Sweet Smell of NEW

Shoppers' World

What's new for '99

BY THOMAS B. HAINES

As any politician will tell you, some truths are truer than others. In aviation, there is no truer truth than the one that states that an aircraft is the finest personal possession you can own. It's true now and it was true in March 1989, the last time we published an overview of the current crop of general aviation aircraft. ■ Back then, the GA industry was in the doldrums. The number of new students was declining, aircraft deliveries were plummeting, the number of new models introduced or in development was minimal, and things looked pretty glum. However, 1988 was a bit of an anomaly. It appeared the decline in deliveries had bottomed out—manufacturers delivered 1,212 units compared to 1,085 in 1987; Cessna, which had stopped piston aircraft production only two years earlier, was hinting that it might resume manufacturing; new management at Piper brought back the Super Cub and pledged great things; and several industry initiatives showed promise in turning around the declining number of pilots. With those morsels of good news, we set about predicting that the worst was behind us and that 1989 would begin the rebirth of general aviation as we had known it in the booming 1970s. ■ OK, so we were a little optimistic. Things did not turn around. In fact, by 1994 the number of deliveries had sunk even further to 928—and the pilot population continued its decline, Cessna stayed out of the piston market, and Piper went bankrupt. ■ But a lot has happened in the intervening years that bodes well for the health of the GA market. Most significant was the passage in August 1994 of the General Aviation Revitalization Act (GARA). Skyrocketing liability insurance premiums were a major concern for GA manufacturers and a prime reason that Cessna bailed out of the piston market. GARA, which limits a manufacturer's liability for an aircraft and its components to 18 years, offered the sort of relief that the manufacturers needed. As a result, liability insurance premiums have at least stabilized. ■ As soon as the legislation passed, Cessna set into motion a plan to begin building single-engine aircraft. Less than a year after the bill was signed, company officials broke ground for a new factory in Independence, Kansas—and little more than a year later, in July 1996, the factory opened. Last year, Cessna pro-

PHOTOGRAPHY BY MIKE FIZER

Many dreams are realized in Cessna's interior appointment showroom. Here customers choose from dozens of fabrics, leathers, woods, and laminates when specing the interiors of their corporate aircraft.

duced 775 single-engine piston aircraft, more than double the 1997 number of 360. But the number is slightly less than the 800 aircraft the company projected early last year that it would build, and it's significantly less than the 2,000 airplanes per year that Cessna forecast when it first jumped back into the piston market.

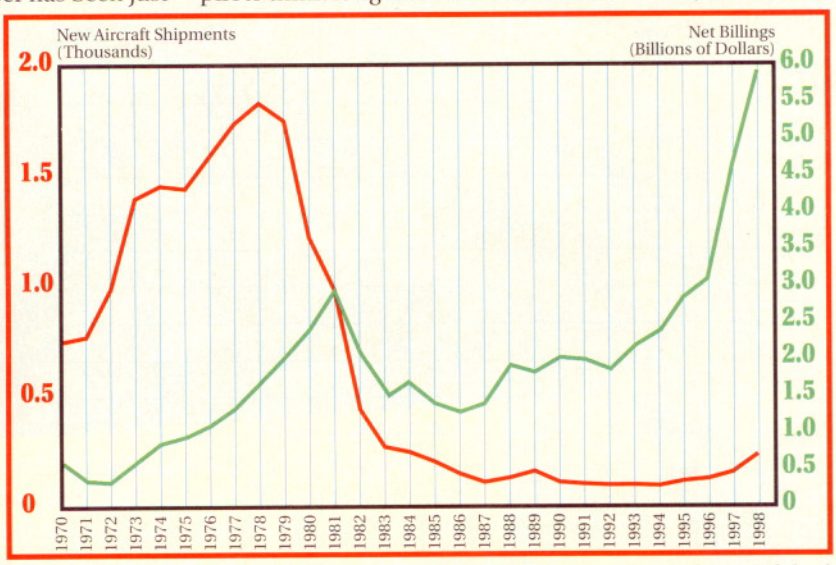
Still, it's a remarkable recovery from just a few years ago. Last year, across its jet, turboprop, and piston lines, Cessna delivered 1,077 aircraft, compared to 618 in 1997. Just three years earlier the *entire industry* delivered a total of, ironically, 1,077 aircraft.

The turnaround at Piper has been just as astounding. In the depths of its bankruptcy in 1991, the struggling company delivered just 41 units. A new company, The New Piper Aircraft emerged from Piper's bankruptcy in 1995, and, with its new management and ownership, has not looked back. In 1998, 295 new Pipers rolled out of the factory, compared to 222 in 1997. This year, the production plan calls for 329 units. Last year brought a number of product enhancements, including new engine and fuel management systems, new avionics suites from Garmin, and a host of other refinements. Most significantly, Piper unveiled its new Malibu Meridian, a single-engine turboprop that made its first flight last August. Certification is set for mid-2000.

Mooney, Commander, Raytheon, and other manufacturers have similar tales of success in the last half of the 1990s. Their individual successes have contributed to an overall increase in deliveries of 30 percent among member companies of the General Aviation Manufacturers Association. Overall, U.S. manufacturers delivered 2,223 new airplanes in 1998 worth $5.9 billion, compared to 1,569 units and $4.7 billion in 1997. While only U.S. manufacturers can join GAMA, European manufacturers have also been successful. Socata, Pilatus, Dassault Falcon Jet, and Eurocopter, for example, all broke recent records for deliveries and/or billings.

So what's driving this rebirth of general aviation? A lot of factors, including stable prices for avgas, jet fuel, and hull and liability insurance; a continuing decline in the quality of airline service; an increasing need for airline pilots; increased optimism about the future of general aviation; a declining GA accident rate, and an uptick in the number of student pilots. Without a doubt, though, the biggest factor is the economy.

General aviation is a fragile industry. It is the last industry to feel an upswing when the economy picks up and the first to suffer the effects of a contracting economy. Personal airplanes are, for the most part, recreational vehicles purchased with discretionary income. When discretionary income shrinks, as it does when inflation grows, aircraft sales plummet. And even when things seem strong economically, pilots think long and hard before committing to such a large outlay of cash. Likewise, corporations must feel very comfortable with their projected earnings before they will ante up tens of millions of dollars for a new aircraft, even if the purchase makes perfect sense from a business standpoint. And at the first hint of economic contraction, buyers cancel orders.



In the economy, general aviation is the last to feel an upswing and the first to suffer.

But the United States is in the midst of one of the longest periods of economic expansion in history. Finally, general aviation is feeling the effects and sales are on the rise.

Even in good times, though, an aircraft purchase can be a major investment. However, a number of changes in recent years have made it easier than ever for people to buy aircraft. A big factor in the business jet market has been the exponential growth of fractional ownership programs. Now, companies or individuals can purchase shares of an aircraft. With the purchase come the tax advantages of owning an aircraft, access to an airplane for a prearranged number of hours per year, and a host of other services for far less than it would cost to own and operate a business jet outright. The programs, which represent some 18 percent of all business jet orders, have opened the general aviation experience to more people than ever. Some of the customers will like the experience enough to buy an aircraft of their own.

For the most part, the fractional ownership bonanza has been confined to the jet set, but a few companies are trying it with turboprops and even piston aircraft. Pilots of more modest means who desire to buy a new aircraft also have new options. Among them are extended financing terms. Back in 1988, we thought that the financing plan offered by Beech Aircraft for its Bonanzas and Barons was notable. It allowed pilots to put 10 percent down and then finance the balance for seven years at 9 percent for the first five years and 1 percent over the prime rate for the balance of the loan. Today, finance companies are allowing pilots to purchase new aircraft for little to no down payment and to extend the loan for as long as 25 years. As a result, monthly payments for some new aircraft can be as little as those for a luxury automobile or sport utility vehicle. So, while the price of your average piston single has nearly doubled over the last 10 years, the monthly financial bite is still manageable for some pilots who are enjoying the economy's low unemployment, low inflation, and booming stock market.

Overall, prices for new airplanes have increased faster than inflation throughout the 1990s. The average price of a single-engine piston aircraft in 1989 was approximately $130,000. That equates to about $180,000 in 1998 dollars. Today, the average single goes for about $250,000. However, with those higher prices come greater comfort and more capability, if not more speed. Today's airplanes provide snazzy and quiet interiors and avionics panels stuffed with products only dreamed of a decade ago. Loran was the rage in the late 1980s. Today, it's been supplanted by GPS, including models capable of IFR approaches and sporting color moving maps. Piston singles certificated for flight

Starting Line

Sweet Smell of NEW

Candidates for first-airplane purchases

BY MICHAEL P. COLLINS

Every pilot has dreamed of owning his or her own brand-new airplane. Although not all of us will have a chance to savor the experience of flying a just-delivered airplane home from the factory, and some of the rest of us may have to compromise—say, by purchasing a new Cessna 172 when what we *really* want might be a Learjet 45—there is some good news: The selection of new entry-level aircraft is greater today than at any time in the past decade.

General aviation's fleet of stalwart trainers—the Cessna 150 and 152, Piper Cherokee and Tomahawk, and Beech Skipper—has done little except grow older over the past decade. The opportunities for pilots seeking to purchase that first airplane have actually increased, however, with the updating of several proven and capable performers. In addition, some new entries in the trainer field have shown themselves to have potential as personal aircraft.


Diamond Katana DA20–C1

Diamond Aircraft's sporty Katana has proven popular with U.S. flight schools. The distinctive Canadian-built composite two-place, with long, narrow wings that belie its motorglider heritage, boasts control sticks instead of yokes, and a fighter-like canopy that offers unrestricted visibility. Originally built with an 80-horsepower Rotax 912 engine, the Katana now is delivered with a 125-hp Continental IO-240—and a four-place Katana is now flying in Austria, with certification expected late this year. Diamond also assembles the Austrian-built Xtreme, a motorglider that looks like a Katana with extra-long wings.

Zenith Aircraft's CH2000, another Canadian import, received U.S. certification in 1995 under Joint Airworthiness Regulations/Very Light Aircraft rules. Assembled in Midland, Ontario, the two-place airplane features conventional aluminum construction and a 116-hp Lycoming O-235. Cruise speed is 104 knots at 75-percent power. Although the design seems to target the training market, the CH2000's base price—$69,900 in 1997 for a day/VFR aircraft—is one of the lowest of any aircraft in this survey.

Socata's Tampico—a four-place low-wing with distinctive gullwing doors and a stabilator positioned aft of the vertical tail—was just finding its way from France to U.S. flight lines a decade ago. Pilots who are trained in the 160-horsepower Tampico find that the additional 20 hp and constant-speed propeller of Socata's Tobago make it a very comfortable personal aircraft. The Tobago XL offers 200 hp and a bit more payload; all three airplanes share the same wide, roomy fuselage with the high-performance, retractable-gear Trinidad. New to both the Tobago and Tampico are trailing-link main landing gear.

Ten years ago, Cessna was not in the business of manufacturing piston-engined aircraft. In 1996 Cessna's venerable Skyhawk was reintroduced as the 172R. Although the basic airframe is unchanged, the new Skyhawk features state-of-the-art avionics and an updated interior with seats that can withstand a 26-g impact. Under the cowling a fuel-injected 160-hp Lycoming eliminates the possibility of carburetor icing while it turns the propeller at an ear-pleasing maximum 2,400 rpm. Not only is the new Skyhawk much quieter than its predecessors, it's faster, too—cruising at an honest 120 knots. Last year Cessna introduced the 172S Skyhawk SP (see "Cessna Skyhawk SP: Ponying Up the Skyhawk," September 1998 *Pilot*), with an additional 20 fuel-injected horsepower (achieved with the same engine by allowing a faster 2,700-rpm redline); the new model quickly proved popular with buyers who operate in high-elevation environments.

New Piper Aircraft in Vero Beach, Florida, has been quietly increasing production of its Archer III—in fact, the company plans to deliver 100 of them this year (see "The New Piper's Archer III: Primary Piper," November 1998

in known icing are now available from Mooney and Commander. Air conditioning has become more common on many models, as have sophisticated fuel and engine monitoring systems (see "Safety Pilot: What's New in Aircraft Safety?" page 98).

Another factor driving some purchases is the greater value offered by new entrants in the field. Cirrus and Lancair, for example, spent the last half of the 1990s developing and certifying new models that offer levels of comfort, speed, and safety not available from most other models—and certainly not at the prices offered by the two newcomers. To meet the Lancair Columbia 300's speed and cabin size in any other brand, for example, you would have to spend some 50 percent more. Still to be seen is whether these two companies can deliver their new products in volume, the level of after-sales support they can provide, and how the market will react when these new airplanes become used models.

It is the booming used-aircraft sales market that is driving some buyers to opt for new. With the average GA airplane now about 30 years old, good-quality, low-time aircraft are becoming increasingly difficult to find. And when found, they command premium prices. For example, a low-time 1986 Cessna 172 with

a few common avionics upgrades brings a price in excess of $95,000, according to *Vref*. Because of these inflated prices, some prospective buyers will turn to the new market, even though a new Skyhawk has a price tag of about $155,000. The 60-percent premium is worth it to them because they know that the new airplane will have a higher resale value.

There is no turning back the calendar. The 1986 model is still 13 years old, so all other things being equal, the 1999 Skyhawk will always be worth more. And, of course, there is nothing quite like flying around in an airplane surrounded by the sweet smell of new.

Following is a summary of some of the new airplanes you can buy in 1999. It's not an exhaustive listing by any means, but it will give you an idea of some of the varied models available. We have grouped the aircraft—somewhat subjectively—into various categories, based on performance or characteristics. A quick perusal will show you that there is a new aircraft available for about any application you can imagine. More detailed specifications along with additional photographs are available on AOPA Online (www.aopa.org/pilot/aircraftdb.shtml). □

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Socata Tobago

Luscombe Model 11E

New Piper Archer III


New Piper Arrow

Pilot). While similar to New Piper's 160-hp Warrior III trainer, the Archer boasts an additional 20 hp, cruises about five knots faster (128 knots at 75-percent power), and can be outfitted with such options as autopilot and air conditioning, which are not available on the Warrior. New Archers are equipped with a Garmin avionics stack—including a GNS 430 GPS/navcom with color moving map—and radios accompanied by an optional S-Tec autopilot. The Archer is also the first airplane in Piper's Step-Up Program, which allows buyers to trade in their airplanes after 18 months of ownership, for credit toward a larger, faster Saratoga—perhaps on the way to a Seneca V or Malibu Mirage. New Piper's Arrow continues to be popular in its role as a complex trainer.

A personal aircraft now on the horizon is Luscombe Aircraft's Model 11E Spartan, a four-place, tricycle-gear airplane based on the Luscombe Model 11 Silvaire. The Silvaire, a taildragger designed by Don Luscombe, was produced from 1938 to 1961. A 185-hp, fuel-injected Continental IO-360-ES will allow the Spartan to cruise at about 113 knots. The Spartans, currently listed at a base price of $138,500 that includes II Morrow and S-Tec avionics, will be built in a new factory in Altus, Oklahoma.

Also on the horizon is a rebirth of the Grumman/Grumman American Tiger. TLM Aircraft is completing a factory at the Eastern West Virginia Regional Airport near Martinsburg, West Virginia, where it plans to manufacture the TLM Aircraft Tiger (see "Pilot Briefing," p. 34). TLM's Tiger is based on the Grumman American AG–5B Tiger, a canopied four-place, 180-hp low-wing that boasts a 75-percent-power cruise speed of 139 knots. The company hopes to be producing aircraft early next year. In addition to the $214,000 Tiger, the company plans to eventually return the 150-hp AA–5B Cheetah to production. □

Cessna 172SP

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Stick and Rudder Club

Lower the tail, raise the fun

BY ALTON K. MARSH

No longer is there a Piper Cub abuilding somewhere on a factory floor, but tailwheel aircraft are far from dead. New models continue to evolve and old models are returning to the showroom for the first time in decades.

American Champion Aircraft has restored to production nearly all of the easy-to-fly, fabric-covered tailwheel models originally designed by Champion Aircraft and Bellanca Aircraft. The aircraft have excellent over-the-nose visibility and good landing manners to aid the less-than-proficient tailwheel pilot.

The Citabria line now includes the entry-level 121-knot Aurora 7ECA ($63,900), the 140-kt Adventure 7GCAA ($71,900), and the 135-kt Explorer 7GCBC ($74,900). (All speeds are maximum cruise speed.) Those prices are up $4,000 to $5,000 compared to 1998. Citabrias have limited aerobatic capability because they have no inverted-flight fuel or oil systems. Enjoy an occasional aileron roll or just fly rightside up, comfortable in the knowledge that your aerobatic aircraft is stronger than it needs to be.

American Champion also makes the 141-kt (maximum cruise speed) Scout 8GCBC utility tailwheel aircraft ($92,900) and the fully aerobatic Super Decathlon 8KCAB ($98,900).

Also producing a full line of tailwheel and nosewheel aircraft (minus the stick) is Maule Air of Moultrie, Georgia. Over the years the company has produced numerous models from one basic design. Prices range from $99,069 for the MX–7-160 Sportplane to $450,000 for an M–7-420AC turboprop-powered aircraft. Thirteen of the current models cost less than $160,000. They have metal wings with a fabric rear fuselage.

Another workhorse with a tailwheel is the Aviat Husky A–1A, which in 1998 gained a 90-pound gross weight increase, giving the typically equipped aircraft a 710-pound useful load. The base price is $107,585. An A–1B model with an 800-pound useful load, originally ordered by government agencies, is available to the public for $119,385. New for the Husky this year are a baggage access door and a rear storage area.

Aviat is better known for its $171,000 Pitts S–2C aerobatic aircraft, the latest model of a high-performance biplane that once dominated world aerobatic competition. It continues to be a

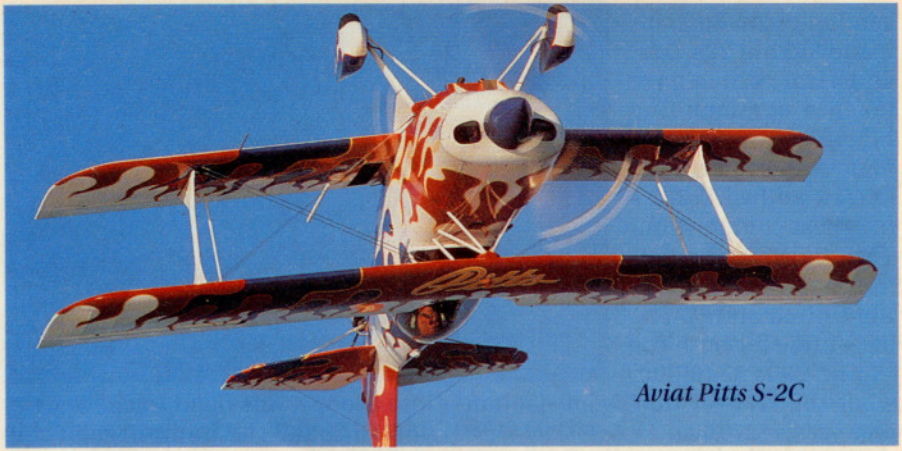
favorite at the lower levels of competition and as an aerobatic trainer.

Aviat is developing two new models, the sporty Aviat Millennium Swift and the two-seat Aviat 110 Special with side-by-side seating. The 110 is a customer step-up airplane, intended to fill a product niche between the Decathlon and the Pitts.

Sales of two other aerobatic aircraft—the $175,000 Extra 200 and $240,000 Extra 300L from Germany—have been strong, pouring 40 to 70 aircraft into the U.S. market each year with little fanfare. The Extra is winning the business of airshow performers as well. Officials of Florida-based Aero Sport, the United States distributor, say that the Extra 200 and 300L are certified for the highest G load of any aircraft in production, at plus or minus 10 Gs.

Recently returned to production is the $147,000 Cap Aviation (formerly Mudry) CAP 10B, sold in this country by the Florida-based French Connection airshow performers. They fly the same model in their act. CAP Aviation's CAP 232 has won first place in world aerobatic competition.

Also available for high-performance



Aviat Pitts S-2C

Maule Orion

aerobatics are Russian-made Sukhoi 29s, 31s, and 31Ms, which have taken a commanding role in the world aerobatic scene and are the Extra's and CAP 232's toughest competition. They are certified experimental/exhibition in the United States. The base price for both the 31 and 29 is $240,000, while the 31M—featuring an ejection seat—costs $275,000.

American Champion Adventure

Built for fun is the Waco YMF Super conventional-gear biplane, available for $254,500. It is made by Waco Classic Aircraft Corporation of Battle Creek, Michigan.

Also dedicated to fun are the Micco SP20 and the Melex M–26. The Micco SP20—based on an older Meyers 145 design—costs $147,500 for the VFR version and $162,900 when IFR-equipped. FAA certification is expected in May for the 140-knot, Lycoming IO-360-powered aircraft, with first deliveries the same month.

The FAA-certified Melex M–26, built by Aircraft Company Limited of Poland, doing business as PZL Mielec, sells for $258,000 (before avionics are installed). Avionics packages are roughly $20,000. The 160-kt aircraft was built originally as a military trainer and has a jet-like tandem-seat cockpit. The trigear M–26 has a stick, retractable gear, and a 300-horsepower engine.

The top end of the sport market may one day be dominated by the pressurized VisionAire Spirit VA–12B. For $500,000, you'll get a 300-kt IFR-equipped aerobatic jet airplane. The tandem two-seater will propel you into a loop at the flight levels, or carry you to that $100 hamburger 1,500 miles away. The single-engine jet's future depends at the moment upon market reaction, which has been quite favorable.

Extra 300L

It's hard to replace the fun of a Cub, but the industry is obviously trying. In many cases they are taking older designs (to avoid high certification costs) and making them better. □

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Waco YMF Super

Sweet Smell of NEW

Exploring the middle ground

BY MARC E. COOK

It's the great middle ground these singles occupy. Quick, but not overwhelmingly fast. Capable but not too complicated. They need to have good performance without the expense of high fuel burn or complex systems. They are, in some ways, the hardest airplanes to design. But for 1999, there is the widest range of choices in this class that we've seen in years. All the major players are here—Cessna, Commander, Mooney, and Socata—as well as a few upstarts in Cirrus, Gavilan, and Lancair.

Pundits have pinned the hopes of general aviation on the likes of the Cirrus SR20 and the Lancair Columbia 300. Both are composite, low-wing, four-place airplanes with fixed gear, and each promises excellent performance. Cirrus is closer to actually delivering customer airplanes. Although there are some interesting systems on the SR20—namely the standard airframe parachute system and single-lever throttle/prop control—it is a fairly conventional design otherwise. It uses standard prepreg fiberglass and a traditional engine-in-front configuration. Cirrus claims 160-knot cruise speeds from the 200-horsepower Continental IO-360. When Trimble's GA division was put up for sale, Cirrus was forced to refigure Garmin avionics into the production line; in the end, it's probably a fortuitous turn of events for SR20 owners. Base equipped price is $171,300.

When the SR20 and Columbia were first introduced, Lancair was considering back-certifying a 210-hp variant; it looks as though that won't happen. Instead, Lancair appears to favor the market slice just above the Cirrus, starting with 300 Continental horsepower and culminating in suggestion and rumor of future turbocharged and retractable-gear ver-

Step-up Singles

sions. For now, the Columbia—to be produced in a new Bend, Oregon, facility—will have fixed gear; a roomy, four-place cabin; and, like the SR20, side-stick control. Both airplanes, incidentally, rely upon large, center-mounted multifunction displays as part of the standard avionics suite.

Lancair claims better than 190 knots in cruise for the 300 and greater payload than the SR20—no surprise, given its greater total power. Pay that back with higher fuel burns, the need to carry more gas, and a slightly higher sticker. The Lancair starts at $189,00 with basic avionics or about $225,000 with standard IFR equipment.


Cirrus SR20

Switch mental gears now from smooth fiberglass and future-think to rivets and strut-braced wings. Yes, the youngsters will have to take on none other than the Cessna Skylane. Rugged, dependable, old enough to remember Strom Thurmond as a paper boy—the Cessna has seen it all. Cessna has come a long, long way from flimsy interiors of creaky Royalite; the new airplanes are as elegant as anything the aftermarket is doing.

At a base price of $223,700, the new Skylane is well equipped, with dual navcoms, a VFR GPS, and a single-axis autopilot. Two option packages are on the sheet—one including an IFR-approach-approved KLN 89B in addition to the standard Bendix/King stack plus a two-axis autopilot for $10,200, and the other offering an HSI for $11,000.

Another familiar face among the middleweights is the Commander 114B. In the years since the revitalized four-placer reentered production, Commander has concentrated on detail refinements, particularly interior options and a reduction in cooling drag. You'll notice the tiny nose slits feeding the IO-540 Lycoming (rated at 260 hp) in an attempt to squeeze a few knots from the beamy airframe. Commander succeeded, too; the new airplane is a few knots faster than the old, rounding up to about 160 knots at optimum altitude and power.


Mooney Eagle

Commander 114B


Lancair Columbia 300

Commander for 1999 has upgraded the standard avionics package to the new Bendix/King Silver Crown Plus and offers the new Garmin GNS 430 as an option. Commander has also made available a number of large-screen moving maps and produced a number of small airframe refinements for this year. Base price for an IFR-equipped airplane is now $370,925.

Last year, Mooney took the daring step of eliminating its long-running entry-level airplane in favor of a new long-body replacement. The Eagle (see "From the Mooney Mold," February *Pilot*) uses the same fuselage as the Ovation and a derated version of the more expensive model's Continental IO-550. By limiting maximum rpm to 2,400, this engine turns out 244 hp. Other changes—including a switch to a two-blade prop and fewer avionics and instruments—have helped to chop away at the Eagle's bottom line. At $319,000 base, it's significantly less dear than the Ovation—yet the Eagle is nearly the Ovation's performance match. Maximum cruise speed is listed at 175 knots, and climb performance is nearly the same as the Ovation's.

Socata's Trinidad has been revised with better basic equipment and a more comprehensive avionics package. For the equipped price of $347,490, you get a two-axis autopilot and flight director, IFR GPS, and a host of other amenities. Powered by a 250-hp Lycoming, the TB20 provides good speed—about 163 knots at optimum altitude and power—with excellent climb performance.

The Colombian-built Gavilan 358 has yet to appear on American soil—it's still in the early production phase and awaits full U.S. certification. When it arrives here, it'll be pulling a packing-crate-friendly, square-cornered cabin behind a turbocharged 350-hp Lycoming. Don't expect big numbers on the airspeed; the power is there to provide the 1,550-pound full-fuel payload, so 130 knots is understandable. Initial price will be $336,000.

With choices like the Gavilan and the Cirrus/Lancair models in the same category, it's clear that the middle ground is wider and flatter than most people expect. One thing's for sure—for 1999, there's plenty of hardware in the niche. □

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Cream of the Crop

Sweet Smell of NEW

High-end piston singles and light twins

BY PETER A. BEDELL

Ten years have brought back many of the same players to the high-end piston product line. Perennials like Raytheon's Beech Bonanza and Baron are still selling steadily as are New Piper's Malibu Mirage and Seneca. Much like today's luxury cars, upscale airplanes come standard with lots of goodies that were previously offered only on the options list, if at all. Weather radar, lightning detection equipment, IFR-approved GPS, entertainment systems, and leather interiors are the standard these days.

Besides the familiar faces, the 1990s have brought a few newcomers to the "cream of the crop" arena. Cessna has brought back and modernized its 206 Stationair in normally aspirated and turbocharged forms. Performance numbers of the $305,000 to $341,000 206s are largely the same, but vastly improved interiors, safety enhancements, instrument panels, and avionics breathe new life into these go-anywhere singles (see "Return of the Workhorse," January *Pilot*).

Another relative newcomer appeared in 1995 when Commander Aircraft took its 114B and added a turbocharger to create the high-performance 114TC (see "Capable Cruiser," October 1998 *Pilot*). With a wide cabin, good looks, and 180-knot cruise at FL250, the Commander 114TC makes a luxurious cross-country machine with high-altitude capability and an optional TKS ice protecting system certified for flight into known-icing conditions.

Also offering TKS is Socata's Trinidad TC. Like the Commander, this turbocharged French single features a wide, comfortable cabin with a carlike interior and 180-knot-plus performance at 25,000 feet (see "Socata Trinidad: French Revival," July 1998 *Pilot*).

Socata Trinidad TC

Mooney's new player in this segment is the Ovation, which was introduced in 1994. Powered by a normally aspirated 280-hp Continental IO-550-G turning a quiet 2,500 rpm, the Ovation cranks out 185- to 190-knot cruise speeds at 75-percent power. The Ovation utilizes the "long-body" Mooney fuselage, which greatly increases interior volume compared to that of older Mooney designs.

While the Ovation is great for flatland pilots, Mooney makes a high-altitude performer that also uses the long-body fuselage. Formerly known as the TLS, the Bravo boasts 210-knot cruise speeds at altitudes above 20,000 feet. Both the Ovation and Bravo are available with TKS and known-ice approval. With TKS and all the bells and whistles, Bravos and Ovations can push the $500,000 mark.

Ringing in at around the same price, Raytheon continues to sell its normally aspirated A36 and turbocharged B36TC Bonanzas at a steady pace. Although their basic designs date to 1947, they remain a performance benchmark for other aircraft companies. Bonanzas have always combined good speed with spirited handling and durable construction. Expect cruise speeds of 170 knots in the A36 and better than 200 knots in the B36TC if it's flown above 20,000 feet. Unfortunately, the Bonanza has no factory-available deice system although some aftermarket STCs

Piper Malibu Mirage

Commander 114TC

to install boots or TKS are available.

Like Raytheon, New Piper has two heavy singles for high- and low-altitude duties—the Saratoga II TC and the Saratoga II HP, respectively. Taking a different tack than Raytheon, New Piper trades off some speed for a cavernous cabin. Inside, the 'Togas can be configured with six seats or five with an executive/entertainment console. Real-world speeds of the HP are 155 to 160 knots, while the TC can muster true airspeeds as high as 190 knots at 20,000 feet. New Piper recently began shipping Saratogas with a stack of Garmin avionics backed by S-Tec autopilots and horizontal situation indicators.

New Piper's Malibu Mirage (see "Three for All," March 1998 *Pilot*) boasts a 215-knot cruise at FL250, a pressurized cabin, and known-ice capability. The Mirage, which lists for nearly $1 million when loaded with options, represents the pinnacle of piston singles.

Bellanca is still producing its high-performance Super Vikings. These retractable-gear, four-place airplanes come from a different mold but offer 160-knot-plus cruise speeds and delightful handling. Bellanca plans to produce six Vikings in 1999. Get one soon because the workmanship put into the Viking's wooden wings is a true work of art that has all but disappeared from aircraft manufacturing.

Lake Aircraft is actively churning out its amphibians, now called the Seafury and the Seafury 270. The normally aspirated Seafury can muster 130 knots out of its boat-hull airframe while the turbocharged 270 can achieve 155 knots above 12,000 feet. Lake sold 26 airplanes last year; all but seven were the military version dubbed Seawolf. At $500,000 or more Lakes are pricey but, after 100 hours of flying one, a recent buyer said, "It's a million dollars of fun for half the price."

Those with a need for two engines will find that only three piston-powered airplanes remain in production—Raytheon's Beech Baron 58 and New Piper's Seneca V and Seminole. New Piper steers individual buyers to the Seneca V, leaving the $340,000 Seminole to fill the role of multiengine trainer at large flight schools—a role it has done well for 20 years. New Piper's $510,000 (standard) Seneca V cruises at better than 190 knots at altitudes higher than FL180. Automatic wastegates on the Continental TSIO-360s and sophisticated engine instrumentation highlight some of the recent changes to the big-cabin twin.

Mooney Bravo

With the basic design approaching its fortieth straight year in production, the normally aspirated Beech Baron promises cruise speeds of around 200 knots and the ability to carry about 1,600 pounds of load. When loaded with options, new Barons are leaving the factory with price tags nearing $1 million.

New Piper Seneca V

Cessna 206

The next 10 years will likely bring more new designs. Extra, the German manufacturer of high-performance aerobatic airplanes, is expecting known-ice certification of its single-engine, composite Extra 400 any day now. The third airplane is now flying behind a liquid-cooled Continental LTSIO-550. A turboprop version, powered by a Pratt & Whitney PT6, is also in the works. Extra's U.S. distributor, Aero Sport, of St. Augustine, Florida, expects deliveries to start this year in Europe. The price will be around $800,000 for a well-equipped 400.

Newcomers like Lancair, Cirrus, Morrow Aircraft, and even Toyota are stirring the industry and will likely offer future entries in the high-end piston field. If nothing else, the competition is bound to spice up what was once a dismal market. □

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Kerosene Alley

Sweet Smell of NEW

A booming economy prompts a bizjet explosion

BY THOMAS A. HORNE

Thanks to an unprecedented economic boom and seemingly boundless optimism, the turbine-powered segment of general aviation manufacturing has shot clean out the top of the sales forecast charts of just a few years ago. Since the last "Sweet Smell of New" ran in 1989, 17 new turboprop and turbofan airplanes have been certified. Another 13 are on the drawing boards in varying states of market readiness. That's a lot of action in 10 short years.

Turboprops, single and multi

From today's new single-engine turboprops you have a choice of either the $2.6 million (typically equipped) Swiss-built Pilatus PC–12 with its huge cabin/cargo area; the smaller TBM 700 ($2.6 million) and its 300-knot hot rod aura; the futuristic-looking Jetcruzer ($1.39 million), with a canard, huge winglets, 350-knot cruise, and 850-shp powerplant set up in a pusher-prop configuration; or the venerable Caravan—Cessna's boxy utility hauler that kicked off the turboprop-single groundswell way back in 1983. Today's Caravans come in two variants: The standard Caravan I (about $1.36 million), which closely resembles the original, and the Grand Caravan, a stretched, similarly priced version. The Caravan I was—and remains—a big hit with Federal Express, which bought an entire fleet of the airplanes.

More turboprop singles are on the way. The New Piper's Malibu Meridian, with its 262-knot cruise speed and $1.35 million price tag, is designed as a lower-cost alternative to the TBM 700. The Ayres Loadmaster is a huge cargo- and people-hauling design born of a desire to dethrone the Caravans from their primacy in this niche.

Learjet 45

As for new multiengine turboprops, Raytheon's Beech King Air C90B and C90SE, B200 and B200SE, and 350 are still plugging along, even though the designs are basically 30-plus years old. An executive version of the Beech 1900 commuter airplane—the 1900D—is also available.

As with the 90 series of old, the new C90s are Raytheon's entry-level turboprop twins, with 245-knot cruise speeds and approximate price tags of $2.6 million (C90B) and $2.052 million (C90SE). The SE has a no-frills panel and is billed as an "economy" model. The B200s, which go for about $3.9 million, continue to sell fairly well, serving as multipurpose business transportation over routes as long as 1,450 nm (B200) to 1,750 nm (for the $3.3 million B200SE).

Other multiengine turboprops are real heavy iron, with heavier takeoff weights, bigger useful loads, and much more powerful engines. These include everything from the Fairchild Dornier Merlin 23 to the *ne plus ultra* of multi turboprops—Bombardier's de Havilland Corporate Dash 8-300, with its 50 seats, 43,000-pound takeoff weight, 2,380-shp engines, and $14.5 million price.

Light jets

Over the past 10 years the Cessna CitationJet (CJ) has been very successful. This $3.37 million or so, 378-knot "baby jet" has garnered more than 250 sales in its production run. At serial number 360, however, the CJ will go away and the CJ1—a newly announced model—will take its place. The CJ1 will have a Collins Pro Line 21 avionics suite with two 8-by-10-inch

New Piper Malibu Meridian

Cessna CitationJet

Gulfstream V

Sino-Swearingen

color LCD displays, a 200-pound gross weight increase, and a price that will be competitive with the existing CJ.

Ascending the rest of the Cessna "light-jet" (if you consider less than 20,000 pounds max takeoff weight light) line are the Bravo (430 knots, 2,000 nm, about $4.84 million); the Ultra (430 knots, 1,700 nm, about $6.45 million); and the Excel (430 knots, 1,800 nm, about $7.5 million). As you ascend the price ladder, you obtain ever-bigger cabins with more seats (and maybe even more speed and range).

Beginning in 2000 with the CJ1, Cessna will start ushering in two other new light-jet models: the CJ2 and Ultra Encore. The CJ2 will be an enlarged version of the CJ1, with a max cruise speed of 400 knots, a range of 1,900 nm, and a price of $4.195 million. The Ultra Encore will replace the Ultra, and yield slightly more speed and range in the bargain, along with trailing link landing gear, a Honeywell Primus 1000 avionics package with three 8-by-10-inch screens, and reduced vertical separation minimums (RVSM) certification as standard equipment.

Raytheon continues to sell its Beechjet 400A, a 1990 makeover of a Mitsubishi design from 20-plus years ago. The 440-knot Beechjet's comparatively roomy and sumptuous cabin is its big draw, in spite of a typically equipped $5.9 million price. The big news at Raytheon is the upcoming certification of a brand-new light jet, the $4.15 million Premier I. The Premier I, which recently made its first flight, has a hybrid construction, with a composite fuselage and aluminum wings. Raytheon says the airplane will have a max cruise speed of 461 knots, and a maximum range of 1,500 nm.

The prize for longest range in this group of airplanes goes to a design that's yet to have a conforming prototype—the Sino-Swearingen SJ30-2. It's advertised as being able to cruise as fast as 460 knots, and as far as 2,500 nm. All this for an estimated $3.8 million or so.

Rounding out today's light jets is Bombardier's Learjet 31A, a 470-knot, approximately $6.1 million hot rod that sports a comfortable cabin and the fastest cruise speed of any airplane in this group.

Yet another light jet—this one still in the concept phase—is the Century Aerospace CA–100. Priced at $2.38 million, and with a cabin and performance profile similar to those of the CJ, the CA–100 is being designed as a much more economical alternative to a CJ, which runs about $1 million more than the CA–100's projected price.

The VisionAire Vantage is another design that has yet to be frozen. It's unusual in that it's powered by a single turbofan engine, a Pratt & Whitney JT15D-5. It will be interesting to see how the market responds to the concept of a single-engine business jet. At

this point, the VisionAire project is threatened by financial crises that have forced layoffs and caused problems with vendors. This 350-knot, 900-nm airplane promises operating costs 40 percent less than those of other light jets, and will sell for "about $2 million," VisonAire says.

Perhaps the biggest news affecting this new generation of light jets is not so much the airframes per se, but the powerplants that make their fuel efficiency and economies of operation possible. The Williams Rolls-Royce FJ44 series of engines power the CJ, the Premier I and SJ30-2, and will be used in the CJ1, CJ2, and CA–100. Together with advanced cockpit design, these improvements give the light end of the business jet spectrum some of the same enhancements and capabilities that used to be the sole province of much larger airplanes.

Falcon 900EX

Medium- and super-mid-sized jets

The newest of the medium-sized jets (defined here as having max takeoff weights between 20,000 and 30,000 pounds) is Cessna's Citation Excel, a 476-knot, 2,220-nm, approximately $7.5 million aircraft that fits the niche between the company's smaller Bravo and larger Citation VII, a 460-knot, approximately $10.9 million jet that's been in Cessna's growing stable of jets since 1992.

The Learjet 45 and 60 are also in the growing mid-size fleet. The Lear 45 is a clean-sheet design.These Lears give customers a choice between a smaller (45) or larger (60) cabin, shorter or longer range (1,900 vs. 2,300 nm), and lower or higher price (about $8.2 million for the 45; $11 million for the 60). All that and the famed Learjet speed, too (about 450 knots for both airplanes).

The Israel Aircraft Industries Astra SPX is no slouch in the speed department, either. It can haul up to nine people more than 2,100 nautical miles at speeds of 460 knots, making it a very competitive airplane—even at its $11.7 million price tag when typically equipped.

Raytheon's Hawker 800XP, a $10.8 million, 2,500-nm airplane, continues to be one of the most popular in the mid-sized category. Its big draw is its comfortable cabin.

In the new super-midsize category you've got a choice of one newly certified jet—the Galaxy Aerospace Galaxy—and three others awaiting their papers. These include Cessna's Sovereign, Raytheon's Hawker Horizon, and Bombardier's Continental. The super-midsize jets have larger cabins than their medium-size stablemates, speeds between 440 and 470 knots, and ranges of between 2,500 (Sovereign) and 3,600 (Galaxy) nm. Prices run from $12.7 million (Sovereign) to $16.9 million (Galaxy).

The large and global

In this group, we have the truly large cabins, ones that most of us really can stand up in. The traditional big three of this category—Bombardier, Dassault Falcon Jet, and Gulfstream—continue to dominate this segment. However, the addition of the Cessna Citation X in 1996, together with the announcement of the Boeing Business Jet (BBJ) and the Airbus A319CJ, have helped to boost the range of the big and long-legged. With the exception of the Mach 0.92 Citation X, the large jets have maximum cruise speeds in the Mach 0.82 range. The big differences are in maximum range and cabin design.

Bombardier's offerings are the Challenger 604 and the Global Express. Both sport the flat floors and wide cabins that have been a Challenger design signature. Bombardier also has the Canadair Corporate JetLiner and Canadair Special Edition, both of which

are executive variants of Bombardier's very successful Canadair Regional Jet (RJ) airliner.

The 604 can cover 3,900 nm and costs, typically equipped, about $21.8 million. The JetLiner and Special Edition are usually set up to carry bigger passenger loads—15 or so—have 3,100-nm maximum ranges, and are priced in the $23 million range.

Dassault Falcon Jet (DFJ) harps on the safety afforded by its three-engine Falcon 50EX, 900C, and 900EX. The 50EX is the physically smallest of these three, but at 482 knots, a maximum range of 3,200 nm, and a price of approximately $17.3 million (typically equipped), it's a good value in a big bizjet. The 900EX (about $29.6 million, 4,500 nm range) is the biggest, longest-range airplane in the Falcon lineup. The newest model, the 900C, has a five-tube Honeywell Primus 2000 avionics suite and a maximum range of 4,000 nm. Lately, DFJ has made some noises about developing a supersonic business jet in the near future. But so far, the company hasn't been able to identify powerplants durable enough for the job.

The Falcon 2000 is a departure for DFJ in that it's a twin-engine design. This is a 3,000-nm airplane in the $19.6 million range.

Gulfstream's two airplanes are the G-IVSP and G-V. The G-IVSP ($28.6 million, 4,100 nm) is an outgrowth of the G-II and G-III designs that preceded it. The G-V, however, is the company's top of the line, with a 6,500-nm range and a whopping $38 million price tag. It was the first of the so-called global jets.

A worthy competitor to the G-V is Bombardier's Global Express, a clean-sheet design that has a 6,700-nm maximum range and a $37.7 million price.

Finally, we have the biggest of the big. Not about to be upstaged by general aviation manufacturers, Boeing and Airbus decided to get in on the global jet market. They did it by modifying existing airliners—the 737-700 in Boeing's case, the A319 in Airbus'. Both have maximum ranges in the neighborhood of 6,300 nm, and both promise the roomiest of interiors, something you'd expect of airplanes originally designed to carry 120-plus passengers. The BBJ should sell for $33.75 million; the 319CJ, $35 million.

The final price of any of the medium, super-midsize, and large jets can vary substantially. It all depends on the customer's choice of instrumentation, interior and paint, currency and interest rate fluctuations and, of course, any negotiated price changes in the sales contract. A completion can easily run a customer an additional $6 million above the airplane's basic price.

All those zeros

By now, the prices listed here have probably made you breathless. Well, if it's any comfort, some of the biggest operators of corporate jets are also more than a little nervous about buying a new jet outright. Some can't justify such a purchase. Enter a concept that burst to life in the early 1990s: fractional ownership. Bombardier, Executive Jet Aviation, Gulfstream, Pilatus, and others have come up with schemes whereby shares of an airplane can be sold, along with the right to use it for a certain number of hours per year. It's a concept that's been wildly successful, bringing hundreds of first-time bizjet users into the fold. It's also caused some heartburn among corporate flight departments, who feel threatened by the fractionals' growing eminence.


Raytheon Hawker 800XP

Whether to individuals, companies, or fractional ownership organizations, sales of turbine airplanes are a true testament to the current strength of the economy. Right now, the good times are rolling. But in the back of every industry insider's mind lurks a nagging question: How long can this go on? □

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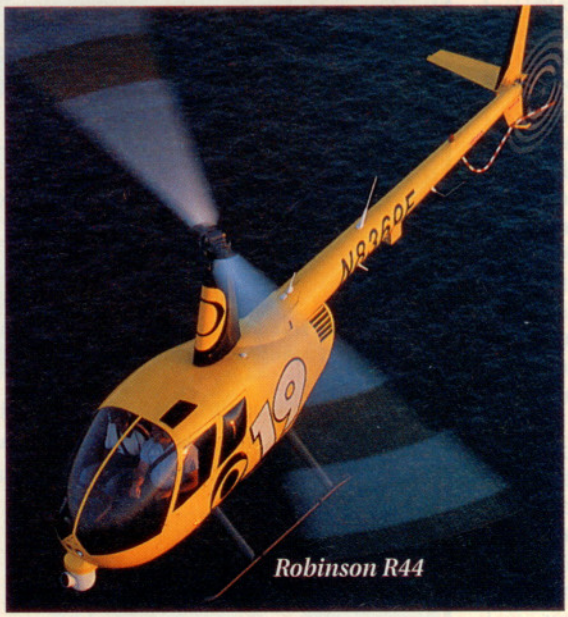
Helicopter highlights

From trainers to tiltrotors

BY TIM McADAMS

Throughout the past decade, helicopters have slowly been coming of age. The impetus has been the introduction of advanced technologies into rotor systems and cockpit design. Composite materials have simplified many dynamic parts, and microprocessor-driven electronic cockpits have allowed for better trend monitoring and increased reliability. The emerging GPS technology has permitted instrument approaches to a point in space, and manufacturers have responded with more IFR-capable models than ever before. In fact, almost every new model has or is expecting single-pilot IFR certification. While all this has provided a much-needed shot in the arm for operators of turbine-powered ships, smaller piston-powered designs have fared well also.

In 1992, with the introduction of the R44 Astro, Robinson Helicopter answered the recreational helicopter pilot's age-old question, "Now that I have my rating, what can I do with it?" The R44 is a four-place version of the company's highly successful R22, offering true two-plus-two seating. An R22 pilot now can move up to more room and speed to haul the family around or cart people off to business meetings. Also available in police or electronic news gathering versions (see "News Hawk," December 1998 *Pilot*), the R44 incorporates many of the R22's advanced features, including a rotor RPM governor, automatic carb heat system, and Robinson's patented tri-hinge rotor design. The R44 was designed under the more stringent requirements of FAR Part 27, and sports an advanced fuselage design that minimizes drag and boosts its cruise speed to 130 knots while sipping just 11 gallons of fuel per hour.


Robinson R44

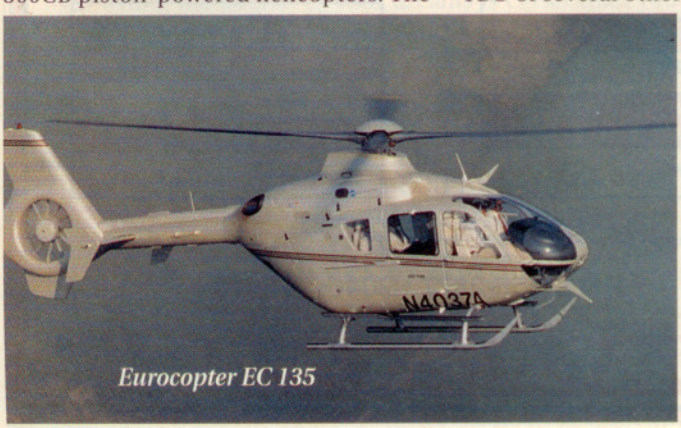
In competition with Robinson is Schweizer Aircraft with the 300C and 300CB piston-powered helicopters. The two-seat 300CB is based on the three-seat 300C airframe except with a smaller Lycoming HO-360 engine that offers a higher TBO. Aimed at the flight training market, the company has extended the TBO of several other major components and made them more accessible to increase the aircraft's cost effectiveness. Schweizer also produces a larger four-seat turbine-powered helicopter, the 330 SP, which it based on the 300C's proven dynamic systems.

Enstrom Helicopter Corporation builds turbine- and piston-powered versions of the same airframe. Two three-seat models, the 280FX Shark and the F-28F Falcon, are powered by turbocharged Lycoming HIO-360-F1AD engines. The model 480 uses the same fuselage but is configured for five seats and powered by an Allison 250-C20W turboshaft.

Bell Helicopter has introduced the 407, an evolutionary version of the highly successful 206 series (JetRanger and LongRanger). It has an expanded cabin, a four-blade composite rotor, and increased performance from its Allison 250-C47 turbine engine with full authority digital engine control (FADEC). This year Bell plans to introduce the 427, a twin-engine version powered by Pratt & Whitney PW206D turbine engines.

Eurocopter has also introduced new single-engine turbine- and light-twin models. In addition to the existing AStar and Twinstar helicopters, the manufacturer offers two new models—the EC 120 with a single Turbomecca Arrius 1F turbine engine and the twin-engine EC 135 with either the Turbomecca Arrius 2B or PW206B engines. Both models feature a FADEC system for optimal engine performance and a fully enclosed fenestron tail rotor for safety and noise reduction.

Boeing at press time had just sold its turbine-powered helicopters acquired from McDonnell Douglas to a Dutch firm, MD Helicopters Holding. This line includes the single-engine Notar (no tail rotor) MD 520N and the stretched MD 600N, powered


Eurocopter EC 135


Schweizer 330

MD 520N

by the Allison 250-C20R and the 250-C47, respectively. Also part of the package is the company's twin-engine (PW206 with FADEC), Notar-equipped MD Explorer.

Eurocopter's twin-engine BK 117 model continues to dominate the emergency medical helicopter market. Currently in production are the C1 and B2 versions using the Turbomecca Arriel 1E2 and Lycoming LTS-101-750 B1 engines respectively. Eurocopter's twin-engine retractable-wheeled Dauphin N2 got a little sprucing up with the introduction of the N3 model. Carrying it one step further, Eurocopter announced the N4 model and then later renamed it the EC 155; the model made its debut in 1998. Although powered by the same engines as the N3, the EC 155 was built to carry more payload. The expanded fuselage and vibration-reducing five-blade rotor system make it a strong contender in the corporate market.

Bell Helicopter has become a serious player in the corporate arena with the introduction of the twin-engine Model 430. Based on the sleek lines of the discontinued 230, it incorporates numerous improvements such as a four-blade composite rotor system, Allison 250 C40 engines with FADEC, and an 18-inch-longer cabin. Rounding out the Bell line are the beefy utilitarian two-blade 212 and its four-blade brother, the 412.

Agusta Aerospace traded the twin-engine A109 helicopter's Allison 250-C20R engines for the FADEC-equipped Pratt & Whitney PW206 engines, added cocoon-type soundproofing in the cabin, and introduced it as the A109 Power. It maintains the original model's reputation for speed and is aimed primarily at the corporate and emergency medical services markets. An interesting spinoff is the A119 Koala, a single-engine version powered by a Pratt & Whitney PT6B-37 turbine engine.

A longtime favorite of the corporate market is the twin-engine Sikorsky S–76. Sikorsky enhanced the S–76C+ by installing FADEC-equipped Turbomecca Arriel 2S1 engines.

The introduction of the BA609 tiltrotor may have the most profound effect on the industry. Once a project of Bell and Boeing, it's now a joint venture between Bell and Agusta. Their plan is to produce a new powered-lift category aircraft that will cruise at 275 knots and land and take off vertically. Certification is expected in 2001. □


Bell 430