

C-27J: Pilots' Views



Chief Test Pilot, Gianluca Evangelisti, and Test Pilot, Agostino Frediani, have been with the C-27J Spartan program from the start. Both talked to *FRONTLINE*'s Peter Pigott at the Alenia Caselle facility about the aircraft.

The C-27J originated with the G222. What did it take from the aircraft?

Evangelisti: Apart from the shape, the two aircraft are drastically different. The C-27J retains the very good handling qualities of the G222, but drastically increases the performance and especially the "operability." Of course, we are talking about an aircraft that came out 30 years ago. The C-27J is a new aircraft, it has new systems and even new capabilities, and especially new "survivability" that we think is extremely important on an aircraft of this type. Around the world we have many conflicts that need tactical air transport, so in the C-27J we built in the capability to survive in a hostile environment. You must think of this aircraft as a bomber – it has been designed to reach a particular point at a particular time to deliver the cargo – flying regardless of the weather or the hostile environment.

What can you tell me about its propulsion? What about the Rolls Royce engines?

Evangelisti: The engine power is more than adequate for us to perform from 2000 foot runways with up to 90% of the maximum take-off weight. This advantage allows us to perform what we call "tactical operations."

But the aircraft is very robust. It allows 3.0g and -1.0g, so you can sustain negative G operations. This is never required on commercial aircraft, but number of Gs are important on military aircraft as this gives you the ability to perform the tight manoeuvres required by the role and take evasive action to escape threats. The Rolls Royce engines allow the C-27J to fly high, fast and far, but are also very efficient at low speeds, such as those required for searching during a SAR mission. The aircraft also has very good manoeuvrability at low speeds. Furthermore, the C-27J's top speed of up to 325 knots, allows it to very quickly ferry to the required area in response to an incident requiring SAR.

That covers the engines, what about avionics?

Evangelisti: The Honeywell navigation system is very accurate and redundant and allows you to follow search patterns automatically. We have two auto pilots and regardless of the weather conditions, "area searching" flown on autopilot is very accurate.

Our radar is extremely powerful, it allows for target acquisition over the sea and has weather and mapping capabilities, which are both usable at the same time on different screens.

The Canadian Forces are looking for an aircraft with SAR capability at sea and in the North. We have 10 million sq kilometres of land and 15 sq kilometres of ocean to patrol. Is the C-27J capable of the job?

Frediani: In Halifax we flew with your Canadian Forces officers to demonstrate our capability for pinpointing boats in the sea. We demonstrated our "loiter" as well as the very low cargo delivery speed. As you know, when you search for a boat you must also have the capability to drop something very precisely.

Evangelisti: The C-27J was designed to operate from any type of unprepared strips, such as those in Canada's north, and we have a ramp and side doors which can be used to deliver all types of loads. Landing gear height can be adjusted on the ground – if a pallet to be loaded is on a truck, we can match the truck's floor height, making it very easy to slide cargo into the aircraft, without external ground support, using the powerful winches that are in the standard configuration.

I might also stress something essential for the Search and Rescue role: the visibility from the cockpit is excellent. There are 16 windows in the cockpit and two dedicated wide windows in the cargo area for extra observers. We put in more windows for safety reasons, even though this increases the weight. There is always a good view for searching, low level flying and formation flight.

One can't help notice the landing gear. Although based in southern Canada, whatever aircraft chosen will have to land in the North on semi-prepared runways or no runways at all.

Evangelisti: The landing gear is particularly strong. Yes, we developed a new landing gear from the old G222 because we wanted to have a positive capability to land on unprepared surfaces. Four wheels, two on each side, and each wheel with an independent shock absorber to ensure positive contact with the ground regardless of possible bumps. We have an adaptive anti-skid system that allows you to land on all surfaces with superb performance. You can land with full pedal deflection at touch down. By the way, we have landed on snow in northern Europe with very good performance. And what we are very proud of is that the system allows all the pilots to have the same performance, because when you go on a



C-27J Spartan soars over Parliament Hill during October 2003 Canadian Tour.

short unprepared strip you want to be sure to make it. So the procedure of landing is not based on a pilot's ability, but on the procedure: full pedal deflection before touch down and full reverse at ground contact. We worked a lot on that and took advantage of the experience gained in the six months we spent in Africa in 1994, flying from all kinds of runways – dirt, semi-prepared and smooth.

Operating in the North means that the aircraft and crew have to be entirely self-reliant and independent of any outside aid. How does the C-27J match up to this requirement?

Evangelisti: We have a civil certified APU (Auxiliary Power Unit). This third engine, with a dedicated battery for starting, is “in-flight essential.” What this means is that it can provide, if necessary, all electrical, pneumatic and hydraulic power in critical conditions throughout the flight envelope up to 30,000 ft and up to the aircraft's top speed.

We have two engines and with the APU, so that even if we lose two generators we always have an extra generator from the APU which is sufficient for all the systems on board, including full anti-ice capability. This is very important for Canadian conditions. And if we lose the APU generator (bad day really!) we have batteries that allow 45 minutes with all the essential apparatus. I tell you, we looked specifically for redundancy in all systems that had anything to do with the aircraft's safety.

Looking at the aircraft outside your office, one can't help notice the wing. What about the sets of flaps on it?

Evangelisti: There are four sets of flaps – 1 and 2 for take off, 3 for delivery of paratroops and SAR to fly at very low speeds,

and the 4th is used for landing. Concerning our wings – first, we have three spar wings which means we will never have to replace the wings due to fatigue. Second, we can support high loads – up to 3.0g and more. Third, if you are in a hostile environment and hit by bullets, the wings will not collapse. This is a very robust structure. We put a lot of thought into the smallest details. For example, in the case of medevac, we can maintain sea level pressure in the fuselage for patients, up to 5,000 metres in height. In addition, we have internal electrical sockets for the medical equipment that doctors need. We have, if needed, internal oxygen and masks for all passengers.

One of the big selling points of the C-27J is its compatibility with the Lockheed Martin C-130, especially the J model which Canada may purchase.

Evangelisti: Yes, the C-27J is unique for C-130 compatibility. It can interoperate with the C-130 in terms of loading the pallets from one aircraft to the other without repacking. For air delivery, the loadmaster wants to be sure that integration of the load is maintained. If you repackage the pallet to fit it into a different cargo area, the integration is lost. A pallet prepared for a C-130 can be put inside a C-27J without changing anything – same blocking system, same platforms. We can load up to 3 platforms with the same type of air delivery as the C-130. The C-27J has complete commonality with the C-130.

You have flown this aircraft millions of miles. What in your opinion is its most outstanding characteristics?

Frediani: There are many, but four points come to mind: all the systems have a redundancy; it is very easy to fly; there is

excellent situational awareness in the cockpit; and it has very good tactical performance.

Evangelisti: This is an airplane that never breaks – that is my opinion. Do you know that in flight testing we reached up to 51 flights in one month? Extremely good performance.

The SAR aircraft chosen will be operating in the most severe winter conditions to say nothing of the heat of a Canadian summer. It was designed and built here in this mild Mediterranean climate. How is it going to cope in ours?

Evangelisti: Going around the world on demo tours we have flown in all types of environments. From Alaska, where we encountered severe turbulence, to Singapore, where it is very hot and humid, and then Saudi Arabia, where it was up to 50°C. There were no problems, no big failures. As for cold starts: we are certified to -43°C. We did all the cold weather trials in northern Europe – there is a good film that shows the aircraft completely frozen and we started the APU and it quickly went to a comfortable temperature inside with all the avionics working properly. When you build a military aircraft, you must consider all these aspects.

One final question to both of you. Of all the aircraft you have ever flown, is this better than others in its class?

Evangelisti: We do not like to make comparisons – we are pilots after all, not commercial people. But talk to the pilots who have flown the C-27J, talk to the pilots in the Canadian Air Force pilots who have flown it. Ask their opinion. In my opinion, this is a definitely good product and that is very easy for us to say it. When we went around the world and were accompanied by pilots from different air forces and experiences, we never had adverse comments. This is a pilot's plane. It is easy to fly. When we do aerial displays and show very tight manoeuvres like “barrel rolls” or “inverted re-entry,” as we did last year in Halifax, it is not just our skills as pilots, but the C-27Js performance and handling capabilities. **FL**

Peter Pigott is FrontLine's Aviation Correspondent.