

# Avalanche News

Number 51

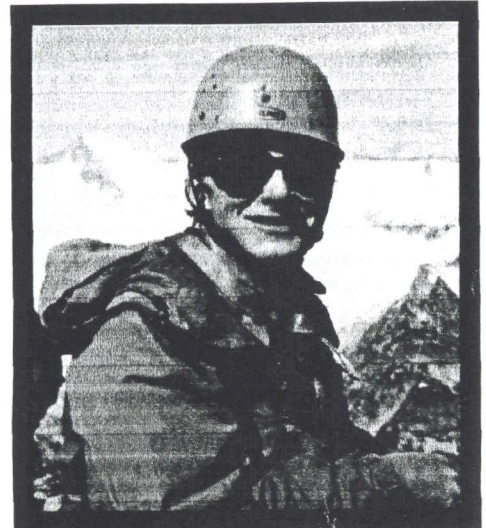


Winter 1997

## IN MEMORY OF:



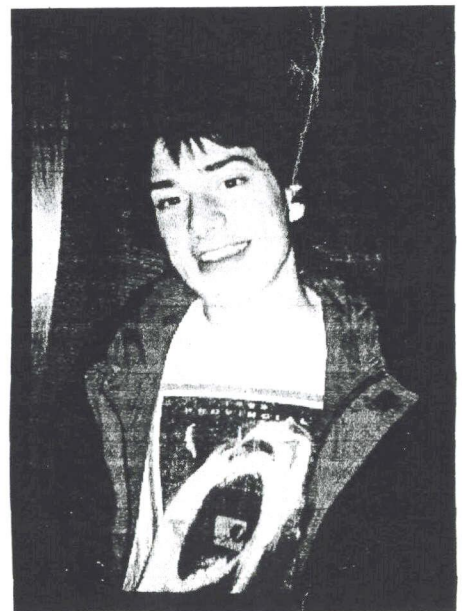
Art Twomey



Kent Swanson



Warren Williams



Nathan Emery



## Contents

- . Helicopter Tragedy - page 2
- . Recoilless Rifle update - page 3,4
- . New Publications - page 4
- . CAA/CAC Spring Meeting - page 4

- . Safety Fuse Assemblies  
A Historical Perspective - page 5,6
- . Feature Product - page 6
- . Retail Outlets Carrying Safety  
And Snow Observation Equipment - Page 7

# Helicopter Crashes

On the 11, January 1997, the disaster occurred when the helicopter traveling to the CAA Training School crashed. Nathan Emery, Kent Swanson, Art Twomey, Warren Williams and Jorg Marquart were all killed. A moment in time that will never go away or be changed. To the families of the three young men from Australia, America and Canada our thoughts are specially sad. It is because of their new spirit and love of the mountains that Art did the work he was doing. Most of us who live and work in the mountains have lost friends and loved ones there. The tragic irony of this loss, when the purpose of the course that they were flying to is prevention of accidents, is cruel and wasteful.

Nathan, 19 years old, grew up in Golden BC surrounded by mountains and people who loved the mountains. After finishing high school he hitchhiked across Canada and wrote about his adventures. When Nathan came back he worked in the bush for forestry consultants. Nathan wanted to start getting the skills needed to safely travel and work in the mountains. The course was his next step on this path.

Kent, 25 years old, was working at Mammoth Lakes California on the ski patrol when he headed north for the course. During his time at college he joined the local mountain rescue team. After completing his degree he guided on Mt Rainier and Mt Whitney while working for the American Alpine Institute. Kent wanted to become an international mountain guide. The

course was his next step on this path.

Warren, 27 years old, who liked to be known as 'Wozza' had recently arrived from Australia. At the age of 17 he discovered the mountains in the Grampians and was dedicated to a mountain life. After finishing the outdoor education program at La Trobe University Bendigo he continued to teach outdoor pursuits. Warren's aim was to be an international mountain guide. The course was his next step on this path.

These three young men who came from different and far off places for this course had a common goal. They were about to experience one of the most memorable weeks of their lives in the perfect alpine setting for an avalanche course.

Jorg Marquart had been a machinist and pilot in Switzerland before starting his own helicopter charter company in the late 1980's. He and Art had flown many times to Ptarmigan Lodge. Having flown in the mountains of Europe, Jorg loved the joy of flying in the vastness of the mountains of southern Canada.

What can we say about Art, our well known friend? The opportunity to share the mountains was why Art and Margie started one of the first ski touring lodges in the 1970's. This was nearly the 20th year that Art had been leading avalanche courses for the CAA. No more enjoyable an evening or ski tour could be had than spending time with Art. He was a gifted teacher, story teller, scientist, trapper - a true renaissance man. For all of us who spent time learning and being with him we shall never forget. -Alan Dennis-

# Recoilless Rifle Update

It took over two years but the accident investigation report is finally in. The fatal accident involving an inbore detonation of a 106mm recoilless rifle (RCL) round (Alpine Meadows, California, November 23/94) has significantly impacted how this type of ordnance is used for avalanche control.

Tests performed by the US Army in their attempt to determine the cause of the accident have been expensive and extensive. Although they were unable to confirm with absolute certainty why the inbore occurred the report defines what investigator *believe* to have been the problem.

The Summary section of the accident report states that cracks in the microstructure of the base plug allowed hot propellant gases to penetrate into the explosive filler and cause a partial detonation of the projectile before it could exit the barrel. The term stress corrosion cracking (SCC) was used to define this defect. The report went on to state that ***"There is no data that can explain why only one base plug has failed (or was affected by SCC). However, in the absence of more information it is believed that the base plug had some unknown condition that was both peculiar to this base, and contributed to its failure."***

The report also stated that this was the first inbore with a 106mm RCL since 1967 (27 years) so have considered that the Alpine Meadows accident was an isolated incident.

Recommendations from the report included the following:

1. Lot MA-55-7 be permanently suspended and directed for demilitarization (the round responsible for the inbore was from this lot);
2. All remaining M346A1 (106mm RCL rounds) lots be restricted to remote firing from behind a barricade;
3. If future production is planned, the configuration manager should consider using an aluminum alloy that is less susceptible to stress corrosion cracking.

There were considerable debates regarding appropriate barricades as some programs wanted to fire the weapon standing on the gun deck and others were satisfied with firing from a distance. After thorough investigation it was determined that a barrier sufficient to protect the gun crew on the deck would be huge, heavy, costly and take up most of the available space of existing decks (if not more). For these reasons all programs which still use a 106mm RCL remotely fire from behind a barrier *off* the gun deck.

The outcome of this unfortunate incident has resulted in a loss of confidence of the 106mm RCL system even before the final report was delivered. Now that the report is out many programs that were previously planning to use the 106mm RCL have made alternative plans. At the present time there are two programs in the US where 106mm RCL rifles are used (Alpine Meadows and Mammoth Ski areas) and one in Canada (Rogers Pass). Programs which had previously intended to use the 106mm RCL have gone to other types of artillery such as the 105mm Howitzer or fully operational tanks systems where recoilless rifles have previously been used.



It appears that recoilless rifles used for avalanche control are slowly being phased out as systems become too old and ammunition stockpiles are depleted. The primary attraction to these systems have been the incredibly low cost (rifles in the US are leased out for \$100/year and rounds cost as little as \$10 each). It's an incredible shock to the budget when it becomes apparent that the cost of installing an avalanche control device designed and built for the 21st century cost as much as 1000 times what the surplus artillery system used to cost.

There is no doubt that surplus military artillery weapons have played a significant role in many North American avalanche control programs. When they were first being used (around 1948) there simply were no alternatives (aside from extended closures of facilities). Over the years avalanche control devices have become available that are specifically designed to initiate avalanches.

Although significantly more expensive, the effectiveness and reliability of these systems outweighs the few positive features of aging artillery systems originally designed to blow up tanks and disable military troops.

Perhaps the time is drawing near when we will give a twenty-one gun salute as the last of the recoilless rifle rounds used for avalanche control are fired off into the sunset (Alan Dennis has already put in a bit to fire the last round!).

Who knows, you may some day find yourself in a room with the new generation avalanche controller as he/she sits at a computer terminal, under the florescent lights, sipping on a cappuccino, wearing a T-shirt performing A/C, and us old timers can start saying,... "Remember back in the good ol' days .....?"

Mike Boissonneault  
Chair, CAA Explosives Committee

### New Publications

1. Guide Neige et Avalanches: connaissances, pratiques, securite.  
- Fax for information. Contact Anena, Fax order: + 3347 642-8166.
2. The Snowbooklet by Nolan Doesken and Arthur Judson.  
- International orders call: 970-491-8545 or email: odie@ulysses.atmos.colostate.edu,  
Or fax: 970-491-8449
3. ISSW Proceedings: order from CAC (\$30 in Canada)  
(\$35 for USA), includes surface mail.

### CAA/CAC Spring Meeting

SILENT AUCTION, DOOR PRIZE, SPONSORED BEVERAGES, AND MEETINGS OF COURSE

AT RAMADA INN  
PENTICTON  
MAY 7, 1997

## Safety Fuse Assemblies A Historical Perspective

In the good ol' days we had the CXA safety fuse assembly. It came in various lengths and burned at a consistent rate of 131 seconds/metre. It had a distinctly recognizable detonator on one end and a copper thermolite connector on the other. It was safe to use, reliable, accessible and affordable. In my 6 years of using this product on the Granduc Road, (where the five person crew would use over 1,000 fuses/season) I can recall only one occasion when we had a misfire. I have also spoken with others who used the CXA fuse for many years and they too report extremely low to nil duds. Should we expect anything less? I think not. Ask anyone who has had to approach a primed bag of Amex or handcharge how they felt about it. No doubt about it,... it's about as uncomfortable as it gets.

Today,... it is different. The quality and reliability of safety fuse assemblies available for use in Canada is poor to bad when compared to the CXA product of yesteryear.

The problems started in 1993 when the Brownsberg Plant in Quebec (where the CXA fuse was assembled) shut down. The shut down was primarily the result of the mining industry moving away from the use of safety fuse assemblies as an initiation system in favor of nonel or electric systems. With a dramatic reduction in the demand of safety fuse assemblies compared with the cost to produce them it was only good economic sense to shut the plant down. Apparently, the demand for fuse dropped from 18,000,000 per year to around 100,000. Although we can sympathize with the manufacturer of this product, this is a clear case where there is a wide discrepancy between good economic sense and good practical sense. As a result of this shutdown, the avalanche control community (and many logging companies) have suffered multitudinous problems with the fuse products supplied after the Brownsberg plant shut down.

The Brazilian made Mantstart, Safety fuse

assemblies which initially replace the CXA products were used from the very onset with some degree of skepticism. As we are all aware, there were a variety of problems with the Mantstart fuse. These problems led to a manufactures recommendation to use two fuses and that if a misfire were to occur, two hours must pass (rather than the WCB regulation half hour) before the misfired charge could be approached. There were also reports of erratic burn times and hot burning fuses that placed additional restrictions on their use by not allowing the fuse to pass into the "through" tunnel of a cast primer. Clearly, the Mantstart fuse was not acceptable, both from the perspective of safety to the user and from it's poor performance, reliability and quality in the short time that it was used.

Through the efforts of the CAA Explosives Committee and ICI Explosives a new "interim" safety fuse assembly labeled as the Clover X-371 was developed and introduced at the beginning of this winter. What was intended as an end of the safety fuse woes turned out to be a continuation of the grief we all suffered last winter. Within a few weeks of use, it became evident that the quality of the new interim fuse was suspect. The apparent cause of the problems have been traced to packing material getting into the fuse and pentaerythritol tetranitrate (petn) interfering with the reaction of the lead azide in the detonator.

Reports of frequent duds when using the X-371 led to another manufactures recommendation to double fuse. Once again, we were back to using two fuses per charge. Although, this procedure may be common for some types of explosive avalanche work (cornice, case charges) it can be awkward during helicopter bombing where safety and simplicity of procedures is paramount. (Con't)



Recent information from ICI Explosives reports that X-371 safety fuse manufactured after December 13, 1996 should be defect free. We are waiting for more information regarding the status of fuses made after this date. Until further notice, two X-371 fuses should be used to prime any explosive charge, regardless of date of manufacture.

This situation pretty much brings us to where we are today. Although the past few years have resulted in various levels of frustration for all who have used these products let me say, there is light at the end of the tunnel. Here is what is being done to ensure that the avalanche community gets a safe, reliable safety fuse assembly:

- The CAA Explosive Committee is working on your behalf with various explosive companies including federal and provincial regulatory agencies to define exactly what our needs are and to stress the importance for safety, quality and reliability;
- ICI Explosives continues to voice the concerns of the avalanche industry and leads the effort to supply us with a quality fuse. Tentative arrangements have been made to supply us with a safe and reliable fuse for next winter. Details will follow at the spring meeting.

Safety fuse assembly which has no restriction to double fuse can be obtained from Sardis Explosives in Chilliwack (858-6919). The

product they supply is the Ensign Bickford, Sword fuse. Be aware that the currently available Sword fuse only has a 6 grain detonator which is **insufficient** to detonate a snowdet (RDX and TNT). It works fine with nitro glycerin or 100% pentolite products. Sardis intends to provide the Ensign Bickford fuse in the future with an 8 grain detonator. They are also hoping to supply this fuse with a 12 grain detonator for next winter.

Please continue to report details of any misfires to the CAA infoex bulletin. I have also been asked by Paul Orr (Blasting Coordinator with the BC Workers' Compensation Board) that any avalanche control misfires which occur in BC be reported to him (as per WCB reg 46.22). His phone number is (604) 273-2266 ext 5016; fax # (604) 279-7494. Paul Orr's mailing address is: WCB of BC, Box 5350, Vancouver BC, V6B 5L5.

It is important that this information be documented rather than just talked about. I am confident that through the efforts of all involved persons and agencies that we will find a return to the good ol' days for the winter of 1997-98 when we can confidently use a safe reliable safety fuse product.

Mike Boissonneault  
Chair, CAA Explosives Committee

Committee Members: Niko Wies  
Collani Bezzola  
Bernie Protsch  
John Buffery

### CANADIAN AVALANCHE CENTRE'S FEATURE PRODUCT:

**GENUINE GUIDE GEAR:** is pleased to introduce two **new professional avalanche probes**. Both models are considerably lighter, stiffer, and less expensive than other cable styles probes currently on the market.

Model 320/Model 230

Length: 320CM Weight: 320 Grams  
Length: 230 CM Weight: 238 Grams

MATERIALS TUBING: Easton 7075 E9, 49" O.D., 18" Segments  
CABLE: Stainless Steel Coated with Nylon (Not PVC)  
HARDWARE: Fully Anodized Aluminium  
CARRY SAC: Durable 420 Nylon, Double Stitched with 2 tie on points.  
AVAILABLE AT: Mountain Equipment Co-op, Carletons, Coast Mountain Sports, Escape Route, Katmandu, Fresh Tracks.

SPECIAL ORDERS AVAILABLE  
PRICES AVAILABLE UPON REQUEST

G-3 - 5514 WOODCHUCK PLACE, NORTH VANCOUVER  
604-990-0502 FAX: 604-990-0502 EMAIL: g3@axionet.com

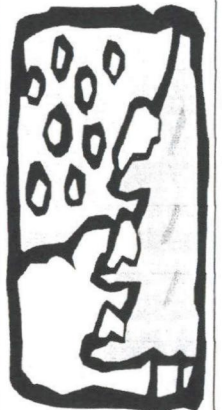
Following is a partial list of retail outlets in the western part of the country that supply our industry with safety and snow observation equipment. We would like to make this a regular yearly feature in our AVALANCHE NEWS. If you have a retail outlet, or know of one that sells this type of equipment please let us know so they can be included in the next issue.

### RETAIL OUTLETS CARRYING SAFETY AND SNOW OBSERVATION EQUIPMENT

Below the lists of retailers are preceded by number. Match the corresponding number in the table to the items listed on the left. Asterisk marks indicate the item they sell.

- |  |   |
|--|---|
| 1. SNOWPACK OUTDOOR EXPERIENCES LTD.<br>333 BAKER ST.<br>NELSON, B.C.<br>250-352-6411                            | 2. TRACK 'N TRAIL<br>10148 82nd Ave.<br>EDMONTON, A.B. T6E 1Z4<br>403-432-1707                      |
| 3. OUTDOOR BOUND CLOTHING & EQUIP<br>257 VICTORIA ST<br>KAMLOOPS, B.C. V2C 2A1<br>250-372-3347                   | 4. ESCAPE ROUTE<br>113-4350 LORIMER RD.<br>WHISTLER, B.C.<br>604-938-3228                           |
| 5. MONOD SPORTS LTD<br>BOX 310, 129 BANFF AVE<br>BANFF, AB.<br>403-762-4571                                      | 6. CARLETON RECREATIONAL EQUIP<br>3201 KINGSWAY<br>VANCOUVER, B.C.<br>604-438-6371                  |
| 7. MOUNTAIN EQUIPMENT CO-OP<br>CALGARY, AB<br>VANCOUVER, B.C.<br>OTTAWA, ONT.<br>TORONTO, ONT.<br>1-800-663-2667 | 8. GENUINE GUDE GEAR (G-3)<br>5514 WOODCHUCK PLACE<br>NORTH VANCOUVER, B.C. V7R 4P1<br>604-990-0502 |
| 9. THE HOSTEL SHOP<br>ABBOT PASS TRADING CO. LTD<br>1414 KENSINGTON RD NW<br>CALGARY, AB T2N 3P9<br>403-283-8311 | 10. CANADIAN AVALANCHE CENTRE<br>300 1st ST W BOX 2759<br>REVELSTOKE, B.C. V0E 2S0<br>250-837-2435  |

ITEM	1	2	3	4	5	6	7	8	9	10
TRANCEIVERS	*	*	*	*	*	*	*		*	
TRANCEIVER ACCESSORIES					*	*	*		*	
PROBE	*	*	*	*	*	*	*	S	*	
SHOVEL	*	*	*	*	*	*	*		*	
SAW	*	*			*		*			
FIRST AID KITS									*	
<b>SNOW STUDY EQUIP</b>										
THERMOMETERS	*	*	*	*		*	*			*
LOUPES	*	*	*	*		*	*			*
CRYSTAL SCREENS	*	*	*	*		*	*			*
RULERS			*			*	*			*
DENSITY KITS						*				*
ALTIMETER	*						*			
SLOPEMETER		*		*			*			
SNOW STUDY KITS	*	*			*	*				



S: will do custom orders.

### Avalanche News

*Publisher:* Jack Bennetto  
Manager, Snow Avalanche Program  
Ministry of Transportation and Highways  
940 Blanshard Street  
Victoria, BC, Canada, V8W 3E6  
604-387-6931

*Design:* Thom Atherton  
P.O. Box 810  
Revelstoke, BC, Canada  
250-837-5215

*Next Deadline:* June 15, 1997

*Managing Editor:* Alan Dennis  
*Associate Editor:* Dan Nixon  
Canadian Avalanche Centre  
Box 2759  
Revelstoke, BC, Canada, V0E 2S0  
250-837-2435

*Submission Guidelines:*  
• Double spaced, typewritten  
• Major PC wordprocessor format  
• Photos, slides, or illustrations  
• PC TIF, WMF, CGM format  
• Always send hardcopies



## Sponsors of the Avalanche Bulletin



**ski-doo**  
ENGINEERED FOR THE WAY YOU RIDE. ®



Patagonia  
Monod's Sports  
Vancouver Sun  
BC Parks  
University of Calgary  
BC Forest Service  
Yamaha  
Selkirk College  
Sunshine Village  
InfoEx  
Totem Outdoors  
Evans Forest Products  
Weather Network  
Iron Creek Snowmobile Club  
Mountain Equipment Co-op  
Revelstoke Snowmobile Club  
Golden Snowmobile Club  
The North Face  
ICI Explosives



Alberta Snowmobile Association  
Carleton Recreational Equipment  
BC Environment Lands and Parks  
Alberta Recreation Parks and  
Wildlife  
Elkview Coal  
Wilson Sports  
Sno Much Fun Cat Skiing  
Alpine Club of Canada  
Mountain Magic Equipment  
BC Snowmobile Federation  
Abbot Pass Trading Company  
Bighorn Printing and Design  
Avalanche Safety Workshop in  
Calgary  
National Search and Rescue  
Secretariat  
Dunvegan Snomobile Club  
Wintering Hills Snomobile Club



Winter avalanche information is available from December to April from the  
Canadian Avalanche Association

BY PHONE:

. In Alberta and B.C.: 800-667-1105

. In Calgary: Calgary Herald Talkies: 403-243-7253 then dial SNOW (7669)

. In Vancouver: 604-290-9333

ELECTRONICALLY:

. Canadian Avalanche Association BBS: 604-837-4893 (8N1 to 9600baud)

. Internet: [www.avalanche.ca/snow](http://www.avalanche.ca/snow)

BY FAX:

. Call for information: 604-837-2435