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COMPARE the Comp Air 7

"Aerocomp asks us to consider turbine-powered kit airplanes"

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Author: Ken Armstrong. *Reprinted with permission.*

How do you categorize a seven-place, turbine-powered aircraft in the homebuilt, kit airplane market? There was a time when the thought of an exotically powered homebuilt aircraft fueled dreams – but from a practical standpoint it was an unobtainable apparition for the family man on a budget.

Aerocomp, Inc. now fuels this former fantasy with an airframe kit and turbine propulsion package that will allow many aviators to haul heavy loads at speeds normally only achievable by the sleeker speedsters of the kit aircraft industry. For instance, the Comp Air 7 Turbine can haul useful loads up to 1670 pounds at cruise speeds as high as 280 mph true at 21,000 feet. Those who don't wish to don oxygen can still hustle along at 258 mph true at 12,500 feet.

The Dollar Factor

But at what cost? The beefed-up airframe kit for the turbine installation is priced at $42,995, and a firewall-forward turbine engine package is priced at $45,995. This grouping includes a three-blade constant-speed propeller with full-feathering and reverse-pitch capabilities plus all the gauges, engine controls and cowlings needed to house the 660-shp Walter 601D turbine.

Why so cheap? Well, the engine is "on condition." This means it has reached its recommended overhaul time, and it has likely been removed from some aircraft operating in the commercial world.

Engine Question

So, how well will it hold up in your airplane if it has been removed from a certified aircraft to meet the TBO requirements? My guess: quite well.

You see, commercial operators are always conducting power checks on their engines to ensure the turbine is able to produce at least the normal rated power specified by the manufacturer. When they are factory-new, they are typically able to produce approximately 5% more than their rated power, and after a few thousand hours, the normal wear and tear typically reduces their output to the rated range. If an engine drops below the minimum specified power output, you can rest assured a commercial operator will remove this engine and send it to the factory for overhaul. As a result, when you buy one of these engines, odds are you receive an engine that has simply run out of time-but still produces at least the factory rating. Or it's an engine that has dropped slightly below that power minimum. Because it is unlikely that Comp Air 7 pilots will be operating at high power settings (unlike the commercial operators), it is likely that the engines stiff have many hundreds of hours (if not thousands) of good service life left.

Of course, if you ask the engine manufacturer about this, the company will likely tell you the engine should or must be overhauled. After all, overhauls are a source of profits. You decide who should pocket the money.

What You Get for $100,000

Initially, the seven-place Comp Air was piston powered with engines up to 300 hp (this option is still available with a kit price that is discounted $3000). The Comp Air series boasts a 46.5-inch-wide cabin and options for a sport aerobatics version with limit loads of +6/-4 G.

Other choices include tricycle or tailwheel gear, extended-range fuel tanks, an external belly-mounted cargo pod, and a selection of floats.

The turbine-powered Comp Air 7 incorporates a raked windshield to reduce drag and mass-balanced controls. Moreover, the kits include larger and beefier tail surfaces that ensure the power up front is entirely controllable and that the stability profiles are suitable for private pilots.

More attention to drag reduction to increase cruise speeds can be found on the flush-mounted landing gear and on flush-fit Thermopane doors that have an additional benefit of providing a quieter cabin.

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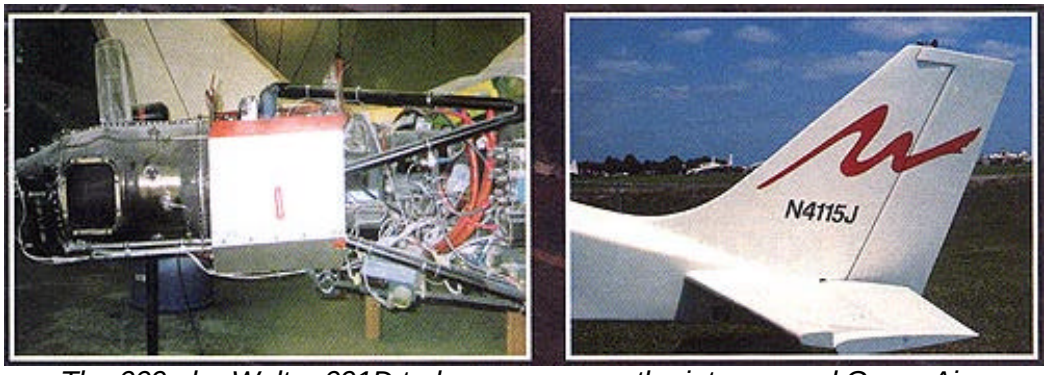
There's plenty of panel room in a Comp Air. This is in one of the piston-powered versions.

This model appears to accommodate eight passenger seats ... plus two for the pilots.

Photos by Howard Levy



The 660-shp Walter 601D turboprop powers the jet-powered Comp Airs. Static and dynamic balance of controls is important on aircraft of this class.

Comp Air 7 Turbine

Specifications:

Wingspan	35 ft.
Wing area	178 sq. ft.
Empty weight	2100 lb.
Gross weight	3770 lb.
Useful load	1670 lb.
Length	29.5 ft.
Height	8 ft.
V_{NE}	258 mph IAS
Cruise	280 mph TAS (21,000 feet)
V_{SO}	50 mph IAS

FOR MORE INFORMATION,
contact Aerocomp Inc. at
2335 Newfound Harbor Dr.
Merritt Island, FL 32952 USA
call/fax 1-321-453-6641
http://AEROCOMPinc.com

Comp Air 7

continued

Telling the Comp Air 7 and 8 apart involves counting seats or windows. This is a 7.

Although this is a seven-place aircraft, you wouldn't want to jam big folks into the back as the seats are fairly narrow. Up front the seats are big and comfortable, and the broad expanse of the instrument panel can be well equipped with engine instrumentation and a deluxe suite of avionics with room to spare. Because the aircraft is all-composite, the wing panels can be sealed to hold almost as much fuel as you could ever want to carry up to the maximum gross weight of 3770 pounds.

Start and Go

The engine appears to be a PT-6 look-alike, and that's good if it provides the reliability of that famous Canadian turbine. Start up is quite standard for PT-6 operators with the starter turning the engine over to a minimum of 12% rpm to ensure adequate airflow for combustion and cooling; then fuel in introduced to the sparking igniters to get the show on the road.

Similar to the PT-6, the temperature and rpm increases are monitored to keep them within limits, and like the Pratt & Whitney, the temperature seldom reaches anywhere near starting limits. Ron Lueck and I, plus a big buddy for ballast, taxied for the active runway at Sun 'n Fun's Lakeland Airport. The Comp Air 7 handled predictable during taxiing, and the beta range and reverse thrust were always available to control the taxiing speed, which tends to be quite high as the turbine produces lots of thrust even at idle.

Lueck warned us about the abundant thrust prior to firewalling the throttle. This device is also known as a thrust lever or power lever and other names on various turbine installations. At any rate, it's easy to forget how quickly a lightly loaded turboprop aircraft accelerates, and it was all I could do to count the couple of taxi lights that seemed to be in a rush to get behind us.

A healthy crosswind was blowing, but the takeoff was so quick that it had no time to affect our directional control. Lu4eck quickly rotated the nose to an impossible high angle, but the airspeed increased until he pulled the power back somewhat to produce a cruise climb of 175 mph and 2000 fpm!

We didn't get to climb long as the weather moved in to drench the final day of the fly-in. We leveled off at 60% power and produced a 210-mph indicated cruise speed that quaffed 32 gph.
At this speed the cabin was reasonably quiet. That is due to the insulative characteristics of the composite sandwich and to the attenuated sound of turbine exhaust being mellower than the explosive bangs generated by piston-popping powerplants.

The controls get quite heavy at this airspeed, especially in roll, and it is unlikely that pilots flying this heavy-load hauler will want to cavort with the eagles. For cross-country flying, these very solid controls would be quite acceptable and even desirable for folks who like to fly certified factory-built aircraft. But I wouldn't want to fly an aerobatic program with this heavy stick loading unless my name was Samson and I was dating a girl named Delilah. However, these forces would be reasonable for hauling the family on a cross-country as long as you don't have the tendency to fight turbulence with control inputs (many pilots do). In turbulence, I generally teach my students to place their hands in their laps and raise dropping wings with a light touch of rudder or let the next bump bring it up on its own (it usually does).

We checked pitch stability at this high cruising speed by displacing the elevator control and letting go – and fount id quite good with the aircraft gently porpoising through three cycles to reach its trim speed. We were also able to fly hands and feet off the controls for a prolonged period with the Com p Air 7 showing no tendency to depart from its heading.

The –7 possessed such gently stall characteristics that we were prepared to push the envelope at the low altitude forced on us by the overcast. Even aggressive maneuvering or attempts to get the aircraft to depart at steep angles were unsuccessful; the –7 just nodded its nose gently downward under all stalling conditions we tried.

We returned to the traffic pattern quickly, but on the way we played with sideslip angles and control separation between rudder and aileron and found the airplane behaved quite well. Lueck greased the Comp Air onto the runway and then apologized for the landing; he must have landed on something sharp as a main gear tire went flat as we taxied off the runway.

By the time we had finished, our evaluation flight had lasted only half an hour, but it had given us a fair sense of the possibility a turbine can add to a homebuilt. With a power loading of only 5 pounds per horsepower, the Comp Air 7 is an impressive performer form the moment the brakes are released until cruising altitude is reached a few minutes later. This airplane promises an absolutely minimum takeoff run and an obstacle-clearance climb that could only be compromised by a barrier such as the Empire State Building.

Similarly, with that big propeller disk and the ability to put the propeller into reverse, you don't really have to worry about runway length because you can just land across it and use reverse to stop in a few aircraft lengths.

A Turbine in Your Future?

To be honest, I've never thought a turbine installation was feasible for the average aviator's pocketbook. Of course, cash flow doesn't cease after the purchase because the fuel flow and eventual overhaul costs can be significant. However, when you consider the performance and the reliability intrinsic in turbine operations, the initial and direct operating costs may seem reasonable – especially when you factor in your personal safety.

FOR MORE INFORMATION, contact Aerocomp Inc. at 2335 Newfound Harbor Dr., Merritt Island, FL 32952; call/fax: 1-321-453-6641. http://AEROCOMPinc.com