Alpine Skiing Technical Statement

Adam Chadbourne

As former Alpine Program Director for Burke Mountain Academy (Vermont), Snowsports Director at Waterville Valley and Waterville Valley Academy (New Hampshire), and a six-year U.S. Ski Team coach, Chadbourne is now in his third year as Alpine Program Director for the Steamboat Springs Winter Sports Club. He was honored by both U.S. Ski and Snowboarding and the Vermont Alpine Racing Association as their Coach of the Year in 2010. In 2007, he led the Burke Mountain Academy alpine program to US Ski and Snowboard Club of the Year honors. In the past two seasons two of Chadbourne’s athletes have made the Men’s US Ski Team, and both men and women have been absolutely dominant at the younger ages on the regional, national, and international stage. Under Chadbourne’s leadership the SSWSC was named Alpine Program of the year for the past two consecutive years; a highly coveted and extremely rare honor. In his coaching roles, Adam has worked remarkably closely with multiple Olympic medalists, including Mikaela Shiffrin, Andrew Weibrecht and Ted Ligety. While working in the Eastern Region, Chadbourne was the chairman of the Eastern Development Committee, where he focused on enhancing training and competition opportunities for Eastern alpine ski racers.

The areas outlined below address the most fundamental technical philosophy, concepts, and terminology in ski racing. Agreement on these principles and terminology is important across groups of different age, sex, and ability so that a team can provide a simple foundation on which all athletes can learn and refine skills. In presenting common, fundamental goals we enable athletes to more easily transition between coaching groups and age ranks. That is not to say that coaches must work in absolute lock step. Critical to the success of teaching good skiing is a healthy degree of autonomy between groups and coaches. But, we must also agree on specific over-arching principles. All coaches are uniquely skilled. Encourage them to draw on their personal judgment, experiences, creativity, and passion for ski racing. In this way, one can best deliver and build upon these fundamental umbrella concepts as appropriate to the needs of an individual group or athlete.

**Technical Skiing Philosophy:**
Taking the time to teach good technical skiing = faster, more versatile ski racers. In order to develop the fastest skiers we must focus first and foremost on mastery of technical skiing outside of gates.

Regardless of ability or age, all work should begin by teaching, refining, revisiting, and always reinforcing specific technical fundamentals. The requisite technical skills required for successful ski racing are consistent from the youngest ages through the World Cup level. Though delivery mechanisms are always dependent on a multitude of factors, the fundamental technical goals are the same. High volume in both directed free skiing and drills followed by quality gate training are critical to this end. In most cases the focus in gate training should be tactical in nature. *Technical deficiencies should typically be addressed outside of the course unless they are a specific result of poor tactics.*
Refining a carved turn into and through the fall line with an intentionally executed radius is the foundation on which all other technical skills are developed. The following technical basics lay the groundwork for any athlete to carve shorter radius turns with maximum fall-line pressure.

**Fundamental Technical Terms and Description:**
Much of the adopted terminology here was developed some years ago by the USSA in order to describe the two most critical positions employed in effectively carving the top of a turn through the fall-line. It is vital to understand and communicate to athletes that though we will talk about and work extensively on refining specific positions, carving a turn is a dynamic process. The two key positions outlined below describe specific points in time throughout an ever changing process of movement.

**Athletic Stance** – The position through which any athlete must pass in transition in order to execute a properly carved turn.

(Athletic Stance)
Basic elements of the athletic stance include:
- Hips and shoulders face the direction of the skis (body square to the tips)
- Natural stance width
- Ankles and knees flexing (not leaning) forward
- Arms up and forward in a relaxed and natural posture
- Looking ahead
**Parallel Position** – The Parallel Position describes the process of developing appropriate lead of the inside half of the body as one progresses into and through the turning phase.

(Parallel Position)
In its static form the key points of this position include:
- The athlete demonstrates the same natural stance width, ankle/knee flexion, arm position, and forward visual focus as in the athletic stance.
- The inside ski tip, knee, hip, shoulder, arm and hand are all slightly ahead of the outside half of the body; displaying the same degree of inside lead at all points (hence “parallel position”).
- The uphill hip is elevated relative to the downhill hip (this will occur naturally with adequate lateral use of the inside knee).
(Leveling through apex and completion, note continued STRONG parallel position)

(Blended SL with movement between fundamental positions)
**Pole Plant** - A strong, deliberate forward pole plant is an essential skill in SL. In GS and high speed turns in a speed course the athlete should also move the arms forward purposefully in transition. A double pole plant or touch can be beneficial in GS but is not a pre-requisite provided the arms and shoulders are calm and driving forward while re-centering through the athletic stance.

**Movement:**
“Movement” is possibly the most general term in ski racing. It is also one of the most frequently used terms by coaches. But what does movement mean specifically? After one develops a concrete understanding of the two positions above and can demonstrate them appropriately in static positions, traverse, straight run, single turn, etc, he or she must learn to bring those elements into the dynamic process of turning. Proper lateral and fore-aft movements between and through the above described positions are paramount to linking arced turns.

The movements described below are specific to carving GS turns but apply to carved turns in all events to one degree or another. There are obvious differences in the degree and nuance of movements in SL, GS, and SG/DH. But the underlying principles are the same. For example: inclination during initiation is typically most obvious in long SG/DH turns, is an important factor in GS, and is much less prevalent in SL. Still, whether making a shorter or longer radius turn, all should be initiated with forward ankle
flexion and lateral ankle/knee movement. In all disciplines the aim is the same; develop a strong platform from which to build pressure above and through the fall-line.

Description of movements from completion of one arced GS turn to completion of the next:

- The athlete’s shoulders are deliberately level exiting the fall-line. Before the turn is completed he or she begins an aggressive forward movement with his knees while extending slightly from the mid thigh. Disciplined forward movement of the arms accompanies and assists in the movement of the center of mass in order to maintain ankle flexion. This movement continues through the athletic stance phase of the turn ensuring ankle flexion and forward placement of the center of mass relative to the mid-line of the ski.
- As he or she completes the initial movement from parallel position to the athletic stance (while executing the points above) he must proactively shift weight to his uphill ski. This is not a step; but a purposeful, fluid transfer of weight. Transferring weight to the uphill ski early in transition allows the athlete to establish a platform from which to build pressure for the new turn.
- When one moves to the new outside ski it is critical that he or she not come to a fully extended position. Too much extension in transition will cause a speed reducing hook, a significant reduction of ankle flexion, and a “dead spot” allowing for little or no forward ankle flexion or lateral knee movement.
- Once the uphill ski “platform” is established the athlete continues to “face away” from the intended direction of travel (staying in the athletic stance); even as he progressively builds pressure on the new outside ski with lateral movement of both knees down the hill. This lateral movement of the knees, though relatively slight at first, will set the tone for the entire turn. It provides the tip purchase necessary for the more forceful movements to come.
- Now that pressure is established over the new outside ski in the athletic stance the athlete will continue to progressively build edge angle and pressure with his knees. He will continue to do so first by inclinating while still facing away (leading to a long outside leg with positive ankle flexion).
- From this point forward the athlete progressively builds inside lead (parallel position) as the edge angle increases and the ski bends through the top of the turn and the athlete enters the fall line.
- The parallel position is ever changing as is angle of the shoulders relative to the snow surface. Both parallel position and leveling are slight as one enters the turn. Both peak through the apex and completion.

(Aggresive forward “MOVEMENT” through completion and into transition: ANKLE FLEXION, weight transfer to new outside ski and “STACKED” position)
Carving slalom turns is similar but requires some slightly different skills:

- In slalom the athlete must maintain a significantly taller position throughout the turn and transition than in GS and speed events.
- A taller position allows for quicker and more aggressive use of one’s ankles and knees and faster reaction time.
- Inclination and use of the hip play a much smaller role in SL than GS. Consequently, though movement between the athletic and parallel positions remains essential it is less apparent.
- More quick, aggressive use of the knees is essential to arcing a slalom turn.
  - The knees are used to create and maintain ankle flexion (forward movement).
  - Forward knee movement from a relatively neutral position is vital to producing speed on flat terrain.
  - Aggressive lateral use of the knees early in the turn is the primary method for creating early edge angle. Though lateral knee movement is used to initiate turns in all disciplines they are used more forcefully early in the turn in SL.
- A strong pole plant is an essential tool in SL. Upper body should remain quiet and the pole(s) should be planted roughly 18 inches ahead of the toe piece of the binding.
- Shoulders should stay more level throughout a slalom turn than in other events.
- There should also generally be more apparent separation between the upper and lower body than in GS.
- In a course the blocking movement and pole plant should be one in the same with minimal movement of the upper body. This requires a relatively high, quiet hand position with minimal use of the arms and good direction at the gate.

High speed turns in SG and DH are built upon the fundamentals of the GS turn. There are too many other elements of speed skiing to address in this document (jumping, gliding and glide turns, general body position, and tuck). Speed necessitates a document unto its own.