

SPECIAL SECTION: **CABIN TECHNOLOGY AND FURNISHINGS**

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Chuck Leavell

The Rolling Stones

keyboardist talks about life
on the road—and in the sky

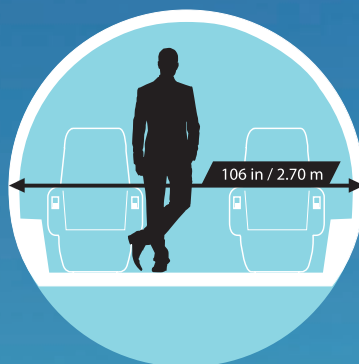
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SPECIAL SECTION:

CABIN TECHNOLOGY AND FURNISHINGS

New technology continues to improve cabin connectivity, lighting, and in-flight entertainment (*page 58*) while innovative designs are making your home in the sky increasingly comfortable, versatile, and visually appealing (*page 62*). Plus, listings of refurbishment and MRO centers and cabin-electronics manufacturers (*page 65*).



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- Special Section: New Aircraft
- BJT Readers' Choice survey results
- HondaJet Elite, Bell 407 Eagle reviews

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Chuck Leavell photo courtesy of Allen Farst Photography. Montage by Greg Rzekos.



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TURKEY

It offers historic mosques, amazing outdoor markets, gorgeous scenery, and more. **Page 70**



BJTONLINE.COM EXCLUSIVE

- Aircraft to avoid
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- Understanding preowned market gyrations



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6 UP FRONT: You're probably not too late to see the **Rolling Stones**—and definitely not too late to vote in **BJT's** Readers' Choice survey.

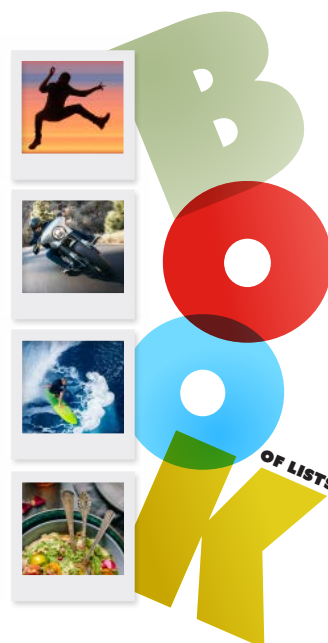
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8TH ANNUAL BJT BOOK OF LISTS

Discover seven **aviation-themed restaurants**, nine hotel suites with eye-popping nightly rates, 13 places to connect with the universe, seven amazing libraries, and much more.

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CHUCK LEAVELL

The **Rolling Stones'** longtime keyboardist, a former member of the Allman Brothers Band, talks about his half-century musical career, his environmental work, and his frequent use of business jets.

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Up Front

If you've ever fantasized about what it might be like to play on stage with the Rolling Stones, you'll appreciate Margie Goldsmith's interview (page 16) with Chuck Leavell, who has had that dream fulfilled since 1982. In a wide-ranging Q&A, the Stones' keyboardist and musical director discusses how his mom helped him visualize music beyond the notes on the page, what it was like to be a member of the Allman Brothers Band, and the Stones' reliance on business aviation.

By the time you read this, Mick Jagger and his group will probably have wrapped up their North American tour, but if you missed it, don't worry: it likely wasn't your last chance to catch one of their amazing shows. As Leavell told Goldsmith, "The passion and groove are still there. My gut feeling is, no, it's not the last time [we'll tour]." I suspect he's right—especially considering that Jagger was recently performing at peak level just weeks after open-heart surgery.

Thank you to everyone who has already participated in our ninth annual **BJT** Readers' Choice Survey, the results of which we'll publish in our winter edition in December. A record number of you have responded to tell us about your experiences and preferences regarding private lift. We know that the industry pays close attention to the results of this survey, so by taking a few minutes to complete it, you become part of a powerful mechanism for positive change.

Haven't voted yet? If you're reading this before October, there's still time to make your

voice heard at BJTonline.com/2019survey. As thanks for your input, we will make a donation to Corporate Angel Network, an organization that provides free flights to treatment centers on business aircraft for cancer patients and their families.

BJT's Book of Lists (page 36) is back! Despite this being the eighth annual edition, we have managed to come up with dozens of fresh lists that range from whimsical to educational, including the "5 Top Texas Oil Museums," "10 Must-Try Northern Thailand Dishes," and "5 Top Schools To Learn Fly Fishing." You might want to check out the version of this feature at BJTonline.com, where the lists are augmented with links to more information about many of the places and topics they cover.

Which reminds me: make sure you sign up for our free biweekly newsletter, **BJT Waypoints**, so you don't miss out on our wealth of online-only features, including videos, industry news, interviews, and more. (Go to BJTonline.com/subscribe.) We have plenty of exciting content already lined up for 2020, and we can't wait to share it with you.



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MARK WAGNER

Jennifer English speaks with Dassault Falcon Jet president and CEO Jean Rosanvallon at the European Business Aviation Convention & Exhibition in Geneva last May.

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If you've already paddled, climbed, hiked, and biked and are yearning for new thrills, you may be glad to hear that some luxury hotels and resorts now provide helicopter experiences.



CHRIS MCLENNAN

Guests at Hawaii's Four Seasons Resort Lanai can enjoy a full day's helicopter flight over the islands of Molokai, Kahoolawe, Lana'i, Hawaii (aka the Big Island), and Maui. You can soar over remote beaches, coffee estates, active volcanoes, and waterfalls, and include a stop or two for a gourmet picnic lunch, hiking tour, or visit to local attractions.

New Zealand's Helena Bay Lodge will transport you in its own Leonardo AW109S Grand to Great Barrier Island to fish for snapper, kahawai, and king-

fish. The lodge also offers several other helicopter jaunts, including one that makes stops at the caves at Waitomo, home to thousands of luminescent glow worms; Aranui Cave, to see stalactites and stalagmites;

Hobbiton, for lunch and a look at the movie sets of the Lord of the Rings trilogy and The Hobbit; and Waiheke Island, for a wine tasting and dinner.

Back in the States, at the Sagamore Pendry Baltimore, you can take a guided tour through the award-winning Sagamore Spirit Distillery followed by a helicopter ride over Sagamore Farm and spring house, birthplace of Sagamore whiskey.

Andronis Concept Wellness Resort, the biggest spa on the Greek island of Santorini, has its own helipad. You

can choose a breathtaking chopper trip across the Aegean to Athens or to such renowned islands as Mykonos, Crete, and Rhodes. A car and driver will meet the chopper and escort you on a bespoke tour.

The Boulders Resort and Spa in Scottsdale, Arizona has a helipad, too. You can board a chopper right on the property for an airborne tour of Sedona, one of America's most beautiful places, where you can land for lunch before returning to the resort.

—Margie Goldsmith



Places to Take Your Jet

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Lexus All Star Chef Classic, Los Angeles.

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Info: lexusallstarchefclassic.com

OCTOBER 3-5

Barrett-Jackson Car Auction, Las Vegas.

Some of the world's rarest classic cars will go

to the highest bidders. Info: barrett-jackson.com

OCTOBER 10-13



New York City Food & Wine Festival, New York.

Start saving up calories now! Info: nycwff.org

OCTOBER 22-24

NBAA-BACE, Las Vegas. The National Business

Aviation Association's annual convention is

happening, and *Business Jet Traveler* will be

there to cover the news alongside our sister

publications *NBAA Convention News*, *Aviation*

International News, and *AINAlerts*. Info: nbaa.org

—Jennifer Leach English



Giving Back

City of Hope

City of Hope is a 106-year-old research and treatment organization focused on cancer and other life-threatening diseases. It is on the cutting edge of stem-cell and immune-system research and gives precedence to efforts to combat lymphoma and other blood-forming cancers as well as Type I diabetes.

The organization—which is based northeast of Los Angeles and has locations across southern California—prioritizes patients' dignity and emotional

well-being. It provides access to support groups and other resources to help ease the anxiety and depression that often accompany a life-threatening or life-changing diagnosis. Engraved on a gate at its main hospital is a quote from Samuel Golter, a physician who largely shaped the institution: "There is no profit in curing the body if, in the process, we destroy the soul."

—Jennifer Leach English



BJT readers—who represent one of the highest-net-worth magazine audiences anywhere—clearly have the means to contribute to a better world. To help you do that, we spotlight deserving organizations in every issue. All of them have received a four-star overall rating from Charity Navigator (charitynavigator.org), which evaluates philanthropic institutions based on their finances, accountability, and transparency.



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Benjamin Franklin

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Tawaraya's Ultimate Ryokan

While many high-end hotels tout infinity pools, well-equipped gyms, and imposing reception areas, Kyoto, Japan's acclaimed Tawaraya has none of these things. Instead, this ryokan (a traditional Japanese inn) offers omotenashi, a style of hospitality that anticipates a guest's every need, and 18 serene, minimalist accommodations.

When I check into my semi-suite, I find it furnished with cushions and a low table for taking tea. When I return from my exploration of neighborhood boutiques, eateries, art shops, and sake bars, two custom-made futons crafted from natural silk floss have been prepared on the tatami mats to ensure a good night's sleep.

Tawaraya is widely considered Kyoto's best ryokan, with Hideaway Report rating it 96 out of 100 points and likening a stay here to travel back in time. In fact, the inn's roots go way back: it has perfected its artful hospitality over three centuries and 11 generations, serving nobles, entrepreneurs, scholars, and samurai before Japan opened to the West and it began welcoming such guests as filmmaker Alfred Hitchcock and current Swedish king Carl XVI.



The author's husband, Niklas Quarfö Nielson, enjoys a meal at Tawaraya.

GENMA Z. PRICE

Rooms at Tawaraya start at around \$450 per person per night (inclusive of tax and service and based on double occupancy), but it's not easy to get one: you can telephone (+81 75 211 5566) to inquire about availability, but you can make and confirm reservations only via fax. Yet the inn is typically always full.

Nevertheless, it's rare to meet another guest along its silent hallways; and even communal spaces such as the library and sitting areas are designed more for quiet introspection than socializing. Every guestroom faces

inwards and is fronted by expansive sliding glass doors that access private contemplation gardens where sunlight and shadow interplay over green leaves and moss-covered stones.

Typical of the ryokan experience, a stay includes an in-room kaiseki dinner—a meal that embodies the current moment in nature through dishes that are carefully balanced in terms of flavor, color, and texture.

It can run to 20 courses, but my dinner included five. Among the offerings: clear soup made with local river fish; small bites of tamago, shrimp, tofu, and Maki sushi; trout and grated daikon crowned with purple cicely flowers; and a plate of crab, raw squid,

and asparagus. Courses are timed so that I've only just put down my chopsticks and had a few moments to reflect before my room attendant reenters and kneels behind the paper shoji screen partitioning the room to carefully arrange the next dish.

You can request another in-room service as well as a geiko (the Kyoto word for geisha) to entertain you with songs, dances, and drinking games during dinner. Also available: an after-dinner massage on your futon, which I can recommend.

—Gemma Z. Price

Museum Watch

Penn Museum's \$102 Million Revamp

Philadelphia's Penn Museum, which chronicles 10,000 years of human history, is undergoing its largest transformation in 118 years. The \$102 million revamp of the facility, which was established in 1887, includes air conditioning of more than 30,000 square feet of galleries and public spaces and reinstallation of most of the signature galleries. As part of the renovation, the museum's 13-ton sphinx of Ramses II—the largest sphinx in the Western Hemisphere—is being moved to a new main entrance hall, which will open November 16.

The revamp includes a reimagined version of the museum's Mexico and Central America Gallery, which will showcase art and artifacts celebrating craftsmanship and culture as well as archeological excavations.

Also being reimagined are the Africa Galleries, which will highlight that continent's culture and include interpretive displays for visitors of all ages. Both of these projects will be unveiled November 16.

The revamp has been multi-phased so that many exhibits at the facility—formally known as the University of Pennsylvania Museum of Archeology and Anthropology—can remain open during construction. For instance, while the new Ancient Egypt and Nubia Galleries (set to debut in 2022) are being built, the museum will still showcase its Egyptian collection through a dynamic 6,000-square-foot exhibition that allows visitors to trace the journey of an artifact from excavation to storage and research.

—Margie Goldsmith



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Today's cars can drive you...crazy

Our columnist recalls a trip in an out-of-control rented auto and grumbles about complex dashboard technology.

by Joe Sharkey

A few years ago, after an all-night cross-country flight to California, I tumbled into my rental car at LAX and sped off, late for a business-travel conference.

As I headed out of the airport, I couldn't figure out how to turn off or even turn down the radio, which was blasting hip-hop music at belt-grinder volume. Meanwhile, the rear wipers were slapping away on a sunny day, and I had no idea how to stop them. On the 405 South, I was informed that my emergency blinkers were on when a car swerved up, horn honking, with the driver shouting angrily and waving. I stabbed anxiously at the dashboard display. The sunroof slid open.

This triggered a realization that, a great many decades after I first got a driver's license, I was no longer fully situationally adept at just hopping into a rental car, turning on the ignition, and driving

away with long-accumulated knowledge of how cars work. Confusion today mounts as complex car-automation technologies spread. Among these innovations are emergency-braking, pre-collision, and lane-departure-navigational systems, to name just a few. And there is no end to it all.

"For a great many drivers, 2019 will mark a revolution in driving on a scale never before seen," two scientists say in a recent report in the *Journal of Cognitive Engineering and Decision Making*.

"Until now, the need for drivers to know about how cars work has been minimal. The basic controls of the car [could] be quickly mastered," say the authors, Stephen M. Casner, a flight instructor and research psychologist at NASA, and Edwin L. Hutchins, a cognitive scientist at the University of California San Diego.

It's becoming more of a challenge for us drivers to quickly master the "mode complexities" of these

technologies in our own new-model cars—but the job is even tougher when the car we hop into is an unfamiliar model we acquired at a rental agency. "More challenging still is the situation in which drivers rent vehicles that contain this equipment... leaving them little time to inform themselves about how the car works," write Casner and Hutchins with some alarm.

The two researchers see some similarities to the mid-1970s and 1980s, when complex new aircraft technology "changed the task of flying the airplane in surprising and fundamental ways" and unexpected problems emerged as pilots interacted with what the industry began to call "automation surprises." In response, the aviation industry embarked on study and training programs to define and mitigate cognitive and other issues of situational awareness "to help pilots understand



their new role as team players in a new cockpit consisting of both humans and automation.”

The automotive world, argue Casner and Hutchins, needs to heed that precedent and devise better ways to educate drivers who buy or rent new cars with an enormous array of navigational and other systems that often differ from manufacturer to manufacturer. When renting vehicles, drivers routinely encounter “cars made by any number of manufacturers,” they point out.

The results of a survey presented in 2016 to a National Transportation Safety Board panel show that 40 percent of drivers of cars with advanced automation reported that “their vehicle reacted in a way that startled them or in a manner they did not expect,” Casner and Hutchins write.

Their focus was on the safety and navigational aspects of advanced driver-assistance automation, and on the need for manufacturers and car-rental

companies to provide more readily absorbable user information—especially as self-driving vehicles are poised to enter the market in coming years.

But as I encounter routinely in rental cars—and in my own 2019 Subaru Forrester, which came with eight user manuals—dashboard functions that once worked well with a good old knob, dial, or push button now are designed with display interfaces that can be infuriating and difficult to understand.

The technology columnist David Pogue agreed, in an article in *Scientific American* last spring titled “Automobile Dashboard Technology Is Simply Awful.”

Pessimistically, he wrote: “A good user interface (A) is easy to navigate, (B) puts frequently used controls front and center, (C) gives clear feedback as you make a change and (D) is apparently beyond the capabilities of today’s car companies.” **BJT**

I couldn’t see how to turn off the radio, which was blasting hip-hop.



Joe Sharkey

(jsharkey@bjtonline.com), the author of six books and a longtime **BJT** contributor, wrote a weekly business travel column for the *New York Times* for 16 years.

Squawk talk

Buying or selling an airplane? Here's a primer on what conditions qualify as "discrepancies," which ones typically get fixed, and who pays for the work.

by Jeff Wieand

The slang expression for a problem identified with an aircraft is "squawk," which my *American Heritage Dictionary* defines as "a loud screech," but also as a "complaint." Either or both will suit for many aircraft issues. The word used in polite society for airplane squawks, however, is "discrepancy," a word that figures prominently in Federal Aviation Administration regulations. Unfortunately, the FAA never explained the term, so I turned to my ancient copy of *Black's Law Dictionary*, which defines "discrepancy" as "a difference between two things which ought to be identical...a variance."

For an aircraft, this raises the question: variance from what? An obvious candidate is the type design, the FAA-approved blueprint, but that will account for only some of the discrepancies identified in shop visits. To this we could add variances from applicable FAA regulations and the aircraft's maintenance manual, which provides limits and tolerances for installed equipment and portions of the aircraft, like the leading edges. But this will still not account for many "discrepancies" that show up on lists provided by jet service centers.

Consider a few examples of discrepancies identified in recent pre-buy inspections (edited slightly so as to more closely approximate English): "several pen marks in the cabin, one on a seat and the rest on upper side-wall panels," "latch loose on left-hand galley drawer #2," and "veneer on forward lavatory partition ashtray is disbanding" (disbonding?). No type certificate problems here. Many "discrepancies," in other words, don't have anything to do with the aircraft's airworthiness and are characterized by service centers as "notes of condition," "action optional," "information only," and the like. Part of the reason

service centers call out pen marks and scratches on wood veneer is to try to avoid getting blamed for causing the blemishes. In sum, a "discrepancy" is really an issue the service center wants to draw attention to, not necessarily something that needs immediate attention or rectification.

Airworthy discrepancies, however, do require rectification, so a service center performing an inspection that discovers such discrepancies can't return the aircraft to its owner without qualification unless they are cured. This doesn't mean that the service center will actually identify on a discrepancy list which discrepancies it considers "airworthy"; some do, some don't. A good discrepancy list, however, not only identifies the discrepancy but also indicates what it varies from, such as "not in compliance with Section x of the aircraft maintenance manual," and may even indicate required actions and an estimated cost.

Discrepancy Armageddon is a typical occurrence during a pre-purchase evaluation. In a wholesale transaction, discrepancies can be the buyer's problem since the aircraft is generally sold "as is" with minimal due diligence. In a retail transaction,

on the other hand, the jet buyer will hire a service center to perform a pre-purchase evaluation of the aircraft and its records. As it proceeds with the work, the facility generates discrepancies, which it memorializes on one or more lists that it updates throughout the process.

The question is then: Who is supposed to pay to fix these things? A retail seller is likely obligated to deliver an airworthy aircraft, but the answer is complicated. First, as noted earlier, many discrepancies are merely notes of condition. Unless the buyer has negotiated one fabulous purchase agreement, the seller will not be on the hook for a scratch on wood veneer or a stain on a seat. On the other hand,



JOHN T. LEWIS

even though they're not obligated to do so, sellers sometimes take care of discrepancies like that just because they want to deliver an aircraft they're proud of, especially if the discrepancies are easy or inexpensive to address.

"Airworthy" discrepancies, though, can be difficult and costly to fix: windshields needing replacement, brakes that are worn to the bone, leading edges that are out of limits, extensive surface corrosion requiring the aircraft to be stripped, treated, and repainted...the list is endless. And don't think such things go unnoticed in a good pre-buy. The business of a service center is fixing airplanes, so when a jet comes in for a pre-buy, it's basically an invitation to keep the shop busy for a month or two—rather like inviting your dry cleaner over to tell you what needs cleaning in your closet.

Fearing overzealous maintenance technicians and costly squawks, some sellers try to put a cap in the purchase agreement on their financial exposure for fixing things: if the discrepancies they're on the hook for exceed a certain dollar amount, the buyer must either accept responsibility for the overage or terminate the deal. This can be a self-defeating strategy, of course, since the seller will likely have to fix those items for any retail buyer, but sellers often think they can address discrepancies cheaper themselves or at their favorite shop rather than at a service center perceived as holding the aircraft hostage in a pre-buy.

Any good aircraft purchase agreement will require the seller to repair equipment and systems that are not properly operational. This, of course, begs the question of what's proper—the same old issue, a discrepancy from what? The best standard is a variance from the manufacturer's stated limits and tolerances—if there are any. Lacking stated limits, common sense can often substitute. If you need a crowbar to pry open a drawer in the galley, it probably needs fixing.

Suppose the parties can't agree? The pre-buy service center is often made the arbiter of disputes, for lack of anyone better. But talk about a loud screech? Service center personnel, not famous for Solomonian wisdom, are loath to perform this role; it basically requires them to side with one client against another, and their work package includes neither the time nor the compensation for adjudicating disputes between buyer and seller. The idea often makes the most sense if the pre-buy is at the airframe manufacturer's facility, where it is easier to obtain authoritative advice.

That advice may also be needed when a disagreement arises not about whether to fix something but about how to fix it. When there are multiple options for correcting a squawk, the seller typically deploys two time-tested standards: what's cheapest and what's fastest. The buyer may be sympathetic with the latter, but not the former. There's often a right and a wrong way to do a repair, and you can guess which the cheapest usually is. Accordingly, the buyer is best served by a purchase agreement that rules out repairs resulting in non-standard inspections, FAA Form 337s (for major repairs and alterations), engineering dispositions, and the like. **BJT**



Jeff Wieand
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COURTESY ALLEN FARST PHOTOGRAPHY



The Rolling Stones' longtime keyboardist, a former member of the Allman Brothers Band, talks about his half-century musical career, his environmental work, and his frequent use of business jets.

CHUCK LEAVELL

by Margie Goldsmith

Chuck Leavell, the Rolling Stones' de facto musical director, has played keyboards for the group on records and on tour since 1982. Earlier, he was a member of the Allman Brothers Band (it's his piano solo you hear on their classic "Jessica") and a cofounder of the jazz-rock outfit Sea Level, which took its moniker from his first initial and surname.

Leavell has also performed or recorded with many other leading musicians, including Eric Clapton, Aretha Franklin, George Harrison, the Black Crowes, and Pink Floyd's David Gilmour. The latest of his six solo albums, last year's *Chuck Gets Big*, finds him backed by a 17-piece brass band and performing original songs alongside classics from the Stones, the Allman Brothers Band, and other artists. Leavell is as passionate about the environment as he is about music. He cofounded Mother Nature Network, an environmental news website that attracts more than 10 million monthly visitors; and he manages a 4,000-acre forestry plantation of southern yellow pine in Georgia, where he lives with his wife of 46 years, Rose Lane. His TV show, *America's Forests with Chuck Leavell*, features individuals who are passionate about preserving forest habitats. He has written three books on that subject (including one for children) as well as an autobiography, *Between Rock and a Home Place*.

We caught up with him in Chicago, where he was performing with the Stones on their 2019 North American tour.



COURTESY CHUCK LEAVELL/FILE

You credit your mother with teaching you something important about music.

My mom would say, “Chuck, what do you think a big storm would sound like [as music]?” Or, “What do you think it would sound like if you hit a home run on your baseball team?” Or, “What do you think it might sound like if you were mad at one of your friends?” It made me think of music much more in terms of feelings than of notes and chords.

When you were 13, you saw Ray Charles in concert. What impact did that have on you?

He was such a powerful performer with such a great voice and was such a great piano player. And he had a great band. I left that concert thinking there was only one career choice for me. If I could ever be in a band that moved people the way this band moved me, that would achieve my life’s goal.

The following year, you were in a band. What made you think you could be successful as a musician?

I had the passion for it. The other musicians were quite good, and we practiced three or four times a week, learning whatever records had come out that week so we could play them at our regular YMCA Friday night show. Then we were invited to be the band for a Saturday morning program modeled after *American Bandstand*. We were paid 50 bucks at the YMCA for four guys [to split] and 100 bucks for the TV program. It made us be disciplined at that young age to learn new music and to keep things fresh.

“When I was very young, my dad said, ‘You make your own luck.’ To me, that means learning how to be in the right place at the right time.”

At age 20 you were asked to join the Allman Brothers. How did that happen?

I’d moved to Macon, Georgia and did some recording in Muscle Shoals and heard about Capricorn Records. Then I was invited to play on Gregg Allman’s first solo record, *Laid Back*, and that led to the invitation to join the Allman Brothers Band.

After the Allmans broke up, you had some good years with Sea Level and other work, but I understand that you got to a point where you contemplated quitting music.

In 1981, I had a little trio and was playing small clubs, but the phone wasn’t ringing for session work and Capricorn Records had gone bankrupt, so my musical career was floundering. I came home frustrated one day and talked to my wife. I said, “Rosie, obviously music isn’t doing all that great right now, so maybe I should just focus on the land and learn more about forestry.” She listened patiently and said, “Well, that’s interesting, Chuck, but guess what? The Rolling Stones called you.” I thought she was pulling my leg, but she gave me the number. I called and within about 48 hours I was on a plane to do the audition.

And so you became their pianist as well as musical director.

Yes. That term “musical director” sort of evolved through these 37 years in part because I’ve always taken copious notes. There’s a tremendous body of work, and I’ve got two huge books of notes. That led me to being the go-to guy when we would review any particular song that we hadn’t done in a while. So I was given that title.

What artists have you most enjoyed working with?


Certainly, the biggest early break was the Allman Brothers Band—a huge boost to my career musically, financially, the travel, the exposure to large audiences, and the opportunity to record. And we had a really good run as Sea Level. But how can I not mention the Rolling Stones? It was just such an incredible opportunity when that phone call came and they put me to work in 1982.

In my career, one thing has led to another. The 1989 tour with the Rolling Stones with Eric Clapton as a special guest led to Eric inviting me to play with him, which I did for about two and a half years. The relationship with Eric led to the invitation to do George Harrison’s last tour. And in subsequent years, working for John Mayer on a couple of records, and then touring with David Gilmour.

How much of your career resulted from happenstance?

When I was very young, my dad said, “You make your own luck.” To me, that means learning how to be in the right place at

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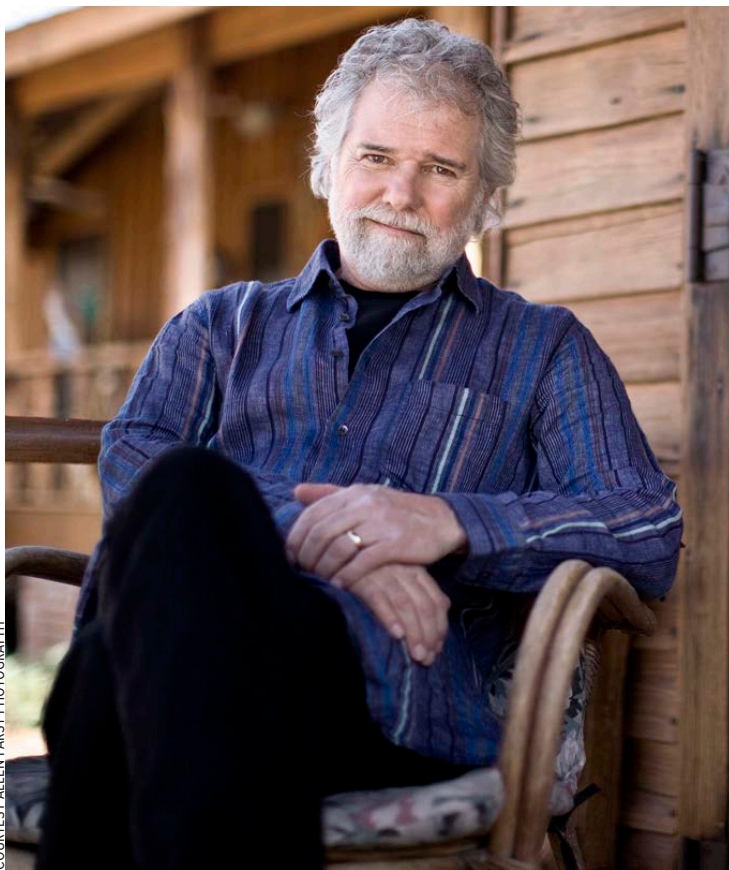
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FASTFACTS

- **NAME:** Charles ("Chuck") A. Leavell
- **BORN:** April 8, 1952 (age 67), Birmingham, Alabama
- **POSITION:** Pianist and musical director for the Rolling Stones since 1982
- **PREVIOUS POSITIONS:** Cofounder of jazz-rock ensemble Sea Level. Member of Allman Brothers Band. Keyboardist with many artists, including Eric Clapton, David Gilmour, John Mayer, and George Harrison.
- **EDUCATION:** Left high school midway through senior year to pursue music. Has honorary doctorates from Central Michigan University, Mercer University, Bowdoin College in Maine, and the Warnell School of Forest and Environmental Resources at the University of Georgia.
- **TRANSPORTATION:** Flies privately on tour with the Rolling Stones and other artists.
- **CHARITIES:** Has endowed the Chuck and Rose Lane Leavell Scholarship at the Warnell School of Forestry & Natural Resources at the University of Georgia. Contributes to Saint Jude Children's Research Hospital in Memphis, and Methodist Home for Children & Youth in Macon, Georgia.
- **PERSONAL:** Lives in Bullard, Georgia with Rose Lane Leavell, his wife since 1973. Two grown daughters: Amy, 44, and Ashley, 37. Three grandchildren and another on the way.

the right time. I've always tried to keep my ears and eyes open for opportunities. That advice has always served me well.

Which artists have been difficult to work with?

When I joined the Allman Brothers Band, it was not long after they'd lost Duane Allman to the motorcycle accident, so I came in during turbulent times. And there was more turbulence when the band temporarily broke up in 1976, which led to forming Sea Level. You sometimes go through difficult times with any artist. But you persevere.

What new acts are you listening to now?

St. Paul & the Broken Bones, a soul group from Birmingham, Alabama. They are absolutely fantastic.

What artists do you wish you could play with?

I've played with Bonnie Raitt a couple of times and if she rang me up to play on a record, I would jump at that. There are a couple of others, like Jackson Browne. I've never recorded with him, but I've always loved his music.

You're on tour with the Stones now. How is it?

Just getting back in front of the audience after having the postponement for a couple of months due to Mick's health issue was magical—interacting with the crowd, getting the train back on the tracks, so to speak.

Do you think that this Stones tour will be the last?

The band loves performing, and the passion and groove are still there. My gut feeling is no, it's not the last time.

You've seen a lot of changes in the music business during your long career. Where do you think it is headed?

Look, anybody can have a studio in their house or basement, or on their laptop, which means artists can make records on a label or self-release or just stream. It really crowds the field, and you have to go through a lot of weeding to find the good stuff. On the other side of the coin, it seems to me that most labels are only interested in a hit these days. Unless you're already very established, like a Madonna or U2 or Bruce Springsteen, it certainly is not like what it used to be. I think the labels overlook a lot of good artists because they'd rather take their chances on something that they think is going to be a hit, usually something that's not necessarily that artful.

I've been in the business a long time and never would have predicted that the computer and digital worlds would have had this big of an effect on how we create and release music. I guess you're [someday] going to have a brain implant that'll get you any song that anybody in the world can write.

How did your involvement with tree farming and conservation begin?

It started with my wife inheriting land in the 1980s from her grandmother. Her family have been stewards of the land for generations. I wanted to make sure that whatever we did going forward was going to be something that would be good for the land. That's how we got into forestry.



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Where does that marvelous thing that has given me such a great career and so much joy come from? It comes from the resource of wood. There's a direct connection between the instrument that I play and where it comes from. When I was performing with the Fabulous Thunderbirds, I did a correspondence course in forestry that really helped me gain some knowledge; then, I got into advocacy. Then came Mother Nature Network and my TV program, *America's Forests with Chuck Leavell*, for which we've completed three episodes.

What are your thoughts on climate-change initiatives and how they relate to your forestry conservation efforts?

We are experiencing a pretty drastic climate change throughout the planet and mankind is mostly responsible. I don't understand why those who deny it don't see the truth. We need to engage in policies that can make a difference and this administration doesn't seem interested in that. That's disturbing.

Do you ever get tired of touring?

It's what I've done since I was 17, so it's my life. I love travel. I love either going to new places or going back to places that I've been many times before and seeing some of the changes.

What's it like flying privately with the Stones?

My wife travels with me everywhere and flying private makes it easy for us. And you're with your family of band members. There are no distractions as you would encounter with the commercial airlines. And the service is amazing. You walk on the plane, and there's already a layout of food. Private flying certainly takes some of the strain out of travel.

Do you remember the first time you flew privately?

Yes. With the Allman Brothers Band, and we had what was then known as the Starship, which Led Zeppelin and Elton John also used. It had a bar with an organ built into the bar. It was pretty luxurious. At one point on a Stones tour in the 90s, we used the Sultan of Brunei's 747. It was one of the most luxurious airplanes I've ever been on.

How often are you now flying privately?

Probably 50 to 60 percent of the time, and with the Stones, always.

When you're flying with the Stones, does the band jam on board?

Not so much. It's usually, let's get from A to B. We have had some challenges. In Jakarta [Indonesia], the luggage truck ran into one of the engines and the charter operator said, "It's a four-engine plane, we'll be fine." We said, "No, we won't be fine." We abandoned that flight and had to cancel the show because of it.

Do the Stones own the airplane they fly?

No, it's always a charter. They're not interested in having to maintain their own plane.

Many rock stars' marriages don't last, but yours has endured for nearly half a century. Why do you think you've managed to make it work?

I think the adage is give and take, which you have to learn through the course of the marriage. Both of our parents stayed together till they passed away, so we had role models. I think those are the main ingredients. The sticktoitiveness, give and take, and sharing joy together. That's what Rosie and I do each and every day.

Any new projects?

I'd like to do another children's book oriented toward music. I've also got an idea for a gospel record to show how rock piano is evolved mainly from gospel. The title would be *The Gospel According to Chuck*. Also, recently, Rose Lane and I purchased another piece of land, which is in need of some restoration.

What has music done for you?

It's given me an incredible career. It has taught me how to communicate with people through music and the importance of that. And it's shown me how music can change people's lives, literally. It can make people fall in love. Music can change the world.

Margie Goldsmith

(mgoldsmith@bjtonline.com), a longtime **BJT** contributor, interviewed *Shark Tank*'s Robert Herjavec for our spring 2019 issue. This interview has been edited and condensed.



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A rift among brokers

New standards could make the business more ethical—or create an exclusionary market.

by James Wynbrandt



ADOBE STOCK

In a historic first, an industry stamp of approval for preowned aircraft brokers and brokerages has been adopted, with the initial group of applicants now qualified. “We’re really excited about where this is going,” says Brian Proctor, chairman of the sanctioning trade group, the International Aircraft Dealers Association. Proctor is also president and founder of the Mente Group, a consultancy and brokerage that is a charter IADA accredited dealership.

An accreditation process has long been called for by advocates of greater professionalism and ethical behavior in the unregulated aircraft brokerage business. But some industry champions of such goals say IADA’s initiative is dividing the brokerage community and creating a competitive advantage for an exclusionary group to the detriment of aircraft buyers and sellers.

The problem that standards seek to address is longstanding: with no licensing or certification requirements, no standard brokerage agreements,

and wingtip-to-wingtip multimillion-dollar deals, the field can draw unscrupulous and incompetent practitioners who harm both customers and the profession’s reputation.

Don’t expect Washington to come to the rescue. The Department of Transportation only last year published decades-in-the-making rules governing air charter brokers; and with sympathies for complaining business jet buyers and sellers likely low, the Federal Trade Commission doesn’t have preowned aircraft on its radar.



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IADA, formerly the three-decades-old National Aircraft Resale Association (NARA), has stepped in to fill the gap. Rebranded last year to reflect its members' and the industry's increasingly global scope, IADA retains NARA's code of ethics but also mandates that members pass a test to earn approval (accreditation for brokerages/dealerships, certification for brokers) and sign an oath to observe the ethics code, among other new requirements.

Since the rebranding, IADA has grown from some two dozen to more than 40 member firms, a cohort that handles about half of retail preowned transactions, though comprising just 3 percent of all brokerages, according to the trade group.

Clearly, IADA wants its approvals to become the industry standard for signifying quality and ethical behavior to buyers and sellers alike. But we spoke with several opponents of its code (all of whom requested anonymity, citing concerns including privacy and about being accused of sour grapes). Among the issues they noted is that IADA allows only large, high-volume brokerages to join, precluding many reputable and successful companies from earning its approval. IADA requires members to have a brick-and-mortar office infrastructure and at least three brokers on staff; it also requires that brokers conduct a minimum number of transactions per year (typically about 10), based on factors such as aircraft category and value. Some brokerages that would qualify resist joining (as they did with NARA) for reasons that include a lack of perceived benefit and a preference for independence.

In response to claims that IADA is exclusionary, Proctor says the organization was simply eager to take a bold step in advancing the cause of industry ethics, starting with its current members and similarly configured brokerages.

"We don't want to disenfranchise smaller firms," Proctor says, but he cites IADA's limited ability to process candidates and concerns about being "overwhelmed" by applications. He adds that the organization had "a lot of pushback internally" about the program. But, he emphasizes, "Twelve months ago, none of [the standards] existed. Today we have an accreditation program that's gone through one cycle. I think it's a little unfair to shoot bullets while we're trying to develop [the standards]."

To ensure that its broker and dealership certification tests are rigorous and objective, IADA selected Joseph Allen Aviation Consulting to create them, based on industry knowledge culled from the

organization's most experienced members. But it doesn't bolster IADA's inclusiveness assertions that the Joseph Allen website states its accreditation programs "create a competitive advantage in your market."

Among other changes accompanying the rebranding was creation of a web-based aircraft exchange listing platform on which all members must post their inventory (currently some 500 aircraft). The aircraft are listed market-wide, but IADA intends the site to become the industry's go-to source for preowned action, and members have access to data that is not available market-wide, Proctor says. The platform, he adds, is one element of the kind of value that IADA,

An accreditation process has long been called for by advocates of greater professionalism in the unregulated aircraft brokerage business.

like all trade groups today, must offer members.

IADA's international ambitions have also been questioned in the context of its intentions of raising ethical standards. Acknowledging that in parts of the world "kickbacks and referral fees"—both prohibited by IADA's code—"are normal" in pre-owned-aircraft transactions, Proctor says, "If you operate in places that can't be successful [without such tactics] and can't live according to the standards we created," then you shouldn't apply to join the group. "We're not going to change our ethics position; people will have to adapt," he adds.

The organization's makeover was born in the wake of the collapse of Singapore-based charter fleet owner/operator Zetta

Jet, which imploded amidst claims of malfeasance, including insider deals and kickbacks involving fleet transactions. IADA instituted a more aggressive approach to confronting allegations of member misconduct under its new regime (Proctor was named NARA president and CEO in late 2017), but its ability to police and enforce its code remains untested.

IADA aside, no industry institution has claimed interest in creating standards. The National Business Aviation Association's Certified Aviation Manager (CAM) program accredits flight department professionals, but small, noncommercial Part 91 operations are at the core of the NBAA's constituency; aircraft brokers and brokerages are not. Moreover, the CAM program has no code of ethics to enforce or requisite policing arm to ensure compliance. FBOs, meanwhile, have the National Air Transportation Association, which confronts lower-stakes ethical issues.

But a concerted effort was underway to develop brokerage standards by a loose coalition that included many NARA and non-NARA members; and many in the latter group feel IADA's approach has subverted those efforts for its own benefit.

Without making pledges, Proctor says IADA will likely revisit membership requirements, though "we don't know the timing," and the first change would "probably" be a downward revision in the minimum number of brokers.

"My request to the industry is give us a little more time," he adds. "If we step forward five years, I think the industry is a lot better off. In the short run, it's imperfect."

Whatever IADA's membership rules, "the goal is to get 200 to 250 brokers" in the group, Proctor says, which would consign the majority of professionals to operating without access to the industry-wide code of ethics and seal of approval the organization seeks to create.

For now, since IADA acknowledges that its limited resources and policies exclude many fine brokers and brokerages from its ranks, what's its advice to buyers and sellers considering working with any of the 1,200 non-affiliated entities?

"We aren't qualified to speak [about] non-IADA members," Proctor says. "We can only speak about those we do know."

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James Wynbrandt
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Learjet 40

It delivers midsize-cabin comfort at a light jet price.

by Mark Huber

The six- to seven-passenger Learjet 40 is basically a Learjet 45 with two feet lopped off the fuselage, two fewer cabin seats, and 100 gallons less fuel capacity. The idea behind both models was to offer the market medium-sized jet comfort and performance with light jet operating economics, and in that regard the airplanes deliver brilliantly.

The difference between the 40, which began to be delivered in 2004, and the 40XR, which came to market in 2005, are the latter's Honeywell TFE731-20AR engines, which were tweaked to reduce balanced field length at higher temperatures and offer improved time to climb and better high-speed cruise. Many 40s have been converted to 40XRs and those that have been have engines designated TFE731-BR.

Depending upon the mission, the engine upgrade can produce dramatic results. A 40XR will fly 936 nautical miles farther than a straight 40 and make the run from Jackson, Wyoming to Teterboro, New Jersey in just under four hours. For departures and arrivals at sea-level airports, the 40XR offers 177 nautical miles of extra range and an increased takeoff weight of 650 pounds. Used model 40s without the engine upgrade generally sell for around \$200,000

less than those that have it. Compared with the Citation Encore, the 40 provides 45 knots faster cruise speed and 200 nautical miles of additional range. The 40 is built to the more rigorous FAA Part 25 standards for larger business jets and must be flown with two pilots.

The 40 also has a bigger interior than competing aircraft. The flat-floor, oval-shaped passenger cabin measures 17 feet, 9 inches long and has a cross section of 4 feet 11 inches high by 5 feet, 1 inch wide. Overall cabin volume is 363 cubic feet—53 cubic feet more than on the Encore and 57 more than on the Hawker 400XP. The additional space makes it feel as if you're riding in a midsize rather than in a light jet.

A small closet and refreshment center are opposite the cabin door. The six slide/swivel individual reclining passenger seats are arranged in a forward club-four configuration and are followed by two forward-facing passenger seats. There is more passenger legroom on the 40 than on the larger model 45. Fold-out tables deploy from the cabin sidewalls and a large lavatory with sink, belted flushing potty, and 15-cubic-foot wardrobe is in the aft cabin. Internal and external baggage capacity totals 65 cubic feet, very respectable for a light jet. The air-

Learjet 40 at a Glance

Passengers/crew (typical)	6/2
Maximum takeoff weight	20,350 lb
Top cruise speed	465 ktas
Range*	1,631 nm
Cabin	Length: 17.7 ft
	Height: 4.9 ft
	Width: 5.1 ft
Baggage (internal/external)	15/50 cu ft

*Four passengers, IFR NBAA 200 nm reserve. Source: Conklin & de Decker

craft can be equipped with 12-inch forward and aft entertainment monitors.

A variety of upgrades are available for the Learjet 40 and 45, but given these airplanes’ price points, not many make economic sense. One that does is the conversion of the original Honeywell Primus 1000 glass panel avionics’ CRT displays to more modern, lighter, and more reliable LCD monitors. Several providers offer other avionics performance upgrades that will keep Model 40s compliant with new regulations.

A more modern version of the 40, the \$11 million (new) Learjet 70, was produced from 2013 to 2017, but aside from newer avionics and a restyled cabin, it’s basically the same airplane. For those who want the performance of the 40 with even more cabin space, Bombardier announced in July that it will begin deliveries of the \$9.9 million, six-seat Learjet 75 Liberty in 2020. But if you want Learjet performance with a comfortable cabin at an extremely reasonable price, a used Learjet 40 will keep you happy and save millions of dollars in the process, while Bombardier’s recommitment to business jets (*see sidebar*) should assuage any concerns you may have about future product support.

BJT

Mark Huber
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Why Used Learjet 40s Are Worth Considering Now

Most readers of the financial pages are acquainted with Bombardier’s disastrous attempt to challenge Airbus and Boeing for the single-aisle airliner market, which ended in Canadian government bailouts and a significant change in upper management. Bombardier began work on the C Series airliner in 2004 amidst visions of grandeur, only to plunge from the sky like Icarus, its stock price collapsing from more than \$7 in 2011 to 58 cents by 2016. Bombardier ended up ceding the C Series program to Airbus in 2018 much the same way one would dispose of Grandma’s avocado-green refrigerator—pushed to the curb with a prayer that someone takes it away.

Arguably, the C Series math was never going to work for Bombardier, as the program’s cost escalated past \$6 billion. Meanwhile, Boeing was developing the competitive 737Max line for just \$2 billion and Airbus rolled out the A320neo for slightly less. The difference in these numbers seems even more dramatic when you consider the size of the companies’ pockets: in 2018 Boeing and Airbus posted revenues of \$101 billion and \$72 billion, respectively, while Bombardier took in just \$16.2 billion. Between 2013 and 2017, also, Bombardier recorded annual losses in the billions.

To keep the ship afloat, the company cut the fat, then cut into the bone. More than 10,000 employees lost their jobs, and programs at the profitable business jet division were rolled back, shelved, or killed. This included flushing nearly \$1 billion on the canceled all-composite Learjet 85, which had been supposed to dethrone Cessna from its leadership position in the midsize-cabin bizjet market but instead it became an emblem for a dying Learjet brand. Support for older Learjets also suffered before improving in recent years, according to the annual product-support survey in our sister publication *Aviation International News*.

Product support isn’t the only thing getting better at Bombardier, which posted a modest profit in 2018 after years of crippling losses. Besides exiting the C Series quagmire, over the last year the company has also sold off its other commercial aircraft programs in order to better focus on its corporate jet business. Also, it has certified the world’s largest purpose-built business jet, the Global 7500; introduced three new bizjet derivative programs (Global 6500 and 5500 and Learjet 75 Liberty); and refreshed its popular Challenger 350 super-midsize twin.

Such achievements have yet to be reflected in used Learjet prices, which have taken a beating in recent years. So now is a great time to buy. A 2007 Learjet 40 currently fetches around \$1.9 million—about \$1 million less than a comparable Cessna Citation Encore+. In many ways the Learjet 40 is more capable.—M.H.



ADOBE STOCK

Charter's new world order

Seemingly overnight, three providers have revamped the aircraft-access landscape. Here's how the changes could affect you.

by James Wynbrandt

In the relative blink of an eye, a seismic shift has changed the map of the charter world, whose future is now being shaped by a trio of holding entities-cum-access providers: Directional Aviation Capital (DAC), Vista Global Holdings (VGH), and Wheels Up. Who are they, how did things change so quickly, and what does their emergence mean for you?

The three represent a new kind of provider that aims to use its subsidiaries to deliver a full range of solutions—including per-seat charter, corporate flight department-style lift, and owner-like access to the latest large-cabin jets. All three rely upon proprietary technology platforms to optimize operations and deliver real-time information. Their apparent ambition is to serve as a one-stop shop for business jet travelers—to have the capability and flexibility

to provide whatever you need for every flight at every time in your life.

You've likely heard these conglomerates' names before, but unless you've followed their recent developments, you may not have noted their aftershocks or the changes they herald.

Cleveland-based DAC, for example, was founded by chairman Kenn Ricci in 1981, but until this decade its OneSky division, which includes the Flexjet fractional-ownership program and

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jet-card provider Sentient Jet, didn't exist. Dubai, UAE-based VGH was launched only recently, in August 2018, by Thomas Flohr, founder and chairman of membership and on-demand charter operator VistaJet, to acquire companies to meet expected long-term global demand for private aircraft access.

Wheels Up, which debuted in 2013 with a "membership" model—charging a fee for pay-as-you-go access to an aircraft fleet—later added an in-house brokerage and per-seat offering to its benefits, but it seemed to have limited global ambitions until last May. That's when it purchased light jet charter fleet owner/operator Travel Management Company, aka TMC Jets. "Wheels Up is officially in deal mode," declared founder and CEO Kenny Dichter (creator of the NetJets Marquis Jet Card).

Meanwhile, VGH has added two U.S.-based companies to its portfolio—XOJet, noted owner/operator of a midsize/super-midsize jet fleet, and per-seat charter pioneer and charter app developer JetSmarter—and has promptly merged the two into XO, a "digital jet marketplace." And DAC's OneSky, for its part, has acquired U.K.-based charter broker and app developer PrivateFly, bolstering its online and mobile charter booking capabilities.

Such developments should soon result in service enhancements and perhaps lower prices. PrivateFly just introduced a \$29,000 one-way transcontinental fixed rate aboard Challenger 300s, a price made possible, CEO Adam Twidell says, by synergies with its new siblings. Flohr, explaining VGH's JetSmarter acquisition, says the latter's technology would be embedded throughout the group's companies, immediately improving catering, flight tracking, concierge, and other services.

Among the longer-term implications, if there's any broad future for per-seat charter, the VGH deal may have saved it, as ownership by Vista Global will provide some breathing room for the shared-cabin concept championed by JetSmarter, which faced financial and PR challenges at the time of its sale.

Not a customer of any of the new Big Three providers? You'll likely be affected in the long-term, anyway. Most charter flights involve companies that manage and operate aircraft—often dozens or even more than a hundred—on behalf of individual owners. Though many offer jet cards or other block-time arrangements in addition to on-demand charter, most of these providers admit they've been slow to push their technology forward, often noting that their customers prefer human contact, anyway. But with market competition rather than customer



MARK WAGNER

In the near future,
charter customers
could see service
enhancements and
lower prices.

preference driving the pace of adoption, expect it to accelerate, further pushed by the continuing entry of more tech-savvy customers into the charter arena.

A longer-term conundrum has yet to unfold: all three companies champion an asset-light, shared-economy model, based on the premise that there's no reason to own an aircraft when you can have access to the same asset without buying it. Indeed, if you wanted, say, Bombardier's popular new Global 7500, you'd have to wait a couple of years for one from the manufacturer versus a few months for access through VGH, whose deliveries of some 30 orders for the ultra-long-range jet are scheduled

to commence soon. (Alone among the three providers, DAC offers an ownership option through OneSky's Flexjet, which in May unveiled an innovative day-based fractional-ownership program for the Gulfstream G650.) But if the shared-economy trend truly does reduce the need to own, how will aircraft manufacturers stay in business and have the resources to develop platforms for tomorrow's charter customers?

For years, would-be disruptors have floated plans for converting excess fleet capacity into a more "democratized" charter market. That excess exists because owners are content to let jets sit idle, as Argus data on the higher utilization rates of aircraft in owned-and-operated versus managed fleets attests. But unused capacity begins to disappear in a shared economy. If the airframers sold only as many business jets as capacity demanded, could they stay in business? Or would the greater efficiency wrought by these brave new access models lead to an overcompensating increase in demand for room onboard?

In addition to DAC, VGH, and Wheels Up, a number of entities dotting the charter landscape have developed their own offerings with either the requisite underpinnings to expand their integrated operating models or the ability to deliver valuable additions to an acquisitive conglomerate, JetSuite, Jet Linx, and PlaneSense among them. As stand-alones or subsidiaries, such providers will likely continue to push charter's boundaries. And you can't discount the power of visionary leadership, as exemplified by the captains of DAC, VGH, and Wheels Up, in sparking innovations yet unveiled.

Indeed, don't be surprised to hear about access options that today seem hard to imagine or too good to be true. Should they materialize, remember one thing that never changes in the charter space: the need for due diligence. The Big Three have backing from investors with good reputations, plus histories of growth and additional signs of success. But like many other providers, they are all privately held, and their financial health is unknown. **BJT**



James Wynbrandt
(jwynbrandt@bjtonline.com), a multi-engine instrument-rated pilot and regular **BJT** contributor, has written for the *New York Times*, *Forbes*, and *Barron's*.



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Piper M600

This single-engine turboprop has a time-tested fuselage, modern avionics, pleasant flying qualities, and a bargain price tag.

by Mark Huber

Piper's M600 is ideal for an owner pilot transitioning out of a piston-engine-powered aircraft or for a corporate flight department needing short-hop or short-field supplemental lift.

In a little less than three years since the model's introduction, Piper Aircraft has delivered 99 of these single-engine, six-seat turboprops. The \$2.994 million airplane builds on Piper's M-series fuselage, which dates back to the company's piston-engine twin Navajo of the 1960s through 1980s and its now discontinued line of Cheyenne twin turboprops.

The M600 is one of three M series aircraft currently in production. (The others are the piston-powered M350, formerly known as the Malibu, and the M500 turboprop, formerly called the Meridian.) As the accountants would say, the fuselage is fully amortized, with development costs having been paid down back in the days when people smoked in airplanes.

No one is going to call the inside of this airplane voluminous: the cabin interiors for all M Class Pipers measure 12 feet, 4 inches long; 4 feet, 2 inches wide; and 3 feet, 11 inches tall. Take a peek behind the pilot and copilot to the club-four configuration of facing passenger seats. If Procrustes had had an airplane, this would be it. Yes, you could throw four people back there, but you'd probably be accused of inhumane treatment. (To be fair, the same knock applies to several other single-engine turboprops and light jets.) Not even the fresh, jet-like interior styling can compensate for going hip-to-hip, knee-to-knee with your fellow man.

For many missions, though, that's not an option: an M600 with a full bag of gas (270 gallons) has a sparse remaining available payload of just 422 pounds, barely enough for the pilot up front and one passenger and a small dog riding in the back. Still, on runs the length of Mackinac Island,



Michigan to Chicago (269 nautical miles) you could conceivably go seats full in an M600.

Compared with the M500, the M600 has a more modern-looking interior with upscale leather and convenience features, including cupholders, USB charging ports, and fold-out work tables. Entry is through an aft fuselage door that measures 46 by 24 inches. There is a small 20-cubic-foot baggage compartment behind the aft-most passenger seats that can hold 100 pounds.

Beginning in 2017, M600 buyers could opt for the “EXP” exterior and interior option, which offers more ways to customize the aircraft’s appearance. Options include multiple colors and stitching patterns for seats, embroidered or embossed logos, customized cockpit and threshold plates, custom ceiling bezels, leather-wrapped control yokes, new exterior-paint schemes, and luggage to match the scheme selected. The aircraft is also available with a new Hartzell, five-blade, swept-tip propeller that reduces cabin noise and vibration. Starting with serial number 81 in mid-2018, the M600 received additional upgrades, including a new fuel control unit that facilitates engine starting temperatures that are up to 100 degrees Fahrenheit cooler.

The other main differences between the M600 and M500 concern avionics, power, payload, range, speed, and, of course, price. For roughly an extra \$600,000, the M600 delivers the more feature-packed Garmin G3000 touchscreen-controlled avionics system with larger displays and a variety of capabilities to simplify single-pilot operations. It is the same system that is standard



in many light jets, as opposed to the more basic Garmin G1000 in the M500. Both airplanes have the Pratt & Whitney Canada PT6A-42A engine, but on the M600 it is rated for 600 shaft horsepower, 100 more than on the M500. While the M600 has a range of 1,658 nautical miles (no reserves), the M500, holding 90 fewer gallons of fuel, tops out at 1,000 nautical miles. Full-fuel payload in the M500 is just 315 pounds—basically you and your luggage. The extra horsepower and the redesigned wing make the M600 slightly faster at maximum cruise power, 274 knots compared with 260 in the M500.

The M600’s new wing—which is only a few inches longer than that on the M500—enables it to hold more fuel, and the fuel differential also accounts for the M600’s heftier maximum takeoff weight—6,000 pounds, 908 more than the M500’s takeoff weight. The new wing is also home to a wider-track main landing gear design that makes strong crosswinds—up to 17 knots—easier to navigate on the runway.

Surprisingly, the required takeoff distance difference between the two airplanes when fully loaded is less than 200 feet, but the M600 needs more than 500 feet of additional runway to stop. This is an airplane that can easily use runways shorter than 3,500 feet (sea level, standard temperature). The M600 does particularly well under high altitude/high temperature conditions like those encountered in places such as Telluride, Colorado (field elevation 9,078 feet). Fuel burns are about the same in both at cruise power—39 and 37 gallons per hour, respectively, on the M600 and M500, and both aircraft have an approved service ceiling of 30,000 feet.

The M600 comes with a solid five-year, 1,500-hour airframe warranty (seven years and 2,500 hours for the engine). Bryant Elliott, Piper’s senior product marketing manager, is not sure whether owners will keep the airplane that long, based on Piper’s experience with Meridian buyers, as many transition into jets or replace their Pipers with upgraded models. However, he acknowledges that M600 owners are typically flying their airplanes on much longer missions than M500/Meridian owners do.

Priced more than \$1 million below comparably equipped albeit somewhat faster single-engine turboprops such as the Daher TBM 940 and Pilatus PC-12 NG, the M600 has obvious market appeal, a time-tested fuselage, modern avionics, and pleasant flying qualities. You could spend more to get nearly the same performance from another aircraft. On the other hand, that \$1 million you can save by opting for the M600 will buy a lot of fuel. **BJT**

2019 Piper M600 at a Glance	
Base price	> \$2.994 million
Crew	1–2
Passengers	4–5
Maximum cruising speed	274 knots
Range	1,658 nm (no reserves)
Fuel capacity	270 gal
Maximum takeoff weight	6,000 lb
Takeoff distance	2,635 ft
Landing distance	2,659 ft
Engine	Pratt & Whitney Canada PT6A-42A, 600 shp
Avionics	Garmin G3000

Source: Piper

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On the pages that follow, you'll find **BJT**'s latest Book of Lists—our 8th annual collection of facts, opinions, and trivia about travel, aviation, dining, the arts, and more. Visit **BJTonline.com** for a version of this feature that includes links to related websites.

OF LISTS

8 Oldest European Restaurants

1. **Stiftskeller St. Peter (803)**, Salzburg, Austria. The oldest by several centuries, this establishment was built inside St. Peter Abbey.
2. **Zum Franziskaner (1421)**, Stockholm, Sweden. Built by the friars, it is popular because of its brewing techniques, which have been maintained since its opening.
3. **La Tour d'Argent (1582)**, Paris. Pressed duck is a specialty at this restaurant, which offers a view of the Seine.
4. **Zur Letzte Instanz (1621)**, Berlin. The restaurant has hosted Beethoven, Napoleon, and Angela Merkel.
5. **A La Petite Chaise (1680)**, Paris. Founded under the reign of Louis XIV, the restaurant, famous for its herring, salmon, and duck terrine, is a favorite eatery of artists, writers, and politicians.
6. **Botin Restaurant (1725)**, Madrid, Spain. Botin—where artist Francisco Goya worked—is known for its specialties, including eels, roast lamb, and roasted suckling pig.
7. **Tavares Rico (1784)**, Lisbon, Portugal. This iconic restaurant offers an exquisite menu of seafood, beef, pork, lamb, and duck.
8. **Rules Restaurant (1798)**, London. Guests here have included Charles Dickens, H.G. Wells, Clark Gable, and Charlie Chaplin.

—Marilyn Jones

3 Houses within Museums

1. **Muddy Waters's cabin.** The remains of his home during sharecropping days are in the Delta Blues Museum in Clarksdale, Mississippi.
2. **Maud Lewis's mini-house.** The Art Gallery of Nova Scotia in Halifax exhibits her 12-square-foot longtime home, every inch of which is covered with her artwork.
3. **Fallen Star.** This art installation at UC San Diego's Stuart Collection—a small furnished cottage created by Do Ho Suh—is perched at an angle off the roof of a building.

—Margie Goldsmith

6 Top American Rivers for Whitewater Kayaking

1. **Nantahala River**, North Carolina. This mountainous stream plunges down steep rapids and through rock gorges on U. S. Forest Service public land.
2. **Payette River**, Idaho. This crystal-clear 83-mile tributary to the Snake River is attractive to family groups and famous for ideal summer rafting and kayaking.
3. **Arkansas River**, Colorado. This classic Rocky Mountain river southwest of Denver offers more than 100 miles of thrilling descents broken by long, calm stretches.
4. **West Branch Penobscot River**, Maine. This steep 14-mile course studded with class III to V rapids is the most challenging in the Northeast.
5. **Gauley River**, West Virginia. When Summerville Dam opens each fall, experienced kayakers call the Gauley, with 100 major rapids, the “Beast of the East.”
6. **Tuolumne River**, California. This gorgeous river begins in the high Sierra in Yosemite National Park and flows through the Grand Canyon of the Tuolumne.

—Thomas R. Pero



10 Must-Try Northern Thailand Dishes

1. **Khao soi.** Northern Thailand's version of khao soi (which is made differently in neighboring Laos and Myanmar) is an addictive dish of soft egg noodles and (traditionally) chicken leg in a creamy yellow curry, garnished with a nest of deep-fried crispy noodles.
2. **Naam phrik ong.** This punchy dip of blended pork, tomatoes, chili, and fermented shrimp and soybeans is usually served with steamed veggies and sticky rice.
3. **Sai oua.** Unlike any sausage you've ever tasted, this street snack is packed with lemongrass, galangal, chili, and zingy kaffir lime leaves.
4. **Laab muu khua.** Originating from Thailand's northwestern Isaan province, this is a spicy "salad" of roughly chopped pork or chicken, mixed with lemongrass, chili, lime juice, fish sauce, dried spices, and cilantro.
5. **Gaang hang lay.** Usually made with slow-cooked melt-in-the-mouth pork belly, this fruity curry is loaded with ginger, tamarind, and turmeric but usually proves less spicy than better-known Thai curries.
6. **Miang kham.** Thailand's variation on tacos are betel leaf-wrapped bites of varying flavor, be they sweet, spicy, sour, or salty.
7. **Jin tup.** Beef that's really been put through its paces, jin tup is marinated, grilled, and then extensively tenderized before being served with a spicy dip.
8. **Kanom jeen nam ngiao.** This fresh and eclectic rice noodle dish traditionally consists of pig blood curd and pork balls in a light tomato broth, topped with bean sprouts and pork crackling.
9. **Gaang khanun.** Perhaps the least famous of all Thai curries, this is more of a hot-and-sour soup of pork chunks, unripe jackfruit, and cherry tomatoes.
10. **Khao kan jin.** This is a satisfying patty of minced pork, pork blood, and long-grain rice, steamed in a banana leaf and garnished with garlic oil.

—Crystal Reid



5 Top Texas Oil Museums

1. **East Texas Oil Museum,** Kilgore. Boomtown USA, a life-size diorama, chronicles the 1930s discovery of oil and how it changed the small towns of East Texas.
2. **Ocean Star Offshore Drilling Rig & Museum,** Galveston. A retired rig houses offshore drilling exhibits and illustrates life on a drilling rig.
3. **Permian Basin Petroleum Museum,** Midland. Combining science, education, and history, exhibits and interactive learning experiences examine the petroleum industry and its origins.
4. **Spindletop-Gladys City Boomtown Museum,** Beaumont. Early 20th century objects fill village buildings, offering a sense of what it was like to work and live here during the oil boom.
5. **Luling Oil Museum,** Luling. This museum conjures up life here during Central Texas's 1920s oil boom.

—Marilyn Jones



East Texas Oil Museum

13 Reasons to Visit Concord, Massachusetts

- 1. Author's Ridge.** Graves of Ralph Waldo Emerson, Henry David Thoreau, Louisa May Alcott, Nathaniel Hawthorne, and others.
- 2. The Wayside.** Hawthorne's last home.
- 3. Concord Center for the Visual Arts.** One of the oldest in the U.S.
- 4. Concord Museum.** Contains many historical artifacts and exhibits.
- 5. Daniel Chester French house.** Home of the famous sculptor.
- 6. Emerson House.** Emerson's home is a museum and National Historic Site.
- 7. Ephraim Bull House.** Where Concord grapes were originally cultivated.
- 8. North Bridge.** Where the American Revolution began.
- 9. October Farm.** Home of renowned ornithologist William Brewster.
- 10. Orchard House.** Alcott's family home, where she wrote *Little Women*.
- 11. The Old Manse.** The Hawthornes moved in on their wedding day.
- 12. Robbins House.** Home of former slave Caesar Robbins.
- 13. Walden Pond.** Where Thoreau built a cabin.

—Jeff Wieand



Actors portray Sophia and Nathaniel Hawthorne at his last home.

9 Places to Sleep in Luxury under the Stars

- 1. SkyLodge Adventure Suites,** Cuzco, Peru. Climb 400 feet or hike an intrepid trail to transparent capsules that hang from a cliff at the top of a 1,200-foot mountain, offering a vast view into Sacred Valley.
- 2. Linkwasha Camp, Hwange National Park,** Zimbabwe. Sleep in a sumptuous bed on a wooden platform in the African bush. It's alongside a pan where elephants drink through the night.
- 3. Bangkok Tree House,** Bangkok, Thailand. With a mangrove forest for walls, the "View with a Room" at Bangkok Tree House offers a tranquil night under the stars in one of Asia's busiest cities.
- 4. Finn Lough Resort,** Northern Ireland. Tucked into a forest beside a lake, the bubble domes at Finn Lough allow for cozy views of the night skies even when it's chilly outside.
- 5. Skyscape, Omahau Hill Station,** Twizel, New Zealand. The glass roof and walls at Skyscape reveal your closest—and farthest—neighbors: tufts of native scrub bushes on the grassy plains and distant hills of Mackenzie Country.
- 6. Tinyeleti Treehouse, Lion Sands Game Reserve,** South Africa. This romantic open-air "treehouse," alongside the Sabie River, is like a luxurious hotel room—minus walls and a roof.
- 7. Soneva Jani,** Maldives. Private villas, built on stilts over an impossibly turquoise lagoon, offer daytime views of the reefs below; at night, the villas' roofs slide open to reveal a universe of stars.
- 8. Suite, L'Albereta,** Erbusco, Italy. At the touch of a button, the roof over the four-poster bed in this boutique hotel suite slides back to reveal starry, starry nights.
- 9. Doro Nawas Camp,** Damaraland, Namibia. Suites are snuggled around a rocky outcrop in the dramatic and rugged Damaraland, one of the best areas in the world for stargazing.

—Narina Exelby

3 Western Craft Beer Trails Worth Following

- 1. The Bend Ale Trail,** Oregon. This trail, in the state's high sagebrush plateau, is the largest in the West, claim the 18 breweries on its path.
- 2. Denver Microbrew Tour,** Colorado. Right in the heart of the Mile-High City are tap rooms that would have had old-time miners lining up to wet their whistles.
- 3. Northern California.** Start at San Francisco's Anchor Brewing Company, the state's granddaddy of craft beer, and 21st Amendment Brewery and Cellarmaker Brewing Company, then head north across the Golden Gate to Lagunitas Brewing in Petaluma; Bear Republic Brewing in Healdsburg; and Russian River Brewing and Third Street Aleworks, both in Santa Rosa.

—Thomas R. Pero

7 Scenic Places to Take Biplane Rides in the U.S.

- 1. Kauai, Hawaii.** Fly over the sacred Na Pali coastline, the Hanakapi'ai Valley with its cascading 3,000-foot waterfall, and the Kilauea River leading to the lush Hanalei Valley.
- 2. Martha's Vineyard, Massachusetts.** Look down on Chappaquiddick Island, Oak Bluffs, Edgartown, and Vineyard Haven.
- 3. Sevierville, Tennessee.** Take to the air over Great Smoky Mountain National Park, Dollywood, Pigeon Forge, and the city of Sevierville.
- 4. St. Augustine, Florida.** Fly over America's oldest city and get a bird's-eye view of historic fort Castillo San Marcos, St. Augustine Lighthouse, and the Intracoastal Waterway.
- 5. Southern Utah:** Soar over the Red Cliffs surrounding Kanab in a 1935-design red and white Waco biplane.
- 6. Mesa, Arizona.** Soak up the sands of the Sonoran Desert in a historic N2S Stearman open-cockpit biplane.
- 7. Seattle.** Buzz the Space Needle, Ballard Bridge, Gasworks, and Puget Sound.

—Debi Lander



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13 Historic U.S. Forts Worth a Visit

1. **Bent's Old Fort**, La Junta, Colorado.
Reconstruction of the 1840s trading post.
2. **Castillo de San Marcos**, St. Augustine, Florida.
Famous Spanish 17th century fort.
3. **Fort DeRussy**, Marksville, Louisiana. Site of a Civil War battle.
4. **Fort Fisher**, near Wilmington, North Carolina.
Site of 1865 battles; partly washed away.
5. **Fort McHenry**, Baltimore. Birthplace of the national anthem.
6. **Fort Morgan**, near Mobile, Alabama.
Take the ferry from Fort Gaines.
7. **Fort Phil Kearny**, Banner, Wyoming.
Indian Wars site on the Bozeman Trail.
8. **Fort Pulaski**, near Savannah, Georgia.
The walls are still full of cannonball holes.
9. **Fort Scott**, Fort Scott, Kansas. Important Western and Civil War fort.
10. **Fort Smith**, Fort Smith, Arkansas.
On the Native American "Trail of Tears."
11. **Fort Sumter**, Charleston, South Carolina. Worth it for the boat ride.
12. **Fort Ticonderoga**, Ticonderoga, New York.
Important colonial and Revolutionary War site.
13. **Fort Union**, Mora County, New Mexico.
Beautiful spot on the Santa Fe trail.

—Jeff Wieand

10 Places to Feel Small

1. **Utila**, Honduras. Swim alongside whale sharks, the largest fish in the ocean, which are found year-round off the coast here.
2. **Monument Valley**, on the Arizona/Utah border. Stand at the base of a 1,000-foot-high butte in this vast valley on the Colorado Plateau.
3. **Avenue of Baobabs**, western Madagascar. The road winds through trees towering nearly 100 feet high, some of which have trunks with a circumference of more than 145 feet.
4. **Namibia**. Camp out in the flat, 1,900-square-mile Etosha salt pan.
5. **Wat Phra Dhammakaya**, near Bangkok, Thailand. Known as the Temple of a Million Buddhas, it covers almost 1,000 acres.
6. **Rub' Al Khali (the Empty Quarter)**, Oman. At 250,000 square miles, it's the world's largest sand sea.
7. **Moab Giants**, Moab, Utah. Life-size models of dinosaurs "roam" the landscape.
8. **Perito Moreno Glacier**, near El Calafate, Argentina. Take a boat ride to the foot of the three-mile-wide glacier, whose mouth is about 250 feet high.
9. **Tanzania and Kenya**. Watch as more than two million wildebeest move between the plains of Serengeti and the Masai Mara during the nearly 2,000-mile Great Migration.
10. **Shanghai Tower**, Shanghai. Enjoy the view from a 118th floor sightseeing deck, the world's highest at 1,840 feet.

—Narina Exelby



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8 Pilots Who Led the Way

1. **Raymonde de Laroche.** In 1910, she became the world's first licensed female pilot.
2. **Bessie Coleman.** The first woman of African-American descent and the first of Native American descent to hold a pilot's license, "Queen Bess" earned her wings in 1921 and became famous for her loop-the-loops.
3. **William P. MacCracken, Jr.** In 1927, he received the first pilot license issued by a civilian branch of the U.S. government after Orville Wright turned down the honor.
4. **Eleanor Zabel Willhite.** This lively barnstormer and commercial pilot, who in 1928 became the first deaf woman to earn a license to fly, was also South Dakota's first female pilot.
5. **Dwight Eisenhower.** He learned to fly while stationed in the Philippines and, in 1939, became the first U.S. president to be a licensed pilot.
6. **Steve Fossett.** He completed the first solo round-the-world flight without refueling in 2005—just three years after he became the first person to circumnavigate the globe solo in a hot-air balloon.
7. **Miles Hilton-Barber.** In 2007, he became the first blind pilot to make a microlight flight from London to Sydney, Australia. Hilton-Barber used speech-output technology and sighted copilots to complete his 55-day journey.
8. **Jessica Cox.** The first licensed pilot to fly using only her feet, Cox, who was born without arms, passed her 2008 checkride in an Ercoupe 415C.

—Lauren Fitzpatrick

10 Eco-Friendly Luxury Resorts

1. **Grootbos Private Nature Reserve,** South Africa. The resort is on an eco-reserve of more than 6,000 acres overlooking the Atlantic Ocean near the Cape of Good Hope.
2. **El Silencio Lodge & Spa,** Costa Rica. The property takes an all-encompassing approach to energy conservation, water management, waste disposal, and recycling.
3. **Chaa Creek,** Belize. The resort's 400-acre nature reserve offers a wide range of activities, including birdwatching, hiking, canoeing, and horseback riding.
4. **El Nido Resorts,** Philippines. The resorts encompass a designated turtle sanctuary, marine reserve, and managed protected area.
5. **Viceroy Snowmass,** Aspen, Colorado. A member of LEED (Leadership in Energy and Environmental Design), the resort was awarded Gold Certification for its energy savings, recycling, and green housekeeping measures.
6. **Turtle Bay Resort,** Oahu, Hawaii. The North Shore's only full-service resort, which has its own green committee, employs 1,600 solar panels, and uses beach trash to make surfboards.
7. **Alto Atacama Desert Lodge & Spa,** Chile. The lodge reuses water for irrigation, heats swimming pools with solar energy, and has employed many other eco-friendly initiatives.

8. **Mara Expedition,** Kenya. This resort is operated by the Great Plains Conservation Group, which supports programs such as Rhinos without Borders, Ride for Lions, and Big Life Foundation.
9. **Parkroyal on Pickering,** Singapore. This hotel in a garden has received many awards for its conservation efforts, including World Travel Award's World's Leading Green City Hotel.
10. **Ramada Eco Beach Resort,** Australia. Seventy percent self-sustainable, the resort employs solar panels for each villa and reuses wastewater to irrigate the surrounding environment.

—Marilyn Jones

9 Hotel Suites with Eye-Popping Nightly Rates

1. **Royal Penthouse Suite, President Wilson Hotel (\$80,000),** Geneva. This 18,000-square-foot suite features 12 bedrooms, 12 marble bathrooms, one of the world's biggest TV screens, a Steinway grand piano, and a 1930 Brunswick billiard table.
2. **The Mark Penthouse, The Mark (\$75,000),** New York. This five-bedroom, four-fireplace, six-bathroom penthouse, designed by Jacques Grange, includes a conservatory, a library lounge, and a 2,500-square-foot rooftop terrace that overlooks Central Park.

3. **Penthouse Suite, Hôtel Martinez (\$51,000)**, Cannes, France. After mixing and mingling on Cannes's red carpet, relax in a 10,700-square-foot suite featuring Europe's largest private hotel terrace and relish the stunning sea view.
4. **Diamond Suite—Prince Rainier, Hôtel de Paris Monte-Carlo (\$50,724)**, Monaco. This nearly 9,000-square-foot suite on the French Riviera includes large terraces, a library, a study, spacious living and dining rooms, and a heated infinity pool.
5. **Grand Riad, Royal Mansour (\$43,480)**, Marrakesh, Morocco. Enjoy an opulent décor and stunning artworks in this four-bedroom suite, which occupies more than 19,000 square feet.
6. **Penthouse Suite, Faena Hotel (\$40,000)**, Miami. Stylish custom furnishings designed by Frank Pollaro and accentuated with extravagant gold-and-black elements help make this five-bedroom, two-level oceanfront penthouse ideal for entertaining.
7. **Sultan Suite, Ciragan Palace Kempinski (\$36,900)**, Istanbul, Turkey. Stay at the awe-inspiring ancient palace that harbors the Kempinski in a suite with Bosphorus views.
8. **Les Grands Appartements, Hôtel de Crillon (\$36,200)**, Paris. Splash in the two-ton Carrera marble bathtub before you doze off in a bed covered with exquisite French linen in one of two Les Grands Appartements designed by the late fashion icon Karl Lagerfeld.
9. **Royal Suite, The Plaza (\$30,000)**, New York. Overlooking Fifth Avenue, this suite features three bedrooms, en suite baths with 24-carat-gold-plated fixtures, a library, entertainment and fitness rooms, and a kitchen for guests who travel with a personal chef or wish to retain one for the duration of their stay.

Note: Prices are approximate and may vary depending on season, exchange rate, and other factors.

—Petra Loho

7 of China's Scariest Outdoor Attractions

1. **Fuxi Mountain Skywalk**, Henan province. Jutting out from the side of Fuxi Mountain, this horseshoe-shaped glass walkway sits nearly 1,200 terrifying feet above a lush green valley.
2. **Coiling Dragon Cliff Walk**, Hebei province. This circular glass walkway, which crowns the crest of Tianmen Mountain, is almost 5,000 feet long and 4,600 feet high.
3. **Haonyagu Glass Bridge**, Hebei province. Billed as the world's longest glass bridge, this 1,600-foot-long heart-stopper sways on its suspension cables as the brave traverse it.
4. **Shilinxia Viewing Platform**, Pinggu district (near Beijing). Stretching 11 meters farther into the abyss than the Grand Canyon Skywalk, this circular glass viewing platform reaches out more than 100 feet horizontally from a 1,300-foot-high mountain.
5. **Mount Huashan**, Shaanxi province. The five peaks that make up the Huashan Mountain Range are home to some of the most dangerous trails in the world, consisting of narrow splintering planks nailed onto the rock more than 6,500 feet from the ground.
6. **East Tiahang Glasswalk**, Hebei province. As if a glass-bottomed bridge nearly 3,900 feet up weren't scary enough, this unique attraction has been built to appear as if it's cracking as thrill-seekers walk across it.
7. **Tiger Leaping Gorge Sky Ladder**, Yunnan province. Visitors to Tiger Leaping Gorge have the time-saving but life-threatening option of climbing this vertical ladder of 170-odd rusting rungs, which are somewhat dubiously bolted onto the rock face, over a stomach-flipping drop of 12,434 feet.

—Crystal Reid

10 Places and Groups Offering Adventures with Animals

1. **Mountain Horse Farm**, Naples, New York. Pet and snuggle up to cows at this retreat in the Finger Lakes region.
2. **Juneau Dog Sled Discovery**, Juneau, Alaska. Learn to mush and take a one-mile dogsled ride.
3. **Falconry School**, County Mayo, Ireland. Wearing a special glove, teach a Harris hawk to land on your hand.
4. **Paragon Guides**, Vail, Colorado. Enjoy a half-day trek and picnic lunch with llamas.
5. **Living with Elephants Foundation**, Botswana. Meet the foundation's adopted elephants.
6. **Various tour groups**, Uganda. Come face to face with the last remaining gorillas in the wild.
7. **Ocean Quest Adventures**, Newfoundland and Labrador, Canada. Snorkel your way to an encounter with humpback whales in their largest summer gathering place.
8. **Chengdu Panda Base**, Chengdu, China. Nearly a hundred giant pandas live at this research center, which is open to the public.
9. **Classic City Clydesdales**, Bishop, Georgia. Take a one-hour trail ride on the back of a gentle Clydesdale.
10. **Omega Park**, Montebello, Canada. Watch wolves dinner feeding from a viewing platform, then spend the night in a log hut with panoramic glass windows that overlook their territory.

—Margie Goldsmith





5 Aircraft Featured in 'Airport 1975'

1. **Beech Baron.** Its pilot suffers a fatal heart attack, forcing it to descend into the path of a 747, killing the jumbo jet's copilot and flight engineer and incapacitating the captain.
2. **Boeing 747-100.** After it collides with the Baron, a flight attendant takes control of the aircraft.
3. **Cessna T-37.** The Air Force trainer is sent to survey damage to the 747, which has a large hole above the right seat in the flight deck.
4. **Learjet 23.** This company business jet shuttles experienced 747 pilot Alan Murdock and an executive to join the disabled aircraft's rescue attempt.
5. **Sikorsky HH53.** This twin-engine heavy-lift helicopter is pressed into service to lower Murdock into the 747's cockpit and assume control of the airplane.

—Jerry Siebenmark

6 of the World's Most Isolated Hotels

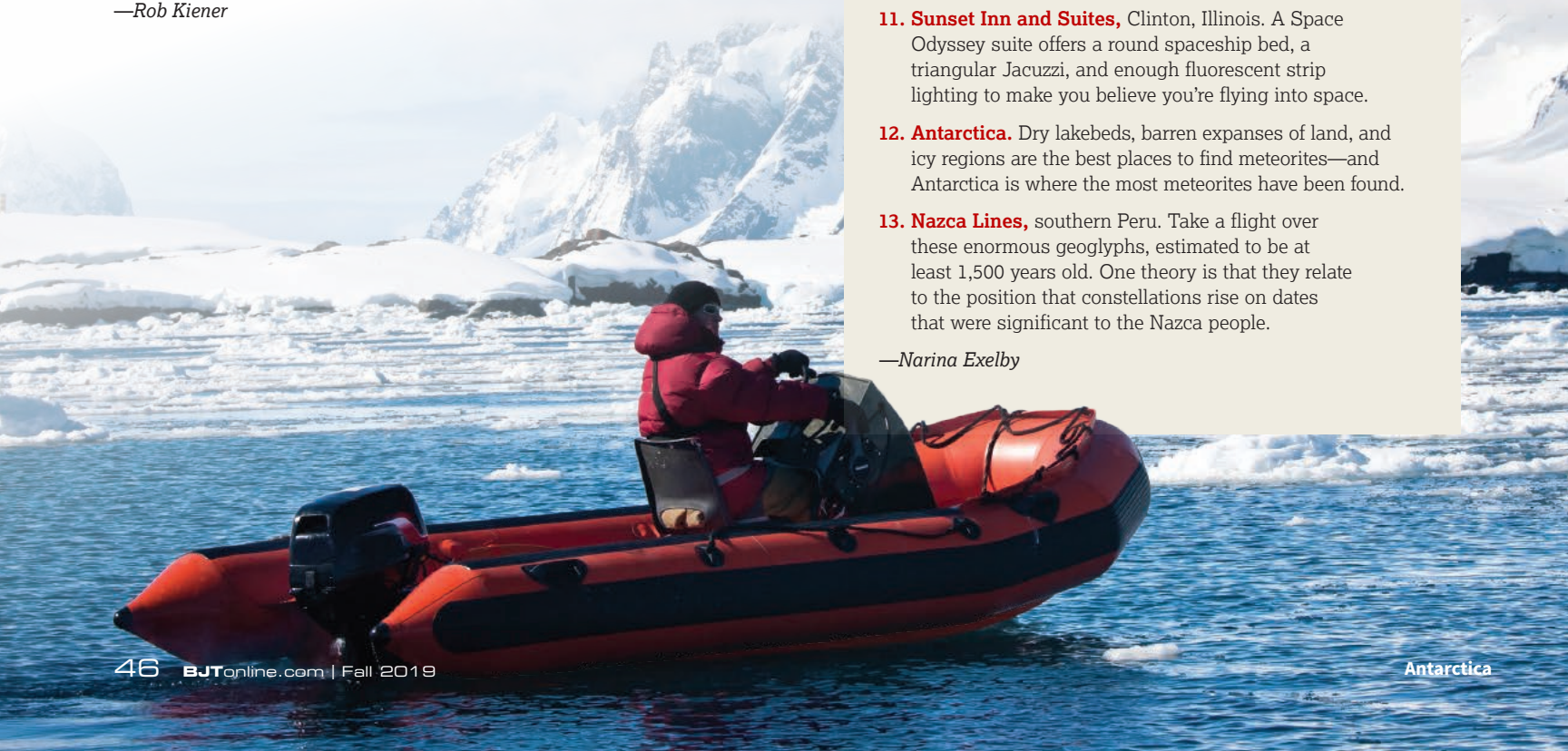
1. **Fogo Island Inn,** Newfoundland, Canada. Located on its own island (Fogo), which is off another island, it has 29 rooms, all with floor-to-ceiling views of the North Atlantic.
2. **Three Camel Lodge,** Mongolia. With rooms designed in the style of traditional nomadic tents, this is the only luxury eco lodge in the Gobi Desert.
3. **The Ice Hotel,** Jukkasjarvi, Sweden. At 124 miles north of the Arctic Circle, this hotel offers "warm" rooms as well as its world-famous "cold" rooms, which are carved completely out of ice and snow every year.
4. **White Desert Whichaway Camp,** Antarctica. It's hard to find more remote lodging than these chic well-heated sleeping pods at the bottom of the world, which are surrounded by penguins and ice.
5. **Qasr Al Sarab,** Abu Dhabi, United Arab Emirates. This hotel is located amidst the rolling dunes in Abu Dhabi's "Empty Quarter," the largest uninterrupted sand desert in the world.
6. **Constance Tsarabanjina,** Madagascar. Twenty-five luxurious villas with thatched roofs are the only lodging on a remote private island off the Madagascar coast.

—Rob Kiener

13 Places Where You Can Connect with the Universe

1. **Kennedy Space Center,** Merritt Island, Florida. At the Visitor Complex, you can meet an astronaut, sit in a shuttle that traveled in outer space, and train in a flight simulator.
2. **Alabama Space Science Exhibit Commission,** Huntsville, Alabama. Enroll in Space Camp, where multi-day programs for children and adults cover space-related themes such as robotics, aviation, and technology.
3. **Zero-G Experience,** various U.S. locations. Flying in a specially modified Boeing 727, you'll feel what it's like to exist without gravity.
4. **Disneyland,** Anaheim, California. At the new Galaxy's Edge, a 14-acre Star Wars-inspired theme area, you can live out your sci-fi dreams and pilot the Millennium Falcon into hyperspace.
5. **Delphi, Greece.** Wander through the archaeological site that ancient Greeks believed to be the center of the universe.
6. **Iceland.** Head off in a 4x4 to explore the Highlands, which scientists say closely resemble the geography on Mars.
7. **International UFO Museum and Research Center,** Roswell, New Mexico. Learn about the 1947 Roswell Incident and more.
8. **Wycliffe Well,** Australia. Keep an eye on the sky in this tiny northern town, known as one of the top UFO-spotting places on the planet.
9. **Pingualuit Crater,** Quebec, Canada. Hike the rim of this 1,300-foot-deep crater, now a lake, which was formed when a meteor crashed into earth about 1.4 million years ago.
10. **Center for the Study of Extraterrestrial Intelligence,** Joshua Tree, California. Experience a week-long training program for making contact with beings from other worlds.
11. **Sunset Inn and Suites,** Clinton, Illinois. A Space Odyssey suite offers a round spaceship bed, a triangular Jacuzzi, and enough fluorescent strip lighting to make you believe you're flying into space.
12. **Antarctica.** Dry lakebeds, barren expanses of land, and icy regions are the best places to find meteorites—and Antarctica is where the most meteorites have been found.
13. **Nazca Lines,** southern Peru. Take a flight over these enormous geoglyphs, estimated to be at least 1,500 years old. One theory is that they relate to the position that constellations rise on dates that were significant to the Nazca people.

—Narina Exelby



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7 Cities That Travel Writer Margie Goldsmith Loves

1. **Old Delhi, India.** Squeeze through the narrow alleyways of a bustling bazaar to buy everything from silk saris, handmade paper, and aromatherapy oils to a wide variety of freshly cooked food.
2. **Paro, Bhutan.** Home to a sacred Buddhist monastery, the Tiger's Nest, Paro is a place where you can walk past archers practicing in the fields, look up at golden spires, and listen to tinkling temple bells.
3. **Cartagena, Colombia.** A colorful coastal town within a walled city and a 500-year-old fortress, Cartagena boasts cobblestone streets, flower-covered balconies, and, at night, music in every small park.
4. **Buenos Aires, Argentina.** The city's oldest neighborhood features antique stores, art galleries, cafes, small restaurants, and (on Caminito Street) colorful tin houses. Tango is everywhere—even on the sidewalks.
5. **Kyoto, Japan.** In one of the world's gentlest cities, you can take part in a tea ceremony, eat delicious sushi, and walk through the Gion geisha district and the restorative Kyoto Cultural Forest.
6. **Sintra, Portugal.** This shoppers' paradise (antiques, porcelain, wine, jewelry) is also a UNESCO World Heritage Site with the must-see whimsical National Palace of Pena.
7. **Oaxaca, Mexico.** Southern Mexico's most diverse city, another World Heritage Site, offers excellent nearby archeological sites, temples, museums, charming markets, and delicious food, including famous Oaxacan chocolate.

—Margie Goldsmith



5 Kentucky Bourbon Distilleries Worth Touring

1. **Maker's Mark, Loretto.** Choose from five tours at this family-run operation, whose old-fashioned distillery is a National Historic Landmark.
2. **Woodford Reserve, Versailles.** This small-batch premium distillery was established by Elijah Pepper in 1812 and passed down to his son, Oscar.
3. **Jim Beam American Stillhouse, Clermont.** Tours and tastings are available at both Beam's older rural stillhouse in bluegrass country and urban stillhouse in Louisville.
4. **Wild Turkey, Lawrenceburg.** The hourly "From Barrel to Bottle" tour takes visitors through the distillery and historic rickhouse where the oak barrels age.
5. **Heaven Hill Springs Distillery, Bardstown.** Visit the instructive Bourbon Heritage Center in historic Bardstown near My Old Kentucky Home state park and campground.

—Thomas R. Pero



5 Websites for Vacationers with a Specific Focus

1. **onthesnow.com.** Pick resorts based on locations, weather conditions, ratings by skiers, and more.
2. **gaytravel.com.** A comprehensive listing of LGBTQ-friendly destinations, cruises, tours, and events.
3. **glutenfreetravelsite.com.** Thousands of hotels, restaurants, and vacation getaways, listed according to location.
4. **destinationdeluxe.com.** Luxury properties with wellness programs around the world.
5. **beeplushive.com.** A directory of properties that promote sustainable travel.

—Marilyn Jones

8 Dining Experiences for People Who Don't Fear Heights

1. **Dinner in the Sky,** locations around the world. Your 22-seat dining table dangles from a crane at 150 feet in the air for a thrilling gourmet meal with a view.
2. **Sirocco,** Bangkok, Thailand. The world's highest alfresco restaurant offers five-star dining on the 63rd floor of Lebua at State Tower.
3. **Marina Bay Sands Skypark,** Singapore. Choose from modern Asian, Italian, and American menu options at one of the three rooftop restaurants at Singapore's glitzy resort complex.
4. **Le Panoramic,** Chamonix, France. Ride a cable car to the summit of Le Brévent and savor foie gras on the open-air balcony with views of Mont-Blanc.
5. **Atmos Wine Bar,** Seattle. Head to the Space Needle and enjoy a cheese board on the 500-foot-high Loupe level, where you'll find the world's only revolving glass floor.
6. **At.mosphere,** Dubai, UAE. It takes a full minute in the elevator to reach the restaurant on level 122 of Burj Khalifa, the world's tallest building. At 1,450 feet high, At.mosphere holds the Guinness World Record for Highest Restaurant from Ground Level.
7. **Aerfun Paris Balloons,** Paris. Dine on a lavish three-course meal as you float above the French countryside.
8. **Revolving Restaurant Allalin,** Saas-Fee, Switzerland. Soak up 360-degree views of the Alps from 11,482 feet above sea level in the world's highest revolving restaurant.

—Lauren Fitzpatrick



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7 of the World's Most Amazing Libraries

1. **New York Public Library**, New York. Founded in 1895, the world's third-largest public library shows precious collections of over 53 million items to more than 18 million visitors per year.
2. **Melk Monastery Library**, Melk, Austria. This 18th century, baroque-styled library features stunning frescoes and guards a world-famous collection of musical and medieval manuscripts.
3. **St. Catherine's Monastery Library**, St. Catherine, Egypt. Lying at the foot of Mount Sinai and dating back to the sixth century, this is one of the oldest libraries in the world. It preserves the second-largest collection of early manuscripts.
4. **Rampur Raza Library**, Rampur, India. Once part of a palace, this library looks after the oldest handwork pieces of Arabic calligraphy, including the seventh century Quran written on parchment in early Kufic script.
5. **Tianjin Binhai Library**, near Beijing. This futuristic five-level library, set in a 360,000-square-foot cultural center, features terraced bookshelves and holds 1.2 million volumes. One curiosity: many of the shelves are lined not with real books but simply with printed images of their spines.
6. **State Library of Victoria**, Melbourne, Australia. The centerpiece here is the LaTrobe Reading Room, a soaring octagonal space with the capacity to accommodate more than 500 readers. Founded in 1854, the library houses the folios of Captain James Cook and superb collections of books about chess and art.

7. **The Library of the San Francisco Monastery**, Lima, Peru. Built in the early 17th century, this is one of the oldest extant libraries in the Americas. Some of its more than 25,000 rare texts predate the country's conquest by the Spanish.

—Petra Loho

5 of the World's Most Expensive Restaurants

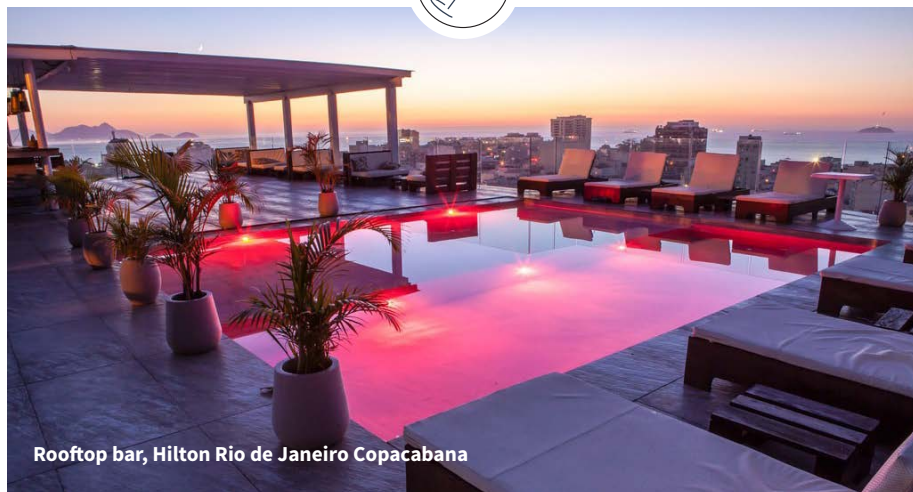
1. **Sublimotion (about \$2,000 per person)**, Ibiza, Spain. A Michelin two-star chef, a multifaceted laser light show, and up to 20 delicious courses make this worth every cent, say satisfied diners. A bonus: the entry tickets are edible!
2. **Ultraviolet (about \$875 per person)**, Shanghai. Twenty (always changing) courses prepared by chef Paul Pairet are offered to just 10 guests nightly at this immersive avant-garde, one-table restaurant.
3. **Per Se (about \$685 per person)**, New York. This Columbus Circle eatery is chef Thomas Keller's second Michelin three-star restaurant.
4. **Masa (about \$595 per person)**, New York. Simple, traditional, and seasonal sum up the offerings at this award-winning 26-seat sushi restaurant headed up by chef Masayoshi Takayama.
5. **Restaurant Le Meurice (about \$450 per person)**, Paris. Located within one of Paris's most iconic hotels, this Michelin two-star establishment lives up to its elegant surroundings with food created by chef Alain Ducasse.

—Rob Kiener

14 Memorable Rooftop Bars

1. **The Flute a Perrier Jouet Bar**, the Dome at Lebua, Bangkok, Thailand. Sip champagne under the stars at this 64th floor stunner, one of more than half a dozen rooftop bars at the Dome at Lebua.
2. **Agra, Alila Solo hotel**, Central Java, Indonesia. A rooftop lounge and bar offers 270-degree city views.
3. **Lido, Alila Bangsar hotel**, Bangsar, Malaysia. Enjoy 360-degree vistas of Kuala Lumpur.
4. **Charmaine's, Proper hotel**, San Francisco. Get an up-close look at the light installation by artist Jim Campbell that sits atop Salesforce Tower.
5. **Ginkgo Restaurant and Sky Bar**, VP Plaza Espana Design hotel, Madrid. On the hotel's 12th floor, with 360-degree views, palms, and tropical foliage.
6. **Cerise, Virgin Hotels Chicago**. It's 26 stories up and offers day parties, salsa nights, and even drunk yoga.
7. **Three Sixty Rooftop Bar**, Hilton St. Louis. Sweeping views of downtown, the Gateway Arch, and the mighty Mississippi River.
8. **Octave Rooftop Lounge & Bar**, Bangkok Marriott Hotel Sukhumvit, Bangkok, Thailand. A sizzling bar scene, plus 360-degree city views.
9. **The Aviary**, Perth, Australia. This iconic open-air bar is in the heart of the city but feels far away.
10. **Flair Rooftop Restaurant & Bar**, Shanghai. Watch spectacular sunsets and enjoy sushi and tapas-style dishes.
11. **Rooftop bar**, Hilton Rio de Janeiro Copacabana. Views of Copacabana Beach, Christ the Redeemer, and more.
12. **The Rooftop by JG**, Waldorf Astoria Beverly Hills. It doesn't get more L.A. than this garden setting, which offers Hollywood views.
13. **Ozone**, Ritz-Carlton Hong Kong. The highest rooftop bar in the world (118th floor) features wild architecture.
14. **54thirty**, Le Méridien Denver Downtown. The name of the Mile-High City's highest open-air seasonal rooftop bar indicates its height in feet above sea level.

—Margie Goldsmith



Rooftop bar, Hilton Rio de Janeiro Copacabana

10 Great Places to Stargaze

All of these locations have been designated as International Dark-Sky Places by the International Dark-Sky Association, which works to protect night skies from light pollution.

1. **Cedar Breaks National Monument**, Cedar City, Utah. This park offers telescopes and ranger-led, laser-guided tours.
2. **Central Idaho Dark Sky Reserve**, central Idaho. America's first International Dark Sky Reserve has Gold Star status—the highest ranking for night-sky quality.
3. **Mayland Earth to Sky Park**, Burnsville, North Carolina. This park in the Blue Ridge Mountains boasts a well-equipped observatory.
4. **Aoraki Mackenzie/Mount Cook National Park**, New Zealand. You can see the Southern Cross constellation here.
5. **Pitcairn Islands**. One of the most secluded places on earth, this is the only island group to be named an International Dark Sky Sanctuary.
6. **Grand Canyon National Park**, Grand Canyon, Arizona. The state also has more than half a dozen other designated dark-sky areas, including Flagstaff and Sedona.
7. **Big Bend National Park**, Alpine, Texas. This park is also notable as a protected area for nearly two thousand species of birds, mammals, reptiles, and plants.
8. **Galloway Forest Park**, southwest Scotland. This is the largest forested park in the U.K.
9. **Warrumbungle National Park**, South Wales, Australia. Warrumbungle offers crystal-clear night skies, low humidity, and high altitude.
10. **Dinosaur National Monument**, Dinosaur, Colorado. Before the sun sets and you start stargazing, check out the fossil remains of the dinosaurs that once roamed here.

—Margie Goldsmith



8 Beautiful Beaches That Aren't Made of White Sand

1. **Shell Beach**, western Australia. Visit the Shark Bay World Heritage area for a look at this gleaming white beach, made from billions of miniature shells.
2. **Crane Beach**, Barbados. Turquoise water, sheer cliffs, and crashing waves have made this pink sand beach a favorite with boogie-boarders and sightseers.
3. **Reynisfjara Beach**, Iceland. Travel 112 miles southeast from Reykjavik to marvel at the black sand and basalt columns, both formed from cooled lava.
4. **Pfeiffer Beach**, Big Sur, California. This astonishing purple beach owes its color—which is especially vivid after rain—to a concentration of garnet.
5. **Papakōlea Beach**, Big Island, Hawaii. The lava mineral olivine, also known as Hawaiian Diamond, gives the sand an unusual green hue.
6. **Porto Ferro Beach**, Sardinia, Italy. A mixture of orange limestone and volcanic deposits combine to create bright orange sand.
7. **Kokkini Beach**, Santorini, Greece. Sheltered by a towering rock wall, this red sand beach is photogenic, but beware of crowds and rockslides.
8. **Honomalino Bay**, Big Island, Hawaii. At first glance, the sand appears black, but it's actually a tasteful blend of black and white, resulting in one of Hawaii's salt-and-pepper beaches.

—Lauren Fitzpatrick

Reynisfjara Beach, Iceland

7 Aviation-Themed Restaurants

1. **Runway34**, Zurich, Switzerland. Eat in a hangar under a Russian propeller aircraft and watch airplanes take off from the Zurich airport.
2. **First Airlines**, Tokyo. Take a first-class international “flight,” minus takeoff, thanks to virtual-reality goggles, while enjoying gourmet “in-flight” meals.
3. **The Airplane Restaurant**, Colorado Springs, Colorado. A Boeing KC-97 tanker now refuels its passengers on the ground with menu items like the Flying Chicken Florentine.
4. **First Flight Island Restaurant & Brewery**, Key West, Florida. Grab a beer and a burger in the historic building where Pan Am Airways was born.
5. **Lily Airways**, Wuhan, China. A retired Boeing 737 was brought over from Indonesia, plunked in a shopping center, and converted into a fine-dining restaurant.
6. **The Proud Bird**, Los Angeles. Look for the P-40 Flying Tiger replica as you explore dishes from six kitchens offering Asian, Italian, and American cuisine in an aviation-focused food hall.
7. **Bomber Restaurant**, Ypsilanti, Michigan. Named for the B-24 bombers once manufactured nearby, this restaurant serves classic diner dishes with a generous side of WWII memorabilia.

—Lauren Fitzpatrick

5 Top Schools to Learn Fly Fishing

1. **Reel Women Fly-Fishing School**, Jackson Hole, Wyoming. Beginners get out on the spectacular Snake River with views of the Grand Tetons.
2. **Wulff Fly-Fishing School**, Livingston Manor, New York. Learn casting on ponds at the historic home of Joan and Lee Wulff, next to the Beaverkill River.
3. **Montana Women's Fly-Fishing School**, Bozeman and Big Sky, Montana. Wade right into the Gallatin, Madison, and Yellowstone rivers.

4. **Florida Keys Fly-Fishing School** at Florida Keys Outfitters, Islamorada, Florida. Features small classes taught by saltwater experts.

5. **Trout Unlimited Fly-Fishing School**, Traverse City, Michigan. Invites beginners to the delightful Boardman River flowing through the piney woods.

—Thomas R. Pero



Favorite Aircraft of (VIP) Flyers

In BJT interviews over the years, we've often asked our subjects what aircraft they own, fly, and love. Here are some of the answers they gave us.



MICHAEL SPAIN-SMITH

Paul Stanley
rock star (Kiss)

"If it's a few hours' flight, any of the Citation IIs or the variants that came after are terrific. But if it's my family, I've always been a fan of the Embraer Legacy...I'm happy with a Falcon 50...and you can't beat any of the Gulfstreams."



COURTESY OF DANA MECUM

Dana Mecum
auto auctioneer

"I've got a Citation Excel [but] I was on a customer's Falcon 7X a few weeks ago, and that was really nice. Maybe in three years or so I'd buy one."



ERIC WOLFGINGER

Alejandro Bulgheroni
Argentine businessman

"We have a Global 5000 and a Hawker 800. And two helicopters."



JILL RICHARDS

Larry Fitzgerald
Arizona Cardinals football player

"I love the Challenger 605 in terms of configuration and comfort and the look of it from the outside. But I think the [Citation] CJ3 is probably the most practical. I also love the Citation X. It's so fast. I mean, I was flying from New York back to Phoenix, and it was four hours and 10 minutes."



WILSON GROSSMAN

Brad Keselowski
stock-car race driver

"I liked [the Learjet 45] immediately. There's nothing about it that's extraordinary; it's just very well executed, and it has great performance in every category."



ESSDRAS SUAREZ

Mary Matalin
political consultant

"[Air Force One and Two] are the ultimate in terms of connectivity and comfort. But my family likes the total convenience and flexibility of private flying on smaller planes, where you can get into and out of where you want to go."





CAROL MOIR

Bruce Dickinson
rock star (Iron Maiden) and pilot

"The greatest benefit of traveling in a 747 is that because of its colossal size and freight capability we can carry our stage production and all our stage equipment in the cargo hold."



MANUELLO PAGANELLI

Robert Herjavec
tech entrepreneur and *Shark Tank* star

"[I own] a GIV. Prior to the Gulfstream, I had a Bombardier Challenger 601. That was a great plane, but it's hard to beat the windows on a Gulfstream."



AMY MUNDELL

Chester Weber
combined driving athlete

"It would be great to have a Gulfstream G650 because I travel to Europe so often. If I am going to New York or someplace like that, perhaps a Citation Excel would be appropriate."



CY CYR

Tony Robbins
motivational speaker

"I thought, 'This [Bombardier Global Express] is like flying in an apartment building.' [This aircraft] is one of the greatest gifts in my life."



BILL BERNSTEIN

Ernie Boch, Jr.
auto dealer

"[I own a] Citation Sovereign. When rumors of the newly developed Sovereign started, we said, 'Wow, it's almost the perfect plane for the Northeast.' The runway at the airport I go out of is about 4,000 feet so it can easily get in and out."



COURTESY OF ASHLEY LONGSHORE

Ashley Longshore
artist

"Heavy jets. I love the Citation X, but baby, get me on that G [Gulfstream]."



Favorite Aircraft of (VIP) Flyers

JEFF BERLIN



Bob Taylor and Kurt Listug
Taylor Guitars owners

"We needed the range, but also the [capable] cabin [of the G450]. And Gulfstream's support network is global, which was an important consideration."

BILL BERNSTEIN



Manfredi Lefebvre
executive chairman, Silversea Cruises

"Two years ago, we owned a Cessna Citation II, and we're buying another. It's good at landing at many airstrips, and it does the distances I need in Europe."

MANUELLO PAGANELLI



Erin Andrews
sportscaster

"[The King Air 350] is fabulous. You can do the lie-down bed, which is wonderful. There's wireless, which is huge for me because on Sundays I'm on the plane before *Sunday Night Football*, so I'm able to keep up with the game...The layout is wonderful, the Wi-Fi is huge. It's just a wonderful experience."

JOHN PAUL MITCHELL SYSTEMS



John Paul DeJoria
entrepreneur

"[I prefer a Gulfstream] GIV for great distances. [Mine is] probably the most beautiful GIV in the world—converted to a G450 inside with GV avionics. I have a Lear 60 for shorter flights. But the world invented an unbelievable jet and that's the Falcon 2000. It's now my everyday jet. [It's] a bit wider and taller than the GIV and fits 10 people comfortably. It has about the same speed as a GIV but uses half the fuel."

MICHAEL BARR



Bob Pittman
chairman/CEO, iHeart Media, and pilot

"I love the Falcons. I guess there is an argument for every plane, but I think as a pilot that the Falcon flies like a sports car. Incredible control, very manageable airplane, has a great feel to it, and it's very controllable on the ground. Almost no matter what happens—I have landed in all sorts of weather conditions: crosswinds, high altitude, hot and heavy—it handles beautifully. And having that third engine is great."

BILL BERNSTEIN



Chris Burch
entrepreneur and investor

"The GIV really is incredibly helpful—not for positioning, it's for comfort. I feel much happier in the plane when I fill it with people than when I fly it alone. It's really beautiful."

CHAD KEIG



Francis Ford Coppola
film director

"In California...I use the Socata TBM 850, a small, very fast plane that can take only four people but is perfect for frequent business trips from Napa to Los Angeles. I also own the Falcon 7X, which I use for long trips, whether I'm going to Italy or dealing with hotels or films or handling wine sales in Asia. It was intriguing because it was the first business jet to do fly-by-wire, and it has three engines."

COURTESY OF DAVID COPPERFIELD



David Copperfield
magician

"I like the [Bombardier] Challenger 300 and Challenger 604. We can fly from here [Las Vegas] to Georgetown [in the Bahamas] in four hours."

GEORGE PIMENTAL



Issy Sharp
Four Seasons founder

"[I like the] Challenger 604. Sometimes a Challenger 300 for short trips. I like the idea that it's Bombardier, and that plane has a great track record. Because it's part of their business I've always felt that they would never compromise on the plane. It's a very, very comfortable plane to fly and very safe."

CHAD SLATTERY



Frank Gehry
architect

"XoJet uses Challengers and has the Citation X, which I love."

BILL BERNSTEIN



Richard Branson
entrepreneur

"[I have] a Falcon 50EX. I need a small plane just to get out of the British Virgin Islands. And I use that for shorter distances."

BILL BERNSTEIN



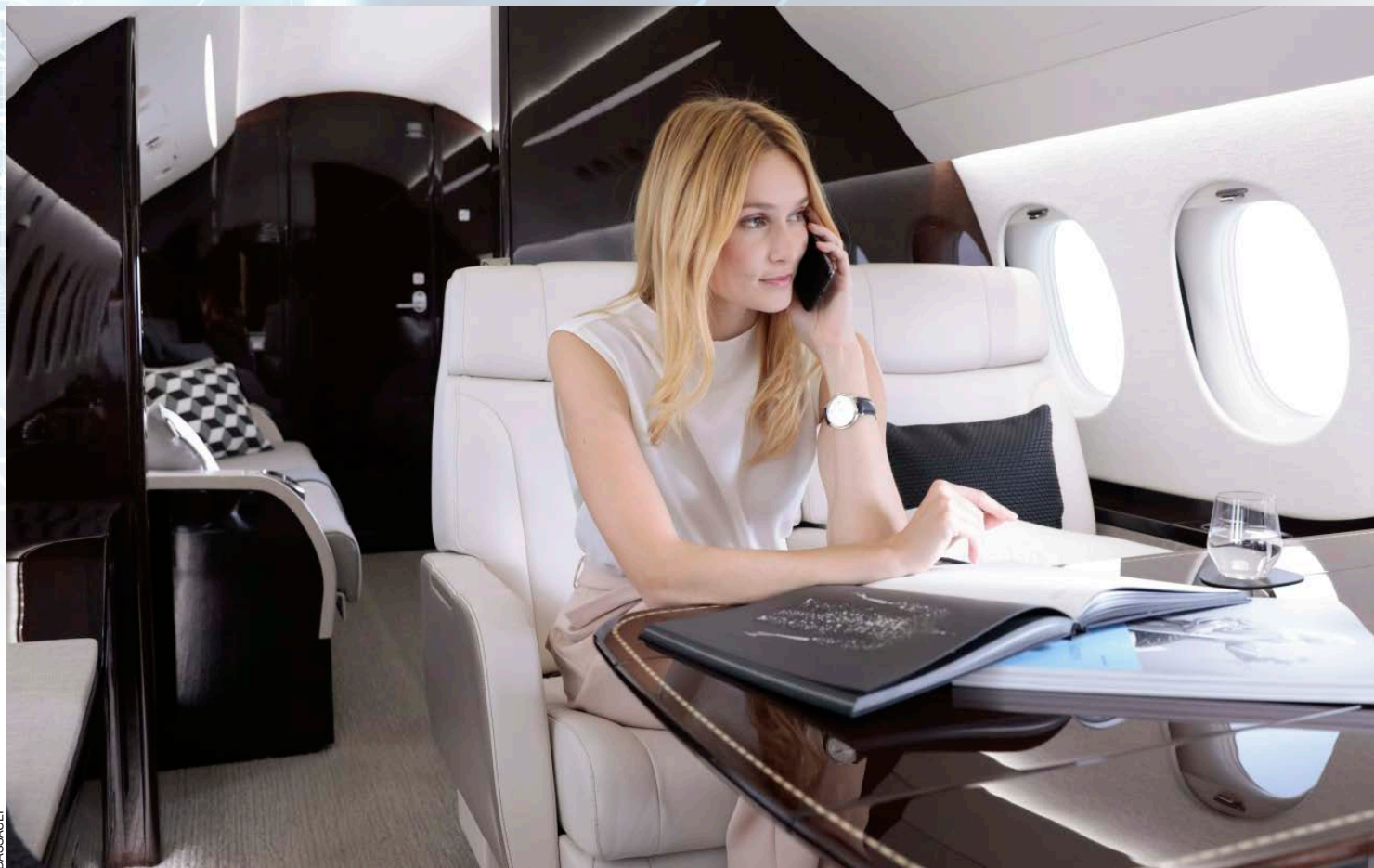
Herb Kohler
chairman/CEO, Kohler

"I have two Lear 45s, a Global Express XRS, and a Gulfstream GIV-SP. The Lear's are little workhorses, highly useful tools, and they're flying every day somewhere around the U.S."



Cabin Technology

It just keeps getting better



The latest products continue to improve connectivity, lighting, and in-flight entertainment.

by Amy Laboda

Business jet cabin technology has been advancing rapidly for years, and the progress shows no signs of slowing. Improvements in entertainment, airborne connectivity, and even onboard air and water quality are making your ride better than ever.

Consider, for example, cabin pressure altitude, which is critical for passenger health. At cabin altitudes higher than 8,000 feet, you can feel fatigued, dehydrated, and even ill from oxygen deprivation. Gulfstream's newest aircraft, the G600, can maintain a 4,850-foot cabin altitude at its maximum altitude of 51,000 feet, far above the weather and most traffic. The compressed air in the cabin, which is completely replenished every two minutes, reduces the effects of jet lag.

Outside air at the rarified altitudes where business jets fly is extremely dry—think Death Valley, California. The newest jets have humidification systems that further enhance health and comfort, and companies such as Panasonic Avionics now offer seat-integrated air-decontamination systems. The Panasonic Nanoe works by applying low voltage to moisture, which bursts into nano-sized electrostatic atomized particles.

Cabin lighting and video technology have improved, as well. Collins Aerospace won a 2019 Crystal Cabin award for its LED lighting, the ULED, which is a tough little multitasking unit. It has much longer life than a standard reading light and can be switched between a focused beam for reading and a

dome light that can be synchronized to other cabin lighting to match ambience, including brightness and color.

The company also plans to produce lighter and more flexible Secant micro LED panels. “These unique panels are millimeters thin, and can cover a bulkhead, ceiling, or even sidewalls of an aircraft, then be set to work in unison,” says Andrew Clegg, Collins’s director of business development, interiors, evacuation, water, and lighting solutions. Imagine a huge 4K video panel that can project calming scenes (perhaps of the destination) or the graphics needed to run a business meeting across a bulkhead wall. That’s on the horizon in about three years, according to Clegg. For those who don’t care for the experience of flying, the panels could be programmed to create the illusion of being somewhere else.

Airbus once prophesized that it would develop a fuselage that was all window by 2050. Collins Aerospace could make you feel that you’re inside such a fuselage a lot sooner.

“Ultimately, the whole fuselage could be paneled with Secant and there would be no need for windows,” says Clegg. “You could use external cameras to make the walls of the aircraft seem transparent.”

Bombardier has its own cabin-lighting innovation with its Soleil system, which it introduced this past May exclusively on its flagship Global 7500. When mated to the aircraft navigation system, Soleil can synchronize the outdoor lighting conditions of the departure and arrival points with the cabin lighting. During the flight, the system manages the red and blue light wavelengths to simulate a gradual, scientifically calculated transition between the two time zones. It warms tones for the sunset and evening, shutting down blue light and increasing passengers’ production of sleep hormones; then it simulates sunrise and morning light in sync with the destination, which turns on internal “wake up” hormones. The system can cue the crew to serve meals in line with the shifting time, and passengers arrive rested and ready to work with minimal jet lag.

Big strides
have been
made recently
regarding
connectivity.

Securing Onboard Networks

Securing all the data flowing to and from a business aircraft is essential. It takes a lot to stop aggressive and intelligent hackers and ransomware scammers, but two companies, RazorSecure in Europe, and Satcom Direct in North America, are on the case. Both companies secure mobile networks, but they go about it differently.

RazorSecure has grown from its principal business—securing public Wi-Fi and private networks carrying critical data on European trains—to securing aircraft with its proprietary monitoring and robust virtual private networking software. RazorSecure expects its cybersecurity intrusion-detection software to be available by year-end with an airborne wireless router made by U.S.-based VT Milptoe.

Satcom Direct uses its established SD Pro dashboard to monitor threats to private aircraft subscribers and can deliver a real-time, centralized, inflight view of the cabin network to flight departments and security experts. Any abnormal behavior is flagged, and potential threats are blocked before they can reach the digital devices in use on an aircraft.

If a compromised device is detected attempting to use the network, both RazorSecure and Satcom Direct’s services can block it from propagating the threat or “calling home” through a back door to hackers.

“About 80 to 90 percent of risk is in how hackers exploit the human factor,” says Michael Skou Christensen, vice president of Satcom Direct International.

Satcom Direct notes that hackers are going after passengers on business jets with rising frequency. In the first quarter of 2019, the company logged a 54 percent increase from the same quarter in the previous year in serious threats to the 600 aircraft that subscribe to its threat-monitoring service. These threats are often from sophisticated, well-known hackers, some of whom are hired by nation states or criminal entities that hope to create chaos or target specific VIPs. —AL

Gulfstream’s G600 can maintain a 4,850-foot cabin altitude at its maximum flying altitude.





Bombardier's Soleil system can simulate a gradual transition between lighting conditions at departure and arrival points.

"We call it dynamic daylight simulation," says Tim Fagan, manager of industrial design for business aircraft at Bombardier. "It employs different wavelengths of light that you'd experience throughout the day. Of course, if you're having a working session, you can use slightly bluer shades of white to illuminate the session. If you're relaxing—watching a movie or reading or just chilling out—you might want to shade a little bit towards those warmer tones. It's a powerful system, not only for long flights, but even for flights of two or three hours that might include a work session or a meal with family."

Stepping aboard a factory-new business jet you may notice a lack of tablet-sized perma-mounted touchscreens or membrane buttons to control lighting, cabin temperature, furniture position, and video. The seat-side controller persists, but its form factor has changed significantly. MRO and aircraft completions firm Lufthansa Technik's cabin-management and entertainment system, called "nice," which is featured on Bombardier's newest aircraft, is controlled by an elegant circular OLED touch dial. The controller rises from the recesses of a side ledge positioned where a person's hand would fall, and with a single gesture it delivers touch-and-turn functionality for lights, sound, audiovisual equipment, and more.

Though some version of hardwired control for cabin management will likely always exist, many manufacturers are employing powerful, quick, and increasingly stable wireless networks. To use the system, passengers are delivered a QR code on boarding that allows them to download a proprietary app that (for security purposes) works on that flight only. (Companies can modify this for a single-owner aircraft.) Once logged in, passengers can control the lighting system, exchange messages with the crew, and access the entertainment system and the internet through the app.

Big strides have been made recently regarding the connectivity that keeps passengers tethered to work and home while flying. Early air-to-ground (ATG)

connectivity using cell towers, which works above 10,000 feet, was barely able to keep up with the streaming needs of the modern business jet. Provider Gogo's ATG network is limited to North America for now (it does use satellites for international travelers), and Gogo is now delivering 4G speeds. Newcomer SmartSky Networks is promising to launch its high-speed ATG service this year. The two companies plan to debut 5G ATG by 2021.



A circular OLED touch dial that rises from a side ledge controls Lufthansa Technik's cabin-management system.

The fastest connections blanketing the earth are on Ka and Ku band satellite networks from vendors such as Inmarsat and Viasat. Inmarsat's GX fleet consists of four satellites and will include seven by mid-2021. The company's current focus is on completing coverage for flights over the polar regions.

The satellites deliver nearly 5G speeds that allow 20 or more passengers to access their cloud-based entertainment products on the ground and at all altitudes. Such high speeds and high capacity mean aircraft no longer need heavy, expensive, onboard hard drives preloaded with music and movies that must be constantly updated. You can stream the content you desire from your personal devices.

Pulling all this technology together, Lufthansa Technik is introducing Skyretreats, unveiling the first version of the concept on Airbus's ACJ220 business jet in the third quarter of this year. The design integrates several technologies, including a 4K roll-up display, LED "sky-panels," smart-touch windows, and tables that can double as computer monitors. The cabin design is also one of the first to include voice control for the nice cabin-management system. What will they think of next?

BJT

Do Drink the Water

With today's focus on eliminating plastics from our environment's waste stream, more and more people are avoiding bottled water. Unfortunately, airplane water tanks aren't sterile, and bringing on tap water from foreign ports can be problematic.

German innovator Diehl Aviation can make the tap water on aircraft safe to drink. The company's UV-LED water-disinfection unit offers a retrofit antibacterial filter based on UVC LEDs—a compact, robust technology with low power consumption, which can be integrated close to or directly into any faucet. Diehl claims that the unit kills 99.99 percent of germs. —AL

Amy Laboda

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Cabin Furnishings

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Thanks to innovative design concepts, business aircraft cabins are increasingly comfortable, versatile, and visually appealing.

by Amy Laboda

It's likely that you don't think much about whatever you're sitting on right now. But someone probably did. And if you happen to be on a business jet, it's a safe bet that your seat benefited from the expertise of engineers and designers with thousands of hours of experience, which is why you can so easily make lumbar adjustments, raise a leg rest, slide and swivel, and perhaps turn it into a flat bed. Similar care goes into the development of most all cabin furnishings, which become more comfortable, versatile, and innovative every year.

They're also becoming more reminiscent of passengers' residences back on earth. Boeing Business Jets and Airbus Corporate Jets, along with completion centers Comlux and Lufthansa Technik and a slew of others, recently unveiled concepts for upcoming widebody aircraft interiors, and the

designers' goal seems clear: create the illusion that the VVIP in the passenger cabin is at home.

Sky Style, a business aviation-focused design studio, is changing up cabin looks with curves, softer lines, removable privacy bulkheads, and custom-fit storage units that descend from above. One design would give the cabin crew the ability to fully set a dining table and cater a meal for six in the galley. With the push of a button, the galley pass-through opens and that tabletop slides on an integrated track over an existing adjustable hi-low conference table. So the crew can serve a meal without interrupting a private meeting for setup.

Interior designers at Boeing and Airbus, meanwhile, are catering to specific

Lufthansa Technik's Skyretreat design for the upcoming Airbus ACJ220 narrowbody.





corners of the globe with design concepts that incorporate more native elements and materials than ever before, including ethnic symbolism and art. One example is the recently unveiled Nature's Touch interior by Lufthansa Technik for the Airbus ACJ and Boeing BBJ, which channels Eastern tastes. Another is Greenpoint Technologies' Boeing BBJ 777X Lotus interior, which features a grand, circular entryway opening to elevated lounges, a sunken media area, a backlit bar, a library with a dancing OLED virtual fire framed by a hearth, and a ceiling that can mimic a starry night scene.

Above left: Flying Colours converts regional airliners for VIP use. Above right: a Comlux-designed cabin.

Deep-seated Principles

Bombardier's in-house designers have been thinking a lot lately about the seats in their aircraft. "We wanted to put aside what is thought of as typical and start from the principles of seated comfort," says Tim Fagan, the company's manager of industrial design for business aircraft. "We asked basic questions: What makes a comfortable recliner? How do you pivot the seat? How does the seat move? How does it support the body?"

Bombardier recently introduced its combination settee and deep-reclining chaise lounge as options on its Global 7500 and upcoming Global 6500 aircraft. The Nuage chaise is designed to offer a deep recline with leg elevation. With the push of a button, silent, hidden pneumatics shift it to lay flat, providing bench seating for three or four individuals, or a sleeping surface for one.

Completions firm Lufthansa Technik, meanwhile, has debuted its Iacobucci-designed chair as part of its Skyretreat interior concept for the Airbus ACJ220 business jet. The chair is slim yet offers recline, swivel, and leg-rest functions.

This year, also, Collins Aerospace Systems launched its next-generation Evolution seat, which provides more room inside the cabin by reclining in one continuous motion on a proprietary triple-roller system, allowing it to be set closer to bulkheads than other seats. Its extended leg rest accommodates taller occupants; its headrest can be manually adjusted to a precise angle for reading while reclining; and its armrests can be lowered when the seat opens flat to become a wider sleeping surface. Seat controls allow for one-touch adjustments to takeoff/landing position, as well as a "zero gravity" position. —AL

This year, Sky Style provided potential customers a walk-through virtual-reality (VR) tour of its refined Genesis cabin concept at the European Business Aviation Conference & Exhibition (EBACE) in Geneva. Showcasing four new and diverse BBJ Max 7 interiors, the VR allows the company to swap out interiors on the fly to please the sensibilities of customers. Wearing VR goggles, customers stroll from the entry of the cabin, noting the wide opening and the inviting way the pattern in the carpet leads past the semi-open galley. The spacious lounge includes a curved couch that seems to float away from the sidewall, with a large ottoman that stows beneath it. Wingback swivel chairs can slide up to a large conference table for work or dining, or shift away from the table and recline, almost as if they, too, were floating and not anchored.

Lufthansa Technik used the EBACE show to tease attendees with its Skyretreat design for the upcoming Airbus ACJ220 narrowbody. The wooden floor slats mimic those on a classic yacht, as do the summery couches and chaise lounges with loose cushions. Ceilings are lit to enhance a sense of height and space.

Comlux chief interior designer Lauri Church maintains that these packaged designs are great starting points for ideas but says that "our goal is a boutique type of aircraft." The Indianapolis location of the Swiss company takes factory-new aircraft and, using either Comlux's in-house team or the owners' designers, creates one-off interiors.

In May the company delivered its first VIP widebody cabin completion, an Airbus ACJ330. The 2,200-square-foot interior can accommodate 31 passengers and incorporates several master suites, lounges, and a dining

One BBJ cabin features a virtual fireplace and a ceiling that can mimic a starry night scene.



Bombardier's Nuage chaise lounge



Left: Greenpoint Technologies designed this lounge for a Boeing BBJ 777X. Above: A worker at MSB Aerospace, one of several companies producing bespoke furnishings for business jet cabins.

area, as well as first-class seating for an entourage. The aircraft is also equipped with a gym and an entertainment area featuring a 52-inch curved OLED monitor.

“Our clients are asking for the galleys to be more like what we would see in our own home with cooktops open to the lounge and a bar you can belly up to,” Church says. “We have clients who want to cook for themselves on the airplane, not just be served catering. These open kitchens are constructed with movable walls that can close them off when there is cabin crew onboard.”

Flying Colours finishes and refurbishes cabin interiors of new and used business jets in North America and Asia. Gabi Hasko, vice president of program management, planning, and design for the company, agrees with Comlux’s Church. “Today’s cabin designers are bringing us floor plans—created in collaboration with owners—that use cabinets that appear to be freestanding, resembling someone’s furniture at home rather than extensions of bulkheads,” he says.

Interior designers from outside the aviation industry have to learn that designing for a business jet is different. Hasko explains that you can’t just bring your favorite chair or cabinetry onboard and fix it to the floor—aircraft regulations are clear about that. However, designers are receptive to the requests and requirements of owners and operators, and designers of new and renewed business jet interiors are beginning to reflect a preference for clean lines and natural materials. Veneers of stone tile and exotic wood are being used to lighten and brighten cabins. If you prefer carpet, you can opt for rich, sculpted patterns that are reminiscent of places you love.

Jets outfitted by Flying Colours are filled with credenzas and cabinets that tuck into every nook and cranny, ready to store all of the necessary accoutrements for a comfortable flight—china, glassware, cutlery, liquor, bedding, hand luggage, audiovisual equipment, and more. It can all be made to look much like your cabinetry at home, or, if you prefer, it can be nearly invisible, melting into the bulkheads.

“Instead of putting a toe-kick under a credenza, we can make it appear to float above the flooring and feel lighter, even though, like the rest of the aircraft

fixtures, it must be secured against turbulence in flight,” says Hasko. The profiles of recliners and sofas are getting slimmer, freeing up more space in the cabin, he notes. The materials, such as high-grade leathers and carbon fiber, are sophisticated and supple and yet meet the stringent requirements for fire resistance demanded by safety regulations.

Aircraft being finished for 2020 and beyond are using the lightest, toughest materials for furnishings to help cut fuel expenses and increase range.

Savannah, Georgia–based fittings and fixtures manufacturer MSB Aerospace is one of several companies turning out bespoke furnishings for these airplanes’ cabins. The company began as a partner with Bombardier in Montreal, but in 2018 MSB opened its Savannah manufacturing facility to better serve its U.S.-based customers.

“We are all about discovering ways to use all of the nooks and little hidden spaces in an aircraft to their maximum with pop-ups and pullouts,” says Shannon Gill, managing director of MSB. The company manufactures hyper-lightweight honeycombed fixtures and cabinets that are covered with unique, hand-finished veneers.

Gill believes that the next wave of cabin design will feature lighter furnishings, straighter lines, and more European influence. “There is a movement away from the dark veneers that we’ve seen in the past,” she says. “We are seeing a desire to give the airplane that real living-space feel. We are building a lot of cabinet and drawer inserts that provide storage solutions for hand baggage and any objects that come onboard the cabin. We’ve also recently created bar solutions, including a wine cooler and liquor cabinet in the credenza opposite the couch in the lounge, designed so that a VIP can serve guests without going to the galley.”

In the end, good business jet cabin design is all about comfort and functionality, with an accent on safety. By collaborating with leading architectural and design houses, manufacturers and cabin completion firms are working to keep cutting-edge style and individuality as hallmarks of business jet design, all while making the passenger cabin environment increasingly welcoming.

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North Little Rock, Arkansas.

Cabinetry, upholstered products, and finishes.

Dassault Falcon Jet

(dassaultfalcon.com, 501-372-5254)

Little Rock, Arkansas.

Completion of Falcon Jets.

Delta Interior Design

(deltainterior.com, +39 031-357-4960)

Lombardy, Italy.

Desert Jet

(desertjet.com, 800-381-5387)

Palm Springs, California.

MRO services.

Dumont MRO

(dumontgroup.com/maintenance, 302-777-1003)

Wilmington, Delaware. Also:

Bloomington, Illinois (302-317-3316),

Burleson, Texas (817-615-8546).

Paint, interior, avionics, heavy maintenance.

Duncan Aviation

(duncanaviation.aero, 269-969-8400)

Battle Creek, Michigan. Also: Lincoln, Nebraska

(402-475-2611), other locations throughout U.S.

EAD Interior Design

(ead-aerospace.com, +33 562 130 870)

Saint-Lys, Occitanie, France.

Eagle Aviation

(eagle-aviation.com, 803-822-5555)

Columbia, South Carolina.

EH Aviation Advisors

(aviation-advisors.ch, +41 79 647 1137)

Consulting about cabin design and engineering.

Elisen Technologies

(elisen-assoc.com, 514-636-5454)

Montreal.

Elliott Aviation

(elliottaviation.com, 800-447-6711)

Minneapolis. Also: Des Moines, Iowa; Moline, Illinois.

Embraer Executive Jets

(executive.embraer.com/global/en, 321-751-5050)

Melbourne, Florida. Also: São Paulo, Brazil (+55

11 30408432), Farnborough, England (+44(0)

1252 379270), Beijing (+86 (10) 6597 9988),

Dubai, United Arab Emirates (+971 4 568 3743),

Singapore (+65 6734 4321).

Completes Embraer jets.

Executive Air

(executive-air.com, 701-258-5024)

Bismarck, North Dakota.

Farnborough Aircraft Interiors

(aircraftinteriors.co.uk, +44(0) 1252 377234)

Farnborough, England.

Field Aviation

(fieldav.com, 905-676-1540)

Mississauga, Ontario, Canada.

Flightstar

(flightstar.com, 800-747-4777)
Savoy, Illinois.

Flying Colours

(flyingcolourscorp.com, 705-742-4688)
Peterborough, Ontario, Canada. Also:
Chesterfield, Missouri (636-530-7000),
Singapore (+65 6908 6610).

GAL Mena Aerospace

(mena.aero, +973 17 339 558)
Muharraq Governorate, Bahrain.

GDC Technics

(gdctechnics.com, 210-496-5614)
Fort Worth.
Focus on airliner executive/VIP conversion.

GKN Aerospace

(gknaerospace.com, +44 (0) 121-210-9800)
Shirley, England.

Global Aircraft Interiors

(globalaircraftinteriors.com, 631-981-8470)
Ronkonkoma, New York.

Greenpoint Technologies

(greenpoint.com, 425-828-2777)
Bothell, Washington.
Focus on airliner executive/VIP conversion.

Gulfstream Service Centers

(gulfstream.com/product-support/service-centers, 800-810-4853)
Appleton, Wisconsin. Also: Savannah, Georgia (912-965-3000) Dallas (214-902-7500), Long Beach, California (562-420-1818) Brunswick, Georgia (912-267-6300), Westfield, Massachusetts (413-562-5860).

Haeco (Taeco) Aircraft Engineering

(haeco.com/en/home, +86 592-573-7296)
Xiamen, Fujian, China.

Hangar R

(hangar-r.com, 469-865-2110)
Grand Prairie, Texas.

Helicopter Specialties

(helicopterspecialties.net, 608-758-1701)
Janesville, Wisconsin.
Helicopter completion/refurbishment.

Heli-One

(heli-one.ca, 604-276-7500)
Richmond, British Columbia, Canada.
Also: Jasionka, Podkarpackie Voivodeship, Poland (+48 17 77 14 900),
Sola, Rogaland, Norway (+47 51-94-1400).
Helicopter completion/refurbishment.

Helispec

(334-527-0020)
Brantley, Alabama.
Helicopter completion/refurbishment.

Heritage Aviation

(heritagemetalfabrication.com, 972-988-8000)
Arlington, Texas.
Helicopter completion/refurbishment.

Hillaero Modification Center

(hillaero.com, 402-474-5074)
Lincoln, Nebraska.

Iacobucci HF Aerospace

(ihfelectronics.com, +39 0775 392531)
Ferentino, Lazio, Italy.
Seats, interior components.

Innotech Aviation

(innotechaviation.com, 514-636-7070)
Dorval, Quebec, Canada.

Interior Development Group

(idgjets.com, 770-234-9142)
Chamblee, Georgia.

International Jet Interiors

(intljet.com, 631-737-5900)
Ronkonkoma, New York.

JCB Aero

(jcbaero.com, +33 5 62 07 7171)
Auch, Occitanie, France.

Kvand Aircraft Interiors

(kvand.com, +7 495 749 43 37)
Moscow.

Legacy Aviation Services

(legacy-aviation.com, 405-350-2100)
Yukon, Oklahoma.

LifePort

(lifeport.com, 360-225-1212)
Woodland, Washington.
Helicopter completion and refurbishment.

Lufthansa Bombardier Aviation Services

(lbas.de, +49 30 8875 4600)
Schönefeld, Brandenburg, Germany..

Mecaer Aviation Group

(mag-incorporated.com, 267-341-0130)
Philadelphia.

Metro Aviation

(metroaviation.com, 318-698-5200)
Shreveport, Louisiana.
Helicopter completion/refurbishment.

MNG Jet

(mngjet.com, +90 212-999-3000)
İstanbul, Turkey.
Helicopter completion/refurbishment.

New United Goderich

(newunitedgoderich.com, 519-228-6052)
Huron Park, Ontario, Canada.

Ormond Aircraft

(ormondaircraft.com, 386-672-4022)
Ormond Beach, Florida.

Penta Aviation Services

(penta-aviation.com, 604-273-4649)
Richmond, British Columbia, Canada.

Pentastar Aviation

(pentastaraviation.com, 800-662-9612)
Waterford Township, Michigan.

PrivateSky Aviation Services

(privatesky.net, 239-225-6100)
Fort Myers, Florida.

PRO Aircraft Interiors

(proaircraftinteriors.com, 954-786-0908)
Pompano Beach, Florida.

Ranger Aviation

(rangeraviation.com, 325-949-3773)
San Angelo, Texas.

RAS

(rascompletions.co.uk, +44 1959 576 747)
Kent, England.

Richmor Aviation

(richmor.com, 800-359-2299)
Hudson, New York.



Robinson Aircraft Interiors
(robinsonair.com, 469-635-5050)
Fort Worth.

Rose Aircraft Service
(roseaircraft.com, 800-392-2551)
Mena, Arkansas.

Rotorcraft Services Group
(rotorcraftservices.com, 817-625-0192)
Fort Worth.
Helicopter refurbishment..

Ruag Aviation
(ruag.com, +41 31 376 64 50)
Bern, Canton of Bern, Switzerland.

Sabena Technics
(sabenatechnics.com, +33 1 56 54 42 30)
Paris.

Sabreliner
(sabrelineraviation.com, 573-883-3729)
Ste. Genevieve, Missouri.

Safran
(safran-group.com/aviation, (33) 1 40 60 80 80)
Paris.

Sierra Completions
(sierracompletions.com, 303-347-7440)
Centennial, Colorado.

Sikorsky
(sikorsky.com, 800-496-4337)
Stratford, Connecticut.
Helicopter completion/refurbishment.

Southstar Aircraft Interiors
(southstarinteriors.com, 830-278-4108)
Uvalde, Texas.

SR Technics
(srtechnics.com, +41 58 688 66 66)
Zürich, Switzerland.

ST Aerospace
(staero.aero, +65 6287 1111)
Singapore.

Stambaugh Aviation
(stambaughaviation.com, 912-265-7244)
Brunswick, Georgia.

StandardAero
(standardaero.com, 480-377-3100)
Scottsdale, Arizona. Also: about a dozen other
North American locations and facilities in Netherlands, Singapore, Australia.

Starling Aerospace Interiors
(fly-sai.com, +44 1372 378079)
Leatherhead, England.

Stevens Aviation
(stevensaviation.com, 800-359-7838)
Greenville, South Carolina. Also: Dayton, Ohio
(937-454-3400), Nashville, Tennessee (615-365-2121).

Summit Aviation
(summit-aviation.com, 302-834-5400)
Middletown, Delaware.

SureFlight
(sureflight.com, 484-718-3136)
Coatesville, Pennsylvania.

Talco Aviation
(talco.aero, 210-319-4371)
San Antonio.

Textron Aviation
(txtav.com, 316-517-8270)
Wichita, Kansas. Also multiple other North
American locations.

Trimec Aviation
(trimecaviation.com, 817-626-1376)
Fort Worth.

Voyager Jet Center
(voyagerjet.com, 412-267-8000)
West Mifflin, Pennsylvania.

West Star Aviation
(weststaraviation.com, 800-922-2421)
East Alton, Illinois. Also: Grand Junction, Colorado (800-255-4193), Chattanooga, Tennessee (423-661-8900), Perryville, Missouri (618-876-9608), Aspen, Colorado (970-925-2528), Wheeling, Illinois (847-850-5445) Englewood, Colorado (970-261-7895), Scottsdale, Arizona (618-797-8429), Conroe, Texas (936-333-3113), Minneapolis.

Western Aircraft
(westair.com, 800-333-3442)
Boise, Idaho.

Yingling Aviation
(yinglingaviation.com, 316-943-3246)
Wichita, Kansas.

Though this directory includes companies that BJT deems noteworthy, a listing here does not represent an endorsement by the magazine. Visit BJTonline.com for an expanded interactive directory that covers a wide variety of business aviation manufacturers and service providers.

TURKEY

This fascinating and ancient country offers historic mosques, amazing outdoor markets, gorgeous scenery, and more.

by Marilyn Jones

Turkey—where Europe meets the Middle East—deserves a high position on your list of places to visit. A vibrant Western country with many stories to tell, it has a long and rich history and a diverse landscape that embraces pristine beaches and the honeycombed hills of Cappadocia.

Now is a good time to go. Tourism declined a few years ago, following violence along the southeastern border, but it's again on the rise—up 30 percent from 2017 to last year. With the first phase of Istanbul's new airport having opened in 2018 and nonstop flights available to that city from several points in the U.S., Canada, and England, travel to Turkey is relatively easy.

Before making the journey, though, do your homework: study the country's history and hire a reputable guide. With so much to see, you'll need to make many decisions about what to prioritize.

Istanbul, the largest city in Turkey with a population of 15 million, is the obvious place to begin. It is divided by the Bosphorus Strait, which also serves as the border between Europe and Asia. The narrow strait connects the Black Sea and Marmara Sea.

The Hippodrome in the oldest part of the city dates to third century Byzantium. Here, chariot races were held along a U-shaped track. When Constantine the Great moved the government from Rome to Byzantium, he put his mark on the Hippodrome by expanding it to accommodate 100,000 spectators.

Surviving monuments are located in what was the middle barrier of the racecourse. Constantine and his



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Grand bazaar shops in Istanbul.

successors brought works of art from all over the Roman Empire to adorn the newly named Constantinople (now Istanbul). Monuments here include the Serpent Column, which dates from the fifth century B.C., and a pink granite Egyptian obelisk, from the 15th century B.C.

Don't miss the Hippodrome, which is part of Sultan Ahmet Square. The Square also includes Hagia Sophia museum and Basilica Cistern which, along with Topkapi Palace and Suleymaniye Mosque, make up Istanbul's UNESCO World Heritage Site.

Sultan Ahmet Mosque is also in the square. The square, museum, and mosque are framed by a beautifully landscaped park that tourists and locals frequent.

Be sure to visit one or more of Istanbul's bazaars. The Grand Bazaar, which dates from the 15th century, is one of the largest and oldest covered markets in the world, with more than 4,000 shops. Between 250,000 and 400,000 people visit it every day. Another bazaar—this one covering 384 city blocks—is the Spice Market. Mounds of paprika, saffron, cumin, leaf pepper, and



Traveler Report Card

ACCOMMODATIONS:

Ciragan Palace Kempinski Istanbul (A+), a five-star hotel overlooking the Bosphorus Strait, offers impeccable service, lovely public areas, and lavish accommodations.

Argos (A+) in Cappadocia is a cave hotel in Old Uchisar Village. On the site of an ancient monastery, Argos restored historical dwellings, underground tunnels, and caves to offer guests a unique perspective on the area. **Kolin Hotel** (B-) in Canakkale is a convention-style facility in a remote area of the city overlooking the Dardanelles.

DINING:

Meze by Lemon Tree (A) is an excellent small restaurant in Istanbul's Beyoglu district opposite the Pera Palace hotel where Agatha Christie and Ernest Hemingway were guests. Reservations are suggested and can be made at mezze.com.tr. **Tugra Restaurant** (A), in the Ciragan Palace Kempinski Istanbul hotel, serves exceptional food. Terrace seating offers views of the Bosphorus. **Old Greek House** (B+) in Mustafapasa (Cappadocia) is as much about atmosphere as food; both are memorable. **Seki** (A+) in the Argos in Cappadocia hotel provides fresh, locally sourced ingredients and wine along with beautiful views from its terrace. **Zeytin** (B) in the Canakkale Kolin hotel serves international and Turkish cuisine in attractive surroundings.

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TYPE

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CATEGORY

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IN PRODUCTION

ALL

MANUFACTURER

ALL

MINIMUM PRICE

ALL

MAXIMUM PRICE

ALL

RANGE


















ALL

SEATING

ALL

RESETSEARCH

All aircraft data provided by Cirium & de Descamps

MODEL	MANUFACTURER	CABIN SIZE	RANGE	PRICE NEW	PRICE USED	COMPARE	
	1300	Twin Commander	213 cu ft	1,210 nm	\$1.9M	\$262K - \$1.1M	LOG IN TO COMPARE
	206AL	Bell	208 cu ft	206 nm	\$820K	\$1.6M - \$2.0M	
	206B3	Bell	54 cu ft	270 nm	\$1.4M	\$325K - \$1.1M	
	206BR	Bell	54 cu ft	270 nm	\$1.5M	\$310K - \$1.1M	
	206L1	Bell	73 cu ft	240 nm	\$200K	\$400K	
	206L3	Bell	73 cu ft	215 nm	\$1.0M		
	206L4	Bell	73 cu ft	253 nm	\$2.3M		
	206L7	Bell	73 cu ft	106 nm			
	208 Caravan	Cessna	271 cu ft	325 nm			
	208 Caravan/Cargo Pod	Cessna	271 cu ft				
	208 Grand Caravan/Cargo Pod	Cessna	353 cu ft				
	208B Grand Caravan	Cessna					
	208B Grand Caravan EX	Cessna					
	208B Grand Caravan EX/Cargo Pod	Cessna					
	212						
	214B						
	214ST						

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TYPE

JET

CABIN SIZE

823 CU FT

RANGE

3,193 NM

PRICE NEW


\$20M

EMBRAER LEGACY 500 RANGE

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NEW YORK

Range in the maximum 775 range of the aircraft (including a 100% range) (Price paid with all passenger seats occupied).



Google

EMBRAER LEGACY 500 SPECS

IMPERIAL

METRIC

PRICING		PRODUCTION		FINANCIAL	
Price New	\$20M	Year Started	2014	Total Fixed Cost/Year	\$104,305
Price Used (Min)	\$18M	Year Ended	In Production	Total Fixed Cost/Hour	\$1,915
Price Used (Max)	\$19M			Total Fixed Cost/Unit Distance	\$4/rev
				Total Misc Cost/Hour	\$136,952
				Total Misc Cost/Year	\$544
				Total Crew Cost/Year	\$405,130
				Total Fuel Cost/Year	\$1,557
				Total No Cost/Year	\$870
				Total Variable Cost/Year	\$1,190,358
				Total Variable Cost/Hour	\$2,993
				Total Variable Cost/Unit Distance	\$6/rev

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curry line the fronts of stalls, inviting you to stop and shop. In addition to spices, you can buy cheese, tea, candy, and souvenirs.

If you enjoy nightlife, you'll love the Beyoglu district, which has everything from rooftop bars and dance clubs to basement jazz cafes. This is a great area to visit in the daytime, too. Located on the north bank of the Golden Horn, it has a pedestrian mall, coffee shops, and restaurants.

Cappadocia is about an hour east of Istanbul by air. It is known for its natural beauty and interesting human history. Wind- and rain-carved tuff spewed from ancient volcanoes into gorges and pinnacles, creating the region's unusual appearance. When early settlers realized they could chisel the volcanic rock, they made cave-like structures that served as houses, storerooms, stables, and churches. Many are still in use.

At the Goreme Open-Air Museum, another UNESCO World Heritage Site, you'll find a vast collection of churches, chapels, and housing that

monks inhabited a thousand years ago. Because sunlight and rain didn't penetrate some of the sanctuaries, many of the frescoes portraying Christ and religious saints that decorate the caves remain brightly colored. The only damage is from the vandals who marred the frescoes before the site was protected.

At Kaymakli, one of Cappadocia's underground cities, you'll encounter tourists crowded into limited space; this attraction isn't for the claustrophobic. First carved out in the eighth to seventh centuries B.C., these cities were expanded by Christians to hide from Romans and later Turks persecuting them. They stayed underground for days or weeks, until it was safe to surface.

The cities were used until the beginning of the last century to escape waves of Ottoman persecution. Tunnels branch off into living spaces, storage areas, wineries, and kitchens. Tunnels that are only about four feet high and narrow connect many rooms.

Tell your guide you want to visit a few villages and explore other attractions in the area, including the fairy chimneys, pigeon valley, and Red Valley, a popular sunset location where it's a party every night.

The highlight of any trip to Cappadocia is a hot-air-balloon excursion. Every day, more than 100 colorful balloons paint the sky just before



Top, hot-air balloons fly over the valley at Cappadocia. Left, an underground city. Right, Trojan horse in Troy.





Above, columns in ancient Troy. Right, near Goreme at sunset. Below, a beach on the island of Gokceada.



sunrise and sail over villages cut from the rock and natural formations. If you don't take a flight, at least watch one morning from your hotel window.

Although Canakkale is a vacation destination for Turks, it is relatively unknown to foreigners. Located four hours west of Istanbul by car, Canakkale is a city of just under 200,000. It is on the Dardanelles strait connecting the Sea of Marmara with the Aegean and Mediterranean seas. The city is the gateway to Troy, Gallipoli, and Aegean Sea islands.

Dating back more than 5,000 years and serving as a key influence on Homer's Iliad, Troy is among the world's best-known archeological locations and one of the most mysterious. This is the site of the Iliad's Trojan War and famous Trojan horse.

When the Greeks launched a thousand

ships to recapture Helen of Troy, their destination was present-day Turkey. After years of warfare, the Greeks pretended to surrender and built the wooden horse as a supposed gift to the Trojans. No one knows what portion of this story, if any, is true, but the legend lives on.

New in 2018 is the Troy Museum, located at the entrance to the Troy archeological site. Several exhibits outline the city's history, including the Bronze Age of Troy, the Trojan War, and the Ottoman Period.

Just across the Dardanelles from Canakkale is Gallipoli. It is most associated with the battles that took place here during World War I between Allied and Turkish troops. The peninsula forms the northern bank of the Dardanelles, which provides a sea route to the Russian Empire, an Allied power during the war. Russia's allies—Britain, Australia, New Zealand, and France—launched a naval attack, followed

Traveler Fast Facts

WHAT IT IS:

Turkey (population, 82 million) is in Europe and Asia, bordered by Greece, Bulgaria, Georgia, Armenia, Iran, Iraq, and Syria; the island nation of Cyprus is 75 miles to the south. The country is surrounded by water on much of three sides: the Aegean Sea to the west, the Black Sea to the north and the Mediterranean Sea to the south. The largest city is Istanbul. The capital is Ankara.

CLIMATE:

The coastal areas bordering the Black Sea have warm, wet summers and cool to cold, wet winters. Mountainous areas experience sharply contrasting seasons, including winters with temperatures plunging to 40 degrees below zero.

WHAT TO KNOW BEFORE YOU GO:

Because of the political climate, check travel advisories before visiting. (The U.S. State Department posts these at travel.state.gov.) Credit cards are widely accepted in the country, but you should also bring currency in small bills. Bazaars and attraction vendors in Istanbul, Cappadocia, Canakkale, and other major tourist sites will quote prices in dollars, euros, and Turkish lire. In remote areas, only Turkish lire are accepted.

GETTING THERE:

About 35 international airports in Turkey—including Istanbul Ataturk, Nevsehir Kapadokya, and Canakkale—welcome private jets. Airlines that serve Istanbul Ataturk Airport with direct flights from the U.S., Europe, the Middle East, Asia, and Africa include Turkish Airlines, Air Canada, and Air France.

GETTING AROUND:

Istanbul traffic can be heavy, especially during morning and late afternoon. Although taxis are readily available, other public transportation might be a better option. Metro, tram, and funicular lines in the city center are well maintained and supervised by security personnel. Although it isn't necessary to travel with a group and many Istanbul residents speak English, you'd be wise to employ a guide who can navigate rural areas where English isn't often spoken and public transportation is limited. Two tour companies, Travel Atelier and KD Tours, serve the entire country. Many parts of Istanbul and Canakkale are handicap accessible; most historic attractions are not.



by an amphibious assault. The goal was to capture Istanbul. After eight months the land battle was abandoned. You'll see memorials to fallen soldiers and markers that pay tribute to military heroes on both sides of the conflict. More than 100,000 men lost their lives.

Gokceada, Turkey's biggest island, is known for its unspoiled landscape, sandy beaches, and Greek-influenced culture. You'll discover tiny villages with streets barely passable by car and amazing views of the sea. There are a few hotels, so you can stay overnight here if you wish.

You'll find the atmosphere on Bozcaada Island very different with its medieval castle, charming village of about 2,000 residents, and inviting beaches.

During Ottoman rule, Greeks and Turks resettled here, and today the village is literally divided between the two groups. Each has its religious institutions—mosques on the Turkish side and churches on the Greek side. The houses are architecturally different in the two districts as well. The grid-planned Greek district has restaurants, galleries, and hotels along its cobblestone streets while the Turkish quarter is mostly residences. Mini-buses that depart from the square next to the castle entrance can take you to Ayazma or Habbele beaches.

On a two-week vacation, you can probably find time for at least a brief stop at most of the places mentioned in this article. But many of them deserve longer visits, as do some attractions we haven't even mentioned. Don't be surprised if you find yourself pondering a return trip before you even leave the country.

BJT

Marilyn Jones

(mjones@bjtonline.com) wrote about Egypt for **BJT** last year. For her visit to research this article, she was a guest of Turkey Tourism, and Turkish Airlines provided transportation.

8 Must-See Historic Attractions in Turkey

Hagia Sophia. Once the world's largest cathedral, it was constructed in the sixth century and converted into a mosque when the Ottoman military conquered what is now Istanbul. Today it's a museum and a symbol of its city's diverse religious and political history.



The Basilica Cistern. Built in the sixth century to provide water to Istanbul in case of siege, this underground labyrinth is lined with wooden walkways set between ornate pillars, many of which were salvaged from ruined temples.



Sultan Ahmet Mosque. Also known as the Blue Mosque, this 17th century structure is Istanbul's most popular attraction.



Topkapi Palace. This Istanbul museum is also the world's largest and oldest palace. It served as the main residence and administrative headquarters of the Ottoman sultans from the 15th to 19th centuries.



The Suleymaniye Mosque. This grand Ottoman mosque, built between 1550 and 1557, crowns one of Istanbul's seven hills and offers spectacular views from its terrace.



Goreme Open-Air Museum. There are 11 refectories in this large museum in Cappadocia, which contains frescoes, as well as furnishings and other features carved from porous rock.



Troy. Because the ruins span several incarnations of the city, it can be difficult to know what you're looking at. Built and inhabited from Troy I (3000 to 2600 B.C.) until Troy IX (85 B.C. to A.D. 500), the site is a mixture of walls and rocks.



Bozcaada Castle. When Fatih Sultan Mehmet II conquered the island of Bozcaada in 1455, he rebuilt this large castle, which had been demolished in the 14th century.





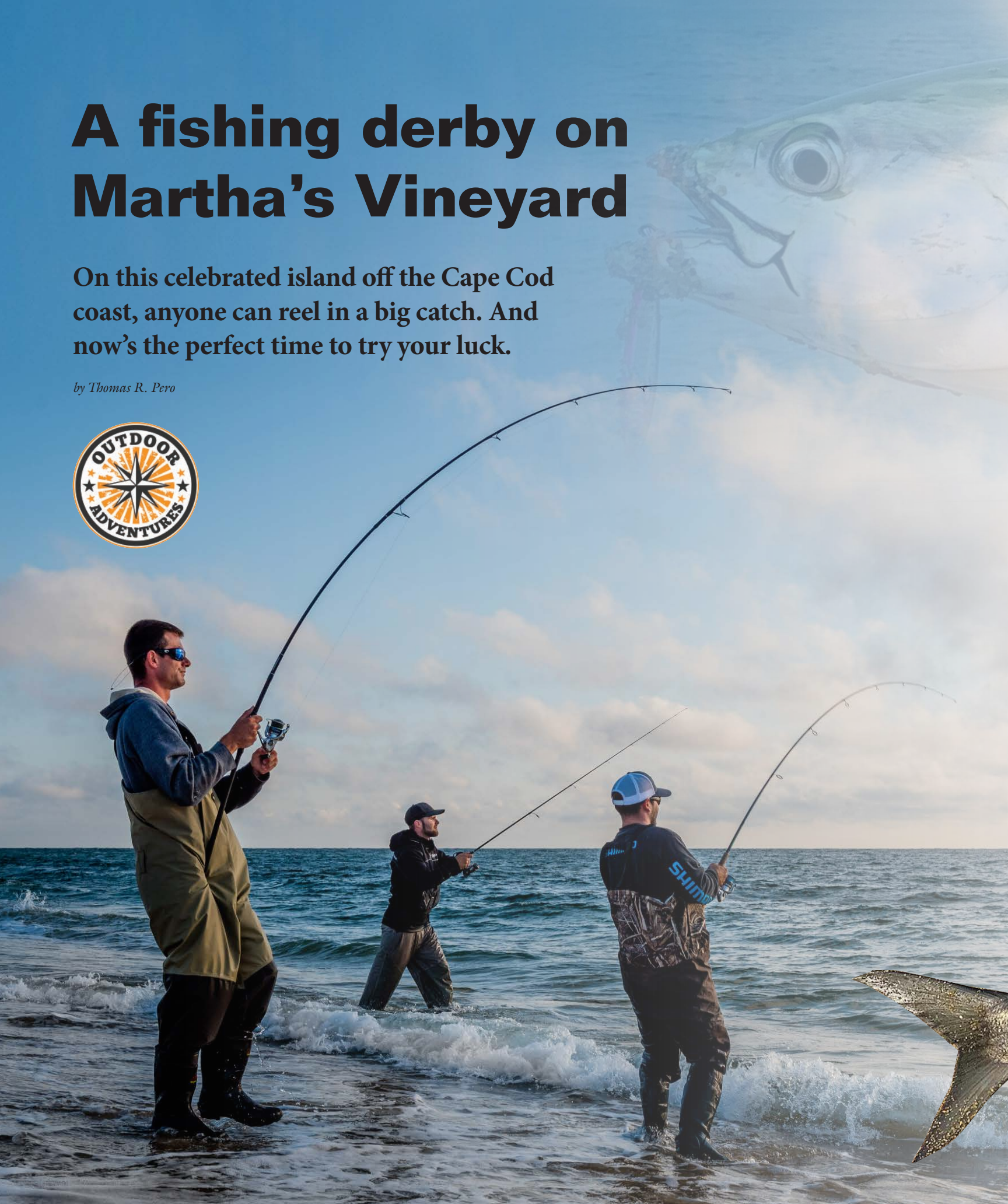
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A fishing derby on Martha's Vineyard

On this celebrated island off the Cape Cod coast, anyone can reel in a big catch. And now's the perfect time to try your luck.

by Thomas R. Pero



At its core, fishing is the most egalitarian of outdoor adventures. Even on Martha's Vineyard, sandy summer playground of presidents and stars of assorted stripes, the fish are not impressed with who is on the other end of the line. You have to be lucky. It pays to be talented.

Yes, it also helps to be modestly athletic, but I've seen short, slender folks out-fish brawny six-footers. And, yes, it helps to have a boat, especially on saltwater. But on Martha's Vineyard, anyone can walk or bike to a favorite stretch of beach, wade into the surf, and catch a fish as big as—or bigger than—the one reeled in by the hedge-fund maven trolling by in his new center-console sport fisher with twin turbocharged diesel engines.

Hundreds of winners in the Martha's Vineyard Striped Bass and Bluefish Derby attest to this relatively even playing "field." The winning striped bass caught from a boat last year, for example, weighed 39.20 pounds, while the winning striper reeled in from shore was just shy of that at 37.69 pounds. (There are, however, wider disparities regarding other species, notably bonito and albacore, which tend to run in deeper water.)

The 2019 derby will take place from September 15 to October 19. There are six principal categories: Mini-Junior and Junior (ages 4–8 and 9–14, respectively), Adult All-Tackle and Fly-Rod (ages 15–64), and Senior and Senior Fly Rod (ages 65 and up). Participants must register before opening day, online or at derby fish-weighing stations at tackle shops throughout the island.

Dating back to America's colonial past, striped bass have been a popular sport fish along the Atlantic seaboard, from the

Carolinas to Maine. In recent decades, the species has become less abundant. Overfishing of both stripers and their food sources is the double whammy. To halt the population decline, particularly of large spawners, federal and state fisheries managers have curtailed commercial openings and set strict limits on the size and number of fish that recreational anglers may take home for dinner.

Joe El-Deiry, volunteer president of the Martha's Vineyard Derby, says that while Massachusetts regulations allow a daily limit of one fish that is more than 28 inches long, the derby, to set a good example for the future of the resource, requires that any bass entered measure 34 inches. He says that research by biologists has also revealed that survival among released fish is not as good as had previously been assumed.

"We have to do a better job," El-Deiry says, indicating that the derby plans to produce an instructional video to show anglers proper techniques for playing, unhooking, and releasing valuable stripers for maximum survival. "We're also backing the state's plans to make circle hooks mandatory with bait." Circle hooks were pioneered by offshore big-game anglers pursuing marlin and sailfish and have been successful in reducing mortality caused by deep hooking.

When I spoke with El-Deiry, he expressed optimism for the future. He says that menhaden, a small herring-like fish, have really come back—acres of the vital forage fish are visible in August in the Lagoon off Oak Bluffs and in Edgartown Harbor. And his 17-year-old son Luke is catching and releasing more and more 24- to 28-inch stripers. "Of course," Joe says, "he fishes every day." **BJT**



PHOTOS: MARTHA'S VINEYARD STRIPED BASS AND BLUEFISH DERBY



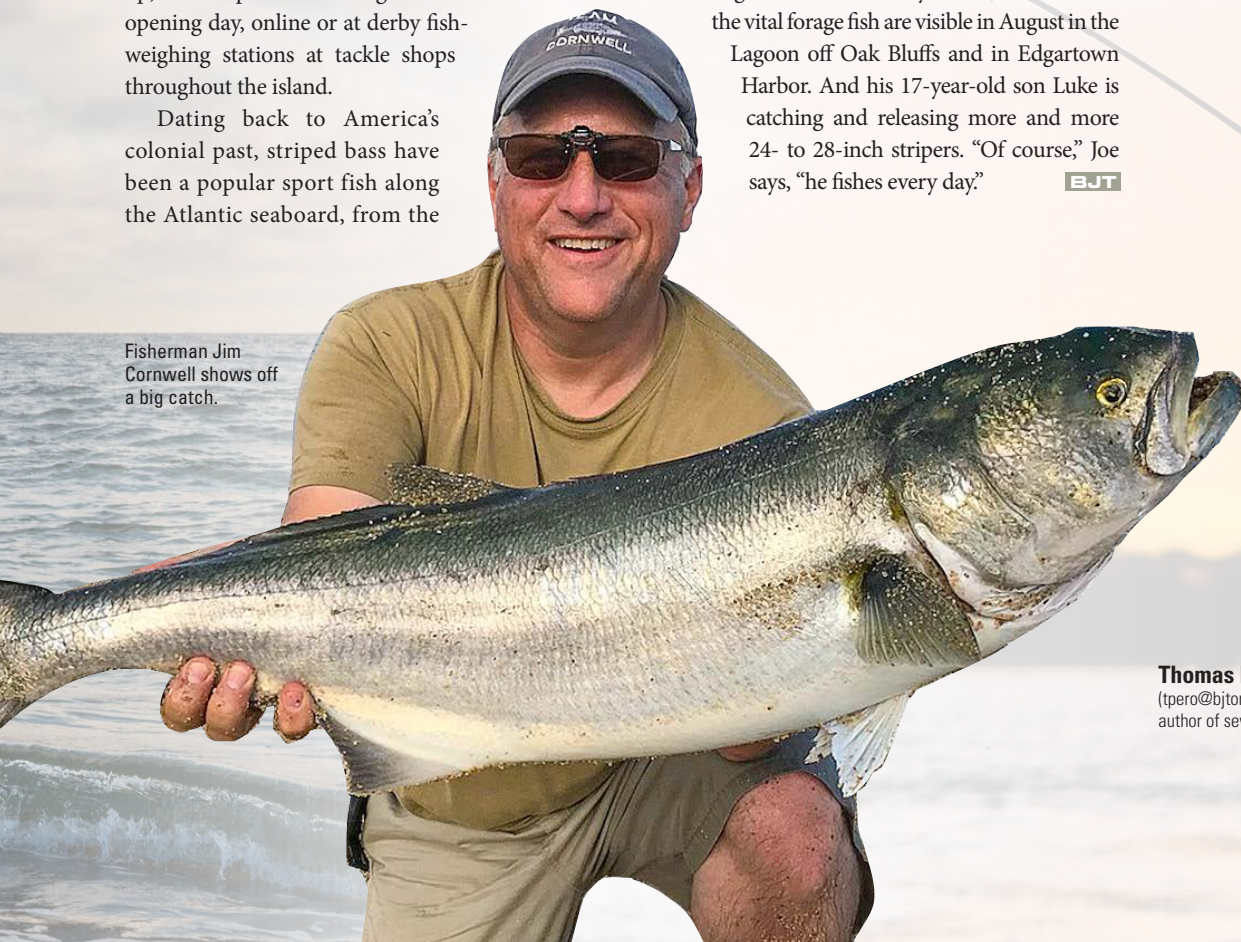
A Bit of History

The Martha's Vineyard Striped Bass and Bluefish Derby was started in 1946 to encourage returning war veterans and their families to vacation on Martha's Vineyard. Back then, the now-glamorous destination was a sleepy backwater of weathered cedar-shingle shacks dotting the sand dunes, with a colorful cluster of Methodist summer-camp gingerbread cottages on one end of the island and a village of Native Americans on the other. In 1987, the derby was purchased from the island's chamber of commerce and recast as a nonprofit organization. Last year, the 3,500 participating anglers raised \$42,000 in entry fees, all donated to island teenagers who aspired to go to college to study environmental and marine sciences. To date, the derby has raised more than \$650,000 for scholarships. —T.R.P.

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Fisherman Jim Cornwell shows off a big catch.



Will drones ever carry passengers?

Perhaps, but only if a lot of technological challenges can be addressed.

by Mark Phelps

Will autonomous passenger flight become a reality? Short answer: no one knows.

That might be hard to believe, given the way the aviation industry and Congress have committed so publicly to wholesale integration of unmanned aircraft into the national airspace. If there is a realistic timeline somewhere, it's likely that it calls for this integration to come in stages.

Short-range package delivery in rural areas has already started. The next step would likely involve heavier cargo carried over longer distances in increasingly larger rotary- and fixed-wing aircraft. And finally, carrying passengers, probably initially in urban areas in electrically powered air taxis. For now, though, those windshieldless jumboliners remain just a twinkle in futurists' eyes.

How far along are we already, and what needs to happen to take the next steps?

The last time I visited Singapore, drones were making package deliveries to the thousand or so cargo ships moored in one of the world's busiest harbors. That seems an easy, practical, and highly useful way to take advantage of current drone technology. Rather than having to send a small boat or manned helicopter out to a ship, you could much more inexpensively dispatch a small quadcopter drone, guided by GPS, to deliver anything from emergency medication to an order for a pizza and a six-pack.

The biggest challenge, if the service starts to catch on, would be making sure the drones don't run into each other. So traffic control is important. Still, if not much manned helicopter traffic were in the area, and all the routes were over water, the risk of any collision would likely be limited to losing the drone and the cargo.

Consequences ramp up quickly, however, as the drones get bigger, fly higher, and venture into airspace over populated areas. While it might

be enough to simply monitor the position and routes of delivery drones over water or sparsely populated land, some form of telemetry-driven sense-and-avoid technology would be required in tighter quarters. Development of that technology is ongoing and parallels the advances we see in self-driving automobiles.



The telemetry piece is critical. Not only would each drone need to sense and avoid its neighbors; it would also need access to what those other drones' next moves are going to be, no matter how small. This crowdsourcing technology is critical if self-driven cars are to become mainstream. Second-by-second updates on turns and lane changes could be shared in a cloud of data available to all virtual "drivers" on the highway, enabling closer spacing and thus, less traffic congestion, faster speeds, and improved efficiency. Particularly in an urban environment, this technology would be a must-have safety feature for autonomous flying drones—whether carrying packages or passengers.

While this electronic infrastructure is vital, it's the aircraft themselves that have been getting most of the attention. Conceptual rotorcraft designs are on the CAD-CAM screens of most of the major manufacturers. Configurations include everything from single-seat "flying bikes" to detachable minivan-size pods suspended beneath a multi-

rotor mother ship. In the urban environment, all-electric, fast-charging designs are thought to be the most practical, since the mission involves short distances. For longer flights, the jury is still out on how electric a hybrid needs to be.

Battery development is key in that decision. Have we reached a plateau in battery potential with lithium-ion? Or is there an equivalent in battery technology to Moore's Law in computer processing capability? With the potential for reducing battery weight and increasing endurance a moving target, the extent of future roles for fully electric aircraft remains a question mark.

Safety has to be the primary driver in any future passenger-travel platform. Commercial aviation's current safety record came about only through layer upon layer of checks and triple-checks from design to production to operations. And as we have seen recently, there are still cracks in the fortress walls. Autonomous flight will have to double down on that safety culture if the last layer of defense in an emergency—the pilot—is to be removed from the equation. While it's true that automation can perform most of the duties of flying an airplane more reliably and efficiently than a human pilot, the machine can only do what some human somewhere has "taught" it to do.

Artificial intelligence and machine learning could advance to the point where the machine can actually "outthink" a human pilot. But we're not there yet. How smart would drones have to get before you would be willing to trust your family to one? **BJT**



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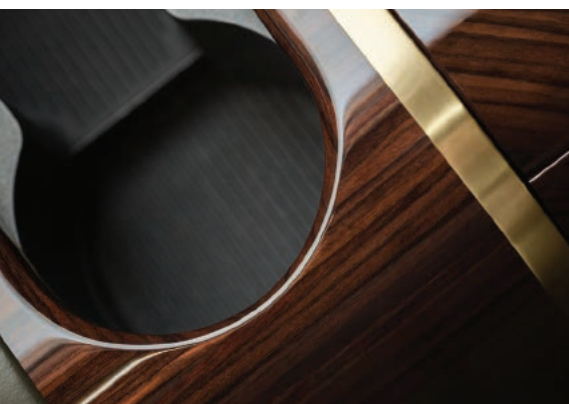
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