

## DHC-5NG Buffalo versus C-27J Spartan

The DHC-5NG is a development of the de Havilland DHC-5 Buffalo STOL utility transport aircraft. Design on the original Buffalo aircraft was started in 1962 when the US Army invited 25 companies to submit proposals for a new STOL tactical transport aircraft. The Buffalo won the competition, and the development costs were then shared between the US Army, the Canadian government and de Havilland. The first prototype was delivered to the US Army for evaluation in 1965.

The C-27J is a development of the Fiat (subsequently Alenia) G222 military transport aircraft. Design on the original was started in 1963 under an Italian Air Force research project contract. The first prototype flew in 1970.

Both the Fiat G222 and the de Havilland Buffalo were powered by General Electric T64 turboprop engines driving Hamilton Standard 3-bladed propellers. The two aircraft are virtually of the same external size, but the G222 is significantly heavier. This gave the Buffalo an important manoeuvrability and performance advantage over the G222 in many roles including SAR missions.

A total of 108 G222 aircraft were built, of which 46 were for the Italian Air Force, and 20 for Libya. The US Army took delivery of 10 aircraft designated C-27A in 1991, but all 10 had been parked by the end of 1999 as "unsuitable for service". de Havilland produced 121 DHC-5 Buffalos, of which 106 were for export. The STOL capabilities and manoeuvrability of the Buffalo remains unsurpassed even today for aircraft in this category.

An improved version of the G222 was conceived in 1995 during negotiations between Lockheed Martin and Alenia on potential offsets for the proposed Italian purchase of C-130J Hercules aircraft. Formal announcement of the joint offset project was made in 1996 and the first prototype flew in 1999. The Italian Air Force was the initial customer for G222, as it was for the C-27J – on condition that Alenia take back the 39 remaining G222s.

Development and certification costs were shared equally between Alenia and Lockheed Martin, but by 2003, Lockheed Martin was seeking reduced participation in the project. Global Military Aircraft Systems (GMAS) was then formed in 2005 as a joint venture by Alenia and L-3 Communications with the near term objective of promoting the C-27J for US military requirements.

The DHC-5NG "Next generation Buffalo" is a logical development of the original DHC-5 Buffalo aircraft in the same way as the G222 became the C-27J. Incorporating new technology into proven airframes is nothing new; the C-130 first flew in 1954 and has been developed into the C-130J; the Boeing 737 has been in continuous production since 1967, and has recently been selected by the US military as the next generation Anti Submarine Warfare aircraft - the P-8.

Whereas the engine, propeller and flight deck equipment for the C-27J has been based on the military equipment of the C-130J, the DHC-5NG will be equipped with the latest technology commercial equipment. The upgrade, which is complete from flight deck through all systems, is centered on the engine/propeller combination from the DHC-8Q400. DND and the Canadian taxpayers will benefit greatly from using commercial equipment in terms of reliability, supportability and cost of operations. The Pratt & Whitney Canada PW-150 engine will, as an example, start off with more than 10,000 flying hours between overhauls.



**“Thumbnail” comparison between the C-27J, the DHC-5NG and DND’s current CC-115 Buffalo:**

	C-27J	DHC-5NG	CC-115
Original design.....	1963	1962	1962
Modernized to current model.....	1995	2009	N.A.
Wing span.....	94’2”	96’	96’
Overall length.....	74’6”	79’	79’
Overall height.....	34’8”	28’8”	28’8”
Cabin length.....	28’1”	31’5”	31’5”
Max cabin width.....	8’0”	8’9”	8’9”
Cabin height.....	7’4”	6’10”	6’10”
Operating Weight Empty.....	37,480lbs	24,000lbs	23,200lbs
Max Take Off – transport.....	70,106lbs	49,200lbs	41,000lbs
Max Take Off – tactical role.....	67,240lbs	49,200lbs	41,000lbs
Max Take Off - STOL/unprepared airfield.....	N.A.	41,000lbs	41,000lbs
Max Take Off Engine power.....	4,637 shp	3,133 shp*	3,060 shp
Max level speed.....	315 kts	300 kts+**	235 kts
Single engine service ceiling.....	14,500’	20,000’+**	14,300’
Take Off distance to 50’.....	2,100’	1,250’	1,540’
Stalling speed.....	90 kts	71 kts	65 kts
Total fuel capacity.....	21,320lbs	13,807lbs	13,807lbs

Notes: \* de-rated from 5071 SHP in Q400. \*\* conservative estimate of performance

The following may be concluded from the above:

The design role of the C-27J is to be a “medium size” supplement to the C-130J. If Canada needs a third type conventional Transport aircraft, then the C-27J may be a suitable option. The Buffalo can operate on short unprepared surfaces that are totally inaccessible to the C-27J and has much better manoeuvrability. If Canada’s needs to maintain its SAR mission capability, including operations in mountainous terrain, than the DHC-5NG is the only answer.

**Strategic procurement strategy, Italy versus Canada:**

- *Italy funded the initial development of the G222 with no external customers; Canada funded 1/3 of the DHC-5 after de Havilland had won the US Army competition.*
- *Italy got Lockheed Martin to co-fund the development of the G222 into the C-27J as an offset obligation against the Italian purchase of C-130Js; Canada has purchased C-17s and C-130Js with offset obligations, but considers maintenance and support for aircraft that we will have bought and own – as an offset opportunity!*
- *Italy purchased 46 G222s for their Air Force and then ordered C-27Js as replacement; Canada ordered 15 DHC-5s, but will now potentially replace the Buffalos in the SAR role with the Italian product instead of paying less money to develop the Canadian aircraft.*
- *When the Italian border police and Coast Guard required Maritime Surveillance aircraft in the late 90s, Italy directed an order for 7 ATR-42 Surveyors to Alenia. Last month Italy announced that the Air Force and Navy would receive 4 ATR-72 MPAs from Alenia. The government and the Air Force have one vision: use Italian products when you can!*
- *Orders for the Dash 8 Maritime Surveillance Aircraft, built in Canada and modified in Canada by Field Aviation now stands at 29 aircraft. All have been won in international competition against the likes of the ATR-42/72 from Alenia. So far, no opportunities to bid on Italian requirements - and no opportunities to meet Canadian requirements.*

