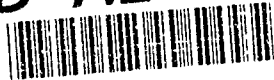


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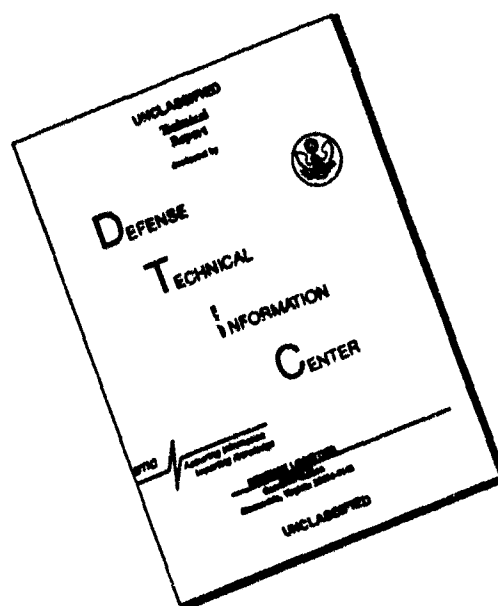
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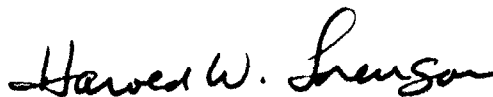
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After a reorganization in 1990, MITRE expanded from three to five operating centers. Personnel from two of the centers are located primarily at our headquarters in Bedford, Massachusetts (with one technical division located in the Washington area). These two centers are the Center for Air Force Command, Control, and Communications (C³) Systems and the Center for Intelligence and Special Programs. The remaining three operational centers are based in McLean, Virginia: the Washington C³ Center, the Center for Advanced Aviation System Development, and the Center for Civil Systems.

The principal sponsor for the Center for Air Force C³ Systems is the Air Force Electronic Systems Division (ESD), which develops ground-based and airborne sensors, radios, computers, software, and displays, and integrates them into command and control systems. We also provide support to other parts of the Air Force, including Rome Laboratory, Air Force Logistics Command, Tactical Air Command, and Strategic Air Command.

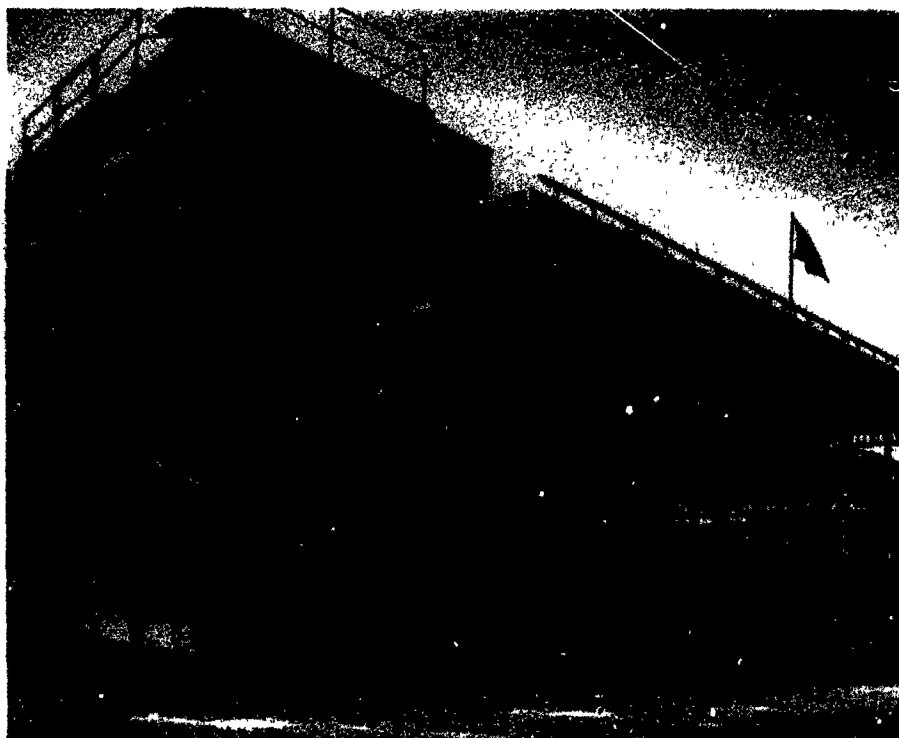
This publication is an overview of the professional activities of the Center for Air Force C³ Systems for the 1990 calendar year. As in past years, our employees have made valuable contributions to the technical and scientific communities through their documents, journal articles, presentations, and participation in group activities. Many of our staff teach in local colleges and universities. Unclassified reports generated within the Center for Air Force C³ Systems are listed here, as well as participation of our staff in professional and honorary organizations.

We are proud of our employees and their many professional activities, successes, and contributions to the community. We are pleased to recognize them in this *Summary of Professional Activities* publication.



Harold W. Sorenson
Group Vice President and General Manager
Center for Air Force C³ Systems

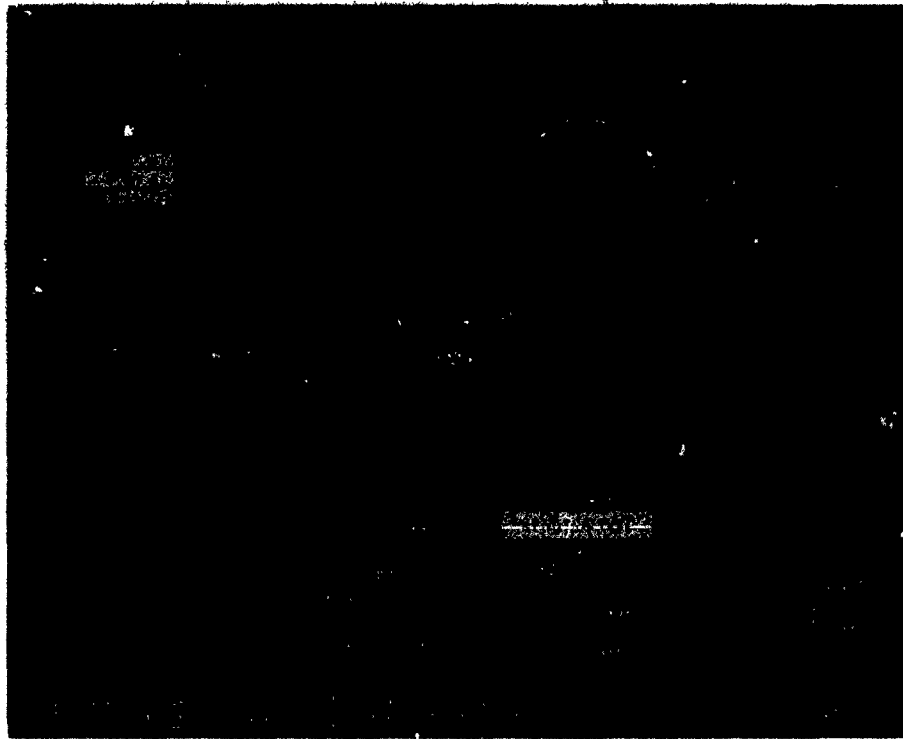
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*View of work in progress
on MITRE-Bedford's
M-Building, Spring 1991.*

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*Graphics-based rapid
prototyping tools enable
D040's Human Factors
Engineering for User
System Interface specialty
group to explore
alternative techniques
for presenting data to
decision makers.*

*These events were
sponsored or organized by
MITRE, and included
participants from outside
MITRE.*

10 January
Workshop on High
Frequency Antenna
Element Modeling,
MITRE-Bedford

14-15 March
Air Force Association
(AFA)/ESD Radar
Symposium, MITRE-
Bedford

4 April
Workshop on High
Frequency Antenna
Element Modeling,
MITRE-Bedford

19-21 June
Seventh Annual Command
Center Improvement
Program (CCIP), Com-
mand Center Upgrade
Information Conference,
McLean, Virginia

11 July
Workshop on High
Frequency Antenna
Element Modeling,
MITRE-Bedford

11-12 September
AFCEA's New Horizons
at ESD Symposium,
MITRE-Bedford

17 October
Workshop on High
Frequency Antenna
Element Modeling,
MITRE-Bedford

24 October
Personal Computer Fair,
MITRE-Bedford

1 November
SSC Special Events
Processing — Space
Surveillance Network
Improvement Program
(SSNP), MITRE-Bedford

18-20 November
Technical Exchange
Meeting VIII,
Charlottesville, Virginia



*The Military Microwave
Landing System Program
(D050) is replacing the
Instrument Landing
System and providing
safer, more efficient use of
the airspace environment.*

The titles of 38 classified reports have been omitted from this list.

**Allen, David P.,
Jacobi, Lee W.,
Nesser, Phillip J.,
Pearlman, John L.,
Teig, Lucien J.,
Zernik, Peter M., D080**
Target Scattering Modeling Year-End Report, MTR-10640, February 1990.

**Allen, David P.,
Teig, Lucien J., D080**
Extrapolation of Radar Cross Section Data into the Rayleigh Region Using a Crossed Dipole Method, M90-15, March 1990.

Annavedder, Edwin K., D040
An Alternative Radar Threat Discrimination Algorithm, MTR-11067, December 1990.

**Arsenault, Charles E.,
Casey, Kevin J.,
Lafleur, Valerie S.,
Sweeney, Joanne M., D050**
Design and Operation of the Environmental Simulation System (ESS), MTR-10740, Vol. 1, May 1990, Vol. 2, July 1990.

**Asnani, Krishin G.,
Former MITRE
Employee**
Government Open Systems Interconnection Profile (GOSIP), M90-37, July 1990.

**Asnani, Krishin G.,
Former MITRE
Employee,
Friedman, Gerald M., D070**
High-Speed Networking, M90-38, July 1990.

**Attridge, Walter S.,
Former MITRE
Employee,
Buley, Ernest R., W150**
Software Audit, MTR-10803, March 1990.

**Atwood, John E.,
Babbitt, Howard S., III,
Berk, George,
Cronson, Harry M.,
DeVincentis, John,
Devine, James F.,
Engels, Peter D.,
Haberkorn, Ronald A.,
McClay, C. Phillip,
Parisi, Samuel J.,
Rotholz, Ersch,
Sheehan, William C.,
Solomon, Moise N., D090**
MMIC Technology Quarterly Report, M90-22, 31 March 1990, M90-22, Ser. 2, 30 June 1990.

**Auer, Ronald R.,
Caceres, José,
Osborn, Roy B., D040**
Integrated Tactical Warning and Attack Assessment (CSSR) Integrity Test Requirements for Certification, MTR-10843, August 1990.

**Babbitt, Howard S., III,
Berk, George,
Chu, Alejandro,
Cronson, Harry M.,
DeVincentis, John,
Devine, James F.,
Engels, Peter D.,
Haberkorn, Ronald A.,
McClay, C. Phillip,
Parisi, Samuel J.,
Rotholz, Ersch,
Soares, Steven,
Solomon, Moise N.,
Weitzman, Peter S.,
Wrick, Varley L., D090**
MMIC Technology Quarterly Report, M90-22, Ser. 3, 30 September 1990.

**Babbitt, Howard S., III,
Berk, George,
Chu, Alejandro,
Cronson, Harry M.,
DeVincentis, John,
Devine, James F.,
Engels, Peter D.,
Haberkorn, Ronald A.,
McClay, C. Phillip,
Parisi, Samuel J.,
Rotholz, Ersch,
Scherer, Ernst F.,
Soares, Steven,
Solomon, Moise N.,
Weitzman, Peter S.,
Wrick, Varley L., D090**
MMIC Technology Quarterly Report, M90-22, Ser. 4, 31 December 1990.

**Baker, Clifford E.,
Giddings, Victor T.,
Rice, Timothy B.,
Sain, Joseph A., D070**
Software Development Plan, MTR-10492, Rev. 1, September 1990.

1990
Summary of
Professional
Activities

**MITRE
Technical
Reports**

**Baker, Clifford E.,
Lander, Julian C.,
Sain, Joseph A., D070**
*Experimental Version
Prototype (EVP) Strategic
Defense Initiative (SDI)
Simulation User's Guide,*
March 1990, MTR-10812,
Rev. 1, April 1990.

Barile, Edward C., D080
*Low Frequency Multipath
Target Scattering Simula-
tion Using Crossed
Dipoles,* MTR-10944,
September 1990.

*Method of Images for
Scattering from Objects
Over a Ground Plane,*
MTR-10941, Septem-
ber 1990.

**Barr, Paul C., D080,
Bressel, Jonathan G.,
Former MITRE
Employee,
Harris, Joel D., D080,
Valas, Chris J., Former
MITRE Employee**
*Real-Time Programmable
Parallel Digital Signal
Processor Architecture,*
M89-64 SM, October
1990.

Barto, Jonney L., D050
*Air Force JTIDS Network
Library Design Guide,*
MTR-10872, June 1990.

*Air Force JTIDS Network
Library Design Guide,*
MTR-10872,
Rev. 1, August 1990.

**Beanland, Charles J.,
Dipietro, Robert C.,
Glatfelter, Glenn L.,
D080**
*Experimental Wide-
Bandwidth HF Digital
Receiver Development,*
MTR-10727, July 1990.

**Beanland, Charles J.,
Glatfelter, Glenn L.,
Schuster, Marvin A.,
D080**
*Wide-Bandwidth HF
Digital Receiver Tech-
nology,* MTR-10772,
July 1990.

Bello, Phillip A., D090
*Performance Analysis of a
Rake Modem/Codec over
the Nonstationary
Nondisturbed Wide Band
HF Channel with Applica-
tion to Power Control,*
MTR-10966, August
1990.

**Bello, Phillip A.,
Fishman, Philip M.,
Liu, Chi-Ren, D090**
*Experimental Results on
Radiometer Detection of
WBHF Signals,* MTR-
11036, September 1990.

Blaha, Richard J., D060
*Large-Screen Display
Technology Assessment
for Military Applications,*
M90-16, September 1990.

**Blanco, Mario A.,
Cantor, Stephen R.,
Cottrell, James R.,
Haley, Ann M., D090**
*MILSTAR Terminal Data
Flow Architecture Study,*
MTR-10521, June 1990.

**Bland, Robert G., D090,
Carter, Jeffrey T., D090,
Graves, Ralph C., D090,
Levreault, Robert P.,
D090,
Rowe, Martin A., D080,
Russell, Richard G.,
D090,
Wickwire, Kenneth H.,
D090,
Ying, Tin Yau, D050**
*A Wideband HF Concept
for Small ICBM Intrawing
Communications,* MTR-
11059, December 1990.

**Bowen, Charles D., D040,
Wilder-Smith,
Christopher, D050**
*Military Airspace Man-
agement System User's
Guide,* M90-74, October
23, 1990.

**Branigan, Claire,
Scappaticci, Charles,
D040**
*Open Systems Intercon-
nection Prototype,* M90-
44, July 1990.

Breen, Paul T., D060,
Broder, Alan J., Former
MITRE Employee,
Gordon, Scott E., G030,
Johns, James R., G110,
Masterman, Hugh C.,
D060,
Veron, Harry H., D060,
Wittenburg, Timothy M.,
G030,
McCarley, Nancy E.,
W140,
Greenwood, Dorothea
G., W140
Appendix: Technology
Assessments for the
Modular Environment for
Defense Imagery Analysis
(MEDIA) Systems Study,
MTR-90W00159, Decem-
ber 1990.

Bruno, Ann T., D060
Mission Planning and
Control in the RSAF C³
System, MTR-10807,
March 1990.

Butler, G. Michael,
Capozza, Paul T.,
Hopkinson, Thomas M.,
Rushanan, Joseph J.,
D080
The VLSI Design of a
Radix-2 Fast Fourier
Transform Processor.
MTR-11053, Decem-
ber 1990.

Butler, G. Michael,
Hopkinson, Thomas M.,
Johnson, Bruce L.,
Vaccaro, John J., D080
VLSI Design of a PN-
Matched Filter, MTR-
10801, March 1990.

Cabana, Kevin A.,
Sampson, Mark B., D060
Optimal Sampling for
Communication Privacy
Equipment Discrete-
Outcome Testing, MTR-
10929, June 1990.

Calabro, Joyce R., D040
A Successful Method for
Documenting Display
Requirements, MTR-
10900, May 1990.

Campbell, Susan E., D040
Display Design Verifier
(DDV) System Descrip-
tion, MTR-10793,
February 1990.

Carhoun, Dean O., D080
Adaptive Nulling of
Transient Atmospheric
Noise Received by an HF
Antenna Array, M90-72,
September 1990.

Carhoun, Dean O.,
Games, Richard A.,
Williams Ronald T., D080
Principal Components
Sidelobe Cancellation
Algorithm, M90-82,
November 1990.

Carter, Jeffrey T., D090
Hardness Assurance
Guidelines for the
MILSTAR LRIP Program,
MTP-10895, May 1990.

Chaikof, Melissa K.,
D090
CCPDS-R Analytic
Performance Model,
MTR-10714, July 1990.

Chan, Agnes H.,
Games, Richard A., D080
On the Quadratic Spans of
Debruijn Sequences,
MTP-287, February 1990.

Chen, Cheng-Hong,
D050,
Dunn, Dennis B., D050,
Genova, Arthur F.,
D050,
Low, Johnny, D050,
Rotholz, Ersch, D090,
Snodgrass, David K.,
D050,
Teunas, James A., D090,
Treesh, Frederick H.,
D090,
Wong, Andrew S., D050
VHF/UHF Frequency
Synthesizer Techniques,
M90-88, November 1990.

Chown, Terry L., D040
Test Plan and Test
Procedures for the First
Space Tactical Warning
Attack Assessment (TW/
AA), System Test, MTR-
10633, March 1990.

Integrated Tactical
Warning and Attack
Assessment (TW/AA) End-
to-End System Perfor-
mance Test Plan, MTR-
10848, August 1990.

1990
Summary of
Professional
Activities

**MITRE
Technical
Reports**

**Chown, Terry L.,
Stuebe, Richard D., D040**
*Integrated Tactical
Warning and Attack
Assessment (TW/AA)
End-to-End Technical
Performance Test No. 1
Procedures: Volume 2 —
Space Participants
(Scheduled 8 November
1990), MTR-10851, Vol.
2, October 19, 1990.*

Clapp, Roger E., D080
*The Coupling of Lattice
Vibrations, Orbiting
Holes, and Single Charge
Pairs in Oxide Supercon-
ductors, M89-76, February
1990.*

**Clapp, Roger E., D080,
Eddy, F. Neal, D080,
Schoen, Joel M., D080,
Schwartz, Jack, D080,
Zwillinger, Daniel I.,
D080,
McClay, C. Phillip, D090,
Montgomery, Albert G.,
D090**
*Superconducting Analog
to Digital Converters,
M90-52, August 1990.*

**Colbert, William P.,
Former MITRE
Employee**
*NATO Iceland Air Defense
System (IADS), Opera-
tional Concept Document,
MTR-10934, October
1990.*

*Development Test and
Evaluation (DT&E)
Program Concepts for the
Iceland Air Defense
System (IADS), MTR-
10933, October 1990.*

Collins, Marie S., G110
*The Design and Imple-
mentation of a Secure
Update Processor, MTR-
10977, October 1990.*

**Comparetto, Gary M.,
D040**
*The Performance of the
FH/MFSK Class Wave-
form with Forward Error
Correction Coding and
Chip Diversity in a
Nuclear-Disturbed Slowly-
Fading Channel, MTR-
10846, August 1990.*

*An Analytic Expression for
the Magnitudes of the
Signal and Intermodu-
lation Outputs of an Ideal
Hard Limiter, Assuming
"n" Input Signals Plus
Gaussian Noise, MTR-
10630, February 1990.*

**Conway, John L.,
Freiter, Sandra J.,
Leger, Jeffrey R., D060**
*Super Graphics Worksta-
tions for Real-Time C³
Systems, MTR-10894,
August 1990.*

**Cort, Pamela S., D060,
Deleppo, Donald J., D060,
Dour, Thomas L.,
Former MITRE
Employee,
Forgione, Ernest A.,
D060,
Hastings, Gary E., D060**
*Joint STARS/ATOC
Sembach Interoperability,
MTR-10798, March 1990.*

**Coviello, Vincent L.,
D060**
*User's Guide for the
PRESSURS Data Simula-
tion System, MTR-10784,
January 1990.*

**Cuomo, Donna L.,
Murphy, Marian J., D040**
*Human Factors Society
1990 Annual Meeting Trip
Report, M90-101, Decem-
ber 1990.*

**Daeke, Lynn E., D050,
Powers, Susan A., D060,
Marcuson, James D.,
D060,
Yeh, Helena H., D060**
*Automatic Terminal
Initialization (ATI)
Reference Manual, MTR-
10779, April 1990.*

**Dagnese, Edward P.,
Grasso, Alfred, D090**
*Dual Modem Upgrade
Channel 1.5 Field Test
Results and Evaluation,
MTR-10656, May 1990.*

**Davies, Kenneth R.,
D040**
*Integrated Tactical
Warning and Attack
Assessment (TW/AA) End-
to-End Technical Perfor-
mance Test No. 1 Proce-
dures: Volume 1 —
Atmospheric Participants
(Scheduled 8 November
1990), MTR-10851, Vol.
1, October 19, 1990.*

DeBroux, Patrick S., D090

A Tapered Resistivity Profile for the Cosine Current Distribution on a Non-Reflecting Broadband Dipole Antenna, MTR-10940, August 1990.

Deforest, Delbert D., Jones, Ann D., D060

A Proposal for a Revised System/Software Development Process (Formerly A Revised Process for B-5 Management), M89-74, January 1990.

Delbert, Edith, C., Sylvestre, Neil G., Colten, Bernard B., Starsiak, Michael H., D090

Cost Estimates for Maintenance and Support of the AFLC Local Area Networks, MTR-10987, September 1990.

Dequattro, Pamela A., D040

Integrated TW/AA Target System Model, MTR-10903, Vol. 1, June 1990.

Deresh, Bruce A., D080
Introducing Correlation Into One- and Two-Dimensional Monte Carlo Simulations: An Example for OTH Radar, MTR-10818, April 1990.

Economical Radar Acceptance Testing with Constrained Risks of False Test Outcomes, MTR-10875, April 1990.

deVegvar, Michael, Dipietro, Robert C., Priest, Patricia, Torres, Jose A., Townes, Stephen A., D080

Initial Results of Processing NRL 8-Element Airborne Radar Data, MTR-10893, May 1990.

Drolet, Robert C., D050
Detailed Operational Acceptance Test Procedures for AN/TSQ-146(V)1, 2 Multiplexer Terminals, MTR-10802, May 1990.

Dunbrack, Daniel P., Bastos, Joseph W., D090
GWEN Airborne I/O Station Field DT&E Test Report, MTR-11040, November 1990.

Dunlop, David, D040
Integrated TW/AA Acquisition Transition Plan: FY1990, MTR-10902, June 1990.

Eastman, Willard L., Sousa, Michael J., D080
QR Decomposition Sidelobe Cancellation Architectures for Constrained and/or Excess Degrees of Freedom Processing, MTR-10974, August 1990.

Elkins, Terence J., D080
OTH Radar Performance Estimation, MTR-10938, July 1990.

Estochen, Eric L., D060
JTIDS Interoperability Assessment, MTR-10792, January 1990.

Fante, Ronald L., D080
Additional Radar Clutter Introduced by a Sidelobe Canceler, MTR-10811, March 1990.

Optimized Adaptive, Cancellation of Specular and Diffuse Multipath, MTR-10883, June 1990.

Fante, Ronald L., Barile, Edward C., D080
Insights Into the Effectiveness of Space-Time Processing in Rejecting Airborne Clutter, MTR-10937, July 1991.

Fante, Ronald L., Gude, Kalpak S., D080
Cancellation of Specular and Diffuse Jammer Multipath Using a Multi-Tap Sidelobe Canceler, MTR-10781, January 1990.

Fante, Ronald L., Mongiardo, Salvatore, D080
Description of a Computer Code to Calculate Antenna Near Fields, MTR-11032, November 1990.

1990
Summary of
Professional
Activities

**MITRE
Technical
Reports**

**Fante, Ronald L.,
Robertshaw, Gregory A.,
Zamosciany, Stephen,
D080**

Observation and Explanation of an Unusual Feature of Random Arrays with a Nearest Neighbor Constraint, MTR-11033, December 1990.

**Fellows, Brian D.,
Robertson, John M.,
D050**

Tactical Communications System Analysis for Automated Weather Support to the Tactical Air Force, MTR-10978, October 1990.

**Fentress, Vernon A.,
Kleekamp, Charles W.,
D050**

AT&T Fiber Optic Connector Evaluation, MTR-10925, June 1990.

**Francesca, Marie A.,
D060**

The Role of Prototyping in Systems Development, M90-27, Vol. 1, Ser. 1, Rev. 1, June 1990.

**Fridman, Jonathan D.,
D050**

Systems Integration Test Bed and Performance Measurements for the AN/FCC-101 (V) DCS-NATO Interface/Engineering Design Model (DNI/EDM) Multiplexer, MTR-11011, November 1990.

**Friedman, David H.,
D090**

Implementation of a Nonlinear Wave Digital Filter Cochlear Model, MTP-294, September 1990.

Gados, Ronald G., D040

Automated Threat Aggregation Through Application of Statistical Cluster Methods, MTR-10634, April 1990.

Games, Richard A., D080

Multiple Mainbeam Sidelobe Cancellation Architectures for Constrained and/or Excess Degrees of Freedom Processing, MTR-10816, April 1990.

**Games, Richard A.,
Williams, Ronald T.,
D080**

Performance Analysis of a Concurrent Adaptive Least-Squares Sidelobe Cancellation System with Excess Degrees of Freedom, MTR-10976, September 1990.

Gamota, George, A010

Gaining Ground: Comparison of U.S. and Japanese Technology, M90-91, November 1990.

Garvey, Paul R., D090

A Framework for Estimating the Cost to Build Trusted Computer Systems, MTR-10671, February 1990.

**Georgopoulos, Voula C.,
D050**

Neural Networks for Optical Implementation, M90-2, January 1990.

**Girard, Mary M., D080,
Husbands, Charles R.,
D050**

Fiber-Optic Digital Data Link and Cable Plant in Support of Advanced Over-the-Horizon Radar System, MTR-10757, January 1990.

**Gorzela, Donna B.,
Schmidt, Brian K., D090**

Software User's Manual for the MAC HF Network Simulation, MTR-10868, June 1990.

**Green, Warren K.,
Lipka, Patrick T.,
Murphy, Roy, D080**

BMEWS Site III Upgrade Joint Communication Implementation Plan, MTR-10304, Rev. 3, August 1990.

**Gregorio, Donna D.,
D040**

Object-Oriented Technology Day Presentations, MTP-382, April 1990.

**Grimaldi, Lawrence A.,
D040**

An Analysis of Database Management Systems Usage for the Space Command Information Retrieval System (SIRS), MTR-10632, February 1990.

Grubis, Albert J., D060
A Software Development Approach for Real-Time Embedded Systems, M90-36, June 1990.

Hale, MacFarland, D080
The ITTDCD MULTIBUS® Continuous Speech Recognizer (MBCSR) User's and Programmer's Guide, MTR-9286, Vol. 1, May 1990, Vol. 2, June 1990.

**Harris, Clifford H.,
Lucente, Michael A.,
Muir, Robert M., D080**
Ultra-Reliable Memory (URM) Architectures Project, MTR-10728, June 1990.

Harris, Darwyn P., D040
A System Engineered Approach for SCIS Testing, M90-17, August 1990.

**Harris, Richard M., D014,
Hosage, Brent A., D070,
Jacobus, Roy W., A030**
Technical Centers, M90-59, October 1990.

**Hatzis, Patricia M.,
Powell, Frederic D., D050**
A Successive Partial-Relaxation Gaussian Algorithm for Area Navigation Operations with the Microwave Landing System (MLS), MTR-10910, April 1990.

Two Gaussian Position Reconstruction Algorithms for the Microwave Landing System, M90-77, September 1990.

Haycock, Richard A., D060
PC-Prophet Analysis of the Proposed Peace Shield HF Contractor's Radio Net, M90-31, August 1990.

Hegerich, Michael G., D050
Design and Operation of the Cooperative Automatic Analog Test (CAAT) Box, MTR-10746, January 1990.

**Holland, Mark A.,
Connors, Thomas L.,
Giallombardo, Susan R.,
Picca, Frank,
Proctor, David A.,
Therrien, J. Henry, D060**
MCE/NATO ACCS Compatibility Study, Volume 1 — ACU/ACC/ RP/SFP/RPC Functional Analysis, MTR-10973, Vol. 1, September 1990.

**Holland, Mark A., D060,
Connors, Thomas L., D060,
Giallombardo, Susan R., D060,
Holmer, Philip E., D060,
Picca, Frank, D060,
Slattery, Norma J., D090**
MCE/NATO ACCS Compatibility Study, Volume 2 — Analysis of Candidate Enhancements for Improved ACCS Compatibility, MTR-10973, Vol. 2, September 1990.

Horowitz, Barry M., A010
Technical Centers at MITRE, M90-35, June 1990.

Modernized Electronics in DOD Systems, M90-48, August 1990.

Hosker, James J., D050
JTIDS Network Design Utility Aid (UTI) Reference Manual, MTR-10870, June 1990.

Program Design Description for the JTIDS Network Design Utility Aid (UTI), MTR-10918, July 1990.

Phase Retrieval Using the Error-Reduction Algorithms, M90-73, November 1990.

Hoyt, JoAnn B., D060
Overview of the Digitization and Transformation System (DATS), MTR-10980, September 1990.

**Hunt, Samuel N.,
Eddy, F. Neal,
Providakes, Jason,
Teig, Lucien J.,
Moylan, J. Daniel,
Dulchinos, John, D080**
MITRE Forestport HF Vertical Array Status and Results FY90, M90-75, October 1990.

1990
Summary of
Professional
Activities

**MITRE
Technical
Reports**

Irvin, William L., D070
World-Wide Military Command and Control System (WWMCCS) Information System (WIS) Automated Message Handling System (AMHS) Final Test Report, MTR-10958, November 1990.

Irwin, Robert C., D040
Discrimination Algorithm for Ballistic Missile Attack Assessment, MTR-10845, May 1990.

Jacobus, Roy W., A030
Personnel and Organization Charts for the Eight MITRE Technical Centers Located at Bedford, Massachusetts, M90-12, February 1990.

Personnel and Organization Charts, M90-33, May 1990.

Statistical Project Data on the Bedford Technical Centers, M90-54, September 1990.

Kahn, David A., Former MITRE Employee
Air Defense versus Strategic Bombers and Cruise Missiles, M90-24, May 1990.

Kaplan, Allen J., D050
GWEN TLCC FRACAS Program, MTR-10908, September 1990.

Klein, Leslie, Marek, Peter M., D090
Technical Analysis/Cost Estimate (TA/CE) for SHF Demand Assignment Multiple Access, MTR-11025, October 1990.

Krajewski, Joel A., D040
ASAT Trajectory Model, MTR-11000, October 1990.

Kramer, J. David R., Reid, Wallace S., D080
Low Observable Track Detection — An Airborne Application, June 1990.

Kramer, J. David R., D080, Tomljanovich, Nicholas M., D080, Davis, Curt W., Lincoln Laboratory, Poirer, Leon J., RADC
Ultra-Wideband Radar Applicability to Air Defense — Red Team Assessment, M90-18, March 1990.

Krantweiss, Gerald, G030, Lee, Kathy L., G030, Passin, Thomas B., D090, Smith, Irving R., G030
HPM Final Report Volume 2 Selected Antenna Electrical Characterizations and GEMACS Analysis, MTR-10715, Vol. 2, February 1990.

Kreindel, Burton, Mutrie, Henry W., Vasilik, Michael V., D090
Performance Risk Analysis Group (PRAG) — Source Selection Activities Guide, M89-79, January 1990.

Performance Risk Analysis Group (PRAG) — Source Selection Activities Guide, M89-79, Rev. 1, December 1990.

La-Garde, Ivan, D050
Colocation Design: Issues on the IADS GAG Radio Suite, MTR-10813, April 1990.

Colocation Design Issues for a Ground-Based Communication Station, M90-80, November 1990.

Lansdowne, Zachary F., D090
Protocol Optimization for the Groundwave Emergency Network (GWEN), MTR-10965, December 1990.

Lau, Luk Shun, Higginson, Jeffrey L., Cameron, James A., D090
Nuclear Survivability Allocated Threat Document for the IADS Fiber Optic Network, MTR-10788, January 1990.

Leva, Joseph L., D050
Formulation and Solution of Several Radar Ranging Problems, MTR-10970, September 1990.

Lipka, Patrick T., D080, Murphy, Roy, D080, Truckenbrodt, Arthur C., D040
BMEWS Site III Upgrade Joint Communication Implementation Plan, MTR-10304, Rev. 2, July 1990.

Little, Thomas A., D070
DOD-STD-2167A Statement of Work, MTR-11073, November 1990.

Lyon, Edith L., Former MITRE Employee
Comprehensive Volume of Abbreviations Used at MITRE, M87-32, Rev. 1, March 1990.

Maeks, Joel, D090
Simplified Availability Lower Bounds for the GWEN FOC Network, MTR-10873, April 1990.

Makhlouf, Mahmoud A., D070,

James, John H., D070, Lambert, David W., G110
Performance Assessment of C³I Systems, M89-73, February 1990.

Marek, Peter M., Schwartz, James E., Sherlock, Peter H., Sleeper, Harry A., D090
Universal MODEM Specification, Type A, Volume I, MTR-10892, Vol. 1, July 1990.

Melancon, Paula J., Rheaume, Luke J., D080
General Interface Control Document (ICD) for BMEWS, Site III, RAF Fylingdales Modernization, MTR-10967, September 1990.

Mercier, John D., Ware, Beverly J., D050
AN/TSQ-111 Communications Nodal Control Element (CNCE) Applications Manual, MTR-10577, Rev. 1, January 1990.

Metcalf, Bruce D., D050, Singh, Darshan, Former MITRE Employee, Jaeger, Jerold L., D050, Forni, Luigi S., D050
Ethernet Laser Link Evaluation, MTR-10971, September 1990.

Michaud, Marion C., Goethert, Joanne B., D080
Evaluation of Processing Efficiency on Multi-Processor Architectures — Volume 2: Alliant FX/80, MTR-9291, Vol. 2, May 1990.

Michaud, Marion C., Schroeder, Michael A., Goethert, Joanne B., D080
Evaluation of Processing Efficiency on Multi-Processor Architectures — Volume 1: Encore Multimax, MTR-9291, January 1990.

Miller, Phillip J., D060
NMR Display Prototype Experiment Results, MTR-10926, August 1990.

Morrison, Stephen A., D070
User's Guide to WIS-Kermit, M90-58, Vol. 1, June 1990.

User's Guide to WISKERS, M90-58, Vol. 2, June 1990.

Programmer's Guide to WIS-Kermit, M90-58, Vol. 3, June 1990.

Mosier, Jane N., D040
User Interface Day: Issues in Acquisition of User Interface Software, M90-53, August 1990.

Moulin, Daniel, D080
High-Performance Analog-to-Digital Conversion, MTR-10767, January 1990.

Normolye, Marie B., D060
The ABCCC III Digital Map Database: A Case Study, MTR-10808, May 1990.

1990
Summary of
Professional
Activities

**MITRE
Technical
Reports**

Parisi, Samuel J., D090
*180° Lumped Element
Hybrids and Their Circuit
Application*, MTR-10800,
February 1990.

Pease, Richard W., D040
*An Overview of Technol-
ogy for Large Wall Screen
Projection Using Lasers
as a Light Source*, M90-
28, July 1990.

**Perlmutter, Yvonne M.,
D090**
*Statement of Work (SOW)
for MILSTAR Low Volume
Force Element (LVFE)
Terminal Program*, MTR-
10905, December 1990.

**Peterson, Donald R.,
D040**
*Granite Sentry System
Capabilities and Phasing*,
MTR-10847, July 1990.

Phillips, Lori C., D080
*VLSI Design for Testabil-
ity*, M90-85, December
1990.

**Provenzano, Patricia A.,
D060,
Rebovich, George, Jr.,
G030**
*A Covariance Analysis for
an AOA-AOA ESM
Tracking System*, MTR-
10743, October 1990.

**Rajkowski, Joseph M.,
D090**
*Design and Performance
of a DDS-Based 8-Ary
FSK Modulator*, MTR-
11054, December 1990.

**Ranzinger, Belinda A.,
D040**
*Integrated Tactical
Warning and Attack
Assessment (TW/AA)
End-to-End Technical
Performance Test #1
Procedures: Volume 3 —
Ballistic Missile Partici-
pants (Scheduled 8
November 1990)*,
MTR-10851, Vol. 3, 19
October 1990.

**Ranzinger, Belinda A.,
Snell, Richard D., D040**
*Combined Ballistic Missile
and Atmospheric Tactical
Warning and Attack
Assessment (TW/AA) End-
to-End System Perfor-
mance Test Plan and
Procedures*, MTR-10626,
July 1990.

**Rice, Timothy B.,
Sain, Joseph A.,
Todd, Russell F.,
Baker, Clifford E.,
Bonenfant, Nancy M.,
Cohen, William L.,
Currie, Douglas E.,
Lander, Julian C., D070**
*Design Software Engi-
neering Notebook*, MTR-
10725, September 1990.

**Rizzari, Jo-Ann,
Hersey, Dawn M., D030**
*Computer-Based Training
Commercial Product
Survey*, M90-43,
June 1990.

Roberts, John E., D090
*Automatic Recognition of
Connected Speech*, MTR-
10955, November 1990.

Roberts, John R., D070
JOPES Menu Navigation,
MTR-10882, April 1990.

**Robertshaw, Gregory A.,
D080**
*The Effect of Systematic
and Random Illumination
Errors on the OTH
Receive Array Radiation
Pattern*, MTR-10782, Vol.
1, February 1990.

**Robertshaw, Gregory A.,
Zamosciany, Stephen,
D080**
*OTH-B Transmit Antenna
Pattern Simulations: A
Comparison of GE and
MITRE Predictions*, MTR-
10888, May 1990.

**Rogers, Steven R.,
Peterson, Donald R.,
D040**
*CMAFB Systems Center
Upgrade Operations
Concept*, MTR-10850,
November 1990.

Russell, Richard G., D090
*Data Transmission
Analysis*, MTR-10841,
March 1990.

**Salamone, Patricia P.,
Callwood, Richard, III,
Schmidt, Brian K., D090**
*Alaskan High Frequency
Radio Network Test
Results*, MTR-11003,
October 1990.

Schoen, Joel M., D080
*Superconducting Analog
to Digital Converters*,
M90-52, August 1990.

**Shelton, David H.,
Zasada, David M., D080**
*Excision of Narrowband
Interferers from a
Wideband Waveform,*
MTR-9295, October 1990.

Sherlock, Peter H., D090
*SHF Portable Terminal
System Level A Specifica-
tion,* MTR-10948, August
1990.

**Simone, Richard R.,
D050**
*Measured Signal Charac-
teristics and Predicted
Digital Performance of the
Savona/Schwarzwald DCS
Troposcatter Link,* MTR-
10913, June 1990.

Sirois, Sarah J., D090
*Hazeltune Generation II
Hybrid Scan Antenna
Design Evaluation,* MTR-
10575, April 1990.

Siy, Peter F., D090
*GWEN LF Demodulator
Prototype Development
Summary,* MTR-11060,
December 1990.

**Siy, Peter F.,
Carter, Jeffrey T.,
Higginson, Jeffrey L.,
Joseph, John P., D090**
*Total Dose Radiation Test
Results for the AMD
AM9518 Data Cipherng
Processor,* MTR-10916,
June 1990.

**Siy, Peter F.,
Joseph, John P.,
Taylor, Timothy L., D090**
*Test Fixture Development
for Total Dose Radiation
Testing of the AMD
AM9518 Data Cipherng
Processor,* MTR-10809,
April 1990.

**Spiegler, David B.,
Coviello, Vincent L.,
D060**
*Database Sizing/Timing
for Meteorological Data
and Products to Support
the Tactical Air Force
(TAF),* MTR-10901,
August 1990.

**Stockdale, Thomas C.,
Webb, John K.,
Feldman, Herbert,
Luke, Daniel W., D080**
*Evaluation of Auxiliary
Tracker Approach to
Solving the EED Problem
at Robins AFB, Georgia,*
MTR-10946, December
1990.

**Strohmeyer, George R.,
Kleekamp, Charles W.,
D050**
*Tactical Fiber Optic
System (TFOS) Analysis,*
MTR-10789, January
1990.

**Summers, John F., G030,
Kirkland, Anne M.,
D090,
Fam, Bahaa W., G030,
Olson, Sherry L., G030,
Lepley, Margaret A.,
G030**
*Target Extraction in
Multisensor Imagery,*
MTR-10799, February
1990.

**Sussman, Steven M.,
D090**
*Timeslot Assignment for
GWEN UHF Links,* MTR-
10885, April 1990.

**Tiffany, G. Bradford,
Torreta, Joseph,
Kriegel, John E., D080**
*High Power Digital RF
Synthesis HF Transmitter
Technology,* MTR-10964,
September 1990.

**Tromp, Laurens D.,
D080**
*OTH-B Data Normaliza-
tion Study,* MTR-11007,
October 1990.

**Vaccaro, John J.,
Hopkinson, Thomas M.,
Moore, Kevin C., D080**
*Programmable Systolic
BCH Decoder,* MTP-289,
April 1990.

**Vaccaro, John J.,
Hopkinson, Thomas M.,
Moore, Kevin C.,
Hwang, Robert J., D080**
*GF (2 π) Programmable
Systolic BCH Decoder,*
MTR-10952, October
1990.

**VanZandt, James R.,
D040**
*Debris from Kinetic Kill
ASAT Engagements,*
MTR-10804, March 1990.

*Spacefilling Heuristics for
Search Routes,* MTR-
10943, September 1990.

Veron, Harry, D060
*Device Assessment for
Virtual Reality, M90-47,*
August 1990.

Vitkevich, John A., D090
*VLSI/VHSIC Chip Costing
for Electronic Systems
Acquisition, MTR-10674,*
March 1990.

Waks, Norman, A010
*Management of Very
Large Technical Systems,*
M89-77, January 1990.

*Professional Trends in
Engineering Management
and Management Science
Support to Senior Manag-
ers in the Public Sector,*
M89-78, January 1990.

Ware, Beverly J., D050
*Design and Operation of
the ICD-001 MITRE
CESE Emulator (MICE)
Box, MTR-10748,*
September 1990.

*Design and Operation of
the Digital Transmission
Group Emulator (TRAP)
Box, MTR-10747,*
September 1990.

*Design and Operation of
the BITE Activation/
Isolation Test (BAIT) Box,*
MTR-10745, July 1990.

**Weigand, Robert M.,
D050**
Tactical FDDI, MTR-
11010, December 1990.

Weiner, Melvin M., D080
*Noise Factor and Antenna
Gains in the Signal/Noise
Equation for Over-the-
Horizon Radar, MTR-*
10989, August 1990.

*Electrically-Small,
Quarter-Wave, and
Resonant Monopole
Elements with Disk
Ground Planes in Free
Space, M90-93, December*
1990.

*Input Impedance and Gain
of Monopole Elements
with Disk Ground Planes
on Flat Earth, M90-92,*
December 1990.

**Weiner, Melvin M.,
Editor, D080**
*Antenna Performance
Influenced by the Finite
Extent and Conductivity of
Ground Planes. A
Collection of Reprints by
J.R. Wait, et al., M90-79,*
September 1990.

White, Alfred L., D050
*User's Manual for Version
3.3 of the Site Analysis
Tools (SAT) Software,*
M90-60, September 1990.

Wilk, Kathryn L., D070
*MVS/TSO User's Refer-
ence Manual, M83-28,*
Rev. 1, October 1990.

Willard, David G., D050
*Link Margin Verification
Demonstration Unit,*
MTR-10785, January
1990.

**Wyatt, Richard C.,
Hale, MacFarland, D080**
*Programmatic Interface to
a Relational Database:
Design and Implementa-
tion Manual, MTR-9292,*
February 1990.

*Programmatic Interface to
a Relational Database:
Program Maintenance
Manual, MTR-9293,*
June 1990.

Young, Olga M., D080
*ADSIM, an Object-
Oriented Hybrid Time-
Stepped/Event-Based
Large-Scale Air Defense
Simulation, MTR-10773,*
January 1990.

A010
*C3I FCRC Year-End
Report Fiscal Year 1990,*
MITRE Program,
M90-5, August 1990.

*C3I FCRC Proposed
Fiscal Year 1991, MITRE
Technology Program,*
M90-6, August 1990.

*Civil Systems Division
Year-End Report Fiscal
Year 1990, MITRE
Technology Program,*
M90-7, August 1990.

*Civil Systems Division
Proposed Fiscal Year
1991, MITRE Technology
Program, M90-8, August*
1990.

C060

Source Selection Reference Manual, M90-95, December, 1990.

D040

Computer Resources Life Cycle Management Plan for the CSSR, M89-48, February, 1990.

D060

System Specification for the Integrated Tactical Situation Display System, MTR-10979, September 1990.

Technical Requirements Document for the Puerto Rico Operations Center, MTR-10917, August 1990.

D070

C/I FCRC Retrospective, MITRE Technology Program, M90-41, August 1990.

Civil Systems Division Retrospective, MITRE Technology Program, M90-40, August 1990.

User's Guide for the Compliance Testing for the Retirement Program (CRP) Application, M90-29, May 1990.

D090

Connectivity Analysis for Peacekeeper Rail Garrison Higher Authority Communications Systems, MTR-11057, Vol. 1, December 1990.

Initial Test Report — California to Bedford Over-the-Air Proof-of-Concept Testing, M90-20, April 1990.

Initial Test Report — Florida to Bedford Over-the-Air Proof-of-Concept Testing, M90-14, March 1990.

The Network and Distributed Information Systems Management Specialty Group/The Operational Networks Group of the Management Information and Computer Services Department.

MITRE-Bedford Integrated Network Management Concept of Operations, M90-50, September 1990.



MITRE Division D060, Tactical Command and Control, supports the development of tactical command and control systems for the Air Force and U.S. allies. An example is the Joint Surveillance Target Attack Radar System (Joint STARS) which detects, locates, and supports attacks against moving and stationary ground targets in real time. The airborne platform interfaces with airborne and ground-based C³I elements and with attack aircraft. MITRE served as the General System Engineer, and provided additional support as part of Operation Desert Storm.

**Allen, David P.,
Teig, Lucien J., D080**
"Extrapolation of Radar
Cross Section Data into
the Rayleigh Region
Using a Crossed Dipole
Method," 6th Annual
Conference for the Re-
view of Applied Compu-
tational Electromagnetics,
sponsored by the Applied
Computational Electro-
magnetics Society
(ACES), Monterey,
California, 19-22
March 1990.

Baker, Clifford E., D070
"Designing an Object-
Oriented Simulation in
Ada," Calgary, Alberta,
Canada, 1990 Summer
Computer Simulation
Conference, 16-18
July 1990.

**Barile, Edward C.,
Fante, Ronald L.,
Torres, Jose, D080**
"Study of DPCA and
Space-Time Processing for
Reduction of Airborne
Clutter," IEEE Interna-
tional Antenna & Propaga-
tion Symposium, Dallas,
Texas, May 1990.

Barr, Paul C., D080
"Finite-Register Simula-
tion for Radar Signal
Processor," 1990 Summer
Computer Simulation
Conference, Calgary,
Canada, 16 July 1990.

**Bello, Phillip A.,
Fishman, Philip M.,
Liu, Chi-Ren, D090**
"Experimental Results on
Radiometer Detection of
WBHF Signals," 1990
IEEE Military Communi-
cations Conference
(MILCOM '90),
Monterey, California, 30
September-3 October
1990.

Blaha, Richard J., D060
"Large-Screen Display
Technology Assessment
for Military Applications,"
Society of Photo Optical
Instrumentation Engineers
(SPIE) Symposium on
Electronic Imaging
Science and Technology,
Santa Clara, California,
11-16 February 1990.

"Large-Screen Display
Technology Assessment
for Military Applications,"
5th Annual Pacific In-
ternational Defense
Electronics Conference
and Exposition, Honolulu,
Hawaii, 26-30 November
1990.

Blanco, Mario A., D090
"A Multi Rician Fading
Model for Radio Commu-
nication Systems," 1990
IEEE Global Commu-
nications Conference
(GLOBECOM '90), San
Diego, California, 2-5
December 1990.

**Blanco, Mario A.,
Willard, Douglas, D090**
"On the Statistical
Characterization of
Communications Nets: A
Dynamic Programming
Approach," 1990 IEEE
Military Communications
Conference (MILCOM
'90), Monterey, Califor-
nia, 30 September-3
October 1990.

**Blomquist, Scott E.,
D040,
Becker, Lee A. (Worce-
ster Polytechnic Institute)**
"A Shell for Routine
Process Planning," AAAI
Workshop on Manufacture
Planning, Boston, Massa-
chusetts, August 1990.

Breen, Paul T., D060
"Real Time Graphics
Performance in the PHIGS
Environment," and
"Command and Control
Graphic Futures," Na-
tional Computer Graphics
Association (NCGA '90),
Anaheim, California,
19-22 March 1990.

Carhoun, Dean O., D080
"Adaptive Nulling of
Transient Atmospheric
Noise Received by an HF
Antenna Array," 1990
Symposium on Antenna
Applications, University
of Illinois, September
1990.

**Presentations
at External
Conferences**

"Coping with Excess Degrees of Freedom in an Adaptive Sidelobe Canceller," 12th Annual Communications, Electromagnetic, Propagation, and Signal Processing Affiliates Program, University of Illinois, April 1990.

Carhoun, Dean O., Games, Richard A., Williams, Ronald T., D080
"A Principal Components Sidelobe Cancellation Algorithm," 24th Annual Asilomar Conference on Signals, Systems, and Computers, Monterey, California, October 1990.

Carlson, Robert T., D050
"Technologies and Techniques for Lasercom Terminal Size, Weight, and Cost Reduction," Opto-Electronics and Lasers Symposium, The International Society for Optical Engineering, SPIE OE/LASE '90, Los Angeles, California, January 1990.

Carter, Jeffrey T., Black, David K., Hahn, Gerard E., Joseph, John P., D090
"Statistical Radiation Evaluation of the 54F04 Hex Inverter Using a Large Sample Size," 1990 Hardened Electronics and Radiation Technology (HEART) Conference, Monterey, California, 12-16 February 1990.

Carvin, Neil A., D050
"Spectrum Management of a Military Spread-Spectrum System Operating in a Shared Government/Civilian Band: A Case Study," IEEE Military Communications Conference (MILCOM '90), Monterey, California, October 1990.

Chaikof, Melissa K., Pullen, Karen W., D090
"A Queuing Model and Optimization of a Software Design Parameter," Operations Research Society of America/The Institute of Management Sciences (ORSA/TIMS) Joint National Meeting, Philadelphia, Pennsylvania, 30 October 1990.

Clapp, Judith, D070
"A Total Quality Control Model for Software," Second Annual Software Quality Workshop sponsored by Rochester Institute of Technology and DACS, 14-16 August 1990.

"What is Software Quality and Who is Responsible for It," Software Process Improvement Workshop sponsored by AIAA Technical Committee on Software Systems and the Software Engineering Institute, November 8-9, 1990.

Clapp, Roger E., D080
"Dynamical Energy Storage in Biomolecules," 34th Annual Meeting of the Biophysical Society, Baltimore, Maryland, 18-22 February 1990.

"Magnetic Coupling in Biomolecules," Research Medicine and Radiation Biophysics Division Seminar, Lawrence Berkeley Laboratory, Berkeley, California, 26 March 1990.

"Synchronized Excitations within High T_c Oxide Superconductors," March Meeting of the American Physical Society, Anaheim, California, 12-16 March 1990; Gordon Research Conference on Superconductivity, Ventura, California, 19-23 March 1990; Gordon Research Conference on Condensed Matter Physics, Strongly Correlated Electron Systems, Wolfeboro, New Hampshire, 11-15 June 1990; Gordon Research Conference on Particle-Solid Interaction, Holderness, New Hampshire, 9-13 July 1990; Fourth Annual Conference on Superconductivity and Applications, New York State Institute on Superconductivity, State University of New York at Buffalo, Buffalo, New York, 18-20 September 1990.

Climek, David M., D080,
Waugh, Charles W.,
D080,
Jones, Carol A. (RADC),
Butler, Richard C.
(RADC)

"Multimedia Communications in the Air Defense Environment," MILCOM '90, Monterey, California, 30 September-3 October 1990.

Clune, Michael I.,
Basel, Ki Jong, D090
"Connectivity/Availability of SSTS," 1990 IEEE Military Communications Conference (MILCOM '90), Monterey, California, 30 September-3 October 1990.

Comparetto, Gary M., D040
Sensitivity to Waveform and Coding Choices in a Slow-Fading Nuclear Disturbed Channel," and "A Communications Design to Support the Strategic Defense System Brilliant Pebble Concept," MILCOM '90 Conference, Monterey, California, 30 September-3 October 1990.

Comparetto, Gary M., D040,
Burian, Phil E. (Martin Marietta Corporation)
"An Overview of the Strategic Defense Initiative (SDI) National Test Bed (NTB) Communications Architecture," 11th Armed Forces Communications and Electronics Association (AFCEA) Western Conference and Exposition Program, Orlando, Florida, 21-23 February 1990.

Comparetto, Gary M., D040,
Foose, William, W070
"An Evaluation of the Gaussian Approximation Technique Applied to the "Multiple Input Signal Case of an Ideal Hard-Limited," MILCOM '90 Conference, Monterey, California, 30 September-3 October 1990.

Conway, John L.,
Freiter, Sandra J.,
Leger, Jeffrey R., D060
"Super Graphics Workstations for Real Time C³ Applications," Society for Information Display (SID) 1990 International Symposium, Las Vegas, Nevada, 15-17 May 1990.

Conway, John L.,
Leger, Jeffrey R.,
Southard, David A.,
Veron, Harry, D060
"Stereoscopic Displays for Terrain Database Visualization," Stereoscopic Displays and Applications, Society of Photo-Optical Instrumentation Engineers, Santa Clara, California, 12-13 February 1990.

"Stereoscopic Displays for Terrain Database Visualization," National Computer Graphics Association (NCGA '90), Anaheim, California, 19-22 March 1990.

Couture, Ronald G., D040
"Rapid Prototyping on Graphic Workstations: Users' Perspective," Human Factors Society Annual Meeting, Orlando, Florida, October 1990.

Cozzens, John H.,
Sousa, Michael J., D080
"Improved Rank Determination for SVD-Based Detection Algorithms," 24th Annual Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, California, November 1990.

**Presentations
at External
Conferences**

Cronson, Harry M., D090

"On-Wafer S-Parameter and Waveform Measurements," 36th Automatic Radio Frequency Techniques Group (ARFTG) Conference, Monterey, California, 29-30 November 1990.

Cuomo, Donna L., D040

"Strategic Defense System Command Center Human-in-Control Experimental Program," Operations Research Society of America (ORSA) Annual Meeting, Philadelphia, Pennsylvania, October 1990.

"Methodology for Determining the Human Role in the Strategic Defense System Command Center," Human Factors Society 34th Annual Meeting, Orlando, Florida, October 1990.

Cynamon, Joseph J., D080

"Documentation Standards for Radar Simulation," 1990 Summer Computer Conference, Calgary, Canada, July 1990.

DeRosa, Joseph K., D060

"What is Data Fusion: A Military View," First Workshop on Sensor/Data Fusion, Northeastern University, 11 September 1990.

Dym, Harry, D080

"Interpolation by Reproducing Kernel Space Methods," Second Society of Industrial and Applied Mathematics (SIAM) Conference on Linear Algebra: Signals, Systems, and Control, San Francisco, California, November 1990.

Eastman, Willard L., D080

"The Extended Berlekamp-Massey Algorithm," IEEE International Symposium on Information Theory, San Diego, California, January 1990.

Emery, David E., D070

"A Prototype Implementation of the Ada Binding to POSIX," Tri-Ada 1990, Baltimore, Maryland, December 1990.

Fante, Ronald L., D080

"Theory of Space-Time Processing," IEEE Boston Section, September 1990.

Ferguson, Thomas J., D090,

Cho, Chien-Ching, D090,
Cozzens, John H., D080

"SDI Network Connectivity Optimization," 1990 IEEE Military Communications Conference (MILCOM '90), Monterey, California, 30 September-3 October 1990.

Fishman, Philip M., D090,
Sonnenschein, Alex,
Former MITRE
Employee

"An Approach to Minimization of the Detectability of Spread-Spectrum Signals," 1990 IEEE Military Communications Conference (MILCOM '90), Monterey, California, 30 September-3 October 1990.

Flanzbaum, Mark I., D080,

Vaz, Richard F., D090
"GPS-Based Modem Synchronization for Man-Portable Satellite Terminals," Institute of Navigation Global Positioning System '90, Colorado Springs, September 1990.

Francesca, Marie A., D060

"The Role of Prototyping in Systems Development," National Computer Graphics Association Conference, Anaheim, California, March 1990.

Freedman, David D.,
Li, James Y. M.,
McLaughlin, Michael R.,
O'Laughlin, Daniel G.,
D060

"Fusion Evaluation Test Bed for the E-3 Airborne Warning and Control System (AWACS)," Data Fusion Symposium (DFS '90), Laurel, Maryland, 15-18 May 1990.

Funch, Paul G., D093
"Data Collection and Model Calibration," The Sixth International COCOMO Users' Group Meeting, Software Engineering Institute, Carnegie-Mellon University, Pittsburgh, Pennsylvania, 23-25 October 1990.

Gaffney, Leah M., Cho, Chien-Ching, D090
"A Stepwise Regression Approach to System Cost Risk Analysis," Institute of Cost Analysis/National Estimating Society (ICA/NES) 1990 National Conference, Los Angeles, California, June 1990.

Galarowicz, Debra A., Slatewala, Moiz A., D06A
"Integration of Multi-Protocol Command and Control Systems," DECUS Europe 1990 Symposium, Cannes, France, 3-7 September 1990.

Games, Richard A., D080
"Sequence Complexity Using Linear and Quadratic Spans," Discrete Mathematics Seminar of the Mathematics Department at the University of Lowell, Lowell, Massachusetts, November 1990.

Garganese, Ugo S., D050
"The Search for a Faster Reliability Verification Approach," Twenty-eighth Annual Reliability Engineering and Management Institute (REMI), University of Arizona, 24 October 1990.

Garvey, Paul R., D090
"A Framework for Estimating the Cost to Build Trusted Computer Systems," Aerospace Corporation Colloquium, Los Angeles, California, June 1990; Society of Cost Estimating and Analysis, Los Angeles, California, June 1990; 24th Annual Department of Defense Cost Analysis Symposium, Leesburg, Virginia, September 1990.

Girard, Mary M., D080, Husbands, Charles R., D050
"Fiber-Optic Internal Calibration Techniques for Large Planar Radar Arrays," DARPA/RADC Symposium Photonics Systems for Antenna Applications, Monterey, California, December 1990.

Goddard, Gary W., D090
"Circuit Card Cost Estimating for Military Electronic Equipment," Twelfth Annual Conference of the International Society of Parametric Analysts (ISPA), San Diego, California, 7-10 May 1990.

Gorzela, Donna B., Schmidt, Brian K., D090
"An Event-Driven Simulation of an HF Network," Operations Research Society of America/The Institute of Management Sciences (ORSA/TIMS) 29th Joint National Meeting, Philadelphia, Pennsylvania, May 1990.

Guertin, Ralph F., Johnson, Raymond C., Wamsley, Deborah A., D090
"Monte Carlo Analysis of Matched-Filter Performance after Narrowband Interference Suppression," 1990 IEEE Military Communications Conference (MILCOM '90), Monterey, California, 30 September-3 October 1990.

Guttrich, Gordon L., Sievers, Werner E., D080
"Experimental Test Bed Briefing," and "AOTH Master Briefing," JCS/JASONS, The Pentagon, Washington, D.C., April 1990; JASONS, San Diego, California, June 1990.

"Forestport Briefing," JASONS, San Diego, California, June 1990.

**Presentations
at External
Conferences**

**Haberkorn, Ronald A.,
Heim, Peter J.,
McClay, C. Phillip,
Parisi, Samuel J., D090**
"Microwave Optical
Integrated Circuit for
Phased Array Antennas,"
DARPA/RADC Sym-
posium on Photonics
Systems for Antenna
Applications, Monterey,
California, 13-14 Decem-
ber 1990.

**Halbfinger, Eliezer M.,
Smith, Barry D., D040**
"The Range Scheduling
Aid," Space Operations
Applications and Research
Symposium, Albuquerque,
New Mexico, June 1990.

**Hale, MacFarland,
Wyatt, Richard C., D080**
"A Programmatic Inter-
face to a Relational
Database," Upstate New
York ORACLE's Users'
Group, 1990.

**Handwerker, Jacob,
D090**
"Helixant: A Normal
Mode Helix Antenna
Prediction Program," 1990
IEEE Antenna and
Propagation Society
International Symposium,
Dallas, Texas, 7-11 May
1990.

**Harris, Clifford H.,
Lucente, Michael A.,
Muir, Robert M., D080**
"Memory System Reliabil-
ity Improvement through
Associative Cache
Redundancy," Custom
Integrated Circuits
Conference, Boston,
Massachusetts, May 1990.

Harris, Darwyn P., D040
"Ethics in the Workplace,"
Brown University, January
1990.

Hosker, James J., D050
"An Investigation into the
Gerchberg-Saxton and
Error-Reduction Algo-
rithms," Tufts University
Seminar for Electro-Optics
Technology Center
(EOTC), Medford,
Massachusetts, 26 January
1990.

Jarvis, Ted, D040
"Dynamic Weapon-Target
Assignment and Defense
Against SLBMs," SDIO
Brilliant Pebbles BM/C3
Workshop, Naval Post-
graduate School,
Monterey, California,
19-21 June 1990.

**Katz, Joseph L., G110,
Smith, Barry D., D040**
"Range Scheduling Aid,"
The Third International
Conference on Industrial
and Engineering Applica-
tions of Artificial Intelli-
gence and Expert Systems,
IEA/AIE-90, Charleston,
South Carolina, July 1990.

Kim, Kwang H., D060
"Finite Impulse Response
Estimator"; "Integration of
Electronic Support
Measures and Alpha-Beta
Radar Tracker," Society of
Photo-Optical Instrumen-
tation Engineers (SPIE),
Signal and Data Process-
ing of Small Targets 1990,
Orlando, Florida, 16-18
April 1990.

"Proportional Integral-
Differential Estimator,"
American Control
Conference 1990, San
Diego, California, 23-25
May 1990.

**Kramer, J. David R.,
D080**
"Science and Technology
of Over-the-Horizon
Radar," Harvard/MIT
Seminar on Science,
Technology, and National
Security, Cambridge,
Massachusetts, 21 March
1990.

"Ultra-Wideband Radar,"
OSD/DARPA Ultra-
Wideband Radar Review
Panel, 22 February 1990.

**Kramer, J. David R.,
Reid, Wallace S., D080**
"Track-Before-Detect
Processing for an Airborne
Type Radar," IEEE 1990
International Radar
Conference, Arlington,
Virginia, 7-10 May 1990.

Kramer, J. David R., D080,
Tomljanovich, Nicholas M., D080,
Davis, Curt W. (Lincoln Laboratory),
Poirier, Leon J. (RADC)
 "Characteristics of Ultra-Wideband Radars Pertinent to Air Defense Surveillance"; "Impulse Radar Assessment for Air Reference Surveillance," Los Alamos Symposium on Ultra-Wideband Radar, Los Alamos, California, 5-8 March 1990.

Kreindel, Burton, D090
 "Troubling Title and Title Insurance Issues," 1990 Boston Bar Association Continuing Legal Education Seminar, Boston, Massachusetts, October 1990.

Krueger, Paul E., D090,
Weitzen Jay A. (University of Lowell)
 "DBPSK Signalling Rates that Maximize the Performance of 60 GHz Crosslinks in a Doubly Dispersive Channel," 1990 IEEE Military Communications Conference (MILCOM '90), Monterey, California, 30 September-3 October 1990.

Kurys, Daniel J.,
Couture, Ronald G., D040
 "Evaluating Graphical User Interface Tools for Command and Control Applications," National Computer Graphics Association Conference (NCGA '90), Anaheim, California, March 1990.

Logan, James R., D040
 "Range Scheduling Aid," Space Network Control Conference on Resource Allocation Concepts and Approaches, Greenbelt, Maryland, 12-13 December 1990.

Low, Johnny,
Wong, Andrew S., D050
 "Systematic Approach to Cosite Analysis and Mitigation Techniques," Tactical Communications Conference, Fort Wayne, Indiana, April 24-26, 1990.

Malloy, Mary Ann, D060
 "The Application of Object-Oriented Techniques to Processing United States Message Test Formats," The Third International Technology of Object-Oriented Languages and Systems Conference (TOOLS PACIFIC '90), Sydney, Australia, 28-30 November 1990.

Marley, Frederick C., D080
 "Impact of VHDL on DOD Acquisition Process," Spring 1990 VHDL User's Group, Boston, Massachusetts, April 1990.

Millar, Robert I., D050
 "Principles of Spread Spectrum Communications," IEEE Boston Section, Lecture Series on Spread Spectrum Communications, February 1990.

"Low Probability of Intercept Communications," Harvard/MIT Seminars on Science, Technology, and National Security, April 1990.

Moynihan, Richard A., D090
 "Aircraft Force-Sizing for Surveillance Missions," Operations Research Society of America (ORSA) National Meeting, Las Vegas, Nevada, May 1990.

Murphy, Marian J., D040
 "Rapid Prototyping on Graphics Workstations: User's Perspectives," Human Factors Society Annual Meeting, Orlando, Florida, October 1990.

**Presentations
at External
Conferences**

**Newport, Kris T.,
Schroeder, Michael A.,
Whittaker, Gregory M.,
D080**

"Techniques for Evaluating the Nodal Survivability of Large Networks," MILCOM '90, Monterey, California, 30 September-3 October 1990.

Newport, Kris T., D080
"Incorporating Survivability Considerations Directly into the Network Design Process," IEEE Infocom '90, San Francisco, California, 5-7 June 1990.

**Nowacki, Carol L., D080,
Chang, Chong (Tufts University)**
"An Uninterpreted, Behavioral Simulation of a Cluster Array Processor for Signal Processing Applications," 21st Pittsburgh Conference on Modeling and Simulation, May 1990.

"Performance Modeling of a Cluster Array Processor Using VHDL," VHDL User's Group Meeting, Boston, Massachusetts, April 1990.

**O'Brien, Arthur E.,
D040,
Hanzis, John E., D080**
"A Climatic Cloud Atlas for North America," Cloud Impacts on DOD Operations and Systems, 1989/90 Conference (CIDOS-89/90) at Naval Postgraduate School, Monterey, California, 9-11 January 1990.

**O'Callahan, John P.,
Veron, Harry, D060**
"3D Displays for C/I Applications," New England Chapter, Society for Information Display (SID), March 1990.

Palo, Edward A., D080
"Spread Spectrum Technology," Washington, D.C./Northern Virginia IEEE Chapter on Microwave Theory and Techniques 1990-1991 Lecture Series on Spread Spectrum Communications, 7 March 1990.

**Paradie, Michael J., D060
Nawab, S. Hamid (Boston University)**
"Two Models for the Classification of Ringing Sounds," 1990 IEEE International Conference on Acoustics, Speech, and Signal Processing, ICASSP-90, Albuquerque, New Mexico, 3-6 April 1990.

Parker, Lee, D080
"Description and Deficiencies Associated with the TAC Brawler Computer Simulation Implementation of a Multimode Pulse Doppler Airborne Radar Clutter Performance Model," TAC Brawler User's Group Meeting, Arlington, Virginia, 15-18 October 1990.

**Parmentola, John A.,
D040**
Invited speaker, "Using Gravity to Monitor Arms Control Treaties," in the MIT Seminar Series on Technology, Defense and Control, Cambridge, Massachusetts, 18 November 1990.

Passin, Thomas B., D090
"Component Stress Characterization," System Effects Assessment Team — Winter Meeting, Naval Post Graduate School, Monterey, California, 30 January 1990.

"Burnout Testing of Microwave Diodes";
"Modeling the Response of Certain Non-Linear Circuit Elements," Fifth National Conference on High Power Microwave Technology, U.S. Military Academy, West Point, New York, 13 June 1990.

Pease, Richard W., D040
"An Overview of Technology for Large Wall Screen Projection Using Lasers as a Light Source," Society of Photo Optical Instrumentation Engineers, Santa Clara, California, 14 February 1990.

Peterson, Carol L., D070
"Reducing Risks in a Dynamic Environment," 1990 International Conference on Information Systems Quality Assurance, Orlando, Florida, 26 April 1990.

Prelle, Myra Jean, G110, Wollrath, Ann M., G110, Brando, Thomas J., G110, Bensley, Edward H., D070
"The Impact of Selected Concurrent Language Constructs on the SAM Runtime System," Workshop on Object-Based Concurrent Systems at OOPSLA/ECOOP '90 Joint Conference, Ottawa, Canada, October 1990.

Providakes, Jason, D080, Farley, Donald (Cornell University), Sahr, John (Cornell University), Swartz, Wesley E. (Cornell University)
"The Altitude and Cause of Type 3 Radar Auroral Echoes," URSI, September 1990.

Rama Rao, Basrur, D090
"An Optimization Technique for the Design of Multi-Frequency Radomes," 1990 IEEE Antenna and Propagation Society International Symposium, Dallas, Texas, 7-11 May 1990.

Rama Rao, Basrur, Debroux, Patrick S., D090
"Wideband HF Monopole Antennas with Tapered Resistivity Loading," 1990 IEEE Military Communications (MILCOM '90), Monterey, California, 30 September-3 October 1990.

Rayson, James K., D060
"Digital Technologies for Terrain Representation," National Computer Graphics Association (NCGA '90), Anaheim, California, 19-22 March 1990.

Reece, Mary Jo, D040, Bodeau, Deborah J., D116
"A Multilevel Mode System for Space Applications: Lessons Learned," Sixth Annual Computer Security Applications Conference, Tucson, Arizona, December 1990.

Reeves, John J., D040, M. Kokar (Northeastern University)
"Qualitative Monitoring of Time-Varying Physical Systems," 29th IEEE Conference on Decision and Control, Honolulu, Hawaii, December 1990.

Ruddy, John M., D090, Carlson, Robert T., D050, Ferguson, Thomas J., D090, Haberkorn, Ronald A., D090, Hulkower, Neal D., D090, Providakes, George F., D090
"Concept for a Cost/Technology-Driven Mobile Satellite Communications (MOBILSATCOM) System," AIAA-90-0864, 13th International Communication Satellite Systems Conference, Los Angeles, California, 11-15 March 1990.

Sandini, Daniel L., D060
"Experience in Modeling a Concurrent Software System Using STATEMATE," 1990 IEEE International Conference on Computer Systems and Software Engineering, Tel-Aviv, Israel, 8-10 May 1990.

**Presentations
at External
Conferences**

Schmidt, Brian K., D090
"Computing Network
Availability When Link
Failures are Dependent,"
Operations Research
Society of America/The
Institute of Management
Sciences (ORSA/TIMS)
29th Joint National
Meeting, Philadelphia,
Pennsylvania, May 1990.

Schoen, Joel M., D080
"Analog Hardware
Descriptive Language,
IEEE Standards Commit-
tee 30 Report," VHDL
Users' Group Meeting,
Redondo Beach, Califor-
nia, October 1989, and
VHDL Analog Design
Workshop, Milpitas,
California, January 1990.

Schoen, Joel M., D080,
Marcotte, Richard A.,
D070,
Nieberg, Maureen J.,
D070
"System-Level Applica-
tions and Research
Directions for Model-
Based Diagnostic Reason-
ing," The American
Association for Artificial
Intelligence 1990 Work-
shop on Model-Based
Reasoning, Boston,
Massachusetts, July 1990.

Schroeder, Michael A.,
Whittaker, Gregory M.,
D080
"A Knowledge-Based
Approach to the Computa-
tion of Network Nodal
Survivability," MILCOM
'90, Monterey, California,
30 September-3 October
1990.

Schultz, Herman P., D070
"Software Acquisition
Metrics," Software Im-
provement Conference --
DOD Mission Critical
Software Acquisition
and Improvement, Wash-
ington, D.C., 29-30
November 1990.

Schuster, Marvin A.,
D080
"Co-Fired Ceramic
Multichip Packaging for
Military Applications,"
1990 Government
Microcircuit Applications
Conference, Las Vegas,
Nevada, 6-8 November
1990.

Siegel, Alan, D040
"Distributed Target
Identification," Brilliant
Pebbles Element Study
In-Process Review,
Arlington, Virginia, 26
January 1990.

Sievers, Werner E., D080
"AOTH Master Briefing,"
and "Experimental Test
Bed Briefing," RADC
(Briefing to Industry),
Griffiss AFB, January
1990; RADC, Griffiss
AFB, March 1990;
DARPA, Washington,
D.C., May 1990; DBA
Systems, Inc., Fairfax,
Virginia, June 1990.

Smith, Barry D., D040
"A Portable, Graphical
Interface to a Scheduling
Aid," International
Association of Knowledge
Engineers' Conference
(IAKE-90), San Francisco,
California, October 1990.

Smith, Barry D., D040,
Katz, Joseph L., G110
"The Range Scheduling
Aid," 3rd International
Conference on Industrial
and Engineering Applica-
tions of Artificial Intelli-
gence and Expert Systems,
Charleston, South Caro-
lina, July 1990.

Smith, Derrin, D040
"Technology Initiatives in
China," Council on
Foreign Relations Annual
Conference, New York,
New York, May 1990.

Southard, David A., D060

"Terrain Visualization with Superworkstation Graphics," Society for Information Display (SID) 1990 International Symposium, Las Vegas, Nevada, 15-17 May 1990.

Stiefel, Malcolm L., D060

"Hardware and Software Selection Process," IEEE Computer Society, Boston Section, 18 October 1990.

Sussman, Barry, D040

"The Neural Network Solution to the Weapon Assignment Problem," A Tutorial, Summer Computer Simulation Conference (SCSC), Calgary, Alberta, Canada, July 1990.

Tomljanovich, Nicholas M., D080

"Advanced Surveillance Tracking Technology," Paul Revere Chapter 1990 Technical Symposium, 14-15 March 1990.

Troiano, Thomas M., D090

"Recent MITRE Experience Estimating MILSATCOM Hardware Costs with PRICE H," GE PRICE Model User's Group Symposium, Burlington, Massachusetts, 9-11 October 1990.

Utley, Kurt E., D080

"Airborne Surveillance Radar," NATO AEW&C Programme Management Agency (NAPMA), Brunssum, Netherlands, April 1990.

Van Guilder, George G., D050

"JTIDS F-15 Cockpit Demonstration," Association of Old Crows, Ft. Walton Beach, Florida, 12-14 November 1990.

Vitkevich, John A., D090

"Tools for Costing Microelectronics," National Conference of the Institute of Cost Analysis/National Estimating Society, Manhattan Beach, California, 20-22 June 1990.

"Cost Estimating Technique for ASIC Chip Development," GE PRICE Model User's Symposium, Burlington, Massachusetts, 9-11 October 1990.

Waugh, Charles W., D080,

Akins, A. J. (RADC), Romano, B. C. (RADC) "MRC Testing and Results," MILCOM '90, Monterey, California, 30 September-3 October 1990.

Weitzman, Peter S., D090

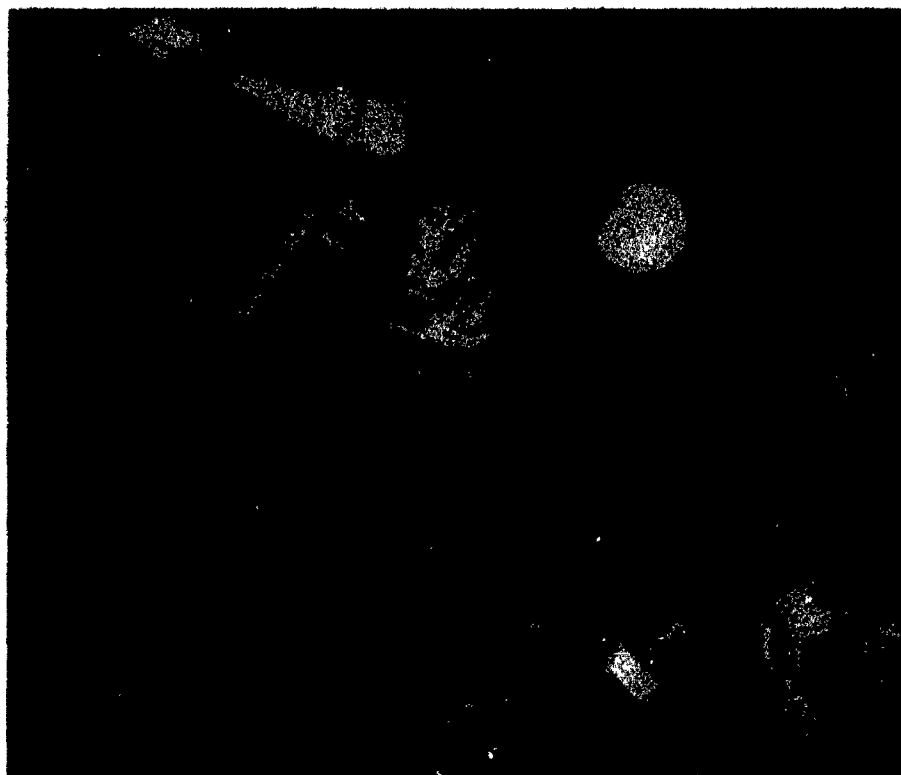
"Calculation of Transmission Line Parameters and Electric Field Distributions of Coplanar Electrodes on Layered Dielectric Substrates," International Union of Radio Science (URSI) National Radio Science Meeting, Boulder, Colorado, 3-5 January 1990.

"Characterization and Simulation of Proton-Exchanged Integrated Optical Modulators with Various Dielectric Buffer Layers," 1990 Annual Meeting of the Optical Society of America (OSA) OPTCON '90, Boston, Massachusetts, 4-9 November 1990.

Yoon, Chun S., D080,

Cedric, George (JPO), Pryk, Zenon (RADC), Cammarere, Mark (TSC), DiDomigio, Richard (TSC), Grazian, Robert (TSC), Stiefvater, Kenneth (TSC)

"Joint STARS Helicopter Classification Mode Definition and Performance Projection," 36th Annual Tri-Service Radar Symposium, Monterey, California, 26-28 June 1990.



D070 provides photographic support to the Wave Tile Apparatus Antenna Project.

Blaha, Richard J., D060
"Large-Screen Display
Technology Assessment
for Military Applications,"
*Current Overviews in
Optical Science and
Engineering SPIE Advent
Technology Series*, Vol.
AT 1, Winter/Spring 1990.

Booth, Michael S., D090,
Jacomb-Hood, A. W.
(General Electric,
Syracuse, New York),
**Houston, D. E. (General
Electric, Syracuse,
New York),**
**Alcorn, T. (General
Electric, Syracuse,
New York)**
"A Novel Aperture
Isolation Circuit for Use in
Phased Array Systems,"
*IEEE Transactions on
Microwave Theory and
Techniques*, December
1990.

Chan, Agnes H.,
Games, Richard A., D080
"On the Linear Span of
Binary Sequences Ob-
tained from Q-ary M-
sequences, Q Odd," *IEEE
Transactions on Informa-
tion Theory*, Vol. 36., No.
3, May 1990, pp. 548-552.

"On the Quadratic Spans
of DeBruijn Sequences,"
*IEEE Transactions on
Information Theory*, Vol.
36, No. 4, July 1990, pp.
822-829.

"On the Quadratic Spans
of Periodic Sequences,"
*Advances in Cryptology-
CRYPTO'89, Lecture
Notes in Computer
Science*, Vol. 435,
Springer, Berlin-New
York, IEEE Intl. Sympo-
sium on Information
Theory, San Diego,
California, January 1990,
pp. 82-89.

Clapp, Roger E., D080
"Dynamical Energy
Storage in Biomolecules,"
Biophys. J. 57, 243a,
February 1990.

"Synchronized Excitations
within High T_c Oxide
Superconductors," *Bulletin
of the American Physical
Society* 35, 1990,
pp.1363-1364.

"Mechanisms of Entropy
Disposal: Their Role in
Shaping Prebiological and
Biological Organization,"
*Prebiological Self
Organization of Matter*,
edited by Cyril
Ponnamperuma and
Frederick R. Eirich,
Hampton, Virginia:
A. Deepak Publishing,
1990, pp. 99-114.

Cozzens, John H.,
Sousa, Michael J., D080
"Enhancements to SVD-
Based Detection," *Second
Intl. Workshop on Singu-
lar Value Decomposition
(SVD) and Signal Process-
ing*, University of Rhode
Island, Kingston, Rhode
Island, June 1990, pp.
152-156.

Cozzens, John H., D080,
Cho, Chien-Ching, D090,
Ferguson, Thomas J.,
D090
"SDI Network Connectiv-
ity Optimization,"
*Proceedings of the
MILCOM 1990 Confer-
ence*, Monterey, Califor-
nia, October 1990.

Cozzens, John H., D080,
**Krim, Hamid (North-
eastern University),**
**Proakis, John G. (North-
eastern University)**
"On Spatial Smoothing
and Linear Prediction,"
*Proceedings of Internal
Conference on Acoustics,
Speech, and Signal
Processing (ICASSP)*
1990, Albuquerque, New
Mexico, April 1990, pp.
2639-2642.

"Resolution of Closely
Spaced Coherent Plane
Waves," *Second Intl.
Workshop on Singular
Value Decomposition
(SVD) and Signal Process-
ing*, Kingston, Rhode
Island, June 1990, pp.
102-106.

**Papers
Published in
Refereed
Professional
Journals and
Conference
Proceedings**

**Dhar, Sachidulal,
Fante, Ronald L., D080**
"A Model for Target
Detection with Over-the-
Horizon Radar," *IEEE
Transactions on Aero-
space & Electronic
Systems*, Vol. 26, 1990,
pp. 68-83.

**Drake, Marvin D.,
Franks, Glen B.,
Siewert, Ronald O., D050**
"Optical Binary Phase-
Only Correlator System
for Rapid Target Recogni-
tion, Discrimination and
Tracking," SPIE Vol.
1347 Optical Information-
Processing Systems and
Architectures II (1990),
*Proceedings of the
International Society for
Optical Engineering
(SPIE)*, San Diego,
California, 9-13 July
1990.

Drake, Marvin D., D050
"Vernier Scaling in
Shortened Optical
Correlators," 1990 Optical
Society of America
Applied Optics, Vol. 29,
No. 29, 10 October 1990,
p. 4333.

**Eastman, Willard L.,
D080**
"Inside Euclid's Algo-
rithm, Coding Theory and
Design Theory," *Institute
for Mathematics and Its
Application (IMA)
Workshop on Codes and
Designs*, Springer-Verlag,
New York, 1990, pp. 113-
127.

Fante, Ronald L., D080
"Effect of Error Correla-
tions and Systematic
Errors on Average Array
Sidelobes," *IEEE Trans-
actions on Antennas &
Propagation*, Vol. 38,
1990, pp. 124-129.

Forger, Andrew F., D070
"Display Rapid Proto-
typing and Simulation
System," *Proceedings
of the 1990 Summer
Computer Simulation
Conference*, July 1990,
pp. 424-429.

**Fridman, Jonathan D.,
D050**
"Optical Fiber and
Atmospheric Laser
Tactical Communication
Systems and Local Area
Networks," *Proceedings
— The Third European
Military Fibre Optic and
Local Area Network
Conference (EMFOC-
LAN)*, Munich, Germany,
25-26 June 1990.

Garvey, Paul R., D090
"A General Analytic
Approach to System Cost
Uncertainty Analysis" in
the refereed book of
articles, *Cost Estimating
and Analysis-Tools and
Techniques*, June 1990.

**Hale, MacFarland,
Wyatt, Richard C., D080**
"A Developer-Friendly
Programmatic Interface to
ORACLE," *Database
Programming & Design*,
July 1990, pp. 37-45.

"Developing a Friendly
Interface to Oracle,"
*Database Programming
and Design*, Vol. 3, No. 7,
July 1990.

**Helm, Peter J.,
McClay, C. Phillip, D090**
"Frequency Division
Multiplexed Microwave
and Baseband Digital
Optical Fiber Link for
Phased Array Antennas,"
*IEEE Transactions on
Microwave Theory and
Techniques*, Vol. 38, No.
5, May 1990, pp. 494-500.

**Husbands, Charles R.,
D050**
"Evolving Fiber-Optic
LAN Technology,"
*Electro '90 Conference
Record*, 9-11 May 1990,
pp. 714-717.

"RF/Microwave Fiber-
Optic Applications to
Avionics Systems,"
*Proceedings of the
European Military Fiber
Optic Conference (E-
MFOC '90)*, pp. 51-46.

**Husbands, Charles R.,
Marzot, Giovanni S.,
D050**

"Intelligent Optical
Bypass Switch Design for
Survivable Networks,"
*Proceedings of the
European Military Fiber
Optic Conference (E-
MFOC '90)*, pp. 111-114.

**Kramer, J. David R.,
Reid, Wallace S., D080**
"Track-Before-Detect
Processing for an Airborne
Type Radar," *IEEE 1990
International Radar
Conference Proceedings*,
Library of Congress,
Catalog Card No. 90-
081178, May 1990, pp.
422-427.

**Matthews, James W.,
D050,
Kaveh Pahlavan
(Worcester Polytechnic
Institute)**
"Performance of Adaptive
Matched Filter Receivers
Over Fading Multipath
Channels," *IEEE Transac-
tions on Communications*,
Vol. 38, No. 12, Dec.
1990, pp. 2106-2113.

**Meehan, Stephen J.,
O'Neil, Sean D.,
Vaccaro, John J., D080**
"A Universal Input and
Output RNS Converter,"
*IEEE Transactions on
Circuits and Systems*,
CAS-37, No. 6, June 1990.

Muder, Douglas J., D080
"How Big is an N-Sided
Voronoi Polygon?,"
*London Mathematical
Society*, 1990.

**Nowacki, Carol L., D080,
Chang, Chornng (Tufts
University)**
"Performance Evaluation
of a Cluster Array
Processor for Signal
Processing Applications,"
*19th Intl. Conference on
Parallel Processing*, Vol.
3, St. Charles, Illinois,
August 1990, pp. 374-
375.

**Parmentola, John A.,
D040**
"The Gravity Gradiometer
as a Verification Tool,"
*Science and Global
Security*, 1990, Volume 2,
pp. 1-15.

Pavloff, Michael S., D090
"Purification and Chemi-
cal Characterization of
Peptide G1, an Inverte-
brate Neuropeptide That
Stimulates Cyclic GMP
Metabolism," *Journal of
Neurochemistry*, Vol. 55,
No. 3, 1990.

**Perry, Bernard D.,
Rifkin, Robert, D080**
"Bandwidth Effects on
Signal Fading for the Mid-
Latitude HF Channel,"
*Proceedings of the
MILCOM 1990 Confer-
ence*, Monterey, Califor-
nia, October 1990.

**Perry, Bernard D., D090,
Richard, Marc N., D080,
Rushanan, Joseph J.,
D080,
Bello, Phillip A., D090,
Nissen, Christopher A.,
D090**
"Performance of an
Experimental Spread
Spectrum High Frequency
Link over Several Paths,"
*Proceedings of the
MILCOM 1990 Confer-
ence*, Monterey, Califor-
nia, October 1990.

Powell, Frederic D., D050
"A Rotated-Coordinate
Gaussian Position Recon-
struction Algorithm for the
Microwave Landing
System," *Journal of the
Institute of Navigation*,
Vol. 37, No. 3, Fall 1990,
pp. 273-283.

**Providakes, Jason, D080,
Seyler, Charles (Cornell
University)**
"Collisional Electrostatic
Ion Cyclotron Waves as a
Possible Source of
Energetic Heavy Ions in
the Magnetosphere," *J.
Geophys. Res.*, 95, 3, 855,
1990.

**Providakes, Jason, D080,
Swartz, Wesley E.
(Cornell University),
Kelley, Michael C.
(Cornell University)**
"Radar Observations of
Ion Cyclotron Waves
Associated with Two
Barium Shaped Charge
Releases," *J. Geophys
Res.*, 95, A12, 21, 067,
December 1990.

1990
Summary of
Professional
Activities

**Papers
Published in
Refereed
Professional
Journals and
Conference
Proceedings**

Reeves, John J., D040,
Kokar, M. (Northeastern
University)
"Qualitative Monitoring of
Time-Varying Physical
Systems," *Proceedings of
the 29th IEEE Conference
on Decision and Control*,
December 1990.

Sousa, Michael J.,
Zwillinger, Daniel I.,
D080
"Analytical Determination
of the Matrix Pseudo-
Inverse," *Macsyma
Newsletter*, Vol. VII, No.
3, July 1990, pp. 1-9.

Veron, Harry, D060
"A New Approach for
Analyzing the Visual-
Resolution Characteristics
of Shadow-Mask CRT
Monitor Configurations,"
*Proceedings of the Society
for Information Display
(SID)*, Reprinted from
Volume 30, No. 4, 1989,
(published in 1990) pp.
281-285.

Wilkinson, Charles K.,
D040
"Attitude Motion of a
Nonattitude-Control
Cylindrical Satellite,"
*AIAA Journal of Guid-
ance, Control, and
Dynamics*, Volume 13,
Number 3, May-June
1990.

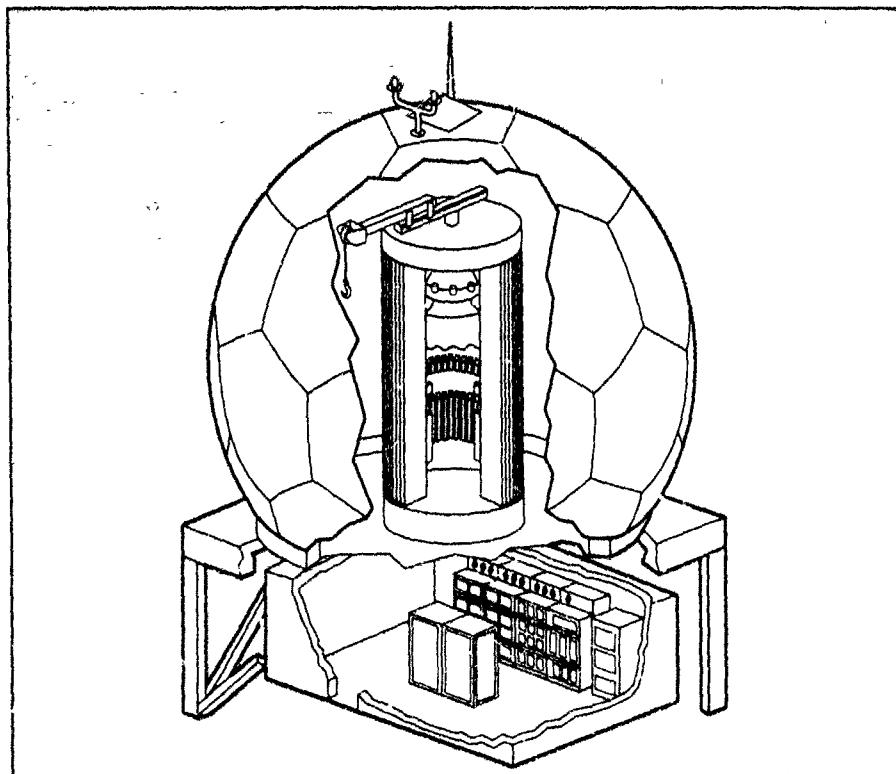
Books

Canty, William J., D060,
Monahan, John H.,
Former Vice President,
MITRE,
Shay, John W., D010
*MITRE and the AWACS, A
Systems Engineering
Perspective*, (compendium
of articles), MITRE 1990.

Masterman, Hugh C.,
D063,
Johnson, Clifford
(Compugraphic Inc.),
Silverstein, Melvin
(Nortech Engineering)
*How to Select a CRT
Monitor*, Beta Review
Press, Millwood, Virginia,
1990.

Patents

Barr, Paul C., D080
"Three-Level Distributed
Control for Networking
I/O Devices," Patent No.
4,905,219, 27 February
1990.



Division D080 is the system engineer for new Air Force radar systems that provide warning of attacks by ballistic missiles or air-breathing vehicles upon the North American continent. This role permits the division to apply its broad expertise in systems, sensors, and signal processing to these programs. For the North Warning system, the modern unattended short range radar and communications equipment illustrated above have virtually no moving parts and promise to improve system reliability by a factor of four.

This category includes MITRE staff who played a special role (beyond that of "member") in external professional organizations.

Barck, Peter E., D080
Member of IEEE Design Automation Technical Committee, VHSIC Hardware Description Language (VHDL) Analysis and Standardization Group; Member of the IEEE Design Automation Technical Committee, Working Group on VHDL, Modeling and Coding in VHDL; Member of the IEEE Design Automation Technical Committee, Working Group on System-Level Modeling; Steering Committee Member for the VHDL Users' Group.

Bello, Phillip A., D090
Reviewer for *IEEE Transactions on Communication Theory*; Member of Communications Theory Committee (IEEE Communications Society).

Betz, John W., D080
Referee for *IEEE Transactions on Aerospace and Electronic Systems*.

Blanco, Mario A., D090
Reviewer for *IEEE Transactions on Communications*, *IEEE Transactions on Information Theory*, and *IEEE Transactions on Circuits and Systems*.

Bowden, Samuel J., D040
Senior Member, Institute of Industrial Engineers (IIE), Accreditation Visitor for Programs in Industrial Engineering; Alternate Member, Engineering Accreditation Commission (EAC); Accreditation Board for Engineering and Technology (ABET); Session Chairman: "The National Testbed," 1990 Summer Computer Simulation Conference, The Society for Computer Simulation International, Calgary, Alberta, Canada, 16-18 July 1990.

Brayer, Kenneth, D040
Editor of the *IEEE Transactions on Communications for Fading, Dispersive and Multipath Channels*, Peer Reviewer for university research proposals submitted to the National Science Foundation.

Breen, Paul T., D060
Co-Chairman, Project Requirements and Applications, Society of Photo-Optical Instrumentation Engineers (SPIE) Symposium, Santa Clara, California, 11-16 February 1990; Co-Chairman, Aerospace and Military Graphics, National Computer Graphics Association (NCGA '90), Anaheim, California, 19-22 March 1990; Chairman, Interactive Aspects of Workstations, and

Seminar Co-Chairman, 1990 Tutorial Committee, Society for Information Display (SID) 1990 International Symposium, Las Vegas, Nevada, 14-18 May 1990; Vice-Chairman, New England Chapter, Society for Information Display (SID); Member, American National Standards Institute (ANSI) Standards Committee, Large-Screen Projector Measurement Standard; Chairman, Workstation Committee, Member, Technical Program Committee, Society for Information Display (SID).

Bridgham, Mary B., D040
Board of Directors of Rocky Mountain Chapter, Armed Forces Communications and Electronics Association (AFCEA), 1988-1990, Vice President-Membership (Industry) 1990-1992.

Brooks, Alan W., D070
Treasurer, Boston Area IEEE & Computer Society.

Campbell, Susan E., D040
Panel Member and Presenter of LUIS Strengths and Weaknesses, "Rapid Prototyping on Graphic Workstations: Users' Perspective," Human Factors Society Annual Meeting, Long Beach, California, October 1990.

Carhoun, Dean O., D080
Reviewer for *IEEE Transactions on Aerospace and Electronic Systems*.

Carlson, Robert T., D050
Chairman, Optical Communications Working Group Strategic Defense Initiative.

Cosentino, Ronald J., D080
Referee for *IEEE Transactions on Computers*.

Cronson, Harry M., D090
Member of Technical Program Committee for IEEE MTT-S International Microwave Symposium; Member of Steering Committee Automatic Radio Frequency Techniques Group (ARFTG liaison) for IEEE MTT-S International Microwave Symposium; Member of IEEE Admission and Advancement Committee; Reviewer of *IEEE Transactions on Instrumentation and Measurement* and *Transactions on Microwave Theory and Techniques*.

Cudlitz, Stephen, D060
MITRE Contact for MIT/Industrial Liaison Program; MITRE Representative to IPC (Institute for Interconnecting and Packaging Electronic Circuits); Member of Ad Hoc Committee of IEEE/CHMT Society and Solid State Device Society (Components, Hybrids, and Manufacturing Technology Society); Northeastern University National Council Director.

Davis, Terry L., D090
MITRE-Bedford Corporate Senior Representative for the Society of Women Engineers.

Deniston, Dale R., D040
C² Plans Engineer, United States Army Space Command (Reserve).

DeRosa, Joseph K., D060
Member of Board of Directors, Armed Forces Communications and Electronics Association (AFCEA); Member of the Industrial Advisory Board, Northeastern University Center for Electromagnetics Research (CER).

DiFranza, Michele J., D050
Member of the Boston Section Executive Committee for the American Society for Quality Control (ASQC) as Chairperson for Professional Development.

Dresp, M. Robert, D090
Technical Editor and Reviewer of *IEEE Communications Magazine*.

Dyer, John C., D090
MITRE Representative to the Technical Committee on Economics, American Institute of Aeronautics and Astronautics (AIAA).

Eachus, Robert I., D070
Member of U.S. TAG to ISO-IEC/JTC1/SC22/WG9 (Ada), the International Standards Organization Working Group for the Ada Programming Language; Member of the Ada Rapporteurs Group; Member of the Uniformity Rapporteurs Group.

Eastman, Willard L., D080
Referee for *IEEE Transactions on Circuits and Systems*.

Eaves, Reuben E., D090
Member of Communications Theory Committee (IEEE Communications Society); Member of Satellite and Space Communications Committee (IEEE Communications Society).

Emery, David E., D070
Technical Editor of IEEE Standards Committee P1003.5 (Ada Binding to POSIX); Chairman, ACM Special Interest Group on Ada (SIGAda) Associated Standards Working Group; Principal Member and Delegate to Soederfors Ada 9X Workshop, SIGAda 9X Working Group; SIGAda National Lecturer; Member of ISO-IEC/JTC1/SC22/WG9 Ada Uniformity Rapporteur Group and Information Systems Rapporteur Group. "An Overview of the POSIX/Ada Binding" (Session Chair and Presenter), ACM SIGAda Summer Meeting, Los Angeles, California, August 1990.

Enright, Charles S., D090
Invited Author of "Some Reflections on PERT and Project Management," *PM NETwork—The Professional Magazine of the Project Management Institute*, May 1990.

Fante, Ronald L., D080
Member of IEEE Fellows Selection Committee; Member of Awards Committee of the IEEE Antennas and Propagation Society.

Ferguson, Thomas J., D090
Chair and Organizer of "Survivable Communications," 1990 IEEE Military Communications Conference (MILCOM '90) Monterey, California, 30 September–3 October 1990.

Fridman, Jonathan D., D050
Chairman and Organizer of The Third European Military Fiber Optic and Local Area Network Conference (EMFOC-LAN), 25–26 June 1990, Munich, Germany.

Galin, Melvyn P., D070
Conference Administrator for the National Conference on the Advancement of Research (NCAR); Advisor to the Executive Committee of the Second International Symposium on Integrated Network Management sponsored by the International Federation for Information Processing (IFIP); Member of the Commonwealth of Massachusetts Energy Advisory Board; Executive Secretary of the Governor's Advisory Committee on Information Technology, Commonwealth of Massachusetts; Deputy MITRE Representative on the Board of Regent's Task Force on Administrative Organization and Management of the Massachusetts Public Higher Education System; Deputy MITRE Representative to the Massachusetts Business Roundtable (MBR) and member of the MBR Education Task Force; MITRE Representative on the Advisory Group to the New England Project of the MIT Energy Laboratory; Member of the Military Affairs Council of the North Suburban Chamber of Commerce; President and Member of the Board of Directors of the Institute for Educational Services.

1990
Summary of
Professional
Activities

**External
Professional
Roles**

Games, Richard A., D080
Referee for *IEEE Transactions on Aerospace and Electronic Systems*, *IEEE Transactions on Information Theory*, *Journal of Cryptography*, *Journal of Combinatorial Mathematics and Computing*.

Garvey, Paul R., D090
Elected to the International Board of Directors, International Society of Parametric Analysts (ISPA), May 1990; MITRE-Bedford Alternate Delegate to the Space Systems Cost Analysis Group (SSCAG); Chaired cost risk analysis technical session, Society of Cost Estimating and Analysis (SCEA) Conference, June 1990; Referee for *The Journal of Parametrics*.

Georgilas, Christine J., D070
Vice President — New England Software AG Users Group.

Gera, Livio J., D070
Officer of Federal Information Processing Council of New England.

Gibson, Diane G., D040
Secretary, Rocky Mountain Chapter of AFCEA.

Goodwin, Nancy C., D040
Chair, National Program Committee for Human Factors Society 1990 Annual Meeting.

Grimaldi, Lawrence A., D040
Chairperson of the Programs Committee for the 1990 AFCEA (Armed Forces Communications and Electronics Association) Space Symposium, Air Force Academy.

Harris, Darwyn P., D040
Panelist on "Minorities in Technical Careers," Brown University, March 1990.

Hazle, Marlene, D070
Vice Chairperson of Requirements Working Group, Ada Programming Support Environment (APSE) Evaluation and Validation Team.

Helme, Marcia P., D090
Reviewer for *Networks*.

Housman, Edward M., D070
Appointed Special Interest Group Cabinet Representative for ASIS SIG/CR.

Hulkower, Neal D., D090
MITRE-Bedford Delegate to the Space Systems Cost Analysis Group (SSCAG) and Chair of its data subgroup; Honors and Awards Chair and Council Member of the New England Section of the American Institute of Aeronautics and Astronautics.

Husbands, Charles R., D050
Chairman of Electro '90, Session 39, Boston, Massachusetts, 9-11 May 1990.

Kalish, Candace E., D070
Member of AIAA Technical Committee.

Kirkland, Michael R., D040
Reserve Deputy Sheriff, Douglas County, Colorado; Program Chairman, War on Drugs portion of 1990 AFCEA Space Symposium.

Kozma, Adam, D080
Member of Radar Systems Panel, IEEE Aerospace and Electronic Systems Society; Reviewer for *IEEE Transactions on Aerospace and Electronic Systems* and *IEEE Transactions on Antennas and Propagation*.

Kreindel, Burton, D090
Technology Task Force — Chief Justice's Commission on the Future of the Courts; Boston Bar Association — Residential Conveyancing Committee and Title and Title Insurance Committee.

Krupp, Peter C., D070
Member of Ada Run-Time Environment Working Group (ARTEWG), sponsored by ACM/SIGAda and AJPO.

Kuhnert, Bruce R., D050
Chairman of IEEE
Communications Society
(COMSOC) System
Engineering Committee,
June '88-June '90.

Kurys, Daniel J., D040
"Rapid Prototyping on
Graphics Workstations:
User's Perspective of
Tools," Panel Session
Discussion, Human
Factors Society 1990
Annual Meeting (HFS
'90), Orlando, Florida, 15
August 1990; Member of
IEEE Standards Commit-
tee P1201, "Graphical
User Interface Application
Programming Interfaces
and Driveability," Seattle,
Washington, October
1990.

Lagace, Robert L., D080
Chairman of Boston
Chapter of IEEE Society
on Social Implications of
Technology.

Luke, Daniel W., D080
Referee for *IEEE Transac-
tions on Aerospace
Electronic Systems*.

**Masterman, Hugh C.,
D060**
Member of the Technical
Program Committee,
Society for Information
Display (SID) 1990
International Symposium,
Las Vegas, Nevada, 14-18
May 1990.

Mauro, Charles V., D090
Honors and Awards Chair
of International Society of
Parametric Analysts
(ISPA); Chaired chapter
development.

Metzger, Louis S., D090
Member of MILCOM
Conference Board of the
IEEE Communications
Society; Member of Air
Force Studies Board
Committee on Tactical
Communications.

Mosier, Jane, D070
Liaison, Human Factors
Society to the CHI '90
Conference on Human
Factors in Computing
Systems.

Muder, Douglas J., D080
Referee for *Discrete and
Computational Geometry*.

Newport, Kris T., D080
Chairman/Organizer of
"Multimedia Communica-
tion Networks II" session
at MILCOM '90,
Monterey, California, 30
September-3 October
1990.

Nowacki, Carol L., D080
Reviewer for *IEEE
Transactions on Circuits
and Systems*; Reviewer for
the 1990 International
Conference on Parallel
Processing.

O'Neil, Sean D., D080
Referee for *IEEE Transac-
tions on Aerospace and
Electronic Systems*.

Owens, Martin F., D070
Member of ISO/IEC STC
1/SC7/WG3; Author and
Editor of International
Standard SEI-Member of
Questionnaire Advisory
Board; Member of
Defense Software Devel-
opment Standards Advi-
sory Board and Author of
sections of DOD-STD-
2167A Guide Book.

**Parmentola, John A.,
D040**
Accepted the position of
Adjunct Fellow of the
Center for Science and
International Affairs at the
John F. Kennedy School
of Government.

**Pierstorff, Buckley C.,
D080**
Session Chairman of
"Radar Simulation
Techniques," 1990
Summer Computer
Simulation Conference,
Calgary, Canada, July
1990; Member of the
Board of Directors,
Society for Computer
Simulation; Treasurer of
Eastern Simulation
Council of Society for
Computer Simulation;
Chairman of Radar and
Communications Group,
Summer Computer
Simulation Conference;
Session Chair, "Communi-
cation Simulation Tech-
niques" and "Communica-
tion Network Simulation,"
1990 Summer Computer
Simulation Conference,
July 1990.

1990
Summary of
Professional
Activities

**External
Professional
Roles**

Pomponi, Silvester J., D060
Member of the C³I Technical Committee of American Institute of Aeronautics and Astronautics (AIAA); Panel Chairman: American Institute of Aeronautics and Astronautics (AIAA) Workshop on Quantitative Assessment of C³I Systems, May 1990.

Powell, Frederic D., D050
Invited Speaker, University of Vermont Seminar on Applied Mathematics, "Chaotic Behavior of Newton-Raphson Position Reconstruction Algorithms in Unconventional Geometries of the Microwave Landing System."

Pullen, Karen W., D090
Associate Editor of *Journal of Cost Analysis*; Referee of *Computers and Industrial Engineering*; Chaired "Uncertainty Cost Analysis," Operations Research Society of America/The Institute of Management Sciences (ORSA/TIMS) Joint National Meeting, Philadelphia, Pennsylvania, 30 October 1990.

Rama Rao, Basrur, D090
Member of URSI Commission A on Electromagnetic Metrology; Chair and Organizer of MITRE Antenna Workshops, two workshops on various antenna-related subjects.

Roberts, John E., D090
Member of the Advisory Panel of the Voice System Users Association associated with *Speech Technology* magazine.

Rushanan, Joseph J., D080
Chairperson, Boston Section of IEEE, Information Theory Chapter.

Sawyer, John J., D080
State-of-the-Art Instructor, Introduction of SPICE Circuit Analysis, Northeastern University, April-June 1990.

Schoen, Joel M., D080
Chairman of IEEE Standards Coordinating Committee 30 Analog Hardware Descriptive Languages; Steering Committee of VHDL Users' Group; Program Co-Chairman of VHDL Users' Group Meeting; Steering Committee and Program Committee of Analog Design Workshops; Paper Referee for 28th Design Automation Conference; Program Chair, 1993 Summer Computer Simulation Conference.

Schultz, Herman P., D070
Member of Steering Committee for Software Engineering Institute's (SEI's) Software Measurement Initiative; Member of the SEI Software Acquisition Metrics Working Group, Carnegie-Mellon University, Pittsburgh, Pennsylvania.

Schuster, Marvin A., D080
MITRE Industrial Liaison Committee Member, Northeastern University Center for Electromagnetics Research; MITRE Corporate Representative to JEDEC (Joint Electron Devices Engineering Council), Solid State Products Engineering Council.

Siegel, Alan, D040
Participant in SDI Tracking Panels, 3 May 1990 in Los Angeles, California, 7-9 August 1990 in Washington, D.C., 27-29 November 1990 in Mountain View, California.

Smith, Barry D., D040
"Mission Planning and Scheduling," Session Chair, Space Operations, Applications, and Research Conference (SOAR), Albuquerque, New Mexico, June 1990.

Smith, Derrin R., D040
Consultant, Denver Center for Teaching International Relations.

Sousa, Michael J., D080
Referee for *IEEE Transactions on Signal Processing*.

Stiefel, Malcolm L., D060
Founder and Chairperson, Computer Systems Committee on Standards, American Institute of Aeronautics and Astronautics (AIAA); Member Emeritus of Technical Committee on Computer Systems, American Institute of Aeronautics and Astronautics (AIAA); Contributing Editor for S. Klein Newsletter on Computer Graphics; Contributing Editor for *Computer Graphics Review Magazine*.

Sullivan, Edward M., D050
Member of Board of Directors and Technical Program Committee, International Electronics Packaging Society (IEPS); Session Co-Chair of "High Speed Packaging and Modeling," 10th Annual IEPS Conference, Marlborough, Massachusetts, September 1990.

Sussman, Steven M., D090
Technical Reviewer for IEEE Communications Society; Member of Technical Committee on Communications System Engineering (IEEE Communications Society); Session Organizer of IEEE International Conference on Communications.

Topiwala, Pankaj, D080
Reviewer for *Mathematical Review*; Referee for *IEEE Transactions on Aerospace and Electronic Systems* and *IEEE Transactions on Circuits and Systems*.

Townes, Stephen A., D080
Industrial Liaison for the IEEE Central New England Council Third Biennial Acoustics, Speech, and Signal Processing Miniconference.

Trasko, Darrell S., D050
Member of American Institute for Aeronautics and Astronautics Technical Committee for Digital Avionics; Member of Selection Committee for Best Technical Paper, 9th Digital Avionics System Conference.

Utley, Kurt E., D080
Member of Northeastern University Industrial Advisory Board.

Vaccaro, John J., D080
Referee for Idaho State Board of Education Research Grant Program.

Vitkevich, John A., Jr., D090
Chaired the Hardware Cost Estimating Track at the National Conference of the Institute of Cost Analysis/National Estimating Society, June 1990.

1990
Summary of
Professional
Activities

**External
Professional
Roles**

Weiner, Melvin M., D080
Reviewer for *IEEE Transactions on Aerospace and Electronics Systems*.

Werth, Janet L., D090
Secretary of the Boston Chapter of the Antennas and Propagation Society of the IEEE.

White, Brian E., D050
Session Chairman, "Cosite Mitigation Techniques for Multi-Radio Platforms/ Locations," Tactical Communications Conference, Fort Wayne, Indiana, April 24-26 1990.

Wickwire, Kenneth H., D090
Reviewer for *Mathematical Reviews* and *Zentralblatt fuer Mathematik*; Referee for *Journal of the Operational Research Society* (England).

Williams, Cindy L., D040
Military Operations Research Society (MORS); Co-Chair of Working Group on Military Applications of Space, MORS Symposium, 22 May 1990. Operations Research Society of America/The Institute of Management Science; Chair of Mission Planning Session at Joint National Meeting, 7-9 May 1990.

Williams, Ronald T., D080
Referee for *IEEE Transactions on Acoustics, Speech, and Signal Processing* and *IEEE Transactions on Aerospace and Electronic Systems*.

Wilson, John A., D090
Technical Reviewer for IEEE Computer Society.

Wolfinger, Barbara E., D090
Referee for the *Journal of Parametrics*, a publication of the International Society of Parametric Analysts (ISPA).

Wood, Robert H., D06A
Vice President for Programs, Kaiserslautern Area Armed Forces Communications and Electronics Association (AFCEA) Chapter, Ramstein Air Base, Germany, July 1990-June 1991.

Worsman, David W., D070
Chairman, Data on the PBX Special Interest Group AT&T Definity/85 Users Group.

Barr, Paul C., D080
Adjunct Faculty, Professor
of Electrical and Com-
puter Engineering,
Graduate School, North-
eastern University.

**Beamer, Raymond A.,
D040**
Associate Professor of
Mathematics, Colorado
Technical College,
Colorado Springs,
Colorado.

Blanco, Mario A., D090
Adjunct Associate
Professor, Graduate
Courses, Electrical
Engineering, Worcester
Polytechnic Institute;
Lecturer, Graduate School
of Engineering, Northeast-
ern University.

Broderick, John C., D070
Instructor, Computer
Information System
Department Course:
"Foundations of Program-
ming," (Pascal), Bentley
College.

Cabana, Kevin A., D060
Mathematics Lecturer,
Clark University, Worces-
ter, Massachusetts.

**Comparetto, Gary M.,
D040**
"Military Satellite
Communications: A
Comprehensive Approach
to System Design and
Evaluation," George
Washington University.

Davis, Willis L., D050
Lecturer — Statistics,
Department of Statistics,
Harvard University.

**DiFranza, Michele J.,
D050**
Lecturer — Quality and
Reliability Engineering
and Member of the
Quality Program Commit-
tee, North Shore Commu-
nity College, Beverly,
Massachusetts; Lecturer
— Quality and Reliability
Engineering, Boston
Section of the American
Society for Quality
Control.

Edwards, Jerry, D040
Assistant Professor of
Mathematics, Chapman
College, Colorado
Springs, Colorado.

Elgass, Stephen C., D040
Adjunct Professor,
Computer Science
Department, Regis
College, Colorado
Springs, Colorado.

**Fridman, Jonathan D.,
D050**
Adjunct Faculty, Univer-
sity of Lowell.

Goldberg, Aaron, D080
Adjunct Assistant Profes-
sor, Boston University,
College of Engineering.

Gregorio, Donna D., D040
"The C++ Programming
Language," Northeastern
University.

**Grimaldi, Lawrence A.,
D040**
Adjunct Professor, Space
Systems Management
Course, Webster Univer-
sity, Colorado Springs,
Colorado.

Hall, W. Dale, D090
Lecturer, Mathematics,
School of Engineering
Technology, Northeastern
University.

**Hansen, Stanley W.,
D040**
Assistant Professor,
Colorado Technical
College, Colorado
Springs, Colorado.

**Johnston, Shaída S.,
D040**
Adjunct Professor of
Mathematics, Pikes Peak
Community College,
Colorado Springs,
Colorado.

Keough, Gerald E., D070
Associate Professor,
Department of Mathemat-
ics, Boston College.

**Kirkland, Michael R.,
D040**
Colorado Law Enforce-
ment Academy Instructor,
Colorado Springs,
Colorado.

Kozma, Adam, D080
Co-Chairman of Synthetic
Aperture Technology and
Applications (an intensive
course), College of
Engineering, University
of Michigan.

**Teaching
Appointments**

Krenzin, Michael D., D040

Part-Time Instructor at
Pikes Peak Community
College, Colorado
Springs, Colorado.

Kruger, Suzette N., D040

Adjunct Professor,
Computer Science, Regis
College, Colorado
Springs, Colorado.

Lamensdorf, David, D080

Adjunct Professor of
Electrical Engineering,
Northeastern University
(industry advisor to Ph.D.
candidate).

Logan, James R., D040

Adjunct Professor,
Computer Science
Department, Regis
College, Colorado
Springs, Colorado.

Makhlouf, Mahmoud A., D070

Taught graduate course
"Operating Systems
Design and Implementa-
tion," Boston University.

Marcotte, Alfred G., D080

Senior Lecturer, Math-
ematics Department,
University College,
Northeastern University.

McGee, Michael A., D040

"Introduction to Computer
Information Systems,
MIS151," January-May
1990, Creighton Univer-
sity, Omaha, Nebraska.

McQueen, Stanley F., D070

Adjunct Associate
Professor of Computer
Science, Colorado
Technical College,
Colorado Springs,
Colorado.

Oliver, Vernon E., D050

Lecturer — Elements of
Thermodynamics II, and
Problems in Mechanical
Engineering Technology,
Department of Mechanical
Engineering Technology,
University of Lowell.

Pavloff, Michael S., D090

Faculty, Department of
Mathematics, Harvard
University Extension.

Permenter, Lawrence F., D060

Adjunct Faculty, Math-
ematics, Tidewater
Community College,
Virginia Beach, Virginia.

Price, Charles H., Jr., D090

Senior Lecturer and
Course Consultant, School
of Engineering Technol-
ogy, Northeastern
University.

Rushanan, Joseph J., D080

Adjunct Assistant Profes-
sor, Bentley College.

Sanyal, Probal K., D080

Adjunct Assistant Profes-
sor, Syracuse University.

Sawyer, Jerry A., D090

Member of AIAA Surviv-
ability Technical Commit-
tee; Member of the
Standards and Lessons
Learned Subcommittee.

Schoen, Joel M., D080

Adjunct Faculty, North-
eastern University.

Slattery, Norma J., D090

"Fundamentals of Alge-
bra," Continuing Educa-
tion Division, University
of Lowell; "Graduate
Record Exam (GRE) Math
Review," and "Graduate
Management Aptitude
Test (GMAT) Math
Review," Community
Education Division,
University of Lowell.

Smith, Derrin R., D040

Adjunct Professor, Center
for Management Develop-
ment, Graduate School of
Business, University of
Denver, Colorado.

Suresh Babu, B. N., D080
Adjunct Faculty, Department of Electrical Engineering, University of Lowell.

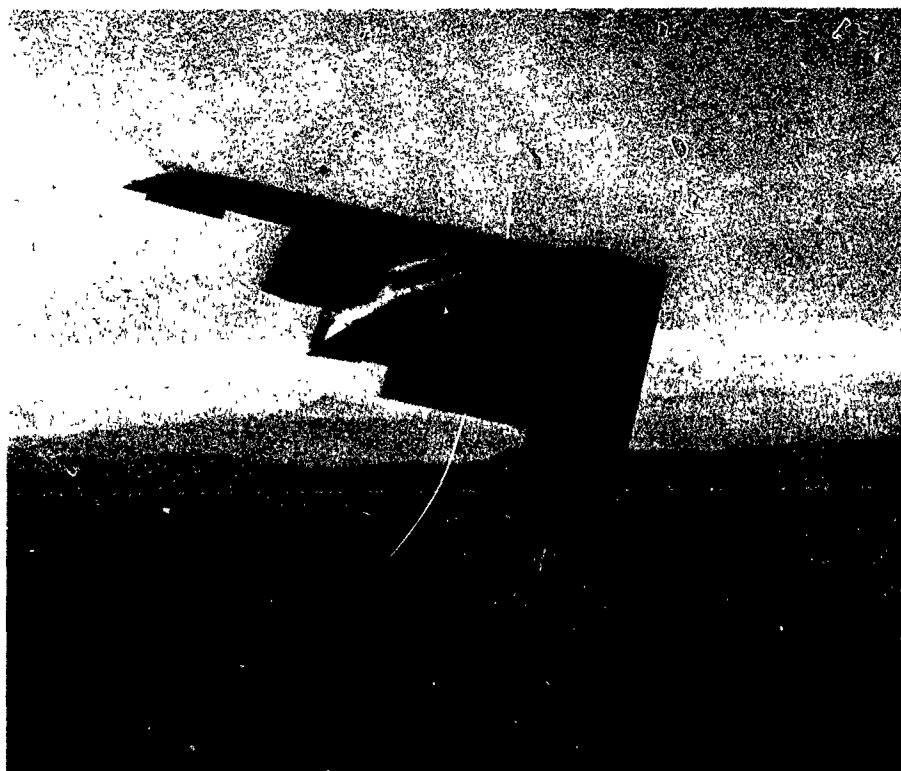
Swarz, Robert S., D050
Adjunct Professor, Department of Electrical Engineering, Worcester Polytechnic Institute.

Teng, Chojan S., D080
Adjunct Faculty, Department of Electrical Engineering, University of Lowell.

Walker, Karen D., D040
Instructor, Pikes Peak Community College and Colorado Technical College, Colorado Springs, Colorado.

Waterworth, John J., D070
Division of Continuing Education, New Hampshire College.

Wilson, John A., D090
Adjunct Faculty, Computer Information Systems, New Hampshire College.



System engineering of communications sub-systems, such as the advanced low frequency/very low frequency receiver for the B-2 bomber, is one of the ways in which D090 supports the strategic assets of the Air Force.

1990
Summary of
Professional
Activities

**Fellows and
Associate
Fellows**

Phillip A. Bello, D090
Institute of Electrical and
Electronics Engineers
Fellow

Kenneth Brayer, D040
Institute of Electrical and
Electronics Engineers
Fellow

**Roger A. K. Burton,
D060**
British Interplanetary
Society
Fellow

Royal Aeronautical
Society
Associate Fellow

Harry M. Cronson, D090
Institute of Electrical and
Electronics Engineers
Fellow

Reuben E. Eaves, D090
American Institute of
Aeronautics and
Astronautics
Associate Fellow

Ronald L. Fante, D080
Institute of Electrical and
Electronics Engineers
Fellow

Optical Society of
America
Fellow

Electromagnetics
Academy
Fellow

MITRE Corporation
Fellow

George Gamota, D011
American Physical Society
Fellow

American Association for
the Advancement of
Science
Fellow

Ukrainian American
Engineers Association
Fellow

Nancy C. Goodwin, D040
Human Factors Society
Fellow

Edwin J. Green, D070
Institute of Electrical and
Electronics Engineers
Associate Fellow

Aditya K. Kamal, D080
Institute of Electrical and
Electronics Engineers
Fellow

Optical Society of
America
Fellow

Carl F. Kurth, D080
Institute of Electrical and
Electronics Engineers
Fellow

Walter C. Lee, D050
American Association for
the Advancement of
Science
Associate Fellow

Milton D. Rubin, D080
American Association for
Advancement of Science
Fellow

**Richard J. Sylvester,
D070**
MITRE Corporation
Fellow

Williams, Cindy L., D040
Adjunct Research Fellow,
Center for Science and
International Affairs, John
F. Kennedy School of
Government, Harvard
University, Cambridge,
Massachusetts.

1990
Summary of
Professional
Activities

**Honors
and Awards**

MITRE annually selects a small number of programs for special recognition; we granted program awards to about 150 Bedford personnel in 1990, many of whom are members of the Center for Air Force C³ Systems. *Program Accomplishment Awards* were given for participation in the Sentinel Bright I program. *Program Achievement Awards* were given for participation in the Joint Tactical Information Distribution System (JTIDS), Milstar Radome Engineering, and the North Warning System.

Bajgot, Douglas A., D090
Northeastern University Technology Award (first in graduating class) for Associate's degree in Engineering Technology.

Cronson, Harry M., D090
Selected for inclusion in *Who's Who in America*.

Eastman, Willard L., D080
NASA Tech Briefs award for contributions to a deepspace Reed-Solomon decoder.

Gall, Melvyn P., D070
Certificate of Commendation from Governor Michael S. Dukakis for work on the Governor's Advisory Committee on Information Technology.

Grimaldi, Lawrence A., D040
Received the Meritorious Service Award from AFCEA for his involvement in the 1989 Space Symposium held at the Air Force Academy.

Helme, Marcia P., D090
GTE Warner Award for Creative Technical Achievement and Innovation, 10 May 1990.

Housman, Edward M., D070
Received American Society for Information Science (ASIS) SIG-of-the-Year Award for participation as Officer of the Special Interest Group on Classification Research (SIG/CR).

Hulkower, Neal D., D090
Main belt asteroid, 4285 Hulkower, named after Neal D. Hulkower by the International Astronomical Union in appreciation for his work at the Jet Propulsion Laboratory.

Vargas, Arsenio, D090
Featured in League of United Latin American Citizens (LULAC) National Educational Service Centers, Inc.

Vawter, Michael D., D050
Meritorious Service Medal, U.S. Air Force, Air National Guard.

Weiner, Melvin M., D080
Member of Electromagnetics Academy (five-year term). Selected for inclusion in *Who's Who in Electromagnetics* (Electromagnetics Academy).

Our people belong to many professional societies, as shown in the list that begins on the following page. At the right is a list of professional societies that represent the greatest membership within the Center for Air Force C³ Systems.

Institute of Electrical and Electronics Engineers	632
Association for Computing Machinery	173
Armed Forces Communications and Electronics Association	64
Boston Computer Society	64
American Physical Society	35
American Institute of Aeronautics and Astronautics	32
Air Force Association	28
American Association for Artificial Intelligence	28
American Mathematical Society	21
Association of Old Crows	21
American Radio Relay League	20
American Association for the Advancement of Science	18
Digital Equipment Corporation User Society	18
Apple Programmers and Developers Association	17
MITRE-Bedford Amateur Radio Club	16
Mathematical Association of America	14
Society for Information Display	13
MITRE Technical Women's Group	12
Operations Research Society of America	12
Society for Computer Simulation	12
International Test and Evaluation Association	11
National Estimating Society	10
Society of Photo-Optical Instrumentation Engineers	10

**Professional
Societies**

Acoustical Society of America	American Institute of Chemical Engineers	American Society of Photogrammetry and Remote Sensing
Ada Jovial Users Group	American Institute of Physics	American Statistical Association
Air Commando Association	American Management Association	Apple Professional Exchange
Air Force Association	American Mathematical Society	Apple Programmers and Developers Association
Air Traffic Controller's Association	American Meteorological Society	Applied Computational Electromagnetics Society
Aircraft Owners and Pilots Association	American Nuclear Society	Armed Forces Communications and Electronics Association
American Association for Artificial Intelligence	American Philosophical Association	Army Association
American Association for the Advancement of Science	American Physical Society	Association for Automated Reasoning
American Association for the History of Medicine	American Psychological Association	Association for Computational Linguistics
American Association of Physics Teachers	American Psychological Society	Association for Computers and the Humanities
American Association of University Professors	American Radio Relay League	Association for Computing Machinery
American Astronautical Society	American Society for Engineering Education	Special Interest Group for Artificial Intelligence
American Astronomical Society	American Society for Metals	Special Interest Group on Ada
American Business Women's Association	American Society for Naval Engineers	Special Interest Group on Automata and Compatibility Theory
American Congress on Surveying and Mapping	American Society for Quality Control	Special Interest Group on Automata and Computation Theory
American Defense Preparedness Association	American Society for Solar Energy	Special Interest Group on Computer Aided Design
American Economic Association	American Society for Testing and Materials	Special Interest Group on Computer Architecture
American Geological Society	American Society for Wind Energy	Special Interest Group on Computer Graphics
American Geophysical Union	American Society of Civil Engineers	
American Institute of Aeronautics and Astronautics	American Society of Clinical Pathologists	
American Institute of Aeronautics and Astronautics	American Society of Mechanical Engineers	
	American Society of Military Engineers	
	American Society of Naval Engineers	

Special Interest Group on Computer Human Interaction	Board of Professional Engineers	Aerospace and Electronic Systems Society
Special Interest Group on Computers and the Physically Handicapped	Boston Bar Association	Antennas and Propagation Society
Special Interest Group on Data Communications	Boston Computer Society	Biomedical Society
Special Interest Group on Graphics	Central States VHF Society	Circuits and Systems Society
Special Interest Group on Office Information Systems	City and Guilds Institute of London (England)	Communications Society
Special Interest Group on Operating Systems	Cognitive Science Society	Components, Hybrids and Manufacturing Technology
Special Interest Group on Programming Languages	Computer Measurement Group	Computer Society
Special Interest Group on Simulation	Computer Professionals for Social Responsibility	Control Systems Society
Special Interest Group on Software Engineering	Cornell Society of Professional Engineers	Education Society
Association for Symbolic Logic	Corporate Planners Round Table	Electromagnetic Compatibility Society
Association for Systems Management	Digital Equipment Corporation User Society	Electron Devices Society
Association for Unmanned Vehicle Systems	Electronic Industries Association	Engineering Management Society
Association of Former Intelligence Officers	European Association for Theoretical Computer Science	Geoscience and Remote Sensing Society
Association of Old Crows	Federal Information Processing Council	Information Theory Society
Association of the United States Army	Federation of American Scientists	Instrumentation and Measurement Society
Astronomical Society of the Pacific	Florida Engineering Society	Lasers and Electro-Optics Society
Audio Engineering Society	History of Science Society	Lightwave Technology Society
Berkeley Macintosh User's Group	Human Factors Society	Management Society
Biophysical Society	Institute for Interconnecting and Packaging Electronic Circuits	Medicine and Biology Society
	Institute of Econometric Research	Microwave Theory and Techniques Group
	Institute of Electrical and Electronic Engineers	Nuclear and Plasma Science Society
	Acoustics, Speech and Signal Processing Society	Nuclear Space and Radiation Effects Society

**Professional
Societies**

Oceanic Engineering Society	International Neural Network Society	Mensa
Quantum Electronics and Applications Society	International Radio Consultative Committee (CCIR)	Meridian User Group
Reliability Society	International Society for Hybrid Microelectronics	Military Operations Research Society
Signal Processing Society	International Society for Mini- and Microcomputers	MITRE-Bedford Amateur Radio Club
Social Implications of Technology Society	International Society for Optical Engineering	MITRE Technical Women's Group
Software Engineering Society	International Society for the Study of the Origin of Life	National Association for Female Executives
Solid State Electronic Society	International Society for the System Sciences	National Association of Flight Instructors
Systems, Man, and Cybernetics Society	International Society of Parametric Analysts	National Computer Graphics Association
Institution of Electrical Engineers (U.K.)	International Studies Association	National Estimating Society
Institution of Electronic and Radio Engineers (U.K.)	International Test and Evaluation Association	National Military Intelligence Association
Institute of Environmental Sciences	International Union of Radio Science	National Security Industrial Association
Institute of Industrial Engineers	League for Programming Freedom	National Society of Black Engineers
Institute of Management Sciences	Linguistic Society of America	National Society of Professional Engineers
Institute of Navigation	MACAPP Developers Association	Navy League
Institution of Electrical Engineers (U.K.)	Managing Apple Computers in Information Systems	New England Chapter of Health Care Information and Management Systems Society
International Amateur-Professional Photoelectric Photometry	Massachusetts Bar Association	New England Communications
International Association of Knowledge Engineers	Massachusetts Conveyancers Association	New Hampshire Society of Professional Engineers
International Association of Personnel Women	Massachusetts Society of Professional Engineers	New York Academy of Sciences
International Astronomical Union	Materials Research Society	Oceanic Engineering Society
International Communications Association	Mathematical Association of America	Open Software Foundation
International Electronics Packaging Society		Operations Research Society of America
		Optical Society of America
		Order of Engineers

Planetary Society	Society for the Advancement of Materials and Process Engineering	The Electromagnetic Academy, Institute for Electromagnetic Modeling and Applications
Pritsker Users Group	Society of American Military Engineers	The Retired Officers Association
Quality Assurance Institute	Society of Automotive Engineers	The USENIX Association
Radio Amateur Satellite Corporation	Society of Experimental Mechanics	Union of Concerned Scientists
Radio Society of Dhahran, Saudi Arabia	Society of Exploration Geophysicists	United States Air Force Academy Association of Graduates
Radio Society of Great Britain	Society of Industrial and Applied Mathematicians	United States Army Field Artillery Association
Radio Technical Commission for Aeronautics	Society of Photo-Optical Instrumentation Engineers	United States Defense League
Royal Aeronautical Society	Society of Reliability Engineers	United States Naval Institute
Scientific Committee for Investigation of Claims of the Paranormal	Society of Women Engineers	United States Strategic Institute
Seattle CASE Users Group	Software Maintenance Association	VHDL Users' Group
Security Affairs Support Association	Software Psychology Society	Verdex User Group
SES/Workbench User Group	Software through Pictures Users Group	Voice Systems Users Group
Smithsonian Association	Sun Microsystems Users Group	Washington Apple Pi (Macintosh Users' Group)
Society for Computer Simulation	The Cambridge Society (Cambridge University, U.K.)	Yale Sciences and Engineering Association
Society for Information Display	The Computer Museum	
Society for Information Management		
Society for Software Engineering		
Society for Space Research, West Germany		

1990
Summary of
Professional
Activities

**Honorary
Societies**

During 1990 our people were members of many honorary societies, which are listed below. The honorary societies listed at right represent the greatest membership within the Center for Air Force C³ Systems.

Eta Kappa Nu	180
Tau Beta Pi	173
Sigma Xi	75
Phi Beta Kappa	44
Phi Kappa Phi	33
Sigma Pi Sigma	29
Pi Mu Epsilon	25
Sigma Tau	10

Alpha Kappa Mu	Phi Omega Epsilon
Alpha Lambda Delta	Phi Tau Phi (Scholastic Honor Society of America)
Alpha Phi Delta	Phi Theta Kappa
Alpha Pi Mu	Pi Delta Epsilon
Alpha Pi Nu	Pi Mu Epsilon
Alpha Sigma Nu	Pi Tau Sigma
Arnold Air Society	Psi Chi National Honor Society
Beta Gamma Sigma	Sigma Beta Tau
Beta Kappa Chi	Sigma Chi
Chi Epsilon	Sigma Epsilon Rho
Epsilon Delta Pi	Sigma Epsilon Sigma
Epsilon Sigma Pi	Sigma Gamma Tau
Eta Kappa Nu	Sigma Pi
Franklin Honor Society (Roosevelt University)	Sigma Pi Sigma
Gamma Beta Phi	Sigma Tau
Golden Key National Honor Society	Sigma Xi
Kappa Mu Epsilon	Tau Alpha Pi Association
Lambda Sigma Tau	Tau Beta Pi
National Engineering Society	Tau Epsilon Sigma
Omicron Delta Kappa	Tau Kappa Alpha
Phi Beta Kappa	Upsilon Pi Epsilon Association
Phi Delta Kappa	
Phi Delta Lambda	
Phi Eta Sigma	
Phi Kappa Nu	
Phi Kappa Phi	

We have attempted to report all pertinent staff activities for 1990. We apologize for any inadvertent errors or omissions.

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