

A BIBLIOGRAPHY OF BLAST RELATED ARTICLES

David Jacobson

October 1986

Preface

Introduction

This booklet contains a list of BLAST related publications. It is meant to serve two functions. The first is to provide references which contain information and methodologies which were either directly incorporated into BLAST algorithms or were influential in their development. The articles, books, and conference proceedings describe the heat transfer algorithms, and some of the plant and system models at a level of detail currently unavailable in the BLAST 3.0 User's Manual.

The second function is to provide BLAST users access to information about the verification and actual applications of BLAST. This section includes many references which document how a BLAST energy analysis compares to actual building data and other models such as DOE-2. Some references are listed because they contain information about energy analysis programs which are either similar to BLAST or are a predecessor as is the case with NBSLD. In addition, this booklet contains a long list of references where BLAST was the primary tool for some type of energy related analysis. They include studies involving daylighting and passive solar design strategies and the effects of thermal mass.

Search Methodology

The primary sources of material for this list were publications of people closely related with the development and day to day use and maintenance of BLAST and other closely related energy analysis programs. That list includes: B. Andersson, F. Bauman, W.L. Carrol, D. Herron, D.C. Hittle, L. Lawrie, D. Leverenz, R. Kammerud, T. Kusuda, C.O. Pedersen, E.F. Sowell, J.D. Spitler, G.K. Yuill and G.N. Walton. A computer bibliographic search was completed at the Engineering Library at the University of Illinois at Urbana-Champaign in the Fall of 1985. The two primary databases used were the Engineering Index through September 1985 (published by Engineering Information Incorporated) and the Department of Energy Database from January 1983 to October 1985. The DOE Database is a combination of a number of printed indices. In addition to finding all publications of the above authors, a search of all abstracts in these

databases for key words such as BLAST and NBSLD, was completed. The list was narrowed down by finding articles which also contained such key phrases as heating load, cooling load, energy consumption, building energy and simulation. This assured that articles whose abstracts contained a common word like BLAST (the computer searches did not differentiate between upper and lower case letters) used in a totally different context would not be included.

Additional references were obtained from the ASHRAE Handbook of Fundamentals and from the reference lists in the articles themselves.

Updating the List

The search is clearly not complete. There are undoubtedly important authors and papers which have been left out. The computer searching technique is not foolproof. It is also extremely expensive. Thus, it was limited to the above two databases. Any additions a reader wishes to suggest should be sent to the BLAST Support Office, 30 MEB, Department of Mechanical and Industrial Engineering, 1206 West Green Street, Urbana, IL, 61801.

Applications and Verification

- Amber, J., D.J. Leverenz, D.L. Herron, "Automated Building Design Review Using BLAST (Building Loads Analysis and System Thermodynamics). Final Report," U.S. Army Construction Engineering Research Laboratory, (USA-CERL), Champaign, IL. (Available through NTIS, PC A03/MF A01, Report No. AD-A-151707/7/XAB, CERL-TR-E-85/03).
- Andersson, B., M. Adegran, T. Webster, R. Kammerud, W. Place, "Thermal Effects Resulting From Occupant Behavior and Building Operation," Proceedings of the Passive and Hybrid Solar Energy Update Conference, Washington, D.C., September 26, 1983. (Available through NTIS, PC A13/MF A01; 1, Report No. CONF-830980).
- Andersson, B., F. Bauman, R.C. Kammerud, "Verification of BLAST by Comparison with Direct-Gain Test Cell Measurements," Lawrence Berkeley Laboratory Report LBL-10619, October 1980.
- Andersson, B., J. Hayes, C.B. Winn, (eds.), "Verification of a Micro-Computer Building Energy Analysis Program - M.E.P.A.," Proceedings of the National Passive Solar Conference, Knoxville, TN, August 30, 1982.
- Andersson, B., W. Place, R.C. Kammerud, P. Scofield, "The Impact of Building Orientation on Residential Heating and Cooling," Energy and Buildings, Vol. 8, No. 3, pp. 205-224, 1984. (also see LBL Report No. LBL-12046).
- Ang, S.T., J. Stephenson, "Computing Building Heat Loads. A Comparative Survey of Four Heat Load Determination Programs. Final Report," Auckland University, Department of Mechanical Engineering; New Zealand Energy Research and Development Committee, Auckland, May 1983. (Available through NTIS, PC A04/MF A01; 1, Report No. NZERDC-P-74).
- Balik, J.S., G.B. Barney, H.J. Sauer, B.E. Hegler, "Effects of Roof Mass and Insulation on Building Thermal Loads," Advances in Energy Technology, University of Missouri Department of Natural Resources Conference on Energy, Rolla, MO, published by University of Missouri, November 1981.
- Bauman, F., B. Andersson, W. Carroll, R.C. Kammerud, N.E. Friedman, "Verification of BLAST by Comparison with Measurements of a Solar-Dominated Test Cell and a Thermally Massive Building," ASME Journal of Solar Engineering, Vol. 105, No. 2, 1983. Also in Proceedings, ASME Solar Energy Division, 3rd Annual SSEA/H&C Operational Results Conference, 27 April- 1 May 1981. (also see LBL Report No. LBL-11387).
- Bauman, F., E. Altmayer, A. Gadgil, R.C. Kammerud, M.W. Nansteel, "Convective Heat Transfer in Buildings: Recent Research Results," ASHRAE Transactions, Vol. 89, Part 1A, pp. 215-233, 1983. (also see LBL Report No. LBL-13883).

- Bergeson, D.E., D.B. Ligon, "Width to Length Aspect Ratios in Passive Solar Applications," Alternative Energy Sources, pp. 101-102, December 1983.
- Carroll, W., and N. Friedman, "Comparison of BLAST Predictions with Measured Performance for a Thermally Massive Building," Lawrence Berkeley Laboratory Report LBL-11679.
- Carroll, W.L., T.L. Webster, A. Mertol, "Passive Cooling Technology Assessment: Synthesis Report," Proceedings of the Passive and Hybrid Solar Energy Update, September 15, 1982, pp. 15-32, Conference, Washington, D.C., November 1982. (Available through NTIS, PC A16/MF A01, Report No. CONF-820940).
- Cumali, Z.O., A.O. Sezgen, R. Sullivan, R.C. Kammerud, E. Bales, L.B. Bass, (eds.), "Extension of Methods Used in Analyzing Building Thermal Loads," Proceedings, Thermal Performance of the Exterior Envelopes of Buildings, Washington, D.C., pp. 411-420, 1981. (Available through NTIS, PC A99/MF A01; 1, Report No. ASHRAE/SP-28; CONF-791233).
- Curtis, B., B. Andersson, R.C. Kammerud, W. Place, K. Whitley, "Thermal Mass: Its Role in Residential Construction," Proceedings of the 2nd International Conference on Energy Use Management, Los Angeles, Vol. 3, pp. 1294-1361, October 22-26, 1979. (also see Lawrence Berkeley Laboratory Report No. LBL-9290).
- Derickson, R.G., "Combinations of Passive Solar and Energy Conservation Measures that Provide Balanced Heating and Cooling Performance in Residential Design: A Look at the Full Range of U.S. Climates," Alternative Energy Sources, pp. 94-95, December 1983.
- Fontoynt, M., W. Place, F. Bauman, "Impact of Electric Lighting Efficiency on the Energy Saving Potential of Daylighting from Roof Monitors," Energy and Buildings, Vol. 6, No. 4, pp. 375-386, presented at the International Daylighting Conference, Phoenix, AZ, February 1983. Also in 1983 International Daylight Conference, Fontoynt, M., W. Place, F. Bauman, T. Vonier, (eds.) pp. 377-380 Lawrence Berkeley Laboratory, Berkeley, CA, 1983. (Available through NTIS, PC A18/MF A01; 1, Report No. CONF-830229).
- Frey, D.J., M.J. Holtz, "Site Handbook: Data Acquisition System Information, Johnson Controls, Inc. Building, Salt Lake City, Utah," (Available through NTIS, PC A10/MF A01;-1, Report No. DOE/CE/30749-T1).
- Frey, D.J., A.J. Yager, "Field Instrumentation for the Passive Solar Commercial Buildings Monitoring Program," Passive and Hybrid Solar Energy Update, Washington, D.C., September 5, 1984. (Available through NTIS, PC A13/MF A01; 1, Report No. CONF-8409118.)
- Gadgil, A., D. Goldstein, R.C. Kammerud, J. Mass, "Residential Building Simulation Model Comparison Using Several Building Energy Analysis Programs," Proceedings of the 4th National Passive Solar Conference, Kansas City, MO, pp. 187-190, October 3-5, 1979, Published by the International Solar Energy Society, Inc.,

American Section, University of Delaware, Newark, DE, 1979. (also see LBL Report No. LBL-9293).

Gadgil, A., D. Goldstein, J. Mass, "Heating and Cooling Loads Comparison of Three Building Simulation Models for Residences: Twozone, DOE-1, and NBSLD," Changing Energy Use Futures International Conference on Energy Use Management, Los Angeles, CA, Vol. 1, pp. 356-364, October 22-26, 1979, Published by Pergamon Press, New York, NY and Oxford, England.

Gillette, G., T. Kusuda, "A Daylighting Computation Procedure for Use in DOE-2 and Other Dynamic Building Energy Analysis Programs," Journal of the Illuminating Engineering Society, Vol. 12, No. 2, pp. 78-85, January 1983.

Girgis, M.A., P.W. Fairey, G.G. Ventre, R.L. Walker, "Passive Solar Retrofit Techniques for Warm-Humid Climates," Annual ASME Technical Conference on Commercial Building Heating and Cooling Applications, Florida Solar Energy Center, Cape Canaveral, FL, pp. 363-373, 1983. Also at Annual ASME Technical Conference on Commercial Building Heating and Cooling Applications, Orlando, FL, April 19, 1983.

Gupta, C.L., J.W. Spencer, R.W.R. Muncey, "A Conceptual Survey of Computer-Oriented Thermal Calculation Methods," National Bureau of Standards Building Science Series No. 39, Washington, DC, 1971.

Herron, D., J. Eidsmore, R. O'Brien, D. Leverenz, "Use of Simplified Input for BLAST Energy Analysis. Final Report," U.S. Army Construction Engineering Research Laboratory, (USA-CERL), Champaign, IL. (Available through NTIS, PC A06/MF A01, Report No. AD-A-131261/0).

Hittle, D.C., "A Comparison of Building Energy Use Calculated with Actual and Synthesized Weather Data," ASHRAE Transactions, Vol. 85, Part 2, pp. 167-189, 1979.

Hittle, D.C., "Building Loads Analysis and System Thermodynamics (BLAST) Users Manual," Version 2.0, Vol. 1 and 2 Technical Report E-153, U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL, 1979.

Hittle, D.C., "Energy Conservation Strategies for Army Installations. Final Report," U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL, pp. 33, January 1984. (Available through NTIS, PC A03/MF A01, Report No. AD-A-137918/9; CERL-IR-E-187).

Hittle, D.C., Bishop, "An Improved Root-Finding Procedure for Use in Calculating Transient Heat Flow Through Multilayered Slabs," Journal of Heat and Mass Transfer, Vol. 26, No. II pp. 1685-1693.

Hittle, D.C., D.L. Herron, "Simulation of the Performance of Multizone and Variable Volume HVAC Systems in Four Geographical Locations," ASHRAE Transactions, Vol. 83, Part 1, 1977.

Hittle, D.C., R.E. O'Brien, G.S. Percivall, "Analysis of Energy Conservation Alternatives for Standard Army Buildings. Final Report," U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL, pp. 144, March 1983. (Available through NTIS, PC A07/MF A01, Report No. AD-A-129963/5; CERL-TR-E-183).

Hittle, D.C., B. Sliwinski, Construction Engineering Research Laboratory (CERL) Thermal Loads Analysis and Systems Simulation Program, Vol. 1 and 2, Interim Report E-81 U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL, 1975.

Hittle, D.C., G.N. Walton, D.F. Holshouser, D.J. Leverenz, "Predicting the Performance of Solar Energy Systems," Interim Report E-98, U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL.

Hittle, D.C., G.N. Walton, D.F. Holshouser, "Method for Estimating Solar Heating and Cooling System Performance," ASHRAE Transactions, Vol. 82, Part 2, pp. 56-65, 1976.

Jensen, R.N., "Design of an Energy Conservation Building," National Aeronautics and Space Administration, Hampton, VA, pp. 32, November 1981. (Available through NTIS, PC A03/MF A01, Report No. NASA-TM-83175).

Judkoff, R., D. Wortman, J. Burch, "Empirical Validation of Building Energy-Analysis Simulation Programs: A Status Report," Passive and Hybrid Solar Energy Update Conference, Washington, DC, September 15, 1982, (Available from NTIS, MF A01, Report No. SERI/TP-254-1721; Conf-820940-5, or contact authors of the Solar Energy Research Institute, Golden, CO.)

Judkoff, R., D. Wortman, J. Burch, "Empirical Validation Using Data From the SERI Class-A Validation House," American Solar Energy Society Meeting, June 1, 1983, Minneapolis, MN. (Available through NTIS, MF A01, Report No. SERI/TP-254-1928; CONF-830622-9).

Judkoff, R., D. Wortman, J. Burch, "Measured Versus Predicted Performance of the SERI Test House: A Validation Study" ASME/AIChE National Heat Transfer Conference, Seattle, WA, July 24, 1983, (Available through NTIS, PCAO2/MF A01, Report No. SERI/TP-254-1953; Conf-830702-16).

Kammerud, R., B. Andersson, W. Carrol, C. Christensen, B. Curtis, M. Hannifan, W. Place, "Human Comfort and Auxiliary Control Considerations in Passive Solar Structures," Building Energy Management, Conventional and Solar Approaches, Proceedings of the International Congress, Povoá de Varzim, Portugal, pp. 241-250, May 12-16, 1980, Pergamon Press, New York, NY and Oxford, England, 1981.

Kammerud, R., B. Andersson, F.E. De Oliveica, "Human Comfort and Auxiliary Control Considerations in Passive Solar Structures," Building Energy Management, Conventional and Solar Approaches, Proceedings of the International Congress,

Povoa de Varzim, Portugal, pp. 241-250, May 12-16, 1980, Pergamon Press, New York, NY and Oxford, England, 1981.

Kammerud, R., W. Place, "Building Energy Analysis of Integrated Passive Designs," U.S. Department of Energy Passive and Hybrid Solar Energy Program Update Meeting, Washington, DC, pp. 3.33-3.36, September 21, 1980, (Available through NTIS, PC A16/MF A01, Report No. Conf-800972)

Kammerud, R.C., W. Place, "The Effect of Occupant Use Patterns on the Performance of Direct-Gain Passive Solar Systems," Proceedings of the 2nd International Conference on Energy Use Management, Los Angeles, CA, Vol. 3, pp. 1367-1374, October 22-26, 1979. (also see LBL Report No. LBL-9370).

Kao, J.Y., E.T. Pierce, "Sensor Errors: Their Effects on Building Energy Consumption," ASHRAE Journal, Vol. 25, No. 12, pp. 42-45, December 1983.

Kirts, R.E., "Control Strategies for Reducing Heating, Ventilating, and Air Conditioning (HVAC) Energy Consumption in Single Buildings: Final Report January - June 1982," Naval Civil Engineering Laboratory, Port Hueneme, CA, March 1983. (Available through NTIS, PC A03/MF A01, Report No. AD-A-128748/1; NCEL-TN-1658.

Kusuda, T., C.B. Lowenhaupt, "Simplified Analysis of Thermal and Lighting Characteristics of Windows: Two Case Studies," National Bureau of Standards, Building Science, No. 109, pp. 105, February 1978, National Bureau of Standards, Washington, DC.

Lawrie, L.K., W. Klock, D. Leverenz, "Evaluation of Microcomputer Energy Analysis Programs. Final Report," U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL. (Available through NTIS, PC A03/MF A01, Report No. AD-A-144684/8; CERL-TR-E-193).

Leverenz, D.J., D.L. Herron, J. Eidsmore, R.E. O'Brien, "Use of the Building Loads Analysis and System Thermodynamics (BLAST) Computer Program to Review New Army Building Designs for Energy Efficiency," Technical Report E-190, October 1983, U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL.

Leverenz, D.J., D.L. Herron, A. Stumpf, A. Eidsmore, "Energy Impact Analysis of the Military Construction - Army Building Delivery System," Technical Report E-188, October 1983, U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL.

Leverenz, D.J., D.L. Herron, A. Stumpf, T.N. Veriroglu, (eds.), "Implementing Energy Conservation into the MCA Process," presented at the 4th Miami International Conference on Alternative Energy Sources, Miami Beach, FL, December 14, 1981, University of Miami, Coral Gables, FL, 1982. Also published by U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL, 1982.

Martin, M., "Ventilation Cooling of Nonresidential Buildings," Proceedings of the Passive and Hybrid Solar Energy Update, pp. 189-195, September 5, 1984, (Available through NTIS, Report No. CONF-8409118.)

NECAP: NASA Energy/Cost Analysis Program, Vol. I, User's Manual and Vol. II, Engineering Manual, NASA Report CR-2590, September 1975.

Patterson, R.J., "Conservation of Energy in the Residential Building Community via Computer Applications," Michigan State University, East Lansing, MI, pp. 177, 1981.

Peavy, B.A., D.M. Burch, F.J. Powell, C.M. Hunt, "Comparison of Measured and Computer-Predicted Thermal Performance of a Four Bedroom Wood-Frame Townhouse," Building Science Series No. 57, April 1975, Institute for Applied Technology, National Bureau of Standards, Washington, DC.

Peterson, J.L., B.D. Hunn, "Application of DOE-2 in the Predesign Phase of Commercial Building Design, Proceedings of the Annual Meeting, American Section, International Solar Energy Society, Houston, TX, Vol. 5, pp. 767-72, June 1, 1982.

Place, W., C. Conner, R.C. Kammerud, B. Andersson, F. Bauman, W. Carroll, A. Mertol, T. Webster, M. Fontoynt, T.C. Howard, "Predicted Impact of Roof Aperture Design on the Energy Performance of Office Buildings," Energy and Buildings, Vol. 6, No. 4, pp. 361-373, presented at the International Daylighting Conference, Phoenix, AZ, February 1983.

Place, W., P. Coutier, M. Fontoynt, R.C. Kammerud, B. Andersson, F. Bauman, W.L. Carroll, T.C. Howard, A. Mertol, T.L. Webster, "Predicted Impact of Linear Roof Apertures on the Energy Performance of Office Buildings," Proceedings of the Passive and Hybrid Solar Energy Update Conference, Washington, DC, September 26, 1983. (Available through NTIS, PC A13/MF A01; 1, Report No. CONF-830980).

Place, W., M. Fontoynt, C. Conner, R. Kammerud, B. Andersson, F. Bauman, W. Carroll, T.C. Howard, A. Mertol, T. Webster, "Daylight Strategies," Passive and Hybrid Solar energy Update conference, Washington, DC, September 15, 1982. (Available through NTIS, PC A16/MF A01, Report No. CONF-820940).

Place, W., M. Fontoynt, C. Conner, R.C. Kammerud, B. Andersson, F. Bauman, W. Carroll, T.C. Howard, A. Mertol, T. Webster, "Roof Apertures in Office Buildings," Energy and Buildings, Vol. 6, 1984, pp. 361-373. Also in Proceedings, International Daylighting Conference, Phoenix, AZ, February 16-18, 1983. (also see LBL Report No. LBL-14790).

Place, W., M. Fontoynt, R.C. Kammerud, F. Bauman, B. Andersson, T.C. Howard, "Commercial Building Daylighting," Proceedings of the 7th National Passive Solar Conference, August 29-September 1, 1982, pp. 453-458. (also see LBL Report Nos. LBL-14790 and LBL-14348).

Place, W., R.C. Kammerud, W. Carroll, B. Curtis, B. Andersson, C. Christensen, M. Hannifan, "Human Comfort and Auxiliary Control Considerations in Passive Solar

Structures," Proceedings, AS/ISES Solar Jubilee, June 2-6, 1980, pp. 821-825. Also in Proceedings, International Congress on Building Energy Management, May 12-16, 1980. (also see LBL Report No. LBL-10034).

Powell, J.W., K.A. Barnes, "Comparative Analysis of Economic Models in Selected Solar Energy Computer Programs: Final Report (F-Chart 3.0, F-Chart 4.0; SOLCOST, BLAST, and DOE-2 codes)," National Bureau of Standards, Washington, DC, January 1982. (Available through NTIS, PC A06/MF A01, No. N-8312589, Report No. PB-82-184995; NBSIR-81-2379.)

Robertson, D.K., J.E. Christian, "Comparisons of Four Computer Models with Experimental Data from Test Buildings in Northern New Mexico," ASHRAE Transactions, Vol. 91, Part 2B, pp.591-607, 1985. (Available through NTIS, PC A02/MF A01; 1, Report No. CONF-850606-15.

Romanko, K.J., W. Rudoy, "Some Effects of Thermal Mass in Multifamily Dwellings - 2. Effects on Heating and Cooling Loads," Westinghouse Electric Corporation, Monroeville, PA. (Also the ASHRAE 1981 Annual Meeting, Cincinnati, OH.)

Sowell, E., "The BLAST Program, Version 2.0: Input Booklet," Report No. CERL-TR-E-154, U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL, June 1979.

Spielvogel, L.G., "Comparisons of Energy Analysis Computer Programs," ASHRAE Transactions, Vol. 83, Part 2, pp. 293-299, 1977.

Spitler, J.D., D.C. Hittle, D.L. Johnson, C.O. Pedersen, "Fan Electricity Consumption for Variable Air Volume," ASHRAE Transactions, Vol. 92, Part 2B, pp. 5-18, 1986.

Sullivan, P., D. Mahone, W. Fuller, R.C. Kammerud, W. Place, B. Andersson, "Incremental Cooling Load Determination for Passive Direct-Gain Systems," Proceedings, AS/ISES Annual Meeting, 27-30 May 1981. (also see LBL Report No. LBL-12048).

Tavana, M., H. Akbari, T. Borgers, R.C. Kammerud, "A Simulation Model for the Performance Analysis of Roof Pond Systems for Heating and Cooling," Proceedings, AS/ISES Solar Jubilee, June 2-6 1980, pp. 816-820. (also see LBL Report No. 9292.)

Tichy, J., C. Quinn, "Simulation Analysis of Trombe Wall System Performance Based on the Akbari-Borgers Channel Flow Solution," Rensselaer Polytechnic Institute, Troy, NY.

Treado, S., J. Barnett, T. Kusuda, "Energy and Cost Evaluation of Solar Window Film Use in an Office Building, Technical Note (Final)," National Bureau of Standards, Washington, DC, March 1983. (Available through NTIS, PC A07/MF A01, Report No. PB-83-214692; NBS-TN-1174.)

Treado, S., G. Gillette, T. Kusuda, "Daylighting with Windows, Skylights, and Clerestories," Energy and Buildings, Vol. 6, No. 4, pp. 319-335, 1984, presented at the International Daylighting Conference, Phoenix, AZ, February 1983.

Treado, S., G. Gillette, T. Kusuda, "Evaluation of the Daylight and Energy Performance of Windows, Skylights, and Clerestories," National Bureau of Standards, Washington, DC, pp. 27, June 1983. (Available through NTIS, PC, A03/MF A01, Report No. PB-83-240481).

Turiel, I., R. Boschen, M. Seedall, M. Levine, "Simplified Energy Analysis Methodology for Commercial Buildings," Energy and Buildings, Vol. 6, No. 1, pp. 67-83, January 1984.

Windingland, L., "Parametric Analysis of Energy Consumption in Army Buildings by the Building Loads Analysis and System Thermodynamics (BLAST) Computer Program," Technical Report No. E-162, August 1980, U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL.

Yuill, G.K., E.G. Phillips, "Comparison of BLAST Program Predictions with the Energy Consumptions of Two Buildings," ASHRAE Transactions, Vol. 87, Part 1, pp. 1200-1206, 1981.

Yuill, G.K., P. Ramsay, F.A. Curtis, "Use of Solar Energy in Air Traffic Control Cabs," ENERGEX '82 - A Forum on Energy Self-Reliance: Conservation, Production and Consumption, Regina, Canada, Vol. II, pp. 1200-1203, August 23, 1982.

Algorithms and Calculation Procedures

- Brisken, W.R., S.G. Reque, "Heat Load Calculations by Thermal Response," ASHRAE Transactions, Vol. 62, pp. 391, 1956.
- Burch, D.M., B.A. Peavy, F.J. Powell, "Experimental Validation of the NBS Load and Indoor Temperature Prediction Model," ASHRAE Transactions, Vol. 80, Part 2, pp. 291-313, 1974.
- Cumali, Z., P. Davis, G. Courville, E. Bales, (eds.), "Analysis of the Thermal Mass Effect of Ground Using Multidimensional Response Factors," Proceedings of the Building Thermal Mass Seminar, Knoxville, TN, June 2, 1982. (Available through NTIS, PC A21/MF A01, 1, Report No. CONF-8206130.)
- Dougall, R.S., R.G. Goldthwait, "Effect of Interior Partitions and Thermal Mass in Modeling Small Homes with an Hour-by-Hour Computer Program," Heat Transfer in Energy Conservation, Presented at the Winter Annual Meeting of ASME, Atlanta, GA, November 27 - December 2, 1977, pp. 17-25, Published by ASME, New York, NY.
- Groth, C.C., M. Lokmenhekim, "Shadow-A New Technique for the Calculation of Shadow Shapes and Areas by Digital Computer," Second Hawaii International Conference on System Sciences, Honolulu, HI, January 22-24, 1969.
- Gupta, C.L., "A Systems Model for Environmental Design of Buildings," National Bureau of Standards, Building Science Series No. 39, Washington, DC, 1971.
- Hittle, D.C., "Calculating Building Heating and Cooling Loads Using the Frequency Response of Multi Layered Slabs," Ph. D. Thesis, University of Illinois, Urbana, IL, 1981.
- Hittle, D.C., "An Algorithm for Modeling a Direct Expansion Air-Cooled Condensing Unit," ASHRAE Transactions, Vol. 88, Part 2, 1982.
- Hittle, D.C., D.L. Johnson, "New Control Design Principles Based on Measured Performance and Energy Analysis of HVAC (Heating, Ventilating, and Air Conditioning) Systems. Interim Report," U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL, pp. 46, January 1985. (Available through NTIS, PC A03/MF A01, Report No. AD-A-151708/5/XAB; CERL-IR-E-85/02.)
- Hittle, D.C., D.L. Johnson, "Summary of USA-CERL Research on Control of Heating, Ventilating, and Air-Conditioning Systems. Final Report," U.S. Army Construction Engineering Research Laboratory (USA-CERL), Champaign, IL, pp. 20, July 1984. (Available through NTIS, PC A02/MF A01, Report No. AD-A-145530/2; CERL-SR-E-197.)
- Hittle, D.C., C.O. Pedersen, "Calculating Building Heating Loads Using the Frequency Response of Multi-Layered Slabs," ASHRAE Transactions, Vol. 87, pp. 545-568, 1981.

- Jensen, R.N., "NECAP 4.1: NASA's Energy-Cost Analysis Program Engineering Flow Chart," National Aeronautics and Space Administration, Hampton, VA, May 1982. (Available through NTIS, PC A08/MF A01, Report No. N-8233826; NASA-TM-83242.)
- Jensen, R.N., "NECAP 4.1: NASA's Energy-Cost Analysis Program Input Manual," National Aeronautics and Space Administration, Hampton, VA, May 1982. (Available through NTIS, PC A07/MF A01, Report No. N-8230708; NASA-TM-83239.)
- Jensen, R.N., R.H. Henninger, "NECAP 4.1: NASA's Energy-Cost Analysis Program User's Manual," National Aeronautics and Space Administration, Hampton, VA, July 1983. (Available through NTIS, PC A12/MF A01, Report No. N-83-35499; NASA-TM-83238.)
- Jensen, R.N., D.L. Miner, "NECAP 4.1: NASA's Energy-Cost Analysis Program Fast Input Manual and Example," National Aeronautics and Space Administration, Hampton, VA, August 1982. (Available through NTIS, PC A04/MF A01, Report No. N-8310566; NASA-TM-83241.)
- Kerrisk, J., N. Schnurr, J. Moore, B. Hunn, "The Custom Weighting Factor Method for Thermal Load Calculations in the DOE-2 Computer Program," Symposium paper CI-81-3 No 3, presented at ASHRAE Annual Meeting, Cincinnati, OH, June 28 - July 2, 1981.
- Kusuda, T., "Comparison of Energy Calculation Procedures," ASHRAE Journal, Vol. 23, No. 8, pp. 21-24, August 1981.
- Kusuda, T., "Fundamentals of Building Heat Transfer," Journal of Research of the National Bureau of Standards, Vol. 82, No. 2, pp. 97-106, September - October 1977, National Bureau of Standards, Washington, DC.
- Kusuda, T., "NBSLD, The Computer Program for Heating and Cooling Loads in Buildings," NBS Building Science Series 69, National Bureau of Standards, Washington, DC, July 1976.
- Kusuda, T., "Procedure Employed by the ASHRAE Task Group for the Determination of Heating and Cooling Loads for Building Energy Analysis," ASHRAE Transactions, Vol. 82, Part 1, pp. 305-314, 1976.
- Kusuda T., "Thermal Response Factors for Multi Layer Structures of Various Heat Conduction Systems," ASHRAE Transactions, Vol. 75, Part 1, pp. 250-269, 1969.
- Kusuda T., T. Alereza, L. Hovander, "Development of Equipment Seasonal Performance Models for Simplified Energy Analysis Methods," Center for Building Technology, National Bureau of Standards, Washington, DC, Vol. 88, Part 2, pp. 249-262, 1982.

Kusuda, T., E.T. Pierce, J.W. Bean, "Comparison of Calculated Hourly Cooling Load and Attic Temperature with Measured Data for a Houston Test House," ASHRAE Transactions, 1981, Vol. 87, Part 1, pp. 1185-1199, (Ch-81-18 No 1), 1981.

Kusuda, T., F.J. Powell, "Use of Modern Computer Programs to Evaluate Dynamic Heat Transfer and Energy Use Processes in Buildings," National Bureau of Standards Special Publication, Vol. 1, No. 361, pp. 407-418, 1972, National Bureau of Standards, Washington, DC.

Kusuda, T., G.N. Walton, G. Courville, E. Bales, (eds.), "Conduction Transfer Functions and the Heat Balance Method for Thermal Simulation of Multiroom Buildings," Proceedings of the Building Thermal Mass Seminar, 1982. Also, Proceedings of the National Bureau of Standards, Washington, DC, pp. 99-176, August 1983. (Available through NTIS, PC A21/MF A01; 1, Report No. CONF-8206130.)

Leverenz, D.J., N. Bergan, "Development and Validation of a Reciprocating Chiller Model for Hourly Energy Analysis Programs," ASHRAE Transactions, Part 1A, pp. 156, 1983.

Mackey, C.O., L.T. Wright, "Periodic Heat Flow - Homogeneous Walls and Roof," ASHVE Transactions, Vol. 50, 1944.

Mackey, C.O., L.T. Wright, "Periodic Heat Flow - Composite Walls and Roof," ASHVE Transactions, Vol. 52, 1946.

Mast W.D., "Comparison Between Measured and Calculated Hourly Heating and Cooling Loads for an Instrumented Building," ASHRAE Symposium Bulletin No. 72-2, 1972.

McCabe, M.E., G.N. Walton, "Validation of New Heat Transfer Algorithms," Proceedings of the Passive and Hybrid Solar Energy Update, National Bureau of Standards, Gaithersburg, MD. Also in proceedings of the US DOE Assistant Secretary for Conservation and Renewable Energy, Washington, DC, Passive and Hybrid Solar Energy Division, pp. 151, October 1984. (Available through NTIS, PC A13/MF A01; 1 Report No. CONF-8409118).

Miner, D.L., "NECAP - NASA's Energy Cost Analysis Program. Operations Manual. Final Report," Computer Sciences Corporation, Hampton, VA, pp. 85, June 1982. (Available through NTIS, PC A05/MF A01, Report No. N-8231770; NASA-CR-165802.

Mitalas, G.P., "Room Thermal Response Factors," ASHRAE Transactions, Vol. 73, Part 1, 1967.

Mitalas, G.P., "Calculation of Transient Heat Flow Through Walls and Roofs," ASHRAE Transactions, Vol. 74, Part 2, 1968.

- Mitalas, G.P., "An Experimental Check on the Weighting Factor Method of Calculating Room Cooling Load," ASHRAE Transactions, Vol. 75, Part 2, pp. 222-232, 1969.
- Mitalas, G.P., "Comments on the Z-Transfer Function Method for Calculating Heat Transfer in Buildings," ASHRAE Transactions, Vol. 84, Part 1, pp. 667, 1978.
- Mitalas, G.P., J.G. Arsenault, "Fortran IV Program to Calculate Heat Flux Response Factors for a Multilayer Lab," National Research Council of Canada, Division of Building Research, Computer Program No. 26, June 1967.
- Mitalas, G.P., "Transfer Function Method of Calculating Cooling Loads, Heat Extraction, and Space Temperature," ASHRAE Journal, Vol. 14, No. 12, pp. 52, December 1972.
- Mouen, E.D., "Application of the Thermal Response Factor Method to Building Elements with Air Cavities," Ph D. Thesis, University of Illinois, 1973.
- Muncey, R.W., "The Thermal Response of a Building to Sudden Changes of Temperature and Heat Flow," Australian Journal of Applied Science, Vol. 14, No. 2, pp. 123, June 1963.
- Muncey, R.W., J.W. Spencer, "Calculation of Non-steady Heat Flow: Consideration of Radiation within the Room," JIHVE, Vol. 34, 1966.
- Peavy, B.A., "A Note on Response Factors and Conduction Transfer Functions," ASHRAE Transactions, Vol. 84, Part 1, pp. 688-690, 1978.
- Pedersen C.O., E.D. Mouen, "Application of System Identification Techniques to the Determination of Thermal Response Factors from Experimentation Data," ASHRAE Transactions, Vol. 79, Part 2, pp. 127, 1973.
- Pedersen C.O., E.D. Mouen, "The Thermal Response Factor Method and Building Elements Containing Air Cavities," Second Symposium on the Use of Computers for Environmental Engineering Related to Buildings, Paris, France, June 13-15, 1974.
- "Procedure for Determining Heating and Cooling Loads for Computerized Energy Calculations Algorithms for Building Heat Transfer Subroutines," Published by Task Group on Energy Requirements for Heating and Cooling, ASHRAE, February 1975.
- Romanko, K.J., W. Rudoy, "Some Effects of Thermal Mass in Multifamily Dwellings - 2. Effects on Heating and Cooling Loads," Westinghouse Electric Corporation, Monroeville, PA. Also the ASHRAE 1981 Annual Meeting, Cincinnati, OH.
- Rudoy, W., L.M. Robins, "Comparison of Cooling Load Calculations," ASHRAE Transactions, Vol. 83, Part 1, pp. 38-50, 1977.
- Sonderegger, R.C., "Dynamic Models of House Heating Based on Equivalent Thermal Parameters," Ph.D. Thesis, Princeton University, NJ, 1977.

- Sowell, E.F., G.N. Walton, "Efficient Computation of Zone Loads," ASHRAE Transactions, Vol. 86, Part 1, 1980.
- Steinmuller, B., P. Minogue, "A Simplified Dynamic Model for Calculating the Thermal Performance of Buildings - Comparison with Experiments and a Detailed Model," International Symposium on Energy Conservation in the Built Environment, Dublin, Ireland, October 1, 1982.
- Stephenson, D.G., "Calculation of Cooling Load by Digital Computer," ASHRAE Journal, pp. 41, April 1968.
- Stephenson, D.G., G.P. Mitalas, "Calculation of Heat Conduction Transfer Functions for Multi Layer Slabs," ASHRAE Transactions, Vol. 77, Part 2, pp. 117, 1971.
- Stephenson D.G., G. P. Mitalas, "Room Thermal Response Factors," ASHRAE Transactions, Vol. 73, Part 1, pp. III.2.1, 1967.
- Stephenson, D.G., G.P. Mitalas, "Cooling Load Calculations by Thermal Response Factors," ASHRAE Transactions, Vol. 73, Part 1, pp. III, 1967.
- Walton, G.N., "A New Algorithm for Radiant Interchange in Room Loads Calculations," ASHRAE Transactions, Vol. 86, Part 2, 1980.
- Walton, G.N., "The Application of Homogenous Coordinates to Shadowing Calculations," ASHRAE Transactions, Vol. 85, Part 1, pp. 174-180, 1979.
- Walton, G.N., "Passive Solar Extension of the BLAST Program," Draft Report, U.S. Army Construction Engineering Laboratory (USA-CERL), Champaign, IL, December 1980.
- Weise, M.R., "NECAP 4.1: NASA's Energy Cost Analysis Program Thermal Response Factor Routine," Computer Sciences Corporation, Hampton, VA, August 1982. (Available through NTIS, PC A04/MF A01, Report No. N-8310562; NASA-CR-165982.)