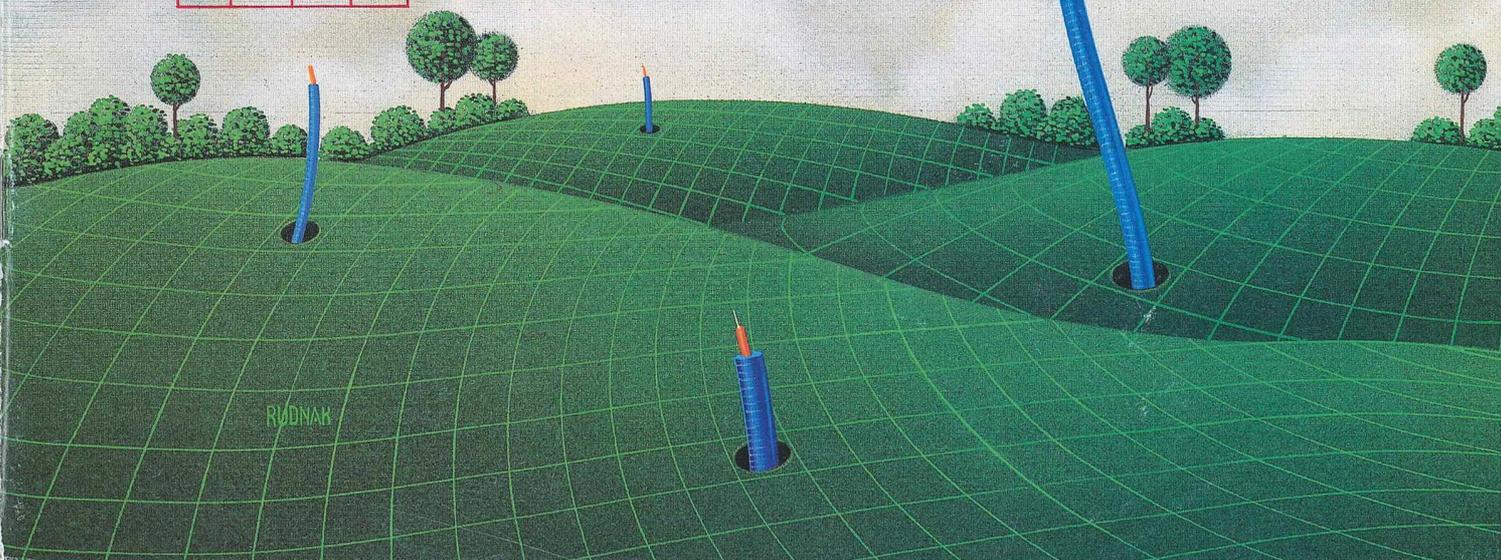
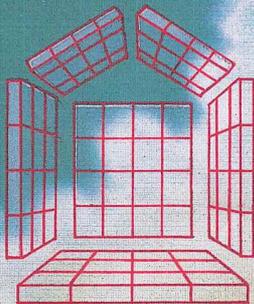


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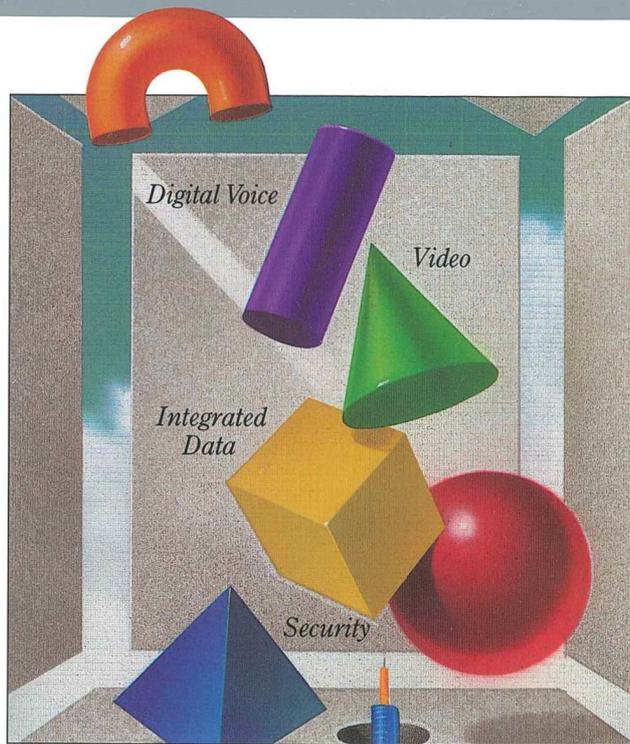
December 1987

A Northern Telecom Magazine

*Jeno F. Paulucci and
Southern Bell build the
city of the future*



RUDNAN



HEATHROW, FLORIDA: FIBER CITY

*Southern Bell, Northern Telecom,
and Jenof. Paulucci take fiber the last mile...
and into the future*

by Cliff Probst

"I'm building a city," states entrepreneur and developer Jenof. Paulucci. "I want the future now. I don't want to have to catch up later."

The fiber optic communications system for Paulucci's Heathrow development just north of Orlando, Florida, was announced on September 11, 1987, by Southern Bell, Northern Telecom, and Heathrow Telecommunications. The system represents the first commercial application of Integrated Services Digital Network (ISDN) services to the home; the first delivery of ISDN

over fiber to any customer; and the first use of the single-mode fiber to deliver digital voice, data, and video services to the home over the same transmission line.

"Our local telecommunications network at Heathrow, when completed, will be among the most advanced networks anywhere," says Karen Mangum, Southern Bell project manager. "It will offer basic ISDN service—with two voice or data channels and one signaling channel (2B + D)—as well as cable television transport and

other non-switched video services."

"I don't know the first thing about fiber optics," Paulucci admits. "But I know what people need. And I know the most important thing we do is communicate."

Ettore and Michelina Paulucci left the depleted sulphur mines of Pesaro province in Italy to find work in the Iron Range of Minnesota in 1912. Luigino Francesco Paulucci was born a few years later. Jenof's determination to succeed was forged during his family's early struggles in the mines and during

“The Paulucci family believes in quality.”

the Depression. “You make up your mind,” he says, “not to be poor . . . not to be discriminated against . . . not to fail.”

Paulucci's first success was the Chun King Corporation, a purveyor of processed Chinese foods. He founded the company with a \$2,500 loan in 1946 and sold it for \$63 million in cash 20 years later. When asked about the likelihood of Luigino Francesco Paulucci from Duluth, Minnesota, making that kind of money selling Chinese food, Jenó shrugs and says simply, “That's America.”

At his mother's insistence, Paulucci, who still considers himself a Duluthian, turned his attention to Italian foods, quickly dominating the frozen pizza market and developing Jenó's Pizza Rolls, for which he and humorist Stan Freberg appeared in television commercials.

Paulucci first came to Florida in search of water chestnuts and celery for Chun King. He wasn't originally interested in buying land, and credits his wife and brother-in-law with helping him see the investment potential in purchasing Florida horse farms at \$400 per acre. Now, after three generations of Paulucci family investment in Florida, he speaks with the fervor of a convert. “We can always make more pizza,” he says, “but we can't make more land.”

Heathrow includes 3,000 acres, with two miles of frontage on Interstate 4, 15 miles north of Orlando. H. Gordon Wyllie, chairman, Heathrow Land and Development Corporation, projects that building Heathrow will be a ten-year, \$2 billion-plus project.

Paulucci truly intends to build a city of the future, referring often to plans for people-movers, lasers, and “intelligent homes.” “I like to look ahead,” he says. “When you develop land, you accept responsi-



Entrepreneur Jenó F. Paulucci

“Heathrow is the legacy of three generations of the Paulucci family.”

ney's Epcot Center, a few miles on the other side of Orlando: “Heathrow is a real city. Real people live here. They work here, shop, and play here. They don't pay admission to come in, look around, and then go home.”

Heathrow has its own 24-hour security, with a fire and rescue station on site. Land has been dedicated for an elementary and middle school. There will also be a day care center, an enhanced educational facility, and a learning center for children from kindergarten through the 12th grade.

Approximately 700 people now reside in the city of the future. Plans call for a total of 4,000 homes, single- and multi-family dwellings. Current prices start at \$120,000 and extend into the millions of dollars. The existing homes and those under construction are clustered in cul-de-sacs around the golf course, the country club, the racquet club, and some of the 25 lakes on the property.

The landscaping is lush, reflecting another of Paulucci's interests. “When you develop land, you accept responsi-

bility to protect the quality of life, not just to make a buck. The more you protect the environment, the more valuable the land becomes.” Paulucci once threatened to fire a contractor for suggesting that a few trees be removed to accommodate building plans.

All plans, like a specially designed “Heathrow” mail box and the type of lettering on it, are governed by Heathrow covenants. “Details ensure quality,” comments Gordon Wyllie. “The Paulucci family believes in quality.”

Six hundred of Heathrow's prime acres are dedicated to the International Business Center, which will include offices, shops, hotels, a heliport, a Lifestyle Center, a Car Care Center, a Performing Arts Center, a library, and Southern Bell's central office. The premier commercial resident will be the American Automobile Association (AAA), which is moving its national headquarters from Falls Church, Virginia, to a new, 300,000 square-foot, \$50 million building in Heathrow.



Heathrow: landscaping and fiber optics.

“This is the first residential rollout of ISDN... .”

does.” Thomas A. Reiman, president of Heathrow Telecommunications, offers this comment: “You could put this development anywhere in the United States—same acreage, same money—but without Jenó, it just wouldn't work.”

The first group of homes, which are being wired as they are constructed, will begin receiving ISDN voice and data services over fiber next June, with video transport capability added by March of 1989. “In the near future,” Reiman asserts, “Heathrow homeowners will be able to select ISDN advanced services just like they select the color of carpet for their floors or wallpaper for the kitchen.”

Reiman plans to have a multitude of services from which homebuyers can choose. Security is provided by alarm monitoring, card access, and medical alert systems. There will be home banking, home shopping, climate control, intercom, and energy management. Cable television, with program menus and pay-per-view, will also offer a videotape rental service, eventually allowing homeowners to select a tape and have it directly downloaded into

their sets without leaving their homes or using a VCR.

A Heathrow business owner/resident will be able to link his or her den and office so that any office task can be performed at home, without special installations or data line charges. And videotext information services will allow residents to reserve a tennis court, check on the lunch menu at the country club, find out whether the school bus will be late, as well as access national and international information.

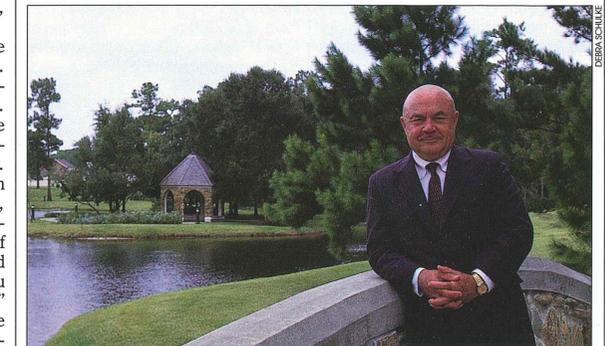
“This is the first residential rollout of ISDN in the country,” Reiman says, “and residential ISDN has to look, feel, and act differently from commercial ISDN. You can't just tell people, ‘This is science.’ You have to touch their lives. And the service has to be extremely user-friendly.”

The goal of Heathrow Telecommunications is to make ISDN a household acronym. Focus groups of residents will help identify needs and examine new services.

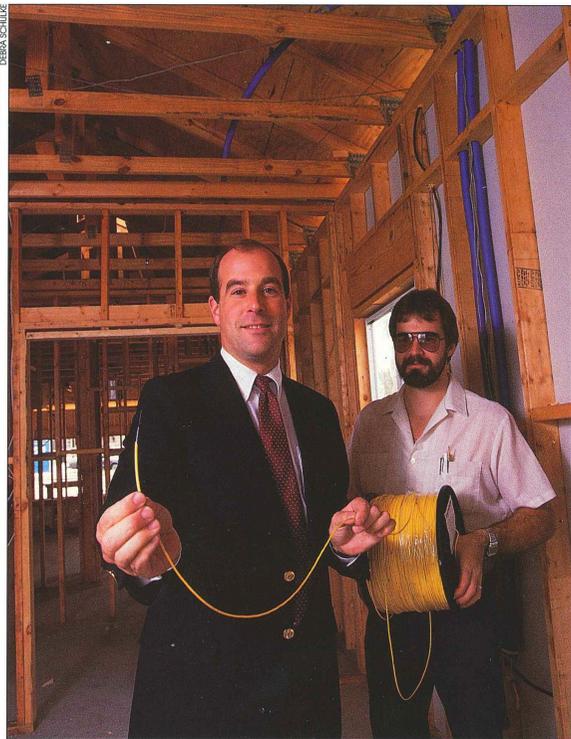
“Most people don't know what ISDN stands for,” Reiman continues. “But if it helps make home life easier or

Competition for the AAA move was intense. Jenó was more intense. Arriving in Falls Church for a presentation to AAA President James B. Creal, Paulucci found himself on the wrong side of the interstate only minutes before his scheduled appointment. He ordered his driver to stop, ran across the interstate and access roads, climbed a hill, crossed over a barbed-wire fence, ran in the rear entrance of the AAA building, and told a startled Creal whom he met on a stairwell, “You see how much I want you in Heathrow!”

“Jenó doesn't always get what he wants,” confides a Heathrow executive. “But he's in a better mood when he



On the grounds: H. Gordon Wyllie of Heathrow Land and Development Corporation.



In touch with the future: Heathrow Telecommunications President Thomas Reiman (holding fiber cable) and senior technician Michael Underwood in a Heathrow home.

more secure for our residents, it will help satisfy real needs and will be welcomed. Commercially, we don't need to do as much explaining. For example, the American Automobile Association is a communications company and we don't need to instruct AAA personnel on the basics. We can provide them with options, however, that will allow them to increase productivity while decreasing costs."

Northern Telecom will supply the fiber and the electronics for the integrated voice, data, and video access system. The central office switch will be a DMS-100. The optical interface will be on each subscriber line card in the DMS-100 rather than in a separate fiber bay. This interface will provide ISDN voice and data services over the fiber access system.

Video programming will be transmitted to the central office from the Heathrow-owned cable company in the form of 54 channels, for conversion to optical signals. Channel preferences will be signaled from the television controller in the home to the video selector in the central office. Residents' TV selections will be approved by a control position linked to the video selector and the cable company.

The optical signals from the DMS-100 and the video selector will be multiplexed on the fiber and transmitted via pulses of light as one digital bit stream to the home. An Optical Network Interface in each residence will de-multiplex the signal into video, voice, and basic ISDN signals. Video signals will be carried by coaxial cables to the television controller; ISDN sig-

"This is not a trial, not an experiment."

nals will be carried by copper to their respective terminals. Double jacks—one for POTS, one for ISDN—will make user access very easy.

In anticipation of future developments, such as high-definition television (HDTV), fiber cable will also be installed inside the home, along with the copper and coaxial cable. This may ultimately allow video signals to remain optical all the way from the central office to the television set.

The capacity of single-mode fiber is estimated to be four billion bits-per-second, more than 2,500 times the capacity of a copper carrier system. Because of this wide bandwidth, as well as its exceptional transmission quality, fiber optic cable has been used extensively in the network for interoffice transport. An increasing amount of fiber is being added to the local loop through optical fiber digital loop carrier systems, such as the DMS-1 Urban, which link the central office to points close to residential developments or office parks. Voice and data signals are then sent to individual homes and offices over copper wire pairs.

Until recently, replacing copper with fiber in that "last mile" of the network has not been cost-effective. Few small businesses and even fewer homeowners have a need for fiber's capacity, and the cost of installation would be difficult to recover. However, the cost of fiber is dropping, while the cost of installed copper is actually increasing. Fiber requires less maintenance, and some experts are predicting that fiber-to-the-home will become cost-effective for the delivery of plain old telephone service within the next few years.

Meanwhile, technology is bringing the telecommunications, computer, and cable television industries closer together. And ISDN services are

beginning to capture the attention of sophisticated end-users. In the words of Southern Bell's Richard K. Snelling, executive vice president—network, "Technology can push, but the market must pull."

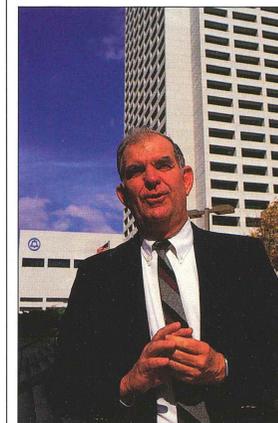
Heathrow is pulling. "The time is right for a commercial rollout," says Heathrow's Reiman, placing special emphasis on "rollout." "This is not a trial, not an experiment. The real estate development business is too competitive, too fickle. Even though we're first in the country with residential ISDN applications, we can't afford to make mistakes. We recognize this is a challenge, but we have confidence in Dick Snelling and the forward-thinking people at Southern Bell and Northern Telecom. Heathrow is investing in its future with this relationship."

Southern Bell's Karen Mangum believes that despite the advanced technical nature of the Heathrow system, her company's role should be seen in traditional terms: as a provider of the public transport of communications between homes and businesses. Snelling agrees. "We have a 100-year heri-

tage of public trust," he says. "We're at the threshold of the Information Age, but we can't let our zeal for the future override quality, reliability, and economy. In Heathrow, we see the opportunity to demonstrate our continuing commitment to those basic characteristics of service, while adapting the local network to meet the rapidly increasing demand for data and video communications. Mr. Paulucci believes in the future and in quality. So does Mr. Reiman, so does Northern Telecom, and so do we at Southern Bell."

Michael Frame, vice president, systems engineering, is in charge of product line development for Northern Telecom's Transmission Group. He emphasizes the strength of Northern Telecom's commitment to the Heathrow project: "Working closely with Southern Bell and Heathrow, Northern Telecom will provide the network that will give Heathrow residents the world's first application of basic rate ISDN over fiber optic transmission. We have committed the development of resources to give Heathrow residents the world's first application of digital

"Technology can push, but the market must pull."



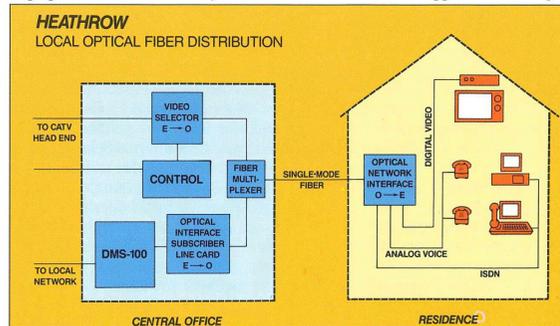
Southern Bell's Richard Snelling

Believing in quality and in the future.

voice, data, and video services over a single optical fiber. Broadband access, such as we are developing for Heathrow, will be the standard for the public network in the 1990s and beyond."

Tom Reiman points out that Heathrow is an excellent choice for this application: a mixed-use development in the midst of one of the fastest growing areas in the country, backed by a totally committed developer. And, he notes that other companies are approaching Heathrow wanting to participate. "They know that ISDN is the future," he says, "and they want to see how their products and systems will work with it."

Jeno F. Paulucci sits in his office surveying the Florida landscape outside his window. "Heathrow is the legacy of three generations of the Paulucci family," he reflects, "and the fiber communications system will be its heart and arteries."



The optical signals from the DMS-100 and the video selector will be multiplexed on the fiber and sent via pulses of light as one digital bit stream to the home.