

A. MICHAEL NOLL

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Education

B.S.E.E. - Newark College of Engineering - June 1961

M.E.E. - New York University - June 1963

Ph.D. (EE) - Polytechnic Institute of Brooklyn - June 1971
Thesis: "Man-Machine Tactile Communication"

Employment

- 9-06 to present Professor Emeritus of Communication – Annenberg School for Communication (University of Southern California)
- 9-06 to 5-10 Research Professor - Annenberg School – Conduct archival and historical research on Dr. William O. Baker.
- 9-84 to 9-06 Professor of Communication - Annenberg School - Taught courses in communication technology and systems. Conducted research in communication policy, social impacts, and industry structure.
- 9-92 to 7-94 Dean - Annenberg School - Lead the School through a transitional phase, creating a broader vision and definition of the study of communication that resulted in a major merger of units.
- 9-82 to 8-96 Adjunct Professor - Interactive Telecommunications Program (Tisch School - New York University) - Taught graduate level courses in basic telecommunication technology and systems.
- 3-77 to 9-84 District Manager - AT&T - Identified and evaluated opportunities for new telecommunication products and services, based on technological advances and customer needs. Developed business plans, including the definition of trials and exploratory development.
- 1-83 to 6-83 Adjunct Professor - Annenberg School for Communication and the Speech Science and Technology Program (University of Southern California) - Taught graduate level courses in basic telecommunication technology and in the engineering concepts fundamental to speech technology.
- 7-73 to 3-77 Member of Technical Staff - Bell Laboratories (Murray Hill, NJ) - Performed basic research in interpersonal communications; evaluated visual communication and teleconferencing systems.
- 6-71 to 6-73 Technical Assistant to the Director of the White House Office of Science and Technology (Washington, DC) - Responsible for science and technology policy relating to computer security, privacy, information systems, computer exports, educational technology, and joint US/USSR cooperative programs.

- 6-61 to 6-71 Member of Technical Staff - Bell Laboratories (Murray Hill, NJ) - Performed basic research in person-machine communication, speech processing, computer graphics, computer art, aesthetics, and tactual force-feedback communication.

Affiliations & Boards

- **Columbia Institute for Tele-Information** (Columbia University Business School) -- Senior Affiliated Research Fellow (present) -- Director of Technology Research (2000-2002) -- Visiting Director (1995).
- **Communications Media Center** (New York Law School) -- Affiliated Scholar (former).
- **Marconi International Fellowship Foundation** (at Columbia University) – Senior Advisor (2002-2005).
- **IEEE History Center** – Trustee (2001-2006)

Honors

Cullimore Scholarship Award - NCE - 1960.
 Member Tau Beta Pi - Engineering Honor Society - 1960.
 Member Eta Kappa Nu - Electrical Engineering Honor Society - 1959.
 Eta Kappa Nu Outstanding Young Electrical Engineer - Honorable Mention - 1970.
 NJIT Distinguished Alumni Medal for Outstanding Achievement - 1994.

Professional Society Membership

Present: Institute of Electrical and Electronics Engineers (Senior Member).
Past: Audio Engineering Society.
 Acoustical Society of America.
 Society for Information Display.
 Society of Motion Picture and Television Engineers.

Patents

Six granted in speech-processing technology and man-machine tactile communications.

Publications

Over 95 published papers in speech-processing technology, computer graphics, computer art, aesthetics, interpersonal communications, man-machine communications systems, and other topics. Ten books on telecommunications technology and business. Well over 100 op-ed pieces and articles in various newspapers and trade magazines. Seasoned reviewer of classical music concerts.

A. Michael Noll

BOOKS

Published:

An Introduction to Telephones and Telephone Systems, Artech House, Inc. (Norwood, MA), 1986.

Introduction to Telecommunication Electronics, Artech House, Inc. (Norwood, MA), 1988.

Television Technology: Fundamentals and Future Prospects, Artech House, Inc. (Norwood, MA), 1988.

SIGNALS: The Science of Telecommunication, with John R. Pierce (senior author), Scientific American Books (New York, NY), 1990. [also translated into German, Dutch, & Spanish]

Introduction to Telephones and Telephone Systems (Second Edition), Artech House, Inc. (Norwood, MA), 1991.

Introduction to Telecommunication Electronics (Second Edition), Artech House, Inc. (Norwood, MA), 1995.

Highway of Dreams: A Critical Appraisal of the Communication Superhighway, Lawrence Erlbaum Associates (Mahwah, NJ), 1997.

Introduction to Telephones and Telephone Systems (Third Edition), Artech House, Inc. (Norwood, MA), 1999.

Principles of Modern Communications Technology, Artech House, Inc. (Norwood, MA), 2001.

Crisis Communications: Lessons from September 11, Rowman & Littlefield Publishers, Inc. (Lanham, MD), 2003 (Edited collection of papers treating the communication aspects of the tragedy of September 11th).

The Evolution of Media, Rowman & Littlefield Publishers, Inc. (Lanham, MD), 2007.

Bell Labs Memoirs: Voices of Innovation, co-edited with Michael Geselowitz, IEEE History Center (New Brunswick, NJ), printing by Amazon, 2011.

Self-Published:

Choosing Well: Finding the Best and Avoiding the Rest, with Andrew Whaling, LuLu, 2010.

A History of the Annenberg School at the University of Southern California, LuLu, 2010.

Memories: A Personal History of Bell Telephone Laboratories, 2015, posted by IEEE History Center.

A. Michael Noll

PUBLISHED PROFESSIONAL PAPERS

(sole authored, except as noted)

- P00 "A Re-Coupled Difference Amplifier," *The Orbit* [Newark College of Engineering], Vol. 5, No. 2, (January 1961), pp. 6-7.
- P0 "Electronic Computer – Friend or Foe?" *The Orbit*, Vol. 5, No. 3, (March 1961), pp. 8 & 16.
- P1 "Short-Time Spectrum and Cepstrum Techniques for Vocal-Pitch Detection," *Journal of the Acoustical Society of America*, Vol. 36, No. 2, (February 1964), pp. 296-302.
- P2 "Effects of Head and Air-Leakage Sidetone During Monaural Telephone Speaking," *Journal of the Acoustical Society of America*, Vol. 36, No. 3, (March 1964), pp. 598-599.
- P3 "Subjective Effects of Sidetone During Telephone Conversation," *Communication and Electronics*, IEEE, (May 1964).
- P4 "Stereographic Projections by Digital Computer," *Computers and Automation*, Vol. 14, No.5, (May 1965), pp. 32-34.
- P5 "Computer-Generated Three-Dimensional Movies," *Computers and Automation*, Vol. 14, No. 11, (November 1965), pp. 20-23.
- P6 "Human or Machine: A Subjective Comparison of Piet Mondrian's 'Composition with Lines' and a Computer-Generated Picture," *The Psychological Record*, Vol. 16. No. 1, (January 1966), pp. 1-10.
- P7 "Choreography and Computers," *Dance Magazine*, Vol. XXXXI, No. 1, (January 1967), pp. 43-45.
- P8 "Computers and the Visual Arts," *Design Quarterly* No. 66/67, (1967), pp. 65-71 (first half of P13).
- P9 "Cepstrum Pitch Determination," *Journal of the Acoustical Society of America*, Vol. 41, No. 2, (February 1967), pp. 293-309.
- P10 "A Computer Technique for Displaying n-Dimensional Hyperobjects," *Communications of the ACM*, Vol. 10, No. 8, (August 1967), pp. 469-473.
- P11 "Computerized Pictures," *Art and Artists*, Vol. 2, No. 6, (September 1967), pp. 12-15 (invited reprint of P8).
- P12 "The Digital Computer as a Creative Medium," *IEEE Spectrum*, Vol. 4, No. 10, (October 1967), pp. 89-95.
- P13 "Computers and the Visual Arts," *Design and Planning 2: Computers in Design and Communication* (Edited by Martin Krampen and Peter Seitz), Hastings House, Publishers, Inc.: New York (1967), pp. 65-79.
- P14 "Computer Graphics in Acoustics Research," *IEEE Transactions on Audio and Electroacoustics*, Vol. AU-16, No. 2, (June 1968), pp. 213-220).

- P15 "Clipstrum Pitch Determination," *Journal of the Acoustical Society of America*, Vol. 44, No. 6, (December 1968), pp. 1585-1591.
- P16 "Computer Animation and the Fourth Dimension," *AFIPS Conference Proceedings*, Vol. 33, 1968 Fall Joint Computer Conference, Thompson Book Company: Washington, D.C. (1968), pp. 1279-1283.
- P17 "The Digital Computer as a Creative Medium/Digitalni kompjuter kao kreativno sredstvo," *Bit International*, Published by Galerije grada Zagreba, Yugoslavia) No. 2 (1968), pp. 51-62 (invited reprint of P12).
- P18 "Human or Machine: A Subjective Comparison of Piet Mondrian's 'Composition with Lines' and a Computer Generated Picture," *Psychology and the Visual Arts*, Edited by James Hogg, Penguin Books: London (1969), pp. 302-314 (invited reprint of P6).
- P19 "The Intelligibility of Shouted Speech," (with D.J. MacLean), *Proceedings of the Symposium on the Aeromedical Aspects of Radio Communication and Flight Safety*, AGARD/NATO Advisory Report 19, pp. 10-1 to 10-13, December 1969 (London).
- P20 "A New Approach to Computer-Generated Holography," (with M. C. King and D. H. Berry), *Applied Optics*, Vol. 9, No. 2, (February 1970), pp. 471-475.
- P21 "Pitch Determination of Human Speech by the Harmonic Product Spectrum, the Harmonic Sum Spectrum and a Maximum Likelihood Estimate," *Proceedings of the Symposium on Computer Processing in Communications*, Vol. XIX, Polytechnic Press: Brooklyn, New York, (1970), pp. 779-797.
- P22 "Whither Speech Production," *Journal of the Acoustical Society of America*, Vol. 47, No. 6 (Part 2), (June 1970), pp. 1614-1616.
- P23 "Art Ex Machina," *IEEE Student Journal*, Vol. 8, No. 4, (September 1970), pp. 10-14.
- P24 "The Digital Computer as a Creative Medium," *Perspectives on the Computer Revolution*, Edited by Zenon W. Pylyshyn, Prentice-Hall: Englewood Cliffs, N.J. (1970), pp.349-358 (invited reprint of P12).
- P25 "Computer-Aided Design Systems," *Emerging Methods in Environmental Design and Planning*, Edited by Gary T. Moore, MIT Press: Cambridge, Mass. (1970), pp. 115-117.
- P26 "Gaussian-Quadratic," *1971 IEEE International Convention Digest*, pp. 44-45.
- P27 "Scanned-Display Computer Graphics," *Communications of the ACM*, Vol. 14, No. 3, (March 1971), pp. 145-150.
- P28 "Animation in a Four Dimensional Space," *Filmmakers Newsletter*, Vol. 4, No. 5, (March 1971), pp. 29-32.
- P29 "The Digital Computer as a Creative Medium," *Cybernetics Art and Ideas*, Edited by Jasja Reichardt, Studio Vista Limited: London (1971), pp. 143-164 (invited reprint of P12).
- P30 "Subjective Assessment of the Speech Communication Papers Presented at the 80th Meeting of the Acoustical Society of America," *Journal of the Acoustical Society of America*, Vol. 50, No. 4 (Part 1), (October 1971), pp. 1081-1084.

- P31 "The Pendula of Science and Technology," *The Bridge of Eta Kappa Nu*, (February 1972), p. 17.
- P32 "Computing Power," *Papers Prepared for the Special Workshop on Engineering Software Coordination*, Compiled by Robert L. Schiffman, University of Colorado (April 1972), pp. 14-17
- P33 "The Cepstrum and Some Close Relatives," *NATO Advanced Study Institute on Signal Processing*, University of Technology: Loughborough, U.K. (1972), pp. I-2.1 to I-2.12.
- P34 "Man-Machine Tactile Communication," *SID Journal* (The Official Journal of the Society for Information Display), Vol. 1, No. 2, (July/August 1972), pp. 5-11.
- P35 "The Effects of Artistic Training on Aesthetic Preferences for Pseudo-Random Computer-Generated Patterns," *The Psychological Record*, Vol. 22, No. 4, (Fall 1972), pp 449-462.
- P36 "Real-Time Interactive Stereoscopy," *SID Journal* (The Official Journal of the Society for Information Display), Vol. 1, No. 3, (September/October 1972), pp. 14-22.
- P37 "The Interactions of Computers and Privacy," *Honeywell Computer Journal*, Vol. 7, No. 3, (Fall 1973), pp. 163-172.
- P38 "Some Advice on Science Advice," *The National Science Policy and Organization Act of 1975*, Hearings Before the Committee on Science and Technology, U.S. House of Representatives, 94th Congress, 1st Session, on H.R. 4461 and H.R. 7830, U.S. Government Printing Office: Washington, D.C. (1975), pp. 650-684.
- P39 "Teleportation Through Communication," *IEEE Transactions on Systems, Man and Cybernetics* Vol. SMC-6, No. 11, (November 1976), pp. 753-756.
- P40 "Teleconferencing Communications Activities," *Communications Society*, Vol. 14, No. 6 (November 1976), pp. 8-14.
- P41 "The effects of visible eye and head turn on the perception of being looked at," *American Journal of Psychology*, Vol. 89, No. 4 (December 1976), pp. 631-644.
- P42 "Human or Machine? Aesthetic Preferences for Pseudo-Random Computer-Generated Patterns," *Creative Computing*, Vol. 3, No. 6 (November-December 1977), pp. 96-102 (abridgement of P6 and P35).
- P43 "A Marketing Approach to Science Policy," Letter to the Editor, *Physics Today*, Vol. 31, No. 2 (February 1978), pp. 9-13.
- P44 "The Effects of Communications Medium on the Fundamental Frequency of Speech," *Communications Quarterly*, Vol. 26, No. 2 (Spring 1978), pp. 51-56.
- P45 "Man-Machine Tactile Communication," *Creative Computing*, Vol. 4, No. 4 (July-August 1978), pp. 52-57 (invited reprint of P34).
- P46 "The Use of Picturephone Service in a Hospital," (with James P. Woods, Jr.), *Telecommunications Policy*, Vol. 3, No. 1 (March 1979), pp. 29-36.
- P47 "Cepstrum Pitch Determination," *Speech Analysis*, Edited by Ronald W. Schafer and John D. Markel, IEEE Press: New York (1979), pp. 179-195 (invited reprint of P9).

- P48 "Teletext and Videotex in North America: Service and System Implications," *Telecommunications Policy*, Vol. 4, No. 1 (March 1980), pp. 17-24.
- P49 "Natural Language Interaction With Machines: A Passing Fad? Or the Way of the Future?," *Proceedings of the 18th Annual Meeting of the Association for Computational Linguistics*, (June 1980), p. 137.
- P50 "Computers and the Visual Arts: A Retrospective View," *Catalog of the SIGGRAPH '82 Art Show*, (July 1982).
- P51 "A Bell System View of Videotex," (with Dennis J. Sullivan, Jr.), *Telecommunications Policy*, Vol. 6, No. 3 (September 1982), pp. 237-241.
- P52 "Mechanisms and Conduits of Information Flow: Options and the Need to Make Choices," *Information and Technology Exchange Among Engineering Research Centers and Industry: Report of a Workshop*, National Academy Press (June 1985), pp. 37-46.
- P53 "Videotex: Anatomy of a Failure," *Information & Management*, Vol. 9, No. 2 (September 1985), pp. 99-109.
- P54 "Teleconferencing Target Market," *Information Management Review*, Vol. 2, No. 2 (Fall 1986), pp. 65-73.
- P55 "Bell System R&D Activities," *Telecommunications Policy*, Vol. 11, No. 2 (June 1987), pp. 161-178.
- P56 "The Effects of Divestiture on Telecommunications Research," *Journal of Communication*, Vol. 37, No. 1 (Winter 1987), pp. 73-80.
- P57 "The Digital Computer as a Creative Medium," *Media USA*, Edited by Arthur Asa Berger, Longman, Inc.: White Plains, New York (1988), pp. 545-553 (invited reprint of P12).
- P58 "The Broadbandwagon," *Telecommunications Policy*, Vol. 13, No. 3 (September 1989), pp. 197-201.
- P59 "Telecommunications in the United States," (with Everett Rogers), Chapter 10 in *Telecom 2001: A Strategic Forecast*, Thomas L. McPhail and Brenda M. McPhail, McPhail Research Group: St. Louis, Missouri (1990), pp. 155-166.
- P60 "High Definition Television (HDTV)," Chapter 57 in *Media USA* (Second Edition), Arthur Asa Berger (Editor), Longman: New York (1991), pp. 431-438.
- P61 "The Future of AT&T Bell Labs and Telecommunications Research," *Telecommunications Policy*, Vol. 15, No. 2 (April 1991), pp. 101-105.
- P62 "Withdrawal Effects of Metoclopramide," (with Drew Pinsky), *The Western Journal of Medicine*, Vol. 154, No. 6 (June 1991), pp. 726-726.
- P63 "Voice vs. Data: An Estimate of Future Broadband Traffic," *IEEE Communications Magazine*, Vol. 29, No. 6 (June 1991), pp. 22, 24-25, & 78.
- P64 "Anatomy of a Failure: Picturephone Revisited," *Telecommunications Policy*, Vol. 16, No. 4 (May/June 1992), pp. 307-316.

- P65 "An Inquiry Into the Privacy Aspects of Caller-ID," *Telecommunications Policy*, Vol. 16, No. 8 (November 1992), pp. 690-693.
- P66 "telephone," entry in *Academic American Encyclopaedia*, Grolier: Danbury, CT (1995), pp. 79-80.
- P67 "The Beginnings of Computer Art in the United States: A Memoir," *Leonardo*, Vol. 27, No. 1, (1994), pp. 39-44.
- P68 "A Study of Long-Distance Rates: Divestiture Revisited," *Telecommunications Policy*, Vol. 18, No. 5 (1994), pp. 355-362.
- P69 "The Beginnings of Computer Art in the United States: A Memoir," *Computers & Graphics*, Vol.19, No.4 (1995), pp.495-503 (invited reprint of P67).
- P70 "The Extraterrestrials Are Coming," *Telecommunications Policy*, Vol. 20, No. 2 (March 1996), pp. 79-82.
- P71 "CyberNetwork Technology: Issues and Uncertainties," *Communications of the ACM*, Vol. 39, No. 12 (December 1996), pp. 27-31.
- P72 "Network Security and Reliability: Emergencies in Decentralized Networks," in E. Noam and A. NiShuilleabhain (Eds.), *Private Networks and Public Objectives*, Elsevier Science B. V. (Amsterdam, The Netherlands), 1996, pp. 343-356.
- P73 "POTS: Plain Old Telephone Service," in Jerry D. Gibson and Elaine Gibson (Eds.), *The Communications Handbook*, CRC Press, Inc. (Boca Raton, FL), 1997, pp. 291-300.
- P74 "A Study of Long-Distance Rates: Divestiture Revisited," in E. Noam and A. J. Wolfson (Eds.), *Globalism and Localism in Telecommunications*, Elsevier Science B. V. (Amsterdam, The Netherlands), 1997, pp. 63-73 (reprint of P68).
- P75 "Internet Pricing Vs. Reality," *Communications of the ACM*, Vol. 40, No. 8 (August 1997), pp. 118-121.
- P76 "The Costs of Competition: FCC Telecommunication Orders of 1997," *Telecommunications Policy*, Vol. 22, No. 1 (February 1998), pp. 47-56.
- P77 "The Digital Mystique: A Review of Digital Technology and its Application to Television," *Prometheus*, Vol. 16, No. 2 (1998), pp. 145-153.
- P78 "Scanned Display of Computer Graphics," in *Seminal Graphics* (Ed: Rosalee Wolfe), ACM SIGGRAPH, 1998, pp. 303-310 (invited reprint of P27).
- P79 "The Digital Mystique: A Review of Digital Technology and its Application to Television," in Darcy Gerbarg (Ed.), *The Economics, Technology and Content of Digital TV*, Kluwer Academic Publishers (Boston), 1999, pp. 61-72 (invited reprint of P77).
- P80 "The Evolution of Television Technology," in Darcy Gerbarg (Ed.), *The Economics, Technology and Content of Digital TV*, Kluwer Academic Publishers (Boston), 1999, pp. 3-17.
- P81 "Telecommunication Competition: Much Ado About Nothing?," *info*, Vol. 1, No. 2 (April 1999), pp. 117-120.

- P82 "The Future of Communication: An Essay for the Year 2000," *foresight*, Vol. 1, No. 2 (May 1999), pp. 165-172.
- P83 "Does Data Traffic Exceed Voice Traffic?," *Communications of the ACM*, Vol., 42 No. 6 (June 1999), pp. 121-124.
- P84 "Communications," *Milestones of the 20th Century*, Grolier (Danbury, CT), 1999, pp. 246-249.
- P85 "The Impending Death of Over-the-Air Television," *info*, Vol. 1, No. 5 (October 1999), pp. 389-391.
- P86 "Telecommunication Privatization: Mixed Progress," *info*, Vol. 2, No. 1 (February 2000), pp. 21-23.
- P87 "Statement," Foreign Government Ownership of American Telecommunications Companies, Hearing before the Subcommittee on Telecommunications of the Committee on commerce, House of Representatives, September 7, 2000, U.S. Government Printing Office, pp. 166-171.
- P88 "Technology and the Future of the University: A Sober View," *Information Communication & Society*, Vol. 3, No. 4 (2000), pp. 645-647.
- P89 "Telephone Signalling Systems, Touch-Tone," with Leo Schenker, *Encyclopedia of Physical Science and Technology, Third Edition, Volume 16*, Academic Press (2002), pp. 535-543.
- P90 "Accelerating Technology: The Pace of Transmission Systems," *Prometheus*, Vol. 20, No. 1 (March 2002), pp. 15-20.
- P91 "Preface," to Symposium on Communications on September 11, *Prometheus*, Vol. 20, No. 3 (September 2002), pp. 195-199.
- P92 "Technology and the Future of the University: A Sober View," in William H. Dutton and Brian D. Loaders (Eds.), *Digital Academe*, Routledge (London), 2002, pp. 35-38 [invited reprint of P87].
- P93 "Technological Challenges of Powerline Telecommunication," *info*, Vol. 4, No. 1 (2002), pp. 4-6.
- P94 "Telecommunication Basic Research: An Uncertain Future for the Bell Legacy," *Prometheus*, Vol. 21, No. 2, June 2002, pp. 177-193.
- P95 "Internet TV: Definition and Prospects," Chapter 1 in Eli Noam, Jo Groebel, and Darcy Gerbarg (Eds.), *Internet Television*, Lawrence Erlbaum (Mahwah, NJ), 2004, pp. 1-8.
- P96 "TV Over The Internet: Technological Challenges," Chapter 3 in Eli Noam, Jo Groebel, and Darcy Gerbarg (Eds.), *Internet Television*, Lawrence Erlbaum (Mahwah, NJ), 2004, pp. 19-29.
- P97 Preface and Introduction, in A. Michael Noll (Ed.), *Crisis Communications: Lessons from September 11*, Rowman & Littlefield (Lanham, MD), 2003, pp. ix-xvi.
- P97 "Bell Telephone Laboratories, Incorporated: an early Digital Media Lab," LEONARDO On-Line OLATS, June 2014 [invited, web publication].
- P98 "Early Digital Computer Art at Bell Telephone Laboratories, Incorporated," *LEONARDO*, Vol. 49, No. 1 (February 2016), pp. 55-65.

P99 "The Howard Wise Gallery Show (1965): A 50th-Anniversary Memoir," *LEONARDO*, Vol. 49, No. 3 (June 2016), pp. 232-239.

A. Michael Noll

EDITORIALS

Op-Eds & Letters to the Editor

- OE1 “Miracle of the Bells Extolled,” *Los Angeles Business Journal*, November 12, 1990, p. 21.
- OE2 “The Failures of AT&T Strategies,” *The New York Times*, Business Section, Sunday, March 31, 1991, Section 3, p. 9.
- OE3 “The A.T.&T. Stumble,” *The New York Times*, Business Section, Sunday, October 27, 1991 [letter to the Editor].
- OE4 “Videophone: A Flop that Won’t Die,” *The New York Times*, Business Section, Sunday, January 12, 1992, Section 3, p. 13.
- OE5 “In Health Care, Technology is Not the Villain,” *The New York Times*, Business Section, Sunday, August 23, 1992, Section 3, p. 13 [letter to the Editor].
- OE6 “Monopoly Runs Amok: N.J. Bell Wins, the Public Loses,” *Daily Record*, (Morris County, NJ), January 1, 1993, p. A11.
- OE7 “New Jersey’s Touch-Tone Rip-Off,” *Daily Record*, (Morris County, NJ), June 20, 1993, p. B4.
- OE8 “It’s Ma Bell Against Her Grown-Up Babies,” *The Los Angeles Times*, August 29, 1993, p. M5.
- OE9 “Baby Bells Should Stick with Strengths,” *The Los Angeles Times*, October 22, 1993, p. B15.
- OE10 “The Phone Company Has Gone Hollywood,” *Daily Record* (Morris County, NJ), January 7, 1994, p. A11.
- OE11 “10 years After Bell’s Breakup,” *The New York Times*, Business Section, Sunday, January 23, 1994, Section 3, p. 13.
- OE12 “We Pay Too Much for Local Phone Service,” *Daily Record* (Morris County, NJ), March 18, 1994, p. A17.
- OE13 “The Collapse of the ‘Information Superhighway’: A Perspective on the Failed Telco/CATV Deals,” *Telecommunications*, Vol.28, Number 7, July 1994, p. 19.
- OE14 “Dialling for Dollars,” *The Los Angeles Times*, October 3, 1994, p. B7.
- OE15 “Another Perspective on the Telco-CATV Debate,” *Telecommunications*, Vol. 28, No. 12, December 1994, p. 20.
- OE16 “Communications policy is taking an unhealthy turn,” *The Star-Ledger*, August 28, 1995, p. 19.
- OE17 “Telecom Reform Legislation: A Case of Industry Remonopolization?,” *Telecommunications*, Vol.29, No.10, October 1995, p. 30.
- OE18 “Aren’t We Glad They Broke Up Bell?,” *Los Angeles Times*, April 24, 1996, p. B13.

- OE19 "AT&T needs strong leadership now," *The Star-Ledger*, November 12, 1996, p. 13.
- OE20 "The Telecommunications Act—One Year Later," *Multichannel News*, February 3, 1997, p. 61.
- OE21 "AT&T on course to face storms of competition," *Daily Record* (Morris County, NJ), May 28, 1997, p. A15.
- OE22 "The message doesn't get through to AT&T," *The Star-Ledger*, July 24, 1997, p. 20.
- OE23 "Upbeat on Newark," *The Star-Ledger*, August 3, 1997 [letter to the Editor].
- OE24 "Newark University would spur city's renaissance," *The Star-Ledger*, August 25, 1997, p. 10.
- OE25 "Affairs of the Heart: The Bids to Acquire MCI," *Multichannel News*, November 10, 1997, p. 69.
- OE26 "Don't Call Us, We'll Call You," *Los Angeles Times*, November 14, 1997, p. B9.
- OE27 "Will AT&T's new leader be up to the challenge?" *The Star-Ledger*, December 3, 1997, p. 28.
- OE28 "Has AT&T Begun Its Last Chapter?" *Los Angeles Times*, June 28, 1998, p. M5.
- OE29 "Merger marks the beginning of the end for AT&T," *The Star-Ledger*, July 16, 1998, p. 18.
- OE30 "The AT&T Merger: A \$48B Wager," *Multichannel News*, July 27, 1998.
- OE31 "Capitol Mess," *tele.com*, Vol. 3, No. 8, July 1998 [letter to the Editor].
- OE32 "Merger Media Mantra: Bigger Is Better," *Los Angeles Times*, January 25, 1999, p. B5.
- OE33 "Little reason for alarm as zero hour approaches," *The Star-Ledger*, May 18, 1999, p. 16.
- OE34 "Two Monopolies Are Not Better Than One," *Los Angeles Times*, July 26, 1999, p. B11.
- OE35 "Redstone Knows Content Is King," *Los Angeles Times*, September 9, 1999, p. B11.
- OE36 "Long-distance competition hasn't cut prices," *The Star-Ledger*, November 16, 1999, p. 30.
- OE37 "Come Jan. 1, Chicken Little Will Eat Crow," *Los Angeles Times*, December 28, 1999, p. B9.
- OE38 "BPU should reject Bell Atlantic deregulation plan," *The Star-Ledger*, July 14, 2000, p. 20.
- OE39 "A Big 'Nein' to Deutsche Telekom," *Los Angeles Times*, July 26, 2000, p. B9.
- OE40 "AT&T Should Divest Armstrong," *Daily Record* (Morris County, NJ), August 20, 2000, p. O2.
- OE41 "AOL/Time Warner and the Convergence Myth," *Communications Week International*, February 5, 2001, pp. 10-11.
- OE42 "The Last Book," *Faculty Forum: The Newsletter of the UISC Academic Senate*, Vol. 2, No. 2, 2000-2001, p. 11.

- OE43 “Lucent symbol a big red zero,” *Daily Record* (Morris County, NJ), August 15, 2001, p. A6 [letter to the editor].
- OE44 “Telecoms in times of global tragedy,” *Communications Week International*, September 24, 2001, p. 11.
- OE45 “2002 Predictions,” *Communications Week International*, January 21, 2002, p. 7.
- OE46 “WorldCom executives should be in a jail cell,” *Daily Record* (Morris County, NJ), July 10, 2002, p. A8.
- OE47 “A natural monopoly — and a competitive one?” *Communications Week International*, August 12, 2002, pp. 10-11.
- OE48 “A Misguided Campaign For Over-the-Air Digital TV,” *New York Law Journal*, Vol. 6, No. 4, September 4, 2002, p. S12.
- OE49 “Research Scandal May Hang Up Future of Telecommunications,” *Los Angeles Times*, October 6, 2002, p. M5.
- OE50 “From the ruins: a vision of rebirth for the telecoms industry,” *Communications Week International*, October 21, 2002, pp. 12-13.
- OE51 “Telecom Research: Where’s the Support?” *Telecommunications*, Vol. 37, No. 12, November 2003, p. 12.
- OE52 “The Bell breakup 20 years later,” *The Star-Ledger*, January 2, 2004, p. 23.
- OE53 “The choice that changed everything (or did it?),” *Sunday Star-Ledger*, November 20, 2005, Section 3, p. 4.
- OE54 “Telecom mergers returning us to monopoly,” *The Star-Ledger*, March 7, 2006.
- OE55 “Toll roads: Come to a full stop,” *Los Angeles Times*, February 15, 2007 [letter to the editor].
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- OE63 “Stereo Stars,” *BBC Music*, March 2017, p. 8.

A. Michael Noll

GENERAL SHORT ARTICLES

Newspapers, Trade Magazines, Journals, Columns

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- C2 “Rethinking the Digital Mystique,” *Telecommunications*, Vol. 30, No. 2, February 1996, p. 43.
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- C4 “The Hazards of Cyber Overload,” *Telecommunications*, Vol. 30, No. 3, March 1996, p. 44.
- C5 “The communications revolution began in New Jersey; it may end here,” *The Sunday Star-Ledger*, April 21, 1996, Section Ten, p.5.
- C6 “The Internet: Is it all talk, or can it deliver?,” *The Sunday Star-Ledger*, June 2, 1996, Section Ten, p. 5.
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- C9 “The e-mail generation puts its stamp of approval on the written letter,” *The Sunday Star-Ledger*, July 21, 1996, Section Ten, p. 5.
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- C11 “Sizing the Industry: The Numbers Tell the Story,” *Telecommunications*, Vol. 30, No. 9, September 1996, p. 34.
- C12 “Peter B. Denes • 1920-1996,” *Journal of the Acoustical Society of America*, Vol. 100, No. 4, Pt. 1, October 1996, p. 1916.
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- C17 “New Media, Old Paradigms,” *Telecommunications*, Vol. 31, No. 12, December 1997, p. 32.

- C18 "The Rating Game: Does It Make Sense?," *Telecommunications*, Vol. 32, No. 4, April 1998, p. 27.
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- C23 "Cyberphones: Coming Soon to a Terminal Near You?," *Telecommunications*, Vol. 33, No. 3, March 1999, p. 18.
- C24 "The Myth of Partial Privatization," *tele.com*, Vol. 4, No. 5, March 8, 1999, p. 94.
- C25 "The Bell Breakup @ 15 Years," *tele.com*, Vol. 4, No. 13, June 21, 1999, p. 90.
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- C29 "Rate Expectations," *tele.com*, Vol. 5, No. 5, March 6, 2000, p. 78.
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- C32 "Telecom Follies," *tele.com*, Vol. 5, No. 7, September 4, 2000, p. 84.
- C33 "Selling Out," *tele.com*, Vol. 5, No. 19, October 2, 2000, p. 88.
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- C47 “John Robinson Pierce 1910-2002: A Biographical Memoir,” (with Edward E. David, Jr. and Max V. Mathews), *Biographical Memoirs*, Vol. 85, 2004 (The National Academies Press), pp. 2-17.
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- C50 “Telecommunications Restructuring: All in the Family,” *Telecommunications Online*, December 5, 2005.
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- C52 “Broadband brings BORSCHT Functions to the Home,” *Telecommunications Online*, March 21, 2006.
- C53 “Obituary: Dr. William O. Baker,” *IEEE History Center Newsletter*, Issue 70, March 2006, pp. 13 & 16.
- C54 “Time to Restructure Telcom Yet Again: Past Perspective for Future Focus,” *Telecommunications Online*, April 18, 2006.
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- C56 “Telcos vs Cable: Is Municipal Oversight at Risk?” *Telecommunications Online*, May 16, 2006.
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- C60 "The Digital Era: New Applications Rooted in Bell Labs Breakthroughs," *Telecommunications Online*, February 20, 2007.
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- C92 AT&T’s proposed T-Mobile acquisition: Going from monopoly to duopoly,” *FierceTelecom*. March 23, 2011.
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- C99 “Telstar satellite: Proving the naysayers wrong,” *FierceTelecom*, July 3, 2012.
- C100 “There Would Be No Silicon Valley Without New Jersey,” *IEEE Spectrum On-Line*, June 20, 2014 (co-authored with Michael N. Geselowitz).
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- C102 “Censoring of Sensoring,” *Quello Center at Michigan State University* (Blog), January 14, 2015.
- C103 “What is the Internet?” *Quello Center at Michigan State University* (Blog), February 18, 2015.
- C104 “A Viewpoint on the FCC Decision on Network Neutrality,” *Quello Center at Michigan State University* (Blog), February 26, 2015.
- C105 “Email Stamps: A Way to Control Spam,” *Quello Center at Michigan State University* (Blog), May 23, 2015.

- C106 “Charging Along: Too Many Rechargers,” *Quello Center at Michigan State University* (Blog), June 22, 2015.
- C107 “Speech Recognition Reassessed,” *Quello Center at Michigan State University* (Blog), July 15, 2015.
- C108 “Spooking & Snoozing Post Snowde,” *Quello Center at Michigan State University* (Blog), August 25, 2015.
- C109 “The Evil Web,” *Quello Center at Michigan State University* (Blog), September 26, 2015.
- C110 “Is Over-the-Air Radio Dying?” *Quello Center at Michigan State University* (Blog), November 2, 2015.
- C111 “What If No Electrical Grid?” *Quello Center at Michigan State University* (Blog), December 8, 2015.
- C112 “Apple vs. US Government,” *Quello Center at Michigan State University* (Blog), February 21, 2016.
- C113 “Is the Internet Destroying Scholarship?” *Quello Center at Michigan State University* (Blog), April 5, 2016.
- C114 “Deplorable Telephony,” *Quello Center at Michigan State University* (Blog), April 8, 2016.
- C115 “Claude E. Shannon: Cult Figure,” *Quello Center at Michigan State University* (Blog), May 7, 2016.
- C116 “Ultra-Narrowband Networks,” *Quello Center at Michigan State University* (Blog), May 20, 2016.
- C117 “Online Education,” *Quello Center at Michigan State University* (Blog), June 29, 2016.
- C118 “A Challenge to Virtual Reality,” *Quello Center at Michigan State University* (Blog), September 26, 2016.
- C119 “Access Is Not Content,” *Quello Center at Michigan State University* (Blog), October 7, 2016.
- C120 “Hollywood Fever Afflicts ATT,” *Quello Center at Michigan State University* (Blog), October 23, 2016.
- C121 “Is Apple Lost?” *Quello Center at Michigan State University* (Blog), December 29, 2016.
- C122 “AT&T Goes Hollywood,” *Quello Center at Michigan State University* (Blog), November 22, 2017.
- C123 “Are We All Just Lazy?” *Quello Center at Michigan State University* (Blog), December 11, 2017.
- C124 “Disney Buys Murdoch,” *Quello Center at Michigan State University* (Blog), December 16, 2017.
- C125 “New Media Addiction,” *Quello Center at Michigan State University* (Blog), January 13, 2018.
- C126 “University Research: A Skeptical Perspective,” *Quello Center at Michigan State University* (Blog), January 13, 2018.

- C127 “Smart Devices – Foolish Users,” ,” *Quello Center at Michigan State University* (Blog), April 26, 2018.
- C128 “AT&T’s Tarnished Brand”, *Quello Center at Michigan State University* (Blog), May 16, 2018
- C129 “The Innovation Garden”, *Quello Center at Michigan State University* (Blog), May 20, 2018.
- C130 “The Natural Stupidity of Artificial Intelligence,” *Quello Center at Michigan State University* (Blog), June 17, 2018.

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REVIEWS

INITIAL:

Reviews – New Records: “Concerto for Cello in E Flat,” [review of recording of Shostakovich piece on Columbia MS 6124], *The Orbit*, Vol. 5, No. 3, (March 1961), p. 11.

BOOKS:

BR1 Review of J. E. Katz *Connections: Social and Cultural Studies of the Telephone in American Life*, in *Information, Communication & Society*, Vol. 5, No. 1 (2002), pp. 137-142.

CLASSICAL MUSIC CONCERTS:

CR1 “Making Life Worth Listening,” *Classical New Jersey Society Journal*, Vol.3, No. 10, November 7, 2002, pp. 17-18 [review of Arbor Chamber Music concert on October 27, 2002].

CR2 “Organ recital plus: There are pipes and then there are *pipes!*,” *Classical New Jersey Society Journal*, Vol. 3, No. 11, November 14, 2002, pp. 13-14 [review of James Hicks organ recital on November 3, 2002].

CR3 “Jansons conducts and Cárdenes leads,” *Classical New Jersey Society Journal*, Vol.3, No. 13, November 28, 2002, p. 13 [review of Pittsburgh Symphony Orchestra concert on November 14, 2002].

CR4 “The Felix Hall phenomenon,” *Classical New Jersey Society Journal*, Vol.3, No. 13, November 28, 2002, pp. 15-16 [review of Felix Hall organ recital on November 17, 2002].

CR5 “Spanning the ages,” *Classical New Jersey Society Journal*, Vol.3, No. 16, December 19, 2002, pp. 16-18 [review of Ars Musica Chorale concert on November 23, 2002].

CR6 “The Rutgers conductor search: Looking toward Philadelphia,” *Classical New Jersey Society Journal*, Vol.3, No. 18, January 2, 2003, pp. 9-10 [review of Rutgers University Orchestra concert on December 6, 2002].

CR7 “Magnificat! And a surprise tenor,” *Classical New Jersey Society Journal*, Vol.3, No. 18, January 2, 2003, pp. 11-12 [review of Calvary Chorale concert on December 8, 2002].

CR8 “Orchestration showpieces: New Philharmonic at 25,” *Classical New Jersey Society Journal*, Vol.3, No. 38, May 22, 2003, pp. 18-19 [review of New Philharmonic of New Jersey concert on May 17, 2003].

CR9 “Not the same old same old,” *Classical New Jersey Society Journal*, Vol.3, No. 40, May 29, 2003, pp. 16-17 [review of Madison String Quartet concert on May 24, 2003].

CR10 “Sonic ambiance: What an organ! What brass!” *Classical New Jersey Society Journal*, Vol.4, No. 5, November 20, 2003, pp. 23-24 [review of Cathedral Brass & Percussion concert on October 19, 2003].

- CR11 “Gloria, Gloria: Poulenc, Rutter,,” *Classical New Jersey Society Journal*, Vol.4, No. 6, December 18, 2003, p. 25 [review of Crescent Choral Society concert on November 15, 2003].
- CR12 “Little-known little Bach: Miniatures in a large space,” *Classical New Jersey Society Journal*, Vol.4, No. 6, December 18, 2003, pp. 25-26 [review of Anthony Newman organ recital on November 16, 2003].
- CR13 “Two full houses: Beethoven still a big draw,” *Classical New Jersey Society Journal*, Vol.4, No. 8, January 8, 2004, p. 66 [review of Mostly Music concert on November 23, 2003].
- CR14 “The Myth of the Walt Disney Concert Hall,” *Classical New Jersey Society Journal*, Vol.4, No. 15, April 15, 2004, pp. 23-24.
- CR15 “Halcyon Trio in L.A.: Zipper a winner,” *Classical New Jersey Society Journal*, Vol.4, No. 16, April 29, 2004, pp. 25-26 [review of Halcyon Trio concert in Zipper Hall on April 6, 2004].
- CR16 “Love songs, part 1: Premieres galore!” *Classical New Jersey Society Journal*, Vol.4, Nos. 21/22, July 22, 2004, p. 27 [review of Harmonium Choral Society concert on May 22, 2004].
- CR17 “Felix Hell returns: Virtuoso visits Sacred Heart,” *Classical New Jersey Society Journal*, Vol.4, No. 23, August 5, 2004, p. 27 [review of organ recital by Felix Hell May 23, 2004].
- CR18 “Young cellist with impressive credentials,” *Classical New Jersey Society*, Vol. 5, No. 14, March 31, 2005, pp. 23-23 [review of concert by the New Philharmonic of New Jersey on March 12, 2005].
- CR19 “Fresh Beethoven: Searching for connections,” *Classical New Jersey Society*, Vol. 5, No. 19, June 9, 2005, pp. 19-20 [review of concert by the New Philharmonic of New Jersey on May 14, 2005].
- CR20 “MSU’s Robert Aldrdge goes left coast: David Singer in Lalaland,” *Classical New Jersey Society*, Vol. 5, No. 20, June 9, 2005, pp. 16 [review of concert by the Los Angeles Chamber Orchestra on May 7, 2005].
- CR21 “Eugeniu Doga in company with famed composers – Calvary Concerts in Summit open concert with a winner,” *Classical New Jersey Society On-line Reviews* [review of concert by the Manhattan Piano Trio on September 18, 2005].
- CR 22 “A family affair – Crisp 18th century music,” *Classical New Jersey Society On-line Reviews* [review of concert by the Lyrica Chamber Orchestra on September 25, 2005].
- CR23 “Star turn, (as usual) – Less-known Beethoven and Dohnanyi,” *Classical New Jersey Society On-line Reviews* [review of concert by Mostly Music on October 2, 2005].
- CR24 “A Messiaen celebration: Musical crystal and birds,” *Classical New Jersey Society On-line Reviews* [review of concert by the Tremblay Ensemble on October 2, 2005].
- CR25 “A need for substance: Pelted by Fred Waring,” *Classical New Jersey Society On-line Reviews* [review of concert by the Summit Chorale on November 6, 2005].
- CR26 “Hostetter takes over: Energy and enthusiasm,” *Classical New Jersey Society On-line Reviews* [review of concert by the Colonial Symphony on December 3, 2005].

- CR27 “Mozart for warmth: And Mozart for Mozart,” *Classical New Jersey Society On-line Reviews* [review of concert by the New Philharmonic of New Jersey on December 10, 2005].
- CR28 “Organic music: Los Angeles less-known treasures,” *Classical New Jersey Society On-line Reviews* [review of various organ recitals in Los Angeles on January 15, 22, 28 2006].
- CR29 “A new work for the viola canon: Schickele remembers,” *Classical New Jersey Society On-line Reviews* [review of concert by the Pasadena Symphony on January 21, 2006].
- CR30 “Winter in Pasadena: New choral music presented,” *Classical New Jersey Society On-line Reviews* [review of concert by Pasadena Pro Musica on January 29, 2006].
- CR31 “CalPhil in Italy: A broad swath of history,” *Classical New Jersey Society On-line Reviews* [review of concert by the California Philharmonic on March 24, 2006].
- CR32 “Dance music without dancers: Your bass-ic virtuoso,” *Classical New Jersey Society On-line Reviews* [review of concert by the Los Angeles Chamber Orchestra on April 8, 2006].
- CR33 “And the beat goes on, and the audiences came and went at will,” *Classical New Jersey Society On-line Reviews* [review of chamber music marathon by the Los Angeles Chamber Orchestra on May 6 & 7, 2006].

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WEB-PIECES

(Short, timely opinion pieces posted at Noll's Web site.)

"Comcast's Bid for AT&T Broadband," from BBC Radio interview in July, 2001.

"Lucent's Unclear Future," from BBC Radio interview on July 23, 2001.

"Digital Television," from live radio interview on KPFK (West Hollywood, CA) on August 2, 2001.

"Video Privacy," from *Daily Breeze* (Torrance, CA) newspaper interview on August 30, 2001.

"Telecom in Time of Tragedy," from interview by *Business News New Jersey* on September 12, 2001.

"The Comcast/AT&T Deal: Light at the End of the Tunnel for AT&T?" February 2002.

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PATENTS

- 3,420,955 “Automatic Peak Selector,” A. Michael Noll (filed November 19, 1965; issued January 7, 1969).
- 3,493,684 “Vocoder Employing Composite Spectrum-Channel and Pitch Analyzer,” James M. Kelley, A. Michael Noll, and Manfred R. Schroeder (filed June 15, 1966; issued February 3, 1970).
- 3,555,191 “Pitch Detector,” A. Michael Noll (filed July 15, 1968; issued January 12, 1971).
- 3,566,035 “Real Time Cepstrum Analyzer,” A. Michael Noll and Manfred R. Schroeder (filed July 19, 1969; issued February 23, 1971).
- 3,919,691 “Tactile Man-Machine Communications System,” A. Michael Noll (filed May 26, 1971; issued November 1, 1975).
- unissued “Raster Scan Computer Graphics System,” A. Michael Noll (filed February 5, 1970; abandoned at Supreme Court in 1977).
- 4,081,620 “Sidetone Control Circuit for a Telephone Set,” D. J. Goodman, J. D. Johnston, A. Michael Noll (filed May 20, 1977; issued March 28, 1978).

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UNPUBLISHED MONOGRAPHS

“The Bell System and Urban Problems,” April 24, 1969.

“An Evaluation of Federal Assistance to the Cities: A Case Study in Bureaucracy,” August 6, 1970.

“An Evaluation of Community Involvement in Urban Problems: A Case Study in Futility,” December 17, 1970.

“An Evaluation of Federally Assisted Code Enforcement in Newark: A Case Study in Mismanagement,” July 1, 1971.

“Cable Television: A Personal View,” May 1, 1972.

“Technology for Education,” June 8, 1972.

“Research in Man-Machine Communications and Systems,” February 22, 1973.

“Federal Support of Research in Computer Science and Engineering,” May 29, 1973.

“The Fragmentation and Collapse of the Bell System,” by Nathaniel A. Mittel (pseudonym), dated February 25, 1986 (written late 1974).

“Competition Comes to Telecommunications: Ma Bell in Crisis,” February 20, 1976.

“Science Advice and the White House,” March 4, 1976.

“Divestiture: The Last Chapter Unfolds,” by Nathaniel A. Mittel (pseudonym), dated November 11, 1998 (written February 10, 1988).

“The Size of the Electronic Communication Industry,” February 20, 1988.

“The Effects of Divestiture: What the Annual Reports Tell Us,” May 3, 1989.

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COMPUTER ART

Computer Generated Animation:

“Computer-Generated Ballet”(1965).

“Four-Dimensional Hyperobjects” (1965).

“4-D Hyper Movie.”

“Simulated Basilar Membrane Motion (3-D)” with R.C. Lummis and M. M. Sondhi.

“Incredible Machine” (1968) — main-title animation sequence for award-winning movie by Owen-Murphy Productions for the American Telephone & Telegraph Company.

“The Unexplained” (1970) — main-title animation sequence for Encyclopedia Britannica Special by Lee Mendelson Productions for NBC and colorcast on April 3, 1970.

Shows (1965-1975) :

Howard Wise Gallery, New York City: 1965 (with Bela Julesz) “Computer-Generated Pictures” (early USA computer-art exhibit).

Fall Joint Computer Conference, Las Vegas: 1965 (with Maughn Mason) “Computer-Art Exhibit.”

Galerie im Hause Behr, Stuttgart, Germany: 1967 “Computergrafik” (organized by M. Krampen).

Studio f, Ulm, Germany: 1967 “Computergrafik” (organized by M. Krampen).

Summit Art Center, Summit, New Jersey: 1967 “Computer Sight and Sound.”

House of Art, Brno, Czechoslovakia: 1968 “Computer Graphic.”

Gallery, Jihlava, Czechoslovakia: 1968 “Computer Graphic.”

Gallery, Cottwaldov, Czechoslovakia: 1968 “Computer Graphic.”

Institute for Contemporary Arts, London, England: 1968 “Cybernetic Serendipity.”

Galerije Grada Zagreba, Zagreb, Yugoslavia: 1968 “Tendencije 4.”

Kubus Gallery, Hanover, Germany: 1969 “Computer-Kunst” (sponsored by Clarissa Contemporary Art and Gottfried Wilhelm Leibniz Gellellseheft).

University of Madrid, Madrid, Spain: 1979 “Generacion Automatica de Eormas Plasticas.”

Pinacoteca do Estado de Sao Paulo, Sao Paulo, Brasil: 1971 “Arteonica.”

National Gallery of Modern Art, New Delhi, India: 1972 “Computer Art.”

Allen Memorial Art Museum, Oberlin, Ohio: 1972 “Computer Art.”

Watson Art Gallery, Wheaton College, Amherst, Massachusetts: 1975 “Computer Art Exhibit.”

Permanent Collections:

Large prints of “Gaussian-Quadratic” and “Computer Composition With Lines” are in the permanent collections of the Los Angeles County Museum of Art and the Fisher Gallery at the University of Southern California.

Movie prints (16 mm) of computer animation are in the permanent collections of the Museum of Modern Art (New York City) and the Academy of Motion Picture Arts and Sciences (Los Angeles).

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TEACHING RESPONSIBILITIES (past & present)

Annenberg School for Communication (USC)

- ANSC 180 Communications Systems & Technology
 Technology literacy for undergraduates. Telephone system, television, compact disc.
- COMM 471 Communication Systems & Technologies
 The basic technological principles of modern communication systems and technologies.
- COMM 472 Telecommunication Strategic Analysis
 Techniques for strategic and critical analyses of telecommunication businesses and technologies.
- COMM 495 Undergraduate Honors Seminar
 A historical and comparative study of interpersonal, interactive, and mass communication media.
- COMM 571 Communications Technologies
 Basic technological concepts necessary to understand the working's of modern communications products and services, including frequency, bandwidth, electricity, modulation, and digital conversion.
- COMM 572 Telephone & Data Telecommunications Systems
 Technological principles and workings of telephone and data telecommunications systems. Issues for management and policy from a technological perspective.
- COMM 574 Tele-Media: A Strategic and Critical Perspective
 Analyses of the historical, technological, consumer, financial, business, and regulatory aspects of the information superhighway and other new technologies.
- COMM 575 Visual Communications Systems
 Technological principles and workings of visual communication systems, including television, video recording, and CATV. Management and policy issues from a technological perspective.

Interactive Telecommunications Program (NYU) — 1980s & 1990s

- H79.2009 Interactive Telecommunications Technologies
 (NYU version of ANSC 571)
- H79.2010 Interactive Telecommunications Systems
 (NYU version of ANSC 572 & 575 combined)
- H79.2264 Telephone Communication
 (NYU version of ANSC 572)

Speech Science and Technology Program (USC) — 1983/84

- SPST 578 Engineering Concepts for Speech Science
 Fourier, Laplace, Z-transforms, analog and digital filters, electric circuit elements,
 linear systems.
- SPST 593 Speech Signal Analysis
 DFT, digital filters, mapping, sampling, conjugate poles, LPC, fundamental
 frequency estimation, formant estimation.

A. Michael Noll

SERVICE RESPONSIBILITIES AT USC (representative past list – not current)

University

Committee on Library and Information Systems, Member (1984-1985)
University Library Committee, Member (1985-1986)
Graduate and Professional Studies Committee, Member (1986-1988); Chair (1989-90)
Data Communications Advisory Committee, Chair (1986-1987)
Academic Program Review Committee, Member (1989-90)
Undergraduate Graduation and Retention Committee, Member (1992-1994)

Annenberg School

Facilities and Equipment Committee
 Member (1985-1987; 1988)
 Chair (1984-1985)
Comprehensive Examination Committee
 Member (1984-1985; 1987-1988)
 Chair (1985-1987; 1989-1990; 1991-1992)
Budget Advisory Committee
 Member (1986-1988)
Washington Program Director Search Committee
 Member (1986)
Academic Behavior Committee
 Chair (1988-1989)
Curriculum Committee
 Member (1988)
Masters and Undergraduate Committee
 Chair (1991-1992)
Administration and Finance Committee
 Elected Member (1992)
Strategic Planning Committee
 Member (1991-1992)