

# Orbis Flying Eye Hospital



## Challenge

Exponentially increase the number of ophthalmic professionals in remote locations around the world to be trained in a fully functionally teaching hospital on an aircraft, which also supports efforts to operate, and treat hundreds of patients. The solution must be intuitive, easy to use and reliable.

## Solutions

Outfit a newly renovated MD-10 aircraft with state-of-the-art networked AV and automation technology to stream high-definition, live audio and video feeds from the operating theater, laser treatment room and other key areas of the mobile hospital to a 46-seat classroom located at the front of the aircraft as well as to local hospitals and around the world.

## Donations, Volunteers, and Technology Help Visually Impaired Around the World

In September 2016, the Orbis Flying Eye Hospital®, the world's only mobile and fully accredited ophthalmic teaching hospital on board an MD-10 aircraft, touched down in Shenyang, China. This event marked the 40th active care and teaching program conducted in China by nonprofit Orbis International since its inception in 1982. The MD-10 is the third-generation aircraft donated to Orbis by FedEx marking a 33-year partnership.

In 2015 alone, the Flying Eye Hospital and its partner institutions conducted more than 2 million eye screenings and exams, 30,000 trainings for doctors, nurses and other eye care specialists, and nearly 66,000 eye surgeries in remote and underserved areas of the world.

Having the ability to train even more eye care specialists, the state-of-the-art, third-generation Flying Eye Hospital was unveiled to the public in June 2016 during a seven city US tour, including a stop at the FedEx terminal at New Jersey's Newark Liberty International Airport.

The Newark unveiling was particularly poignant for the team in attendance from the Rockleigh, New Jersey world headquarters of Crestron.



Bob Ranck, CEO of Orbis International and Dan Feldstein, Chairman and COO of Crestron at the June 2016 unveiling of the third-generation Orbis Flying Eye Hospital.

Crestron founder, George Feldstein and his wife Lynda, both avid pilots and aviation enthusiasts toured the second-generation Flying Eye Hospital at an airshow in Oshkosh, Wisconsin in 2012. "After taking a tour, and learning that Orbis had a new plane planned, he knew exactly what he needed to do, and he knew exactly how Crestron could help," said Dan Feldstein, Chairman and COO of Crestron. "He immediately went to work. Unfortunately, he passed in 2014 and was not able to see this come to fruition, but my parents instilled their passion for giving to me and my siblings. We are honored to be able to continue my father's legacy and honor his memory in helping complete the project that he started." The combined value of the equipment and integration services donated by Crestron is \$300,000.

In addition to Crestron, global support partners include Alcon Foundation, FedEx, Jepsen, L'Occitane®, OMEGA®, and other sponsors.

### Stunning Facts

"There are 285 million blind or visually impaired people in the world," said Bob Ranck, CEO of Orbis International. Eighty percent of them don't have to be. Ninety percent of those impaired are in the developing world, and that's where the Flying Eye Hospital operates. "There's a difference between 'give a man a fish' and 'teach a man to fish,'" Ranck said. "This hospital is about teaching a man to fish. This is about our medical colleagues on the eye care team: nurses, doctors, anesthesiologists, surgeons, biomedical engineers—the whole team—and helping to upskill them for challenges they face in their environment. We need our medical colleagues in the developing world to have the skills to address the problems of the patients they are seeing."

Orbis facilitates a community of more than 400 medical volunteers to lead training endeavors around the world. "Cybersight is our online telemedicine portal bringing the medical training and consultancy that we do on the ground to an online platform that ensures continuity of support and mentorship," Ranck added. "In 2016 alone, we have engaged people from 129 countries for our Cybersight live teaching events," said Dr. Danny Haddad, Chief of Program at Orbis. "This approach allows us to do more with the people we already have partnerships with—to increase the intensity and types of training we do with them—but equally important to also have an impact in places we could never work in person for lack of resources, lack of stability, conflict, etc."

### A Global Platform

"The idea is to give people of low and middle-income countries access to an equivalent—or as near-to-equivalent—standard of residency training that you'd expect to see here in the U.S.," said Dr. Jonathan Lord who currently serves as Global Medical Director at Orbis.

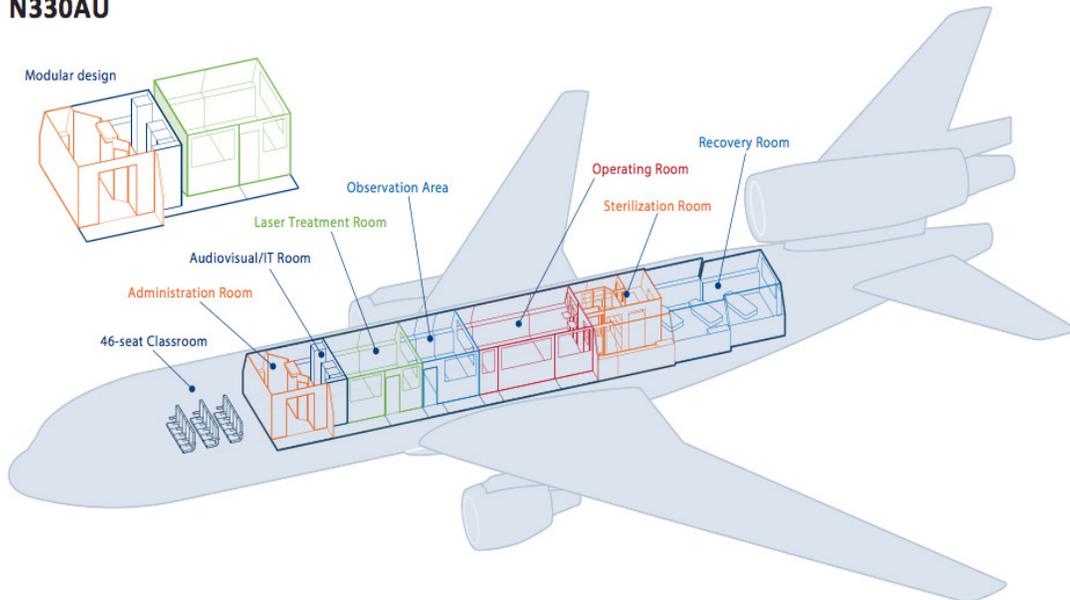
"We can [stream an operation] and have live communication with a classroom at the local hospital. Or we can transmit [the recording] around the world ..."

**Dr. Jonathan Lord**  
Global Medical Director  
Orbis International



The MD-10-30 Flying Eye Hospital (N330AU) was assembled with a modular design making future upgrades easier to implement.

## N330AU



Dr. Lord has been a Volunteer Faculty member at Orbis since 1997 and part of the Flying Eye Hospital team since 2010. "The biggest single challenge is that no one has ever tried to do this with an aircraft before, but the advantages are what makes it so exciting," he said.

As you enter the MD-10 aircraft, the learning experience begins in the 46-seat classroom, which looks and feels like the business class section in any other plane. However rather than passengers, the seats are filled with local doctors, nurses, biomedical engineers and other eye care specialists watching real-time eye surgery or other procedures on a 50-inch, 3D-capable monitor streamed from one of the hospital rooms located behind the classroom.

"The microscope in the operating theater is linked to a 3D system so everyone here [in the classroom located] can get the same feeling—as though they're sitting at the operating microscope," said Lord. "The Crestron system is really helping advance what we do in the aircraft." In addition to seeing a live procedure on the 50-inch monitor, two-way audio enables trainees to hear a surgeon and theater staff, and

ask questions to better understand training sessions. "In every room, you can control all the cameras that are placed around the aircraft—you can show what's happening in any other room and we can enable two-way communication between those rooms. That enhances the training capacity," he said.

### Easy to Use

With 400-plus medical volunteers, the technology interface had to be easy-to-use. More than 20 Crestron touch panels, audio and visual distribution systems, multimedia processors, cameras and monitors create a fully integrated solution for each Flying Eye Hospital space. In addition to the operating theater, the hospital includes a laser treatment room, a sterilization room, a recovery room, an observation area, a small administration room and an audiovisual/IT room. "You have a control panel and you're able to pull up anything that's happening in the plane so people can see what's happening in other parts of the aircraft," said Lord. "You can focus and move any of these cameras so you can make sure that people see exactly what you want them to see."

"We need our medical colleagues in the developing world to have the skills to address the problems of the patients they are seeing."

**Bob Ranck**

CEO

Orbis International

### Integrated Solution

Occupying a compact space between the administration and laser treatment rooms is the audiovisual/IT room. "The biggest challenge has been dealing with the space limitations on the plane," said Brian Studwell, Director, of Consultant Programs at Crestron. "One of the great things we were able to bring to the table was concealed cables for all the distribution and being able to power a lot of the transmitters and receivers remotely over that same single cable." All inputs and monitor outputs are connected using Crestron DigitalMedia™ technology allowing for any camera picture to be routed to any display. In addition, a Crestron Sonnex® multi-room audio system and Crestron speakers provide audio throughout the plane. "There is a 32x32 DM® switcher, and a DigitalMedia Presentation System running the classroom," said Studwell.

A large display in the AV/IT room shows all cameras located throughout the plane. "This is where you can switch screens, increase the volume of the microphones, change the sources, and change the destinations," said Gangadhar Jalli, audiovisual Support Manager for Orbis International.



All inputs and monitor outputs are connected using Crestron DigitalMedia technology allowing picture to be routed anywhere.

The ability to live-stream from the aircraft is new to the third-generation hospital. "We can transmit this and have live communication with a classroom at the local hospital. Or we can transmit it around the world; we can send it to other countries." Lord added. Live-streaming has increased the potential audience reach. "The technology that we've got on this plane significantly advances our training mission," he said.

One of the biggest advances Lord noted is that cell phone technology is now available most everywhere in the world. "People can join the training and participate in the lectures just using a smartphone and a simple application."

During programs, local hospitals are introduced to Cybersight® medical services. "It allows them to upload cases—case details, pictures—and put them on a forum where they can get a mentor to talk to them about the case," said Lord.



Upon completing training aboard the hospital each participant is given a thumb drive or a DVD containing all training materials, recordings of all surgeries they've seen, all lectures they have attended, and all training sessions. "They can go away and watch it again," Lord noted. "Only by having this background technology are we able to do this."

## Technology Increases Access

"Technology is really driving forward medical education. It connects people around the world," Lord added. "It allows you to build that global community that improves the quality of education, drives forward standards, and makes sure that those 285 million people in the world who are blind or have low vision can have access to quality eye care services to improve their lives and their communities' lives."

During 2017, the Orbis Flying Eye Hospital programs will be in South East Asia and Africa.

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**Dr. Jonathan Lord**  
Global Medical Director  
Orbis International

## Equipment List

2	Crestron infiNET EX® & ER Wireless Gateway
1	Crestron iServer® Network Audio Server
5	Crestron Network Stream Player
23	Crestron DigitalMedia Graphics Engines
1	Crestron 32x32 DigitalMedia Switcher
8	Crestron DigitalMedia 8G+® Receiver and Room Controller with Scaler
12	Crestron DigitalMedia 8G+ Transmitter 201
5	Crestron Certified DigitalMedia 8G+ Input Card with HDBaseT® connectivity for DM Switchers
6	Crestron 2-Channel 4K Scaling HDMI® Output Card for DM® Switchers
1	Crestron DigitalMedia Presentation System 300
1	Crestron High-Definition Digital Video Annotator
1	Crestron 3-Series Control System
1	Crestron Sonnex® Multiroom Audio System
2	Crestron 15.6-inch HD Touch Screen
2	Crestron 20-inch HD Touch Screen
2	Crestron Handheld Touch Screen Remote
2	Crestron 8.7-inch Wireless Touch Screen
2	Crestron 5.7-inch Wireless Touch Screen
5	Crestron V-Panel™ 15-inch HD Touch Screen Displays
8	Crestron V-Panel 24-inch HD Touch Screen Display



# Volunteers with Wings

Gary Dyson piloted the first program on the newly renovated MD-10 Orbis Flying Eye Hospital to Shenyang, China in September 2016.

There's no doubt that without the hundreds of medical and support volunteers and corporate donations the Orbis Flying Eye Hospital couldn't happen. But it takes a pilot to get this MD-10 hospital off the ground and to remote destinations around the world.

Gary Dyson has been a captain with FedEx, flying worldwide for 30 years. It's his day job. But for more than 15 years he has also been a volunteer pilot, flying between 25 and 30 programs for the Orbis Flying Eye Hospital.

"When I found out about Orbis in about 1999, I called and said, 'Hey, I'm a DC-10 captain. I would like to help you fly the airplane,'" said Dyson. A year later FedEx contacted Dyson to help train existing pilots. Today the programs are flown exclusively by FedEx pilots.

For more than 30 years, FedEx has played an indispensable role in helping Orbis achieve its vision of a world in which no one is needlessly blind. "Even before we started helping them fly the airplane we shipped supplies for them all over the world for free,

so when we became involved as pilot it just made it all that much the better," Dyson added.

In addition to donating the MD-10 airframe to Orbis, FedEx manages the completion of routine and critical maintenance procedures, including the annual safety checks for the Orbis Flying Eye Hospital to ensure its airworthiness, and provides spare aircraft components as needed.

"For a pilot, it's very special to fly an airplane like this because it's one-of-a-kind, so getting to do that is a privilege," said Dyson. "And then getting to see the life-changing events out there that we witness when people get their sight restored is amazing, and it makes us as pilots want to come back and do it again and again. It's my dream volunteer job."



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