

# RECAP

April 2006

For Professionals Who Monitor the Weather. From the Manufacturers of Capricorn™ and Orion™ Weather Stations.

## ▼ Application Highlight: *Horizon Systems Group, Ice Management Orion Weather Station plays a part in safety of Arctic oil exploration*

Horizon Systems Group out of Nova Scotia, Canada, provides ice management services to a large offshore oil exploration company in the Canadian Beaufort Sea.

### A Potential Problem

When Horizon Systems was looking for a weather station to support their operation in the Arctic, they knew they had a job on their hands. According to their research, most conventional systems freeze up when the temperatures hit  $-40^{\circ}$  C.

### What is Ice Management?

Sean McDermott of Horizon explains: "Ice management is a term we coined almost 25 years ago when we were responsible for monitoring and tracking ice that might impact the safety of our operations and possibly cause us to stop drilling. In open water years (summer), this involves tracking individual ice floes using onboard radar, helicopter recon, fixed wing recon and satellite tracking."

"In winter, we need to monitor the ice type and form around us. We need to make sure that the ice is stable enough to support our on-ice activities such as building ice roads, relief well pads, evacuation shelters (in case of uncontrolled blowout) and runways."

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*"I wouldn't hesitate to recommend the Orion System to anyone who has a demanding application..."*

*— Sean McDermott, Horizon Systems Group*

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"We tie our knowledge of the ice stability in with our weather monitoring and forecasting program. Currently, by using historical weather information, we know just what sort of wind strengths must occur to make our ice become mobile and unusable."

### Orion's Heated Sensor Option Provides Solution

Research and colleagues in the industry pointed them towards Columbia Weather Systems' Orion station. With no moving parts and a heated sensor option, the Orion was well-suited to the application.

"The gear arrived and was quickly installed, which was good... the wind chill was  $-57^{\circ}$  C," relates Sean McDermott, in his capacity as ice advisor. "The rest of the installation was similarly easy, and the few questions we had were quickly and efficiently answered from Columbia's toll free support."

"The Weather Master Software is flexible, and the Capricorn Weather Display is a big hit, especially with the frequent visitors to our ice office," he adds. "I wouldn't hesitate to recommend the Orion System to anyone who has a demanding application and even those who don't."



### INSIDE ReCap

- ▶ WIRELESS WEATHER STATIONS
- ▶ SOFTWARE UPDATE
- ▶ HAZMAT WEATHER, PART I

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► **Product Highlight: *Wireless Weather Stations***

All weather stations offered by Columbia Weather Systems are available in a wireless version. Spread spectrum bandwidth and channel-hopping technology minimize the effects of interference to prevent data corruption. Proprietary signal coding provides data verification security.

**Fixed-Mount Wireless Weather Stations**

For fixed-mount weather stations, two wireless transceiver options offer line-of-site range at 3 miles and 20 miles. These transceivers are certified for use without an FCC site license in the United States and Canada. They are also CE approved.

For Capricorn 2000 or Capricorn 2000EX weather stations, weather sensors are connected to the control module which is housed with a transceiver in a weatherproof enclosure. One or two transceivers are also connected at the data viewing point(s) — the Weather Display Console and/or computer.

For the wireless Orion Weather Station, a transceiver is housed in the weatherproof enclosure near the sensor head. A single transceiver is connected to the Orion Interface

Module at the data display site, which then is connected to a Weather Display Console and/or computer.

These stations require power at the site of the weatherproof enclosure. This power can be AC, battery or solar. The Orion sensor head requires significantly less power and is a good choice for solar or battery-powered operation.

A wireless weather station system configuration would include the weather station itself with display or software, plus a weatherproof enclosure and transceivers.



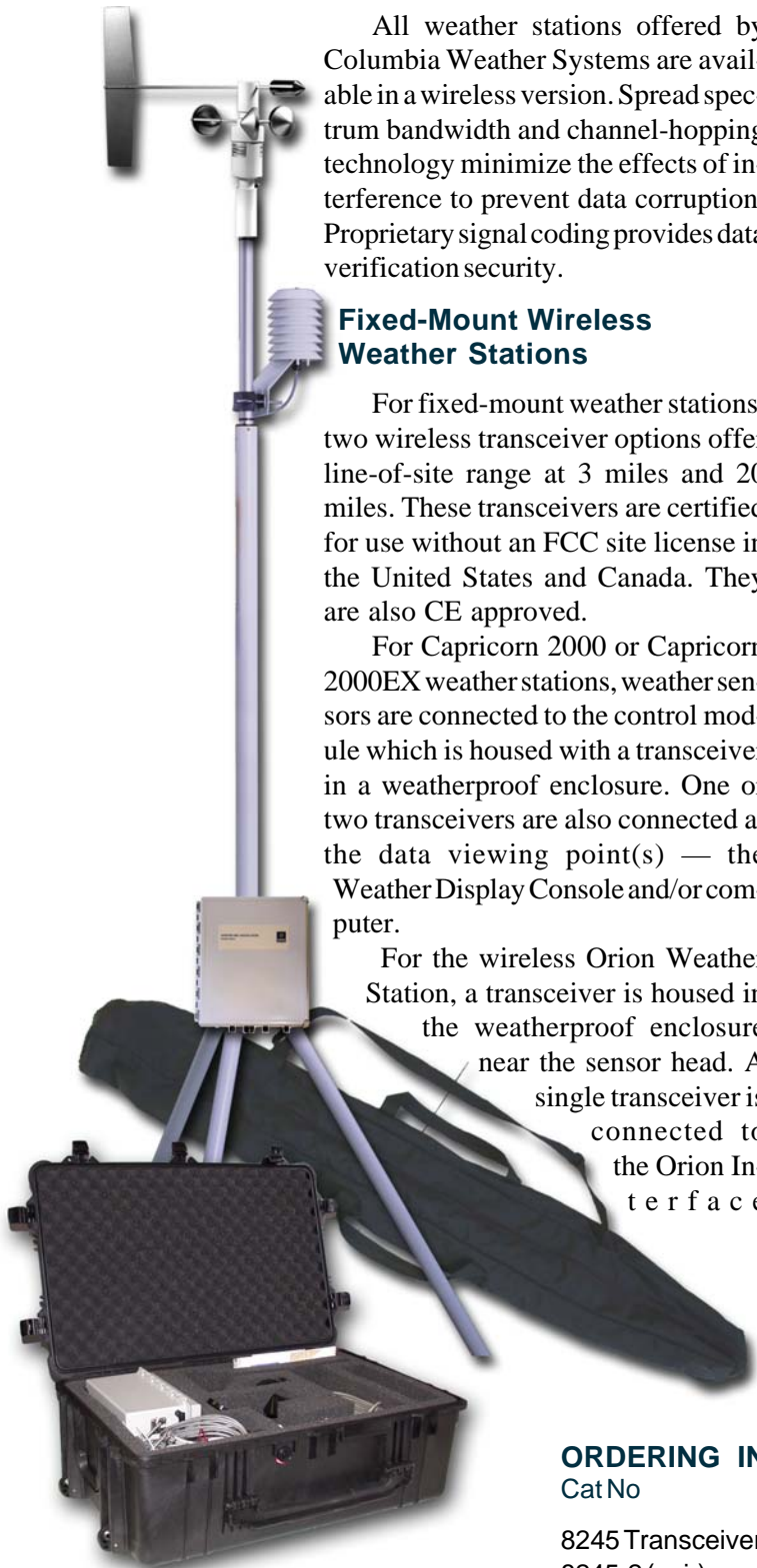
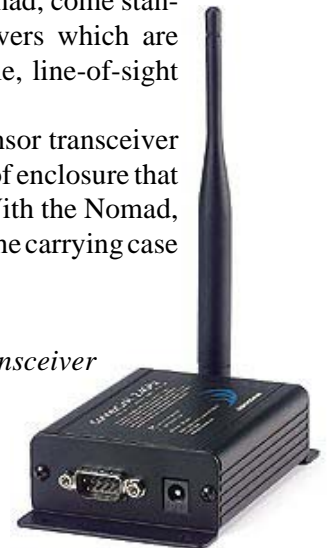
*Weatherproof enclosure houses the Capricorn 2000 Control Module and transceiver.*

**Portable Wireless Weather Stations**

Our portable weather stations, Pegasus Fly-Away Kit and Orion Nomad, come standard with 2.4 GHz transceivers which are good over a two to three mile, line-of-sight range.

With the Pegasus, the sensor transceiver is mounted in the weatherproof enclosure that is hung on the tripod mast. With the Nomad, the transceiver is mounted in the carrying case with the battery pack.

*Catalog No. 8245 Transceiver*



*Pegasus EX Portable Weather Station*

**ORDERING INFORMATION**

Cat No	LOS Range	Frequency	Ouptut Power	Price
8245 Transceiver	3-mile	2.4 GHz	100mW	\$350
8245-2 (pair)	"	"	"	\$700
8253 Transceiver	20-mile	900MHz	1W	\$260
8253-2 (pair)	"	"	"	\$520
88160 Weatherproof Enclosure				\$250

## ▼ Weather Watching

### **HazMat Weather Part I: Mitigating the Unthinkable**

by John Gerrish

New scientific innovations occur all the time and new products are brought to market making our lives better and easier — computers, the Internet, cell phones, compact discs, lasers. Where would we be without satellite communications, plastics, synthetic and composite “man-made” materials that are stronger and lighter than steel?

These new products don't come without a cost. Many of these materials are developed using petroleum-based materials, caustic chemicals, corrosive acids, and complex chemical compounds which are hazardous to people and the environment. The waste products from these processes and materials are also harmful; containing and disposing of them is problematic. Accidents happen. Even worse, what about deliberate acts of sabotage and terrorism?

**Hazardous Materials (HazMat) primarily come in three forms: radiological/nuclear, biological, and chemical.**

From 1995 to 2004, there have been over 150,000 HazMat related incidents and accidents on our nation's highways, waterways, airways, and railways. Over 5,000 have been classified as “Serious Incidents.”

Many industrial sites store or transport HazMat chemicals in pressurized liquid or solid form. When these chemicals are exposed to air, they can instantly vaporize and be carried on the wind.

**Businesses store hazardous materials.** Pool and Spa outlets store enormous amounts of chlorine-based products. Many fertilizers are chemically based and can be extremely volatile when mixed with petroleum products, as evidenced in the Oklahoma City bombing. The methamphetamine epidemic in our country requires caustic chemicals that are extremely dangerous and toxic.

Because many chemicals or chemical compounds are highly flammable or even explosive, city ordinances now require businesses that store toxic chemicals to mark their buildings with symbols to notify emergency and fire personnel what types of chemicals are stored inside.

#### **Terrorism**

September 11, 2001 changed our world forever. We were served notice of an emerging and deadly threat. Not only do we have to prepare against accidents and incidents, now our emergency responders must become prepared and trained against deliberate acts of terror and weapons of mass destruction.

County, state, and federal officials have formed agencies to prepare for the unthinkable — from railroad accidents with hazardous materials, to highway incidents, to deliberate acts of terror.

**Biohazards** — bacteria and virus strains such as Anthrax, Typhoid, Small Pox, Bubonic Plague, and Cholera — can also be carried on the wind or through our water systems. Plagues wiped out over 25 million people, one-third of Europe's population, between 1347 and 1352. In Asia, millions died of Cholera. Although an accident of this magnitude is unlikely, a deliberate act of terrorism is a frightening thought.

In the early 20<sup>th</sup> century, unethical warfare brought these biological agents to the battlefield to kill the enemy en masse. Today, these airborne virus and bacterial agents can contaminate an entire geographical region and spread rapidly, infecting a large population center in a very short time.

A **nuclear** accident is unthinkable, but the threat is extremely real. Chernobyl is a prime example where nuclear radiation spread downwind for hundreds of miles, contaminating everything in its path. A “dirty bomb” is a relatively small nuclear device designed to create a low-yield explosion and a high-contamination debris/dust cloud. Minute dust particles contaminated with radiation would be carried far downwind to pollute everything they touch. Ground Zero and the surrounding area could be uninhabitable for years.

**Our first line of defense is our local fire and police departments.**





## ▼ *HazMat Weather continued...*

County, State, and Federal Emergency Management agencies, fire departments, and HazMat teams are trained to recognize a threat and take action. They respond to contain and neutralize the effects of potentially deadly toxins. Accident and Incident Commanders are highly trained in mitigation techniques. Through all of this, one constant holds true: airborne contaminants pose the greatest threat to the population.

*Knowing precise weather conditions is vital to HazMat mitigation.*

Wind, temperature, humidity, and other atmospheric conditions are paramount in determining downwind contamination areas, chemical dispersion rates, and evacuation areas. Knowing the character of the atmosphere is like knowing battlefield terrain.

Computerized Toxic Chemical dispersion programs have been developed to decipher the character of airborne chemicals and to predict their character. These modeling programs complement the decision-making tools an Incident Commander has at his disposal. However, with ever-changing weather conditions, the variables soon get beyond the scope of the software.

By automatically ingesting weather data into computer programs such as CAMEO/ALOHA (Computer-Aided Management of Emergency Operations/Areal Locations of Hazardous Atmospheres) and MARPLOT (Mapping Application for Response, Planning, and Local Operational Tasks), Incident Commanders have the ability to make computer-aided decisions that affect both the mitigation process and any evacuations that may be necessary.

**Weather monitoring equipment is a real force-multiplier.** What used to take multiple personnel to compute and plot a toxic plume is now done automatically by computer generation. Mission-critical data is now instantly and continuously available. Data can be instantly transferred to keep all Command levels apprised of vital weather conditions and critical toxic chemical modeling.



*Arizona HazMat Exercise Downwind Accident Plot Mat*



Automated weather stations mounted on emergency vehicles, Mobile Command Posts, and stand-alone portable weather systems are used to track weather conditions in tactical situations or in the middle of a “hot zone” from a safe distance.

### **HazMat Weather Factors**

**Wind Direction and Wind Speed.** By knowing the wind’s character, experts can plot a toxic plume model to determine the scope of the contamination cloud.

**Temperature** readings are crucial because different chemicals vaporize at different temperatures. Some vaporize instantly when they come in contact with air, others vaporize at different ambient temperatures. Also, the warmer the atmosphere, the more vapor the air can hold, thus the more intense a plume cloud can become.

**Relative Humidity** readings are crucial because they indicate the percentage of moisture contained in the atmosphere, which can easily become contaminated by the toxic cloud vapor.

**Dew Point Temperature** indicates the temperature at which the atmosphere becomes totally saturated (100% humidity) and dew or fog may form. In a toxic environment, this means the toxic chemicals will be trapped close to the ground in a saturated atmosphere and persist until the weather conditions change.

**Barometric Pressure** is a strong indicator of the upward and downward air movement in the atmosphere through air density. When pressure rises, the air aloft is sinking downward. This creates higher pressure and often traps the air close to the surface. Consequently, if the pressure is falling, this means the air is rising upwards, thus creating the ability for the chemicals to rise up and disperse into the atmosphere.

**Rainfall** washes chemicals out of the atmosphere; however, this means that it contaminates the ground and/or ground water.

▼ **HazMat Weather...**

Water (or rainfall) also activates some chemicals - for example phosphine. This gas is used for pest control and as a fumigating agent. For farm use, it is often sold in the form of aluminum phosphide pellets, which yield phosphine gas on contact with atmospheric water.

**Conclusion**

Monitoring atmospheric conditions won't stop accidents and incidents from happening, but it provides a powerful and valuable tool in mitigating their effects and protecting lives.

*Look for Part II in the next issue of Recap and view John's Powerpoint presentation at [www.columbiaweather.com](http://www.columbiaweather.com).*

▼ **Software Updates**

A new feature of Columbia Weather Systems' proprietary **WeatherMaster™** Software is the ability to have a customized display screen. Users can request a custom display screen suited to their particular application, including such things as calculated parameters or user-supplied graphics such as a company logo.

**Weather View 32,™** the popular weather monitoring software with a graphical user interface, will soon be available for Orion Weather Stations.

**ORDERING INFORMATION**

Cat. No.	Price
8290 WeatherMaster	\$395
8273 WeatherView 32	\$250



▼ **Customer FollowUp**

As reported in the last newsletter, Sullivan West Volunteer Fire Department in Tennessee purchased a Capri-corn 2000 fixed-mount weather station with the help of a grant from their local Home Depot.

The department serves an area 41 square miles with a population of 12,000. It is staffed by 40 volunteers and averages one call per day.

Using WeatherMaster software, their weather data is posted on their website at [www.sullivanwest.com](http://www.sullivanwest.com).

*~ photo by Danny Baines*

▼ **Columbia Weather Systems News & Events**

**Puget Sound AMS**

In mid-March John Gerrish, Sales Director, was the featured speaker for the Puget Sound chapter of the American Meteorological Society at the Seattle office of the National Weather Service. With the theme "From Meteorological Science to Operational Application," John gave a lesson on HazMat Weather. (See accompanying article and view PowerPoint presentation on our website.)

Many of the audience were affiliated with the University of Washington which is known for a strong meteorology department.

As a visual aid, John displayed an Orion Nomad portable weather station with a Weather Display Console and demonstrated how WeatherMaster software works in conjunction with CAMEO/ALOHA HazMat software.

**Naval Shipyards: Bremerton, WA**

While in the area, John met with the harbormaster at the Puget Sound Naval Shipyards to review their Capri-corn 2000 installation.

**Oregon Fire Chiefs' Association**

During the first week of April, John again led the charge with a trip to the Oregon Fire Chiefs' Association Spring Conference in Redmond to support their training efforts. Vehicle-mount weather stations have recently been purchased by the Portland, Gresham, and Tualatin Valley Fire Departments in Oregon.

**Disaster Preparedness and Free Lunch at the Northwest Fire and Rescue Expo, May 19-20**

Our next show will be at the Portland Expo Center on May 19-20. This show is sponsored by the Oregon Fire Equipment Dealers Association in cooperation with the Oregon Fire Chiefs' Association.

The Expo offers two half-day educational sessions on disaster preparedness. Lunch is provided to attendees both days.

For more information visit [www.northwestfirerescue.com](http://www.northwestfirerescue.com). Contact us for free tickets.

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