A CONTEXTUAL READING LIST

on
Broadband Communication Receiver Technology

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In an attempt to provide a perspective on the subject of broadband communication receiver technology (in particular, digital radio design) that incorporates a wide variety of aspects, including economic, social, political, as well as technological, the following reading list is provided. The theme is broadband “last-mile” delivery, which is currently the most active arena for digital radio design.

The primary sources are articles from major newspapers and newsmagazines, such as the *NY Times* (which each Monday devoted its business section to “The Information Industries”) and *The Economist*, magazine publications of the IEEE (principally the *IEEE Communications Magazine* and the *IEEE Spectrum*), and web postings of some authority (such as from a government agency).

A few words precede each citation as an indication (along with the title) of its subject.

- Extolling the multiple virtues of software-defined radio
  
  “A Cellphone for All Standards” by B. Bing and N. Jayant starting on page 34 of the May 2002 *IEEE Spectrum*.

- Examining reasons for the crash of the telecommunications industry in 2001
  
  “The telecom crisis: Too many debts; too few calls” starting on page 59 of the July 20, 2002 *The Economist*.

- Digital television (DTV) roll-out embroiled in different interests of consumer electronics manufacturers, broadcasters, government, and cable industry
  

- The political, technological, content, and consumer issues holding up the roll-out of digital television
  
  “The Big Picture on Digital TV: It’s Still Fuzzy” by E. A. Taub starting on page G1 of the 9/12/02 *NY Times*.

- Trends, issues, and opportunities for policy makers and business leaders engaged in promoting more aggressive adoption in US of broadband usage.
  

- Improved digital technology for broadcast analog radio reception
  
  “As Digital Radio Stumbles, New Products Fill the Gap” by B. J. Feder, on page C2 of the 9/30/02 *NY Times*. 
• Overview of current research on wireless communications, including reconfigurable radio, under Information Systems Technologies program of European Commission


• The twisted politics of forced access for competitors to the old networks of the phone companies as they upgrade to broadband

“Baby Bells are Hoping for a Reprieve” by J. S. Lee, on page C10 of the 11/11/02 NY Times.

• Some companies see wireless internet access (Wi-Fi) as next big thing to fuel innovation and investment in communications.

“Businesses, Big and Small, Bet on Wireless Internet Access” by J. Markoff, starting on page C1 of the 11/18/02 NY Times.

• Argument for phone companies to lay fiber to replace their copper wires or risk obsolescence.

“Paving the Last Mile with Glass” by P. E. Green, Jr., starting on page 13 of the December 2002 IEEE Spectrum.

• In economic terms likens telecommunications networks to the railroad industry of the robber-baron era.

“Digital Robber Barons” by P. Krugman, on page A35 of 12/6/02 NY Times.

• Predicts wireless internet access likely to represent only a tiny fraction of overall telecommunications market for several years.


• Linking the “old-economy” telegraph and railroad industry to the “new-economy” telecommunications industry

“Making the Economy Run on Time” by Tom Standage, on editorial page of 12/15/02 NY Times.

• Defense department complains that wireless internet access (Wi-Fi) could interfere with military radar.

“Limits Sought on Net Access Without Wire” by John Markoff, starting on page C1 of 12/17/02 NY Times.
• Agreement on technology for cable delivery of high definition TV should allow set-top box standardization and should help accelerate transition to digital television.

  “Pact Lifts Obstacle to HDTV Transition” by Eric A. Taub, on page G7 of 1/2/03 *NY Times*.

• Research reveals that most serious impairment to terrestrial broadcast DTV reception is multipath.


• Cities are using free-access wireless internet infrastructure as corporate placement inducements

  “More Cities Set up Wireless Networks” by John Markoff, on page C7 of 1/6/03 *NY Times*.

• Reasons for the telecommunications industry collapse

  “What’s Wrong with Telecom” by Peter A. Bernstein, starting on page 26 of January 2003 *IEEE Spectrum*.

• The promise of ubiquitous broadband and consumer demand for mobile communication

  “What’s Right with Telecom” by Steven M. Cherry, starting on page 30 of January 2003 *IEEE Spectrum*.

• A governmental policy intended to foster more flexible and efficient use of the radio spectrum

  “F.C.C. Expected to Extend Satellite Operator’s Reach” by Barnaby J. Feder, on page C6 of 1/27/03 *NY Times*

• Discussion of impact of Federal Communications Commission (FCC) recommendations on spectrum crowding intended to accommodate wireless local area network expansion, an amalgamation of technological, business, social, and political issues

  “More Air for Wi-Fi” by Steven M. Cherry, starting on page 51 of February 2003 *IEEE Spectrum*.

• The trend in internet access is toward broadband and away from dial-up service.

  “As Broadband Gains, The Internet’s Snails, Like AOL, Fall Back” by Saul Hansell, starting on page C1 of 2/3/03 *NY Times*.
• A new class of chips for cellular phones combining basic computing, communications processing, and memory on a single chip will give cellphones PC-like capabilities (thereby expanding the possibilities of software-defined, digital receivers).

  “New Chip for Cellphones To Be Introduced by Intel” by Matt Richtel, on page C6 of 2/13/03 NY Times

• Political strife within the Federal Communications Commission reflected in recently issued regulations with enormous impact on the future of local telephone service and broadband roll-out in the US.

  “The Telephone Wars” on editorial page A16 of 2/22/03 NY Times

• Another application of digital radio with societal impact: ubiquitous radio frequency identification chips.

  “A Radio Chip in Every Consumer Product” by Claudia H. Deutsch and Barnaby J. Feder, starting on page C1 of 2/25/03 NY Times

• New technologies extend reach of broadband wired delivery.


• The challenge to the necessity of spectrum ownership engendered by “software-enabled” radio’s accommodation of spectrum sharing is one example of technology-driven shifts in the copyright versus innovation debate.

  “Pondering Value of Copyright vs. Innovation” by Amy Harmon, on page C2 of 3/3/03 NY Times

• Predicting ill effects for the telecommunications industry and consumers from the recent Federal Communications Commission “deregulation” decree.

  “The Telecoms in Purgatory” by Robert J. Samuelson, on page 49 of 3/10/03 Newsweek

• Some examples of commercial-military technology transfer in communications technology.

  “Military Now Often Enlists Commercial Technology” by Simon Romero, on page C1 of 3/10/03 NY Times
• Convergence of the personal computer and wireless telephony is shifting the center of gravity of digital technology.

  “Untethering From Clunky PC Box, Silicon Valley Hikes Wireless Frontier” by Steve Lohr, starting on page C1 of 4/7/03 NY Times

• Status of last-mile broadband communications over power lines.

  “Power Line Communications: State of the Art and Future Trends” by N. Pavlidou, A. J. Han Vinck, J. Yazdani, and B. Honary, starting on page 34 of April 2003 issue of IEEE Communications Magazine

• Commentary on the recent ruling requiring Baby Bells to keep voice networks open to competitors, but excluding new broadband equipment.

  “Share and Share Not” by Willie D. Jones, starting on page 19 of April 2003 issue of IEEE Spectrum

• FCC monitoring field tests of broadband delivery over ordinary electric power lines.

  “Internet via the Power Grid: New Interest in Obvious Idea” by John Markoff and Matt Richtel, on page C7 of 4/10/03 NY Times

• Technological battle between cable and satellite for interactive entertainment delivery customers.

  “Trying to Close Technology Divide As Satellite Operators Battle Cable” by Matt Richtel, starting on page C1 of 4/15/03 NY Times

• Through government intervention, Korea surges ahead in broadband delivery, and its social impact.

  “America’s Broadband Dream is Alive in Korea” by Ken Belson and Matt Richtel, starting on page C1 of 5/5/03 NY Times

• Trends in wireless in-craft airline passenger broadband communication access.


• A booming, emerging technology targeted at short-range radio applications.

• A wideband standard-identifying front-end followed by a demodulator is promulgated as a reconfigurable receiver architecture.


• The many forms of TV delivery.

“Cable or Satellite? Please Stay Tuned” by S. Schiesel, starting on page G1 of the 7/31/03 NY Times.

• Ubiquitous digitization with its networking of all appliances via digital communications marches on.

“Digital (Fill in the Blank) Is on the Horizon” by S. Lohr, starting on page A1 of the 8/1/03 NY Times.

• Radio-frequency spectrum as a valuable natural resource.


• Wireless high-speed interconnect chipset benefits from antenna arrays.

“Start-Up Plans to Introduce Alternate Wi-Fi Technology” by J. Markoff, starting on page C2 of the 8/18/03 NY Times.

• With new FCC rules allowing the regional phone companies to deny access to new equipment, plans are announced for installation of fiber to the curb over the next decade.


• An emerging broadband delivery technology: wireless metropolitan-area networks (MANs).


• An emerging technology for wireless replacement of data cables between digital appliances.


• Radio-frequency identification succeeds bar codes as inventory control aid.

“EZ Does It” by J. Surowiecki, on page 36 of the September 8, 2003 New Yorker.
• The use of radio frequency transfer of data between chips has the potential to dramatically alter electronics fabrication technology.

  “New Sun Chip May Unseat the Circuit Board” by J. Markoff, starting on page C1 of the 9/22/03 NY Times.

• More about RFID tags: looming Defense Department adoption for inventory tracking, privacy issues, new specifications for standards, interference concerns, and GPS-linked active systems.

  “How to Find That Needle Hopelessly Lost In the Haystack” by B. J. Feder, starting on page C1 of the 9/29/03 NY Times.

• Another advance in chip technology that will impact communication system capabilities.

  “I.B.M. to Disclose Power-Saving Chip Design” by S. Lohr, on page C15 of the 9/30/03 NY Times.

• Some research and development directions in mobile communications at the Japanese company NTT DoCoMo.


• A survey of the future for telecommunications companies after the bubble noting business opportunities with the growth in mobile phones and broadband internet access.


• Using peer-to-peer infrastructure and voice over internet protocol (VoIP) for free phone calls.

  “Sir, to Whom May I Direct Your Free Call?” by N. Thompson, starting on page 1 of Money & Business section of 10/12/03 NY Times.

• Transition from terrestrial broadcast analog to digital television in Germany.

  ‘German Way: To Go Digital No Dawdling” by M. Landler, starting on page C1 of 11/3/03 NY Times.

• Residential broadband delivery via fiber in Italy.

  “In Milan, Working to Unfurl a High-Tech Blanket of Fiber” by E. Sylvers, on page C4 of 11/3/03 NY Times.
Start-ups making low-power radio frequency chips hope to revolutionize the next generation of wireless communications technology.

“Oldest Living Start-Up Tells All” by S. Lohr, starting on page C1 of 11/10/03 NY Times.

An update on the competition for residential broadband delivery among the cable companies, the phone companies, and wireless entrepreneurs.

“Fast and Furious: The Race to Wire America” by M. Richtel, starting on page 1 of Money & Business section of 11/16/03 NY Times.

Reconfigurable software-defined radio is reaching the market as a multi-faceted boon at the base station and the handset.

“How the radio changed its spots” starting on page 31 of Technology Quarterly section of 12/6/03 issue of The Economist.

The latest figures on broadband delivery in the US show slowing adoption relative to the previous year.


RFI tags in tires and other wireless tracking devices raise privacy concerns for automobiles.

“This Car Can Talk. What It Says May Cause Concern.” by J. Schwartz, starting on page C1 of 12/29/03 NY Times.

Predictions of action in the technology industry in 2004, covering television technology, initial public offerings, telecommunications, venture capital, cellphones, software companies, and security technology.


The standards battle in the signal/modulation format for ultrawideband radio continues.