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HOW TO TAKE OVER IN AN EMERGENCY

The purpose of this chapter is to give you confidence that if you had to take over because the pilot was disabled, you could do it. You already know the basics:

1. You know how to keep the airplane flying, wings level, how to make gentle turns, and how to climb and descend.
2. You know how to interpret the most important flight instruments—the altimeter, the airspeed indicator, the attitude indicator, and the heading indicator.
3. You know how to navigate by pilotage and by the VOR system, and you know how to use the ADF to fly directly to a radiobeacon or a broadcasting station.
4. You know how to communicate with control towers and with ATC and flight service stations.

What do I mean by the pilot being disabled? One thinks right away about the worst case, but there are many more likely causes of pilot disability than a fatal heart attack. Here is a simple example. Everything is going along smoothly when the pilot suddenly cries out in pain. It may be nothing more than a bee sting at a sensitive spot—e.g., the eyelid—that could interfere seriously with the pilot's control of the aircraft. If you can take over for just a few minutes, the worst will be over, and the pilot can resume control.

Here is another example: The pilot has a sudden and excruciating abdominal pain and literally doubles over. It could be an attack of

food poisoning, or it could be something more serious. Either way, it probably needs medical attention as soon as possible, and until then, the pilot can fly the airplane only with great difficulty. If you can take on most of the work, things will be all right.

Consider a less dramatic but nonetheless serious problem—the pilot suffering from severe fatigue and sleep deprivation, who is also taking sedative medication, and who keeps falling asleep at the yoke. Or the pilot who is frankly under the influence of alcohol or marijuana or some other mind-altering drug. Pilots like that will endanger the lives of everyone aboard unless you insist on taking over.

There is the pilot with blocked Eustachian tubes, who develops excruciating stabbing ear pain during a climb or descent. Air trapped in the nasal sinuses can do the same as it expands or contracts. Unbearable tooth pain can be caused similarly by air trapped in a cavity.

Even in the worst case—a heart attack or stroke—chances are good that quick medical attention can save the pilot's life. Your task, then, is to fly safely to the nearest airport, under instructions from ATC controllers.

WHAT TO DO IMMEDIATELY

Don't panic! What you do in the first minute—even the first 10 seconds—is critically important. Let's suppose you look over to your left and realize, to your horror, that the pilot is slumped over the yoke or slumped back in the seat. If the aircraft is not on autopilot, it will probably already be in an unusual attitude, most likely in a steep bank and diving. The abnormal racing sound of the engine and of the air rushing by the cabin as the airspeed picks up may have been what alerted you to look over at the pilot in the first place.

1. Reach over without delay and pull the pilot away from the yoke.

2. Kill the power by pulling the throttle or power quadrant all the way back in one rapid movement. You don't want engine power making the dive worse!

3. Level the wings immediately, according to what you see outside or on the attitude indicator. If the aircraft is in a steep bank to the left, turn the yoke to the right, and vice versa.

4. As soon as the wings are level or nearly level, pull back gradually on the yoke to bring the little airplane up onto (but not above) the artificial horizon, or to get the nose of the real airplane up toward (but not above) the real horizon, if you can see outside.

5. Start a climb to recover the lost altitude, by pushing the throttle forward to get full power, and do it immediately, as soon as you have returned to level flight. The airplane is probably still trimmed for level flight at a moderate power setting, so full power will automatically start it climbing. It may be very important, because of terrain, that you regain the lost altitude quickly. In that case, turn the trim wheel toward you (or turn the trim crank clockwise) to raise the nose and reduce the airspeed, resulting in a greater rate of climb. However, keep an eye on the airspeed indicator; you don't want the needle anywhere near the bottom of the green arc, where there would be a danger of losing lift altogether.

When an airplane is diving and turning out of control, it can pick up speed very quickly. Unless the procedure described here is carried out right away, the maximum permissible speed (red line on the ASI) could be exceeded. Sooner or later, then, if the airplane doesn't hit the ground first, the speed can pick up enough to tear off the wings. And since an abrupt pull-out from the dive will impose stronger forces than the wings can sustain, pulling back on the yoke to get out of the dive has to be gradual. The best preparation for these critical first few seconds is to practice "recovery from an unusual attitude"—a standard procedure taught to all pilots. This should be part of the regular "pinch-hitter" training (described

below), and you should request the instructor to give you this important practice.

Here is a little exercise in reading the instruments. Look at Fig. 5.1 and see how quickly you can grasp the important message the AI and altimeter are telling you. Do it now, before reading further. You should have recognized at once that this aircraft is in a diving turn to the right. You can tell that because the little airplane in the AI is well below the horizon. Moreover, the right wing is down below the horizon, in the dark area, so the airplane is banked to the right at nearly a 30-degree angle. The aircraft is momentarily at 7740 feet above sea level, but it must be losing altitude rapidly, as would be seen clearly if the VSI were shown here. In fact, this is just the situation postulated above, where you must instantly pull back the throttle to kill the power, turn the yoke (here to the left) to level the wings, pull up gradually to stop the dive, then bring in power again to regain the lost altitude.

People often have difficulty remembering which movement of the trim wheel (or trim crank) does what. A good idea is to sit in the airplane on the ground and change the trim, saying "nose up" as you rotate the wheel toward you, "nose down" as you rotate it away. I like to think of looking at the trim wheel from the side, and imagine a model airplane mounted to it, facing forward. Then the rotation

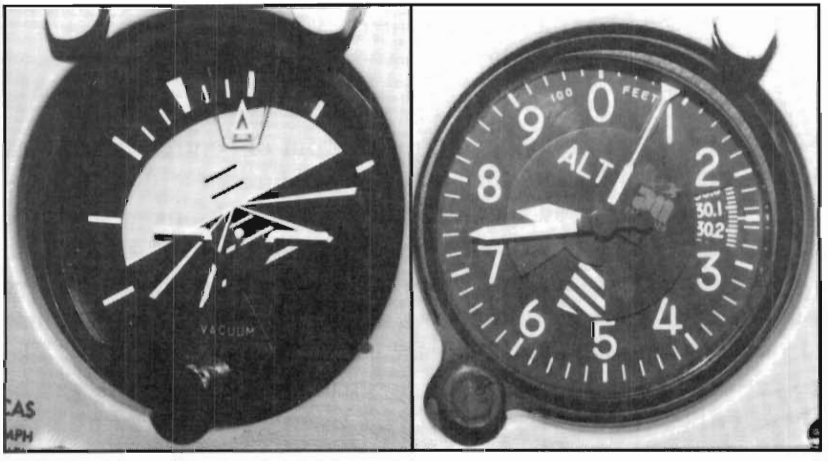

Fig. 5.1. Recognizing an unusual attitude. What's going on here?

that tips up (or down) the nose of the imaginary airplane will do the same for the real one. With a trim crank it's arbitrary—clockwise–nose up, counterclockwise–nose down.

WHAT TO DO NEXT

If you happen to remember what altitude you were at when the trouble began, get back there, then stop the climb by lowering the nose with the trim wheel, reduce the power somewhat, and adjust the trim for level flight at that power setting. If you have no idea what altitude you should be levelling off at, examine the chart and climb 1000 feet above the safe altitude shown there (see page 2-4) for the rectangle you are in. But don't waste time looking for the chart or studying it; just climb, the controller will tell you what to do next.

If the airplane was on autopilot when the trouble began, it is likely that no unusual attitude will have developed, and everything will be easier. The airplane will continue smoothly on its way. You ought to learn the few simple tricks about operating an autopilot. If you usually fly with one, get the pilot to let you practice. In its simplest form, an autopilot is a device that maintains the wings level. To initiate a turn, you have to disconnect it temporarily. Often, however, you can "command" a turn by simply turning a little knob. This gives one a great feeling of power—such a big machine responding to such a tiny manipulation!

More complex autopilots can hold a heading that is set by a little "bug" that you can position on the HI. Then to turn to a new heading, you have only to move the bug. Many autopilots will track a NAV course, i.e., will keep the VOR needle centered, crabbing the airplane as required to stay on the chosen radial. There will also be a selector switch to determine if the autopilot is to work on NAV1 or NAV2. Finally, advanced types of autopilot maintain a constant pitch attitude—whatever you set, for level flight, climb, or descent—and also will hold a desired altitude automatically.

If you should be forced suddenly to assume the pilot's job, determine right away if the autopilot is in use, and what it is set to do. You can always shut it down, of course, by flipping a switch or pressing