(photo: Burrana)

Power to the people

SMARTPHONES, TABLETS AND SIMILAR DEVICES BARELY EXISTED 20 YEARS AGO. NOW, AIRLINES NEED TO CATER FOR PASSENGERS NOT JUST BRINGING THEM ON BOARD BUT WANTING THEM TO BE CHARGED AT ALL TIMES. **BERNIE BALDWIN** REPORTS

Power outlets for passengers are among the newer cabin elements introduced by airlines as they seek to provide their customers with as many amenities as possible during a flight. At first it was mainly to enable those with laptops to keep them charged, as smart phones and other personal electronic devices came along a bit later.

Nowadays, of course, almost everyone travels with at least a smartphone and many with multiple devices. With increasing numbers of airlines offering entertainment via streaming through a wireless network directly to those devices, it's important to keep them topped up with power. Travellers don't want the device cutting out at the very moment of a film's dénouement.

Valour Consultancy has recently issued the 2019 edition of its paper, *The Future of Aircraft Seating and In-Seat Power,* so for founder and partner Craig Foster, the topic is very current. One of the first things to assess is the fact that different countries have different electricity supplies on the ground, so onboard power outlet systems need to cater for all of these and for the many different devices needing to be charged.

"Generally speaking, 110V AC power outlets are universal in nature and accept plugs from countries throughout the world," Foster observes. "Astronics' outlets, for example, are compatible with plugs from over 170 countries. Older 12-15V 'cigarette lighter' DC plugs require a DC-to-AC adapter in order to charge devices, but are few and far between these days. However, passengers with newer, USB Type-C devices travelling on aircraft with only USB Type-A outlets and no AC sockets won't be able to charge their devices."

A new name Burrana may be, but it encompasses the heritage and knowhow of digEcor and Rockwell Collins. Its CEO, David Withers, describes how the company's products address different power supplies.

"Our standalone power solutions can be either USB-A (5V@2.1A), USB-C (5-20V@3A), or 110V AC (up to 160W)," he begins. "USB power has become a ubiquitous power source for tablets, smart phones and other devices worldwide and our 110V AC jacks which are primarily used for laptop power are universal and compatible with standards for North and South America, UK, Europe and the Asia-Pacific and can charge any consumer device. No adaptors are necessary."

Jason Davies, marketing executive at IFPL says that the company's Universal Remote Power Outlet is designed to accept a broad range of worldwide consumer AC plugs in one single unit. "It therefore removes complexity and the number of onboard power sockets required," he notes. As with Burrana, compatible plugs include North and South American, UK, European and Asia-Pacific standards. This unit provides 110V AC power, enabling passengers to use and charge their electronic devices."

Air France Industries KLM Engineering & Maintenance also offers sockets for passengers. "Laptops can be connected to 115V AC or 220V AC, while portable electrical devices can be connected to USB power which is a standard power for all countries. Users need to have their own power cable," remarks Stéphane Petit of the company's business development department.

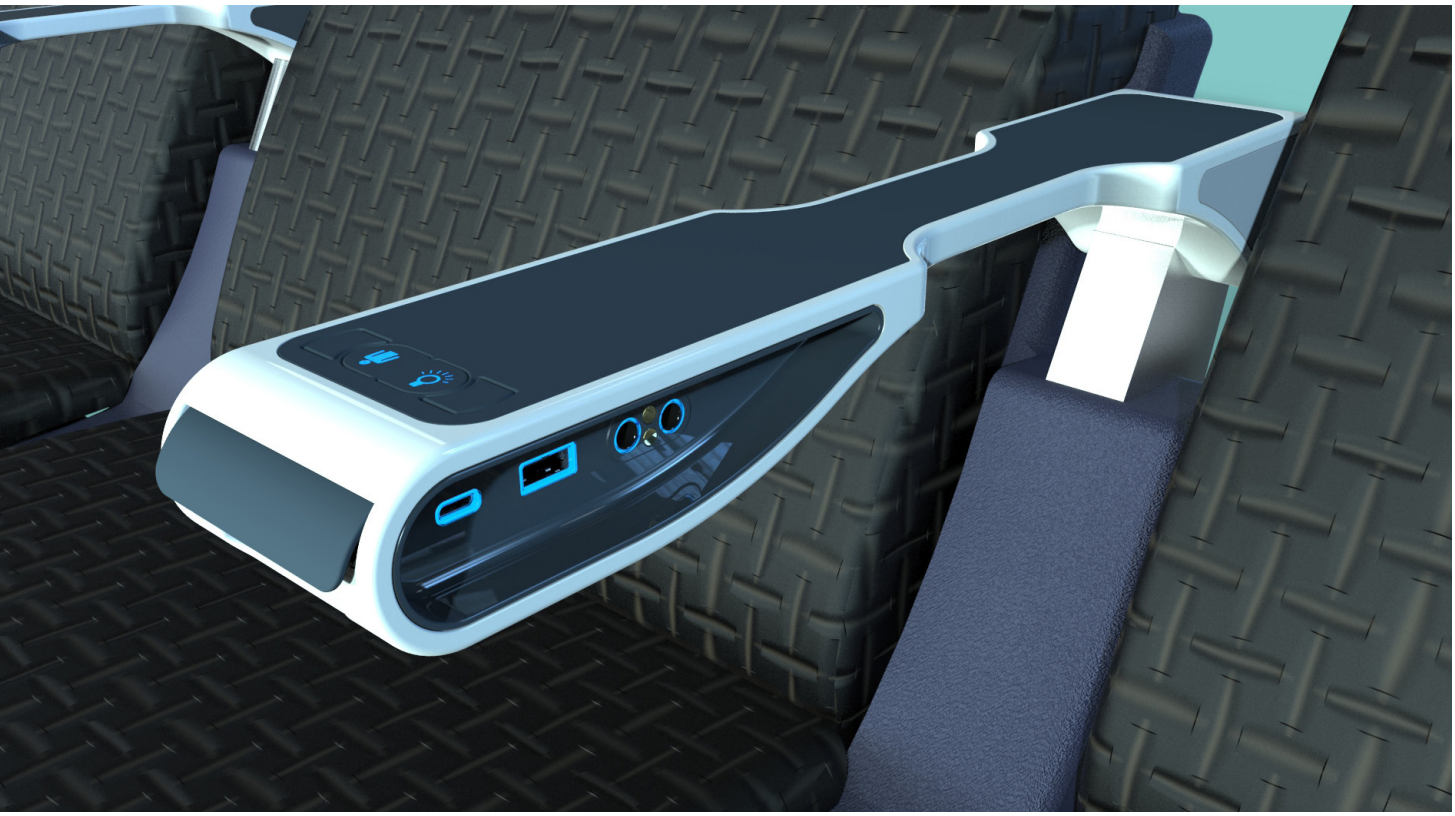
While a range of outlets is available, airlines are likely to have a preference for a type of outlet – full plug sockets, USB ports, a combination of these or others – with some offering different capabilities for each cabin.
"The most installed outlet is USB power," Petit reports of his company's experience. "Only the business seats are equipped with combination 115V AC and USB power, although sometimes premium economy has this option."

↑ Burrana's double USB port *(photos: Burrana)*

Burrana offers numerous in-seat power options for USB and laptop power, dependent on airlines' needs and cabin configurations. "It all comes down to the airline, the aircraft type (widebody or narrowbody), the cabin class (P, J, PremY or Y) the seat design, whether they are retrofitting power to an already fitted seat versus fitting power to a new seat," Withers explains. "There are many variables. However, generally airlines are looking for USB power in all classes, 110V in premium cabins and more recently, USB-C power.

"Variables dictate what solution fits a particular airline with a particular product solution pertaining to class. Widely we see a First, Business and Premium Economy solution include a 110V laptop power plus USB power product at each seat (or multiple USB sockets), installed as an integrated solution as part of the IFE system or seat controls," he continues. "Long range economy is often integrated as part of the embedded IFE system with USB power offered somewhere around the screen with or without its own audio jack. Narrowbody passenger power is often a standalone USB power solution USB-A (5V@2.1A), USB-C (5-20V@3A) that includes as an option audio jacks."

IFPL, according to Davies, has identified that future passenger trends will move towards a strong consumer demand from USB-A to USB-C. "IFPL's new ↘



↑ IFPL's seat arm concept *(photo: IFPL)*

product gives confidence to airlines that they can now invest in seamless seat integration, with a clear upgrade path," he declares. "Powering passengers' Personal Electronic Devices (PEDs) is now a growing trend that airlines need to meet, thus providing another opportunity for airlines to generate additional ancillary revenue."

Davies adds that with consumer devices increasingly adopting USB-C as standard, IFPL's products provide high speed data and power for PEDs. Moreover, they can be "seamlessly and aesthetically integrated within the seat".

Valour's research tells a similar story, though with a bit more breadth across the industry. "In future, we expect airlines to adopt primarily USB only in economy class cabins," Foster confirms. "With the emergence of Type-C and USB Power Delivery (PD) it is possible to provide up to 60W of power to a variety of Type-C enabled devices through one, universal cable. USB has a number of advantages over AC power – systems are less expensive, less obtrusive and weigh less.

"In premium economy cabins, however, airlines will continue offering a variety of charging options (USB, AC and AC+USB combo outlets) as expectations are higher and the need to provide an enhanced experience is greater. AC+USB and Type-A/Type-C combination outlets are likely to prove popular to ease the transition to Type-C," he adds. "Premium cabins will also probably see a growing adoption of inductive charging in future, given the increased real estate available compared with increasingly cramped economy cabins."

As for the placement of sockets, this varies from airline to airline. A number of considerations between the supplier and the airline go into the decision of where the power outlets should be placed.

"Airlines generally prefer to have outlets situated somewhere on the seat in front and would prefer that their passengers do not need to scramble to find an outlet located on the bottom of their seat between their knees," Foster comments. "Airlines consider things like comfort, ease of use/ease of location, and whether a plugged-in cable would represent a tripping hazard when designing layouts."

Burrana works with its airline customers to design a bespoke solution that suits their requirements and success criteria. "We do this by using efficient design, innovative materials and reduced component count, with reversible USB power outlets so passengers aren't frustrated in figuring out which way to connect their cables," Withers elaborates. "The determination of where power sockets are housed depends on the seat vendor and type. Whether the seat vendor is amenable to an end of seat arm installation [if a new seat is being retrofitted], whether an IFE screen is fitted at the seat, if the seat is a front row seat with a bulkhead or not, what class the power is to be fitted in, and what the overall product offering includes. We also offer ergonomic design solutions, with the passenger front of mind, so accesses to the ports are within easy reach and don't compromise the passenger space."

At IFPL, the company's USB products are now available in both front and rear mount variants allowing for customised installation options. "The correct location and orientation of the socket is crucial to its long-term reliability. Where possible we aim to influence the installation location," Davies says.
For AFI KLM E&M's Petit, one factor sits above

the rest in socket placement. "The position must be visible," he stresses. "The seat back is appreciated compared to under the seat. An in-arm solution means not having to disturb the passenger when you have to move. But it depends of the definition of the in-arm and we have to consider the reliability and maintenance of the system."

Designs from seat manufacturers clearly differ from one to another, so power outlet solutions need to be able to adapt to the different types of seats. When outfitting new aircraft, in-seat power suppliers like to work with the seat manufacturer to create a bespoke solution, if possible.

"There is a standard installation for economy seats, fixed on the seat beam," Petit notes. "For the business class seat, the outlet location depends on the design of the seat, each one being customised according to the airline. But we do get the opportunity to develop a customised solution with the seat supplier."

Valour's Foster recounts that in-seat power vendors have historically worked very closely with IFE vendors, with USB ports often integrated into seatback screens. "However," he notes, "in the narrowbody market, where embedded IFE is much less prevalent than in the widebody market, we'll see in-seat power vendors and seat manufacturers work much more closely.

"KID-Systeme and IFPL, for instance, are integrating their system with Mirus's Hawk seats for AirAsia. IMAGIK and RECARO had a similar relationship for the GOL deployment, while Burrana is collaborating with the likes of Acro, RECARO, HAECO and Aviointeriors on various programmes. As opposed to just creating provisions for easier fitment later, seatmakers are starting to view pre-integrated in-seat power as a unique design feature that can help set them apart from competitors and increase profit margins," he adds.

"For airlines, the benefits of these integrations include lower part count, reduced installation and maintenance costs. Additionally, power that can be integrated into the seat design in a more aesthetic manner that does not compromise ergonomics, is viewed more favourably by passengers who benefit from a more enhanced experience which can help drive a better Net Promoter Score (NPS)," Foster advises. "Furthermore, the seat structure itself can be used to help with heat dissipation resulting in lighter and less obtrusive power equipment, further improving total cost of ownership."

Already noted above as working with Mirus, Davies declares that IFPL: "provides a fresh approach to peripheral integration that can be applied to new or existing seats. We are excited to be collaborating with our partners who share our vision of seamless seat integration and look forward to sharing further details in the near future."

Withers says Burrana always relishes the opportunity to work with an airline's seat supplier in this and other areas. "Absolutely," he proclaims. "That is exactly how we like to work in tailoring bespoke solutions for our customers. We already have collaboration agreements in place with seat vendors including Acro, RECARO, Aviointeriors and HAECO for pre-integration for various programmes.

"There are various ways an airline customer can choose to install our power solutions including: as a fully integrated solution as part of our seat-centric GLIDE IFE system; in existing seats as part of a direct aircraft retrofit; with a Supplemental Type Certificate (STC) or an OEM Service Bulletin with Burrana hardware kit; or by choosing the new Burrana USB seat spar modification kit, which enables airlines to install power on a current seat without revisiting seat certification.

"We have also been known to redesign hardware to fit unique seat requirements and we will continue to do so," Withers concludes.

The advice for airlines thus appears to be, if a passenger wants to bring a portable device on board, that these companies and their competitors will find a way to keep it fully powered.

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(photo: IFPL)