

Keeping Cool



Nobody likes to climb into a sweltering cabin, only to boil while picking up a clearance and waiting to take off. Making the passenger experience enjoyable during ground operations and Air Traffic Control delays is an important part of airplane ownership. Air conditioning reduces the inflight fatigue factor, keeps you feeling better and ready to safely complete a trip. With that in mind, and summer almost upon us, in this issue we have information on after-market air conditioners for both the Baron and the Bonanza to share with you.

—The editor

Air conditioning for your Baron

BY THOMAS P. TURNER, CLEVELAND, TENNESSEE

Things have changed since the Baron was a new design. A wonderful airplane, Barons sometimes seem nonetheless quite Spartan when measured against modern standards of comfort. After all, we drive air-conditioned autos from our air-conditioned homes to our air-conditioned offices. Many of us rarely linger unprotected in the heat of summer.

Certainly, there are fewer hotter places than the cabin of a Baron that has spent the day on a summer's sunny ramp, a veritable Plexiglass oven. Face it—you'd like to crank up the air conditioning for yourself and your passengers, maybe even arrange to have your Baron "pre-cooled" by the line staff before time to board.

If you want to add air conditioning to your 55 or 58 Baron, and have the option of cooling the cabin before engine start, you have a new choice: Check out the Aircenter, Inc. Cool-Air™ system.

Gary L. Gadberry, president of Aircenter, Inc., is no newcomer to aircraft modification. A major supplier and reseller of piston Aero Commander airplanes, Gadberry's Chattanooga, Tennessee-based

Aircenter holds literally dozens of commonly installed STCs for the big Aero Commander twins.

In recent years Gadberry has turned his attention to the Baron and Cessna's 310Q and R models, earning air conditioning STCs for these airplanes as well. Aircenter has also successfully earned 337 one-time approvals to install air conditioning in the Cessna 303 Crusader; Piper Aztec; Beech Twin Bonanza and Twin Beech; Cessna 401; and Socata TB20 Trinidad; and is working on an STC'd system for 28-volt Bonanzas.

Cool-Air™ Baron Specs

The Aircenter, Inc. Cool-Air™ system is an electrically powered, environmentally safe R-134a air conditioning system approved by STC for installation in the B55, C55, D55, E55, 58 and 58TC Barons. The powerful 16,500 BTU system (as compared to 14,000 BTUs in factory air conditioning) uses the same lightweight components that are standard in the Cessna CJ-series jets—totaling 64 pounds, mounted aft of the rear baggage area.

A prototype that I examined about three years ago was originally placed in the nose baggage compartment, but Aircenter wisely determined pilots did not want to give up nearly one-third of the nose baggage capacity.

Two evaporator motors propel 400 cubic feet per minute of cool air flow. That's a ton and a half of cold air—enough, I found, to almost immediately provide a noticeable dif-



AirCenter's components are the same as those used in new Citation jets.

ference in a heat-soaked airplane on the ramp.

The price

Now for what you really want to know. The current kit price is \$15,900. Installation is another roughly 60 to 80 worker-hours for older Barons that do not have the overhead ventilation “channel” and outlets (the installer must fabricate a channel for your airplane), or about 40 to 60 hours (kit installation and wiring) for later-model airplanes where the air conditioning can be spliced into the existing vent system.

There have been 15 Baron units and more than 50 in Aero Commanders completed to date. Gadberry says any good installation shop can “a/c” your airplane, although he’s actively looking for partnering “installation centers” around the country.

Installation

The heart of the Cool-Air™ kit is a combined condenser/compressor unit produced by Enviro Systems, Inc., a major supplier of aviation-grade environmental components for more than 25 years. Gadberry is quick to explain that it is not an automotive knock-off.

The unit mounts on a kit-contained “hat-shelf” mounted across the lower fuselage bulkheads, running from Station 192 to 233. Original plans to mount the unit directly on the fuselage structure were thwarted by interference with servos from the Baron’s commonly installed KFC200 autopilot. Hence, the use of the hat-shelf—actually a pair of runners firmly attached to the structure that holds the air conditioning clear of the autopilot.

The kit (which includes everything except the rivets), creates a strengthened air inlet and exhaust on the underside of the fuselage aft of the baggage area. Intake air is drawn into the condenser by electric fans. The electric air-conditioning compressor circulates cooling refrigerant, but this compression causes the refrigerant to heat—hence the condenser, essentially a radiator used to re-chill the refrigerant and condense it into a liquid. Now-liquid refrigerant then is expanded back into a gas through the evaporator, where its temperature is just above freezing—similar to the effect that causes a spray can to cool as its contents are expelled.

Fan-driven cabin air circulates through the evaporator (another radiator, used to cool cabin air); chilled air then is ducted to the passenger compartment. Air conditioning is



Cool air flows to positions above every seat.

available through adjustable outlets above all passenger seats. Although the air isn’t freezing, Aircenter does claim a 20 F drop in air temperature over the evaporator. “It won’t make ice cream,” quips Gadberry, but it is enough, as I already observed, to make a noticeable difference right after start-up in a hot airplane on the ramp.

The kit includes an air-conditioner control panel on the instrument panel, but the control is more than a simple switch. Within the panel is an electronic load-shedding device that constantly samples the alternator output. If the device senses loss of a single alternator, it will automatically cut off the air conditioning compressor and a light warns the pilot. Lose an alternator or a voltage regulator (or an engine) and the unit will automatically shut off to avoid overpowering the remaining electrical power.

In fact, the air conditioner does draw a fair amount of electricity. Gadberry recommends 90-amp alternators on the IO-470 (belt-driven alternators) Barons, and 100-amp alternators on the IO-520/550 Barons (the same alternators needed for factory air conditioning). Unlike factory engine-driven units, however, there is no loss of engine power when using the air conditioner.

Despite the logic that it doesn’t affect aircraft performance, the FAA nonetheless requires the Cool-Air™ air conditioner to be turned off for takeoff and landing—a holdover from engine-run compressor certification.

TAX INCENTIVES

As part of the post-9/11 economy stimulus package, Congress has passed what is called a Bonus Depreciation. According to Gary Gadberry of Aircenter, Inc., aircraft own-

ers depreciating their aircraft for business are eligible for this bonus in addition to “normal” business asset depreciation.

This added investment incentive can pay for as much as 92 percent of the cost of

the Baron Cool-Air™ system. Contact Gadberry for more information that you (and your accountant) can review on Bonus Depreciation, which is scheduled to be eliminated in 2005.

Weight and balance

As stated, the kit weighs in at 67 pounds, almost all of which is concentrated between Stations 195 and 207. Averaging about Station 201, the 67 pounds exerts roughly 135 (x100) pound-inches aft of the datum. The slight translation of the center of gravity aft is easily countered with weight in the nose baggage area if needed. You should, of course, reference your own airplane's weight and balance data to make a definitive calculation.

Pre-cooling

Unlike the engine-driven factory air-conditioning system, the Cool-Air™ unit can be run on external power. You can call the FBO and ask them to hook up the power cart and turn the power and the air conditioning on while you perform your pre-flight inspection. Then the cabin can be cool and ready for you and your passengers before you board.

Warranty

All components carry a one-year warranty by Enviro Systems, administered through Aircenter, Inc., which has PMA (parts manufacturing authority) for the device.

For more information, contact Gary Gadberry at Aircenter, Inc. at 423-893-5444 or aircentr@aol.com / <www.aircenterinc.com>