Jump ramp set up

Here are a few tips that I hope will help you to set up your jump quickly and accurately.

In most circumstances the jump ramp and associated course and video buoys are easy to set up.

There is no need to hire a surveyor if you are accurate with your tape measure. A jump course can be set up very accurately with a tape measure and basic math skills.

Firstly, lets define the parts of the jump ramp. The 'Ramp surface' is the angled surface that actually comes in contact with the skier, starting below the waterline and extending up to the high point of the ramp. The 'Front of the ramp is the vertical or angled surface between high point of the ramp surface and the water below it; the 'Bottom of the ramp is the area about the water line on the approach side of the jump surface.

There should be transverse water lines painted on both the ramp surface and the front of the ramp. The ramp surface water line is 84mm wide must be centered 2.1m from the high point of the jump. The tolerance up or down the surface is 42mm.

While the jump is still out of the water the jump surface and waterline should be homologated. Never believe that a jump has had the lines painted on them correctly.

The water lines on the front of the jump need not span the entire front of the jump. A short line near each anchor eye is sufficient. This 18mm wide line is to be centered 455mm below the high point of the ramp. The tolerance up or down on the front of the ramp is 9mm. Most times, because the front of the ramp is not perfectly plumb this cannot be homologated on shore and can only be verified while floating. Don't measure down the front of the ramp to homologate the 455mm unless the front of the ramp is plumb. If the front of ramp is angled then you have to place a straight edge along the high point of the ramp that extends far enough out so you can measure a plumb line to the water off the side of the jump.

I prefer a jump with eyebolts facing front and rear at each corner for attaching the anchors and leveling weights.

Tides, currents, irregular bottom, stumps and dead trees on the bottom, rapidly changing water levels, hard bottoms, and mud bottoms are among the many problems encountered while setting up and anchoring a jump ramp.

There are many ways to set up and anchor a jump ramp. The method I prefer in non-tidal, still waterways with relatively flat clean bottoms (perfect for man-made ski lakes) consists of two pre-measured wires and six anchors

A 100m long outer course wire of 3.2mm stainless steel wire that defines both the course line and the start and end of the 100m jump course and a 30m long inner course wire

(used for the Corson video jump measurement system). This method is not the best choice for tidal areas or waterways with a current. I will suggest an alternative method for moving water closer to the end of this document.

These cables must have loops clamped/crimped at precise locations for the attachment of course or video buoys.

The outer wire is 100m from end to end and it defines the course It starts with the left entry gate/start of course buoy attached at the zero-end and it ends with the ride out / end of course buoy attached at the 100m end of the wire. The second buoy on this wire is the outer jump gate buoy, located at 25m (aka outer zero-video-buoy) and then we attach the video jump metering buoys every 5m (preferred) or 10m thereafter, out to 30m from the jump gate buoy. The left jump gate buoy will be a point on the 0 line of the x-axis

Medium to strong anchoring is necessary for the outer wire.

The anchors for the outer wire should be, 1m/1.5m away from each end of the cable on an extended course line. This allows for a system of give-and-take so the outer wire can be easily moved back and forth between the anchors.

The inner wire is 30m and only needed for the video metering buoys. It has video buoys at: the zero-loop (inner zero-video-buoy), one every 5m (preferred) or 10m thereafter to the final buoy at 30m-eye. This wire requires medium to light anchoring.

Whenever possible, stretch the outer wire on shore, parallel to where you want to locate the jump course. You can place something at both ends of the wire as a visual reference when establishing the line of the jump course. This is also a good time to put the buoy tie off ropes on the wire. The ropes for the buoys should be at least 1m longer than water depth. This will allow you to tie the buoys with a give-and-take system so they can be adjusted up or down so their equators are at water line for the event.

Attach the start and end of course buoys and a buoy at the 25m outer jump gate. Be sure to only tie them to the very end of the rope so they float loose and won't interfere with your ability to tighten the wire later. Put ropes on the remaining loops for attaching buoys on long tethers.

Next, establish the course line by running the course with a boat. When you're happy that you have an ample straight run into the ramp, the ramp will be located where you want it, there is a safe ride out area, and the water is no less than chest deep throughout the jump course, then drop some light anchors with buoys to mark the approximate course.

Using the buoys dropped by the boat as references, drop in the permanent anchors for the outer wire and pull the wire tight using ropes with truckers hitches, ratchet straps or some other method of give-and-take at both ends.

Pull down start of course, end of course and outer jump gate buoys so the water line is on their equator. Check that start and end of course are where you want them and the outer jump gate buoy is parallel to where you want the high point of the jump to be. Check that the outer jump gate buoy is in line between start and end of course buoys.

The video buoys create a lot of lift so you need to weigh down the wires so they don't get pulled up close to the surface. Used automotive brake rotors are easy to get and are usually free and they will slide right down the buoy rope and hold the wire down. Be sure the attachment loop is in the center hole of the weight. If you don't have brake rotors then concrete building blocks with holes will suffice. (I will list some suggestions and methods for making anchors at the end.) Now tie the remaining buoys to the outer wire placing a weight over the rope first. If you have pulled the outer wire sufficiently tight between the anchors and there are no snags on the bottom, the buoys should all be in a pretty straight line. Swim along the wire locating any snags or tangles and adjust as necessary. More weight on the video buoy lines may be required if the course will not stay submerged or straight.

After you have the outer wire straight and tight it is time to install the jump ramp anchors; one anchor for the front and one for the rear. The jump surface is centered 6.75m from and parallel to the outer wire. The ramp anchors will be centered on the jump, so they too will be located 6.75m from the outer wire. The high point of the ramp will be centered on and perpendicular to the outer jump gate buoy.

The jump ramp requires very heavy anchoring.

The ramp anchors should be located between 3- 4x the water's depth in front and behind the ramp, e.g. in 3m deep water the front anchor should be between 9m and 12m in front of the jump gate buoy and the same distance plus the length of the actual jump ramp behind the jump gate buoy.

Put temporary buoys on the attachment point of the ramp anchors and temporary buoys along the outer wire perpendicular to the ramp anchors. Move the ramp anchors until the centers of the temporary buoy on the anchor measures exactly 6.75m from the buoys on the outer wire. Don't install the ramp yet. It will be in the way and it is often a good idea to allow the anchors to settle before stressing them.

Next we will install the inner wire. The inner wire runs parallel to the outer wire. They are usually 10m apart. 10m is not required but is simple for measurements. Your situation may require something else but throughout this text I will refer to the y-axis distance as being 10m.

Install the inner wire anchors approx 1m away from the ends of the wire and put temporary buoys on the anchors. Measure and establish 10m between the outer jump gate buoy and the inner wire anchor. Repeat at the 30m video buoys. This will bring your outer and inner wires parallel, 10m apart on the y-axis. Put brake rotors over the buoy

ropes and place all the buoys on the inner wire. Again be sure the lines come up through the center hole of the rotors.

The outer wire will be +6.75 y-axis and the inner wire will be –3.25 on the y-axis. The center of high point of the ramp will be 0 on both the x and y-axis.

Next we must square the grid. You have several boxes of buoys that allow you to square the x-axis to the y-axis of the grid. The 10x10m box comprised of the outer jump gate buoy, the inner zero-video buoy, the inner and the outer 10m video buoys is usually easiest to measure.

The diagonal of a 10m square is 14.14m. Measure from corner to corner and determine how your box is shaped. It will probably be a little diamond shaped. By moving the inner wire using give-and-take between the anchors you should be able to square up the box so all-4 sides measure 10m and the diagonals measure 14.14m. While it is possible to square the box by moving the 100m outer wire it is usually much easier to move the 30m inner wire.

A further check is to measure the distance from center of jump to center of outside 20m video buoy. That should be 21.11m. Be sure to measure from center of high point of jump ramp. If the front of the ramp is sloped it will not read correctly at the waterline

Now you install the jump ramp. Equal length leaders about 2m make a good bridal for the front and rear of the jump ramp. Make 4 equal leaders with approx. 150mm loops on each end. Attach the leaders to eyes at each corner of the jump ramp and bring the anchor lines up through the loops on the other end. Move the jump ramp for and aft by give-and-take from the front and rear anchor ropes until the high point of the ramp is perpendicular to the inner and outer video zero-buoys. This is the 0 line for the x-axis of the grid.

If the box is exactly square, and the attachment points of the ramp anchors are exactly 6.75m parallel to the outer wire and the 4 leaders attaching the ramp to the anchor lines are all the same length and the high point of the jump is aligned perpendicular to the centers of both zero-video buoys then the course has to be correct.

Finally we must install the two inner gate buoys. These are located 4m perpendicular to the outer gate buoys. These require medium anchors. Many jump ramps have the inner jump gate buoy (the 2.75m buoy) attached to them via a PVC pipe so all you have to install is the entry gate buoy. Do your best to get the gate buoys square using your eye and maybe an observer on shore or in the boat.

I prefer to not pass the ropes through the eye on the buoy. I make a much bigger loop make from 2.5mm electrical wire to attach the rope to the buoy. I have tried small ropes, wire, zip ties, and clips to attach the buoys to their ropes. I prefer electrical wire.

The ramp’s anchor ropes need a shock absorber to keep from jerking the anchors out or breaking an anchor line. Often I use a 10-speed bicycle tube as a bungee. They are cheap

and easy to find. Many people use sections of elastic cord. Some cut bands out of truck tire inner tubes. Whatever you use, always keep spares handy.

I like to put the bungee on the front since it can be closer to the surface for ease of checking. The bungee should be attached so if it breaks the anchor rope will stay attached to the ramp. The bungee can should only be used to shorten the anchor rope

After you have decided exactly where the jump will be located and both front and rear ropes are tight, untie the front anchor rope and tie a 150mm loop approx 1m toward the anchor from the point where the anchor rope goes through the leaders and then another one approx 1.5m further from the first loop. Loop the bicycle tube between these 2 loops. The rope between the loops should still be very slack when you pull the bicycle tube tight. Now take the anchor rope back through the leaders and pull the jump tight and adjust it to be perfectly aligned between the zero video jump buoys.

Put closed cell foam sub-buoys on all anchors. Make sure they are deep enough so as not to get hit by a boat during low water. Make a detailed map of the locations of all anchors relative to landmarks on shore so they can be quickly found in the event of an interruption of an event.

Anchors are not just weight. They have to be the right size and shape for the conditions at that site. A 20L (5 gal) bucket full of cement may be heavy but it is not a good anchor on many sites. If your bottom is thick mud then this might be a good anchor for you. If you have a hard or solid sand bottom then buckets full of cement just fall over and roll around.

On some bottoms the anchors will sink and may prove to be impossible to move so be sure of it's location before you allow it to settle in. Tie a few PFDs or floats to give your anchors some buoyancy until you are sure it is locate correctly.

A good way to make anchors is by filling tires with cement. Lay a tire on its side on top of some plywood or stiff cardboard and fill it with concrete. Put a galvanized or stainless steel eye towards one end. Put several vertical tubes in the concrete so you have vertical holes all of the way through after the concrete sets. You can use PVC pipes or even just rolled up cardboard. After it is in place you can hammer spikes through these holes to help anchor it on hard or sandy bottoms.

Different sized tires will make different sized anchors. And they are easier to roll around that a lot of the anchors I have used.

Large screw type anchors work well in sandy bottoms but are sometimes difficult to get into the correct position. Screwing them into the bottom while holding your breath is also a challenge.

If your anchor will be permanent and your bottom is such that the anchor will get irretrievably sucked under the mud you may want to attach a short stainless cable leader

or a length of galv chain with an eye to attach the anchor ropes and sub buoy to. If you keep a sub-buoy on it this leader will stay above the mud a long time after the anchor has disappeared. This makes it much easier to reattach the ramp if you break an anchor rope.

To adjust the ramp level it is convenient to hang buckets off the corners and add weight to the buckets. The buckets will allow you to use rocks of many sizes to fine tune your installation.

On tidal sites it is common to use a counter weight through a pulley centered on the front with 2 anchors off the back. The jump ramp will be swinging on radius of the back anchor lines and, depending on which way the tide is running, the ramp will be moving forward or backward. The front uses only one anchor and rope that runs through a pulley at the center of the ramp's front waterline. This rope holds a counter weight below the front of the ramp that keeps the back anchor ropes tight and allows the ramp to move up and down with the tides or waves. The back anchors are set as closely to 45 degrees off the back as conditions allow. Since the jump can rise and fall without pulling out the anchors no bungee is needed for this set up.

The direction of the stream also has a great impact on your set up. The stream running up the jump surface will end up submerging the bottom of the ramp, making the ramp too steep. A stream running into the front of the ramp will lift the bottom of the ramp, making it too flat. Many times setting a ramp to record tolerances in moving water is impossible.

I make my front and rear anchor lines long enough they can all be tied together and left on the bottom after the ramp has been removed. Using a grapple hook makes it very easy to find the anchor lines later.

After each jump event you should loosen the ropes on the video buoys. This will keep the wind and waves from moving the wires or breaking a rope.