Downhill Skills

Downhill techniques are used to control downhill speed and make necessary changes in direction, while at the same time enabling the skier to maintain as much velocity as possible. The particular downhill technique used by a skier is mainly determined by the snow/trail conditions and the skier's level of ability.

Here's video analysis of a very good junior jackrabbit 4 skier:

- Downhill Step Turn: L2T Tech Videos - Downhill Cornering.mp4
- Tuck position: L2T Tech Videos - Downhill Tuck.mp4

Here's video analysis of a racing skier in the Train to Train phase (age 12-16):

- Downhill step turn : T2T Tech Videos - step turn.mp4
- Tuck: T2T Tech Videos - tuck side.mp4

Here's video analysis of a competitive racer:

- T2T Tech Videos - step turn.mp4
- T2T Tech Videos - tuck side.mp4
- T2T Tech Videos - tuck front.mp4

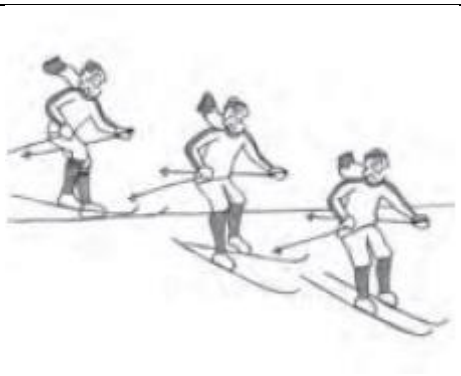
Helpful Drills and Skills

Snowplow	Nov 2017 DH and other drills - 1. DH Series_ Snowplow.mp4
Snowplow turns	Nov 2017 DH and other drills - 2. DH Series_ Snowplow Turns.mp4
Stem Christie turns	Nov 2017 DH and other drills - 3. DH Series_ Stem Christie.mp4
Step Turns on Flats	Nov 2017 DH and other drills - 4. DH Series_ Step Turn on Flats.mp4
Step turns on downhills	Nov 2017 DH and other drills - 5. DH Series_ Step Turn on Downhills.mp4
Skid stops / hockey stop	Nov 2017 DH and other drills - 7. DH Series_ Skid _Hockey_ Stop.mp4
Skid turns	Nov 2017 DH and other drills - 8. DH Series_ Skid Turn.mp4
Skid into a step turn	Nov 2017 DH and other drills - 9. DH Series_ Skid to Step Turn.mp4
High Speed Turns	Nov 2017 DH and other drills - 10. DH Series_ High Speed Downhill Turns.mp4
Tucking	Nov 2017 DH and other drills - 11. DH Series_ Tuck.mp4

Skills Progression

Bunny Rabbit / Jack Rabbit #1: Side Stepping This technique should be practised on a gentle slope that is packed but not or icy. Poles could be used, but may make this exercise more difficult to accomplish. • The skier stands on the flat at the start of a gentle slope, with skis perpendicular to the fall line • Arms and hands forward and to the side for balance • The skier places his/her weight on the uphill ski and then lifts the downhill ski, placing it 10 cm downhill from the original position • The uphill ski is then placed beside the downhill ski • Skis are kept parallel	
Bunny Rabbit / Jack Rabbit #1 Snowplow Braking If the skier can demonstrate a stable Ready Position moving down a gentle slope, he/she is ready to be introduced to Snowplow Braking on a similar slope. • The skier makes a wedge, by spreading the tails of the skis apart (the tips come together) • The skier controls his/her speed by adjusting the size of the wedge and edging their skis • The pressure (braking) on each ski is fairly equal, with minimal turning to one side • The skier maintains the upper body in the Ready Position	
Jackrabbit #1 / #2: Snowplow Stop: This technique should be practised on a moderate downhill slope that is packed, but not icy. • The skier begins by demonstrating Snowplow Braking • The skier returns to the top of the slope • The skier moves down the hill in the Ready Position showing a good wedge and keeping the ski tips together • By applying equal pressure on the inside edges of the skis (rolling inward with the ankles) the skier is able to safely reduce speed to a full stop	
Half-Snowplow Braking • The skier Free Glides down the track on an easy to moderate hill and in softer snow conditions • Part way down the skier lifts the right ski out of the track and places it in a wedge position with the tip close to the tracks and the tails farther away • Pressure is applied to the inside edge of the right ski by shifting much of the skier's weight to the ski and rolling inward on the ankle • The pressure is applied until the skier is able to significantly reduce speed	

• Both skis are then placed parallel in the tracks • Repeat with the left ski	
JR2: Snowplow Turn This technique should be practised on a moderate downhill slope that is packed, but not icy. • The skier starts down the hill in a proper Snowplow position • The skier applies his/her weight unequally to the skis, so most of the body weight is placed on the right ski and the ankle is rolled inwards. This will cause the right ski to start to move perpendicular to the fall-line • The skier continues to face down the hill • After the skier's skis turn to the left, he/she unweights the right ski and transfers his/her weight mainly to the left ski while rolling the left ankle inward	
Jackrabbit 3 : Downhill Tuck This technique should be first practised on flat terrain and then evaluated on a medium slope where the skier has a 10 metre run to demonstrate the technique. • In a "low tuck" the upper body is bent to a horizontal position, and knees and ankles are bent so the thighs are parallel to the snow • In a "high tuck" the knees and ankles are bent so the thighs are only slightly bent • Poles are held under the arms and tightly against the body • The skier can safely descend a medium hill in a low or high tuck	
JR3-4 Skate Turn This technique should be practised on a packed, gentle downhill slope. • The skier performs Double Poling just in front of the place he/she wishes to turn • As the skier recovers the arms and upper body forward, the inside ski (the ski that is on the side to which the skier is turning) is unweighted and pointed in the new direction • The skier edges and pushes off the outside ski transferring the body weight to the inside ski • The skier then glides with the skis parallel and equally weighted in the new direction. • Another Double Poling action completes the turn.	

Jackrabbit #4 Step Turn This technique should be practised on a packed, moderate, untracked slope. • The skier starts in a “high” tuck position and glides down the hill • The skier completes several Step Turns in one direction, using small, quick steps, and consistently maintaining the tuck position • The skier keeps the weight on the heels • During this exercise there is a complete weight transfer from one ski to the other • Skis are edged when weight shifting The skier can Step Turn both to the left and right.	
Parallel Side Slipping This technique should be practised and assessed on a steep well-packed downhill slope. • The skier maintains the Ready Position throughout • By moving the knees and rolling the ankles in and out, the skier shifts the weight alternately on the uphill and downhill edges • Skis remain parallel while slipping down the hill sideways • The skier demonstrates control by stopping mid-slope	

Fun Drills for Step Turns

The Stork Stance. Skiers practise standing on one leg while remaining balanced. They are allowed to extend their hands sideways to steady themselves. Alternate legs.

Rubber Leg. Skiers first stand tall on one leg/ski, and then relax it, letting it slump into a flexed position at the ankle and knee. Alternate legs.

One-Legged Pops. Skiers pop/spring off one leg, which is bent, and then land on it. Alternate legs.

Back Leg Lifts. Skiers extend one leg/ski rearward and off the snow while bending forward at the waist. They then move the same leg/ski forward, without weighting it, and return their upper body to an upright position. Repeat with the opposite leg.

Poison Peanut Butter. Skiers lift one ski and then the other off the snow so that the “poison peanut butter” (i.e. the snow) doesn’t stick to their skis. The coach encourages the skiers to keep moving by saying “quick, don’t let the peanut butter stick!”

Practise on Slalom Course. High speeds are not necessary and course poles should be fairly far apart. Start off easily so that everyone can accomplish the technique; then move the gates closer together.

More Advanced Downhill Technique *"Learn-to-Train" stage of development*

A full discussion of the biomechanics of downhill techniques can be found in section 8.3 of the CCI-L2T Reference Manual (On Snow) starting at page 292. Click here for a copy. The "101" version is:

Ready Position Ready Position is a transitional downhill technique that is used when the trail is uneven or when quick changes of direction are necessary. The skier's feet are slightly farther apart (shoulder width) than in the other tucks. The skier assumes a relaxed crouch. The hands are down in front and slightly out to the sides to help maintain balance. The torso is inclined forward, but not so far as to be parallel to the snow. The weight is distributed evenly across the skier's feet.	
Low Tuck Position The back should be parallel to the snow, the elbows held close together and in front of the knees, and the hands in front of the chin. For a low Tuck, there must be considerable flex in the hips, knees and ankles.	
High Tuck Adopting a higher Tuck by not bending as much at knees and hips permits better blood flow to the legs and easier breathing. The high Tuck position is also used when preparing for a turn	

Step Turn

Use a Step Turn when he/she is skiing fast and wishes to maintain that speed while making changes in direction. This technique involves taking a series of incremental steps in the direction of travel around a corner while gliding forward.

1) As the skier approaches a turn, his/her weight is evenly distributed on both skis. The skier adopts the Ready or Tuck position. The skier lifts the inside ski, putting all the body weight on the outside ski which is edged. The skier then explosively extends the outside leg and transfers the weight to the inside ski in the new direction.


2) As the skier lifts the inside ski and points it in the new direction, the skier's upper body and hips change orientation to face the new direction of travel. Thus, when the push takes place, the shift of weight to the inside ski is facilitated by correct body positioning over the inside ski.


3) The skier's weight returns to the outside ski in preparation for the next step.


4) The skier continues to take steps to the inside of the turn until the change of direction is completed and the track straightens out. At high speed, the steps must be rapid. It is important to emphasize quick and complete weight shift from ski to ski.

Parallel Turn

The Parallel Turn is the most effective high-speed turn when turning space is limited and the turn must be done very quickly. The technique is also used when snow conditions are such that the skier cannot do a Step Turn around a corner, for example on an icy course. A Parallel Turn will slow the skier down relative to a Step Turn, as the sliding action causes the skier to lose speed. There also can be a significant loss of grip wax with this technique, particularly in icy conditions.

Mechanics: The Parallel Turn should not be confused with the technique of the same name used in Alpine skiing. Rather it is a cross-country skiing technique that has evolved from the relatively traditional descending techniques known as the basic Christie, the stem Christie and the parallel Christie.

Progression: Parallel Turn from Snowplow Entry.

This turn is essentially a combination of a narrow Snowplow Turn and Side Slipping.

Have the skier ski down the slope in a narrow Snowplow position and begin a Snowplow Turn. The mechanics of the technique are as follows:

1. The skier enters the turn in a narrow Snowplow position.

2. The skier initiates the turn by turning the hips and upper body into the turn.

3. The skier keeps the knees flexed, weights the downhill ski briefly (if traversing the slope), then transfers the weight sharply onto the outside ski to carve through the turn (with the outside ski becoming the new downhill ski as the skier exits the turn).
4. The inside ski tracks parallel to the outside ski from the mid-point of the turn.
5. The weight shift, an accompanying angling of the knees and ankles into the hill during the turn and the edging of the inside of both skis through the latter part of the turn permit slipping and turning.
6. The poles are carried as for the Ready Position throughout