

## Digital Television History: "Take One"

**Defining Vision: The Battle for the Future of Television, by Joel Brinkley, Harcourt Brace and Company, 1997, 402 pages.**

Reviewed by Herbert A. Terry\*

How the United States ended up with digital television when it set out to develop high-definition television (HDTV) is a complex story. Future historians will understand the story differently, and more thoroughly, than we understand it today. Joel Brinkley's journalistic account will be an important starting point for those future interpretations of the development of digital television.

Brinkley's story is not always pretty. It is heavy on the impact of individual egos and corporate self-interest. If his account is right, the National Association of Broadcasters's (NAB) initiative to replace National Television Standards Committee (NTSC) television with HDTV began as no more than a cynical spectrum grab aimed at defeating a nearly-accomplished Federal Communications Commission (FCC or Commission) transfer of unused UHF spectrum to land mobile radio in 1986. To block the transfer, broadcasters promised to bring the public sharp, wide-screen television with dramatically enhanced sound if the FCC kept the spectrum from land mobile. At that point, broadcasters neither knew nor cared if HDTV was possible. They had hardly thought through the profound and costly effects of HDTV on their industry if they got what they wanted. Spectrum protectionism was far more important than bringing the public the best broadcast service in the world, despite public posturing to the contrary by those in the industry.

Most who have attentively followed the HDTV/digital wars know Brinkley's basic story line. Japan (with Multiple Subnyquist Sampling Encoding (MUSE)) starts out far ahead. HDTV initiatives in the U.S. have a share of economic as well as spectrum protectionism. As competing systems are developed by several companies, it becomes clear that in order to fit the information-rich HDTV signal into a small, 6 MhZ spectrum pipe allocated by the FCC, the signal must be digital rather than analog. But the switch to digital stretches the technical ability of the competing companies to their limits and, in the end, no company produces a clearly superior system. A composite system, a "Grand Alliance," emerges and eventually gains FCC support.

Unfortunately, the move to digital undermines the economics of developing HDTV at all. Why would a sane broadcaster spend millions only to end up with a costly, but still single-channel, delivery system with little-enhanced revenue-generating potential? Why not exploit the possibilities digital provides, such as the multicasting of less-than-HDTV pictures and nonbroadcast services?

Care is required in moving in this direction, however, because Congress (and maybe even the public) believed broadcasters' promises of their intent and desire to develop HDTV. Failing to develop HDTV could result in Congress charging broadcasters for spectrum space they thought they would get for free. But careful maneuvering appears, for the moment, to allow broadcasters to avoid paying for spectrum and still keep open all of their technological options.

While there is not much new about the already well-known "big picture" in Brinkley's account, he does offer wonderful detail at very personal levels. His cogent and often acerbic account is, primarily, the story of the personalities—both individual and corporate—behind the digital wars.

His opening part, "The Scheme," outlines HDTV's cynical birth. Then NAB Vice President John Abel was the scheme's creator—the man who thought up the ploy of asking for HDTV in order to block land mobile. But HDTV, Abel soon discovered, was beyond contemporary U.S. broadcast technology. So, according to Brinkley, the NAB and its allies enlisted the aid of Japan's public broadcasting network, NHK, with its at least demonstrable MUSE analog system, to show that HDTV was possible. The NAB failed to inform their Asian counterparts that the MUSE demonstrations were political ruses to defeat land mobile and not, in fact, a true expression of U.S. broadcaster interest. To the surprise of the NAB, what really made the initiative work, and led the FCC to withhold the spectrum from land mobile, was not the quality of the pictures MUSE delivered but rather Congressional hostility to the idea that those beautiful pictures might have resulted from Japanese rather than U.S. technology.

Part two of Brinkley's work, "The Players," is the book's best. Here he portrays the major companies and individuals who, eventually, brought HDTV/digital television proposals to the Advanced Television Service Committee (ATSC) for testing. RCA/Sarnoff Labs comes across as a proud, but declining, system developer that not only failed to recognize that it no longer had any God- (or Sarnoff-) given right to lead the U.S. broadcast innovation, but also seemed incapable of understanding why it was regarded as "foreign" even though it partnered with Thomson (French) and Phillips (Dutch). Zenith, by then in even deeper economic and creative decline than RCA/Sarnoff, had good ideas but lacked the resources to develop them. In the end, Zenith was encumbered by an inability to work effectively with its nonbroadcast-experienced partner, AT&T/Bell Labs.

One theme of Brinkley's account is that broadcast experience alone is not enough for the digital age—that, like it or not, insights from the space program, from military contract work, from cable television, and from Silicon Valley are necessary to solve the HDTV/digital puzzle. While broadcast engineers claimed digital television was "impossible," Korean-American Woo Paik, working for VideoCipher (ultimately General Instrument) in "isolated" San Diego, simply went to the corporate basement and made it work.

Egos—corporate and individual—figure big in Brinkley's story. At times they threatened to bring everything down, but the day was often saved by a few legal and/or technological statesmen. MIT's "Grand Vizier" Nicholas Negroponte had the proper digital vision early on, and this vision worked its way into the systems proposed by MIT and General Instrument. But Negroponte ultimately clashed with Richard Wiley, the head of the advisory committee that a perhaps cynical FCC created to evaluate alternative HDTV systems and make standards recommendations. Brinkley's clearest hero is Wiley. He comes across as a focused and unbiased leader genuinely interested in seeing HDTV (and eventually digital) through despite the roadblocks thrown up by the industrial players, Congress, and even the FCC (to which his committee reports). CBS's Joe Flaherty also could have been counted as a voice of reason when the bickering of other players threatened to unravel everything. Peter Fannon insisted upon the integrity of tests conducted by his Advanced Television Test Center. Near the end of the story, Joe Donahue (of Sarnoff) and Bob Rast (of General Instrument) compromised the interests of their principals in order to hold the Grand Alliance together in the face of late broadcaster opposition and indifference or indirection from Reed Hundt, under whose watch digital standards were finally adopted.

Part three of the book, "Tests," chronicles the chaos surrounding efforts to complete prototypes for testing at the Advanced Television Test Center and the delays, backbiting, and fudging, if not outright cheating, entangling the testing process. Brinkley's account suggests that the Grand Alliance system, although created by the parties to bring competition to a close and move forward, was not just another cynical compromise but, instead, was a much better system than any of the parties could have developed independently. It is, however, also a scary account if one believes that America's leading-edge communications technology companies should be able to make realistic promises, meet deadlines, and at least occasionally seek to solve problems with the public interest in mind.

The fourth part of the book, "Politics," reviews both the internal corporate politics of the Grand Alliance—delicately working out who would make what once a common system was proposed—and the last-minute real politics of HDTV/digital after Congress realized that billions of dollars could be applied to the deficit if broadcasters, like others, were brought into spectrum auctions or forced to pay directly for spectrum space. According to Brinkley, broadcaster cynicism returns and, despite substantial disinterest in really developing HDTV because of its costs and uncertain revenue potential, leads broadcasters to give the impression, if not the outright promise, that HDTV will be deployed if Congress continues to provide transition spectrum without charge. The book concludes with an epilogue that takes the story through mid-1996 when two experimental HDTV stations—WRC and WRAL—finally made it on the air to begin testing HDTV systems.

Future historians will likely enhance Brinkley's account in several ways. The book is at its best when it deals with technologists, engineers, and those corporate executives who managed each company's participation in the HDTV/digital system development process. But some grander parts of the business history of digital seem to be missing. Except for his descriptions of Zenith, one could get a sense that the highest management levels of the involved companies rarely intervened in what was going on. But, given the speculation that total corporate investment in HDTV/digital has approached 500 million dollars, that hardly seems likely. It is the sort of thing, however, that is much harder to get a handle on at present than the kind of legal and technological information Brinkley marshals

admirably. His account seems similarly incomplete when it comes to explaining the internal workings of the FCC and the involvement of Congress. Brinkley focuses his attention on several FCC chairs, but leaves out the important roles played by FCC staff and other commissioners. Little is included about Congress or the FCC that is not already well known from trade press accounts. While there is more to learn about congressional and FCC involvement, Brinkley's focus is the technologists, lobbyists, and lawyers in the trenches who made HDTV happen.

Near the end of the book, Brinkley addresses the seemingly last-minute interest of the computer industry in the advanced television proceedings. Brinkley sheds light on the disputes between computer proponents of progressive scanning and broadcaster proponents of interleaved scanning. He also provides nontechnical explanations of the significance of packetizing, interoperability, and the role of compression alternatives in the evolution of digital technology. Brinkley argues that the computer folks were disadvantaged because Chairman Patrick deliberately filled the initial ATSC with broadcasters. However, he never fully explains why they waited as long as they did before finally, forcefully intervening in something so dear to their interests as millions of new digital display devices in homes and businesses.

Like most journalistic accounts, this is instant history—and very good instant history at that. Brinkley's account is not the whole story of HDTV/digital and, of course, the story is not over. As his telling shows, however, the path to the next generation of television (or television combined with computing) has hardly been straight and it would be folly, today, to believe that the course is now clear. But those who want to understand how we got where we are today are well served by Brinkley's account.

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