



# SPRITE

## VRM10 Digital Audio Variometer

Recorded alarm messages including undercarriage warning

## Operations manual



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## 1.0 Introduction

This manual describes the Tasman Instruments digital Variometer, user operation and configuration settings.

VRM10 Sprite will fulfill the needs of both sport and competition pilots alike. It enhances the information to the pilots own “feel” to maximize use of available sources of lift when flying around the field or cross country. The response is both rapid and controlled, it is true to the “feeling” of the air by the pilot, re-enforcing the pilots mental image of air being sampled by the aircraft. Technology employed in both hardware and software has many innovations developed by Tasman Instruments and includes features suggested by users of the Tasman Instruments V1000/2000 previous products.

### 1.1 Development Objectives

VRM10 Sprite’s key designed element is a software module that is able to reject rather than filter inputs from the pressure sensor/TE probe. Because the filter is not “loaded up” working on inputs that are not relevant to the pilot, a faster response in the filtering can be used than otherwise would be possible.

The high resolution that is available from the digital converter results in the instrument being able to respond accurately..

High resolution digital converters are slower in operation. To minimize this Sprite uses multiple simultaneous measurements which provide a rapid initial response. Most pressure sensor Variometers have a small delay to respond, just a fraction of a second, but still a delay that is significant when in flight.

Connectivity is provided for Tasman Instruments Air Data package or Flight Pack and for a new Speed to Fly facility that will utilize other areas of the display that are available.

## 2.0 Features and Benefits

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### 2.1 Variometer

- High resolution, low noise for a steady indication with fast response.  
Gust and fast changes rejected.
- +/-19.9 Kts full scale audio and digit display.
- Fully altitude compensated.  
No practical height limit
- No flask required.  
Removing the flask helps to speed up the response.

### 2.2 Display

- Maximize pilot “eyes outside” time.  
Simple operation with a visual presentation that is clear and informative.
- Needle bar LCD display with 0.5Knot segments.
- Elapsed time clock.  
Time of flight at a glance.
- Up/Down arrows 40second filter result trend.  
Is the climb improving? Decision to re-center or leave helper.

### 2.3 Audio

- Adjustable response filter 1.0 to 4.0 seconds in 0.5sec steps.
- Adjustable sink threshold 0.0, 2.5, 4.0 knots. 0.0 1.2, 2.0 M/sec  
Sink tones have a delay of 20 seconds in sink before becoming active.
- Tone type selection.  
Tasman or more traditional sliding lift/sink tones.
- PTT Mute input.  
Mute the Variometer during radio transmissions. (Could be set to +10Kts tone by request.)
- Panel side sound path.  
Audio tone with minimal power drain.
- External speaker connection with internal speaker disconnection.

## 2.4 Power Control

- Power Up selection.  
Set for auto switch on with Master power or manual power-up.  
Auto power-up may be useful where there PIC is in a rear seat.
- Reverse polarity power connection protection  
Internal auto reset fuse provided.

## 2.5 Supply Voltage measurement

- Supply voltage measurement and monitoring.  
Display of voltage and spoken word “Low Battery” when 10.5 volts or below. (4 repeats)

## 2.6 Remote Display

- Remote display for two seat installation has inbuilt speaker with volume controls.
- Simple 2 seat installation with only one small wire only.  
With RJ style connectors.

## 2.7 Alarms

- Voice alarms for both battery condition and undercarriage where switches are fitted. Voice alarm for undercarriage has power to cut through to the pilots attention in busy circuit conditions where mistakes are made.

## 2.8 Mechanical

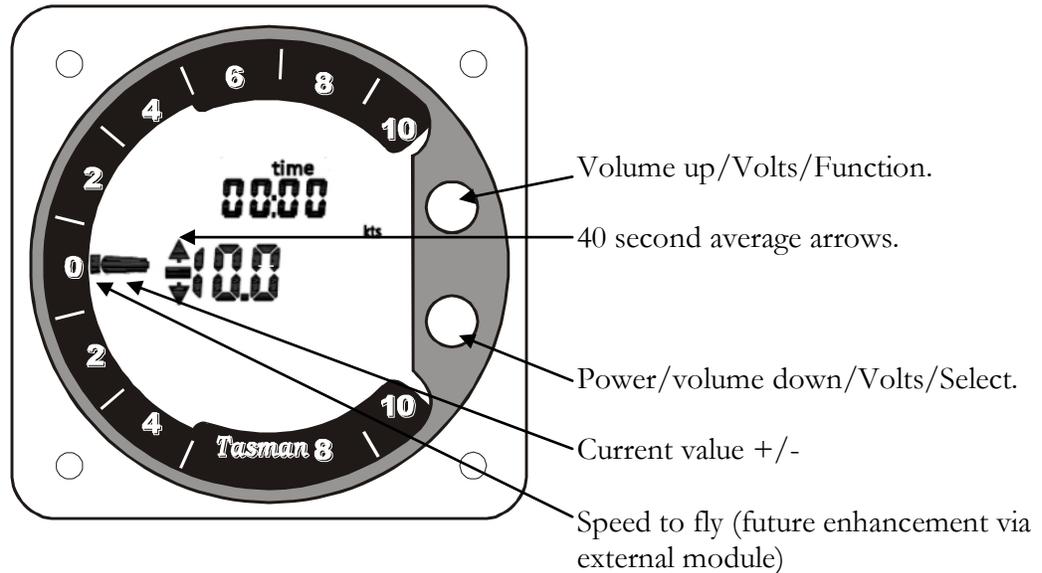
- Small size and light weight with minimal power consumption
- .60.6mm rounded square 62mm deep.173 grams weight.

## 3.0 Operation

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### 3.1 Controls

Two buttons have multiple functions, the primary functions are for power and volume control.



### 3.2 Display

- Primary areas of the LCD display are a semi circular bar or pointer. This is always indicates the current lift/sink rate with a user selectable filter time.
- The center of the screen has two number fields. The center digits +/-19.9 which by default is the average lift rate based on a 20 sec fixed filter, or can be selected by the user to be the current value as above.
- Up/down arrows above and below the Minus sign. These arrows indicate the trend of a 40 second average, increasing or decreasing. The purpose is to assist the pilot's decision about re-centering or leaving a climb.
- The 4 digit field is an elapsed timer which counts hours/seconds since power-up. This can be used as flight time data reference.
- There is a units flag shown and is default Kts can be selected as M/sec.

## 4.0 Pilot Operation

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### 4.1 Switching on

If power is applied from the a/c battery and no display is present then press and hold the lower button for 1-2 seconds. A BEEP should be heard and the display will momentarily show all segments then HELLO, and finally the operating screen as shown above.

### 4.2 Switching off

Switch off by pressing and holding down the power button. Hold for 3 beeps. Automatic power down will occur if the Variometer has not changed altitude significantly during the previous 2 hours.

### 4.3 Volume setting

A press or tap of a button will cause a *beep*, clears the display giving only a number in the center representing the current volume setting 0-5. If the volume is at its limit, either up or down then two *beeps* will be heard. The display will continue to display volume setting for 2 seconds then return to the run screen.

### 4.4 Voltage measurement

Press and hold both buttons down simultaneously to show supply voltage.

### 4.5 Time clock

The clock will count elapsed time from power-up.

It may be useful to wait till final cockpit checks to switch on the Variometer so that the time is fairly representative of the flight time. Note the displayed time at landing for record keeping.

### 4.6 Messages and warnings

Messages and warnings are suppressed for the first minute after power-up.

If the undercarriage warning is triggered, either by a fault or pilot action, the display will blank and ESC will be displayed.

If either of the buttons are pressed while ESC is displayed, the warning will be suppressed for two hours, then becoming active again. **Undercarriage warning** will repeat six times.

**Low Battery** will repeat 4 times. **Note:** the volume is fixed.

After ESC display has cleared, then after a short delay, normal Variometer function will resume.

#### **4.7 Remote display.**

For a Slave or Remote display installation some of the above functions are modified.

##### **Switching on/off -Auto/manual**

If the Remote has been powered down by use of the Remote display Power key, then the Remote display will be in manual mode ie. Power control by the Remote display power key.

If the Remote display is left **on** when the Main display has powered down, then the Remote display will be in auto mode ie. power on/off with the main display.

#### **4.8 Messages and warnings.**

No messages are played by the Remote display.

note that Variometer display and audio on the Remote display will not be available during Messages and Warnings on the Main display.

## 5.0 Setup options.

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There are a number of functions that can be modified that control the behavior of the Variometer.

Access to these functions is available by pressing and holding the top button, the Function button, until a second beep is heard after about 2 seconds. The display will show **End**. If the button is released **End** will be shown for about 2 seconds unless there is another press of the Function button. Then 8 pages can be scrolled through.

Fcn 0-8, Fcn 0 is **End**.

Enter and exit from setups is only when **End** is displayed.

To change any of these functions, the lower key, or Select key will scroll through the available settings described below.

**Note:** the default values as shipped.

### 5.1 Setup functions

#### Fcn 1

**SLo/FASt**      Default SLo

Center LCD screen is either the 20sec average SLo, or the current value filtered at the selected response speed FASt.

#### Fcn 2

**10FS/5.0FS**      Default 10Kts

Current value graphic is either 10Kts/5.0Kts. Full Scale.

#### Fcn 3

**x.x SEC**      Default 1.5 seconds.

Current value filter response speed x.x is 1.0-4.0 seconds in 0.5 second increments.

#### Fcn 4

**Lo x.x**      Default -2.5 Kts

Threshold value of sink tone. x.x 2.5/4.0/on/oFF.

on- Sink tone enabled on any negative value.

oFF- Sink tone disabled.

**Note:** Any setting with sink tones active has a delay before tones are present of 2 seconds continuous in sink.

#### Fcn 5

**1/0 HI**      Default 1

Tasman or Legacy style Lift tones.

1- Tasman style. i.e. Interrupted solid beeps lifting in pitch and decreasing interval.

0- Legacy style. Sliding pitch with intervals.

## Setup options cont

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### **Fcn 6**

#### **1/2 GPh**

Graphic bar segments either needle style 1, or bar graph2.

Default 1.

### **Fcn 7**

#### **0/1 PUP**            Default 0

Power- up style.

0- Button control of power.

1- Power from external supply active.

### **Fcn 8**

#### **PLAY0**

Audition available audio messages. 1-4

## 6.0 Special setups Not normally accessed by the user.

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This area has some facilities for Interrogating serial numbers , setting units, calibration of Voltmeter.

It is accessed by holding down both buttons at Power-up until a beep is produced then releasing the power button before the Function button.

Scroll through the pages with the Function key. Change by Select key. Exit when **End** is displayed, press Select key while **End** is displayed to exit setup and re-start, changes are saved.

Note: There are two processors, one for the display PCB and another for the Sensor PCB. These also have separate software versions.

### **Unit**

Select KTS/Msec

### **SErS**

Serial number of sensor. Press Select to toggle display.

yymm Year month

DDXXX day serial

### **SofS**

Software version of sensor

X.X

### **SErd**

Serial number of display. Press Select to toggle display

yymm Year month

DDXXX day serial.

### **Sofd**

Software version of display.

X.X

### **Volt**

Voltmeter calibration. Press both buttons together to enter. Up/down keys to adjust. Both keys to exit.

1X.X

### **diSP**

**LocAL/SLAvE** Toggle with Select key.

Setting for display PCB if it is a Slave repeater.

### **End**

Press Select to exit and re-start

## 7.0 Specifications

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**Note:** The performance of this instrument can be adversely affected by leaks of the pneumatic system and is dependant on a correctly compensated and positioned TE probe.

### Variometer

Resolution	0.1Kts.
Maximum reading	+/-19.9Kts
Drift	Negligible
Accuracy	+/- 0.5 Kts Full scale
Noise	+/- 0.1Kts max 1.0 second response time

### Electrical

Operating voltage	6 to16 volts DC. 12V nominal.
Operating current	50mA @12V minimum volume setting Max 200mA (Internally fused)

### Temperature

-30 to 60 degrees celcius (non condensing)

### Mechanical

Dimensions	61.3 x 61.3 x 69mm W-H-Depth to tip of tube barb.
Mass	175gm.