

NAME: \_\_\_\_\_ PERIOD: \_\_\_\_\_ DATE: \_\_\_\_\_

LAB PARTNERS: \_\_\_\_\_ LAB #28

## INTERPRETING WEATHER STATION MODELS

### INTRODUCTION

The reporting of present weather conditions and the forecasting of future weather is the combined effort of thousands of weather stations throughout the world. More than 600 stations exist in the United States alone. These stations report their weather variables to the National Weather Service. This weather information is computerized, analyzed and plotted on weather maps. Weather maps can then help to forecast changes in the weather. Symbols and numbers are placed on the weather maps to represent the atmospheric variables at a particular place and time.

### OBJECTIVES

In this laboratory exercise you will:

1. Analyze 4 weather station models and determine weather factors found at those locations.
2. Draw 4 weather station models accurately placing the weather factors in the correct position on the model.
3. Answer summary questions whose answers are based on the relationship of variables found on station models.
4. Use your knowledge of weather station models to determine weather conditions on two weather maps of the United States.

APPROXIMATE TIME    2 Periods

### MATERIALS

Earth Science Reference Tables

Pencil

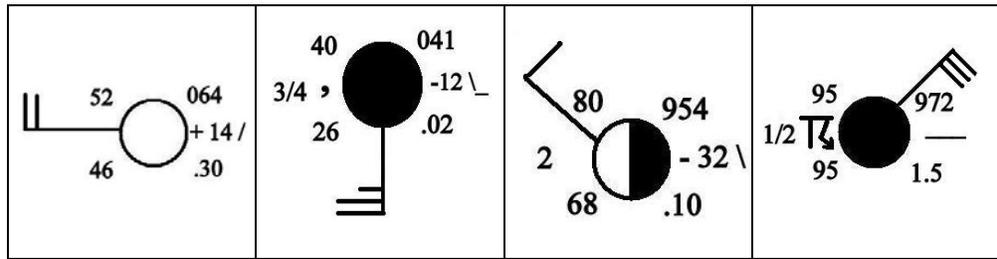
Optional: Supplemental Weather Information Sheets

### PROCEDURES

**Part 1:** Using your Earth Science Reference Tables as a guide, analyze station models 1-4 and fill in the weather data requested in the data table. Be sure to decode all necessary data.

**Part 2:** In this part you are given weather observations in the data table. Take the data from the Data Table and fill in the information in the correct location on station models 5-8. Be sure to encode any necessary data.

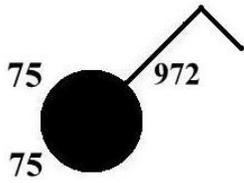
**Part 3:** Using the maps of the United States determine the weather information requested.



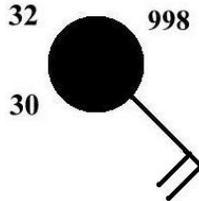
WEATHER FACTOR	STATION #1	STATION #2	STATION #3	STATION #4
TEMPERATURE (°F)				
DEW POINT (°F)				
BAROMETRIC PRESSURE (MB)				
WIND DIRECTION				
WIND SPEED (knots)				
PRECIPITATION (in)				
CLOUD COVER (%)				
BAROMETRIC TREND				
PRESENT WEATHER				
VISIBILITY (mi)				

			
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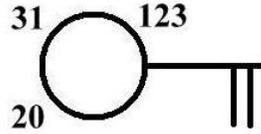
<b>WEATHER FACTOR</b>	<b>STATION #5</b>	<b>STATION #6</b>	<b>STATION #7</b>	<b>STATION #8</b>
<b>TEMPERATURE</b> (° F)	<b>30°</b>	<b>72°</b>	<b>33°</b>	<b>54°</b>
<b>DEW POINT</b> (°F)	<b>27°</b>	<b>72°</b>	<b>32°</b>	<b>40°</b>
<b>BAROMETRIC PRESSURE</b> (MB)	<b>989.4</b>	<b>987.2</b>	<b>998.7</b>	<b>1032.0</b>
<b>WIND DIRECTION</b>	<b>North</b>	<b>Southwest</b>	<b>Northeast</b>	<b>None</b>
<b>WIND SPEED</b> (knots)	<b>15</b>	<b>25</b>	<b>10</b>	<b>Calm</b>
<b>PRECIPITATION</b> (in)	<b>.12</b>	<b>None</b>	<b>.50</b>	<b>None</b>
<b>CLOUD COVER</b> (%)	<b>75</b>	<b>100</b>	<b>100</b>	<b>Clear</b>
<b>BAROMETRIC TREND</b>	<b>-1.0 Decreasing</b>	<b>+1.0 Rising</b>	<b>-2.4 Decreasing</b>	<b>+3.1 Rising</b>
<b>PRESENT WEATHER</b>	<b>Snow</b>	<b>Fog</b>	<b>Sleet</b>	<b>Clear</b>
<b>VISIBILITY</b> (mi)	<b>1/2</b>	<b>1/4</b>	<b>1</b>	<b>Unlimited</b>



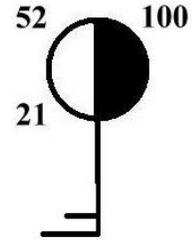
A



B



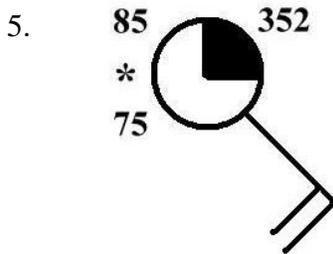
C



D

**LABORATORY QUESTIONS**

1. Which weather station model above would most likely have snow? \_\_\_\_\_
2. Which weather station model above would most likely have rain? \_\_\_\_\_
3. Which weather station above has the highest air pressure? \_\_\_\_\_
4. Which weather station model above has the highest wind speed? \_\_\_\_\_



Of the shown weather variables discuss two things that are wrong with this station model.

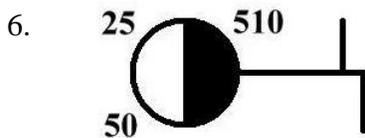
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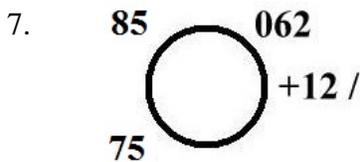
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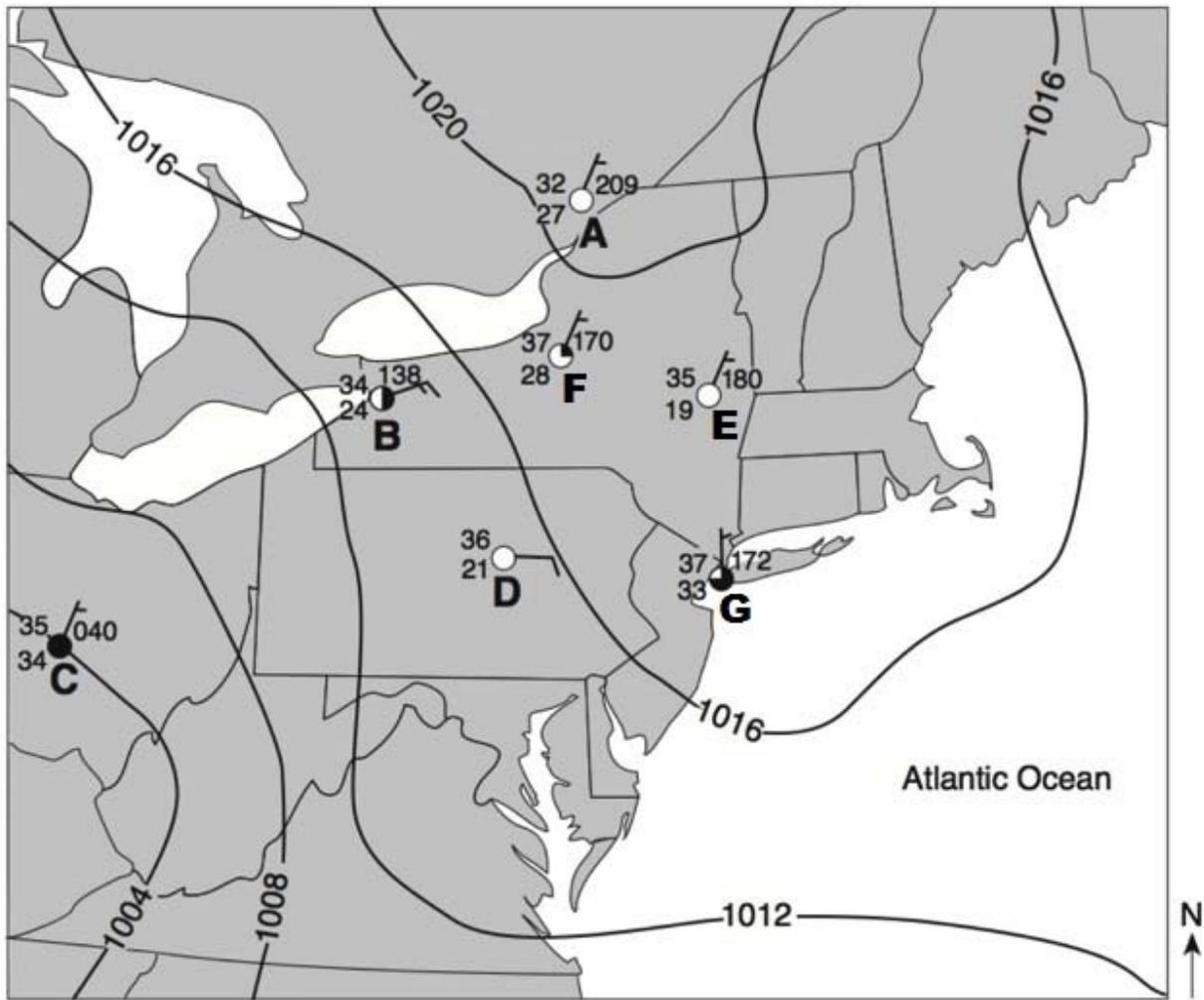


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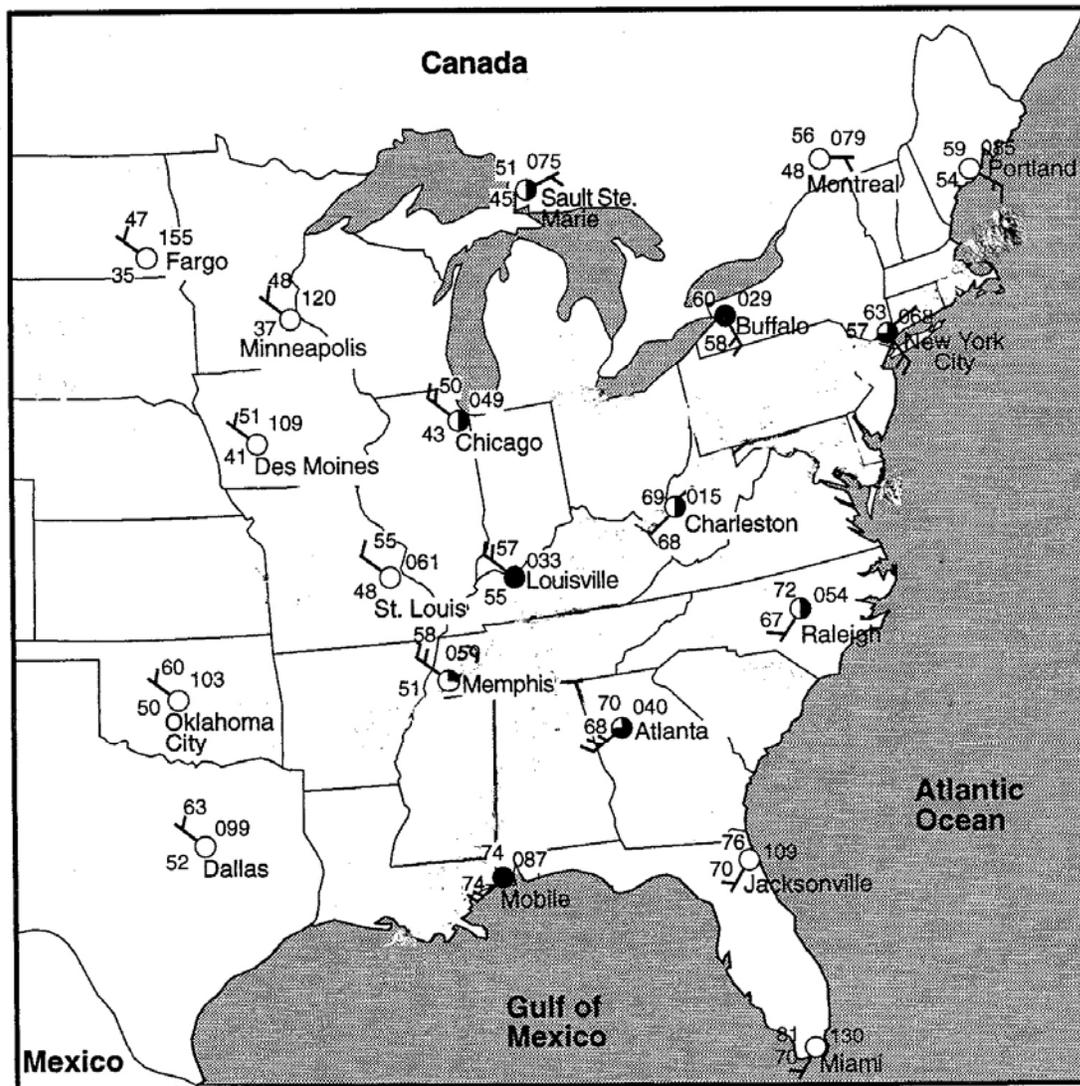
Determine what was the barometric pressure 3 hours ago. (Show work).

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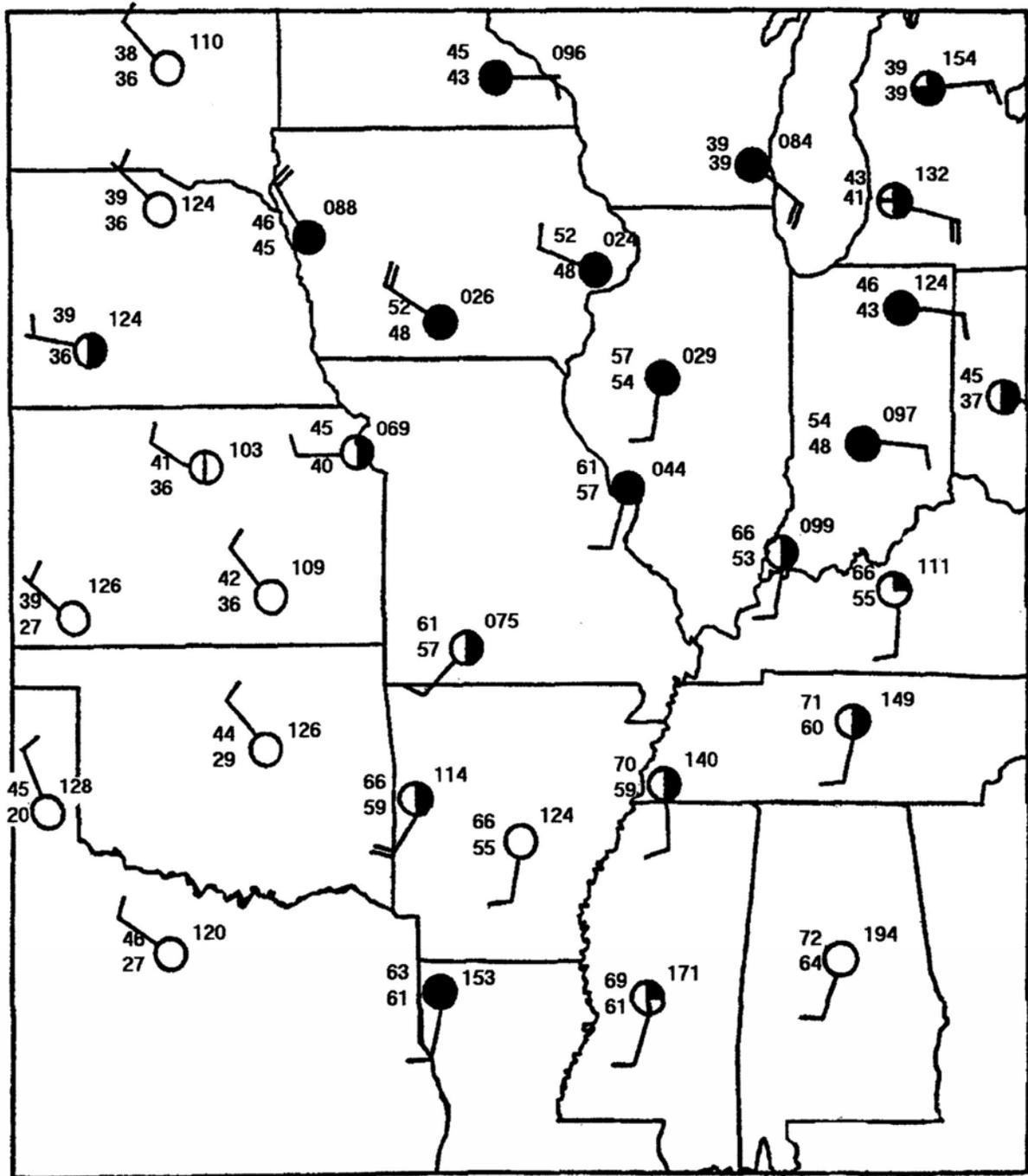
**Map 1- Northeastern U.S.**

- Using your ESRT on page 3 to determine which city (cities) have the highest temperature.  
\_\_\_\_\_
- Which lettered city has the greatest chance of precipitation? \_\_\_\_\_
- Which lettered city has an air pressure reading of:  
1004.0 mb \_\_\_\_\_ 1018.0 mb \_\_\_\_\_ 1020.9 mb \_\_\_\_\_
- Which lettered city (cities) have a wind direction of:  
North \_\_\_\_\_ East \_\_\_\_\_ East Northeast \_\_\_\_\_
- What is the general sky cover in Buffalo, NY? (Use ESRT)  
\_\_\_\_\_
- Using the isobars, give an approximate air pressure at station model D. \_\_\_\_\_



**Map 2 - Eastern U.S.**

7. Which named city (cities) have the lowest temperatures? \_\_\_\_\_
8. Which named city has the lowest chance of precipitation? \_\_\_\_\_
9. What is the air pressure at:  
 Buffalo \_\_\_\_\_ Miami \_\_\_\_\_ Fargo \_\_\_\_\_
10. Determine the wind direction at:  
 Dallas \_\_\_\_\_ Montreal \_\_\_\_\_ Jacksonville \_\_\_\_\_
11. List 2 cities that have clear sky cover. \_\_\_\_\_



**Map 3 – Midwest U.S.**

12. On the map above, draw the 40, 50, 60 and 70 isotherms. Make sure you are using the correct numbers which represent temperature and not dewpoint!

13. Place a large “L” on the map to indicate where the center of the low pressure would be. What three variables/evidences from the station models did you use to put the “L” where you did?

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_

## LABORATORY CONCLUSION QUESTIONS

1. What is the reason that meteorologists use weather station models instead of writing all the information out on a weather map?

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2. If the barometric trend is increasing what changes to the weather will occur?

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3. If the barometric trend is decreasing what changes to the weather will occur?

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4. What weather variable on the station model do you believe is most important? Why?

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5. What is the rule for converting the barometric pressure from the station model to a normally written pressure?

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6. For each of the weather variables found on a station model that are listed in the table below, state the instrument that would be used to measure it.

<b>Station Model Variable</b>	<b>Instrument</b>
Temperature	
Dew Point	
Pressure	
Wind Speed	
Wind Direction	
Amount of Precipitation	