



Operating Handbook  
For  
**SORCERER AUTOPILOT**



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## General Introduction

The TruTrak autopilot can be defined as being an orthogonal rate system. This means that gyroscopic rate sensors sense motion about each of the major axes (roll, pitch and yaw). These sensors generate the fast signal responses necessary to create an autopilot with the best possible dynamic performance.

To fly an aircraft well about the axis controlled by the ailerons, velocity of aileron movement must be directly proportional to the rate of roll for small movement. This means that aileron position corrections do not lag behind motion of the craft about the roll axis. Aileron control systems that use a turn coordinator, which senses twice as much azimuth as roll rate, cannot do this. Instead, yaw disturbances in turbulence cause undesired aileron movement. In some aircraft this effect is so severe that the controls may even momentarily move in the wrong direction.

The goal at TruTrak is to create systems with the very best dynamic performance available—systems that do not need to be disengaged in turbulence, but instead provide function when needed most.

The complete TruTrak autopilot system combines all the electronic and sensing elements needed for the roll and pitch functions within a single panel-mounted programmer/computer package. A rate-gyro-controlled yaw damper can be added to the system.

Basic directional control is provided by digital selection of a GPS track. This replaces heading selection on the DG and eliminates drift as well as crosswind correction. In the GPS steering mode of operation, the system responds to digital guidance information to fly a complex navigation program.

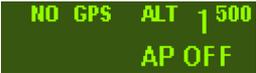
The vertical portion of the system contains a digital altimeter and associated altitude selector with selectable increments as small as fifty feet. Altitude transitions can be made by airspeed, vertical speed, or horizontal distance (VNAV) selection. If an upward vertical speed is selected which is beyond the capability of the aircraft, there will be no stall. Instead, the autopilot will cause the aircraft to climb at a pre-set minimum safe airspeed. This is the only known system to provide this safety feature.

For any set of features all TruTrak computers are identical. Servos likewise are identical in velocity response. Servos do differ according to total torque required. By providing setup functions in the programmer for system activity and torque, one TruTrak programmer-servo combination can fly any aircraft.

As a starting point in understanding how to operate the TruTrak system, the following describes the presentation of data, the operating controls, and the procedures for selecting modes of operation.

## Autopilot Power Up

The autopilot master switch should be in the off position when the engine is started. Aircraft electrical systems can generate voltage transients during an engine start and like other avionics systems, the autopilot should not be subjected unnecessarily to these conditions. After start up, turn on the autopilot master switch and keep the aircraft stationary as the internal gyros are initialized. This takes approximately ten seconds during which time the display will show the words **PWR UP** in the lower right. When initializing is complete **PWR UP** will change to **AP OFF**.



NO GPS ALT 1500  
AP OFF

## Mode and Data Display

The display shows operating modes and associated data. It is also used to display setup mode screens and their values. When displaying operating modes, the left side shows lateral data and the right side shows vertical data. **NO GPS** will be displayed in the top left of the display when no GPS signal is detected. A flashing period will appear when a GPS signal is detected, but no position information is available. The words **NO FIX** will be displayed. Once GPS position data becomes valid a flashing asterisk will appear and the display will show **GPS OK**. If GPS flight plan information is being received over the serial channel or if GPS steering information is being received, a flashing plus sign will be shown in place of the asterisk.

The upper left display is labeled **TRK**, showing the electronic DG slaved to GPS track. When the GPS track is not available, **TRK** will be replaced by **BANK**. This means the autopilot is using its internal gyros for bank angle control. The lower left display labeled **SEL** shows the selected GPS ground track when in the standard track mode. When in the gyro mode, the lower left shows the current selected bank angle. The upper right display shows altitude or selected altitude, and the lower right display shows either selected vertical speed or selected airspeed.

Underlined numbers indicate a value that can be adjusted by rotating the knob. A sample of the display is shown below.



TRK 104 ALT 1500  
SEL 104 vs 500

## Sorcerer Setup Procedure

In the Sorcerer setup screens, pressing **VS UP** on the rocker switch will advance the page to the next setup screen. Pressing **VS DN** will return to the previous screen. All values are changed by rotating the knob. Pressing the knob will exit the setup mode.

### Lateral Setup

To enter the lateral setup mode, press and hold the **TRK** button for two or more seconds until the first setup screen appears. This screen shows the current value for the **LAT ACTIVITY**. Any value between **0** and **24** may be chosen. In this example, the value of **3** is selected. The higher the number is set, the faster the servo moves the control system. Too low of a setting will cause hunting, too high of a setting will cause hunting and the servo to be overactive and jitter. (Any lost motion or play between the servo and the control surface can cause hunting in still air).

```
LAT ACTIVITY  3
             EXIT  VS UP ▶
```

The next setup screen is for adjusting **LAT TORQUE**. This determines how much torque the roll servo is allowed to apply with 12 being the maximum. A default value of 12 is set at the factory but may need to be modified to suit a particular aircraft or pilot. Trutrak recommends a setting of 12 for all aircraft. If the torque setting is too low the AP may not be able to control the aircraft in all flight conditions. This could cause the aircraft to drift off selected track.

```
LAT TORQUE  12
◀ VS DN EXIT  VS UP ▶
```

The next screen shows the RS-232 input **BAUD** rate setting. The default setting is 9600. Consult the Sorcerer installation manual for information on how to setup some GPS receivers to properly communicate with the Sorcerer AP.

```
BAUD  9600
◀ VS DN EXIT  VS UP ▶
```

## 6

The next screen shows the **BANK ANGLE** adjustment. It is adjustable to LOW, MED, or HI. This will limit the AP bank angle to approximately 13°, 18°, and 24° respectively. This setting has no effect on the GPSS mode. It only affects GPS TRK and GPS NAV modes.



BANK ANGLE MED  
← VS DN EXIT VS UP →

The next screen is the **MICROACTIVITY**. This setting is used in cable controlled systems to remove any slack or lost motion introduced by the cables. This setting should be left at zero unless advised by the factory.



MICROACTIVITY 0  
← VS DN EXIT VS UP →

Advance to the next setup screen. This is the **GPSS GAIN** setting. This setting should be left at 16 unless advised by the factory.



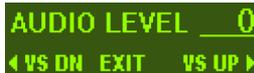
GPSS GAIN 16  
← VS DN EXIT VS UP →

The next setup screen is **SPEECH**. This setting turns the speech annunciation on and off. If the speech is turned off, the autopilot will give a series of alerter tones for important information. If the speech is turned on, there will be a voice annunciation for important information.



SPEECH ON  
← VS DN EXIT VS UP →

The next setup screen is for **AUDIO LEVEL**. While this screen is displayed, the autopilot will send an audio tone to the audio system. Adjust the value between **0** and **16** for the desired volume.



AUDIO LEVEL 0  
← VS DN EXIT VS UP →

The next screen is the **EXT DG/HSI** selection. Use the knob to select either **Y** (yes) or **N** (no) depending on whether an external DG or HSI is connected to the system. Leave setting at **N** for Garmin G3X.



EXT DG/HSI? N  
← VS DN EXIT VS UP →

The next screen is the **YAW DAMPER** selection. Select **Y** (yes) or **N** (no) to indicate whether or not a yaw damper is present. If **N** is

selected, this is the final lateral setup screen. Click the knob to exit the lateral setup mode. If **Y** is selected push **VS UP** on the rocker to advance to the next setup screen.

```

YAW DAMPER? Y
◀ VS DN  EXIT  VS UP ▶

```

If the **YAW DAMPER?** was answered with **Y**, then the next setup screen will be for **YD LEVELING**. This is the fine adjustment for the yaw damper to maintain a ball centered condition. The value is adjustable from -8 to 8 and is used as necessary to have the yaw damper keep the aircraft slip/skid indicator (ball) centered when the yaw damper is engaged and the autopilot is flying the aircraft straight and level. When adjusting this value, allow a few seconds for the yaw damper to respond to each new value setting.

```

YD LEVELING  0
◀ VS DN  EXIT  VS UP ▶

```

The final setup screen is for yaw damper activity. The yaw damper activity functions exactly like the lateral and vertical activity settings. This setting is adjustable from **0** to **12**, where **0** is the lowest activity and **12** is the highest activity.

```

YD ACTIVITY  1
◀ VS DN  EXIT  VS UP ▶

```

## Vertical Setup

To enter the vertical setup menu, press and hold the **ALT** button for two or more seconds until the first setup screen appears. This screen is the **VRT ACTIVITY** adjustment. Any value between **0** and **24** may be chosen. Choose a level that gives the best overall performance in all modes of flight.

```

VRT ACTIVITY  3
EXIT  VS UP ▶

```

The next setup screen is for **VRT TORQUE**. Any value between **0** and **12** may be selected. A default value of 12 is set at the factory.

```

VRT TORQUE  12
◀ VS DN  EXIT  VS UP ▶

```

Trutrak recommends a setting of 12; however the value may be lowered to suit pilot comfort level.

The next setup screen is the **MIN AIRSPD** setting. This value is displayed in knots Indicated Airspeed. This value should be set above the clean stall speed of the aircraft, but not so high as to interfere with maneuvering with the autopilot engaged.

```

MIN AIRSPD  70
< VS DN EXIT  VS UP >
  
```

The next screen displayed is the **MAX AIRSPD** setting. This value is also displayed in knots Indicated Airspeed. It should be set safely below the redline IAS of the airframe, but not so low as to interfere with maneuvering with the autopilot engaged.

```

MAX AIRSPD 160
< VS DN EXIT  VS UP >
  
```

The next screen is the **NORM CLIMB** setting. This value is the default indicated airspeed value selected when an altitude select is entered above the current altitude.

```

NORM CLIMB 120
< VS DN EXIT  VS UP >
  
```

The next screen is the **STATIC LAG** adjustment. This allows the user to compensate for lag in the static system of the aircraft that causes pitch oscillations in calm air. Select the lowest value over the range **0** to **2** which results in the elimination of “hunting” in the altitude hold mode.

```

STATIC LAG  0
< VS DN EXIT  VS UP >
  
```

This adjustment should be done in still air at cruise airspeed.

The next setup screen is **MICROACTIVITY**. This setting should be left at zero unless advised by the factory.

```

MICROACTIVITY 0
< VS DN EXIT  VS UP >
  
```

The final screen is the **HALF-STEP** setting. Most of the time, this setting will not need to be adjusted. When it is set to **Y** (yes), then the pitch servo will have a higher resolution and take smaller steps. However, it will also have less available torque. This setting should be

```

HALF-STEP?  N
< VS DN EXIT
  
```

left at **N** (no) unless the nose of the aircraft moves up and down very slightly in very still air.

Push the knob to exit the setup menu.

## Controls

The autopilot can be engaged in one of three ways; (1) Pushing the **AP** button; (2) using the control wheel steering switch; (3) pressing the **GPSS** button when a GPSS steering signal is available. The CWS (Control Wheel Steering) switch is a momentary switch that should be located on the stick/yoke for accessibility. When this switch is held closed for 1.5 seconds from a disengaged state, the AP will engage. If held closed for 1.5 seconds from an engaged state, the AP will enter CWS mode. When the switch is momentarily closed (pressed and released) from an engaged state, the AP will disengage.

## Lateral Modes

When the autopilot is engaged it will synchronize to the current GPS ground track. At this time the cursor will be located underneath the numbers indicated by **SEL** on the display. The desired ground track can be changed by rotating the knob to select a new track. Rotating the knob will increment the selection by 5°. Pressing and holding the knob while rotating will give 1° increments.

Pushing the **TRK** button at any time will return the autopilot to the basic track selector mode.

When an external heading source (DG or HSI) is present and turned on, pressing **EXT** will engage the external DG mode. When in this mode, the heading “bug” within the external DG or HSI will control the direction that the autopilot flies. For use with a Garmin G3X system, the **EXT** button will still follow the heading bug of the PFD, but **N** must be selected in the lateral setup menu.

## **GPS Steering (GPSS)/GPS Nav Mode/GPSV**

Pressing the **GPSS** button will enter either GPS Nav or GPSS mode. The type of steering command that is available will determine how the autopilot will fly a flight plan programmed into the GPS.

If only NMEA (RS-232) GPS information is available, the autopilot will overfly each waypoint prior to turning and intercepting the course line to the next waypoint.

With ARINC steering commands, the autopilot will follow lateral steering or bank commands generated by a navigation system (EFIS or GPS). This means the autopilot will round corners and not overfly the course line to the next waypoint. The display will indicate when the autopilot is in one of these modes by displaying GPSS in the bottom left of the display.

The vertical GPS Steering mode (GPSV) is also engaged with GPSS if the signal is present. If the autopilot is engaged during a climb or descent, you must either zero the vertical speed with the rocker switch or press the **ALT** to engage GPSV. The vertical steering can be decoupled by selecting any other vertical mode. To re-engage the vertical steering, press **GPSS** again, then press **ALT** or set the SVS to 0 using the rocker switch.

```
TRK +104  ALT 1500
GPSS      svS  0
```

**NOTE: If there is not a steering signal present the GPSS button will not function.**

## NAV/LOC Course Mode

Pressing the **NAV** button will bring up the **NAV COURSE (VOR)** or **LOC COURSE (ILS)** setup screen depending on which is selected by the navigation receiver. The setup screen for this mode is shown below.

```
NAV COURSE 104
INTERCEPT ANGLE 30
```

Use the knob to adjust the selected NAV COURSE to the proper value. Once set, press enter to advance to the intercept angle. This value is adjustable from 15° to 45°. Rotating the knob will give 5° increments. Press and hold the knob while rotating to get 1° increments. When the desired intercept angle is set, press the knob to enter this mode.

```
NAV COURSE 155
INTERCEPT ANGLE 25
```

The selected intercept angle is converted to an intercept direction according to which side of the course the aircraft is flying.

In addition, intercept direction is underlined which means it can be adjusted. With this feature the current direction can be adjusted (for

example if being vectored) until the selected inbound course is crossed. During the intercept phase of the approach, the lower left display will alternate between **INT** and **NAV** or **LOC** depending on which mode has been selected by the navigation receiver. When the aircraft is established on the inbound portion of the approach, the lower left display will indicate the selected course.

```
TRK 104 SEL 1500
+ 104
LOC 155 ALT HOLD
```

If the above is **LOC COURSE** and glide slope is present (ILS), flying below the glide slope in **ALT HOLD** mode for a minimum of seven seconds will arm the glide slope coupler. When this occurs, the display will show:

```
TRK 155 SEL 1500
+ 155
LOC 155 GS ARM
```

When the Glide slope is intercepted, the display will show:

```
TRK 337 ALT 1500
EXT LS GS CPLD
```

Glide slope coupling can be terminated by entering either the **ALT HOLD** or **SVS** (selected vertical speed) mode. The lateral mode will switch from **LOC COURSE** to **TRK** mode. The selected track will be the same as the inbound course.

**NOTE: When coupled to the glide slope, one push of the VS rocker in either direction will command a 500 fpm climb and enter TRK mode.**

## REV Course Mode

Click the **REV** button to enter the **REVERSE COURSE** setup screen. This refers to flying the localizer or VOR in the reverse direction. Operation of this mode is the same as **NAV COURSE** or **LOC COURSE** except that there will be no glide slope coupling.

## Gyro Back-Up Mode

The lateral modes previously described are based on GPS track being present. When GPS is lost, the autopilot uses its internal gyros for bank control and **TRK** is replaced with **BANK**. This mode is only a backup and would seldom be needed; however, it does provide a means of selecting a desired bank angle, and a means of adjustment if the aircraft turns when

```
BANK SEL 1500
10°R ALT HOLD
```

zero bank is selected. The selected bank angle can be adjusted by rotating the knob. The angle is selectable in 1° increments up to 5° in either direction. After 5° the number will move in 5° increments up to a

A digital display with a black background and green text. The top line shows 'TRIM SEL 1 500' and the bottom line shows '0.0 °/MIN ALT HOLD'.

total of 30° in either direction. If the aircraft makes a turn with 0° bank selected, press and hold the knob to bring up the gyro trim adjustment. This value is displayed in degrees per minute. It is adjustable in 0.2°/min increments up to a total of 10° in either direction. Adjust the trim value until the aircraft stops turning with 0° bank selected. If an external heading source (HSI or DG) is present, the **EXT** mode remains functional, and if the GPSS/GPSV signal source is functional, the **GPSS** and **VS**(GPSV) modes will also be functional. The remaining modes, **NAV**, **LOC COURSE**, and **VNAV** navigation should not be used when GPS track is absent.

## Yaw Damper

The Yaw Damper can be used whether or not the autopilot is engaged. It automatically comes on when the autopilot is engaged. When the autopilot is not engaged the Yaw Damper can be toggled on or off by pressing the **TRK** button. If the autopilot is not engaged, the yaw damper will automatically disengage at the user selected minimum airspeed. When the autopilot is not engaged and the yaw damper is engaged the display will be as shown below.

A digital display with a black background and green text. The top line shows 'TRK 104 ALT 1 500' and the bottom line shows 'YD ON AP OFF'.

## Vertical Modes

When the autopilot is engaged it will synchronize to the vertical speed being flown at the time to the nearest 100'. At this time it will be in the basic vertical speed operating mode. While in this mode, the upper right section of the display shows altitude and the lower right section shows **SVS** (selected vertical speed). This mode can also be entered by pressing either end of the vertical speed rocker. If the system is in transition to a selected altitude pressing the appropriate direction of the vertical speed rocker will switch from airspeed to vertical speed. It will not cancel the selected altitude unless the selected vertical speed is in the opposite direction.

## Altitude Hold Mode

Press **ALT** to select **ALT HOLD** mode. The selected altitude will be to the nearest 100 feet as viewed on the digital altimeter. For example, pressing enter between 4950 and 5050 will select 5000.

## Vertical GPS Steering Mode (see also GPSS)

**If there is a vertical steering signal present** when the GPSS mode is active, and the autopilot is in altitude hold or zero vertical speed, the autopilot will enter the vertical steering mode automatically. In the **VS (Vertical Steering)** mode the autopilot follows vertical steering commands generated by a navigation system (EFIS or GPS). **NOTE: If there is not a vertical GPS steering signal present the autopilot will NOT have VS (GPSV) function.**

### *On GPS WAAS/LPV Approach*

Once the VDI has been above the center by one dot for at least 7 seconds the VS mode will ARM, and the display will show:



TRK 338 SEL 1496  
EXT LS GS ARM

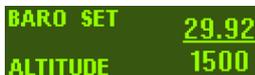
As the VDI passes through center, the autopilot will couple to the virtual glide slope, and the display will show that the autopilot is now coupled to the virtual glide slope as below:



TRK 337 ALT 1500  
EXT LS GS CPLD

## Barometer set

**The barometer must be set prior to using the altitude select feature.** To enter the **BARO SET** screen, press and hold **SEL**, for approximately three seconds. The display will show the following screen.



BARO SET 29.92  
ALTITUDE 1500

Rotate the encoder to match the displayed number to the current barometer setting; the default will always be **29.92**. When this is done press enter. If the displayed altitude is not correct to the nearest 10 ft adjust it by rotating the encoder knob. Press enter to accept the current

altitude and exit the barometer set mode. The settings will not be saved without pushing enter.

When the autopilot is engaged and in altitude hold, upon exit of the barometer set page the autopilot will climb or descend to the current selected altitude. \*(Garmin G900X only), barometer value will be automatically set if the G900X barometer value is adjusted.

## Altitude Select Mode

Pressing **SEL** will display the **SEL ALT** set up screen. At this screen the **SEL ALT** numerals are underlined so that rotation of the knob selects the target altitude to the nearest 500'. Press and hold the knob while turning to get 50' steps. Press enter to save the value and advance the cursor to the IAS or SVS setting.

```
SEL ALT      3500
SEL IAS 115 KTS
```

If a higher altitude has been selected, the pre-set (**NORM CLIMB**) airspeed is displayed. This value can be modified by rotating the knob. When the airspeed has been set press enter and the altitude transition will begin. The autopilot will then revert to the normal flight display. To use vertical speed for the transition instead of airspeed, simply press the vertical speed rocker switch in the desired direction to reach the target rate.

```
SEL ALT      3500
SEL IAS 115 KTS
```

If a lower altitude than current is selected by at least 500 ft, the autopilot will allow you to choose a rate of descent. The default is 500 fpm. Use the vertical speed rocker to adjust the setting to the desired value. Press enter after selecting the rate to return to the normal flight display.

```
SEL ALT      1500
SEL VS 500↓
```

Both the selected altitude and airspeed can be modified while in transition to the selected altitude. Press the knob once to move the underlined cursor to selected altitude. Press it a second time to move it to airspeed and a third time returns it to direction(if in TRK mode). After a short period of time it will return automatically to direction.

```
TRK +104 SEL 3500
SEL 104 SAS 115
```

## *Stopping the Transition to a Selected Altitude*

Once the aircraft is in a climb or descent to a selected altitude the process can only be stopped by entering the **ALT HOLD** mode. This is done by pressing the **ALT** button. The AP will capture the nearest 100 ft and enter **ALT HOLD** mode.

## VNAV Mode

Pressing **VNAV** will display the **VNAV** setup screen.

**NOTE: If there is not a GPS signal present, the VNAV button will not function.**

The **SEL ALT** field is underlined. This value can be adjusted by rotating the knob to select a target altitude. Press enter to save this value.

```
SEL ALT 1 500
DIST 30 NM
```

The cursor will move to the **DIST** field. Rotate the knob to select the ground distance in **NM** that you want to travel to reach the selected altitude. Press enter to enter save this value and begin the transition to the selected altitude.

```
SEL ALT 1 500
DIST 40 NM
```

As in the altitude select mode, the selected altitude and selected distance can be adjusted by pressing the knob to move the cursor first to the selected altitude, then to the selected distance. A third press will return the cursor to direction, or after a short period of time the cursor will return automatically to direction.

```
TRK 104 SEL 1 500
SEL 104 DST 40.0
```

## Minimum Airspeed

Any time the autopilot is engaged and the airspeed falls to the minimum airspeed setting the autopilot will begin to flash **MIN AS** and

```
TRK 104 MIN AS
SEL 104 SVS 1000↑
```

drop the nose of the aircraft to maintain the minimum setting.

## Maximum Airspeed

Any time the autopilot is engaged and the airspeed reaches the maximum airspeed setting the autopilot will begin to flash **MAX AS** and pull the nose of the aircraft up to maintain the maximum setting.

```
TRK 104 MAX AS
SEL 104 svs 1000+
```

## Initializing the Autopilot

### GPS Acquisition

If there is no GPS signal the top left portion of the display will read **NO GPS**. If a GPS signal is present but satellites have not yet been acquired, the upper left portion of the display will read **NO FIX** with a flashing • below. When the GPS obtains a fix the period will be replaced by an asterisk and the display will switch to show **GPS OK** with a flashing \* below. This means that when a certain velocity is attained **TRK** will appear followed by the current track. This happens at approximately 10 knots ground speed as detected by GPS and will even occur at rapid taxi speeds. The four possible screens are shown below.

```
NO GPS ALT 1500
PWR UP
```

```
NO GPS ALT 1500
AP OFF
```

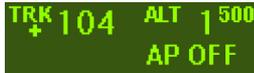
```
• NO FIX ALT 1500
AP OFF
```

```
* GPS OK ALT 1500
AP OFF
```

## Altitude Select with AP Off

A target altitude can be set prior to take-off while still on the ground. As with the AP on, pressing **SEL** will display the **SEL ALT** setup screen. The procedure is to select the desired altitude and then press enter. **NOTE: The Barometer must be set prior to attempting to enter the altitude select screen.**

The display will show the selected altitude even though the autopilot is still off. This will serve as a reminder that the autopilot will climb to the selected altitude when engaged. It will not climb at a selected airspeed, but will default to a vertical speed of 500 fpm. The rate of climb can be adjusted with the vertical speed rocker.



TRK 104 ALT 1500  
AP OFF

## Gyro Set

When the initializing has been done correctly the gyros should already be centered at the time of take off. To perform a manual gyro set, press and hold the knob with the system disengaged. Hold the knob for approximately 40 seconds. The display will show **GYRO SET** while the knob is held in. **This should only be done with the aircraft stationary!** This procedure is not necessary for normal flight and should only be performed when advised by the factory to do so.

## Engaging the Autopilot

Since the autopilot synchronizes to vertical speed, be sure that you can maintain the rate of climb when the AP is engaged. Otherwise airspeed will diminish as the aircraft attempts to sustain vertical speed. As airspeed diminishes to the pre-set minimum it will hold this value and thus prevent a stall.

When aircraft vertical speed is **approximately less than 400 feet per minute, the autopilot will initially select zero vertical speed.** The vertical speed rocker can be used to change the initial value if desired.

## Setting Pitch Trim

The pitch servo contains a torque sensor that sends a signal to the controller when the up or down force applied on the servo gearbox is greater than a threshold value. When this signal indicates an out-of-trim

condition that persists in one direction for more than a few seconds, the three moving horizontal bars will come into view and move in the direction in which trim is required. The trim should be adjusted to return to a neutral trim condition. With mechanical trim this is easily done, but with electric systems it may be necessary to develop a technique. If the trim is slow enough, the pilot has plenty of time to react when the bars disappear before the trim condition is reversed. With a fast trim it will be necessary to tap or pulse the trim button so that it will be slow enough to turn it off before going too far.

## Power Loss

If there is a momentary loss of electrical power, the autopilot will disengage. When this happens it is necessary to do a **GYRO SET** in flight before re-engaging the autopilot. Fly the aircraft as straight and level as possible while pressing and holding the knob. Continue holding the knob for about 20 seconds. Engage the autopilot and note the difference between the **TRK** and **SEL** values. If this is more than 15° repeat the gyro set procedure. A value below 15° will automatically slave away over a short time with straight flight. After landing, perform another gyro set procedure once the aircraft is stationary, this time hold the knob for approximately 40 seconds. This will ensure the gyros are calibrated properly for the next flight.

## GPSS Missed Approach Function

This missed approach function only works when the autopilot is already coupled to the GPS glide slope. To initiate, press the **VS UP** or **DN** rocker switch (either direction will work). This will start a 500 fpm climb but the autopilot will remain in GPSS mode. At this time, the approach can be suspended on the GPS (pressing **SUSP** on a GNS430/530). The autopilot will maintain the 500 fpm climb, but will fly the missed approach pattern.

## AUTO PILOT SETTINGS LOG

LAT

ACTIVITY \_\_\_\_\_  
TORQUE \_\_\_\_\_  
BAUD \_\_\_\_\_  
BANK ANGLE \_\_\_\_\_  
MICROACTIVITY \_\_\_\_\_  
GPSS GAIN \_\_\_\_\_  
SPEECH \_\_\_\_\_  
AUDIO LEVEL \_\_\_\_\_  
EXT DG/HSI \_\_\_\_\_  
YAW DAMPER \_\_\_\_\_  
YD LEVELING \_\_\_\_\_  
YD ACTIVITY \_\_\_\_\_

VRT

ACTIVITY \_\_\_\_\_  
TORQUE \_\_\_\_\_  
MIN AIRSPD \_\_\_\_\_  
MAX AIRSPD \_\_\_\_\_  
NORM CLIMB \_\_\_\_\_  
STATIC LAG \_\_\_\_\_  
MICROACTIVITY \_\_\_\_\_  
HALF-STEP \_\_\_\_\_



TruTrak Flight Systems, Inc.