after hours"
F advisory	IFR and VFR special-use airspace	varies (may be controlled on uncontrolled)	varies (may be controlled or uncontrolled)	training area, parachuting area
F restricted	only aircraft with prior permission!	varies	prior permission required	restricted military airspace
G	IFR and VFR	-	-	most airspace in Canada is Class G

Communications Failure

602.138 Where there is a two-way radiocommunication failure between the controlling air traffic control unit and a VFR aircraft while operating in Class B, Class C or Class D airspace, the pilot-in-command shall

a) leave the airspace

What method of issuing clearances and instructions will the tower use?

- i. where the airspace is a control zone, by landing at the aerodrome for which the control zone is established
- ii. in any other case, by the shortest route

b) where the aircraft is equipped with a transponder, set the transponder to code 7600

c) inform an air traffic control unit as soon as possible of the actions taken pursuant to paragraph (a).

How can you do this with a comm failure?

SAFETY - Communications

- ! Always check CFS and NOTAMs for up-to-date aerodrome information
- ! Keep a good **lookout** for traffic, even when control tower is present
- ! Report updates to your position and intentions
- ! Maintain safe spacing from other traffic How can spacing be maintained? What are the applicable ROW rules?
- ! Follow proper joining procedures and respect right-of-way
- ! Follow all tower instructions if able to do so safely
- ! If not able to follow an instruction safely, inform tower ASAP – an amended instruction will be issued
 - ! example: can't fly over city and overhead the field as Island Air student pilot. Can you think of other examples?

SAFETY - General

! Avoid wake turbulence!

You're turning base following a Dash-8 on short final. How do you avoid its wake turbulence?

! Gentle and medium turns only

! Maintain rectangular pattern using appropriate wind corrections

! Beware of illusions created by drift and do not allow your flying to be influenced by them.

Review

- Q What are the 5 legs of the circuit? What procedures would you follow to fly a circuit from take-off to final approach?
- Q In which direction are circuit turns usually made?
- Q Where can you find out about special procedures used at a particular airport?
- Q What are the procedures for joining the circuit at a controlled airport?
- Q What are the procedures for joining the circuit at an uncontrolled aerodrome?
- Q How do you leave the circuit?

Conclusion

- ✓ Today you learned how to operate safely in the vicinity of controlled and uncontrolled aerodromes
- ✓ The amount of information may seem overwhelming – don't worry, we'll spend the next few lessons perfecting take-offs, circuits and landings

QUESTIONS?