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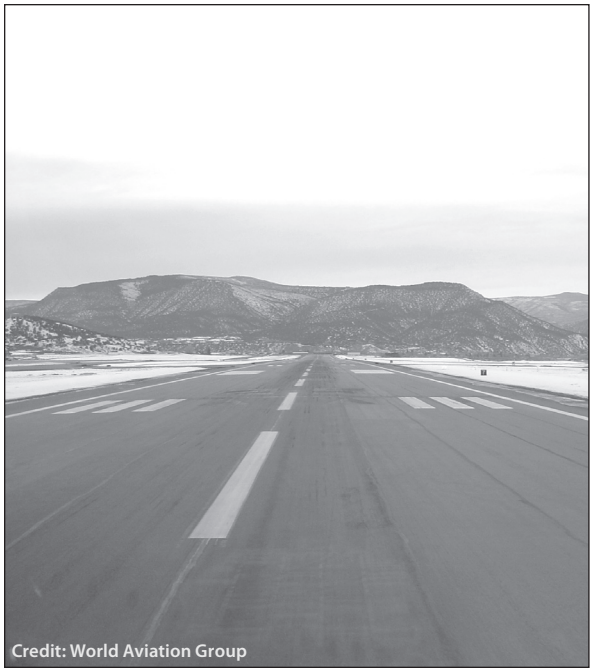
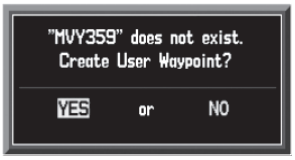
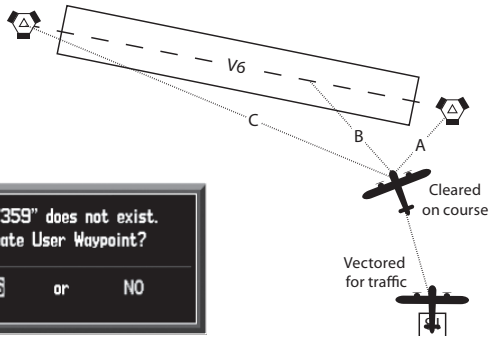

Credit: World Aviation Group

Going missed from the flare ... page 6



Roll your own ... page 9



Vector chaos ... page 21

LOW DOWN ON A MISSED

Start your missed from below the MDA/DA, and the obstacle alligators can bite hard even when you fly the published procedure.

Both photos credit: World Aviation Group

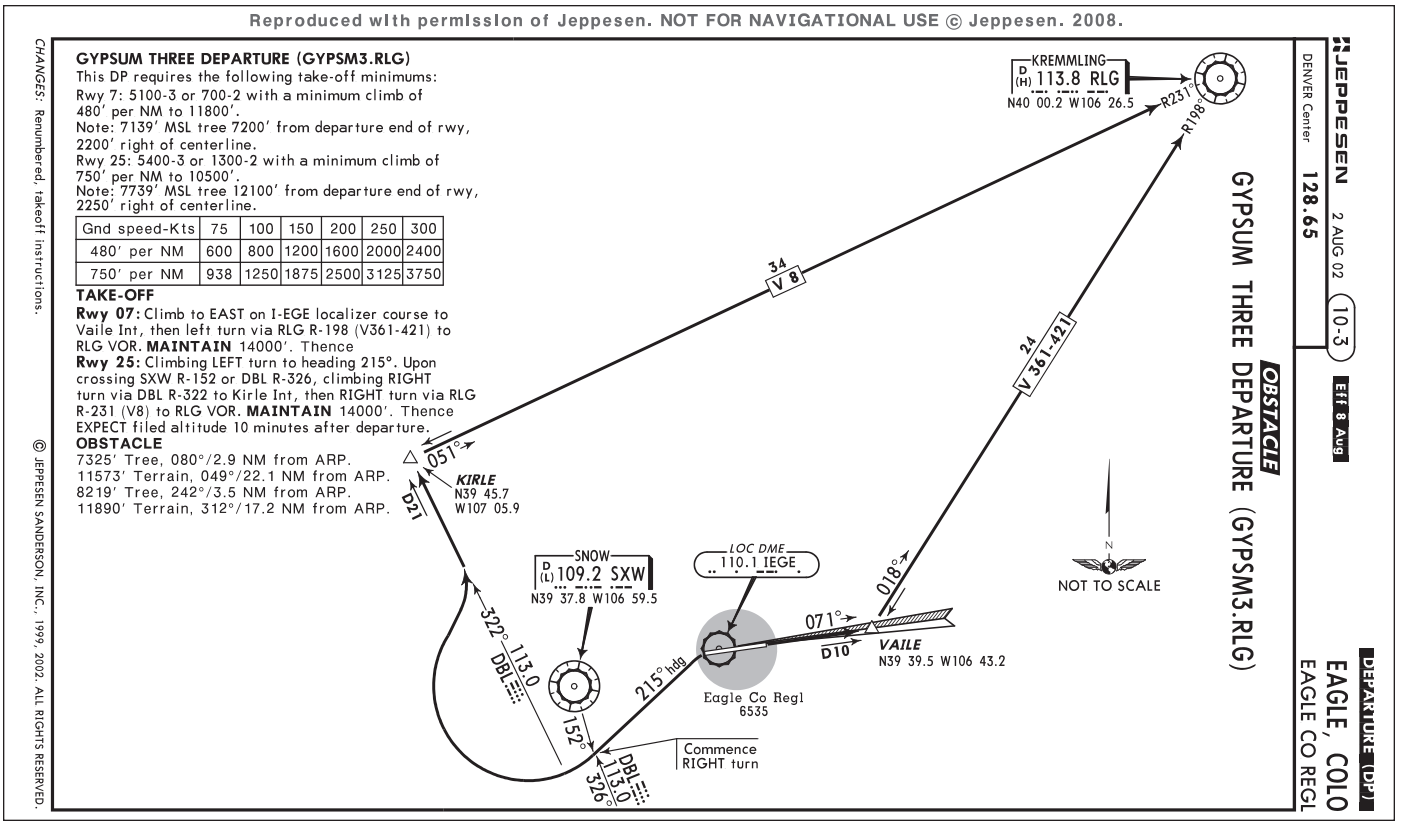
Above: *Center in this shot is KEGE. The view from a runway (left) shows what you'd be looking at (briefly) on a too-low missed approach.*

by Scott C. Dennstaedt

Here's the scenario: You are flying your nicely-equipped, pressurized, Cessna P210 Centurion into Eagle, Colo., (KEGE) just after sunset. The ceiling is a couple hundred feet above MDA and you have been cleared for the LDA DME Rwy 25 approach. Eagle Tower clears you to land and you break out of the overcast and spot the runway end identifier lights (REILs) just visible through the mist.

You perform another quick GUMP-check as you start a normal descent to land straight-in on Runway 25. Just as you are ready to add that last notch of flaps, your landing light catches what appear to be several deer occupying the runway. D'oh! The LDA/DME RWY 25 doesn't publish circling minimums, so your only choice is to execute the published missed approach, right?

Ah, but wait. AIM 5-4-21(h) recommends that a pilot who commences a missed approach below the MDA/DA or after the MAP use



the runway's obstacle departure procedure (ODP) in place of the published missed approach procedure. In other words, in the event of a balked landing after an instrument approach, you should toss the published missed approach and execute the ODP for the landing runway. For Eagle, that would be the GYPSUM Three departure (the ODP)—which I'm sure you briefed fully before starting the approach.

AIM for Perfection

I try to convince all of my instrument students to spend some quality time reading the AIM because it generally supplies the pilot with much-needed guidance not found in the FARs. However, not all of it is sound advice. AIM 5-4-21 (h) is a perfect example of bad AIM.

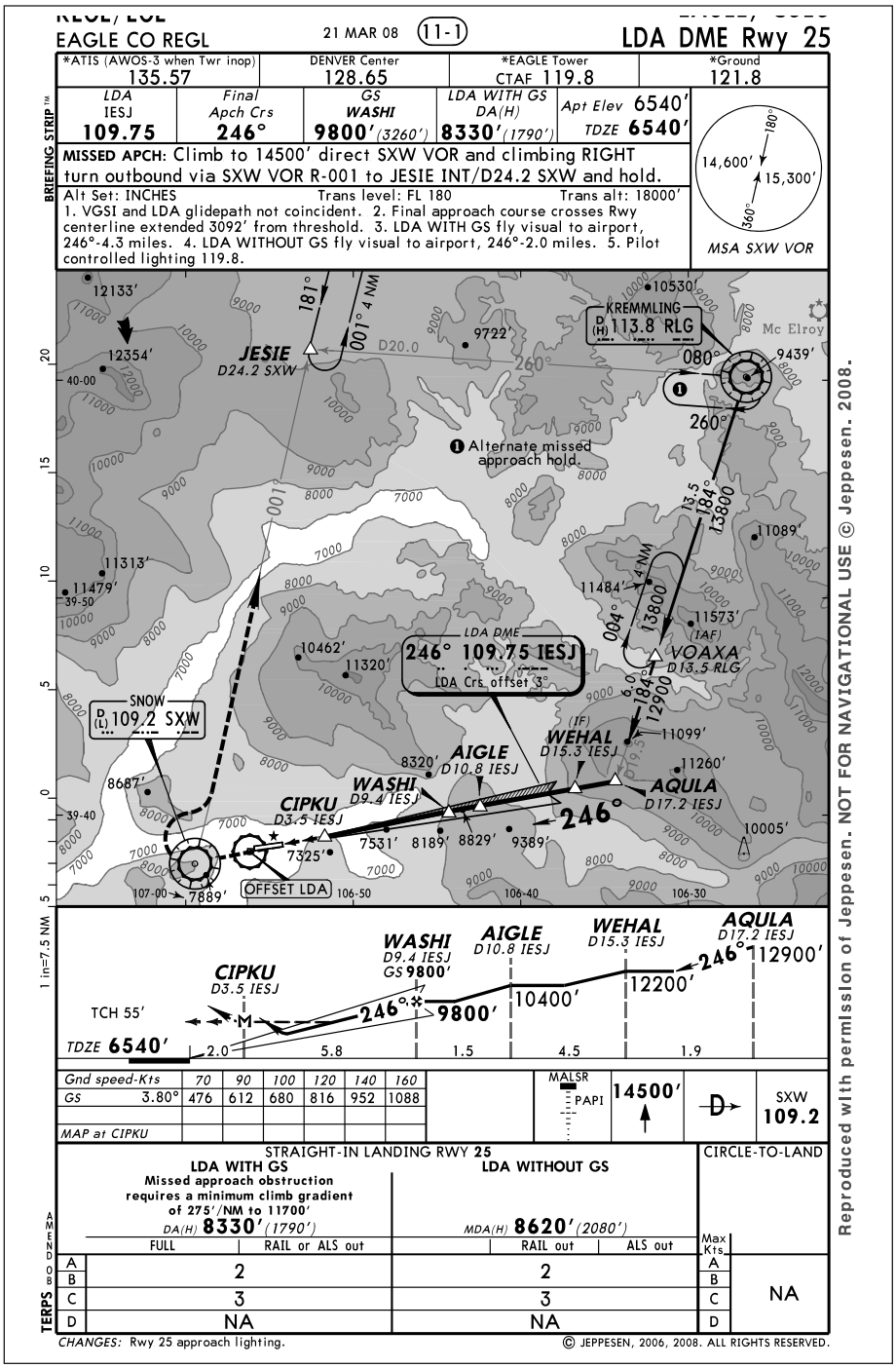
Except for Category-III ILS approaches, every standard instrument approach procedure (SIAP) ends once you descend below the MDA/DA. Sure there's a visual segment, but once you leave the protection of the SIAP by descending below the MDA/DA, you are in uncharted territory, so to speak. There are no assumptions, guidelines or rules about what to do in the unlikely event of a balked landing during cruddy flight conditions and the AIM provides crummy guidance.

AIM 5-4-21(h) states, "Missed approach obstacle clearance is predicated on beginning the missed approach procedure at the Missed Approach Point (MAP) from MDA or DA and then climbing 200 feet/nm or greater." When you caught a glimpse of the deer, you were certainly well below the MDA/DA. The AIM further clarifies, "Initiating a go-around after passing the published MAP may result in total loss of obstacle clearance." I couldn't agree more with these two statements.

Here's where AIM 5-4-21 (h) derails: "To compensate for the possibility of reduced obstacle clearance during a go-around, a pilot should apply procedures used in takeoff planning. Pilots should refer to airport obstacle and departure data prior to initiating an instrument approach procedure. Such information may be found in the Take-off Minimums And (Obstacle) Departure Procedures section of the U.S. Terminal Procedures publication." As I read this statement, if an ODP exists, the pilot should consider executing it after a balked landing.

Making an Eagle

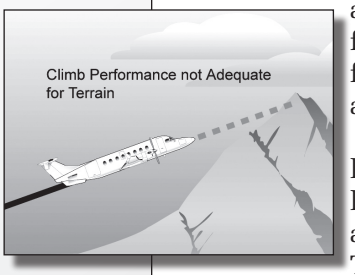
Eagle, Colo., (KEGE) is a challenging place to fly an instrument approach. You have the choice of two. The RNAV (GPS)-D doesn't publish straight-in minimums, even though it is essentially straight in, because



Right: *The missed approach for the LDA DME Rwy 25 is simple laterally, but might be beyond your capabilities vertically, especially from below the MDA. The ODP for the same runway (left) is both more complex and more challenging in terms of required climb.*

MORE OPTIONS COURTESY OF YOUR FAA

With the NBAA's insight, the FAA is in the process of modifying AIM 5-4-21(h). The following language has been submitted for publication in the August 2008 update to the AIM, and it offers some better guidance:



Missed approach obstacle clearance is predicated on beginning the missed approach procedure at the Missed Approach Point (MAP) from MDA or at the DA. Some missed approach procedures require commencement of an immediate turn and/or climb of 200 ft/nm or more at the MAP. In these instances, initiating a go-around after passing the published MAP (for example, a balked landing) may result in total loss of obstacle clearance because the aircraft flight path may not fall within missed approach procedure protected area. To compensate for the possibility of reduced obstacle clearance during a balked landing/go-around, a pilot should consider the airport operating environment, including known natural (trees/vegetation) and man-made obstacles. At some airports, pilots may wish to refer to airport obstacle and departure data prior to initiating an instrument approach procedure.

Such information may be found in the Take-off Minimums And (Obstacle) Departure Procedures section of the U.S. Terminal Procedures publication. Depending upon the airport operating environment, characteristics of the published missed approach procedure, overall aircraft performance capability, and other relevant considerations, pilots may wish to take one or more of the following actions after initiating a balked landing/go-around beyond the published MAP:

1. Where practical, re-establish the aircraft laterally and vertically on the published missed approach procedure (for example, a straight-ahead climb, as rapid as possible, may be all that is necessary to re-join the missed approach segment; re-joining a turning missed approach may also be possible if the turn point has not yet been reached).

2. Adjust aircraft climb performance as necessary for the local environment (i.e., climb as rapidly as possible to avoid obstructions that were not a factor in the design of the published missed approach procedure).

3. Maintain visual conditions and reattempt landing, if practicable.

4. Where available, fly a published obstacle departure procedure (ODP) for the relevant runway.

5. Comply with ATC instructions when radar vectors have been issued or can be requested.

NOTE: As soon as possible, pilots should coordinate with and/or inform ATC of his or her intended actions

Assuming the ceiling and visibility permit, your best option is number five or perhaps number three at a towered airport. At an uncontrolled field, number one and two in most cases are your best bet, especially if you were executing an ILS approach. In the case of a straight-in ILS approach, you are not far below the DA in the first place and joining the published missed approach while applying maximum climb performance is perhaps the most practical course of action.

I would also add a sixth option to this list. Predicated on the aircraft's speed and performance characteristics, a circle-climb over the airport is much easier than attempting a complex or unfamiliar ODP. What you might try in a Cessna 172 may be completely different than in a King Air 200. — *S.D.*

it has an exceptionally high MDA of 2400 feet above the pavement. The other possible approach is the LDA DME Rwy 25. This approach only publishes straight-in minimums with an MDA that's still 1790 feet off the ground.

A note on the LDA DME RWY 25 approach plate mandates a minimum climb gradient of 275 feet per mile for the missed approach. A climb gradient of 275 isn't far off the standard missed approach climb gradient of 200 feet per mile, but remember that the missed approach instructions assume you start the missed at or above 1790 AGL (8330 feet MSL), not the 200 feet AGL you might be at for a go-around.

Once you drop below the MDA, you've left the protection of the approach procedure. The published missed for the LDA DME Rwy 25 requires a straight-ahead climb to 14,500 feet and direct to the Snow VOR. However, the current version of the AIM recommends that you apply procedures used in takeoff planning and that would mean flying the GYPSUM Three Departure in favor of the published missed approach.

A close look at that ODP reveals serious problems. Departure from Runway 25 requires a climb of 750 feet per mile to 10,500 feet. Putting that in perspective for our P-210, a 110-knot climbout speed with a climb rate of 1000 fpm at sea level is about 556 feet per mile. At 9000 feet, that same 110 knots indicated is 130 knots true. Assuming we can still make 1000 fpm, that's about 460 feet per mile. Try this in a normally-aspirated airplane that sees 1000 fpm at sea level and you'll be lucky to see 500 fpm at 9000 feet on a 10°C day. That pencils out to 230 feet per mile.

In the case of an airport such as Eagle, with a high MDA offsetting somewhat the hazards of an obstacle-rich terrain, what's wrong with trying to enter the traffic pattern to reattempt a landing? Would you rather execute a hasty departure with only good fortune to help you out? If weather permits, entering the traffic pattern at least gives you the time to think through your options.

Busted Clearance

Your ATC approach clearance gives you the permission to execute the missed approach in its entirety as it is published or alternate missed

(continued on page 23)

The only problem I have with all of this is that this supposedly tight system we fly in gets totally gutted when you add vectors. Vectors take you off your filed course, and when the vectors suddenly stop, so do the rules. There is no bible on how to recover from a bad vector. Or even a good one.

Keep in mind that what the controller expects you to do may totally conflict with your most logical choice of action. Get it clarified before you get a slip in the mail: "Our records show a loss of separation involving N7647Q on June 13 ..."

This article first appeared in the May 1988 IFR *(Vol. 4, No. 5) under the title "Clearances after the Vector." Seems we still haven't figured out this vector thing. Jeff Parnau was the founder and original publisher of* IFR.

LOWDOWN ON THE MISSED

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approach instructions provided by ATC. There's no doubt that executing the ODP would be contrary to your clearance. In order to execute the GYPSUM Three Departure, you would need to get an amended clearance from Eagle Tower (assuming the Tower is not closed) or consider the situation to be an emergency.

One could argue that executing the missed from below the MDA/DA constitutes an emergency. Consequently, FAR 91.123(a) allows the pilot in command to deviate from the assigned ATC clearance to execute the ODP without having an amendment in hand.

No matter how you try to reason this, the FAA has failed to recommend a safe course of action for balked landings under instrument flight conditions. On the other hand, there is regulatory support for engine inoperative flight paths, but not for balked landings. I certainly don't train my instrument students to brief the ODP (if any) for the landing runway.

In the end, the AIM guidance provides a bum steer and causes the pilot to be in direct violation to his or her last ATC clearance.

Just to keep you honest, your GPS or FMS will likely have the published missed approach immediately available and not the ODP. ODPs are not generally coded in the database unless they are graphically depicted, such as the GYPSUM Three. A missed approach is a high-demand maneuver and you don't want to be reading the fine print of an ODP or plugging new waypoints into the GPS or FMS while executing this surrogate missed approach. There's also no guarantee that the ODP's navaids are even operational.

Plan for the Missed

The moral of the story is to prepare for a possible balked landing—it's probably not an item on your approach checklist and it's not commonly part of instrument training. There's no way to anticipate every possible complication, but being down low with nowhere to go is a vulnerable situation and you don't want to make a hasty decision.

If the SIAP has an unusually high MDA /DA or early MAP, that's a clue that landing must be assured (or at least the ability to remain visual in the airport's traffic pattern until a runway becomes available) in low-performance aircraft prior to leaving the protection of the SIAP.

Next time you are shooting approaches with your CFII, have him or her throw in a "surprise" balked landing after descending below the MDA/DA. Remember that practicing this in VMC with an instrument instructor in the right seat will always seem easier. The obstacle alligators are always hungrier when you're in the soup.

Scott Dennstaedt is a CFI specializing in TAAs and weather training for pilots. His website is www.chesavtraining.com.