

## THE GLIDE SLOPE

The glide slope is the second part of the ILS approach system that provides vertical, up/down guidance toward the runway touch-down area. It usually provides guidance for a 3° glide slope.

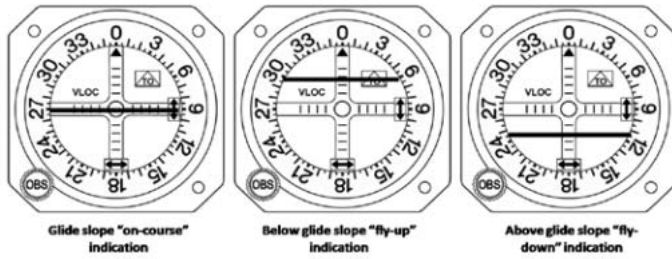


Fig. 8 Glide Slope Needle Indications

It is this particular part of the ILS infrastructure that gives us the luxury of the “precision” part of the

ILS approach. Conveniently, the glide slope signal is automatically paired to a tuned localizer frequency. In other terms, the glide slope requires no additional receiver in the helicopter other than the localizer radio navigation receiver.

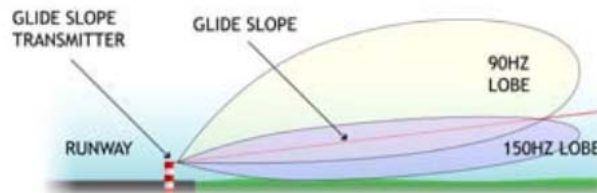


Fig. 9 Glide Slope Signal

For simplicity, think of the glide slope as being a localizer turned on its side. However, unlike the localizer antenna, the glide slope antenna is normally 750-1250 down the runway and between 400 and 600 feet to one side of the centerline. At times the glide slope antenna will



Fig. 10 Glide Slope Antenna  
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be displaced further from the approach end of the runway if the approach angle needs to be altered in locations where obstructions may require a higher approach angle. And like the localizer, when your receiver has sufficient voltage to receive accurate glide slope signals, the “off-flag” will be out of view.

### **Glide Slope Usability & Range**

The glide slope is usable out to approximately 10NM. The glide slope is even more sensitive than the localizer but like the localizer, the glide slope is more sensitive as the helicopter gets closer to the runway threshold.

The glide slope is set to 3° to the horizontal plane and is only 1.4° thick or 0.7° above and below the “on path glide slope”.

At five miles from the runway, which is where we typically find the Outer Marker (OM), the 3° glide slope angle results in the glide slope being 1500 feet above runway elevation. At ½ NM or the typical location of the Middle Marker (MM), when installed, the glide slope angle is a mere 200 feet above runway elevation. It is of importance to note that the current FAA policy regarding Middle Markers (MM) is to decommission them as they fail. If your knowledge level is not up-to-speed on marker beacons don't be alarmed; we cover them in detail in the next section!

At the Outer Marker, each dot of displacement is equal to 50 feet per vertical dot. At the Middle Marker, you can expect 8 feet of displacement for each vertical dot. The associated deflection of the glide slope on the CDI indicates where the helicopter is on the glide-path angle. If the helicopter were above the glide path, the CDI indication would show the needle deflected downward telling you to “fly down.” Inversely, if you found yourself below the glide path, which is not a good place to be, you would observe a “fly up” indication with the CDI glide slope needle above the center horizontal position.



beacon, the Inner Marker (IM). The Inner Marker (IM) is found at the runway threshold and is typically used by our fixed-wing brethren flying the heavy iron and need to get very low minimums on the approach. It is of importance to note that the current FAA policy is to decommission Middle Markers (MM) that fail. As with all ground-based navigation systems, maintenance on marker beacons can be very costly. With GPS and WAAS systems and associated instrument approaches dominating the field, it isn't hard to see the reasoning behind the decision.

The important fact about marker beacons you need to know is that they serve as “range” or distance indications during the approach. Although marker beacons come in three flavors you will more than likely only become accustomed to the outer and middle marker beacons along with their corresponding signals viewed and heard in the helicopter cockpit.

### ***How They Work***

Marker beacons are low powered transmitters of 3 watts or less with antennas that send a narrow beam of radio energy straight up through the approach path. At 1000 feet above the marker-beacon antenna, the array is designed to produce an elliptical pattern with dimensions of approximately 2400 feet in width and 4200 feet in length. The signal sent from the marker-beacon transmitter is coded to trigger an appropriate light and audio indication on your marker beacon receiver in the helicopter. The marker-beacon typically has an option of “high” or “low” sensitivity on the marker-beacon control panel. In simple terms, on “high sensitivity” the receiver will pick up the signal sooner than it would if the receiver were on “low sensitivity”. Candidly, the setting you utilize in your helicopter during training will become a personal preference as I have found many different opinions on which sensitivity level to keep your receiver on. Some keep it on high sensitivity as it gives an indication of the marker-beacon little sooner on the approach.