



MISCELLANEOUS EQUIPMENT NEEDED



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International Aerobatic Club, Inc.

A Division of the Experimental Aircraft Association and the
National Aeronautic Association

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TAB 1 - 02

Various miscellaneous equipment must be constructed and provided by organizers of IAC sanctioned contests. Many chapters have these items already on hand. In order to standardize and to provide new contest directors or chapters sponsoring contests for the first time with some guidance, we will discuss them in this booklet.

These items are:

- Hot box panels (Optional if alternate means of no-radio recall is provided)
- Boundary sighting devices
- Aerobatic zone markings

THE HOT BOX PANELS

Hot Box panels are used to signal "hot" and "cold" boxes thereby controlling competitor entry into the box. **Note: In 2004, use of Hot Box Panels became optional provided an alternate method of no-radio recall is provided.** If Hot Box panels are not used, an operable two-way radio is mandatory for box entry and an alternate method of no-radio recall (E.g. smoke bomb) must be available.

Construction/Assembly:

Four 4 X 8' plywood panels of 1/4" thickness (minimum), exterior grade, must be used. Do not use particle board though it is cheaper. It is not as strong and will not withstand weather.

Assemble with good hinges (3" strap or equivalent) bolted with nuts on the bottom. Do not use wood screws as they will loosen with repeated flipping of the panels. Place hinges on the upper (orange) side so panels can fold inward.

The two outer 4 X 8 sheets should be cut into 4' square panels to make the

signal easier to operate physically and for the recall signal.

Painting:

Bright (international) orange and bright white is used. DO NOT use red paint. Orange is brighter and more visible and, more importantly, the most common form of color-blindness is red-green ...a red panel on green grass would be camouflaged.

Outer panels should be all white on the underside so that when the panel is folded inward, a perfectly square 8 x 8 is seen.

The orange panels (rectangle) should be bordered with a minimum 6" wide white stripe around all sides but no more than 8" wide. The white "X" should go across the entire orange panels. Stripes should be at least 6" wide to be seen easily from 4,000 feet but no more than 8" as it blurs the color-coding and leads to confusion.

Most competitors condition themselves to enter the Aerobatic Box only after they see the white square. It is very visible from 4,000' though it is only half of the total panel. The white striped border around the orange highlights and defines the overall panel, and the "X" serves as a reminder. The "X" is not necessary for visibility, however, as the white border is good enough.

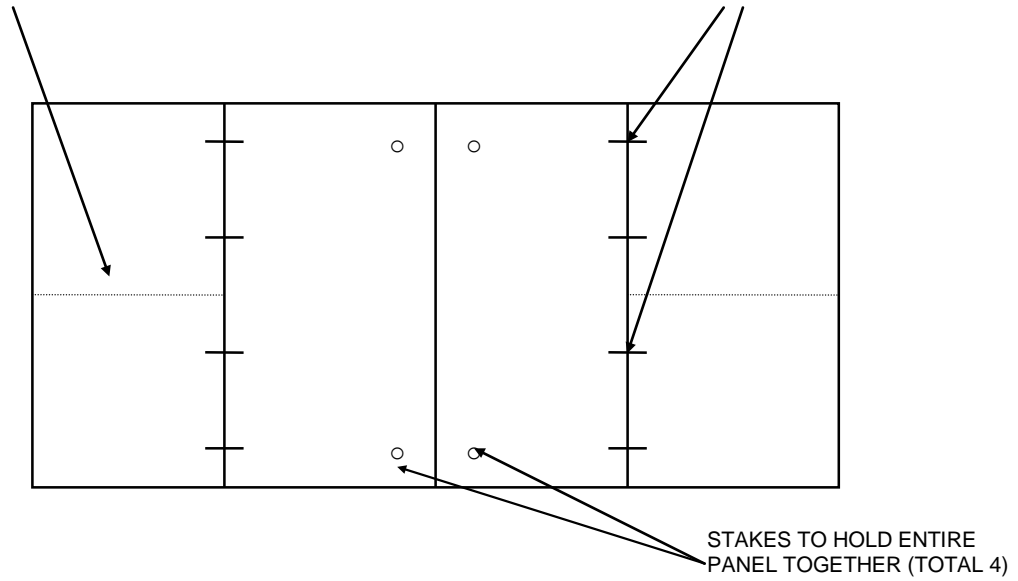


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Hot box panel construction:

OUTER MOST PANELSCUT IN HALF

HINGES (TOTAL 8)





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Boundary Sighting Devices

On the following page are a couple of examples of boundary sighting devices that are used by boundary judges to call "outs". The accuracy of these devices is extremely important as penalties can often decide the outcome of a contest.

The box should be surveyed with stakes at the exact corners of the buffer zone of the box. Sighting devices and the boundary judges are always located at the corner of the buffer zone, not the corner of the box.

Once you have located the corners (usually only two since only two boundary judges are usually used –one diagonal from the other), the surveyors must also put out stakes that you can sight on with the devices themselves so you can properly align them with the edge of the box.

The ideal situation is to be able to "see" the other corners of the buffer zone since if the alignment of the devices is done off of those corners, it is the most accurate. Most terrain features do not permit this, however, and the surveyor must lay down some stakes along the edge of the buffer zone for you to align the sighting devices.

IAC favors sighting devices that use ropes or strings, as they are very accurate. Two wires or strings must always be provided for each edge of the zone. The boundary judge uses both as a sight. He or she lines them up and when the entire aircraft goes outside these wires or strings, an "out" is called into the chief judge. If these devices are left out overnight the string may "sag". Checked the device every day of the contest to make sure they are in alignment with the surveyor's stakes.

Sighting devices made of conduit or tubing are not always as accurate as using two strings to sight on, since lateral movement is possible on the part of the boundary judge. When using the device pictured below, made of tubing, the vertical leg must also be used by the boundary judge so he or she can make sure they are "sighting" on the device properly.

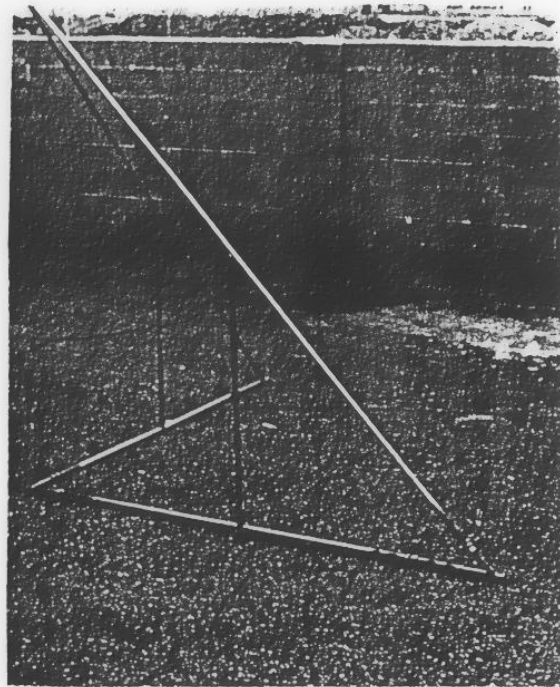
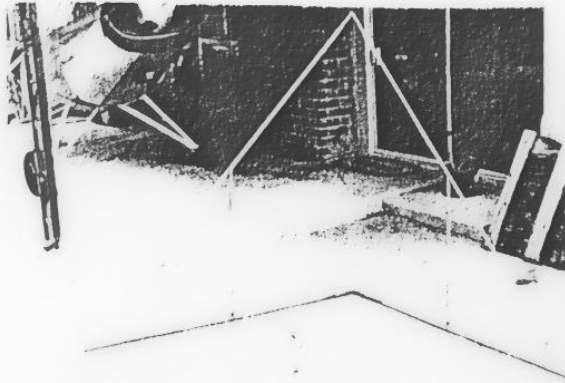
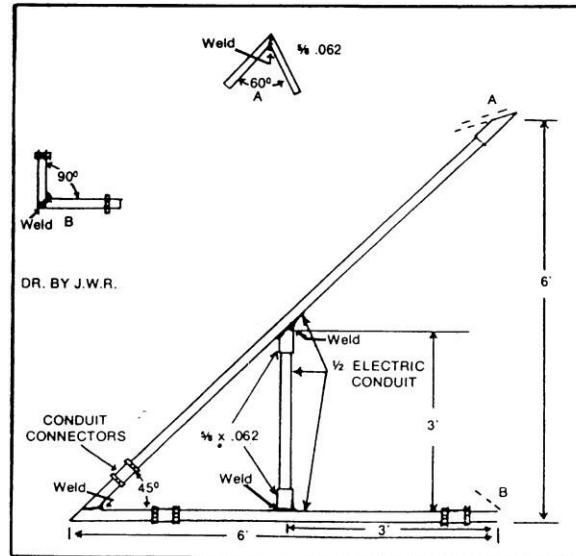
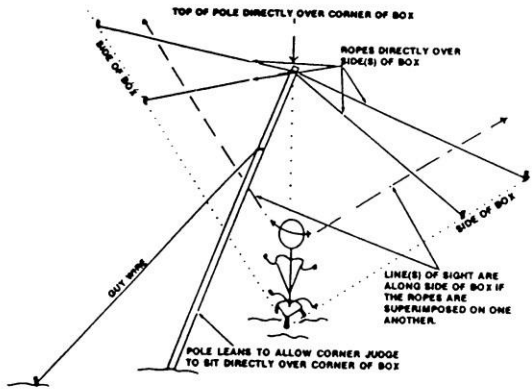
To review:

- Use two strings/wires to sight on.
- Boundary sighting devices are always located on the corners of the buffer zone - - not the aerobatic box.
- Check alignment of wire/string devices every day against the surveyor's stakes.
- Lastly and most importantly, put someone in charge of the devices and the boundary judges themselves and make sure they are properly trained in the use of the sights, the radio, the IAC "Official Contest Rules" regarding boundary infringements, and other details.

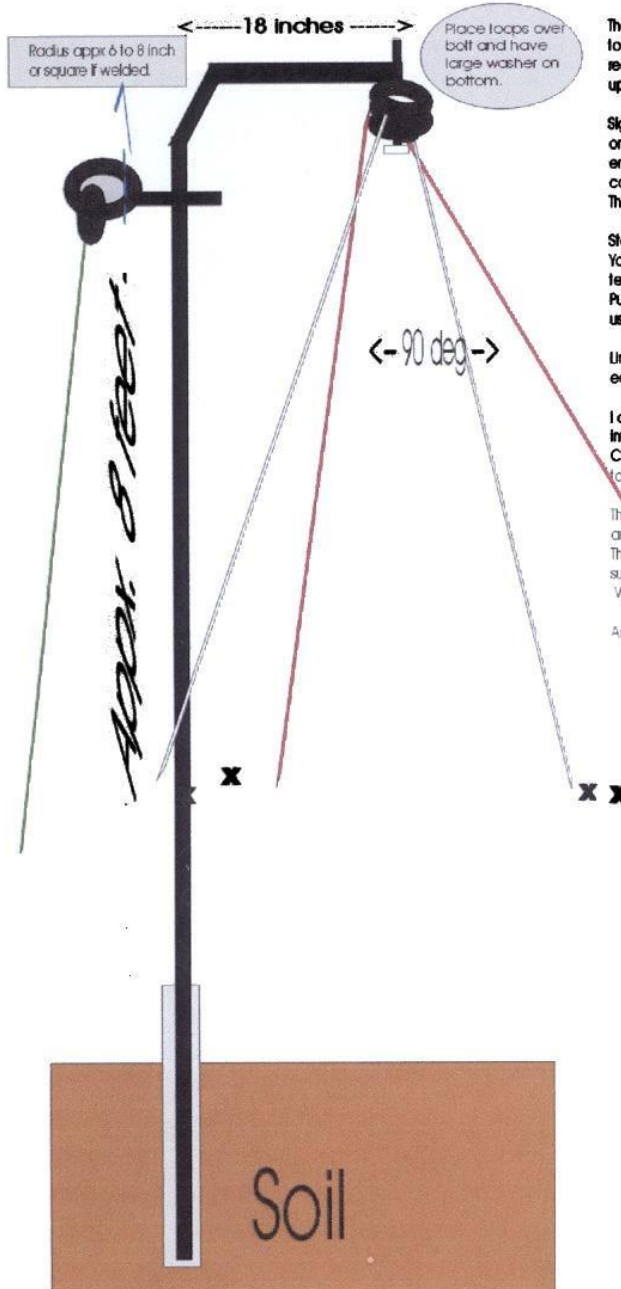


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Boundary sighting device construction:



BOUNDRY SIGHTING DEVICE



The curved upper section of the pipe should point to the (+) in the box center and the pull on the line at the rear eyebolt should be 180 degrees away from the upper horizontal section or box center. (approx. 8 foot rope)

Sighting Lines running down each side are separate loops on a bolt inserted vertically through the horizontal end of the pipe and must be exact in alignment. Use different colors for the top and bottom lines. The 2 sets of lines must pull 90 degrees from each other.

Start with 25 foot ropes on top paired with 15 foot under. You can always shorten them if need, stake to ground using tent pegs or whatever. Pull them exactly down the out of bounds line. Be sure to use a different color for top and bottom rope. (airboat supply store)

Line judges sit in lazy boy recliner under the ball and can easily sight both boundaries while reaching for a cone.

I drove a slightly larger ID pipe (id larger than OD of device) tubing into the ground as a socket for the actual sighting device pipe. Clean out the base pipe by removing every few inches and tapping to clear dirt.

The device is currently used at northeast regional in New York and tubing in Florida.

The first set in New York was made as described by me using electrical supply conduit and the second by Will Tryon of Chapter 23 in Florida. Will did a great job by bending and welding polished aluminum tube.

An alternate line configuration can be 1 stake with 1 line high and 1 low.

Materials List (for 2 sighting devices)

- 2- 10 foot 1 inch galvanized electrical conduit.
- 2- 90 degree elbows or pipe bender for corner
- 2- 2 foot pieces as base. (ID equals 1 inch +)
- 2- (2 or 3) inch eyebolts and 4 nuts.
- 2- (3 or 4) inch 3/8 bolts, 4 nuts and washers
- 2- larger washers for bolt head to support the boundary sighting lines.
- 50- foot white rope.
- 30- feet different color rope.
- 2- 8 foot rope for counter pull.
- 10- tent pegs

Submitted by Tom Murphy Chapter 23, Pompano Fl



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THE AEROBATIC BOX MARKINGS

IAC does not have any rules regarding the size or number of aerobic box markings. However, the better run contests are noted for excellent, large markings that are clearly visible from all areas of the box. IAC urges contest directors to consider the following layout, which is in conformance with rules governing the World Aerobic Championships. Note that any type of material may be used, but it must be white in color. Sailcloth, bed sheets, Styrofoam insulation sheets, and painted plywood have all been used.

Box Markings

