131 Victoria St.
67 Breimba Street,
GRAFTON. N.S.W.
AUSTRALIA.
24th November, 1964.

Dear Mr. Rogallo,

I trust you will forgive my delay in answering your enquiry regarding the wing. Our private lives here have been a little topsy turvy, moving house and so on. You will have to forgive the crudeness of the design, and lack of technical information, for I am an amateur in my work as compared with that which you are undertaking.

I will not bore you with the complete history of it's development, but will summarise by saying that it was given to me, by the local water ski club to construct a ski kite. After investigating the standard type used in model form, deemed them too dangerous for this coward to operate. I investigated in model form some other ideas based on the bats wing, and I had more or less decided to reject these also, when I saw a picture of the Ryan research aircraft, which was illustrated in the booklet you sent me.

I then endeavoured to adapt this wing shape to lift a water skier. The many modifications, models and full sized experiments are now realised in the following form.

The airframe is constructed of three 1½" o/d aluminium tubes with a wall thickness of 1/16". The keel is 15'1" long, and the outer arms measure 13' from the tip of the keel to their extremity. The cross-boom is 10' long, and of the same sized tube as the keel. Strengtn and floatation are provided by wooden plugs inserted at the apex, and the ends, and where the cross-boom adjoins the airframe. The material used for plugs would be equivalent to your Douglas fir, and are three inches long and 6 inches at the apex and where the cross-boom attaches to the keel. Hinge plates are provided at the apex so that the outer arms fold against the keel. A high tensil ¼" bolt is passed through the keel and cross-boom. A ¼" x 1" o/d aluminium washer of ⅛" thickness separates the keel and cross-boom so the cross-boom can be rotated around the ¼" bolt to lie along the keel without fouling. The ¼" bolt which secures the keel and cross-boom is placed 5'11" from the apex. The outer arms are secured to the cross-boom by ¼" bolts.being passed through both. The handlebar from which the seat is also suspended, is of ⅞"o/d mild steel tube, is 4'7" from the base of the triangle it forms, to it's apex, and 3' across the base of the triangle. 4" below it's apex the seat is attached to a spacer tube. At the base of the triangle on either side, a lug is welded and drilled to take a 3/16" D shackle. All the straining wires attached to these D shackles and allow for rapid assembly and dis-assembly. The apex of the handle bar is attached to the spreader boom by a U bracket which in turn is secured by a nut to the bolt which passes through the cross-boom and keel. The handlebar can thus be hinged backwards to lie along the cross-boom in the folded position for carrying. The two point consists of 2 tubes welded to the handlebar near the centre and protude

10" in front of it. A release mechanism which can be operated by the hand via a cord is mounted at the apex formed by these two tubes. The seat is a light pine board 6½" wide with a small piece of carpet glued to the top and a car safety strap passes underneath the seat and is attached at it's mounting point near the apex of the handlebar.

The setting for the most comfortable seating position has been found when the keel is held in the horizontal position and the seat rests against the handlebar and there is a gap of 8" between them. (See diagram). The handlebar is set at right angles to the keel. This gives an average angle of attack of 10° to the horizontal, being the neutral position for flat and level towed flight. The minimum angle of attack to the horizontal is zero degrees, and the maximum about 28°, depending on the arm length of the individual pilot.

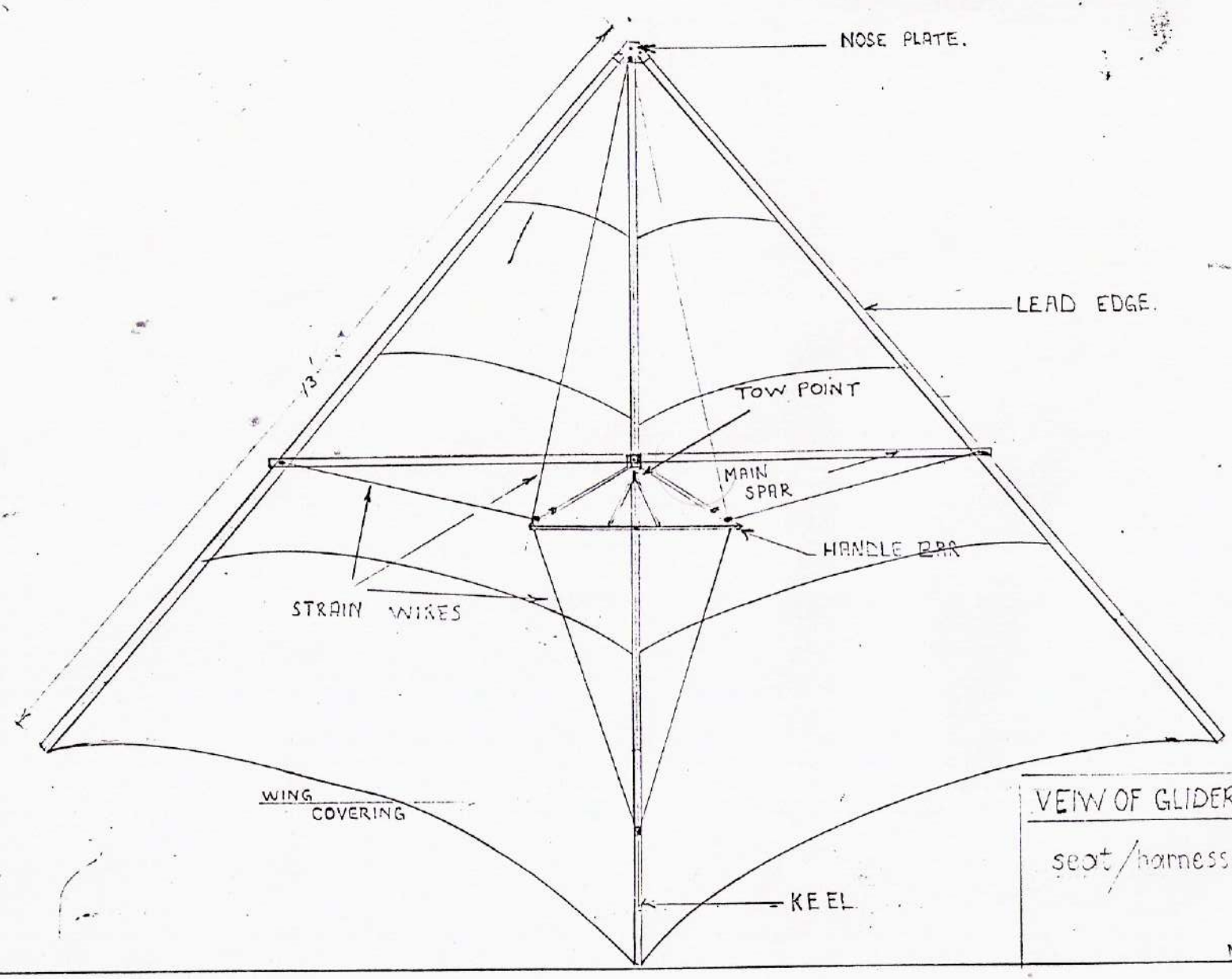
The membrane is of a waterproof nylon and the basic pattern excluding attachment to airframe is a sweepback of 45°. It is attached to the airframe simply by forming tubes of material and slipping it on. Battens have been incorporated in the trailing edge, six in all, but these are not adequate as some flutter still exists. The airframe incorporates a sweepback angle of 50°. An angle which experiment gave maximum performance.

There are six straining wires, one from each end of the cross-boom to the D shackles, two from the apex to the D shackles, two from the trailing edge of the keel to the D shackles. Most of the lift is referred via the handlebar to the seat.

The only other components which I consider part of the system is the quick release on the speed boat and a special 100' rope, which is supplied with floatation in case both releases are operated, and it may find it's way to the bottom of the river. A normal jump start while supporting the kite is employed. The seat is allowed to hang loosely from the shoulder of the skier around his back. Once he is ski-ing evenly, the seat is swung under the backside by pushing the handlebar down and forward. At 20 m.p.h., it takes the full weight of the skier. The usual take-off speed in still air is 25-30 mph., and flat and level flight between 30-35 mph. As we haven't an airspeed indicator, I can only estimate these things as the boat speedo could not be relied upon. The best glide so far has been a distance of about 300 ft. from a height of about 60'. It is very stable in free glide and the control is very light to operate. This is not the case with towed flight. There is a definite nose-up tendency at low altitudes and other peculiar effects occur with side gusts and so on. These have never felt dangerous, even in gusty 25 mph cross winds. Generally speaking, it is pleasant to fly and not really fatiguing. A towed flight of 32 minutes was accomplished without effort. We have been planning a flight of 2 or 3 hours duration as an attack on the world ski kite endurance record and feel that this will be a 'piece of cake'. I trust the photographs and drawings, along with this description will give you a clear idea of the device.

cont. over

①



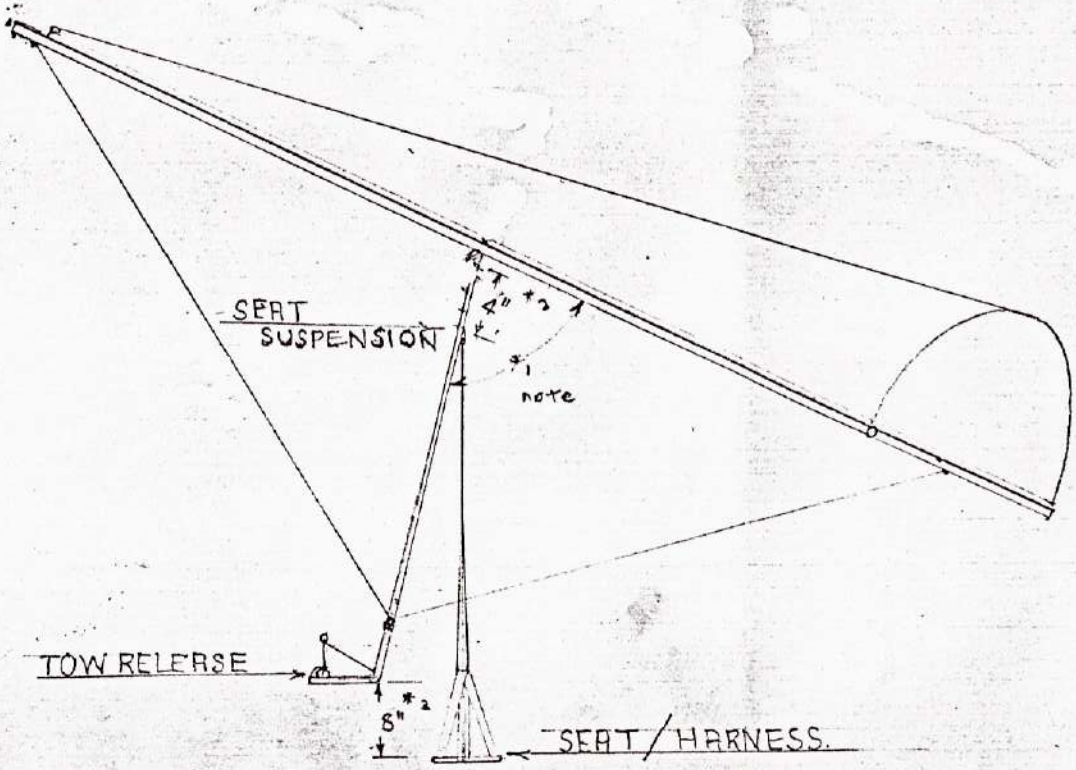
VEIW OF GLIDER FROM BELOW

seat/harness omitted.

NOT TO SCALE

1.

COPIES OF DRAWINGS SENT TO F. ROSALLO 24/11/64

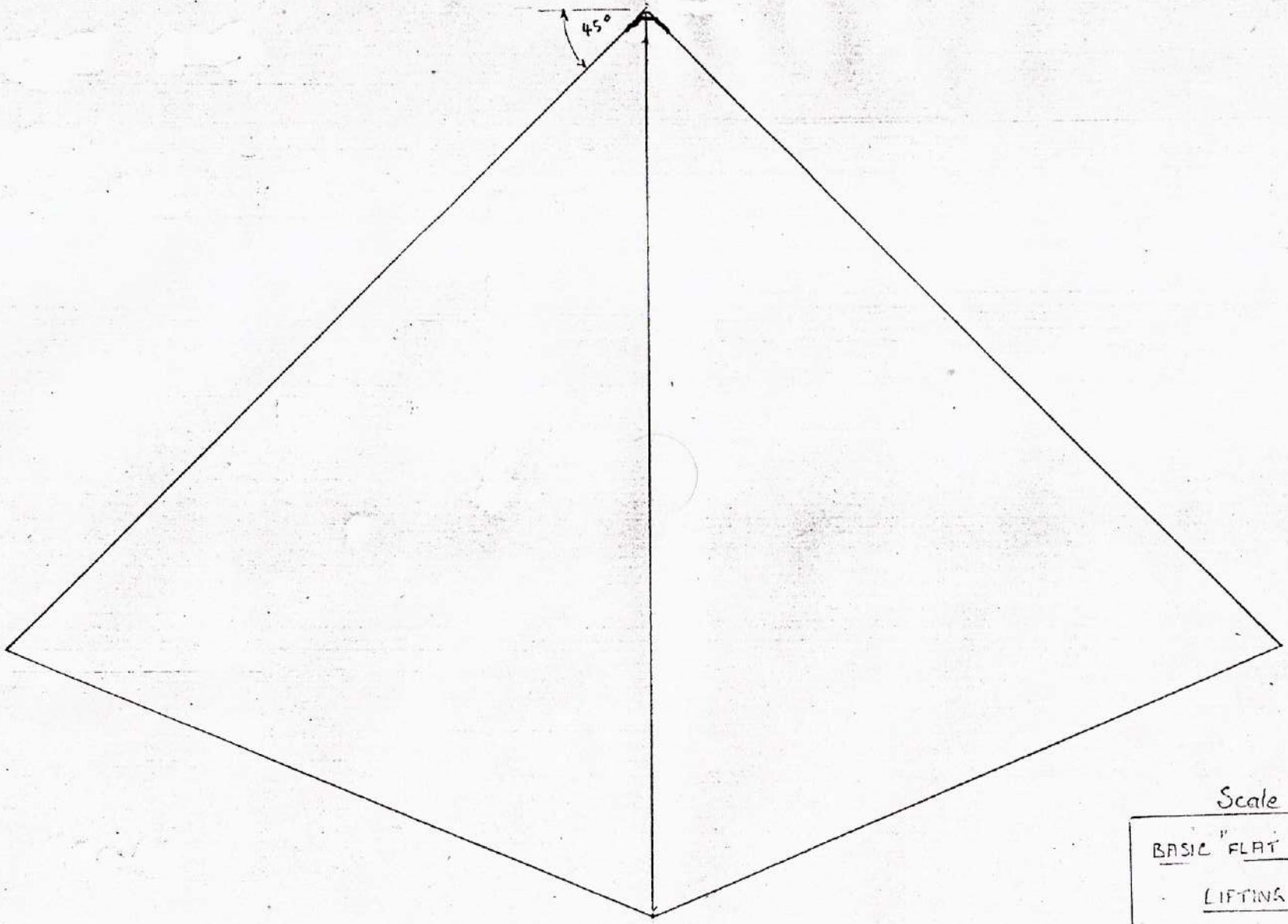


SIDE VIEW OF GLIDER.

*note. This angle is 90° for gliding flight. 76° for low speed "kite" operation

* 4" actual, mod since drawing.

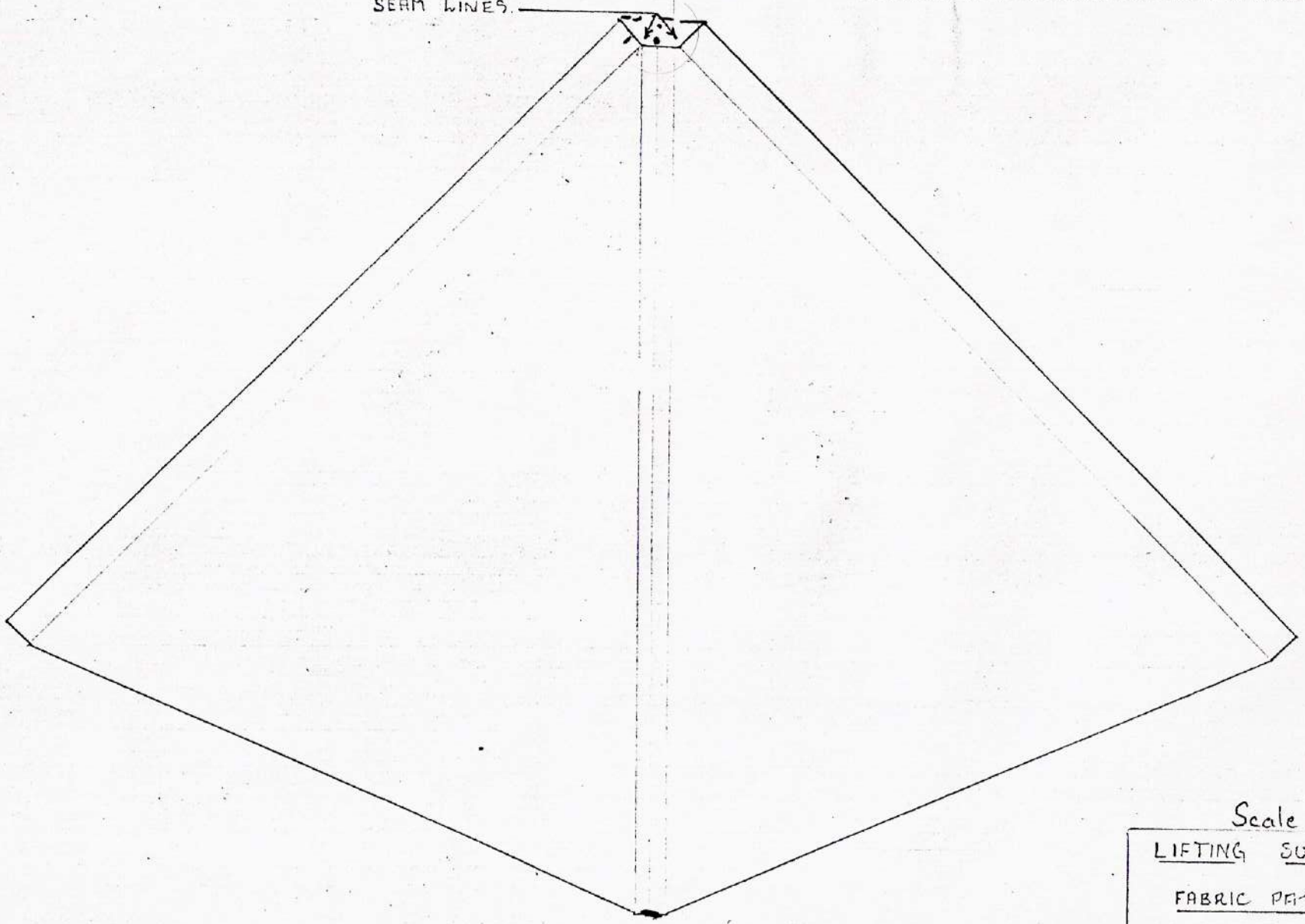
*3 8" with seat at rest against w' bar.



Scale $\frac{1}{2}" = 1'$

BASIC "FLAT PATTERN"

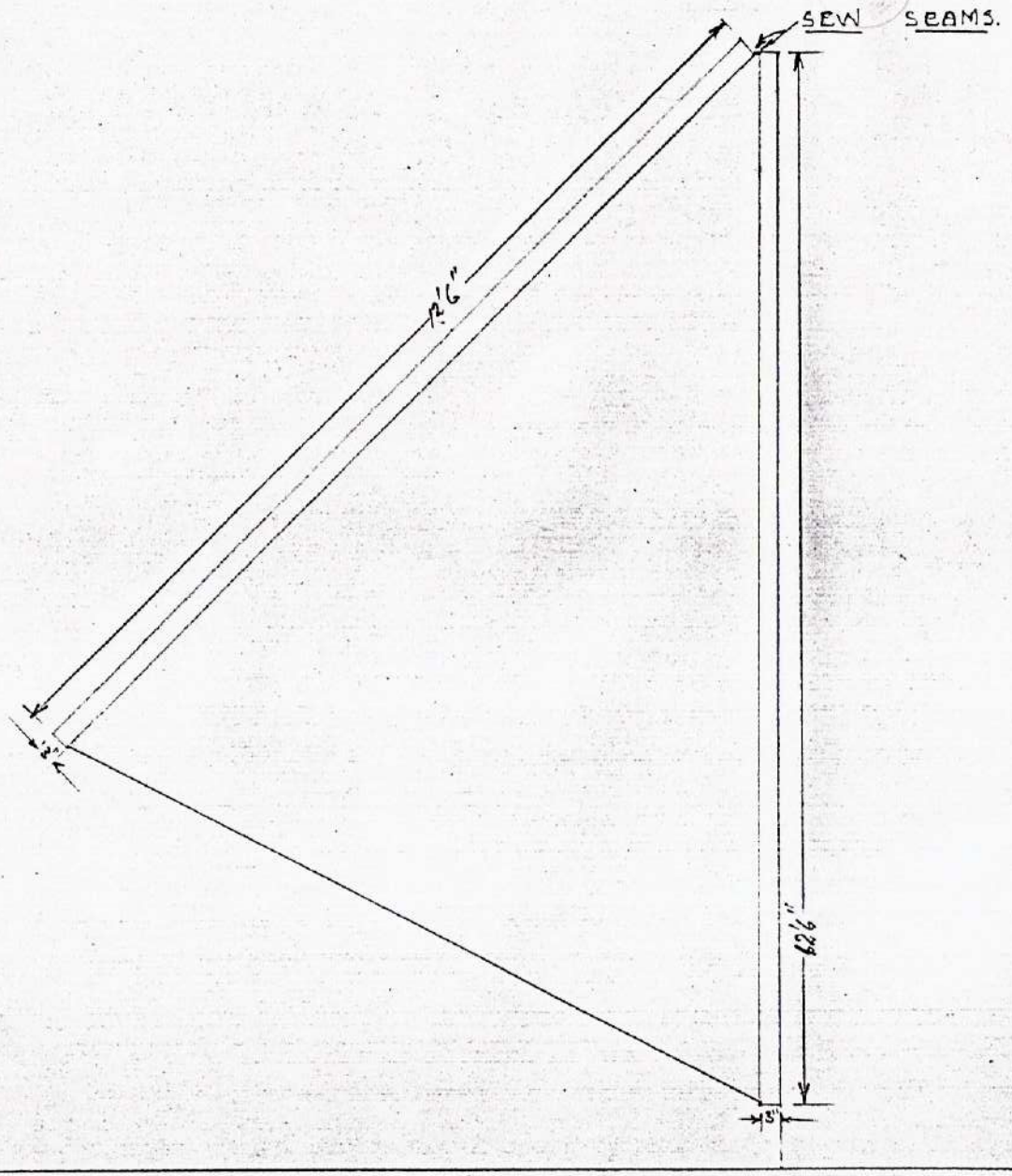
LIFTING SURFACES



Scale ½" = 1 FT.

LIFTING SURFACE

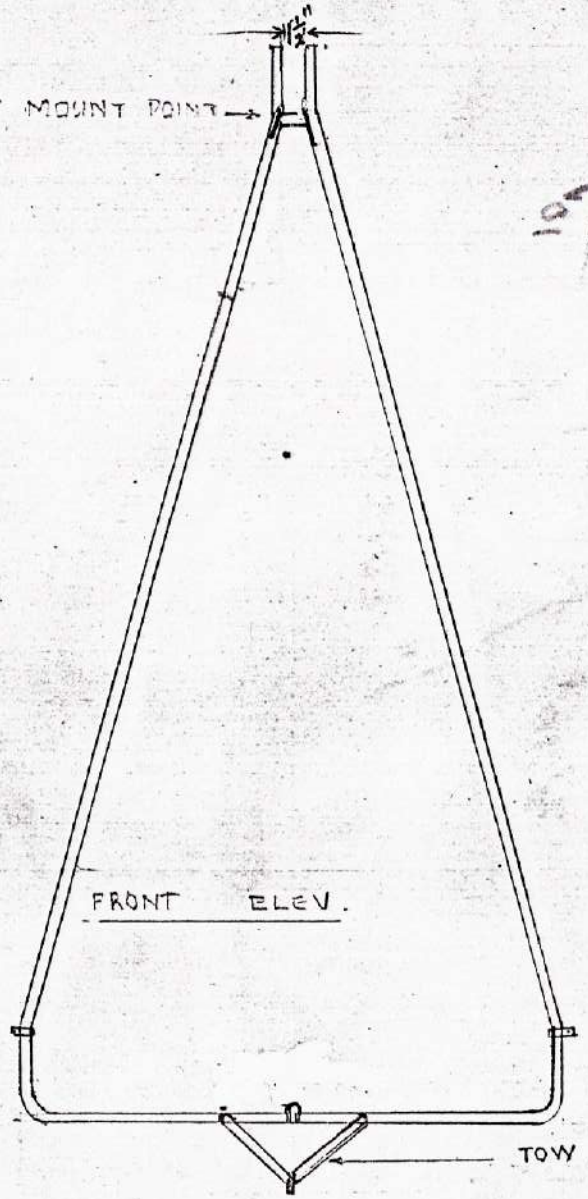
FABRIC PATTERN CUT.



Scale $\frac{1}{2}$" = 1'

LIFTING SURFACE
SEAM DETAIL.

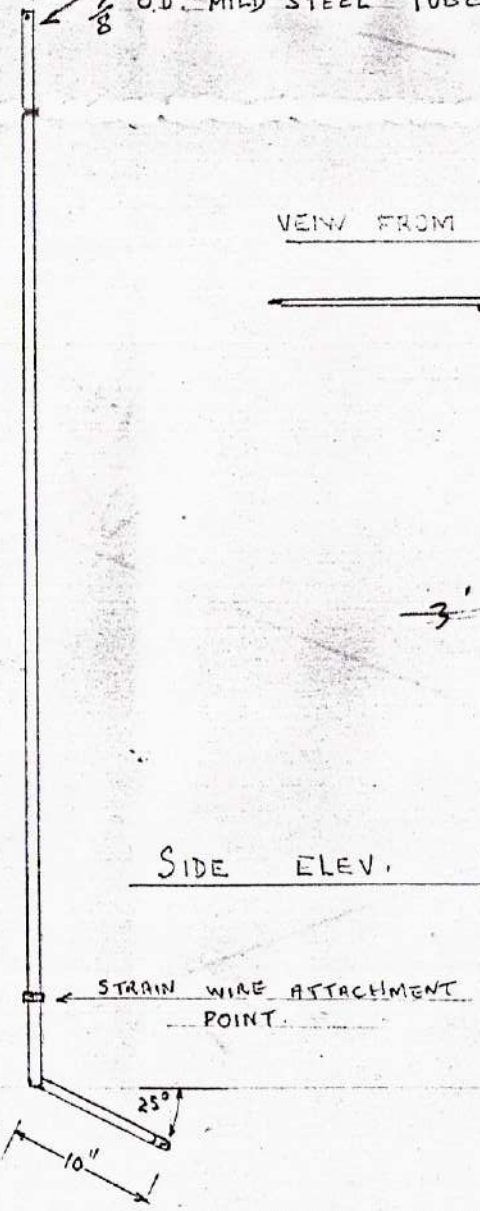
⑥



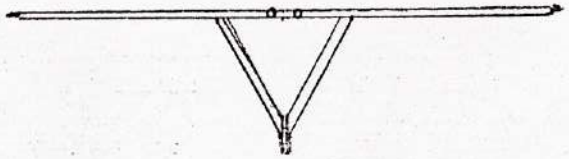
4"

3'6"

6"



VIEW FROM ABOVE.

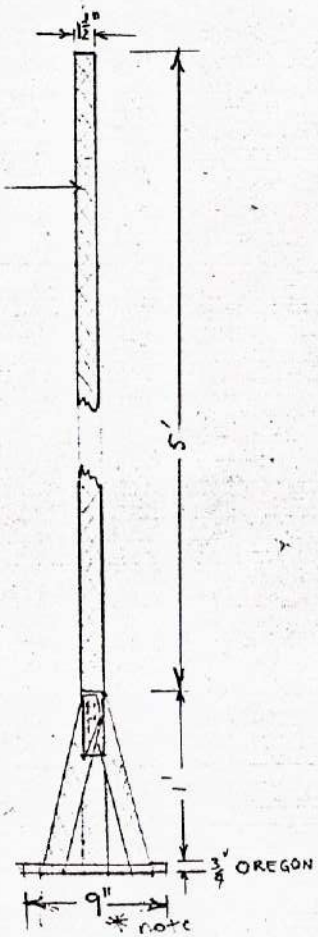


3' 4½"

3/8" = 1'

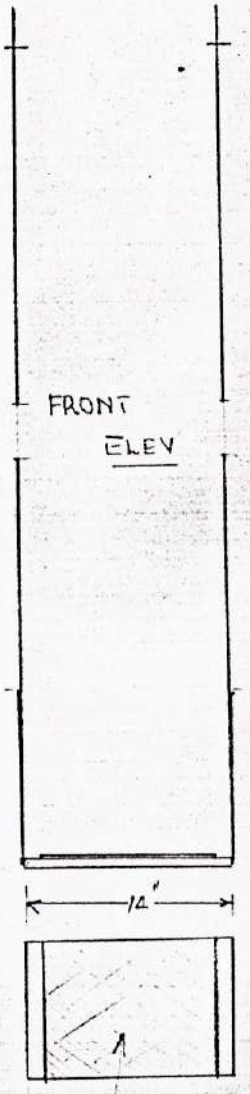
HANDEL/TOW BAR.

AND SEAT ATTACH POINT



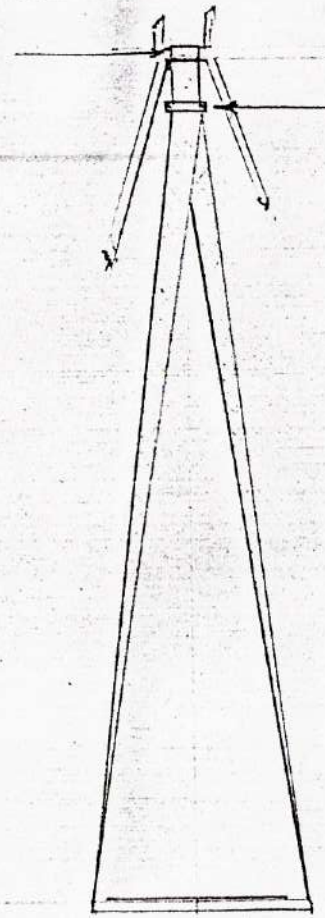
SIDE ELEV

VEIWED FROM BELOW.



FRONT ELEV

VEIWED FROM ABOVE



* note. dependant on pilot size.

Scale 1" = 1'

HARNESS / SEAT

AND ATTACHMENT PRINCIPLE.

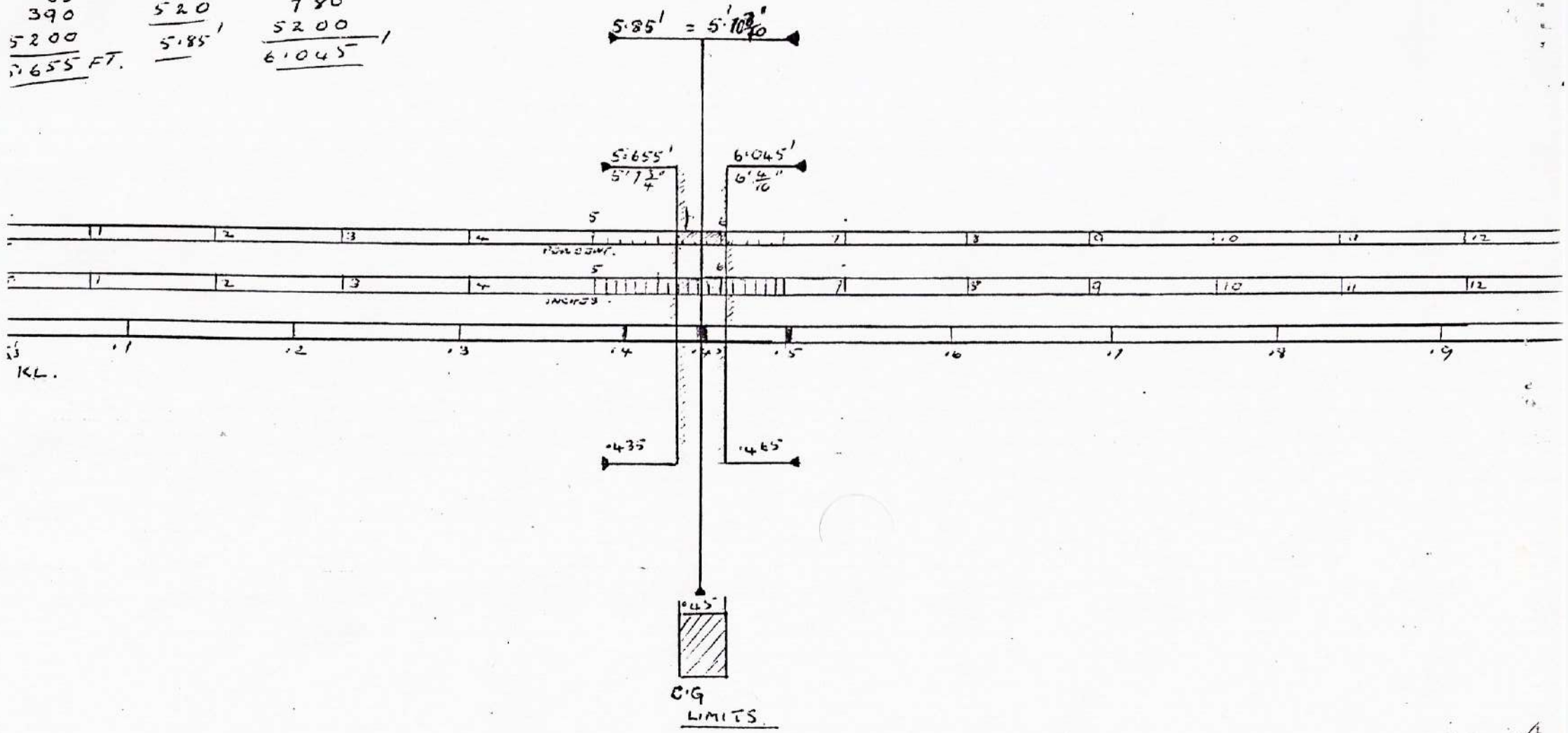
HARNESS GLUED TO SEAT

ROUGH NON SLIP SURFACE. GLUED IN PLACE.

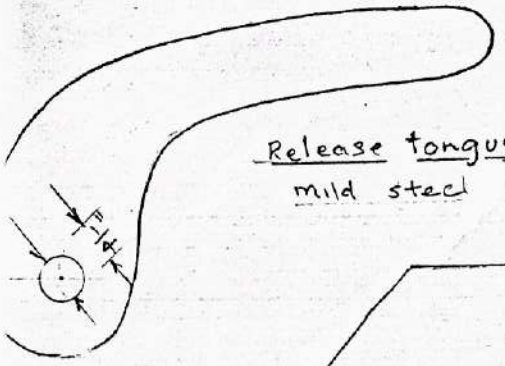
13
·435 X
65
390
5200
5·655 FT.

13
·45 X
65
520
5·85'

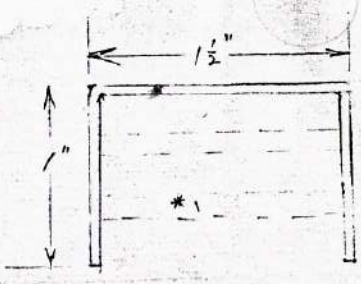
13
·465
65
780
5200
6·045 /

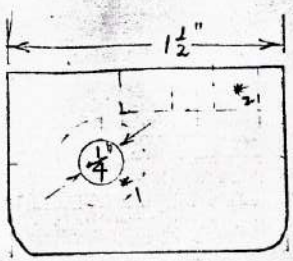


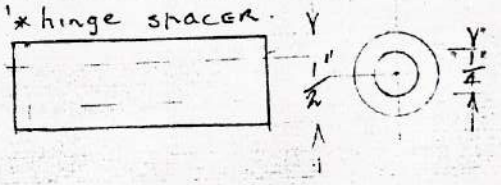
I have tried to keep within these limits. The seat mounting falls about 5'10½"



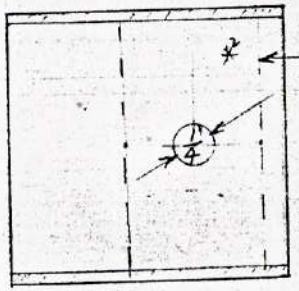
Release tongue $\frac{1}{8}$" thick mild steel plate.





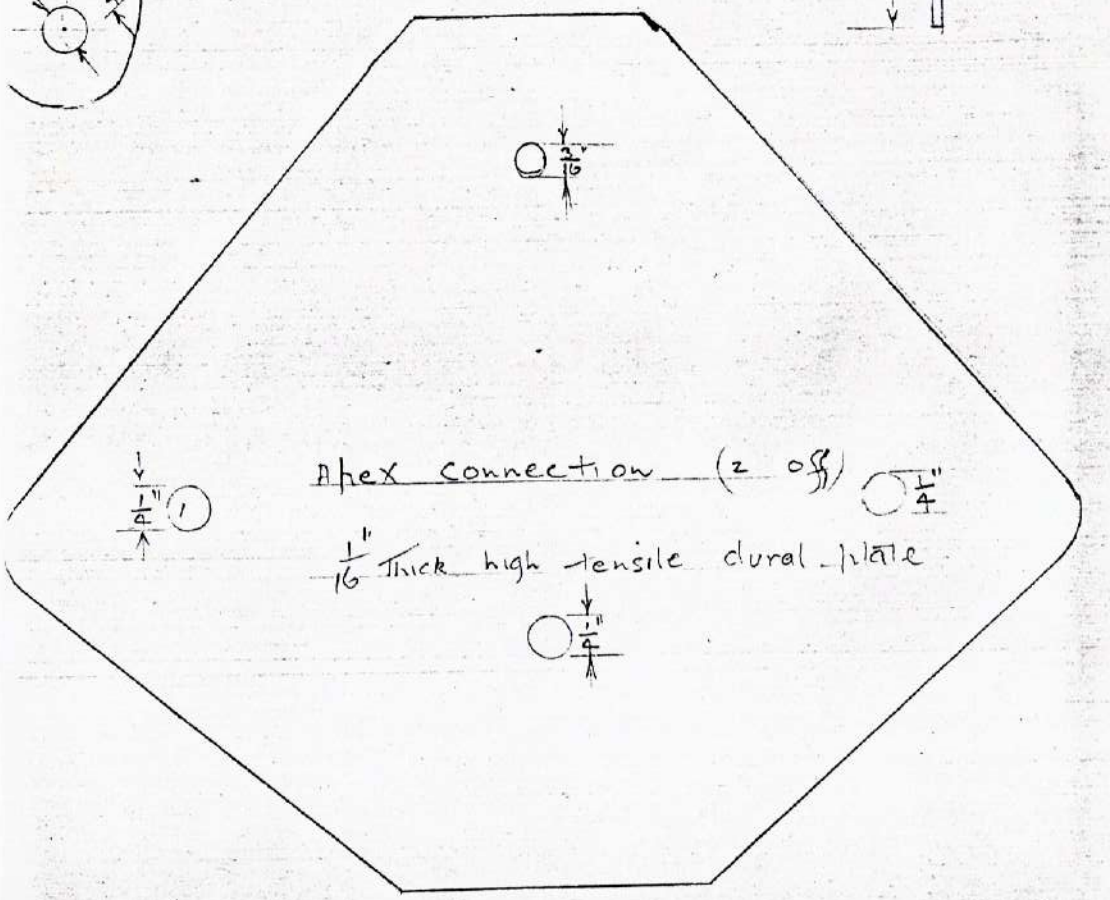


"U. bracket" handel bar mount and hinge.

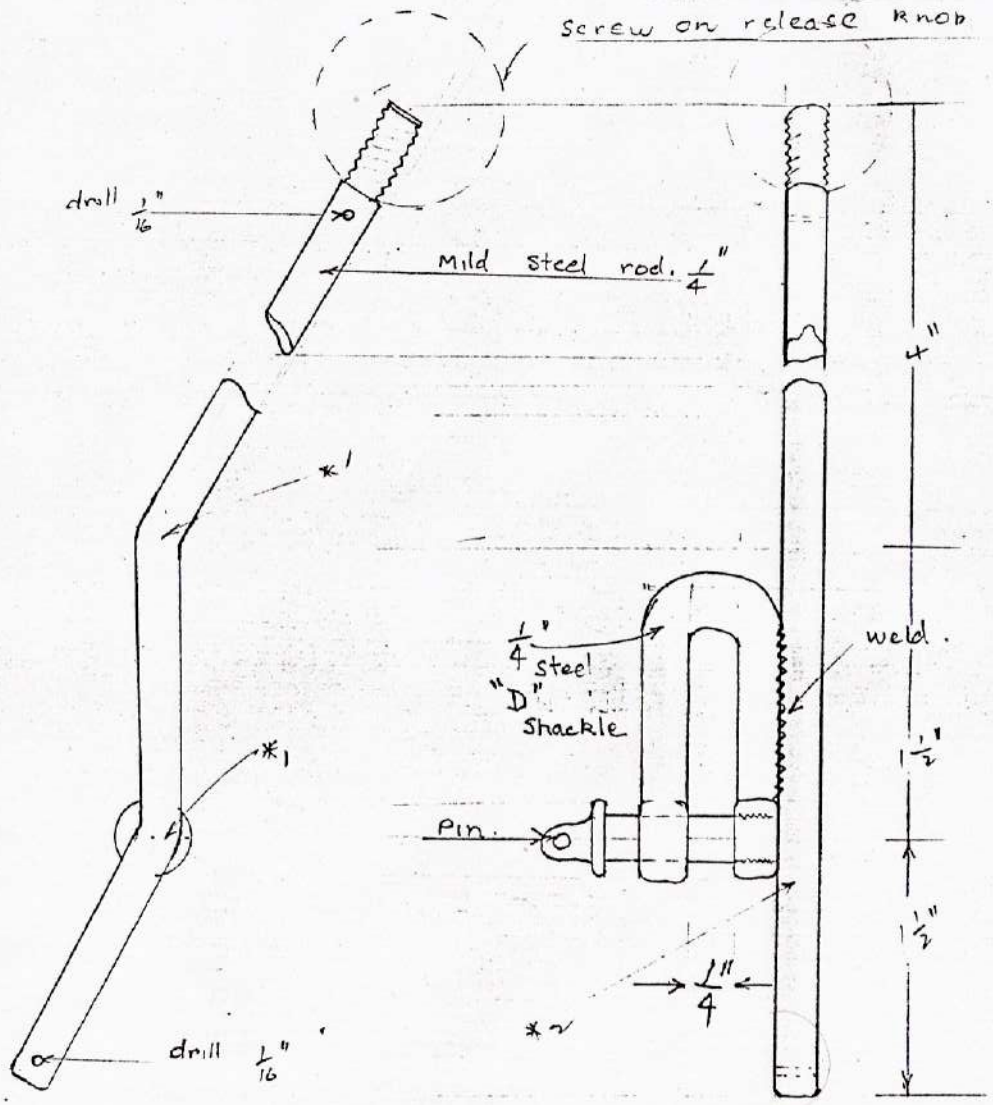


*2. bracket stiffening $\frac{1}{4}$" dural plate

hinge $\frac{1}{16}$" MILD STEEL PLATE.



ACTUAL SIZE.



RELEASE LEVER.

*1 bend to adjust.

*2 bend outwards to clear bolts.