Water Extraction, Drying and Repairs to 3 Floors of Federal Building

Frank Bartow, CR

November 1993

INSPECTION

Project Log

Monday, November 29. 1993

Assessment of damages by John Doe and Frank Bartow agreed that water extraction should begin on the third floor and work down. Extraction began immediately using water extraction trucks with hoses accessed through the back stairwell. Even though the accident happened on the third floor, most extraction work was done on the floors below. As soon as each area was completely extracted, drying equipment was put in place.

Several large documents were removed to the Purofirst warehouse to be placed in the drying room.

Crews worked until 2:00 pm to complete extracting, removal of debris and removal of wet ceiling tiles, placing drying equipment and arranging extension cords so as not to break the electrical circuits.

9:00 AM: RH 68% first floor
RH 71% second floor
RH 45% other areas
RH 80% outdoors Temp 74

Readings verified with sling psychrometer.

Walls are wet on first and second floors at least 18 inches up from floor, and in some areas wet to the ceiling. Drying equipment installed to bring down the relative humidity and to facilitate drying of walls. (Total of 21 dryers and 5 dehumidifiers in use at this time.) After the indoor RH in the water damaged area became 45%, the dring equipment was directed specifically toward walls.

Tuesday, November 30

7:00 AM Wayne Jones checked and relocated drying equipment. He also discovered trouble with electrical circuits causing some equipment to malfunction. He decided to bring more cords and plex boxes. The in-house electrician was called to help locate circuits and test the load on the transformer so that one phase of the 3-phase circuit would not be interrupted. Moisture meter readings were taken and indicated that walls were wet on first floor also.

RH 40% temp 68% first floor
RH 36% temp 66% second floor

Documents remained in the drying room at Purofirst warehouse.

3:30 PM Wayne Jones checked and relocated drying equipment. Hooked up a 30′ black cord with 2 plex box on the first floor. Hooked up a 15′ orange cord with 4 plex box on second floor. Assessed that walls were drying very slowly and that breaks in circuits were interrupting power to equipment. Moisture meter readings indicated the walls were still

very wet.

5:00 PM Frank Bartow and Sue Goodman inspected the site. Apprised that first floor walls were still saturated in rooms 133, 102, and 101 and hall 139. On the second floor, walls were wet in the hall by the telephone room, rms 246 and 218. Also wet were inside and outside walls of rms. 216, 217; outside walls of 219, 220 and 222. Walls in rooms 212 and 229 were also wet. An inspection of the carpet determined that all carpet was dry.

Wednesday, December 1

Electrical circuits held quite well due to the additional cords and plex boxes that were added yesterday.

4:45 PM In a phone conversation, Frank Bartow and Adam Man decided that baseboards should be removed and holes drilled to release water in all rooms with wet walls. The baseboard removal and drilling was scheduled for Thursday, Dec. 2. Wayne Jones inspected site to check and reset drying equipment.
5:30 PM first floor RH 45% temp 74%

Documents removed from dryer at 7:00 pm.

Thursday, December 2

4:00PM Marc Scott and Wayne Jones began pulling baseboards and drilling holes to release water and to allow air flow to expedite drying. In the Conference Room accumulations of water in the walls began spewing out when the holes were drilled.

Additional pieces of drying equipment were necessary and all previous pieces were reset to facilitate drying. (Total of 31 dryers and 5 dehumidifiers on site.) Extra extension cords were needed to assure continuous circuit availability. Cleaned up and hauled debris. Scott & Jones left the site at 8:30 PM.

Friday, December 3

4:30 p.m. Checked equipment for proper operation and reset as indicated by moisture meter reading. Tried, without success, to get Saturday access to building. Discovered that third floor walls need to be drilled also. An unpleasant order was found in room 217 from an electrical short in dehumidifier # 13. Faulty DH removed and replaced.
5:00 pm RH 48% temp 72

Saturday, December 4

Worked during the morning trying to contact someone who could approve access to the building. Talked to officer Jones at Capitol Police and Lee Kilmer at Sam Houston maintenance. Officer Jones paged Wayne Jones

at 12:35 that access would be available at 1:00 pm.

1:00 Wayne Jones entered building and determined that more holes were needed. Frank Bartow arrived at 1:30 and confirmed this decision. Holes were drilled on all three floors everywhere wet walls still existed. Additional drying equipment and necessary cords were added. (Total 39 dryers; 6 dehumidifiers; 1 Industrial Dehumidifier) 5:00 pm RH 46% temp 70. Left building at 5:30 pm.

Sunday, December 5

12:00 N Inspected drying process. Reset equipment for maximum capacity. Recorded RH 33% and temp 72. (same equipment)

Monday, December 6

7:30 am: Monitored & checked walls. Equipment reset for maximum drying operation. First floor walls were dry EXCEPT ROOM 102. Some still wet on second floor. Removed baseboards in room 214 and set up two dryers.

Met with Cliff Nortan, building manager, and projected that the work would probably be finished by Tuesday night.

Removed equipment from areas where walls were dry. (Total equipment still at site: 18 dryers, 4 dehumidifiers and 1 industrial dehumidifier.)

Tuesday, December 7

Wayne Jones and Courtney Nolan made final meter readings and checked all areas for dryness. All walls were found to be completely dry. Removed all drying and dehumidifying equipment, cords, etc. and exited the project at the end of 2 hours.

Friday, December 10

Relative humidity readings and wall moisture content readings were made to monitor the dryness of the building.

Monday, December 13

Joel Roberts contacted Wayne Jones to inquire about the repairs to drywall and ceilings and installation of cove base on the 1st, 2nd and 3rd floors of the Treasury Building. Mr. Roberts was at that time not sure who would be performing the repair work. Mr. Jones agreed to call James Brown or John Doe to secure more information. At 5:30pm, Mr. Brown called to give information to Mr. Jones. Mr. Brown said that since this work would be paid for by insurance, he would like Purofirst to perform the repair work.

Tuesday, December 14

11:30am Mr. Brown called Mr. Jones to authorize Purofirst to complete

all the repairs including baseboards, filling holes, replacing ceiling tiles, and ceiling repairs. Mr. Jones agreed to secure requirements for fire codes. Mr. Jones received instructions from Mr. Brown concerning the security clearance for workers who would be in the building after business hours.

2:00pm Mr. Jones had a conversation with Ken Smith to explain that Purofirst had not proceeded quickly with repairs because it had not been determined who would perform the repair work. Mr. Smith agreed that Monday, December 21, would be acceptable to begin repairs.

Friday, December 17

Wayne Jones and Dan Williams visited the job site. They measured baseboards and gathered information necessary for securing materials for repairs. Mr. Jones also measured relative humidity and moisture content in the walls for a confirmation that dryness had been attained before repair work would begin.

Monday, December 20

2:00pm Purofirst sent a fax to James Brown with the names and social security numbers of the repair workers so that D.P.S. would permit them into the building.

8:00pm Dan Williams and Courtney Nolan arrived at the Treasury Building to begin repair work. They continued their work nightly and finished at approximately 3:00am on December 24.

Wednesday, December 29

1:30pm Federal Building official documents were delivered to Ken Smith from warehouse dryroom.

Friday, December 31

9:00am All areas of water damaged carpet were cleaned. Project was completed.

****

SPECIAL PROBLEMS

1. Finding enough electrical outlets and circuits to avoid overloads but still accommodate all extracting, drying and dehumidifying equipment. With many additional extension cords this problem was alleviated.

2. Water dripping on computer in room 102. Ken Smith informed Frank Bartow that computer damages would be handled in-house.

3. Walls were retaining water. By the end of the third day, it was determined that walls were not drying at the normal expectancy rate. Slower drying usually indicates trapped water inside the walls. When holes were drilled behind baseboards, findings included saturated dry wall, some areas of saturated insulation and pockets of water that flowed out of walls.

4. Saturated documents were transported to the drying room at Purofirst warehouse. Computer generated reports several inches thick required page by page exposure to dehumidified forced air. Documents were dry in 3 days.

The Federal Building

The Federal Building is a 7 story structure. The exterior is reflective glass. The interior is common office decor and materials. The carpet is glue-down level loop. The walls have vinyl covering in most areas, some have painted drywall. The ceilings are 10 feet high with acoustical tiles in most areas. Some ceiling areas have painted or wall papered covering. The baseboards are 4 inch rubber cove base. The doors are wood with metal frames. There are no windows opening to the outside.

The building was 4 years old initially used as a bank. Now it is being used by the federal government as a financial office. The condition of the property was excellent.

An automatic coffee maker in the cafeteria on the third floor of the Federal Building malfunctioned and poured a steady stream of water onto the tile floor of the cafeteria. Water began to seep through the flooring, through the ceiling of the floor below. The second floor rooms and hallways were covered with glued-down commercial carpet which was completely saturated. Water was also dripping on second floor furniture - desks, chairs, credenzas, bookcases and file cabinets.

Water was dripping through the second floor into the first floor where it saturated some carpet ares and furniture. Later in the evaluation it was discovered that walls in most of the offices were saturated and contained pockets of water. On Wednesday at 4:45 p.m. Frank Bartow conferred with Adam Man and it was decided that baseboards had to be removed and holes must be drilled in the walls so the water could drain and the drying equipment could reach the wet areas.

Acoustical ceiling tiles that had become saturated with water fell on both the second and third floors. Some ceiling drywall was also effected.

The water damage was found early in the morning of Monday, November 29, 994. It was not determined how long the water had been running.

AREAS AFFECTED:

Carpet wet: 102 (*see note below regarding computer)
& Sheet rock damage
101 & ceiling damage
135 6 ft. into the room from the door
Hallway around these rooms, Carpet & walls wet
Hallway by rooms 246,247,250,212,248,214,218
and men's room
Ceiling damages in 218, 217,219
Carpet saturated and furniture wet in all these rooms
plus 216 220 and 222. Later added 215,225 & 133.
At least 4 desk chairs need cleaning (rm
217)

Water dripped on a computer in room 102 and Frank Bartow was informed by Ken Smith that computer damages would be handled in-house.

The lighting available during the inspection was recessed fluorescent tubes mounted in the ceiling grid and daylight available through the exterior walls which were totally glass.

Instruments were utilized to determine moisture in carpet, walls and air. These instruments included a Tramex Moisture Encounter, a Delmhorst Moisture Tester, a hygrometer, and a sling psychrometer. Another instrument used was an Archer AC Circuit Breaker Indentifier. Documentation for these instruments is included in this report.

Some explanations made to Purofirst by Ken Smith effected the length of the project. Mr. Smith informed Frank that he wanted the building completely and thoroughly dry no matter what it would take. He also wanted it done with minimal interruption to the daily workings of the offices. That meant that some air movers had to be turned off during business hours which extended the drying time by several days. Mr. Smith further explained that he wanted Purofirst to perform all of the work including repairs, which varied from the usual instructions from the federal agency. (They usually perform the repair with internal personnel.)

Mr. Adam Man would not consent to utilizing the HVAC system to assist in the drying of the building due to the effects it may have on delicate computer equipment and comfort for employees.

The following pages contain information, specifications and documentaion relevant to the scientific instruments utilized in this project.

ARCHER Cat. No. 61-2721

AC CIRCUIT BREAKER IDENTIFIER

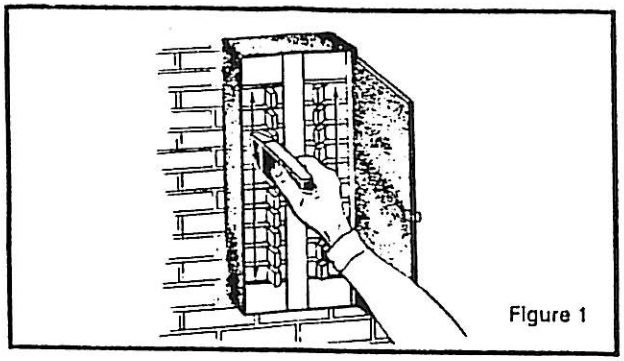


Figure 1

The Archer AC Circuit Breaker Identifier makes it easier and safer to identify the breakers and fuses that control power to outlets and lighting fixtures in your home or office.

Caution: Use extreme care when you work around AC circuits. A severe shock hazard exists. Your circuit breaker identifier is not intended to replace good electrical practices, but to assist you in knowing how your home or workplace is wired.

INSTALLING THE BATTERY

The receiver uses a 9-volt battery. For longest life, we recommend you use an alkaline battery, such as Radio Shack Cat. No. 23-553. Follow these steps to install the battery.

1 Slide off the battery compartment cover.

2 Snap the battery contacts onto the battery.

3 Place the battery in the compartment.

4 Replace the battery compartment cover.

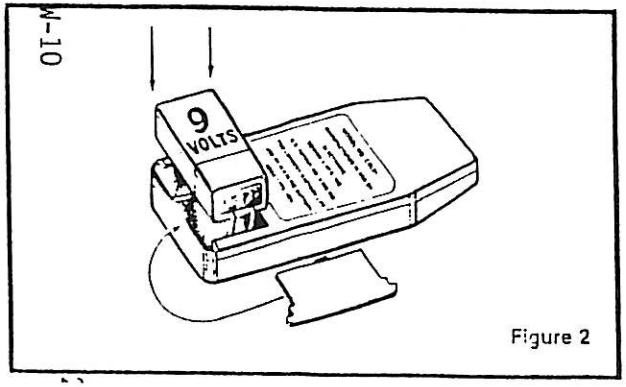


Figure 2

TESTING THE IDENTIFIER

Follow these steps to confirm the identifier is properly operating.

1. Plug the transmitter into an outlet that has power.
2. Turn the thumbwheel until it clicks to turn on the receiver. The indicator lights.
3. Place the receiver next to the transmitter. If the identifier is working and the outlet has power, the receiver beeps and the indicator flashes six times per second.

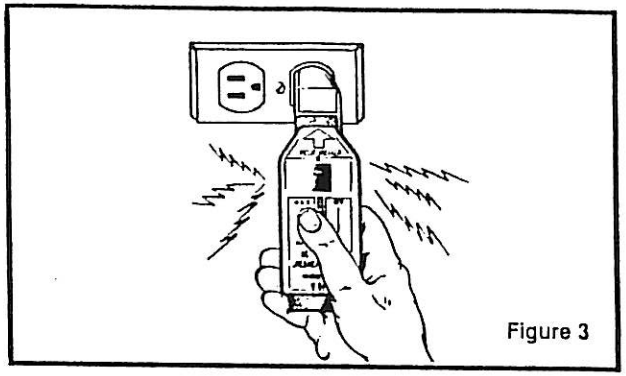


Figure 3

USING THE IDENTIFIER

Identifying the Distribution Box

Follow these steps to identify the distribution box that contains the breaker or fuse that controls power to an outlet.

1. Plug the transmitter into the outlet. Confirm that the outlet has power by performing the steps under "Testing the Identifier."
2. Turn the thumbwheel to MAX for maximum sensitivity.
3. Pass the receiver over the closed door of each distribution box. When the receiver beeps and the indicator flashes six times per second, you have identified the correct distribution box.

Note: Some distribution boxes shield the transmitter's signal enough to block it from the receiver. If you cannot identify the distribution box using the above steps, follow the steps under "Identifying the Breaker" for each distribution box.

Identifying the Circuit Breaker

Once you find the correct distribution box, follow these steps to identify the correct circuit breaker or fuse.

1. Plug the transmitter into the outlet. Confirm that the outlet has power by following the steps under "Testing the Identifier."
2. Position the receiver as shown in Figure 1 and pass the receiver's arrow over each circuit breaker or fuse. The receiver beeps and the indicator flashes six times per second when it is near the correct breaker.
3. Slowly turn the thumbwheel toward MIN to reduce the receiver's sensitivity as you pass the receiver over the breakers. This lets you isolate the single fuse or circuit breaker that controls power to the outlet.
4. To confirm that you have selected the correct breaker or fuse, turn off the breaker or remove the fuse to see whether the receiver stops beeping.

Notes:

- To identify the breaker or fuse that controls power to an incandescent light fixture, remove the light bulb and screw a light socket adapter (not supplied) into the socket. Next, plug the transmitter into the adapter. Then, follow Steps 2 through 4.

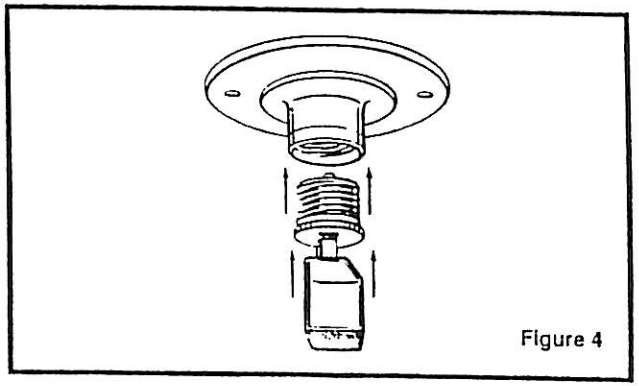


Figure 4

- If you have lights controlled by dimmers, either turn them off or set them to their maximum brightness. Dimmers can cause the identifier to give a false reading.

RADIO SHACK
A Division of Tandy Corporation
Fort Worth, Texas 76102

OPERATING INSTRUCTIONS

moisture encounter

TRAMEX

David White

Manufactured by:

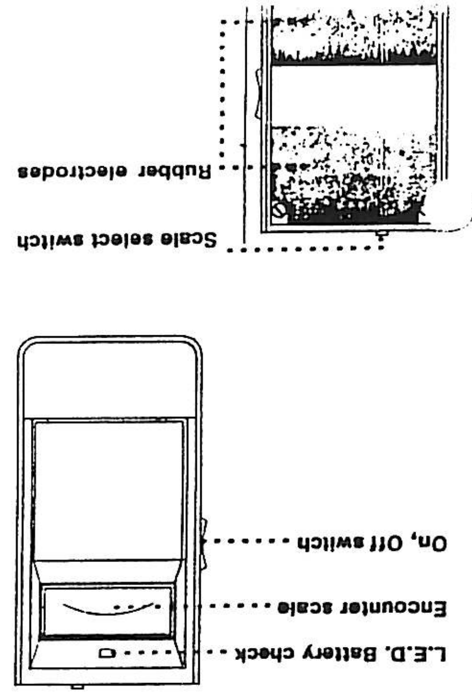
David White

TRAMEX

11711 River Lane
P.O. Box 1007
Germantown WI 53022

DISTRIBUTED BY:

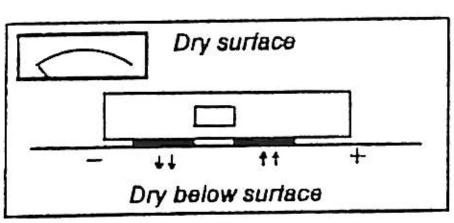
moisture encounter

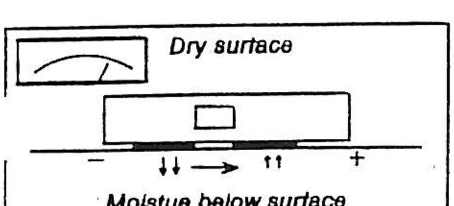


How it Works

The Moisture Encounter is a unique moisture detection instrument which transmits AC signals from 2 rubber electrodes into the material being tested. At any one instant during the cycle, one electrode is positive and the other [illegible]ative
[illegible]hen the material is dry, the resistance is [illegible]gh and the signals are insulated from each other.

When the material contains moisture the conductivity increases by at least 6 orders of magnitude (ie. 1,000,000 times) and the negative signals are attracted to the positive giving an accurate flow which is measured and indicated on the analogue dial.

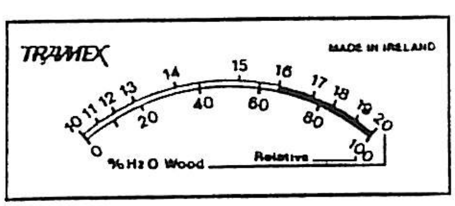




Three scales of sensitivity give suitable signal stengths for testing timber and wood products, felt-roofing, plaster and brick.

The soft rubber electrodes are designed to detect moisture without scratching or damaging the surface in any way.

How to Operate
1. Select the relevant scale.
2. Switch on.
3. Hold the **Moisture Encounter** directly on to the material being tested ensuring the soft rubber pads are in firm contact with the surface.
4. For wood read the moisture content off the upper scale in percentage moisture by weight.
5. For felt-roofing, plaster and brick use the relative scale.



6. Battery check. When the **Moisture Encounter** is switched on, the L.E.D. will commence to flash. This is a reminder to avoid returning the unit to its carrying case while switched on thereby draining the battery.

If the light does not flash when switched on, the battery needs replacing. This unit takes a 9 volt PP3 battery, 1604, 6F22, 6LF22 or equivalent.

Scale 1. Testing Timber and Wood Products
When testing timber and wood products hold the unit directly to the surface and read the percentage from the top scale on the meter.

Calibration is from 10-20% with the range 11-18% most clearly defined. Wood below 10% is generally considered safe for painting indoors, therefore no movement on the dial should be apparent. Wood exposed to outside atmosphere is generally considered safe for painting up to approx. 14%. The calibration is an average of many different readings on the most popular species and as such it is regarded as an average close approximation.

Scale 2. Felt-rooting
Moisture in built-up roofs covered with rooting felt, PVC, modified bitumens, etc. can result in spliting and blistering on the roof surface. In addition moisture can cause considerable heat loss through wet insulation and damage to the contents and fabric of the building.

The **Moisture Encounter** can be used to confirm a new roof has been installed dry and to trace leaks in an old roof.

As there are many different types of membrane and insulations it is not possible to calibrate to give a percentage moisture measurement. The Relative Scale is used for checking the difference between wet and dry.

A leak in a built-up roof may enter the building a long distance from where the moisture enters the roof. Take the **Moisture Encounter** to the area above the leak. Place it on the roof so that the signals penetrate the felt and indicate if moisture is present. By checking across the roof, the outline of the "Moisture Profile" can be marked with spray paint or chalk. By this method the entire wet area can be outlined thereby leading to the defect which allows water entry.

If gravel surfacing is present it needs to be removed by scratching with a claw hammer or similar to ensure close contact with the surface.

No cutting of the membrane is necessary in order to detect moisture. However, it is always recommended that a core be cut to determine the depth and density of water before deciding to carry out repairs.

Scale 3. Plaster, Brickwork
When testing plaster, the readings are taken on the relative scale. When the reading is in the green area the plaster is considered safe for the application of paint. When in the red it is considered wet. **Please note.** The presence of salts on the surface could give a high reading.

Masonry walls which have been placed on soil which becomes wet or saturated or those that have defective or non-existant moisture barrier, often have moisture migration into them. Because of the high cost of remedial work it is essential that the extent of the dampness be identified. Sliding the **Moisture Encounter** across the wall surface, with the electronic pads in contact, will show the difference between wet and dry even if it is not visible.

Fire damage. Quite often a lot of water damage is caused during the fighting of a fire. The **Moisture Encounter** can be used to check walls, furniture, carpets, drapes etc. and is extremely useful in the maintenance and renovation of all types of buildings.

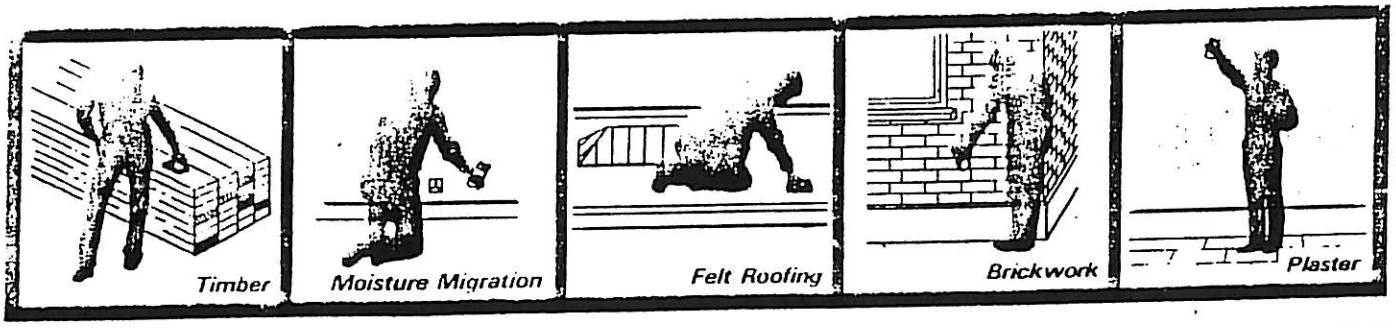
Limitations
On dense concrete mid scale readings may be obtained even if the material is dry. When moisture is present a higher reading will be obtained so a comparison can be made. If a more accurate reading is required contact your supplier for details of the Concrete Scanner.

The Moisture Encounter will not detect moisture through certain rubber roof membranes due to the presence of carbon black filler. These include EPDMs and Butyls. If this is the case, contact your supplier for details of the C.R. Scanner which has been specially developed for these materials.

Testing
All Tramex instruments are rigorously tested to ensure long life under rough conditions. New batteries will need to be occasionally installed and replacements should be kept in reserve and installed once battery check light (LED) is not constantly lit.

Moisture Encounter. Patent Pending.

To ensure that this product meets its specified performance standards, the user should follow all operating instructions and check the controls on the job site. Neither the manufacturer nor its distributors assume responsibility for improperly controlled work.



Warranty/Service
This electronic instrument is guaranteed by David White to be free from defects in material and workmanship for a period of one year from the date of purchase (see owner's registration card for limitations an exclusions).

A product alleged to be defective may be returned, properly packaged and postage prepaid to the supplier or David White, Inc.: 268 S. Johnson Street, Berlin, WI 54923-2297. Request for authorization to return merchandise and all correspondence pertaining to repair or service should be addressed to:

David White
Customer Service Department
11711 River Lane
Germantown WI
53022-3307

FOREWORD

THESE RELATIVE HUMIDITY TABLES are computed for a barometric pressure of 29.00 in-Hg. At lower barometric pressures (higher altitudes) the true relative humidity will be slightly greater than that indicated by these tables. At 25.00 in-Hg and 70°F. dry-bulb, this difference is 1% at 80% relative humidity and 4% at 20% relative humidity. At 100°F., this difference is less than 1% at 80% RH and is 2% at 20% RH. At 40°F., this difference is 1% at 80% RH and is 6% at 20% RH.

It is cautioned that values above 140°F. dry-bulb are obtained from curves which were extrapolated by the National Bureau of Standards from the Weather Bureau data at temperatures below 140°F. Extrapolated values cannot be considered as being absolutely correct.

HOW TO USE THE TABLES

Pages 6 and 7 are arranged for dry-bulb temperature and wet-bulb thermometer depression. The balance of the pages are arranged for humidity values to be taken directly from wet-bulb and dry-bulb temperatures without first determining the depression.

Locate in margin the reading corresponding to the dry-bulb indication. Locate in other margin the reading corresponding to the wet-bulb indication. The relative humidity is read at the intersection of these two columns. For example—given dry-bulb temperature 144°F. and wet-bulb temperature 112°F., relative humidity is 37%.

IMPORTANT DIRECTIONS FOR HYGROMETERS

Care should be taken to keep the wick clean and supplied with water. Distilled water is preferable. Soluble salts and dirt particles accumulated on the wick adversely affect the rate of evaporation and capillarity, causing inaccuracies in the wet-bulb readings. Wash the wicks frequently, discard and replace when the material becomes hard. Additional wicks can be purchased in lots of one dozen.

For Accurate Readings with Stationary Hygrometer—Accuracy with fixed-position hygrometers, such as the Mason's Form, can be obtained only by creating rapid circulation around the bulbs. When taking observations, fan the air vigorously around the instrument with hand fan or similar device for a full-minute or more, then immediately take the readings . . . first, the wet-bulb; then, the dry-bulb.

For Readings Below the Freezing Point—At temperatures below freezing, the capillarity effect of the wicking is lost. Remove wick from thermometer and apply water directly and sparingly to bare bulb. A thin coat of ice will then be formed on the bulb and evaporation from the frozen surface will go on as before. Accurate results can be expected only with finely graduated thermometers; and the lower the temperature, the more critical is this requirement.

HOW TO USE THE SLING PSYCHROMETER

First, remove the instrument from the protecting case. Saturate the wicking covering the bulb, with water at room temperature, then whirl the instrument for 15 or 20 seconds, holding it away from the body. Stop and read the wet-bulb thermometer; then repeat the whirling operation until two or more wet-bulb readings agree at the lowest indication obtainable. The wicking must be kept perfectly clean and thoroughly saturated to secure accurate indication. See paragraph "Important Directions."

Complete tables may be ordered from:

National Technical Information Service
Department of Commerce
Springfield, VA 22161

Order publication number PB257-023/2. All orders prepaid: $11.95 (1986 price) plus $3.00 shipping/handling.