

HIDDEN COSTS

Some lawmakers think aircraft owners should not be left to sink or swim in a flood of unexpected airworthiness directives.

BY MARK M. LACAGNINA

In this world, nothing is certain but death and taxes. . .

...and airworthiness directives.

If aircraft had been around two centuries ago, Ben Franklin well might have included this phrase in his oft-repeated passage. Very few—if any—of today's general aviation aircraft have escaped airworthiness directives. The flow of ADs from the Federal Aviation Administration's headquarters and regional offices over the years has turned from a trickle to a gusher. Last year, general aviation aircraft and equipment were the subjects of nearly 200 ADs, or roughly double the number issued 10 years ago.

ADs are about as welcome as fire ants at a picnic. But it would be hard to dispute the need for most of the directives that are issued. Basically, they are amendments to aircraft type certificates. When the FAA issues an AD, it is telling owners, in effect, that evidence shows there may be a mechanical or operational problem that could affect the safety of flight in their aircraft. The FAA typically gives owners a certain period of time in which to have the problem checked out by a licensed mechanic and fixed, if necessary, before the aircraft again can be flown. Sometimes the work specified in ADs is relatively simple, such as an amendment to the aircraft's operating manual. At the other end of the spectrum are

emergency ADs that require extensive and expensive structural modifications.

There is, of course, no way to determine when, and how many, ADs will be issued on a particular aircraft. The costs of AD compliance, therefore, are variables that cannot be accounted for effectively in determining the price of aircraft ownership.

The general aviation industry claims that it is doing a good job in voluntarily reimbursing aircraft owners for the costs of complying with ADs on their products. But some owners have complained that the manufacturers' support leaves much to be desired. Their complaints have not fallen on deaf ears. Two legislators—one, a U.S. representative, the other, a state senator—have introduced legislation that would force manufacturers to pay the costs associated with ADs on their products.

U.S. Rep. John F. Seiberling (D-Ohio) introduced the Defective Aircraft Remedy Act last August. The bill would require manufacturers to pay all but labor costs for ADs that are issued because of design or manufacturing defects in their aircraft.

Seiberling, who is neither a pilot nor an aircraft owner, became interested in the AD situation after receiving a letter from one of his constituents. "He brought to my attention that there is no redress by aircraft owners when they are notified by the FAA of a de-

sign or manufacturing defect in their airplanes," Seiberling explained. "They have to fix them at their own expense or else be in noncompliance with the FAA's airworthiness directives. Normally, in considering this situation, you would ask about the manufacturers' warranties. Unfortunately, most of the warranties are rather short—some as little as six months. So, it seems to me that something has to be done to remedy the situation."

While many aircraft owners might utter a heartfelt amen to this statement, there are several serious implications of Seiberling's legislation that need to be considered carefully.

The bill would charge the FAA with determining whether an AD is related to ordinary wear and tear or to a design or manufacturing defect. The FAA issues ADs solely on the basis of safety. Only in rare cases—such as the engine pylon failure that led to the DC-10 crash at Chicago—does the FAA concern itself with who is at fault. The agency surely will fight tooth and nail against being placed in a position in which it would have to decide who should pay for the ADs that it issues.

The bill also would leave reimbursement for labor costs to be decided by existing warranty agreements. Currently, manufacturers often go beyond their warranties to pay the labor costs, as well as the parts costs involved in air-

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worthiness directives on their products.

Critics of Seiberling's legislation point out that manufacturers are not required to offer warranties and that they might not, if they were subject to the liabilities imposed by the bill.

While it is somewhat off the general subject of ADs, it is interesting to note that the consumer laws that govern warranties do not extend to those on aircraft. This is because the Federal Trade Commission does not consider aircraft as consumer products. The FTC defines consumer products as those purchased for personal, family or household purposes. According to the General Aviation Manufacturers Association, only about four percent of new general aviation aircraft are purchased for personal use; the rest are bought by businesses.

Above all, GAMA claims that the Defective Aircraft Remedy Act is unconstitutional. Stanley J. Green, vice president and general counsel, offered the following hypothetical situation: "Let's assume that I own a new airplane made by Cessna and that it has Goodrich tires on it. After flying it for a while, I burn out the tires and replace them with another brand. A couple of months later, there is a problem with the tires.

"Now, who is liable?" he asked. "Under the Constitution, if Cessna did not certificate or build the airplane that way, you cannot hold Cessna liable for a problem with a different brand of tires. But Seiberling's bill *would* hold Cessna liable."

Seiberling does not consider the Defective Aircraft Remedy Act as a finished product. "I hope that by putting it in, we can get some critical comments and then see if we can move ahead," he said. "Some of the manufacturers' people have told me they think they can handle this through their contracts with buyers—to take another look at their warranties. If so, that would be fine. But I really cannot see why they should not have some obligation to pay for at least the cost of materials in repairing airplanes that are defective. The tire and auto manufacturers have to do that. Why shouldn't the aircraft manufacturers?"

Seiberling has not yet decided whether or not to reintroduce the Defective Aircraft Remedy Act this year. "It all depends on what sort of re-

sponse the industry comes up with," he said. "We may modify the bill or decide that it is unnecessary, depending on what the industry does."

Seiberling is not the first to bring the AD situation into the legislative arena. Illinois Senator John A. Davidson introduced a similar bill in his state's legislature four years ago. However, the bill was voted down by his colleagues because it did not set a time limit on manufacturers' liability.

Davidson came right back with the bill in 1979, this time adding a clause limiting manufacturers' liability to reimbursing only the original owner for the costs of ADs issued within five years of the original sale of the aircraft.

The modified bill sailed through the Illinois legislature and onto Governor James Thompson's desk. "It was at this time that the FAA and the industry started to take me seriously," Davidson recalls. Both GAMA and Langhorne Bond, then administrator of the FAA and a former transportation secretary for Illinois, urged Thompson to veto the bill. And he did.

Undaunted, Davidson mounted a campaign to override the governor's veto. He got the necessary votes in the state's senate, and an override vote seemed assured in the Illinois House. But the vote never was taken; Davidson abruptly had withdrawn the bill.

Davidson said he decided to back off when, at the last minute, GAMA offered to prove that the industry was doing voluntarily what he was seeking to force them to do. GAMA sent Davidson all of the ADs and the service bulletins (which spell out manufacturers' allowances for parts and labor) issued during an 18-month period on Beech, Cessna and Piper aircraft.

"Their data gave me an indication that they were trying to take care of their own house," Davidson said. "And that is all I am interested in. I am not interested in putting legislation on the books that we do not need."

Davidson also solicited information from aircraft owners on their experiences in complying with ADs on their new aircraft. "From the nearly 150 responses I have received, it appears that one manufacturer [Beech] has been doing a pretty good job in correcting their errors," he said. "But, according to the letters, there are a couple [Cessna and Piper] that leave something to

be desired in customer relationships."

Davidson said he is giving serious thought to reintroducing the bill in the Illinois legislature this year. "If I do go back with it, I will be looking at service hours on the aircraft, rather than years. We may want to look at 500 hours, rather than five years," he said.

However, GAMA contends that Davidson's bill also is unconstitutional, since federal law prohibits states from intervening in contracts between manufacturers and their customers. Other critics point out that if Illinois adopted such legislation, owners in other states would rush to register their aircraft in Illinois to seek protection from the costs of airworthiness directives.

It is clear that Seiberling and Davidson both hope the industry will redouble its efforts to take the burden of AD costs off the shoulders of aircraft owners. It also is clear that they will not hesitate to reintroduce their bills, if the industry fails to respond.

Either way, the bottom line is not particularly attractive. GAMA estimates that manufacturers hand over more than five percent of the purchase price of new aircraft to their insurance companies to cover product liability. It is not unreasonable to assume that any increase in product liability would be reflected in even higher price tags on new general aviation aircraft.

However, there may be a solution that would be equitable for both those who build and those who buy general aviation aircraft. For years, major automobile and household appliance manufacturers have offered extended service contracts on their products. This gives the individual buyer the choice of paying a little more money for extra protection and relieves those who do not opt for such protection from sharing the collective burden of paying the indirect costs associated with increased product liability.

At least a few aircraft manufacturers considered such plans, but abandoned them after finding their customers were cool to the idea. Now may be a good time for aircraft builders and buyers to reconsider extended service contracts.

Perhaps the best we can hope for is that the manufacturers will attack the problem at its root—that they will step up their efforts to increase the structural integrity and reliability of their products and put a cap on the AD flow. □

A LITTLE HISTORY HELPS

Buying an aircraft? Check it out before your check goes in.

BY MARY F. SILITCH

Deciding which aircraft you want to buy is much easier than deciding which aircraft you should buy. And picking the ultimate airplane for your use is a lot simpler than actually buying it. Fuel efficiencies, inviting aerodynamic lines, top-of-the-line speed and monthly payments that do not leave your bank-book barren are easy to judge. You can weigh the advantages of the aircraft that appeal most, and, by judiciously figuring what capabilities the aircraft of your dreams should have, you can decide which one you want to have on your tiedown spot, come spring.

But there are factors other than wingspan, fuel consumption and equipped price that must be considered in your deliberations. Are there any major maintenance problems with your chosen vehicle? Have any airworthiness directives been issued against it? If so, have the ADs been complied with? Does the type have a pattern of problems that may lead to ADs requiring correction? Is the aircraft free and clear of monetary claims, or does the mechanic who replaced a faulty magneto three months ago have a lien on record? Does the seller have a loan on the aircraft that must be paid off before it can be really yours? Does it legally belong to the person who wants to sell it to you? To whom is it registered? How can title be transferred?

Whether the aircraft you fancy is new, picked perhaps from the pages of the *AOPA Pilot* "Aircraft Directory," or used, these questions can be as important to you, a prospective purchaser, as its range at 55-percent power with optional long-range tanks. AOPA can help you answer these questions, just

as the annual directory (p.59) can help by giving the basic specifications of new aircraft.

Some of the newer aids available from AOPA are those that help provide information about the serviceability and reliability of the aircraft model you have in mind. The AOPA Aircraft and Airmen Records Department (Post Office Box 19244, Southwest Station, Oklahoma City, Oklahoma 73144; 800/654-4700; in Oklahoma, 405/682-2511) can assist you in a number of ways.

Your initial call for help may well be to ask for service difficulty reports (SDRs) on your aircraft. These reports are computer print-outs of maintenance problems that are sent to the Federal Aviation Administration. They are compiled from malfunction or defect reports (MDRs), which come from owners and pilots voluntarily and from repair stations and air taxi operations, which are required by federal regulation to report irregularities. And, General Aviation District Offices (GADOs) of the FAA report serious problems.

The MDRs are coded and fed into an FAA computer, in Oklahoma City, that is programmed to signal when a certain number of reports have accumulated on a particular aircraft model. A system analysis summary of these reports is prepared each month, and, if there seems to be a problem area developing—a trend in the same type of difficulty with a particular model—the summary is sent to the FAA region responsible for certification of the aircraft. There, FAA personnel investigate the matter and discuss the incidents with the manufacturer to see what information it has received from custom-

ers with similar problems. If there is a definite safety problem, the summary could spur the issuance of a service bulletin by the manufacturer to correct the problem and/or the issuance of an airworthiness directive by the FAA.

Floyd Bowman of the FAA's Maintenance Analysis Center said that the FAA began publishing service difficulty reports in June 1973 after the air carrier reports and general aviation reports were put on the computer together. FAA keeps only five years' worth of data in the computer records.

If you are interested in what the computer readout reveals about the type of aircraft you want to buy, AOPA's Oklahoma City office can obtain the data for you; each print-out report is \$12 if you are an AOPA member (\$24 if you are not). You receive the reports by return mail, at a 10 percent discount if you charge on Visa or Master Card. The reports also are available directly from the FAA (Safety Data Branch AFO-580, Post Office Box 25082, Oklahoma City, Oklahoma 73125; 405/686-4171). Cost for each is a minimum of \$3; the price varies according to the length of the listing. The reports should be mailed within five or six days, depending on workload.

SDR listings may run from less than a page for a newly introduced aircraft to 70 or more pages (or about 850 reports) for troublesome aircraft that have been in service during the entire five-year period for which data is available. The brief description includes component make, model and serial number; part name and number; the condition and location of the difficulty; the aircraft, engine and propeller

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models and serial numbers; plus the total time on the engine and the time since overhaul. A short explanation of the difficulty usually is included.

Bowman estimates that the FAA receives reports on only 10 percent of the equipment problems discovered in the field. Although the FAA is encouraging pilots and aircraft owners to report problems, the number of MDRs is declining—in 1978, there were 17,231 reports filed; in 1979, there were only 15,962; and in 1980, the numbers dropped to 15,261. You can get malfunction or defect cards from your local GADO or possibly from your fixed-base operator. If the problem required the aid of a mechanic, check with him before you report anything to avoid duplicating his effort.

SDRs are helpful in spotting trends to developing problems and in pinpointing areas that should be more closely inspected. And since the FAA itself sometimes moves slowly, especially on defects that are not immediately hazardous, it is not a bad idea for you to try your own trend-spotting on an aircraft you are considering seriously. For example, it took almost a year to get an airworthiness directive on the Piper PA-23 series aircraft following a computer-triggered alert of twisting, breaking assist steps on all models. AD 80-26-04 finally addressed the problem.

Sometimes, however, Bowman pointed out, it takes only one notice. He cited a report of a cracked rudder on a Gulfstream, which immediately was followed by a service bulletin from the manufacturer. "It depends on the seriousness of the problem," he said.

AOPA also can help you track down the airworthiness directives and service bulletins that apply to your chosen aircraft. Once you have picked the aircraft, its serial number can be fed into the Aircraft Technical Publishers computer for a print-out of the identification numbers of all the airworthiness directives that have been issued against that individual aircraft. The list applies to a particular serial number, not the whole model series since some ADs against the type might not pertain to the individual aircraft you intend to buy.

The listing does not include the texts of the ADs or bulletins, but you do not have to wade through page after page of identification numbers that apply not to your aircraft but to others in the

series. The AD service is available through AOPA's Aircraft and Airmen Records Department; it costs members \$28 for airframe listings and \$42 for airframe and engine listings. (For non-members, the charges are \$35 and \$52.)

Compliance with ADs is mandatory; they are Federal Aviation Regulations, amendments to Part 39. No one, according to the regulations, is allowed to operate an aircraft or a piece of equipment that has an AD issued on it, without meeting the requirements of the AD. Records of compliance with directives must be kept in the aircraft or engine logbooks; with the list of applicable ADs, you can determine if all of the necessary work has been done.

Incidentally, there are three categories of ADs. If there is no emergency, a notice of proposed rule making is published in the *Federal Register*, inviting comments on the proposed action. If the problem is of a more urgent nature, an immediate adopted rule is published, usually effective in fewer than 30 days following publication; these are mailed to registered owners of affected aircraft. An emergency AD, effective on receipt, is sent to owners by telegram when immediate action is necessary and is published in the *Federal Register* as soon as possible.

AOPA's Service and Reference Department (Post Office Box 5800, Washington, D.C. 20014; 301/951-3914) advises prospective owners to have their own mechanic check an aircraft—or even perform a full annual inspection—before final agreement to purchase is made. With the service difficulty reports in mind, the AD list in hand, and a firsthand inspection of the aircraft finished, you should find no surprises left for the ferry flight to your homebase. Although AOPA has in the past recommended to purchasers a mechanic's inspection of a used aircraft, it is not a bad idea to have it done before settling on a new aircraft. The word from a mechanic whose work you know and trust could make the final decision for you.

Service and Reference will send you a packet of information about purchasing aircraft (aimed mainly at the used-aircraft purchaser). It includes information about what steps must be taken, the necessary forms for a bill of sale and registration, Federal Communications Commission application for an aircraft

station license, *AOPA Pilot* reprints (including pilot reports on your model, if you so request) and a brochure on buying a used aircraft. The department even can offer advice on the price being asked, comparing it with current prices in the *Aircraft Price Digest*.

Once you decide on the aircraft you will buy, Service and Reference strongly advises that you get a purchase agreement in writing. It should include the price, how much you are offering as a down payment, how the balance is to be paid and when, the delivery date and so forth. Anything you and the seller agree to should be put in writing. If there are ADs that need to be complied with and the seller is to take care of them, get it in writing. If he offers a free annual or a 30-day guarantee, put it in the document. If you are buying from a dealer, he probably has a standard form; but it can be amended.

The next aid AOPA can offer is in searching the title, closing the sale and registering the aircraft. For this, the Aircraft and Airmen Records Department steps back into the picture, if you wish. You can record the bill of sale and registration form directly with the FAA, or AOPA can do it for you, along with performing other services. If you are applying for a loan on the aircraft, the bank will require a title search. Even if you are paying cash, it is a good idea, since the seller's certificate of registration is not legal evidence of ownership in a dispute.

Each registered aircraft has a folder in the FAA's Oklahoma City office; AOPA's title searchers look through the file to determine if the seller is actually the registered owner of the aircraft and if there are any liens, or claims, against the aircraft that must be settled before you buy. The title search will turn up any lien for which a release has not been received and correspondence that might indicate there is a lien not yet recorded. The title search costs members \$12 (\$15 for nonmembers); for aircraft weighing more than 12,500 pounds and for jets, the charge is \$20 (\$25 for nonmembers). There is a 10-percent discount when the fee is charged to Visa or Master Card. For rush, 24-hour service, add \$5.

If you are buying a used aircraft and are interested in its history, AOPA can provide you with a chain of title that goes back to the original owners for \$25.

For protection against any liens not recorded, AOPA offers its members title insurance. The Internal Revenue Service, for instance, does not have to register liens or attachments against aircraft with the FAA. Title insurance also protects against defective titles, forgery on previous documents and fraudulent transactions. The cost of the title insurance premium is based on the price of the aircraft—\$4 for each thousand dollars of insured value. For a \$30,000 aircraft, the premium is \$120; for a \$50,000 purchase, it is \$200.

If the seller of the aircraft, your bank and you all are in different places, you might want AOPA's Oklahoma City office to provide closing service. All documents can be sent to AOPA, and when it is time for settlement, the association can use a closing room at the FAA, placing a conference telephone call to all parties involved to close the deal. The documents then are registered with the FAA and time-stamped in. There is a backlog in the actual recording process; but the owner receives the pink copy of the registration form as a temporary certificate (to be kept in the aircraft along with the airworthiness certificate).

AOPA's help is particularly valuable if you are importing (or exporting) an aircraft, as there is additional red tape to be dealt with. Copies of documents from your aircraft file can be obtained through AOPA's Oklahoma City office, also (and copies of your pilots license or medical certificate can be obtained, too, for that matter).

If you want a special N number when you register your aircraft, AOPA can get that for you, too, for \$20. The FAA tried to do away with special numbers, but AOPA objected.

With all the red tape that must be dealt with in buying an aircraft, it is easy to see why people feel they need help. We once received a call from a student pilot who had asked his flight instructor to pick out a suitable airplane for him to buy. His flight instructor went one step further and offered to take care of all the paperwork and registration chores for his student. Then the instructor carefully registered the aircraft in his own name; neither he nor the aircraft were seen again.

If you need help in buying or registering an airplane, turn to the right people—call us. □

AIRCRAFT MANUFACTURERS

Adams Balloon Loft, Inc., P.O. Box 12168, Atlanta, Ga. 30355; 404/452-8066.

Aerospatiale Helicopter Corp., 2701 Forum Dr., Grand Prairie, Tex. 75051; 214/641-0000.

Agusta Helicopters, Italy. U.S. Office: Agusta Helicopters, 1 West Loop S., Suite 600, Houston, Tex. 77027; 713/270-0550.

Air Tractor, Inc., P.O. Box 485, Olney, Tex. 76374; 817/564-5641.

Arctic Aircraft Co., P.O. Box 6-141, Anchorage, Alaska 99502; 907/243-1580.

Avian Balloon Co., S. 3722 Ridgeview Dr., Spokane, Wash. 99206; 509/928-6847.

Avions Marcel Dassault-Breguet Aviation, France. U.S. Office: Falcon Jet Corp., Teterboro Airport, Teterboro, N.J. 07608; 201/288-5300.

Ayres Corp., P.O. Box 3090, Albany, Ga. 31706; 912/883-1440.

Balloon Works, The, Rhyne Aerodrome, RFD 2, Statesville, N.C. 28677; 704/873-0503.

Beech Aircraft Corp., 9709 E. Central, Wichita, Kan. 67201; 316/681-7111.

Bell Helicopter Textron, P.O. Box 482, Ft. Worth, Tex. 76101; 817/280-2011.

Brantly-Hynes Helicopter, Inc., P.O. Box 1046, Frederick, Okla. 73542; 405/335-2256.

British Aerospace, England, Scotland. U.S. Offices: British Aerospace, Inc., Suite 207, 2101 L St., N.W., Washington, D.C. 20037; 202/857-0125. British Aerospace, Inc., P.O. Box 17414, Dulles Int'l Airport, Washington, D.C. 20041; 703/435-9100.

Cameron Balloons Ltd., England. U.S. Office: Cameron Balloons, U.S., 3600 Elizabeth Rd., Ann Arbor, Mich. 48103; 313/995-0111.

Canadair Ltd., Canada. U.S. Office: Canadair, 274 Riverside Ave., Westport, Conn. 06880; 203/226-1581.

Caproni Vizzola, Italy. U.S. Office: Graham Thomson, 3200 Airport Ave., Santa Monica, Calif. 90405; 213/390-8654.

Cessna Aircraft Co., Wichita, Kan. 67201; 316/685-9111.

De Havilland Aircraft of Canada Ltd., Garratt Blvd., Downsview, Ontario M3K 1V5, Canada; 416/633-7310.

Eagle Aircraft, P.O. Box 4127, 1755 Westgate Dr., Suite 200, Boise, Ida. 83704; 800/635-7500.

Eiriavion, Finland. U.S. Office: PIK Pacific, 4935 W. 121 St., Hawthorne, Calif. 90250; 213/644-1552.

Emair, Hangar 38, Industrial Airpark, Harlingen, Tex. 78550; 512/425-6363.

Embraer, Brazil. U.S. Office: Embraer, 1100 N.E. 7 Ave., Dania, Fla. 33004; 305/920-7201.

Enstrom Helicopter Corp., P.O. Box 277, Menominee, Mich. 49858; 906/863-9971.

Gates Learjet Corp., Mid-Continent Airport, P.O. Box 7707, Wichita, Kan. 67277; 316/946-2000.

General Balloon Corp., 865 W. 18 St., Costa Mesa, Calif. 92627; 714/642-3545.

Glaser-Dirks, West Germany. U.S. Offices: Glaser-Dirks East, 1110 Mitsy Forest Dr., Marietta, Ga. 30067. Glaser-Dirks West, P.O. Box 7282, Berkeley, Calif. 94707; 404/973-1414.

Glasflügel, West Germany. U.S. Office: Graham Thomson Ltd., 3200 Airport Ave., Santa Monica, Calif. 90405; 213/390-8654.

Great Lakes Aircraft Co., P.O. Drawer A, Eastman, Ga. 31023; 912/374-5535.

Gulfstream American Corp., P.O. Box 2206, Savannah, Ga. 31402; 912/964-3000.

Hiller Aviation, Inc., 2075 W. Scranton Ave., Porterville, Calif. 93257; 209/781-8000.

Hughes Helicopters, Centinela & Teale Streets, Culver City, Calif. 90230; 213/871-5212.

I.C.A. Brasov, Romania. U.S. Office: Sprague Aviation, Inc., 2550 Pleasants Valley Rd., Vacaville, Calif. 95688; 707/446-0152.

Israel Aircraft Industries, Israel. U.S. Office: Atlantic Aviation Corp., Westwind Sales, Greater Wilmington Airport, P.O. Box 15000, Wilmington, Del. 19850; 302/322-7223.

Laister Sailplanes, Inc., 2714 Chico, S. El Monte, Calif. 91733; 213/442-4945.

Lake Aircraft, P.O. Box 399, Hooks Memorial Airport, Tomball, Tex. 77375; 713/376-5421.

LearAvia Corp., P.O. Box 60000, Stead Airport, Reno, Nev. 89506; 702/972-0711.

Marsh Aviation Co., 5060 Falcon Dr., Mesa, Ariz. 85205; 602/832-3770.

Maule Aircraft Corp., Rt. 5, Moultrie, Ga. 31768; 912/985-2045.

Mitsubishi Aircraft International, Inc., 12700 Park Central Dr., Suite 1310, Dallas, Tex. 75251; 214/387-5600.

Mooney Aircraft Corp., P.O. Box 72, Kerrville, Tex. 78028; 512/896-6000.

Nippi, Japan. U.S. Office: Aerosport, 32301 Corydon Rd., Lake Elsinore, Calif. 92530.

Pezetel, Poland. U.S. Office: Melex U.S.A., Inc. 1200 Front St., Raleigh, N.C. 27609; 919/828-7645.

Pilatus Britten-Norman Ltd., England. U.S. Office: Jonas Aircraft and Arms Co., Inc., 120 Wall St., New York, N.Y. 10005; 212/344-0355.

Piper Aircraft Corp., Lock Haven, Pa. 17745; 717/748-6711.

Pitts Aerobatics, P.O. Box 547, Afton, Wyo. 83110; 307/886-3151.

Raven Industries, Inc., P.O. Box 1007, Sioux Falls, S.D. 57101; 605/336-2750.

Robinson Helicopter Company, 24747 Crenshaw Blvd., Torrance, Calif. 90505; 213/539-0508.

Rockwell International, General Aviation Division, 5001 N. Rockwell Ave., Bethany, Okla. 73008; 405/789-5000. Sabreliner Division, International Airport, 6161 Aviation Dr., St. Louis, Mo. 63134; 314/731-2260.

Scheibe, West Germany. U.S. Office: Graham Thomson, Ltd., 3200 Airport Ave., Santa Monica, Calif. 90405; 213/390-8654.

Schempp-Hirth, West Germany and France. U.S. Office: Graham Thomson, Ltd., 3200 Airport Ave., Santa Monica, Calif. 90405; 213/390-8654.

Schleicher, West Germany. U.S. Office: Schleicher Sailplanes, Inc., P.O. Box 118, Port Matilda, Pa. 16870; 814/237-7996.

Schweizer Aircraft Corp., P.O. Box 147, Elmira, N.Y. 14902; 607/739-3821.

Short Brothers Ltd., Northern Ireland. U.S. Office: Short Brothers U.S., Suite 255, 2222 Martin Dr., Irvine, Calif. 92715; 714/955-2330.

Sikorsky Aircraft, North Main St., Stratford, Conn. 06602; 203/386-4000.

Swearingen Aviation Corp., P.O. Box 32486, San Antonio, Tex. 78284; 512/824-9421.

Taylorcraft Aviation Corp., 14600 Commerce St., N.E., P.O. Box 243, Alliance, Ohio 44601; 216/823-6675.

Thunder Colt Balloons Ltd., England. U.S. Office: Thunder Colt USA, 114 Sandalwood Ct., Santa Rosa, Calif. 95401; 707/546-7124.

Tom-Cat Helicopters, Inc., Rt. 1, Box 7G, Owatonna, Minn. 55060; 507/451-0782.

Varga Aircraft Corp., 12250 E. Queen Creek Rd., Chandler, Ariz. 85224; 602/963-4914.

Vickers-Slingsby, England. U.S. Office: Sprague Aviation, 2550 Pleasants Valley Rd., Vacaville, Calif. 95688; 707/446-0152.

Weatherly Aviation Co., 2304 San Felipe Rd., Hollister, Calif. 95023; 408/637-5534.