



Independent Ideas

Could ALR's Janus concept find a future in the inventory of the world's air arms?

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A Switzerland-based team of aircraft designers and engineers believes that a lightweight supersonic advanced trainer and multi-mission aircraft could be appealing to air arms investing in a new generation of combat aircraft such as the F-35 Joint Strike Fighter.

Janus is said to be smaller and lower-cost than contemporary advanced trainers such as Alenia Aermacchi's M346, BAE's Hawk or the Northrop T-38 Talon. Conceived by the Arbeitsgruppe für Luft- und Raumfahrt (ALR), Janus is meant to fill in for high-performance combat aircraft in the so-called red-air mission by acting as an aggressor for front-line crews, or as a companion trainer so live flight hours on new fighter types can be substituted for a less expensive aircraft type. ALR also sees it playing a peacetime air policing role, which is currently performed by front-line aircraft.

Another potential market is the increasing number of private companies that operate ex-military aircraft to service military training contracts. Aircraft in use include the A-4 Skyhawk, Dassault Alpha and Hawker Hunter.

The seasoned ALR team draws on experience from a number of European aircraft programs. The organization's

previous work includes a 1970s study on Piranha—a lightweight canard delta microfighter designed to meet the needs of small nations looking to replace the F-5 Tiger and the Mikoyan MiG-21, a challenge that remains today. Both types are still in service with several European air arms.

In part, Janus came about because of Switzerland's woes with procurement plans to replace its fleet of Northrop F-5 Tigers. A referendum in May 2014 rejected the purchase of the Saab Gripen in spite of the fact that just weeks before, the Swiss air force was unable to respond to a hijacked Ethiopian airliner landing in Geneva. Neighboring nations scrambled to escort the airliner down. ALR believes a platform like Janus could handle 80% of Swiss air policing duties for far less than using F-5s or F/A-18s.

"There are no new designs for lightweight fighters, but if you wish to replace an aircraft [such as] an F-5, the only options are the Saab Gripen or secondhand F-16s, but these are not low-cost options," says Georges Bridel, managing director of ALR.

"A major cost factor is the use of high-performance combat aircraft in a variety of missions in which their performance and capabilities are not fully

ALR's Janus is a lightweight, single-engine advanced trainer that could also perform limited air policing duties.

required. This consumes airframe flight hours at a high pace and leads to a waste of resources," the organization states.

Janus would be a fly-by-wire 4,800-kg (10,500-lb.) mid-swept-wing monoplane powered by a single afterburning low-bypass turbofan producing 9,500-10,000 lb. of thrust in reheat, which could push the aircraft to Mach 1.3. Though resembling the South Korean T-50 Golden Eagle, Janus features a deeper sweep of the main wing and is about 2 meters (6.5 ft.) shorter in length.

About 50% of the aircraft's structure would be composite, with a focus on using off-the-shelf equipment, including the powerplant. ALR has identified three potential engines for Janus—the Ukrainian Ivchenko-Progress AI-222, the Honeywell/ITEC F-125 and the Japanese IHI Corp. XF5, which is the engine fitted to the X-2 demonstrator aircraft.

Supersonic capability is "essential" for the air policing mission, says Group Capt. (ret.) David Hamilton, who has consulted on what the air force requirements might be for such a role. Air policing missions regularly have to intercept airliners traveling at high subsonic speeds, so a supersonic capability would be needed to catch up with them, although there is little need to exceed this level of performance; doing so would add to the cost.

As a trainer, the aircraft would have an advanced two-seat cockpit with simulated stores and radar. ALR suggests that a live, virtual constructive training system could be implemented but weapon work would be simulated. The company sees no need for a weapon capability on the aircraft in its current form, although a gun pod would be a requirement for the air policing mission. Intercept guidance data could be provided by ground radar.

Bridel believes the Janus could eventually follow the development pattern of the T-38 and expand into a combat capability with weapons, in the way that the F-5 evolved from the Talon. An "uprated engine version, a longer fuselage, armament and operational equipment make a combat version feasible," says Bridel. ☐