

Training & Proficiency

The teaching of flight is as essential to aviation as wings, for pilots are trained, not born, and good pilots forever strive to perfect themselves through higher ratings and recurrent training.

The PILOT, through this special supplement, has attempted to map the avenues open to those seeking instruction and self-improvement in today's world of aviation.

by DON DOWNIE / AOPA 188441

■ ■ There's nothing really glamorous about aeronautical home study. It has none of the satisfaction of a "grease job" landing, or the exhilaration of a smooth lazy eight, or the gratification of an ETA that's right on the money.

It is, however, one of the ways to acquire knowledge of those things that can best be learned on the ground. And home study does have a number of factors going for it: a self-imposed pace, or lack of it; leisure for studying and restudying problem areas; absence of that formal ground-school atmosphere that can be intimidating to those whose student days are a long way behind them; and provision of a great mass of information, in a manner easily accessible to aspiring airmen.

I asked J. W. ("Pete") Campbell (AOPA 322831), FAA's dynamic spellbinder at many an AOPA Flight Training Clinic, about the merits and demerits of home study.

"It's the motivation to learn that really counts," he replied. "I studied for the ATR at home, many nights until 2 a.m., because I wanted it right.

"I believe that well over half the technical books available are good," Campbell continued. "I do feel that authors of technical aviation material should be flight instructors, and I believe that

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BY THE BOOK *continued*

publishers owe it to the reader to give the qualifications of the author."

Over the past 14 years, more than 600,000 copies of William Kershner's three books—*The Student Pilot's Flight Manual*, *The Advanced Pilot's Flight Manual*, and *The Instrument Flight Manual*—have been purchased. Kershner (AOPA 84904) suggests that those using home study to pass an FAA written exam should remember that the test is based on actual conditions (usually a cross-country flight for the private exam), and should be familiar with the tools and background of actual flying. They should review the FARs, the Airman's Information Manual, sectionals and other charts, he emphasizes: "In effect, review what they have done in the airplane and affirm that all that's been done is understood. Know where to look for information.

"I would suggest," he adds, "that the written for a private license not be taken until after the first solo cross-country—or the first solo cross-country into a controlled field—so that the experience will help with the questions. I don't believe that home study without flying will result in passing the written . . ."

The process of imparting aeronautical information has come a long way over the years. According to John Dohm, vice president and editorial director for Pan American Navigation Service, the first of the "quiz systems" in aeronautical training was developed by the late Charles A. Zweng in 1937. Entitled *Aeronautical Training*, the Zweng manual went through 35 printings until it was replaced in 1959 by *The New Private Pilot*, written by Dohm and Ernest Brooks.

"Today's self-test publications normally give more and tougher questions than the student will find on his FAA test," says Dohm. "Answers are bound into most books, either at the end of the publication or at the end of each chapter. Thus the do-it-yourselfer can actually see whether or not he's given sufficient study to cover the material and can, more importantly, note areas of study where he may be weak.

"Call it a 'quiz system' or 'programmed learning,' this approach has opened up a whole new vista to learning vs. merely reading."

Dohm has been preparing aviation education materials for over 30 years and has some rather definite convictions. "I have come to the conclusion that there is a large body of airmen concerned mainly with taking on only enough information to get them through the FAA written exams with something above a passing grade. However, the philosophy behind our manuals has always been to provide all the information the FAA says the pilot needs to be a safe and efficient airman—not just to result in a correct answer of 70% of the questions."



Pan American Navigation Service publishes and keeps current 16 titles on general aviation. "With a good home-study course," says Dohm, "as opposed to questionnaires purporting to be guaranteed copies of the FAA exams, a student can proceed at his own pace, absorbing as much or as little as his capacity or his allotted time allows. He can test himself on what he's read and, just as important, he can learn to use the mass of reference materials which are the working tools of today's serious pilots.

"The average student pilot," he adds, "is a working man with a living to make. The classroom may represent a rather awkward and unfamiliar situation for him. Home study removes the self-consciousness and enables him to learn in a noncompetitive environment."

In the home-study field, many publishers, e.g., Jeppesen, provide full "programmed courses" with a variety of question-and-answer responses, computers, plotters, sample maps, and the like.

Jack Switzer (AOPA 288995), a former Air Force pilot who now runs a pharmacy, flies an elderly Cessna 172, as time permits, and is working on a long-overdue instrument rating.

"Working a one-man store means that I just can't get to a regular ground school for every meeting," says Switzer. "I've

found that the Jeppesen courses are the best for me. If you're going for an IFR written, as I am, what's the extra \$29.95 to put it all in one package? After I get the written out of the way, I still have the complete course package for handy reference. If you take the time to read through manuals like this, you have the entire package laid out in an orderly manner. This programmed approach is great, and the sample final exam with critique is frosting on the cake."

Jeppesen currently has seven texts that are revised frequently to keep them up-to-date. These include a *Flight Review*, which, coupled with the company's *Flight Manual*, covers all the material required for the new biennial flight review.

AOPA has five training manuals—a spinoff from material used at flight-training clinics—that are now packaged for home study. These include the *360° Rating Course*, the *Instrument Procedures Course* (two parts), the *Instrument Flight Test Preparatory Course*, and *Mountain Flying. How to Fly Floats*, by J. J. Frye, has been added to the AOPA package as an outstanding briefing for land-lubbers who don't want to get their feet wet.

The U.S. Government Printing Office, Washington, D.C., supplies a variety of FAA training manuals and written test guides. In addition, several publishers have come out with their own reprints of sections of—or complete—FAA publications at substantially lower prices.

The two best-sellers of Aero Publishers, Inc., are *Federal Aviation Regulations for Pilots*, at \$1.95, and the *Airman's Information Manual* (complete Part 1, plus excerpts from Parts 2, 3 and 3A, and 4), at \$2.50.

"Regarding the merits of home study for pilots, we feel there is no other way," says L. W. Reithmaier, vice president and editor-in-chief of Aero Publishers. "Even if a pilot attends a controlled course for his certificate, continuous home study is a necessity to keep current, especially in the FARs."

Last year, Aero Products Research, Inc., another supplier of pilot aids, produced more than half a million aviation books and training packages. APR President Leonard Wilstein (AOPA 188839) explained that "since we don't have the expense of preparation, because all government publications are in the public domain, we are able to supply copies of these at rates much lower than the Government Printing Office.

"Frequently, government publications are back-ordered or can take many weeks to obtain. Since we're in a highly competitive market, we all work quickly. Write-in requests are mailed out the same day, but we prefer to have our publications purchased through regular book shops or aviation distributors."

The FAA's package of "Exam-O-Grams" comprises 37 VFR and 27 IFR quiz forms that the GPO will mail out as available, without charge—a price that's hard to beat. However, APR has retained

an additional 15 VFR and 5 IFR sheets which it sells at \$1.98, while it will supply both sets for \$3.50.

Wilstein points out that a pitfall for students using the do-it-yourself approach is loss of enthusiasm caused by reading too many uncorrelated books. "By using a packaged approach of programmed learning, this is eliminated," he says. "Any student can keep up his enthusiasm, motivation, or whatever you want to call it, if he has the assurance that he's getting what he'll need."

A copyrighted feature of APR's programmed training courses is a color-coded exam sheet on which the student can see the proper answer only after looking through a special polarized viewer. This eliminates the need for using a card to cover the answers—or for having them put in the back of the book.

Under its new FAR 61.105, FAA specifies that an applicant for a private pilot certificate "must have logged ground instruction from an authorized instructor, or must present evidence showing that he has satisfactorily completed a course of instruction or home study . . ." Applicants who have opted for home study rather than ground school are urged to have a certificated flight or ground instructor certify that they have completed an appropriate course.

Many instructors may be reluctant to sign such a recommendation unless they have quizzed the student extensively. After all, if I, as a CFI, recommend you for a written exam and you "blow it," the FAA will rightly have some doubt as to just how smart I am. Bill Kershner sums it up when he advises that you "pay your instructor for his time for a general review of your knowledge. If, after such review, you both feel that there are gaps, then go back to the books and fill them in."

The payoff in any educational program is how well the students progress. A sampling of letters from satisfied users of various home-study courses included the following comments:

"So far, the course is great and the text informative."

"I just finished two days of testing for flight engineer. There were approximately twenty of us from all over the country. I wired you last week for your flight engineer's manual. I know I would never have made it without that book. Only two of us, out of the twenty, were accepted."

"I borrowed one of your books for my private exam. Decided I liked it, so bought one for my commercial."

"I look to your manuals not only as a quick reference guide or a means to an end, but also as an up-to-date compilation of material that can readily be understood by my students."

A final enthusiastic do-it-yourselfer wrote: "I passed the private written with ease after studying the private programmed course. The material was arranged for complete retention. You just can't beat it. I plan to use the instrument course after passing the commercial. It's like having a ground school in your own home." □

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In the Classroom

by WILLIAM GARVEY / AOPA 480899

■ ■ For those with the time, money and inclination, the aeronautical education available to them at schools across the nation is as varied as the enterprise of aviation itself. There are schools that will teach you to fly almost anything that moves through the air. Besides piloting, a student today can enroll for courses on servicing, designing and managing airplanes, waiting on passengers, or spraying soybeans. If a job exists in aviation, almost invariably there's a school somewhere which offers it as a course.

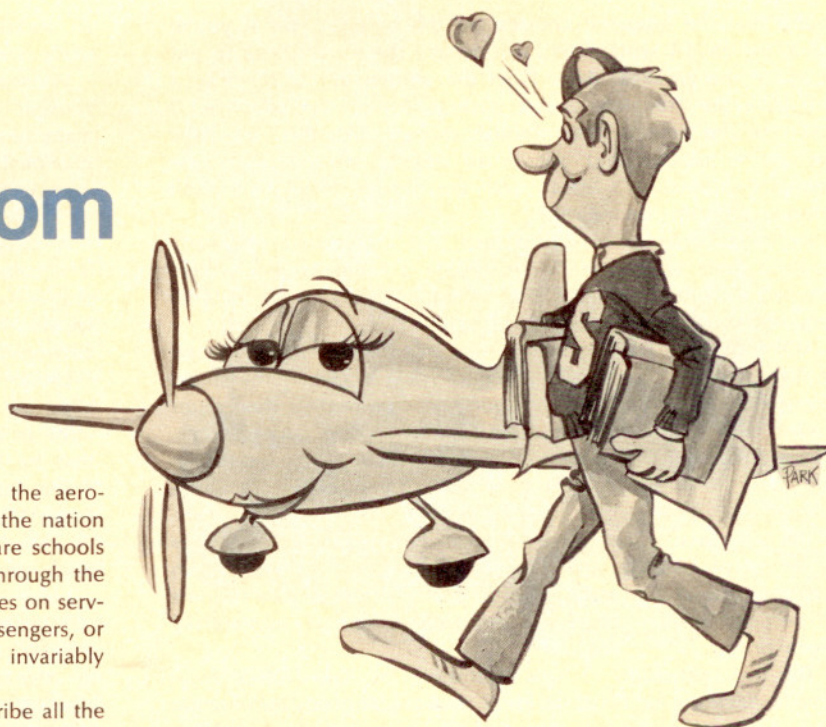
It would require an encyclopedic publication to describe all the aviation-related studies available at every college, maintenance or flight school in the country. Instead, this article will try to give some idea as to the types and cost of training available at the schools in various categories.

One fact which appears universally true when dealing with flight training is this: there is no inexpensive way to obtain pilot ratings. The expense may be in dollars or it may be in the form of time (especially time spent in the military service), but either way, it costs plenty.

Colleges and universities have long been involved in aviation, and today there are scores of them (both public and private) in the field. Bastions like Auburn, Florida Institute of Technology, Ohio State, San Jose State, Purdue, Embry-Riddle, and Oklahoma State, are well-known for their flying credentials, but two-year community colleges are beginning to draw a substantial number of aeronautical students to their day and night classes.

Parks College of Aeronautical Technology offers an example of the courses and degrees given at larger academic institutions.

A division of St. Louis University, Parks is a coed school, located in Cahokia, Ill., just three miles from St. Louis. Founded in 1927, the school now has 750 students and offers bachelor of science degrees in aerospace engineering and in aeronautics, with con-



centrations in aircraft maintenance engineering, aeronautical administration, aeronautical meteorology and in transportation. The college also offers associate degrees in science for aircraft maintenance engineering technology, aircraft maintenance management, aviation flight technology and aviation management.

As with most larger schools, Parks offers flight training as part of its curriculum. The nice thing to remember about collegiate flight training is that flight time is applied to an academic degree as well as to FAA ratings. And many schools offer training at prices lower than the average for the area.

Parks will take a student from groundling up through multi-engine, instrument, and commercial, but the instruction for that will cost about \$5,000, in addition to the \$1,200 he must pay for room, board, tuition and fees per trimester.

Dowling College, located about 50 miles east of New York City in Oakdale, N.Y., is a small private school that prides itself on the quality of its aeronautical program, which it began five

years ago.

Aviation students at Dowling may choose to pursue bachelor of science degrees in aeronautics, aeronautics and management, and aeronautics and applied mathematics. All the programs are strong on technological studies, with the required courses including calculus, physics, aerodynamics, and navigation, but the liberal arts are not forgotten. English, speech, philosophy, and history are also required courses.

Again, flight training is available to students at a cost in addition to the \$3,500 annual expense for room, board, and tuition. Of the 175 students in Dowling's aeronautics program, between 50 and 80 are actually involved in the flight-training program, conducted under contract with a nearby FBO.

Junior colleges such as Mt. San Antonio in Walnut, Calif., may be the answer for those with limited budgets who want to be educated in the ways of aviation. There is little or no tuition fee at these public schools, and no room and board charges, since almost all their students are day hops.

"Mt. Sac" offers associate (two year) degrees in science for commercial flight training, air transportation and air traffic management, as part of its curriculum. Such courses will help a student pass his written FAA pilot exams or even initiate him as an air traffic controller. Some students taking air traffic management may actually be employed part-time by the FAA under the "work-study" program during their course of study.

Miami-Dade Community College in Florida offers a range of programs similar to Mt. Sac's and, as with many schools, it offers flight training in conjunction with an outside organization. In Miami-Dade's case the flight training is handled by Burnside-Ott, one of the best known commercial aviation training centers in the country.

There are several operations similar to Burnside-Ott, all of them large facilities whose existence is greatly dependent upon the training of pilots. Included in this class of pilot training centers are Spartan School of Aeronautics in Tulsa, Okla., Acme School of Aeronautics in Fort Worth, Tex., Sierra Academy of Aeronautics in Oakland, Calif., American Flyers of Ardmore, Okla., and Aviation Training Enterprises, Inc., (IFR specialists) with several locations around the country.

You can walk into many of these schools, having never risen higher than the top floor of an office building, and walk out months later qualified to pilot commercial twins or even handle the flight engineer duties on a Boeing 727.

Burnside-Ott estimates that going from gosling to instrument pilot with a commercial rating will cost \$4,600. You can add a multi-engine rating to that for \$650. You'll need at least all of the above ratings, plus 500 hours' total flight time (of which 100 hours must be in multi-engine craft) before becoming eligible

to take the Learjet program. Getting signed-off as a qualified pilot for the school's Learjet Model 24 will cost about \$7,000. The flight test alone costs \$1,100.

You need to have only a commercial ticket with an instrument rating, and about \$4,600, to sign up for the Boeing 727 flight engineer program. And Burnside-Ott accepts Master Charge, American Express or Bank Americard as payment.

One organization offering training right up to the turbojets, with special emphasis on the jets, is FlightSafety International, with headquarters in New York City. Aside from its ultra-modern pilot academy in Vero Beach, Fla., FlightSafety has some special facilities in eight other U.S. locations, plus one in Toulouse, France.

The heart of FlightSafety's advanced programs is its sophisticated electronic flight simulators for such aircraft as the Sabreliner, Gulfstream I and II, Westwind, Learjet, Falcon, and BH-125. FlightSafety attracts the cream of the pilot crop for recurrent training. To cite one example, the men who pilot Air Force One fly FlightSafety's simulators regularly.

But not everyone wants to fly million dollar jets, or even things with wings for that matter. Some want to fly choppers, and there are also schools for such people.

Certain general flight schools like Acme do offer helicopter training, but there are schools that specialize in rotary wing education. Island Helicopters of Garden City, N.Y., is an example.

The school, located at Roosevelt Field (Lindbergh's takeoff point), uses five Bell 47s and three Sikorsky S-55s for training students.

The Bell 47, either dual or solo, rents for \$95 per hour. It's easy to understand why a helicopter rating costs at least \$3,500 at Island, and a commercial ticket costs an additional \$15,600. Mind you, those costs are figured for a student using the Bell exclusively. If he wanted to use the bigger Sikorsky, the hourly rate would increase by \$105.

Island also offers training for helicopter flight instructor certificates, category ratings, external load operations certificates, air-line transport (VFR) ratings and even ag operations.

Johnny Dorr's Merigold Flying School in Mississippi uses more traditional equipment to train its budding ag pilots—Piper Cubs and ragwing Stearmans. For students commercially rated, or those with equivalent flight experience, Dorr's course takes about four weeks and costs \$2,035. The program includes 15 hours of chemical and entomology classes as well as 15 hours of flying the Cubs and 25 hours in the Stearmans.

Probably the quietest flight school anywhere is conducted in Elmira, N.Y., by the Schweizer Aircraft Corp., America's foremost sailplane manufacturer.

The company's school has done away with its weekend soaring course and now stretches its power-pilot transition class over a

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IN THE CLASSROOM *continued*

four- or five-day period. The school is open from May 1 through November 1 and all classes begin on Monday. For \$295, power-plane pilots get about six to eight hours of flight time, plus one of the most interesting ratings awarded by FAA, that of "Glider (Aero Tow Only)."

You can also get commercial glider and glider flight instructor ratings at the Schweizer school. No one ever got rich flying gliders, but wouldn't it be nice if you could.

If you've just got a weekend to spend, but still want to take a crack at something new, go to North American Flying Service in Little Ferry, N.J., or any one of the several schools that offer seaplane ratings. The transition from wheels to floats takes about seven hours and costs around \$200.

The AOPA Air Safety Foundation has one other suggestion for those with a spare weekend and a yearning for learning. The Foundation conducts a series of ground and flight courses at varying locations throughout the country each year. Some 16,721 students, ranging from white-knuckle wives to ATP candidates, took the courses within the last year.

Ground courses include instruction for students interested in taking FAA exams for private, commercial, instrument, flight instructor and ATP/flight engineer ratings, or for those pilots who want to know more about weather or just want to update themselves on regulations and procedures.

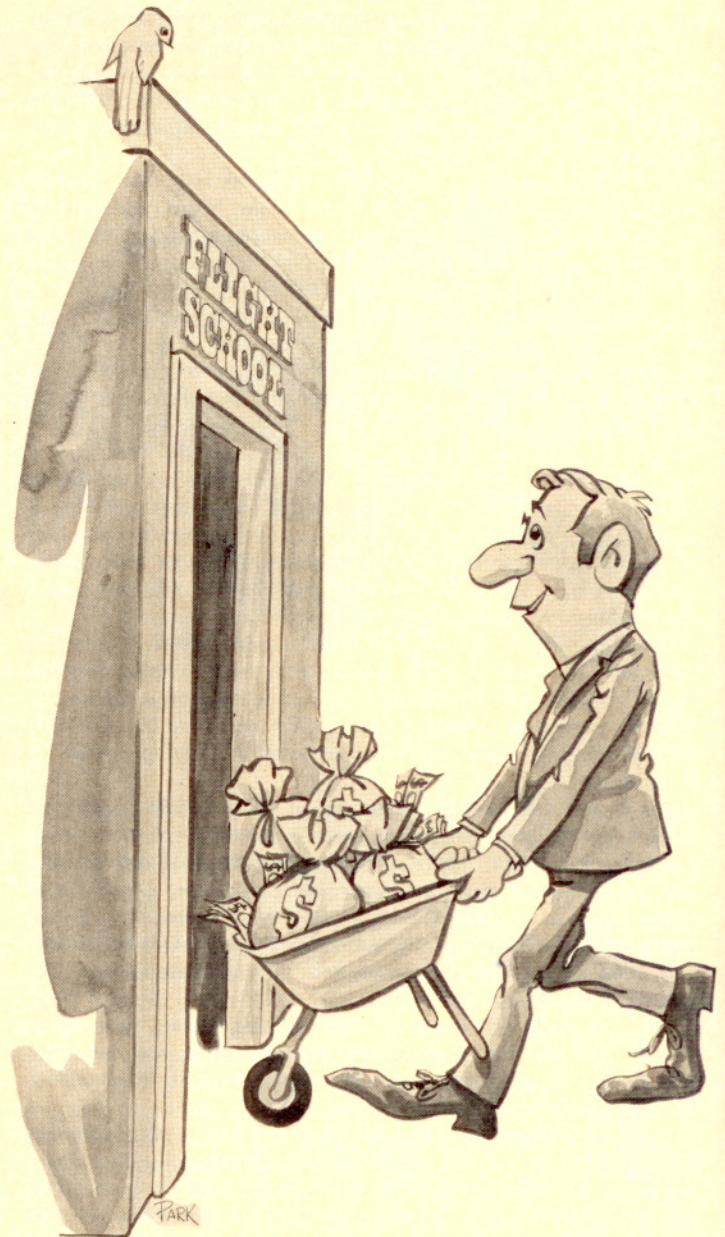
There are courses for mechanics as well as flight instruction for instrument students, reluctant "copilots," and those who would like to traverse mountains.

An education in aviation is available to almost anyone. Generally, the more involved a person becomes in flying, the greater the demands will be upon his time and wallet. This article is intended only to give some idea of the variety of ground and flight courses being offered today.

Acme, in its sales literature, offers its own guidelines for selecting a training school. These include the following questions: Does the school guarantee, in print, its ground school, oral exams and checkrides? Does the school have a flight simulator, or better yet, a three-axis simulator? Does the school offer you the names and telephone numbers of recent graduates? Does the school offer instruction seven days a week?

To these might be added, Is the school approved by the FAA and approved for VA benefits?

Any person interested in furthering his aeronautical education would be well advised to contact several schools and compare their curriculums, costs, and facilities to determine which is best suited to his own situation. □



Training & Proficiency

At the Airport

by BERL BRECHNER / AOPA 466558

■ ■ An airplane is an awfully expensive classroom. Also, a very inefficient one, especially when it comes time for an extended discussion between learner-pilot and instructor.

So, in the past few years, the concept of on-the-ground classroom instruction, before and after flight, has mushroomed. A new jargon is sprouting up at airports that formerly depended on a couple of instructors and a few airplanes to teach people how to fly.

Now, often as not, learning to be an aviator is part of an "integrated learning package," which is spiced-up with audio-visual training aids, stage checks, audio textbooks, oral quizzes and flight-prep briefings. Somewhere in all of that, the student pilot even gets to fly a real airplane.

The days when a person could get into an airplane and teach himself have been gone for 40 years. And the days when one person could simply pass on his knowledge to another are fading fast.

Most common among the airport-based programs are the courses organized by four major aircraft manufacturers, and then sold to airport operators for use in training students.

Beech has its Aero Centers; Cessna has its Pilot Centers; Grumman-American sponsors its Flying Centers; and Piper has its Flite Centers. Over the past three or four years these manufacturer-sponsored efforts have spread around the country, with Cessna leading the pack.

Recent tallies show Cessna with more than 500 such centers in the U.S. and Canada, followed by Piper with 350, Beech with

about 115 and Grumman-American with 70. Each company has had its course tailored to fit its training aircraft, and also the type of audio-visual equipment used varies among the centers. But, fundamentally, they do the same thing—create a better, more informed pilot, in a shorter time, hopefully for less money. The companies also say that their courses present a dramatic visual package, attractive to the prospective student pilot or advanced pilot, motivating him in his desire to fly or to improve his flying talents.

Although it usually goes unsaid, a big reason manufacturers are so wrapped-up in flight training is to sell airplanes. Research has shown that the student pilot develops a great allegiance to the plane that he learns to fly, and the first one that he buys is usually a product of the company which built his trainer. In addition, the manufacturers sell their training programs and materials to fixed-base operators, at prices in the \$1,000 to \$2,000 range.

All four aircraft-company-sponsored courses offer a program that results, upon successful completion, in at least a private pilot rating. Cessna and Beech offer commercial and instrument ratings, while Piper's programmed instruction will carry a student through commercial, instrument, and multi-engine ratings.

Jeppesen-Sanderson, a Denver-based company that has made pilot accessories, charts, and training aids for years, handles the spadework for all the manufacturers' courses. At present Jeppesen is the uncontested leader in this field, although a company official says he expects some competitors to enter the integrated pilot-training business in the near future.

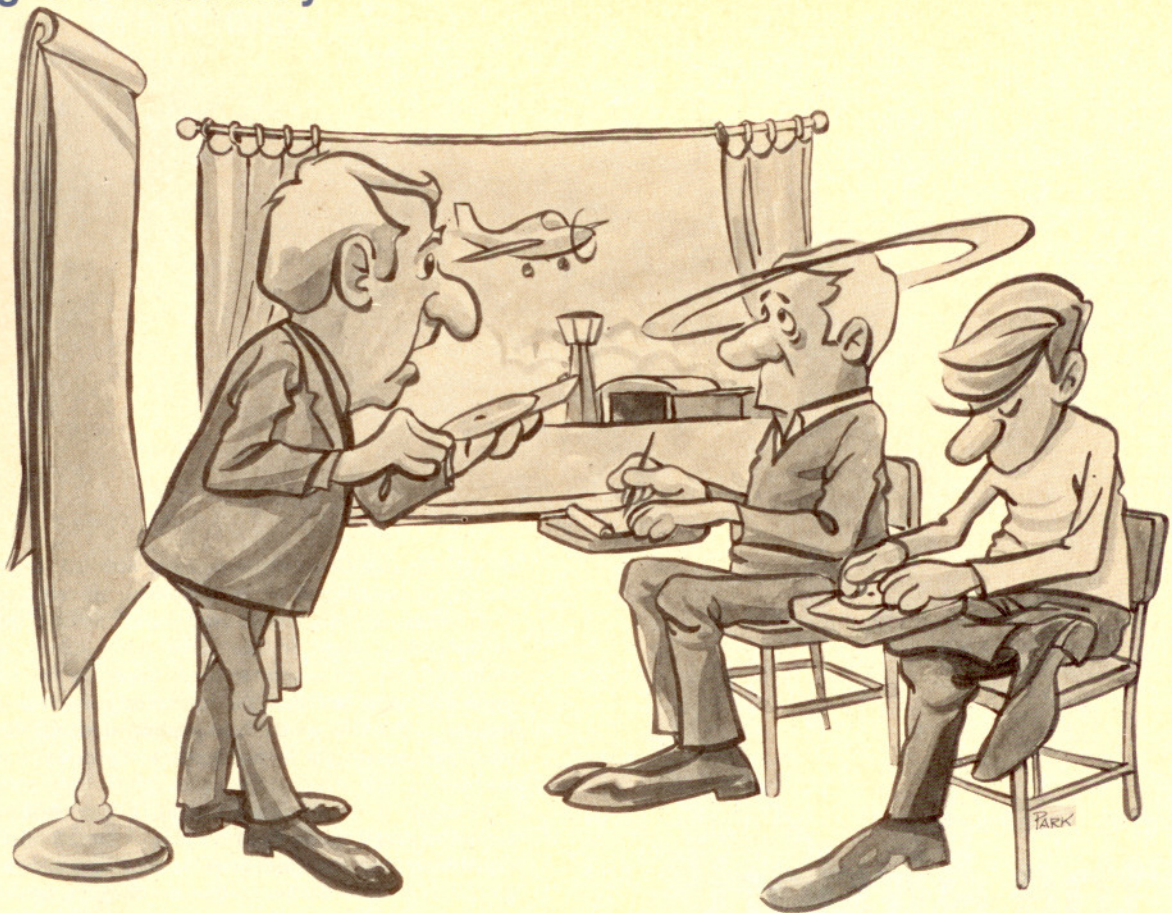
Each of the airport-based courses is similar, relying on filmstrips, 8mm film and audio cassettes for ground instruction, along with text materials for home study by the pilot.

The pilot working toward his private license may receive more instruction in an airport room than he receives at the controls of an airplane. For instance, when a classroom environment is used at a Grumman-American flying center, a student pilot can expect 51.5 hours of classwork. In addition, he gets almost 18 hours of pre- and post-flight briefings.

To the pilot who learned by doing, and who read some books at home to pass his written exam, this much ground chatter about flying probably seems staggering.

But according to Don Sellers, who played a big part at Jeppesen in developing the flight training programs, "The student who takes any one of these courses really has a leg up . . . He's in an environment where he can learn rapidly, and he is prepared before he is in the air." FAA records, says Sellers, show the average flight time toward a private license is 60 hours. Students passing through the Jeppesen-designed courses generally require 40 to 45 hours of flight time before their checkride, he said.

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AT THE AIRPORT *continued*

Though only a minority of FAA-certificated schools utilize the programmed courses, most of the others have created their own programs to meet the requirements of Federal Aviation Regulation Part 141. The regulation prescribes a general format for pilot schools—what equipment they should have, how much and what type of instruction they should provide, the qualifications of pilots and instructors, how to keep records, and the many other facets of managing a flight school.

So, even though a school at an airport may not have a programmed course with cassettes, filmstrips, and wall-size navigation computers, it probably does have at least the rudiments of ground school.

There are, also, a large number of airport-based schools with ground-simulators—from the basic tabletop models to more elaborate units that actually move in response to control pressures, and may even record the flight path. As the hourly cost of time in an airplane goes up, the utilization of simulators (which may be a half or a third of the cost) seems to increase. Simulators, though, are not part of any required ground training; rather they serve as an optional aid to give more training at less cost.

There are, at the last FAA count, 2,625 certificated flight schools. This leaves a large body of schools that are not certificated. Categorizing these schools is an almost impossible task—since they range from fairly complete on down to the most basic (where the ground school frequently consists of no more than talking about flying over a cup of coffee).

There are no simple answers when it comes to flight training, and the associated ground talks. Statistics may show all the reasons why an integrated flight-training program is more effective, but you, the “student” pilot, may prefer the informality of low-key sessions at the airport cafe. As things now stand, you can

find either—it’s up to you.

Effective November 1, 1974, a revised FAR Part 141 takes effect, and pilot training at the airport will eventually take on a whole new look. The new regulation will bring about a revamping of most approved-school courses, tightening up on the quality of instruction, and monitoring more closely the training given at the schools.

In addition, a lot of little things will change. If a simulator is used, it must be the closed-cockpit type; it must have controls to simulate rotation of the trainer about three axes; and for IFR instruction the simulator must record the flight path. Classrooms under the new regulation must be adequately heated, lighted, ventilated, and be located away from “distracting” flight operations and maintenance areas. Also, the school must have “pilot briefing areas” for preflight preparation.

Schools that are granted examining authority by the FAA will have broadened authority to recommend their pilot school graduates for certificates and ratings—without the graduate taking an FAA flight or written test. During his training though, he must pass exams and checkrides administered by the school. Putting it simply, the training that goes on at an airport will become more like the education to be found at a college. There will be exams, grading and rating systems, transcripts, and close controls on the people permitted to teach ground and flight subjects.

“Many flight instructors and fixed-base operators will learn new words and new ways of doing things,” explained FAA operations specialist Larry Musser, one of the people responsible for the changes in Part 141. He estimated it would take three to five years for the pilot-training schools to fully grasp the intent of the new reg.

One thing, Musser noted, helps to explain the intent of the new regulation: “If a school is going to be certificated, there can be no flying school unless there is a ground school.” He estimated that, due to the complexity of the added requirements in the revised regulation, 20 percent or more of the 2,625 cur-

rently certificated pilot schools would drop their FAA endorsement. But, in time, as instructors move to new schools and an understanding of the procedures spreads, there will again be a resurgence in the number of approved schools.

As Musser explained it, pilot training at the airport will require four steps on the part of the school:

1. Explain objectives;
2. Provide training aid;
3. Confirm training;
4. Use oral or written tests to confirm knowledge.

The schools that go through the new procedures to get FAA certification will have acquired some status, said Musser. "Their prestige will be enhanced." A more pragmatic benefit of FAA approval is that the school can take as flight students those who receive VA benefits—paying 90 percent of the training costs.

To help the schools meet the new requirements, the FAA is in

the process of publishing an Advisory Circular that would spell out in detail the minimum requirements for an approved school. The FAA says that if an operator follows their format, he will have no problem in gaining approval.

As prestige among FAA-certificated schools spreads, "people will go to such schools," says Musser, "to insure a higher quality of training."

To pilots who have learned to fly under the go-to-the-airport-and-fly method, all this ground training, simulator time, phase checks, and audio-visual aid may seem extreme.

But it is more a reflection of the complexity of flight in today's airspace, compounded by the broad scope of the rules and regulations that pilots are expected to adhere to. And although the act of flying a basic airplane hasn't changed in 30 years, everything around that airplane has changed, and that is what is being reflected in the training the pilot receives at the airport. □

Training & Proficiency In the Cockpit



by ROBERT W. SWEAZEY / AOPA 387609

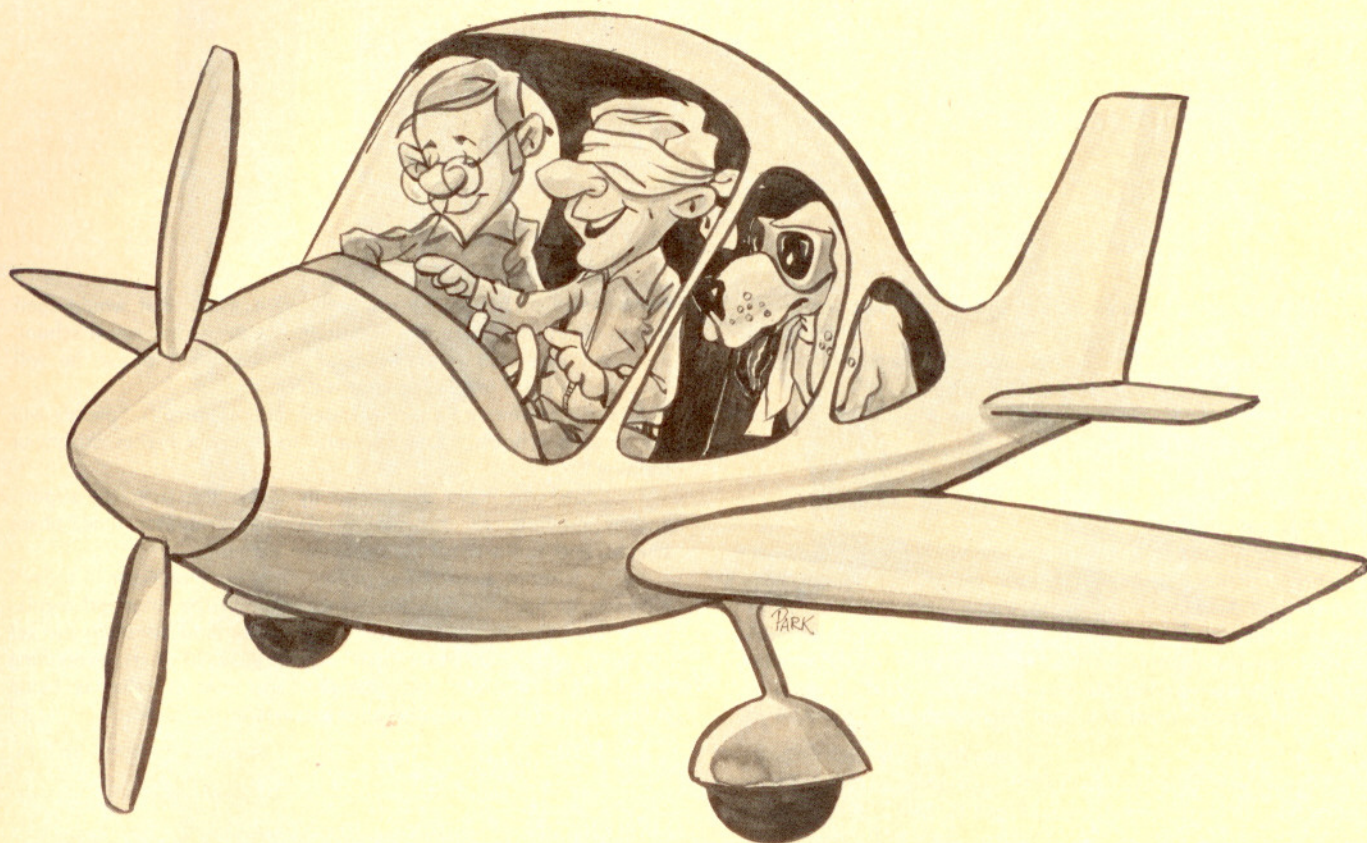
■■ Down through the years, much rhetoric has been employed to describe pilot proficiency, or lack of it. Articles have been written telling how to fly straight and level, make good takeoffs and landings, make coordinated turns, and perform everything else pertaining to piloting technique.

Proficiency in the airplane is an endeavor that must be pursued on a full-time, continuing basis. It must be sought and revered by

all pilots, no matter what their background or experience level.

A popular dictionary gives the definition of proficiency as "well advanced in an art, occupation, or branch of knowledge." In relating that meaning to aviation, let us add our own definition: A proficient pilot is one who can correctly manage any flight situation that confronts him. (This should not be interpreted as meaning that he will continue into any situation, for, if adverse condi-

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IN THE COCKPIT *continued*

tions are present, he may be demonstrating his best judgment by turning around, or not going in the first place.)

The ability to manage any flight situation properly comes not from super-quick powers of deduction or reasoning, but from advance planning and practice—lots of it.

If we look at the airline captain, we see a person who daily encounters all forms of flight situations, yet consistently delivers his passengers to their destination in a safe manner. The key elements he has going for him are his many hours of training, experience, and practice.

Most of us are not airline captains, so what do we have going for us? Our previous training may have been minimal or extensive. The number of hours in our logbook may be few or many. The type of pilot license we have may be anything from a student permit to an airline transport pilot certificate.

But no matter where we happen to be on the scale, it is just not enough—we must move higher yet. We must have the attitude that we should increase our proficiency. Only by constantly trying to perfect our qualities of airmanship can we hope to properly manage all the flight situations we may encounter.

For many years the FAA has let us be the judge of our own proficiency, but now that has changed. The requirement for a biennial flight review says that every two years we must expose our basic flying skills to an instructor for evaluation. The situation provides a golden opportunity for us to increase our skills by indi-

cating to the instructor that we would like a little dual on cross-wind takeoffs and landings, instrument work, slow flight or stalls, or whatever area we would find beneficial.

The AOPA Air Safety Foundation's SKY=SAFE course is designed expressly for compliance with the biennial flight review requirements. It provides not only the flight review but also a concentrated ground-school program. The foundation's other flight-training courses also fulfill the biennial review requirements in conjunction with their training objectives.

For the instrument-rated pilot, there is another fairly recent requirement. Now he is obliged to have made six instrument approaches within the six months preceding any IFR flight. FAA now also requires an instrument-competency check if the recent-instrument-experience requirements have not been met for two six-month periods in a row.

Like the minimum passing grades on written exams, the above requirements reflect only the minimum recent experience the FAA feels is necessary. But we are not working for minimum standards; we are striving to achieve the highest possible standards. We must, therefore, do more than the minimum amount. What can we do to aid in achieving that all-important quality of proficiency?

First and foremost is our attitude or desire to be a proficient pilot—to be the best pilot we are capable of being. This desire for improvement must be ever present.

Proficiency really begins with the preflight. It is here that we can utilize a systematic method to satisfy ourselves completely that the airplane is in an airworthy condition. Preflighting should not be downgraded or left to someone else. Only by personally

making a careful and consistent examination of the entire aircraft can we be totally assured of its readiness.

Weight and balance planning is overlooked by many pilots. A few minutes spent on organizing the loading of your airplane and plotting the weight and balance data can pay large dividends in terms of aircraft performance and successful flights.

During our initial training, our instructor was constantly extolling the virtues of the checklist. Now that we are on our own, we may sometimes substitute our familiarity with the aircraft for the checklist. This is the first step toward trouble. We find ourselves forgetting to do things—for example, not setting the altimeter or DG, or taking off with the fuel selector incorrectly set, or landing without extending the landing gear. The proper use of the checklist can prevent all of these situations. After all, it is virtually impossible to make an unintentional gear-up landing when properly using a prelanding checklist.

Commensurate in importance with the checklist is having the proper tools onboard and available. By tools, we mean computer, plotter, and current maps. Having the the maps open and properly folded before starting the engine often makes the difference between knowing where we are and wondering where we are, once the flight is in progress.

Many pilots carry a screwdriver and a pair of pliers, as well as appropriately sized hex wrenches, to effect a cure if a faulty knob comes off or other minor problems arise.

A good survival kit should be part of everyone's flight bag. The size or complexity of the kit is strictly up to the individual. Prior planning is the main ingredient.

There are many ways we can increase our proficiency or ability while flying straight and level. For instance, when flying cross-country, we should select the proper cruising altitude and then maintain it. Not plus or minus 500 feet—not even plus or minus 100 feet—but right on the altitude. This is not the easiest thing to do at first, but with practice it is amazing how good we can become.

When we do not have passengers along, how about practicing Dutch rolls to help improve rudder-aileron coordination? Statistics tell us that most landing accidents involve improper directional-control techniques. Accordingly, rudder coordination exercises are worth constant attention.

Stalls and approaches to stalls are good review maneuvers. For instance, do you know the difference between an airplane's response to a stall while skidding and its response to a stall while slipping? If not, obtain the services of a good flight instructor and practice both types of stalls. During this same flight, how about practicing some accelerated stalls as well?

The greater the degree of our familiarity with slow flight and stalls, the better our airspeed control will be. If our airspeed control is good, then our landing approaches will be good. If the ap-

Flight Training for Veterans

Eligibility—Veterans who served for more than 180 continuous days after Jan. 31, 1955, or were discharged for service-connected disability after that date, or servicemen on active duty. Exclusions: Not for those dishonorably discharged, or 6-month enlistees under the reserve program, or those on active duty for training under enlistment, or those in the Reserves.

Eligibility ceases 10 years from date of last separation from service after Jan. 31, 1955, or Aug. 30, 1977, whichever is later. (This is a 1974 change; previously the law stated 8 years and Aug. 30, 1975.)

Prerequisites—Private pilot's license and second-class medical.

Approved courses—Must generally be accepted as necessary to attain recognized vocational objective in field of aviation, or be recognized as "ancillary" (auxiliary) to pursuit of another vocation.

Benefits—90% of established charge for tuition and fees. 1½ months' entitlement for each month of active duty after Jan. 31, 1955, up to 36 months. Full 36 months' entitlement for more than 18 months' service. Each \$220 paid as an allowance counts as one month's entitlement.

Bill under consideration in Congress would increase benefits to \$270 for each month's entitlement.

Application procedure—Procure forms from VA offices. State chosen FAA-approved flight school and course of study on application; send to VA with copy of discharge. VA will send Certificate of Eligibility, which flight school must endorse (certifying enrollment) and send back to VA. Student and flight school jointly submit "Certificate of Flight Training" each month training is received.

proach is consistently good, then the landing will probably be good as well. There is a snowball effect, with one area leading into another. If our proficiency is low, the snowballing may work in an undesirable manner.

Training required to obtain an additional certificate or rating should be undertaken with the attitude that this is really the time to move ahead; the time to soak up all the instruction we can; the time to practice until performance is as close to being flawless as possible.

When the situation permits, fly with other pilots and observe their techniques. If their methods are better than yours, copy them. If they are not, go fly with someone else. Seek to learn from the experiences of others.

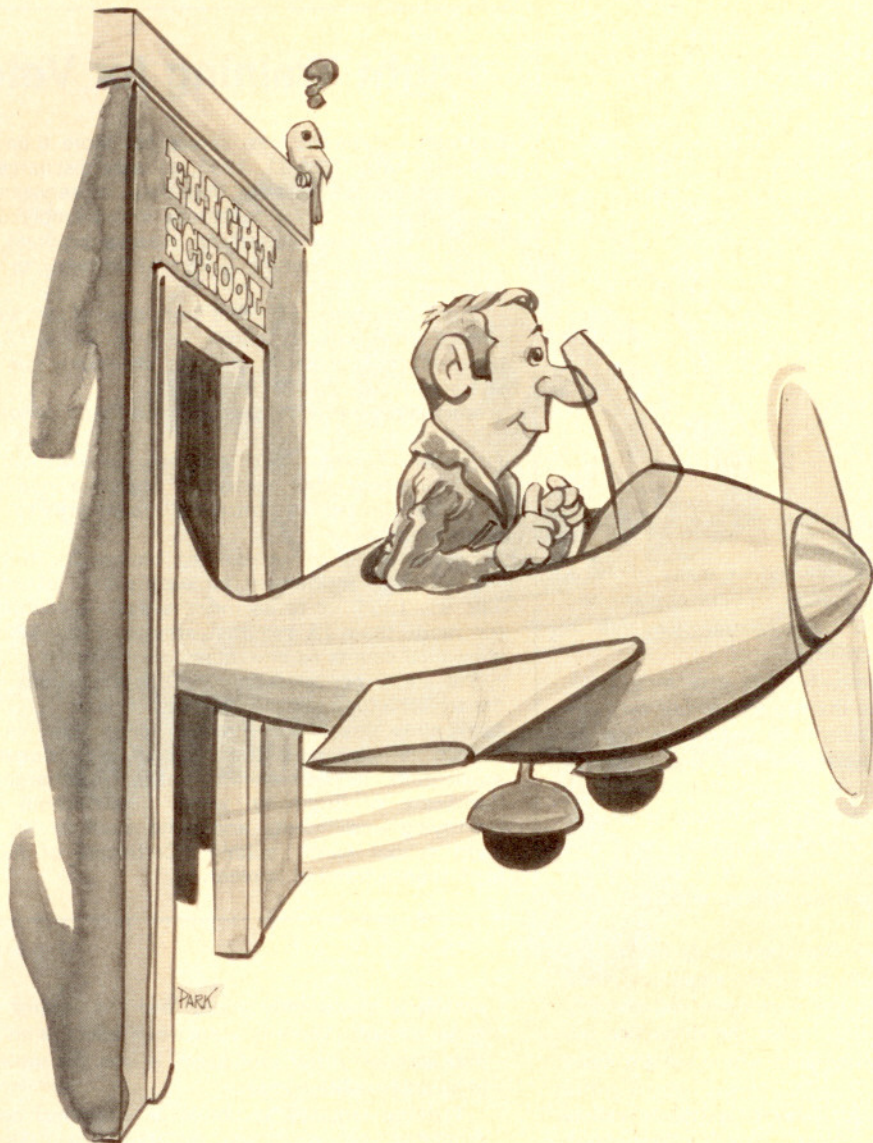
One good competency drill is the blindfold cockpit check. To practice it, have another pilot sit with you in your airplane, on the ground, with the engine off. Have him call out specific instruments or controls. With your eyes covered, locate the items by touch only. You should be able to do this correctly, with no hesitation. If you can't, continue to study the cockpit layout and the relative positions until you can rapidly complete the drill.

Night flying is another area that we may periodically need to review and practice. If we do go on a night training flight, we should not only practice landings, but also many of the same maneuvers we practice during daylight. When was the last time you practiced slow flight or stalls at night?

Nighttime provides an excellent opportunity to practice instrument work. Take another pilot, preferably an instructor, along. Put the hood on and proceed with a review of basic instrument flying. Many times a VFR flight at night is very much akin to an instrument flight, because there is no readily identifiable horizon.

If we are instrument rated, we should frequently file IFR, even if

Training & Proficiency



IN THE COCKPIT *continued*

the weather is good. This develops proficiency in the IFR system without any weather-induced stress.

Many times when we can see our destination airport, we cancel IFR and proceed VFR. From a proficiency viewpoint, however, we should often make the full instrument approach.

The value of recurrent instrument training cannot be overestimated. True instrument proficiency comes only through constant practice and refresher training. This training should place considerable emphasis on basic instrument-flying skills. Aircraft control should become so automatic that it can be done without conscious thought. To achieve this type of proficiency, periodic reviews and practice of all aspects of instrument flying—full panel, partial panel, holding patterns, instrument approaches—are required. The AOPA Air Safety Foundation's Instrument Refresher Course provides a review of all of these and makes for an enjoyable way to upgrade skills.

Whether we are instrument rated or not, we pay for many services that are available to us and should be used.

Approach control and its radar, air route traffic control centers, and flight service stations are but a few of the facilities at our disposal. How about obtaining a practice DF steer on the next train-

ing flight, or traffic advisories from approach control?

From a VFR standpoint, good review and practice maneuvers include gliding spirals, steep 720-degree turns, and slips such as would be used in slipping to a landing. All of these require planning and coordination, as well as aircraft control. When all the elements are mastered, then our proficiency has been improved. These maneuvers must, however, be continually practiced to maintain an advanced state of proficiency.

Emergency maneuvers are worthy of continuous review and practice. Success in meeting emergency situations comes from prior planning and immediate institution of a familiar and previously rehearsed procedure. The more we have prepared and practiced, the greater are our chances of a correct response.

One of the best ways to maintain and improve proficiency is to acquire the services of a good flight instructor and work out a regular recurrent training program—perhaps working on stalls and slow flight one week, reviewing basic instrument flying the next week, and spending still another session on crosswind takeoffs and landings. Whatever the particular curriculum we follow, we should stay with it and practice it. As a result, we will find our skills and ability advancing at a most rewarding rate.

Proficiency, whether it be VFR or IFR, can be summed up in four words: desire, training, review, and practice. These four key elements are vital to the skill we achieve as pilots. □

Colleges and Universities with Flight Training and/or Ground School Programs*

ALABAMA

Alabama Institute of Aviation Technology, Ozark, Ala. 36360
 Auburn University, School of Aviation, Auburn, Ala. 36830
 Gadsden State Jr. College, Gadsden, Ala. 35903
 Jacksonville State University, Jacksonville, Ala. 36265
 Tuskegee Institute Flying School, Tuskegee Institute, Ala.
 36088
 University of South Alabama, Mobile, Ala. 36688

ALASKA

Anchorage Community College Aviation Program, University
 of Alaska, Anchorage, Alaska 99504
 Sheldon Jackson College, Sitka, Alaska 99835

ARIZONA

Arizona State University, Tempe, Ariz. 85281
 Cochise College, Douglas, Ariz. 85607

ARKANSAS

Henderson State College, Arkadelphia, Ark. 71923
 Phillips County Community College, Helena, Ark. 72342
 Texarkana College, Texarkana, Ark. 75501

CALIFORNIA

Allan Hancock College, Santa Maria, Calif. 93454
 Bakersfield College, Bakersfield, Calif. 93305
 Bakersfield College, Desert Campus, Ridgecrest, Calif. 93555
 Cerritos College, Norwalk, Calif. 90650
 Coast Community College, Costa Mesa, Calif. 92626
 College of Alameda, Alameda, Calif. 94501
 College of Marin, Kentfield, Calif. 94904
 College of San Mateo, San Mateo, Calif. 94002

*Source: FAA

College of the Desert, Palm Desert, Calif. 92260
 College of the Redwoods, Eureka, Calif. 95501
 Cypress College, Cypress, Calif. 90630
 De Anza College, Cupertino, Calif. 95014
 Foothill College, Los Altos Hills, Calif. 94022
 Glendale College, Glendale, Calif. 91208
 Grossmont Community College, El Cajon, Calif. 92020
 Harvey Mudd College, Claremont, Calif. 91711
 Loma Linda University, Extension Division, Riverside, Calif.
 92505
 Long Beach City College, Long Beach, Calif. 90806
 Los Angeles Pierce College, Woodland Hills, Calif. 91364
 Los Angeles Trade-Technical College, Los Angeles, Calif.
 90015
 Merced College, Merced, Calif. 95340
 Modesto Jr. College, Modesto, Calif. 95350
 Monterey Peninsula College, Monterey, Calif. 93940
 Mount San Antonio College, Walnut, Calif. 91789
 Mount San Jacinto College, Gilman Hot Springs, Calif. 92340
 Ohlone College, Fremont, Calif. 94537
 Orange Coast College, Costa Mesa, Calif. 92626
 Palo Verde College, Blythe, Calif. 92225
 Palomar College, San Marcos, Calif. 92069
 Pasadena City College, Pasadena, Calif. 91106
 Reedley College, Reedley, Calif. 93654
 Sacramento City College, Sacramento, Calif. 95822
 San Bernardino Valley College, San Bernardino, Calif. 92403
 San Diego Mesa College, San Diego, Calif. 92111
 Santa Rosa Jr. College, Santa Rosa, Calif. 95401
 Sierra College, Truckee, Calif. 95734
 Sierra College, Rocklin, Calif. 95677
 Southwestern College, Chula Vista, Calif. 92010

COLORADO

El Paso Community College, Colorado Springs, Colo. 80903
 Metropolitan State College, Denver, Colo. 80204
 Rangely College, Rangely, Colo. 81648
 USAF Academy, USAF Academy, Colo. 80840

DELAWARE

Delaware Technical and Community College, Georgetown,
 Del. 19947

DISTRICT OF COLUMBIA

Washington Technical Institute, Washington, D.C. 20001

FLORIDA

Broward Community College, Fort Lauderdale, Fla. 33314
 Embry-Riddle Aeronautical University, Daytona Beach, Fla.
 32015
 Florida Institute of Technology, Melbourne, Fla. 32901
 Florida Keys Community College, Key West, Fla. 33040
 Indian River Community College, Fort Pierce, Fla. 33450
 Lake City Community College, Lake City, Fla. 32055
 Lake Sumter Community College, Leesburg, Fla. 32748
 Manatee Jr. College, Bradenton, Fla. 33505
 Miami-Dade Community College—South Miami, Fla. 33156
 Miami-Dade Jr. College—North Miami, Fla. 33167
 St. Petersburg Jr. College, Clearwater, Fla. 33515

IDAHO

Boise State College, Boise, Ida. 83707
 Ricks College, Rexburg, Ida. 83440

ILLINOIS

Belleveille Area College, Belleveille, Ill. 62221
 Parks College of Aeronautical Technology, St. Louis Uni-
 versity, Cahokia, Ill. 62206
 Prairie State College, Chicago Heights, Ill. 60411
 Rock Valley College, Rockford, Ill. 61109
 Southern Illinois University, Carbondale, Ill. 62901

FAA-Certificated Flight and Ground Schools

FAA Advisory Circular AC 140-2I, "List of Certificated Pilot Flight and Ground Schools," covers the United States, Puerto Rico, and the Virgin Islands. Complete names and addresses of FAA-certificated schools are provided, and letter codes following each listing indicate the type of school—basic or advanced ground school; primary, commercial, instrument, or flight instructor training; types of aircraft in which training is conducted; and special courses offered (helicopter, glider, gyroplane, seaplane, aerial application, etc.). AC 140-2I is available free of charge, and can be ordered from: Department of Transportation, Distribution Unit, TAD-484.3, Washington, D.C. 20590.

COLLEGES continued

Southwest College, City Colleges of Chicago, Chicago, Ill. 60652
 University of Illinois, Institute of Aviation, Savoy, Ill. 61874

INDIANA

Ball State University, Muncie, Ind. 47906
 Indiana State University, Terre Haute, Ind. 47809
 Purdue University, Lafayette, Ind. 46207
 Vincennes University, Vincennes, Ind. 47591

IOWA

Iowa State University, Ames, Iowa 50010

KANSAS

Hesston College, Hesston, Kan. 67062
 Johnson County Community College, Merriam, Kan. 66203
 Seward County Community Jr. College, Liberal, Kan. 67901

LOUISIANA

Louisiana Technical University, Ruston, La. 71270
 Louisiana Technical University—Barksdale Center, Shreveport, La. 71107
 Northeast Louisiana University, Monroe, La. 71201
 Northwestern State University, Natchitoches, La. 71457

MARYLAND

Harford Community College, Bel Air, Md. 21014

MASSACHUSETTS

Aviation Careers Institute, Norwood, Mass. 02062
 Bryant and Stratton Jr. College, Boston, Mass. 02115
 Bryant-McIntosh Jr. College, Lawrence, Mass. 01842
 North Shore Community College, Beverly, Mass. 01915
 Worcester Jr. College, Worcester, Mass. 01608

MICHIGAN

Alpena Community College, Alpena, Mich. 49707
 Andrews University, Berrien, Mich. 49104
 Delta College, University Center, Mich. 48710
 Ferris State College, Big Rapids, Mich. 49307
 Genesee Community College, Flint, Mich. 48503
 Grand Rapids Jr. College, Grand Rapids, Mich. 49502
 Henry Ford Community College, Dearborn, Mich. 48128
 Kellogg Community College, Battle Creek, Mich. 49017
 Northwestern Michigan College, Traverse City, Mich. 49684
 Schoolcraft College, Livonia, Mich. 48151
 Western Michigan University, Kalamazoo, Mich. 49001

MINNESOTA

Mankato State College, Mankato, Minn. 56001
 North Hennepin State Jr. College, Minneapolis, Minn. 55428
 Southwest Minnesota State College, Marshall, Minn. 56258
 University of Minnesota, Minneapolis, Minn. 55455
 University of Minnesota Technical College, Crookston, Minn. 56716

MISSOURI

Central Missouri State University, Warrensburg, Mo. 64093
 Meramec Community College, St. Louis, Mo. 63122
 Metropolitan Jr. College, Kansas City, Mo. 64111
 Missouri Western College, St. Joseph, Mo. 64507
 School of the Ozarks, Point Lookout, Mo. 65726
 Southeast Missouri State University, Cape Girardeau, Mo. 63701

MONTANA

Flathead Valley Community College, Kalispell, Mont. 59901

NEBRASKA

Chadron State College, Chadron, Neb. 69337
 McCook College, McCook, Neb. 69001

NEVADA

University of Nevada, Reno, Nev. 89507

NEW HAMPSHIRE

Nathaniel Hawthorne College, Antrim, N. H. 03440
 New England Aeronautical Institute, Nashua, N. H. 03060
 Plymouth State College, Plymouth, N. H. 03264
 University of New Hampshire, Durham, N. H. 03824

NEW JERSEY

Mercer County Community College, Trenton, N. J. 08608
 Somerset County College, Somerville, N. J. 08876

NEW MEXICO

Eastern New Mexico University, Clovis Campus, Clovis, N. M. 88101
 New Mexico Jr. College, Hobbs, N. M. 88240
 New Mexico Military Institute, Hobbs, N. M. 88240

NEW YORK

Corning Community College, Corning, N. Y. 14380
 Dowling College, Oakdale, N. Y. 11769
 Orange County Community College, Middletown, N. Y. 10940
 Queensboro Community College, Bayside, N. Y. 11364
 Rochester Institute of Technology, Rochester, N. Y. 14614

State University College of Arts and Science, Plattsburgh, N. Y. 12901
 State University of New York, Agricultural and Technical College, Cobleskill, N. Y. 12043
 State University of New York at Farmingdale, Agricultural and Technical College, Farmingdale, N. Y.

NORTH CAROLINA

Guilford Technical Institute, Jamestown, N. C. 27282
 Lenoir Community College, Kinston, N. C. 28501
 Wayne Community College, Goldsboro, N. C. 27530

NORTH DAKOTA

Bismarck Jr. College, Bismarck, N. D. 58501
 Lake Region Jr. College, Devils Lake, N. D. 58301
 Minot College of Business, Minot, N. D. 58701
 North Dakota State University, Fargo, N. D. 58102
 University of North Dakota, Grand Forks, N. D. 58201
 Valley City State College, Valley City, N. D. 58072

OHIO

Cuyahoga Community College, Parma, Ohio 44130
 Kent State University, Stow, Ohio 44224
 Lorain County Community College, Elyria, Ohio 44035
 Miami University, Oxford, Ohio 45056
 Ohio State University, Columbus, Ohio 43210
 Ohio University, Athens, Ohio 45701

OKLAHOMA

Oklahoma State University, Stillwater, Okla. 74074
 Southeastern State College, Durant, Okla. 74701
 University of Oklahoma, Norman, Okla. 73069
 Western Oklahoma State College, Altus, Okla. 73521

OREGON

Lane Community College, Eugene, Ore. 97405
 Mount Hood Community College, Gresham, Ore. 97030
 Rogue Community College, Grants Pass, Ore. 97526
 Southwestern Oregon Community College, Coos Bay, Ore. 97420
 Treasure Valley Community College, Ontario, Ore. 97914

PENNSYLVANIA

Community College of Beaver County, Beaver Falls, Pa. 15010
 Pennsylvania State University, University Park, Pa. 16802

PUERTO RICO

World University, San Juan, P. R. 00917

RHODE ISLAND

Johnson & Wales College, Providence, R. I. 02903

SOUTH CAROLINA

Florence—Darlington Technical Education Center, Florence, S. C. 29501

SOUTH DAKOTA

Augustana College, Sioux Falls, S. D. 57102
 University of South Dakota, Vermillion, S. D. 57069

TENNESSEE

Jackson State Community College, Jackson, Tenn. 38301
 Middle Tennessee State University, Murfreesboro, Tenn. 37130
 Motlow State Community College, Tullahoma, Tenn. 37388

TEXAS

Central Texas College, Killeen, Tex. 76541
 Cooke County Jr. College, Gainesville, Tex. 76240
 LeTourneau College, Longview, Tex. 75601
 Sam Houston State University, Huntsville, Tex. 77340
 San Jacinto College, Pasadena, Tex. 77505
 Southwest Texas Jr. College, Uvalde, Tex. 78801
 Texas State Technical Institute, Waco, Tex. 76705

UTAH

Dixie College, St. George, Ut. 84770
 Southern Utah State College, Cedar City, Ut. 84720
 Weber State College, Ogden, Ut. 84403

VERMONT

Norwich University, Northfield, Vt. 05663

VIRGINIA

Virginia Polytechnic Institute and State University, Blacksburg, Va. 24060

WASHINGTON

Big Bend Community College, Moses Lake, Wash. 98837
 Central Washington State College, Ellensburg, Wash. 98926
 Grays Harbor College, Aberdeen, Wash. 98520
 Green River Community College, Auburn, Wash. 98002
 Highline Community College, Midway, Wash. 98031
 Lower Columbia College, Longview, Wash. 98632
 Peninsula College, Port Angeles, Wash. 98362
 Spokane Community College, Spokane, Wash. 99206
 Walla Walla Community College, Walla Walla, Wash. 99362

WISCONSIN

Gateway Technical Institute, Kenosha, Wis. 53140
 University of Wisconsin, Madison, Wis. 53706