



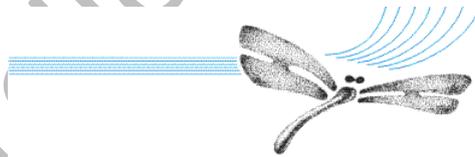
Darling Downs Soaring Club

## Hornet VH-GKJ

Serial Number 76

Pilot Handling Guide and Conversion Document

## Glasflügel 206



Rev 2 31 December 2020

***These notes are a conversion guide only and not a substitute for the Manufacturer's Flight Manual.***

## Contents

General notes on conversions .....	3
Basic Overview.....	3
The requirements to fly the Hornet.....	3
External Features.....	3
Limitations .....	3
Cockpit Features .....	4
Cockpit Ballast .....	4
Daily Inspection notes .....	4
<b>Inserting the Batteries</b> .....	5
Glider Accessories and Storage .....	6
Flight Characteristics .....	6
Controls: .....	6
Takeoff and Aerotow:.....	7
General: .....	7
Thermalling:.....	7
Cruising:.....	7
Stalling: .....	7
Spinning: .....	7
Water Ballast: .....	7
Airbrakes.....	7
Circuit and Landing:.....	7
Pilot responsibilities.....	8
Instrumentation.....	8
Batteries .....	8
OpenVario.....	8
S10 Vario.....	10
Flarm.....	10
Dittolog .....	10
MicroAir Radio .....	10
Air Avionics Digital Altimeter .....	11
Shutting down the Instruments.....	12
End of the Day .....	12
Rigging and De-Rigging .....	12
Rigging (Requires 3+ people) .....	12
Derigging the glider and put it in the Trailer .....	17

S10 Operation from the Manual..... 17

    4.1 Push Button – Rotary Switches ..... 17

        4.1.1 Power Button..... 17

    4.2 Rotary Switches ..... 17

    4.3 Buttons ..... 19

    4.4 Switching on the Unit ..... 19

## General notes on conversions

1. Your conversion to a new type must be authorized by an instructor who has flown the aircraft type.
2. They must outline the important features of the aircraft.
3. You should not do your first conversion in crosswind or gusty conditions.
4. Spend some time getting comfortable with the cockpit layout.
5. Get someone to lift the tail to show the takeoff and landing nose attitudes.

For the Hornet, you need to purchase your own SD/s card and USB Stick with pre-loaded files. Purchase these from the DDSC Bar -see *Instrumentation* Section for more info. You must read this document and the flight manual. When you go to do your conversion, an instructor will give you a quiz on the important aspects of converting to the glider.

## Basic Overview

The Hornet is a 15m unflapped sailplane constructed of fibreglass manufactured by Glasflügel. The aircraft is a perfect first cross country glider with forgiving characteristics. The aircraft has retractable undercarriage, trailing edge airbrakes. It was previously fitted with water ballast bags in the wings but water ballast is **not permitted** and the equipment is unserviceable. The Hornet is the first cross country glider in the club fleet.

## The requirements to fly the Hornet

To fly the Hornet pilots need to have 40 hours total and assessed competent from undergoing a dual check in the Duo Discus.

## External Features

Airbrakes	Trailing edge speed limiting type
Flaps	Not fitted
Wings	15m
Undercarriage	Retractable
Tailplane	T-tail

## Limitations

Vne	Max permitted speed	135 knots
Vra/Va	Max rough air and max manoeuvring speed	81 knots
Vt	Max aerotow speed	73 knots

Max airbrake operation speed	135 knots
Max All Up Weight (MAUW) with water ballast	420 kg
Min cockpit weight, including parachute	81 kg
Max cockpit weight, including parachute	110 kg

## Cockpit Features

Canopy and Jettison	Two-piece canopy with back section hinging backwards. Pull both red levers back to unlock canopy. To jettison pull open both levers and push canopy up. Care needs to be taken when opening or closing canopy as overstressing can bend metal frame. Do not attempt to close canopy without first unlocking red knob. Care is needed with an open canopy in windy conditions. An open canopy can have similar effect to a magnifying glass in sunny conditions and burn objects in the cockpit. At no stage must the canopy itself or clear view side window be held to lift or close canopy. Only hold levers or canopy frame when opening or closing canopy. Always close and lock both levers when leaving or ground handling glider.
Trim Ballast	There is no ballast compartment. Additional ballast must be secured on the harness attachment points
Instruments	See specific section
Seat Adjustment	Backrest angle can be adjusted by moving knob on Right side of cockpit forward or back.
Control Column	Anti P.I.O. (Pilot Induced Oscillation) parallelogram type. Control column has a slightly different feel but is easy to get used to.
Ventilation	Right side of instrument panel
Trim	Green button on control Column. Pressing button moves trim with stick position.
Wheel Brake	Hand grip lever on airbrake handle
Tow Rope Release	Conventional yellow handle
Water Ballast Lever	Black knob on right side NOT OPERATIONAL
Undercarriage Lever	Black handle on right side
Airbrake Lever	Blue handle on left side
Rudder Pedal Adjustment	Black knob on right side of control column
Batteries	Behind headrest in lower compartment

## Cockpit Ballast

The Hornet has NO provision for trim ballast. Pilots who are under the minimum pilot weight can use lead weights to sit on to bring them up to minimum weight. Consult an instructor to position and secure the weight properly. There is a 6kg sheet lead weight available that has straps to attach to the seat belt attachment points for pilots (with parachute) less than 65kgs.

<b>Min Pilot weight</b>	<b>65 kg</b>
<b>Max Pilot weight</b>	<b>103 kg</b>

## Daily Inspection notes

In addition to the daily inspection routine:

- Tyre Pressures:
  - Main Wheel: 36 psi
  - Tail Wheel: 22 psi
- Main Pin: One main pin with a spring-loaded lock
- Check pitot and Static Ports for blockages from wasp nests. There is no Total Energy probe and the rubber cover must be on the inlet on the fin.
- Check control box at the base of the control column. Foreign objects can get lodged in and jam controls. Make sure the boot covering the box is secure and tight.
- Open and check trailing edge airbrakes making sure hinges and control arms are secure.
- Ensure batteries are secured. Batteries are located in a metal box behind the spars to stop fore and aft movement. Take Care to not disconnect the speaker cable as you put the batteries in.

#### Inserting the Batteries

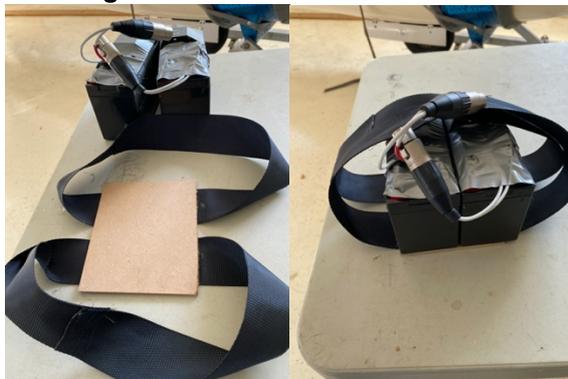


Figure 1- battery straps

Figure 2 - batteries on strap holder

The luggage compartment lid can be lifted and held on Velcro on the top of the fuselage area to keep it out of the way. The batteries should be put together on the support plate with the straps to hold them together. Insert them behind the spars, with the leads to the left as you look into the battery box. Store the leads to the left so the cover can come down and lock.

- Test undercarriage warning using the TEST button
- Ensure the tail dolly tyre is pumped up EACH day
- Check Tyre pressures of the main and tailwheels
- Put the luggage compartment lid down and lock it on the Dzus fastener



Figure 3 inspection of brakes and control box

## Glider Accessories and Storage

GKJ has tow out gear used to enable the pilot to tow the glider to the launch point without the need for extra help. Care must be taken to ensure that the felt on the inside of the wing walker and tail dolly is in good order and is clean. Storage of tow out gear when not in use is marked on the wall of the hangar. Do not leave it on the ground.

GKJ also has a canopy cover. The cover must be installed when the glider is not in use and make sure to attach the straps underneath also. When the glider is being flown store the cover in the baggage compartment behind the pilot's head in the cockpit. Take care to ensure cover is kept clean as any dirt will scratch the canopy when cover is installed.



## Flight Characteristics

### Controls:

All controls are light to the feel and are responsive

### Takeoff and Aerotow:

Set trim forward or slightly back from full forward depending on pilot weight. Raise tail and balance on main wheel when airspeed is gained ready for takeoff.

### General:

At height, experiment with airbrakes and note the loss of height with different speeds

If this is your first aircraft with retractable undercarriage, ensure you know how to operate it and how difficult or not it is for you.

### Thermalling:

Recommended thermalling speed is 45 knots. The glider may have a tendency to drop a wing lower than 45 knots.

### Cruising:

The Hornet can be flown up to 75 knots before the sink rate becomes too excessive. The Hornet has a 38:1 glide ratio with best LD at about 50 knots.

### Stalling:

The glider stalls in the conventional manner. Recovery is progressive forward movement of the stick until flying speed is returned.

Stall speed is 35-42 knots (varies with pilot weight). Stall speed (brakes open) is about 2 knots LOWER.

### Spinning:

The Hornet has typical spin characteristics and recovers easily with the standard spin recovery technique.

### Water Ballast:

**Do not fill with water ballast.**

### Airbrakes

Trailing edge airbrakes have the benefit of being powerful and are also speed limiting (the glider will not pass VNE with brakes out) so once the pilot gets used to the slightly different feel, they will find them useful and easy to use.

### Circuit and Landing:

- Use approach speed of
  - 53 knots (no wind) minimum cockpit load;
  - 63 knots (no wind) at maximum cockpit load
- The aircraft is fitted with an undercarriage warning. If airbrakes are deployed with the undercarriage up, it will sound.
- The flight manual recommends full brake shortly before touchdown (but the approach can be brake as required)
- Trailing edge airbrakes have a reputation in some people's eyes of being dangerous and the cause of some accidents in the past. Unlike standard scissor type airbrakes that increase the stall speed when opened, trailing edge airbrakes on the Hornet do not. Do not close the brakes below 40 knots.
- Roll control is adequate for ground roll

- On ground roll when below stall speed, hold tail wheel on the ground by applying back stick. This will help with directional control and help to prevent the glider nosing over and scraping the belly.

## Pilot responsibilities

- Understand how to DI the glider
- Understand how to operate the glider (including limitations)
- Understand how to Rig / De-Rig the glider
- Make yourself familiar with the Hornet trailer

## Instrumentation



Figure 4- Instrument panel

## Batteries

- Master battery turns on the electrics. UP for ON; Down for OFF.
- Select either A or B

## OpenVario

- The OpenVario IS NOT A TOUCH SCREEN. AVOID TOUCHING THE SCREEN. Clean with water only (like a canopy)
- There are many YouTube videos and other info on the web
  - [https://www.youtube.com/watch?v=qppuKiyIH\\_Y&list=PLPHdOV0Gq\\_NSyApS-LwkfvNwopDW68Lf&index=3](https://www.youtube.com/watch?v=qppuKiyIH_Y&list=PLPHdOV0Gq_NSyApS-LwkfvNwopDW68Lf&index=3)
    - Note the controls in the video are slightly different to ours:
      - 'X' Esc is our *double-click*
      - 'M' Menu is our *Long-Press*
      - 'Fn' mouse/curse mode not available
      - Button click select is our *Short-Press*
  - [https://www.stefly.aero/tutorials/software\\_first\\_steps/](https://www.stefly.aero/tutorials/software_first_steps/)
    - Info about SD card and USB stick
- You will need to establish your own profile to use on the OpenVario and have your own SD card for uploading. The USB and SD card slots are in the front of the lower right side of the panel (see photo above). The SD card inserts upside down (terminals up and towards panel). More details below. The SD card must be inserted in the panel before the Master Switch is

Turned ON (and remain installed for the duration of the OpenVario's use). Note - The OpenVario will not work without an SD card.

- After the Flarm and/or S10 obtains a GPS fix, the Openvario is ready for use.
- The USB stick only need to be inserted while uploading (waypoints and tasks) or downloading (traces) files
- The only INPUT DEVICE is a dual knob encoder on the upper LHS of panel:
  - Each knob emulates the arrow keys on a keyboard (ie one knob up/dwn and other left/right)
  - The encoder also has a push button on the end with 3 function (LEARN THESE):
    - Short-press (cf left mouse click)      SELECT highlighted item
    - Double-Short Click                      ESC (exit item/menu)
    - Long-Press                                  enter MENU
  - If one is doing a lot of setup (ie configuring/tailoring the look of XCSoar, then a basic (Linux compatible) usb connected keyboard can help – plug into usb socket – Advanced user only 😊
- **Waypoint files are loaded** onto a dedicated USB stick (Set up the USB stick (formatted FAT32) with the following folder structure– *openvario/upload/xcsoar*). With the OpenVario OFF, insert the USB stick. Files are transferred to Openvario outside the XCSoar program using the Open Vario setup menu. Once loaded, they need to be added using the XC Soar menu. (Note a waypoint file is setup already on the imaged files by default)
- **Flight files can be downloaded** onto the USB stick. The folder structure on the stick must be *openvario/igc*.
- Setting a Task
  - The easiest way to set a task is to save your set task (and only this one) to a specific file (eg *Task\_and\_Waypoints.cup*) on the USB stick using SeeYou on a PC. Then upload the file onto Openvario (outside XCsoar program). Then within XCSoar go to Menu/Task/Manage/More and open the loaded *Task\_and\_Waypoints.cup* file. The waypoints and task is there ready!, or
  - Within XCSoar select Menu/Task/Manage(?)/New. Then manually add the task selecting the waypoints.
- To obtain the required SD card and USB stick, you can either:
  - Purchase your own SD card (not micro, minimum of 8GB, class 10) and then download an image from [here](#) PLUS format ([see here](#)) your own USB stick for uploading/downloading files. You are on your own with this option, or
  - Purchase a SD card and USB stick from the DDSC Bar (mailed out so plan in advance) with a basic setup to get you started.
- This SD card and USB stick is YOURS and shouldn't be left in the glider. It would be wise to back up each in case you lose/corrupt them.
- Once you have you own SD card, you are free to format the look of XCSoar to suit your needs including:
  - Number and type of screens;
  - Info boxes
  - Safety heights (default set at 1000')
  - etc. (and setting this is outside the scope of this instruction set.)
  - DO NOT change 'Devices' settings in the Menu otherwise the connected hardware (Flarm & S10) may cease to communicate ...

## S10 Vario

- The S10 is an IGC logger and tasks can be uploaded using the micro USB on that instrument (cannot be the same one as OpenVario!)
- Serial Number is NB8; Calibrated on 9/6/2020.
- Fitted with Bluetooth for transmitting to tablet or phone.
- It is currently configured for Electronic total compensation.
- Functions and setup are locked down and cannot be changed without the password.
- Safety height is set to 1000ft
- Operation:
  - Pressing any of the buttons or rotary knobs will turn on the S10
  - Select DDSC
  - Select your QNH/Height
  - Press the Middle button to proceed.
  - Hold down the bottom button for 5 seconds to turn off.

<https://gliding.lxnav.com/products/s10/docs/>

For more quick information see page 17.S10 Operation from the Manual

## Flarm

- Flarm display on RHS of panel.
- Also displayed on OpenVario (by default) – can be disabled by user.
  - Keeping the data.fln file up-to-date in OpenVario will display the Flarmnet database (aircraft IDs)

## Dittolog

- Insert key in left hand side of panel.

## MicroAir Radio

<http://www.microair.com.au/images/pdf/M760installusermanualverM.pdf>



Figure 5 - Radio functions

2	Priority Switch	Momentary push down switch
3	Volume / On / Squelch	Click On - Rotate knob for volume Rotate ring for squelch
4	Receiver / Transmit Annunciator	Red / Green LED
5	Mode Switch	Momentary push down switch
6	Frequency Adjust	Rotate for MHZ adjust Push briefly to change to KHZ Rotate for KHZ adjust
7	Toggle switch	Momentary push down switch
11	LCD Display	Two lines of eight characters each

### Air Avionics Digital Altimeter



Figure 6 - altimeter main screen



Figure 7 - altimeter Baro adjust screen

- The Altimeter turns on with main power.
- The altimeter reads height in feet AMSL

- To set a QNH, turn either the outer or inner knob to select. Select the height/pressure. Push knob to return to altimeter screen or wait about 3 seconds.
- If you need to change to standard pressure 1013.2 above 10000ft, press the top right soft key.

### Shutting down the Instruments

- Turn the radio OFF
- Turn the Open Vario OFF
  - MENU (Long hold on button)
  - Scroll to last menu item QUIT
  - Enter, accept YES to shut down, scroll down to POWER OFF, ok, scroll to YES
- Switch off the S10
- Switch Master down to OFF.
- (Altimeter, Dittolog and Flarm shut off with the master)

### End of the Day

- Turn off the undercarriage warning switch
- Clean the canopy
- Add canopy cover
- 2 Batteries on charge
- Always store the glider with the canopy cover on, side window closed and airbrakes unlocked. If stored with one wing down place some protective carpet and a wing weight on the lowered wingtip and remove or choke the tail dolly to prevent the glider shifting.
- Notify Jenny Thompson of any defects, problems or issues.

### Rigging and De-Rigging



Figure 8 Rigging Tool and tie down kit

### Rigging (Requires 3+ people)

1. Leave the trailer hooked onto a car for stability when removing the glider
2. At the front of the trailer at the spars, remove the R clips pin holding the wing root holders in the trailer.

3. Undo the inner clamp nuts on the wing middle sections and turn the clamps to the wall to avoid damaging the wing as it comes out.
4. Release the lock on the cradle by pulling the wire up that is located on the floor of the trailer near the tail.
5. Pull the fuselage out and then lift the fuselage in its cradle away from the trailer. Lift the tail as it is taken out to avoid scraping the underside. Do not stand on the middle part of the trailer.
6. Remove the canopy for security reasons. Put the airbrake handle into the ½ out position and the stick to the central position
7. Lubricate all fittings and place the wing pin and the rigging tool into the cockpit.
8. NOTE: there are shims on the lift pins – ensure they remain (the number of shims is noted on the fuselage at the pins)
9. Take the Left wing first (double spar end).
10. Lift the wingtip with its support away from the wall of the trailer and place the two rollers onto a ridge on the floor, which enables a clear run for the rollers all the way out of the trailer while one person keeps the wing upright. The wing root holder has a stop that prevents it running off the trailer door.
11. Lift the wing root off the spar holder, pull the wing out while keeping it upright and then insert into the fuselage to take the weight of the spar.
12. Open the airbrake half out before engaging the connecting pins.
13. Then the wing is carried into position, rotated and the wing-spar placed into the Fuselage and the tip onto the wing stand.
14. Proceed with the right wing accordingly. Make sure the airbrake is half out. Push the wing in far enough to engage the location pins
15. Now the rigging tool is used to pull both wings home and the wing pin is inserted.
16. Lift the tail and lower the undercarriage (the tail needs to be lifted very high)
17. Fit the tailplane.
18. Replace the canopy.









## Derigging the glider and put it in the Trailer

(Note this procedure has not been checked – please mark up comments and provide to jenny to update when next de-rigged)

1. Place the glider at least one wing-length away from the rear of the trailer.
2. Slide the fittings onto both wings and remove the sealing tapes.
3. Put the wing stand under the left wingtip and place a weight on it.
4. Remove the tailplane and secure it on the side of the trailer. Remove the canopy for security reasons.
5. Roll the fuselage trolley under the cockpit, engage the link to the Tost-release. Lift up the tail and retract the wheel.
6. Place a small piece of carpet next to the wing-root support onto the trailer floor.
7. Take the weight of the wings and remove the main pin; Use the rigging tool to disengage the spar and wing connections
8. Remove the right wing, rotate and place the wingtip support with the rollers on the red marked ridge on the trailer floor for a clear run of the support rollers.
9. Slide the wing in and rest the leading edge onto the piece of carpet on the trailer.
10. Lift the spar onto the support, slide the intermediate support to the proper position and lift the wing into its final position while keeping the wing upright.
11. Secure the wing at the front and middle of the trailer.
12. Proceed with the left wing accordingly.
13. Replace the canopy.
14. Roll the fuselage with its trolley into the trailer and secure all fittings in the trailer (inner clamp nuts on the wing roots, etc)
15. Install the tailplane and ensure locked in. Tape some foam on the end near the trailer to avoid it getting damaged if it slides back.

## S10 Operation from the Manual

For full detail, refer to the S10 Manual.

### 4.1 Push Button – Rotary Switches

The two Rotary switches also have a push button function. The LXNAV S8x/S10x detects short or long presses of the push button. A short press means just a click, a long press means pushing the button for more than one second.

#### 4.1.1 Power Button

The system is powered up by pressing any of the push buttons or a press of either of the rotary knobs. A long press of the upper rotary knob will turn the S10 off. Use this instead of the avionics master switch.

#### 4.2 Rotary Switches

The upper rotary knob is designed for direct volume control. A short-press on the upper rotary knob will produce an option to select between options and adjust volumes for the Vario, Speech and FLARM beep.

A long-press on the upper rotary knob will shut down the system cleanly.



The lower rotary knob is used to adjust settings within the current mode or within menus. With the lower rotary push button, it is possible to toggle between the MC and the Ballast and Bugs settings. In all other menus this knob is used for setting values and editing texts

### 4.3 Buttons

The three buttons between the two rotary knobs have fixed functions. The top button is ESC (CANCEL), the middle is to switch between modes and the lower button is the ENTER (OK) button. The upper and lower buttons are also to rotate between subpages in the WPT and TSK modes.



1

1 - Rotary switch with push button  
Enter and operate only in the volume menu

2

2 - Push button used for:

- Mode selection
- Confirm option in some menus

3

3 - Push button used for:

- Switch between modes
- Exit from the menu

4

4 - Push button used for:

- Mode selection
- Confirm option in some menus

5

5 - Rotary switch with push button used for:

- Adjusting the level of the zoom
- Enter/confirm the selection/function

### 4.4 Switching on the Unit

Pressing any of the buttons or rotary knobs will turn on the S8x/S10x. The first LXNAV welcome screen will appear with the system information (Device name, Version, Serial number...) The S8xD rear seat unit cannot be powered up before the S8x/S10x has been powered up.