



新喷气机一览

巴西航空工业公司的莱格赛450

巴西飞机制造商承诺推出一架革命性的飞机，新机即将投入市场

Embraer's Legacy 450

The Brazilian airframer promised a "game changer," and it is delivering.

作者: by Mark Huber

十几年前，巴西航空工业公司迈入公务机市场，由此引发了一些质疑。当时这家飞机制造商已经凭借涡轮螺旋桨通勤飞机和支线飞机在国内市场上享有鼎鼎大名。刚刚迈入这个新行业时，巴西航空工业公司把 ERJ-135 和 E190 两款飞机改造成了公务机，机上增加了油箱，做了高档的内饰装修，还强化了机舱的隔音。

不久后，巴西航空工业公司宣布要研发四款全新的公务机，其中包括入门级的飞鸿 (Phenom) 100 和中型洲际飞机莱格赛 (Legacy) 500。如今巴西航空工业公司位于佛罗里达州新墨尔本的工厂正在组装飞鸿100和体型更大的飞鸿300，而莱格赛500正在巴西做飞行试验。预计2013年年末莱格赛500的姐妹版450将完成首飞，450较500机身略短。

当巴西航空工业公司CEO 弗雷德里克·弗雷里·科拉多 (Frederico Fleury Curado) 在2007年宣布450和500的研发计划时，他号称它们是“与众不同的飞机，将带来颠覆性的变化。”

他的公司准备交付市场的，正是这样的产品。

A LITTLE OVER A DECADE AGO, EMBRAER'S ENTRY INTO the corporate jet market engendered some skepticism. Until then, the Brazilian airframer had been best known in the civil market for its commuter turboprops and regional jets. Its initial foray into the corporate jet industry involved taking two of those models, the ERJ-135 and the E190, and turning them into bizjets by adding more fuel tanks, upscale interiors and enhanced cabin soundproofing.

But then Embraer announced plans for four completely new airplanes to complete the spectrum, from the entry-level Phenom 100 to the transcontinental, midsize Legacy 500. Today, the Phenom 100 and larger 300 are being assembled at Embraer's new Melbourne, Florida campus, while the Legacy 500 is in flight test in Brazil. The company expects a slightly shorter variant of the 500, the 450, to make its first flight later this year.

When Embraer CEO Frederico Fleury Curado announced plans for the 450 and 500 in 2007, he promised a "game-changer, a not-me-too aircraft."

That's just what his company intends to deliver.



莱格赛450可容纳7-9名乘客，可完全平放的全卧式俱乐部座椅是它最大的特色，在中型飞机上绝无仅有。

The Legacy 450 can seat seven to nine passengers and features fully berthable, lie-flat center club seating, the only flat bed in midsize aircraft.

巴西航空工业公司提出了一个简单的价值主张“功能更全、成本更低”，并迅速在公务机市场上赢得一方天地。凭借这一“杀手锏”，它从赛斯纳手中抢走一大块市场份额，又摧毁了豪客比奇的喷气机市场，还给庞巴迪带来实实在在的威胁。450如今也祭出了这个大杀器。

莱格赛450的机身横截面与500相同，相较于同类公务机而言，它们的舱内空间之大史无前例。巴西航空工业公司称450的市场定位为“中轻型”公务机，450机上可以搭载7-9个乘客，具体载客量取决于舱内布局。卫生间有实木门、洗手台、真空抽水马桶，此等豪华配置在同尺寸的公务机中并不多见。还可以用一张面对入口的双人位沙发代替右手边的储藏柜和朝后的座位。如果您不需要沙发，也可以把这个空间打成一个全尺寸的干式或湿式厨房。湿式厨房设有冷、热水，四加仑饮用水、冰柜、水晶藏柜、陶瓷和银器藏柜，以及一个110V电源插座。可选项包括显示器、咖啡机，厨房旁边也可以安置一张单人座椅。

想带一大堆衣服上飞机吗？没问题！行李舱非常大，容积高达150立方英尺！乘客能携带更多行李，行李中可以有滑雪板、高尔夫球杆、和其他中型或超中型喷气机所能容纳的一切物品。

在驾驶舱中，我们可以看到一些超一流的设施。

传统的中杆操纵器不见了，取而代之的是连接电传操纵系统（FBW）的侧杆操纵器。FBW移除了飞行控制系统与飞行控制表面（副翼、方向舵、升降舵和扰流板）之间的机械连接。飞行员的操作能与传感器输入和电脑处理的飞行控制规则相结合，以确保既迅速、又精确地输入不会偏离飞机安全性能范围的数据。FBW最早应用于军用战斗机上，后来逐渐在民用飞机上普及。

驾驶舱拥有最先进的罗克韦尔科林斯（Rockwell Collins）Pro Line Fusion 航电套件。控制台内的四台大型主动矩阵LCD和可选的抬头显示器能为驾驶员提供高精度图像；直观的MultiScan气象雷达系统覆盖范围可达300英里，能提供电子图表、地图、以及气象示意图；机场地面管理系统能最大限度减少转弯错误或与地面上的其他车辆碰撞导致的危险，即使能见度有限时也是如此。该系统能在减少驾驶员工作负荷的同时，集中显示所有安全系统提供的飞行数据。MultiScan气象雷达系统的预测功能不仅能引导飞行员远离恶劣气象条件，甚至还能安全穿越。Fusion

Embraer has rapidly gained bizjet market share by offering a simple value proposition: more for less. It's a formula that has already taken a big bite out of the business of Cessna, helped to destroy the jet market for Hawker Beechcraft and made Bombardier hear footsteps. The philosophy lives on with the 450.

The 450 and 500 share a fuselage cross section that provides unprecedented cabin space for aircraft in this category. Aboard the 450—which is positioned in a niche Embraer calls “mid-light”—there is room for seven to nine passengers, depending on the cabin layout. The lavatory features a solid door, vanity, basin and vacuum toilet—a luxury not usually seen in an airplane of this size. Cabin choices include a two-place divan opposite the entry door in lieu of the forward right-hand storage cabinet and the aft facing seat. If you don't want the divan, you can use the space for a full-size dry or wet galley. The latter features hot and cold water, four gallons of potable water, an ice drawer, crystal storage, compartments for china and silverware and a 110V power outlet. Options include a monitor and espresso maker, and another single seat can be positioned next to the galley.

Flying with a stable of clothes horses? No problem. The baggage hold is cavernous for an airplane in this category: 150 cubic feet. Passengers can bring more luggage, skis, golf clubs and anything else than they could fit into almost any other midsize or super-midsize jet.

Add to all that space some serious whiz-bang, starting in the cockpit.

The traditional control yokes are gone, replaced by side sticks connected to a fly-by-wire (FBW) flight-control system. FBW eliminates the mechanical linkages between the flight controls and the flight-control surfaces (ailerons, rudder, elevator and spoilers). Pilot inputs are combined with sensor inputs and computerized flight-control laws for crisper and faster inputs that do not deviate from the aircraft's performance envelope. FBW appeared first on fighter jets and, later, on airliners.

The cockpit offers state-of-the-art Rockwell Collins Pro Line Fusion avionics. The four large active-matrix LCDs in the panel connect the pilots with synthetic enhanced vision with an optional head-up display; electronic charts, maps, graphical weather depiction from an intuitive MultiScan weather radar system that sees up to 300 miles out; and an airport surface-management system that minimizes the chances of making a wrong turn or colliding with another vehicle on the ground, even when visibility is limited. The system minimizes pilot workload while incorporating data from just about every known safety system. The MultiScan weather radar has the predictive capability to guide pilots not just around bad weather but over it. Fusion can grow to accommodate future technology add-ons such as voice recognition, surface guidance and automatic dependent surveillance-broadcast (ADS-B), the future of air traffic control.

系统还能有效扩展以集成新一代产品，包括语音识别，地面引导、广播式自动相关监视（ADS-B）、空中交通管制预警系统。

450采用了霍尼韦尔公司出品的Ovation Select高分辨率机舱管理系统，乘客能使用安装在吧台内的个人控制器、手持无线遥控器或厨房触摸屏，通过该系统管理舱内的娱乐、通讯、照明、温度、遮阳板等。它还集成了高速卫星通信系统和各种电子产品，包括iPods、MP3播放器、Apple TV和游戏系统。此外，由于它采用了以太网主干，因此还具有强大的诊断和故障排解功能。Ovation多媒体接口还支持可选的JetMap3HD移动地图程序和新闻、天气、体育的更新。Ovation采用了罗申（Rosen）公司的高级HD显示器和欧图（Alto）音响组件。在45000英尺的最大巡航高度时，增压系统能使莱格赛450的客舱压力高度保持在令人舒适的6000英尺。

机上配备了霍尼韦尔HTF7500E双引擎（单个推动力达6540磅），飞机起飞22分钟后，就可抵达43000英尺高空。

除了硬件方面，巴西航空工业公司也努力为中型公务机客户提供耗资千万的客户所享受的同等服务。去年公司聘请Jay Beever担任内饰设计副总裁，之前他担任湾流公司新品开发部内饰设计经理，其设计作品包括湾流650、G550和G450飞机的内饰。借助最新高科技工具如电脑建模、动画、渲染软件，巴西航空工业公司的佛罗里达设计中心将为450客户提供无与伦比的内饰选择和个性化方案。

“我们将使中型喷气机客户享受与‘世袭’（售价为5000万美元）客户同等的工期，”巴西航空工业公司的公务机销售副总裁 Robert Knebel 说。毫无疑问，这种服务必将赢得客户青睐。 ■



驾驶舱拥有电传操纵系统（唯一一架具备此项性能的中型飞机）、一流的航电套件和雷达，雷达不仅能引导飞行员远离恶劣气象条件，甚至还能安全穿越。

The cockpit offers a fly-by-wire flight-control system (the only midsize aircraft with this capability), state-of-the-art avionics and radar that can guide pilots not just around bad weather but over it.

PASSENGERS ON THE 450 WILL BE TREATED TO Honeywell’s high-definition Ovation Select cabin-management system, which allows for control of entertainment, communications, lights, temperature, window shades and more via drink-rail-mounted units, wireless handheld remotes or a galley touchscreen. The system can interface with high-speed satellite communications and a variety of consumer electronics, including iPods, MP3 players, Apple TV and gaming systems. Moreover, it is built on an Ethernet backbone and offers extensive diagnostic and troubleshooting capability. Ovation’s media interface also hosts the optional JetMap3HD moving-map applications and provides news, weather and sports updates. Ovation uses high-end Rosen HD monitors and Alto audio components. The aircraft pressurization system keeps cabin altitude at a comfortable 6,000 feet at the 450’s maximum cruising altitude of 45,000 feet.

You can get up to 43,000 feet just 22 minutes after takeoff thanks to the aircraft’s pair of quiet, state-of-the-art Honeywell HTF7500E engines (6,540 pounds of thrust each).

Beyond the hardware, Embraer is moving to give midsize airplane customers the same care and feeding afforded those who spend tens of millions more. Last year the company hired Jay Beever as vice president of interior design. He previously served as design manager for new product development at Gulfstream Aerospace, where he worked on the recently introduced G650 and the Elite interiors for the G550 and G450. Embraer’s plan is to offer customers an unmatched array of interior choices and personalization for the 450 with the help of the latest high-tech tools, including computer modeling, animation and rendering software at its Florida design center.

“We are going to give midsize-jet customers the same completion experience they would have if they ordered a [\$50 million] Lineage,” says Robert Knebel, Embraer vice president for executive jet sales. It’s a safe bet the customers will like it. ■

莱格赛 450 概览

价格 (2013美元)	1675万美元
乘客	7-9
机组人员	2
航程*	2,300 海里*
最大巡航速度	0.83 马赫
机舱	长: 6.83 米
	宽: 1.83 米
	高: 2.08 米
	容积: 19.20 立方米
行李舱	内部容积: 1.13 立方米
	外部容积: 3.12 立方米

资料来源: 巴西航空工业公司
* 远程巡航、四名乘客、两名飞行员、NBAA 200 海里备降距离

LEGACY 450 AT A GLANCE

Price (2013 \$)	\$16.57 million
Passengers	7-9
Crew	2
Range*	2,300 nm*
Max cruising speed	Mach 0.83
Cabin	Length: 6.83 meters
	Height: 1.83 meters
	Width: 2.08 meters
	Volume: 19.20 cu meters
Luggage compartments	Internal: 1.13 cu meters
	External: 3.12 cu meters

Source: Embraer
* Long-range cruise, four passengers, two pilots, NBAA 200 nm reserve