Flying NDB Approaches

Some important factors when flying NDB approaches:

Since ADF indicators have no warning flags, you should continuously monitor the NDB audio identifier during an approach. If it stops, the navigation signal should be considered unreliable.

Remember the three primary rules when flying ADF:

1) The needle always drops toward the tail (except in extreme wind conditions)
2) When intercepting an ADF course, what matters is the difference between your present heading and the desired course. This is your intercept angle. When the ADF indicates your intercept angle, you are crossing the desired course (turn on course now!).
3) Once on course, you must strive to maintain your inbound heading. DO NOT make continuous small heading changes to keep the needle straight up. If you do, it is extremely difficult to recognize that you are off course and equally difficult to determine how to correct back to course. If you instead maintain your inbound heading, when the needle moves away from straight up by more than five or ten degrees, you know you are off course.

Course corrections

1) Assuming you are on the proper heading, note the relative bearing error on the ADF (i.e., how many degrees the needle is left or right of the nose)
2) Turn toward the tip of the needle. The amount of heading change should be twice the relative bearing error (from 1 above).
3) What should you see immediately after turning the aircraft? If flying toward the station, when you make the above correction the needle should cross over and now be on the other side of the nose. If flying away from the station, when you make the correction the needle will move further away from the tail showing what would appear to be a larger relative bearing error.
4) You are again on course and should turn back to the correct on-course heading when the ADF relative bearing is equal to your intercept angle (which is also the number of degrees you turned to make the correction).

Here's an example: Final approach course is 090 degrees. You are faithfully maintaining that heading and the ADF needle has drifted 10 degrees right. You should turn the aircraft 20 degrees to the right (double the error) to a heading of 110. The needle will now be showing 10 degrees left and will continue dropping toward the tail. When it drops to 20 degrees left (which is your intercept angle, the number of degrees you turned the aircraft off the proper on-course heading), turn the aircraft 20 degrees left back to 090.

Sometimes things are too busy to calculate how far to turn. Two simple rules can be used at any time to make equally effective "quick and dirty" corrections back to course:

1) If tracking toward the station on the proper heading and the needle is off to one side, turn toward the tip of the needle until the needle crosses through center and continues at least 10 degrees to the other side of the nose. Stop your turn. You will know you are on-course when the needle drops to a relative bearing equal to the difference between your present "correction" heading and the desired course. At that time turn the aircraft back to the correct on-course heading.

2) If tracking away from the station on the proper heading and the needle is off to one side, again turn toward the tip of the needle. As you do so the tip of the needle will continue to move away from the tail - keep turning until it is 30 to 45 degrees off the tail. Stop your turn. You will know you are on-course when the needle drops to a relative bearing equal to the difference between your present "correction" heading and the desired course. At that time turn the aircraft back to the correct on-course heading.