



COMMUNICATIONS  
FORUM

UNIVERSAL BROADBAND  
TELECOMMUNICATIONS:  
THE BIG GAMBLE

October 29, 1987

Seminar Notes

MASSACHUSETTS INSTITUTE OF TECHNOLOGY  
COMMUNICATIONS FORUM

UNIVERSAL BROADBAND  
TELECOMMUNICATIONS:  
THE BIG GAMBLE

October 29, 1987

Seminar Notes

Robert Pepper  
Office of Plans & Policy, FCC

Walter S. Baer  
Times Mirror

Robert Rast  
American Television and Communications Corporation

Gail Kosloff  
Student Rapporteur  
MIT

This session took place at the end of a day-long conference which addressed the future of broadband ISDN (Integrated Services Digital Network) services to the home. The major issue that surfaced during the sessions was: Is it technology-push or consumer demand that is driving interest and investment in broadband ISDN?

Dr. Walter Baer began by calling himself a "technology optimist." He defined broadband ISDN as a system that can carry a combination of voice, video, and data signals at high speeds and foresees the future of transmission as all digital. In his opinion the real question to be asked is: "How do we get from where we are today to this broadband network in the future?"

He cited the vast discrepancy between the use of fiber in the interexchange plant versus the local loop. According to Baer, as you move from the interexchange plant toward the subscriber location ("the last mile"), the use of fiber optic facilities (especially SLC-96) has become very popular. Yet fiber optics has not yet reached all the way to the home.

Baer referred to Marvin Sirbu's work on the economics of getting fiber digital switched facilities to the home. Sirbu estimates that by the 1990s it will cost below \$2,000 per home to equip homes with these facilities. The key question here is predicting penetration. Reflecting on history, Baer noted that it took 30 years for Cable TV to gain 50% penetration.

Dr. Baer reiterated a question raised by Charles Judice of Bellcore in the context of the long-term adoption process foreseen for fiber to the home: Should we be looking at 1990's technology or those available in the year 2000. In his opinion, only video to the home would really require the bandwidth proposed by broadband ISDN. Other services, e.g. videotex, can already be provided to the home over copper facilities. Thus the issue becomes determining the break-even point for replacing narrowband teleco systems and cable systems with the fiber optic broadband systems.

Baer reviewed the plans/trials of several local telcos to install fiber to the home. He noted these seem to have been undertaken without much consideration for consumer demand. Baer believes most of these field trials are being carried out to see if the cost of installing fiber to the home can be justified on voice services alone. One example is BellSouth's plans to install fiber by 1989 to homes with two telephone lines; in Orlando, Florida it is working with

Northern Telecom on a project involving 200 homes. Also, Southwest Bell is working with GTE on similar trials.

In general, Dr. Baer is skeptical about how quickly these broadband services will evolve, although he believes these kinds of tests will continue. In looking ahead to the mid- to late-1990s, he believes the cost of fiber will come down to where it becomes a threat to cable and narrowband facilities. At this time the telcos will also have been released from many of the regulatory restrictions that now constrain them. This may spark fierce competition between the cable companies and the telcos. Baer believes at this point we will have to decide whether to address the economic or political arguments for broadband.

Robert Rast was less optimistic about the future of broadband services to the home as he took on the consumers' perspective. He raised the question "where's the beef?" for the end-users, consumers. Rast noted the difficulty of the conference attendees to identify areas other than POTS (Plain Old Telephone Service) and entertainment video which would drive the development of broadband ISDN. Although he foresees an "information revolution" in the next twenty-five years, he believes we must accept it will be slow to come and consumers will be slow to change.

To summarize his point of view, Rast stated that "technology-push, devoid of consumer demand, is a formula for failure." As examples he noted the failure to date of AT&T's Picturephone, as well as the concept of telecommuting. Rast believes that "we cannot assume people are waiting for infinite bandwidth into their homes" especially in light of the sums of money spent on technology like videotex which has not yet caught on in the consumer market. (Note: Minitel has been touted as a success by the French government, but it operates in an environment where the terminals were given free to consumers and rate of return regulation does not apply to the PTT).

Rast believes that the industry needs to devote more time researching who is pulling on the demand side for broadband services. In his opinion, the needs of potential customers other than consumers (e.g. third party service providers) must be recognized. The difficulty, according to Rast, becomes one of convincing entrepreneurs to pursue specific consumer demands and avoid creating a massive system solution. He believes people in the industry should be careful about "hyping" consumer pull to justify development of broadband services.

In responding to Rast's question of "where's the beef?"

Russ Neuman responded in jest: "it looks like the buns will be there anyway, no matter where the beef is."

Robert Pepper\* made an analogy between the future of broadband ISDN and the definition of a good engineer: one who develops a solution in search of a problem. He reiterated Rast's point that really only one application has been cited to justify laying broadband to the home: entertainment video. With this in mind, installing fiber becomes a question of replacing existing copper facilities.

Pepper explained the difficulties he foresees when telcos try to convince state regulators to accelerate depreciation on existing copper plant to justify the installation of optical fiber to the home. The primary problem will be arguing for fiber when coaxial cable television systems pass over 80% of homes and have 50+% penetration. Already the Massachusetts PUC (Public Utility Commission) has denied investments into fiber and the California PUC has denied investments in new technology. Pepper said, it is important to note, however, that you cannot generalize about State PUC views regarding implementing new technologies.

Pepper noted the historical distrust between industries (e.g., newspaper publishers vs. telcos, cable companies vs. telcos). He believes the framework for these relationships will change in the next seven to ten years as the cost of broadband technology declines and cable companies find themselves reapplying for franchises. He believes if telcos are allowed by Judge Greene to provide content there will be greater incentive for them to invest in broadband networks given they will have a better feel for how much capacity will be used. Also, he believes competing players will continue to use the regulatory process to try to disadvantage the competition.

Finally, Pepper believes as we approach the concept of a "wired world" another set of regulatory and policy questions will need to be addressed. He raised the question of how new broadband technologies would compete with terrestrial broadcast services. Pepper encourages all interested parties to participate in the regulatory process (currently there is a Notice of Inquiry regarding HDTV to which interested parties should respond.)

In looking at interim strategies for moving fiber towards the home, Barry Cook of NBC raised the prospect of using "hybrid" systems. This might involve running fiber from remote distribution points and then using coax (cable) to take the transmission the last thousand feet. Dr. Baer acknowledged that research on this "hybrid" system concept

is being pursued by cable companies like his own, Times Mirror. They are in the process of evaluating how cost-effective a plan this could be.

In general it appears that the campaign to push broadband fiber optic facilities to the home will continue to be steeped in controversy since several questions remain unanswered, including: Who is going to pay for it? and What kinds of services will it carry (especially in light of the fact that new services like HDTV and home-shopping can be delivered to the home over a variety of means including existing coax, DBS, videotape/disk, or over a switched fiber system)?

\*Robert Pepper spoke in terms of his own opinions and not as a representative of his employer, the FCC.