

About the B800



Since 1978 **BORGELT INSTRUMENTS** has been manufacturing instruments for the soaring community. Continuing our commitment to incorporate improved methods and technology whenever appropriate we present to you the **B800**.

Progress in electronic technology has brought many instrumentation options to soaring. However one instrument that is essential is the variometer. Design of a variometer system to allow response and display of information that is not only useful to the pilot's decision making but minimises the time spent looking at the information is essential.

The **B800** is an enhancement and development of the B500 cross country variometer system and continues our unsurpassed reputation for reliability and ease of use and as usual we make the system unit available into fit standard 57mm or 80mm instrument panel mounting holes.

The B800 replaces the linear variometer scale of the B500 with a logarithmic scale to cater for the weakest and strongest lift while losing no resolution in the most usual lift scales and places a **digital display** in the variometer scale which can display the running **average** rate of climb and also a whole thermal average or **Integrator** and uses the **high brightness LEDs** to display a **comparison** of the two which is important for recognising strengthening or weakening lift when climbing as well as our **green LED** and **audio change** when the lift is above the running average.

This is the most complete information suite for quickly centering thermals and maximising total rate of climb over the whole flight.

Audio volume control is now from the front panel of the main unit as on the B400 and B700 and the climb audio modes are front panel selectable the same as on the B700. These modes selections are very useful for ridge or wave soaring.

The optional two channel audio is retained.

During inter thermal cruise the **B800** displays **relative netto, netto average and speed command** data on the main unit.

On the optional GCD, **Performance Index** is displayed during cruise. This is the ratio of achieved performance in the glide to the assumed performance of the clean glider at that weight in still air. The bugs setting is then adjusted to match this, trimming the polar to that being actually achieved..

We are mindful of the large variation of experience and expertise of the users of our instruments and careful consideration has been given to design an instrument system which not only serves the needs of early cross-country pilots but delivers high performance to top competition pilots.

The B800 system architecture allows us to use the B800 as a development platform and add other features and functions in the future.

The new **Borgelt B800** variometer system consists of several components designed to be compatible and can form a complete GPS linked variometer capable of driving almost any glide computer. (e.g. Borgelt B2000/B2500 or various PDA/PNA based glide computers) or the main unit can be used with an Oudie or other PNA device and be controlled from it.

The 'heart' of any vario is the sensor, something we at Borgelt Instruments are proud to have perfected in our variometers. Pressure transducers replaced flow sensors in our variometers in 1982 and their reliability and accuracy has been excellent. The B800VE uses surface mount technology in the electronics, and the variometer display is by a small stepper motor driven pointer plus several high brightness LEDs. This provides a display with exceptional resolution and far better contrast than the LCD type pointers (often described as 'muddy' or 'indistinct' or lacking in resolution typically 0.4Kt or 0.2m/s) The LED's allow quick interpretation minimising scan times. A quick glance delivers the information. Most manufacturers are now abandoning the LCD pointer type display and using the physical pointer driven by a stepper motor.

The system components are:
B800 SYSTEM UNIT



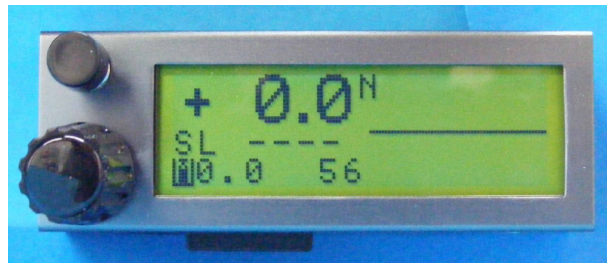
All basic **total energy variometer/audio** functions and ALL the advanced variometer functions of **digital averager, integrator, comparator, speed command, netto/relative netto and speed command audio**, with all functions properly altitude compensated to 22,000ft (6,700m) and serial data output including GPS, air data and pilot settings.

The B800 system unit is 115mm deep including connectors and is available in 57mm or 80mm sizes. An airspeed sensor is included in the B800 which enables calculation and display of the advanced variometer functions.

Only one standard panel hole is required, 57mm or 80mm. (57mm version shown with all LEDs lit)

The unit may be run on its own using data input for MacCready, bugs, ballast from a PDA /PNA(CAI 302 format) or with the B800 GCD.

B800 GCD
Glareshield Control and Display unit



The optional GCD is a small unit 30mm high by 82mm wide and only 30mm deep, which is designed to mount under, over, in the lip of the instrument panel cover or mounted on the front of it.

See drawings in Appendix 2 Installation section of the B800 Manual for suggested mounting methods.

The controls are closer to the pilot and the display is very close to his/her line of sight, assisting with orientation and lookout. By separating it from the variometer the variometer pointer does not obscure its displays. It is supplied with a 0.5m cable with plug, which connects to the B800 variometer unit by plugging it in to a socket on the back of the instrument.

IT IS WELL WORTH TAKING THE SMALL AMOUNT OF EXTRA TROUBLE TO MOUNT THIS UNIT AS SUGGESTED.(see B800manual for details)

Mounting the GCD is no more difficult than mounting an instrument in a panel hole and has the advantages of being easier to reach and the GCD display is just below the pilot's external line of sight. Even when changing Macready, bugs, ballast, volume etc the pilot's peripheral vision is still effective outside the cockpit.



Photos of installations in a Discus 2 and an ASW27B. Note these are early B500 instruments with red push buttons(now black).

Note the mini SD card slot under the GCD. This is for card access and you should allow for the card to be present in your installation as the database is always read from the card. While the GCD will work without a card present you will be unable to navigate using the B800 as there will not be a database.

The B800GCD receives GPS and air data from the B800 variometer unit/B800HP-GPS and in addition to the display of the average rates of climb the B800 is controlled by the GCD. The pilot can enter MacCready, bugs contamination, ballast state, control B800audio volume and balance and in addition a simple but complete **GPS navigation display with turnpoint database, wind and final glide computer** is included (requires HP_GPS also) This makes the instrument ideal for club gliders and as a backup while the B800 also supplies RS 232 serial air and GPS data to any desired full function glide and navigation computer such as the Borgelt B2000/B2500 or any of the PDA/PNA type devices. *(see PDA-PS later)

While the B800 can be controlled by a PDA/PNA, using the GCD keeps the variometer "housekeeping" functions separate from the glide computer which simply picks up these changes in the serial data stream going to it from the B800. This simplifies both the control of the variometer and of the glide computer and provides the advantages of the near line of sight display. It also declutters the glide computer display by putting variometer "housekeeping" functions on the GCD instead of the glide computer screen.

The B800GCD has a mini SD card slot under the display to hold the databases. GCD program upgrades and system EEprom changes may be handled by writing files to the card using a PC with card reader.

GPS unit for B800 (B800HP_GPS)



A small high performance 16 channel GPS unit is an optional part of the B800 and plugs in to a connector at the rear of the B800. This GPS uses the latest low power technology and draws less than 30mA at 12 volts as well as providing genuine 4Hz (4 times a second) fixes.

This unit provides GPS navigational data to the B800 and enables the navigation, wind and final glide functions on the GCD. It also ensures that GPS navigational data is available in the serial datastream from the RS232 port to drive PDA/PNA type glide computers.

Total energy is by probe. TE probes provide by far the best and most reliable TE compensation with the least setting up and tuning.

Borgelt Instruments manufactures and recommends a suitable two hole TE probe of the modified Irving type in both fuselage and fin mount varieties. Feedback from users is that these provide excellent total energy with no setup required.

The B800 has an **Outside Air Temperature** probe (OAT) and the temperature is displayed on one of the GCD pages and when fitted the temperature is used in the internal calculations.

The **B800** allows for optional expansion to a Glide Computer (e.g. Borgelt B2000/B2500, various PDA/PNA type devices) by transmitting serial data, GPS and air data from the B800 in the form of serial messages at 1 Hz in the same manner as done by the B50. The decode of this message is available on the Borgelt Instruments website under "manuals - B50 - DDM".

See www.borgeltinstruments.com

When a GCD is not fitted the B800 will accept bugs, ballast and MacCready information in CAI 302 format.

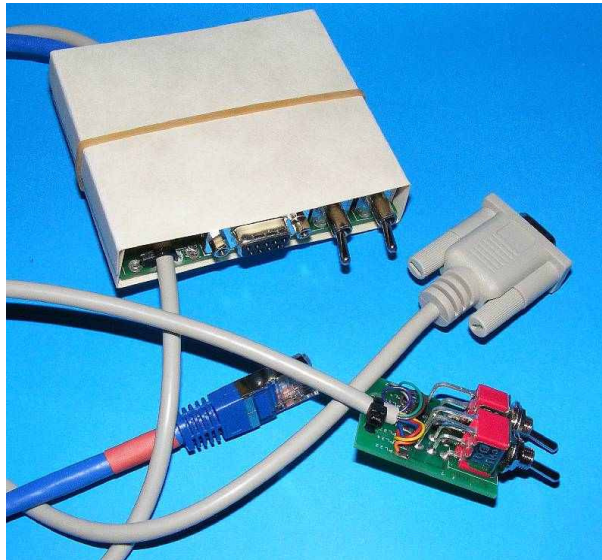
Options

Borgelt B2500 Tactical Glide Computer

(see Borgelt Instruments website www.borgeltinstruments.com)

PDA(Personal Digital Assistant - Palmtop computer) (not available from Borgelt Instruments)

PNA(Personal Navigation Device – usually an automotive GPS unit modified to run glide computer software) (not available from Borgelt Instruments)



This optional device connects to the B800/B500 or other variometer system and supplies power and data to various other devices - a B2500 glide computer, a Flight Recorder(FR), a Flarm unit(or second FR) and a PDA/PNA which can receive 5 volt power at 1 amp and data from the B800.

Installation is simplified as 12 volt power must be supplied only to the B800 and the PDA-PS distributes power and data to and from the FR, FLARM, PDA and B2500 and there is a serial port for B800/B2500 program maintenance.

There is a connection for a FR on this unit, connection for a FLARM (or second FR) and two panel mountable switches which allows connection of the data to/from FR/FLARM direct to the PDA/PNA for declarations and optionally allows selection of FR/FLARM GPS or B800air data/GPS for flight information.

The PDA_PS automatically combines B800 data with serial data from a FR/Flarm if available and autobauds the data rate to that of the FR/Flarm.

Specifications:

Weights B800 includes HP_GPS and GCD but excluding speakers.

	57mm	550	gr	(19 oz)
	80mm	630	gr	(21 oz)
Speakers (each)		160	gr	(5 oz)

Universal PDA_PS/dataport 160gr (6 oz)

B800 power consumption (depending on audio volume)
Approx 100-180 milliamps at 10 to 16 volts DC depending on audio volume.
All B800 variometer functions are altitude compensated to 22,000ft.

Note 1: We reserve the right to change specifications and features at any time.

Note 2: Please note that this document describes the operation of the B800system as at August 4th 2011