Copy

K-49

DOE/R4/10253--T1-Pt.1

p + I

Prefabricated Heat-Exchanging Fireplace

FINAL TECHNICAL REPORT

OF APPROPRIATE TECHNOLOGY GRANT

Grant Number: DE-FG4480R4 10253

BY

Michael A. Schleper
2858 Cliffview Court
Villa Hills, Kentucky 41016

DOE/R4/10253--T1-Pt.1

DE84 000770

June 15, 1981

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

NOTICE

PORTIONS OF THIS REPORT ARE ILLEGIBLE.

It has been reproduced from the best available copy to permit the broadest possible availability.

Handwritten signature

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

MASTER

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

TABLE OF CONTENTS

Summary	.1
Body.	.2
Appendix.	.5
Application for D.O.E. Grant	
Climatological Data	
Diagrams & Sketches	
Equipment Used	
Miscellaneous Invoices	
Operational Data	
Periodical Information	
Progress Photos	
Similar Equipment Info	
U.L.H.&P. Bills & Info	

FINAL TECHNICAL REPORT

RE: Appropriate Technology Grant No. DE-FG4480R4

SUMMARY

The purpose of this project was to research the potential energy efficiency, using the ductwork of a conventional forced-air heating system to distribute the heat produced from a currently manufactured heat-exchanging prefabricated fireplace (see Equipment Used section of appendix).

A heat-exchanging fireplace was installed in a 2000 square foot home and the standard air distribution equipment was ducted directly to the forced-air heating system of the home. The standard air distribution equipment for the fireplace included two squirrel-cage blowers which were connected to a thermostat, allowing a choice of temperature ranges; and a snap disc thermostat was used to disconnect the blowers in order to avoid blowing cold air after the fire died out. Arranged in this manner, one is able to set the regular home thermostat a few degrees lower than the fireplace thermostat, and this will allow the regular heating system to turn on after the fire has gone out in the fireplace.

Energy consumption in both the fireplace and the conventional heating system was monitored (see Operational Data section of the appendix) throughout a heating season and then compared with past heating seasons (see U.L.H.&P. Utility Bills Info section of the appendix) when only a conventional heating system was used.

From the data collected, it was possible to determine the relative merits of using a heat-exchanging fireplace interconnected with a conventional forced-air heating system as an energy saving device.

While most fireplace packages (see Similar Equipment Info section of the appendix) on the market offer forced-air kits to improve the efficiency by circulating the heat throughout the room, they have not expanded upon this concept to provide a system which could easily be interconnected with the existing forced-air ductwork of a home and efficiently heat the entire house with the fireplace.

Through a detailed analysis of all project data, it was found that, having to incur the initial cost of installing the fireplace in an exsisting structure, made it unfeasible to consider as an energy saving device. If, however, this design could be incorporated into a house under construction, and a fireplace was already planned, substantial savings could result.

BODY

Initially, we began gathering information and manufacturer's brochures for prefabricated fireplace units currently available (see Similar Equipment Info section of appendix). Upon choosing a prefabricated fireplace unit (see Equipment Used section of appendix), we ordered said unit along with various miscellaneous equipment required for this project. At this time, we also continued to gather any and all information available (see Periodical Information section of appendix) which would contribute to our general understanding and knowledge of fireplace systems, heat transfer, effeciencies of varoius types of wood, etc..

We also made arrangements to receive local climatological data from the National Weather Service, located nearby at the Greater Cincinnati International Airport, which would provide information required relating to heating degree days (see Climatological Data section of appendix).

Upon receiving the prefabricated fireplace package, we did a series of measurements to determine the most effecient layout for installing the fireplace and interconnecting it with the exsisting return-air ductwork of the house (see Diagrams and Sketches section of appendix).

We then made arrangements to acquire a supply of firewood for use in the system and proceeded to weigh each piece of wood so we could determine it's approximate value in B.T.U.s (see Progress Photo section of appendix).

Construction of the fireplace took approximately two weeks, with different stages of the work being recorded in the Progress Photo section of the appendix.

During the process of installing the system, no real difficulties were encountered, except that the flue size of the prefab unit needed to be fourteen inches in diameter, instead of the ten inch diameter originally estimated.

This meant considerable additional expense over what was originally estimated.

During the heating season, records were kept for the following data:

- * Total number of days in the heating season = D = 123
from October 28, 1980 to February 27, 1981 incl.
- * Total number of heating degree days in heating season = H = 3891.
- * Total number of hours that the fireplace heat system functions = T = 477.8.
- * Total weight of firewood used = W 5881.25#.
- * Total cost of firewood used = C = \$120.00 = 2 chords.
- * Total electric kilowatt hours used for heating during the heating season = E = 7650.
- * Total cost of electric kilowatt hours used for heating during the heating season = S = \$302.76.

In addition to this data, historical information ("H" and "E") is gathered for the past two heating seasons for this particular home (see U.L.H.&P. Bills & Info section of appendix).

For purposes of this study, it was determined that the house uses 747 kw per month for light and power exclusive of heating, so this figure could be deducted from the utility bills to figure the kw used for heating.

Then the proportion of E/H for each of these past heating seasons would give us the number of kilowatt hours per heating degree day consumed for this particular house. we would add up these two figures and then divide by two to get the average number of kilowatt hours per degree day (equal to A) for this home.

$$1977-1978 \text{ season} \quad \frac{15629 - 2988 \text{ kwh}}{4535} = \frac{12,641}{4535} = 2.787$$

$$1978-1979 \text{ season} \quad \frac{15078 - 2988 \text{ kwh}}{4095} = \frac{12,090}{4095} = 2.952$$

$$2.95 + 2.78 = 5.73$$

$$5.73/2 = 2.869 = A$$

The following equation is then used to determine the number of kilowatt hours of electric saved by using the fireplace heat distribution system (X).

$$\frac{E + X}{H} = A$$

$$E + X = AH$$

$$X = AH - E$$

$$X = 2869(3891) - 7650$$

$$X = 11163.279 - 7650$$

$$X = 3513$$

Next one must compare the number of kilowatt hours of electric saved by the fireplace heat distribution system (X) to the cost of the firewood (C).

$$\frac{C}{X} = \frac{120}{3513} = .03415 \text{ Dollars per kilowatt hour}$$

This C/X is equal to the rate one is paying for wood heat in dollars per kilowatt hour.

The rate one is paying for electric heat is the total cost of kilowatt hours used for the heating season (S) divided by the total number of kilowatt hours used for heating during the heating season (E).

$$\frac{S}{E} = \frac{302.76}{7650} = .0395 \text{ \$/kwh} = \text{rate for elec.heat}$$

If C/X, which is .0341 , is less than S/E, which is .0395, then the amount by which it is less than, represents the amount in dollars that one is saving for every hour the fireplace heat distribution system is used. In this case, one calculates the payback period based on the number of hours the fireplace heat distribution system is used, which results in a savings of .0054 per hour by using this heating system. At an installation cost of \$3,155.00 , you would have to use the fireplace for 584,259 hours or 24,344 days or 66.69 years to get a payback.

As this payback of 66 years is ridiculous to consider, one must realize that the system becomes very feasible if it is installed during the construction phase of a new home, where the owner will more than likely have a fireplace anyway. Then the cost of the additional equipment and a payback period would fall more into the realistic range.

THE END

APPLICATION FOR D.O.E. GRANT

REGION IV

DEPARTMENT OF ENERGY — APPROPRIATE ENERGY TECHNOLOGY
SMALL GRANTS PROGRAM, 1980

APPLICATION FORM

FOR DOE USE ONLY

Date Received: _____

Proposal Number: _____

NOTICE FOR HANDLING PROPOSALS

This proposal shall be used or duplicated only for Department of Energy evaluation purposes, and this notice shall be affixed to any reproduction or abstract thereof. Disclosure of this proposal outside the Government for DOE evaluation purposes shall not be made unless permission is obtained from DOE. The restrictions contained in this notice do not apply to any data or commercial or financial information contained in this proposal if it is already generally available to the public, is already available to the Government on an unrestricted basis or is the property of the Government, or is or becomes available from any source, including the proposer, without restriction.

CONFIDENTIALITY NOTICE

This Notice is to be completed BY THE APPLICANT
if confidential data is contained in the proposal.

The data contained on page(s): __, __, __, __ of this application have been submitted in confidence and contain trade secrets and/or privileged or confidential commercial or financial information, and such data shall be used or disclosed only for evaluation purposes, provided that if a grant is awarded to this applicant as a result of or in connection with the submission of this application, the Government shall have the right to use or disclose the data herein to the extent provided in the grant. This restriction does not limit the Government's right to use or disclose the data obtained without restriction from any source, including the applicant.

- 6a. Principal Applicant (Please print)

(name)

(street)

(city)

(state)

(zip)

(phone number)

(hours)

- (name)

(street)

(city)

(state)

(zip)

(phone number)

(hours)

- 7a. _____ 4-25-80
(Applicant's signature) (date)
- _____
(Title, if applicable)
- 7b. _____
(Co-applicant's signature OR signature of authorized individual within the organization, agency or business)
- _____
(Title, if applicable)

PROJECT DATA SHEET

8. Where did you first hear about the Small Grants Program?

- ☐ Direct mail material
- ☒ Newspapers or magazines
- ☐ Appropriate technology publications
- ☐ Meetings, workshops or conferences
- ☐ Radio
- ☐ Television
- ☐ Friends
- ☐ Other: _____

9. Check the category that **best** describes your project type.

- ☐ **Idea Development** (studies, etc.)
- ☒ **Device Development** (building and testing of new or improved energy-saving devices)
- ☐ **Demonstration** (demonstrating or promoting existing Appropriate Energy Technologies)

10. Check the **one** category that best describes you as an applicant:

- ☒ Individual
- ☐ Local non-profit organization or institution
- ☐ State or Inter-state government agency
- ☐ Local or county government agency
- ☐ College or university
- ☐ Small Business
- ☐ American Indian tribe
- ☐ Other: _____

11. Which of the following category(s) best describes your project?

BIOCONVERSION

- ☐ Agricultural/Forest waste
- ☐ Alcohol production
- ☐ Methane production
- ☐ Municipal waste use
- ☐ Residential waste use
- ☐ Other: _____

CONSERVATION

- ☒ Building design/retrofits
- ☒ Efficiency improvement
- ☐ Energy monitoring/management
- ☐ Recycling

- ☐ Transportation
- ☒ Waste heat recovery
- ☐ Other: _____

ELECTRIC PRODUCTION

- ☐ Co-generation
- ☐ Hydroelectric
- ☐ Other: _____

ENERGY STORAGE

- ☐ Chemical
- ☐ Inert mass
- ☐ Fluids
- ☐ Other: _____

GEO THERMAL

- ☐ Space/Water heating
- ☐ Power generation
- ☐ Other: _____

INFORMATION DISSEMINATION

- ☐ Classroom education
- ☐ Library resource
- ☐ Training workshops
- ☐ Other: _____

COMBINATION SYSTEMS

- ☐ Agricultural
- ☐ Aquatic
- ☐ Residential
- ☐ Other: _____

OCEAN

- ☐ Biomass
- ☐ Thermal
- ☐ Wave
- ☐ Other: _____

SOLAR

- ☐ Active heating/cooling
- ☐ Collectors
- ☐ Passive (greenhouse)
- ☐ Passive (other: _____)
- ☐ Photovoltaic
- ☐ Other: _____

WIND

- ☐ Electric
- ☐ Mechanical
- ☐ Other: _____

WOOD

- ☐ Hot water
- ☐ Space heating
- ☐ Other: _____

12. What are you going to do with your grant?

- ☐ Design and build energy saving devices
- ☐ Demonstrate a modified technology to others
- ☐ Monitor the performance of a specific energy device or system
- ☐ Promote energy awareness through newsletters, libraries, networking, etc.
- ☐ Develop training programs or workshops
- ☐ Perform community energy surveys and assessments
- ☒ Study and report on new energy saving concepts

13. What group(s) will directly benefit from your project?

- ☒ Homeowners
- ☐ Renters
- ☐ Low income/minority groups
- ☐ Farmers
- ☐ Businesses
- ☐ Community agencies
- ☐ Teachers or other researchers
- ☐ Other: _____

14. What is the major energy impact of your project?

- ☐ Developing new renewable energy resources
- ☐ Encouraging energy conservation practices
- ☐ Increasing energy awareness
- ☒ Improving the energy efficiency of existing devices
- ☐ Substituting renewable energy resources for non-renewable resources (e.g., oil, natural gas, coal)

15. Provide a brief, non-technical, descriptive summary of your project. What are you trying to accomplish with your project? The purpose of this project is to research the potential energy efficiency using the ductwork of a conventional forced-air heating system to distribute the heat produced from a currently manufactured heat-exchanging prefabricated fireplace.

A heat-exchanging fireplace will be installed in a 2000 square foot home and the standard air distribution equipment will be ducted directly to the forced-air heating system of the home. The standard air distribution equipment for the fireplace includes two squirrel cage blowers which will be connected to a thermostat, allowing a choice of temperature ranges; and a fan speed control, allowing us to vary the velocity of the air movement. A snap disc thermostat will also be used to disconnect the blowers in order to avoid blowing cold air after the fire dies out. Arranged in this manner, one is able to set the regular home thermostat a few degrees lower than the fireplace thermostat, and this will allow the regular heating system to automatically turn on after the fire has gone out in the fireplace.

Energy consumption in both the fireplace and the conventional heating system will be monitored throughout a heating season and then compared with past heating seasons when only a conventional heating system was used.

From the data collected, it will be possible to determine the relative merits of using a heat-exchanging fireplace interconnected with a conventional forced air heating system as an energy saving device.

16. What special energy-saving devices, systems or information will exist when your project ends? How will others use what you have developed or learned?

While most fireplace packages on the market offer forced-air kits to improve their efficiency by circulating the heat throughout the room, they have not expanded upon this concept to provide a system which could be easily interconnected with the existing forced air ductwork of a home and efficiently heat the entire house with the fireplace.

If project results merit, the energy conservation measures demonstrated could be adapted to both new and existing residential/commercial structures, thus developing and promoting new energy-conserving technology.

This technology would lower our winter dependence on conventional electric or gas fuels used for conventional heating systems and in effect conserve non-renewable energy resources.

It is also my hope that the success of this project would attract attention from local media and spark community interest in overall energy conservation.

17. Detailed project description. Answer **both** parts A and B. Use additional pages, if necessary.

- (A) Provide a complete technical description of your project. Include procedures, drawings and any supporting data that are available. Be sure your answer specifically describes how your project will meet each of the Technical Evaluation Criteria listed in the Program Solicitation Booklet. Clearly indicate any confidential information or data as described in the instructions.
- (B) Fully describe how your project meets the State Review Criteria listed in the Program Solicitation Booklet. Specifically, explain how your project meets community or state energy needs, how you plan to utilize local labor and materials, etc. Describe any special qualities your project has.

PART A

The first step of the project is to install a forced air fireplace, giving careful thought to such considerations as the outside air intake location, close and easy access to home forced air heating system supply ductwork, and practical routing of flue piping.

The following sketch shows the manner of installation:

Continued on page A-5.1

∴, the thermostat and fans are connected according to the following electrical diagram:

Note that the white lead from the 110 volt AC power source at left does not connect to the thermostat, 3-way switch, or fan speed control. It merely ties off in each box with wire nuts. When the red wire is added, it does not connect to the thermostat, but ties off with wire nuts.

During the heating season, records are kept on the following data:

Total number of days in the heating season = D
 Total number of heating degree days in heating season = H
 Total number of hours that fireplace heat system functions = T
 Total weight of firewood used = W
 Total cost of firewood used = C
 Total electric kilowatt hours used for heating during
 the heating season = E
 Total cost of electric kilowatt hours used for heating
 during the heating season = S

In addition to this data, historic information ("H" and "E") is gathered for the past three heating seasons for this particular home.

Continued on page A-5.2

the proportion of $\frac{E}{H}$ for each of these past heating seasons would give us the number of kilowatt hours per heating degree day consumed for this particular home. We would add up these three figures and then divide by 3 to get the average number of kilowatt hours per degree day (equal to A) for this home.

The following equation is then used to determine the number of kilowatt hours of electric saved by using the fireplace heat distribution system (X).

$$\frac{\text{Total electric kilowatt hrs. used during heating season} + X}{\text{Total number of heating degree days in the heating season}} = A$$

$$\frac{E + X}{H} = A$$

$$E + X = AH$$

$$X = AH - E$$

Next one must compare the number of kilowatt hours of electric saved by the fireplace heat distribution system (X) to the cost of the firewood (C).

$$\frac{C}{X} = ? \text{ Dollars per kilowatt hour}$$

This $\frac{C}{X}$ is equal to the rate one is paying for this wood heat in dollars per kilowatt hour.

The rate one is paying for electric heat is the total cost of kilowatt hours used for heat during the heating season (S), divided by the total number of kilowatt hours used for heating during the heating season (E).

$$\frac{S}{E} = \text{rate one is paying for electric heat in dollars per kilowatt hr.}$$

If $\frac{C}{X}$ is greater than $\frac{S}{E}$, then the amount by which it is greater represents

the amount in dollars that one is saving for every hour the fireplace heat distribution system is used. In this case one calculates the payback period based on the number of hours the fireplace heat distribution system is used.

Continued on page A-5.3

if $\frac{C}{E}$ is greater than $\frac{C}{X}$, then the amount by which it is greater represents

the amount in dollars that one is spending over and above the cost of electric heat to use this fireplace heat distribution system. In this case, the fireplace heat distribution system is not feasible as an energy and money saving device.

Having checked with local building, health, and environmental officials, I have found no institutional barriers which would be encountered in carrying out this project.

PART B

The potential impact of this project is great because, if the system of distributing heat from a fireplace by means of exsisting ductwork is proved feasible, then this energy saving device will be useful to anyone who plans to build a house or commercial structure, having a forced air heating system; or those who wish to install this system in an exsisting structure, having a forced air heating system.

Statistics show that approximately 90% of all new housing in this region employs a forced air heating system.

Wood is also a renewable energy resource that is very available in this entire region.

This proposed heat distribution system would save for the user in two ways. First, the cost of the electric or gas bill for heating would be reduced. Second, the demand for each of these energy resources could be substantially reduced, allowing the utility companies to serve more people without increasing the capacity of their exsisting energy producing systems.

As I stated above, I have found no institutional barriers(e.g., environmental or zoning regulations) that would affect this proposed project.

This project uses exsisting technologies to demonstrate the feasibility of effectively distributing heat from a fireplace throughout a structure by means of exsisting forced air ductwork.

The environmental impace of this project will be positive, as it will reduce consumption of non-renewable natural gas supplies and non-renewable coal supplies currently used to produce electric power in this region. It will also promote the use of more effecient wood burning fireplaces.

Continued on page A-5.4

At present time, the distribution of heat from a fireplace is limited to immediately adjoining rooms at best, with remaining rooms and floors of a structure not benefiting from this heat source.

This project will require no additional funding and will be completed within the shown time frame.

All labor and materials used for this project are locally available and relatively inexpensive.

Standard accounting procedures in the form of a general ledger will be used to record all funds expended with all receipts being retained for record.

18. If you have submitted this proposal to other agencies for funding consideration, list those agencies and indicate the current status of your application with them.

Agency name	Date submitted	Current status
1.		
2.		
3.		
4.		

19. What are the qualifications of all **key** personnel on the project? Include consultants and subcontractors. Show how much time each participant will devote to the project. Only list qualifications that relate to this project.

Mr. Lee Grosser, Mechanical Engineer, 8 hours. Mr. Grosser has been a registered mechanical engineer for 21 years, and will check the engineering and design of the system.

Regal Electric, Electrical contractors for over 10 years, 10 hours. This firm will install the wiring and electrical controls for the project.

Professional Heating Corp. Heating and ventilating contractors, 12 hours. This firm will install ductwork and flue piping.

Siekman Masonry, Masonry contractors for over 15 years. 32 hours. This firm will construct a masonry base and enclosure for the prefabricated firebox.

Michael A. Schleper, carpentry, 60 hours. I intend to assist in all activities including miscellaneous framing and finish work. I have been in the construction field for 10 years and have a B.S. Degree in Construction Management.

20. Time schedule. Please list all major activities you plan during each month of your project. The example given below is based on a solar hot water heating system demonstration project. If your project lasts more than 12 months, add lines to the activity table.

Month After Award	Description of activity(s)
1	get equipment estimates
2	purchase equipment, start site preparation
3	build collectors
4	build collectors, install system
5	install monitoring instruments and test
6	begin monitoring and data analysis
7	monitor collectors, analyze data
8	monitor collectors, analyze data
9	monitor collectors, analyze data
10	monitor collectors, analyze data
11	Begin writing final report, continue monitoring and analysis
12	Submit final report

SAMPLE ONLY

Month After Award	Description of activity(s)
1	July Complete design and engineering.
2	August Get material and equipment estimates.
3	September Purchase material, install and test equipment.
4	October Begin monitoring system and collect data.
5	November Collect data.
6	December Collect data.
7	January Collect data.
8	February Collect data.
9	March Collect data.
10	April Collect data.
11	May Analyze data and begin writing report.
12	June Submit final report.

BUDGET SUMMARY

(See instructions on next page)

Cost Category Number	Cost Category	Totals from Budget Support Sheet
1.	SALARIES and WAGES	\$ 480.00
2.	FRINGE BENEFITS	-
3.	EQUIPMENT	\$ 800.00
4.	MATERIALS/SUPPLIES	\$ 225.00
5.	TRAVEL	-
6.	CONSULTANTS/SUBCONTRACTS	\$1,600.00
7.	SPACE COSTS — RENTALS	-
8.	OTHER COSTS & OVERHEAD	\$ 50.00
TOTAL AMOUNT REQUESTED FROM DOE:		\$3,155.00

COST SHARING SUMMARY (IF APPLICABLE)

OUTSIDE SOURCE OF SUPPORT	AMOUNT
1.	
2.	
3.	
4.	
TOTAL AMOUNT CONTRIBUTED BY OTHERS:	

BUDGET SUPPORT SHEET

(Enter each category total on the the Budget Summary)

1. SALARIES AND WAGES				2. FRINGE BENEFITS	
Personnel	Estimated hours	X	Hourly rate		
Applicant	60		8.00	480	
2.					
3.					
4.					
Total Salaries and Wages				\$ 480	Total Fringe Benefits \$ ---
3. EQUIPMENT COSTS				4. MATERIALS AND SUPPLIES	
Prefabricated firebox				800	
				Framing materials	50
				Misc. parts	10
				Hour meter moniter	65
				Finish materials	100
Total Equipment Costs				\$ 800	Total Materials and Supplies \$ 225
5. TRAVEL COSTS				6. CONSULTANTS AND SUBCONTRACTS	
				Mechanical Engineer 8 hrs. x \$25/hr.	200
				Electrical Contractor	100
				Heating Contractor	400
				Masonry Contractor	900
Total Travel Costs				\$ ---	Total Consultants/Subcontracts Costs \$1600
7. SPACE COSTS AND RENTALS				8. OTHER COSTS & OVERHEAD	
				Stationery & Typing	50
Total Space Costs and Rentals				\$ ---	Total Other Costs & Overhead \$ 50

CLIMATOLOGICAL DATA

LATITUDE 29° 03' N LONGITUDE 84° 40' W ELEVATION (GROUND) 849 FT. STANDARD TIME USED 1457H HRS 250814

DATE	TEMPERATURE °F					DEGREE DAYS BASE °F		WEATHER TYPES ON DATES OF OCCURRENCE		SNOW, ICE, PRECIPITATION		STATION		WIND				SUNSHINE		SPY COVER TENTHS		DATE	
	MAXIMUM	MINIMUM	AVERAGE	DEPARTURE FROM NORMAL	AVERAGE DEW POINT	HEATING DEGREE DAYS WITH WIND	COOLING DEGREE DAYS WITH WIND	1 FOG 2 HAZE 3 THUNDERSTORM 4 ICE PELLETS 5 HAIL 6 BLAZE 7 DUSTSTORM 8 SNOW, HAZE 9 DRIVING SNOW	SNOW, ICE PELLETS IN. 07 AM IN.	PRECIPITATION WATER EQUIVA- LINT IN	SNOW, ICE PELLETS IN. IN. FEET M.S.L.	RESULTANT DIR.	RESULTANT SPEED M.P.H.	AVERAGE SPEED M.P.H.	FASTEST MILE		MINUTES	PERCENT OF POSSIBLE	SUNRISE TO SUNSET	MIDNIGHT TO MIDNIGHT			
															SPEED M.P.H.	DIRECTION							
																					16		17
1	2	3	4	5	6	7A	7B	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
1	41	36	40	4	36	25	0		0	0	0	29	03	29	7.0	8.1	13	27		10	10	1	
2	43	29	36	-1	28	29	0		0	1	1	29	01	30	12.8	14.4	21	29		9	7	2	
3	42	22	32	-5	19	33	0		0	0	0	29	13	31	3.0	6.8	12	29		2	4	3	
4	40	26	34	-3	30	31	0	4	0	39	1	28	04	13	6.8	8.2	21	08		10	10	4	
5	39	20	35	-3	34	30	0	1	0	20	2	28	11	35	11.2	12.8	20	34		10	10	5	
6	39	21	30	-6	25	35	0		0	01	1	29	01	28	10.7	11.8	21	29		7	4	6	
7	39	19	26	-10	22	37	0		1	0	0	29	26	34	9.7	10.4	16	34		4	5	7	
8	44	24	32	-7	24	33	0		0	0	0	29	41	35	5.5	6.3	12	01		10	9	8	
9	44	34	34	-5	26	31	0		0	0	0	29	41	30	2.9	3.6	10	30		6	6	9	
10	50	25	38	-1	27	27	0		0	0	0	29	28	26	5.4	6.2	14	32		10	9	10	
11	41	25	33	-7	24	32	0		0	1	1	29	21	31	8.4	10.4	18	34		10	8	11	
12	56	23	40	0	24	25	0		0	0	0	29	09	23	14.2	14.7	22	24		0	0	12	
13	54	32	43	3	23	22	0		0	0	0	29	55	31	10.6	15.2	21	29		2	2	13	
14	46	20	33	-8	13	32	0		0	0	0	29	18	30	5.0	7.5	17	31		0	0	14	
15	59	24	43	2	23	22	0		0	0	0	29	08	23	12.4	13.1	22	24		9	7	15	
16	56	26	36	-6	24	29	0	1	0	05	1	28	05	33	14.1	17.4	30	35		6	6	16	
17	40	26	36	-4	21	27	0		0	1	1	28	70	26	8.1	15.0	23	24		7	6	17	
18	35	29	34	-8	18	31	0		2	13	2	28	08	03	7.1	10.6	17	06		6	8	18	
19	32	21	27	-16	16	38	0		1	1	1	28	74	30	13.5	13.7	21	31		9	8	19	
20	37	23	30	-13	22	35	0		1	1	1	28	02	28	11.8	12.4	18	28		10	9	20	
21	52	21	37	-6	24	26	0		0	0	0	29	00	11	2.3	7.5	15	08		8	6	21	
22	45	33	39	-5	25	26	0		0	0	0	29	09	07	12.2	12.5	17	10		10	10	22	
23	55	31	43	-1	27	22	0		0	0	0	29	11	02	10.4	11.1	17	02		1	1	23	
24	59	25	42	-3	24	23	0		0	0	0	29	19	31	4.9	6.5	15	31		2	1	24	
25	56	31	44	-1	22	21	0		0	0	0	29	27	05	6.3	8.2	13	36		6	5	25	
26	47	42	55	9	31	10	0	3	0	0	0	29	16	22	12.5	16.4	28	20		9	9	26	
27	58	38	48	2	40	17	0	1	0	12	0	29	28	03	5.2	9.6	15	08		3	4	27	
28	74	36	56	10	37	9	0		0	0	0	29	31	16	9.0	11.4	16	20		1	2	28	
29	74	57	66	19	44	0	1	1	0	40	0	29	00	19	16.6	16.8	25	20		10	10	29	
30	66	50	58	11	47	7	0	1	0	10	0	28	74	23	14.4	16.5	30	24		6	6	30	
31	83	44	64	16	42	1	0		0	6	0	29	00	19	10.3	10.8	22	21		0	0	31	
SUM		SUM		TOTAL		TOTAL		TOTAL		TOTAL		FOR THE MONTH:		TOTAL		TOTAL		TOTAL		TOTAL			
1566		945		766		1		NUMBER OF DAYS		1 72		2 125		04 126		3 7		11 1		30 24			
AVE		AVE		AVE		AVE		PRECIPITATION		DEF		DATE: 30		CROSSING		MONTH		AVE		AVE			
50.5		29.6		40.1		-1.6		27		46		1		2.01 INCH		10		-2.37		6.2		5.9	
NUMBER OF DAYS		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL			
MAXIMUM TEMP.		MINIMUM TEMP.		5066		1		THUNDERSTORMS		1		PRECIPITATION		SNOW, ICE PELLETS		GREATEST DEPTH ON GROUND OF SNOW,		ICE PELLETS OR ICE AND DATE		GREATEST DEPTH ON GROUND OF SNOW,			
39		43		4		0		HAY FOG		01		59		4-5		2 2		16		2 16			
0		1		23		0		AB4		1		CLEAR		5		PARTLY CLOUDY		8		CLOUDY 14			

SUMMARY BY HOURS

AVERAGES										RESULTANT WIND	
WIND LOCAL TIME	SKY COVER PERCENT	STATION TEMPERATURE IN °F.	TEMPERATURE				RELATIVE HUMIDITY %	WIND SPEED M.P.H.	DIRECTION	SPEED M.P.H.	
			AIR °F.	WET BULB °F.	DEW PT. °F.	GROUND °F.					
01	6	29.05	37	33	26	66	10	30	2	1.8	
04	5	29.03	34	31	25	64	8	28	2	2.6	
07	5	29.05	32	29	24	73	6	27	2	2.2	
10	6	29.07	41	37	31	70	11	26	3	3.4	
13	6	29.05	47	40	31	55	14	28	6	4.0	
16	5	29.02	49	40	29	49	14	28	7	7.0	
19	7	29.03	45	37	26	50	11	30	4	4.2	
22	6	29.05	40	35	26	58	10	29	3	3.1	

HOURLY PRECIPITATION (WATER EQUIVALENT IN INCHES)

[illegible]

SUBSCRIPTION PRICE: \$3.30 PER YEAR INCLUDING ANNUAL SUMMARY. FOREIGN MAILING \$1.95 EXTRA. SINGLE COPY: 25 CENTS FOR MONTHLY ISSUE, 30 CENTS FOR ANNUAL SUMMARY. THERE IS A MINIMUM CHARGE OF \$3.00 FOR EACH ORDER OF SHELF-STOCKED ISSUES OF PUBLICATIONS. MAKE CHECKS PAYABLE TO DEPARTMENT OF COMMERCE, NOAA. SEND PAYMENTS, ORDERS, AND INQUIRIES TO NATIONAL CLIMATIC CENTER, FEDERAL BUILDING, ASHEVILLE, NORTH CAROLINA 28801.

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA 28801.

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / ENVIRONMENTAL DATA AND INFORMATION SERVICE

Daniel B. Mitchell
DIRECTOR, NATIONAL CLIMATIC CENTER

MONTHLY SUMMARY

LATITUDE 39° 03' N LONGITUDE 84° 40' W ELEVATION (GROUND) 650 FT. STANDARD TIME USED: EASTERN WHEN #53814

FEBRUARY 1981
GREATER CINCINNATI AIRPORT

DATE	TEMPERATURE °F			DEGREE DAYS		WEATHER TYPES		SHOW. ICE	PRECIPITATION		STATION PRES	WIND		SUNSHINE		SKY COVER		DATE			
	MAXIMUM	MINIMUM	AVERAGE	HEATING	COOLING	1 FOG 2 HEAVY FOG 3 THUNDERSTORM 4 ICE PELLETS 5 HAIL 6 GRAPE 7 DUST/STORM 8 SMOKE, HAZE 9 BLIZZARD	ON DATES OF OCCURRENCE		WATER EQUIVA- LENT	SNOW, ICE PELLETS		RESULTANT DIRECTION	RESUL- TANT SPEED M.P.H.	FASTEST MILE SPEED M.P.H.	DIRECTION	MINUTES	PERCENT OF POSSIBLE	SUNRISE TO SUNSET	MIDNIGHT TO MIDNIGHT		
1	41	31	36	4	29	0	1	0	1.20	0	28.80	19	10.8	13.2	20	18		10	10	1	
2	31	9	20	-12	16	45	0	1	.04	0	28.99	27	15.9	20.4	28	27		9	9	2	
3	15	4	10	-22	5	55	0	1	1	0	29.32	26	13.7	15.1	21	24		7	7	3	
4	20	7	14	-18	7	51	0	1	0	0	29.34	29	11.6	12.8	21	24		2	1	4	
5	26	1	14	-18	7	51	0	1	1	0	29.42	21	6.9	7.8	21	24		5	5	5	
6	34	24	29	-3	23	36	0	1	1	0	29.22	24	10.9	11.5	18	24		10	10	6	
7	42	25	34	2	26	31	0	1	0	0	29.01	21	9.0	10.1	20	22		8	8	7	
8	35	14	25	-7	15	40	0	0	0	0	29.18	20	9.4	10.1	20	22		5	5	8	
9	39	12	26	-6	12	39	0	1	0	0	29.18	20	9.4	10.1	20	22		7	7	9	
10	52	34	43	11	32	22	0	0	.70	1	29.81	15	15.7	17.0	15	17		10	10	10	
11	52	-3	25	-7	16	40	0	1	.26	1	29.09	27	16.9	18.4	30	28		9	9	11	
12	14	-10	2	-31	6	63	0	1	0	0	29.84	20	5.5	7.1	12	17		0	0	12	
13	36	5	21	-12	6	44	0	1	0	0	29.84	12	5.1	5.3	9	10		7	5	13	
14	46	15	31	-2	20	34	0	1	0	0	29.74	11	3.1	4.4	9	10		1	1	14	
15	56	24	40	13	30	25	0	0	0	0	29.55	18	4.7	6.0	13	23		8	7	15	
16	48	44	46	17	43	19	0	0	.27	0	29.36	19	9.4	9.8	14	20		10	10	16	
17	54	48	50	17	50	15	0	1	.06	0	29.29	20	8.2	8.5	14	20		10	10	17	
18	59	39	49	16	53	14	0	2	.34	0	29.20	17	7.2	7.5	12	16		10	9	18	
19	55	46	51	17	53	14	0	2	.30	0	29.96	23	7.2	8.5	22	29		10	10	19	
20	56	36	46	12	42	19	0	1	.01	0	29.91	32	9.2	10.2	17	34		0	2	20	
21	54	37	46	12	39	19	0	0	0	0	29.08	04	2.3	4.9	12	03		10	10	21	
22	62	42	52	18	41	13	0	1	.51	0	29.78	15	11.8	13.2	20	22		10	10	22	
23	47	35	41	6	37	24	0	0	.03	0	29.67	22	17.1	18.4	26	22		9	9	23	
24	45	33	39	4	34	26	0	0	0	0	29.92	24	12.2	13.4	18	24		9	7	24	
25	55	30	43	8	32	22	0	0	0	0	29.13	31	2.5	8.1	13	27		1	0	25	
26	46	30	38	2	30	27	0	0	0	0	29.32	07	11.0	11.5	16	06		1	2	26	
27	58	25	42	6	30	23	0	0	0	0	29.26	12	10.2	11.7	16	12		7	6	27	
28	58	39	49	13	44	16	0	1	.14	0	29.94	25	8.3	12.5	17	22		10	10	28	
SUM		SUM			TOTAL	TOTAL			TOTAL	TOTAL		FOR THE MONTH:				TOTAL	%	SUM	SUM		
1237		674			658	0	NUMBER OF DAYS	3	66	2.6	129.16	22	5.5	11.2	30	28		195	188		
AVE.		AVE.	AVE.	DEF.	AVE.	DEF.	PRECIPITATION	DEF.							DATE: 11	POSSIBLE	MONTH	AVE.	AVE.		
44.2		24.1	34.2	0.9	17	-30	0	0.62										7.0	6.7		
NUMBER OF DAYS		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL	
5		17		2		438		0		0		0		0		0		0		0	
MAX		MIN		MAX		MIN		MAX		MIN		MAX		MIN		MAX		MIN		MAX	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438		0		0		0		0		0		0		0	
5		17		2		438															

JANUARY 1981

GREATER CINCINNATI AIRPORT

1001 491										1261 0										NUMBER OF DAYS										TOTAL										TOTAL										FOR THE MONTH:										TOTAL										SUM										SUM																																																											
AVE AVE AVE DEF AVE DEF DEF										PRECIPITATION										57										4.025										16										126										5.110										1										26										22										1										184										196																			
32.3 15.8 24.1 -7.0 16										210										0										2.01 INCH										5										-2.77																				DATE: 06										MONTHS										MONTHS										AVE										AVE										6										3									
NUMBER OF DAYS										TOTAL										TOTAL										2.0 INCH										1										GREATEST IN 24 HOURS AND DATES										GREATEST DEPTH ON GROUND OF SNOW, ICE PELLETS OR ICE AND DATE																																																																															
MAXIMUM TEMP										MINIMUM TEMP										3440										0										PRECIPITATION										SNOW, ICE PELLETS										3										10+																																																																					
5.0 32										-32										0										DEF										DEF										HAY FEE										0										29										6-7										3.5										6										3										10+																			
0										16										25										5										468										0										CLEAR 10										PARTLY CLOUDY										5										7										2										3										10+																			

MORE OBSERVATIONS PER DAY AT 3-HOUR INTERVALS. FASTEST WIND SPEEDS ARE FASTEST OBSERVED ONE-MINUTE VALUES WHEN DIRECTIONS ARE IN TENS OF DEGREES. THE / WITH THE DIRECTION INDICATES PEAK GUST SPEED.

ANY ERRORS DETECTED WILL BE CORRECTED AND CHANGES IN SUMMARY DATA WILL BE ANNOTATED IN THE ANNUAL SUMMARY.

TOTAL PCPN IS NEW RECORD LOW FOR JANUARY.

AVERAGES										RESULTANT WIND		
HOUR	LOCAL TIME	STATION	COVER (PERCENT)	PRESSURE IN.	TEMPERATURE				RELATIVE HUMIDITY %	WIND SPEED M.P.H.	DIRECTION	SPEED M.P.H.
					AIR °F	WET BULB °F	SOIL 1 FT. °F	°C.				
01	7	26	17	23	21	15	74	5	7	26	5	5
04	7	26	16	22	20	15	76	5	7	26	5	5
07	7	26	17	21	19	15	77	5	7	26	5	5
10	6	26	21	23	22	17	77	10	5	26	5	5
13	6	26	19	28	26	20	73	11	6	26	5	5
16	6	26	16	30	27	19	65	12	6	26	5	5
19	6	26	18	26	23	15	65	8	6	26	5	5
22	7	26	18	24	21	14	68	6	6	26	5	5

[illegible]

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA 28801.

Daniel B. Mitchell
DIRECTOR, NATIONAL CLIMATIC CENTER

USCOMM--NOAA--ASHLEYVILLE

52/24/81

795

LATITUDE 39° 03' N LONGITUDE 84° 40' W ELEVATION (GROUND) 609 FT. STANDARD TIME USED: [AST] MN WEAN #93814

SUMMARY BY HOURS

HOUR	LOCAL TIME	SUN COVER TENTHS	STATION PRESSURE IN.	AVERAGES						RESULTANT WIND	
				TEMPERATURE			RELATIVE HUMIDITY %	WIND SPEED M.P.H.	DIRECTION	SPEED M.P.H.	
				AIR °F	WET BULB °F	DEWPT. °F					
01	7	28	25	32	29	22	70	9	23	1.	
04	7	28	25	31	29	22	70	9	23	1.	
07	7	28	24	30	27	22	72	6	22	2.	
10	8	28	27	33	30	24	71	11	23	3.	
13	7	28	24	37	33	26	67	11	25	4.	
16	8	28	23	37	33	25	63	10	25	5.	
19	8	28	24	34	30	24	66	6	27	2.	
22	7	28	26	32	29	23	69	7	26	2.	

MORE OBSERVATIONS PER DAY AT 3-HOUR INTERVALS. FASTEST MILE WIND SPEEDS ARE FASTEST OBSERVED ONE-MINUTE VALUES WHEN DIRECTIONS ARE IN TENS OF DEGREES, THE / WITH THE DIRECTION INDICATES PEAK GUST SPEED. ANY ERRORS DETECTED WILL BE CORRECTED AND CHANGES IN SUMMARY DATA WILL BE ANNOTATED IN THE ANNUAL SUMMARY.

HOURLY PRECIPITATION (WATER EQUIVALENT IN INCHES)

[illegible]

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA 28801.

Daniel B. Mitchell
DIRECTOR, NATIONAL CLIMATIC CENTER

USCOMM--NDAA--ASHEVILLE

796

MONTHLY SUMMARY

LATITUDE 39° 03' N LONGITUDE 84° 40' W ELEVATION (GROUND) 649 FT. STANDARD TIME USED: EASTERN WHEN OBSERVED

NOVEMBER 1980 GREATER CINCINNATI AIRPORT

DATE	TEMPERATURE °F			DEGREE DAYS		WEATHER TYPES		PRECIPITATION		WIND		SUNSHINE		SKY COVER		DATE
	MAXIMUM	MINIMUM	AVERAGE	DEPARTURE FROM NORMAL	AVERAGE	HEATING INDEX	COOLING INDEX	WATER	SNOW	WIND	WIND	PERCENT	PERCENT	SUNRISE TO	SUNSET TO	
1	58	33	46	-4	31	15	0	0	0	0	0	0	0	5	4	1
2	58	28	43	-7	30	22	0	0	0	0	0	0	0	5	1	2
3	65	41	55	6	39	10	0	0	0	0	0	0	0	5	5	3
4	59	40	50	1	42	15	0	0	0	0	0	0	0	5	2	4
5	53	30	42	-6	32	23	0	0	0	0	0	0	0	5	4	5
6	74	41	57	17	49	24	0	0	0	0	0	0	0	5	4	6
7	50	31	41	-14	42	4	0	0	0	0	0	0	0	5	6	7
8	48	26	37	-16	35	9	0	0	0	0	0	0	0	5	8	8
9	49	26	37	-16	35	9	0	0	0	0	0	0	0	5	8	9
10	34	23	28	-11	22	30	0	0	0	0	0	0	0	5	2	10
11	27	35	31	-11	22	30	0	0	0	0	0	0	0	5	2	11
12	22	35	28	-10	23	30	0	0	0	0	0	0	0	5	2	12
13	65	33	49	4	23	16	0	0	0	0	0	0	0	5	7	13
14	55	42	49	5	28	16	0	0	0	0	0	0	0	5	7	14
15	43	34	39	-5	37	26	0	0	0	0	0	0	0	5	10	15
16	41	29	35	-7	29	30	0	0	0	0	0	0	0	5	7	16
17	35	30	33	-10	28	32	0	0	0	0	0	0	0	5	10	17
18	40	27	34	-9	28	31	0	0	0	0	0	0	0	5	8	18
19	44	23	34	-8	27	31	0	0	0	0	0	0	0	5	2	19
20	48	26	37	-14	27	28	0	0	0	0	0	0	0	5	1	20
21	50	23	37	-14	26	28	0	0	0	0	0	0	0	5	7	21
22	48	24	36	-12	24	30	0	0	0	0	0	0	0	5	7	22
23	45	38	42	-2	42	23	0	0	0	0	0	0	0	5	10	23
24	39	24	32	-8	27	33	0	0	0	0	0	0	0	5	4	24
25	37	22	30	-10	24	35	0	0	0	0	0	0	0	5	2	25
26	46	35	41	-4	32	28	0	0	0	0	0	0	0	5	10	26
27	36	34	35	-2	35	24	0	0	0	0	0	0	0	5	10	27
28	40	33	37	-1	29	30	0	0	0	0	0	0	0	5	10	28
29	40	33	37	-1	29	30	0	0	0	0	0	0	0	5	9	29
30	56	29	43	5	27	22	0	0	0	0	0	0	0	5	4	30
SUM	1517	570	657	6.97	0	0	0	2.58	1.2	29.17	124	2	7	110	1	25
AVE.	50.6	32.3	41.5	-2.3	31	61	0	0.08	0.04	1.0	10.1	0.02	0.02	3.5	0.01	16.0
SEASON TO DATE	50.6	32.3	41.5	-2.3	31	61	0	0.08	0.04	1.0	10.1	0.02	0.02	3.5	0.01	16.0
NUMBER OF DAYS	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
MAXIMUM TEMP.	74	41	57	17	49	24	0	0	0	0	0	0	0	5	4	6
MINIMUM TEMP.	22	28	31	-11	22	30	0	0	0	0	0	0	0	5	2	10
DEP.	15	0	240	103	0	0	0	0	0	0	0	0	0	0	0	0
WEATHER TYPES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PRECIPITATION	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WIND	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUNSHINE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SKY COVER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.
† TRACE AMOUNT.
+ ALSO ON AN EARLIER DATE, OR DATES.
HEAVY FOG - VISIBILITY 1/4 MILE OR LESS.
FIGURES FOR WIND DIRECTIONS ARE TENS OF DEGREES CLOCKWISE FROM TRUE NORTH. DD = CALM.
DATA IN COLS. 6 AND 12-15 ARE BASED ON 7 OR

MORE OBSERVATIONS PER DAY AT 3-HOUR INTERVALS.
FASTEST MILE WIND SPEEDS ARE FASTEST OBSERVED ONE-MINUTE VALUES WHEN DIRECTIONS ARE IN TENS OF DEGREES. THE / WITH THE DIRECTION INDICATES PEAK GUST SPEED.
ANY ERRORS DETECTED WILL BE CORRECTED AND CHANGES IN SUMMARY DATA WILL BE ANNOTATED IN THE ANNUAL SUMMARY

SUMMARY BY HOURS

HOUR	LOCAL TIME	SKY COVER	STATION PRESSURE	TEMPERATURE				RELATIVE HUMIDITY	WIND SPEED	WIND DIRECTION	RESULTANT WIND
				AIR °F	WET BULB °F	DEW PT. °F	°F				
01	4	29.17	38	35	30	75	8.2	22	3.2		
04	4	29.16	37	34	30	78	9.6	22	2.7		
07	4	29.17	36	34	30	81	8.8	24	1.8		
10	6	29.20	42	39	35	78	11.3	25	2.4		
13	6	29.18	48	42	34	64	12.8	27	4.4		
16	6	29.16	49	42	32	56	11.8	26	4.7		
19	6	29.17	43	38	30	63	9.6	25	1.5		
22	5	29.18	40	36	30	69	8.9	22	2.1		

HOURLY PRECIPITATION (WATER EQUIVALENT IN INCHES)

HOUR	A. M. HOUR ENDING AT												P. M. HOUR ENDING AT												HOUR
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
1																									1
2																									2
3																									3
4																									4
5																									5
6																									6
7																									7
8																									8
9																									9
10																									10
11																									11
12																									12
13																									13
14																									14
15																									15
16																									16
17																									17
18																									18
19																									19
20																									20
21																									21
22																									22
23																									23
24																									24
25																									25
26																									26
27																									27
28																									28
29																									29
30																									30

SUBSCRIPTION PRICE: \$3.30 PER YEAR INCLUDING ANNUAL SUMMARY. FOREIGN MAILING \$1.95 EXTRA. SINGLE COPY: 25 CENTS FOR MONTHLY ISSUE, 30 CENTS FOR ANNUAL SUMMARY. THERE IS A MINIMUM CHARGE OF \$3.00 FOR EACH ORDER OF SHELF-STOCKED ISSUES OF PUBLICATIONS. MAKE CHECKS PAYABLE TO DEPARTMENT OF COMMERCE, NOAA. SEND PAYMENTS, ORDERS, AND INQUIRIES TO NATIONAL CLIMATIC CENTER, FEDERAL BUILDING, ASHEVILLE, NORTH CAROLINA 28801.

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA 28801.

noaa

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / ENVIRONMENTAL DATA AND INFORMATION SERVICE

Daniel B. Mitchell
DIRECTOR, NATIONAL CLIMATIC CENTER

USCOMH--NOAA--ASHEVILLE

12-31-80

790

DATE	TEMPERATURE °F			DEGREE DAYS BASE °F		WEATHER TYPES ON DATES OF OCCURRENCE		SNOW, ICE PELLETS OR SLEET		PRECIPITATION	STATION PRESSURE	WIND			SUNSHINE		SKY COVER (%TMS)		DATE				
	MAXIMUM	MINIMUM	AVERAGE	DEPARTURE FROM NORMAL	AT OPEN POINT	HEATING TENSION BEGINS WITH MIN.	COOLING TENSION BEGINS WITH MIN.	1 FOG 2 HEAVY FOG 3 THUNDERSTORM 4 ICE PELLETS 5 HAIL 6 BLIZZARD 7 DUSTSTORM 8 SMOKE, MIST 9 LEAVING SNOW	IN. 07 AM.	WATER EQUIVA- IN.	SNOW, ICE PELLETS IN.	RESIDUAL DIR.	RESULTANT SPEED M.P.H.	AVERAGE SPEED M.P.H.	FASTEST MILE		MINUTES	PERCENT OF POSSIBLE		SUNRISE TO SUNSET	MIDNIGHT TO MIDNIGHT		
															SPEED M.P.H.	DIRECTION							
1	79	49	64	1	57	1	0	1	B	0	0	0	28.93	22	5.4	E.2	12	25			4	2	1
2	68	50	59	-3	49	6	0	1		.21	0	0	28.92	27	6.1	E.5	16	34			6	7	2
3	53	42	48	-14	43	17	0	1		0	1	0	28.93	28	8.1	E.8	18	31			10	9	3
4	50	35	43	-19	35	22	0	2		0	1	0	29.04	29	4.4	E.9	9	27			10	9	4
5	55	33	44	-17	33	21	0	2		0	0	0	29.31	02	1.3	N.9	13	01			3	9	5
6	62	29	46	-15	32	19	0	0		0	0	0	29.36	23	3.6	E.3	14	28			1	4	6
7	71	45	58	-3	41	7	0	0		0	0	0	29.13	24	6.2	E.1	9	25			0	0	6
8	81	42	62	2	51	3	0	1		0	0	0	29.56	22	8.0	E.2	12	23			0	0	9
9	75	53	64	4	54	1	0	0		0	0	0	29.58	04	1.9	E.8	16	05			0	0	9
10	81*	47	64	5	51	1	0	3		.24	0	0	29.55	29	3.6	E.5	16	30			3	3	10
11	42	38	50	-9	36	15	0	0		0	0	0	29.56	28	10.7	E.1	21	29			5	4	11
12	55	33	44	-15	32	21	0	0		0	0	0	29.16	31	1.8	E.1	15	34			3	2	12
13	58	27	43	-15	32	22	0	0		0	0	0	29.29	01	7	E.7	25				1	1	13
14	71	39	55	-3	34	10	0	0		0	0	0	29.19	19	5.2	E.1	14	23			7	8	14
15	78	56	67	10	40	0	2	0		0	0	0	29.15	22	9.2	E.8	15	33			10	10	15
16	80	51	66	9	50	0	1	0		0	0	0	29.18	20	9.3	E.1	16	22			6	5	16
17	71	62	67*	11	57	0	2	1		1.06	0	0	29.00	20	12.3	E.9	20	22			10	10	17
18	66	45	56	0	50	9	0	1		.59	0	0	29.56	28	5.0	E.5	14	22			10	9	18
19	57	33	45	-11	38	20	0	0		0	0	0	29.62	31	8.1	E.8	18	31			2	1	19
20	63	33	48	-7	38	11	0	0		0	0	0	29.05	23	9.6	E.9	17	24			9	7	20
21	69	39	54	-1	43	11	0	0		0	0	0	29.07	24	7.0	E.5	17	26			1	3	21
22	62	42	52	-2	37	13	0	0		0	0	0	29.25	06	8.0	E.6	14	08			4	3	22
23	67	42	55	1	37	10	0	0		0	0	0											

MORE OBSERVATIONS PER DAY AT 3-HOUR INTERVALS.
FASTEST MINUTE WIND SPEEDS ARE FASTEST OBSERVED
ONE-MINUTE VALUES WHEN DIRECTIONS ARE IN TENS
OF DEGREES, THE / WITH THE DIRECTION INDICATES
PEAK GUST SPEED.
ANY ERRORS DETECTED WILL BE CORRECTED AND
CHANGES IN SUMMARY DATA WILL BE ANNOTATED IN
THE ANNUAL SUMMARY

SUMMARY BY HOURS

HOUR	LOCAL TIME	SUN GLASS TEMPERATURE	STATION PRESSURE IN.	AVERAGES						RESULTANT WIND	
				TEMPERATURE			RELATIVE HUMIDITY %	WIND SPEED H. P. H.	DIRECTION	SPEED M. P. H.	
				AIR °F	WET BULB °F	DEW PT. °F					
01	4	29.10	46	43	39	77	6.5	22	2.5		
04	4	29.11	43	41	38	83	6.4	24	2.5		
07	4	29.13	42	40	38	86	6.5	22	2.6		
10	5	29.15	52	47	42	72	10.1	25	3.3		
13	6	29.12	55	50	41	54	11.1	27	5.5		
16	6	29.09	60	50	40	51	10.5	28	5.5		
19	6	29.10	53	46	40	63	7.3	23	2.2		
22	6	29.11	45	44	39	71	7.4	23	2.2		

DEC 12 1980

HOURLY PRECIPITATION (WATER EQUIVALENT IN INCHES)

[illegible]

SUBSCRIPTION PRICE: \$3.30 PER YEAR INCLUDING ANNUAL SUMMARY. FOREIGN MAILING \$1.95 EXTRA. SINGLE COPY: 25 CENTS FOR MONTHLY ISSUE, 30 CENTS FOR ANNUAL SUMMARY. THERE IS A MINIMUM CHARGE OF \$3.00 FOR EACH ORDER OF SELF-STOCKED ISSUES OF PUBLICATIONS. MAKE CHECKS PAYABLE TO DEPARTMENT OF COMMERCE. NOAA SEND PAYMENTS, ORDERS, AND INQUIRIES TO NATIONAL CLIMATIC CENTER, FEDERAL BUILDING, ASHEVILLE, NORTH CAROLINA 28801.

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA 28801.

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / ENVIRONMENTAL DATA AND INFORMATION SERVICE

Daniel B. Mitchell
DIRECTOR, NATIONAL CLIMATIC CENTER

USCOMM--NOAA--ASHEVILLE

18/11/81

LATITUDE 29° 03' N LONGITUDE 84° 41' W ELEVATION (GROUND) 664 FT. STANDARD TIME USED: 145110H WHEN #93814

SUM	SUM			TOTAL	TOTAL			TOTAL	TOTAL	FOR THE MONTH:		TOTAL	SUM	SUM	
2377	1724			48	166	NUMBER OF DAYS	1 E	029	14	21	1.5	E	31	24	
AVE	AVE	AVE	DEF	AVE	DEF	PRECIPITATION	DEF					DATE: 01	POSSIBLE MONTH	AVE	AVE
74.2	56.0	68.6	0.6	60	4	3E	B	C-22						5.6	5.2
SEASON TO DATE															
				TOTAL	TOTAL	SNOW, ICE PELLETS				GREATEST IN 24 HOURS AND DATES		GREATEST DEPTH ON GROUND OF SNOW,			
						5.0 INCH	0					ICE PELLETS OR ICE AND DATE			
				MINIMUM TEMP.	MINIMUM TEMP.	THUNDERSTORMS	4	PRECIPITATION	1	SNOW	ICE PELLETS				
5	4	32*	32*	0	DEP.	DEP.		MEANT FOG	7	74	16-17	0			
						4	115	CLEAR	5	PARLY CLOUDY	E	CLOUDY	13		

MORE OBSERVATIONS PER DAY AT 3-HOUR INTERVALS. FASTEST MILE WIND SPEEDS ARE FASTEST OBSERVED ONE-MINUTE VALUES WHEN DIRECTIONS ARE IN TERMS OF DEGREES. THE / WITH THE DIRECTION INDICATES PEAK GUST SPEED. ANY ERRORS DETECTED WILL BE CORRECTED AND CHANGES IN SUMMARY DATA WILL BE ANNOTATED IN THE ANNUAL SUMMARY.

AVERAGES										RESULTANT WIND			
HOUR	LOCAL TIME	SKY COVER	STATION	PRESSURE	TEMPERATURE				RELATIVE HUMIDITY	WIND SPEED	DIRECTION	SPEED	M.P.H.
					AIR °F	WET BULB °F	DEW PT. °F	WIND M.P.H.					
01	4	5	14	63	61	59	58	58	5	17	1	1	1
04	4	5	14	61	61	59	58	58	5	17	1	1	1
07	6	6	16	60	59	58	58	58	5	17	1	1	1
10	6	6	16	60	59	58	58	58	5	17	1	1	1
13	6	6	16	76	67	62	63	63	6	27	3	3	3
16	6	6	12	77	67	61	62	62	6	24	3	3	3
19	6	6	11	69	64	61	76	60	18	1	1	1	1
22	6	6	14	65	62	60	66	60	17	1	1	1	1

[illegible]

296

MONTHLY SUMMARY

STATION 20° 03' N LONGITUDE 84° 40' W ELEVATION (FOOT) 664 FT. STANDARD TIME USED: EASTERN AREA 00034

OCTOBER 1978

GREATER CINCINNATI AIRPORT

AL SCHLEPER & ASSOC.

DEC 11 1978

DATE	TEMPERATURE °F			DEW POINT °F		WIND DIRECTION		WIND SPEED		WIND TYPE		PRECIPITATION		WIND		SUNSHINE		SKY COVER	
	MAXIMUM	MINIMUM	AVERAGE	DEW POINT	DEW POINT	WIND DIRECTION	WIND DIRECTION	WIND SPEED	WIND SPEED	WIND TYPE	WIND TYPE	PRECIPITATION	PRECIPITATION	WIND	WIND	MINUTES	PERCENT	SKY COVER	SKY COVER
1	2	3	4	5	6	7A	7B	8	9	10	11	12	13	14	15	16	17	18	19
1	66	53	59	55	55	7A	7B	8	9	10	11	12	13	14	15	16	17	18	19
2	71	47	59	55	55														
3	69	50	60	55	55														
4	68	50	59	55	55														
5	70	47	59	55	55														
6	66	43	50	55	55														
7	66	40	46	55	55														
8	67	32	50	55	55														
9	67	34	46	55	55														
10	73	42	58	55	55														
11	60	54	57	55	55														
12	77	56	67	55	55														
13	61	49	55	55	55														
14	50	36	44	55	55														
15	54	37	43	55	55														
16	50	37	44	55	55														
17	55	36	46	55	55														
18	65	38	52	55	55														
19	65	43	54	55	55														
20	71	36	55	55	55														
21	75	42	58	55	55														
22	78	46	64	55	55														
23	64	40	52	55	55														
24	57	30	43	55	55														
25	66	36	51	55	55														
26	61	36	49	55	55														
27	59	31	45	55	55														
28	63	35	49	55	55														
29	59	36	49	55	55														
30	73	37	54	55	55														
31	72	39	56	55	55														

* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.
1 TRACE AMOUNT.
- ALSO ON AN EARLIER DATE, OR DATES.
HEAVY FOG - VISIBILITY 1/4 MILE OR LESS.
FIGURES FOR WIND DIRECTIONS ARE IN TENS OF DEGREES COUNTERCLOCKWISE FROM TRUE NORTH. DD = CALM.
DATA IN COLS. 6 AND 12-15 ARE BASED ON 7 OR

MORE OBSERVATIONS PER DAY AT 3-HOUR INTERVALS.
FASTEST MILE WIND SPEEDS ARE FASTEST OBSERVED ONE-MINUTE VALUES WHEN DIRECTIONS ARE IN TENS OF DEGREES. THE / WITH THE DIRECTION INDICATES PEAK GUST SPEED.
ANY ERRORS NOTICED WILL BE CORRECTED AND CHANGES IN SUMMARY DATA WILL BE ANNOTATED IN THE ANNUAL SUMMARY.

SUMMARY BY HOURS

HOUR	LOCAL TIME	SKY COVER	TEMPERATURE				WIND DIRECTION	WIND SPEED	WIND TYPE
			AIR °F	WET BULB °F	DEW PT. °F	RELATIVE HUMIDITY %			
01	4	28-37	48	46	43	82	7.0	22	3.6
04	4	28-37	45	43	41	85	6.0	22	2.7
07	3	28-38	44	42	40	87	6.4	22	4.1
10	6	28-21	54	50	46	74	10.8	23	5.0
13	6	28-38	60	53	46	63	11.5	25	6.0
16	6	28-38	61	53	45	59	10.8	25	5.0
19	5	28-37	53	46	44	72	7.0	22	2.3
22	5	28-38	50	47	43	78	7.8	23	2.6

HOURLY PRECIPITATION (WATER EQUIVALENT IN INCHES)

HOUR	A. M. HOUR ENDING AT												P. M. HOUR ENDING AT											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13	.54	.18	.02	.04	.03	.03	.03	T	.03	.04	.01													
14																								
15																								
16	.01	T																						
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24																								
25																								
26	.04	.02	.01	T	T	T	.05	.06	.02	.10	.18	.05	.01	T	T	T	T	T	T	T	T	T	T	T
27																								
28																								
29																								
30																								
31																								

SUBSCRIPTION PRICE: \$7.55 PER YEAR INCLUDING ANNUAL SUMMARY. FOREIGN MAILING \$1.05 EXTRA. SINGLE COPIES 20 CENTS FOR MONTHLY OR ANNUAL ISSUE. THERE IS A MINIMUM CHARGE OF \$7.00 FOR EACH ORDER OF SHEET-STOCKED ISSUES OF PUBLICATIONS. MAKE CHECKS PAYABLE TO DEPARTMENT OF COMMERCE, NOAA. SEND PAYMENTS, ORDERS, AND INQUIRIES TO NATIONAL CLIMATIC CENTER, FEDERAL BUILDING, ASHEVILLE, NORTH CAROLINA 28801.

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA 28801.

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / ENVIRONMENTAL DATA AND INFORMATION SERVICE

Daniel B. Mitchell
DIRECTOR, NATIONAL CLIMATIC CENTER

USCONE--NOAA--ASHEVILLE 11/27/78 650

HISTORICAL DATA

GREATER CINCINNATI AIRPORT

650

HISTORICAL DATA

五

JAN 9 1978

AL SCHLEPER & ASSOC.

MONTHLY SUMMARY

LATITUDE 39° 03' N LONGITUDE 84° 40' W ELEVATION (GROUND) 659 FT. STANDARD TIME USED: EASTERN UTM 18W 503834

DECEMBER 1978 GREATER CINCINNATI AIRPORT

DATE	TEMPERATURE °F			DEGREE DAYS BASE 65°		WEATHER TYPES ON DATES OF OCCURRENCE		PRECIPITATION		WIND		SUNSHINE		SKY COVER TENTHS									
	MAXIMUM	MINIMUM	AVERAGE	DEPARTURE FROM NORMAL	AVERAGE DEW POINT	HEATING DEGREE DAYS WITH ADJ.	COOLING DEGREE DAYS WITH ADJ.	1 FOG 2 HEAVY FOG 3 THUNDERSTORM 4 ICE PELLETS 5 HAIL 6 BLAZE 7 DUSTSTORM 8 SMOKE - HAZE 9 BLINDING SNOW	SNOW-ICE PELLETS ON GROUND AT 07AM	WATER LAID ON AT 07AM	SNOW-ICE PELLETS IN IN.	RESULTANT DIR.	RESULTANT SPEED M.P.H.	AVERAGE SPEED M.P.H.	FASTEST MILE SPEED M.P.H.	DIRECTION	MINUTES	PERCENT OF POSSIBLE	SUNSHINE TO SUNSET	MIDNIGHT TO MIDNIGHT	DATE		
1	2	3	4	5	6	7A	7B	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
1	53	25	39	1	24	26	0		0	0	0	29.07	19	6.8	8.1	17	23		2	3	1	2	
2	46	31	39	2	35	26	0	1	0	0	0	29.13	10	3.5	6.6	15	08		9	8	3	2	
3	60	41	51	14	51	14	0	1 3	0	1.87	0	28.87	19	12.3	13.7	22	20		10	10	3	3	
4	60	28	44	7	28	21	0	1	0	.12	0	28.80	26	13.1	14.7	20	25		10	9	4	4	
5	47	26	37	1	26	28	0		0	0	0	28.84	23	10.8	11.4	17	23		0	0	5	5	
6	52	32	42	6	32	23	0		0	0	0	28.12	22	5.4	7.1	12	24		2	4	6	6	
7	58	42	50	14	42	15	0	1 3	0	.65	0	28.12	18	5.9	7.3	16	14		10	10	7	7	
8	58	31	45	10	39	20	0	1 3 4 6	0	1.71	0	28.02	36	8.3	11.8	17	01		10	10	8	8	
9	31	18	25	-10	18	40	0	4 6	0	.05	0	28.08	33	10.3	12.4	18	27		9	8	9	9	
10	23	16	19	-19	8	49	0		1	.01	0	28.40	26	8.2	8.2	18	27		0	1	10	10	
11	38	18	28	-6	28	37	0		0	0	0	28.43	21	10.7	11.1	17	20		6	7	11	11	
12	46	23	35	1	26	30	0		0	0	0	28.38	22	10.7	11.1	17	23		2	3	12	12	
13	43	28	36	2	24	29	0		0	0	0	28.26	27	14.2	17.1	23	28		0	2	13	13	
14	38	20	29	-5	18	36	0		0	0	0	28.35	25	11.1	13.8	18	22		3	4	14	14	
15	48	28	38	5	22	27	0		0	0	0	28.12	23	15.1	15.4	23	23		1	2	15	15	
16	48	33	41	8	29	24	0	1	0	.05	0	28.11	23	10.0	11.9	21	25		10	9	16	16	
17	41	24	33	0	21	32	0		0	0	0	28.41	29	11.7	12.2	18	29		2	3	17	17	
18	39	23	31	-2	22	34	0	4	0	0	0	28.21	22	8.1	8.3	16	23		10	9	18	18	
19	39	35	37	4	29	28	0	1	0	0	0	28.88	11	9.3	10.4	17	12		10	10	19	19	
20	63	37	50	17	50	15	0	2	0	.48	0	28.61	22	10.7	14.1	23	29		10	10	20	20	
21	39	26	33	1	23	32	0		0	0	0	28.86	27	15.5	16.3	28	30		9	7	21	21	
22	47	24	36	4	24	29	0		0	0	0	28.05	23	11.2	11.5	21	21		2	1	22	22	
23	44	20	32	0	23	33	0		0	0	0	28.13	14	5.4	6.6	14	15		8	6	23	23	
24	43	31	37	5	30	28	0	1	0	.11	0	28.75	22	6.3	10.1	17	28		10	8	24	24	
25	34	25	30	-2	22	35	0	1	0	0	0	28.96	26	11.1	12.5	22	28		7	7	25	25	
26	33	24	29	-3	20	36	0		0	0	0	28.16	28	11.2	12.7	20	30		9	8	26	26	
27	32	17	25	-7	12	40	0		0	0	0	28.45	29	7.5	9.9	14	28		1	3	27	27	
28	35	15	25	-7	11	40	0		0	0	0	28.48	10	11.6	12.2	16	10		2	2	28	28	
29	48	22	35	4	17	30	0		0	0	0	28.38	13	6.9	9.2	14	11		7	6	29	29	
30	47	38	43	12	39	22	0		0	.35	0	28.33	19	9.9	10.5	20	20		10	10	30	30	
31	59	46	53	22	50	12	0	2	0	1.01	0	28.12	18	12.0	13.7	24	20		10	10	31	31	
SUM		SUM		TOTAL		TOTAL		TOTAL		TOTAL		FOR THE MONTH		TOTAL		2		SUM		SUM			
1392		840		891		0		NUMBER OF DAYS		6.46		7		28.13		23		5.9		11.4		28	
AVG.		AVG.		AVG.		DEP.		PRECIPITATION		DEP.								DATE: 21		POSSIBLE		MONTH	
44.9		27.3		36.0		-79		3.01 INCH		3.60										6.2		6.1	
NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS	
1		1		1		1		1		1		1		1		1		1		1		1	
MAXIMUM TEMP.		MINIMUM TEMP.		MAXIMUM TEMP.		MINIMUM TEMP.		MAXIMUM TEMP.		MINIMUM TEMP.		MAXIMUM TEMP.		MINIMUM TEMP.		MAXIMUM TEMP.		MINIMUM TEMP.		MAXIMUM TEMP.		MINIMUM TEMP.	
90°		32°		90°		32°		90°		32°		90°		32°		90°		32°		90°		32°	
0		3		24		0		-76		-10		CLEAR 12		PARTLY CLOUDY 3		CLOUDY 16				10+			

* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.
T TRACE AMOUNT.
* ALSO ON AN EARLIER DATE, OR DATES.
HEAVY FOG - VISIBILITY 1/4 MILE OR LESS.
FIGURES FOR WIND DIRECTIONS ARE TENS OF DEGREES (CLOCKWISE FROM TRUE NORTH, 00 = CALM).
DATA IN COLS. 6 AND 12-15 ARE BASED ON 7 DR

MORE OBSERVATIONS PER DAY AT 3-HOUR INTERVALS.
FASTEST MILE WIND SPEEDS ARE FASTEST OBSERVED ONE-MINUTE VALUES WHEN DIRECTIONS ARE IN TENS OF DEGREES. THE / WITH THE DIRECTION INDICATES PEAK GUST SPEED.
ANY ERRORS DETECTED WILL BE CORRECTED AND CHANGES IN SUMMARY DATA WILL BE ANNOTATED IN THE ANNUAL SUMMARY

SUMMARY BY HOURS

HOUR	LOCAL TIME	TEMPERATURE				RELATIVE HUMIDITY %	WIND SPEED M.P.H.	RESULTANT WIND	
		AIR °F	WET BULB °F	DEW PT. °F	STATION PRESSURE IN.			DIRECTION	SPEED M.P.H.
01	7	28.12	34	31	26	74	11.0	24	5.2
04	6	28.13	32	29	25	76	10.4	24	5.0
07	5	28.14	31	29	24	77	9.3	23	5.4
10	6	28.17	35	32	27	75	11.8	23	6.6
13	6	28.13	40	36	28	67	15.4	23	7.7
16	7	28.10	41	37	26	66	15.2	23	7.2
19	6	28.11	37	34	28	70	10.4	22	4.6
22	6	28.12	35	33	27	73	11.4	23	5.2

HOURLY PRECIPITATION (WATER EQUIVALENT IN INCHES)

HOUR	A. M. HOUR ENDING AT												P. M. HOUR ENDING AT											
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24																								
25																								
26																								
27																								
28																								
29																								
30																								
31																								

SUBSCRIPTION PRICE: \$2.55 PER YEAR INCLUDING ANNUAL SUMMARY. FOREIGN MAILING \$1.85 EXTRA. SINGLE COPY: 20 CENTS FOR MONTHLY OR ANNUAL ISSUE. THERE IS A MINIMUM CHARGE OF \$2.00 FOR EACH ORDER OF SHELVE-STOCKED ISSUES OF PUBLICATIONS. MAKE CHECKS PAYABLE TO DEPARTMENT OF COMMERCE, NOAA. SEND PAYMENTS, ORDERS, AND INQUIRIES TO NATIONAL CLIMATIC CENTER, FEDERAL BUILDING, ASHEVILLE, NORTH CAROLINA 28801.

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA 28801.

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / ENVIRONMENTAL DATA AND INFORMATION SERVICE

Daniel B. Mitchell
DIRECTOR, NATIONAL CLIMATIC CENTER

USD 11-1-NOAA-ASHEVILLE 01/25/79 650

HISTORICAL DATA

RECEIVED
FEB 5 1979
AL SCHLEPER & ASSOC.

GREATER CINCINNATI AIRPORT

DATE	TEMPERATURE °F				DEGREE DAYS BASE 65°		WEATHER TYPES ON DATES OF OCCURRENCE	SNOW- ICE DEPTH ON GROUND AT 07AM IN.	PRECIPITATION		STATION PRE- SURE IN. - - - ELEV. FEET M.S.L.	WIND				SUNSHINE		24 HOUR EXTENTS				
	MAXIMUM	MINIMUM	AVERAGE	DEPARTURE FROM NORMAL	AVERAGE DEW POINT	HEATING DEGREE DAYS WITH JAN.			COOLING DEGREE DAYS WITH JAN.	WIND DIRECTION		WIND SPEED M.P.H.	WIND SPEED M.P.H.	WIND DIRECTION	WIND SPEED M.P.H.	WIND DIRECTION	MINUTES	PERCENT OF POSSIBLE	SUNRISE TO SUNSET	MIDNIGHT TO MIDNIGHT		
1	2	3	4	5	6	7A	7B	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	50K	20	44K	13	41	21	0	1	5	1.33	T	20.00	30	8.6	11.4	21	22	10	10	10	10	
2	29	2	16	-15	6	40	0	1	8	T	T	.5	20.21	29	15.3	15.7	22	30	5	7	2	
3	12	-3	5K	-26	-3	60	0	1	6	T	T	T	20.54	24	12.3	13.1	18	25	4	3	3	
4	22	11	17	-14	8	48	0	1	6	T	T	T	20.65	27	9.1	10.6	16	28	5	7	4	
5	20	14	17	-14	13	48	0	1	6	T	T	.07	2.6	20.61	03	3.5	4.5	10	10	10	5	
6	23	12	18	-13	17	47	0	2	4	3	T	.4	20.35	02	2.5	3.2	8	01	10	10	6	
7	23	19	21	-10	18	44	0	1	6	.43	3.4	20.10	02	12.3	13.1	17	02	10	10	10	7	
8	19	-1	9	-22	0	56	0	1	6	6	T	T	20.30	28	11.5	12.2	16	28	2	4	8	
9	20	-1	8	-23	0	57	0	1	6	5	T	T	20.41	22	10.9	12.5	18	21	0	2	9	
10	15	3	8	-23	1	57	0	1	6	5	T	T	20.53	29	8.0	10.4	13	20	8	7	10	
11	15	3	8	-22	1	56	0	1	6	5	T	T	20.51	07	8.0	9.4	13	10	10	9	11	
12	29	13	21	-10	17	44	0	1	6	5	T	.3	20.23	08	6.8	7.2	12	08	10	10	12	
13	42	28	35	4	33	30	0	2	6	.24	0	20.77	15	5.3	6.4	16	24	10	10	10	13	
14	41	0	21	-10	16	44	0	1	6	.10	.7	20.01	28	17.9	18.6	25	27	8	6	14	1	
15	19	-6K	7	-24	-6	58	0	1	6	3	0	20.52	20	8.0	11.2	16	15	7	5	15	1	
16	36	17	27	-1	18	38	0	1	6	3	T	0	20.30	20	6.1	7.2	14	21	6	7	16	
17	43	26	35	4	34	30	0	1	6	.10	0	20.16	25	12.9	14.7	24	23	8	7	17	1	
18	26	14	20	-11	13	45	0	1	6	T	0	20.43	02	6.0	11.8	16	08	3	3	18	1	
19	34	19	27	-1	21	38	0	1	6	.07	.2	20.16	12	10.5	11.8	20	11	10	10	19	1	
20	41	34	38	7	37																	

MORE OBSERVATIONS PER DAY AT 3-HOUR INTERVALS.
 FASTEST MILE WIND SPEEDS ARE FASTEST OBSERVED
 ONE-MINUTE VALUES WHEN DIRECTIONS ARE IN TENS
 OF DEGREES. THE / WITH THE DIRECTION INDICATES
 PEAK GUST SPEED.
 ANY ERRORS DETECTED WILL BE CORRECTED AND
 CHANGES IN SUMMARY DATA WILL BE ANNOTATED IN
 THE ANNUAL SUMMARY

HOUR	LOCAL TIME	STATION	STATION OVER TIME	AVERAGES							RESULTANT WIND	
				PRESSURE IN.	TEMPERATURE			RELATIVE HUMIDITY %	WIND SPEED M.P.H.	DIRECTION	SPEED M.P.H.	
					AIR °F	WET BULB °F	DEW PT. °F					
01	04	29.12	22	21	16	79	11.5	28	4.1			
04	07	29.12	20	19	15	82	10.7	28	4.1			
07	10	29.13	19	18	14	81	10.7	27	4.3			
10	13	29.16	20	19	15	81	12.1	27	4.3			
13	16	29.13	23	23	16	74	12.3	26	6.1			
16	19	29.12	25	23	16	72	11.0	26	6.1			
19	22	29.14	23	21	15	74	10.1	27	5.2			
22	01	29.14	21	20	15	76	11.6	28	5.2			

	A. M. HOUR ENDING AT												P. M. HOUR ENDING AT											
#	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1	.05	.06	.03	.08	.11	.15	.08	.11	.13	.09	.09		.07	.09	.06	.03	.01	.01	T	T	T	T	T	T
2				T	T	T	T	T	T	T						T	T	T	T	T	T	T	T	T
3																T	T	T	T	T	T	T	T	T
4				T	T	T	T	T	T	T							T	T	T	T	T	T	T	T
5	T	T	T	T	T	T	T	.01	T	T			T	T	.01	.02	.01	T	T	T	T	.01	T	T
6	.01	.01	.03	.03	.06	.04	.06	.04	.03	.02	.01		.01	.01	T	T	T	T	T	T	T	T	T	T
7				T	T	T	T	T							T	T	T	T	T	T				
8																								
9																								
10																								
11							T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
12	T	T	T				T	.04	.06	.01	.04	T	T	T	T	T	T	T	.02	T		T	.02	.03
13																								
14	.04	T	T	T	.01	.04	.01	T	T	T	T		T	T	T		T	T			T	.02	.02	.03
15																								
16																								
17	.02	T	.01	.02	.03	T	.01	.01	T	T	T	T												T
18																								
19							.01	.02	.01	.01	T	T		T	T	T	T	T	T	T	.02	T	T	T
20	T	T	T	.05	.05	.06	.07	.04	.01	.03	.03	T	T	T	T	T	.01	T	T	T	.01	T	T	T
21	T	.04	.04	.02	T	T	T						.01	T	T	T		T	T	T	T	T	T	T
22	T	T	T	T	T	T	T	T	T	T	T	T					T							
23																								
24		.02	.16	.07	.03	.06	.01	.02	T	T	T	T	T	T	T	.02	.03	.06	.01	T	.01	T	T	T
25	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
26				T	T	T	T	T	T	T	T	T												
27																								
28	T	T	.01	.01	.01	T	T	T	T	T	T	T	.01	.01	.06	.12	.02	.02	T	T	T	T	T	T
29	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
30				T	T	T	T	T	T	T	T	T												
31	T	T	.01	.03	T	T	.01	T	.01	.01	T	.01</												

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA 28801.

Daniel B. Mitchell
DIRECTOR, NATIONAL CLIMATIC CENTER

650

HISTORICAL DATA

LATITUDE: 39° 03' N LONGITUDE: 84° 40' W ELEVATION (GROUND): 869 FT. STANDARD TIME USED: EASTERN WAVE 903814

~~CORRECTED COPY~~ PLEASE DESTROY COPY PREVIOUSLY RECEIVED

February 1979

DATE	TEMPERATURE °F			DEGREE DAYS BASE 65°		WEATHER TYPES ON DATES OF OCCURRENCE		SNOW-ICE PELLETS ON GROUND AT 07AM IN.	PRECIPITATION WATER IN SNOW-ICE PELLETS IN.		AVG. PRECIP. IN. PER HOURS.	WIND RESULTANT DIRECTION SPEED M.P.H. OVERALL SPEED M.P.H. DIRECTION				SUNSHINE MINUTES PERCENT OF POSSIBLE		SUN COVER TIMES		DATE	
	MAXIMUM	MINIMUM	AVERAGE	DEPARTURE FROM NORMAL	AVERAGE	DEPARTURE	HEATING INDEX MEANS WITH JAN 1		COOLING INDEX MEANS WITH JAN 1	1		2	1	2	1	2	1	2	SUNRISE TO SUNSET		MIDNIGHT TO MIDNIGHT
1	20	2	11	-21	2	54	0	5	T	29.28	27	10.2	10.5	16	26			4	5	1	
2	25	-5	10	-22	2	55	0	5	.03	29.33	17	3.1	4.6	9	19			6	6	2	
3	31	22	27	-5	22	38	0	5	.10	29.13	21	6.3	7.9	35	29			10	10	3	
4	31	2	17	-15	8	43	0	4	0	29.24	29	13.1	13.5	20	26			4	5	4	
5	33	-5K	2X	-30	-14	63	0	4	0	29.38	28	5.8	6.3	13	21			0	0	5	
6	28	-1	14	-18	0	51	0	3	0	29.17	13	6.3	6.9	10	12			10	10	6	
7	30	7	19	-13	15	46	0	3	.17	28.91	31	7.2	10.6	21	31			10	10	7	
8	37	-2	8	-24	1	57	0	5	.16	28.21	33	4.7	6.3	13	36			9	7	8	
9	33	-5	4	-28	1	61	0	9	T	29.41	33	6.3	7.8	15	04			2	2	9	
10	16	-2	7	-25	1	58	0	7	T	29.45	26	5.3	5.5	12	27			10	10	10	
11	27	11	19	-13	5	46	0	8	T	29.38	11	8.2	8.8	13	10			11	11	11	
12	34	12	23	-10	17	42	0	6	.11	29.14	03	4.3	10.1	21	34			10	10	12	
13	20	5	13	-20	1	52	0	5	0	29.37	08	7.0	7.3	12	09			10	10	13	
14	35	15	25	-8	15	40	0	5	.04	29.09	13	5.6	7.3	15	10			10	10	14	
15	38	31	35	2	33	30	0	4	.15	28.87	05	3.1	5.2	18	33			10	10	15	
16	31	10	21	-12	11	44	0	3	T	29.38	36	13.2	14.8	20	05			9	9	16	
17	32	-1	6	-27	7	59	0	2	T	29.70	06	18.8	19.0	26	08			3	4	17	
18	23	8	16	-17	6	49	0	2	.14	28.40	09	5.6	11.7	17	08			10	10	18	
19	20	0	10	-24	1	55	0	5	T	29.51	27	4.0	6.8	14	27			1	3	19	
20	42	6	24	-10	13	41	0	4	0	29.37	17	6.2	6.5	14	16			9	7	20	
21	44	32	38	4	35	27	0	2	.44	29.13	24	10.6	13.8	21	24			10	10	21	
22	45	26	36	2	33	29	0	1	.40	29.27	10	8.8	9.4	17	25			10	10	22	
23	51K	44	53K	18	46	12	0	0	.64	29.05	19	7.0	9.6	17	23			10	10	23	
24	48	33	41	6	35	24	0	0	0	29.17	03	13.2	13.8	21	04			10	10	24	
25	37	26	32	-3	31	33	0	0	1.39	28.89	04	21.0	22.0	35	05			10	10	25	
26	29	21	25	-11	21	34	0	1	.02	28.97	34	14.6	15.5	22	36			9	9	26	
27	46	16	31	-5	21	40	0	T	0	29.20	33	2.5	4.9	9	06			2	2	27	
28	48	26	37	1	31	28	0	0	0	29.12	10	8.7	8.8	14	18			9	6	28	
SUM	SUM					TOTAL	TOTAL			TOTAL	TOTAL	FDB	THE MONTH			TOTAL	2	SUM	SUM		
BE4	330					1216	0			3.77	11.7	28.23	02	2.0	9.8	35	05	FDB	219	206	
AVG.	AVG.	AVG.	DEP.	AVG.	DEP.					PRECIPITATION	DEF.					DATE	25	POSSIBLE	MONTH	AVG.	
30.9	11.8	23.4	-13.9	13	328					5.01 INCH	13	0.73							7.8	7.4	
SEASON TO DATE						SNOW, ICE PELLETS		GREATEST IN 24 HOURS AND DATES						GREATEST DEPTH ON GROUND OF SNOW, ICE PELLETS ON ICE AND DATE							
NUMBER OF DAYS						2 1.0 INCH		4													
MAXIMUM TEMP.						MINIMUM TEMP.		4409													
°C						< 32 °		< 0 °													
9						17		25		8						549					
D						CLEAR 5		PARTLY CLOUDY 2						CLOUDY 21							

* EXTREME FOR THE MONTH - LAST OCCURRENCE IF MORE THAN ONE.
1 TRACE AMOUNT
* ALSO ON AN EARLIER DATE, OR DATES.
HEAVY FOG - VISIBILITY 1/4 MILE OR LESS.
FIGURES FOR WIND DIRECTIONS ARE TENS OF DEGREES CLOCKWISE FROM TRUE NORTH. DO = CALM.
DATA IN COLS. 6 AND 12-15 ARE BASED ON 7 OR

MORE OBSERVATIONS PER DAY AT 3-HOUR INTERVALS.
FASTEST WIND AND WIND SPEEDS ARE FASTEST OBSERVED
ONE-MINUTE VALUES WHEN DIRECTIONS ARE IN TENS
OF DEGREES. THE / WITH THE DIRECTION INDICATES
PEAK GUST SPEED.
ANY ERRORS DETECTED WILL BE CORRECTED AND
CHANGES IN SUMMARY DATA WILL BE ANNOTATED IN
THE ANNUAL SUMMARY

SUMMARY BY HOURS

HOUR	LOCAL COVER	STATION TEMP.	AVERAGES						RESULTANT WIND	
			STATION PRESSURE IN.	TEMPERATURE			RELATIVE HUMIDITY %	WIND SPEED M.P.H.	DIRECTION	SPEED M.P.H.
				AIR °F	WET BULB °F	DEW PT. °F				
01	7	26	24	20	18	11	73	9.6	03	2.3
04	7	26	24	18	17	11	73	9.6	03	2.3
07	7	26	23	17	16	10	73	9.6	03	2.3
10	8	26	25	21	19	13	72	10.5	08	2.6
13	8	26	25	26	24	15	55	10.0	34	1.7
16	8	26	21	26	25	17	52	10.4	34	1.7
19	8	26	23	26	25	15	66	9.3	02	2.0
22	8	26	24	23	21	14	68	9.8	02	2.0

HOURLY PRECIPITATION (WATER EQUIVALENT IN INCHES)

[illegible]

SUBSCRIPTION PRICE: \$2.55 PER YEAR INCLUDING ANNUAL SUMMARY. FOREIGN MAILING \$1.25 EXTRA. SINGLE COPIES 20 CENTS FOR MONTHLY OR ANNUAL ISSUE. THERE IS A MINIMUM CHARGE OF \$2.00 FOR EACH ORDER OF SHELF-STOCKED ISSUES OF PUBLICATIONS. MAKE CHECKS PAYABLE TO DEPARTMENT OF COMMERCE, NOAA. SEND PAYMENTS, ORDERS, AND INQUIRIES TO NATIONAL CLIMATE CENTER, FEDERAL BUILDING, ASHEVILLE, NORTH CAROLINA 28801.

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA 28801.

noaa NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / ENVIRONMENTAL DATA AND INFORMATION SERVICE

Daniel B. Mitchell
DIRECTOR, NATIONAL CLIMATIC CENTER

USCDAF--NORF--ASHEVILLE

05/21/79 650

HISTORICAL DATA

LATITUDE 39° 03' N LONGITUDE 84° 40' W ELEVATION (GROUND) 859 FT. STANDARD TIME USED: EASTERN (JAN 1936)

AVERAGES										RESULTANT WIND
HOUR LOCAL	STATION SY. COVER	STATION PRESSURE IN.	TEMPERATURE			RELATIVE HUMIDITY %	WIND SPEED M. P. H.	DIRECTION	WIND SPEED M. P. H.	
			AIR °F	WET BULB °F	DEW PT. °F					
01	0	29.12	43	41	37	79	8	22	7	
04	0	29.11	42	40	37	83	8	22	1	
07	0	29.13	41	39	36	84	6	24	1	
10	0	29.15	45	41	38	79	10	19	2	
13	0	29.11	50	45	39	69	10	23	2	
16	0	29.06	50	45	38	68	9	27	2	
19	7	29.10	47	43	38	75	8	24	1	
22	7	29.11	45	42	38	77	10	24	1	

HISTORICAL DATA

MONTHLY SUMMARY

LATITUDE 39° 03' N LONGITUDE 84° 40' W ELEVATION (GROUND) 869 FT. STANDARD TIME USED: EASTERN WARR 803814

DECEMBER 1977 GREATER CINCINNATI AIRPORT

[illegible]

EXTREME FOR THE MONTH - LAST OCCURRENCE IF
MORE THAN ONE.
1 TRACE AMOUNT
- ALSO ON AN EARLIER DATE, OR DATES.
HEAVY FOG - VISIBILITY 1/4 MILE OR LESS.
FIGURES FOR WIND DIRECTIONS ARE TENS OF DE-
GREES (CLOCKWISE FROM TRUE NORTH). DD = CALM.
DATA IN COLS. E AND 12-15 ARE BASED ON 7 OR

MORE OBSERVATIONS PER DAY AT 3-HOUR INTERVALS. FASTEST MILE WIND SPEEDS ARE FASTEST OBSERVED ONE-MINUTE VALUES WHEN DIRECTIONS ARE IN TENS OF DEGREES. THE / WITH THE DIRECTION INDICATES PEAK GUST SPEED. ANY ERRORS DETECTED WILL BE CORRECTED AND CHANGES IN SUMMARY DATA WILL BE ANNOTATED IN THE ANNUAL SUMMARY.

SUMMARY BY HOURS

HOUR	LOCAL TIME	SKY COVER (TENTHS)	STATION PRESSURE IN.	AVERAGES					RESULTANT WIND	
				TEMPERATURE			RELATIVE HUMIDITY %	WIND SPEED M.P.H.	DIRECTION	SPEED M.P.H.
				AIR °F	WET BULB °F	DEW PT. °F				
01	7	29.03	27	26	23	86	10.0	23	5.5	
04	7	29.03	27	26	23	87	10.0	23	5.5	
07	7	29.03	27	26	23	88	10.5	23	5.7	
10	8	29.07	28	26	23	85	11.8	24	6.6	
13	8	29.05	31	28	25	79	12.6	24	7.0	
16	8	29.04	32	30	25	76	11.4	24	8.1	
19	7	29.05	30	27	24	82	9.5	23	4.7	
22	7	29.06	28	26	23	83	9.9	23	4.8	

HOURLY PRECIPITATION (WATER EQUIVALENT IN INCHES)

[illegible]

SUBSCRIPTION PRICE: \$7.55 PER YEAR. FOREIGN MAILING \$1.05 EXTRA. SINGLE COPY: 20 CENTS FOR MONTHLY ISSUE. 20 CENTS FOR ANNUAL SUMMARY. OTHER DATA IN RECORDS ON FILE CAN BE FURNISHED AT COST VIA MICROFILM, MICROFILME, OR PAPER COPIES OF ORIGINAL RECORDS. MAKE CHECKS PAYABLE TO DEPARTMENT OF COMMERCE, NOAA. SEND PAYMENTS, ORDERS, AND INQUIRIES TO NATIONAL CLIMATIC CENTER, FEDERAL BUILDING, ASHEVILLE, NORTH CAROLINA 28801.

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA 28601.

noaa NATIONAL OCEANIC AND / ENVIRONMENTAL
ATMOSPHERIC ADMINISTRATION DATA SERVICE

Daniel B. Mitchell
DIRECTOR, NATIONAL CLIMATIC CENTER

USCDAH--NDAA--BSHEVILLE

01/18/77

520

HISTORICAL DATA

GREATER CINCINNATI AIRPORT

SUMMARY BY HOURS

HOURLY PRECIPITATION (WATER EQUIVALENT IN INCHES)

SUBSCRIPTION PRICE: \$2.55 PER YEAR. FOREIGN MAILING \$1.85 EXTRA. SINGLE COPY: 20 CENTS FOR MONTHLY ISSUE, 20 CENTS FOR ANNUAL SUMMARY. OTHER DATA IN RECORDS ON FILE CAN BE FURNISHED AT COST VIA MICROFILM, MICROFICHE, OR PAPER COPIES OF ORIGINAL RECORDS. MAKE CHECKS PAYABLE TO DEPARTMENT OF COMMERCE. NOAA. SEND PAYMENTS, ORDERS, AND INQUIRIES TO NATIONAL CLIMATIC CENTER, FEDERAL BUILDING, ASHLEYVILLE, NORTH CAROLINA 28903.

I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, AND IS COMPILED FROM RECORDS ON FILE AT THE NATIONAL CLIMATIC CENTER, ASHEVILLE, NORTH CAROLINA 28801.

Daniel B. Mitchell
DIRECTOR, NATIONAL CLIMATIC CENTER

USCOTF--NORR--RSMVILLE

01/23/78

600

HISTORICAL DATA

MONTHLY SUMMARY

LATITUDE 36° 03' N LONGITUDE 84° 40' W ELEVATION (GROUND) 869 FT. STANDARD TIME USED: EASTERN MEAN 003814

DATE	TEMPERATURE °F			DEGREE DAYS BASE 65°		WEATHER TYPES ON DATES OF OCCURRENCE		PRECIPITATION		WIND		SUNSHINE		SKY COVER TENTHS														
	MAXIMUM	MINIMUM	AVERAGE	DEPARTURE FROM NORMAL	AVERAGE DEW POINT	HEATING SYSTEM BEGINS WITH AN	COOLING SYSTEM BEGINS WITH AN	WATER	SNOW	WIND DIRECTION	WIND SPEED	PERCENT OF POSSIBLE	PERCENT OF POSSIBLE	SUNSHINE TO	SKY COVER													
1	2	3	4	5	6	7A	7B	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	23	-1	11	-21	5	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2	25	12	19	-13	10	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3	25	8	16	-16	10	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
4	25	8	16	-16	10	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5	26	13	20	-12	13	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
6	15	7	9	-23	1	56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
7	18	-10K	4K	-28	1	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
8	25	7	14	-18	5	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
9	26	7	17	-15	7	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
10	27	2	14	-18	4	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
11	27	-2	13	-19	5	52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
12	34	5	20	-13	10	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
13	29	25	27	-6	17	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
14	26	13	20	-13	13	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
15	27	6	17	-16	8	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
16	30	23	27	-6	19	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
17	28	17	23	-10	12	42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
18	25	12	19	-14	3	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
19	24	-3	11	-23	-2	54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
20	27	2	15	-19	2	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
21	25	13	19	-15	7	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
22	25	4	15	-19	3	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
23	28	16	22	-13	10	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
24	34	24	29	-6	16	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
25	35K	27	31K	-4	19	34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
26	27	12	20	-16	10	45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
27	30	4	17	-19	5	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
28	34	23	29	-7	16	36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
SUM		SUM		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		
753		264		1303		0		25		4.6		29.20		34		2.6		7.3		18		31		168		173		
AVG.		AVG.		AVG.		AVG.		AVG.		AVG.		AVG.		AVG.		AVG.		AVG.		AVG.		AVG.		AVG.		AVG.		
26.9		9.4		16.2		-15.3		0		4.15		0		0		0		0		0		0		6.0		6.2		
NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		NUMBER OF DAYS		
1		1		1		1		1		1		1		1		1		1		1		1		1		1		
2		2		2		2		2		2		2		2		2		2		2		2		2		2		
3		3		3		3		3		3		3		3		3		3		3		3		3		3		
4		4		4		4		4		4		4		4		4		4		4		4		4		4		
5		5		5		5		5		5		5		5		5		5		5		5		5		5		
6		6		6		6		6		6		6		6		6		6		6		6		6		6		
7		7		7		7		7		7		7		7		7		7		7		7		7		7		
8		8		8		8		8		8		8		8		8		8		8		8		8		8		
9		9		9		9		9		9		9		9		9		9		9		9		9		9		
10		10		10		10		10		10		10		10		10		10		10		10		10		10		
11		11		11		11		11		11		11		11		11		11		11		11		11		11		
12		12		12		12		12		12		12		12		12		12		12		12		12		12		
13		13		13		13		13		13		13		13		13		13		13		13		13		13		
14		14		14		14		14		14		14		14		14		14		14		14		14		14		
15		15		15		15																						

Average Temperature

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1948	22.6	33.8	45.0	54.4	61.6	72.1	75.5	74.2	68.6	53.0	47.4	37.0	53.9
1949	38.5	39.4	45.1	51.2	64.2	74.6	79.0	74.5	61.6	60.7	43.5	38.4	55.7
1950	41.4	35.2	37.7	48.0	64.2	65.3	72.2	70.5	64.7	60.1	37.8	27.1	52.4
1951	32.6	33.9	45.1	50.7	65.0	72.8	74.9	74.9	65.9	58.5	37.6	34.7	53.5
1952	36.4	36.8	47.3	53.7	62.7	71.3	78.2	74.1	66.5	50.4	44.4	36.4	54.9
1953	36.4	37.8	44.4	49.2	64.3	75.9	76.0	75.9	68.6	59.2	43.1	34.1	55.8
1954	36.2	41.5	38.7	54.7	58.8	74.3	77.5	74.5	71.1	56.9	43.6	24.0	55.5
1955	30.3	34.9	44.3	58.6	65.0	67.0	79.2	77.9	70.5	56.1	40.3	21.9	54.7
1956	24.3	37.4	41.7	50.0	63.3	72.1	74.3	73.4	64.5	60.8	42.6	42.0	54.3
1957	27.8	38.3	47.3	56.1	64.0	72.3	76.3	74.5	67.3	53.1	43.6	38.7	54.6
1958	24.3	25.4	37.8	53.8	63.1	64.0	74.3	73.1	67.3	56.1	46.4	27.0	51.9
1959	24.3	35.6	41.1	55.6	67.9	72.6	78.7	78.5	71.0	56.8	40.6	37.7	55.3
1960	34.5	30.6	24.7	57.7	60.9	70.9	74.4	76.3	70.5	57.1	48.1	28.8	53.1
1961	27.8	38.7	46.5	48.4	59.3	70.1	75.4	74.4	71.8	58.1	44.2	33.5	54.0
1962	28.2	34.4	46.7	52.3	68.4	72.4	74.3	75.1	63.5	56.2	42.8	28.5	53.1
1963	27.7	24.4	44.8	53.8	58.9	68.2	72.3	70.5	65.7	61.8	45.2	22.9	51.0
1964	32.1	30.2	44.1	56.1	65.8	71.9	74.2	73.7	67.1	52.7	47.1	35.5	54.1
1965	30.6	32.8	34.6	53.3	67.1	71.9	73.2	72.5	67.1	53.6	44.2	38.8	53.5
1966	23.8	31.5	47.9	51.1	60.4	73.1	78.8	74.5	66.5	51.0	44.7	33.6	52.6
1967	35.4	27.5	44.8	55.4	65.5	73.0	72.9	71.1	65.3	55.5	40.3	36.8	53.2
1968	26.8	28.1	45.2	55.5	65.7	72.9	75.7	75.3	67.4	55.9	45.6	33.7	53.8
1969	30.2	33.7	37.3	55.2	65.0	71.9	77.3	74.0	66.5	55.7	40.3	30.6	53.1
1970	24.0	30.6	38.0	56.8	65.8	72.2	75.5	75.1	73.7	54.8	45.0	34.0	54.6
1971	24.3	33.3	40.2	51.1	60.8	75.8	74.8	72.4	70.3	61.4	43.2	41.2	54.6
1972	30.2	29.5	40.4	52.5	63.1	65.3	75.5	73.4	68.7	51.7	40.3	36.1	52.3
1973	31.7	33.0	30.6	51.1	59.4	72.3	74.8	73.7	69.6	59.0	45.4	33.6	54.4
1974	35.7	33.9	45.6	54.3	61.9	67.7	75.2	74.3	61.6	53.2	44.4	34.4	53.5
1975	34.0	37.1	38.8	56.4	67.6	72.3	74.6	76.9	62.4	57.5	48.1	37.4	54.9
1976	27.1	41.7	47.0	56.1	60.0	71.5	73.6	71.2	63.6	48.8	34.9	27.6	52.0
1977	17.0	29.8	44.5	53.3	68.2	68.7	77.9	73.9	69.8	52.3	45.4	28.7	52.5
1978	18.4	18.2	34.4	53.4	60.1	72.2	75.0	73.0	70.8	52.6	46.4	36.0	51.0
RECORD	29.7	33.2	41.9	53.7	63.2	71.8	75.5	74.1	67.4	55.9	43.5	34.1	53.6
MEAN	38.1	47.1	51.4	64.4	74.3	82.6	88.0	85.0	78.5	66.8	52.4	41.9	63.6
MAX	21.9	24.3	37.3	47.9	52.1	60.9	63.1	58.3	44.9	38.5	26.2	43.6	

Precipitation

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual
1948	2.63	3.70	5.10	4.36	2.26	3.74	3.55	1.96	1.69	1.81	6.09	4.07	40.96
1949	8.95	3.07	3.95	1.51	1.39	5.30	4.89	4.32	0.98	2.55	0.43	3.17	40.47
1950	9.43	5.54	2.08	3.82	3.12	5.03	4.39	1.93	8.25	1.86	5.37	2.95	53.22
1951	6.65	3.23	4.23	2.58	2.94	1.86	1.18	1.28	2.21	2.56	4.30	6.17	39.19
1952	3.99	3.87	5.17	3.10	3.56	2.92	2.43	1.68	3.06	1.82	2.35	4.18	37.59
1953	4.55	1.05	2.73	2.66	2.59	3.14	7.79	0.31	0.75	1.25	1.22	1.28	25.62
1954	2.54	1.84	2.41	2.55	1.33	3.39	3.79	6.10	2.12	4.13	1.33	2.86	34.39
1955	2.61	6.77	5.05	2.24	4.26	2.39	5.55	0.88	3.97	4.49	4.92	0.38	43.64
1956	2.50	5.92	4.19	4.09	7.04	4.98	3.90	2.91	2.29	1.54	1.91	2.26	43.83
1957	3.08	2.70	1.44	5.62	5.74	2.68	2.44	3.74	3.20	2.34	6.25	5.98	45.30
1958	2.34	0.61	1.73	3.49	5.33	5.19	7.54	2.52	3.67	1.46	2.67	0.08	37.23
1959	7.61	3.18	2.59	2.33	2.62	5.85	2.77	1.80	1.88	3.05	4.04	2.03	40.98
1960	2.48	3.40	1.14	1.32	3.22	6.16	3.15	5.21	1.07	4.00	2.33	1.73	35.30
1961	1.87	3.54	4.76	2.81	7.31	2.28	5.11	1.07	0.97	1.88	3.34	3.39	38.37
1962	3.98	5.58	4.25	1.28	3.64	4.40	8.36	2.14	2.67	2.87	1.37	1.46	42.88
1963	2.04	1.08	9.91	2.01	2.73	1.59	4.34	1.63	0.18	0.29	0.94	1.08	27.99
1964	2.88	1.98	12.18	6.73	1.13	4.32	2.56	2.25	1.65	0.59	2.69	4.92	43.88
1965	3.11	5.02	2.86	4.90	1.46	6.95	4.42	3.24	6.06	3.81	1.26	1.19	38.33
1966	3.84	3.71	1.22	5.38	2.42	2.52	4.06	4.31	2.13	0.57	4.18	3.31	38.67
1967	0.75	1.86	3.63	3.66	5.64	1.72	4.99	0.77	1.79	2.65	3.84	3.44	35.24
1968	1.79	0.84	4.24	3.47	9.48	2.43	7.50	2.26	2.16	1.35	3.21	4.01	42.54
1969	4.64	1.27	1.42	3.58	2.05	4.91	3.28	2.15	2.87	1.55	3.67	2.99	33.97
1970	1.27	1.68	4.71	7.19	1.88	5.73	3.47	2.96	3.87	2.44	2.29	3.32	40.81
1971	2.47	5.80	2.55	1.04	3.31	5.18	3.70	2.45	6.56	1.44	1.68	3.39	40.66
1972	1.96	2.20	3.68	5.80	6.02	2.41	1.50	2.64	5.96	2.55	6.26	4.23	45.30
1973	1.79	1.58	6.11	5.81	3.46	6.27	7.16	2.62	2.63	4.30	4.95	2.06	46.43
1974	3.64	1.03	4.39	5.08	5.53	4.38	3.82	5.75	4.44	1.07	4.19	2.93	46.76
1975	4.05	3.38	6.74	4.16	3.11	5.09	1.62	1.97	3.64	4.50	2.50	3.36	44.23
1976	3.00	2.97	2.14	1.21	1.80	5.94	2.33	4.38	1.95	3.85	0.83	0.21	30.29
1977	1.90	1.20	4.52	4.16	1.53	7.30	1.90	5.43	1.80	3.74	3.90	4.00	41.55
1978	4.52	0.25	1.99	2.28	5.30	6.63	6.86	4.41	0.43	5.03	2.67	6.76	46.83
RECORD	3.51	2.80	3.97	3.56	3.66	4.09	4.20	2.85	2.84	2.50	3.16	3.08	40.31

Indicates a station move or relocation of instruments. See Station Location table.

Record mean values above are means through the current year for the period beginning in 1948.

Heating Degree Days

CINCINNATI, OH.
GREATER CINCINNATI AIRPORT

Season	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
1948-49	0	7	47	287	561	1171	1102	815	736	292	76	9	5091
1949-50	1	0	37	294	773	841	937	949	1070	262	187	4	5164
1950-51	0	0	18	257	559	1116	1146	729	568	487	196	23	5104
1951-52	0	0	41	224	622	970	1132	839	747	402	51	4	5030
1952-53	2	7	179	311	640	1126	1321	132	619	359	202	25	5881
1953-54	1	6	73	114	586	1296	1301	1005	671	273	64	28	5133
1954-55	0	14	66	374	529	907	1058	894	872	350	43	0	5111
1955-56	2	15	64	367	614	803	1270	931	691	442	181	15	5380
1956-57	0	0	70	428	602	969	910	1043	622	305	175	9	5123
1957-58	0	2	82	313	736	867	1178	1063	609	284	151	6	5291
1958-59	0	4	84	318	576	965	1072	872	852	298	84	24	5100
1959-60	0	0	60	309	737	1058	1265	934	797	264	91	2	5543
1960-61	4	0	28	217	541	829	1133	881	758	351	157	0	4944
1961-62	0	0	31	129	649	731	1079	1024	751	374	116	79	4954
1962-63	2	3	24	404	733	891	1025	888	445	425	206	3	5044
1963-64	0	1	27	217	582	964	901	863	591	332	161	31	4671
1964-65	0	0	147	371	614	942	953	774	778	435	50	10	5074
1965-66	5	0	142	244	474	848	1168	670	558	321	176	5	4611
1966-67	0	2	32	391	586	1118	1440	1303	880	346	207	10	6315
1967-68	0	0	21	381	552	891							

Cooling Degree Days

Year	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
1969	0	0	0	0	92	240	319	285	116	31	0	0	1167
1970	0	0	0	28	151	225	336	320	292	21	0	0	1373
1971	0	0	0	0	33	335	313	236	195	25	0	0	1127
1972	0	0	0	0	65	96	334	268	142	0	0	0	912
1973	0	0	0	4	15	7	228	310	278	170	36	0	1046
1974	0	0	0	8	17	70	121	323	297	30	12	2	900
1975	0	0	0	8	18	136	336	378	72	19	3	0	1161
1976	0	0	0	0	35	207	276	202	39	5	0	0	822
1977	0	0	0	7	27	152	407	285	181	4	5	0	1234
1978	0	0	0	4	63	231	315	255	200	2	0	0	1070

DIAGRAMS & SKETCHES

The first step of the project is to install a forced air fireplace, giving careful thought to such considerations as the outside air intake location, close and easy access to home forced air heating system supply ductwork, and practical routing of flue piping.

The following sketch shows the manner of installation:

Next, the thermostat and fans are connected according to the following electrical diagram:

Note that the white lead from the 110 volt AC power source at left does not connect to the thermostat, 3-way switch, or fan speed control. It merely ties off in each box with wire nuts. When the red wire is added, it does not connect to the thermostat, but ties off with wire nuts.

QEDD FRESH AIR INTAKE
 CONTROL
 12-31-50
 BOB S
 WELDING
 PIECE MUST SLIDE
 BACK & FORTH.

88,25
5

12'-0"

0"

20"

8'-0"

29 1/2"

46"

47"

WALK DOOR

WOOD BEAM UNDER JOIST

1500 JOIST

2x4

EQUIPMENT USED

October 6, 1980

Mt. Vernon Fireplaces, Inc.
P.O.Box 151
Mt. Vernon, Mo. 65712

RE: Model 42 with side ducts
and fresh air box

Country-Flame
WOOD STOVES

Comfort-Flame
FIREPLACES

MT. VERNON FIREPLACES, INC.

314 E. Center
Mt. Vernon, Missouri 65712

WILBUR JONES

Business Phone
417-466-7161

Gentlemen:

In accordance with my telephone conversation with your office last week, I am enclosing herewith a cashier's check in the amount of \$675.00 as prepayment for one unit, model 42, with side ducts and a fresh air box. I understand that this unit comes complete with two 525 cfm blowers, thermostat system, two front heat registers, an ash dump, a clean out door, and two return air grills that hide the blowers.

I would greatly appreciate it if you could enclose any pertinent installation instructions with this unit.

Please ship this unit to Mr. Michael A. Schleper at 2858 Cliffview Court, Villa Hills, Kentucky 41016. I do understand that I will have to pay the freight charges upon arrival.

I would appreciate your shipping this unit as soon as possible, as I am trying to have it installed before the heating season begins.

If you have any questions concerning the above, or if you require additional information, please call me at this telephone number, 606-525-8585. Thank you for your help.

Sincerely,

Michael A. Schleper

MAS:jdr

Enclosure

OVER

Mt. Vernon Fireplaces, Inc.

314 E. Center
Mt. Vernon, Mo. 65712
417-466-7161

CONFIDENTIAL WHOLESALE DEALER PRICE LIST MINIMUM DEALER ORDER 14 UNITS

3 COMFORT-FLAME FIREPLACES ARE AVAILABLE

MODELS	Dist. Net		SUGG. ★ RETAIL	FIREBOX OPENING	OVER-ALL WIDTH	OVER-ALL DEPTH	OVER-ALL HEIGHT	SIZE OF DUCTS	WIDTH OF PAD	USE FLUE TILE
Model No. 33 <small>Prev. No. 42</small>	\$419.00			33"	37"	26"	46"	6"	95"	13 X 13
Model No. 37 <small>Prev. No. 44</small>	\$439.00			38"	42"	26"	46"	8"	100"	13 X 13
Model No. 42 <small>Prev. No. 48</small>	\$459.00			43"	47"	26"	46"	8"	105"	17 X 17

- ★ Price includes duct rings applied at no charge.
- ★ Units shipped with 490 CFM Blowers unless 350 CFM Blowers ordered
- ★ Price includes thermostat system, 2 blowers, 2 fresh air grills, ash dump, and clean out doors.
- ★ All prices are F.O.B. Mt. Vernon.
- ★ 20 OR MORE UNITS \$12.00 PER UNIT OFF PRICE

2 - COUNTRY-FLAME STOVES ARE AVAILABLE

MODEL NO.	Dist. Net.	SUGG. RETAIL	OVER-ALL WIDTH	OVER-ALL HEIGHT	OVER-ALL DEPTH	FLUE SIZE	BLOWER	FIREBOX SIZE	HEAT CAP.
Model No. C-M <small>Double Doors</small>	\$375.00		28"	34"	23"	6"	525 CFM	20 X 23	2500 to 3000 Sq. ft.
Model No. F-B <small>Single Doors</small>	\$265.00		29"	34"	28"	6"	525 CFM	20 X 27	2000 to 2500 sq. ft.

C-M Model Only

- ★ Factory Installed Ducts, \$20.00
- ★ Factory Installed, Side Heat Registers, \$20.00 Each.
- ★ Automatic Room Temperature Thermostat System, \$25.00.

TESTED UNDER UL 127

RECOGNIZED BY I.C.B.O. TO CONNECT INTO A CENTRAL HEAT & AIR SYSTEM. HOW TO INSTALL YOUR COMFORT-FLAME FIREPLACE/FURNACE

Your Comfort-Flame is a full masonry unit, to be in a fireplace hull in accordance with chapter 37 of The Uniform Building Code. Check with your local building code enforcement, or heating and airconditioning office.

NOTE: Your chimney must be at least 18' high from ground level, or at least 3' above the peak of the roof. If space is a problem, by using type B gas vent for your ducts, you can place a framed wall just outside the fans on both sides. Your concrete base could then be the width of (C) above.

- 1 - Two 12"x12"x17" Fan Boxes. These should be placed outside the concrete blocks and set on a 3" high platform. Pad with insulation so it does not chatter. It should set on 2x4 spacers — 2 high.
- 2 - 4" Concrete Blocks line both sides and the back of the fireplace. They must extend at least 2" higher than the unit.
- 3 - Angle irons rest on top of concrete blocks to support the weight of the flue. The Flue does not rest on top of the fireplace. (See specification chart for sizes of angle irons.)
- 4 - Clay flue tile. (See chart for sizes.)
- 5 - 1½" thick insulation. Set the fireplace on the insulation and wrap the entire outside with insulation.
- 6 - Ducts connect to central system. (See chart for size)
- 7 - Concrete Base. (See #D for widths.) Dimensions allow for 4" blocks and 4" bricks to line each side of chimney.
- 8 - Hole in concrete block for asbestos wires from limit switch to exit.

Specification Chart

Model No.	Angle Iron Sizes*	Duct Size	Flue Size	Height	Depth
Model 33	3 pcs. 44" 2 pcs 17" 1 pc. 39"	6"	13x13	48"	26"
Model 37	3 pcs. 46" 2 pcs. 17" 1 pc. 39"	8"	13x17	48"	26"
Model 42	3 pcs. 54" 2 pcs. 21" 1 pc. 39"	8"	17x17	48"	26"

*Longest angle irons for top of unit and over the firebox. The shortest ones span between the top pieces. Final piece is

D--95
C--77"
D--95"

Model #42
A--47"
B--58"
C--82"
C--100"

NOTE: Your chimney must be at least 18' high from ground level, or at least 3' above the peak of the roof. If space is a problem, by using type B gas vent for your ducts, you can place a framed wall just outside the fans on both sides. Your concrete base could then be the width of (C) above.

- 1 - Two 12"x12"x17" Fan Boxes. These should be placed outside the concrete blocks and set on a 3" high platform. Pad with insulation so it does not chatter. It should set on 2x4 spacers — 2 high.
- 2 - 4" Concrete Blocks line both sides and the back of the fireplace. They must extend at least 2" higher than the unit.
- 3 - Angle irons rest on top of concrete blocks to support the weight of the flue. The Flue does not rest on top of the fireplace. (See specification chart for sizes of angle irons.)
- 4 - Clay flue tile. (See chart for sizes.)
- 5 - 1½" thick insulation. Set the fireplace on the insulation and wrap the entire outside with insulation.
- 6 - Ducts connect to central system. (See chart for size)
- 7 - Concrete Base. (See #D for widths.) Dimensions allow for 4" blocks and 4" bricks to line each side of chimney.
- 8 - Hole in concrete block for asbestos wires from limit switch to exit.

Specification Chart

Model No.	Angle Iron Sizes*	Duct Size	Flue Size	Height	Depth
Model 33	3 pcs. 44" 2 pcs 17" 1 pc. 39"	6"	13x13	48"	26"
Model 37	3 pcs. 46" 2 pcs. 17" 1 pc. 39"	8"	13x17	48"	26"
Model 42	3 pcs. 54" 2 pcs. 21" 1 pc. 39"	8"	17x17	48" -	26"

*Longest angle irons for top of unit and over the firebox. The shortest ones span between the top pieces. Final piece is to be placed over the front heat discharge grills.

**Optional outside air kit connects to 6" plastic or galvanized pipe, that exits under the fireplace, and to the left of the ash dump, to a foundation vent on the outside of the chimney. If you do not have the outside air kit, you can open your clean-out door, and your ash dump cover plate to get outside combustion air to the fire.

Caution: The first 6' of duct work from the fireplace must be Johns-Manville uninsulated Flex Met Aluminum Duct or a U.L. or I.C.B.O. approved type B gas vent. To use the flex met you must have the 6' inside the masonry. All applications where the 6' is not in the masonry; you must use the type B gas vent. The type B has a 1" clearance to combustibles.

Limit Thermostat: This thermostat mounts behind right hand heat discharge grill, on a specially designed baffle inside of firebox. Cut the asbestos wire into two 3' leads and attach to each lead of the limit switch and run these leads out the hole provided on the side of the fireplace to connect to your regular wiring.

Mt. Vernon Fireplaces, Inc. ★ 314 E. Center ★ Mt. Vernon, MO 65712 ★ (417) 466-7161

Fig. B Side View

Fig. C Top View

Fig. D Electrical Diagram

Each Comfort Flame Comes Complete With:

- (2) 525 CFM, 2 speed blowers
- (2) 12x12x17 fan boxes with attached return air grills
- (2) open/close heat discharge grills over firebox
- (1) sliding ash dump cover
- (1) clean out door
- (1) limit thermostat

- (1) wall thermostat
- (1) pc. 6' asbestos wire
- (1) roll insulation
- (1) hi-low toggle switch
- (1) wall plate for toggle switch
- (1) wall box for toggle switch

How To Duct Your Confort-Flame Into A Central System

Fig. E

Fig. F

Fig. G

Fig. H

Fig. I

Fig. J

Fig. K

Each Comfort Flame Comes Complete With:

- (2) 525 CFM. 2 speed blowers
- (2) 12x12x17 fan boxes with attached return air grills
- (2) open/close heat discharge grills over firebox
- (1) sliding ash dump cover
- (1) clean out door
- (1) limit thermostat

- (1) wall thermostat
- (1) pc. 6' asbestos wire
- (1) roll insulation
- (1) hi-low toggle switch
- (1) wall plate for toggle switch
- (1) wall box for toggle switch

How To Duct Your Confort-Flame Into A Central System

Fig. E

Fig. F

Fig. G

Fig. H

Fig. I

Fig. J

Fig. K

"The Beauty of a Fireplace, with the Efficiency of a Wood Furnace."
Local Dealer

**BULLETIN 705
TIME TOTALIZERS
HK SERIES**

**HK 420 A6
Non Reset**

**HK520 A6
Reset**

... Totalizes the "ON" or running time of electrically operated equipment.

OPERATION

The Eagle HK series time totalizer has a synchronous motor which drives a set of digit readout wheels to indicate the total time the unit is energized.

Six digit-wheels including a 1/10 digit, provide a fine, wide range of time measurement on the HK400.

The HK500 has five digit-wheels including a 1/10 digit, and features a front mounted reset wheel. The HK500 can be hand reset to zero at any time during its operation.

The time totalizer is also available with a key lock feature. See ordering information on page two.

FEATURES

- Large, easy to read digits
- Dust proof dial cover
- Maintenance free
- High impact plastic case
- Can be mounted in any position

SPECIFICATIONS

Dial Ranges

NON RESET

CATALOG SYMBOL	TIME RANGE
HK400A6	99999.9 min.
HK410A6	99999.9 hrs.
HK420A6	999999 sec.

RESET

CATALOG SYMBOL	TIME RANGE
HK500A6	9999.9 min.
HK510A6	9999.9 hrs.
HK520A6	99999 sec.

Electrical Ratings

VOLTAGE	FREQUENCY	SYMBOL
120 volt	60 Hz.	A6
240 volt	60 Hz.	B6

Temperature Range

0° to 140° F.

Finish

Citron Grey.

Weight

1 lb. 2 oz.

Dimensions

3-5/32" x 3-3/8" x 2-21/32".

(See page 2)

GW Eagle Signal
Industrial Controls
A DIVISION OF GULF WESTERN MANUFACTURING COMPANY
701 Federal Road, Cincinnati, Ohio 45202

BULLETIN 705
TIME TOTALIZERS
HK SERIES

MOUNTING DIMENSIONS
DIMENSIONAL - HK500 SERIES - RESET

DETAIL - MOUNTING

Figure 1

1/2" MAX. MTG. PANEL THICKNESS

Figure 2

TYPICAL APPLICATIONS

- Electronic Equipment
- Computers and Office Machines
- Machine Tool Lubrication
- Maintenance Programs
- Industrial Ovens
- Electrical Equip. Rental
- Industrial Cost Analysis
- Nuclear Control Systems
- Recording Machine Down Time
- Radio Transmitters

ORDERING INFORMATION

HK	4	20	A6
Time Totalizer	4 - NON Reset 5 - Reset	20 - Seconds 00 - Minutes 10 - Hours	A6 - 120V/60 Cycle B6 - 240V/60 Cycle D6 - 480V/60 Cycle

Note:
 Dial Lock
 Cover Available.
 Specify HK500-07
 when ordering.

PHONE 513 - 298-9939
TELEX 28-8234

THAL-MOR ASSOCIATES, INC.

MANUFACTURERS' REPRESENTATIVES
3232 ENCRETE LANE DAYTON, OHIO 45439

A. L. Schleper & Associates
848 Donaldson Rd.
Erlanger, Ky. 41018

CUST. ORDER NO. Job #80-351				DATE SHIPPED 10-29-80	F. O. B. FACTORY	SHIPPED FROM Dayton
ITEM NO.	QUAN. ORDERED	QUAN. SHIPPED	B. O.	DESCRIPTION		
1	1	1		Eagle HK410A6		
3cj				PRO FORMA INVOICE		
				NOTE: Please fill out and return as soon as possible the enclosed Resale Certificate		

* SELLER REPRESENTS THAT WITH RESPECT TO THE PRODUCTION OF THE ARTICLES AND/OR THE PERFORMANCE OF THE FULLY COMPLIED WITH THE FAIR LABOR STANDARDS ACT OF 1938, AS AMENDED AND OF ALL REGULATIONS OR ORDERS OF SELLER WARRANTS THAT THE PRICES HEREIN ARE NOT IN EXCESS OF APPLICABLE CEILING PRICES ESTABLISHED BY AGENCIES AND IN EFFECT UPON THE DATE HEREOF OR ANY SUPPLEMENTARY REGULATIONS, AMENDMENTS OR ORDERS WHICH

MISCELLANEOUS INVOICES

INVOICE

G 7383

ERLANGER HARDWARE CO.

DISTRIBUTORS FOR PRATT & LAMBERT PAINTS

3606 DIXIE HIGHWAY

ERLANGER, KY. 41018

PHONE 727-1844

Cust's No. _____ Date 11-1-80 19__Sold to Al Schleper

Address _____

Deliver to JOB 80-351

QTY.	DESCRIPTION	UNIT	AMOUNT	TOTAL
10	Wire-nuts	.07	70	62
6	Demux Conn.	25	150	1 32
10	Wire-nuts	9	90	79
1	HS BIT	1.50		1 50
1	HS BIT	2.50		1 85
1	4 Round Cover	35		31
1PK	1A 3/16	45		40
1PK	3/4 X 8	45		40
50	Clips	8.00		43
RECEIVED				7 62
DEC 22 1980				38
AL SCHLEPER & ASSOC.				8.00

Rec'd by

Al Schleper

		P. 11 • WALL COVERINGS • CARPETING	
C	COVINGTON / 533 PIKE ST. / PH. 261-0209		
D	DEER PARK / 8005 PLAINFIELD / PH. 891-5335		
M	CHERRY GROVE / 8431 BEECHMONT / PH. 474-4547		
N	NEWPORT / 2128 ALEXANDRIA PK. / PH. 781-2155		
W	CHEVIOT / 4103 N. BEND RD. / PH. 662-3920		
F	FLORENCE / 7713 MALL RD. / PH. 525-7422		
T	TRI COUNTY / 11449 PRINCETON PK. / PH. 772-2944		

CODE

DELIVER TO

Q. 3 80-351

DATE BILLED

TERMS-NET 30 DAYS. FINANCE CHARGE:
1½% PER MONTH - 18% ANNUALLY

SOLD BY		PRICE	CASH	CHARGE	C.O.D.	PAID OUT	MOSE, RET'D.	REC'D. ACCOUNT	ORDER NO.
BACK ORDERED	✓	ORDERED	SHIPPED	STOCK NO.	DESCRIPTION	UNIT PRICE	EXTENSION		
			3	4' Wood TACKLAN		35 FT	4 20		
			1	15' Carpet Tape 1 ROLLER			3 00		
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p>RECEIVED</p> <p>DEC 15 1980</p> <p>VEND-R # 660 JOB # 80351</p> <p>COST CODE AMOUNT \$ SCHLEPER & ASSOC</p> <p>OGM 7 56</p> <p>APPROVED BY [Signature] DATE 12-14-80</p> <p>ENTERED BY [Signature] DATE 12/23/80</p> <p>PAID ON 1/9/81 CK. # 7903</p> </div>									
<p>CUSTOMER PLEASE NOTE: I DO HEREBY CERTIFY THAT I HAVE RECEIVED THESE GOODS AND AGREE TO PAY WITHIN THE TERMS OF NET 30 DAYS. ACCOUNTS THAT EXCEED THESE TERMS COULD BE SUBJECT TO THE LOSS OF CREDIT PRIVILEGES.</p> <p>SIGNED BY: [Signature]</p>								TAX	36
<p>11972</p>								TOTAL	7.56

INVOICE NO.

THIS TICKET MUST ACCOMPANY ANY GOODS BEING RETURNED FOR CREDIT.

CUSTOMER COPY

ERLANGER LUMBER CO RECEIVED

DIVISION OF GOERING INDUSTRIES INC

DEC - 2 1980

3244 DIXIE HIGHWAY • ERLANGER, KENTUCKY 41018 • 341-7025

AL SCHLEPER & ASSOC.

DATE:

PAGE:

SOLD TO:

JOB NO.:

CUSTOMER ORDER NUMBER	SHIP REQUESTED DATE	TERMS	SHIP VIA

SPECIAL INSTRUCTIONS:

ITEM NO.	QUANTITY ORDERED	QUANTITY SHIPPED	UNIT	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
	1	1	EA	4 X 16 CORNICE VENEER		

VENDOR # 2280		JOB # 80351	
COST CODE		AMOUNT	
03M		110	
APPROVED BY	DATE		
125	12/16/80		
ENTERED BY	DATE		
DJ	12/17/80		
PAID ON	CK. #		
11/9/81	7909		

ES

BRICK

INVOICE

PHONE
727-1212

ROOFING

TATE BUILDERS SUPPLY CO., Inc.

BLOCKS • SEWER PIPE • STEEL

3511 DIXIE HIGHWAY • ERLANGER, KY. 41018

Driver

Call

Date

11/3

198 *0*

Sold to

Al Schleper & Assoc.

Mailing

Address

Deliver to

Job # 80-351

Time Out	Arrive Job	Leave Job	Time Return	Credit	Paid	Charge	C.O.D.
						☒	

Quantity	Description	Price	Amount
<i>100</i>	<i>Wall Tiles</i>	<i>5.00</i>	<i>5.00</i>
			<i>25</i>
			<i>5.25</i>

RECEIVED

DEC - 2 1980

AL SCHLEPER & ASSOC.

6220 JOB # 80351	
COST CODE	AMOUNT
<i>0411</i>	<i>5.25</i>
APPROVED BY <i>MS</i>	DATE <i>12/16/80</i>
ENTERED BY <i>RU</i>	DATE <i>12/17/80</i>
PAID ON <i>12/24/80</i>	CK # <i>7888</i>

The undersigned will not hold Tate Builders Supply Co., Inc. responsible for damage beyond the curb line.

By

[Signature]

No. 8801

Art's RENT-A-TOOL

10 Keston Lands Rd. Phone 341-3660
ERLANGER, KY. 41018

Renter's
Name

Driver's
Lic. No.

Address

Home
Phone

Driver License Address

Co.
Phone 525-8585

Name

Al Schleper

Phoned
By

Address

Co.
Order No.

Job
DATE
DUE IN 10/30/80 3:10

Quantity	ITEMS RENTED	Tool No.	8 Hrs. Day	40 Hrs. Week	Spec.	Charges
1	4 wheel flat dolly		8/400			

Quont. Out	MERCHANDISE # 360	JOB # 20351	Used	Cost Each	TOTAL RENTAL
RECEIVED	COST CODE	AMOUNT			Total
	DEM	4.00			Del.
	APPROVED BY <i>MS</i>	DATE 12/1/80			Pick-Up
	ENTERED BY <i>OV</i>	DATE 12/1/80			Repair
PAID ON 12/24/80	CK. # 7868				Cleaning
AL SCHLEPER & ASSOC.					Total Mds.

PLEASE READ BEFORE SIGNING

- All equipment must be returned within one day unless otherwise stated.
- Art's Rent-A-Tool reserves the right to declare any article stolen if kept overtime.
- We charge for time out - not time used, including Saturday, Sunday and holidays.
- This is a rental agreement only and renter has not acquired and shall not acquire except as expressly stated herein any right, title or interest to the equipment which is and shall at all times remain the property of Art's Rent-A-Tool.
- Renter assumes all responsibility for equipment while out of possession of Art's Rent-A-Tool, and said equipment is used at renter's sole risk. Renter will indemnify and hold Art's Rent-A-Tool harmless from any and all liability, claims, costs and expenses arising out of renter's use or possession of the equipment.
- In addition to the rental charges, renter will pay for all equipment lost or damaged beyond repair at the replacement cost thereof and for repairable equipment damaged while in renter's possession at the cost for such repairs by Art's Rent-A-Tool, whether or not the equipment is replaced or repaired.
- Equipment is delivered to renter at Art's Rent-A-Tool office or warehouse, and Renter will return the equipment to Art's Rent-A-Tool office or warehouse in as good condition as received, ordinary wear and tear excepted, on the expiration date specified, or sooner, if demanded by Art's Rent-A-Tool. Conditions which prevent satisfactory operation of equipment whether relating to equipment or to ancillary matters, do not relieve renter of responsibility for rental charges. Renter has inspected and received the equipment clean and in good working order and has accepted it as is. Renter will bear all expenses of collection of charges, including court costs and attorney fees.
- A cleaning charge will be made on all items returned unclean.

DATE 10/29/80 TIME 3:10
OUT 10/30/80 9:00

TAX
TOTAL 44.00
DEPOSIT Chg.
DEPOSIT

IF FOR ANY REASON THIS TOOL DOES NOT OPERATE PROPERLY - RETURN IMMEDIATELY

I have read the above terms and conditions and agree thereto:

X

Car License

Clerk in

Clerk out

not paid by the end of the month subject to 1 1/2% per month service charge, plus \$3.00 billing charge.

No. AB 6449

ASA

MARK A. GIEKMAN
MASONRY CONTRACTOR

512 Lowell Avenue
Loveland, Ohio 45140
Phone: 683-0995

Date 11-18 1980

Mike Schleper

Masonry work Fireplace
Labor & Material

\$800.00

RECEIVED

NOV 21 1980

Pilot Contracting Corp.

-0-

VENDOR #	5470	JOB #	80351
COST CODE	105	AMOUNT	800.00
APPROVED BY	MS	DATE	11-26-80
ENTERED BY	[Signature]	DATE	12/17/80
PAID ON	12/10/80	CS #	107248

JANSEN & SONS INC.
629 Western Reserve Rd
CRESCENT SPRINGS, KENTUCKY 40017

RECEIVED INVOICE

NOV 13 1980

1286

Phone 341-0066

TO

Al Schleper & Assoc.
848 Donaldson Road
Erlanger Ky 41018

AL SCHLEPER & ASSOC.

DATE	11-7-80
CUSTOMER ORDER NO.	job # 80-351
SALESMAN	CIT
VIA	pu

TERMS:

QUANTITY	DESCRIPTION	PRICE	AMOUNT																								
3 pc	white WA	1.65	4 95																								
		JAY	25																								
			5 20																								
<table border="1"><tr><td>VENDOR #</td><td>3536</td><td>JOB #</td><td>80351</td></tr><tr><td>COST CODE</td><td></td><td>AMOUNT</td><td></td></tr><tr><td>0611</td><td></td><td>5 20</td><td></td></tr><tr><td>APPROVED BY</td><td>1/2</td><td>DATE</td><td>11/19/80</td></tr><tr><td>ENTERED BY</td><td>01</td><td>DATE</td><td>11/21</td></tr><tr><td>PAID ON</td><td>12/10/80</td><td>CK #</td><td>101251</td></tr></table>				VENDOR #	3536	JOB #	80351	COST CODE		AMOUNT		0611		5 20		APPROVED BY	1/2	DATE	11/19/80	ENTERED BY	01	DATE	11/21	PAID ON	12/10/80	CK #	101251
VENDOR #	3536	JOB #	80351																								
COST CODE		AMOUNT																									
0611		5 20																									
APPROVED BY	1/2	DATE	11/19/80																								
ENTERED BY	01	DATE	11/21																								
PAID ON	12/10/80	CK #	101251																								
J. F. Oberling																											

ORIGINAL

Thank You!

ERLANGER LUMBER CO.

DIVISION OF GOERING INDUSTRIES INC.

RECEIVED

NOV - 3 1980

3244 DIXIE HIGHWAY • ERLANGER, KENTUCKY 41018 • 341-7025

AL SCHLEPER & ASSOC.

DATE: 11/17/80

PAGE:

SOLD TO:

JOB NO.:

CUSTOMER ORDER NUMBER	SHIP REQUESTED DATE	TERMS	SHIP VIA
	10/21	1-10% 1-10% 1-10%	

SPECIAL INSTRUCTIONS:

ITEM NO	QUANTITY ORDERED	QUANTITY SHIPPED	UNIT	DESCRIPTION	UNIT PRICE	EXTENDED PRICE
1	7	7	EA	2 X 8 - 8' KD C17		
2	2	2	EA	4 X 8 - 8' KD C17		
3	10	10	EA	4 X 8 - 8' KD C17		

I Need Del Rec.

VENDOR # 2280		JOB # 810-351	
COST CODE		AMOUNT	
0314		65.89	
APPROVED BY 11/3		DATE 11-4-80	
ENTERED BY		DATE 11-4	
PAID ON 11/7		CK. # 7769	

INVOICE

**Commercial Construction &
Painting Company, Inc.**

SUITE 1 & 2
P. O. BOX 218, 3126 DIXIE HIGHWAY
ERLANGER, KENTUCKY 41018
(606) 341-7911

RECEIVED

NOV 10 1980

AL SCHLEPER & ASSOC.

November 6, 1980

BILLED TO: Al Schleper & Associates, Inc.
848 Donaldson Highway
Erlanger, Kentucky 41018

Att: Mr. Mike Schleper

FOR: Studs around fireplace

Labor \$ 80.00

Material 40.00

Total \$120.00

VENDOR # 2010 JOB # 80351	
COST CODE	AMOUNT
03M	120 00
APPROVED BY MB	DATE 11-12-80
ENTERED BY DJ	DATE 11/13
PAID ON 11/24/81	CK. # 10124

STEEL METAL PRODUCTS

P.O. NO.

JOB 80-351

INVOICE NO. C 24378

CORKEN STEEL PRODUCTS CO.

322 W. THIRD STREET • COVINGTON, KENTUCKY 41012 • TELEPHONE 291-4664

S
O
L
D

T
O

Al Schlegel & Assoc.
848 Donaldson Hwy

S
H
I
P

O

Michael J. Kelly

Enlarge ~~00000000~~ by 4101P

ORDER DATE	SHIP VIA	TERMS: F.O.B. SHIPPING POINT EX-CEPT AS NOTED, DISCOUNT AS SHOWN 10 DAYS, NET 30 DAYS.	INVOICE DATE	DATE SHIPPED
10-27-80	W/C		10-31-80	10-27-80

QUANTITY	DESCRIPTION	PRICE	EXTENSION	TOTAL
102	6" 30# 9000	2.14	2.14	
200	6" 30# 4.5" angles	1.59	3.18	
24	6" 30# pp 50	5.58	16.24	
	<i>less 480%</i>		22.06	1147
				57
				1204

RECEIVED	
VENDOR # 1070	JOB # 80351
COST CODE	AMOUNT
APPROVED BY <i>[Signature]</i> DATE 11/12/80	
ENTERED BY <i>[Signature]</i> DATE 11/13	
PAID ON 11/25/80 CK. # 780.5	

5075 py 7 ex

A 1 1/2% PER MONTH SERVICE CHARGE WILL BE ADDED TO ALL BALANCES THAT ARE UNPAID AFTER 60 DAYS.

ORIGINAL INVOICE

INVOICE

G 7116

ERLANGER HARDWARE CO.

DISTRIBUTORS FOR PRATT & LAMBERT PAINTS

3606 DIXIE HIGHWAY

ERLANGER, KY. 41018

PHONE 727-1844

Cust's No. 80-351 Date 10/23 1980Sold to Al Schleper & Assoc.

Address _____

Deliver to _____

QTY.	DESCRIPTION	UNIT	AMOUNT	TOTAL
25	4 1/2 x 1 1/2	54	1350	11 88
25	3 x 1/2	38	950	8 36
50	1/2 nuts	12	600	5 28
50	1/2 washers	07	350	3 08
2	1 1/2 Bits	9.25	1950	17 16
				45 76

RECEIVED

NOV 12 1980

AL SCHLEPER & ASSOC.

VENDOR # <u>2220</u>	JOB # <u>80351</u>
COST CODE	AMOUNT
<u>0411</u>	<u>48.05</u>
APPROVED BY <u>1/3</u>	DATE <u>11/18/80</u>
ENTERED BY <u>2</u>	DATE <u>11/21</u>
PAID ON <u>11/25/80</u>	CK # <u>7815</u>

48.05

Rec'd by

Al Schleper

INVOICE

G 7185

ERLANGER HARDWARE CO.

DISTRIBUTORS FOR PRATT & LAMBERT PAINTS

3606 DIXIE HIGHWAY

ERLANGER, KY. 41018

PHONE 727-1844

Cust's No. 80-351 Date 10-25-80 19Sold to Al Schleper

Address _____

Deliver to _____

QTY.	DESCRIPTION	UNIT	AMOUNT	TOTAL
	<u>Credit</u>			
<u>9</u>	<u>bolts 1/2 x 5</u>	<u>60</u>	<u>5.40</u>	<u>4.75</u>
<u>5</u>	<u>" 1/2 x 4 1/2</u>	<u>54</u>	<u>2.70</u>	<u>2.38</u>
<u>21</u>	<u>1/2 nuts</u>	<u>12</u>	<u>2.52</u>	<u>2.22</u>
<u>3</u>	<u>1/2 washers</u>	<u>07</u>	<u>21</u>	<u>18</u>
				<u>9.53</u>

RECEIVED

NOV 12 1980

AL SCHLEPER & ASSOC.

VENDOR # <u>2220</u>	JOB # <u>80351</u>
COST CODE	AMOUNT
<u>04-11</u>	<u>CREDIT 10.01</u>
APPROVED BY <u>AK</u>	DATE <u>11-11-80</u>
ENTERED BY <u>OV</u>	DATE <u>11-21</u>
PAID ON <u>11/25/80</u>	CK. # <u>7815</u>

Rec'd by

INVOICE

- G 7123

ERLANGER HARDWARE CO.

DISTRIBUTORS FOR PRATT & LAMBERT PAINTS

3606 DIXIE HIGHWAY

ERLANGER, KY. 41018

PHONE 727-1844

Cust's No. 80-351 Date 01/24 19 80Sold to Al Schlepfer & Assoc

Address _____

Deliver to _____

QTY.	DESCRIPTION	UNIT	AMOUNT	TOTAL
25	Pratt diffon			
	1/2 3 1/2 to 1/2 X 5 bolts	17	4.25	3.74
				19
				3.93

RECEIVED

NOV 12 1980

AL SCHLEPER & ASSOC

VENDOR # <u>2220</u>		JOB # <u>80351</u>	
COST CODE		AMOUNT	
<u>04-M</u>		<u>3.93</u>	
APPROVED BY <u>MS</u>	DATE <u>11/25</u>		
ENTERED BY <u>01</u>	DATE <u>11/21</u>		
PAID ON <u>11/25/80</u>	CK. # <u>7815</u>		

Rec'd by

Michael A. Schlepfer

COMPLETE SERVICE INC.
P. O. Box 022
CINCINNATI, OHIO 45219

INVOICE

No 0101

(513) 961-5053

MICHAEL A. SCHLEPER
2858 CLIFFVIEW COURT
VILLA HILLS, KENTUCKY 41016

DATE	11-7-80
CUSTOMER ORDER NO.	
SALESMAN	S/M - C. ANTER HELPER - D. SHUCK
VIA	

TERMS:

C.S.I. JOB #802

QUANTITY	DESCRIPTION	PRICE	AMOUNT
	FURNISH AND INSTALL FIREPLACE AND FLUE. FABRICATE AND INSTALL DUCT WORK TO HOOK FIREPLACE UP WITH EXISTING FURNACE.		
	MATERIALS - SEE ATTACHED SHEET		\$ 1011 85
	LABOR - SEE ATTACHED SHEET		784 87
	SALES TAX		45 53
	TOTAL.....		\$ 1842 25

ORIGINAL

Thank You!

№ 1137

PHONE 341-4820	DATE OF ORDER
ORDER TAKEN BY <i>Michael J. [Signature]</i>	CUSTOMER'S ORDER NUMBER
☒ DAY WORK ☐ CONTRACT ☐ EXTRA	
JOB NAME / NUMBER	
JOB LOCATION	
JOB PHONE	STARTING DATE

TO: Michael A. J. Klepper
2550 Cliffview Court
Willits Field Northridge 91016

TERMS: Trade

[illegible]

Work ordered by Michael A. S. S. S. S.

Signature

I hereby acknowledge the satisfactory completion of the above described work.

Thank You

TOTAL OTHER

TAX

TOTAL

45 | 53

194225

PHONE 513-298-9939
TELEX 28-8234

D-U-N-S 01-798-2653

THAL-MOR ASSOCIATES, INC.

MANUFACTURERS' REPRESENTATIVES

3232 ENCRETE LANE DAYTON, OHIO 45439

RECEIVED

INVOICE NO. B 97694

NOV - 5 1980

INVOICE DATE 10-29-80

A. L. Schleper & Associates
848 Donaldson Rd.
Erlanger, Ky. 41018

AL SCHLEPER & ASSOC. SHIPPED TO
A. L. SCHLEPER & ASSOCIATES
848 DONALDSON RD.
ERLANGER, KY. 41018

MARK P. O. # Job #80-351

CUST. ORDER NO. Job #80-351		DATE SHIPPED 10-29-80	F. O. B. FACTORY	SHIPPED FROM Dayton	SHIPPED VIA U. P. S. UNLESS NOTED BELOW U. P. S.	TERMS NET 30 DAYS
--------------------------------	--	--------------------------	---------------------	------------------------	--	----------------------

ITEM NO.	QUAN. ORDERED	QUAN. SHIPPED	B. O.	DESCRIPTION	UNIT PRICE	AMOUNT	NET TOTAL THIS INVOICE																												
1	1	1		Eagle HK410A6		30.00																													
3cj					Trans.	2.47	32.47																												
PRO FORMA INVOICE																																			
NOTE: Please fill out and return as soon as possible the enclosed Resale Certificate.																																			
<table><tr><td colspan="2">VENDOR #</td><td colspan="2">JOB #80351</td></tr><tr><td colspan="2">COST CODE</td><td colspan="2">AMOUNT</td></tr><tr><td colspan="2"></td><td colspan="2"></td></tr><tr><td colspan="2"></td><td colspan="2"></td></tr><tr><td colspan="2">APPROVED BY</td><td colspan="2">DATE</td></tr><tr><td colspan="2">ENTERED BY</td><td colspan="2">DATE</td></tr><tr><td colspan="2">PAID ON 10/30</td><td colspan="2">CASH 739</td></tr></table>								VENDOR #		JOB #80351		COST CODE		AMOUNT										APPROVED BY		DATE		ENTERED BY		DATE		PAID ON 10/30		CASH 739	
VENDOR #		JOB #80351																																	
COST CODE		AMOUNT																																	
APPROVED BY		DATE																																	
ENTERED BY		DATE																																	
PAID ON 10/30		CASH 739																																	
Paid 739 10/30 UPS																																			

#5258585

KIRK MEYER
INVOICE

28437

117 W. FOURTH STREET

CINCINNATI, OHIO 45202

PHONE (513) 621-0620

Pay To Mike S.

Nov 6

1980

Mike Schleper.

110680
*0112
*28978
*28978

CASH

VISA

1-24425 Black & Brass	254	00
1-94425 mesh	23	30

opening size $\rightarrow 42\frac{5}{8} \times 24$
Brick. face.

Pd. in Full
Thank You

TOTAL MERCHANDISE

277 30

SALES TAX - OHIO

KENTUCKY

12 48

INSTALLATION CHARGES

Customer Install

TOTAL SALE

289 78

DEPOSIT

CASH

VISA

M. C.

BALANCE

CASH

VISA

M. C.

CONSIGNEE'S
COPY

DUNS 00-696-8820

Car-bell

Express, Inc. - CAML

PLEASE REFER TO THIS NUMBER
WHEN REMITTING

REMIT PAYMENT

O. General Office P.O. Box 762
Springfield, MO 65801

BILLER
TJR

DATE
10/16/80

PRO.
NO.

01222918

CONSIGNEE AND DESTINATION

SHIPPER AND ORIGIN

PAGE 1

MICHAEL A SCHLEXER
858 CLIFFVIEW COURT
MILLA HILLS

MT VERNON FIREPLACE
314 E CENTER
KY 41016 MT VERNON

MO 65712

SHIPPER NAMES, PRO. NO., ETC.			ORIGIN	DEST.	I/C	TERM CHARGE	COMM. CODE	SHIPPER'S OR GBL NO.	VOL.	BILLING TERM
RECEIVED FROM			01	57	0					SPFD

PIECES	HM	DESCRIPTION OF ARTICLES AND SPECIAL MARKS	CLASS	WEIGHT	RATE	FREIGHT CHGS.
1		WOOD STOVE SAW		630	10.47	65.96
		FUEL SURCHARGE			.0230	1.52
1		TOTAL PIECES		630		67.48*
<p>✓ 5850 02M pd 10/24/80 7749 #862 REC. CHECK \$67.48 C-665C 21840 Job 80-357</p>						

INTERLINE SETTLEMENT				C.O.D. FEE		PAY THIS AMOUNT	
DUE C/66"		DUE C/L					
CODE	AMOUNT	CODE	AMOUNT	REVENUE	C.O.D.	PREPAID	COLLECT
							67.48

in good condition

10-21

1

DRIVER

OPERATIONAL DATA

①

hours

0

278

11-10-80 730AM 28#

8 AM 35#

9:30PM 19#

6.1

11-17-80 7:00

6:40 12#

4#

7:10P 16#

11-17-80 7 PM 16#

28#

8 PM 11.5#

9:10 17.5#

9:50 20.5#

10:40 22.5#

14.9

8:25P 9.5#

8:27P 16.0#

9:03P 10.7#

32.5

11-19-80 6:38 12.25#

6:40 15#

7:15 14.75#

8:05 14.75#

9:45 12.75#

9:50 24.5#

40.7

11-16-80 12:30PM 20#

1 PM 12#

4.75#

1:53PM 9.50#

3:30 PM 22.7#

4:23P 16#

5:05P 11.75#

5:40P 12#

6:18 P 21.75#

10:25P 36#

22.8

11-22-80

8:45P 19#

9:15P 17#

9:30P 16.5#

10:50 26#

12:10 24.25#

47.8

(2)

47.8

11-23-80	12PM	15.75#	11-25-80	6PM	12#
	11:30	24.25#		6:10	12#
	1:10P	10.25		7:50	13.15#
	1:35	8#		9:20	17#
	2:15	14.5#		10:45	20#
	3:15P	12.25#			78.3

5:15P	14#	11-27-80			
6:45P	10#		10AM	20.5#	
7:45P	15#		11:30	7.25#	
9:25P	37#		12:15	8.5#	
	58.9		105	12#	

11-29-80 7:35P 15#

24.7

7:45P 5.25#

11-29-80

8PM 15.5#

5:15P 15.5#

9:15P 24#

5:50P 11#

23.4

6:40 10#

11-25-80 7PM 23.75#

8:20 11.25#

7:30 9#

9:15 8.5#

INTAKE = 75°C

10PM 9.5#

DIFFERENTIAL EX < 120°C

10:40P 7#

8:20P 8#

11:15 11#

8:50P 12#

12:05 10.5#

9:50P 15#

74.8

10:15P 10.25#

70.2

(3)

94.8

11-30-80

6:30 12.5 #

8:30 10.75 #

7:30 11.5 #

97.9

12-2-80

7:30 12 #

8 PM 6.75 #

9:15 13.5 #

10 PM 9.25 #

103.5

12- -80

5 PM 15 #

6:45 6.5 #

7:40 9 #

8:45 9 #

9:40 7 #

109.3

12-10-80

6:40 19.5 #

7:20 7 #

8:15 7.75 #

10:05 11 #

11 PM 7.2 #

22 PM OG 15.2 #

116.7

12-11-80 6.5 # 6:20 PM

6:55 AM 6 #

9 AM 11.75 #

120.8

11:40 A 5.5 #

12:25 P 12.5 #

2 P 4 #

2:30 P 4.75 #

124.1

4:50 P 10 #

5:05 P 6 #

6:40 P 9.5 #

9 PM 17.25 #

10 PM 6 #

129.4

12-12-80 6 #

6:30 8.75 #

11:30 12 #

12-14-80 129.4 #

13.5 #

7:15 PM 19 #

8 PM 15 #

(4)

12-14-80

9:00P 14#

138.9#

12-15-80 6:35AM 17#

140.3 HRS

12:15P 13#

3:00P 7.5#

3:30P 5.25#

4:25P 13.5#

12-16-80

143.8 HRS

12:15 AM 16.75

3:05P 14.5

4:45P 13.5

5:45 7.5#

7PM 9.25#

8PM 10#

9:07 13.25#

9:35 25.5#

153.1 HRS

12-17-80

6:15 7.75#

6:30 13.25#

8:05 10.75#

9PM 13.25#

9:23 13.25#

BARKSDALE
LAWRENCE

12-19 CONP

10:35PM 18.75#

11:20 PM 14#

12:20 PM 12#

162.7#

12-20-80

9AM 11.75#

9:30 AM 7#

10 AM 7#

11:25 AM 4#

12:40 21.0#

12:10P 17#

2:00P 11#

3:PM 20.25#

4:35 13.75#

5:30P 9#

6:30 10.25#

8 PM 7.25#

8:50 5.5#

8:55 8.75#

9:20 15.75#

10:10 10.5#

(5)

12-20-80

11:40 PM 17#

11:05 PM 16#

190.9 Hrs

910 AM

12-21-80 5:25#

9:20 4#

9:25 6.5

10:35 AM 27.25#

10:53 17.5#

12:07 P 18.5#

12:50 16#

1:10 4# 17#

2:15 P 11.75#

4:30 6.5#

5:20 PM 14#

5:55 17.25#

6:45 PM 26#

7:24 14.75#

8:30 PM 13.25#

9:50 PM 21.25#

9:55 PM 11.25#

195.7 Hrs 5:45 P 11.25#

12-22-80

12:25 PM 13#

3:30 P 16#

5:05 7.75#

6:10 PM 10.5#

7:45 PM 17#

8:10 8.25#

8:35 4.5#

9:20 P 11.5#

11:07 P 5.5#

11:10 PM 18#

12:05 AM 18#

205.7 Hrs

12-24-80

1:45 PM 6.25#

2 PM 7#

2:10 PM 10.5#

2:42 PM 7#

4 PM 6#

4:07 PM 1.5#

5:00 PM 5#

5:20 PM 4.75#

5:40 PM 13#

6:10 PM 11.5#

7:15 PM 12#

7:37 PM 11#

(6)
12-24-80 CONT.

8:35P 15¹⁷#

9:15P 12.75¹⁷#

10:10P 12.75¹⁷#

10:50PM 14¹⁷#

11:40 15¹⁷#

11:55PM 13.5¹⁷#

218.3 NRS

12-25-80

8:30 6.8¹⁷#

9:35AM 6.75¹⁷#

9:45AM 13.5¹⁷#

10:45AM 11.75¹⁷#

12:15PM 8¹⁷#

12:50PM 14.5¹⁷#

2:20PM 13.25¹⁷#

2:40PM 12.75¹⁷#

225.5 NRS

12-27-80 9AM 9¹⁷#

9:25A 14.5¹⁷#

12:10PM 16¹⁷#

1 PM 12¹⁷#

1:45PM 14.75¹⁷#

3PM 15.25¹⁷#

3:07PM 12.5¹⁷#

5:25PM 8¹⁷#

6PM 11¹⁷#

6:40 18.5¹⁷#

7:50PM 16¹⁷#

8:40PM 15¹⁷#

9:45 11¹⁷#

10:45 14¹⁷#

11:45 14.5¹⁷#

12-28-80 12:40AM 28.75¹⁷#

✓

244.7 NRS

12-28-80
CONT

9:15AM 11.5¹⁷#

9:35AM 17¹⁷#

9:50AM 14.75¹⁷#

11:05AM 15.5¹⁷#

1 PM 15.75¹⁷#

2 PM 13.25¹⁷#

2:25PM 16.25¹⁷#

3:30PM 20.25¹⁷#

4:10PM 18.5¹⁷#

255.8 NRS

12-29-80

1 PM 15.5¹⁷#

2:40 PM 4¹⁷#

⑦

12-29-80 CONT.

276.6 HR

3:55 10.5 #

1-1-81

4:40 14 #

1 PM 10.5 #

5:00 9 #

2:40 PM 9 #

6:20 PM 10 #

3:25 PM 8 #

7:30 21.75 #

1-2-81

9:20 PM 22 #

4:41 PM 17.5 #

261.8 HRS

6:06 PM 11 #

12-30-80

6:45 PM 20 #

9:10 PM 17.25 #

10:18 PM 21.5 #

263.5 HRS

10:45 PM 18.5 #

12-31-80

281.4 HR

12:30 PM 16.75 #

1-3-81

2:00 PM 8.25 #

9:30 AM 6.5 #

2:30 PM 8.5 #

9:40 11 #

3:45 PM 3.5 #

11:38 8.5 #

4:40 PM 15.5 #

12:15 PM 17 #

5:25 PM 6 #

1:20 10.5 #

6:45 PM 12 #

3:05 18.5 #

7:50 8.25 #

5:15 13.75 #

8:30 PM 16.25 #

6:10 14.75 #

9:52 PM 7.5 #

6:50 13.75 #

9:57 PM 9.25 #

8:30 15.25 #

11:30 13 #

9 PM 13.5 #

12:35 PM 14.75 #

(8)

1-3-81 CONT

9:50 PM 15.75#

8:15 15#

11:30 AM 25.5#

9:05 12.5#

1-4-81 1 AM 17#

10 PM 11#

2:40 17#

326.1 HR

6:30 AM 16.25#

1-6-81

8:40 14.5#

3:20 PM 19.25#

7:30 AM 14.25#

4:15 PM 6.25#

9:30 AM 21.5#

5:00 PM 7.5#

10:35 AM 21#

5:50 PM 1.5#

12:15 PM 20#

6:30 PM 11#

1:35 PM 14.5#

7:40 PM 21.75#

3:37 15#

9 PM 12.5#

4 PM 12#

10:30 PM 16.5#

4:52 23#

11:10 16.5#

6 PM 17#

337.2 HR

6:50 9.5#

1-7-81

7:45 AM 17.5#

12:00 PM 16.75#

8:40 PM 17.5#

1:00 PM 13.25#

9:30 PM 19#

2:00 PM 7#

320.2 HR

2:46 PM 7.5#

342.2 HR

1-5-81

1-8-81

7 PM 12.5#

11 AM 21.5#

7:30 PM 15#

11:05 AM 14#

(9)

1-8-81

12:30 PM 8.5#

1:00 PM 14.75#

2:20 PM 13#

2:50 PM 7.5#

3:55 PM 17.5#

5:30 PM 17.5#

7 AM 11.5#

7:35 PM 23#

9:37 11#

10 PM 17#

3.54, 6.4R 1-11-81

1-9-81

6:30 AM 7#

6:45 AM 13.25#

12:00 PM 23.25#

1:45 PM 8.5#

3:00 PM 12.5#

6:20 PM 29.75#

7:15 PM 8#

8 PM 12#

8:13 PM 9#

9 PM 10.25#

4:45 PM 18.25#

11 PM 14.25 PM

1-10-81

6:30 PM 17.75#

7 PM 14#

7:40 PM 14.25#

8:40 11#

9:30 16.5#

10:50 14.5#

11:30 PM 18.25#

12:30 21.25#

3729.2

12:30 PM 16.5#

12:35 PM 13.75#

4:30 PM 29#

6:15 PM 6#

7:00 11.75#

8:00 14#

9:10 10.5#

10:45 4.5#

11:30 11.25#

11:35 16.5#

1-12-81

7 AM 13#

7:30 18.5#

7:45 15.75#

(10)

12-1-81

9:40 AM 12.5 #

11:05 PM 15.25 #

12:00 PM 9.5 #

1:28 PM 17 #

4:00 PM 10.25 #

5:00 PM 14.75 #

6:20 16.75 #

8:20 9.75 #

9:17 AM 11 #

402.1 HR

8:27 PM 15 #

9:40 19.5 #

10 PM 20.5 #

~~17 #~~

414.9 HR

2-4-81 6:50 PM 21.5 #

7:15 13 #

8:30 24 #

8:52 12 #

10 PM 18.5 #

421.1 HR

2-2-81

7:15 PM 11.5 #

7:30 PM 12 #

8:20 PM 3.75 #

8:23 PM 5.5 #

9 PM 9.75 #

9:55 PM 9.5 #

10:30 PM 14.5 #

2-3-81 ~~17 #~~

7:15 AM 13 #

5:45 PM 15.25 #

7:05 PM 16 #

7:30 PM 15 #

2-18-81

3:45 PM 12 #

3:55 13.75 #

2-8-81

3 PM 16 #

3:55 PM 22 #

4:30 15.25 #

5:10 PM 19.25 #

6:15 PM 18.75 #

7:20 PM 15.50 #

8:15 PM 13.50 #

9:22 17 #

(11)

434.7 HRS 2-12-81

7 AM 21.5 #

2-9-81 1 PM 29.25 #

1:50 PM 31.5 #

8:00 PM 7.25 #

" " 38.5 #

8:55 PM 16.5 #

1:15 PM 14.5 #

9:30 PM 18.25 #

IN NOSE 21.25 #

7:20 PM 18.75 #

441.6 HRS

8:30 12.5 #

2-10-81 3:00 PM 16.25 #

7:40 PM 15.25 #

2-23-81

8:30 PM 12.5 #

7:00 PM 16 #

10:35 11 #

8 PM 12.25 #

11:40 AM 12.5 #

8:05 PM 14.25 #

449.4 HRS 953 20.5 #

2-11-81

4718 HRS

12:15 PM 17 #

12:55 13 #

1:40 PM 9.75 #

7:20 PM 15.5 #

8:50 PM 17.25 #

9:25 PM 13.25 #