ILS Approach

Version 2 May 2019

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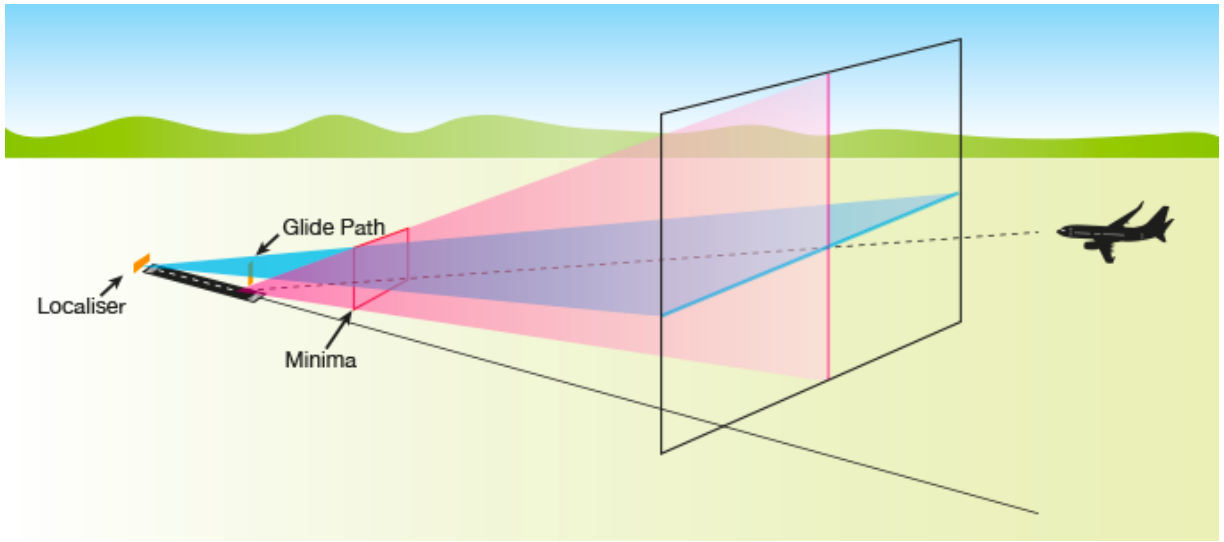
ILS Recap

How ILS works

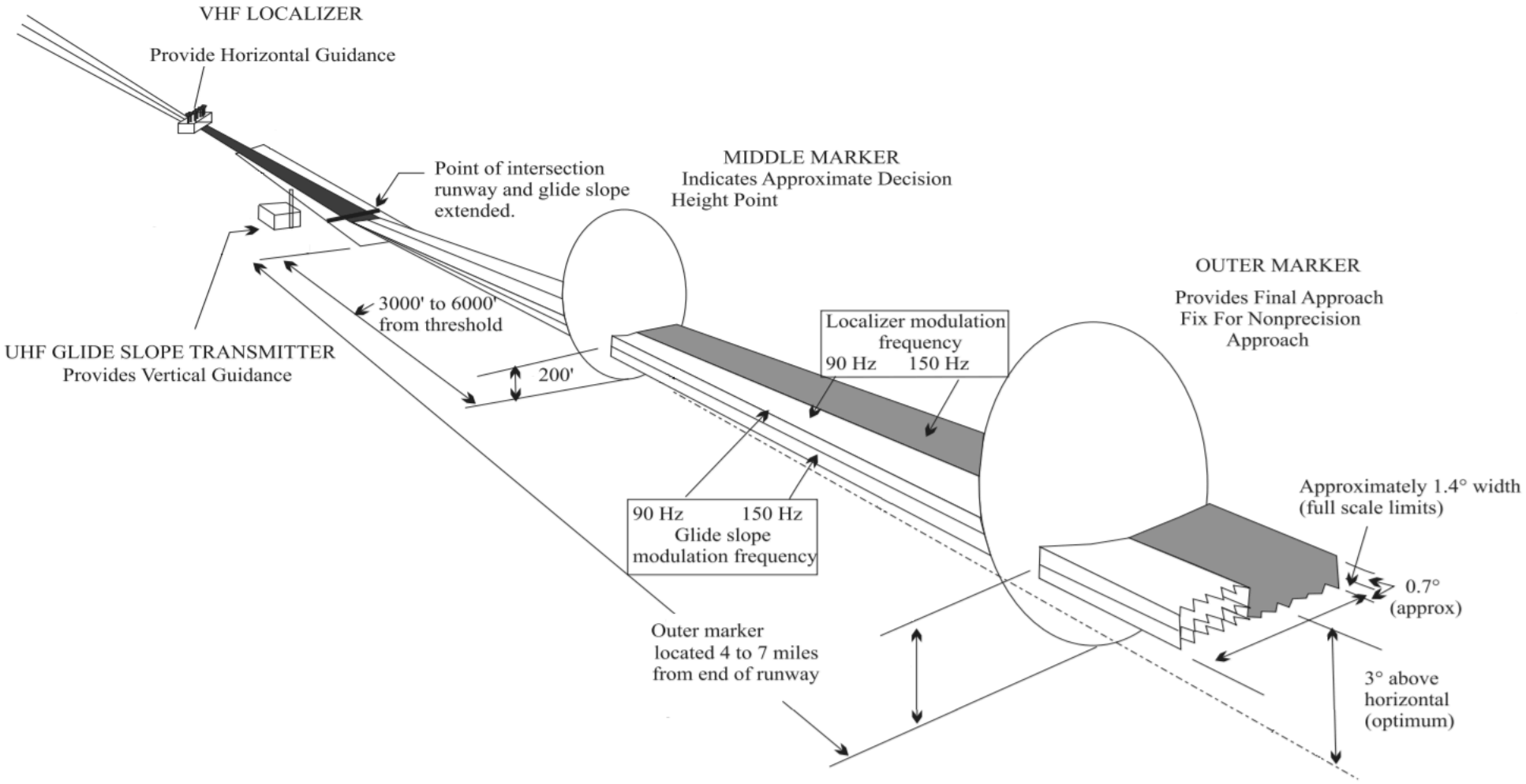


Receiver

Instrument

ILS Detail

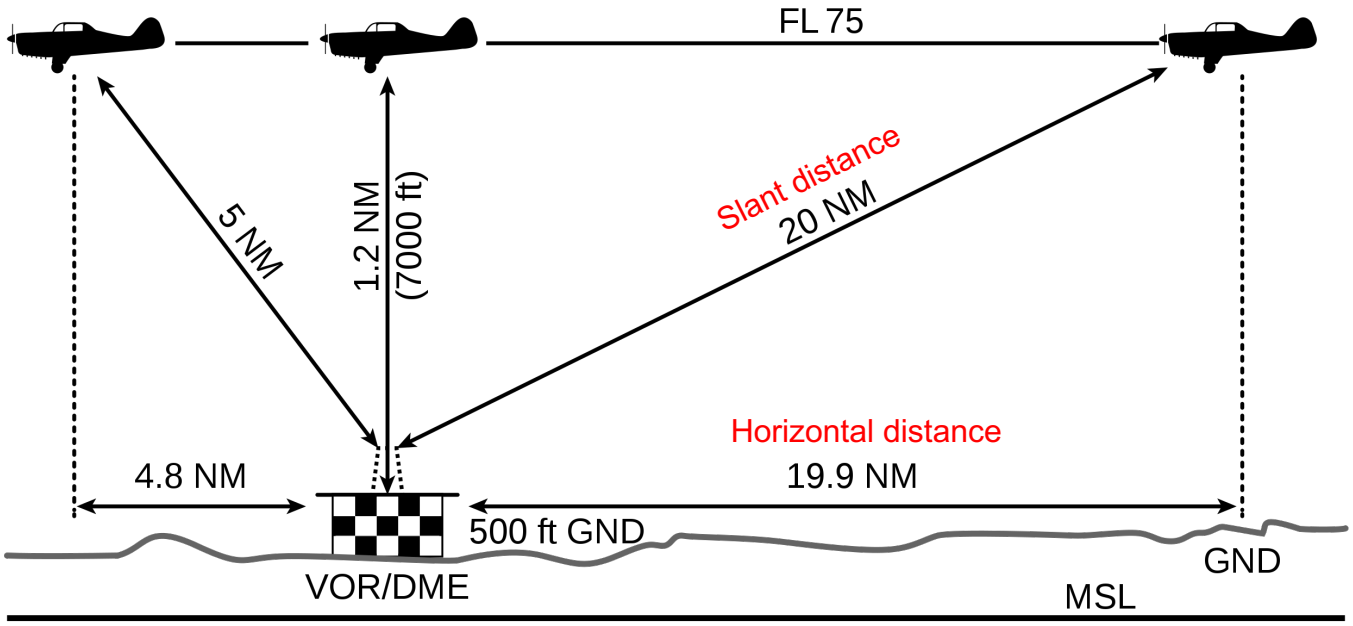
How ILS works



DME

How it works

- Aircraft sends a pulse out on frequency
- Base station receives the pulse and sends it back
- Aircraft receives pulse and calculates the round trip time taken and therefore distance to receiver
- Note it is measuring straight line / slant distance to the base station



DME

EQUIPMENT

AIRCRAFT RECEIVER BOX

RMT means DME frequency is paired to the NAV frequency selected. Often there is a NAV1 / NAV2 switch in the aircraft to select which NAV to pair to

FREQ means DME frequency is tuned directly on the box using the knob on the right (113.85 in this case)

GS/T changes the display to show Ground Speed and Time to Station

Note: DME is separate from the LOC / ILS so needs identing separately. Can take 30 secs between ident morse code beeps

AIRCRAFT AERIAL

GROUND STATION

Ex 19: ILS Approach – Wind Correction

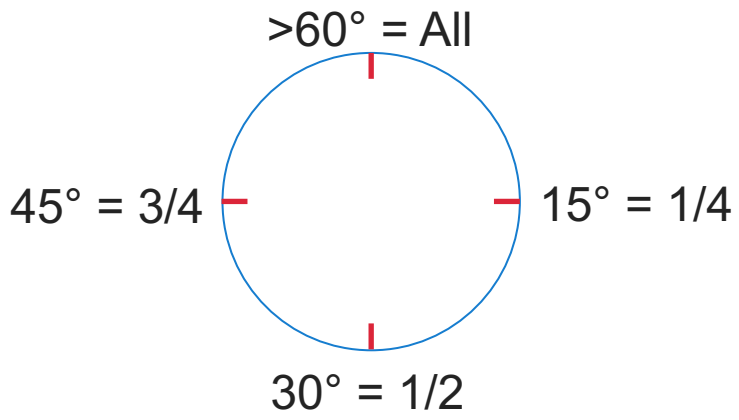
Aim: To use Fly an Instrument Landing System approach to minimums

T Other airplanes, instrument not working, ground station not working
E Misreading display, incorrect frequency
M Lookout (instructor), DOC, Tune Ident Turn Steer check

- Max Drift

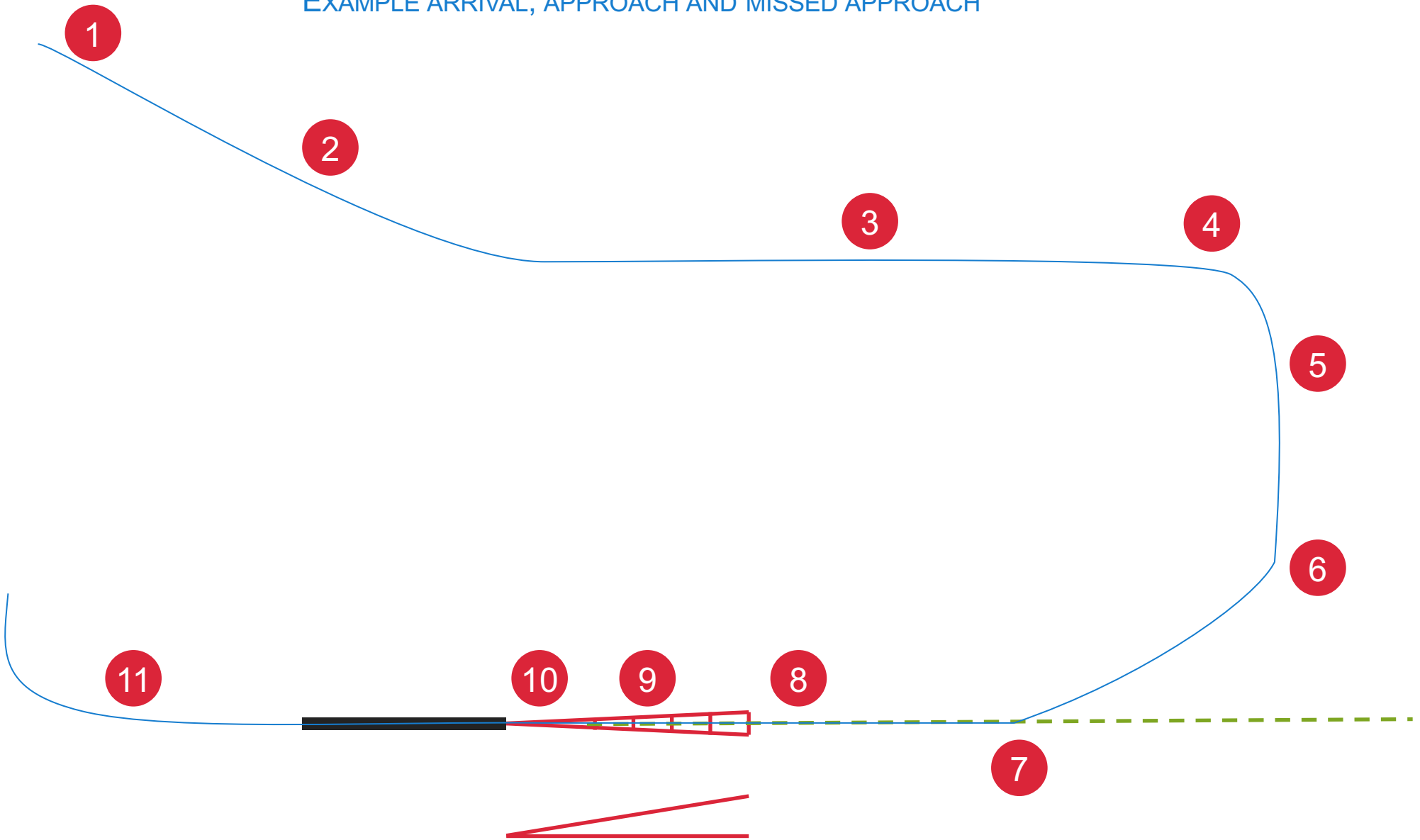
$$\frac{\text{Windspeed x 60}}{\text{TAS}} \quad \text{or at 90kt} = \quad \text{Windspeed x } \frac{2}{3}$$

- Clock code



ILS Workflow

Example arrival, approach and missed approach



ILS Workflow

Pre-Departure

- Ground Brief
  - Review procedure plates / charts
  - Note frequencies for COM and NAV
  - Calculate minima – For IR(R):
    - MDH: Greater of (System minima + 200 ft) or 500ft AAL for a precision approach
    - RVR: >1500m
  - Check winds aloft
  - Calculate drift for inbound leg (when established on the localizer)
- Pre Taxi
  - Set up instruments and frequencies

ILS Workflow - 1

1 Well before arriving

- FREDA checks
- ICE Check
- Tune and listen to ATIS (note arrival runway, Info letter e.g information Xray and QNH)
- Select likely approach plate and brief on proc
- NAV1 Select, Ident, OBS to inbound crs
- NAV2 Select, Ident, OBS as req
- DME Select, Ident, Display
- ADF Select, Ident, Display

2 First contact with approach / radar

- "East Midlands radar, G-RADI, PA28 inbound from the North for practice approach with information Xray, QNH 1010"
- "G-RADI information correct, Squawk 4550"
- "Squawk 4550 G-RADI"
- "G-DI Traffic service, fly radar heading 090 degrees, expect ILS 27 approach"
- "Heading 090 degrees, expect ILS 27, traffic service G-DI"
- Check tower frequency now on COM1 standby

3 Downwind

- Pre landing BUMPFICH checks
- Check for ICE
- "G-DI report ready to copy missed approach instructions"
- "Ready to copy G-DI"
- "G-DI after the missed approach, climb straight ahead to 2500ft "
- "After the missed approach climb straight ahead to 2500ft G-DI"
- Re-brief on minima and missed approach procedure

4 Turn onto BASE

- "G-DI turn right heading 180 degrees base leg"
- "Heading 180 degrees G-DI"
- Turn to heading 180

5 BASE

- "G-DI descend altitude 2500ft QNH 1011"
- "Descend 2500ft QNH 1011 G-DI"
- Descend to 2500ft

ILS Workflow - 2

6 Turning onto approach

- "G-DI turn right heading 240 degrees, cleared for ILS 27 approach, report established"
- "turn right heading 240 degrees, cleared for ILS 27 approach, wilco G-DI"
- Turn right onto heading 240
- Watching for LOC needle coming in from the left
- As the needle moves towards centre, gradually turn onto heading 270° +/- wind drift. Rate of turn proportional to speed of movement of the needle

7 Localizer established

- Once LOC needle is centred….
- "Localizer established G-DI"
- "G-DI Contact tower 124.005"
- Change to tower freq
- "East midlands tower G-RADI, localizer established 7 DME"
- "G-DI East Midlands Tower, continue approach"
- "Continue approach G-DI"

8 Glide slope coming in

- When GS needle is 1 dot above centre:
  - Flaps 1ST stage
  - RPM 1900
- When needle centered, pitch slight nose down (2-3°)
- Looking for 400-500 FPM (approx 5 x ground speed for 3° glideslope)
- Heading changes +/- 10° maximum

9 Closing in, say 3-4 nm

- "G-DI cleared for the low approach go around"
- "Cleared for low approach go around G-DI"
- Heading changes +/- 5° maximum (within the heading bug)
- Callout to yourself "200ft to go….100ft to go"

ILS Workflow - 3

10 Coming up to MDH

- Before MDH, if not visual…
- **Cram** in the power (full throttle)
- **Climb** – pitch nose up 5-10°
- **Clean** – when positive rate of climb, flaps up
- **Call** – "G-DI going around"
- "G-DI Roger"

On the missed approach

11

- "G-DI contact East Midlands Approach on 134.180"
- "134.180 G-RADI"
- Change to approach freq
- "East midlands approach G-RADI climbing altitude 2500ft radar heading 270 degrees"
- "G-DI East Midlands approach, climb altitude 3000 feet, turn right heading 360 degrees"
- "Climb altitude 3000 feet, turn right heading 360 degrees G-DI"