

EXHIBITORS

SECTION

# THE CR21 MICROLOGGER



## INTELLIGENT ENVIRONMENTAL DATALOGGING

- On-site processing compresses more information into each stored data value.
- Direct recording of mean wind vector, standard deviation, max and mins, histograms, input products, differences, and many more.
- Direct measurements from thermistors, humidity sensors, soil moisture blocks, pressure transducers, leaf wetness sensors, tipping bucket rain gages, wind sensors, pyranometers, etc.
- Portable, battery operation (up to six months use on eight D cells).
- Seven analog and two pulse counting inputs.
- Two binary input and four control output ports.
- Data retrieval via the display, cassette tape, CR56 Printer (shown), storage module, telephone interrogation, GOES transmitter or RF link.
- Automated network interrogation when mated with the C2000 Central Microcomputer.
- Over 2,000 in use today.
- Write or call our Canadian Representative for complete technical information.



**CAMPBELL SCIENTIFIC CANADA CORP.**

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## **CANADIAN APPLIED TECHNOLOGY**

Designers/Mfrs of Electronic Systems & Products

Buttonville Airport, 16th Avenue, Markham, Ontario L3P 3J9 / Telephone (416) 477-6681 / Telex: 06-986511

CANADIAN APPLIED TECHNOLOGY is a manufacturer of micro processor based data acquisition, telemetry and processing systems serving industrial and environmental communities. The Company has been concerned with maximizing the efficiency and quality of the environment through an accurate assessment of the natural one since 1969.

CAT provides "turn key" automated systems for applications including power plants, mining, dredging, air environment, water management, scientific research and has a history of reliability and customer satisfaction. CANADIAN APPLIED TECHNOLOGY is also a distributor of supporting instrumentation, thereby giving a single source supplier and support facility to their customers.

*Design Engineering* — working with marketing, CAT engineers constantly review technological developments and customer needs. This directs new product development, which is consistent with current CAT products, for upward compatible designs. CAT will also develop new products based on customer specifications. With selection from over 120 production circuit boards CAT can provide custom engineering services cost effectively.

*Manufacturing* — of systems and off the shelf products is done at our Markham facilities. Working with customer specifications, manufacturing drawings and test procedures, each assembly phase is controlled, monitored and results recorded prior to shipment. Customers purchasing networks are invited to inspect their system in operation prior to site delivery.

*Customer Service* — is supported by engineers totally familiar with the products. Training programs are available at our Markham facility or at customer facilities. This along with "no charge" telephone consultation, "on call" or maintenance contracts and board exchange replacement ensures CAT customers of a fast response to their needs.

**— THE CAT SYSTEM WORKS! —**

**— WE CAN PROVE IT —**

GAMMA INSTRUMENT COMPANY

The Adirondack Type Snow Density Gage has been used for snow sampling by the National Weather Service and the U.S. Geological Survey in the shallow snow packs of the eastern United States since the early 1960's.

The tube's maximum capacity for depth of snow is 60 inches(150CM), while the scale will weigh up to 25 inches(62CM) of water equivalent. By converting weight into vertical measurement by conforming the cutter opening to a known factor of the scale, direct readings of snow density will be obtained in inches or centimeters of water.

In tests conducted by the Soil Conservation Service and the Atmospheric Environment Service the Adirondack Gage was judged to be "very accurate".

Pictured below are the English or "Imperial" type, reading in inches and the new Metric type reading in centimeters.

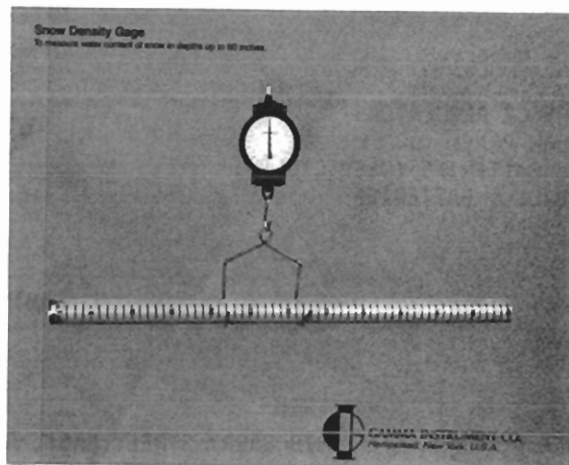
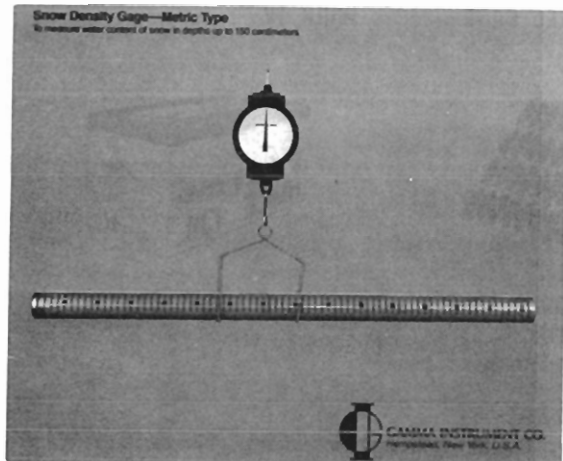
The complete unit consists of:

- The fiberglas tube (5 foot or 150 centimeters long)
- Stainless Steel serrated cutter (40 tooth)
- Tension scale calibrated in inches or centimeters of water
- Brass cradle with non-slip covering
- Wooden handle for driving
- Protective Cork

The retail price is \$ 520.00 U.S.funds

Please call or write:

Mr. John G. Schurr  
Gamma Instrument Company  
52 Chasner Street  
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GENEQ INC.

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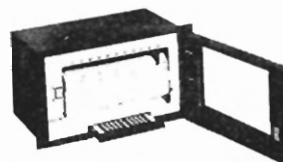
DATA ACQUISITION SYSTEMS / DATA LOGGERS

Complete line of DATA LOGGERS and DATA ACQUISITION SYSTEMS for remote sites or local application:

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- .TELEPHONE MODEM
- .UHF/VHF RADIO
- .CASSETTE RECORDER
- .ENCODERS
- .SNOW PILLOWS
- .TEMPERATURE
- .PRECIPITATION
- .WATER LEVEL
- .WIND



DATA ACQUISITION SYSTEM



RECORDER/DATA LOGGER  
32 CHANNELS

PRECIPITATION:

- .TIPPING BUCKET
- .WEIGHING TYPE
- .SNOW DENSITY

FISHER & PORTER/  
BELFORT  
PRECIPITATION  
GAGE, WEIGHING  
TYPE



TIPPING BUCKET  
SNOW/RAIN GAGE

HYDROLOGY:

- .EVAPORATION STATION
- .WATER LEVEL GAGE
- .CURRENT METER
- .FLOW METER
- .PRESSURE SENSOR
- .WATER QUALITY MONITOR



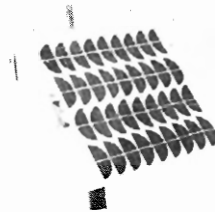
WATER LEVEL GAGE



WATER QUALITY MONITOR  
MARK IV

POWER SUPPLY:

- .VOLTAGE REGULATOR
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- .OIL BATTERIES (DEEP CYCLE)
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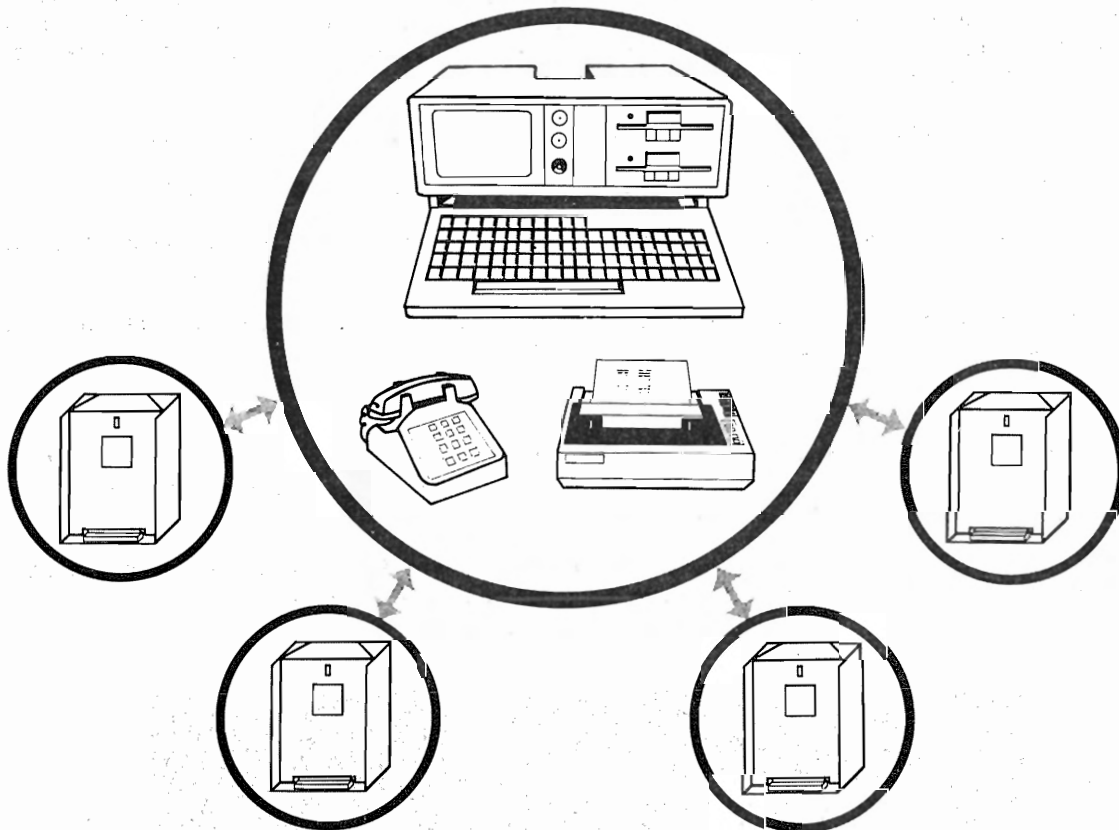
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Proceedings, Eastern Snow Conference, V. 28, 40th Annual Meeting, Toronto, Ontario, June 2-3, 1983

# DIGISPONDER

## MINI SCADA\* SYSTEM

\*SUPERVISORY CONTROL AND DATA ACQUISITION



**MONITOR AND CONTROL ECONOMICALLY, AT ANY DISTANCE,  
VIA DIAL TELEPHONE, DEDICATED LINE, OR RADIO.**

LARGE SYSTEMS	Up to 1000 remote stations, each expandable to 384 alarm and 192 control points, with computer data logging & control.
SMALL SYSTEMS	One or more remote stations, each with 8 alarms reported in synthetic speech, plus 4 controls by DTMF (tone) telephone.

Made in Canada by

### Industrial Measurements Ltd.

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Tel. (416) 474-1246 & 474-1247

Proceedings, Eastern Snow Conference, V. 28, 40th Annual Meeting, Toronto, Ontario,  
June 2-3, 1983

## INFOSCAN® by Infrascan

....Suppose you wanted to identify a cell structure, or measure an area of land, or compare the heat loss in a factory from one year to another. How would you do it? How long would it take? With the INFOSCAN® image processing system, you'd get immediate results. Along with being simple to use and space efficient, the INFOSCAN® identifies, measures and compares.... right in your office.

The INFOSCAN® is an image processor you can use. It can measure areas or distances. Isolate selected gray values. Overlay and compare scenes and maps in any scale. It can process any image; satellite pictures, maps, photographs, video tapes, or any other hard copy data in print or transparency form.

What's more, the INFOSCAN® can process live television pictures or video cassettes.

Contour synthesis allows for enhancement of images in a "Real Time" live mode.

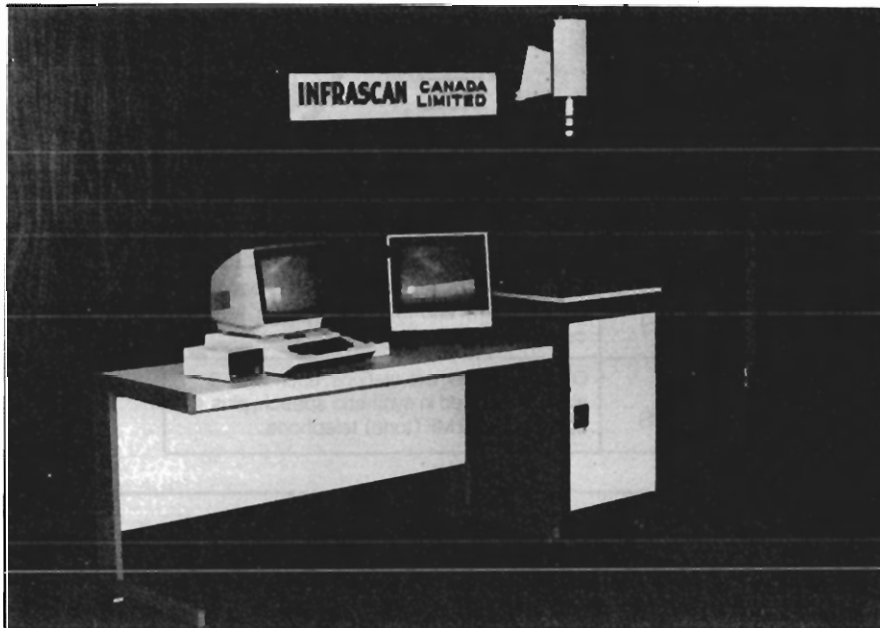
No matter what you want to measure, from microbes to mountains, the INFOSCAN® gives you identification levels - quickly and easily.

Irregular shapes in any scale can be measured and counted. Change detection allows minute changes in scenes to be made instantly visible.

### APPLICATION:

Environment, energy conservation, medicine, hydrology, mineral resources, military, forensics..... These are just a few of the areas which demand, and can use the efficiency and flexibility of the INFOSCAN®.

In the Forest Industry alone the INFOSCAN® can provide change detection, disease detection, fuels inventory, map update, measurement, to name just a few.



Proceedings, Eastern Snow Conference, V. 28, 40th Annual Meeting, Toronto, Ontario, June 2-3, 1983

## ICELERT A Computer-Based System for Runway and Highway Ice Prediction

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PURPOSE The Icelert System, manufactured by Findlay, Irvine Ltd. of Scotland, is designed to monitor runway and highway conditions and give early warning of ice forming on their surfaces. This system is designed to monitor: surface and air temperature; wind speed and direction; dew point; and surface condition (wet, dry, ice/snow). Once the data is interrogated the system can provide up to two hours advance notice of ice formation while accounting for the presence of salt, urea or chemicals. The benefits to be derived from such a system are: economy, smaller quantities of de-icing chemical; safety, it helps prevent surfaces becoming ice-covered without warning; and environmental protection, smaller amounts of chemicals will have a reduced impact to the environment. Applications of this system include:

AIRPORTS With the probes placed in the runways, taxiways and ramps, flush with the surface, the Airfield Operations crew can maintain a constant vigil on the condition of their runways. Data transmitted to the master station via land line or radio link will be presented on a visual display unit or on a printer and thus provide up-to-date information as well as historical trends. One such system was installed at the Toronto International Airport for a Transport Canada evaluation during the winter of 1982. Many airports throughout England and Europe have had systems installed.

HIGHWAYS Those in charge of winter maintenance on highways face a very difficult task, especially in areas where conditions vary. They know it is far more effective to spread salt before ice forms, but it is often difficult to know just where icing conditions are going to develop. An Icelert System consists of a number of out-stations linked by dedicated lines to a central master-station. There, a micro-computer analyses the data, displays it in graphical and tabular form, and generates a visual/audible alarm if the situation becomes critical. Because the master station has a permanent link to each out-station, the information it displays is constantly updated.

OTHER APPLICATIONS The Icelert systems are designed to keep vital services operating during severe winter weather. It does this in a similar manner as mentioned above or by automatically switching on heat whenever necessary and switching the heat off when the danger of icing has passed. These applications include railway points, highway ramps, bridge decks, roofing gutters and footpaths. Not only does this application keep services running, but it does so at far lower costs than can be achieved by manual or simple thermostatic control.

INFORMATION For additional technical information, Icelert is marketed in Canada for Findlay, Irvine Ltd. by Aviation Electric Ltd. as listed below.



**Aviation  
Electric Ltd**



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ST. LAURENT, QUE. H4L 4X8

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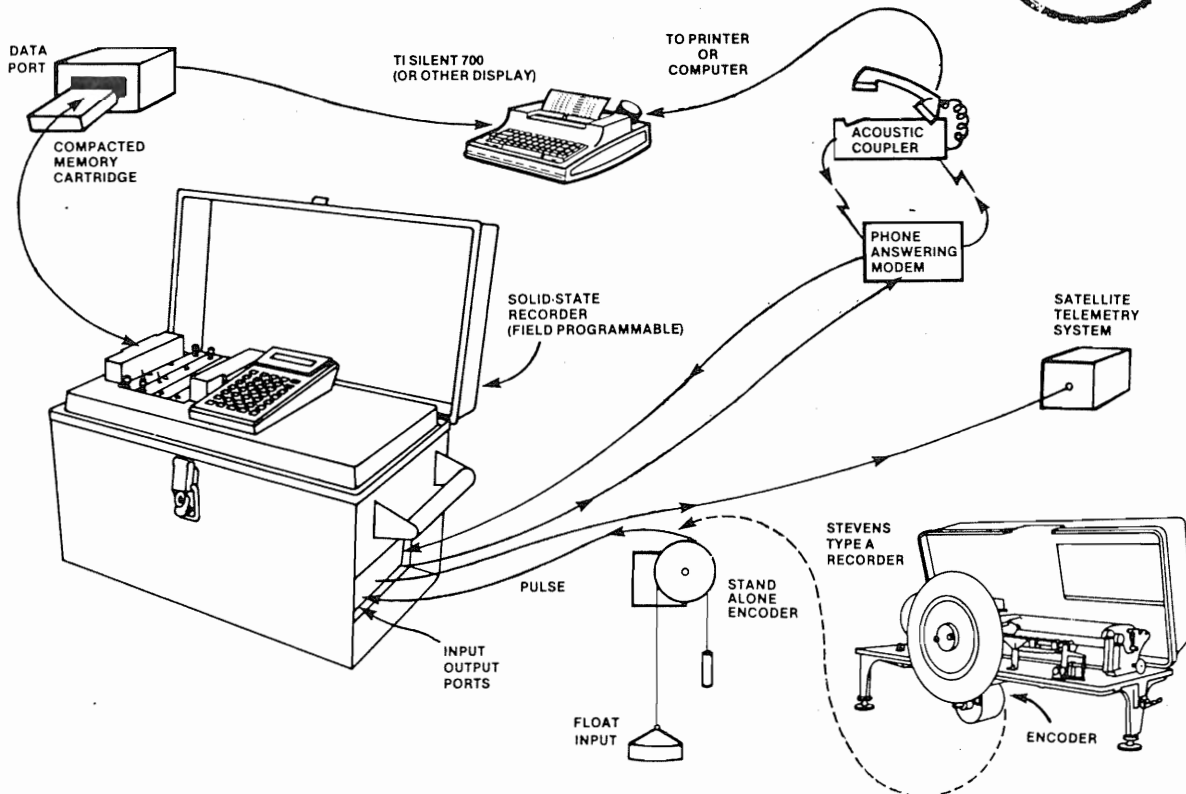
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June 2-3, 1983





# STEVENS WATER RESOURCES PRODUCTS

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**Combining 75 years of experience with innovative new technology to simplify your monitoring now... and in the future**

Many users require sophisticated, complex monitoring systems, while others need only simple recording installations. Stevens Instruments has developed a versatile data compaction system that offers unusual benefits to *both* kinds of users. The system starts with a basic one- or two-input recorder. Later, as your needs increase, your system can be expanded for other functions (gate position, alarm, etc.)

### NEW CONCEPT MODULAR PROGRAMMING

allows easy program changes.

### ON-SITE DATA MASSAGING

### DETACHABLE HAND-HELD TERMINAL

provides "Human-Touch" Assisted Programming, with an alphanumeric system that leads you through the proper programming sequence with "prompting" words and questions. This permits non-technical personnel to accomplish this function with minimum training.

Leupold & Stevens reserves the right to alter specifications and features of the products shown in this bulletin, without prior notice.

### SOLID STATE RELIABILITY

featuring latest-technology energy-efficient micro-processor.

### INTERCHANGEABLE TRANSLATOR

in the event of translator malfunctions any Stevens solid state recorder can be converted for use as a translator, thus assuring continuous data processing.

### FEATURES OF THE FUTURE

The complete Stevens Data Acquisition System of the future, will offer all of the advantages explained above plus the following:

#### TOTAL SYSTEM CAPABILITY MULTIPLE INPUT & OUTPUT RECORDING

#### COMPATIBILITY WITH:

Computers - most types, including the newer micro computers, such as "Apple II" and "Atari" with RS232C inputs.

Telemetry Systems

# Announcing from ACADEMIC PRESS CANADA

**COLBECK  
DYNAMICS OF SNOW AND ICE MASSES**

Edited by SAMUEL C. COLBECK

ISBN: 0-12-179450-4 ..... April 1980, 512 pp.

*Dynamics of Snow and Ice Masses* describes the growth, motion, and decay of snow and ice masses. The book is divided into seven chapters each of which treats one major type of body. These include ice sheets and ice shelves, mountain glaciers, sea ice, icebergs, lake and river ice, snow cover, and avalanches. In each chapter the body's occurrence on earth and its general characteristics are described. The modes of growth of glaciers, ice sheets, and floating ice covers are presented. This is in addition to information provided on the accumulation and distribution of snow, the release of avalanches, and the sources of icebergs. The movements of glaciers, ice sheets, and sea ice are covered in light of solutions of equilibrium equations, knowledge of the material properties of ice, and field observations. In the same manner, the release of avalanches is discussed in terms of the stresses on the snow slab.

CONTENTS: W. S. B. PATERSON, Ice Sheets and Ice Shelves. C. F. RAYMOND, Temperate Valley Glaciers. W. D. HIBLER III, Sea Ice Growth, Drift, and Decay. R. Q. ROBE, Iceberg Drift and Deterioration. GEORGE D. ASHTON, Freshwater Ice Growth, Motion, and Decay. D. H. MALE, The Seasonal Snowcover. R. I. PERLA, Avalanche Release, Motion, and Impact.

AUDIENCE: Geophysicists, hydrologists, civil engineers, petroleum engineers.

OTHER BOOKS OF INTEREST

Colbeck	DYNAMICS OF SNOW AND ICE MASSES 1980	\$67.00
Deepak	REMOTE SENSING OF ATMOSPHERES AND OCEANS 1980	66.25
Deepak	ATMOSPHERIC WATER VAPOR 1980	66.25
Dennis	WEATHER MODIFICATION BY CLOUD SEEDING 1980	48.00
Hoskins/Pearce	LARGE-SCALE DYNAMICAL PROCESSES IN THE ATMOSPHERE 1983 (July)	38.50
Lloyd	MATHEMATICS OF HYDROLOGY AND WATER RESOURCES 1979	38.50
Malins	EFFECTS OF PETROLEUM ON ARCTIC AND SUBARCTIC MARINE ENVIRONMENTS AND ORGANISMS, VOLUME 1 1977	48.75
	VOLUME 2 1977	46.75
Miller	WATER AT THE SURFACE OF THE EARTH, STUDENT EDN. 1982	32.50
Barrett/Martin	THE USE OF SATELLITE DATA IN RAINFALL MONITORING 1981	80.50
Browning	NOWCASTING 1982	60.75
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Hord	DIGITAL IMAGE PROCESSING OF REMOTELY SENSED DATA 1982	37.25
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Budyko	THE EARTH'S CLIMATE: PAST AND FUTURE 1982	53.50
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Academic Press - A subsidiary of Harcourt Brace Jovanovich, Publishers

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All prices are subject to change without notice.

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PERGAMON PRESS CANADA LTD.

HANDBOOK OF SNOW

Principles, Processes, Management and Use

Edited by D M GRAY & D H MALE, University of Saskatchewan, Saskatoon

The only comprehensive, fully-illustrated handbook on the physical principles and management of snow, snowfall and snowcover.

Snow is a precious resource as well as a potential calamity. With its arrival, modes of travel, working and living are suddenly transformed. The HANDBOOK OF SNOW is the first textbook to offer students and professionals the practical information and techniques they need concerning snow.

An Outstanding Academic Book 1982/83

"A valuable reference...there is no other work where so much information on snow, its origin, distribution, and impact is available.

CHOICE

"...could be subtitled "Almost Everything You Wanted to Know About Any Possible Practical Aspect of Snow". The book, engineered by a committee of the National Research Council of Canada, consists of a series of individual chapters written by a wide variety of authors and will tell you which gases absorb onto snow crystals, how snow ridging will influence your crop yield, how to keep your railroad switches clear, how long the studs on your snow tires will last, and the composition of your cross-country klistar wax (did you know that early recipes for ski wax included bacon rind, old bicycle tires, and gramophone records?)...The organizers, editors, and authors involved in the project are to be commended.

ARCTIC

"The book can be well recommended to the general reader in Canada especially since snow is a coast-to-coast phenomenon, and the reader is bound to find several aspects of interest to him. For the educator, the text could well provide an excellent base for several courses in "natural science" especially since each chapter has an extensive bibliography which can serve to extend the studies outlined therein. Insofar as physical scientists are concerned, the astute reader can find a number of suggestions for further applied research in almost every chapter.

PHYSICS IN CANADA

No other book offers the complete coverage of practical information the HANDBOOK OF SNOW does.

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