PART 1

DESCRIPTION AND MANAGEMENT

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PART 1

CHAPTER 1 - ELECTRICAL SYSTEM

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Batteries

1. Two 12 volt 7 ampere-hour lead-acid sealed batteries are located on the parcel shelf behind the rear seat.

Controls and Circuit Breakers

2. The switches listed in Table 1 are on the front and rear cockpit instrument panels, as indicated on Fig 1 and 2.

3. Five circuit breakers are at the bottom of the front cockpit instrument panel and are marked respectively, with their ratings:

Marking	Rating				
MAIN FUSE	5 amp				
RADIO	3 amp				
TURN & SLIP FRONT/REAR	1 amp each				
EL VARIO	1 amp				

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Switch	Marking	Function
Front Cockpit	an a	
Battery main switch	ON/MAIN	At MAIN isolates the batteries
Battery selector switch	BAT11/ TOGGLE BAT1	Selects BAT1 or BAT11 for use
Turn and slip switch	ON/ TURN & SLIP	Switches on turn and slip indicator
Dolphin unit switch	CLIMB/ DOLPHIN	At DOLPHIN, switches on Dolphin unit
Rear Cockpit		
Dolphin unit switch	CLIMB/ DOLPHIN	At DOLPHIN, switches on Dolphin unit
Turn and slip switch	ON/ TURN & SLIP	Switches on turn and slip indicator

Table 1 - Cockpit Switches

Battery Voltage Indicator

4. A small voltmeter in each cockpit indicates the voltage of the battery selected by the battery selector switch. The needle indicates in a green sector if the selected battery voltage is acceptable and in a red sector if it is not.



1 - 1 Fig 1 - Front Cockpit Electrical Controls

Legend

- 1. Battery voltage indicator
- 2. Dolphin unit switch (climb/cruise)
- 3. Turn and slip switch
- 4. Circuit breakers (from left to right)
 - a. Main battery
 - b. Radio
 - c. Turn and slip front
 - d. Turn and slip rear
 - e. Electric variometer

- 5. Battery selector
- 6. Battery main switch



1 - 1 Fig 2 - Rear Cockpit Electrical Controls

Legend

- 1. Dolphin unit switch (climb/cruise)
- 2. Battery voltage indicator
- 3. Turn and slip switch

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CHAPTER 2 - FLYING CONTROLS AND LANDING GEAR

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General

1. Conventional manually-operated flying controls, including airbrakes, are provided. The cockpit controls are fully duplicated and interconnected. They consist of a control column, a pair of rudder pedals, an airbrake control lever and an elevator trimmer lever in each cockpit. The rudder and ailerons cannot be trimmed. All control linkages use a push-pull rod system. There are no control locks but the harness may be used to restrain the control column on the ground when parked.

2. *Airbrakes.* The airbrake lever, on the left wall in each cockpit, operates an airbrake in the upper surface of each wing. The lever also operates the wheelbrake. With the lever fully forward, the airbrakes are locked in. Pulling the lever aft overcomes a geometric lock. Further aft movement starts to extend the airbrakes. At about two-thirds of full airbrake extension, the wheelbrake starts to be applied. With the lever fully aft the airbrake is fully extended and the wheelbrake is fully applied. To lock the airbrake closed, move the lever fully forward and then push it over the geometric lock.

Note: When using full airbrake for landing care must be taken that the wheelbrake is not locked before touchdown.



1 - 2 Fig 1 - Elevator Trim Lever Marking

Elevator Trim

3. Elevator trim is adjusted by a lever, labelled at the base of the lever as shown in Fig 1, on the left side of each cockpit. As the lever is moved fore or aft it exerts spring pressure on the elevator control run to relieve pilot-applied pressure on the control column thus placing the elevator 'in trim'.

Rudder Pedal Adjustment

4. *Front Cockpit*. The rudder pedals can be adjusted fore and aft by pulling the knob at the top right of instrument panel while positioning the pedals to the correct length. Release the knob and press the pedals with the feet to ensure that they are locked.

5. *Rear Cockpit*. Each pedal is free to slide fore and aft along a bar when a bolt (Fig 2) in the pedal is disengaged from the bar by moving it outboard. Slide the pedal along the bar until the required leg length is reached. Release the bolt and check that it has engaged with a hole in the bar preventing further movement. Repeat the process with the other pedal and ensure that equal extension has been achieved.

Landing Gear

6. The fixed landing gear consists of a mainwheel, a nosewheel and a tailwheel.

Wheelbrake

7. The aircraft is fitted with a hydraulic disc wheelbrake on the mainwheel. The master brake cylinder with the brake fluid reservoir is located under the rear seat and is marked with maximum and minimum levels.



1 - 2 Fig 2 - Rear Cockpit Rudder Adjustment

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PART 1

CHAPTER 3 - FLIGHT INSTRUMENTS

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Pressure Heads

1. A pitot head on the leading edge of the fin supplies the pitot and static pressure to the instruments. An Irving tube (Fig 1) is below the pitot head on the fin and supplies modified static pressure to the variometers. There are no pressure head heaters.

Instruments

2. The six identical flight instruments are set on the instrument panel in each cockpit and comprise the following: airspeed indicator (ASI), mechanical variometer, altimeter, turn and slip indicator, accelerometer and electric variometer. A compass is in each cockpit. The instrument layout is shown on Figs 4 and 5.



1-3 Fig 1 Irving Tube

Airspeed Indicator

3. The airspeed indicator (ASI) is calibrated from 0 to 160 knots. A green arc ♦ on the instrument face extends from 42 to 98 knots. The normal range of flying speeds is 42 to 92 knots and is externally bugged. A yellow arc extends from 98 to 135 knots. The speed range to be used with care is 92 knots to the maximum permissible speed of 119 knots. This speed range is also externally bugged. A ◆ yellow triangle at 51 knots and a radial red line at 135 knots are not used.

Altimeter

4. The altimeter is a 3-pointer instrument calibrated from minus 1000 to +20,000 feet. The smallest needle indicates tens of thousands, the medium needle indicates thousands and the largest needle indicates hundreds of feet. A knob at the bottom left of the instrument allows the millibar subscale to be set as required.

Turn and Slip Indicator

5. The electric turn indicator is a single needle pointing up with a single mark either side to indicate a 1 MINute GLIDER RATE TURN (540° in one minute or 360° in 40 seconds) to Left or Right. The slip indicator is a black ball in a tube of liquid with a white background.

Variometers

6. Variometers are sensitive vertical speed indicators. One mechanical and one electric variometer is in each cockpit:

AP101G-1001-15 Flight Instruments



a. *Mechanical.* The Winter mechanical variometer (Fig 2) is calibrated in knots from 0 to \pm 10. (One knot is very nearly 100 feet per minute.) A rotatable 'speed to fly' ring is attached to the instrument face.

b. *Electric*. The Westerboer electric variometer (Fig 3) is calibrated in knots up (+) and down (-) each division representing 2 knots. A knob on the face of the instrument switches it on/off and adjusts the audio volume. Two tones are generated by the front cockpit instrument only, a high and a low tone. From zero with increasing climb an interrupted high tone will gradually increase in pitch with an increasing frequency of interruption. From zero with increasing sink the low tone will gradually decrease in pitch.

c. *Climb/Dolphin Modes.* In the climb mode, the mechanical variometer indicates the glider's rate of climb or descent with no lag. In the Dolphin mode, the instrument indicates the rate of vertical movement of the air mass around the glider, the glider's vertical movement having been cancelled out. Dolphin mode is used, in conjunction with the speed to fly bezel, to optimise flying speed when transitting rising or descending air masses.

d. *Climb/Dolphin Switch*. The rear mechanical variometer system is totally separate thus DOLPHIN can be independently selected in either cockpit. Climb should always be selected in both cockpits for take-off.

CAUTION: With DOLPHIN selected in calm air a steady zero indication is likely, possibly inducing a false sense of security but height is being continually lost. The altimeter must be monitored with DOLPHIN selected. Reliable speed to fly information will only be indicated if the bezel is appropriately set for the weather conditions and the switch is set to DOLPHIN.



1-3 Fig 4 Location of Front Cockpit Instruments and Switches

Key to Fig 4

- 1 Compass
- 2 Altimeter
- 3 Accelerometer
- 4 Electric variometer

- 5 Climb/Dolphin switch
- 6 Turn and slip indicator
- 7 Airspeed indicator
- 8 Mechanical variometer



1-3 Fig 5 Location of Rear Cockpit Instruments and Switches

Key to Fig 5

- 1 Compass
- 2 Mechanical variometer
- 3 Altimeter

- 4 Turn and slip indicator
- 5 Accelerometer
- 6 Electric variometer
- 7 Airspeed indicator
- 8 Climb/Dolphin switch

Compasses

7. Direct reading compasses are mounted centrally above the instrument panel in both cockpits.

Accelerometer

8. An accelerometer is fitted in each cockpit. The 3-pointer accelerometer, labelled ACCELERATION, is calibrated from minus 5g to +10g. One pointer indicates instantaneous acceleration, one pointer indicates maximum acceleration and one pointer indicates minimum acceleration. Red marks appear at +6.5 g and minus 4g (these marks do not indicate Viking airframe limitations). A spring-loaded knob at the bottom left of the instrument, when pressed, allows all pointers to reset to +1g. Accelerometers can be locked prior to the glider being transported by road.

Barograph

9. The Winter barograph is a recording aneroid barometer used primarily on competition or BGA badge claim flights. When required, it may be securely fitted in the barograph mounting on the shelf behind the rear seat, forward of the aircraft batteries.

10. The EW barograph is an electronic barograph that may be carried as an alternative to the Winter barograph when available. It is to be secured in one of the side pockets in either the front or rear seat.

Note: Instructions for use of both barographs are contained in ACP 111 (Gliding Instructors Categorisation Manual) Sect 2 Chap 7.

PART1

CHAPTER 4 - RADIO

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General

1. The ATR 720B radio (Fig 1), labelled COM, is on the front cockpit instrument panel and provides voice communication on 720 channels in the VHF band 118 to 135.975 MHz at 0.025 MHz spacing. The frequency is displayed on a liquid crystal display and is selectable. Up to four frequencies can be held in memory. An automatic squelch facility opens the loudspeaker to any readable signal. A press-to-transmit (PTT) button is on the top of each control column. The transmitter has a notional range of 50 NM. No mute switch is fitted. A loudspeaker is on the right wall in the rear cockpit.

Microphone

2. A microphone is at the end of a flexible boom on the right side of each cockpit. For best results, the end of the boom should be directed at the face. When a PTT button is pressed both microphones are connected to the transmitter.

Aerial

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3. The aerial is moulded into the fin.

Control/Facility	Marking	Effect/Function
Rotary volume control	VOL	Clockwise rotation increases volume
5-position rotary channel selector	Unmarked $ \begin{bmatrix} 1 \\ 2 \\ 3 \\ 4 \end{bmatrix} $	Used for manual frequency selection and to set channel frequencies Preset channels
Rotary frequency selectors		Left knob selects whole MHz Centre knob selects kHz in 100 kHz steps Right knob selects kHz in 25 kHz steps
LCD		5-digit display of the selected frequency.
Enter button	ENTER	With the channel selector set to 1, 2, 3 or 4 pressing the button for two seconds writes the selected frequency into the memory for that channel
Squelch control	SQ/-	When set to SQ, only transmissions exceeding a preset threshold are audible
ON/OFF switch	-/ON	At ON equipment power is switched on

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Table 1 - Radio Controls and Display

Note 1: On some sets the squelch switch is set the reverse way round making the squelch selected position to the right.

Note 2: When selecting 25 kHz steps, the last digit is not shown on the 25 and 75 kHz selection, ie. 130.12 displayed is a frequency of 130.125.



1-4 Fig 1 Radio Control Panel

Controls

4. The radio controls are listed in Table 1.

Operation

5. Select ON. If the channel selector is in the fully left position, the most recently set frequency appears in the display; if the channel selector is at 1, 2, 3 or 4, the display reads that stored channel frequency. For any other frequency set the channel selector to the fully left position and then select the required frequency using the frequency selector knobs. Press a PTT to test the transmitter. Adjust the reception VOLume as required. Select SQ.

Storing Frequencies

- 6. To store a frequency:
 - a. Rotate the channel selector fully to the left.
 - b. Using the rotary frequency selectors set the desired frequency.
 - c. Set the desired channel on the rotary channel selector.
 - d. Press the ENTER button for two seconds.

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PART 1

CHAPTER 5 - GENERAL EQUIPMENT

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Entry to the Cockpit

1. The cockpits are entered from the left side.

Canopies

2. Separate one-piece acrylic canopies are hinged on the right side. A red canopy locking lever (Fig 1) is on the left canopy frame inside each cockpit. A red emergency jettison handle (Fig 2) is on the right wall in each cockpit.

Direct Vision Panels

3. A small sliding direct vision (DV) panel is on the left side of each canopy. Each panel has a small hinged air scoop set into it; ensure that the scoop is closed before sliding the DV panel rearwards to open. Do not use any part of the DV panel as a handle to lift a canopy.



1-5 Fig 1 Canopy Locking Lever



EMERGENCY JETTISON HANDLE

1 - 5 Fig 2 Emergency Jettison Handle

Canopy Operation

4. Canopy operation is the same for front and rear canopies.

5. *Closing*. Canopy closure, after strapping in, is achieved by reaching up, grasping the left frame of the canopy and pulling it down. Closing a canopy from the outside should be carefully controlled by gripping the canopy frame.

1 - 5 Page 2 Move the red locking lever fully forward to lock that canopy. Access to the locking lever from outside is through the open DV panel.

6. Opening. The canopy is unlocked from the outside by reaching through the open DV panel and moving the locking lever rearwards. From inside or outside, grasp the canopy frame firmly and open the canopy until it reaches the fully open position. A restraining cord and clip is designed to fail when the canopy is jettisoned, therefore, the canopy is not to be allowed to reach the fully open position suddenly or abruptly, or be snatched out of the hand in gusting conditions. The canopy should only be opened when access to the cockpit is required.

7. Jettisoning. A red emergency canopy jettison handle (beside a striped black/ yellow placard) is on the right wall. To jettison the canopy, simultaneously pull rearwards the red jettison handle on the right wall and the red canopy opening lever on the left canopy frame. The canopy can then be pushed up and away to jettison. There is no external jettison handle.

Seat Harness

8. A 5-point Irvin harness is fitted to each seat. A Quick Release Fitting (QRF) is permanently attached to the top of the negative g strap. To fasten the harness, ensure that the PRESS to release button, located on the top outer edge of the QRF, is in an upright position. Rotate the box to the stop position (about 20° then insert the right and left lap strap lugs into the side of the QRF. Then insert the two shoulder strap lugs into the top of the QRF. Ensure that all strap lugs lock into the QRF. Next tighten the lap straps together until the body is held firmly but not excessively tightly. Then tighten the shoulder straps by pulling down their adjusting straps until they are firm but not tight. When wearing a parachute, take care that the shoulder straps of the seat harness are positioned on the neck side of the parachute harness straps otherwise there is a tendency for the seat straps to slip off the shoulders.

9. To release the harness, press down the PRESS to release button and turn through 70° to the left or right. All straps are then released simultaneously. Before leaving the aircraft ensure that the PRESS to release button is in the locked position.

Cockpit Ventilation

10. An air intake in the nose is opened by pulling on a ventilator control at the top left of the front cockpit instrument panel. An air scoop is in each DV panel. It is opened by applying finger pressure forward of the hinge line and closed by applying finger pressure to the rear of the hinge line.

Ballast

11. Up to two ballast weights, each weighing 5.6 kg can be fitted on 2 threaded bars in the front cockpit left footwell.

CAUTION: Care should be taken when fitting or removing ballast weights as there is a potential loose article hazard from the 2 wing nuts, washers and locking pins.

Stowages

12. Stowage pockets are on the left and right walls in each cockpit.

Baggage Compartment

13.A baggage compartment is immediately behind the rear cockpit. The baggage allowed is limited to 10 kg (not including batteries) except during aerobatic flights when no baggage is allowed.