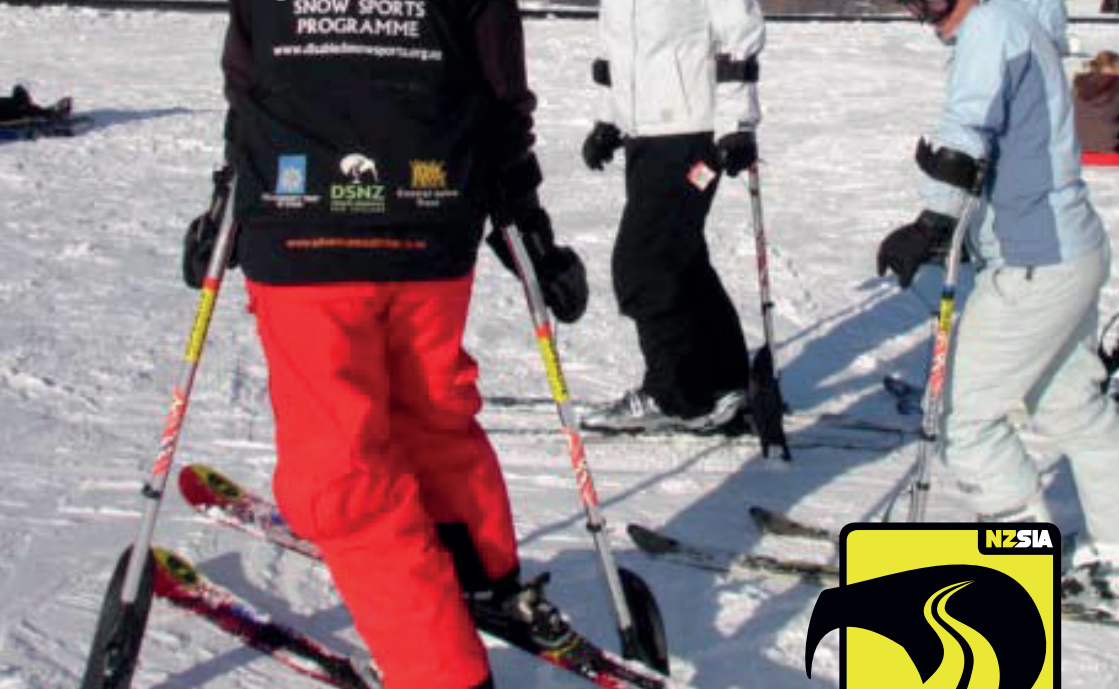


NZSIA ADAPTIVE SNOWSPORTS INSTRUCTORS MANUAL



SECTION THREE:

ADAPTIVE EQUIPMENT



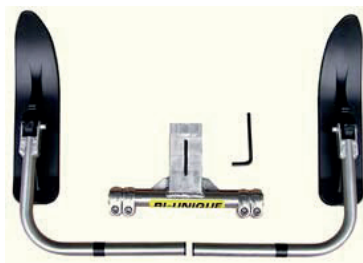
EQUIPMENT

There is an array of adaptive equipment available both commercially and through kiwi ingenuity and adaption.

Standard equipment is adapted to suit each individual, with the use of duck tape and padding some of the most commonly “extras”

Use adaptive equipment with the aim to **use the least amount necessary to achieve the student’s goals**. Equipment used should be assessed throughout the learning process with changes and adjustments being made as necessary.

OUTRIGGERS



Range of hand held outriggers - stand up and sit ski; fixed outriggers

Help to stabilise a student and are either hand held or fixed.

A hand held outrigger is an elbow crutch with the tip of a ski pivoted on the bottom of the crutch. Most outriggers have an adjustable brake screw at the back of the shaft. Most outriggers have a flip-ski function which allows them to be used more easily for propulsion and as a walking crutch. Some outriggers have a claw on the tail of the ski to add friction.

A fixed outrigger is used on a bi-ski when hand held outriggers are unable to be used. They are fixed at a height that creates a turn shape appropriate to the terrain being skied on. Closer to the snow for open turns on learner terrain, further away from the snow for tight turns on steeper terrain.

Set up

Learning to Turn

The outrigger length can be adjusted in two ways. Adjust the cuff height so that it allows free movement of the elbow. The length of the outriggers should be adjusted when the student is on their equipment and in a centred stance. If the outriggers are needed for support the student should be able to weight bear on them while in their centred stance. Padding can be placed on the handles to support the palm. If they are used to assist with balance the ski tips should just brush the snow when they are being swung. Ensure that the outrigger height is set correctly on both sides especially where someone has different strengths and/or arm lengths on each side.

Strengthening the turn

As the student's speed increases the brake screw should be reduced to prevent the outrigger from dragging behind the student. As the terrain gets steeper outrigger length should be shortened to prevent the uphill outrigger from affecting the student's body position.

SKI LINKS



The ski link is a device that is attached to the front of the skis. It prevents the skis from crossing or spreading apart when the student cannot control their skis independently. Independent leg movement is minimised with a link so moving around on the flat is limited to shuffling. Remove the link on lifts and never allow a student to slide backwards when the link is attached. For children and light students an edgy wedgie gives a greater freedom of movement.

If tip separation is the only issue a rope or bungee is effective.

HEEL SPACER BAR



A tube with a bungee through it, and washers at either end. It is positioned between the student's boots, preferably under the heel. The spacer bar is used when the student cannot form a wedge and needs the platform provided by a wedge for balance. Wedge size is determined by the length of the tube. Never allow the student to slide backwards when a spacer bar is attached.

MONOSKI



Freedom Factory Revolution : Tessier Dual and mono skis

A seat mounted on a ski or skis through a shock absorbing frame. Outriggers are used for balance. Mono-skis come in a wide range of designs and performance levels suiting different skiers. Most have a lift loading mechanism and should all have a lift evacuation system and lift safety line fitted. If a higher level of support is needed a high back seat with additional strapping should be used.

SET UP

The dowel test is used to find a centred position for the skier and frame on the ski. With the student strapped in the ski place a dowel or a tennis ball under the **boot sole centre** of the ski. The mono-ski should be roughly

balanced over the dowel/ball when the skier is in their centred stance. If not adjust the placement of the frame on the ski and retest. If a skier has difficulty moving forward the position of the dowel can be moved slightly forward of the boot sole centre for the test.

On snow, if the skier is over-rotating their turns the seat may be set up too far forward. If they are having difficulty pressuring the front of the ski then the seat may be too far back on the ski. Also check the track the ski leaves on flat snow while straight running to ascertain whether the skier is laterally centred in the seat.

Shock Absorbers can be adjusted for preload and rebound. The preload determines the stiffness and amount of travel in the shock and is usually adjusted by screwing a ring up or down at the top of the spring. Do this when there is no load on the spring. The correct setting will allow the shock to have the maximum amount of travel without bottoming out over rough terrain. Rebound determines the amount of “bounce” the shock has. If this is too slow it will be more difficult to transition from one turn to the next, it is too high the ski will bounce too much when rapid pressure is applied.

Bi-Ski



Bi Unique : Mountain Man Bi Skis

A bi-ski is a seat mounted on a pair of articulated skis. It can be used with outriggers, hand held or fixed, or in combination, and/or a handle bar. New Zealand programme bi-skis must be tethered at all times. The two main types used here are the Mountain Man and the Bi-unique. Generally the Mountain Man is used when a higher level of support is needed due to the Mountain Man having a more stable fixed outrigger set up.

Set Up

Determine the amount of support the student will require (see bi-skiing section). The student should only be strapped to the level of support they require. Shoulder straps should be crossed over the student's body so they don't fall off the shoulders. If using fixed outriggers set the height to the appropriate turn shape for the terrain being skied.

If a student has uncontrolled movement in their arms or upper body, strap to allow for this movement to happen, but to prevent injury. In this case extra padding should be considered on the frame to prevent injury.

BIBS

Used by skiers with a visual impairment and at any other time that it would be helpful for other mountain users to have an awareness of the student's needs for safety reasons. Bibs need to be bright. For vision impaired student's both the guide and the student should wear a bib.



CANTS AND TOE AND HEEL LIFTS

Cants and lifts are used to allow a student to stand or sit in their natural stance and at the same time to have the ski or board remain flat on the snow. This can be fore/aft as well laterally. Lifts can also be used to position a fused or prosthetic ankle in a flexed position by raising the heel. They can be made of any suitable material. For small adjustments the cant should go inside the boot. Sections of insole work well for this purpose. For large adjustments cant outside of the boot. If permanent large canting is required placing plastic wedges between the binding and the board/ski works well.

When canting use the cant to fill in the void. For example if a monoskier is sitting in their seat with the ski flat and one buttock higher than the other you place some foam in the space under the high side.

SLIDER FRAMES



Various versions exist for both skiing and snowboarding. The frame has skis attached to the bottom and gives the student a greater level of stability than using outriggers. They are generally used on beginner terrain only. Tethers can be attached to the student's board/skis until the student is able to achieve speed control through turn shape. Some frames have a handle the instructor can use to assist control of the frame. If the student has difficulty controlling their ski a ski can be attached to the frame.

WIRELESS COMMUNICATION AND LOUDSPEAKERS

A loudspeaker amplifies the voice of a sighted guide and is especially useful at speed and in noisy conditions. Wireless communication achieves the same result. The advantage of the loudspeaker is that the student can locate the position of the guide from the direction of their voice.

SLANT BOARDS

Slant Boards allow the binding to be positioned above a ski at any angle. They are used in the same way as cants and lifts but allow greater flexibility of position. Slant Boards are not in common usage.

TETHERS



Tethers can be used to assist the student to make turns and for slowing and emergency stopping. They are attached to the front of skis combined with links, to the tip of a snowboard or the front foot of the rider, and on the frame at the back of a bi-ski. Tethers must also be securely attached to the tetherer.

When using tethers use turn shape to control speed and always ride at a speed at which you can confidently stop .

A single tether can be used occasionally with a mono ski to assist with speed control on steep cat-tracks. Do not tether a monoski in other situations as the tether will restrict the ability of the monoski to turn. If the terrain is too steep, bucket the monoski to flatter terrain where the student is able to control speed with turn shape.

SKI PAL

An adjustable rectangular tube used by the instructor as a teaching aid to assist with balance, turning, and in some cases speed control.



RODS AND POLES

Can be used in various ways to assist the student, such as horse and buggy and side by side. Aim to minimise the amount of dependence the student develops on the rod



RIDER BAR



Useful as a teaching aid to develop movements for snowboarders who have low leg strength and control. Set up with the rider in a centred stance with the hands on the bar. Extra support can be given with webbing around the hips of the rider if needed. The bar can be used to create twist in the board but beware of the rider using the bar to pull against or push away from in a way that changes their stance. The handle allows you to assist with control of the board, either walking or skiing alongside.

BOARD BUDDY

A hula hoop attached to a harness that allows the instructor to stabilise the movement of the rider's CoM. The ski pal can be adapted to make this.

CADS AND SKI MOJO

These help reduce fatigue for standup skiers. They consist of a rod that is attached to the boot and a hip harness either inside or outside of the ski pants.

SKI AND SNOWBOARD PROSTHETICS

Advancements in prosthetic technology are being made all the time. Current models allow for double and single above knee amputees to ski and ride standing up providing hip protection with shock absorbers. Various below knee prosthetics assist with ankle flexion. Ensure prosthetics are well fitted in the student's boots. Where there is not adequate ankle flexion in the prosthetic for a centred stance use a heel lift to create the correct angle.



SKI BIKE

The ski bike provides an alternative way to play and slide. A variety of options include snowboard bikes and ski trikes. Some allow the rider to be seated when riding.

