4 *In organizations where people from many departments and even many locations work together toward common goals, meetings can become important, even pivotal events. For in these regular convocations mutual progress is reported, ideas and alternatives explored, decisions made, and the future charted. ISDN now makes them convenient and inexpensive as well.*

As important as meetings may be, they often consume major segments of our business life. Travel can mean hours and even days of pressure and inconvenience, while costs soar for transportation, accommodations, meals and more. In addition, the meetings themselves can frequently seem like free-form assemblages determined only to fill the time available for their completion.

ISDN offers a better way. Because in company after company, meeting participants have found that electronic meetings – often through simple, inexpensive ISDN video connections – can bring workgroups together in ways that are not only easier, faster and less expensive, but in ways that produce better meetings as well.

Better, Less Costly Meetings

Electronic meetings can offer critical advantages:

- ❖ *Easier scheduling.* Since each meeting participant can attend from his or her own office, or sometimes even from home, time commitments are dramatically reduced.

- ❖ *Reduced costs.* Travel is virtually eliminated; special accommodations are no longer needed. Meetings are now carried on from each participant's office or from a nearby conference room.

- ❖ *Better information.* Information to answer questions, present facts or draw conclusions is now close at hand. Other staff members with special expertise can be quickly added to a meeting for specific ideas or opinions. Video meetings also make it possible to share documents, images and detailed files through the computer or video screen.

- ❖ *Higher productivity.* Perhaps most important, video meetings consistently seem to improve meeting focus, adherence to an agenda, and the exchange of information to all participants. They also seem to reduce small talk and curtail long digressions.

The result is that more and more companies are beginning to use electronic alternatives to the in-person, on-site meetings of the past. With the growing array of video equipment available today, in fact, it is possible for even the smallest businesses to gain the tremendous productivity advantages of dynamic, on-the-spot video conferencing.
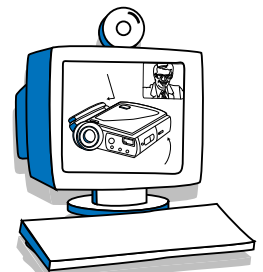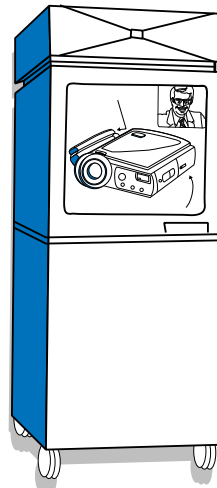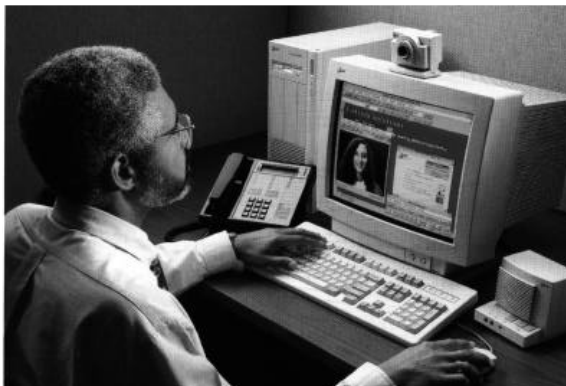
AN OVERVIEW OF VIDEO EQUIPMENT

A breathtaking array of video systems is becoming available, most designed specifically to use the digital speeds and dialed flexibility of ISDN.

◆ *The traditional industrial video system.* At their best, these full-motion, full-color systems can rival broadcast television in image and sound quality. Designed for transmission through larger digital channels, usually at speeds of 384Kbps and above, these systems have in the past required dedicated broadband lines set up especially for the purpose, or leased virtual connections scheduled for specific daily or weekly time segments. With ISDN the same high-quality video meetings can be transmitted either by allocating six B channels in a corporate PRI (6 x 64Kbps equals 384Kbps), or by combining the B channels in three standard BRI connections. Not only are costs significantly less, but the convenience and flexibility of ISDN mean that meetings can be scheduled when they're needed, rather than around the availability of specialized facilities. After a meeting, the six B channels can be returned to the pool available for general communications.
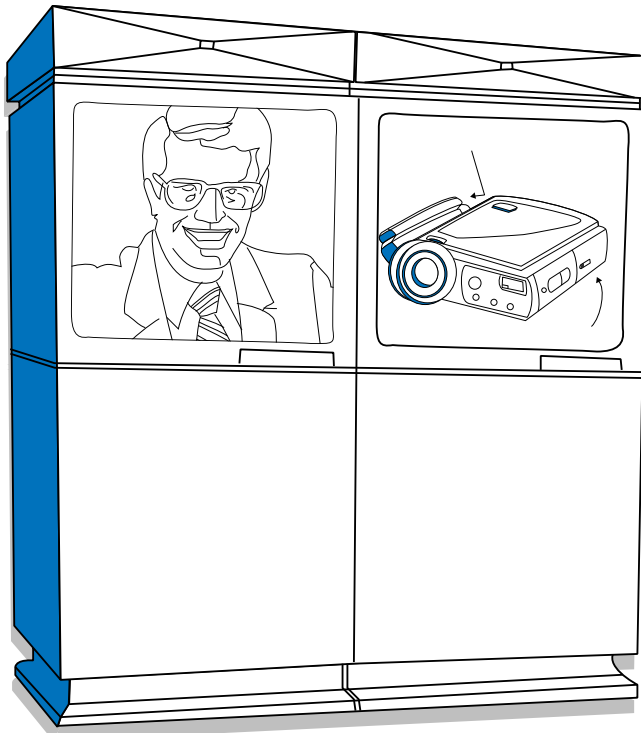
Three types of video systems for ISDN. *A broad range of video systems has been developed specifically for the speed and flexibility of ISDN. Large systems are designed to use six or more B channels. Desktop systems can deliver good quality through the bonded B channels of a single BRI, and roll-about systems can be used either way.*

Desktop video.
The award-winning AT&T Vistium PC-based system offers video refresh rates of roughly 15fps (frames per second) with simultaneous two-way image and sound. Most video systems offered today are H.320 compatible, which means that they can intercon-nect with virtually any other system.

❖ *Midsize, Portable Video Systems.* A growing number of midsize video systems has been specifically designed to respond to a range of environments and bandwidths – ranging from full 384Kbps of six B channels to the 64kbps of a single channel. Often called "roll-about" systems, they can adapt, through either reduced color or slower refresh rates, to the line speed actually available.

❖ *Desktop Video Systems.* One of the most rapidly growing areas in the marketplace is ISDN desktop video. Using the high-resolution monitor of a standard desktop computer or workstation, these systems offer one-on-one video that is more than acceptable, according to most users – for telecommuting, small executive meetings, face-to-face collaborations, sales follow-up, and a host of other activities.

Most of these video systems, large and small, have been engineered or updated to meet standard H.320 specifications – which means that it is technically possible to link virtually any two video systems anywhere in the nation, and even in the world. Many of these emerging systems are also beginning to incor-porate the new set of personal confer-encing specifications, which means that collaborative video, voice and data conferences can be designed and assembled.

Most of today's systems also have built-in facilities to accept overhead and other special cameras for presen-ting maps, documents, printed pieces and other items.

Understanding Video Specifications

The generally accepted international standard for video transmissions on a switched digital network such as ISDN is called *H.320*. Virtually all video manufacturers now support this worldwide speci-fication – which means any H.320 video system can transmit to and from *any other* H.320 system.

Even Intel, which initially developed its own standard for its ProShare systems, now ships H.320 software that lets its systems interconnect with other desktop or room systems.

In the *Personal Conferencing Specification*, Intel and other major manufacturers have taken the next step towards total compatibility. PCS is an *open standard* for both video and data trans-mission through digital connections, and also includes standards that let analog locations join a workgroup session through ordinary voice and modem connections. The PCS *umbrella* also includes the *T.120* specification for digital "multi-point communications and data sharing."

Among the vendors also supporting the PCS standard are AT&T, Compression Labs, Compaq, Hewlett-Packard, Lotus Development, NEC, Novell, Word Perfect and others.

PUTTING VIDEO TO WORK

ISDN gives range and diversity to meetings, large and small, and has begun to alter perceptions of what a meeting is:

❖ *Chase Manhattan Bank* offers a typical example of how a major corporation uses ISDN video to not only improve communication, but save time and money in the process.

According to Isaac Yohanan, global videoconferencing manager, more than 30 Chase business units around the world are in almost constant contact for executive and project-group meetings, worldwide business gatherings, presentations, product introductions and more.

"We use primarily PictureTel room systems," notes Yohanan, "which means that any location can talk to any other. It also means that we can use a single BRI connection for good quality, or three connections for full-motion, full-color worldwide video."

❖ At the Long Island headquarters of one of the world's leading manufacturers and marketers of *perfumes, cosmetics and other women's fashion items*, executives regularly hold quick video meetings with peers in six locations in the New York-Long Island area, as well as with European offices in Paris, Brussels and Rome.

"A video meeting is usually shorter, more to the point," notes the firm's executive director of video conferencing. "Executives are conscious of paying, so they seem to keep more closely to an agenda."

He notes that the firm uses video in many ways, including worldwide product launches in Europe and Asia, conferences with customers and vendors throughout the world, and interviews with job applicants from around the United States.

"What we appreciate most is that we don't have to spend hours traveling to a half-day meeting," he adds. "In a recent New York opening, for example, we had eight executives from all over the world participating. We saved hundreds of hours of travel time and expenses, and the video connections added excitement and glamour to the event."

❖ *PictureTel*, one of the country's leading manufacturers of video equipment, is itself one of the most avid users of ISDN-based video. For example, weekly staff meetings between the company's two major locations in Danvers and Andover, MA, are conducted through video

A product launch
Video not only saves time and money in assembling key participants for a product or market introduction, it can also add drama and excitement to the occasion. Photo from PictureTel.

connections linking the two sites. Often executives and engineers visiting other sites throughout the country also participate in the meetings through dialed ISDN connections.

Kevin Flanagan, PictureTel's manager of public relations, notes that he personally uses ISDN video links to discuss projects and strategies with his agency in New Hampshire, as well as with peers in the U.S., Europe and Pacific Rim.

The company also uses worldwide dialed video links for preliminary interviews with job applicants, for executive meetings with mutual fund managers and other investors in Boston, New York and other financial centers, and for training and update sessions for its nationwide staff of sales representatives.

Video and more.
Many companies are including desktop video, screen sharing and file transfer functions, as well as high-speed LAN and Internet access, in their systems. In several – such as this one from VIVO Software, Inc. – all capabilities, including video, are generated by software. Several also include standard fax and modem capabilities for transmitting to and from the analog world.

❖ *Mullen Advertising*, in Boston, uses video extensively to service its blue-chip nationwide list of clients – including Gitano, Money magazine, Rolls Royce, Bentley, Reebok and Dun & Bradstreet software. Video accelerates the production process, said agency owner James Mullen in an interview, by letting Mullen writers, artists and account executives meet with clients at a moment's notice. The quicker and more directly the agency's staff gets feedback, he noted, the quicker and better will be the ad it delivers.

❖ *Deutsche Telekom, Inc.* uses video for frequent executive conferences from its New York sales office to Hamburg, Frankfurt and other parent-company locations throughout Germany, as well as to several sites in Paris. "ISDN gives us fast, easy video to any of our home offices," says Horst Schad, administrative support manager. "It lets us stay in touch around the world."

❖ *Lotus Development Corporation* in Cambridge uses their PictureTel room and desktop video systems "all the time," says Jerry Audet, telecommunications analyst for the firm. Some meetings are conducted through mutliplexed lines at 384Kbps; others through the 128Kbps connections of a single BRI.

Meetings range from regular staff meetings to product introduc-
tions and demos for the field sales force. Video is also used to link
development teams in Cambridge and California, and for internal
and customer briefings to sites around the world.

✦ The *New York VideoConference Center* in midtown Manhattan is
typical of many public video facilities. The center's facilities can
be linked to virtually any H.320 system in the world through
dialed ISDN connections. The center also offers nationwide video
networking.

Video Collaborations & One-on-One Conversations

ISDN connections can also bring people in different offices and
different locations into virtual work groups. Using dialed BRI
lines, they can work together on documents, files or spread-
sheets, annotate a shared "whiteboard," interconnect to LANs or
other networks as needed, and in general interact with one
another in much the same way as if they shared an office.

A video meeting, of course, can also be as simple as a face-
to-face conversation between two people in different locations
exchanging ideas and information:

✦ The *State University of New York in Buffalo* uses Intel desktop
video equipment to let graduating students be interviewed by
corporations around the country. According to Gene Martell,
director of career planning and placement, the school is part of
InterviewNet, in which students from forty-plus colleges and
universities can be interviewed by any corporation with access to
compatible equipment.

"Video cuts screening costs for potential employers," says
Martell, "while opening up hundreds of opportunities for our
graduating students." Martell expects
that within a few years video will be
as common as the fax is today.

✦ In *Boston City Hall*, chief information
officer Michael Hernon, uses Intel
ProShare video systems as one of his
tools to contact cabinet members and
department heads throughout the city.

"We get the job done, and save time and money in the process."

"We cut meetings to quick, meaningful conferences," says Hernon.
"We get the job done, and save time and money in the process."

Video Banking

A growing number of banks across the country are beginning to
implement extensive programs of ISDN-linked video kiosks and
walk-in centers as a way of extending their reach to new
customers and new areas without expanding their workforce.
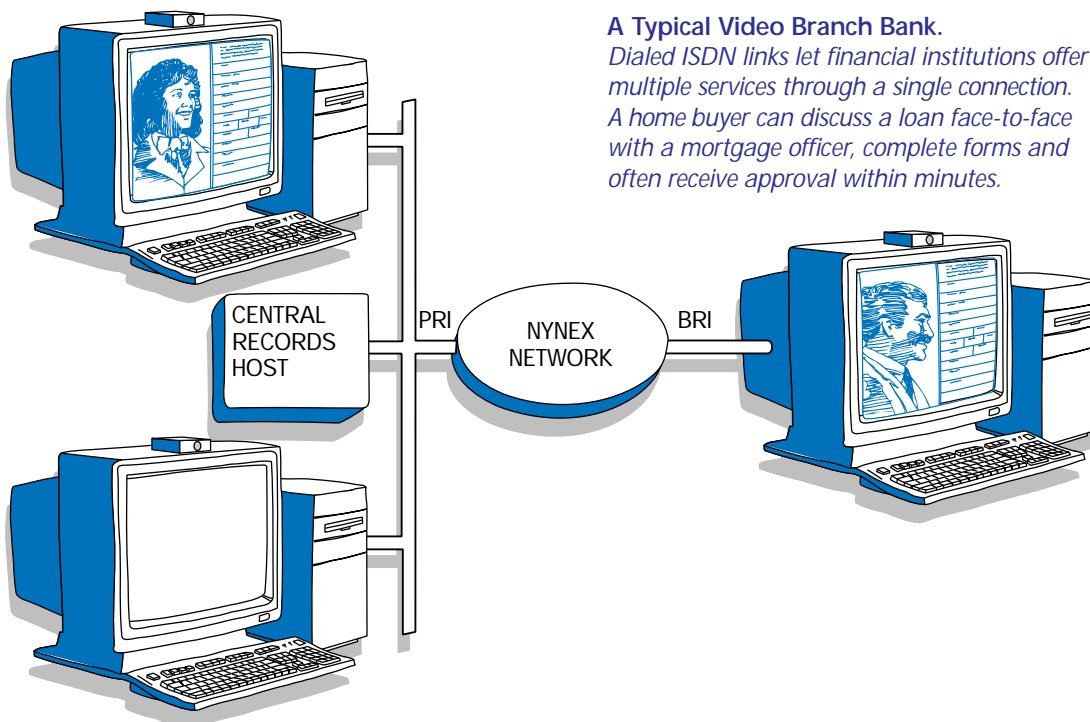
A Typical Video Branch Bank.
Dialed ISDN links let financial institutions offer multiple services through a single connection. A home buyer can discuss a loan face-to-face with a mortgage officer, complete forms and often receive approval within minutes.

According to the industry newspaper *American Banker*, most of these efforts across the nation are built on a growing belief that younger and higher-income consumers are ready to use video banking. With ISDN now able to transport good quality images at cost-effective rates, video banking seems destined to grow as an avenue to this upscale market. The newspaper noted:

❖ *Chemical Bank* has announced plans to close 50 of its 320 branches in the New York metropolitan area. Since some 40 percent of its business is conducted today by telephone and through ATMs, the bank expects the growing availability of these machines to offset the move.

❖ *Chase Manhattan Bank*, also headquartered in New York, is currently testing three video kiosks. Using ISDN connections, the systems offer face-to-face contact with a live banking executive for a range of financial activities. Acceptance has been "extremely high," and the bank plans to expand the program to a growing number of its branches throughout the area.

Perhaps the most aggressive competitive program in the nation built on the power of ISDN is being implemented at *Huntington National Bank* in Columbus, Ohio. In the next three years, the bank plans to extend and expand telecommunications-based solutions to a range of banking needs, while physically closing as many as 40 percent of its traditional branches.

Huntington plans to install a battery of automated teller machines and specialized video phone service centers – most based on the growing speeds and availability of low-cost ISDN

connections. Bank executives believe the centers will draw and retain a growing generation that actually prefers the fast, machine-oriented method of conducting bank business at any hour of the day, any day of the week.

The bank's chairman, Frank Wobst, expects to cut branch-banking costs by more than 25 percent while offering improved services such as 24-hour video availability of a live, human banker for a range of loan, investment and other transactions.

According to industry analysts, Huntington represents the vanguard of a movement that by the end of the decade will close some 40,000 of the nation's existing 100,000 traditional branch banks. Analysts also believe that remote banking, from single cash machines to unmanned walk-in video centers, are the wave of the future – and that the growing availability of ISDN video, voice and data connections will play a key role.

At the *Mortgage Network* in Boca Raton, Florida, an aggressive ISDN-based expansion program is underway to make the firm a major mortgage lender to Florida's real estate market. The firm is now using Intel PC-based ProShare video systems to extend its home mortgage capabilities to specific sites where homes are being sold – builders' offices, model homes and apartments, realty offices and other locations.

Using laptop computers linked through ISDN, prospective home buyers can talk directly to the company's loan officers, complete minimal paperwork, and have a loan approved – all in about ten minutes. According to managing director Dave Patten, the company plans to install PC laptop video systems at more than 1000 builder and real estate offices within two years.

"The flexibility that ISDN gives us is important," he said. "Setting up a video connection is as simple as installing a telephone line."

Distance Learning

Distance learning comes in many forms. Each takes advantage of high-speed digital connections to bring interactive combinations of voice, data, image and video to the challenge of helping people learn. Some dramatic examples of this process are unfolding rapidly throughout the northeast and the nation:

❖ At New York City's *School of Visual Arts*, computer-graphics expert David Biedny recently conducted an interactive, hands-on course in *Adobe Photoshop* and other programs for students in the school's advanced computer graphics program.

What made the occasion significant was that Biedny taught the course from a studio 3,000 miles away in San Francisco. The dialed cross-country ISDN connections carried voice and video

connections as well as interactive computer links between the two locations.

"I think the students and I were all amazed at how successful it was," said the artist. "We used ISDN lines for remote control of a Macintosh in New York using *Timbuktu*, and for video links carrying me to the class and the class to me." As part of the session, students took control of the Mac, and the renowned videographer critiqued their work as they presented it.

"Teleteaching offers enormous potential, but also puts enormous demands on the teacher," says Biedny. "Boring teachers can still put kids to sleep, despite being surrounded by technology. A good teacher, on the other hand, can use technology to reach students like never before. The key is bandwidth, and lots of it. ISDN is a good start."

"A good teacher can use technology to reach students like never before."

❖ At *Massachusetts Institute of Technology* in Cambridge, an ISDN-linked PictureTel 4000 video system has begun to open new worlds for students and faculty alike at MIT's Center for Advanced Engineering Study.

"We use video in many, many ways," says Dr. Shaoul Ezekiel, Professor of Electrical Engineering, Professor of Aeronautics and Astronautics, and Director of the Center. "We use it for video exchanges with outstanding individuals from all over the world, as well as for lectures and courses given by experts in many disciplines. We also originate our own classes for other schools, participate in professional conferences, and hold joint meetings with a wide range of research groups in many other locations."

Linking a university and the world.
At MIT, video helps students reach out for discussions with experts, worldwide symposia and meetings, as well as lectures and courses around the globe.
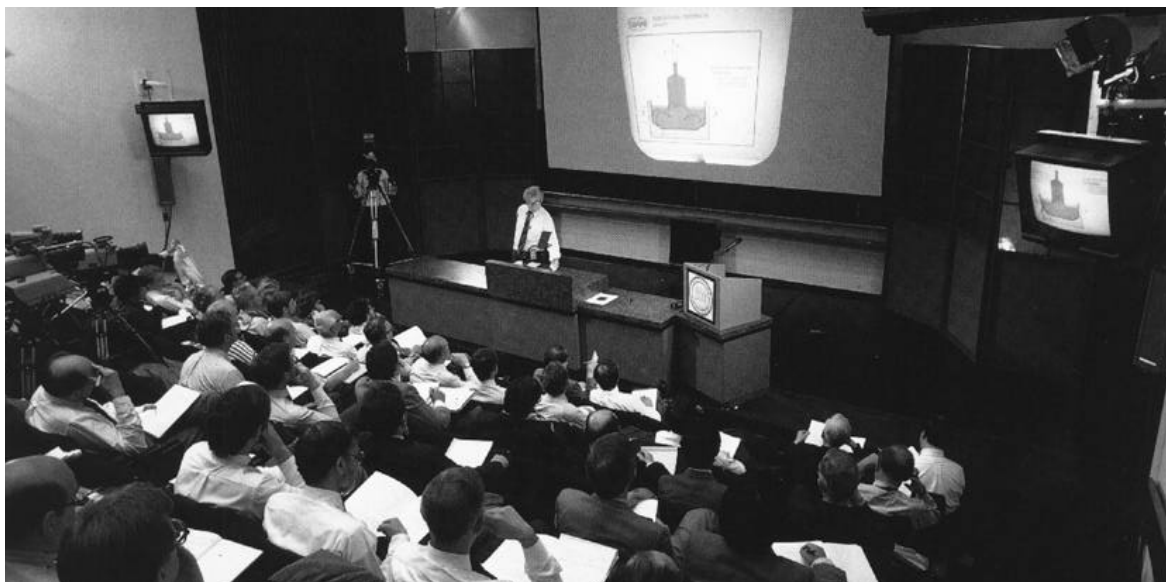
Professor Ezekiel notes that video meetings are frequently held with groups in Japan, Singapore and even China, as well as throughout Europe. The PictureTel system operates through either two B channels in a single ISDN BRI line, or six B channels in three dialed ISDN lines. Because the system adheres to the H.320 video standard, connections with virtually any other video system are possible and practical.

❖ At *New York University* in Manhattan's Greenwich Village, video is only part of the school's innovative and ground-breaking 16-credit "teleprogram" in Information Technology. The program lets advanced students in systems analysis and management – all of whom have full-time jobs – participate in the course at any time of the day or night from the convenience of their own home or office. The curriculum makes heavy use of both live-action and animated video segments to add interest, as well as explain and enhance difficult conceptions.

The new face of education.
A 16-credit tele-course at New York University's Information Technologies Institute offers inter-active problems, self-paced lectures, experiments, animation, and more – all on demand. ISDN speeds also make possible high-speed interaction with the school's host computer.

"Too often, we think of distance learning as someone lecturing for two hours on TV," said Dr. Richard Vigilante, director of NYU's Information Technologies Institute. "But that's not the case. We do use some lectures, of course, but in our self-paced program lectures, experiments, animation and other video sequences are all on-demand – that is, they can be called up and viewed at any time, and replayed as often as needed."

The program also makes heavy use of interactive problem solving using *Lotus Notes*, and gives students direct interactive access to *Excelerator*, a powerful computer-aided software engineering (CASE) program.

"CASE gives computer engineers the same benefits that CAD (computer-aided design) offers architects," says Dr. Vigilante, "for it helps automate the analysis and design of even the most complex structures." The 128Kbps speeds of ISDN let students access the centrally stored program from their own PCs, just as if they were physically on-campus in a computer lab, he adds.

"Using a program like that through a modem would be almost impossible," Dr. Vigilante notes. "It would simply take too long to be of any use." The teleprogram uses two Dell Pentium servers equipped with Netware and DigiBoard ISDN bridges. Students use 486 or Pentium machines with SoundBlaster audio systems and DigiBoard ISDN cards that integrate both terminal adapter and NT1 equipment on a single PC circuit board.

✦ At *Beacon Learning Inc.* in Boston, an ISDN-based Intel ProShare video system adds new capabilities to the firm's computer-based training solutions, says David O'Connell, director of sales and marketing. Beacon incorporates video help connections into their client's customized training, which means that anyone taking a course at a remote site can simply press a PC function key for immediate assistance.

> "Too often, we think of distance learning as someone lecturing for two hours on TV . . . . But that's not the case."

The PC automatically dials and establishes a video connection with a knowledgeable administrator who appears on-screen to offer face-to-face help and guidance.

The firm is also building customized programs of video "classroom" training through the ISDN video links. In effect, students will be able to "attend class," carry on discussions and interactively solve problems through their PCs using the ProShare desktop video connections.

Video Security

ISDN today offers an economical, high-speed alternative to the digital microwave and satellite connections that have traditionally been used for video security installations.

Perhaps the most aggressive implementation of this new technology has been in the *Huntsville, Alabama, school system.* From a single headquarters location, security personnel can monitor television images from 41 separate school locations throughout the area. Video images
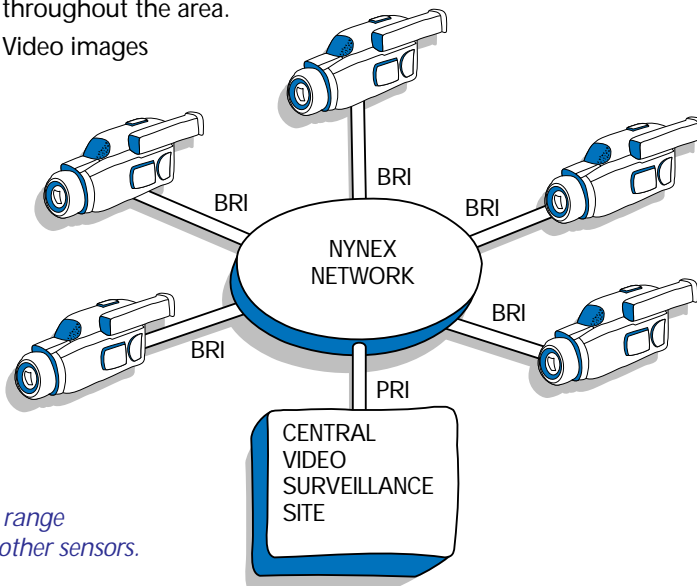
Video security.
ISDN offers an inexpensive alternative to microwave or satellite transmissions. ISDN is also unaffected by weather and similar problems, and offers D channel connections for a range of heat, motion, sound and other sensors.

BRI
BRI
BRI
BRI
BRI
PRI

NYNEX NETWORK

CENTRAL VIDEO SURVEILLANCE SITE

from each school are multiplexed, and forwarded through ISDN BRI connections to a central site where they are displayed on standard PC monitors.

The system also incorporates a wide array of access-control devices, heat sensors, motion detectors, and magnetic stripe badge readers. Signals are sent directly to the central location through the D-channel links.

The innovative security saved some 24 percent on insurance premiums.

School system superintendent Ron Saunders notes that the innovative security installation has saved his school system some 24 percent on its annual insurance premiums. In addition, it has significantly reduced the number of security personnel physically needed at each site, while dramatically improving security coverage.

"ISDN has proven to be more reliable than either microwave or satellite systems," Saunders noted, "because telephone lines are not affected by severe weather or distance limitations. ISDN also lets us expand our system more quickly and much more inexpensively. The same system also gives us powerful back-up channels when and if we need them."

A Video Revolution

"We're just starting to uncover all the uses for this new and exciting way to communicate," says Len De Paolo of *Communications Planning & Services Inc.*, an ISDN systems integrator in Farmingdale. "New uses for easy, convenient video are being discovered every day. This is truly just the beginning."