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Never Break The Chain

Fleetwood Mac's massive hit album *Rumours* was released in 1977, and one song - *The Chain* - was credited to the collaboration of each of the five band members. Various interpretations, one of the song's many meanings that resonates most with us is that of resilience, where the strength of the chain endures despite the forces at work that keep people from being and working together.

Forty-five years after *The Chain* was originally composed, business aviation is recovering from its latest demand/supply disruption, something that seems to occur about once every 10 years.

Supply chain challenges are anything but a rumor in 2021, with the business aviation industry not immune from these buffeting headwinds. While inventory management and supply chain optimization are terms commonly associated with operations, purchasing, and procurement, these days they have become front-and-center topics for management in most company departments.

When supply chains are disrupted, aircraft manufacturers are amongst the most visible businesses in our industry to be impacted. With thousands of suppliers and tens of thousands of part numbers, aircraft are amongst the most complex pieces of machinery that an individual can procure for their own use. As a colleague recently noted,

if an aircraft incorporates a million parts, it simply can't leave the factory with only 999,999 attached.

"...if an aircraft incorporates a million parts, it simply can't leave the factory with only 999,999 attached."

Complex engineering, stringent certification requirements, intellectual property considerations, and numerous sole-source suppliers are complicating factors that forge strength and durability throughout aerospace supply chains, a feature of the industry that sets it apart from many others. Yet despite these bonds, strains and cracks have become commonplace in the industry, impacting cost, quality, schedule, and financial performance.

Supply chain disruptions and logistical challenges in today's COVID-19 world transcend business aircraft manufacturing, of course. The good news is that demand for our industry's products and services is strong and has rebounded smartly from the darkest depths of the coronavirus crisis 18 months ago. Looming ahead of most of us is the hard work: rebuilding supplier relationships, reengaging with our people and customers, and forging new and enduring links that promise to keep us together, in 2022 and well beyond.

Rollie Vincent
JETNET iQ Creator/Director



Outlook

The mood of the worldwide business aircraft owner / operator community in Q3 2021 was the most optimistic we have measured since JETNET iQ Surveys were initiated in late 2010. Net Optimism, the difference in the percentage of respondents who believe that we are past the low point in the current business cycle less those who believe we have not yet reached the low point, was 69.1% in Q3 2021.

“Optimists” outnumbered “Pessimists” by a factor of almost 9-to-1 in Q3 2021, a noteworthy customer metric that continues to fuel sales of new and pre-owned aircraft and higher flight activity this year. With pre-owned business aircraft inventory now hovering near 5% of the in-service fleet, would-be pre-owned buyers continue to flock to the doors of the OEMs, often in the company of their trusted dealer / broker transaction specialists.

With inventory as tight as ever measured in the JETNET database, a question already on many people’s minds is how long will the good

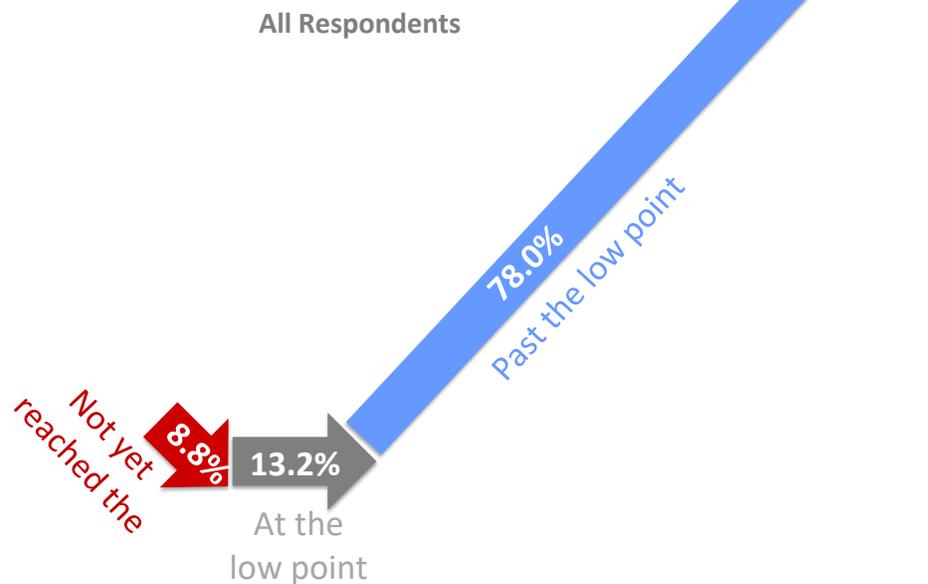
times last? As we discussed in our prior issue of JETNET iQ PULSE, the available supply of new and pre-owned aircraft has essentially evaporated over the past 12+ months. What does this portend for prices?

As we see in other marketplaces for high-end goods (e.g., luxury real estate), customers will not only tolerate but will assertively participate in a market with rising prices - at least to a point. This seems to be an apt description for today’s aircraft marketplace, where rising prices are signaling many to transact quickly, and not to step away from the table. With reports that 20-30% of recent aircraft buyers (and an even larger proportion for fractional and charter customers) are new to business aviation, the quality of their business aviation experience will be a barometer to watch closely in the months and years to come.

Business Aircraft Owner / Operator Sentiment

JETNET iQ Q3 2021 JETNET iQ Global Business Aviation Survey

How would you describe the current market conditions for business aviation?



Source: JETNET iQ Q3 2021 Global Business Aviation Survey of 502 business aircraft owners / operators in 55 countries, operating 3,425 fixed-wing turbine business aircraft

Business Conditions

GDP

The Economist's **GDP growth forecasts** for 2021 are: U.S. +6.0%, Euro Area +4.8%, U.K. +6.4%, Mexico +6.4%, Brazil +5.0%, Canada +5.4%, China +7.9%, Russia +3.8%, and Australia +4.2%



Business jet cycles (take-offs and landings) in August 2021 were up by 19% YOY for U.S. Part 91, up by 100% YOY for U.S. Part 91K, up by 77% YOY for U.S. Part 135, and up by 29% for European EASA 145 operations



Dow Jones Index (U.S.) was up 30%,
FTSE 100 (U.K.) was up 23%,
CAC 40 (France) was up 41%, and
DAX 30 (Germany) was up 30%
YOY from Nov. 4, 2020 to Nov. 3, 2021



U.S. Index of **Consumer Sentiment** was 71.7 in Oct. 2021 vs. 72.8 in Sep. 2021 and 81.8 in Oct. 2020 YOY;
Euro Area **Economic Sentiment Indicator** was 118.6 In Oct. 2021 vs. 117.8 in Sep. 2021 and 89.3 in Nov. 2020



U.S. unemployment rate (seasonally adjusted) was 4.8% in September 2021 representing ~7.7 million unemployed people, down 710,000 from Aug. 2021 (5.2%)



U.S. **Purchasing Manager Index** (Manufacturing PMI) was 60.8 in Oct. 2021 vs. 61.1 in Sep. 2021 and 57.6 in Nov. 2020;
Euro Area **Business Climate Indicator** was 1.70 in Aug. 2021 vs. 1.90 in July 2021, and -1.4 in Aug. 2020



Transactions of pre-owned business aircraft in Jan.-Aug. 2021 were 2,097 jets and 902 turboprops, up 46% and up 35% YOY (JETNET as of Nov. 1, 2021)



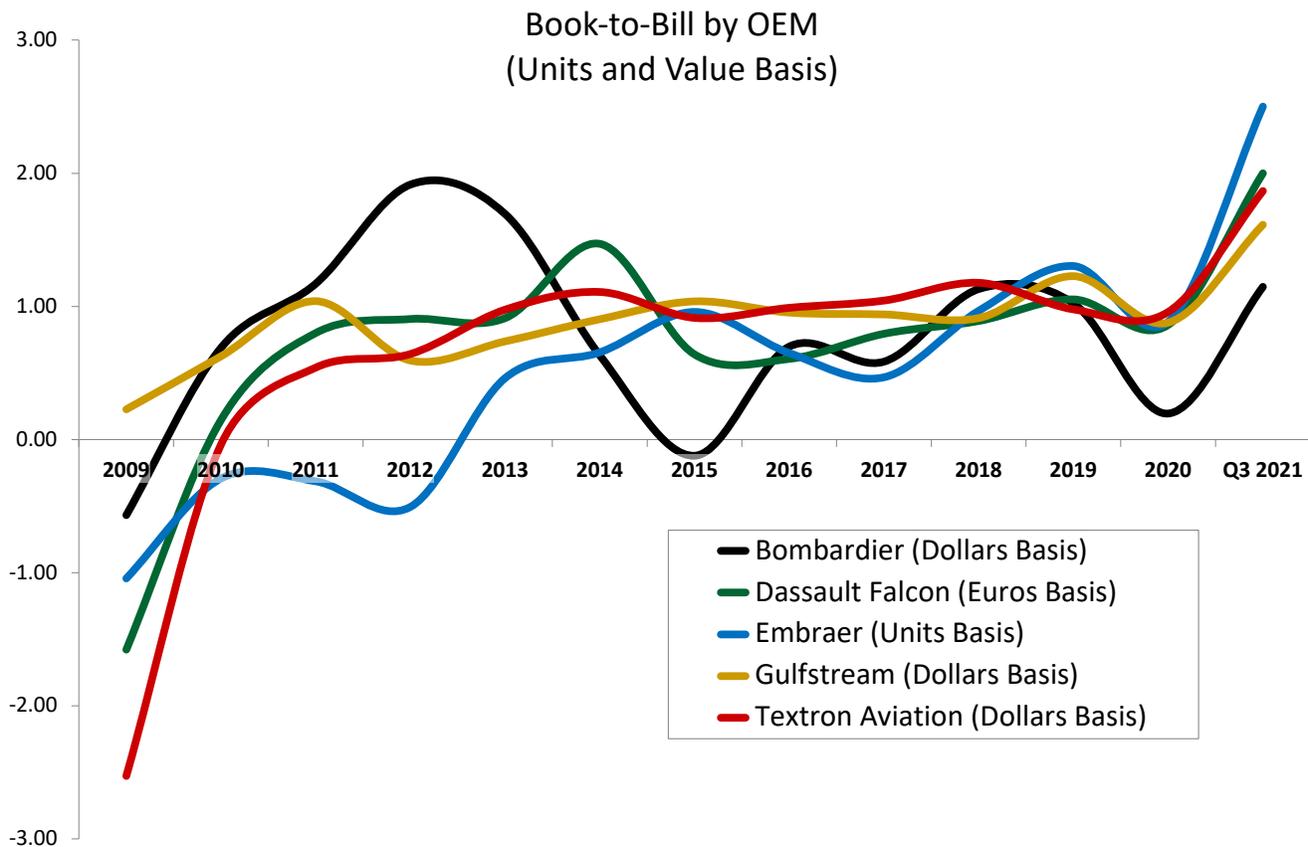
Business aircraft deliveries in 2021 YTD are 379 jets (including Cirrus, Boeing, Airbus) and 189 turboprops (JETNET as of Sept. 28, 2021)

Onwards and Upwards

Business Aircraft OEM Book-to-Bill Performance Through Q3 2021

The “Big Five” business aircraft OEMs continue to enjoy a strong market, with sharply higher book-to-bill ratios and stronger backlogs through Q3 2021. With the rising tide of the marketplace, industry book-to-bill performance this year has been nothing short of impressive, with the 5 largest OEMs all performing stronger than they have in many years.

While we expect book-to-bill ratios to temper somewhat with the traditional Q4 delivery ramp up, strong and sustained order activity should reassure leaders throughout the aerospace supply chain as they consider whether or how much to increase new aircraft production rates in 2022.



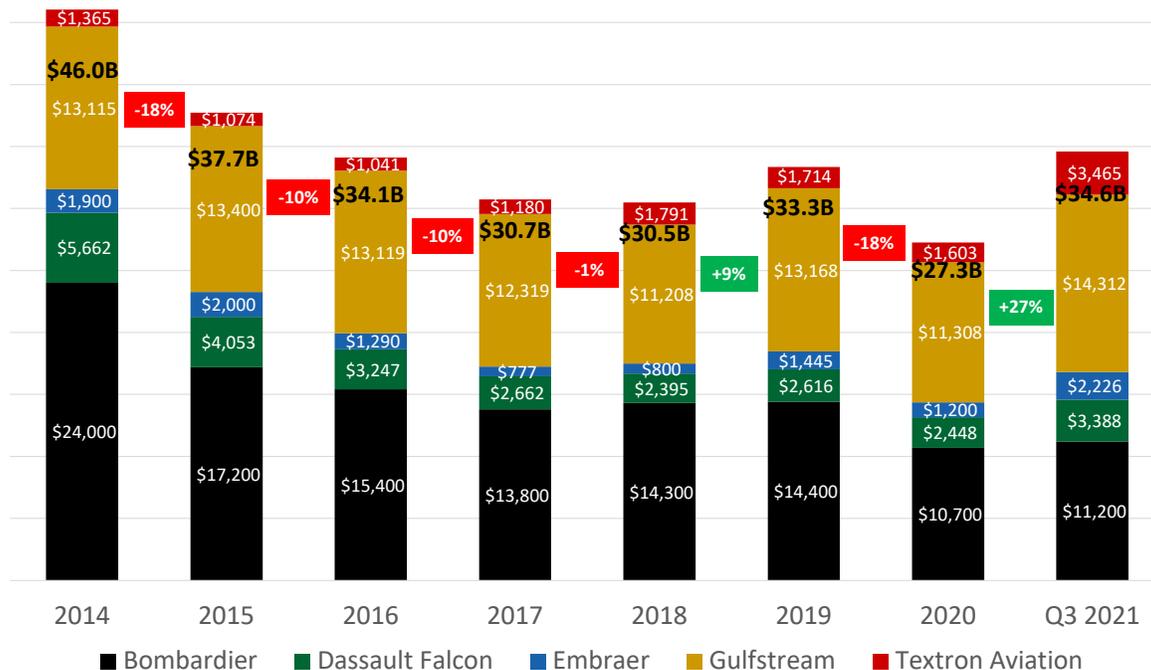
Sources: Regulatory filings and company filings; JETNET iQ analysis and estimates; Dassault Falcon and Embraer are estimated for Q3 2021

The Bounce in Backlogs Continues

Business Aircraft OEM Firm Order Backlog Performance - Through Q3 2021 (\$U.S. M)

We estimate that the value of firm order backlogs at the largest business aircraft OEMs has increased by 27% YOY this year through the end of Q3 2021. At almost \$U.S. 35B, the “Big 5” backlog represents a 6-year high, without counting Q4 2021 sales, which are expected to be robust. The resurgence in backlogs has been most noticeable at Textron Aviation and Embraer, OEMs that focus on market segments up to the super mid-size jet segment. In the case of Textron Aviation, backlog at the end of Q3 2021 was already higher than at any point in time since the Global Financial Crisis and

finally back into a more comfortable 9-to-12-month range that management has been striving to achieve for many years. Although Embraer no longer provides much detail in its quarterly financial reports at the product line level, we estimate that Embraer Executive Aircraft’s backlog value has almost doubled in the first 9 months of 2021 over year-end 2020, an impressive performance fueled in part by strong order activity for the company’s segment-leading Phenom 300E light jet.



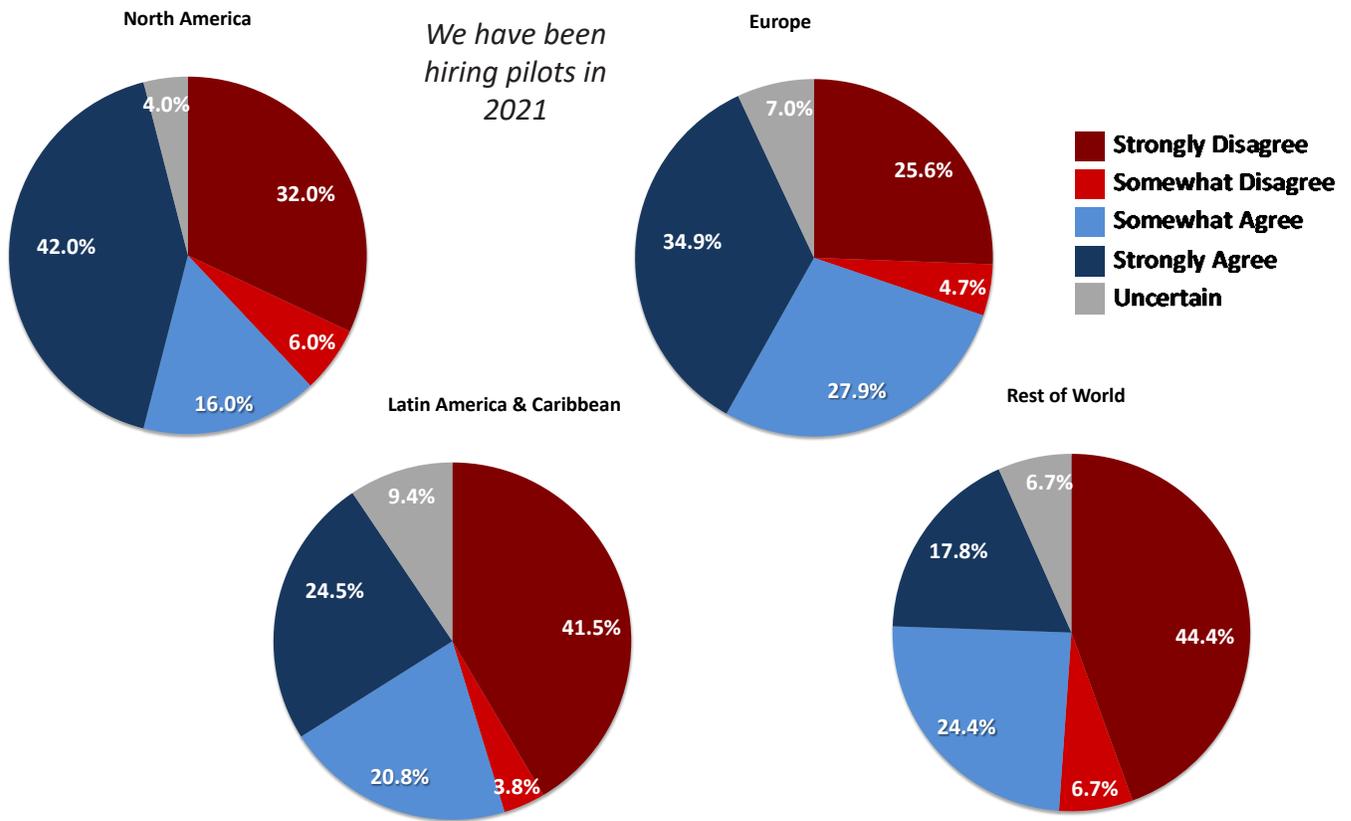
Sources: Regulatory filings and company filings; JETNET IQ analysis and estimates; Dassault Falcon and Embraer are estimated for Q3 2021

Talent: The Battle Resumes

Pilot Hiring by Region – Q3 2021 JETNET iQ Survey

Business aircraft owners / operators in North America (United States and Canada) and Europe appear to be leading the way in pilot recruitment, at least based on our most recent JETNET iQ Survey, in line with a resurgence in business aircraft utilization in these regions. The supply and cost of technical

talent – pilots, A&P technicians, and other professionals – will be important considerations for business aviation leaders to monitor going forward, especially as commercial airline activity recovers from the deepest impacts of COVID-19.



Source: JETNET iQ Q3 2021 Global Business Aviation Survey of 502 business aircraft owners / operators in 55 countries, operating 3,425 fixed-wing turbine business aircraft

About JETNET iQ

JETNET iQ is a business aviation market research, analysis and forecasting service consisting of three main elements:

- **JETNET iQ Reports** are the definitive analytical reference for business aviation, incorporating quarterly state-of-the-industry analyses, owner / operator surveys, and detailed delivery and fleet forecasts;
- **JETNET iQ Summits** are annual industry conferences providing unique data, insights and networking opportunities; and
- **JETNET iQ Advisory** provides customized research and analysis for clients on a project-by-project basis.

JETNET iQ Reports are available in various formats on a subscription basis, and are published regularly by JETNET LLC, 101 First Street, Utica, NY 13501 - **currently offered at 11 different levels**. JETNET iQ is a partnership between JETNET LLC of Utica, New York and Rolland Vincent Associates, LLC, of Plano, Texas.

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Since late 2010, JETNET has conducted quarterly surveys of the worldwide community of business aircraft owners and operators in order to gauge customer sentiment, brand perceptions, aircraft purchase, selling, and utilization expectations, and other factors. JETNET iQ Global Business Aviation Surveys are password-protected and by invitation-only. Potential respondents are drawn randomly from the JETNET worldwide database of business jet and business turboprop owners and operators; they are initially contacted by telephone and/or e-mail by JETNET's team of multilingual researchers. Target respondents include chief pilots, directors of aviation, and senior management. Each survey includes at least 500 respondents in 50 or more countries each quarter, and respondents closely reflect the worldwide distribution of the business jet and turboprop community.

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Appendix

Data sources:

Real GDP growth forecasts (2021): The Economist – October 23, 2021

<https://www.economist.com/economic-and-financial-indicators/2021/09/23/economic-data-commodities-and-markets>

Stock Markets:

Dow Jones Industrial Average: <http://ca.spindices.com/indices/equity/dow-jones-industrial-average>

London Stock Exchange (FTSE 100): <https://www.londonstockexchange.com/indices/ftse-100>

Euronext Paris (CAC 40): <https://live.euronext.com/en/product/indices/FR0003500008-XPAR>

Frankfurt Stock Exchange (DAX 30): <https://www.boerse-frankfurt.de/indices/dax?mic=XETR>

Initial Unemployment Claims: Bureau of Labor Statistics (U.S.); <https://www.dol.gov/ui/data.pdf>; "SA" = seasonally adjusted

Unemployment: Bureau of Labor Statistics (U.S.); <https://www.bls.gov/news.release/pdf/empisit.pdf>

Consumer Confidence: University of Michigan Survey of Consumers (U.S.); <http://www.sca.isr.umich.edu>

European Commission (Euro Area) – Economic Sentiment Indicator; https://ec.europa.eu/info/sites/info/files/full_bcs_2021_08_en.pdf

Business Confidence: U.S. ISM Manufacturing PMI (U.S.)

<https://www.ismworld.org/globalassets/pub/research-and-surveys/rob/pmi/rob202107pmi.pdf>

Eurostat (Euro Area); <https://ec.europa.eu/eurostat/databrowser/view/teibs010/default/table?lang=en>

https://ec.europa.eu/eurostat/databrowser/view/ei_bsci_m_r2/default/table?lang=en

Business aircraft fleet, deliveries, transactions, days-on-market (DOM), utilization: JETNET; GAMA

Survey results: JETNET iQ Global Business Aviation Surveys (Quarterly)

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Definitions and Abbreviations:

For the purposes of these Reports, business aircraft may be classified into 4 primary categories, reflecting propulsion, price, performance, and weight class differences. These categories are: Turboprops (Single-Engine Turboprops - SETP and Multi-Engine Turboprops - METP), Small Jets (Personal Jets, Very Light Jets, Light Jets), Medium Jets (Super-Light Jet, Mid-Size Jet, Super Mid-Size Jet), and Large Jets (Large Jet, Large Long-Range Jet, Large Ultra Long-Range Jet, Airline Business Jet). The "Personal Jet" category includes single-engine turboprop-powered models, today represented by the Cirrus Vision Jet.

B&GA: Business & General Aviation

EIS: Entry in Service

FBO: Fixed Base Operator (private air terminal)

FTSE: Financial Times Stock Exchange (London)

GAMA: General Aviation Manufacturers Association

GDP: Gross Domestic Product

HNWI: High Net Worth Individual

MTOW: Maximum Takeoff Weight

NGO: Non-Governmental Organization

OEM: Original Equipment Manufacturer

QOQ: Quarter over Quarter

QTD: Quarter to Date

S&P: Standard & Poor's

TTM: Trailing Twelve Months

WHO: World Health Organization

YOY: Year over Year

YTD: Year to Date

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