

Bombardier Global 6000

An Aircraft Comparative Analysis of the Global 6000 with other ultra-long range aircraft - May 2014

The Global 6000 is the fourth and latest business jet aircraft model built by Bombardier to compete in the ultra-long range large-cabin market. The ultra-long-range business jet market began in 1995 with the Gulfstream GV followed two years later by the Global Express. The ultra-long range market is defined as a group of large cabin business jets that can fly 5,000 nm or greater distance.

The Global 6000 has a large spacious cabin in excess of 2,000 cubic feet and can travel non-stop over 6,100 nm. Today the ultra-long-range large cabin business jet market has 1,472 aircraft in operation.

BRIEF HISTORY

The Global 6000 traces its roots to the Global Express XRS which was the third ultra-long-range large-cabin business jet produced by Bombardier. The Global 6000 started delivering to customers in 2012. There are currently 85 Global 6000 aircraft in operation worldwide.

Two new aircraft will follow the Global 6000. They are the Global 7000 and Global 8000 ultra-long range large cabin business jets.

Table A represents the in operation Ultra Long Range aircraft market-share percentage by each of the Original Equipment Manufacturers (OEM). Currently Gulfstream (at 707 units) has a 48% share of the market, making it the market-share leader, followed by Bombardier's 37% share (549 units) and Dassault Falcon's 15% share. A combined total of 1,472 Ultra-Long-Range aircraft are currently in operation.

TABLE A

ULTRA LONG RANGE BUSINESS JET MARKET - May 2014			
MODEL	IN OPERATION	YEARS PRODUCED	MARKET SHARE %
Gulfstream GV	191	1995-2002	48%
Gulfstream G500	9	2004-2008	
Gulfstream G550	444	2003-Present	
Gulfstream G650	63	2012-Present	
Total	707		
Global Express	148	1997-2006	37%
Global 5000	157	2005-Present	
Global Express XRS	159	2004-2012	
Global 6000	85	2012-Present	
Total	549		
Dassault Falcon 7X	216	2007-Present	15%
Grand Total	1,472		100%

Source: JETNET

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PAYLOAD AND RANGE

The data contained in **Table B** is published in the *Business & Commercial Aviation* (B&CA) May 2014 issue, and is also sourced from Conklin & de Decker. A potential operator should focus on payload capability as a key factor. The Global 6000's 'Available payload with Maximum Fuel' at 2,804 lbs has the second highest value among the aircraft shown and more than 1,000 lbs greater compared to the Gulfstream G650 at 1,800 lbs.

Note: This aircraft comparison article shows the current ultra-long range business jets in production for Bombardier and Gulfstream only.

TABLE B

Payload & Range

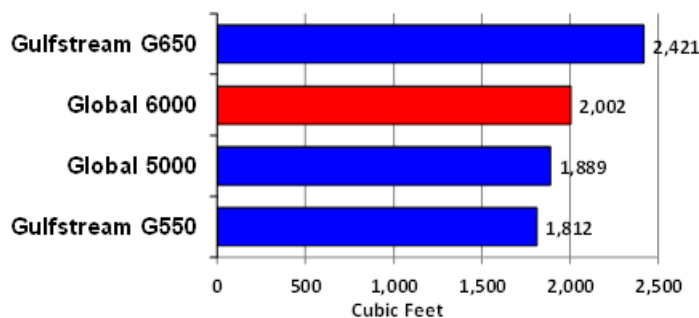
Model	MTOW (lb)	MAX Fuel (lb)	MAX Payload (lb)	Avail Payload w/Max Fuel (lb)	MAX Fuel Range (nm)	MAX P/L w/ avail. fuel IFR Range (nm)
Global 6000	99,500	44,716	5,770	2,804	6,111	5,876
Global 5000	92,750	38,939	7,139	2,930	5,381	4,958
Gulfstream G550	91,000	40,984	5,800	1,706	6,698	5,767
Gulfstream G650	99,600	44,200	6,500	1,800	7,000	5,980

CABIN VOLUME

According to Conklin & de Decker, the cabin volume of the G6000 at 2,002 cubic feet is less than that of the Gulfstream G650 (2,421 cubic feet or 20.9%) as represented in **Chart A**. However, the Global 6000 has a larger cabin volume compared with the Global 5000 at 1,889 cubic feet and the Gulfstream G550 at 1,812 cubic feet.

CHART A

Cabin Volume



POWERPLANT DETAILS

The Global 6000 is powered by two Rolls-Royce BR700-710A2-20 engines, each offering 14,750 pounds of thrust, as shown in Table C. All the engines used in this field of study are manufactured by Rolls Royce.

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Table C

Aircraft Model	# of Engines	Engine Model	Engine Manufacturer	Thrust
Bombardier Global 6000	2	BR 710-A2-20	Rolls Royce	14,750
Bombardier Global 5000	2	BR 710-A2-20	Rolls Royce	14,750
Gulfstream G550	2	BR 710-C4-11	Rolls Royce	15,385
Gulfstream G650	2	BR 725 A1-12	Rolls Royce	16,900

Table D, sourced from the *Aircraft Cost Calculator* (ACC) shows the fuel usage by each aircraft model in this field of study. The Global 6000 (460 gallons per hour - GPH) uses 55 gallons per hour or 13.6% **more** fuel than the Gulfstream G550 (405 GPH) but uses 30 gallons per hour or 6.1% **less** fuel than the Gulfstream G650 (490 GPH).

TABLE D

Model	Fuel Usage (GPH)
Global 6000	460
Global 5000	455
G550	405
G650	490

Source ACC – www.aircraftcostcalculator.com

COST PER MILE COMPARISON

Using data published in the May 2014 *B&CA Planning and Purchasing Handbook* and the August 2013 *B&CA Operations Planning Guide* we will compare our aircraft. The nation-wide average Jet-A fuel cost used from the August 2013 edition was \$6.08 per gallon at press time, so for the sake of comparison we'll chart the numbers as published. **Note:** Fuel price used from this source does not represent an average price for the year.

Chart B details 'Cost per Mile', and compares the Global 6000 to the Global 5000 and G550 factoring direct costs, and with each aircraft flying a 1,000 nm mission with a 1,600 pound (eight passengers) payload. The G550 at \$6.55 cost per mile is lower by 16.8% compared to the Global 6000 (\$7.87 cost per mile). The G650 'Cost per mile' is not yet available.

CHART B



* 1,000 nm mission costs; Gulfstream G650 data not available

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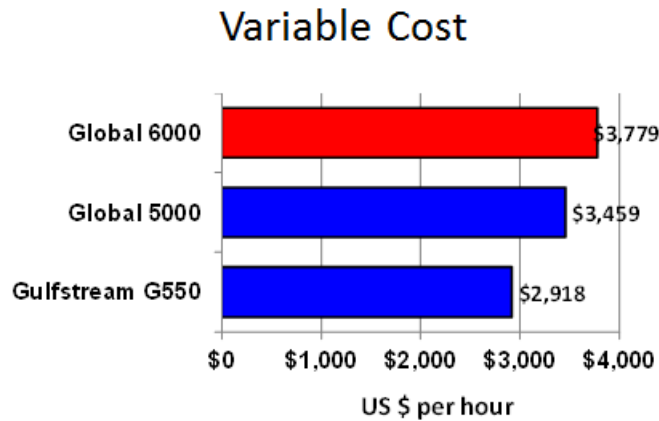
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TOTAL VARIABLE COST COMPARISONS

The 'Total Variable Cost', illustrated in **Chart C**, is defined as the cost of Fuel Expense, Maintenance Labor Expense, Scheduled Parts Expense and Miscellaneous Trip Expense. The total variable cost for the Global 6000 at \$3,779 is higher compared to the Global 5000 (\$3,459) and the Gulfstream G550 (\$2,918). The G650 'Total Variable Cost' is not yet available.

CHART C



Gulfstream G650 data not available

Table D contains the average equipped prices from B&CA for each aircraft. The average speed, cabin volume and maximum payload values are from Conklin and de Decker. The number of aircraft in-operation and percentage 'For Sale' are as reported by JETNET. The Global 5000 has the highest percentage for sale and the Gulfstream G550 has the most pre-owned sold in the past 12 months.

TABLE D

Comparison Table

Model	Long Range Cruise Speed	Cabin Volume Ft ³	Max P/L w/avail Fuel Range (nm)	B&CA Price \$ 2014	In-Operation	% For Sale	Sold*
Global 6000	470	2,002	5,876	\$62.00	85	4.7%	5
Global 5000	471	1,889	4,958	\$50.19	157	11.5%	11
Gulfstream G550	459	1,812	5,767	\$80.00	444	5.6%	53
Gulfstream G650	488	2,421	5,980	\$85.20	63	0%	n/a

Data courtesy of Conklin & de Decker, Orleans, MA, USA; JETNET; Operations Planning Guide B&CA

* Pre-owned Full Sales Transactions in the past 12 months; Source: JETNET

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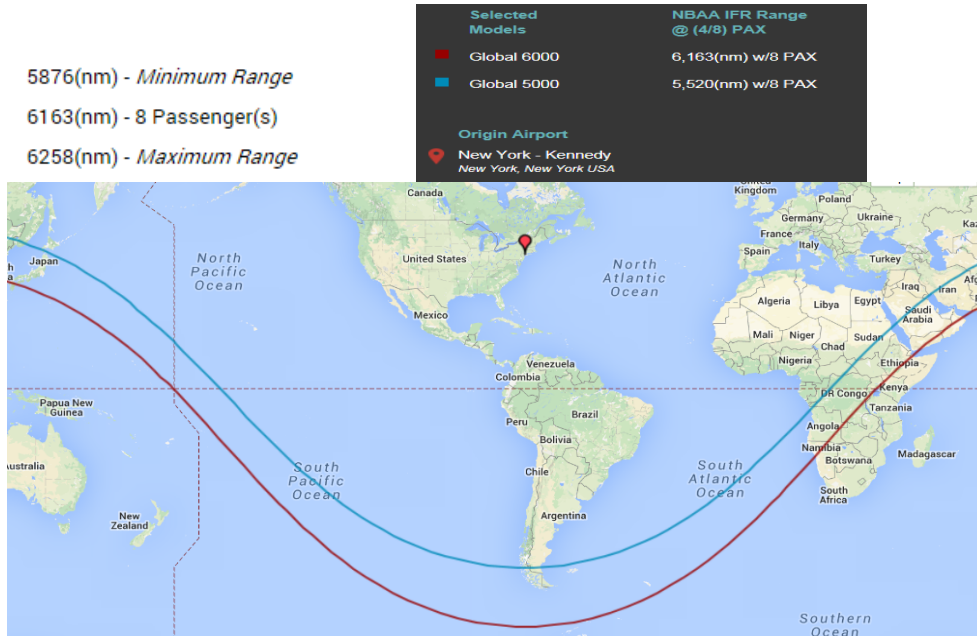
LOCATION BY CONTINENT

Of the 71 wholly-owned Global 6000 aircraft in operation by continent, North America has 45% and Europe has at 40% for a combined total of 85%. Also, there are 7 Global 6000 in fractional service.

CIRCLE RANGE CHART

Bombardier Global G6000 and G5000 from New York-Kennedy airport.

Chart below from Jetrange.jetcraft.com



Theoretical range at M 0.74 with specified passengers/2 crew, NBAA IFR reserves, ISA, typical BOW, maximum allowable fuel, and zero winds. Actual range will be affected by speed, weather, ATC, selected options and other factors.

*Ranges are based on NBAA IFR Ranges (200 nm alternate) and are with either 4 passengers for aircraft with ranges less than 5,000 nm or 8 passengers for aircraft with ranges 5,000 nm or greater with available fuel as sourced from Business and Commercial Aviation magazine.
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PRODUCTIVITY COMPARISONS

The points in **Chart D** below center on the same aircraft. Pricing used in the vertical axis is as published in the B&CA August 2014 Operations Planning Guide. The productivity index requires further discussion in that the factors used can be somewhat arbitrary.

Productivity can be (and it is here) defined as the multiple of three factors:

1. Range with full payload and available fuel;
2. The long range cruise speed flown to achieve that range;
3. The cabin volume available for passengers and amenities.

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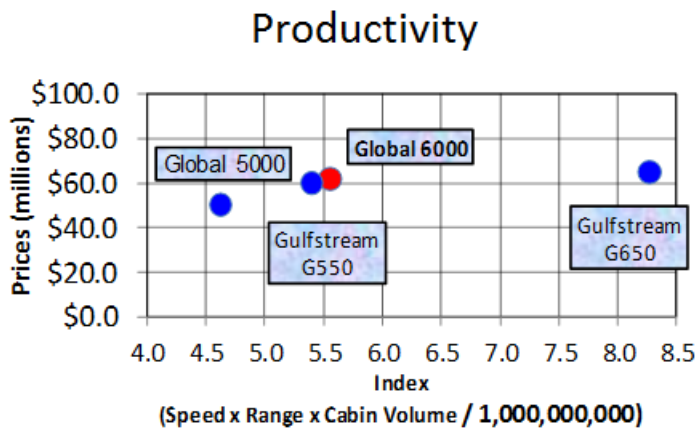
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The result is a very large number so for the purpose of charting, each result is divided by one billion. Added to this chart to illustrate the overall standing of the Global family of aircraft are the Global 6000 and Global 5000 along with the Gulfstream G650 and G550. A computed curve fit on this plot would not be very tight, but when all business jet aircraft are considered, the “r” squared factor would equal a number above 0.9.

Others may choose different parameters, but serious business aircraft buyers are usually impressed with Price, Range, Speed and Cabin Size. After consideration of the Price and Cabin Size, we can conclude that the Global 6000, as shown in our productivity index, is very competitive with the Gulfstream G550 business jets. Another valuable measure is the payload capability of the Global 6000 at 2,804 lbs is more than 1,000 lbs greater than either the G550 or G650. Additionally, the Global 6000 is competitively priced. However, the Gulfstream G650 has created a new target for productivity as shown on Chart D.

CHART D



SUMMARY

Within the preceding paragraphs we have touched upon several of the attributes that business aircraft operators value. There are other qualities such as airport performance, terminal area performance, and time to climb performance that might factor in a buying decision, too, that are beyond the scope of this article.

The Bombardier G6000 aircraft fares well against its competition, so those operators in the market should find the preceding comparison of value. Our expectations are that the Global 6000 ultra-long range large cabin business jet will continue to do very well in the pre-owned market.

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