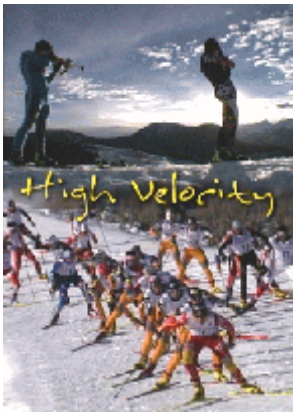
THE MAKING OF HIGH VELOCITY by XCZONE

High Velocity matches the power-endurance of cross-country skiing, and the chilling focus of rifle marksmanship, with the speed of an aerial "pursuit." From cool to calm, the story continues with a solitary winter trek into the "outerspaces," blazing a fresh single track, and crust-cruising through hardwood forests past frost-blasted trees, on route to the mountain summit. Then, rewind the clock to the year 1920 and press play to contrast vintage footage with today's pro-elite skiers as they play on the same trails separated only by time. Fast-forward to 2002 with a preview of extraordinary images of pre-Olympics World Cup racing performances at Soldier Hollow USA, using point-of-view and tracking cameras that allow the viewer to experience the action first hand. "On location, all the athletes, and all the action."



My partner and I at XCZONE have been fortunate enough to compete with a measure of success in one of the coolest sports on the planet, and one which has figured in the defence of nations, but is generally practiced in obscurity.

After so much training and racing, the passion in our veins runs as strong as ever and so does the desire to share this experience on a grander scale. I think many athletes wish that they could share the heart of their best performances with others. This can be problematic with power-endurance sports.

It is thus, that we found ourselves sitting in a SUV on a remote back country road early New Years Day 2001 waiting for a contact, arranged through a mutual friend, to drop off an extra rifle and ammunition. The heavy clouds that had earlier obscured the mountains had quite suddenly cleared, and conditions where ideal for the moment. It would be a good day for shooting our most ambitious film yet - "High Velocity (The Pursuit)."

The production had to contend with a multitude of factors which made an average race day seem like a walk in the park, not the least of which was the weather. We would also be asking the athletes to do something remarkably difficult and bit risky.

After what must have appeared as a nefarious meet, I headed for the airport and Lise raced up mountain roads swerving around fallen trees while Glenn (a 3x Olympian with 16 years experience on the National Team) assembled the rife in the back seat.

Mount Washington, BC rises 7000ft out of the Pacific from temperate rain forests to rugged peaks laden with serious snowfall. Today's mission to capture the speed and precision of biathlon on film.

DVD 1hr 20min+
Shot on-location at Mt Washington, BC; Camp Fortune, QC; Gatineau Park, QC; Valcartier, QC; Cypress Bowl, BC; Soldiers Hollow, UT; Lake Placid, NY.

Sponsored by Subaru USA, Swix, Fischer and SkiTrax Magazine

Soundtracks by Natasha's Ghost, The Aquaphiles, Lucky 7, Cough, Dean Batstone and Pauline van der Roest.

XCZONE ON SKI FILMS

Do a on-line search for ski book, film or video and chances are you will come across hundreds of titles. Nearly all downhill-only skiing. This is quite astounding considering that alpine skiing has only been around for 50 years compared with nordic skiing which has existed for 5000 years.

The current trend in (Alpine) ski films is to take a small group of phenomenal skiers or boarders (uninjured from previous productions) to the top of a mountain in Alaska, have them attempt a first descent of a steep pitch laden with powder while taking big air off high cliffs doing spontaneous new-school freestyle tricks. This is what they do very well. It is spectacular to watch from a safe distance, which is where the camera man is. Two kilometers away with a long lens or in a hovering helicopter.

The final product tends to consist of a tiny back dot (skier) moving down a mountain.

Lise and Glenn reached the base of the mountain ski centre as the helicopter and camera crew lifted into the air. Ten minutes later they had ascended to the summit dressed in outrageously colourful Austrian and Russian spandex racing suits, carrying target rifles on their back and began to draw a crowd of curious onlookers. The helicopter climbed through a steep canyon leading to the mountain, cruising low and fast.

"Thirty seconds to contact," crackled the pilot's voice over the radio.

"Roger, we have visual," Lise responded into the transceiver in her sports bra.

The helicopter appeared, shot up over the athletes and banked steeply around, as the Biathletes took off down the trail passing snow boards like slalom gates. The sound and wash of the blades filled the air as the helicopter dropped down to tree top level in pursuit. The race course was icy fast and varied like a roller coaster; sporting quad burning climbs matched with steep descents through old growth forest bathed in clouds. Recreational skiers, who had been warned at the trail head, jumped off the track or hid under trees as we passed - smiles of disbelief were frozen on their faces that were clearly visible from the air.

Engine indicators redlined as the athletes pushed heart rates near 200 bpm to maximum oxygen uptake (VO2max) at a mile high altitude while the helicopter fought with turbulence off the steep mountain side and in thin air. The skiers, following the track, plunged in and out of thick woods and narrow corridors with constant direction changes that necessitated the camera crew pulling high G tight turns overhead to reacquire the targets. Far below, sailboats navigated into coves borne by fresh shore winds. The chase lasted eleven minutes and covered eight kilometres, with speeds reaching 80 kilometres per hour. What a rush!

The biathletes emerged onto paradise meadows and suddenly stopped. Hearts racing. The rifles were unslung, sight covers flipped open, a full five round magazine loaded, position assumed, bolt closed, trigger pulled and five bullets each fired downrange at falling plate targets the size of silver dollars, fifty metres away. Hits. Sight covers closed, rifle slung, pick up ski poles and accelerate back to race pace. The whole range process took less than twenty-five seconds. Heart rates never recovered below 140bpm - "no rest for the wicked."

The few medium to close up shots tend to be noncontiguous (jump) shots - varying between skiers, terrain, conditions and background. A single ski technique (slalom) is used throughout, employing very little body movement and on only one type of terrain (downhill).

WHAT XC SKI FILMS HAVE TO OFFER

Cross country skiing employs a variety of different techniques, over all-terrain, with high dynamic range of movement driven by a power-endurance engine. Skinny skis accelerate twice as quickly as alpine boards, reaching speeds in excess of 80kph. If an alpine skier is analogous to the space shuttle free falling to Earth, a cross-country skier is like a jet fighter (with a powerful weight to thrust ratio) capable of changing direction, altitude and accelerating quickly.

We believe that cross-country films need to steer way from freeriding first descents in powder or jumping off cliffs. Otherwise, you run the risk of turning out a bad downhill movie. The significance that the skiers are descending or jumping on skinny boards would be lost on the viewer. Instead we have concentrated on continuity, flow, pacing, high dynamic range, speed, power-endurance, three dimensional motion, all terrain, cool PoV and alternative angles. A view of true action.

THE CHALLENGE OF FILMING XC SKIING

With Nordic skiing, there is an intrinsic freedom to go anywhere under your own power, which is part of the challenge in film making. Nordic skiers tend to take-off into the woods on a winding trail system at relatively high speed. Following with a camera crew can be problematic.

Best performances do not always happen in races. Sometimes they occur in training, in solitude, or on rare occasions are captured on film to share.

The helicopter dropped the cinematographer off on the mountain side, neck deep in snow, and returned to base. Upon dragging myself back to the Chalet, I overheard some snow boarders talking, "first, these guys showed up with guns on skinny race skis, and then this helicopter dropped in from nowhere and started a high speed chase shredding down the black diamond, with this guy hanging out on the skid shooting with a camera... way cool, like James Bond... do you think they'll put that in the X-Games?"

Snow mobiles are limited in what hills and corners they can negotiate and are not steady enough for the camera. They can also destroy the trail surface which makes multiple takes difficult. Helicopters have problems following skiers in wooded areas especially over a windy trail system. Tall trees prevent the helicopter from getting close enough to skiers. So most of the photography must be done on fast skis with a steady hand.

XCZONE ON NORDIC SKI FILM MAKING

It is very easy to make a bad nordic skiing film that only a true cross-country skiing enthusiast can sit through. We must have watched every ski film ever made (alpine, telemark and nordic)and then mountain biking, surfing, climbing, etc., making copious notes along the way.

Traditionally, there have been three types of nordic ski films/videos:

Instructional videos - The latest and greatest progressive drills for evolving technique;

Race footage - Local and World Cup race dubbed from TV coverage or from a spectator's/coaches camera; and

Human Interest - Stories of a group of friends and family skiing in the local park, while stopping frequently to munch on granola.

There is still interest in instructional videos. However, these are generally made for and marketed to coaches or athletes, and are more informative then they are entertaining. The photography is basic, long static takes of each technique from various angles. Add some narration and titling. Frequently, race footage of skiers has been used to illustrate finer points of technique (without the permission of either the athlete nor broadcaster). Different camera angles, lens and positions on the race course can give a false picture of technique. Which is one of the reasons that the topic of "new" technique surfaces after every major race broadcast. Technique videos differ from movies (for entertainment) in their style of film making, purpose, and audience. The "XCZONE Technique" video and "Tao of Skiing" CD-ROM are instructional products intended for this market and are distributed separately.

Ski races are regularly broadcast on television or captured by amateur video. Major events, such as the Olympics are seen and taped by millions of people. These tapes are ubiquitous amongst the ski community. Unless, a film crew has extraordinary access before, during and after the race, the product will be no better than you can get by taping it for free. As a film director/cinematographer covering a race, one is not directing anything. Nearly, everything is out of your control, and quality control plunges. A production that is planned and choreographed; that allows for multiple takes on a perfect site given great weather will be far superior than a race environment. A great skier at the Olympics, wearing a black suit, in a snow storm, on an awkward hill looks like a 3 second lumbering blob. The ratio of good footage to bad for a race environment is often 1:1000 that means 99.9% of it is trashed. Now, take the same skier. Dress them in a colourful (broadcast safe colours) suit. Scout out a beautiful mountain top location with a spectacular backdrop. Arrange for fresh grooming. Pick a sunny day with a crystal clear blue sky. Choose terrain that makes the skier look good. Arrange all the proper camera placements. Ski the track multiple times with various angles. Perform the next action from the story-board and edit it together so it flows. Not only is the overall quality of the product much better, but there is a lot less wasted tape. For reasons of both the availability of air taped race footage and restrictive quality control, xczone does not specialize in race coverage, with the exception of a few select events.

The third genre of nordic ski film has been the human interest story, where the emphasis is on the personality rather than exceptional skiing. Most have used average (novice) skiers, depicted in a traditional setting (woolen knee socks, knickerbockers, wood skis and granola) and have a more developed narrative storyline than action. There exist a great many of these films/videos. Since the skiing photography is trivial, this type of film must rely on the strength (and availability) of the characters and compelling nature of the story. If you want a good action ski movie, you enlist the talent of elite skiers. Conversely, if you want to act out a story (where the skiing is incidental), you hire actors. In our film "On Snow" we covered the story of real people as they experienced the longest ski event on Earth. By half way through the first day, some had dropped out and the rest of the cast were strung out over 60 kms of wilderness. We still have a few stories lined up for future projects, contingent upon availability of the players. A project like this takes a significant commitment by all those involved.

In our estimation, people want to see something that they can relate to; something that they can aspire to; and something they would not think of doing, but think it is cool to watch. From a business perspective most people are not willing to pay for skiing that they can relate to. The footage of kids and family touring or novice skiers is something we give away as a matter of good will, and promoting the grass roots of the sport. Similarly, people are unlikely to purchase video race coverage when they can tape it off TV.

XCZONE NON-TRADITIONAL SKI FILMS

A few years ago, I was talking to the producer of a outdoor and sports television network about a project we were working on. I described in length the dynamic ski scenes and storyline and he sounded genuinely interested. Up until the point where I mentioned the challenge of filming some of the more radical ascents. There was a pregnant pause at the other end of the telephone. In cross country skiing we go up and down mountains. He responded with in a condescending tone, "we only show action films" and abruptly hung up. I held the receiver in stunned silence. If that was the image that TV producers have of nordic skiing, no wonder North American coverage of nordic events is so poor and why the public's perception of xc skiing is arcane. Biathlon, for goodness sake, is the most widely spectated winter sport on Earth. Yet, there is a paucity of coverage on this side of the Atlantic. The fact is pro-sports have thrived in America because they are easy to cover - cross-country is not. And when they try once every four years... The phone conversation hardened my resolve, and the first thing I turned to was the dictionary and looked up "action."

PAST WORK

We produced numerous motivational and technical videos in support of our Master's Ski Camps. In the early years they were pretty grim. Blair witch on skis amateur hour, but were for private viewing in front of a receptive audience. Eventually, they became popular enough that the we were giving them away. In 1990 and 1991, we produced two professional videos on Biathlon and Cross-Country skiing of which several thousand were distributed across the country to support ski-biathlon programs. During this time we were doing a lot of the Point of View shots (PoV) for special events TV coverage like World Cups and spent a good time with production crews both behind the camera and in the editing room. It wasn't until 1999 when we released a CD-ROM called "Tao of Skiing" that included 30 minutes of quicktime video with 300 pages containing everything we know about skiing. We sold out of the first two production runs. The feedback from the ski music videos encouraged us release or unleash creatively what had been incubating for a number of years. There seemed to be a real need for an entertaining cross-country ski film within the greater ski and multisporting community.

The Oxford-Cambridge and Webster dictionaries define action as: (ac'tion) = 1. "exertion of energy."

Furthermore, "extreme" means "to the last measure of human endurance, profound and intense."

To my estimation cross-country skiing better fit these words than the act jumping off a cliff into 12ft of powder snow.

This episode of the truth of what we were doing. A mission statement or tag line. And it was Action-Vérité. Where vérité is the french word meaning truth.

> Action-Vérité
> The digital film making of XCZONE experiments with contracting styles of cinéma vérité and escapism to develop tension, stylized rhythm, and inertia. It employs a unique skill-set; combining athleticism and artistry by placing the camera in the same hands as those personally engaged in the experience. The in-action tracking cinematography makes clear the distinction between involvement and commitment for the videographer.

THE MAKING OF HIGH VELOCITY

BACKGROUND

We were sitting on the outside terrasse of a local café in Old Chelsea, nursing a cappuccino while reviewing our notes from the last film "On Snow." A year before we had initiated a survey of the ski community across North America, asking them what they wanted to see in a ski film. There was an overwhelming response. The film "On Snow" captured about 90 per cent of what people asked for. The remaining 10 per cent eluded us owing to availability of athletes and temperamental weather. We planned to capture the remaining desires in this next film - High Velocity. As in "on Snow," there were the things no one thought to ask for, but would later appreciate. You expect the unexpected when you watch a movie. So it is with High Velocity; we hope people will be pleasantly surprised.

The question we get most often is "how the heck did you film that?"

THE IDEA

The idea germinated from a variety of sources. There were all the things that we had scoped out in "On Snow" but did not get around to doing. In some cases it was a case of weather, availability of athletes or complexity that eluded us at the time. Other ideas we deliberately delayed so we could do them justice.

We enjoyed action-adventure films like The Matrix, James Bond, La Femme Nikita and film makers like Jackie Chan, John Woo and Warren Miller. Mountain bike videos like Tread and Kranked raised the standard. Do you remember that Biathlon chance scene in James Bond? So many ski shooting scenes have been done in movies. We thought it would be cool to revisit this scene but use real biathletes instead of actors. Olympic biathletes no less. The view can appreciate talent. And because it is a ski movie we can dispense with any meaningful dialog and just get down to action. Besides athletes generally hate acting. So there are no stunt doubles or cheesy rear projection screens. Since Biathletes are considered by some to be the bad boys of the ski world, we thought we would throw in some Kung Fu. Which just made them badder :-) Again, in the interests of authenticity we used one of the biathletes who has trained in Ving Tsun Kung Fu for a number of years and an expert who trained under Bruce Lee's instructor. So we have this wild chase scene, with helicopters that I envisioned while listening to the Matrix soundtrack. The action scenes within the sequence need to be broken down into digestable chunks where whole scene may last a total of 10-15 minutes.

I like to break the films into three acts with three scenes each. The attention span of a viewer for uninterrupted ski action is about the length of a song or 3 minutes. The viewer needs a break of 30sec to a minute between the action runs. The pace of the scenes and acts needs to vary in intensity so the viewer is not saturated or bored. The total length of the film was planned at 46 minutes. So after the biathlon, sequence we planned an slower peaceful backcountry piece.

We wanted to show something a bit different in backcountry touring. So instead of showing someone slogging knee deep in snow one step at time, we show crust cruising, over lakes, escarpments, over mountains and through caves. A wonderful musician offered to compose a piano piece for the scene.

The Olympics are in Salt Lake City in 2002, and we though there would be a heightened interest in high performance nordic skiing and racing. This is our rational for the next two sequences. The germ of the idea was to compare and contrast today's elite skiers playing on the same trails as enthusiasts 70 years ago. We convinced a half dozen Olympic and pro-elite team athletes to be in the film. It meant a significant time commitment on their part. We found some vintage ski footage at the National Film Board (which we licenced). The main theme of this scene was play.

The final sequence had to be the pre-Olympic World Cup at Soldier Hollow. The way we saw it, there was an opportunity to film the same athletes on the same course as the Olympics, with superb on-trail access during the races. The final product had the potential to look every bit as good or better that the actual Olympic coverage, and we not disappointed.

To round out the final product we edited stock footage from some of the biggest ski races American Berkebiner and World Military Championships. Citizen races like the Noquemanon Ski Marathon, and successful pro teams like the US Subaru-Swix-Fischer Factory Team.

VISUALIZATION

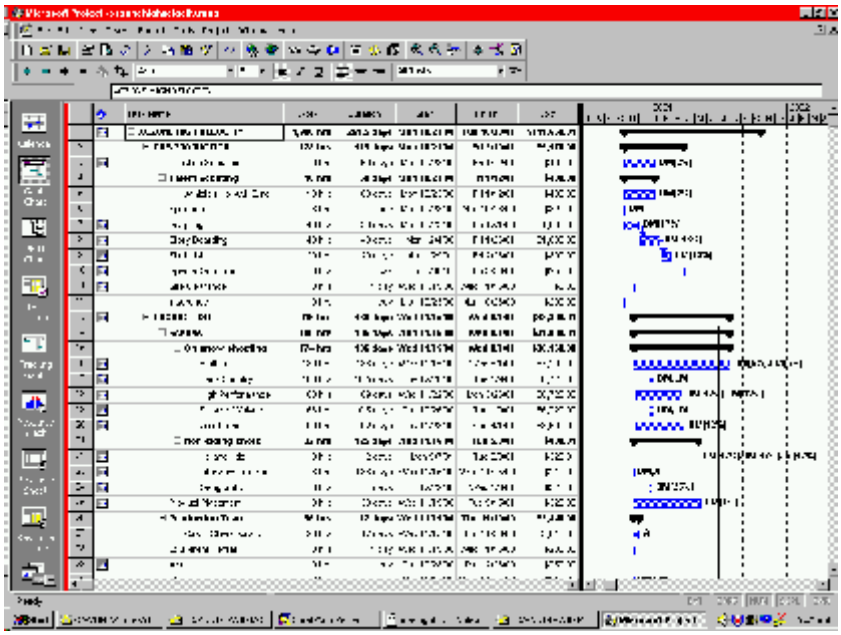
We start with a young idea of the type of film that we want to make, and discuss it in generalities. I have a notebook set aside for the project and keep it close. I write every idea down. Eventually a storyline (as much as an ski film has) starts to emerge and we try and break the project down into acts and scenes. For each scene, there is a different flavour, music, talent, pace, location, action. A scene is envisioned, not in isolation, but with though given to what preceded it and what should follow. I think film making is industrious creativity.

SCOPE

Now for a bit of reality. Producing a high quality video is not a whimsical artistic venture. There is a considerable amount of project management involved. An average commercial sports video (independent film) takes a year to create and costs $30 000. More if you have to outsource all the work. One of the first tasks was to scope out the work in the form of a work break down schedule (WBS). Essentially, it is a detailed list of action items, time to complete, available resources and costs. All of which are linked by dependancies. For example: The video is scheduled for release in October to coincide with the changing of the leaves which is when bike stores switch to skis and the hit count on ski web sites climbs. This means that you have to have the video at the replicator by the beginning of September. But you will have to have your artwork for the packaging ready for the print process before then. The packaging has to have ISBN numbers and Sponsors logos. The sponsor wants to see something before they are willing to release funds and ski magazines need artwork descriptions and a copy of your video for review by July so they can meet their first issues. But the musician who is composing the soundtrack need a draft version to go on in June to work with. You just finished shooting in May.

SPONSORS

Sponsors are great. With a film, it is a leap of faith, because they are committing to a project that they have not seen yet. You need sponsors before production starts. After you have shot 100 hours on a brand of skis it is too late to solicit. It can be a full time job deconficting product placement opportunities and balancing artistic freedom with satisfying the interests of those who have invested in the project. For example: working with sponsor team suits that are not video safe colours (day glow yellow and red).



PRE-PRODUCTION

Pre-production involves the tasks which ought to occur before filming begins. Good initial research and planning are key factors that can reduce costs throughout subsequent stages of the project, and determine the outcome of the project. Production requirements are identified at the earliest stages. The visuals and narrative are developed through the use of story boards, shot lists and scripts.

SCRIPT AND STORY BOARD

I sketch everything out in story boards to capture the motion of the skier with angle / tracking of the camera with some rough annotation. You have to arrive on site with a detailed plan which can be modified on the fly if need be. It is no good having Olympic skiers standing around freezing and a helicopter hovering at $1000/hour while you figure things out. I am constantly jotting down ideas and pictures after skiing around a potential film site, or when I am watching other movies. "Wouldn't it be cool if..."

MUSIC MP3

A good soundtrack is so important to the overall quality of the product. Thankfully, there are so many talented but yet undiscovered artists out there, and a great opportunity for each of us to promote each other's work. I start by searching the database at mp3.com for appropriate music that fits the theme of the sequence and has the right pacing. For the biathlon scene I wanted a 1960's spy theme and found it in surf rock/punk genre. In action sequences it is so important that the beat coincide with the motion on the screen. I contact the musician when I have narrowed the choice for permission or synchronization rights to use their song in the production. Hopefully, everything works out and we are able to give the artist new exposure.

PRODUCTION

The production phase is the time spent behind the camera. It takes the most real time coordination or direction, and is the most time sensitive element. You have to approach it with a good plan - one which includes contingencies. The weather is a huge influence if you are in the business of making ski films. Sunny days with good snow conditions are what you want. Anything less and the footage can be useless in comparison. However, the reality is that more the have the time will be spent waiting in a snow storm - especially where mountains are involved. Avoid shooting unless you know the product will be good. Including bad footage in the final production will bring down the whole value of the product. So what are the factors that we look for in creating good looking visuals? Location, Talent, Framing, Background, Camera Angles, etc.

LOCATIONS

A trail in the woods looks like any trail in the woods on a 30inch TV screen. The hills don't look as steep as they really were nor does the viewer see the panoramic view. So, when we scout for a location it has to be extraordinarily beautiful and unique. This normally means big mountains, bubbly clouds, tall evergreens and serious snowfall. Even better, if it is nearby and warm. The trails need to be of high quality both in their grooming and difficulty. We are looking for south facing (sun lit) trails with character. People want to see somewhere exotic. I choose sections of the trail that offer a variety and three dimensional variation (left-right-up-down), and extraordinary characters like steepness.

BACKGROUND

It is so important when shooting action, NOT to forget about the background. Although the viewer is occupied by the action of the skier, the backdrop is what presents the scene in a way that can make it or break it.

FRAMING

I set the camera up first without the action and frame the scene. This is true for static tripoded, or dynamic panned, dollied, tracked and craned shots. For shots where the camera is moving, I do several dry runs without the skier to note the angles I need at various points to capture the best background. Next I have to place the skier in the shot. Again several dry runs so we can get the right timing. The skier has to be the right distance from the camera and at the correct angle so that the background is in line. This is not too difficult for static shots, but can be tricky when everyone is moving. The catch the right timing and focus, I have the skier go through their motion at full speed, starting from the same point every time. The camera operator is the only one that adjusts their starting point, speed and distance, until we capture the right shot. Generally speaking the sun should be on the skier. (unless backlit for effect) The camera shoots away from the sun but at a slight angle so that the shadow of the camera operator is not in the picture. This can be problematic if the trail is windy and you are moving at 80kph. When I feel the sun roll around during a run, I can change the angle of the camera to look up at the skier and avoid my shadow. Try and lead the action where possible. This is to say, in the framing of the subject keep more space ahead of the skier in the picture. Avoid centred or symmetric shots if possible.

TALENT

Of course, one of the most important elements in a ski film are the skiers. (Although it is possible to make a really bad video with the world's best skier). The skill and fitness has to be impeccable, except for any crashes which we save for the outtakes reel. We choose, Olympic, National and pro-elite skiers for the main sequences with interludes of the average skier that people can relate to. An important part of working with ski talent is setting the conditions where they can show their stuff and making them look good. Having someone ski up an insanely steep and canted slope, in-deep snow will not look very stellar. Firstly, we try and dress them in good looking suits consisting of strong primary colours, while avoiding the extremes of dark or bright video-unsafe colours. Then we choose sections of the trail where the skier can move quickly and the camera operator can keep up. Much of the footage is taken with a runup on slightly descending slope to gain high speed. The clips are relatively short (3-5sec) so everything is timed to come together for that moment. Everything must be done faster, steeper and quicker than real life by about 5-10%, because the action will be viewed on a smaller screen. This means that the athletes are asked to increase the tempo and speed more than race pace, but never to exceed the point where they are struggling or does not look natural. On the down hills, we were reaching speeds in excess of 80kph (60mph) with 5G+ turns. Some of the uphills were steeper than 70 degrees for short pitches.

THE SHOTS

The story board is laid out in much the same order as it will play in the final product. Before a shoot we organize each one of the storyboard elements in to a shot list which makes sense to shoot at one time on one location. The standard shot length is 1-3 seconds with occasional quick clips of longer uninterrupted takes to vary the pace. The camera is rolling for about 3 seconds before and after the take. Special care is taken to capture all the footage necessary to preserve continuity. If a skier is climbing a hill, cresting, riding the flats and then descending. You have to have enough shots at a given site (various angles) to be able to reconstruct natural progression over the terrain in the editing room. Where possible I shoot sequentially (in camera editing) but leave enough lead in and trailing footage on each clip for editing purposes.

My first video was shot entirely in-camera editing. That is recording each shot sequentially, reviewing the take, set the position on the tape for the next shot and recording. This takes a lot of planning and patience, but is a great exercise in leaning how to visualize the finished product during production. To often people shoot in an undisciplined manner hoping to figure it out in the editing room, only to find that they do not have all the necessary footage. The end product in that case consist of a lot of incongruous jump shots. Sometimes it is not logistically practical to shoot scenes (or clips) sequentially. For example, in "High Velocity" all the aerial (helicopter) camera work was done on one day, and the ground views on another.

First person PoV shots where completed another day. We needed to be on location in the Mountains with the talent for wide angle shots, where the background is clearly visible. However, the closeups of boots, skis, glasses, or body parts were shot a month later on the other side of the country on body doubles. (You don't need to drag an Olympic skier to a top of a mountain to take a close up shot of a ski boot) . You can have a second unit shooting half the footage in another location concurrently. You do have to worry about technical continuity when splitting your work. The sky, lighting (intensity, colour) and conditions have to be the same and the skiers dressed the same as they were the day or month before. This is why we tend to provide the wardrobe and ski equipment. Even the pacing or tempo of the skiers must match that of the previous clip.

STABILITY

One of the key elements of camera work is stability. Buy a good tripod. A locked-off static camera shot looks so much better than one where someone is just trying to hold the camera steady. The tripod should also be used for pans. A rock solid camera shot allows for compositing, rotoscoping and other special effects work in post production. Stability is a bit trickier, for shots where the camera is moving. Nearly all our moving shots are hand held because we need to have freedom of motion and the ability to negotiate tight turns at high speed. Traditional steady cam devices are too bulky. The trick is to hold the camera still for 1-5 seconds regardless of what is happening around you. The best advice is that is better to have 1sec where everything is in-focus and stable than it is to have 10seconds where there is a mild shake.

HANDLING

The technique for capturing these images takes a bit of practice. First you have to keep up to the fastest skiers in the world, using legs only and carrying lightweight camera gear and miniature tripod for at least 10 seconds at a time, of which I hope to get 3 seconds of steady usable footage. You need three sets of eyes. One to watch the skiers, one to aim the camera and one set to look where you are going. You can not therefore look through a viewfinder. The camera is aimed by feel either by an overhead or underhanded pistol like grip. The camera operator must maintain the correct distance away from the skiers to keep the subject in focus and in frame, which holding steady. Good biomechanical positioning helps to dampen the vibrations. Being a biathlete comes in handy. There are a few more tricks to.

CAMERAS, ANGLES AND MOVEMENT

We use multiple camera angles and movement in order to achieve the effect of drawing the viewer in to the action. Traditionally, nordic ski videos have shown a 2 minutes of a skier climbing a hill in one uninterrupted take from one viewpoint. Many viewers may have tuned out after 10 seconds. Alternatively, we have multiple cameras rolling (for difficult shots) or get the skier to do the hill several times. Each time the skier is filmed from various camera angles. This has several advantages. One is that the different views engage the attention of the viewer. The other advantage is that the whole sequence can be cut down drastically but yet convey the same experience (or more). The skier in this case made it to the top of the hill in 30 sec, well within the attention span of the viewer. Interesting angles or focal lengths can evoke a mood or add emotional content to the scene. I tend to use a wide angle (tripoded) shot to establish the sequence.

Telephoto shots are great for shooting through snow (skier must fill frame to balance lighting and remain in focus) and when climbing a steep hill. Head-on motion is all within the same focal plan when shooting telephoto. This is why race cars always look like they are standing still. The same is true for skiers. So, I only use a telephoto shot of skiers while panning where they are moving across the background or if they are climbing (a large range of body movement). Telephoto shots are almost always used with a tripod, although sometimes (for effect) you can track by (or around) the subject, to give the effect of the background rushing by.

The majority of shots have the skier fill the middle 80% of the screen (the TV safe areas). I am not a fan of far away shots where the skier is a small speck. I begin the shot by white balancing the camera against the snow or with a white card. I use manual focus and brightness/colour balancing for static shots especially over the white snow. Everything is in full automatic for moving shots at wide angle. The viewer gets a much better sense for speed if the camera is held low to the ground when tracking (1cm to be exact) and angled in such a way to capture the ground rush.

A camera using a, held high above the skier on a monopole gives an interesting craned shot. Adding craning and tracking together with an ulta wide angle lens provides a low budget helicopter shot that we can drop down to boot level in one smooth motion. In composition, we can achieve a continuous flow from real helicopter shots, craned tracking, hand held to special cameras mounted on skis (1000ft to 1inch). Different views involve the audience to varying degrees: a static wide angle view provides a detached feeling. The closer you pull in the more intimate. The audience is brought into the action as the camera moves especially in the case of Point-of-View (PoV) shots. We use four varieties of PoV shots: 1st person where the viewer sees what the skier sees; from the view point of a 3rd person but that skier is not in frame, 3rd person view but with some of the skier in frame (their skis); and an unusual PoV shot like from a ski mounted or poll mounted camera, or birds eye view. Avoid hand held panning back and forth. Instead, either track with the skier or eventually allow them to pass out of frame. Camera angles, focal lengths and point-of-view is a matter of creativity.

We like to put a lot of PoV, and tracking into our work. One challenge to making a smooth transition from static to moving camera shots. This is accomplished a variety of ways: accelerate or decelerate the camera gradually to static shots; zoom for a close up of skier then match framing with a tracking shot; go from a head on telephoto shot of upper body to tracking wide angle upper body shot; as the skier slows down on an up hill switch to a static shot; use cutaways or inserts.

B-FOOTAGE

B-footage is clips of things other than the main action or storyline but help to establish the scene or look off camera. The quality of movie is often determined by the quality of the B-footage. It in a way enhances the primary footage, the way a frame improves a painting.

Try and take as many cutaways as possible during shooting. This is where you ease the camera on and off the action from something else like the sky, trees, snow, birds etc. This allows for a natural transition from the action. Many times you can perform a match edit in post-production (pull onto blue sky and soft cut to the next clip that started at the sky). Cutouts give you the option of easing in or out of the action or trimming a scene. They also add variety so that the viewer is not saturated by action.

Other simple but indispensable clips are inserts. These can be extreme closeups of the skier that you can drop in when ever you need to cut the sequence, or diverse items used as a jump shot to provide the viewer with what is occurring out of frame. These can be things like birds, trees, or helicopters. Sometimes we have shot objects (clouds) that we want to composite or matte into the finished work.

CAMERA GEAR

We work exclusively with digital video. For what we are trying to accomplish, the camera gear has to produce the highest quality video and yet be light enough to do the tracking photography. In other words, I have to be able to hold the thing steady with one hand descending off a mountain at high speed. I chose the Canon GL1 because it provides a very good quality picture and is more compact than the XL1. Both have great optical stabilizing and a superior optics to shooting in high contrast snow conditions.

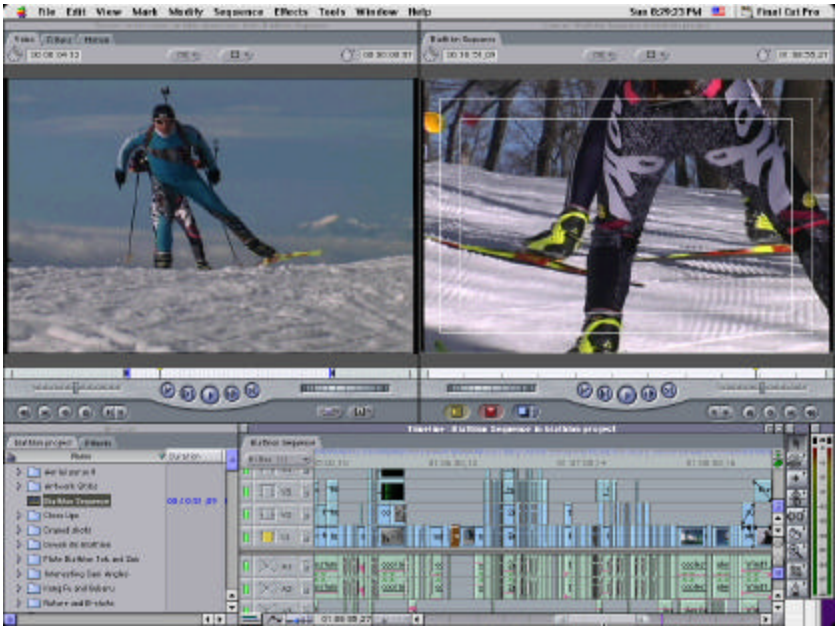
For trickier situations I have the pocket size Canon ZR1. Given the right conditions it can yield footage comparable to the GL1, but is limited in high contrast moving situations. For interesting PoV shots we can use a lipstick camera the size of a thumb that can be mounted on a helmet or skis. This is used in high risk situations where we can not use either of the other two cameras. Last but not least, we carry a light and heavy tripod, a monopole/crane and a light home build steady cam device. This all fits on a harness that we can ski with.

PRACTICAL EFFECTS

In our videos we plan out practical effects and stunts in advance and do several dry runs before hand.

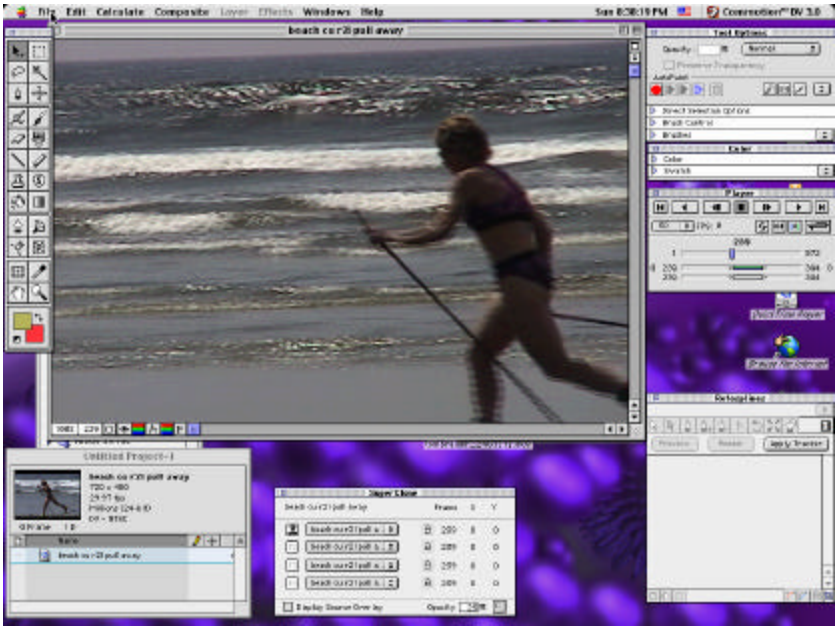
POST-PRODUCTION

It is in post-production that we craft the final product. The raw footage is transferred directly by from the camera by Firewire onto the hard drive of a PowerMacG4 (450Mhz 512MByte RAM, 200G hard drives) where it is edited and enhanced using Apple's Final Cut Pro. The film took up about 80G of space. The material was viewed both on screen and with an external monitor.



Although Final Cut Pro was the work-horse of post-production work, several special software packages where used.

Commotion DV provided excellent deinterlacing for 2x slow motion and rotoscoping.



The Twitor Pro plugin worked magic to get 10x slow motion and time remapping out of 30fps miniDv footage. 3D tiles were produced using Ulead's Cool 3d and imported through Commotion into FCP. All the artwork and stills were produced using Corel Paint and Corel Draw. Poser was used to create 3d working biomechanically sound skier models. Bryce was used to produce the realistic terrain models, outputted as Quicktime movies that were composited using FCP. The Delirium by Digieffects is used to create esoteric particle effects like snow.

The product is preserved in high quality digital format throughout the entire production. We output your video on to tape, in a digital format for CD-ROM or DVD, broadcast on the web, or for use within a presentation.

MEDIA MANAGEMENT

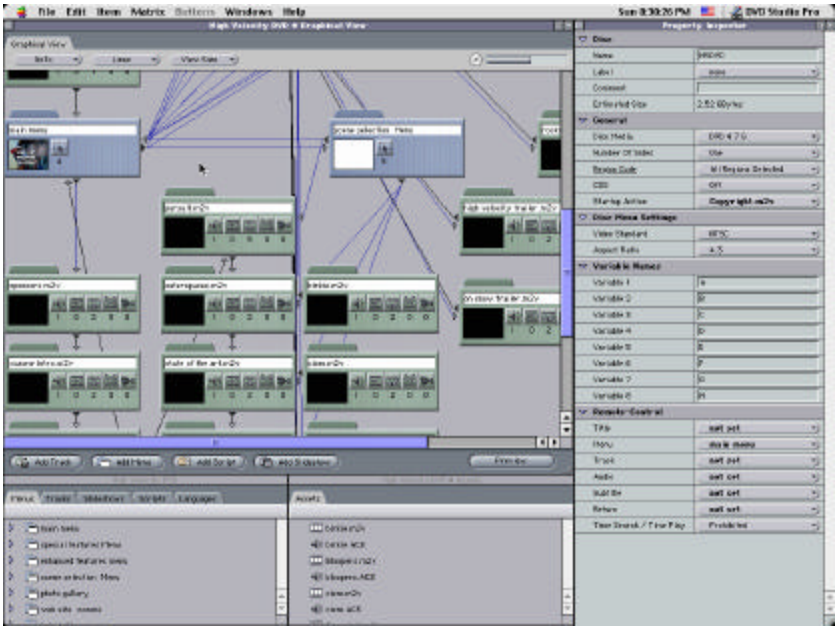
LOGGING BINS

The first job before we could start editing was to store and log each clip into file folders on the hard drives. Over 900 min of tape were shot for our 50min film. After reviewing the footage the best clips were stored. This meant that over 150 min of footage had to be logged. Each clip was between 1-5 seconds. So it worked out to 3000 clips. Each clip has to be given a descriptive name (usually place, person, clothing, action) and a quality rating. That clip was then placed in the scene folder. Once all the footage is on the system we can start the creative process.

CREATING PROJECTS

The film conceptually was broken in to acts and then further into scenes. Each scene is comprised of clips that together form a sequence. All this is organized within Final Cut Pro.

A new project was started in FCP for every scene in the film. This prevents any given project from getting too large to manipulate. Bins were created and all the clips associated with that scene were copied into these bins. Each bin further organized the clips based upon type and story line. Now it is time to build a sequence for the scene. Similar management is done in DVD authoring using Apple's DVD Studio Pro.



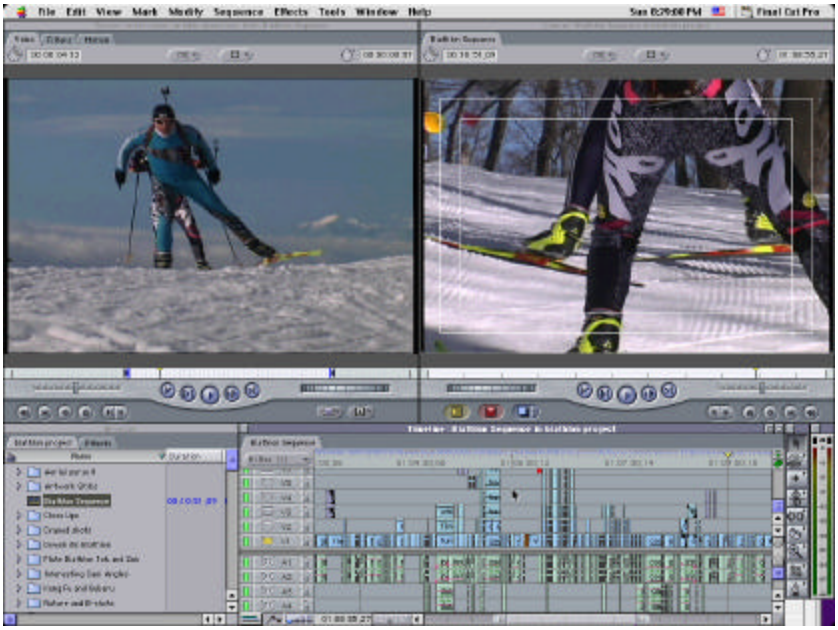
EDITING

In the most basic sense, a sequence is the order in which video-audio clips are played along a timeline.

The first thing I do in assembling a scene is to place the best clips in an order that makes sense given the storyline or story board, and trim the obvious garbage off the start and end points of every clip. Considerable time is spend at this point rearranging the order of the clips to achieve the best flow and impact. No transitions nor special effects are used. Sound is turned off. Orphan clips that do not seem to fit or are superfluous are removed from the sequence.

It is now time to start trimming the clips to pace the sequence, correct the timing and improve continuity.

Multiple angles on the same event are re-assembling clips together. Something that took 10 seconds to do in real life can be cut down to 3 seconds this way and yet the audience actually feels that they are getting more out of it.



We want to make the cuts seamless or unnoticeable. A shot of a skier passing through the screen would be cut so that it began just as they entered the frame and cut just before they left. This way the eye never loses the skier and has to re-engage. Better yet, I will try and match cut. This is where the position and orientation of the skier in the end frame of a clip matches precisely with the first frame of the following clip. This way it appears that only the background has changed and the eye does not have to work to re-acquire the skier. Be careful not to have movement double back on itself or cross the line. If a skier travels left to right across the screen, then the next shot should not have the action going right to left. Try and get the action to gradually orientate to a neutral state, add a few inserts or closeups before changing direction.

Continuity does not mean repetition. Filming a dozen skiers jumping of the same cliff from the same angle, or a skier performing he same technique like slalom for an hour can get boring regardless of how difficult the descent.

Then there is the matter of technical continuity. The activity of cross-country skiing has a large dynamic range of motion and a variety of techniques. The integrity of this motion should be preserved when you reassemble shots. When you cut a shot and replace it with a view from a different angle, you have to at least pick up the motion where it was cut. Better still is to advance the timetime a few frames to create the elusion of continuity. The technique must match as well. Jumping from offset to one-skate technique without a proper transition will be noticed immediately by skiers. They will at least feel that something was wrong. The sequence must also be logical from the perspective of terrain flow. A skier would naturally climb a hill, crest over the top, cruise the flats and descent the other side.

You can't have the skier in a tuck one second and then climbing in the next shot without the audience thinking that they have missed something. Another from of continuity is that of talent. You would never think of taking a closeup of an actor in one clip and substituting them for a completely different person in mid-sentence. So it should be avoided in filming action sports. A contiguous action sequence should keep the same talent wearing the same clothing in the same environment. There should be consistency in the environment, lighting and trail conditions. Jumping from a bright sun lit powdered slope to a groomed ski centre in a snow storm will be noticed. We are long past the days where an actor can convincingly fake an action ski scene in front of a rear projection screen.

After I have had a few passes assembling the shots in silence, I turn on the sound and add the tentative soundtrack. I then adjust the assembly and length of the clips to roughly match the music.

Once this is done and the sequence seems to work. Cut it again. If you are able to remove a clip or shorted another without truly missing it.

COMPOSITING AND EFFECTS

Starting from a nice tight sequence we can think about adding transitions and effects if they are strictly necessary or add value to the product. The first thing that I will do is correct colour, gamma or intensity of the clips so they match better. The next transition I will add are three frame dissolves (soft cuts) on match cuts. Figure out what transition works well within the theme of the film as try and stick with it throughout. I add transitions where there is a change in the scene to significant for a simple cut. Either where there has been an obvious change of scenery, talent or passage of time.

Next I play with changing speed (usually slowing down the action 2-10x) for dramatic effect. This is done with the music.

SOUND MIX

The primary sound in a ski movie is the sound track. Just like a rock video. The visuals are matched first with themselves then with the music using three point editing techniques. Actual ski sounds recording during production and foley (sound effects) are added in where appropriate. Musical sound effects (drums, cymbals etc) are also added it a key points which correspond to visual action.

You have two options when it comes to music. Either have a piece composed for the video (like in our outerspaces scene in High Velocity) or choose music which fits the visuals.

The period of movement in xc skiing technique is about one cycle per second. The tempo of the music must match (on the beat, half or quarter beat) the periodicity of the stroke. MP3.com has been a great resource for finding appropriate songs. We were able to contact talented local artists and request synchronization permissions for the use of their songs in our films.

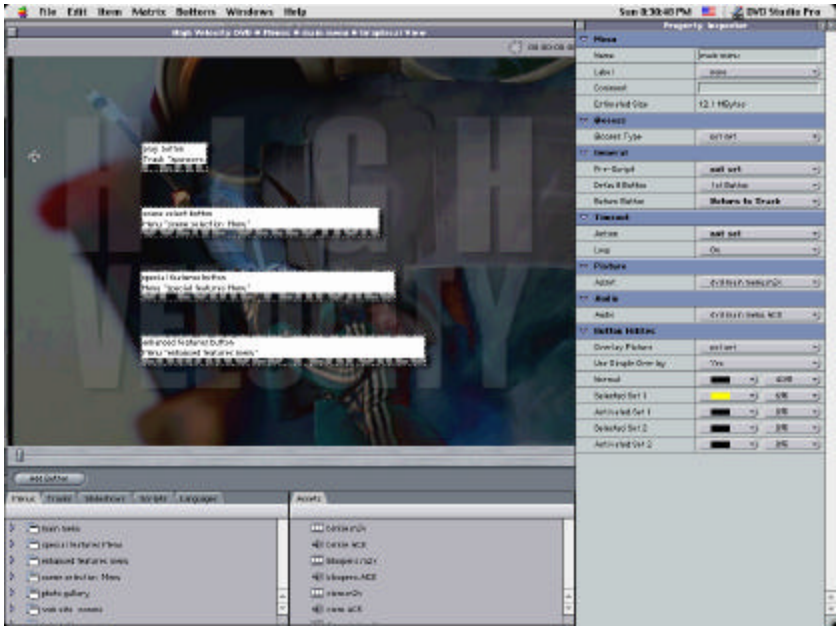
For production sound, foley or narration, I have used an external Stereo mic connected to a minidv recorder. We record directly to tape stereo in 48Khz. We can use a lapel mic for on camera interviews.

ENCODING

After three months of editing, the final product was ready for encoding. From FCP the sequence is exported as MPEG 2 at 7Kbps encoding rate, which compresses it down considerably at DVD quality. We used A.Pack to encode the finished sound track into Dolby Digital 5.1.

AUTHORING

The encoded files are imported into DVD Studio Pro where the DVD is authored. When this is complete we burn a DVD on site and send it off to the factory along with the package artwork for mass replication.



Three weeks later the DVD is on the store shelves, and not too soon, the leaves have begun to fall.