

Airwave

Calypso

Owners Manual

Congratulations on your purchase of an Airwave Gliders CALYPSO. We hope to provide you with many hours of enjoyable flying.

If you ever need any spare parts or advice do not hesitate to contact your nearest Airwave Gliders dealer, or contact us direct.

OPERATING LIMITS

The CALYPSO has B.H.G.A. Certificate of Airworthiness No.8711040

Wing area is162Ft², 15m²

Certified weight limits.....125-280 lbs, 57-128 Kgs

Optimum pilot weight range.....125-210 lbs, 57-95 Kgs

Indicated stall speedapprox. 20 m.p.h. with maximum pilot weight.

Indicated maximum speed 36 m.p.h. with minimum pilot weight.

Flight operations must be limited to non-aerobatic manouvers

It is recommended that this glider be flown by a pilot who is trained to a B.H.G.A. pilot 1 or equivalent.

This glider must not:

- a) be flown with more than 280 lbs (128 Kgs) payload.
- b) exceed 30 degrees nose up or down to the horizon.
- c) exceed 60 degrees bank angle left or right to the horizon.
- d) be flown inverted or backwards.
- e) be flown with auxiliary power unless designed, installed and tested by the factory.

This Glider Was Test Flown By.....*Steve Murphy*
Date.....*12.12.92*.....Place.....*BOSINGTON, SOMERSET*.....

RIGGING INSTRUCTIONS

The CALYPSO may be set up in either of two ways. The first technique is with the control bar set into position at the beginning of the procedure, and it allows the glider to be set up off the ground. This is acceptable in lower wind conditions, and it is effective in keeping the sail clean. In higher winds, however, the second procedure in which the glider is left flat on the ground until ready to launch is preferable. In this procedure the control bar is set into position last, which reduces possible damage to the glider in the event of a sudden gust of wind.

- 1) Place the glider on the ground with nose into the wind and with the zip facing upwards. Open the bag, undo the glider ties and assemble the control frame. Check that all the rigging is outside of the control frame triangle and check that the bolt, wingnut, and ring are fully assembled.

- 3) Roll the glider over and remove the cover and all the ties. Raise the aerofoil kingpost and hook in the aft rigging making sure that the luff lines are untangled. At this stage choose whether to stand the glider on its 'A' frame or leave it flat on the ground.

- 4) Carefully walk each wing out half way, before opening them out to their approximate flying position. **AT THIS STAGE IT IS ESSENTIAL TO ENSURE THAT THE KEEL AND LEADING EDGES ARE ALWAYS IN THE SAME PLANE.**

- 5) Check the battens against the template and for symmetry. Insert the battens from root to tip with gentle pressure, until the batten meets resistance, then lift sail at trailing edge and gently shake in order to billow out. This enables the batten to be completely put into place over the cross spar. **DO NOT FORCE!** To secure with double elastic cords, lift the top loop over the battens end then pull the knot on the bottom loop over the batten end.

- 6) Rotate the tip struts into position, ensuring that they are seated properly against the stop.

- 7) Install the tip batten. Look through the leading edge pocket at wing tip and guide the tip batten onto the tip strut, where it goes into the leading edge.

8) Find the cross tube tensioning wires and pull on them using the goose catch as a handle. When nearing the goose catch channel extrusion use two hands and peg the nose of the goose catch behind the clevis pin on the extrusion. With your thumb lever down the goose catch and secure it with the quick pin. ENSURE THAT THE QUICKPIN IS PROPERLY INSTALLED THROUGH BOTH HOLES IN THE EXTRUSION.

9) The nose batten is never taken out of its pocket, however check that the nose batten is properly positioned on the locating rivet. Close the velcro over the nose batten starting at the top and pulling along the leading edges.

10) If the glider has been assembled flat on the ground, lift it onto the 'A' frame (be careful of the tip battens), ensure that all the lower rigging is untagged.

11) Secure the nose catch. ENSURE THAT THIS CATCH IS CORRECTLY INSTALLED AND FASTENED WITH THE PIP PIN.

12) Insert the four lower surface battens carefully , as there is the possibility of missing the batten pocket as battens enter the sail. When the batten reaches the mylar section push up on the double surface near the leading edge and finish inserting the batten. NOTE: when the batten is inserted properly, the tip should be resting against the bottom of the leading edge.

PREFLIGHT INSPECTION

A thorough pre-flight check is mandatory with all aircraft and the best technique is to walk around the glider checking every tube for dents and damage, and checking all connections and assembly points. The CALYPSO has inspection zips at the wing bolts to ease inspection.

Keep in mind the **THREE MOST CRITICAL** set-up factors these are the nose catch, the control frame bolt and the cross tube to the goose catch on the keel. As stated in the set-up procedure, **ENSURE THAT THE BALL LOCKS ON THE QUICKPINS ARE SECURE AND CANNOT PULL THROUGH.**

Starting at the nose, a suitable pre-flight checklist would be:

- 1) Sight along both leading edges checking for similar curves.
- 2) Walk towards the tip feeling for dents in the tube.
- 3) Pause at the wing bolts and look into the sail through the zip opening.
- 4) Continue to the tip and check the ball tip screws.
- 5) Check that the tip struts are straight and seated properly.
- 6) Walk to the keel checking the battens to ensure that they are properly secured.
- 7) Check the luff line attachment points, both at kingpost and trailing edge grommets. Ensure that the luff lines are not wrapped around the batten ends.
- 8) Check the cross tube wire to goose catch connection.
- 9) Check the rear top rigging and luff line attachments.
- 10) Continue around the glider and repeat items 2 to 7 in reverse order on the other wing.
- 11) Check the nose catch.
- 12) Check all the lower rigging.
- 13) Check that the control frame uprights are straight and that the bolt is correctly assembled with wing nut and ring.
- 14) **HOOK IN AND HANG IN THE HARNESS TO CHECK THAT YOU ARE THE CORRECT HEIGHT FROM THE CONTROL BAR AND THAT YOUR HARNESS IS NOT TANGLED.**
- 15) Instruments on, set altimeter.

FLYING TECHNIQUES

Take Off

The CALYPSO has a neutral static balance and is very easy to launch in both calm and windy conditions. When you hold the glider prior to your take off run, you should have the nose slightly elevated and the wings level. **AGAIN MAKE SURE THAT YOU ARE HOOKED IN!** Run hard and ease the bar out for lift-off.

Turns

The CALYPSO has straight forward flight characteristics, typical for a defined airfoil flex-wing. The glider can be easily directed into a turn, even at very low flying speed. However to obtain the best handling characteristics and fast roll rate it is advisable to pull in for a little extra flying speed then to enter the turn move to one side and push out slightly. The CALYPSO will maintain in a turn of a certain bank angle and radius until the turn is removed. Give yourself an extra margin of safety and **DON'T** fly your glider at the slowest possible airspeed when scratching for lift close to the ground.

Thermalling

This is also very straight forward. The trimspeed of the CALYPSO is slightly faster than the speed that will give you the best climb rate in a thermal. Once you have centered a thermal push out as much as possible without stalling. Maintain anywhere from 10 to 50 degree bank angle, depending on the nature and diameter of the thermal. The CALYPSO will maintain a certain bank angle and radius without further input. The CALYPSO feels very good in turbulence and it does not get displaced very easily by even strong turbulence. The CALYPSO's handling characteristics have been designed to give you the optimum that you need, to achieve your personal longest cross-country flight. The CALYPSO is probably the least tiring glider on the market to fly, because of it's ideal combination of light control inputs and inertia. There is not a lot of work involved in flying a CALYPSO.

FLYING TECHNIQUES (Cont)

STALLS

When practising stalls always make sure that you have sufficient altitude. The stall characteristics of the CALYPSO are very straight forward. Push out gently, the nose will rise and then drop through gently at the point of stall. Do not stall the glider with the nose pitched-up very high. This is one of the most uncontrollable and dangerous manoeuvres for any tailless aircraft and can result in a tailslide and severe tumble. Stalls in a coordinated turn are difficult to do by mistake. If you push out too much in a turn the glider will turn tighter, unless you are flying very very slowly in which case it may just be possible that you may enter a spin (see Spins).

SPINS

The CALYPSO will strongly resist spinning. However should you stall one wing in a turn, move your weight forward and the glider will recover quickly from a spin (half a turn) without entering extreme attitudes and without extreme loss of height.

LANDING

This is a simple matter. Your final approach should be a straight glide into the wind at faster than best L/D airspeed. Bleed your speed off slowly, wings level, and ground skim onto your chosen landing spot. In light or no wind conditions a full flare is required. When it is time to flare, flare aggressively and abruptly and hold 'A' frame out.

FOLDING INSTRUCTIONS

The procedure to fold the CALYPSO is a direct reversal of either of the rigging methods. Make sure that the cross-tube tension stop is free to run forward, and always fold the kingpost after closing the wings. Roll the sail from the outer luff line into the mylar reinforced leading edge pocket. Put one sail tie just ahead of where the top laterals emerge from the sail and put two sail ties ahead of the kingpost holding the leading edge pockets overlapped.

TRANSPORTATION AND STORAGE

Avoid hard spots pressing on the glider during transportation or storage and have as many supports as possible. Use rope or webbing rather than elastic to secure the glider and tie both ends of the glider to a support or down to the ends of the vehicle in order to stop the glider flexing. It is preferable to keep the glider dry, so always keep it with the zip on the bag down and ensure that it is dry before storing.

TUNING

If your CALYPSO has a turn, you have to check for bent battens first and then for bent spars. If you cannot find a bent leading edge, it is still possible, that one of the leading edges has been stressed in a hard landing and this results in slightly different bending characteristics of both leading edges. This is not always necessarily critical and the turn can be tuned out by differential batten bending. The only two battens that should be changed are the two curved tip battens (No 5, No6). For example, if your glider has a right turn in it, the battens on the right hand side would require an addition of approximately 1/2" to the slow wing in this case the right wing.

The camber of the corresponding battens on the fast wing should be decreased by approximately 1/2". This seems to be the best possible method of tuning a turn out of a CALYPSO. Tightening the batten tension also has the same effect as increasing the camber. Having the batten tension slacker improves the handling, possibly at the expense of glide angle. Pitch trim is accomplished by simply moving the hang loop on the griptape, which is on the keel.

To make the glider fly faster, simply move the hang loop forward. The trimspeed covers a range of approximately 7 m.p.h. (Hang loop all the way forward to hang loop all the way back.)

Never try to change the cross-spar tension from the standard factory setting.

MAINTENANCE

Your new CALYPSO will require very little in the way of maintenance if you care for it properly in your day to day use. Here are some general points to follow in maintaining your new CALYPSO.

SAIL

If you must wash the sail, wash it with a light detergent only. Better still, wipe the sail down frequently with a soft, damp cloth and that will keep detergent washing to a minimum. Rinse very thoroughly after cleaning with lots of fresh water.

HARDWARE

1) For all practical purposes, Airwave Gliders hardware is indestructible in hang gliding (flight) applications. "AN" bolts, however, are not indestructible and bending them even in light crashes is common. Check them periodically to be safe. Discard and replace any bent bolts.

2) All bolts, of course, should show exposed threads above the locknut during pre-flight.

BATTENS

When inserting battens, place them in their pockets smoothly and gently to avoid wear on the sail and on the batten ends. Pushing them rapidly into the pockets at an angle will wear out the stitching on the edge of the pockets, not to mention possible damage to the sail itself.

ANNUAL INSPECTION

Even if yours is the best kept CALYPSO, you should have the glider stripped down for a full inspection at least once a year. This can be done by yourself or preferably by one of our professional AIRWAVE GLIDERS DEALERS.

STRIP DOWN

- 1) With the glider upsidedown but folded, remove the 'A' frame from the keel and rigging from the 'A' frame. Undo the double surface zip completely.
- 2) Turn the glider over and undo the two screws holding the sail to the keel at the nose and the tail.
- 3) Open inspection zips at the cross-tube/leading edge junction, then remove the nut securing the cross tubes and lateral wires. Remove the top lateral wires and loosely replace the nut.
- 4) Detach the cross tube tension wires from the swan neck, leaving the swan neck attached to the top aft rigging wire.
- 5) Undo the bolt retaining the top forward rigging wire, and feed the wire out through the sail.
- 6) Undo the kingpost hinge bolt and remove the top rigging with the kingpost.
- 7) Undo the bolt on the keel retaining the aft lower rigging wires, and slide the fitting off the back of the keel.
- 8) Free the cross-tube tension wire from the small webbing loops at the kingpost hole in the sail as you pull the glider frame forward out of the nose of the sail, making sure that the tip struts and the main spans pull out of their holes in the sail.
- 9) Pull out the mylar leading edge reinforcement.

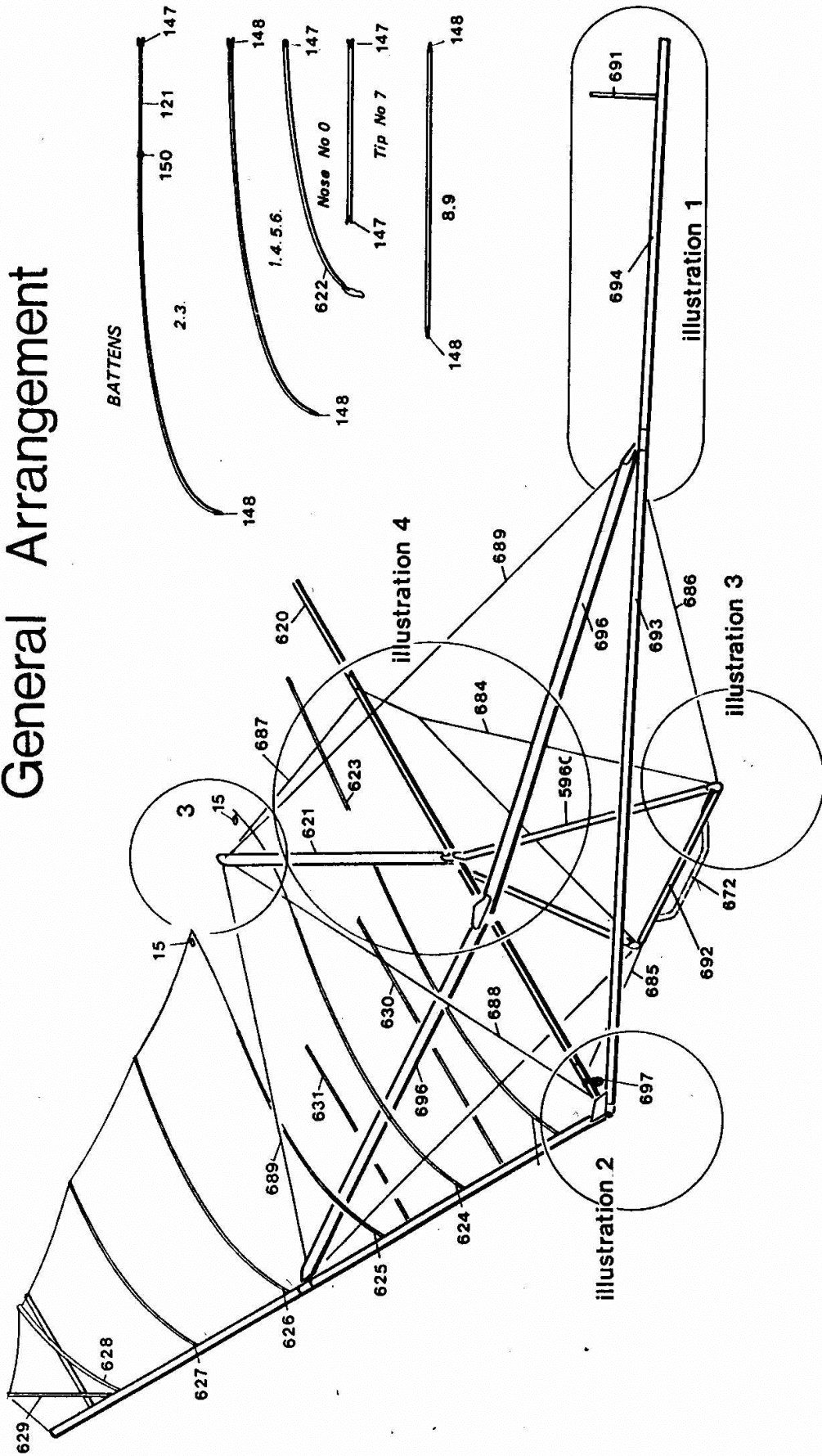
INSPECTION

Check the sail for tears and abrasion. Have any damage repaired by a professional sail maker. Inspect all other parts for damage and replace any rigging. If they show ANY signs of wear then replace them.

PARTS AND DRAWINGS

Use the drawings on the following pages to accurately identify parts for ordering any replacements that you may need.

General Arrangement



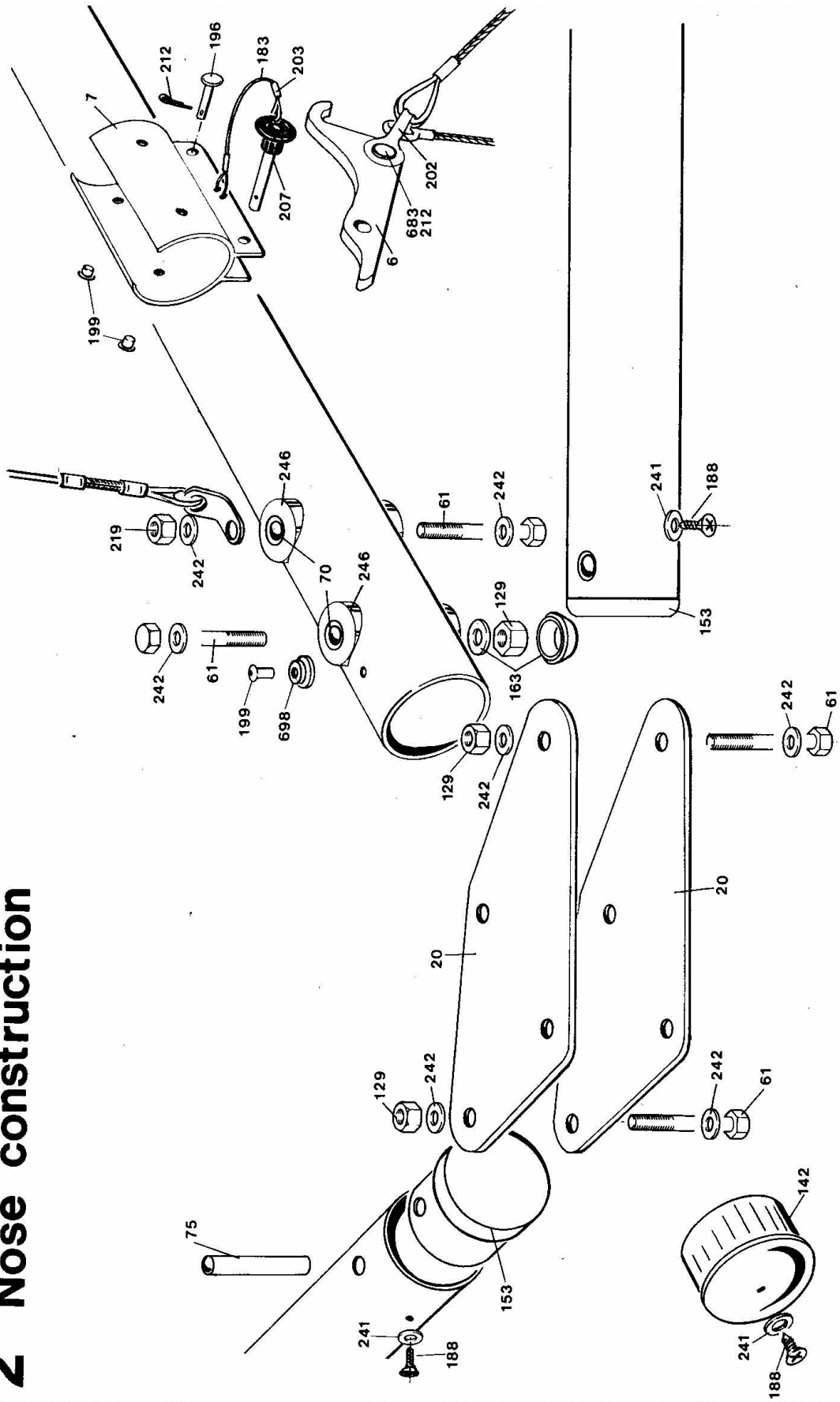
GENERAL ARRANGEMENT

<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>	<u>KEY</u>	<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>	<u>KEY</u>
Leach line top hats	AF LL TH	15	Calypso speedbar	C SB	672
Fibreglass rod	FG 1/4,.7M	121	Aft lower rigging	RG C AL	684
Batten tip 1/2"	PM AG 1/2T	147	Forward lower rigging	RG C FL	685
Batten tip 3/8"	PM AG 3/8T	148	Mainspan rigging	RG C MS	686
Connection sleeves	PM CS	150	Top aft rigging	RG C TA	687
Upright	M4 RD UP/M	596C	Top forward rigging	RG C TF	688
Keel	C K	620	Top lateral rigging	RG C TL	689
Kingpost	C KP	621	Tip Strut	C TS	691
Batten Nose	CB NOSE	622	Basebar	C BB	692
Batten No 1	CB 1	623	Leading edge inner	C LE I	693
Batten No 2	CB 2	624	Leading edge outer	C LE O	694
Batten No 3	CB 3	625	Cross tube	C XT	696
Batten No 4	CB 4	626	Webbing Loop	C WL	697
Batten No 5	CB 5	627			
Batten No 6	CB 6	628			
Batten tip	CB tip	629			
Batten No 8	CB 8	630			
Batten No 9	CB 9	631			

1 WING BOLT & TIP CONSTRUCTION

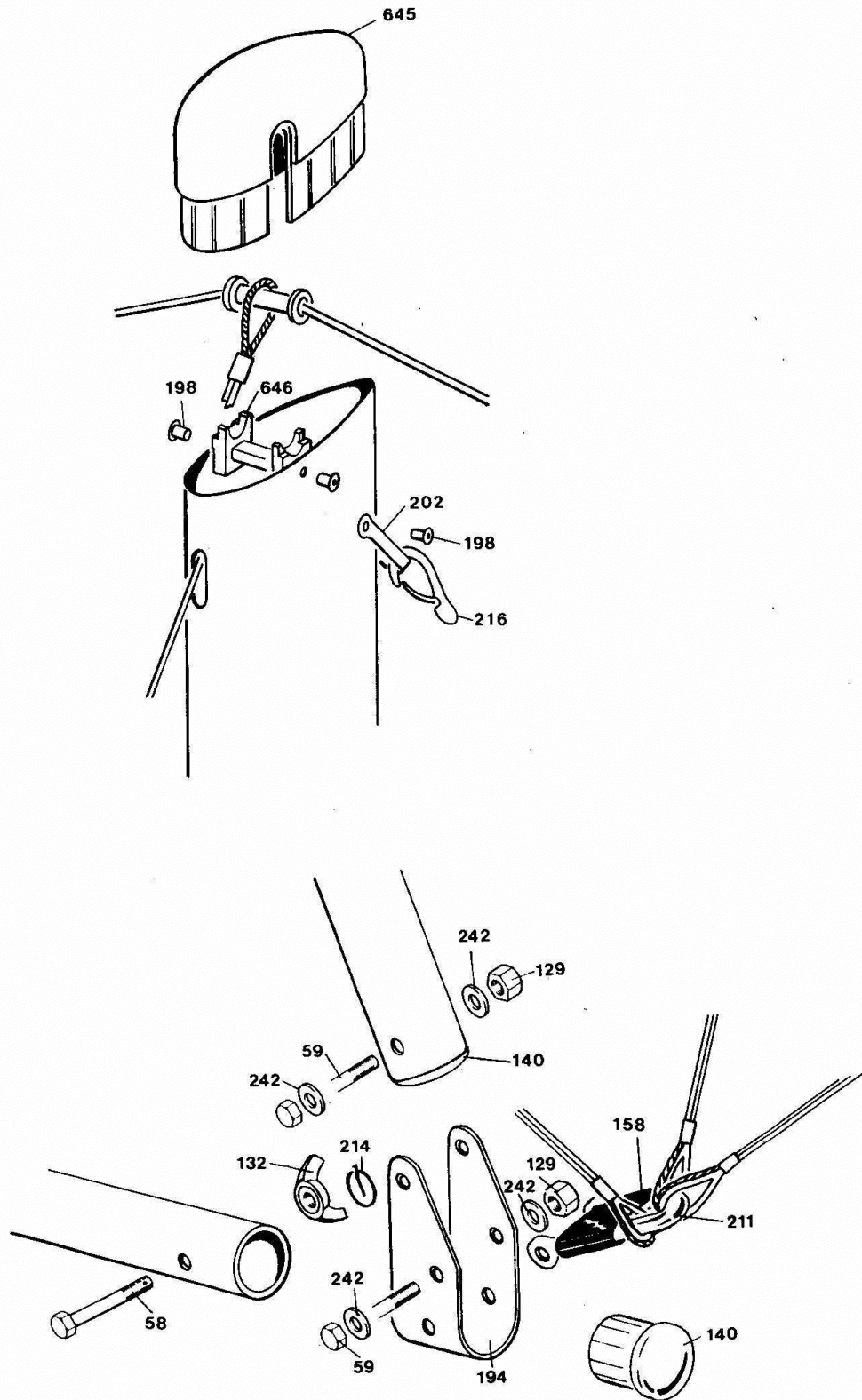
<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>	<u>KEY</u>	<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>	<u>KEY</u>
Hex fitting	AF HF	9	Plastic washer	WA 1 1/4"	239
Leading edge Clamp	AF LEC	13	Washer	WA M8	243
Leading edge clamp spacer	AF LECS	14	Saddle washer	WA SW 39	248
Bolt	BT AN5 21A	65	Calypso leading edge tip	C LE OT	695
Bolt	BT AN5 22A	66			
Stainless steel bush	BU 3/16	75			
Locking nut	NT 5/16"	130			
Ball threaded insert	PM CSBI	151			
Ball & collar	PM CSBS	152			
Cup	PM CSC	153			
Tip strut end cap	PM DM 1/2"	154			
Tip strut wire loop	RG 2MM	172			
Shack cord	RP BE 4MM	182			
Machine screws	SC 6*25MM	186			
Pop rivet	SF D424BS	197			
Pop rivet	SF D639BS	198			
Pop rivet	SF D665BS	199			
Nicopress	SF N 31	204			

2 Nose construction



2 NOSE CONSTRUCTION

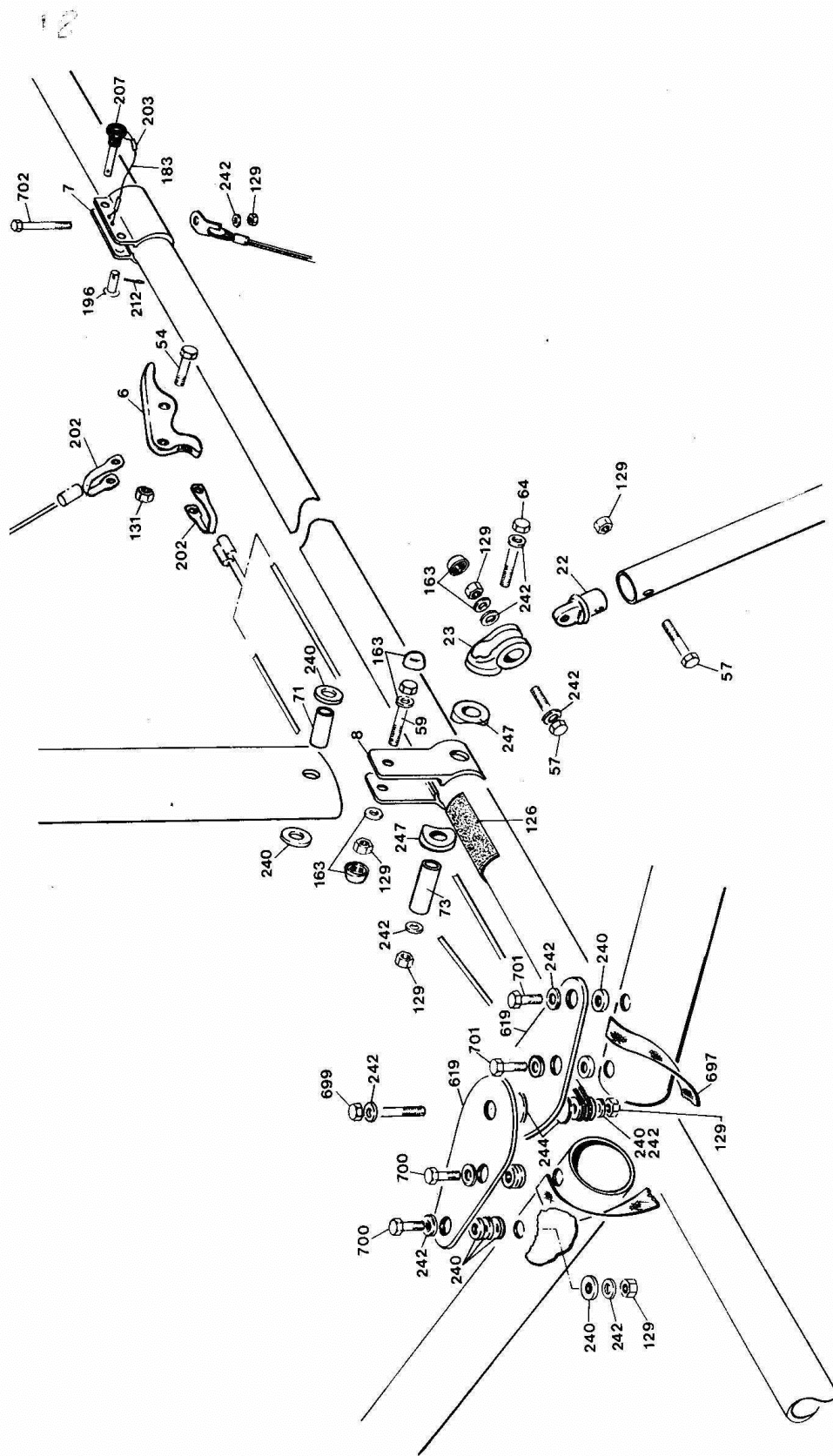
<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>	<u>KEY</u>	<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>	<u>KEY</u>
Goose catch	AF GC	6	Washer	WA M5	241
Goose channel	AF GCX	7	Washer	WA M6	242
Nose plate	AF NP	20	Saddle washer	WA SW 33	246
Bolt	BT AN4 24A	61	Clevis pin	SF CP 32	683
Stainless steel bush	BU 1 15/16"	70	Nose batten fitting	C AF NBF	698
Stainless steel bush	BU 3/16"	75			
Locking Nut	NT 1/4"	129			
Keel end plug	PM 1 5/8"	142			
Cup	PM CSC	153			
Nut Cap	PM MV NCW	163			
Lanyard	RP HS 137	183			
Slef tapping screw	SC SMF AB8	188			
Clevis pin	SF CP 48	196			
Rivet	SF D666BS	199			
Long shackle	SF LS 23	202			
Small Nicopress	SF N 30	203			
Pip pin	SF PP 635022	207			
Split pin	SF SP	212			



3 Ä frame corner & king post top construction

3 'A' FRAME CORNER & KINGPOST TOP CONSTRUCTION

<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>	<u>KEY</u>
Bolt	BT AN4 16	58
Bolt	BT AN4 16A	59
Locking Nut	NT 1/4"	129
Wing nut	NT WN	132
1 1/8" End plug	PM 1 1/8"	140
Desnaggler	PM DMC	158
M4 U bracket	SF AG 4UB	194
Pop rivets	SF D639BS	198
Long shackle	SF LS 23	202
Forged shackle	SF LS 23	211
Split ring	SF SRI	214
Rigging hook drilled	SF YS 50MM	216
Washer	WA M6	242
Plug aerafoil kingpost	PM AKPP	645
Plug insert aero kingpost	PM AKPPI	646



4 Centre line construction

4 CENTER LINE CONSTRUCTION

<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>	<u>KEY</u>	<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>	<u>KEY</u>
Goose catch	AF GC	6	Long shackle	SF LS 23	202
Goose channel	AF GCX	7	Small nicopress	SF N 30	203
Heart bracket	AF HB	8	Pip pin	SF PP 635022	207
Round up top fitting	AF RUF	22	Split pin	SF SP	212
Round up top fitting	AF RUTF	23	Plastic washer	WA 1/4"	240
Bolt	BT AN3 7A	54	Washer	WA M6	242
Bolt	BT AN4 14A	57	Washer (Mylar)	WA MW	244
Bolt	BT AN4 16A	59	Saddle washer	WA SW 36	247
Bolt AN4 31A	BT AN4 31A	64	Cross tube plate	AF CXTF	619
Stainless steel bush	BU 1 3/16	71	XTube retaining webbing	C WL	697
Stainless steel bush	BU 2 1/16	73	Bolt AN4 13A	BT AN4 13A	699
Safety walk	FM Z74531	126	Bolt AN4 10A	BT AN4 10A	700
Locking nut	NT 1/4"	129	Bolt AN4 7A	BT AN4 7A	701
Aero end nut	BT A125 D66	131	Bolt AN4 22A	BT AN4 22A	702
Nut cap	PM NV NCW	163			
Lanyard	RP HS 137	183			
Cleevis pin	SF CP 48	196			

CALYPSO RIGGING

<p>Top Lateral 689</p>	<p>6060</p>
<p>Top Front 688</p>	<p>2055</p>
<p>Top Aft 687</p>	<p>1762</p>
<p>Main Span 686</p>	<p>2406</p>
<p>Aft Lower 684</p>	<p>L1 = 321 L2 = 2328</p>
<p>Front Lower 685</p>	<p>2010</p>
<p>Cross Tube Tension Wire 690</p>	<p>1840</p>

All L lengths are in mm

5 CALYPSO RIGGING

<u>PART DESCRIPTION</u>	<u>PART NUMBER</u>	<u>KEY</u>
Kingpost top slug	AF AFKPS	1
Ali Sheaves	AF AS	3
Rigging sheath	PM DMD	159
Never Kinks	PM NK	164
Bent tang	SF BT	195
Nicopress	SF N 32	205
Rigging hook drilled	SF YS 50MM	216
Wire	SF 2.5 WIRE	284
Thimble	SF 2.5 MM	285
Aft lower rigging	RG C AL	684
Forward Lower rigging	RG C FL	685
Mainspan rigging	RG C MS	686
Top aft rigging	RG C TA	687
Top forward rigging	RG C TF	688
Top lateral rigging	RG C TL	689
Cross tube tension strop	RG C XTT	690

A FEW LAST WORDS

With proper care and maintenance, your CALYPSO will remain for some years at a high level of airworthiness. The CALYPSO has been tested to beyond all currently existing airworthiness standards internationally and these represent the best accumulated knowledge of what constitutes airworthiness in a hang glider. There is much, that we still don't know such as what is the effective lifetime of a hang glider before material fatigue and degradation compromise the airworthiness of the gliders. We do know that there are forces in nature which can severely compromise your safety regardless of the quality of design or condition of the aircraft, you are operating. Your safety is ultimately your responsibility. We strongly recommend, that you fly conservatively, both in your choice of the conditions in which you fly and the safety margins you allow in the manoeuvres you attempt. We recommend, that you only fly with a harness that has been tested for strength and that you always fly with an emergency parachute system.

Your AIRWAVE GLIDERS CALYPSO is the ultimate recreational hang glider. It will give you years of safe and enjoyable flying provided that you treat it properly and always maintain a healthy respect for the demands and potential dangers of the sport. Please remember, that aviation is always potentially dangerous and that your safety depends on you.

You are reminded, that you fly a hang glider at your own risk.

SEE YOU IN THE SKY!

AIRWAVE GLIDERS LIMITED