

庞巴迪公司希望凭借最新的里尔85中型商务机重振雄风

作者：Mark Huber

今年，庞巴迪公司将启动商务航空史上最具雄心的一个试飞项目。它推出的里尔85型喷气机定于2013年投入商业运营。未来几个月内，将有五架试飞机型投入首飞试验。里尔85是第一架经《美国联邦航空法规》（FAR）第25部分的严格标准认证的复合材料飞机。它开创了许多先河：创造了介于中型和超中型之间的新型商务机类别；机舱内饰从豪华汽车业中汲取大量经验；机身和机翼采用复合材料；形成一条运转良好的全球复杂供应链，确保按预定的性能和运营目标，使飞机如期面市。

自豪客比奇公司在80年代推出命运多舛、造型前卫的 比奇星舟飞机后，这在里尔系列飞机的诞生地（堪萨斯州的威奇托）是一件最重要的盛事。庞巴迪公司仅生产53架原型机就花费了近10亿美元的研发成本。因此它希望里尔85能带来意想不到的惊喜。庞巴迪公司还在项目的核心部分采取风险消减措施。

里尔85开创了一个全新的市场定位。据庞巴迪公司介绍，与性能最接近的竞争机型相比，它的机舱容积要多出19%。对中型市场而言，里尔85的机舱宽绰有余：长24.9 ft（7.5 m）、宽6.1 ft（1.85 m）、高6 ft（1.82 m），客舱容积665 ft^3（18.8 m^3），行李舱容积130 ft^3（3.7 m^3），另外还有三个大橱柜可提供30 ft^3（0.8 m^3）的储物空间。

客户能选择多种配置，包括采用双人并排布局的八张单人办公座椅或六张单人座椅，以及一张三位长沙发。单人座椅可倾斜30 in（76 cm）并且能完全放平作为床铺。一次最多能同时放平四张座椅。具有波状外形的单人座椅配有可缩回椅背的扶手，而且能为体形高大的乘客提供更充裕的底部空间。座椅底架内的储物抽屉朝向舱内过道，便于就座的乘客随时打开。其内部大到足以能放下笔记本电脑。配备长沙发和平躺座椅的里尔85能完成3000 nm（5552 km）的航程（搭载四名乘客）。

对中型商务机而言，它的机舱整体设计前卫而大胆。喷溅式的镀铝内饰表面、图案鲜明的地毯、光滑细腻的黑色木料和橱柜、流畅的椭圆形和曲线外形，以及手工缝制的白色纯皮座椅，让人感觉仿佛置身崭新的宾利欧陆款豪车内部。庞巴迪公司特地邀请蜚声业界的英国汽车内饰设计公司Design Q负责设计，这家公司擅长为超级跑车（像阿斯顿·马丁、法拉利和玛萨拉蒂）设计内饰，它还为超级游艇、重要客户和各种固定翼、旋转翼飞机提供豪华内饰的设计服务。Design Q此前曾与庞巴迪公司合作，共同为2007年首次亮相的全球快车XRS型商务机设计了Vision飞行甲板。

设计人员不遗余力地打造了一个令人倍感宽敞的机舱。侧壁不是顺机舱两侧往下延伸，而是基本紧贴座椅。侧壁内装有足以容纳公文包的储物柜，可作为机舱控制区、储物区和侧壁桌台。

使座椅之间保持开放的空间，不仅给人以更开放、更通风的感觉，而且还提供了更多的放脚间。同样，椭圆形装置内设有送气系统、阅读灯和下拉式氧气面罩，它不是沿天花板的全长排列，而是突出于单人座椅的机舱顶部。

这种售价1825万美元的远程喷气机还配有设施齐全的厨房和安装真空抽吸系统的舱尾洗手间。与目前其他的机舱设计一样，里尔85配备了更大的机窗、高度整体化、流线型的机顶和侧壁。庞巴迪公司指定汉莎技术公司提供机舱管理系统；罗克韦尔·柯林斯公司提供功能先进（包括合成视觉）的三屏Pro Line Fusion航电系统；普拉特·惠特尼加拿大公司提供新型PW307B发动机。它的最高巡航速度为0.80马赫（980 km/h），而且能在5000 ft（1524 m）的跑道上顺利起降。

摒弃金属材料，使用复合材料大大减少了飞机的子结构，这不仅能减轻整体重量，而且增加了机舱容积。里尔85的机翼采用了复合材料蒙皮和纵梁以及金属翼肋，这与目前正在研发的庞巴迪C系列支线飞机的设计类似。金属翼肋能更好地吸收机翼内侧的载荷，并能更有效地控制公差。里尔85的机舱要比外形更小的里尔60XR的机舱大1/3，但却比真正意义上的超中型飞机略小一点。

尽管里尔82比里尔60重1/3，它只需要增加20%的推力，满载燃料时它能多飞500 英里 （925 km），而且最高巡航速度也更胜一筹，所以它具有更出色的比油耗。庞巴迪公司位于墨西哥克雷塔罗州（Queretaro）的复合材料生产厂负责生产飞机主结构。最后组装将在威奇托完成。庞巴迪公司的研发和生产团队将密切合作，共同审查位于威奇托、蒙特利尔、贝尔法斯特、北爱尔兰和克雷塔罗的飞机制造商。整个庞巴迪公司致力于里尔85项目的员工有近1250人。

生产复合材料结构时不考虑重量变化、成本和不确定性是一项非常棘手的任务，包括波音公司在内的许多飞机制造商对此都深有感触。庞巴迪公司设计了一种它认为能解决这一问题的生产流程。先通过电脑画出复合材料板材的工程样图，然后借助模具造出原型。这能确保精确控制每个板材和复合材料层的连接，而且有助于控制重量。庞巴迪公司目前正专注于对该流程进行优化，以确保能以正确的产量重复进行生产。尽管将公司的大部分资源都投入了里尔85项目，庞巴迪仍需依赖41家“主要”供应商，而且还在这些供应商的厂内使用了63套试验设备，以保证最后组装时，飞机的所有组件都能正常运转。

这种新型飞机凝聚了庞巴迪公司的大量心血，它很可能会让日渐没落的里尔品牌重振当年的雄风。毫无疑问，它是长久以来又一款出自威奇托的最具创新、令人振奋的新机型。

性能参数 AT A GLANCE

价格（2011年）	1825万美元
乘客	8-9 人
航程*	3000 nm（4828 km）
最高巡航速度	0.8马赫（980 km/h）
机舱	长度：24. 9 ft（7.54 m）
	高度：6. 0 ft （1. 82 m）
	宽度：6. 1 ft （1. 85 m）
	容积：665 ft3（18. 8 m3）

*搭载四名乘客、两名机组人员和 100 nm 储备燃料

资料来源：庞巴迪公司r

Bombardier thinks big with new midsize Learjet 85

by Mark Huber

This year, Bombardier will launch one of the most ambitious flight-test programs in business aviation history. The Learjet 85 is scheduled to enter service in 2013 and as many as five test aircraft could make their first flights in the coming months. The 85 will be the first mostly composite aircraft certified under the stringent requirements of Part 25 of the U.S. Federal Aviation Regulations (FARs) and breaks ground on several fronts: creating a new category of business jet between midsize and supermidsize; featuring a cabin that draws heavily from the luxury automobile industry; using composites for the fuselage and wings; and stitching together a complex global supply chain that must function perfectly for the company to bring the aircraft to market on time and within its performance and weight targets.

The 85 opens a new market niche. Bombardier claims it will have 19 percent more cabin volume than its closest competitor. Indeed, for a midsize, the 85's cabin is already spacious: 24 feet nine inches long (7.5 m); six feet one inch (1.85 m) wide; and six feet tall (1.82 m), yielding 665 cu ft (18.8 cu m) of passenger space and 130 cu ft (3.7 m) of luggage stowage, including three large cabin closets with a combined 30 cu ft (0.8 cu m) of storage.

Several configurations will be available, including eight single executive seats in a double-club layout or six single seats and a three-place divan. The single seats are pitched at 30 inches (76 cm) and recline into full-berthing positions. A maximum of four can be berthed at any one time. The highly contoured single seats feature armrests that retract into the seat backs that can give plus-sized passengers bigger seat-bottom cushions. Seat pedestal stowage drawers that open into the aircraft aisle are significantly easier for passengers to access while seated. They are big enough to hold a laptop computer. The divan and the berthing seats reflect the 85's 3,000-nm (5,552-km) range (with four passengers).

The overall cabin design is bold, even daring, for a midsize corporate jet, with splashes of aluminized interior surfaces, wild-patterned carpet, glossy black wood accents and cabinets, flowing oval and curved shapes and hand-stitched white leather seats that look as if they came from a new Bentley Continental.

Bombardier enlisted Design Q, the UK consultancy best known for automotive styling work on supercars such as Aston Martin, Ferrari and Maserati; the firm also works on mega-yachts and VIP and luxury airline interiors for a variety of fixed- and rotary-wing aircraft.

Designers worked hard to create a spacious-feeling cabin. Rather than running the sidewall ledges down the entire length of both sides of the cabin, the sidewall basically starts and stops next to the seats. Stowage nooks big enough to hold briefcases are molded into the sidewalls, as are cabin controls, ledge space and sidewall table stowage.

Leaving the space open between the seats not only creates a more open and airy look; it yields more legroom. Similarly, oval-shaped units containing gaspers, reading lights and drop-down oxygen masks protrude from the cabin ceiling over individual seats rather than running the full length of the ceiling.

This longer-legged, $18.25 million Learjet also features a full galley and an aft cabin lavatory with a vacuum toilet system. Like several other contemporary cabin designs, the 85 will feature larger cabin windows, and more monolithic, streamlined headliners and sidewalls. Bombardier has tapped Lufthansa Technik to provide the cabin management system; Rockwell Collins for a three-screen Pro Line Fusion avionics system with advanced capabilities including synthetic vision; and Pratt & Whitney Canada for new PW307B engines. Maximum cruise speed is Mach 0.80 (980 km/h) and the aircraft is designed to operate comfortably from 5,000-foot (1,524-meter) runways.

Using composites as opposed to metal eliminates much, but not all, of the aircraft's substructure, saving weight while increasing available cabin volume. The 85's wings will use composite skins and spars and metal ribs. The 85's cabin is one third larger than the smaller Learjet 60XR's, yet slightly smaller than that in a true super-midsize.

While the 85 will weigh one third more than the 60, it will need only 20 percent more thrust, fly 500 more miles (925 km) on a load of fuel and have a slightly higher top cruise speed–all while offering better specific fuel consumption.

Bombardier is relying on its composites plant in Queretaro, Mexico, to fabricate the structure. Final assembly is to take place in Wichita. Bombardier development and production teams are working to validate the aircraft's manufacture in Wichita; Montreal; Belfast, Northern Ireland; and Querétaro. Throughout Bombardier, approximately 1,250 employees are dedicated to the Learjet 85 program. ❑

LEARJET 85 AT A GLANCE

Price (2011 $)	$18.25 million
Passengers	8 to 9
Range*	3,000 nm (4,828 km)
Max. cruising speed	Mach 0.8 (980 km/h)
Cabin	Length: 24 ft 9 in (7.54 m)
	Height: 6 ft 0 in (1.82 m)
	Width: 6 ft 1 in (1.85 m)
	Volume: 665 cu ft (18.8 cu m)

*with four passengers, two crew and 100 nm reserves

Source: Bombardier

《商务航空旅游》杂志是您私人航空旅行的专业顾问

本文最早刊登于《商务航空旅游》杂志—它是AIN集团旗下的公司，该集团还出版**《ABACE展会新闻》**，并提供全球各地知名航空展览的每日简讯，以及按月发行的**《国际航空新闻》**。

在本届上海举办的亚洲商用航空会议暨展览会（ABACE）上，您可以选择迄今为止第一本中文版《商务航空旅游》杂志提供的年度购买指南。它旨在为中国的私人飞机用户提供最全面的购买指南，便于其了解目前市场上最知名的商务机。目前尚无其他私人航空杂志以如此客观、独立的视角提供如此详尽的航空资讯。

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– Jeff Burger



据庞巴迪公司介绍，它推出的新型里尔85中型商务机的机舱容积，比其他性能最接近的竞争机型的机舱容积多出19%。

Bombardier claims the cabin of its new Learjet 85 midsize aircraft will deliver 19 percent more volume than that of its nearest competitor.



庞巴迪公司指定罗克韦尔·柯林斯公司提供功能先进的三屏Pro Line Fusion航电系统 包括合成视觉。

Bombardier selected Rockwell Collins to provide the advanced features of its three-screen Pro Line Fusion avionics system, including synthetic vision.

BUSINESS JET TRAVELER HELPS PASSENGERS MAKE THE MOST OF PRIVATE AIR TRAVEL

This article first appeared in *Business Jet Traveler* magazine–part of the **AIN** group, which also produces **ABACE Convention News** and many other daily editions at leading airshows around the world, as well as the monthly editions of Aviation International News.

Here at the ABACE show in Shanghai, you can also pick the first ever Chinese-language edition of *Business Jet Traveler*'s annual Buyers' Guide. This has been produced to give Chinese private aviation users the most comprehensive guide to buying and using business aircraft available today. No other private aviation magazine covers this mode of transportation in such detail and with such objectivity and independence.

Business Jet Traveler–or *BJT*, as it is widely known–has been helping subscribers maximize their investment in private aviation since 2003. It offers unbiased reviews of new and used aircraft; advice about buying and selling jets; and information about taxes, laws, financing, safety, maintenance, insurance and more. It also features articles about new luxury cars, vacation destinations and other leisure pursuits, plus interviews with famous business jet users ranging from pianist Lang Lang to real-estate mogul Donald Trump and the entrepreneur Sir Richard Branson. It's a blend of content you can't find in any other magazine anywhere in the world.

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