

SNOWPACK TEMPERATURE SENSOR

Ed Campbell^I

A sensor has been developed by the Snow Avalanche Section of the British Columbia Ministry of Transportation & Highways to accurately record temperature profiles through the snowpack at remote weather stations.

The basic design is a four metre long fibreglass/epoxy tube with thermistors spaced every twenty centimeters. The thermistors are epoxied into a modified steel grease fitting and threaded into the tube. The fibreglass/epoxy tube has low thermal conductivity which will help prevent heat transfer between thermistors. In addition, the tube is filled with styrofoam beads to help prevent any heat transfer by creating a dead air space inside the tube. By observing the temperature profile it is also possible to observe the air temperature and a close approximation of the depth of snow on the ground.

At present, this sensor is integrated into a Campbell Scientific micrologger with multiplexor to handle the twenty-one outputs from the thermistors.

A number of minor design changes have been implemented over the past three years to help improve the performance of this sensor. The current design incorporates a moulded fibreglass junction box at the base of the pole. Within this box are two terminal strips into which are connected all of the thermistor and landline wires. The junction box is sealed with a lexan door and a neoprene gasket. This latest design will be in service at eight sites during the 1988/89 winter season. The older design will also be in service at a number of other sites. By the spring of 1989 a good comparison of performance between the new and old designs should be available.

Technical Information

Fibreglass/Epoxy Duct

Length	410 cm
Inside Diameter	7.6 cm
Wall thickness	1.68 mm
Weight	.8 kg/metre
Color	White
Thermal Conductivity	2 BTU/sq.ft/hour/degrees F./inch

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Thermistors

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Make and Model

YSI 44406

Temperature range

-80 degrees C. to 120 degrees C.

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