SLINGSBY T65C

SPORTS VEGA MANUAL

BGA 2716
1947

This manual complies with British Civil Airworthiness Requirements Chapter A6-2 and A6-7, the technical content of this manual has been verified and certified correct.

Signed ....

R. Sanders
Chief Designer

Date: 5TH MARCH '80

C.A.A. Approval No. DAI/2243/46

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1. FLIGHT MANUAL

1.1 INTRODUCTION

Sports Vega is the name given to the type T65C glider designed by Slingsby Engineering Limited.

The Sports Vega has been developed from and retains the appeal and excellent handling characteristics of the type T65A 15 metre high performance Vega glider. It has been designed to meet the needs of a regular club aircraft.

Sports Vega includes the following design features:-

1. Glass fibre main spar giving a smooth ride in the air.
2. Carbon fibre tailplane spar.
3. An easy to operate and effective one piece trailing edge airbrake, which may be operated up to Vne and is speed limiting in a vertical dive.
4. Forward hinging canopy allowing easy access to instruments with gas strut retention in the open position. "Top Dead Centre" canopy catch easily operated from outside and an Instrument panel which is easily removeable.
5. Sprung mainwheel for rough field operation.
6. Single tow hook position for Aero tow and winch launch suitably faired into the fuselage.
7. Wing tip wheels incorporated in aerodynamically designed "Turn Down" wing tips.
8. Automatic coupling of all control circuits when the sailplane is rigged. Only two rigging pins, one for the wing, one for the tailplane, to be inserted on rigging.
9. Wide range of cockpit loads.
10. Roomy cockpit with basic flying controls all at hand, wide range of seat back adjustment; headrest adjustment and rudder pedal adjustment.

11. Accessory tray above the wing spar junction.

12. Fitted total energy tube.

13. Positive stability but retaining light stick loads.

14. Effective trim system throughout the CG and flight range.

15. Dipole VHF aerial installed in fin with co-axial cable to the instrument panel.

1.2 GENERAL DATA

1.2.1 Schedule of Equipment

The Sports Vega consists of:

Port wing

Starboard wing

Tailplane

Fuselage

Wing attachment pin

Tailplane attachment pin

Tailplane locking pin

Rigging tool

Seat back and headrest) These items optional
) for flight
Accessory tray)

Instrumentation Required

All instruments to be aircraft approved.

For USA they should preferably comply with TSO C10B and TSO C2.

Minimum for clear weather flying

Air Speed Indicator 30 - 160 kts
Marked in accordance with Section 1.5.2*

Altimeter

Minimum for cloud flying

As for clear weather plus:

Magnetic direction indicator

Turn and Bank indicator

Variometer

Minimum for aerobatics

As for clear weather plus:

Accelerometer

Recommended Instruments:

Altimeter:	Smith Mk.20A
Airspeed Indicator:	Winter 6FMS4
Accelerometer:	Kelvin & Hughes KB482/01
Turn & Bank Indicator:	Kelvin & Hughes 6A/3953/1
Variometer:	Winter STV5

Equivalent Instrument Characteristics

Instrument	Range	Tolerance (At 20° C)
Altimeter	0-35,000 ft. 0-10,000 m.	± 50ft. (0ft) ± 100 ft (5,000ft) ± 1% (10,000 - 35,000ft)
Airspeed Indicator	30 - 160 knots 55 - 300 km/h	± 2 knots ± 4 km/h
Accelerometer	- 4.5g + 12.0g	-
Turn and Bank Indicator	-	-
Winter Variometer	± 10 knots ± 19 km/h	± 10% (2,000-10,000ft) ± 15% (20,000-30,000ft)
Magnetic Direction Indicator	360 degrees	± 2%

1.2.2 Wing

The double taper plan form wing has skins of woven glass cloth - rigid acrylic foam sandwich construction. The main spars are of I-beam form with unidirectional glass fibre booms and woven glass cloth - rigid acrylic foam sandwich shear webs.

The trailing edge airbrake is of single skin woven glass cloth construction with internal ribs at actuation and hinge positions. When fully deployed the airbrake makes an angle of $44^\circ \pm \frac{1}{2}^\circ$ with the top surface of the wings.

The ailerons are of single skin woven glass cloth construction and are fitted with blinds when assembled to wings.

Sealed panels on the underside of wings provide access to controls, the outer panel for access to the aileron actuator, and the inner panel for the airbrake and aileron pushrod inspection.

1.2.3 Fuselage and Fin

The monocoque fuselage is of all GRP construction and is moulded integrally with the fin.

The sprung main undercarriage, with integral expanding brake shoes, and fixed tailwheel are fully faired in to the fuselage.

The single tow hook is suitably placed with in the profile of the main undercarriage fairing and is suitable for either aero tow or winch launch.

The cockpit has a one piece jettisonable canopy fitted with a sliding window. An anti-glare shroud is fitted over the forward cockpit area and the whole assembly hinges forward with gas strut retention in the open position, giving easy access to the instruments and rudder pedal assembly. The seat back, headrest and rudder pedals are fully adjustable.

1.2.4 Tailplane and Elevator

The 'T' tailplane is of GRP - rigid acrylic foam sandwich construction with carbon fibre reinforced main spar booms and tang assembly. The tailplane tang locates in a rib inside the fin and the tailplane itself is locked in position with a single pin, locating fore and aft.

The one piece elevator is of single skin GRP construction and couples automatically on rigging.

1.2.5 Rudder

The rudder is also of GRP - rigid acrylic foam sandwich construction.

1.2.6 Colour

The sailplane is painted white to keep the surface temperature to a minimum. Under no circumstances should the general colour of the sailplane be changed. Certain areas of the sailplane may be painted in different colours to assist in collision avoidance. These are Wing tips inboard for 50 cms: Fuselage nose (forward portion of canopy): Fuselage side local to cockpit sill and main undercarriage fairing, it is acceptable to part colour the rudder but dark colours are forbidden.

1.3 GEOMETRIC DATA

1.3.1 Wing

Area	10.05	m^2	108.12	ft^2
Span	15.00	m	49.20	ft
Aspect ratio	22.40			
Standard mean chord	0.67	m	2.20	ft
Root chord	0.846	m	2.77	ft
60% span chord	0.680	m	2.23	ft
Tip chord	0.360	m	1.18	ft
Aerofoil	Modified Wortmann FX 67-K-150			
Incidence	$0^\circ\ 30'$		$+0^\circ\ 20'$ / $-0^\circ\ 20'$	
Dihedral	$2^\circ\ 30'$		$+0^\circ\ 10'$ / $-0^\circ\ 10'$	
Aileron area	0.262	m^2	2.82	ft^2
Aileron chord/wing chord	0.17			
Aileron span	2.962	m	9.72	ft
Aileron root chord	0.1153	m	0.38	ft
Aileron tip chord	0.0617	m	0.202	ft
Airbrake type	Trailing edge			
Airbrake hinge line	83%			
Airbrake span	4.0606	m	13.32	ft
Total effective area	1.22	m^2	13.13	ft^2

1.3.2 Tailplane and Elevator

Gross area	1.161 m^2	12.50 ft^2
Span	2.50 m	8.20 ft
Aspect ratio	5.38	
Elevator chord/tailplane chord	0.20	
Elevator area	0.232 m^2	2.50 ft^2
Section $^t/c$	0.15	
Type of elevator	Round nose - no balance	
Mass balance	No	

1.3.3 Fin and Rudder

Gross area	1.059 m^2	11.40 ft^2
Span	1.369 m	4.49 ft
Aspect ratio	1.78	
Rudder chord/fin chord	0.30	
Rudder area	0.314 m^2	3.38 ft^2
Section $^t/c$	0.15	
Type of rudder	Round nose - no balance	
Mass balance	No	

1.3.4 Fuselage

Length excluding rudder	6.430 m	21.10 ft
inclusive rudder	6.720 m	22.05 ft
Max. depth inclusive main u/c in flight attitude	1.4 m	4.59 ft
Max. width	0.698 m	2.29 ft
Max. sectional area	0.46 m^2	4.94 ft^2
Wetted area	8.7 m^2	93.6 ft^2

1.3.5 Undercarriage

Dimension: Mainwheel to Tailwheel (with a/c at rest)	4.168 m	13.67 ft
Mainwheel	5.00 - 5 type III	
	Tyre pressure: 35 - 40 psi	
Tailwheel	210 x 65	
	Tyre pressure: 23 - 26 psi	

1.3.6 Weights

Max. A.U.W.	354 kg	780 lb
Typical empty weight	238.2 kg	525 lb

1.4 PILOTS NOTES

1.4.1 Introduction

The Sports Vega is a high performance club sailplane with a 15 metre wing span. The basic structure of the aircraft is glass and carbon reinforced plastic, metal only being used for fittings and controls. The core material used in the various GRP sandwich structures is a rigid acrylic foam.

The external surface finish of the aircraft is acrylic and is achieved in three stages:-

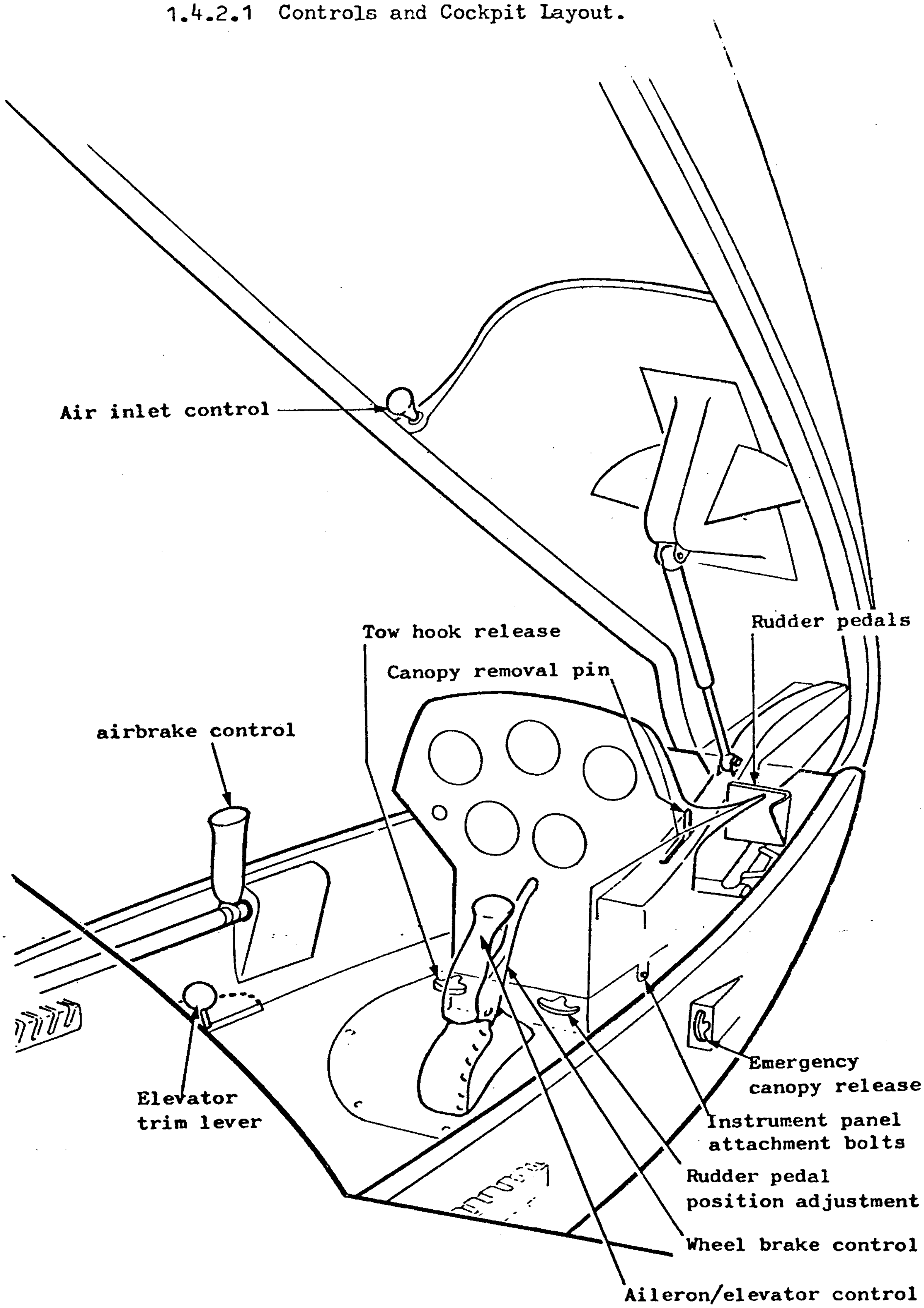
(1) Single coat of white polyester gel coat applied in the moulding process of the components.

(2) An epoxy primer paint applied after 'Final Assembly'.

(3) A white acrylic final coat.

The flight handling characteristics of Sports Vega are orthodox in most respects.

1.4.2.1 Controls and Cockpit Layout.



1.4.2 Controls and Cockpit

The controls are conventional in arrangement and are depicted overleaf.

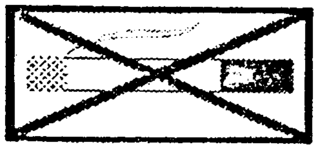
The trailing edge flap brakes are operated by a single control lever positioned on the port side of the cockpit held against the cockpit sill by a light spring until required for use. To deploy the airbrakes rotate the handle to a comfortable position and pull back. Airbrake loads are progressive with minimal suck out.

The elevator trimmer is a spring device mounted on the pushrod under the seat bucket and is controlled by a lever mounted on the port side of the cockpit. To adjust the trim the ratchet is disengaged by pulling the control knob away from the cockpit side and sliding it either forwards or backwards as required and re-engaging the ratchet.

The remaining controls are conventional and require no description.

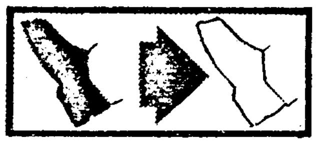
The seating position is variable by means of an adjustable seat back, headrest, and rudder pedals. The rudder pedals are adjustable in flight.

1.4.2.2 Cockpit Symbols.



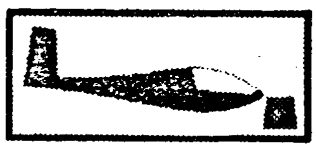
No smoking

Air vent control



Rudder pedal adjustment

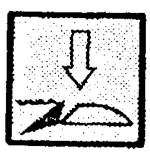
Trim, nose up



Trim, nose down

Tow release

Canopy jettison



Airbrake control movement

1.4.2.3 Typical Placards

WEIGHT SCHEDULE.

Aircraft type: T65C VEGA 15m
Constructors No.
Registration No.
The undermentioned items of equipment only are included in the empty weight:-

ASI	Seat Back
ALT	Head Rest
VARIO	Harness
T/SLIP	Side Panels
COMPASS	Acc Tray
ACCELEROMETER	Rigging Tool

The empty weight is ...525... lbs (...238... kgs).
The tare C.G. at this weight is ..22.83"... aft of the datum.
The datum is defined as the wing leading edge at the root and with the aircraft in the rigging position, i.e. fuselage datum pin horizontal.
The maximum permissable A.U.W. is ...780... lbs (...[illegible]... kgs).
The aircraft was weighed at Kirkbymoorside on ....14 [illegible] 19[illegible]....

....
Chief Inspector
Slingsby Engineering Limited

Date: ..14 JAN 1980..... Authority: DA1/2243/46.

SLINGSBY ENGINEERING LTD
T65C VEGA 15m
FLIGHT LIMITATIONS.

	Speed Vne
Normal flight	135 kts (250.2 km/h).
Airbrakes open	135 kts (250.2 km/h).
Rough air	106 kts (196.4 km/h).
Aero tow	100 kts (185.3 km/h).
Winch/auto	70 kts (129.7 km/h).
Weak link	1000 lbs (453.6 kgs).
Cloud flying TS fitted	YES.

Non aerobatic.
The following are the only manoeuvres permitted:-
Loops, spins, stall turns, chandelles, lazy eights and tight turns up to 3.5G

LOADING LIMITATIONS.

Constructors No.
Empty weight is ....525...... lbs (...237.8.... kgs).
Max. A.U.W. is .....780..... lbs (....[illegible].... kgs).
Weight and C.G. limits meet the loading as follows:-
Max. cockpit load is ....255...... lbs (...115.5... kgs).
Min. cockpit load is .....162..... lbs (...73.5.... kgs).
Ballast must be carried forward aft if cockpit load is less more than .....162..... lbs (....73.5..... kgs), but max. A.U.W. must not be exceeded.

1.4.3 Rigging the Sailplane

Rigging generally requires three people for ease, or two if fuselage and wing stands are employed.

Commence by having the fuselage held or trestled in a level position with aileron controls in neutral, the canopy open and accessory tray removed.

Take starboard wing and offer it onto the fuselage, holding aileron in neutral and the airbrake nearly closed.*
Accurately line up the fuselage rigging pins with their mating bearings in the wing root rib and check aileron and airbrake drives are correctly engaged before finally pushing the wing home.

Next take the port wing and offer up in the same manner. Care is required at this stage to visually line up all the pins and bearings and to check aileron and airbrake drives are coupling correctly before drawing the two wings together with the tool provided.

Next fit the single fixing pin through the tangs and rotate it until the handle locates in its retaining block.

As all the controls couple automatically when the wings are entered up to the fuselage it is now only necessary to carry out a function test on all the controls.

Slide the accessory tray onto the location spigots in the fuselage, securing in position by engaging the two spring loaded bolts at the forward end. If applicable connect any electrical plugs and the radio aerial.

* The ideal position for rigging is with the airbrake proud of the wing top surface by about 0.5 ins.

If the canopy has been removed replacement is carried out as follows:

Slide the canopy assembly spigots into their unibal housings in the forward cockpit lining and lower the front end to enable the forward hinges to come to rest in their GRP housings and, at the same time engaging the locking spigot at the front end. Having pushed the locking spigot fully forward, check the emergency canopy jettison control functions correctly and then re-lock the sliding spigot.

N.B. Under normal circumstances the canopy assembly will already be in position on the fuselage, in which case the assembly instructions given above should be ignored.

It is advisable to ensure that in winds in excess of 10 knots the canopy should be left closed when not essentially required to be open and also when left unattended.

Next take the tailplane and offer it up to the fin top ensuring the tailplane is correctly aligned relative to the fin. Check with progressive lowering into position that the elevator drive plate, spar tang and location spigots are coming together correctly. Push the tailplane right home and slide the assembly pin into position with the aid of the rigging tool. Rotate the pin until the hole in the pin lines up with its counterpart in the tailplane forward spigot; slide the locking clip into position and remove the rigging tool.

Check the elevator control circuit functions correctly.

In order to reduce drag and noise to a minimum it is advisable to seal the wing root/fuselage airbrake hinge line and tailplane/fin junction with 2 in. wide white PVC tape, as follows:-

Lay one layer of tape around the inboard end of the wing and another layer around the fuselage fairing. Lay a joining layer over these two layers thus sealing the wing/fuselage junction.

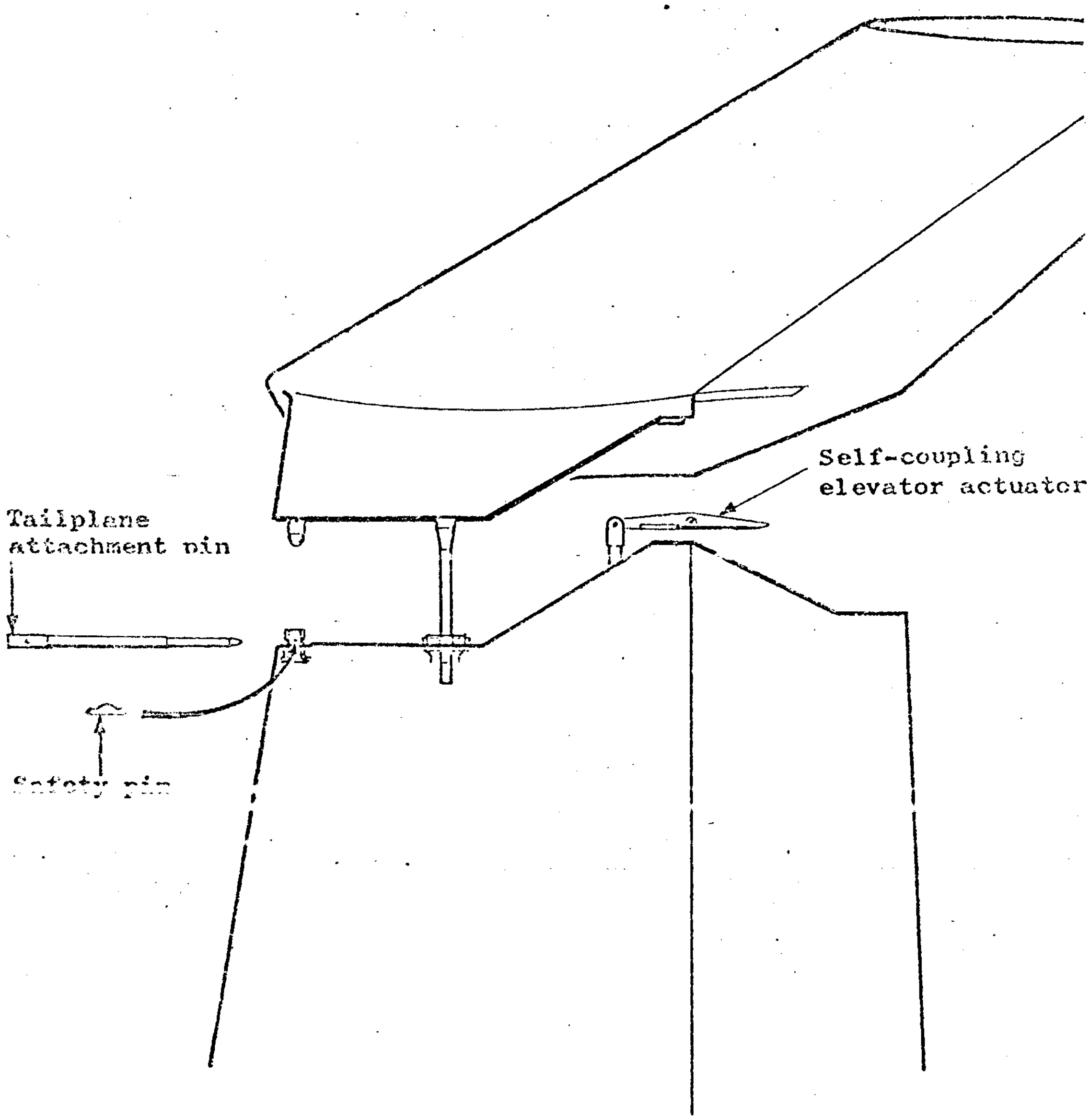
Tapes one and two should be left permanently in position on the wing/fuselage and only the joining layer peeled off/ replaced before de-rigging/rigging the sailplane.

This method of taping the junction prevents any possibility of peeling the Vega paintwork because the joining layer of tape does not come into contact with the paintwork. Extreme caution is necessary when removing the "permanent" tapes or the paint finish may be removed.

The tailplane/fin junction should be taped in a similar manner.

The rigging of the sailplane is now complete.

1.4.3 Tailplane Rigging



1.4.4 Pre-Flight Tests

Having prepared the glider in accordance with the rigging instructions, check the tailplane assembly pin is fully home and that the locking clip is in position. Check the wing rigging pin is in position and held by the lock provided.

Although all the controls are self coupling it is still necessary to check them for full and free movement and also to ensure that there is no free play in the circuits. The rudder cables should also be inspected for signs of fraying.

Level the wings and check the general symmetry of the rigging and the security of the wings and tailplane. Inspect all surfaces for damage .... dents, scratches, cracks, etc.

Before entering the cockpit, check the condition of the seat harness and the security of the anchor points. It is also advisable to ensure the perspex canopy is clean. This normal precaution is important with a canopy of such streamlined proportions if good forward vision is to be maintained. Inspect the seat cushion (if fitted), and adjust the seat back as necessary. Ensure that the seat cushion does not restrict access to the cable release knob. The seat back can be adjusted with the pilot in the cockpit but should the required position be known, it is easier to adjust before occupation of the seat. The seat back can be removed completely for the 'larger' pilot without loss of pilot comfort.

Having entered the cockpit and strapped in (strapping in before carrying out the cockpit check ensures that everything can be reached comfortably) the cockpit check can be carried out.

The tug pilot or winch driver should be briefed to avoid jerking the glider at the beginning of the "take off" run to avoid the glider over-running the launch cable.

Cockpit check prior to take off

B	-	Airbrakes	full, free and correct movement.
C	-	Controls	full, free and correct movement.
B	-	Ballast	in placarded limits.
S	-	Straps	secure and comfortable.
I	-	Instruments	checked and set as required.
T	-	Trim	checked and set as required.*
C	-	Canopy	closed and locked by pulling the catch forwards and upwards (an audible click is confirmation of locking).

* The normal position is just forward of neutral (1 - 2 cm).

In addition to the normal cockpit check the following adjustments may be made.

Adjust the sliding vent in the canopy as required.

Check the operation of the canopy demister control and set as required for take-off.

Adjust the rudder pedals as required, by pulling the rudder release and allowing the rudder bar to adjust itself afterwards or press forwards with the feet to the desired position. Release the control handle and ensure the catch is fully engaged, by tapping the pedals lightly with the feet. Note the rudder pedals can only be adjusted symmetrically.

Engage the tow rope and check the operation of the release against a firm pull. Re-engage the rope and check for security.

The aircraft is now ready for 'take off'.

1.4.5 Aero Tow

Ensure the glider is lined up accurately with the intended direction of take-off to obviate the necessity for any early corrections. Hold the control column firmly back to keep the tailwheel in positive contact with the ground. This assists greatly in keeping Sport Vega straight in the first part of the run.

As the speed increases the stick should be eased forward to lift the tailplane at about 25 knots. Elevator and rudder controls are then effective. At about 40 knots the Sports Vega may be eased off the ground.

Sport Vega is stable on the tow and easily controlled. The trim may be adjusted to trim out any elevator control forces.

Towing at a speed of 65 knots, the glider is comfortable and can be effectively trimmed. The minimum recommended speed for towing is 50 knots and for ferry flights speeds up to 100 knots are permissible.

Release from the tug is effected by pulling the cable release and no change of trim occurs.

1.4.6 Winch Launch

The aircraft behaves quite normally on a winch launch. A slight push force required on the control column at 'unstick' changing to neutral stick forces during the climb and then to a slight pull force just before release.

Normal crosswinds experienced in winch launching present no problems as the aileron and rudder control remains good throughout the launch.

The minimum recommended launch speed is 55 knots but the speed of 60-65 knots is suggested as an ideal control speed, although at the maximum permitted launch speed of 70 knots control remains good. The controls being light and positive throughout with no signs of instability during the launch.

1.4.7 Stalling

In all configurations the glider stalls in a completely vice-free manner. Reducing the speed at a rate of one knot per second you are gently warned of the approach of the stall by a slight buffeting. This commencing approximately two knots before the stall occurs.

At the stall in balanced flight, the glider 'nods', lowering the nose and the wings remain level. The ailerons and rudder remain effective throughout and even coarse use of ailerons does not usually cause a wing to drop. In the event of a wing drop gentle use of the rudder effects immediate recovery.

With the C. of G. fully forward it is difficult to get the glider to remain stalled. But under normal C. of G. conditions with the control column held firmly back the Vega sinks slowly down, still laterally and directionally controllable, until the back pressure is eased to allow the aircraft to accelerate; the stall symptoms immediately disappear.

Standard stall recovery will effect a recovery with a height loss of between 15 and 20 feet.

1.4.8 Stalling in the Turn

Once again there is little or no tendency to drop a wing and in fact reducing the speed at the required one knot per second, it is difficult to get the aircraft to stall. The Sport Vega just wallows round the turn with the speed oscillating between 35 - 40 knots. Recovery is effected by the easing of the backward pressure on the control column and allowing the nose of the glider to depress slightly in order to accelerate to the desired flying speed clear of the stalling range. The ailerons show a reduction in the force required to operate them at large deflections and low speed.

With the C. of G. fully forward it is more difficult to get the aircraft to stall in the turn by slow reduction of speed.

The stalling speeds, as recorded during flight testing, are as follows:-

(i) Straight Flight

	Knots - I.A.S.	Km/h - I.A.S.
Buffet	38	70
Stall	36	67

(ii) Turning Flight

	Knots - I.A.S.	Km/h - I.A.S.
Buffet	39	72
Stall	38	70

1.4.9 Spinning

This glider cannot be made to execute a sustained spin and must be positively encouraged to under take initial stages of spinning. The entry when attempting spinning in the orthodox manner with ailerons neutral is gentle. Even with the C. of G. extended aft, it is difficult to achieve more than three quarters of a turn of a fully developed spin.

The aircraft rolls into the spin but the nose drops very positively and the speed builds up rapidly. The spin rotation converts to a spiral dive with associated accelerations and it is necessary to move the control column forward to prevent excessive 'pitch up'.

Unless recovery is taken promptly, this spiral dive could cause undesirable accelerations. Therefore it is suggested that familiarisation with the aircraft's spinning characteristics is useful, but to carry out spinning with the subsequent spiral dive for no specific reason can serve no useful purpose and can only subject the glider to unnecessary 'positive and rolling' g forces.

Entry into a spin with ailerons opposing the spin creates a very slow entry with yawing. The spin progresses similarly to the 'ailerons neutral' situation.

With 'pro-spin' aileron, the sequence of events is similar to the 'ailerons neutral' situation but speeded up in a very positive manner and should only be practised with great care.

Recovery from the initial stage of the spin in any of these configurations is orthodox and rapid: if the spin configuration is held until the glider has entered a spiral dive then recovery takes considerably more height and care has to be taken not to exceed the speed and loading limitations of the aircraft.

1.4.10 Approach and Landing

The effectiveness of the airbrake and its ease of operation coupled with the absence of any 'change of attitude or trim', makes it an ideal approach control. Progressive forces are required for operation of the airbrakes giving a good feel to the control.

Approaches have been made down to 45 knots but 50 to 52 knots should be considered the normal approach speed. A slightly faster approach is desirable in gusty conditions.

Aileron control remains good throughout the approach to touch down.

Elevator control during the 'round out' is positive and accurate, making it possible to carry out a very smooth 'flare' and consequent reduction of residual height to ground level.

Landing with the C. of G. fully forward particularly in gusty conditions, should be carried out with extra care and speed.

1.4.11 Emergency Procedures

These can be divided into three distinct possibilities:-

(i) In Flight:- In the event of having to abandon the glider in flight the safety harness should be removed and the canopy emergency release handle pulled. The canopy will then automatically remove itself from the cockpit leaving the pilot free to bale or roll out of the cockpit.

(ii) Ground Looping the Glider:- This action may be necessary when it is not possible to stop the glider, by conventional means, in the distance required to prevent a more serious accident occurring. It is accepted that considerable damage may be done to the glider in a ground loop. The ground loop is effected by pitching a wing tip into the ground and applying rudder to turn the aircraft towards the drooped tip. This is only really effective if the tail is still just flying, refer 1.4.13.4 for inspection procedure following a ground loop.

1.4.12 Aerobatics

The Sport Vega is basically non-aerobatic but the following aerobatic manoeuvres are permitted up to 3.5 G.

Loops, spins, stall turns, chandelles, lazy eights and tight turns.

The recommended entry speeds for the manoeuvres are as follows:-

Loops	100 knots
Stall turns	90 knots
Lazy eights	100 knots
Chandelles	not applicable
Spins	not applicable
Tight turns	not applicable

1.4.13 Abnormal Landing Check Procedures

The following inspections must be carried out before further flights are attempted.

1.4.13.1 Check Procedure Following A Landing With The Wheel Brake On

(i) Check wheel for freedom of rotation.

(ii) Apply handbrake, check for brake effectiveness and excessive travel, adjust as necessary.

(iii) Examine mainwheel tyre for excessive creep, flats, bulges, cuts and pressure loss.

1.4.13.2 Check Procedure Following A Landing With Excessive Drift

(i) Visually check the alignment of the mainwheel and tailwheel, if they are obviously distorted investigate further.

(ii) Examine both tyres for creep, flats, bulges, cuts and pressure loss.

1.4.13.3 Check Procedure Following A Landing On Excessively Rough Ground, And Also A Heavy Landing On Main, Tail Or Both Wheels.

(i) Visually check mainwheel tailwheel alignment.

(ii) Remove mainwheel fairing.

(iii) Visually check main undercarriage unit for distortion, buckled or fractured members (investigate paint cracks at welded tube junctions) and that wheel is free to rotate.

(iv) Rubber spring support box, examine for signs of delamination especially along forward sloping edges.

1.4.13.3 (v) Physically attempt to move main undercarriage unit sideways, and inspect wheelbox structure around forward undercarriage security/swivel points.

(vi) Examine both tyres for flats, bulges, cuts or pressure loss.

(vii) Check tailwheel is free to rotate, investigate further, any cracks that appear to be deeper than the gel coat in the tailwheel fairing, especially around the axle.

1.4.13.4 <u>Check Procedure Following A Ground Loop</u>

(i) Check procedure as 1.4.13.3 plus the following.

(ii) Remove tailplane, inspect rigging pin.

(iii) Inspect tailplane in centre portion for cracks, examine bush in tang for security and tang side edges for signs of delamination.

(iv) Examine fin at tailplane mounting points, and tang location rib within the fin, check externally each side at this point for skin damage. At base of fin, leading edge to fuselage junction especially, look for surface cracks.

(v) Tail ballast if fitted, remove rudder and check tail ballast is secure and surrounding structure sound.

(vi) Remove wings, inspect rigging pin.

(vii) Port wing, inspect the following:-
forward wing pick up bearing/housing, aft wing pickup bearing/housing, starboard wing tang pick up bearing/housing, rigging pin bush and surrounding structure.

(viii) Check airbrake and aileron hinges for signs of strain, especially if a severe backward load was known to have been imposed at the wing tip.

1.4.13.4 (ix) With airbrake open examine rear spar, on sloping face inboard portion, for any signs of creasing or delamination.

(x) View upper and lower wing surfaces in an oblique light and look for skin damage particularly at airbrake to aileron junction, and the initial 500mm (20") of wing from root end.

(xi) Repeat for starboard wing.

(xii) Fuselage rigging bars, check security of bushes (four places) and soundness of surrounding structure.

(xiii) Lap harness, check security to seat pan (single screw location on aircraft centreline) look also for signs of delamination or fracture at webbing point exit through seat pan (two places).

(xiv) Check forward edge junction of seat pan to forward cockpit lining.

(xv) Inspect canopy attachment beam member and associated structure for signs of strain, close and lock canopy, visually check frame to fuselage alignment.

1.4.14 Oxygen Control System if Fitted

Never use oil or grease on any part of the oxygen system. Ensure strict cleanliness is observed at all times around all oxygen components especially when connecting mask supply line to regulator bayonet connection.

1.4.14.1 Standard in Flight Oxygen Operation

With regulator on/off knob in off position set cylinder valve open and ensure that the gauge shows an adequate supply of oxygen is available for the intended flight.

Connect oxygen mask supply line to regulator bayonet connection in anticipation of use.

When oxygen is needed turn on/off knob to "on" and select required flow rate by rotating regulator body flow selector fully to its click stop position at either 2 or 4 litres flow per minute.

Turn on/off knob to "off" when the flow is no longer required.

On vacating aircraft close cylinder valve, open regulator on/off knob to bleed system and close on/off knob when gauge registers empty.

Use firm hand pressure only when operating regulator valve mechanism.

1.4.14.2 Servicing

In the event of servicing requirement or malfunction do not tamper with regulator but return to Slingsby Engineering Ltd.

1.5 OPERATING LIMITATIONS - T.65C

1.5.1 Weights

Max. take off weight 780 lb

C.G. range is 9.25 ins to 13.26 ins aft of datum where the datum is defined as the wing root leading edge with the fuselage datum points horizontal.

Each aircraft carries a weight schedule and loading limitations placard.

Any equipment changes must be recorded on the placard and new loading information computed in accordance with Section 1.6

1.5.2 Speeds

Normal flight	*	41 - 135 knots	(76-250 km/h)
Max. rough air speed	*	106 knots	(197 km/h)
Max. aero tow speed		100 knots	(185 km/h)
Max. winch launching speed		70 knots	(130 km/h)
Max. speed airbrakes open		135 knots	(250 km/h)
Normal operating range	*	48 - 106 knots	(89-197 km/h)
Lowest recommended approach speed	*	48 knots	(89 km/h)
Weak Link		1000 lb	

Cloud flying provided turn and slip, variometer and magnetic direction indicator are fitted.

Non Aerobatic

The following aerobatic manoeuvres <u>only</u> are permitted

Loops, Spins, Stall Turns, Chandelles,

Lazy Eights and Tight Turns up to 3.5 G

* 135 knots denoted by a radial red line on the airspeed indicator

106-135 knots denoted by a yellow arc on the airspeed indicator

41-135 knots denoted by a white arc on the airspeed indicator

48-106 knots denoted by a green arc on the airspeed indicator

48 knots denoted by a yellow triangle on the airspeed indicator

1.5.3 Pitot Static Error

The pitot static error is insignificant throughout the speed range with a maximum reading error of 2 knots below the actual air speed value.

1.6 WEIGHING SCHEDULE AND COCKPIT LOADS

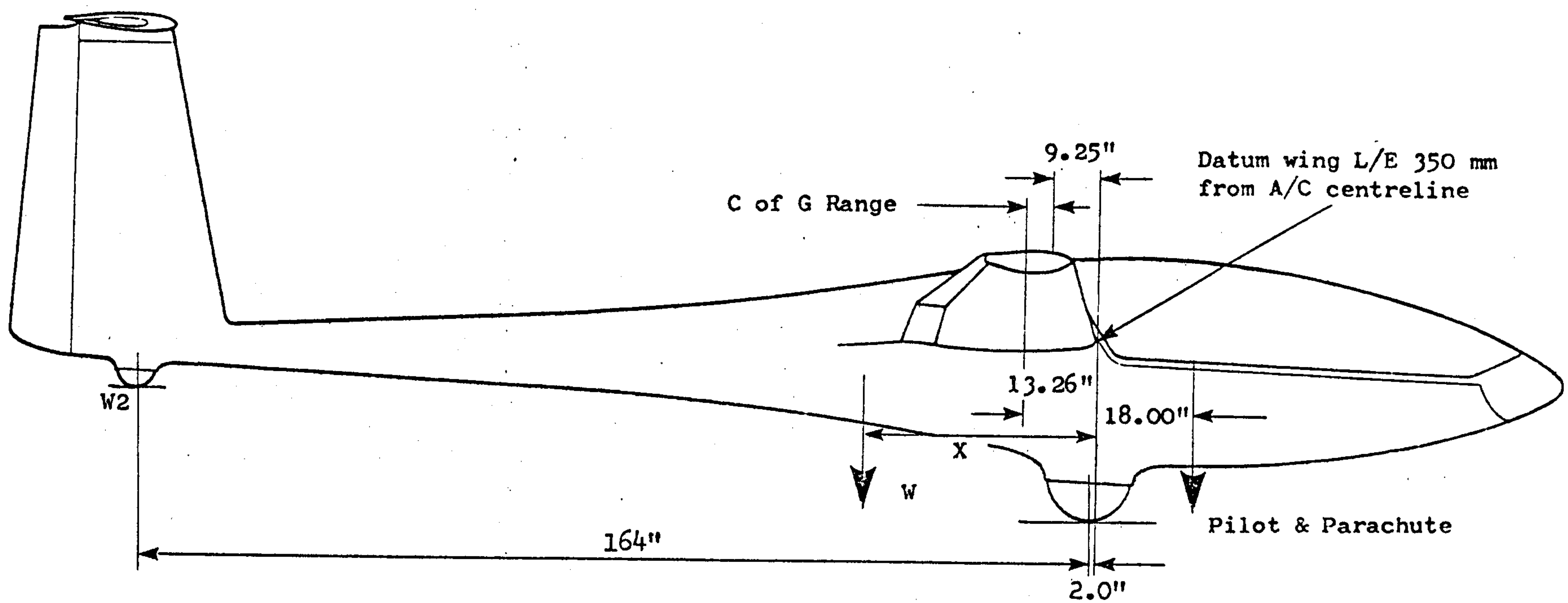
1. The aircraft must be in the rigging position with the fuselage datum points horizontal

2. Empty weight: $W = W1 + W2$

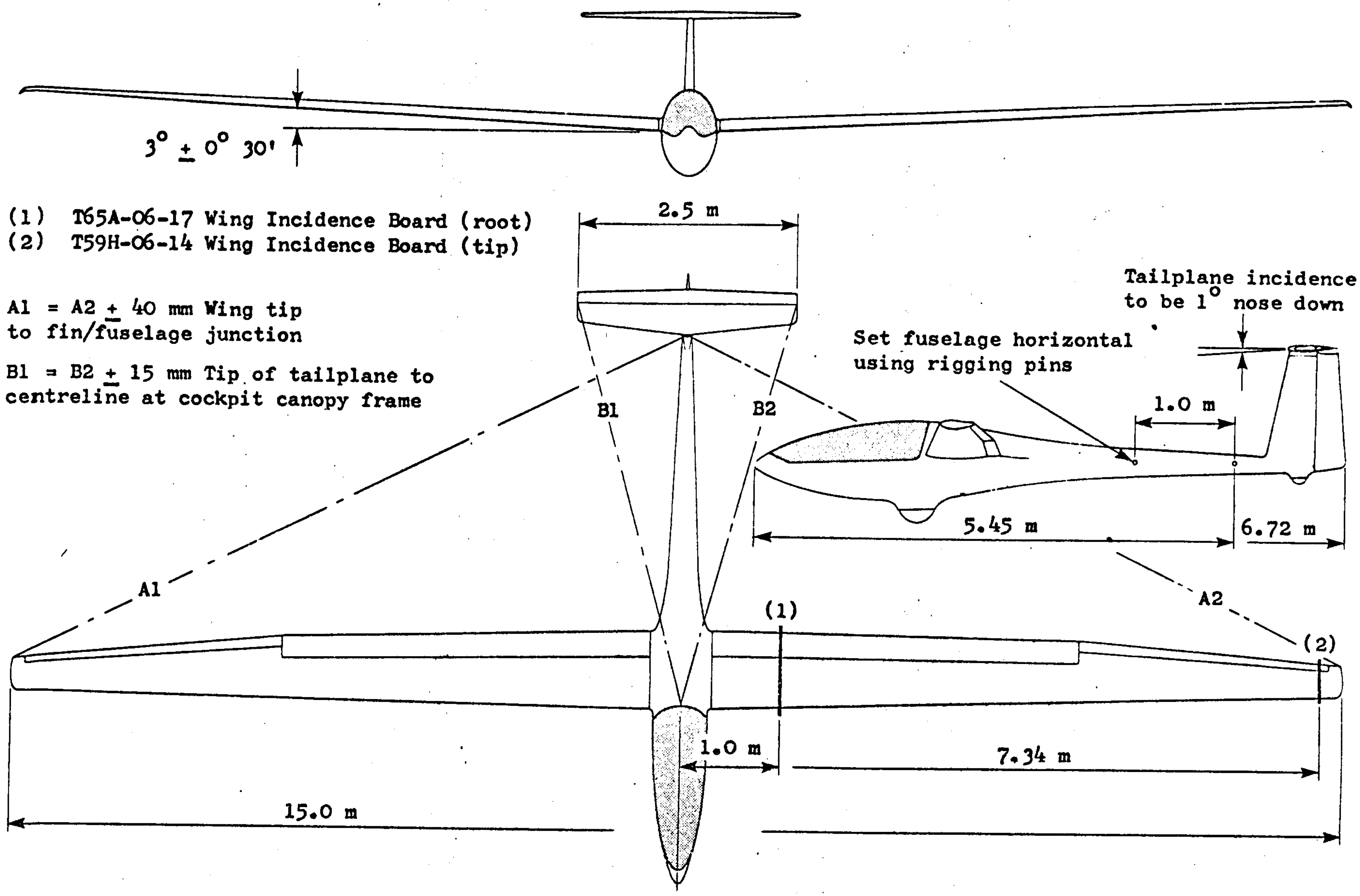
3. Empty C of G: $X = \left(\frac{W2 \times 164''}{W1 + W2}\right) + 2.0''$ aft of datum

4. Minimum cockpit load $= \frac{W(X - 13.26)}{13.26 + 18.00}$ lb

5. Maximum cockpit load is minimum of $780 - W$ lb and or $\frac{W(X - 9.25)}{9.25 + 18.00}$ lb



1.7 RIGGING DIAGRAM



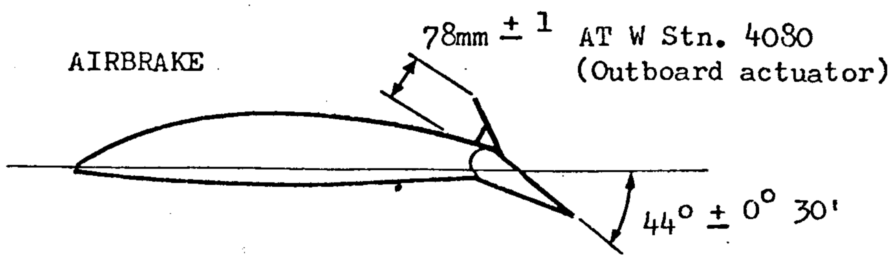
(1) T65A-06-17 Wing Incidence Board (root)
(2) T59H-06-14 Wing Incidence Board (tip)

A1 = A2 ± 40 mm Wing tip to fin/fuselage junction

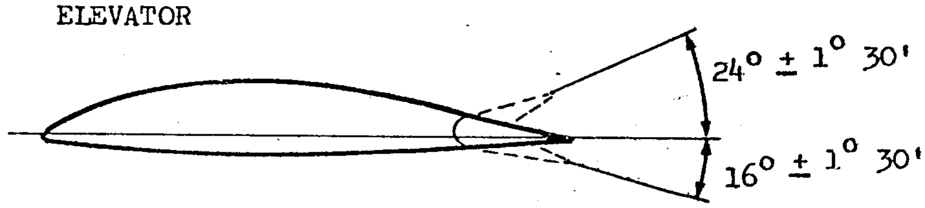
B1 = B2 ± 15 mm Tip of tailplane to centreline at cockpit canopy frame

1.8 Control surface movements Sports Vega

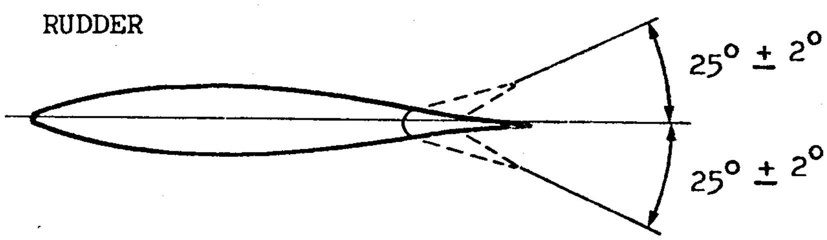
AIRBRAKE



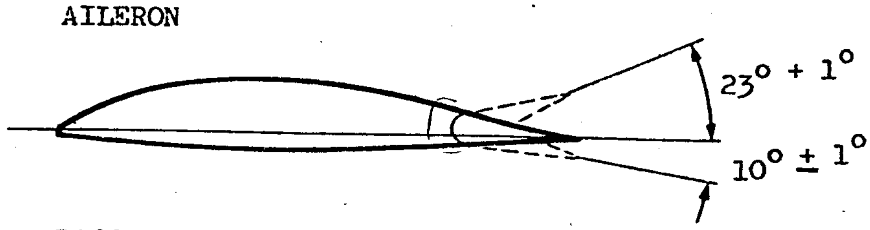
ELEVATOR



RUDDER

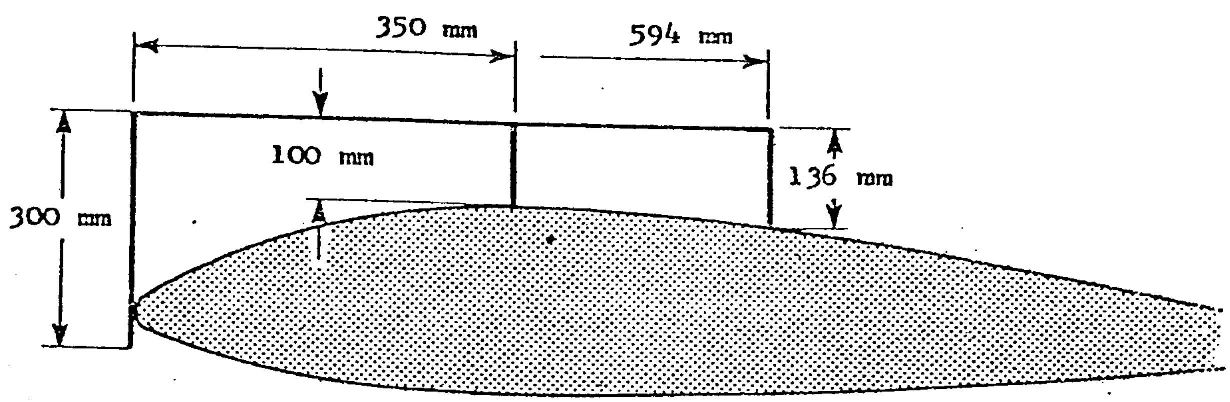


AILERON

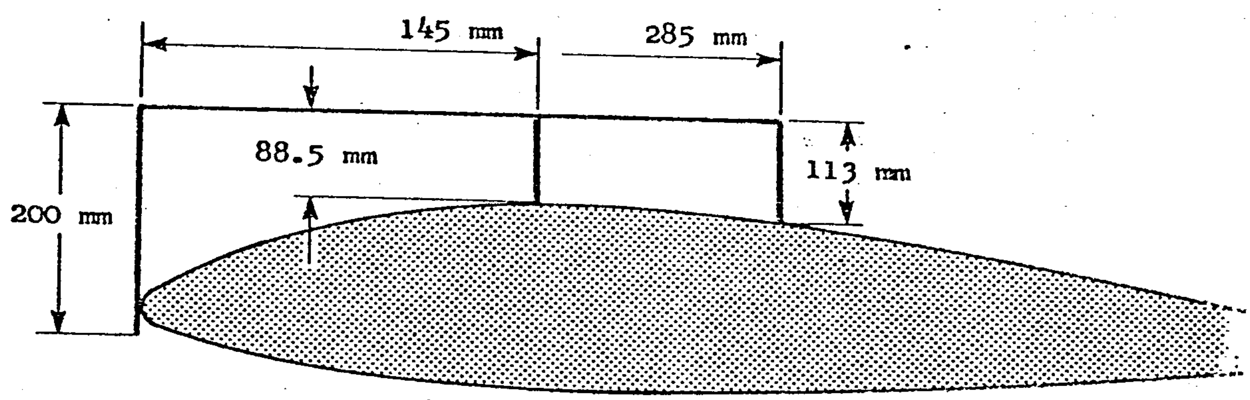


Difference between Port and Stbd. not to exceed 1°

1.9 INCIDENCE BOARDS



(1) T65A-06-17 (wing root)



(2) T59H-06-14 (wing tip)

See Rigging Diagram for locations

1.10 Performance Curve - T65C Sport Vega