WEATHERPAK® MTR
Training Guide

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WEATHERPAK® is the #1 Choice…

In the mid-1980's NOAA (National Oceanographic Atmospheric Administration) approached Coastal Environmental Systems with the prototype of their plume dispersion modeling software ALOHA. They asked us to build a portable weather station designed specifically for hazmat responders that automatically updates the CAMEO/ALOHA model. Since that time Coastal Environmental Systems has become the leading manufacturer of professional portable weather stations.

Since the original was introduced in the 1980's, WEATHERPAK® has undergone many upgrades and revisions to improve performance and dependability – but the original mandate remains the same – design a sophisticated professional weather station to meet the requirements of hazmat responders and build it to withstand the rigors associated with hazmat response.

WEATHERPAK® is rugged...

Constructed of 6061-T6 mil-spec anti-corrosive, non-sparking aluminum, WEATHERPAK® is impervious to most airborne chemicals.

It can be deployed in the hot zone.

It can withstand a decontamination scrub-down while assembled.

WEATHERPAK® is easy to use...

WEATHERPAK® can be deployed by one person without tools in less than 60 seconds, from case to full operation, including tower.

The electronic compass automatically aligns the WEATHERPAK® MTR to True North.

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WEATHERPAK® MTR…
Built for the future

The Receiver/Display is not just a simple radio Receiver and Display – it uses a Linux operating system that is easily upgradeable to meet future requirements.

System Components: Sensor Package

The sensor package consists of a hermetically sealed aluminum cylinder containing the radio, electronic compass, barometer, GPS, a microprocessor and other electronics.

The temperature/relative humidity sensors and barometer port are located beneath the solar radiation shield at the top of the cylinder.

An ultrasonic "no-moving-parts" wind speed and direction sensor is attached to the top of the sensor package.

Solar Radiation Shield

Relative Humidity/Temperature

Transient Protection

Compass

Radio (Opposite Side)

ZENO® Electronics

Pressure Sensor

Transient Protection
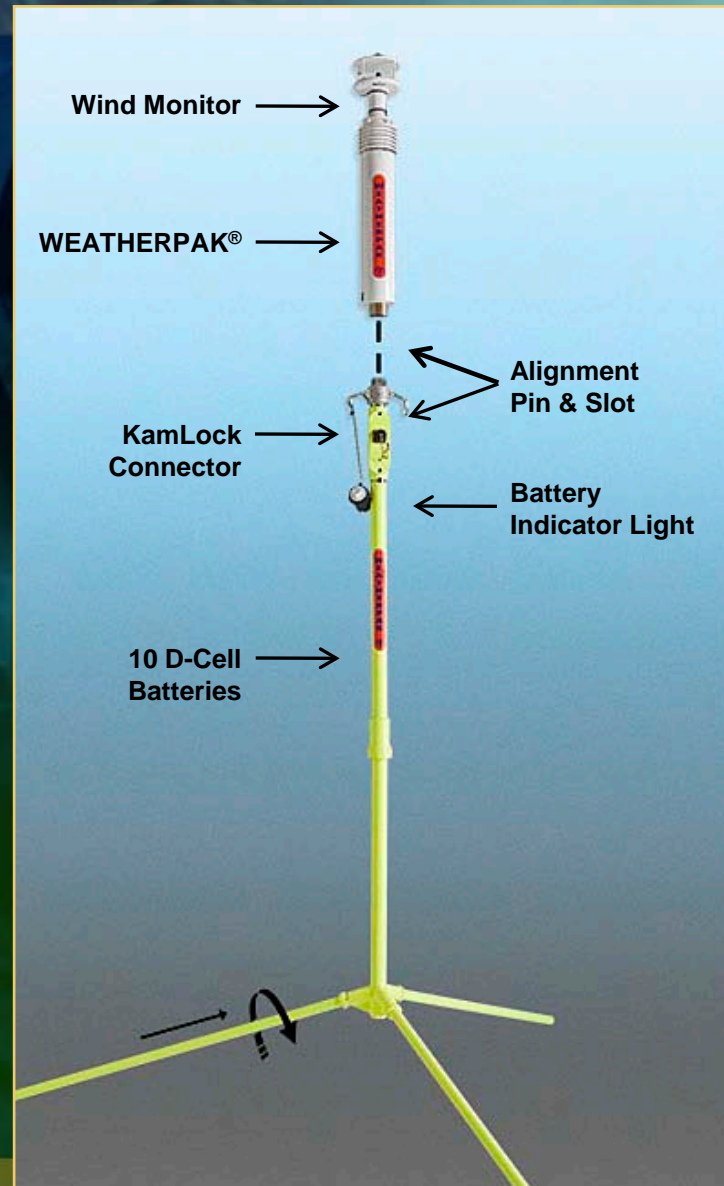
Quick Connect Connector

Tower Connection

System Components: Tower (Tripod)

- The tower contains the power source (ten "D" cell batteries).

- The tower is designed to remain upright in 60 mph winds without additional support or anchoring.

Wind Monitor

WEATHERPAK®

Alignment Pin & Slot

KamLock Connector

Battery Indicator Light

10 D-Cell Batteries

System Components: Receiver/Display Box

Data displayed…

- 5-Minute wind speed & direction
- Compass style wind direction
- Air temperature
- Relative humidity
- Barometric pressure
- Latitude and Longitude

In addition to weather data, three touch-screen buttons at the bottom of the screen open the "WEATHERPAK®s Detected", "Graph Data" and "WEATHERPAK® Status" screens when touched by the operator.

Additional Touch Screens

Following is a summary of the functions of the screens possible on the MTR display.

Active Screen

Once the system boot-up process is done, the Active screen appears and displays data received from the default WEATHERPAK®. If a default station has not been selected, the Active screen remains blank until a station is selected from the WEATHERPAK®s Detected screen and designated as "Active" or "Default". The Active WEATHERPAK®

provides data to the plume dispersion software. It is your MAIN screen.

Access to the WEATHERPAK®s Detected, Graph Data, and Status screens starts here.

Additional Touch Screens

Active Screen
(with optional Background Gamma Radiation Sensor)

With this option, *a Gamma light has been added to the Active Screen on the Display, (and GAMMA labels havebeen added to the WEATHERPAK® and tower).* When gamma radiation levels are in the tolerable range, the light is green. If the level of gamma radiation exceeds specified limits, the light will change to either yellow or red, depending on the amount, and start flashing. An alert will appear on screen that must be addressed by the user before other screens can be accessed.
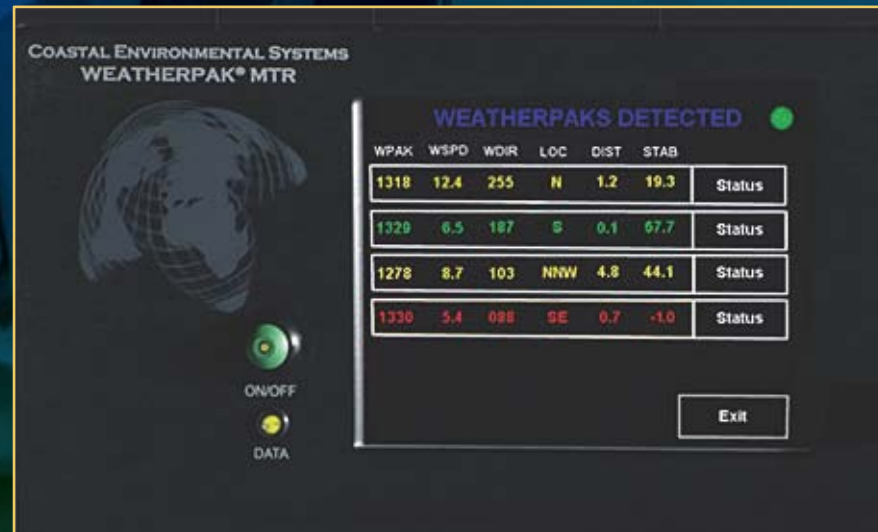
Additional Touch Screens

WEATHERPAK®s Detected Screen

This screen is accessed by touching the "WEATHERPAK®s Detected" button on the Active Screen. It lists all WEATHERPAK®s detected by the receiver and displays the:

- Serial number,
- "Instant" wind speed and direction,
- Direction and distance for THAT WEATHERPAK® – FROM YOU.
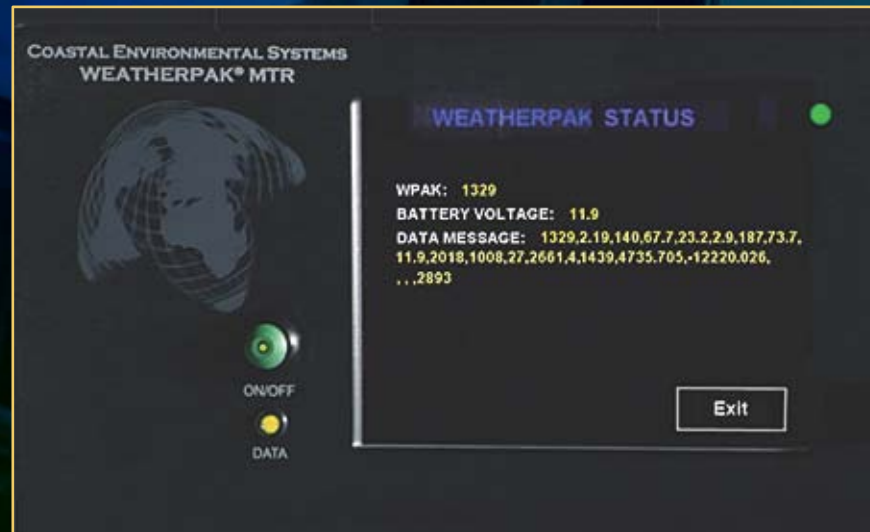
Additional Touch Screens

Preview Screen

Displays data from any station listed on the WEATHERPAK®'s Detected Screen. It allows the operator to view the status of that system and change its Active or Default status.
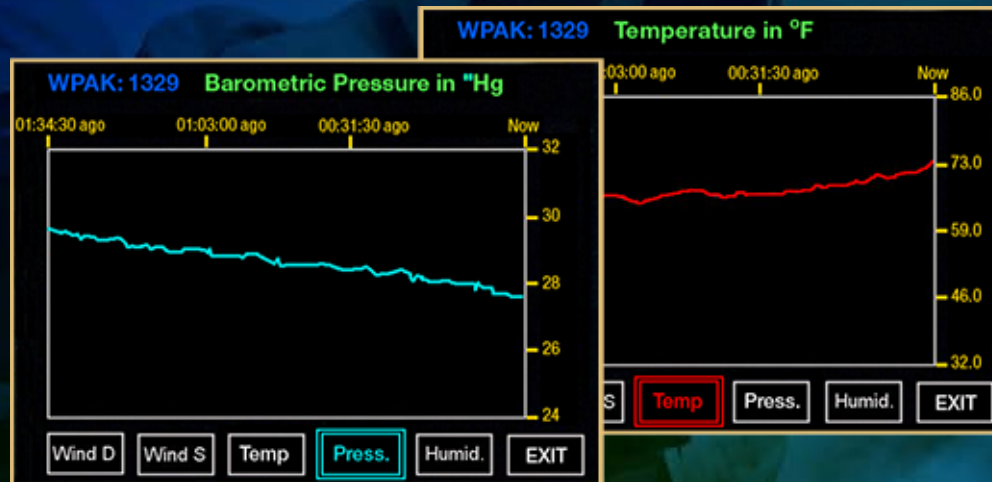
Additional Touch Screens

Status Screen

Displays all information being transmitted by the selected WEATHERPAK®, including its identification number, tower battery voltage, and raw data message.

Additional Touch Screens

Graph Screens

Graph screens track data from each WEATHERPAK® MTR sensor over time. When the display is turned on, data begins to accumulate and is displayed for the most recent three-hour period. Graphs include wind direction and speed, temperature, barometric pressure and humidity.

Additional Touch Screens

Configuration Screens

During the system boot-up process a touch screen button will appear labeled "Configure." When selected, the Configure button opens a series of configuration screens. These screens allow the user to easily configure the way data is viewed.

Select pressure and temperature units, wind units, latitude/longitude formats, data forwarding, and calibrate the touch screen. The previous configuration settings are retained if these screens are bypassed.
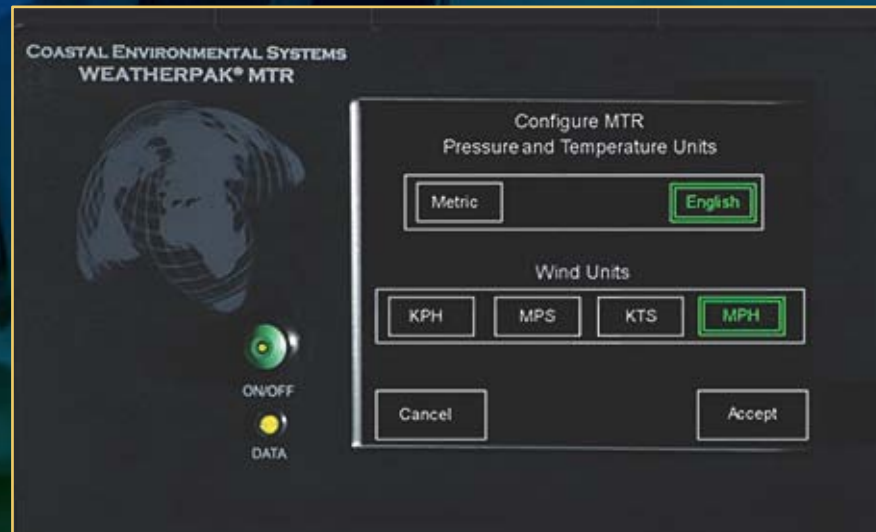
Set-up / Siting Considerations

▪ <u>**Compass Measurements**</u> **–** The WEATHERPAK® has an electronic compass for automatic alignment to North. Like all compasses, it will be effected if located near (laterally) large steel objects (i.e. on top of a van is OK, but next to it is not an ideal location). Try to place the WEATHERPAK® at least 30 meters from large vehicles, cranes, etc.

▪ <u>**Wind Measurements**</u> **–** Select as exposed a site as possible. The wind pattern around a building or other obstacle is disturbed for a considerable distance – try to get the WEATHERPAK® away from that object.

▪ <u>**Radio Transmissions**</u> **–** Deploy the WEATHERPAK® as close to the "hot zone" as safety permits. Maintain good "line of sight" between the WEATHERPAK® and the Receiver. Steel structures, or hills will interfere with the radio signal. Reception range will vary due to signal path and environmental conditions.

Set-up / Siting Considerations

▪ **GPS Operation** – The GPS inside the MTR Receiver/Display and GPS in the WEATHERPAK® work together and provide data to *SmartDetect*™ firmware, which in turn furnishes direction and distance information for additional WEATHERPAK® MTRs operating in the vicinity.

Typically the GPS receiver needs 3-4 satellites in range to receive an accurate location. Occasionally, the receiver only "sees" satellites it is not familiar with. If this occurs it may need to download additional information from the satellites which can take up to 15 minutes. This initialization process should not be interrupted.

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Set-up / Assembly

Open the tower bag and WEATHERPAK® MTR carry case. Remove the WEATHERPAK® as shown.

Please note: the wind sensor is very durable but it can be damaged if used to lift the entire unit.

Set-up / Assembly

Insert each leg into the bottom section of the tower tripod base. Turn until it is secured in the slot.

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Set-up / Assembly

Alignment Slot

Guide Pin

Remove the protective cap. Align the slot on the WEATHERPAK® with the guide pin on the quick release. Push straight in. (DO NOT "screw" the WEATHERPAK® onto the quick release.) This may require an extra push. Then push the arms of the clamp down to assure a tight fit.

DO NOT rotate the WEATHERPAK® or tower when installing or removing.

Set-up / Assembly

Place the entire unit – tower top and WEATHERPAK® – onto the tripod, and securely twist to lock.

The WEATHERPAK® is now running and is sampling data.

When the WEATHERPAK® is removed from the "Quick Release," it will stop sampling and shut itself off.

Replacing the Batteries

- We recommend Alkaline batteries if your use is unknown and infrequent

- Remove battery stop, empty out 10 batteries

- Replace with new batteries

Turn One-Quarter to Open

− +

Use 10 D-Cell Batteries

Connecting to Computer

- Plug the Display box power cord into a power source (110V unless otherwise marked).

- Plug one end of the serial data cable into the computer COM port.

- Turn the Receiver switch on.

- The Receiver power indicator light should now be on. The system will take approximately one minute to boot-up.

- With the WEATHERPAK® MTR assembled and running, and after the Display box has completed the boot-up routine, the amber colored data light should blink briefly, every 30 seconds. If the light doesn't blink, refer to the section on troubleshooting.

- In the event your computer does not have a Serial Port available, you must employ a "Serial to USB" converter. These devices are inexpensive and readily available from most computer retailers.

WEATHERPAK® MTR Operation

- Once the WEATHERPAK® is set-up, it turns itself on, starts sampling, and transmits data every 30 seconds. You can view the data on the Receiver / Display box, or you can view and manipulate the data on the computer using the ALOHA® plume dispersion modeling software.

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Batteries

- WEATHERPAK® MTR is powered by ten alkaline "D" cell batteries, which are located in the top section of the tower. The batteries should be replaced periodically with <u>high quality</u> alkaline batteries. Rechargeable batteries typically do not perform well in the WEATHERPAK®.

- The "Internal" battery in the Receiver/Display box should provide several years of service and is not user maintained. If you believe the internal Receiver/Display battery is not functioning properly, call Coastal's Service Department.

- Please refer to the WEATHERPAK® MTR manual for more on low battery indicators and battery replacement.

<u>Very Important:</u> Study the *WEATHERPAK® MTR User Manual,* Section 7-3 - *"Replacing Tower Batteries and Fuse"* before installing new tower batteries. Improper battery installation will cause system malfunction and likely require fuse replacement.

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Maintenance

Periodic Maintenance Schedule

Routine maintenance is required on the WEATHERPAK® every 12 months. This maintenance is to ensure that the system and its sensors are working and performing to specifications. The actual service varies, based on the sensors installed in your model of WEATHERPAK®. For example, a WEATHERPAK® MTR should have the compass, air temperature (and, optionally, the barometric pressure and relative humidity) sensors tested to their stated specifications. (The wind monitor does not require periodic calibration or maintenance). In addition, the entire WEATHERPAK® should be examined for other damage.

Troubleshooting

Do not take the WEATHERPAK® or the Receiver box apart…

This will void the warranty. If the procedures below do not solve the problem, call Coastal Environmental Systems' Service Department at 800-488-8291 x 157.

Is the WEATHERPAK® on?

Once the WEATHERPAK® is set-up, it turns itself on, starts sampling and transmits data every 30 seconds. If it does not:

- Check that the WEATHERPAK® is properly secured in the quick release...re-seat firmly.
- Check the power connection to the WEATHERPAK®.
- Check the tower batteries and fuse.

Troubleshooting

Is the Receiver/Display box on?

The Display backlight should be on and the Display characters visible. If this does not occur, do the following:

- Be sure the Receiver/Display unit is plugged in and turned on.

- Check the power light on the front panel. It should be lit.

- If the power light is not lit, check for power at the outlet where the Receiver/Display is plugged in.

Power Indicator Light
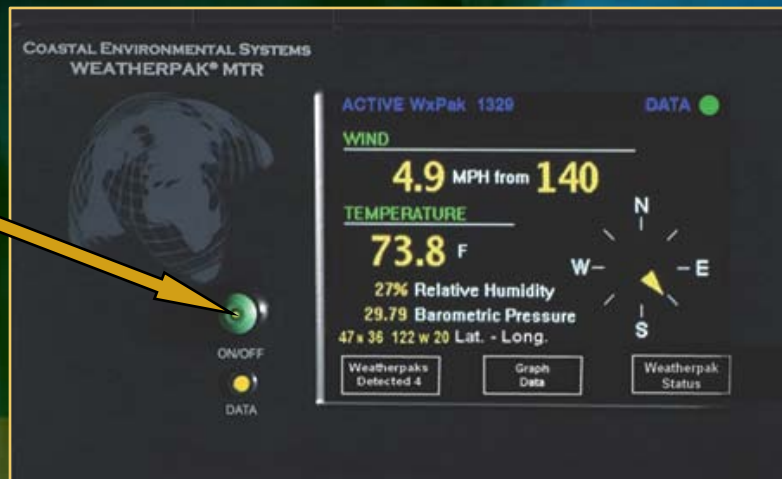
Troubleshooting

Data light not flashing?

Every 30 seconds, the data light will flash, signifying the WEATHERPAK® is updating the display. If the light does not flash, then do the following:

- Be sure the Receiver unit is plugged in and turned on.

- Check the power light on the front panel, it should be lit.

Troubleshooting

Data light not flashing? (continued)

- Check to see if the WEATHERPAK® has "line of sight" (less than 5 miles, no obstructions…hills, steel walls, steel buildings, etc.)

- Confirm that both antennas are properly connected (WEATHERPAK® and Receiver).

- Unclamp and remove the WEATHERPAK® from the tower, wait 10 seconds, then replace the WEATHERPAK® on the tower (this resets it).

- Check to see if the LED tower light is lit; or on older WEATHERPAK®s, if the "Low Battery" beeper in the tower is beeping.

- Confirm that the batteries in the tower are properly aligned and are the correct voltage. (See User's Manual)

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Troubleshooting

The Computer

There is data on the Display, but there is either no data, or erroneous data, at the computer.

- Check all the connections from the Receiver to the computer.

Error messages while running plume dispersion model

These are not related to the use of the WEATHERPAK®. They are messages from the plume dispersion modeling software or your computer's operating system.

- Consult the EPA web site for (**https://www.epa.gov/cameo)** CAMEO®/ALOHA® support.

- Contact Coastal. We are not CAMEO®/ALOHA® experts or certified trainers, but we may be able to help.

Please… Read the User's Manual!

- This presentation is intended to provide a quick overview of the WEATHERPAK® MTR. It is not intended to provide all the information necessary for the proper use and maintenance of the system. The User's Manual provides a great deal more information and a level of detail not available in this presentation.

- A printed copy of the User's Manual was shipped with the WEATHERPAK®. It is also available in a separate file on this disk, in Adobe® PDF format.

- Should you discover contradictory statements or information, consider the Manual as the correct and final source.

- Some features in this guide may not be available on older models.

- If you do find a discrepancy, or have a suggestion on how to make this presentation more useful, please contact the Coastal Environmental Systems Sales Dept. at 800-488-8291.

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ALOHA® and MARPLOT® Screens

- The WEATHERPAK® measures air temperature, relative humidity, barometric pressure, wind speed, and direction every 2 seconds.

- The resulting data is used to automatically compute the stability class of the wind and 5-minute running averages of wind speed, direction, and temperature. Every 30 seconds this data is transmitted to the Receiver / Display box and then output to your computer… automatically updating the plume dispersion modeling software.
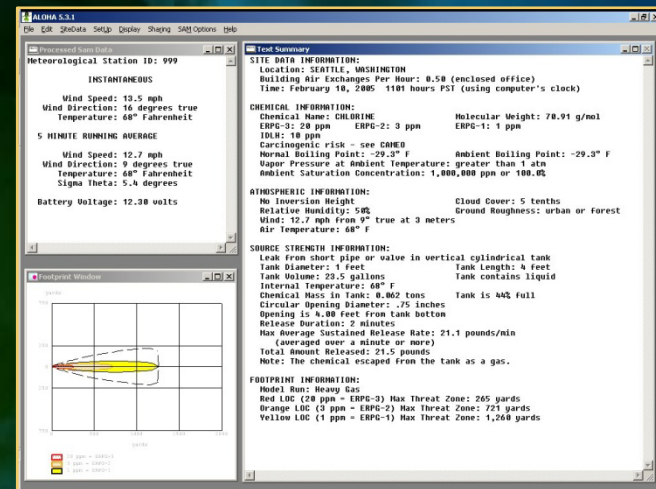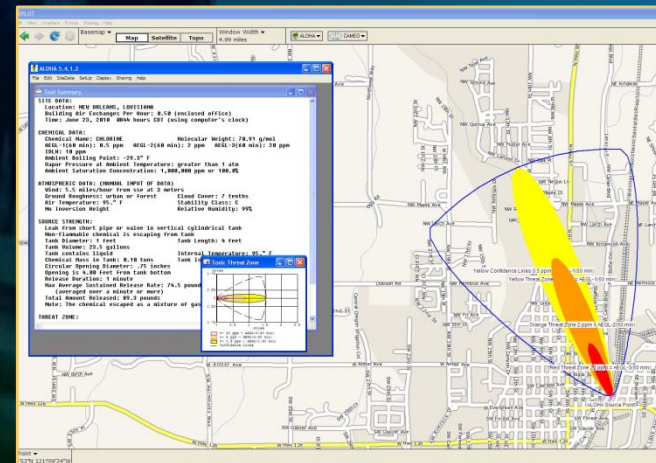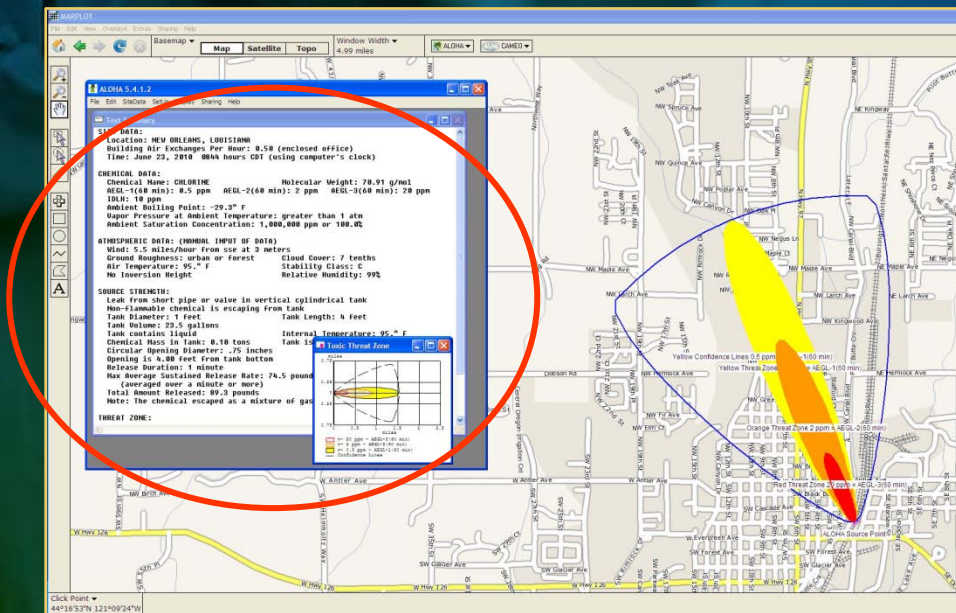
ALOHA® and MARPLOT® Screens

Important Note:

When using the WEATHERPAK® with ALOHA® & MARPLOT®, the ALOHA® application must be running in a window in front of MARPLOT®. The plume dispersion diagram on MARPLOT® will not update every 30 seconds unless the ALOHA® application window is on top.

Resize the ALOHA® window and move it to an area of the screen where the plume dispersion diagram will not be obscured.

While it is advisable to resize the ALOHA® window, do not make it so small that it might be inadvertently "lost" behind the MARPLOT® window.

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