RNF

AIRCRAFT INCIDENT REPORT

(cf. Aircraft Accident Investigation Act, No. 59/1996)

M-03003/AIG-19

LY-ARS
Piper PA30
At Reykjavik Airport
29 June 2003

1. FACTUAL INFORMATION

Location:	Reykjavik Airport (BIRK), 64°07´498´´N, 021°56´26´´W
Date and time (UTC):	29 June 2003 at 19:04 hrs
Aircraft	
- type and registration:	Piper PA30, LY-ARS. Registered as private aircraft
- year of manufacturer:	1969
- serial number:	30-1824
- engines:	Two 160 hp. Lycoming O-320-B1A, piston
Registered owner:	Viktoras Ramonas
Operator/user:	Owner
Description of event:	The aircraft deviated from standard instrument procedure following an ILS approach to runway 19 at Reykjavik Airport
Type of flight:	Private
Meteorological info:	Daylight, light drizzle, overcast at 300 feet, visibility 6 kilometres, wind 320° / 7 knots, temperature 11˚C and dew point 11˚C
Flying conditions:	Instrument Meteorological Conditions (IMC)
Persons on board:	Two
Injuries:	None
Damage to aircraft:	None
Other damage:	None
Commander	
- age and sex:	48 year old male
- licence and experience:	Holder of a Private Pilot Licence/Aeroplane (PPL/A) issued by the Lithuanian Minister of Transport 27 November 1998. Instrument rating 15 March 2002 and PA30 type rating 23 May 2002. Last Medical Certificate, 2nd class, issued 5 March 2003. Total flying time 600 hrs. Total flying time on PA30, 120 hrs. Total flying time during the 90 days prior to the incident was 44 hrs, all on PA30. Total instrument flying time was 108 hrs. The commander had never before the incident performed an ILS approach in minimum weather conditions.

History of the flight
The aircraft departed Bergen Norway (ENBR) at 13:00 hrs on 29 June 2003 for a flight to Reykjavik Iceland (BIRK). The purpose of the flight was to celebrate a 70 year anniversary of the first flight between Kaunas, Lithuania and New York, USA. This was the second leg of the flight to New York.

During the flight preparation in Bergen the commander received weather information for Reykjavik. The forecast (TAF) for Reykjavik from 12:00 hrs to 21:00 hrs was wind 120˚ 5 knots, visibility more than 10 kilometres, few clouds at 800 feet, broken clouds at 2500 feet. Temporarily between 12:00 hrs and 15:00 hrs, visibility 8 kilometres in light rain and drizzle. Becoming between 15:00 hrs and 18:00 hrs, 340˚ 5 knots.

The commander filed an IFR flight plan for the flight to Reykjavik. Bergen and Vaagar (EKVG), Faroe Islands, were filed as alternate airports and the flying time to Reykjavik was estimated 6 hours. According to the flight plan the aircraft had endurance for 10 hours flight. The departure from Bergen was uneventful and the aircraft climbed to FL100. Later in the flight the aircraft climbed to FL120 and maintained that level until descending for the approach to Reykjavik.

At 15:32 hrs a special weather report (SPECI) was issued by the Icelandic Meteorological Office for Reykjavik Airport which was substantially different from the forecast the commander received prior to departing Bergen. According to the report the weather at 15:30 hrs was, wind 310˚ 5 knots, visibility 2 kilometres, fog in the vicinity, few clouds at 300 feet, overcast cloud at 800 feet.

During descent, the commander was informed by Reykjavik Approach Control that runway 19 were in use at Reykjavik Airport. He was given radar vectors to intercept the localizer. At 18:59:12 hrs, after approximately 6 hours flight, the commander was cleared for an ILS (Instrument Landing System) approach to runway 19 and at 19:00:37 hrs he confirmed that the aircraft was established on the localizer (see Appendix A for an approach chart for ILS 19). The aircraft was then handed over to Reykjavik Tower. At 19:02:14 hrs the commander reported five miles on the ILS and the Tower controller cleared the aircraft to land on runway 19. The commander also received a weather update from the Tower controller stating the wind to be 330˚, 3 knots and the cloud ceiling between 250 and 300 feet. According to the commander, he considered the cloud ceiling information reported to be in meters.

At 19:04:23 hrs the Tower controller noticed on the radar screen that the aircraft was higher than normal on the glide path and queried for the current altitude. The commander reported 1000 feet and according to the controller the altitude of the aircraft was subsequently corrected.

The commander had visual contact with the ground when the aircraft was over the Middle Marker (MM). The altitude of the aircraft was then approximately 300 feet. In the commander's report, he states that at this time he looked up from the instruments and began to look for the runway. After a few moments he saw a runway in front of the aircraft running almost perpendicular to its course. The commander also states to have had obstacles to the left of the aircraft including the church tower (356 feet) in visual contact at this time. As the extended centreline of the runway was to the left of the aircraft the commander turned left to line the aircraft up with the runway. However when the aircraft neared he discovered that the aircraft was approaching runway 24 and that runway 19 was to the aircraft's right. The commander therefore turned sharply to the

right to manoeuvre the aircraft for a landing on runway 19. The LY-ARS radar plot shows that the aircraft starts to deviate to the left from the extended centreline of the runway at or just before the Middle Marker (MM) (see appendix B).

The controller at Reykjavik Tower was looking towards the area where he expected the aircraft to appear on the approach when he saw the aircraft flying east of the extended centreline for runway 19. According to the controller the aircraft was on a south-easterly heading when it turned right, flew over runway 24 and landed at 19:05 hrs on runway 19, just after passing the intersection of runway 13/31 (see Appendix C for a chart of Reykjavik Airport).

The aircraft landed approximately 1,000 metres from the threshold of the 1,567 metres long runway. After landing the commander discovered that the remaining runway was not sufficient to safely stop the aircraft and therefore elected to take-off again for another approach. At 19:06:04 hrs the commander contacted Reykjavik Tower requesting visual approach. The Tower controller, in accordance with the missed approach procedure, directed the commander to turn right, climb and contact Reykjavik Approach Control.

The radar recording showed the aircraft, after take off, to climb to approximately 300 feet and turn left. The aircraft was then flown on a north-easterly heading over the eastern part of Reykjavik. Witnesses observed the aircraft as it flew in and out of clouds over the city at low altitude. Several obstacles are in the area east of the airport the highest a 283 feet building. The tower controller, who lost sight of the aircraft shortly after it turned left, called several times directing the commander to climb since the aircraft was flying towards obstacles and higher grounds east of the airport. At 19:06:43 hrs the commander contacted Reykjavik Approach Control. He was instructed by the Approach controller to fly a heading of 120° and climb to 4,000 feet. The radar recording shows the aircraft at this time gradually turning to 120° and climbing to 4,000 feet.

As a precaution the Tower controller instructed another aircraft approaching Reykjavik Airport to perform a missed approach and all runways were cleared of traffic. The Approach controller informed the commander that visibility was getting better west of the airport and offered him to perform a localiser approach to runway 13. The commander declined the offer and requested another ILS approach for runway 19. According to the commander he had only available the ILS 19 approach chart. The aircraft was subsequently given radar vectors for an uneventful ILS approach to runway 19 and landed at 19:32 hrs.

Aids to navigation

The ILS for Runway 19 was used for the aircraft's final approach. After the incident a flight test was conducted by the Icelandic CAA to inspect the systems operation. No abnormalities were found associated with the ILS systems operation (see Appendix D for a description of an ILS system).

Aerodrome information
Reykjavik Airport has three runways. Runway 19 is 1,567 metres long and 45 metres wide. The elevation of threshold 19 is 32 feet amsl. The runway is equipped with ILS approach system with 3.5° glide path augmented by optical Precision Approach Path Indicators (PAPI) set to 3.5° slope. The full runway distance is available for landing on runway 19 with edge lights and there is a runway alignment beacon 600 metres from threshold. The approach minimum for Category A aircraft on runway 19 is 236 feet (Decision Altitude) for a straight-in approach and 700 feet for a circling approach east of the airfield.

Runway 13/31 is 1,230 metres long and 45 metres wide. It is equipped for Localizer/DME (Distance Metering Equipment) approaches. The approach minimum for Category A aircraft is 300 feet for a straight-in approach.

Runway 06/24 is 960 metres long and 30 metres wide. The runway was not equipped with edge lights at the time of incident or instrument landing devices.

Icelandic Civil Aviation Administration has not published any GPS approaches for Reykjavik Airport.

Aircraft examination
The aircraft had minimum navigation and communication equipment for conducting flights in Instrumental Meteorological Conditions (IMC). A Global Positioning System (GPS) satellite navigation receiver had been fitted in the aircraft and connected to the Auto Pilot. The commander also had a portable GPS receiver on board the aircraft during the flight.

During the examination of the aircraft in Reykjavik the aircraft Navigation receiver was inspected by an avionics technician. The result of the inspection was that the Glide Slope receiver functioned normally but the Localizer receiver was found to be unserviceable. According to the commander he was not aware of this malfunction.

Additional information
Due to the Navigation receiver being inoperative further operation of the aircraft was limited to flights in Visual Meteorological Conditions (VMC). The aircraft departed Iceland and continued its flight to the United States in accordance with Visual Flight Rules (VFR).

During the course of the investigation it was discovered that the commander of LY-ARS had only available the approach chart for the ILS 19 at Reykjavik. He did not have with him during the flight charts for other approaches at Reykjavik or approaches to any other Icelandic airport.

2. ANALYSIS AND CONCLUSIONS

The commander of LY-ARS received information on the forecasted weather for his intended flight to Reykjavik prior to departing Bergen. During the flight a special weather report was issued indicating considerable difference between forecasted and actual weather conditions at Reykjavik Airport. Weather information was given to the commander while the aircraft was performing the ILS approach to Reykjavik Airport. The commander reports to have misinterpreted the information on the cloud ceiling considering it to be higher than it actually was by taking the information to be given in metres instead of feet. Before the flight to Reykjavik the commander had never executed an ILS approach in minimum weather conditions.

During the ILS approach the aircraft deviated above the Glide Path but was stable on the Localiser. An inspection of the aircraft Navigation receiver revealed that the Glide Slope receiver functioned normally but the Localiser receiver was unserviceable. The AAIB considers it therefore likely that the approach was executed by using the installed GPS receiver and the Glide Slope receiver.

As the aircraft was breaking out of clouds at the Middle Marker the commander looked up from the instruments and started looking for the runway. The radar recording shows the aircraft turning slightly to the left at this time. When the commander saw a runway in front of the aircraft it had veered of its course and he assumed that this was the runway he had been cleared to land on. When the aircraft neared the airport the commander discovered that he was approaching the wrong runway and instead of performing a go-around he manoeuvred the aircraft towards the runway he was cleared to land on. The aircraft landed past the midway point of the runway and the commander elected to take off again as he considered the remaining runway not sufficient to safely stop the aircraft.

When the aircraft was airborne again following the unsuccessful landing the commander was instructed to make a right turn, climb and contact Approach Control in accordance with the Missed Approach procedure. He however turned left and began to execute a visual approach for runway 19. The cloud sealing was at this time 300 feet or well below the circling minimums. Approach Control offered the commander to execute a Localiser/DME approach to runway 13 since the visibility was improving west of the airport. The commander could however not accept this approach since he did not have the approach charts on board the aircraft.

In the opinion of the AAIB the commander should have performed a missed approach at the Middle Marker (MM) when visual reference with the runway was not established. The pilot looked up from the instruments, approaching the Middle Marker (MM), and got visual contact with the ground. He then continued the approach and allowed the aircraft to veer left of course while trying to get visual contact with the runway.

The AAIB considers that the commander's lack of experience in operating an aircraft in actual instrument weather conditions a probable cause of the incident. Probable contributing factors in the opinion of the AAIB were a malfunction of the aircraft Navigation receiver, poorly equipped aircraft, language difficulties and poor flight planning and preparation.

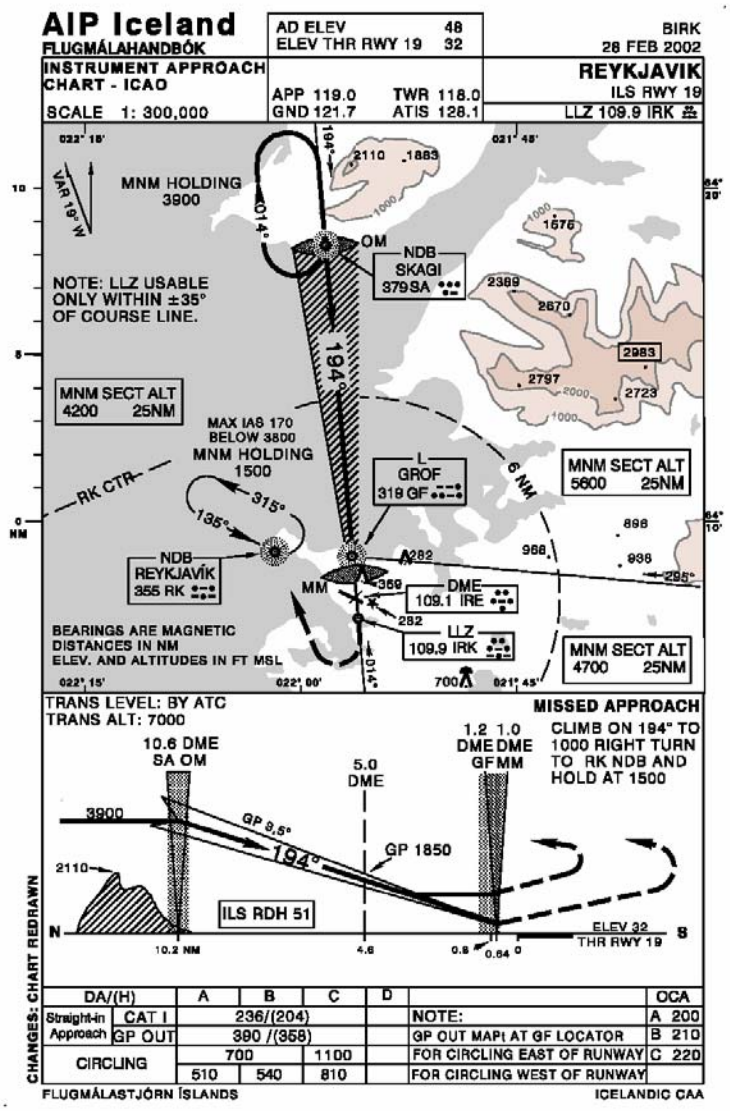
3. SAFETY RECOMMENDATIONS

None.

Reykjavik, 26 April, 2004

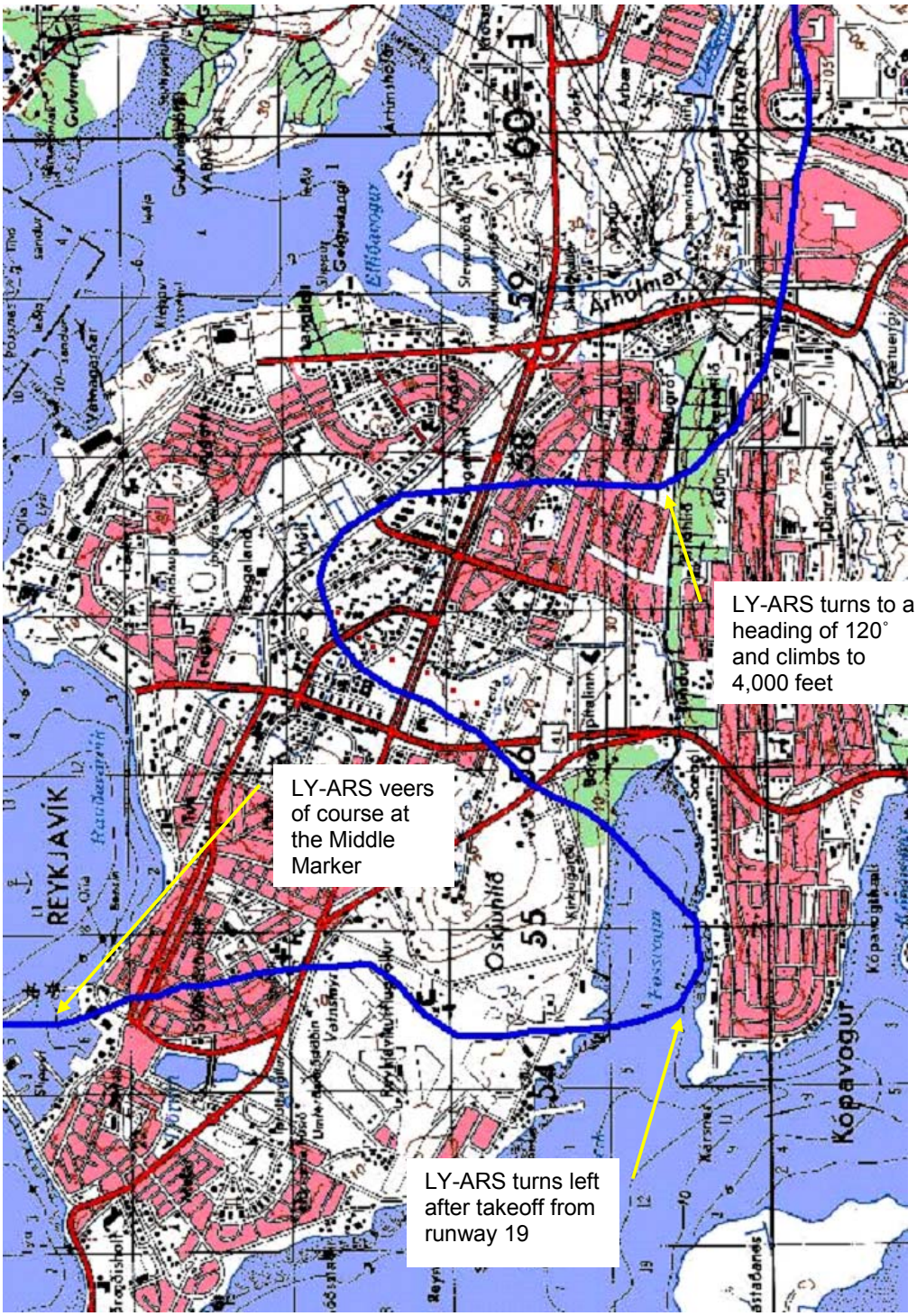
Aircraft Accident Investigation Board, Iceland

Appendix A - AIP Iceland approach chart for ILS 19 (BIRK)

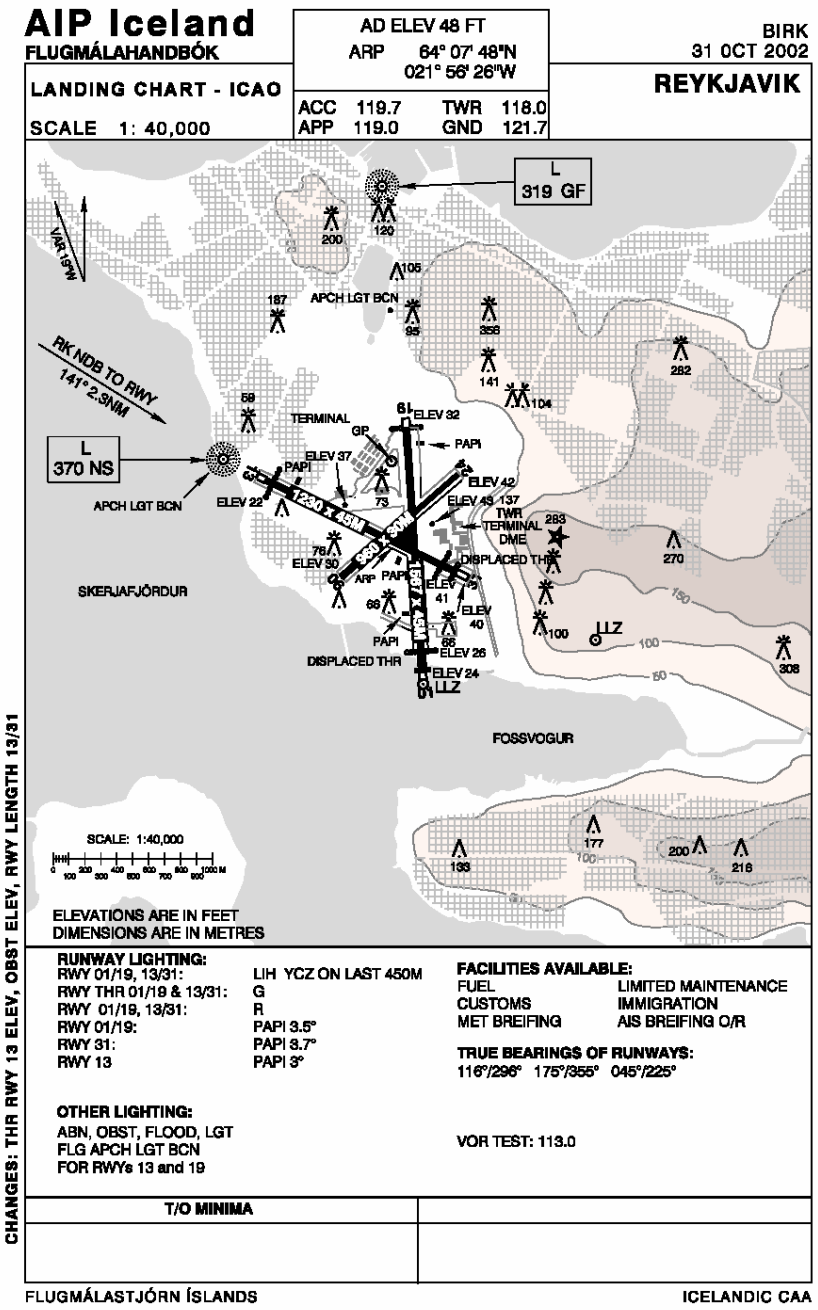


DA/(H)		A	B	C	D		OCA
Straight-in Approach	CAT I	236/(204)				NOTE:	A 200
	GP OUT	390 /(358)				GP OUT MAPt AT GF LOCATOR	B 210
CIRCLING		700		1100		FOR CIRCLING EAST OF RUNWAY	C 220
		510	540	810		FOR CIRCLING WEST OF RUNWAY	

Appendix B - LY-ARS radar plot

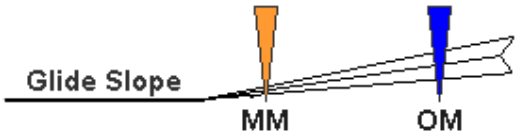


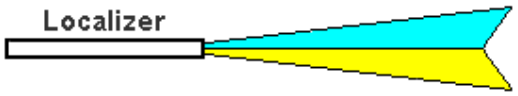
Appendix C - AIP Iceland, chart of Reykjavik Airport



Appendix D - Description of an ILS system

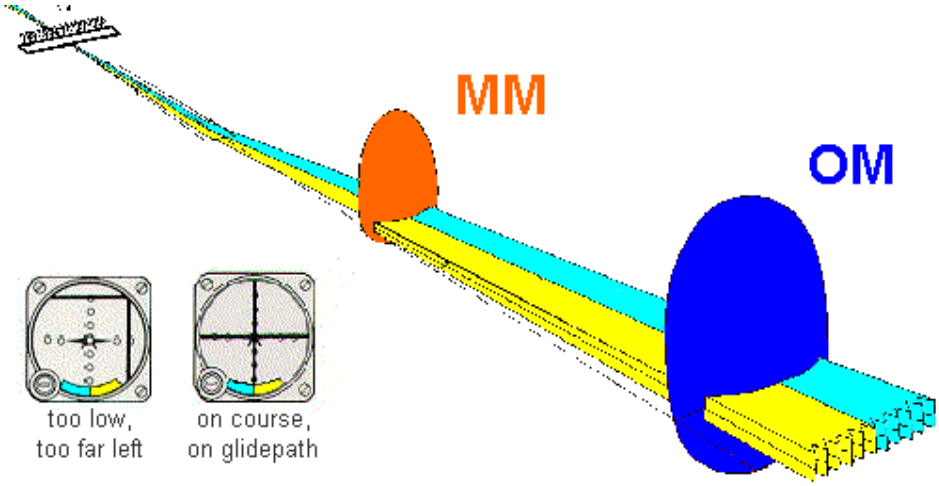
When flying the ILS, the pilot is following the co-location of two signals: a localizer for lateral guidance (VHF); and a glide slope for vertical guidance (UHF). When the Navigation receiver is tuned to a localizer frequency a second receiver, the glide-slope receiver, is automatically tuned to its proper frequency.





The ILS components are categorized this way:

- Guidance information: the localizer and glide slope.
- Range information: the outer marker (OM) and the middle marker (MM) beacons.
- Visual information: approach lights, touchdown and centreline lights, runway lights.



Above is a three-dimensional depiction of the Instrument Landing System. Localizer antennas shown at far end of runway.

The localizer signal provides azimuth, or lateral, information to guide the aircraft to the centreline of the runway. It provides radial information for only a single course; the runway heading. Localizer information is displayed on the same indicator as the VOR information. Near the OM, a one-dot deviation puts the aircraft about 500 ft. from the centreline. Near the MM, one dot means the aircraft is off course by 150 ft.

The Glide Slope is the signal that provides vertical guidance to the aircraft during the ILS approach. The standard glide-slope path is 3° downhill to the end of the runway. When followed faithfully the aircraft altitude will be precisely correct when it reach the touchdown zone of the runway. The glide path projection angle is normally adjusted to 3 degrees above horizontal so that it intersects the MM at about 200 feet and the OM at about 1,400 feet above the runway elevation.