AVALANCHE NEWS

WINTER 1998 VOLUME 54

CANADIAN AVALANCHE ASSOCIATION

WEIS WORDS

FROM THE PRESIDENT

The 97/98 winter avalanche season will be remembered by many who normally do not pay attention to such things. They will recall the associated fatalities which have received so much media focus but they may also remember the CAA / CAC.

The world knows who we are, and it seems, gives us a pretty fair mark. Thanks to all our Members and Operators for the professional contribution you have made during this time of intense media scrutiny and emergency response; we all made a difference.

The CAC has been very busy maintaining all of our regular and emerging services, and at the same time holding down the fort during the media frenzy, hats off to the staff. The work load overshadows some of the long range plans we have but that is as they say "show biz."

Material sales, including the RAC products, are reported to be way up. CAATS is on course to hit 400 students, despite El Nino. Technology has both feet in the door at the CAC, with the LAN system in, direct internet link and computers getting better every day. The town of Revelstoke voted the CAC as the # 1 high technology employer for placing career training candidates!

We saw products of this technology first hand last week in Vancouver when the Directors met, in the form of financial statements. Financial statements that would be the envy of a banker (except for the balance). The meeting ran out of time due to the current issues, massive agenda and new initiatives facing us, but still met the basic needs.

Changes to the Constitution are to be voted on this spring, please pay attention to the mail out, coming in February, containing the proposed amendments.

The Continuing Professional Development program ("CPD") is taking shape and I am personally very excited with the progress. Stay tuned for announcements for this spring and more..

The Oct. 97 trip to Utah to attend the AAAP meetings went very well. John Tweedy showed up and did a fantastic job on a panel discussion regarding explosives regulation issues. All in all our relations with the AAAP are great and we have lots of admiration from them for the cooperative effort we receive from all areas and members of our Association in Canada.

Wishing you the best
Sincerely,

Niko Weis
President
Canadian Avalanche Association
caaweis@mars.ark.com
Phone (250)338-6702

AVALANCHE NEWS

WINTER ISSUE

VOLUME 54

TABLE OF CONTENTS

CANADIAN AVALANCHE ASSOCIATION

SUBMISSIONS TO:
BOX 2759, REVELSTOKE, B. C. V0E 2S0
PHONE: 250-837-2435 FAX: 250-837-4624
EMAIL: canav@avalanche.ca

from the editor's desk....

This month the Avalanche News **goes to the Dogs.** We have a few articles devoted to that usually happy creature that many of us have adopted as a part of our families. You know these family members, (I have two) the ones that don't wipe off their feet before they jump into the car or on the couch. And I have yet to find one that has good breath. As you will learn in this issue, it takes more than just a nose to become an avalanche rescue dog and not just the dogs are special. It takes a special type of master to develop the skills necessary for these dogs to become the best that they can be. So here's to the dogs, that have become such a vital part in our industry.

Also included in this issue is the beginning of the B.C. Highways Avalanche Program, the first 24 years. Interesting reading and hopefully more to come in future issues. Many of us take for granted the work that is done on the Highways throughout BC, but Mike's submission will enlighten us to the past.

Hopefully you will receive this issue on time, seems try as we might there is always a glitch in getting this publication out. Well there shouldn't be anymore Postal Strikes to contend with. Hope you have all had a great winter, looks like it's just about over for us. Remember we are always looking for new information to send out to our readers.

APOLOGY

We have received complaints about the cartoon that appeared on the cover of the Avalanche News Resource List.

On behalf of the staff of the Centre and those involved with the production, we sincerely apologize for affending anyone and regret that the cartoon has upset members and clients of the CAA.

It was not our intention to offend or upset anyone, but to lightly illustrate the land use dilema. The efforts of the CAA/CAC to continue to represent fairly and be a resource to our members, clients and the public is a diverse challenge. We shall endeavour to meet this challenge.

Action Sports Adventures wants Your Photos.....

All year long we are continuously creating new ads, direct mail pieces and promotional materials. In addition we list our library and holdings in directories around the world.

Publications such as **Millimeter, POST, Film and Video, and Videography** have stock footage features several times a year and they are always requesting photographs that are fresh and interesting illustrations of the footage that can be found in the industry.

If you have any photos in the form of slides, prints or digital files, that we can utilize for the purpose of marketing your collection, please send them to my attention as soon as possible. If you have any questions, please call me at 212-721-2800, Fax 212-721-0191

Best regards,
Chrystyna Dattilo, Director of Marketing
Action Sports Adventure
1926 Broadway New York, NY 10023

POLS

PARENTS OF LOST SKIERS

MANDATE

To help, encourage and support parents who have lost their children to the mountains

POLS is a Canadian non-profit organization established to help those parents who are left behind when their son or daughter die as a result of a skiing, snowboarding or mountain climbing accident in the mountains of Canada or abroad. Its intent is to give the kind of help that can only be given by those who have been through it, those who "speak the same language of this kind of loss."

The founder, Beth Stewart, of Ladysmith, British Columbia, lost her son Trevor in an avalanche in Chamonix, France, in 1996. Since then she has found that, for true support and understanding, there is nothing like speaking to someone who has " been there." Trevor's dad, Arlie Petersen and his wife June, are also available to help.

Beth can also put you in touch with others who have had the same experience.

RR # 4
LADYSMITH, BC
VOR 2E0, CANADA
Phone / Fax (250) 245-9915

THE AVALANCHE DOG

by R J Kingston

"My dog is really smart and he has a really good nose. I think you might want to check him out."

I have lost count of the number of phone calls I have received from people who are eager to share a similar story about their dog. Unfortunately, this is only one piece of a very big puzzle. In an era where people are exploring the back country in record numbers, dog handler teams play a vital role in providing an efficient and comprehensive search and rescue service to meet an ever increasing need. The basic information required for anyone who is interested in training a dog for avalanche search and rescue includes where and how to find a good working dog, and how to train the dog. Also, what is the role of a dog handling team when self-rescue equipment such as beacons, probes, and shovels are so widely available? Are dogs as important in avalanche rescue as they were in the days before the development of such high tech equipment?

Will Devlin & Shadow

Research suggests that this may be the case. In Europe between 1962 and 1972, dogs participated in 135 rescues, and out of that number twenty five people were found alive (Daffern, 1983). The high success rate in Europe relative to North America is largely due to the fact that in North America fewer dogs are spread out over a larger area, decreasing the chance of arriving at the scene in time to find a live victim. Data from a Swiss study on avalanche mortalities published in 1992, reported that approximately 90% of persons buried survived if recovered within 15 minutes. The survival rate fell to 30% after 35 minutes, and after two hours the survival rate was 3%. The 15 minute mark is very difficult to achieve in Canada where there are so few avalanche rescue dogs, spread over such a large area.

In cases were self rescue does not occur, the dog's nose and the handler are still number one. It is important to remember however, that the dog is not a miracle weapon. Like any other tool it can break down, but a well-trained dog that is properly employed is an excellent addition to a search and rescue team. One of the most important advantages in using a dog handler team is that fewer people are put at risk when only the dog and handler are in the slide path. A second important advantage is that dog handler teams have a better success rate than

(Continued on page 7)

SOME EXAMPLES OF METHODS USED:

METHOD	TIME TO SEARCH 100 x 100	CHANCE OF SUCCESS buried 3m or less
Course Probe one pass	**20 probers - 4 hrs**	**70 %**
Fine Probe	**20 probers - 16-20 hrs**	**100%**
Dog, hasty search	**1 Dog and Handler - 0.5 hrs**	**90%**
Dog, detailed search	**1 Dog and handler - 1-2hrs**	**95%**
Rescue Beacons	**1Person - < 10 min.**	**98%**

(Continued from page 6)

many other forms of avalanche rescue.

It has been established that dog handler teams are important in avalanche rescue. What are the steps involved in developing a successful dog handler team? Choosing the right dog is the first and most important decision the dog handler makes. Every dog handler has a different opinion on what type of dog and what kind of temperament make the best avalanche dog, but there are some basic guidelines. The age of the dog will dictate what your approach will be in evaluating whether you have a trainable working dog. There are a lot of benefits to starting a puppy, but the screening process can be quite difficult since their personality has not yet developed. Therefore, with puppies you should look at the family tree (the history or blood lines) to evaluate the dogs potential. When examining puppies you are looking for a spunky, independent puppy who has realized that he is an entity to be dealt with. To evaluate and choose a puppy, you should go in with some forethought, and possibly some experienced help. With an older dog the most important factors you will be evaluating are their stability and temperament. This can be done by observing the dog in a variety of situations. An important consideration when choosing an older dog is to test and evaluate him before a bond is formed between the dog and master. Finally, there is the consideration of what breed of dog is best suited to avalanche rescue. In general, working breeds are easier to work and train, and a breed with a good coat will keep warm and work efficiently in adverse conditions.

The most important factor affecting a dog's potential is to ensure that you have a plan before you bring the dog home. For instance, where and how you will kennel the dog, what his training schedule will be, and how he will

(Continued on page 8)

(Continued from page 7)
fit in with your friends and family. Most dog handlers recommend that the dog is kenneled outside, that he is not treated as a pet, and that the dog is only handled by the master. The dog will develop your personality, attitude, and working habits, and people who are looking for a dog to train for avalanche rescue should remember that they are looking for a *working dog,* not a pet.

Once you have a good dog you will need some understanding of the dog's nose, and what scent is. The sensitivity of the canine nose is extraordinary. A dog can smell some odors at as little as one part per trillion. For example, a dog would be capable of identifying one piece of sand that has a human scent on it in an entire dump truck full of sand. Dogs can also work for long periods of time without experiencing nose fatigue like humans do. For instance, a person will initially notice if they are exposed to an offensive smell, but eventually the smell fades away. For a dog the smell never goes away. A dog is capable of tracking a scent for hours and even days, because a scent always stays fresh for a dog. Dogs are also very effective in tracking and scenting because of their relatively large nose - the space in a human nose is 1.5 cubic inches, while a German Shepard's nose is 6 cubic inches. This gives them more space in their nose for a scent to touch the receptor cells at the top of the nose. In addition, a large portion of a dog's brain is devoted to cataloguing the vast amounts of scent information that he is continually processing.

How does a dog utilize these skills to locate a victim at an avalanche scene? Scent itself is an odor from the human body that is caused by a bacteria on the skin. This skin flakes off in a large area around the body. The scent from these flakes of skin rises up out of the snow as a result of the continuous airflow from the bottom of the snow pack to the top. Once the scent rises to the top of the snow pack it is carried by the wind, and the dog is then able to pick up this scent and follow it to the source. Using its' nose to gather information is second nature to a dog, but it requires months, even years, to train a dog to use these instinctive abilities to track and search. A good working dog enjoys searching, but what makes a dog go above and beyond what is expected is the relationship they have with the handler? A well trained dog will work even when they are tired or cold or hungry, in order to please their master. The relationship is built on mutual trust and respect, and is a partnership commanded and controlled by the handler. While building this relationship requires a great deal of hard work and commitment for the dog and the handler, it can be very rewarding. There is always the hope that the work that they are doing will be instrumental in saving the life of an avalanche victim.

As rescue workers, we are continually trying to get the message across to the public that avalanche transceivers are extremely impor-

(Continued on page 27)

A BOY AND HIS DOG

On a Friday, in November of 1996 Chris Stone and a friend hiked up Bridger Bowl ski area and crossed the ridge onto the west side of the Bridger Range. They wore beacons, and Chris brought along his dog. Chris was in the lead and skied into a snow filled gully. After he made two turns, the snow fractured. He was instantly knocked down and began swimming. His poles and skis came off, which was goo, but he was swept 700 vertical feet through some trees and over a small rock band, which was bad. He slammed into a tree, causing a deep contusion to his thigh, before coming to a stop with only his face out of the snow. His partner and dog came to his aid, but self evacuation was impossible because of the injury and lost gear.

Chris got as comfortable as possible and nestled with his dog while his partner skied out for help. A rescue team of two Bridger Bowl patrollers and two search and rescue team members rode the lift, climbed out of bounds over the ridgecrest, and skied to the scene. They stabilized the victim and lowered him to a landing zone where a helicopter airlifted him out. Chris was hospitalized and treated for his injuries. Chris's dog, however refused to follow the rescuers out as they skied away from the scene. Instead, the dog, obviously scared and confused, went looking for his owner and climbed back over the ridge. The next morning he was found, cold hungry, dutifully waiting next to his owner's car in the Bridger Bowl parking lot. Chris and his dog were reunited later that day.

This entry comes to us from south of the border and is reprinted with the permission of the "Beacon" newsletter of the Colorado Avalanche Information Center. It was originally submitted by Ron Johnson, a forecaster in Southwest Montana Avalanche Center.

DEADLINE FOR THE SUMMER ISSUE IS
JUNE 1, 1998

From Northroute Cafe to North Fork Gaz.Ex

by Mike Boissonneault

Snow Avalanche Programs

British Columbia Ministry of Transportation and Highways

We live in a province of mountainous and rugged terrain. Most of our highways have been designed and built many years ago. For many highway corridors there were little or no options as to the location of the highway, they simply had to be built within the runout zone of avalanche paths. Worked fine in the summer months - winter was different!

Despite the usual hassles of dealing with winter travel on provincial highways and trying to understand how and why snow slides off the mountain, Ministry Road Supervisors (known at that time as Foremen) did the best they could. Fortunately, traffic volumes were considerably less than they are now. Most of the time an avalanche on the highway would be the first obvious indication of deteriorating snowpack and rising avalanche hazard conditions. In those days, there were no avalanche safety measures for highways as we know them today. Based on what we now know about avalanches and safety measures, one might say this situation was an "accident waiting for a place to happen."

Tragically, on January 22, 1974, the accident did happen. The place was the Northroute Cafe, approximately 45 km west of Terrace along Highway 16. In what was being described by local Terrace and Kitimat residents as "the worst winter" anyone could recall, there was a total of 210cm of new snow (at the airport) between January 15-22. Schools, businesses, and the airport were closed. The highway between Terrace and Prince Rupert was open despite the fact that avalanches had crossed the road in several places. Forced to turn back, three travelers and a Ministry plow truck driver decided to wait out the storm at the Northroute cafe. The warmth and comfort of the Cafe, with its hot coffee and companionship, was a welcome relief from the dreaded elements outside.

At about 0800 hours the avalanche stuck. A large fast moving avalanche demolished the cafe where 8 people were only moments earlier thankful for the apparent shelter and protection it offered.

(Continued on page 11)

(Continued from page 10)

At 0950 hours a helicopter checking for broken telephone lines discovered the avalanche full of rubble and debris where the Northroute Cafe used to be. Unable to see any signs of life, a call went out the Royal Canadian Mounted Police. By 1000 hours provincial and municipal groups had been notified and a rescue effort was mobilized. The initial search included police with a trained dog and a first aid unit. The dog completed a search of the debris by 1130 hours. No one was found, likely due to the extensive amount of debris within the deposit and as would later become evident, from the depth of burial of most victims. It was not until 1330 hours that probes and shovels arrived along with 20 men to assist in the rescue effort.

Probing was extremely difficult. The avalanche ranged in depth from 1 - 8 metres and was littered with housing debris and trees up to .5 metres in diameter. The search strategy developed was to use front end loaders and shovels to clear the deposit to ground, starting at the western edge of the deposit. Before this began a guard was posted to watch for additional avalanches.

At 1445 hours the body of the plow truck driver was recovered at a depth of 3.6 metres. Half an hour later the sole survivor of the accident was recovered from a depth of 1.5 metres and flown by helicopter to the Terrace hospital. This individual was buried for more than seven hours. His survival was made possible due to the air space created around him. Another body was discovered at 1630 hours, face down under 2.5 metres of debris. Around this time there were approximately 65 rescuers on site. In fading light at 1730 hours another body was discovered under 5 metres of snow.

Concerned about the threat of more avalanches and working in the dark the

(Continued on page 12)

Thurs., Jan. 24, 1974 3—A

Rescuers Halt Digging After 7 Bodies Found

TERRACE, B.C. (UPI) Rescuers fearing further snowslides suspended their operations Wednesday at an isolated highway service complex where seven bodies already have been found under tons of snow.

A Royal Canadian Mounted Police spokesman said the search was suspended at 6 a.m. PST, 20 hours after the huge avalanche roared down a mountainside and buried the northroute truck stop-motel complex in 40 feet of snow.

SEVEN BODIES have been found in the ruins of the complex where as many as 15 persons may have been when the avalanche hit at about 10 a.m. PST Tuesday. Three bodies were found during the predawn hours Wednesday and four bodies and a survivor were recovered Tuesday.

"We know of one person missing and there may be more we don't know about," the spokesman said.

The complex, 28 miles west of Terrace and about 850 miles north of Vancouver, was about "one-third dug out" when the searchers were called away from the scene, the spokesman said. He said heavy rains increased the risks of further snowslides.

Among the bodies discovered Wednesday were the operator of the complex, Charles Daumont, 60, and his 18-year-old daughter Denise, both of Terrace. The other victim was unidentified.

Two service station employes — Steven Mintenko, 40, and Theodore Armstrong, 27, both of Terrace — businessman Donald Lagimodiere, 27 of Prince Rupert, B.C., and 23-year-old Highways Department employe Allan Macdona were found dead Tuesday.

VANCOUVER SUN CLIPPING

(Continued from page 11)

search was temporarily canceled around 1800 hours. The rescue effort resumed a few hours later when another victim was found at 2355 hours, face down under 3 metres of debris. At 0230 hours on January 23 the owner of the Northroute cafe, Charles Daumont was recovered at a depth of 3 metres. Another victim was recovered at 0310 hours under 5 metres of debris and the final body, 18 year old Denise Daumont was found in her bed at 0330 hours under 1.8 metres of snow, apparently asleep at the time the avalanche struck. The search was concluded at 0630 hours due to a concern about additional avalanche activity and the fact that all persons known to be in the building at the time of the accident had been accounted for.

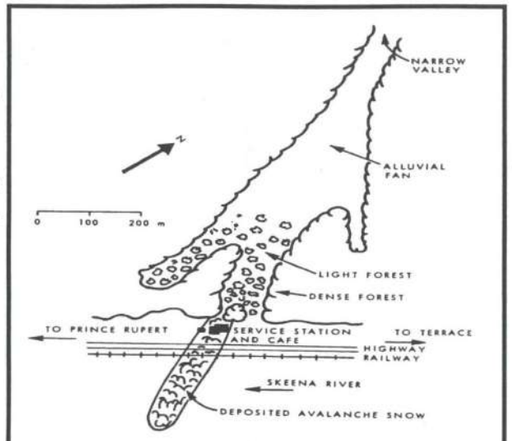


Figure 28 Avalanche site at North Route Cafe, 22 January 1974

OBSERVATIONS at TERRACE AIRPORT, 219M ASL 1974

DATE	TEMPERATURE		SNOW	RAIN	PRECIPITATION
	MAX	MIN	CM	MM	MM
15 JAN	-16	-24	14		10.9
16 JAN	-17	-27	14		9.6
17 JAN	-12	-20	99		63.2
18 JAN	0	-24	22		15.5
19 JAN	0	-4	9		7.1
20 JAN	-2	-4	6		4.8
21 JAN	0	-4	6		5.8
22 JAN	3	-4	40	0.3	26.9

Start zone elevation of the avalanche path above the Northroute Cafe is 1,265 metres. Temperatures the week before the avalanche were as low as -30.0° C. Based on snowfall records at the airport it is likely that at least 3 metres of snow fell at start zone elevation in the 7 days prior to the accident. Temperatures also increased to above freezing (at lower elevation) with 27mm precipitation on the morning of January 22. In consideration of the cold temperatures that snow in the start

(Continued on page 13)

(Continued from page 12)

zone accumulated prior to the accident, it has been assumed that the avalanche contained low density dry snow (20 - 50 kg/m^3) and struck the buildings at an estimated speed of 108 km/h. The deposit crossed both the highway and railway and carried on for an additional 250 metres beyond the location of the Northroute Cafe (see sketch).

The outcome of this tragedy was an Avalanche Task Force commissioned by the Ministry of Transportation and Highways (MoTH) to study and prepare a report on "***measures to be taken to identify and control avalanches as they may endanger highways and facilities adjacent to highways in British Columbia.***" Of the five individuals included in the Avalanche Task Force report, two are well know to our Association - Peter Schaerer and Geoff Freer.

The Avalanche Task Force report identified areas of provincial highways exposed to avalanche hazard, what the severity of the hazard was, and how best to mitigate it. In 1975 the Task Force recognized 37 areas within the province exposed to avalanche hazards in the winter months. Three of these areas were considered high hazard and required the set up of a formal avalanche program. They included Highway 16 between Terrace and Prince Rupert, Kootenay Pass, and the Fraser Canyon. By 1976 avalanche programs had been initiated in these areas, with a headquarters office in Victoria. Other areas were monitored by "roving" avalanche technicians or by staff based out of the Victoria Office. In essence, the Avalanche Task Force report resulted in the formation of the Ministry, Snow Avalanche Programs.

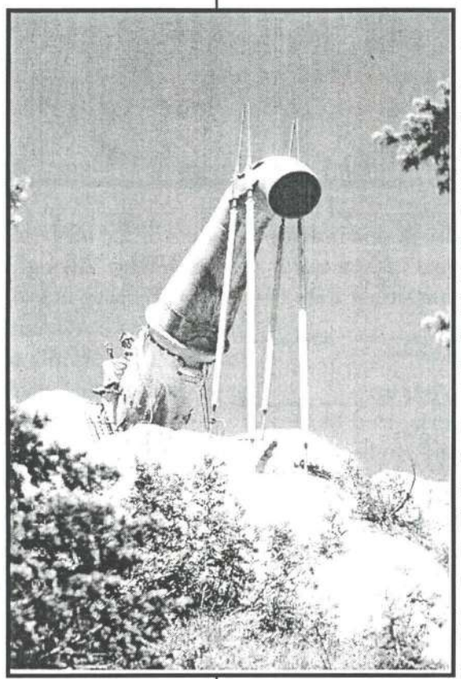
With new highways and ongoing assessments the Ministry now recognizes over 60 avalanche areas. The Ministry, Snow Avalanche Programs has grown from infancy to maturity in the past 24 years and is now recognized as one of the most comprehensive avalanche programs (for highways) in the world. This is due to the collective efforts of many people but primarily to the dedicated Snow Avalanche Technicians and their staff who monitor and control the avalanche hazard around the province.

From relatively humble beginnings the MoTH, Snow Avalanche Programs have grown to include a province wide staff of 31 individuals. With a headquarters based in

(Continued on page 14)

(Continued from page 13)

Victoria, to provide technical support and direction, there are 7 locations around the province with staff who monitor and control the avalanche hazard above provincial highways in their local or regional areas.



For some programs the avalanche problem is literally out the front door of the office, as in Kootenay Pass. Here there are 30 avalanche paths within about an 8 km stretch of highway. The combination of high density of avalanche paths, location of the highway (mid track on most paths), terrain traps, steep road inclines, adverse winter weather and steady traffic adds up to one of the most active avalanche programs in the province. Although no less challenging, the flip side to Kootenay Pass may well be the North West avalanche program, based in Terrace which monitors and controls avalanche concerns on over 900 km of highway. An ability to maintain avalanche forecasting and control services in the North West is made possible due to areas of lesser hazard and lower traffic volumes than at Kootenay Pass.

There is great diversity between individual avalanche programs, however, there are also many similarities. They all share a mandate to ensure safety to the traveling public and to minimize any avalanche related road closures. When the avalanche technician determines that avalanches may reach the highway and be large enough to interrupt the flow of traffic, or injure occupants of a passenger vehicle, the highway is closed.

The use of computers over the past several years has brought our programs (along with everyone else) into a technological age of accessing and disseminating information. Fifty-eight remote weather stations are used around the province to report weather conditions near start zones, as well as 75 manual road level stations. This winter has seen the introduction of 10 automated road side

(Continued on page 15)

(Continued from page 14)

weather stations of benefit to both avalanche forecasters and for highways maintenance considerations. The benefit of the automated stations is that they provide continuous information, rather than observations gathered once or twice a day by a reluctant plow truck driver.

There have been significant advancements in methods of active avalanche control as well. Although areas with low or very low avalanche hazards still rely on preventive closures, most programs use a variety of explosive avalanche control methods to stabilize slopes above the highway. Helicopter bombing is the preferred method of control in many areas. There are four 105mm recoilless rifle programs. The most recent addition to the Snow Avalanche Programs arsenal are the Gaz.Ex Systems. This method of avalanche control is being used above the Duffey Lake road (near Whistler) and at Kootenay Pass.

Gaz.Ex represents state of the art avalanche control. Remotely operated from a computer base station, Gaz.Ex cannons (located in avalanche path start zones) can be fired as soon as the highway has been swept and cleared of vehicles. Cannons are remotely filled with a mixture of propane and oxygen, then ignited with a spark. The resulting explosion of gases is forced out the open end of the cannon to impact the snow. Results have been impressive with the Gaz.Ex. Many users report avalanches produced by Gaz.Ex are larger than with alternative methods used in the past.

Over recent years a growing population has resulted in significant increases in traffic volumes for many provincial highways. This places additional demands on maintaining open highways. In consideration of public expectations to drive without interruption

(Continued on page 27)

Mike Boissonneault *currently works for the British Columbia, Ministry of Transportation and Highways, Snow Avalanche Programs as the Senior Avalanche Officer, a position he has held for the past seven years. Mike's initial work in the avalanche business began on the Granduc Road (1979-1985), located near Stewart, BC on the South East tip of the Alaska Panhandle. With the closure of the Granduc Mine, Mike worked as the Ministry, Snow Avalanche Technician in the Bear Pass (Highway to Stewart) for the winter of 1985-86. For the following three years Mike supplied avalanche consulting services to numerous remote mining operations in the North West part of the province. Mike is also the chair for the CAA, Explosives Committee as well as an active participant in the Avalanche Artillery Users of North America Committee.*

Mike Boissonneault
Senior Avalanche Officer
Snow Avalanche Programs
Phone: (250) 387-7514,
Fax (250) 356-8143
mboisson@vines.gems.gov.bc.ca

TOP DOG: KULA

BY RICHARD AND BARB ROTTEVEEL

Here are just a few anecdotes with Kula the CARDA dog in Vernon. As in every SAR group the first search that you go on you are under the watchful eyes of your peers, especially if you are a dog. We were called to look for a missing snowmobiler at the usual 7:30 pm on Sunday evening. When Kula and I arrived to the search base for this, his first exposure to a typical search, we were met with some skeptical members on our ability to keep up. Kula got out of the truck and loaded immediately on to the snowmobile.We traveled via snowmobile at top speed being second in a line of 25 machines. Every stop I would have him search specific areas for any clues due to the fact that it had snowed and was snowing heavily. We continued on snowmobile until the missing person was found at 6:15 am. At the bottom of he mountain after the night of searching all the searchers were just beat. As we were sitting having a debrief and coffee, Kula was still on search mode and continued searching areas in the parking lot, finding pieces of equipment dropped by the searchers. From that point on, Kula was accepted and expected on every search since.

During an avalanche awareness and rescue training session with 28 members of the SAR group, the members had their first exposure to the speed in which the avalanche dogs work.

We worked on transceiver searches for about 2 hours in total to the point where everyone thought that they were getting pretty good at finding buried transceivers in good time. The question was asked "Well how fast can Kula search an area?" This was a good challenge, so we set up a scenario with 3 buried transceivers wrapped in scented articles in about a 50 meter X 50 meter area. The human searchers had transceivers and would get to start 20 meters closer to the slide site than Kula. Everyone was amazed that Kula rocketed right by them and before the 28 members barely got out of the gate Kula had located and dug up all three burials.

Kula has been a respected member of the SAR group in our area for a total of 6 years now and has earned his retirement as of the last CARDA certification course at Whistler Mountain in January. It has been a rewarding career for Kula and he has been involved in the avalanche awareness training of a total of 750 people including school groups and drop in seminars at Silver Star mountain and at FarWest retail stores. We look forward to the next pup in training to serve the avalanche community.

FUSE NEWS

by MIKE BOISSONNEAULT

There have been a number of issues raised recently regarding the use of safety fuse assemblies. These include a more thorough understanding of exactly how a fuse burns and some important manufactures recommendations regarding how they are handled.

During the month of January 1998 two separate reports from ski areas by avalanche control personnel observed what appeared to be an irregular burn of a safety fuse. In one of these incidents the fuse emitted a 15-20cm flame out the side wall which resulted in nearly severing the fuse in two. In the other incident, an unusually loud "pop" was heard while the fuse was burning. In the incident involving the flare, the patroller was holding onto the handcharge when it occurred. The other incident involved use of a bomb tram. In both of these incidents the flare/pop occurred about 20 seconds after the fuse had been lit. Both charges were deployed immediately afterwards. Also, in both events the fuse burned the expected 135 seconds and detonated the charge.

Since these reports have been filed we have learned new information about burning characteristics of fuse material. Through discussions with representatives from ICI Explosives we have been informed that fuse material is in fact designed to "vent" and that this is an important feature of a fuse to ensure even and consistent burn rates. Apparently, if a fuse does not vent over a period of time, a more violent vent is possible. Loud sounds from a burning fuse are also not uncommon, however, once again, the longer a fuse does not vent, the greater the probability that popping sounds will be heard.

Standard procedures in lighting safety fuse used for avalanche control missions include a period of time to confirm the burn. Characteristics of a burning fuse include the following:

- emits a visible gray smoke from the end of the pull wire
- pungent smell of black powder
- discoloration of fuse side wall
- fuse droops

Additional methods to confirm a burning fuse include dragging the cut end of the fuse in the snow to see that it discolors the snow (the pull wire can be removed as well before this test).

It should not take any more than 4-5 seconds to confirm the burn of a fuse for a hand charge. Confirming the burn when helibombing may take a little longer, due to wind, rotor turbulence and ensuring that the shot is dropped on target. The issues regarding length of time necessary to confirm the burn as well as how a fuse is re-lit (if necessary) have become "burning issues". I ask that you take some time to review your procedures and come prepared to discuss these issues at the Spring meeting.

(Continued on page 18)

(Continued from page 17)

Conditions of Fuse Use

Manufacturers recommendations regarding the use of Mantstart, X-371, X-380, X-381, X-382 and Primafuse safety fuse assemblies include the following:

- *Mantstart* **- dispose of them. They are inferior, unreliable and unsafe;**
- **X-371 must be double fused;**
- **X-380, X-381 and X-382 may be used to prime shots with a single fuse;**
- **The "through" hole on cast primers should not be used with any of the above fuses. Do not punch or use a through hole in nitroglycerin stick products either;**
- **With suspected misfires involving cast primers or nitroglycerin type explosive products a waiting of time of two (2) hours must be observed when using any of the above fuses;**
- **With suspected misfires involving emulsion type explosive products when using any of the above listed fuses a waiting time of 30 minutes (WCB reg 46.116) may be observed;**
- **With suspected misfires involving ANY TYPE OF EXPLOSIVE (even emulsions) when using the *Mexican made X-382 Primafuse* wait two (2) hours before approaching the misfire charge.**

There should be a sheet of paper in any box of fuse to indicate what restrictions apply regarding the use of that particular type of fuse. Please read it. The Mexican fuse has made its way into Canadian markets recently so be sure you are aware of the added restrictions when using this new product. It is labeled X-382 PRIMAFUSE.

The rational for the restricted use of the through tunnel in cast primers is related to the risk of violent fuse vents causing combustion of the explosive material. The two hour wait for suspected misfires is also in consideration of the risk that a burning charge (in which the

(Continued on page 27)

"MEMBERS NOT IN GOOD STANDING"

The following members were declared **"members not in good standing"** at the 1997 AGM because of unpaid dues. If back dues are still not paid by the 1998 AGM, it will be assumed that they no longer wish to maintain a membership with the CAA.

- Thierry Cardon
- Kevin Christakos
- Peter Clarkson
- Mary Clayton
- Franz Fux
- Derek Green
- Richard Marshall
- Greg McAuley
- Roger McCarthy
- Alan McDonald
- Rod McGowan
- John Mellis
- Karl Nagy
- Kris Newman
- David Norcross
- Steve Portman
- Eve Ruttle
- Eric Schadinger
- Graham Underhill
- James Vaillancourt
- Norman Winters
- Jakob Wyss
- Doug Yarwood
- Richard Miller

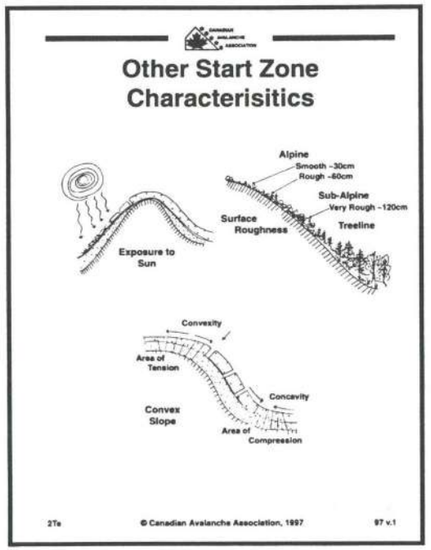
(Continued on page 25)

Recreational Avalanche Course

The Recreational Avalanche Course (RAC) Project is well underway, with many course providers listed on the CAC web page and numerous courses taking place. For those who are not familiar with the project, the Canadian Avalanche Association (CAA) working together with the Canadian Ski Patrol System (CSPS), took on the task of developing materials to assist qualified persons in delivering avalanche safety courses, and set a standard for recreational avalanche safety training. The project was funded by the National Search and Rescue Secretariat and has the following goals, to:

- Improve recreational avalanche safety in Canada
- Introduce a nationally recognized recreational avalanche course standard
- Ensure students receive a high quality course that is compatible with courses from other providers using the materials
- Reduce workload and improve continuity of instruction for organizations and instructors by providing pre-packaged
  - Course outlines
  - Lesson plans
  - Audio visual aids
  - Student manuals

The CAA **does not** certify courses or instructors, but has set standards for course content and duration. There have been two course providers stating/advertising their course is certified, licensed and endorsed by the CAA. **This is emphatically not the case.** The materials and content of the course are recommended by the CAA and CSPS. These course materials are intended to provide a framework that can be adapted by the course provider to meet the needs of the user group, including skiers, snowboarders, climbers,



example of a RAC overhead

snowshoers, snowmobilers or other winter back country recreationalists.

To ensure course participants receive the best possible training, a user agreement must be signed by the course providers prior to receiving the materials and delivering an approved RAC course. This user agreement outlines minimum standards for instructor qualifications, instructor student ratios for field sessions, course duration, minimum course content, student manuals and course locations.

(Continued on page 20)

(Continued from page 19)

One issue that has come up since the inception of this program that could use some clarification is the delivery of information/training sessions that are of lessor duration and content than the RAC standard. Providers are encouraged to deliver these information sessions, however the suggested goal of the session should be to encourage people to take an approved RAC program as this is the minimum material and course duration considered acceptable for persons planning to travel in avalanche terrain.

Course providers are encouraged to keep notes as they use the materials and attend the RAC meeting planned for this spring in conjunction with the CAA Spring Meetings. We need the participation of all RAC course providers to continue to develop these materials and this program as the standard for recreational avalanche safety training.

Persons interested in taking an avalanche safety training course are encouraged to seek out a provider of the RAC program to ensure they receive quality training that meets the minimum standards set by this program. A list of approved course providers can be found on the CAA web page www.avalanche.ca or by contacting the Canadian Avalanche Centre in Revelstoke, BC at 250-837-2435.

Randy Stevens
Recreational Avalanche Course Project

CANADIAN AVALANCHE ASSOCIATION

Canadian Avalanche Centre: Box 2759, Revelstoke, B.C. V0E 2S0
Tel: (250) 837-2435 / Fax: (250) 837-4624

User Agreement

Users of the CAA endorsed recreational avalanche course materials agree to:

- Maximum student to instructor ratio for field sessions of 8:1.
- Adhere to the minimum times for classroom and field sessions as described in Course Outlines of this manual.
- Provide students with the CAA - RAC Student Manual or an approved substitute.
- Use a suitable location to conduct the course. Locations should:
  - Provide adequate avalanche terrain to conduct route finding and safe travel exercises.
  - Contain sufficient snow cover to conduct avalanche rescue exercises.
- Designate at least one course leader for each course. It is the course leader's responsibility to:
  - Ensure all instructors have sufficient skills to safely lead groups in the course area.
  - Ensure all instructors possess knowledge adequate for good quality instruction and training.
- Utilize only course leaders who meet the following minimum instructor requirements:

Course Leaders for Introduction to Avalanche Safety
- CAA Avalanche Safety for Ski Operations, Level 1 certification (Ski Courses.)
- CAA Avalanche Safety for Snowmobile Operations, Level 1 certification (Snowmobile Courses.)
- Instruction techniques training or experience teaching avalanche courses.
- Active member or associate member of the Canadian Avalanche Association.

Course Leaders for Advanced Avalanche Safety
- CAA Avalanche Safety for Ski Operations, Level 2 certification.
- Instruction techniques training. • Active member or associate member of the Canadian Avalanche Association.
- Experience teaching the Introduction to Avalanche Safety course or other avalanche instruction experience.

It is strongly recommended that all instructors working on the courses, not just the lead instructor, meet the minimum instructor requirements.

Signature of course provider_____ Date_____

Print Name_____

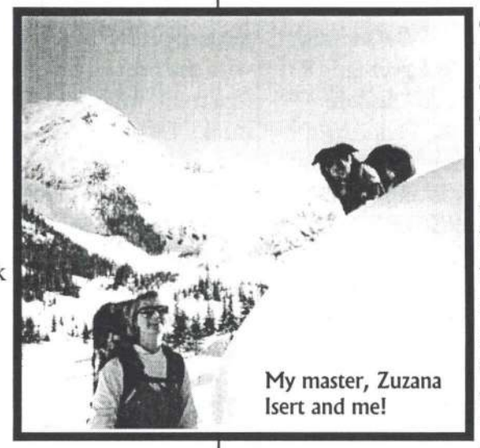
Alberta address: 7943 - 48th Avenue NW, Calgary, AB, T3B 2A7

Example of USER AGREEMENT for RAC

MY LIFE AS A CARDA DOG

by ARROW ISERT

Searching is my favorite game. I live for searching. I'll search for anything when I'm told to, balls, toys, food. But when it comes to humans, and anything that has human scent on it, well that's just the best. You see, my handler has instilled that desire in me. You should see her freak out when I find a glove or a sock that's been sitting buried in the snow for a few days. You'd think she won the lottery. And for me, well I just aim to please, plus I get to play my second most favorite game in the world, a jaw clenching, head thrashing, juicy game of tug of war. And then, I'm Joe Cool.



My master, Zuzana Isert and me!

You see, not every dog is suitable for avalanche search work. To be an avalanche dog you need obedience, agility and desire. You have to watch your master and get along with the other dogs. You have to be cool around helicopters, chairlifts, snowmobiles and snowcats. You need coordination and fitness too. You also need a good coat to keep you warm in freezing temperatures, and you should come from a good line of working bred dogs.

You need to work as a team with your master too, and they have to be trained as much as I do. My master has to be able to read my body language, to understand when I'm on to a find, and command me with hand signals to direct me to cover certain areas of an avalanche deposit. My master has to also be a strong intermediate skier with touring experience, have their CAA Level I, be a member of the local search and rescue (PEP in B.C.), be active in mountain rescue, have current CPR and first aid, and have a RCMP dogmaster recommendation and background check.

Wow, no wonder we have to keep so busy with training all the time. We sure spend a lot of time together. My master even takes me to work with her in the winter. You know, we have to be ready to go on a search at any given time. That's a big responsibility, considering we are a voluntary team. A lot of time and effort go into training and it all leads up to the big annual avalanche dog validation. That's when the RCMP and the Canadian Avalanche Rescue Dog Association put us to the test. In addition to passing the obedience and agility tests, we have to recover two objects, each buried to the depth of 50 to 100 cm within a one-acre area, within twenty minutes. In blowing wind and freezing temperatures sometimes too.

You see, my master has to have total confidence in me, so much so, that if she was ever buried in an avalanche, she would be confident that I would find her. Finding her, or

(Continued on page 25)

IS YOUR TELEMARK EQUIPMENT SAFE ENOUGH?

A viewpoint by Steve Ludwig

A keen telemark skier has reached the top of the ridge, peels off his skins, cranks his boot buckles, puts on the shell layers, and swings his pack back on. Ready for action, right? Not necessarily. There are hazards in resort and backcountry skiing that can be reduced with gear and its' proper use. I've been a serious Telemark skier since 1974, and I average 183 days a year on skis. I work as an Outdoor Skills instructor and ACMG Ski Guide, and I've seen too many equipment problems that affect mountain safety for my liking.

Boots and Bindings - Nordic Downhill skiing is easiest to do with stiff, supportive plastic ski boots. Now in their sixth season of use, the plastics are not going to go away. They are reasonably warm and keep your feet drier than leathers can. These boots are rigid enough to transmit twisting motions right up to your bones and connective tissue. Tele skiers have often told me that the cable or three pin connection is flexible enough to prevent lower and mid-leg injuries. I know of at least five cases where it was not, and knee surgery was required to repair the damage. A parallel equipment development has been the creation of stiffer and stronger bindings to harness the forces that stiff boots can transmit. The manufacturers of stainless steel bindings are using four or five screws to anchor bindings down (Black Diamond and Rainey). Performance Telemark boots and bindings should be attached to the ski with a release mechanism. The new Rottefella release is very expensive and weighs a kilo. It might be all right for lift serviced skiing, but who has $360-cdn to spend on it? I have used the Voile Releases for about 1000 ski days over the last nine seasons and they rarely break or pre-release when set up correctly. They cost $57 cdn for the runaway strap version, and a bit more for the ski brake version. Mine seem to release once per 50 days of skiing, and always for good reason. We haven't even touched on use in Avalanche terrain, just occurrences like a twisting fall with the heel down on the ski, or a battle with a tree trunk where one foot goes each side of the trunk. Lots of skiers use Telemark equipment as their vehicle for backcountry travel, and backcountry travel means avalanche terrain. In my own experience, I was being pulled under the surface of a moving size two avalanche three seasons ago until my Voile Release Mechanism released and freed my legs. My flimsy runaway straps broke, and then I was able to remain swimming on the surface. My binding plates and RIVA II bindings came unhooked in all the turbulence and I was left with lots of equipment to look for. I was unharmed and returned in July to locate my binding plate with RIVA II loyally attached. People who ski in avalanche terrain should be attached to the skis with release mechanisms and flimsy runaway cords or none at all. I might be dead if I had been using steel cable runaways. The Voile ones have a buckle that breaks long before a leg will. Ski brakes would be good at a lift serviced area because they stop the skis quickly on hardpack and they shim the boot sole up off the ski for hardpack performance. Not all Telemark bindings can be used with the Voile kits. The Pitbull and Rottefella cannot work with the Voile. With some clever shop work, the Rainey Designs bindings can be

(Continued on page 23)

mounted on the Voile Release even with the Voile toe wedge that reduces stress on the bindings and boots. Heavy people and people who ski a lot tend to crack bindings unless the Voile toe wedge is in the setup. Care should be taken to use slippery heel pieces, not the kind with gripper teeth, for all these bindings. Skiers who get cold feet or who travel in extreme cold might look into use of Raichle/Intuition molded ski boot liners. They can be fitted in most downhill ski shops and they are lighter, warmer, and eliminate pressure points better than any manufacturers stock inner boot (cost $180 cdn). Frostbite is a safety issue, so get these liners! In extreme environments, neoprene overboots can be fitted over your shells.

Knee Pads – Telemark skiers can and do slam their knees into their own skis and unseen hazards. When lift skiing, I use a hard shell pad underneath my shell pants. In the backcountry, I do alpine turns if I suspect stumps and rocks are lurking in the snow. There have been two occasions when I would have been a stretcher case if not for knee pads. Both times I hit hard enough to see stars as it was.

Ski Poles – Tree skiers and skiers in avalanche terrain should not use any form of pole strap. Even the breakaway type will impede your survival efforts in a moving avalanche. Probe poles with a tapered shaft are universally poor to probe with because they jam in the snow. Remember that the probe is used for checking out snow depths, finding sites for snowpack observations, and hanging the laundry, not just for locating avalanche victims. Someday, a enlightened ski pole manufacturer will design a centimeter scale onto a pencil probe pole, and then we can stop carrying a ruler for snowpack observations, and a separate probe for emergencies. Poles with the broad top hand grip are designed to be too bulky to fit in your own eye socket. I kid you not.

Eyewear – Goggles, blade shades, or sunglasses. Anything to protect your eyes from the scratch of a tree branch or the impact of your own equipment. Eye protection also needs to look after UVA, UVB, Blue light, and some percentage of visible light. They need to look good too.

Helmets – I haven't started wearing one yet, but I don't laugh at people who do. Catch an edge or suddenly collapse deep into depth hoar skiing the trees and you'll know what I mean.

CAC GOES SURFIN' by L Freeland

In my limited knowledge of the NET I have often asked myself, "Is there anything that isn't on the net?" I have found that each and every time I go to look for something, I get side tracked and open a whole new can of worms to look at. I usually find myself gawking at everything I've turned up and forgetting what my first initial inquiry was for.

I'm sure many avid NET users will think this is pretty blonde, but I am blonde, and so I'm sure that there are a few people out there who are just like me. Safe in this logic, I'm sure there has to be quicker system in place for exploring certain venues. I find myself all too often being totally frustrated with the system and of course I never seem to have the time to do any serious surfing. My final conclusion is " someday I will have to take some time to learn how to do this."

There is a lot of information out there and American sites dominate the web. One example is SkiCentral, according to one person's opinion " If it never snowed again, you would never find the time to explore all of its links." Many of these sites seemed to be geared directly to the teenagers who need to see all the graphics. What the web does do, however is to round up the best current information in obscure subject areas. Now with the many ways of actually riding on the snow the number of alternative technologies is mind altering. Here you can look at all the latest fads, monoski, skiboard(short fat skis used without poles), snow sail, snow bike, skijoring….

And it goes on and on.

Ski Resorts will list all their hotels, restaurants and how to buy a lift ticket online ahead of time. But enough of that..

The Canadian Avalanche Association has also been bitten by the WEB BUG and now we are supplying information for both the recreationist and the snow pro. Some of the information available at our site is our twice-weekly bulletin that gives current and up to date information on the snowpack and hazards of the major backcountry areas in Western Canada. You can even follow a link to fill in a report form describing your adventures that will help to contribute to the general understanding of the snow pack. The weather links here are of the highest grade and include live visible and infrared maps from the GOES 9 satellite plus a tutorial on how to use them.

Here's another place worth investigating .rec.skiing.alpine ,rec.skiing.announcements, rec.skiing.backcountry- these groups are combed by on-snow experts from around the world. Post a query concerning equipment, what conditions are really like in a certain location, or anything else that inquiring minds need to know.. and you'll usually get a response within hours.

All in all the NET is a good thing, I just hope I find enough time to use it.

DEADLINE FOR SUMMER ISSUE IS JUNE 1, 1998

(Continued from page 21)

anyone, sure makes me feel special, and I know that I'll get that big Milk Bone at the end of the day. And when the winter season is over, it's time to start training for tracking, which is quite a bit different from avalanche searching, but I'm a very busy dog and I always need a job to do.

You know, it's amazing what we canines can do. It will just be a matter of time before one of us avalanche dogs makes the first live find in Canada….maybe it will be me.

Wooof!!!!

While owners sleep, nervous little avalanche poodles prepare for their day.

Eastern Canada Avalanche Risk Management

The CAC has been successful with a proposal to NSS with a new Initiatives Funding Project. The title of the project gives some idea about the scope of work.

Any CAA member who is qualified and interested in working on the project is requested to contact Alan Dennis for more information.

(Continued from page 18)

MEMBERS NOT IN GOOD STANDING

- Environment Canada
- Icelandic Meterological Office
- Mountain Watch Inc.
- Sage Wilderness Experience

INFOEX™ and the Year 2000

by EVAN MANNERS

Most of you will by now have heard of the "Year 2000" computer problem. Basically, many computer programs are configured to read dates as something like 01/01/99 and when we enter the next century, computers will not be able to recognize the date 01/01/00. The surprising fact is that virtually no software vendor started to do anything about this until around 1995.

During the winter of 1996/97, an inventory of the software used at the Canadian Avalanche Centre was done, and it was determined that none of the software in use would function past the last day of 1999. We began to phase in software replacement soon afterward, by first replacing the Windows 3.1 operating systems on all the computer workstations with Windows 95. A period of staff training and familiarization followed, and then Office 97 was substituted for the old Microsoft Office package. Financial and email software was converted shortly afterward. This left only the Infoex™ system which would fail in 2000.

Most Infoex™ subscribers had indicated that they would prefer to see the bulletin board evolve into an Internet based system, which would allow them to place a local call to their internet provider rather than a long distance call to Revelstoke. The Canadian Avalanche Centre has begun to prepare for this by moving the CACentre computers onto a Windows NT LAN based system, and connecting this system full time to an Internet server in Kelowna. This will allow an internet based Infoex™ system to be developed in the next year and a half.

So, if you are an Infoex™ Subscriber, what can you expect in the way of changes leading up to the year 2000? Next winter, (1998/99), you will have the option of continuing to use the present Bulletin Board, Email, and Fax systems. You will also have the additional choices of filling out your Infoex™ input on a web page, and submitting it by clicking a button at the bottom of the screen. Getting the page unlocked will involve giving the password you presently use to access the dial up BBS. You will then receive the Infoex™ output as an Email message the following morning. An alternate will be to access the service from an Internet FTP site, submitting the same input file you presently send to the BBS, and obtaining the Infoex™ output and/or the weather forecast product as files from the site. With this new service, security will also be tightly controlled, and output files will be garbage text without a software key provided by the Canadian Avalanche Centre. Subscribers wishing to dial in to Revelstoke still because of a lack of local Internet service will be able to do so on the CACentre LAN, as a remote user (this is a service built into Windows 95, so you will need that operating system).

The present bulletin board will not be offered as a service 2 seasons from now, in the winter 1999/2000. Next winter, your company can begin to phase in the new internet or dial in service and train staff, so that the "Year 2000" problem will not be a problem. Take a look at your software in use right now, and get a head start before 2000. If you are running anything Windows 3.11 based or older, you have a po-

(Continued on page 27)

INFOEX AND THE YEAR 2000

(Continued from page 26)

tential problem. Spreading the cost of replacing software and staff training over more than one season is a big help.

NORTHROUTE CAFE TO NORTH FORK GAZ.EX

(Continued from page 15)

throughout the winter months, improvements in the design and management of specific programs is on going. Nobody likes a road closure, but most people, given the option, would rather wait in the comfort of their warm vehicle, or in a cozy roadside cafe than to risk being entombed by snow and ice unable to move or breath.

In the first 24 years the Ministry, Snow Avalanche Programs have grown and learned a lot. No doubt there is much yet to learn. The tragedy of the Northroute cafe has not been forgotten. It continues to be a reminder that safety from the threat of avalanches is important to users of provincial highways and to facilities beside them. As long as there are vehicles on highways, highways in the mountains and snow in the start zones, hazards exist, and so will the avalanche program.

THE AVALANCHE DOG

(Continued from page 8)

tant and relatively cheap. Unfortunately, while transceivers *are* fast and accurate, people have to wear them and know how to use them, and as new users venture into potentially dangerous areas armed with limited knowledge and equipment, avalanche rescue dog teams remain an important part of the search and rescue team.

submitted by R. J. Kingston

R. J. Kingston has worked at Marmot Basin in Jasper, AB for the past nine years in the avalanche/patrol dept. During the last six years he has been a dog handler and has participated in several rescues.

FUSE NEWS

(Continued from page 18)

detonator has failed to function) may smolder and eventually detonate. As emulsions do not support combustion they are exempt from these restrictions (Canadian made fuses only).

Please report any misfires or irregularities using safety fuse assemblies to the info-ex or to the Avalanche Centre if you are a non-subscriber. They should also be reported to the WCB (as per regulation 46.22). Feel free to contact me at (250) 387-7514 if you have any questions or issues regarding fuses or explosive procedures you would like to discuss.

Mike Boissonneault
Chair, CAA Explosive Committee
Bernie Protsch
Colani Bezzola

OUR STELLAR SPONSORS

AVALANCHE NEWS

PUBLISHER: Jack Bennetto
Manager, Snow Avalanche Program
Ministry of Transportation & Highways
4C - 940 Blanshard Street
Box 9850 STN PROV GOVT
Victoria, BC V8W 9T5

Managing Editor: Alan Dennis
CAA Managing Director

EDITOR & DESIGN: Lynn Freeland

DEADLINE FOR THE NEXT ISSUE

JUNE 1, 1998