New Approach to Non-Precision Approaches

Familiarize yourself with instrument procedures at far-away airports without leaving home base

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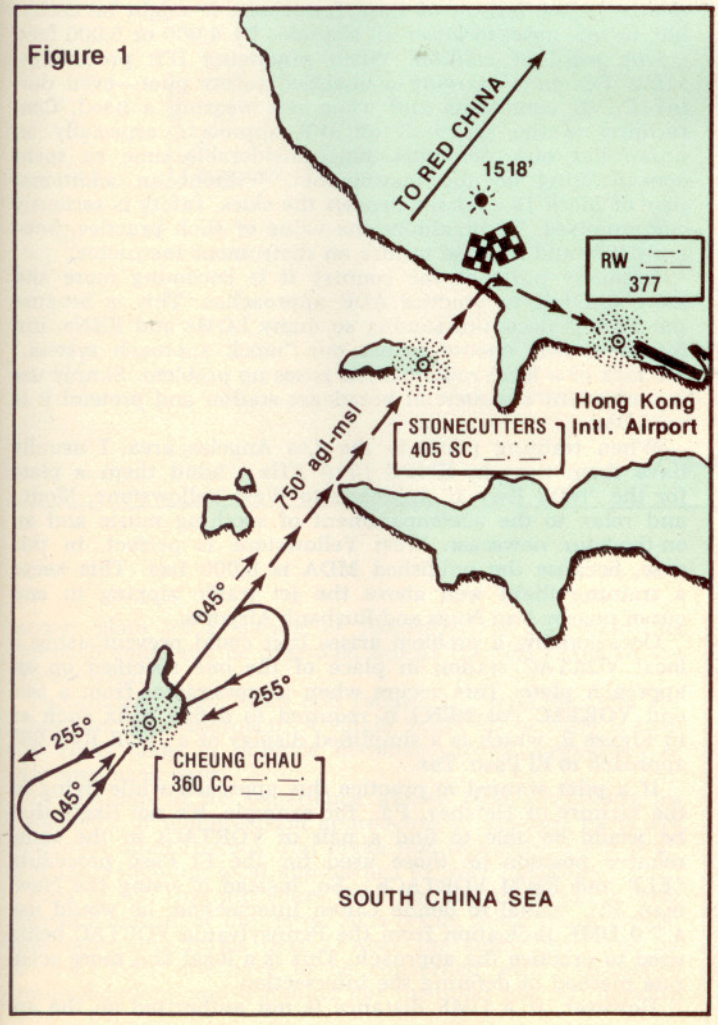


■■ How would you like to shoot a VOR approach to Zamboanga, an ADF approach to Vienna or a localizer approach to Singapore? Well, you can do just that using your own airplane and without ever leaving the local flying area.

These locations may be romantically appealing to most pilots, but the reason for suggesting such adventuresome flying is not to give vent to your wanderlust. Rather, the suggestions that follow, in addition to adding some spice to your flying, are methods to help a pilot become more thoroughly acquainted with the vagaries of non-precision approaches.

The ILS (precision) approach is, believe it or not, easier for the average pilot to master than VOR, ADF and localizer approaches. Once he has learned to move the cross-pointer needles slowly and keep them in place, he can feel justifiably confident about shooting a similar approach anywhere in the world. This is because one ILS approach is essentially the same as every other.

Non-precision approaches, on the other hand, are not so similar. They are like people; each has a unique personality with which to reckon, procedures that somehow differentiate one approach from another. This is one reason that non-precision approaches annually claim more victims than do ILS approaches even though the latter permits a pilot to descend to considerably lower minimums.

The NDB (ADF) approach to Runway 13 at Hong Kong International Airport is an excellent example of just how unique a non-precision approach can be. Figure 1 is a simplified view of this approach but bears little resemblance to the actual approach plate which has such a profusion of hieroglyphic notations that it looks more like an Aresti aerobatic chart.

The approach begins when the pilot is at cruising altitude and is cleared direct to the Cheung Chau NDB for an ADF approach to Runway 13. (English-speaking pilots refer to this as the "Charlie-Charlie" approach.) Upon reaching the beacon, the pilot must descend over it in a series of precise figure eights so as to cross the beacon inbound at 1,000 feet. After passing "Charlie-Charlie," he descends to 750 feet (the MDA) and tracks across almost 10 nm of the South China Sea toward the Stonecutters NDB.

After passing Stonecutters, the pilot plunges straight ahead

and purposefully heads toward a 1,518-foot-high obstacle. Continuing, he should spot a hill on one side of which are two large, brightly-colored, illuminated, orange-and-white checkerboards. The pilot aims for these warning signs and gets as close to them as he dares. He must not overfly the checkerboards, however, because if he is fortunate enough to miss the towering obstacle nearby, he might wind up in Red China. Instead, he banks sharply right and heads toward the RW NDB at the approach end of Hong Kong International's Runway 13. Theoretically, the pilot will then be on short final and should have little difficulty descending over (and through) the adjacent concrete canyons of high-rise buildings to a successful landing.

This is an extreme example of what can be expected during a non-precision approach, but it does demonstrate that a pilot who has learned to shoot a VOR approach at Santa Monica, for example, may not be prepared for what may await him elsewhere.

Unfortunately, the average pilot becomes proficient in executing only those approaches within a relatively short distance of his home airport. This can build false confidence because he may not be sufficiently familiar with the non-precision approach procedures used elsewhere.

But there is a solution to this problem, a new and unique approach to non-precision approaches.

Since the average VOR approach incorporates only one VORTAC, it is possible to use a local station as if it were distantly located. For example, if a pilot lives in beautiful downtown Burbank, Calif., he can practice shooting a VOR approach to Kansas City International Airport by substituting the nearby Van Nuys VORTAC for the MKC VORTAC shown on the Kansas City "VOR Rwy 27" approach plate.

A pilot can practice the Kansas City approach without ever leaving Southern California.

There is one obvious problem with this suggestion, but it is actually a blessing in disguise. After executing the Kansas City approach (while using the Van Nuys VOR), there's no way that a pilot will find a runway at the missed approach point. So, let's convert this liability into an asset. What does a pilot do when he can't find the runway? He executes a missed approach. So here's a way to practice both the VOR approach and the "pull-up" procedure.

Since a pilot knows in advance that he will have to execute a "miss," he will be forced to prepare for that maneuver, something most pilots don't do when relatively certain of finding a runway under the overcast. Learning the pull-up procedure prior to *every* IFR approach is a habit most of us need to develop further.

Another problem easily solved is that of adhering to the altitudes published on an approach plate. Assume, for example, that a Denver-based pilot wants to practice the "VOR Rwy 22L" approach to Knoxville, Tenn. while using the Denver VORTAC. According to the Knoxville approach plate, the pilot is supposed to cross the final approach fix (the VOR) at 3,000 feet (or above). There's obviously no way to fly over the Denver VORTAC at 3,000 feet msl because this station is situated more than a mile above sea level.

The solution is obvious. Simply add some convenient altitude to every altitude shown on the Knoxville approach plate. The lowest altitude shown on the Knoxville plate is 1,500 feet msl which, of course, is the MDA. The Denver-based pilot should mentally add 5,000 feet, for example, to all the altitudes shown on the Knoxville plate. In this case, the MDA would be raised from 1,500 to 6,500 feet, the 3,000-foot altitude required over the VOR would become 8,000 feet msl, etc.

One must be cautious, however, to determine in advance that a practice approach of this nature will not cause the aircraft to barge through a local traffic pattern, TCA, etc. If necessary, the altitudes can be raised farther so as to remain above a nearby airport traffic area during the procedure.

Conversely, if a Knoxville-based pilot wishes to use a nearby VORTAC to practice a "VOR-A" approach to Ely, Nevada, for example, he need not change the altitudes shown on the plate. The MDA at Ely is 8,800 feet, well above the relatively low terrain of East Tennessee. It might be desirable, in this case, to *lower* all altitudes by 4,000 or 5,000 feet.

One word of caution. When practicing IFR procedures, safety demands carrying a qualified safety pilot—even during CAVU conditions and when not wearing a hood. Conforming to the rigors of an IFR approach, especially an unfamiliar one, demands that considerable time be spent concentrating on the instruments. Without an additional pair of Mark IV eyeballs to scan the skies, safety is seriously compromised. To maximize the value of such practice, however, it would be wise to hire an instrument instructor.

In many parts of the country it is becoming more and more difficult to practice ADF approaches. This is because the FAA is decommissioning so many LOMs and RBNs. But for those who choose to use our "mock approach system," the lack of a local radio beacon poses no problem. Simply use a convenient commercial broadcast station and pretend it is an LOM.

When training pilots in the Los Angeles area, I usually have them tune in KMPC (710 KHz), hand them a plate for the "NDB Rwy 1" approach to West Yellowstone, Mont., and relax to the accompaniment of soothing music and an on-the-hour newscast. West Yellowstone is perfect, in this case, because the published MDA is 8,000 feet. This keeps a training flight well above the jet traffic zipping in and out of nearby Van Nuys and Burbank Airports.

Occasionally, a problem arises that could prevent using a local VORTAC station in place of the one specified on an approach plate. This occurs when a cross-radial from a second VORTAC (or RBN) is required to define a fix such as in Figure 2, which is a simplified display of a "VOR Rwy 26" approach to El Paso, Tex.

If a pilot wanted to practice this approach while flying in the vicinity of Hershey, Pa., for example, it's not likely that he would be able to find a pair of VORTACs in the same relative position as those used for the El Paso procedure (ELP and EWM VORTACS). So, instead of using the Newman 131° radial to define Giffen Intersection, he would use a 7.0 DME indication from the Pennsylvania VORTAC being used to practice the approach. This is a legal and more accurate method of defining the intersection.

However, if a DME distance is not authorized on the ap-

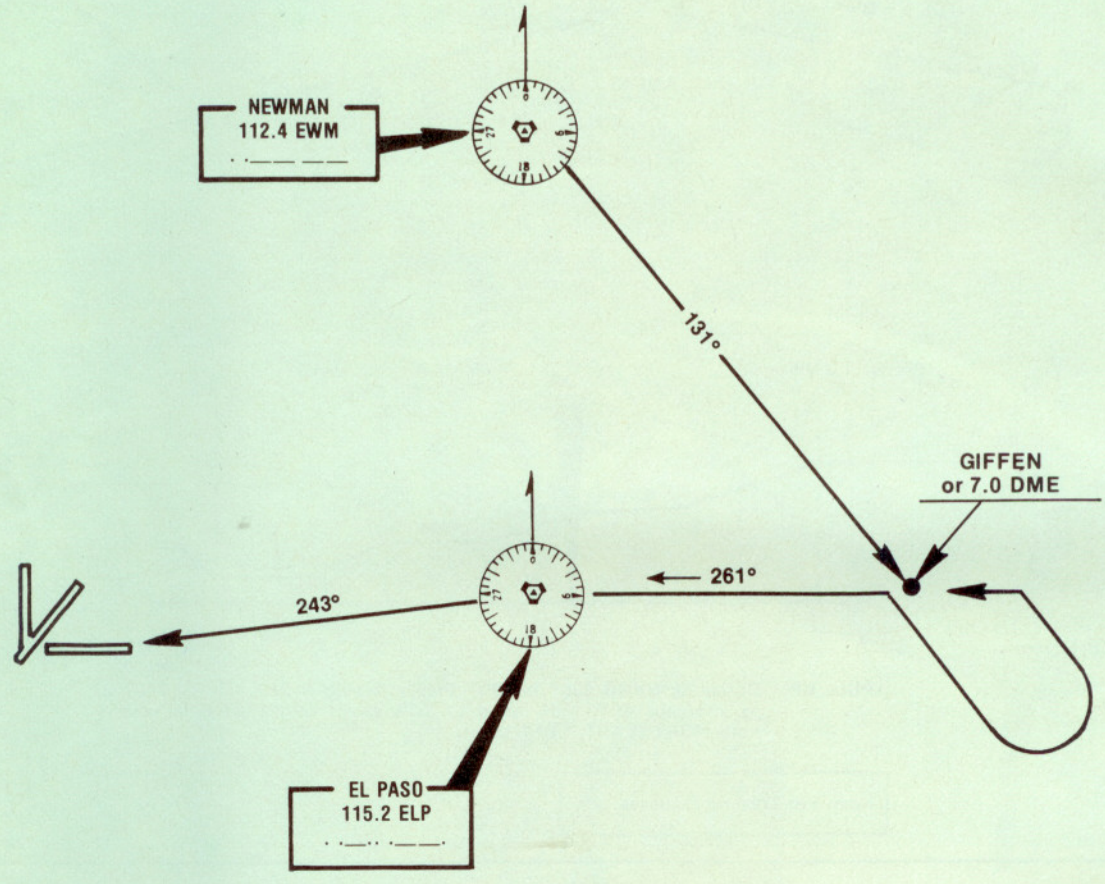


Figure 2

proach plate as a means of identifying a fix, then this approach could not be practiced unless actually flying in the El Paso area.

Fortunately, more than one facility is rarely required for a non-precision approach. A single VORTAC or RBN is usually all it takes to practice distantly-located procedures in your own back yard.

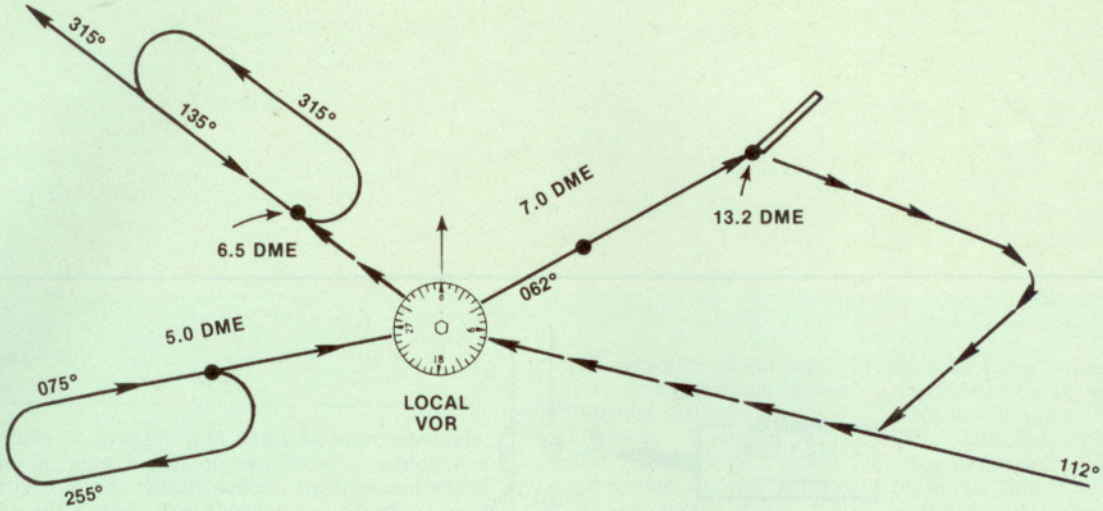
In addition to the experience gained from practicing an assortment of non-precision approaches at altitude, there are numerous other reasons that make this technique more practical than shooting local approaches to "real" airports.

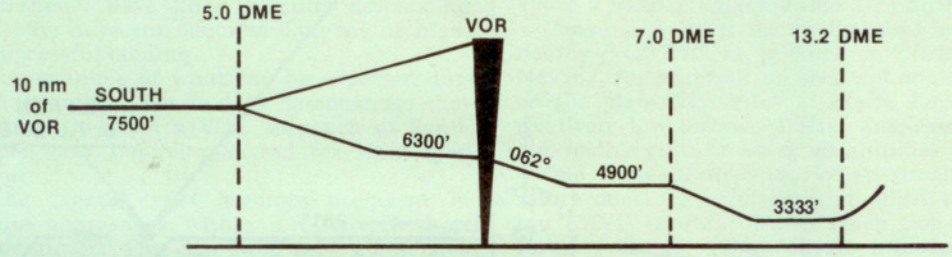
First of all, this procedure does not require working with approach control or the tower. As a result, there are no costly, time-consuming traffic delays. Also, the safety pilot (or instructor) does not have to be concerned with extraneous communications and watching out for other aircraft buzzing around the pattern. Since he is not so pre-occupied, the instructor can spend more time observing and critiquing a pilot's technique.

Also, the instructor can allow his student to digress from the published procedure (like descending below the MDA) without worrying about wiping out someone's chimney with the landing gear. This allows a pilot more time to recognize his own errors and take positive, corrective action. Often, this results in a more meaningful lesson as compared to one in which an instructor must terminate the deviation because of conflicting terrain and/or traffic.

The high-altitude approach also gives the instructor a chance to present his student with a totally unfamiliar approach plate. Having to study a procedure while enroute (or holding) is excellent preparation for the real world of instrument flight. For many pilots, it is a shocking experience to

Figure 3





PULL UP: Climb HEADING 120° to 5800' then climbing RIGHT turn to 7500' to intercept VOR 112° radial to VOR direct to 6.5 DME fix and hold NORTHEAST, LEFT turns.

Note: For Training Purposes Only

deviate to an alternate airport and execute an approach (and possibly a miss) for which he has not planned.

Have you ever tried to practice a back-course ILS approach at a local airport only to find that the prevailing wind (and runway in use) invariably conspires against you? For similar reasons, most pilots rarely have the opportunity to shoot an approach through the "back-door" to an airport.

But that approach can be executed at altitude. After all, the localizer has virtually the same characteristics at 5,000 feet agl as it does at 500 feet. Additionally, other rarely-used, "back-door" approaches (VOR or ADF) can be practiced at altitude.

Difficulties can arise also when practicing a local approach that coincides with the runway in use. Because of excessive VFR traffic in the pattern, a pilot may not be allowed to continue an approach to both the MDA and the missed approach. Instead, the tower controller may request that the approach be broken off at some point (or altitude) which defeats the entire purpose of the flight. More frequently than not, pilots practicing approaches at a busy airport are not allowed to execute the pull-up procedure because this, too, usually conflicts with traffic in the pattern.

All such problems are eliminated by executing the procedure above the airport traffic area. It's a great way to beat the system.

When a pilot elects to use a local navaid as the nucleus for a distantly-located procedure, he has the option of practicing any of thousands of approaches to "airports" all around the world. But perhaps he cannot find a published approach procedure to suit his needs. This problem, too, is easily resolved; the ambitious pilot can create his own procedure. A typical example is shown in Figure 3 and is a procedure that I present to a pilot about to get his instrument rating. It helps me to determine whether he knows how to prepare properly for a strange approach and how well he can execute the procedure.

So you see you can shoot a non-precision approach to Zamboanga, Vienna, Singapore or anywhere else in the world you may care to venture—without ever leaving home. □