

CONTENTS

Host Chapter: Rocky Mountain	1
Program Committee	1
Transactions Staff	1
The State of the Society by Hugh D. McMillan, Jr.	2
The Space Shuttle: Today's System for Tomorrow's World by Col. John L. Fisher	3
Summaries of Technical Sessions, Symposiums, Seminars, and Forums	4

TECHNICAL PAPERS

FIRST TECHNICAL SESSION

2586	Characteristics of Refrigerant Flow in a Capillary Tube by Hisao Koizumi and Kunio Yokoyama	19
2587	A Small-Sized, Oblong, Universal Burner with Low NO _x Emission by Takashi Hashimoto, Shigeyuki Yamazaki and Tadashi Shinozaki	28
2588	The Bidirectional Coil Loop Thermosiphon Heat Exchanger (RP-188) by Thomas W. McDonald and S. Sampath	37
2589	Selection of Working Fluids Appropriate for Solar Rankine Cycle Cooling of Buildings by Ezzat I. Wali ..	48
2590	The Effect of Noncondensable Gases on the Performance of an R-11 Centrifugal Water Chiller Condenser (RP-225) by Ralph L. Webb, A.S. Wanniarachchi and T.M. Rudy	57
2591	Calcium Carbonate Scaling Characteristics of Cooling Tower Water by K.E. Coates and J.G. Knudsen ..	68

SECOND TECHNICAL SESSION

2592	Air Quality Levels in a Two-Zone Space by Laurence C. Rodgers	92
2593	Sizing an Air-Cleaning System by Laurence C. Rodgers	99
2594	The Performance of a Continuous Linear Air Diffuser in the Perimeter Zone of an Office Environment by Gordon H. Hart and Daniel Int-Hout	107
2595	Thermal Comfort during Cyclical Temperature Fluctuations (RP-198) by Frederick H. Rohles, Jr., George A. Milliken, Donald E. Skipton, and Ivanka Krstic	125
2596	Comfort Limits for Heated Ceilings by P.O. Fanger, L. Banhidi, B.W. Olesen and G. Langkilde	141

THIRD TECHNICAL SESSION

2597	Hydronics and Control Valve Selection by John A. Olson	157
2598	Life Cycle Cost Analysis for Buildings by Robert P. Charette	167
2599	A New Algorithm for Radiant Interchange in Room Loads Calculations by George N. Walton	190
2600	Infrared Audits of Roof Heat Loss by Douglas M. Burch	209
2601	Indoor Sound Rating Criteria by Lewis S. Goodfriend	227

FOURTH TECHNICAL SESSION

2602	Survey of Published Heat Transfer Coefficients Encountered in Food Refrigeration Processes (RP-228) by Javier Arce and Vincent E. Sweat	235
2603	Review and Analysis of the Transient Method for Determining Thermal Diffusivity of Fruits and Vegetables by Jerome J. Gaffney, Carl D. Baird and William D. Eshleman	261
2604	Spray Head Design on Fishing Vessels Using Sprayed Refrigerated Seawater by Edward R. Kolbe	281
2605	Rail Vehicle Air-Conditioning Equipment with Overload Relieving System by Toshiharu Matsuda, Seigo Miyamoto and Yasuo Minoshima	290
2606	A New Power Saving Household Refrigerator-Freezer by Toshiyuki Onishi	299

FIFTH TECHNICAL SESSION

2607	Reducing Residential Energy Growth with More Efficient Space Heating Equipment by Dennis L. O'Neal and Eric A. Hirst	311
------	--	-----

2608	Efficiency Improvement Concepts for Residential Gas-Fired Furnaces and Water Heaters by Sherwood G. Talbert, Abbott A. Putnam and Douglas W. DeWerth	327
2609	Field Measurements of a Mobile Home Unitary Heat Pump (in a Heating Mode) by Gordon H. Hart and Victor W. Goldschmidt	347
2610	A Note on the Transient Performance and Degradation Coefficient of a Field Tested Heat Pump—Cooling and Heating Mode by Victor W. Goldschmidt, Gordon H. Hart and Richard C. Reiner.	368
2611	Residential Hybrid Heat Pump State-of-the-Art Assessment by Morton H. Blatt and Robert C. Erickson	376

SYMPOSIUM PAPERS

DV-80-1	BARRIERS AND INCENTIVES IN SOLAR APPLICATIONS	
	Barrier or Incentive: Should Public Utilities Be Involved with Solar Energy? by Mark S. Menzer	397
	An Analysis of Code Related Responses from the Solar Demonstration Program by Joseph Greenberg	403
	Making State Solar Laws Work: Results of a Study of State Solar Energy Incentives by J. David Roessner	413
DV-80-2	ENERGY MANAGEMENT AND CONSERVATION IN GREENHOUSES	
	Research on Conservation and Solar Energy Utilization in Greenhouses by William J. Roberts and David R. Mears	433
	Energy Management and Conservation in Greenhouses —A Manufacturer's View by Harold E. Gray	443
	Energy Conservation Ideas for New and Existing Commercial Greenhouses by Ted H. Short, Michael F. Brugger and William L. Bauerle	448
	Energy-Efficient Crop Production in Greenhouses by Henry M. Cathey	455
DV-80-3	HEAT PUMP CONTROLS	
	Heat Pump Control Solutions Using Advanced Microelectronic Technology by Dale A. Mueller and Ulrich Bonne	461
	Maximizing COP of Water-to-Air Heat Pumps through Condenser Water Temperature Optimization by J. Robert Snyder	475
	Control of a Heat Pump/Storage/Solar Hot Water-Chilled Water Central Plant by Howard Nordeen	483
DV-80-4	DYNAMIC ANALYSIS FOR ENERGY SAVINGS	
	An Experimental Validation of a Rational Model for Dynamic Responses of Buildings by D. Paul Mehta and James E. Woods	497
	Transient Thermal Behavior of an Externally Insulated Massive Building by Parambir S. Gujral, Raymond J. Clark and Douglas M. Burch	521
	The Impact of HVAC Process Dynamics on Energy Use by Dennis E. Miller	535
DV-80-5	ENCLOSED VEHICULAR FACILITIES	
	Fort McHenry Tunnel Ventilation System by Paul K. Hinkley	557
	Variable Pitch Axial Flow Fans for Tunnel Ventilation: A Comparison to Centrifugal Fans by Hans D. Baesel	573
	Contaminant Level Control in Parking Garages (RP-223) by Alexander R. Stankunas, Paul T. Bartlett and Kevin C. Tower	584
DV-80-6	COOL STORAGE	
	Direct Cooling Utilizing Aquifer Thermal Energy Storage by Walter J. Schaetzle, Charles E. Brett and David M. Grubbs	609
	Residential Ice Storage as a Load Management Tool by Richard H. Auris	623
	Design and Control Strategies for Energy Storage by Gideon Shavit	631

DV-80-7	HEAT TRANSFER AND PRESSURE DROP IN REFRIGERATION CONDENSERS AND EVAPORATORS	
	Heat Transfer and Pressure Drop during Condensation Inside Horizontal Tubes with Static Mixer Inserts by S.T. Lin, Naim Z. Azer and L.T. Fan	649
	Laminar Heat Transfer in a Circular Tube with Twisted Tapes during Condensation by Wayne A. Helmer and Javaid Iqbal	662
	Pressure Drop in Evaporative Two-Phase Vertical Upflow of Freon-11 in a Small-Diameter Tube by Abdo H. Abdelmessih and Yemo Adeniji-Fashola	675
	The Effects of Air Flow Maldistributions on Air-to-Refrigerant Heat Exchanger Performance by Thomas J. Fagan, Jr.	699
DV-80-8	WHAT CANADIANS ARE DOING TO CONSERVE ENERGY THROUGH THERMAL STORAGE	
	Thermal Storage in Robson Square, Vancouver, British Columbia by Edward I. Mackie	717
	A System for Maximizing Solar Collection with Thermal Storage by B.T. Tamblyn	724
	Thermal Storage and Water Source Heat Pumps in Canada by Thomas W. Rogers	731
	Ontario Government's Experience with Thermal Storage in New and Existing Buildings by Walter S. Chick, Sr.	741
DV-80-9	CALCULATING INFILTRATION: AN EXAMINATION OF THE MODELS	
	Calculating Infiltration: An Examination of Handbook Models by John E. Janssen, A. Noel Pearman and Thomas J. Hill	751
	Application of a Generalized Model of Air Infiltration to Existing Homes by James T. Cole, Thomas S. Zawacki, Robert H. Elkins, Jon W. Zimmer and Robert A. Macriss	765
	Infiltration-Pressurization Correlation: Simplified Physical Modeling by Max H. Sherman and David T. Grimsrud	778
	The British Gas Multi-Cell Model for Calculating Ventilation by David W. Etheridge and Donald K. Alexander	808
DV-80-10	CONTROL OF VARIABLE AIR VOLUME TERMINALS	
	Controls for Single-Duct Variable Air Volume Terminal Units by Lloyd W. Geake	825
	System-Powered Variable Air Volume Terminals by John P. Kettler	839
	Comparison and Advantages of Dual-Duct Variable-Volume Control Assemblies in Controlling the Perimeter of Large Buildings by M. Leon Kloostra	848
DV-80-11	THERMAL MODELING OF PASSIVE SOLAR ENERGY SYSTEMS	
	Thermal Modeling of Passive Solar Buildings on a Programmable Calculator by Joseph T. Kohler and Paul W. Sullivan	861
	The Bruce Hunn Residence as Simulated by the DEROB System by David O. Northrup and Francisco Arumi-Noe	873
	Design Charts to Size Direct Gain Passive Systems by James W. Taul, Jr.	889

SOCIETY BUSINESS

Officers, Directors, Committeemen, Staff	900
ASHRAE Technical Committees and Task Groups	903
ASHRAE Standards Project Committees	910
ASHRAE Intersociety Representatives	914
ASHRAE Past Meetings	915
Society Presidents	916
ASHRAE Honors and Awards	917
ASHRAE International Associates	922
In Memoriam July, 1979 to June, 1980	923
Index of Technical and Symposium Papers, Volume 86, Parts 1 and 2	925