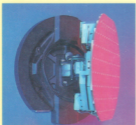


# Business and commercial **Aviation**

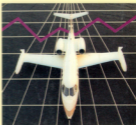
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Canadian Air Crew's S-64 busy pulling legs off the helicopter.

rotor, main shaft inclination, lateral C of G, turbine residual thrust, tail rotor side-thrust, and your natural tendency for a cyclic input to accelerate into translational lift, you really have to work hard to lift straight up. As a result, you should practice lift-offs with a climb vertically to your high hover altitude, followed by a descent to landing - over and over again before attaching the long line.

Subsequent training flights with the long line should use an attached weight that is approximately half the aircraft's lifting capacity. This adds a safety margin by providing additional controllability and helps avoid exceeding engine or transmission limits.

During initial hovering with a load, the pilot should note the position of the weight with reference to the side of the helicopter and skid gear. Of course, this position will change if the length of the long line is modified. At the moment of load lift-off or landing, you will want the slung object to be in that position. If you

lift off with the load in a different position, it will swing through that reference point in an effort to center itself (gravity at work).

As you practice, you are learning how to hold your position while looking out the side of the helicopter - rather than forward - as well as the effects and swinging characteristics of a load that acts as a pendulum. Extra challenges occur as you focus on the nearby engine/transmission instruments and then back to the ground. CAUTION: Overcome the tendency to chase the load, as this will result in a wildly variable flight path. The load swings due to overcontrolling. This is exacerbated by the delay of the load in responding to any input followed by the prolonged swinging related to the pendulum effect. What a pilot needs to do is use ground references to stabilize the helicopter's position, and once this is under control, consider what movement will stop the swing. The lesson to be learned here is that you should only take fleeting glimpses of the load, as your reference for stability is the ground - not the load!

Start training in an obstacle-free open area with a light load, such as fuel drums filled with water in a cargo net, and begin by taking the tension up in the line and lifting the load off the ground while hovering directly over it. Then put it back down and land without lapping the long line all over the load. In time you will be able to easily coil the line or tag it alongside the payload. Once you are proficient in the direct lift and setting the load down in a controlled manner, "walk" it around the area and place it precisely on a spot you select. (A number of old car tires around the area work well for this.) This is good practice for the precision placement of a payload as it typically necessary during "real" operations with machinery assembly in a confined area. During these operations, the load is generally brought within a few feet of personnel on the ground who will grab the cargo or a wire dangling from it, and position equipment so it lines up correctly for their requirements. While there are pilots who can frequently line up belt holes between pieces of equipment, they are few and far between - but it's a good skill to work towards... Since the hovering portion of the training is particularly tiring, try to keep your sessions down to no more than 15

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# AIRMANSHIP



## Airport Alarms

Airports are like homes. They provide necessary shelter and comfort, but they are not as safe as they seem.

by Dan Manningham

*"The port is near, the bells I hear, The people are rejoicing."*

—Walt Whitman

**A**irports are the havens of aviation. They are the sanctuaries where aircraft and aviators find rest, refuge and support. Airports are the gathering places where pilots meet, greet and eat. They are the source of servicing, maintenance and advice.

There is an emotional comfort to the airport environment because it is the harbor at the beginning and end of a journey. There are no bells to hear, but the lights, tones and electronic indications of a final approach can

evoke an emotional response similar to what a sailor feels as he enters a harbor after a long voyage. To a pilot, the reassurance that solid ground is so close relieves the stress of travel and gives way to the anticipation of earthly comforts and convenience.

There are other reasons to appreciate the airport environment. It is the meeting place for fellow aviators. It is the location of fuel, maintenance, food and paychecks. It is the interface between ground and air, stop and go, home and away.

Unfortunately, airports can also be hazardous as well. True, airports do provide the shelter and servicing necessary for flight, and there is a certain sense of security on the ground, but airports can be dangerous places.

*"A ship in harbor is safe, but that is not what ships are built for."*

—John A. Shedd

Ships are safe in harbor, but usually only when they are anchored or docked. Similarly, an airplane on the airport is safe enough once the hangar doors have been closed, but that is not what airplanes are built for.

Airplanes are built to fly, and it should be no surprise that the most hazardous part of the trip may be the portion that takes place on the ground. Much of that danger is inherent to the airport environment.



## Engine Maintenance in Transition

Static new-aircraft sales and the state of the economy in general are reshaping powerplant support procedures and philosophies along lines that call for new market approaches and hyper-creativity.

by Robert L. Parrish





# Turboprop Transition

Forget control manipulation for a while and hit the books. The payoff will be a quicker transition and a high degree of confidence.

by Richard N. Aarons

**B/CA**

AUGUST 1986 VOL. 9 NO. 2

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FOR COMMERCIAL OPERATOR MANAGEMENT



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The Second Tier: "Windows of Opportunity"*



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## Safety

# RADAR ACCIDENTS

Airborne weather radar is not known to have caused accidents but, when used properly, it certainly can prevent them.

By DAN MANNINGHAM

**I**t all started because of thunderstorms. Someone realized that radar equipment could be designed specifically to detect water droplets, especially the large and numerous water droplets associated with active thunderstorms. And, if pilots could "see" these areas of heavy rainfall on a cockpit radar scope they could avoid the severe convective weather associated with such radar images. Airborne weather radar always has been predicated on that simple concept of guilt by association—that heavy rain is very likely an indication of turbulence. And it worked. By the early 1960s nearly all airline cockpits had been equipped with weather radar. Thunderstorm-related accidents decreased dramatically.

Soon after radar's inception, it was discovered that radar systems were capable of detecting landmasses and obstacles. Accordingly, some pilots began using their "weather" radar to aid their navigational tasks, especially on overwater flights that tracked along recognizable coastlines or islands where the contrast between land and water was obvious.

Not long after, pilots recognized that radar also could depict vertical terrain features, thus providing added protection from inadvertent flight into high terrain. At that point, "weather" was omitted from "airborne weather radar" in recognition of this system's broader capabilities. While radar manufacturers may be somewhat reluctant to acknowledge these extra abilities of their systems, they are readily available for the informed user.

Airborne radar has progressed from simple monochrome displays to today's digitized color presentations



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## Are Corporate Airliners Still Viable?

Despite the waning of the "royal barge syndrome," a number of operators still swear by their BAC, Boeing, Douglas and Fokker airliners.

by Robert A. Searles

**M**any flight departments have always felt that there was a place for the airliner in business aviation. Many corporations used such aircraft to transport large numbers of company personnel and equipment long distances, other firms utilized spacious, luxuriously appointed jetties for "marketing" (entertaining customers and prospective clients); others merely wanted to transport the chairman in the style to which he had become accustomed.

However, in recent years two factors might have made the corporate airliner extinct: new, more stringent noise regulations that threatened to ground many of those early-model airliners, and the seeming extravagance of operating such large aircraft, especially considering the recession-induced pressures on flight depart-

ments to trim expenses. But despite increasing operating costs, the image problems of operating corporate airliners today, and the need to refit many of these aircraft with hush kits or other engine treatments, the number of corporate airliners has actually increased in the last two years. According to Aviation Data Service of Wichita, there were 175 jetties in nonairline service at the end of the first quarter of 1982 (B/C/A, July 1982, page 42). Three years later—and six months after the new noise regulations for airline-size aircraft went into effect in the United States—200 such aircraft were in service worldwide (see Figure 1 on page 65).

It seems that the continuing popularity of the corporate airliner can be attributed to the unique range-payload capabilities

of that class of aircraft. Virtually all of the operators contacted by B/C/A said that they use their corporate airliners for international missions, carrying as many as 50 people at a time over nonstop legs up to 4,000 nm. Most of those flights involve transporting several dozen company personnel or customers, but even with smaller passenger loads, many operators have found that an airline-size aircraft is the aircraft best suited to the mission.

"A Boeing 737 has an effective eight-hour range, a [Gulfstream] G-II has roughly a five-hour range, so it might not make Hawaii from the West Coast with a stiff headwind and 10 passengers," said one chief pilot whose Southwest-based company operates a 737.

Other operators also said that their corporate jetliners are capable of longer legs

than current heavy-iron business jets. And although several new long-range business jets presently being developed will narrow the gap, one operator believes that there is "no comparison on comfort" because range is as much a matter of passenger and crew endurance as it is a matter of the physical capabilities of the aircraft and that the large cabin of an airliner offers the most relaxing way to travel.

Boeing notes that the interior of its 737 airliner is nearly a foot taller than most business jets, over 20 feet longer than the longest business-jet cabin, and about 3.5 feet wider than the widest corporate jet. Such an ample cabin means that the interior room can be subdivided to create separate work, rest and eating areas.

"That [space] makes the trip more comfortable," said the aforementioned 737 operator. "The passengers can get up, walk around, sleep, or have a meal prepared for them."

A Northeast-based operator who flies a BAC One-Eleven and a Boeing says that the chairman of his company likes to use the airliner literally as a second office. When traveling, this executive often holds three to four meetings in the airplane each day—on the ground.

Another advantage of the spaciousness of a corporate airliner is that there is room on board for the additional crewmembers often needed on long trips, thereby eliminating the time and expense of re-positioning crews during extended international missions. Also, an airliner's ample baggage area can easily accommodate the golf bags and suitcases of a dozen people on a "customer cultivation" trip.

#### Bigger Not Always Better

But as nice as it may be to have all of the capability of a jetliner at your disposal, many corporations are concerned about the image problems associated with operating a corporate airliner. One flight

department manager claimed that his company's executives could fly transcontinental as cheaply in the firm's Boeing as they could in the company's G-II, but that they almost always choose to fly in the G-II because they are afraid of what people might think if they see the airliner taxi up and only three people get out.

Another flight department manager said that he considered buying a Boeing but that his company's management did not want to purchase a 727 or 737 because they are "recognizable airliners." Subsequently, the department acquired a jetliner that is less well known.

The runway performance of corporate airliners can limit access to some airports, but as the BAC One-Eleven and Boeing operator said, runway limitations are "not too much of a problem." Another operator of a BAC One-Eleven said, "We operate anywhere we want to go, except Aspen [Colorado]." A third flight department manager said that he uses his Boeing on the same fields as he does his Rockwell Sabreliner.

In fact, most of the corporate airliner operators polled by B/CA said that they can get into most 5,000-foot airports. The chief pilot located in the Southwest claimed that his 737 has "no more airport restrictions than a big-iron business jet." But a Northeast-based operator of Boeings did say that parking a corporate jetliner can sometimes pose a problem. He said that because most general aviation ramps are not designed to handle airliners, he calls his destination airport in advance to make sure that arrangements can be made to accommodate his 727.

While runway restrictions may not pose a big problem to corporate jetliner operators, noise can. Because many of the corporate airliners in service were manufactured over a decade ago, January 1, 1985 was a significant date for a number of operators. Part 91 Subpart E required

that all airliner-size aircraft—those weighing 75,000 pounds or more—must comply with FAR Part 36 Stage 2 or 3 by January 1985, although the so-called "Small Communities Exemption" allows some operators to continue to fly noncompliant two-engine aircraft until 1988.

Most of the corporate-airliner operators B/CA talked to had contracted several years ago for fan treatments or hush kits, which can cost from several hundred thousand dollars up to about \$2 million. However, one operator complained about the difficulty of getting an exemption from the FAA, and reportedly his aircraft was grounded for several months. In addition, although the agency has granted exemptions to operators who did not have their aircraft retrofitted by January but had contracted for the work to be done, the exemption is a once-in-a-lifetime proposition and is not transferable to the new operator should the aircraft be sold.

Obviously, that could depress the resale value of some corporate airliners, but one BAC One-Eleven operator expressed optimism that he would have alternatives by the time his exemption expires in 1988. He said that by then he expects San Antonio-based Doc Howard to offer a Rolls-Royce Tay retrofit for his Spay-powered -400, and he added that European operators of the same model have developed hush kits, although they are yet to be certified in the United States.

Although making a corporate airliner noise compliant can be expensive, most operators figured that price in when they bought the airplane, and they do not regret their decision to buy the older jetliner. One operator claimed that you can still acquire a used airliner and refurbish it for under \$10 million—and the difference in acquisition price between a used airliner and a brand-new heavy-iron business jet, plus carrying costs if you had to borrow the money to finance the new



More Boeing 727s were produced (over 1,800) than any other jetliner in history. Thus, it's not surprising that there are more 727s in corporate colors in the United States—30 at the end of the first quarter of 1985—than any other airliner.





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business jet, "can buy a lot of fuel."

The disparity between the acquisition price of a used airliner and a new business jet may be narrowing, however, due to a declining number of available surplus airliners. Since airline deregulation, many older Boeings have been gobbled up by new-entrant carriers, and a minority of the remaining aircraft are readily adaptable to corporate use. Consequently, operators who are interested in a corporate airliner may end up going directly to Boeing, which has a separate office to market its 737-900 to corporate operators.

Even when used airliners were relatively plentiful and inexpensive, some operators opted to buy new jetliners. Two of the corporate-airliner operators contacted by B/CA decided to buy brand-new Boeings. One 737 operator believes that his aircraft is worth more for not having accumulated thousands of hours in airline service, netting, for instance, that the skins on certain older Boeings have notorious corrosion problems. He disclosed that his company bought a new 737 from Boeing in 1979 for \$4.3 million; he estimates that the aircraft's current value is \$8.5 million.

#### Care and Feeding

Most of the corporate-airliner operators interviewed by B/CA do some maintenance of their large aircraft in-house. But for heavy maintenance, most operators rely on the airlines or companies that specialize in airliner support, such as Page Avjet in Orlando (which has extensive experience with Boeing equipment) or Miami-based Air Tech (which specializes in handling BAC One-Eleven). For example, one 737 operator said that an in-house mechanic handles minor mainte-



The spacious interiors of corporate airliners allow the installation of extensive entertainment equipment (above left) or full-size desks (above).

nance, and the flight department maintains a software program to keep track of the work that is done on the aircraft under contract by a major airline.

Corporate operators who have established relationships with carriers that have operated a certain type of aircraft for a long period (for example, several BAC One-Eleven operators contract with USAir, which has flown BAC One-Elevens for over a decade) may be able to avail themselves of the carrier's accumulated knowledge. Because of the airlines' long experience with many of the aircraft used as corporate airliners, many corporate operators have selected the same airline for maintenance as well as flight crew and mechanic training.

All of the corporate-airliner operators contacted by B/CA said that they are operating their large aircraft under Part 91, not Part 125, which would require more paperwork (an operations manual, for instance). However, one Boeing 737 operator pointed out a potential paperwork problem for Part 91 operators who acquire ex-airline equipment. Airline maintenance of jetliners is essentially done "on condition" because the major carriers generally have enough resources to monitor the status of each aircraft component, and thus can operate them beyond the manufacturer's recommended life.

A Part 91 operator does not have those resources, so he must choose whether he will follow the manufacturer's recom-

mendations or try to continue an airline-type maintenance program.

Nevertheless, the aircraft themselves are designed for more rigorous, intensive use, and corporate operators report that airliners are mechanically more dependable and pose no greater a maintenance burden than their business jets. One corporate operator said that the reliability of his 737 "is hard if not impossible to beat. . . . Longevity is designed into airline equipment." A corporate operator who flies a McDonnell Douglas DC-9 boasted, "You can set your watch by it."

As far as parts availability is concerned, Boeing's worldwide support network is a big plus ("There's hardly a country in the world where Boeings aren't flown"), and one corporate operator reports that it is easy to get equipment for his 727. He said it is a little harder to acquire some components for his BAC One-Eleven, but generally there is no problem.

Is a corporate airliner right for your operation? Like a current 737 operator, you may think not. He said he was "skeptical" about corporate airliners at first, but now regards his 737 as the "ultimate corporate aircraft," largely because of its short-field capability.

Still, there will never come a time when we see a corporate airliner in every hangar, but as a corporate operator of two airline aircraft suggested, "Any company participating in the global market should consider a corporate airliner. They have a definite place in business aviation." □

Figure 1

### Worldwide and U.S. Fleets of Airliners Not Used in Commercial Service

	Worldwide/U.S.
707/720	30/16
727	61/32
737	23/10
747	2/0
Aerospatiale Caravelle	6/0
DC-8	7/2
DC-9	12/8
F28	15/1
BAC One-Eleven	44/24
<b>Total</b>	<b>206/93</b>

(Numbers courtesy of Aviation Data Service of Wichita.)

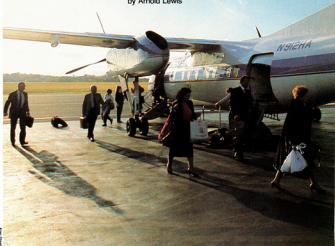


For heavy maintenance, most corporate-airliner operators rely on the major airlines or firms that specialize in airliner support, such as Page Ajet in Orlando. That company has modified and completed about three dozen Boeing 727s as well as numerous BAC One-Elevens, Boeing 707s and McDonnell Douglas DC-9s. The facility also is installing quiet nacelles on DC-8s and 707s.

# IBM: Regional Aviation's Catalyst in the Northeast

*Regional carriers from Virginia to Vermont have matured under the wing of corporate giant IBM, benefiting not only from the traffic it generates, but from an insistence upon safety and excellence as well.*

by Arnold Lewis



**I**nternational Business Machines Corporation wouldn't tell you, but if it would, it would say that it is not in the airline business and does not involve itself with scheduled regional air transportation. That statement would be true. Nonetheless, the computer giant has had a pervasive influence on the growth and development of several commuter/regional airlines that serve various IBM plant locations from the Mid-Atlantic to the Northeast.

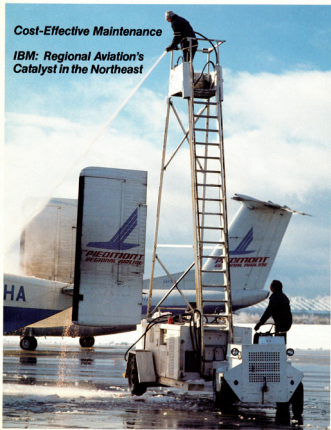
Brockway Air, Colgan and Command Airways all credit IBM with having a significant impact on their

initial growth and development. "It was profound," remarked Command founder and President Kingsley Morse. In the case of Virginia-based Colgan, it was the *raison d'être*. And Brockway, formerly Air North, to this day capitalizes on IBM traffic from a number of plant locations. Where most large corporations have solved their unique transportation problems in-house, through their own corporate flight departments, IBM has chosen to seek solutions in the public sector in such a manner that has benefited the communities as a whole.

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# THE GILDING GAME



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BY LOU ROBERTS