

Am Brammer 30
D-29640 Schneverdingen
Germany
Tel./Fax: +49(0)5193-52667/52669
e-Mail: U.SCHUL@t-online.de
Internet: <http://www.tek-variometer.de>

Dear model airplane pilot,

Thank you very much for the confidence into our products which you have demonstrated in buying our SKYPANEL.

In order to always insure a correct and save operation, please make sure to study thoroughly the operating manual of SKYPANEL.

You will recognize quickly that the start of operation is much easier as you may have anticipated.

Always keep the manual close by for a later quick reference.

Please copy the computer software FlightBook V 2.00 onto your harddisk and start it from there.

The scope of delivery is:

One SKYPANEL

One special connector

One blind connector to protect the pins for the bus interface
(between the cables and the push button pins)

One short cut connector for vario operation without SKYPANEL (taped to the housing). See manual!

One programming push button with cable

One adapter for PC-interface

(not with SKYPANEL "light")

One CD with FlightBook Software

(not with SKYPANEL "light")

We wish you fascinating flights and always happy landings!

Uwe Schulz

A Very Special Flight Sensation

SKYPANEL is featuring the following functions:

Noise- and Range-Check for PPM-RC-Systems

The well known control surface jitter is being analysed with respect to its presence and magnitude. Jitter sources range from temporary “misalignment” of transmitter and receiver antennae to the complete failure of the transmitter. Other reasons include long and badly placed servo cables acting as an antenna, radio wave reflections, disturbing transmitters a.s.o. as well as inherent RC transmitter and receiver performance deficiencies.

3 modes can be chosen from:

1. Feature switched off
2. Sensitivity level 1: Low sensitivity with disturbances indicated by two rings (“ding-ding”) and the announcement “Reichweite”
3. Sensitivity level 2: In this mode the number of disturbed signals per second is counted and signaled as follows: If there are 10 servo pulses/second which are mutilated by more than 20 %, then there are two rings and the word “Reichweite”, as above. 20 mutilated pulses/second would yield three rings etc. The number of rings is thus an indication of noise magnitude.

Sensitivity level 2 is recommendend.

Noise- and Range-Check for PCM-RC-Systems

The above mode can be used for PCM-systems by programming the RX output to “+100%” pulse length. In case of disturbance there is an unwarranted announcement of “height, integrated vario,...” values (see below).

Supply Voltage Check

The voltage is announced automatically as soon as a voltage **drop of 100 mV** is occuring. Only drops are being signaled in order to avoid unwarranted announcements, for instance when double battery installations are being used.

Immediate voltage readings are possible via a defined switch- or slider position at the transmitter. As an additional option, a “**critical voltage**“ level can be defined between **4,3 and 8 Volts**, either by the programming button or via the PC. When this voltage is being reached during operation, SKYPANEL will signal this status in (selectable) time intervalls independent of transmitter switch- or slider position, further refered to as “transmitter settings”. Please note that this measurement is being taken at the RX-terminals. Long wirings may cause voltage drops above 100 mV.

Temperature Check

The temperature measurement is being taken within the SKYPANEL case and can be read via a defined transmitter switch- or slider position. In addition, a “**critical temperature**“ can be defined between 0 °C and 60 °C, the overrun of which is being signaled independently from transmitter settings.

Flight Time Recording

Flight time measurement starts automatically after lift-off /launch at +/- 3 m and can be read immediately by the transmitter setting. Further, a time interval for automatic reading repetition can be programmed by push button or PC. Programming is either “off”, in steps of 10 seconds upwards or such that announcements only occur together with voltage readings.

Altimeter Recording

Altitude readings can adjusted in three modes by transmitter setting:

1. Immediate reading
2. When climbing/sinking through 50 m-levels, i.e. 50 m, 100 m, 150 m,...
3. In programmable regular time intervals

The feature can be programmed “off”.

Integral Vario Feature

By definition, the “integral vario” is monitoring the vertical speed over a specified time interval. In the SKYPANEL, a somewhat simplified version has been implemented by continuously subtracting the altitude value of the beginning of a time interval from the altitude value at the end of this interval. This value is announced according to the transmitter setting either on direct request or in programmable intervals. At the same time, these intervals serve as measurement time base. Announcement is for example: “Steigen 4 Meter (climbing four meters)” or “Sinken ein Meter (sinking one meter)”. This can be helpful when optimizing thermaling.

External Push Button

It allows the very convenient on-site programming of the SKYPANEL without interfacing with a PC and it offers the reading of flight time and maximum altitude after landing.

Data Logger

This particular feature offers information about all featured functions including optional switch positions, for post flight analysis. It acts as a “black box” and is connected to a PC via a built-in RS-232 interface. After data transfer all featured values are displayed graphically and in colour as functions over flight time. The sample rate (time between two full data sets) can be programmed in steps of 1 second. Memory size allows 2.2 hours storage at the maximum sample rate of 1set/second, and for instance, 33.3 hours at 1set/15 seconds. The PC-software “Flight Book” is giving further details. Recording starts at an altitude difference of +/- 3 meters after take-off/launch. If the maximum recording time is overrun, recording will continue yet the “oldest” data sets will be lost (revolving memory).

Flight Log

The flight log is part of the data logger feature and offers acoustic reading of flight time and maximum altitude upon push button operation on-site or by graphic presentation on the PC. The most recent flight is numerated “no. 10”, the previous flight is “no. 9”, a.s.o.

Switches S1 to S4

This feature is quite particular and offers the opportunity to check certain (mechanical) functions like closed or open retract doors and gears and retractible propulsion systems. Small micro switches are connected to SKYPANEL and the switch position can either be read through transmitter setting or on PC. **S4** also input for measurement of revolutions per minute

Bus Interface

SKYPANEL operates on a built-in bus system and offers thus a wide range of future options. Additional sensor systems presently under development may be added on a “plug-and-play”-basis. Sensors for electrical propulsion voltage and current, battery temperature, rpm and others are considered.

PC Software

The PC software “Flight Book” is a class of its own and has been designed specifically for SKYPANEL. Flight data can be transferred and presented in 2D or 3D format. As well a zooming feature allows the detailed analysis of interesting periods during the flight and the data can be put in archive storage, printed, prepared for e-mail transfer or changed into EXCEL-format for further analysis. Further, all programming steps can be performed.

The software is fully self-explaining, yet one remark is to be made: The flight numbers of the “Flight Log” and the PC presentation of the “Data Logger” are not necessarily the same. If required, please refer to the maximum altitude reading for comparison.

Conclusion

Even though SKYPANEL offers a great number of features it is easily operated.

Without triggering by a transmitter signal it operates solely in its data logger and flight log mode. But in a full system operation together with the LPD voice receiver and the variability of different transmitter settings, **it offers a multitude of information for improved flight performance and safety.**

SKYPANEL can be operated with SKYMELODY varios of all generations!

Please note that during acoustic readings, the vario signal is attenuated into the background for better voice apprehension.

TEK users may note that the full system implements two separate pressure sensors dedicated to their functions. Thus altitude measurements will not be interfered by pressure changes at the TEK nozzle. This layout follows the equipment scheme in full size aircraft.

Technical Data

Altimeter range: Approx. – 500 m to + 9000 m

Resolution: 1 m

Current consumption (SKYPANEL only): approx. 13 mA

Operating voltage: 4 – 5 cell normally, up to 10 V max.

Weight: approx. 24 gr

Size: 50x30x15 mm

Features: Noise-/range check for PPM (and PCM) RC-systems

Supply voltage check including alarm setting

Temperature check including alarm setting

Continuous measurement of: Flight time

Altitude

Integral vario

Programmable via external push button or via PC software

4 optional switched inputs for aircraft status control

Input for measurement of revolutions per minute

Flight log feature: storage of max. altitude and flight time for latest 10 flights

Data logger feature with variable recording time

Acoustic reading of all values in synthetic voice

Graphic display and analysis of all data via PC software “Flight Book”

Implemented bus system for further optional sensors (as are current, voltage, rpm,

External temperatures, velocity, etc.)

Interface to SKYMELODY vario

Identification of SKYPANEL connector pins:

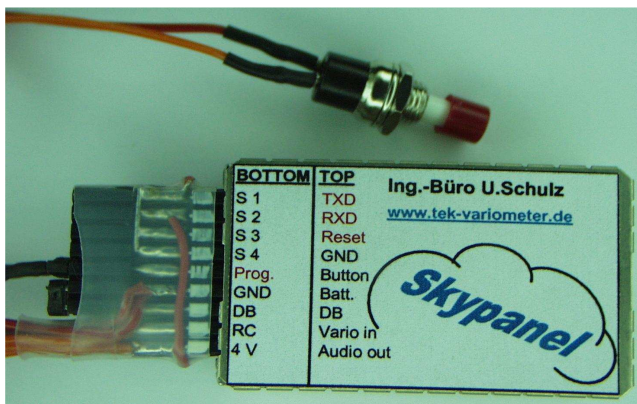


Fig. 1

S1, S2, S3, S4: switches input 1, 2, 3, 4

S4 also input for revolutions per minute.

GND: common, ground

DB, DB: data bus lines

RC: pulse from receiver servo output

4 V: 4 volt supply for transmitter module

Button: programming push button

Batt: power supply input

Vario IN: vario signal input (from vario module)

Audio out: output for transmitter module

Prog., TXD, RXD, Reset : computer interface Lines

SKYPANEL is delivered as shown in fig. 1: The special wiring is already plugged into the SKYPANEL

On the label, the description of the upper row of pins is marked “oben”, the lower row is marked “unten” and is only related to the SKYPANEL. All identification written in black is used for the in-flight wiring, whereas the red markings are dedicated for the computer interface.

The special SKYPANEL connector is marked **WHITE** on its **UPPER** side and must be inserted only as shown in the figure.

Alongside the wiring, 4 discrete switches can be connected to indicate individual functional aircraft statuses like retract gear doors, retractable propulsion systems a.s.o. Furthermore the push button for programming and the 4-pole bus connector for optional sensors can be plugged aside.

Caution: The switches must not connect versus ground but versus 4 volt. In order to avoid malfunction and/or damage, it is therefore highly recommended, that additional in-flight wiring and optional switch wiring are procured from this manufacturer!

Caution: The 4-pole bus connector (DB, DB, Batt. and GND) is reserved only for bus line purposes and **MUST NOT** be used otherwise. A blind connector is provided meanwhile.

The **programming button** may be mounted at any position in the model. If too long, its cable may be rolled into a coil.

For operating the SKYPANEL with a PC, it is just pulled off from the flight wiring and plugged into the special adapter, this one being connected to the PC by a standard serial interface cable.

Operating instructions

3 steps only are needed to get started with the SKYPANEL.

To begin with, RC transmitter, receiver and the Scanner or FRS are off.

1st step: The non-marked 3-pole connector is plugged into the RC-receiver. Select a free output which is dedicated on the transmitter's side either to a 3-position-switch or a slider. If not available, a Y-cable can be used in parallel to an appropriate output, e.g. the aero-tow hook.

2nd step: Plug the cable marked “T” (transmitter) into the transmitter module (138-channel or single-channel module).

3rd step: Switch on the transmitter, LPD-receiver and RX-power supply and adjust the LPD-volume in order to hear the SKYPANEL with its initial announcement: “SKYPANEL, version number, local air pressure,”.

The system is now operational.

In order to implement the **SKYMELODY-vario** the remaining two connectors are used: The previous power supply cable of the vario is plugged to “**VV**” (vario voltage) and the other cable, previously leading to the transmitter module, is plugged into “**VO**” (vario output).

After switch-on, the full system is operational.

Older versions of SKYMELODY (before the introduction of the TEK-option) need a minor modification. Please return it to the manufacturer.

Entering the programming mode

In order to enter into the programming mode, press the push button during the announcement of the local air pressure after initial switch-on.

Further programming steps are led by announcements from SKYPANEL.

Flight Log

The “flight log” is containing information about flight time and maximum altitude of the latest 10 flights and is announced upon pressing the button. Remark: The most recent flight is “no. 10”. System switch-off is terminating this mode.

SKYPANEL/PC Interface

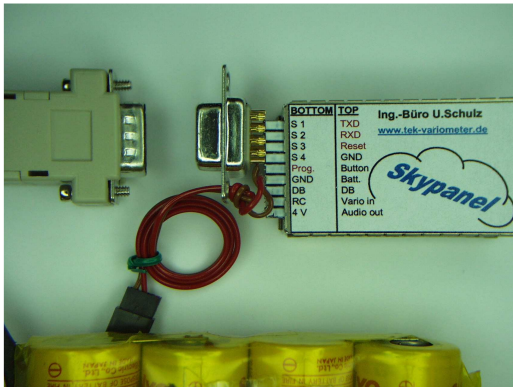


Fig.2

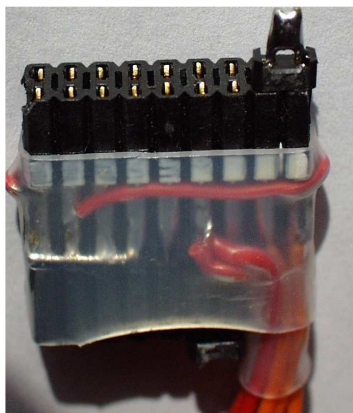
Fig. 2: The provided adapter is the interface between a RS-232 interface cable and the SKYPANEL

NOTE: The white marking on the adapter indicates its upper side and must be plugged as shown in fig. 2.

A RS-232 interface cable (**not provided in the scope of delivery**) is connecting the adapter to the PC and should always be plugged before the battery supply is connected.

The screen of the “Flight Book”-software will show “offline” in its lower left corner. After plugging the battery this is replaced by the local air pressure and the local supply voltage.

Flying with SKYMELODY, yet without SKYPANEL



This configuration is very easily done with by unplugging the SKYPANEL and putting the provided jumper into “Vario IN” and “TON”, previously held by the SKYPANEL in the flight wiring, see fig. 3.

There are no other changes to be made.

The in-flight wiring is designed to remain in the aircraft whereas the modules can easily be interchanged from one model to the other.

Fig.3

Important note:

Damages due to improper handling or resulting from opening of the device will cancel any guarantee. No liability will be taken over for follow-up damages.