

set off/out	vyrazit (na trať)
set the pace, pace sb.	určovat tempo (komu)
spokes	výplet (dráty)
stage	etapa
streamlining	aerodynamický tvar
time trial	časovka
tool/saddle bag	brašnička na nářadí
track racing	závody na dráze
tyre, outer case, cover	plášť (kola)
valve	ventilek
wheel	kolo

## SKIING

Skiing can be divided into three basic groups: Alpine skiing, Nordic skiing, and Freestyle skiing.

- The major Alpine races are the downhill race, slalom, giant slalom, and super-G. Combinations of two or more of these events make up the Alpine combined competitions.
- Nordic skiing includes individual and relay cross-country racing, and ski jumping. Cross-country skiing includes classical style, and skating. The Nordic combined event consists of cross-country racing and ski jumping. A combination of cross-country racing and shooting makes up the biathlon.
- Freestyle skiing is divided into three disciplines: acro (formerly called ballet), moguls, and aerials.

### History

In Scandinavia, Siberia and Central Asia skis were used as a means of winter transport, and for hunting and warfare as early as 3000 BC. Organized competitive skiing began in the 19th century, it is Norway where we can see the transition from early forms of skiing, used solely for transport, to something more like the sport that exists today. In Norway, ski jumping was invented in 1840, first cross-country races were held in 1866. Norwegians were also responsible for the introduction of skiing into the USA in 1841. The spread of Nordic skiing to the rest of the world can be attributed to two major causes: the emigration of Norwegians, and the publication of Nansen's book describing his 1888 expedition on skis across Greenland. Although skiing was almost unknown in the Alps until the 1880s, the very different snow conditions there rapidly led to the development of downhill and slalom races. The international governing body for skiing FIS was formed in 1924, the year in which the sport was first included in the Olympic Games (in Chamamonix). The biathlon, which is based on military patrol races, became an Olympic sport in 1960.

## ALPINE SKIING

### Ski Equipment

Alpine skiing is a technical sport which requires expensive, sophisticated equipment which complies with very strict safety regulations.

This includes a pair of skis fitted with ski bindings and ski brakes, special ski boots which fit into the bindings, and a pair of ski poles.

**Ski clothing** must keep you warm and dry to protect you from the extremes of mountain temperature, but it should be loose enough not to restrict your movements in any way. It should be wind-proof and water-resistant, and be made of anti-skid material. You should wear your clothes in several layers for better insulation, with long underwear when it is very cold, and put on a woolen cap and a pair of gloves. Skiers wear either a jacket and stretch pants or a one-piece or two-piece ski suit.

Every skier needs accessories such as sunglasses, ski goggles, and sun-protection cream. Goggles may be worn as protection from glare, wind, and snow spray, and to improve visibility in some conditions. Rubber ski straps are wrapped around each end of a pair of skis to keep them firmly together when you carry them. Skis are transported in ski bags.

### Skis

Skis are made of various materials, usually combining a variety of plastics with metal, fiberglass, and laminated wood. The length and weight of the skis vary with the competition, and the size and preferences of the skier. Any commercial makings must conform to the regulations of FIS.

#### • Ski construction

All skis have a hard plastic or "A.B.S." top surface, a polyethylene running surface, and steel edges which are flush to the base an slightly proud of the side-walls. The construction of the core varies and may be either foam-injected, torsion box or laminated ("sandwich" construction) The narrowest point of the ski is near the center and is called the "waist". There is also a built-in arch known as the "camber". When laid flat on the ground, the ski will only touch the ground at the shoulder and heel. Manufacturers concentrate on making highly durable skis for different skiers by varying such characteristics as the length, width, weight, flexibility, resistance to twisting or torsion, side carving, absorption of vibrations, etc.

#### • Caring for your skis

Any holes or scratches on the running surface need to be filled in. This can be done using a special "candle" made from a mixture of polyethylene and wax. Edges must be sharp with a clean smooth surface. At the tip and tail they can be dulled with a file or wire wool if necessary. You should wax your skis to make them faster and as well to ease turning. First apply the wax, then iron it, and finally scrape the excess off.

### Ski bindings

The binding is the device which attaches your ski to your boot. It is designed to hold your boot firmly in place when you ski, but to release it when you fall, which prevents you from injury. If a binding is to absorb bumps in uneven terrain without releasing, it must have a certain amount of "elasticity". There are a few types of ski binding: the heel-and-toe system (step-in binding, turnable binding) and the plate system. The heel-and-toe binding consists of two separate units: a toe-piece and a heel-piece. Both are adjustable. Most bindings release sideways at the toe and up at the heel. When you fall and come out of your bindings, "ski brakes" or "safety straps" stop your skis from hurtling downhill.

### Ski poles

are made of strong, lightweight material such as aluminium, with steel tips. Handles or "grips" are made of molded plastic and contoured to fit the skier's hand. A plastic, rubber or metal ring near the tip is known as the "basket". The "shaft" is either straight or bent for downhill race. Ski poles are used for support and to aid balance, and for keeping rhythm when steering short turns. The right length of the pole is necessary for proper planting it.

### Ski boots

Boots should fit to give maximum control over the ski edges and support for the ankles. They form the link between the skier and his ski. Bad boots mean bad transmission of force and poor control of your movements. Your boots must fit exactly and must be as comfortable as possible. They must be rigid enough to prevent any sideways movement of your ankle and at the same time soft enough to flex forward. Ski boots are made of plastic, and consist of two parts: the outer shell and the inner boot. The shell is rigid and supports the foot and ankle, it is made of polyurethane. The inner boot, which cushions your foot, is soft and made of soft plastic or leather, sometimes filled with foam. It is always removable.

There are two main types of boots: rear-entry (where the buckles are at the back) and front-entry. Some boots are high and stiff, others are lower and have a softer forward flex. High-performance competition boots are adjustable in almost every direction.

## Ski Techniques

Ski technique is not an end in itself, but the means to an end. Its object should be the development of a natural, effective and safe skiing style. The way in which ski

techniques are classified and taught varies from country to country. The following example is the Czech school.

- 1) **Basic ski skills:** Carrying, putting on and taking off skis, Standing, walking and turning around on skis on the flat and on the slope; Falling and getting up; Walking uphill.
- 2) **Ski exercises:** Getting used to skis in motion; Skiing down the fall line in the basic stance and in lower stances; Schussing from a gentle slope and then from a steep slope; Transferring the body weight from ski to ski; Lifting one ski (balance exercise); Traversing and edging the skis; Skating and step turning; Side-slipping; Snowplowing; Schussing over bumps and dips; Terrain jumping on skis.
- 3) **Basic Turning:** Elementary open-stance parallel turning (wide-radius and tight-radius turns); Parallel uphill turning; Turning snowplow; Snowplow turning; Stem turning.
- 4) **Parallel turning:** Parallel turning with an "up" and "down" initiation; Short swinging with "edge-set"; Absorption-extension turning on moguls; "Jet" turning; Jump turning; Deep powder snow turning.
- 5) **Stepping techniques:** Stepping onto or against the uphill ski; Competition forms.

## Ski Terminology

- **Basic stance** (on the flat or in the fall line): keep your skis flat, parallel, slightly apart- at about hip-width, and adopt a relaxed, balanced stance. Weight equally over both feet, knees flexed and slightly apart, ankles bent, hips forward- feel your weight over balls of feet, upper body relaxed in a normal stance, head up, eyes in front, arms relaxed, elbows bent, hands forward.
- **Wrong stance:** knees too close together (knock knees), skis edged into snow, hips and bottom sticking out, leaning backward, eyes on ski tips, upper body bent too far forward, arms stiff, weight on the heels of feet, etc.
- **Correct stance on a slope** (for traversing): keep your skis perpendicular to the fall line and parallel, at about hip-width for stability. You must develop correct body angulation and edge control: flex your ankles and press your knees and hips into the slope to set your skis on their uphill edges (i.e. to edge your skis), twist

your uphill hip forward - it will push your uphill ski and shoulder forward so that more weight is on your downhill ski and your upper body is relaxed, leaning out (away) from the hill (i.e. angulation), and facing down the fall line.

- **The fall line:** is the steepest, shortest and fastest line down the slope.
- **Schussing:** when schussing, you ski straight down in the fall line or close to the fall line, on a gentle slope or steep slope.
- **Traversing:** In a traverse you ski across the slope at an angle to the fall line. When you are traversing, standing across a slope, or side-slipping, we speak about the uphill and downhill ski, hip, shoulder.
- **Phases of a turn:** initiation phase, steering phase, end phase, transitional phase.
- **Turning:** When you are steering a turn, we speak about the outside and inside ski, hip, shoulder. About flattened and edged skis, about transferring the body weight from ski to ski, about the weighted and the unweighted ski, about the movement of the body center of gravity, about the simultaneous leg action and the independent leg action, about wide-radius and tight-radius turns, about carved turns and skidded turns.
- **Up-extension:** lower extremities extend up in all their articulations, the body center of gravity moves upward.
- **Down-flexion:** lower extremities flex down in all their articulations, the body center of gravity moves downward.
- **Uphill turn:** is a turn into the slope away from the fall line. It is used for ending turning and stopping.
- **Downhill turn:** is a turn in which you ski in a continuous swing from a traverse, into the fall line and then away from it again into a new traverse in the other direction.
- **Ski slopes:** You can ski on a gentle or a steep slope, on a prepared marked slope which is called a piste or trail, on a bumpy slope which is called a mogul field, advanced skiers can go off-trail skiing. Beginners learn to ski on practice or nursery slopes ended with a flat section or a counter slope.
- **Parallel turning:** the skis stay parallel all the time. They turn all the time. The turn is steered by pressing chiefly against the weighted outside ski, by pushing both knees forwards and into the intended turn. It can be made with a "down" or "up" initiation.
- **Turning with "down" initiation:** From a traverse, you prepare to turn by extending up (i.e. end phase). Transfer your weight onto the uphill ski, you bank your body into the intended turn to change edges, bring your inside ski forward (i.e. transitional phase), flex down fluently, flex knees forwards and

into the intended turn and press against the weighted outside ski (i.e. initiation phase). The steering phase is divided into two parts: the first part is characterized by down-flexion, the other part by up-extension. Both movements are made on the outside weighted ski. The inside ski is unweighted. You counter-rotate your hips and upper body. The inside pole-plant performed in the end phase is used for rhythm and balance.

- **Turning with “up” initiation:** It is prepared by flexing down and planting your inside pole, which acts as a pivot. It is then initiated by extending both legs up and banking your body into the intended turn. Your weight is transferred onto your uphill ski. Then you steer the turn by pushing the knees forwards and into the intended turn, maintain pressure against your outside edged ski. Counter-rotate your hips and upper body.
- **Turning snowplow:** the whole turn is made with the skis in a converging wedge position. The turn is steered by pushing only the outside knee forward and into the turn.
- **Stem turning:** it is used by intermediate skiers and also by experts in difficult conditions. It consists of two phases: the stem phase and parallel phase. Stemming out your uphill ski is the movement that enables an easier initiation of the turn. Stem out your uphill ski, transfer your weight onto it and press against it, then bring the unweighted inside ski parallel. There is also stemming with the downhill ski.
- **Step turning:** it is a means of changing direction while travelling by stepping from one ski onto the other. When used for accelerating, you increase your speed by giving yourself a firm push-off at each step. Flex down, then spring diagonally forwards, push off forcefully from your edged outside ski onto your angled edged inside ski. You can make it with a double-pole push at each step. It is made either uphill from a traverse or as a complete downhill turn.
- **Banking:** is the technique that skiers use to counteract centrifugal force. All the body is leaning into the slope. There is a tendency for a skier's weight to go onto his inside ski. To compensate for this, he must also angulate.
- **Angulation:** the upper body is leaning out from the hill to increase the angle of edged skis and to keep weight against the outside ski. The degree of banking and angulation varies with the speed and tightness of the turn.
- **Centrifugal force:** it is the force of inertia action directed away from the center of the turn.
- **Centripetal force:** it is the turning force applied towards the center of the turn. It counteracts the skier's inertia. It is produced by pressure chiefly against the

egged outside ski. The skier must continue to exert the force throughout the turn. The force operates in a certain direction.

- **Turning around on skis:** there are several ways: star turn, herringbone turning, kick turning. It can be executed either on the flat or on a slope.
- **Walking uphill:** it can be realized by side-stepping or the herringbone.

## Competition Skiing

### The Downhill (Race)

The downhill race is a speed contest in which the fastest descent determines the winner. It demands a high level of technical skill and a great deal of strength and courage.

The *course* is indicated by markers on both sides, gates are used to direct the skier over the course. The vertical drop of the course should be 800 - 1000m for men, and 500 - 700 m for women. The length of the course should be such that the best time recorded should not be less than two minutes, resp. 1min 40s.

Speeds can reach 140Kph, and maintaining control depends on instant reactions to sudden changes in snow conditions and visibility, as well as coping with the turns, jumps and changes of gradient. Downhill racing technique concentrates on ways of increasing speed and on turning accurately and efficiently without any unnecessary braking. The aim is to minimize wind resistance, friction, and to keep the whole ski on the snow. The basis of the technique is the low, crouched stance called "egg".

### Special Slalom

The race is decided by two runs over two different courses. The winner is the competitor with the best aggregate time for the two runs.

The twisting *course*, which is defined by gates (alternately blue and red) should test technical versatility, reflexes, agility, precision and control. It should include turns that allow maximum speed, precision, and neat execution. The snow must be as hard as possible. The gradient of the slope should be 33 - 45 %. All gates should be 4 - 5m wide, and numbered in sequence. Courses should contain open and vertical gates, and combinations. Men's course contains 55-75 gates, women's course 45-60 gates. If a competitor fails to pass through every gate correctly, or fails to finish on at least one ski, he is disqualified. The vertical drop of the course is about 180m. The gates are set to produce a wide variety of different turns of differing radius over varying terrain.

## Giant Slalom

Giant slalom combines the speed of downhill race with the turning skill of slalom. It differs from special slalom in that the gates are wider and are set further apart, the course is longer and the speed greater. It differs from downhill race in that it is more of a test of precise, controlled turning at high speed.

The race is decided by two runs over two different courses. The gates consist of two flags. Gates are alternately red and blue. They are 4-8m wide. The vertical drop of the course is between 250-400m. Most of the gates should be single, not set in combinations.

## Ski Lifts

It was the Swiss who led the way in developing ski lifts. They had already built narrow-gauge mountain railways which ran up a central toothed rail. They also developed "funiculars", carriages that run on much steeper tracks but which are pulled uphill by cables.

They were also the first to build a "cable car" for skiers at Säntis in 1935. Cable cars are large cabins, holding up to 125 people, which hang from a cable suspended between pylons.

Perhaps more important to the growth of recreational skiing was the invention of the "drag lift". The forerunner of all modern drag lifts was the simple "rope tow". Driven by a petrol engine, it consisted of a loop of rope which pulled the skiers uphill. The first ones appeared in 1932 in Switzerland and Canada. Then, in 1934, a Swiss engineer Erich Konstan developed the "T-bar lift" which pulls up two skiers at a time. In the early 1950s a French engineer called Pomagalski took the principle a stage further by inventing the more versatile Poma "button lift". The "chair lift" was invented by an American, Jim Curran, and the first one was built in 1937 in Idaho. Chair lifts were introduced to Europe in 1948/49. Later they were joined by "gondolas" or "telecabines" which are rather like enclosed chair lifts. They originated in France and are called also "bubble cars".

Other non-standard forms of mountain transport are snowmobiles, SnoCats, light aircraft, and helicopters, which have opened up the experience of off-trail "heli-skiing".

### Types of ski lift

- a) drag lifts: Poma "button lift", T-bar lift
- b) Chair lift, Gondola or telecabine ("bubble car"), Cable car, Funicular

## NORDIC SKIING

### 1. Cross-country Skiing ("XC" skiing)

Cross-country or Nordic skiing pre-dates Alpine skiing by centuries. It is claimed to have originated over 4,000 years ago in Scandinavia and Russia as a means of travel and communication during the long northern winters. While Alpine skiing is all downhill, cross-country is on the flat, uphill and downhill.

Cross-country skiing can take three basic forms: "ski touring" on specially prepared trails, skiing off-trail, and competition racing on tracks (called loipes). We must also distinguish two basic techniques: classical cross-country skiing (i. e. running on skis), and skating, which was introduced in 1980 at the World Championship in Oslo by the American skier Bill Koch. It was preceded by one-side skating, so called "Sitonen step" introduced by the skier Pauli Sitonen in 1974.

### EQUIPMENT

Cross-country equipment is simpler, lighter and cheaper than that for Alpine skiing. It falls into three broad categories: recreational skiing, off-trail touring, and racing.

- Clothing must be light and warm, it should be fairly loose-fitting (so as not to restrict your movements), wind- and waterproof, and should allow your body to breathe if you get hot. Traditionally, tourist skiers wear knee-breeches and long woolen socks, a sweater, an anorak (windbreaker), a cap and gloves. Competitors wear elastic one-piece tracksuits and often sunglasses or goggles.

### Boots

Your choice of boots depends on two things: the type of binding you have and the sort of skiing you intend to do. All boots should be warm, light, waterproof, should fit exactly and be perfectly comfortable. Some are low-cut, others come higher above your ankles (used especially for skating technique and off-trail touring). The soles, usually made of nylon or polyurethane, should be flexible vertically (so that you can bend your foot) but rigid horizontally (so that your foot does not twist sideways). Most boots have grooves in the sole which fit over "ridges" on the skis. They prevent your heel from slipping sideways off the ski when turning or skating.

### Bindings

All cross-country bindings work on the same principle: the boots are attached to the ski with a hinged toe-piece that holds the foot firmly in place but which allows the heel to lift up off the ski. However, designs differ: The oldest form is the cable binding. A common design in tourists is the 3-pin binding, in which metal pins

protruding from the binding slot into holes in a lip on the front of the boot. A metal clip then clamps down over the toe. Attempts to standardize the systems then resulted in a 75mm wide "Nordic norm" for general skiing, and a 50mm wide "racing norm". The most modern type is forms of "push-button" bindings.

- **Skis**

Cross-country skis are narrower, thinner and lighter than Alpine skis. They also have more of a curve at the tip, which is important when lifting the tail of the ski off the snow while gliding. Wooden skis are still used in tourists, but synthetic are more durable and have better qualities. They are usually made of fiberglass and with some form of plastic base. They are also available in a "non-wax" form: the base includes fishscales and step patterns. The point about cross-country skis is that they should slide forward when you are gliding or skiing downhill, but that they should not slip backwards when you push off against them or when you are climbing uphill. In other words, they should both grip and glide. Skis must be treated with special wax to give them this property. All skis have a pronounced "camber", which means that they curve upwards in the middle, beneath your foot. This is so that the "kicker" or center section of the ski rises off the snow slightly when you are gliding. When choosing skis, the most important things to consider are length and width, and the intended ski technique. Skis for skating are shorter and provided with edges.

- **Ski poles**

These must be light and strong. For this reason, they are usually made of fiberglass or aluminium, cheaper ones may be bamboo. They are longer than Alpine ski poles (the handle should reach up to your shoulder when the pole is in the snow). Those used for skating are the longest (the handle should reach up to your chin). Baskets are asymmetric because you need support only at the back. The tips are angled forwards slightly. Handles are leather or plastic with a wrist strap.

- **Ski waxes**

Broadly speaking, there are two categories of wax: base waxes and running waxes. *Base waxes* are used to prepare the base of a ski so that the running waxes used later will stick to it properly. A wooden ski also needs a layer of "tar", before the base wax is applied. *Running waxes* are the waxes that grip or glide. The *grip waxes* come in two types: hard waxes and soft waxes ("klisters"). All grip waxes are applied only to the center of the ski (the "kicker" section), where you need the ski to grip the snow when you press down on it and push off for each gliding step. Hard waxes come in small cans and are rubbed onto the base of the ski and then smoothed out into a thin film with a piece of cork.

Soft waxes are stickier, give more grip and come in small tubes. They are easier to apply when warm. The choice of wax depends on the condition of the snow - whether it is old or new, dry or wet - and the temperature. "*Glide*" waxes (*gliders*) are used to make the ski glide more easily. They are applied only at the tip and tail of the ski for the classical technique, but for skating technique - over all the length of the ski. After application they are ironed, and the excessive wax scraped off.

## TECHNIQUES

Cross-country ski technique includes the whole variety of skills that are necessary for a safe and effective movement on skis in the terrain and on trails or tracks.

- **Cross-country ski technique:**

- 1) classical : transition from walking to gliding  
running on skis (langlauf skiing): "gliding step"  
or "diagonal striding"

double-pole push

double-pole push from a one-step

- 2) skating : skating

Sitonen step

- **Other techniques:**

- Turning around on skis (star turn, herringbone turning, kick turning)
- Walking uphill (side-stepping, the herringbone, uphill gliding step)
- Accelerating (skating, double-pole pushing)
- Changing direction (step turning, snowplow turning, jump turning)
- Braking (snowplowing, side-slipping)
- Schussing

### Classical cross-country ski technique

The basic cross-country step is fundamentally a form of walking, or rather gliding on skis. Later it can be developed into a more athletic form called "langlauf", meaning "running on skis". Langlauf techniques include the gliding step or the diagonal striding, and the double-pole push. Pole pushing is an essential part of all forms of running on skis. It is either alternate or made by both arms at the same time.

### Gliding step technique

Two phases can be distinguished: the push-off and the glide. The push-off is made by rapidly extending ("kicking") your rear leg, then giving a strong final

unusually... pole. This propels your body diagonally forwards so that you are fully stretched, with your weight well over your gliding ski. During the glide phase, you plant your pole, pull yourself forward and slide your unweighted ski in front. You flex the leg on which you are gliding and sink down slightly in preparation for the next push-off and extension. An effective gliding step technique depends largely on timing and rhythm.

### **Racing**

includes individual and relay races, and also ski marathons called "citizen racing" as well, which are long-distance mass events.

- The course should ideally be one third flat, one third uphill, and one third downhill.
- Techniques are a combination of diagonal gliding steps with double-pole pushes and double-pole pushes from a one-step, downhill running, step turning, uphill climbing and herringboning. Skating is allowed only in freestyle competitions. If a racer finds himself being overtaken by another competitor, he must give way.
- Distances: men race over 15, 30, and 50 km, women race over 5, 10, and 20km. The height difference in a race is between 100 - 250 m.
- Relays: each team contains four members, men ski a 4x10km relay, women ski a 4x5km relay.

## **2. Ski Jumping**

It originated in Norway about 100 years ago. Ski jumping competitions are held also as part of the Nordic Combined Event, where entrants must compete in cross-country racing as well.

### **Jumping hill**

The jumps are made from specially constructed jumping hills or towers which vary in height according to the length of the jumps: 70m ("normal"), 85 to 90m ("large"), and over 90m (a separate discipline known as "ski flying"). The landing slope must be clearly marked with a blue line for the "norm point", and a red line for the "critical point" which marks the beginning of the transition curve or out-run. Midway between these is the "table point" (green line). The length of the in-run is varied according to the snow conditions and wind speed so that the jumpers land on or around the table point.



given for a combination of two items: the length of the jump and the competitor's style.

The F.I.S. has laid down guidelines for its judges: "the ideal jump shall be executed with power, boldness and precision. It shall at the same time give an impression of calmness, steadiness and control."

### Ski jump

Each jump is divided into five phases: *the in-run*, where the skier gathers speed and adopts a crouched, aerodynamic position, *the take-off*, which largely determines the length of the jump, *the flight*, during which the skier tries to "ride the air" with his body well forward over his skis (the Nordic cable bindings allow this), *the landing*, which must be soft and steady in the "telemark" position, and *the out-run*, where the skier must straighten up and come to a stop safely and without losing balance.

The position of the skis during the flight is controversial. Nowadays most jumpers use the V-position, which is thought to simulate a delta wing, in which swirling air coming off the wing increases lift. However, some ski jumpers still believe in the parallel skis position, in offsetting the skis relative to the body to increase the effective "wing area" and increase lift.

To maximize lift, jumpers can arch their backs to turn themselves into airplane wings. The greater the curvature, the greater the difference in pressure at the belly and the back, and the greater the lift. The same principle explains why airplanes stay aloft. If you hit it right, you feel a big suction into the air. In fact, ski suits that are pervious in front, but airtight behind, round the back so much that the skiers are practically sucked into the stratosphere.

To maximize horizontal speed, jumpers lift out of the back of their bindings on takeoff. They lean forward so that their bodies are almost parallel to their skis. That minimizes the size of their frontal area and therefore air resistance, or drag, enabling them to sustain much of their initial takeoff speed.

### 3. Biathlon

It is a combination of cross-country racing and shooting. Cross-country racing requires intense physical exertion at top speed over an extended period of time while shooting demands extremely fine control and stability.

## History

Biathlon is based on a Scandinavian military exercise. The first historically recorded biathlon competition took place near the Swedish-Norwegian border in 1767. Biathlon became a demonstration sport at the first Winter Olympics in Chamonix in 1924. Women's competitions did not become a part of the Olympics until the 1992 Games in Albertville.

## Synopsis

The object of the competition is to be the first to arrive at the winning-post and to score as high as possible with each shot. In this event skiers carry unloaded rifles and ammunition. In a biathlon competition biathletes ski distances varying from 7.5 to 20km and stop at the shooting range to shoot two or four times. The shooting distance is always 50m and five rounds are fired in each bout at five targets. There are two shooting positions, prone and standing. Penalties for missed targets are imposed either as one minute of added time per target for the individual competition, or as a 150m penalty loop executed immediately after each bout of shooting.

## Competitions

In biathlon there are six international types of competitions: individual sprint, pursuit, mass start, relay, and team competition. In the individual competition men ski 20km and women 15km. Bouts take place after each 4km ski loop. In relay competitions four-member teams ski 7.5km with two bouts of shooting. In the sprint men ski three loops of 3.4 and 3km with two bouts of shooting, women ski three 2.5km loops in the same format.

# FREESTYLE SKIING

## History

The branch of skiing known as "freestyle" started in America in the late sixties and early seventies. It was largely an attempt to introduce more freedom, more fun and more of a challenge into skiing. In its early days, freestyle was known as "Hot Dog Skiing". There is some controversy over who can really be said to have invented freestyle skiing. Its growth and popularity owe much to the two Americans, Doug Pfeiffer and Tom Corcoran, who organized the first freestyle competition at Waterville Valley, Vermont, in 1971, but the history of "trick" or "stunt" skiing goes a lot further back. It can be traced back to 1929, when Dr Fritz Renel wrote a book called "New Possibilities in Skiing". This book applied the principles of figure-skating to skiing. He was followed by other key figures: Stein Erikson in the 1950s, Hermann Goeliner in the 1960s, Art Furrer, Wayne Wong, and Heinz "Fuzzy" Garhammer. Freestyle's first showcase era was the early 1970s. In 1973, after two very bad accidents, the International Freestyle Skiers Association (I.F.S.A.) was formed in order to establish competition rules and more effective safety controls. Successful political lobbying got freestyle into the Olympics- first in 1988 as a demonstration sport (all three events) at Calgary, Canada, then the moguls event gained full medal status at the 1992 Olympics in Albertville, France, and the 1994 Olympics saw aerials included as a full medal sport at Lillehammer, Norway.

## Characterization

Freestyle skiing is free-form, and offers a means of unrestricted self-expression. It has borrowed many of its movements from figure-skating, ballet and gymnastics, but technically, almost anything is allowed, and new techniques are being invented by skiers all the time. Freestyle skiing is divided into three disciplines: Acro (formerly called Ballet), Moguls (formerly Mogul Skiing), and Aerials. Fortunately, freestyle today is still a lot like it was in the early days. The tricks, the technique, the equipment, and the names might be different, but the relaxed attitude, friendly competition, and truly exciting skiing remain the same.

## Acro

It is the only non-Olympic event. The aim of Acro is to develop a series of skiing tricks and stunts into a graceful, choreographed routine which is then performed to music in one run. Acro events are held on smooth, gentle slopes where the snow is fairly dry, wellpacked and easy to ski. Acro contests are often

## VOCABULARY

absorption-extension	oblouky pro přeježdění vln
turning on moguls	acro (dřive balet na lyžích)
acro, acro skiing	akrobatické prvky
acrobatic manoeuvres / manoeuvres	akrobatické skoky (záv.disc.).
aerials	1) hodnocení skoků při akr.sjezdu,
air	2) hodnocení akrobatických skoků
ammunition	munice, náboje (biathlon)
angulation	odklon trupu (od svahu)
APL, Acro Program Layout	plán prvků (acro)
artistic impression	umělecký dojem (známka)
avalanche	lavina
backward lean	záklon
banking	uklonění dovnitř oblouku
basic fundamentals	základní prvky při acro
basic ski skills	základní lyž. pohybové dovednosti
binding, ski binding	lyž. vázání
boots, ski boots	lyž. boty
boot shell	tvrdý skelet boty
brakes, ski brakes	lyž. brzdy k vázání
buckle boots	přezkové boty
button lift	lyž. vlek - tzv. talířová poma
cable car	lanovka
carved garland	tzv. vlnovka
carved turns	(zákl. oblouk jetý po hranách)
carving	oblouky jeté po hranách,
carving skies	tzv. řezané oblouky
center of gravity	jízda po hranách lyží
centrifugal force	carvingové lyže
centripetal force	(zn. s výrazným bočním krojením)
chair lift	těžiště
	odsíťedivá síla
	odsíťedivá síla
	sedáčková lanovka

cloud ocean	inverze (počasí)
continuous turns	napojované oblouky
counter-rotation	protitlatace
counter slope	protisvah
crossover	překřížení lyží (acro)
deductions (DED)	sračky (při hodnocení)
deep powder snow turning	oblouky v hlubokém prachu. sněhu
difficulty charts	koefficient obtížnosti (akrob. lyž.)
diffuse light	rozplylené světlo, difuzní světlo
discard high and low scores	škrtnout nejvyšší a nejnižší známku
double-high push	odpich soupaž
double-pole push	běh soupažný jednodobý
double-pole push from a one-step	smížení těžiště těla
down-flexion	sjezd (záv. disc.)
downhill (racing)	tzv. "hrábnutí", tj. dotyk země
dragging hands	rukou (akr. skok)
drawing lots	losování
drop	převýšení (o svahu)
edged ski	zahraněná lyže,
edges	lyže postavená na hranu
edging, edge-set	hrany (lyže)
elementary open-stance parallel	hranění, zahrnanění
turning	základní oblouk
end phase	(v paralel. postavení lyží)
execution	fáze ukončení oblouku
fall line, ski in the fall line	provedení acro
fire the rifle	spádnice, lyžovat po spádnici
flattened ski	vystřelit z pušky
flips	lyže na ploše
flying kilometer / Kilometro	přemety (acro)
Lanciato (K.L.)	letný kilometr
friction	tření
funicular	pozemní lanovka ("zubačka")
gentle slope	mírný svah

give way	dat přednost
glacier	ledovec
glide	skluz, klouzat
glide phase	fáze skluzu
gliding step, diagonal striding	běh střídavý
goggles, ski goggles	lyž. brýle
gradient of the slope	sklon svahu
grip waxes	stoupací vosky
groove, running groove	žlábk
handover	předávka při štafetě
handspring	skočný přemet (acro)
heel-piece	pata vázání
herringbone	výstup oboustranným odvrátem,
	tzv. stromeček
independent leg action	rozdílná práce dolních končetin
inertia	setrvačnost
initiation phase	fáze zahájení oblouku
in motion	za pohybu
in-run	nájezd (u skoků)
intended turn	tvořený oblouk
"jet" turning	tzv. vystřelovaný (jet) oblouk
judges stand, tower	věž rozhodčích
jumping hill	skokanská věž
kicker	1) skokanský můstek (akrob. skoky),
	2) odrazová zóna běž. lyže
kick turning	obrat přednožením
landing track	dopadová dráha (skoky)
layout	prohnuté (salto)
lean backward	zaklánět se
load the rifle	nabít pušku
loipe	upravená běžecká stopa
mark	známka, známkovat
moguls, bumps	boule na svahu
moguls	akrobatický sjezd (záv. disc.)
off-trail skiing	lyžování mimo upravené vyznačené tratě

one-piece suit, overalls	kombinéza
on the flat	na rovině
out-run	dojezd po skoku
overtake	předjet, předběhnout
pace set time	směřovaný čas (akrob. sjezd)
penalty loop	travní kolečko (smyčka) v biatlonu
pike	schylmo (salto)
pipe, trail, ski run	sjezdovka, upravená lyž. trať
plant a pole	zapíchnout hůl
pole flip	přemet přes hole (acro)
practice slope / nursery slope	cvičný svah
push-button binding	nášlapné vázání s autom. uzávěrem (běž. lyže)
push-off	1) odraz, 2) odpích
push-off phase	fáze odrazu
push-off leg, thrust leg	odrazová noha
rear-entry boots	boty s nazouváním zezadu
redressing poles	kloubové tyče
relay	štafeta
release	uvolnit (o vázání)
return	opakování skoku (akrob. skoky)
rifle	puška
running surface, base	skluznice lyže
schussing over bumps and dips	jízda přes terénní nerovnosti
schussing, straight running	sjezd po spádnicí
sharpen edges	(na)brousit hrany lyží
short swinging with "edge-set"	oblouky s přibrzděním
shooting range	střelnice (biatlon)
side-slipping	sesouvání
side split	bočný rozštěp (akrob. skoky)
side-stepping	výstup stranou
Sitonen step	bruslení jednostranné
simultaneous leg action	společná práce dolních končetin
slip backward	podklouzávat (dozadu)
ski exercises	lyžařská příprava
ski poles	lyžařské hole

skidded turns	smýkané oblouky, jelé po plochách lyží
skiing on tracks (loipes)	lyžování ve stopě
sled, banana boat, akja	kanadské saně
snowplow	oboustranný převrát, pluh
snowplow turning	oblouky z pluhu (začínají a končí v paralel post.)
somersault	salto
spin	točení, rotace, pirueta (acro)
spread eagle	roznožka (manévr ve skocích)
stance	postoj
star turn	obrat přešlapováním
steep slope	prudký svah
steering phase	fáze vedení oblouku
steer turns	zatáčet na lyžích, jezdit oblouky
stem turns	oblouky z převratu
step-in binding	nášlapné vázání
stepping technique	oblouky s přestoupením
step turning	1) odšlapování, 2) kročné oblouky
straight / home stretch	cílová rovinka
stretch pants	šponovky
stunt	akrobatické číslo
swing leg	švihová noha
take-off track	nájezdová dráha na odraz (skoky)
target; hit the target	terč; zasáhnout terč
T-bar lift	lyž. vleč - kotva
technical merit / TM	technická obtížnost (acro)
thrust off	odraz, odrazit se
tie/ draw	nerozhodný výsledek
tight-radius turns	zavřené oblouky
timekeeping	časomíra
toe-piece	špička vázání
track	běžecská stopa, trať
transfer the body weight	přenašet hmotnost těla
transitional phase	fáze přechodu mezi oblouky
traversing	sjezd šikmo

tuck	sbaleně, skrčmo (salto)
turn, turning	oblouk, zatáčení
turning around on skis	obrát na lyžích
turning snowplow	oblouky v pluhu
turns with "down" initiation	(lyže jsou stále v převr.post.)
turns with "up" initiation	oblouky zahajované pohybem těžiště těla dolů
turns with "up" initiation	oblouky zahajované pohybem těžiště těla nahoru
twist	oboustranné převrátění
unloaded rifle	vrut (provedení skoku)
up-extension	nenabitá puška
uphill and downhill ski	zvyšování těžiště těla
uphill turn	vyšší a nižší lyže
upright maneuvers	oblouk ke svahu
walking uphill	přímé skoky
walkover	výstupy na lyžích
wax	kročený přemet (acro)
weighted and unweighted ski	vosk. voskovat
wide-radius turns	zatížená a odlehčená lyže
	otevřené oblouky

Description: traverse, tail opening of the both skis into the snowplow - the snowplow turn to the traverse with the passive turning in the inner ski.

Application in the field.

#### X. Easy run in the field

1. To choose the easiest track and utilize the natural shapes of the field.
2. Change the order of the skiers!
3. Stop on the edge of the track and below the teacher.

#### EXAMINATION OF THE EFFICIENCY

To gain the efficiency level V., these tasks must be handled:

- a/ Traverse /regular slalom track/.
- b/ 5 snowplow turns through the gates /gentle slope, gates - distance 8m, 4m wide/.

## VII. Snowplow turns

To slightly inclined slope

Corn and smooth snow

Organization: one by one, slalom gates

Description: parallel start - transition into the snowplow position, turn by the turning out and weighting the outer ski - strengthening the ski edging at the end of the turn.

1. Snowplow turn in the run out, through the turning out and weighting the ski at the same time.
2. Snowplow turns through the negative gates.
3. Snowplow turns through the vertical slalom gates - distance 6 - 8 m.
4. Without the poles - hands to the sides - hands up.
5. The same with the poles.
- !! 6. Snowplow in the traverse - repeated turning out of the legs into the snowplow position - the uphill ski turns out further - transition through the fall-line.
- !! 7. After the snowplow turns carry on with the step turning.

## VIII. Traverse - according to the conditions and the inclination of the slope also before the snowplow run.

Slope: slightly inclined, with the run out in the flat ground or in the counter slope

Corn snow

Organization: 2 groups, the slalom gates, exercise /practise/ to the both sides

Description: wider parallel track, position of the skis is horizontal - on the uphill edges, the uphill ski is ahead of the downhill ski which is more weighted, bent joints, the knees are directed to the slope /edging/, compensate by the turning out the body from the slope /downhill shoulder is lower/, the body axes are parallel, the poles are directed against the slope.

1. Explain, show, regulate.
2. Attempt - climbing in the traverse with the poles.
3. Knee flexions.
4. The poles in front of the body.
5. Touch the knees with hands from the back.
6. Lift the tail of the uphill ski.
- !! 7. Draw the line with the pole /big pressure/.
- !! 8. Climb into the new upper track.
9. Draw the line with the both poles.
- !! 10. Touch the poles situated aslant with the hips.
11. Uphill step turning.

## IX. Traverse - snowplow turn - traverse

Slope: gentle inclination

Conductive and smooth snow

Organization: one by one, one after another, the slalom gates

G R O U P V. /BEGINNERS/

Help in teaching - ski height from -20 cm to the body height.

I. Checking of the ski equipment - the rules of behaviour on the track

The rules briefly. While teaching they must be unceasingly shown on the practical exercises.

1. Ski length. [length]
2. Pole length. [pole length]
3. Ski shoes.
- !! 4. Binding /setting, brokes/. [binding]
5. Dressing.
- !! 6. Eye protection.

II. Getting used to the ski equipment

A. Standing exercises

Slope: flat ground

Conductive snow

Organization: in the circle, in two lines

!! Very important - never leave out !!

without the poles

1. Knee flexions.
2. Touch the front knees - flexions.
3. Touch the rear of the ski shoes as low as possible - flexions.
4. Touch the side of the right shoe, then the side of the left one.
5. Feel the position with the eyes closed - forwards, backwards, from one ski to the other one.

with the poles

6. Ski sliding forwards and backwards.
7. Alternate ski lifting /the ski tails and tips, the whole ski/.
8. Climbing to the side.
9. Turns with the tail and the tip opening.

B. Movement exercises [movement exercises]

Slope: flat ground

Very conductive snow, the ski track

Organization: the row, the crowd, the ellipse track marked by the slalom gates

1. Walk, slide /no ski lifting/
  - a/ short - long steps
  - b/ help with work of arms /without the poles/
  - c/ pushing off with the poles.
2. Climbing
  - a/ to the side
  - b/ herring bone /the tree/.
3. Falling /no practice, only explanation/.



## V. Snowplow run

Slope: the same as for shoosing

Smooth snow

Organization: 2 or 3 groups, slalom gates

Discription: from the shoosing in the wider track turn out the skis on the inner edges into the tail opening /by the lowering the centre of gravity/, the skis on the same level, the distance of the ski tips about 10 cm, sliding on the inner edges equally weighted, legs bent in joints, the position of hands same as in shoosing.

1. Explanation, performance, attempt on the place /flat ground/.
2. Standing excrcises /with the planted poles/
  - !! a/ from the parallel position climb into the snowplow
  - !! b/ from the parallel position jump into the snowplow
  - !! c/ from the parallel position push out alternately one leg /ski/ into the snowplow /by the inner edge/
  - !! d/ push out from the small snowplow to the big one /jump back into the small snowplow - previous position, repeat again/.
3. Attempt - snowplow in run out /possibly also by lowering the centre of gravity/.
4. Start in the open parallel track - snowplow while running.
5. Stop in the snowplow position in run out.
6. Snowplow with the knee flexions.
7. Keep the poles in front of the body.
8. Without the poles, hands to the sides, hands up.
9. Keep the poles over the head horizontally and vertically.
- !! 10. Shoosing - snowplow - shoosing - snowplow.
- !! 11. Small snowplow - big snowplow - small snowplow - big snowplow.
12. Stop in the snowplow position on the slope /slalom gates, the sound signal/.
- !! 13. Snowplow in the traverse.

**!! Particularly important exercises !!**

## VI. Riding the lift

Only on easy lifts and training fields, otherwise after the snowplow turns.

1. To explain and show the way how to use the lift.
2. Attempt with the spare bar or the ski poles.
3. Help to take off the lift /the teacher without the skis/.
4. The teacher takes off the lift as the last one /on bar with the poorest skier/.  
If the skier falls while riding the lift, he must immediately get out of the track and wait for his group. At the top of the lift leave the area immediately.  
Using a new kind of the lift it is very important to explain everything again!
5. Rules of behaviour: from now important to explain how to behave on the slopes.

- !! 4. Getting up.  
Parallel position of the skis horizontally below the body, leg retraction, the poles next to the body and against the edged skis, stand up.
- 5. Games - the walk in the field.  
Relay race.  
Chase without the poles !Only for children and the young!

### III. Shoosing /sliding/

Slope: start from the flat ground - very gentle slope - finish in the flat ground or in the counter slope

Conductive snow

Organization: 2 groups - practise at the same time

Discription: parallel skis, the tips on the same level, wider position, equal weighting, bend the legs in the ankle, in the knees, in the hips - the body position is adjusted to the slope inclination, look forward, keep the arms in front of the body slightly to the sides, bent in the elbow, the poles directed parallelly backwards.

#### A. Vertical movement

- 1. The first attempt.
- 2. Knee flexions.
- 3. Touch the tips and the tails of the ski shoes.
- 4. Run under the poles /crossed slalom gates/.
- 5. Run without the poles - hands forward, hands up.
- 6. Hold the poles vertically over the head.

#### B. Movement to the sides

- 1. Touch the right and the left edge of the ski shoes.
- !! 2. Alternate lifting of the ski tails.
- 3. Sliding steps while running.
- !! 4. Climb into the new track.
- 5. Easy jumps while running.

!! Very important exercises !!

### IV. Step turning

Slope: nearly flat ground

Corn snow

Organization: 2 groups - slalom gates on the right, on the left in run out on the flat ground - !! everyday practice !!

- !! 1. Running on the place /change of weighting/.
- !! 2. On the place, rebound from one ski in the parallel position.
- !! 3. Stepping around the ski tails with a strong rebound from the inner edge.
- !! 4. Climb repeatedly uphill from a gentle traverse.
- !! 5. Step turning with and without the poles, small steps!!