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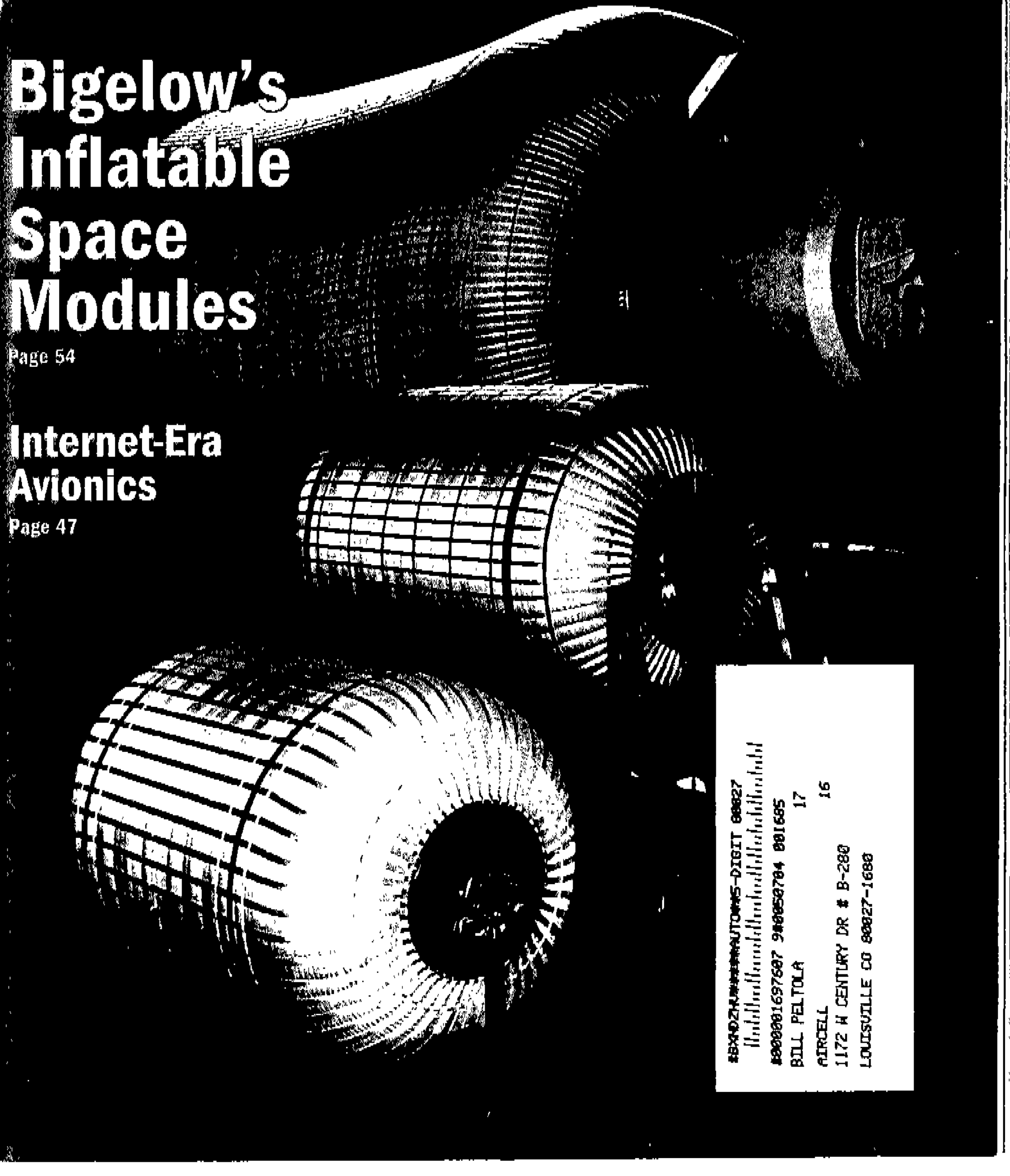

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The Activist Passenger

Vendors say a seat-pocket magazine just isn't enough in today's market

MICHAEL MECHAM/SEATTLE

The inflight entertainment establishment isn't sitting still. It's regrouping, pumping up the "wow" factor in seatback imagery and pushing hard to let Internet-savvy passengers do at 30,000 ft. what they're accustomed to doing on the street.

However, an insurgency has been building over the past year, bent on convincing airlines that their IFE choices can be more portable, less costly and—possibly—a great new source of revenue. The upstarts are mostly unproven, and the establishment isn't napping. Still, is the day coming when passengers will ask what kind of cabin broadband and entertainment alternatives an airline offers in addition to their traditional price-and-schedule questions?

Last year, airline expenditures on inflight entertainment, cabin communications products and services were up 17%, reaching $1.6 billion. That's still not as good as the $2.1 billion of a pre-terrorism/Asian health scare and sour economy in 2000, but the IFE buys are expected to total nearly $1.8 billion this year, the World Airline Entertainment Assn. (WAEA) reported at its 25th anniversary exhibition here last week.

Inflight movies remain the mainstay of IFE, according to the Inflight Management Development Center (IMDC), a consultancy. But an appetite for e-mail services and the right to use their own mobile telephones is building among passengers, although price remains a barrier, says IMDC chief analyst Wale Adepoju. The onboard audience is often fragmented in what it wants, he adds.

Although inflight Internet activities are barely underway, passengers are used to other offerings that they don't get on the ground. "The vast majority of passengers are experiencing interactive television that they have yet to envision in their homes," says Paul F. Liao, Panasonic's chief technology officer in the U.S. Panasonic is the consumer brand for Matsushita, which claims the largest airline client list in wide-body IFE systems.

The WAEA operates as an open forum for airlines, equipment vendors and content providers, and its annual shows are frequently the launching pad for next-generation ideas and equipment in passenger entertainment.

That was the case with the debut of OnAir, the name of a repackaged and repositioned Tenzing as an Internet services challenger to Connexion by Boeing. Paperwork to complete the new company's organization is expected to be finished by year-end. OnAir should be operational in the second quarter next year, says Sita Inc. Senior Vice President George Cooper, who heads its Aircom short message service (SMS) and airline operations. Cooper is to be a senior executive with OnAir.

OnAir will take over the market developed by Tenzing next year by expanding its data services to include voice, instant messaging and other transmissions from passengers' own laptops, PDAs and mobile phones. Sita will be the majority owner.

Sita, which has an all-important credibility with airlines as a data and voice communications applications provider, will be the majority owner. Airbus will be a "substantial" minority investor. Privately held Tenzing, which counted Airbus and Rockwell Collins as major investors, will be absorbed into the new company. At the Farnborough air show, Tenzing, Sita and Airbus announced they would form a new company, but didn't name it (*AW&ST* July 26, p. 29).

Founded in 1999 as the airline dot.com drive got underway, Tenzing focused on data transmissions as a business-to-business service provider. By adding voice services, OnAir expands that strategy to the business-to-consumer (B-to-C) marketing model.

"We want to extend passenger expectations onto the airplane," Cooper explains, "and no more than that. The same prices, the same services" as they are accustomed to on the ground.

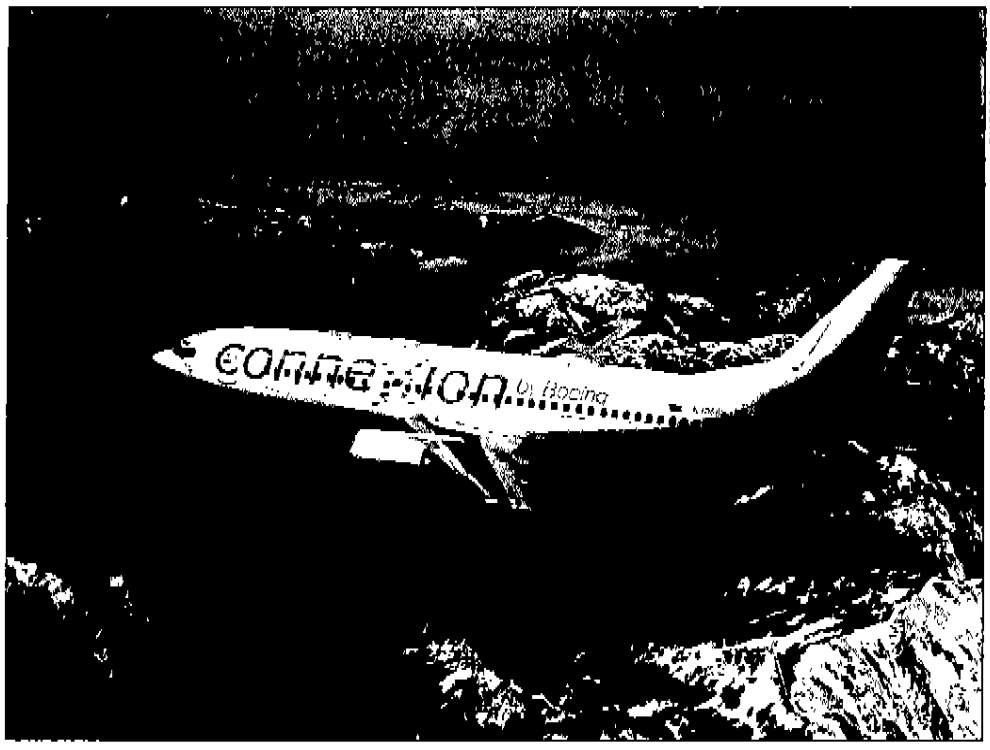
That phrase, "and no more than that,"

is a reference to Boeing's more tech-dynamic broadband approach with Connexion, which offers 5-Mbps. performance but at higher passenger service charges.

OnAir's entry into the B-to-C market will emphasize the use of passengers' own devices, whether laptop computers, personal digital assistants (PDAs) or mobile phones. New services are to be introduced as passenger demand dictates, the idea being that airlines will not be asked to buy into equipment and services before the market will support them.

But OnAir expects passengers to demand more, and quickly. From the outset it is to offer in-seat telephony and SMS. Sita's investment will pay off in this regard; it launched the Aircom inflight SMS service last year that has four airline clients, including Asiana Airlines and Malaysia Airlines, which announced their contracts here last week.

Access to corporate virtual private networks (VPNs) and Internet browsing is to come next year. In 2006, it expects to allow passengers to make and receive calls and text messages using their own cell phones.



COURTESY OF BOEING

Passengers using Connexion by Boeing can send data-rich files from laptops that are either hard-wired or WiFi-enabled from the aircraft. This JPEG photo of the Connexion 737-400 test aircraft was transmitted at DSL line rates while inflight over eastern Washington State.

DESPITE THE AIRBUS connection, OnAir is to be applicable to Boeing airframes as well. It could hardly do otherwise. Lufthansa debuted commercial operations for Boeing's Connexion with retrofits to its A340 fleet; Connexion's first Boeing application will come on a 777-200ER delivery to its newest member, Asiana Airlines, next July.

Onboard Boeing's 737-400 Connexion demonstrator aircraft last week, guests used laptops and PDAs to send e-mails through an in-cabin WiFi network at DSL transmission rates. The VT Miltope WiFi antenna handled transmissions that ranged from short-burst SMS messages to large-file JPEG pictures, all within seconds. Although private cell-phone services from aircraft have yet to receive regulatory approval for commercial use, the Connexion aircraft is testing a pico cell, the transmitter that makes in-cabin cell phone calls possible. A call from eastern Washington to California went through immediately and was clear.

OnAir's inflight connectivity is built on some long-time industrial connections. North American passengers access Tenzing's e-mail system through Verizon Airfone's North American Telephony Service. Outside North America, Inmarsat's nine-satellite constellation provides the connection. OnAir is counting on the 2005-06 launch of three EADS/Astrium I-4 satellites to enable it to achieve new broadband data rates. The fact that so many carriers use Inmarsat for cockpit communications means they will require "a simple avionics upgrade" through their existing antenna rather than a complete retrofit of a new antenna, although Asiana has elected to go that route by joining Connexion.

> Before passengers start dialing up inflight, they'll want **simplified usage protocols** and billing

Two years ago, Inmarsat began offering 64 Kbps. Internet data rates to executive jet and government clients. It has accumulated 500 clients, including one airline, Iberia.

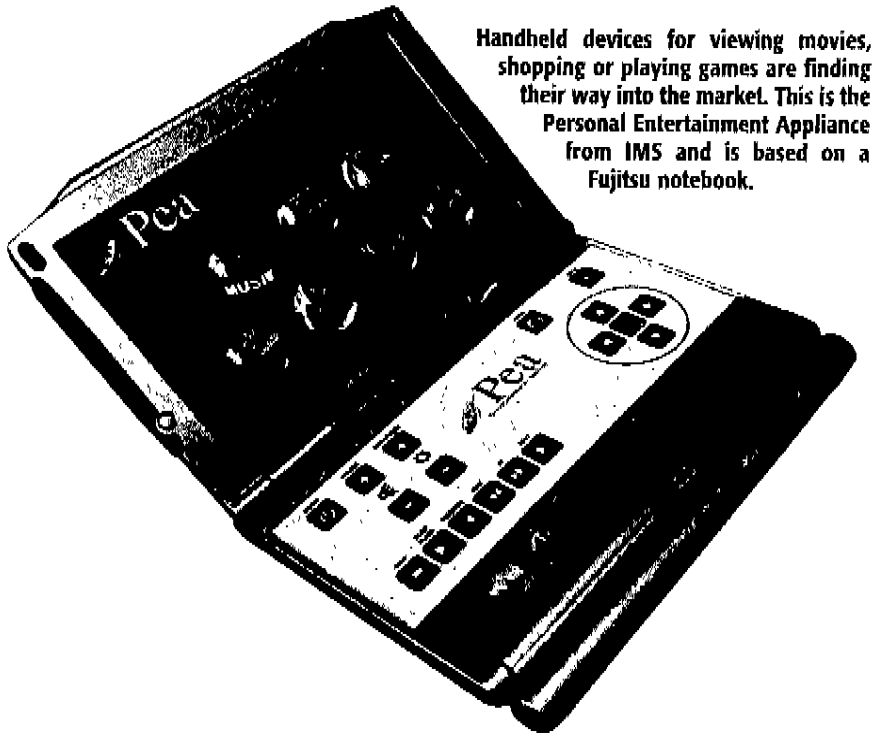
But it is the L-band I-4 system that represents Inmarsat's future. Called SwiftBroadband, the system will provide spotbeam coverage of the globe—minus the polar regions—and guarantee 432 Kbps. data rates, says Lars Ringertz, who heads its aeronautical business. It is awaiting regulatory approval to begin offering cell phone services, as well.

SwiftBroadband represents Inmarsat's L-band competition to the K_u-band operations of Connexion. Inmarsat maintains that its dedicated network will provide more reliable services, despite Connexion's faster transmissions because it uses leased transponders that can become overburdened. Connexion officials respond that there is a lot of K_u-band capacity so they can lease additional transponders as necessary.

There are two inhibitors to the inflight use of mobile phones: the possibility that they might interfere with the aircraft's avionics and the even larger issue that multiple cell repeaters on the ground will be overwhelmed by a flood of overhead signals. The former problem remains under study, but the second issue can be overcome in a variety of ways—by introducing new mobile phones with power suppression switching or by us-

ing the inflight pico cells to accomplish the same task. Regardless, the industry is gearing up for an inflight mobile phone revolution.

The IFE industry is eager to tap into today's mobile phone culture. But before passengers start dialing up inflight, they'll want simplified usage protocols and billing. The industry thinks the simplest billing is through their monthly mobile phone statement. Since last March, Verizon Wireless customers have been able to use Airfone seatback phones on United Airlines and Continental Airlines and see the charges show up on their monthly Verizon statement. But Airfone expects that within a year or two, regulatory approval will be won for inflight cell phone use, says President William E. Pallone. The possibilities include voice over internet protocol (VOIP) services and text messaging for PDA appliances, and Verizon is flight testing a VOIP system now that can be integrated with IFE systems.



Handheld devices for viewing movies, shopping or playing games are finding their way into the market. This is the Personal Entertainment Appliance from IMS and is based on a Fujitsu notebook.

WHILE AIRFONE CHASES the North American GSM mobile phone market (which uses a different transmission standard from the rest of the world), Arinc and Telenor, Norway's telecom and Inmarsat's largest industrial shareholder, are after the other 75% of the world's cell phones. Bernt Fanghol, Telenor's program management director, says that while 50% of all business travelers are carrying laptops, 83% of them are carrying mobile phones. So there's a huge potential market.

Arinc's installed equipment base means the addition of a mobile phone pico system can be accomplished for less than $100,000 per aircraft, far less than having to penetrate a hull for a new installation. Most calls are expected to be short, under 3 min. About 50% of mobile users will prefer text messaging to voice. Telenor expects passengers to be willing to pay $3.50 a minute for voice services and $1 a minute for text transmissions.

Meanwhile, Arinc is looking for its SkyLink broadband service to expand beyond the executive jet level, where it began six months ago, into commercial aircraft. Virgin Atlantic has become its first commercial customer.

Inmarsat is using a lightweight antenna from Chelton Antenna for its SwiftBroadband satellite transmissions.

SkyLink uses WiFi rather than hard wires, which will save airlines substantial installation costs. But WiFi has limited applicability since not all laptop users have the service. Senior Business Development Director Thomas E. Mullan says SkyLink is achieving 5 Mbps. transmission rates to the aircraft and 256 Kbps. back.

ARINC HAS CHOSEN the Mijet broadband antenna from Starling Advanced Communications of Yoqneam, Israel, a subsidiary of Rafael and Elbit Systems. Mijet achieves an unusually low profile—just 5 in.—to reduce drag (see Inside Avionics on p. 53). At 24-in.-dia., the antenna system is small enough to fit on single-aisle aircraft, and it is this market that Starling is emphasizing. All of Arinc's SkyLink equipment will weigh just 150 lb. and consume 350 watts of power, Mullan says.

Arinc is working with another newcomer, IMS, a subsidiary of Systems and Software Enterprise Inc., which has developed the Personal Entertainment Appliance (PEA). IMS has taken standard Fujitsu notebooks, ruggardized them for clumsy passengers, sealed off their access ports to prevent download theft and changed their keyboards to include basic channel/volume/etc. selections. The prototypes come in three sizes, with the standard using a 10.4-in. diagonal screen.

The result is a simple display that airlines can hand out from a service cart. They can be battery operated (depending on use, batteries last 5-8 hr.) or

plugged into a docking station (naturally, it's called the pod).

IMS began talking with airlines about PEAs this fall, and Business Development Director Michael Childers predicts, "There will be PEAs in the sky this fall."

The concept is simple, but IMS' vision is anything but. Besides offering 12-20 movies, interactive games, 40-100 CD music choices and electronic or audio books, Childers says the PEA can be used for in-air shopping—and not just from an airline's duty-free selections. He envisions airlines earning fees from well-known catalogue merchants eager to gain access to a captive audience. Passengers will swipe credit cards to buy services. The units will store the credit card and any purchase information for downloading after the flight.

THE SELLING POINT for airlines is a less-than-$2,000-per-screen price tag.

PEA is following in the footsteps of APS' digEplayer 5500. Introduced at last year's WAEA conference, the portable entertainment centers are already in use by six airlines, and APS last week announced that Ryanair will become its first European low-fare customer. DigEplayer offers up to 64 movie choices.

APS shows how quickly ideas can bubble up from the ground in IFE. Its founder, Bill Boyer, works—he still does—on an Alaskan Airlines ramp. Alaska launched the digEPlayer on its long-haul flights.

This portable audio-visual on-demand (AVOD) entertainment concept is especially suited for the single-aisle market, which rarely has IFE systems, except for limited applications, such as JetBlue's attention-grabbing inflight television services.

Virgin Atlantic has begun experimenting with General Dynamics Advanced Information Systems' Your Entertainment Station Solo (YES Solo) on a 747-400. YES Solo's AVOD approach can be either portable or a seatback installation and use WiFi access. Connexion has been demonstrating it as a seatback installation for the past year.

The WiFi application allows it to receive news feeds through Rockwell Collins' Airshow 4200 system. Like the other portable AVOD suppliers, General Dynamics is applying a commercial-off-the-shelf approach to its hardware. It has turned to Hewlett-Packard for the devices.

While most IFE vendors concentrate on hardware, CoKinetics, a Stamford, Conn., software spinoff of Deutsche Asset Management, thinks the future in IFE is through better management of legacy systems. Its AirPlay software replaces the interactive engine in current displays so airlines can have greater control over their IFE offerings. CEO Kris Stevens explains that Internet-savvy passengers, especially the younger ones, think nothing of playing a game while using an Internet chat line and listening to music. "So why shouldn't airlines allow them to do all three inflight?" he asks. Online shopping is another obvious possibility, but so might hookups to electronic trading or services platforms, he says. And in the background, airlines will take a fee for making it all possible.

3D Progress

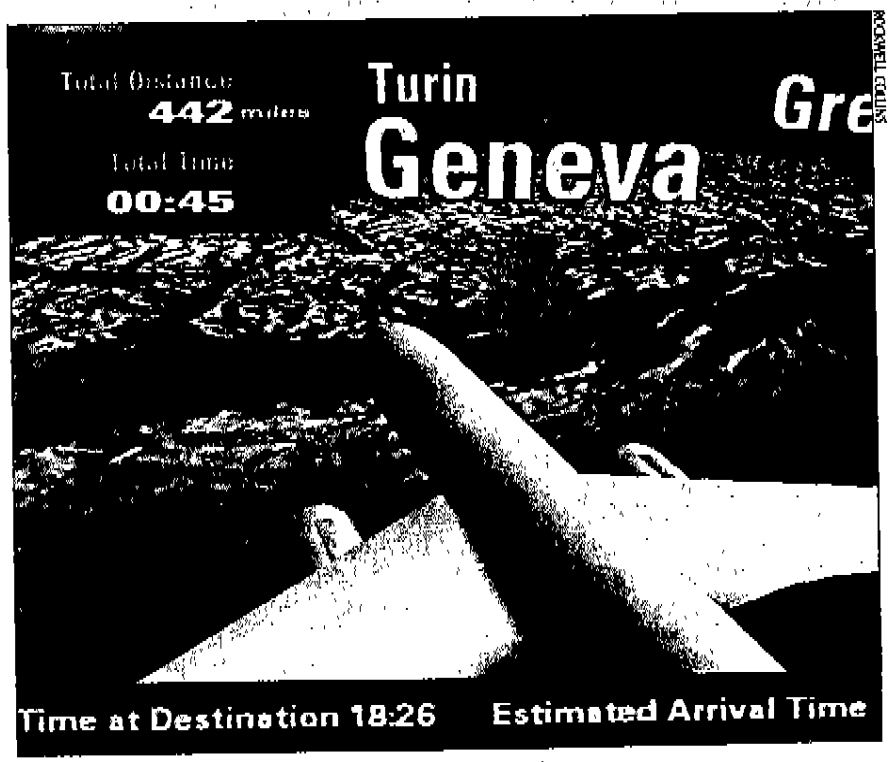
SEATTLE

The typical seatback display takes on a dynamic new look with the introduction of 3D imagery for the familiar moving map that tracks a flight's progress in the Rockwell Collins Airshow 4200/4200i systems.

Launched last week with an order from Air New Zealand, the new displays are the same size as current systems and require no additional wiring for retrofits, according to Tim Rayl, senior director of airshow systems. Air New Zealand will install them on eight new Boeing 777s and seven retrofitted 747s in mid-2005. They will be integrated with Rockwell Collins eTES cabin inflight entertainment systems.

Airshow 4200 is aimed at the 90% of the airline market that is video-based. Besides the 3D moving maps, it supports a distributed architecture for overhead or in-seat video displays. Options include MPEG-2 video, multilanguage placenames and a World Explorer internet service. It will be available for new aircraft or as retrofits.

Airshow 4200i is a digitally based product that provides an interactive moving map, ethernet-based distribution for inflight entertainment systems and the opportunity to be integrated with the various client/server architectures that are emerging. It uses solid-state hardware for better realiability than a CD-Rom drive and puts Rockwell Collins in the position of being a service provider.



Rockwell Collins has updated its moving map technology with 3D imagery with Airshow 4200. Besides news and sports, they can also show airport gate information.