



China's Aircraft Industry Gets Off the Ground

By Kathleen Kingsbury



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The ARJ21 prototype takes shape at a Shanghai factory

ALY SONG / REUTERS

China's Bangda airport in Tibet is challenging for planes as well as pilots. Tucked between mountain ranges on the Tibetan Plateau, Bangda's runway is the world's highest at 14,000 ft. (4,300 m) above sea level. Because the air is so thin there, the large Boeing and Airbus aircraft that comprise most of China's domestic fleet lack the power and lift to take off and land comfortably under certain conditions, especially in bad weather with a full load of passengers. So in 2002, the Beijing government came up with a surprising solution: China would build a small passenger jet so good that

not only could it handle Bangda with ease, it would put the country on the map as a commercial aerospace manufacturer.

Five years later, a prototype of the jet sits in a nondescript hangar 30 minutes north of Shanghai. Dubbed the Advanced Regional Jet for the 21st Century — the ARJ21 — the aircraft is the fruit of China's first solo commercial aircraft project in nearly 40 years, and it promises to be one of the world's most technologically sophisticated when it takes off for the first time in March 2008. Onboard are the most advanced avionics, propulsion and malfunction-monitoring systems available. With room for 90 passengers (up to 105 in a stretch version), "the ARJ21 will prove China is striving to become a world-class aircraft manufacturer," says Wang Yawei, vice president of the ARJ21's financier, the state-run China Aviation Industry Corporation I (AVIC I).

Commercial-jet manufacturing is a notoriously difficult business, yet China's boundless business ambition appears to be supported by promising markets. As worldwide air travel steadily increases, airlines will need to buy almost 29,000 planes worth \$2.8 trillion over the next two decades, with nearly one-third of them destined for Asian carriers, according to Boeing, the No. 1 manufacturer of commercial jets. In China alone, domestic airlines could spend as much as \$340 billion for 3,400 new aircraft — nearly quadrupling the current fleet of about 1,000 — by 2026. There's also booming demand for smaller, so-called regional jets like the ARJ21, aircraft with fewer than 150 seats flown on short-haul domestic routes. At least 1,600 regional jets could be purchased between now and 2025, according to Canadian aircraft maker Bombardier. "There's never been more demand than right now," says Luo Ronghuai, president of AVIC I Commercial Aircraft Co. Ltd. (ACAC), which oversees the ARJ21 program.

Of course, rosy projections and grand national ambitions alone aren't enough to guarantee the successful launch of a new aircraft — let alone a new commercial aerospace manufacturer. The duopoly of Airbus and Boeing own the market for large jetliners; Bombardier and Brazil's Embraer are entrenched as leaders in regional jets and turboprops. Indonesia discovered just how treacherous the market can be in the 1990s when that country's government tried to bootstrap an aircraft-manufacturing industry by building 100-seat turboprop planes. The venture failed following Asia's 1997 financial crisis when it lost government funding. During the 1960s, a Japanese consortium that included Mitsubishi Heavy Industries and Fuji Heavy Industries

built a 60-passenger turboprop — the YS11 — but the plane never found much of a market outside Japan and production was halted in 1974.

China, which has years of experience making military aircraft, thinks it can succeed where others have failed. ACAC sees an opening in the market today for smaller jets. China has recently begun building more regional airports, particularly in western provinces, to allow for more point-to-point flying and ease congestion at central airports. Those routes will likely be serviced by smaller planes, according to Chinese aviation officials. "There's a hole in the market we can fill," says Luo.

That window is quickly closing. Since the ARJ21 project was announced, both Bombardier and Embraer have launched models that will rival it. To date, Embraer alone has already sold 127 of its 50- to 100-seat aircraft to Chinese airlines. Manufacturers in Japan and Russia also plan to field brand-new regional jets within the next three to five years. With the ARJ21's maiden flight set for next year, "China has a head start," says George Haley, head of the Center for International Industry Competitiveness at the University of New Haven in Connecticut. "But it won't last long."

Stiff competition is likely to come from Japan's Mitsubishi Heavy Industries, which is working toward the 2012 debut of a fuel-efficient regional jet, called the MRJ, that will be built from the same advanced composite materials Boeing is using in its upcoming 787 Dreamliner. (Mitsubishi is one of Boeing's key parts suppliers.) The Japanese government is helping to bankroll the company's comeback in commercial jets with a pledge to pay a third of the MRJ's reported \$1 billion in development costs.

ACAC's venture is also dependent on government funding. Such subsidies could ultimately backfire by creating World Trade Organization disputes with private manufacturers such as Bombardier, says Paul O'Neill, an airline-industry analyst for Deloitte. But for now, "the government's probably willing to put in whatever it takes to succeed," he says. Meanwhile, ACAC is counting on another home-court advantage: a guaranteed customer base in China's state-owned airlines. The Civil Aviation Administration of China (CAAC), the country's industry regulator, announced Aug. 31 that it will block the creation of any new Chinese airlines until 2010 — unless the new carrier flies the ARJ21. All of the 71 ARJ21s sold thus far have

been to Chinese carriers serving the fast-growing mainland travel market. "The government still controls fleet purchases," says Richard Pinkham, an industry analyst at the Centre for Asia-Pacific Aviation, a Singapore-based consultancy. "That will provide a big boost to marketing efforts."

But ACAC still has to deliver a competitive airplane. The company is not starting from scratch. It has made parts for both Boeing and Airbus since the early 1980s. ACAC's Shanghai factory was named one of Boeing's best in 2005, and China's engineers have so far set a fast pace in the rollout of the ARJ21. "Staying on schedule is our biggest challenge," says chief engineer Jiang Liping. At full capacity, ACAC hopes to build 50 of the jets a year. The supply chain is state of the art. Fuselage sections are built at factories throughout China — located in cities including Chengdu, Xi'an, and Shenyang — and are shipped to Shanghai for final assembly. Critical components, such as advanced electronics and engines, are being sourced from 19 foreign suppliers, including the U.S.'s GE and Honeywell. "ACAC has been strong about demanding on-time delivery," says Martin Lin, Beijing representative for Rockwell Collins, which is making the ARJ21's primary avionics systems.

Meeting delivery dates will be only ACAC's first step in establishing itself as a player in the aviation trade. Potential buyers will want assurances that service and maintenance needs can be met for decades to come. "If a plane is sitting on a runway, an airline can't wait three days for a part," says John Bruns, head of Boeing's commercial operations in China. Competitors such as Bombardier have extensive global networks to ensure parts availability and to provide operators with support. China will need to build its own global support system virtually from scratch.

And then there's the little matter of getting the ARJ21 certified to fly not just in China but in other countries as well. Before it ever carries a passenger, the jet's safety will be vetted by Chinese officials and by those from the U.S. Federal Aviation Administration, which has an office in Shanghai to monitor the project. Beyond Asia, ACAC hopes to sell the jet in the U.S. and Europe. It's not clear if the recent spate of quality issues faced by Chinese manufacturers of low-end products, such as toys and clothing, will ultimately hurt ACAC's chances. "Customers could hesitate because it's made in China," says O'Neill of Deloitte. "Airlines will be conscious of such talk."

With so much at stake, China will likely do whatever it takes to overcome concerns. After all, the ARJ21 represents only the beginning of the country's aerospace ambitions. At the Paris Air Show in June, Bombardier announced it plans to invest \$100 million with ACAC in designing additional versions of the ARJ21. Ultimately, China intends to go toe-to-toe with the biggest in the business. In March, Chinese leaders pledged to invest at least \$6 billion to produce a 150-seat jetliner that by 2020 could be competing with the Boeing 737 and Airbus A320. "The ARJ21 is just the start for us," says ACAC's Luo. "Really, the sky's the limit." First, though, you've got to get the plane off the ground.

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