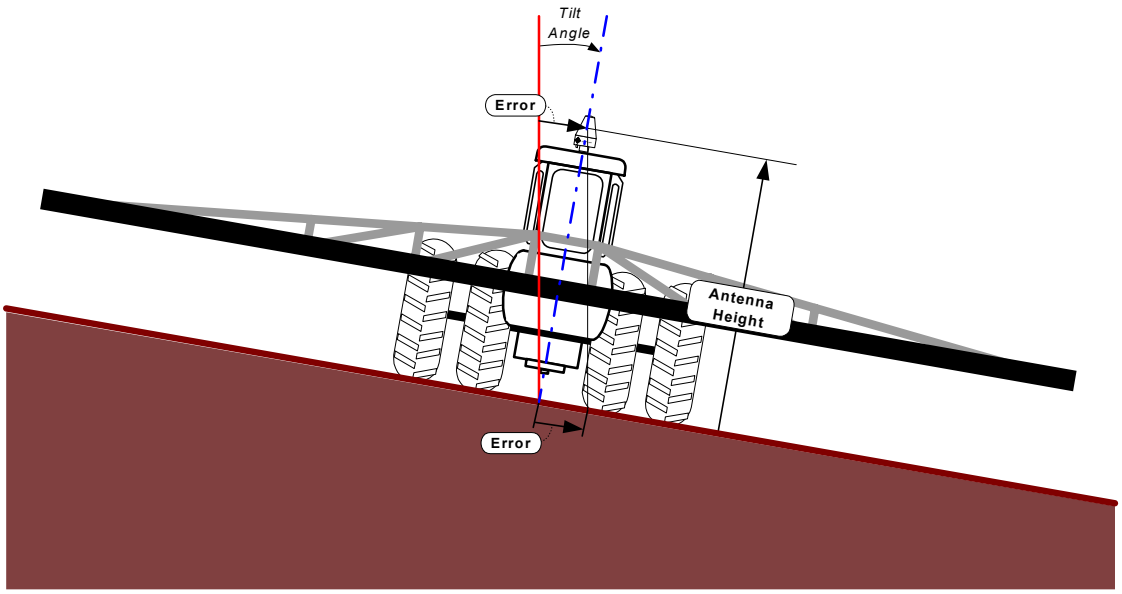
LB-5 Smartbar
Tilt Upgrade Option
Operation Manual Addendum



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Addendum to Part Number ASST-013-0008

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Introduction

The **LB-5 Smartbar Tilt Upgrade Option** provides straight parallel swath guidance on fields that are not level. This option corrects position errors that occur when an applicator machine moves over an uneven field.

For accurate DGPS signal reception, the GPS antenna is usually placed on the highest part of the applicator machine. This may be on top of the operator's cab. The antenna height may be from about 8 feet to about 20 feet. If the surface of the field is not level, this antenna position and the center of the applicator boom are not in the same place. The difference between the antenna's position and the center of the boom is tilt error *(see diagram on page 1)*. If a field's surface along a swath line is not uniformly at the same tilt angle, swath paths created by following the DPGS position will not be straight. If the field's surface between adjacent swath's is not at the same tilt angle, the swath patterns created by following the DPGS position will leave gaps or overlap.

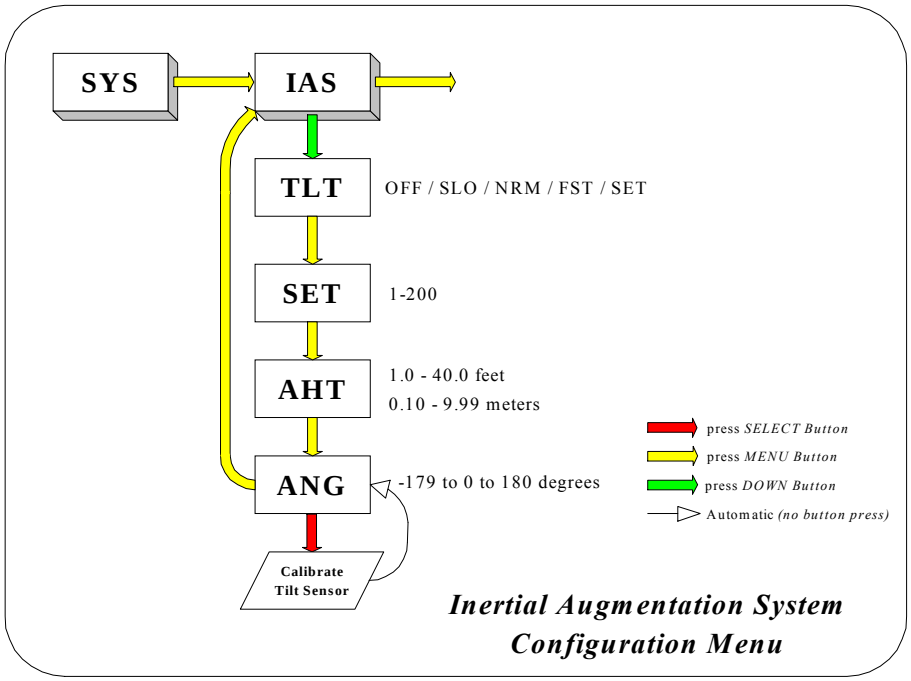
The **LB-5 Smartbar Tilt Upgrade Option** measures the machine tilt using a solid state inclinometer. Once the machine's tilt is determined, the "error" can be calculated and corrected. This tilt correction provides for straight parallel swathing on fields that are not level.

As a machine moves along a swath path, various bumps in the field and the machine's vibration can cause erroneous inclinometer *tilt readings*. The LB-5 filters these *tilt readings* to eliminate most of these errors. During the **LB-5 IAS** (*Inertial Augmentation System*) configuration, the user can adjust this filter for very rough fields with only gradual changes in slope or very smooth fields with abrupt changes in slope.

Tilt Sensor Upgrade Option Installation

The Tilt Sensor Upgrade Option is installed into a new or existing LB-5 Smartbar at the factory by adding the Tilt Sensor (inclinometer). An LB-5 light bar, with the Tilt Sensor Upgrade installed, can use LB-5 firmware updates to the IAS as they become available.

IAS Configuration



When an LB-5 Smartbar has a Tilt Sensor Upgrade Option installed, a new top level configuration menu **IAS** is added just following the **SYS** top level menu. Press the *DOWN Button* at the **IAS** top level menu to enter the **IAS** configuration sub-menus.

IAS configuration sub-menus are used to setup the tilt correction calculation parameters and to calibrate the tilt sensor:

TLT - Tilt Control Mode

Press *SELECT* and/or *DOWN buttons* to select between tilt control modes:

- **OFF**
- **SLO** - Slow
- **NRM** - Normal
- **FST** - Fast
- **SET** - use precise setting

When **OFF** is selected, LB-5 tilt sensors have no effect on swath guidance.

When **SLO** is selected, the effective tilt angle will change slowly because the tilt angle filter has the greatest effect. This mode is used for rough fields with gradually changing slopes.

When **NRM** is selected, the effective tilt angle will change normally. The tilt angle filter will have a medium effect on the effective tilt angle. This setting is usually used for the tilt control mode.

When **FST** is selected, the effective tilt angle will change fast because the tilt angle filter has the least effect. This mode is used for smooth fields with rapidly changing slopes.

When **SET** is selected, the effective tilt angle change rate may be controlled in precise increments by the next sub-menu (**SET**).

SET - Tilt Filter Precise setting.

Tilt Filter Precise settings range from 1 to 200. 1 is the setting for the fastest tilt angle response (minimum filtering). 200 is the setting for the slowest tilt angle response (maximum filtering). Tilt filter precise setting is not usually required. It is provided for unusual conditions.

The corresponding precise setting for preset modes:

SLO 160

NRM 80

FST 40

Press the *SELECT button* to increase the Precise setting by 10.
Press the *DOWN button* to decrement the Precise setting by 1.

AHT - Antenna Height

The GPS antenna height is entered and displayed. This is an important part of the tilt error correction. It must match the measurement between the antenna mounted on the applicator machine to the ground.

The setting range is 1.0 feet to 40.0 feet or 0.10m to 9.99m.

Press the *SELECT button* to increase the Antenna Height by 1.0 feet or by 0.10 meter.
Press the *DOWN button* to decrement the Antenna Height by 0.1 feet or by 0.01 meter.

ANG - Tilt Angle Readout and Calibration

The measured tile angle is displayed as –179 degrees (tilted to the left) to 180 degrees (tilted to the right). 0 degrees is displayed when level. The tilt sensors must be calibrated after installation any time the LB-5 firmware is updated.

To calibrate the tilt sensors:

- Stop the applicator machine on known level ground.
- Press the *SELECT button* to calibrate the tilt sensors.
- ANG display will read approximately 0 degrees.