Gunbarrel Fire Managers Use Weather Balloon to Measure Upper Level Wind Speed and Direction

Monday, August 25, 2008

Firefighters closely track current and predicted weather as it directly influences fire behavior. Firefighters carry special weather monitoring equipment with them to measure weather conditions at regular intervals and from multiple locations on the fire throughout the day. Fire managers also use permanent and/or temporary Remote Automated Weather Stations (RAWS) to monitor weather in the area of the fire.

Fire managers always review local weather forecasts from the National Weather Service, and can request spot weather forecasts for the specific fire area. On large fires, an incident meteorologist from the National Weather Service works on-site as part of the incident management team to provide specific, current information for firefighters.

Yesterday afternoon the incident meteorologist (IMET) working on the Gunbarrel Fire released a weather balloon (called a Pibal or pilot balloon) into the air to track the path and speed of winds at various altitudes. The balloon, filled with 10 grams of helium, is designed to rise at 500 feet per minute. The IMET watched the balloon's movement through a special double-axis telescope called a theodolite. He measured the balloon's elevation and azimuth in the sky at one-minute intervals using dials mounted to each axis.

The balloon was monitored as it rose 15,000 feet above ground level. A computer program was then used to analyze the balloon's horizontal movement. The computer can only analyze twenty minutes worth of data, however Pibals can be tracked for as long as they remain visible through the theodolite, sometimes for up to an hour.

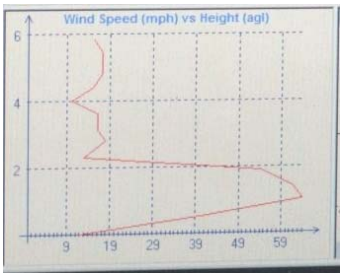
By tracking the balloon's movement, the IMET was able to make a better assessment of local weather factors. Lower level clouds were observed moving slower than the balloon while higher level clouds were seen moving with the balloon. Upper level winds high above the mountain tops are often amplified. The higher a balloon travels, the more likely it is to be influenced by the faster jet stream.

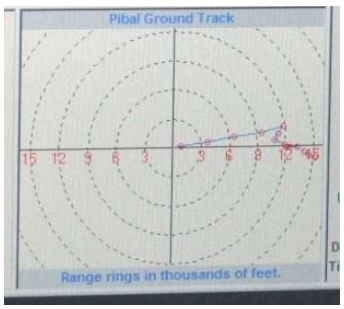
"It's amazing how one simple ten gram balloon can indirectly forewarn a potentially dangerous fire environment," said Dave Lipson, Gunbarrel IMET based out of Riverton, WY.

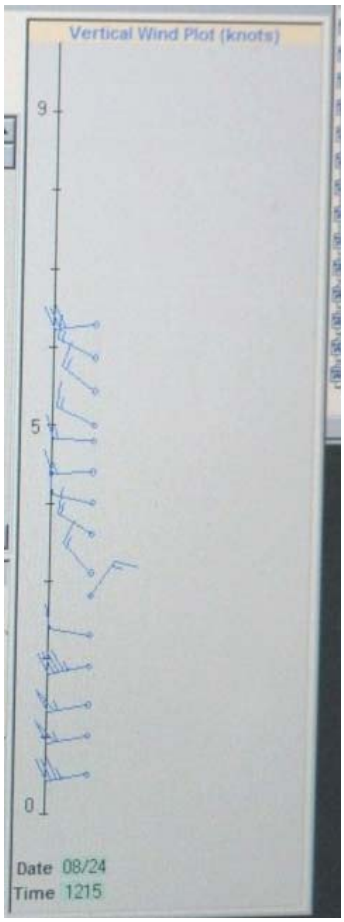
Helium-filled Pibal

Theodolite telescope

Taking measurements







A computer model graphs wind speed and direction