WITE32™

Release Notes

(web-site Version)

Version 2.70

07/12/2002

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CHAPTER 1

NEW FEATURES INTRODUCED IN WITE32

1.1 Improvement of Guzik S1701B Spinstand Accuracy

The accuracy of spinstand positioning is limited by linear scale accuracy. Starting from the Version 2.70, WITE32 provides a procedure for measuring the repeatable component of the linear scale error and compensating for it.

1.1.1 Enabling Linear Scale Correction

The scale correction procedure is implemented in the new *Scale Correction* test included in the *Spinstand Test* module. After you run the test, the repeatable component of the error is measured, the correction coefficients are calculated and stored inside the Spinstand Control Box, and the correction is enabled. The coefficients are stored in non-volatile memory and are not affected by powering the spinstand off or restarting it. For more details please refer to Section 3.3 of this document.

Note: You must run the *Scale Correction* test once again and calibrate the scales if the Spinstand and/or Control Box have been replaced.

1.1.2 Disabling Linear Scale Correction

To disable the Linear Scale Correction follow the procedure below:

- Select the *Configure* | *Device*… menu item from the *WITE32 Engineering Dashboard*, the *Device Configure* dialog box opens.
- Press the *Run Alignment Program* button, the *Alignment Program* dialog box opens.
- Select the *File* | *Factory Settings Mode*… menu item, the factory settings mode *Password* dialog box opens.
- Enter the password, press the *OK* button.
- Select the *Parameters* | *Spinstand Parameters*… menu item, the *Spinstand Parameters* dialog box opens.
- Press the *Set Closed Loop Parameters* button, the *Closed Loop Parameters* dialog box opens.

- Uncheck the *Scale Correction* check box to disable the scale correction.
- Press the *Close* button in the *Closed Loop Parameters* dialog box.
- Press the *Save data in EEPROM* button in the *Spinstand Parameters* dialog box.
- Press the *Close* button in the *Spinstand Parameters* dialog box.
- Close the *Spinstand Alignment* dialog box.
- Close the *Device Configure* dialog box.

1.2 New Format of TAA Section in Calibration File

The WITE32 software Version 2.70 uses a new calibration file format to store the TAA calibration coefficients. The format allows you to keep individual records for different head amplifiers by adding a head amplifier name and a custom head amplifier ID to each stored coefficient. Therefore, more than one TAA calibration coefficient can be recorded for the same head.

The WITE32 will recognize the currently installed head amplifier automatically and select an appropriate record. A custom head amplifier ID is saved to the head amplifier EEPROM chip. The function of saving the ID is available in WDK32. For more details on how to program a custom ID to a head amplifier EEPROM, please refer to *WDK32 Version 2.70 Release Notes*.

The TAA calibration coefficients in the *TAA Calibration* dialog box of the WITE32 Version 2.70 have a new semantic. The analog front-end gain (UP and head amplifier) is not factored into the coefficients. That means the numerical value of the TAA calibration coefficients is not the same as in the WITE32 Version 2.69. As a result, when the calibration file does not contain any information relevant to the currently installed head amplifier, you will receive the following warning messages after starting the WITE32 software, or changing zone:

- The message presented on Figure 1 will be displayed, if the TAA is not calibrated.

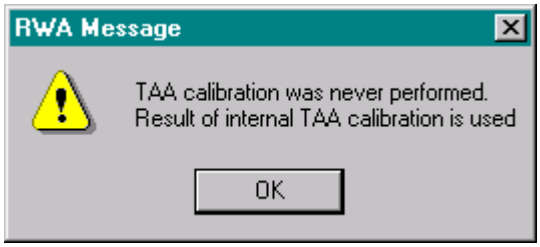

Figure 1: RWA Message, TAA Calibration Never Done

- The message presented on Figure 2 explains the situation, when the TAA is calibrated, but for a different head amplifier model or for a different custom head amplifier ID.

Figure 2: RWA Message, TAA Calibration for Different Head Amplifier Model or Head Amplifier ID

The message presented on Figure 3 appears after the message on Figure 2.

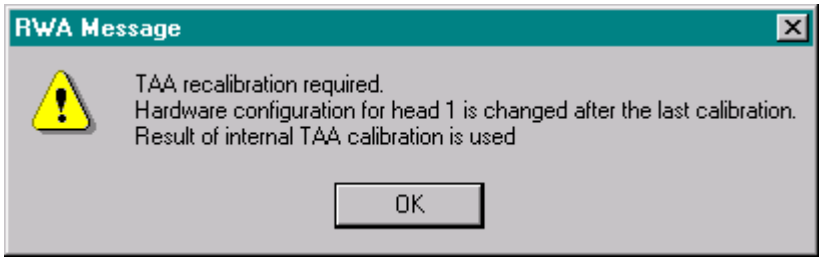

Figure 3: RWA Message, TAA Recalibration Required

Note: Once TAA is calibrated and the coefficients are saved to the calibration file, the warning messages will appear only after the changes in the head amplifier name or in the custom head amplifier ID.

1.3 WROffset Test Modifications

The following modifications of the WROffset test algorithm have been done in the WITE32 Version 2.70:

1. The *Iterations* textbox is renamed to *Runs*.

2. The test execution time in the case of multiple runs is reduced comparing to previous versions of WITE32.

3. The new *TAA Iterations* text box specifies the number of revolutions for the TAA averaging in every point of the track profile built during one run of the *WROffset* test. This improves the accuracy of measurement by reducing the positioning and amplitude error.

4. The band erase operation is performed between runs of the *WROffset* test, if the *Runs* textbox value is greater than one, and the *Write* option is selected for the test. Three tracks will be erased at the following locations: –0.5*WriteWidth, Track Center, +0.5*WriteWidth.

5. The *Adjust Gain at Each Offset* option is removed from the configuration dialog box of the *WROffset* test. The Main Gain attenuator is adjusted once at the offset corresponding to the maximum TAA, and then this fixed gain is used for measurements in the track profile points around the Amplitude Thresholds for Track Center and Track Width calculation.

1.4 Balancing Test Modification

1. The WITE32 software Version 2.70 saves the results of the balancing ring screw calibration:

   - To the ***balance.ini*** file for the S1701A+, S1701A, S1701CF, S1701MP, S312MPCF, S312MP spinstand models. This file is located in the WITE32 root directory. If you reinstall WITE32 to another directory, or replace the Spinstand the calibration data will be lost. In that case, you will receive a warning message and will need to repeat screw calibration procedure.
   - To the non-volatile internal memory of the S1701B spinstand. It is not necessary to repeat the balancing ring screw calibration after you reinstall WITE32 to another directory.

Note: You must repeat the calibration for each new balancing ring installed on the Spinstand. No warning message will be displayed.

2. The following cap types have been renamed in the *Balancing* dialog box:

Cap Type	*Old Name*	*New Name*
D	D [3.5 fscrews]	D [3.5 fixing screws]
G	G [balancing ring]	G [media, chuck, ring: 3 screws]
H	H [balancing ring]	H [balancing ring :3 screws]

1.5 WCalc Module Modification

The WCalc module performs a test result calculation. The detailed description of the WCalc module functionality is provided in *WITE32 Version 2.68 Release Notes*.

Now you can change a default WCalc result name to a more informative one. A new *WITE Calculator* dialog box is added to the module. Use this dialog box to define the result names:

1. Install WCalc module into WITE32.

2. Open the *WITE Calculator* dialog box. Click the *Configure* item in the main menu of the *Engineering Dashboard* dialog box and select the *WITE Calculator* item in the drop-down menu.

3. Find the *WCalcTx* text box with the result name you want to change and type the new name there (see Figure 4). Press the *Save* button.

4. Restart WITE32 to activate the new result names. Now, the Result Processor will display a column with the new name instead of a default one (see Figure 5).

Note: Changing the result names will not affect the current session of the WITE32 software. You must restart the software to make the result names changed.

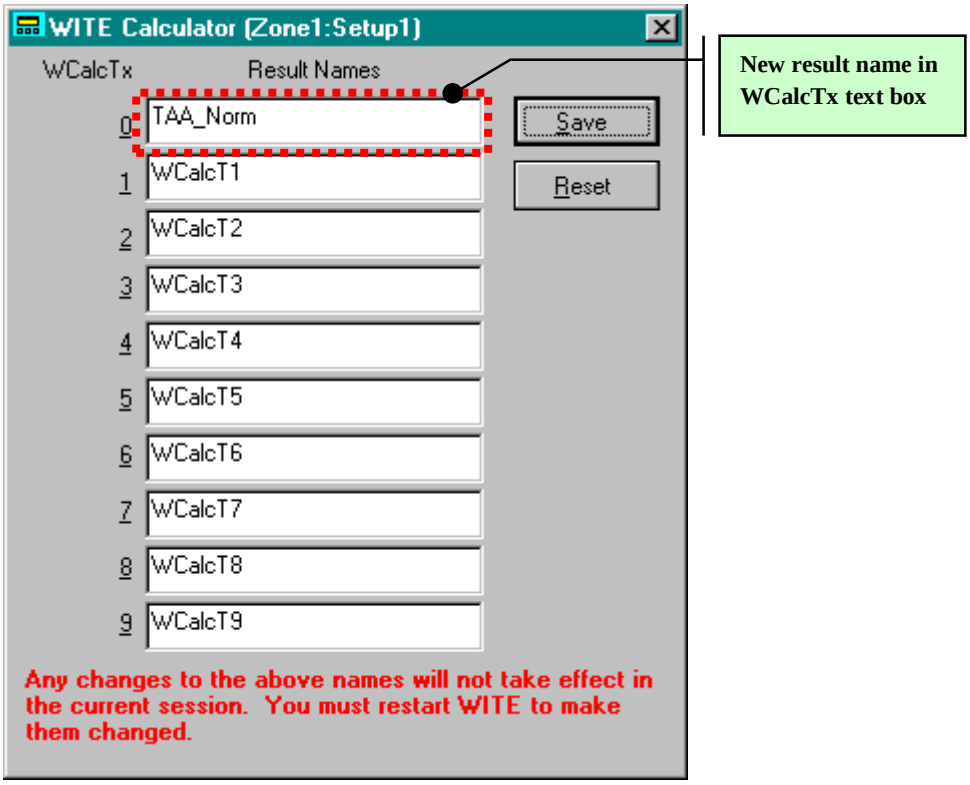

Figure 4: WITE Calculator Dialog Box

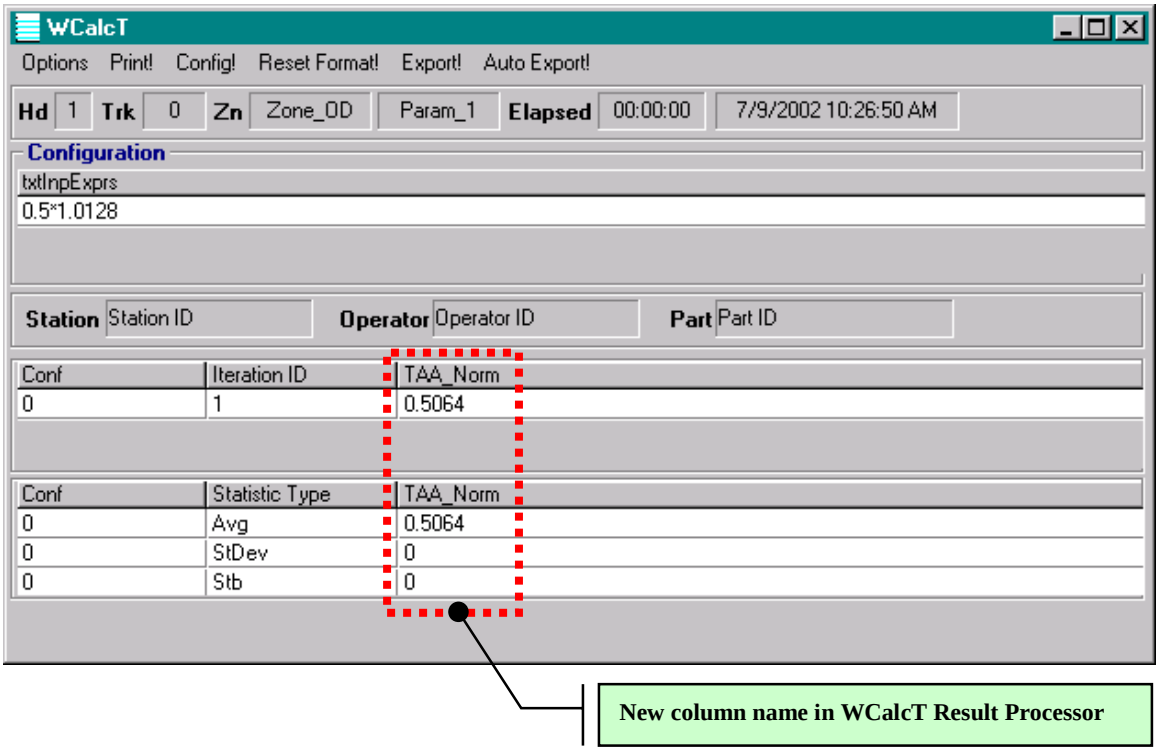

Figure 5: Result Processor with Changed Column Name

1.6 Improvements of Servo

1.6.1 Frequency Balance Calibration for Servo-2

A new servo parameter is calibrated during Servo Calibration. The name of the parameter is *Frequency Balance*. The value of the *Frequency Balance* parameter characterizes the variation of signal amplitude in servo channel depending on signal frequency. Typically, this value should be in the range 0.7 – 1.0.

1.6.2 Abort Button for Servo Erase Operation

Starting from WITE32 Version 2.70, the *Servo Erase* operation can be aborted by pressing the *Abort* button.

1.7 New Head Amplifier Models

The WITE32 software Version 2.70 supports the following new head amplifier models:

- LILIPUT_AEJ
- SR1710AGA
- SR1776AAA
- SR1790
- DUAL_SR1795AGA
- DUAL_SR1795_2M
- DUAL_SR1795_2Q
- VM541708

1.8 New Head Stack Models

The WITE32 software Version 2.70 supports the following new head stack models:

- COBRA3_M61889 – COBRA_P0.5
- SR1774 – INVADER1774

1.9 Multipoint MR Impedance Measurement

New Multipoint MR impedance measurement is now implemented in WITE32 Version 2.70 for 81G5102 and 81G5108 head stacks.

Select the *MR Impedance Measurement Method* item in the *Control* | *Head Amp…* menu to start the Multipoint MR impedance measurement. The system performs the following operations:

1. Measures MR voltage $\boldsymbol{V_i}$ corresponding to $\boldsymbol{n}$ bias currents $\boldsymbol{I_i}$.

2. Calculates MR Impedance as: $R_{MR} = \frac{1}{n-1} \sum_{i=2}^{n} \frac{(V_i - V_{i-1})}{(I_i - I_{i-1})}$

1.10 WDK Update

If you are running your custom modules written using WDK32, you may need to get an updated WDK32 Version 2.70 and recompile your modules, due to modifications in the WITE32 RWA control library (RWA32.DLL).

1.11 Miscellaneous

1. The new field called *Frequency Step* is added to the Result Processor Configuration Area of the *Spectral Integral SNR* test.

2. The *Test Pattern* column is added to the table on the graphic output dialog boxes for the *Alternative Spectral Elimination* and *NLTS vs. Write Current* tests.

CHAPTER 2

FIXED BUGS

The following bugs were discovered in WITE32 Version 2.69 or earlier, and fixed in WITE32 Version 2.70. The description below explains the bug behavior as it appeared in WITE32 Version 2.69.

2.1 Spinstands

1. The "Thermal Compensation Exceeded Limit" error message pops up on the S1701B spinstands intermittently.

2. HLM-2F head loading mechanism for the S1701B spinstands: no diagnostics in the case when both top and bottom heads are enabled in WITE32, but only one cartridge is installed.

2.2 Head Amplifier Drivers

1. Fix head select property for the following head amplifiers: 81g5004, 81g5014, and SR1715. Wrong channel might be selected on head change event.

2. Fix head select property for VM5910 head stack. Only first 4 heads instead 8 are supported.

2.3 Miscellaneous

1. If the WITE32 is installed to the root directory of a drive and only DLL version of an external module is installed, opening the *Select Modules* menu will damage the external module path information in WITE.INI file. The module will not be shown in the menu. Moreover, the software will not find the selected module after WITE32 restart.

2. The radio buttons in the *Apply Results to:* frame of the *Servo Calibration* dialog box did not operate properly. The calculated Servo Range is always saved to the current setup in the current zone only even when the *All Setups in the Current Zone* or *All Setups in all Zones* radio buttons are selected.

3. When a programmable differentiator is installed on the Analog Box main filter matrix board, starting WITE32 results in the improper error messages:

   - “Error 1045: PRF: Cutoff frequency – 10.000000, out of range. Please, set the appropriate value in the Control | Filter dialog box.”

   - “Error 1046: PRF: Boost factor – 5.000000, out of range. Please, set the appropriate value in the Control | Filter dialog box.”

CHAPTER 3

SPINSTAND TEST MODULE

3.1 Spinstand Test Module Overview

The WITE32 Version 2.70 has a new *Spinstand Test* module included in the WITE32 installation CD. With this module you can verify and improve the spinstand performance.

The module incorporates the following tests:

- The *Scale Correction* test improves the positioning accuracy of the S1701B spinstands.
- The *PES* test is a tool for measurement and analysis of position errors.
- The *Off-Track Modulation* test measures the TAA and the TAA modulation with an offset from the track center.

Note: The *Scale Correction* test requires a license. To obtain a license, call the Guzik Technical Enterprises sales department.

3.2 Test Module Installation

To install the test module use the procedure described below:

1. Select the *File* | *Select Modules…* from the main menu of the *Engineering Dashboard* dialog box.
2. Press the *Install* button, choose the OXSPINSTD.DLL file, and press the *Open* button. The *Spinstand Tests* module will appear in the *Available Modules* list.
3. Select the *Spinstand Tests* module in the list of *Available modules* and press the *Add* button. The *Spinstand Tests* module will move to the *Selected Modules* list.
4. Press the OK button to close the Module Selection dialogue box.

Now, you can assign the tests from the module to the *Configurable test buttons (Soft buttons)* on the *Engineering Dashboard* dialog box.

3.3 Scale Correction Test

3.3.1 Test Overview

The accuracy of spinstand positioning is limited by linear scale accuracy. The scale correction procedure is implemented in the *Scale Correction* test to measure the repeatable component of the linear scale error and compensate for it.

After you run the test, the repeatable component of the error is measured, the correction coefficients are calculated and stored inside the Spinstand Control Box, and the correction is enabled.

Before using the test please read the following information:

- This test runs on the S1701B spinstands only.
- The *Scale Correction* test requires a license based on the RWA and Spinstand serial numbers. To obtain the license, call the Guzik Technical Enterprises sales department for quotation.
- The balancing cable between Spinstand Control Box SCB-02 and the host computer must be installed before starting this test. Check for the cable connection first.
- Start the *Scale Correction* test at least 30 minutes after powering the spinstand on.
- You can run the test only when the spinstand is stopped, so the spindle is not rotating. Otherwise the test does not start and the following message appears: "Can't perform *Scale Correction* test when device is ON. Please, stop device from WITE32 dashboard."
- The *Scale Correction* test saves the correction coefficients inside the Spinstand Control Box. Therefore, the coefficients are not affected by powering the spinstand off or restarting it. However, you must run the *Scale Correction* test once again and calibrate the scales if the spinstand and/or Control Box are replaced.

3.3.2 Scale Correction Test Algorithm

The test performs the following operations:

1. Performs linear movement on a distance about 0.02 Inch and acquires data from the optical scales.
2. Calculates scale distortion (linearity error).
3. Sends the calculated scale distortion to spinstand for error compensation.

3.3.3 Scale Correction Test Configuration Dialog Box

To assign the *Scale Correction* test to one of the *Configurable test buttons (Soft buttons)* on the *Engineering Dashboard* dialog box, position the mouse pointer over the *Configurable Test Button* where you want to assign the test and right-click the mouse. The list of all available tests appears. Select the *Scale Correction* test in the list and the button becomes labeled "Scale Correction".

To configure the *Scale Correction* test, press the *S (Setup)* button to the left of the *Configurable test button (Soft button)* labeled "Scale Correction".

The *Scale Correction* dialog box appears:

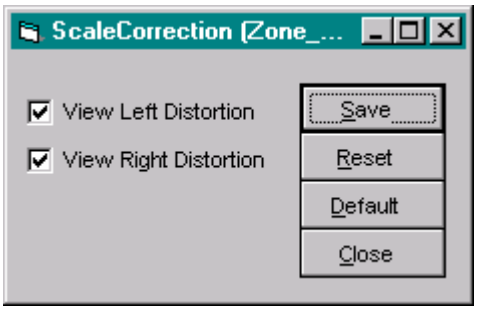

Figure 6: Scale Correction Dialog Box

Check the *View Left Distortion* and/or *View Right Distortion* check boxes to display the measured Linear Scale error, which will be sent to the spinstand, to compensate for the error.

3.3.4 Test Results Area of Result Processor for Scale Correction Test

There is the *Test Results* area definition for the *Scale Correction* test:

Name of the Field	*Comments*
Conf	Scale identification: 0 left scale, 1 right scale
ScaleCorrMin(%)	The minimum value of distortion in percent from scale period
ScaleCorrMax(%)	The maximum value of distortion in percent from scale period
ScaleCorrMin(uIn)	The minimum value of distortion (µInch)
ScaleCorrMax(uIn)	The maximum value of distortion (µInch)

3.3.5 Example of Graphic Output Dialog Box for Scale Correction Test

If you enable the *View Left Distortion* and/or *View Right Distortion* check boxes in the *Scale Correction* test configuration dialog box, the test will show the left scale distortion and/or right scale distortion plots. The figure below presents the example of the *Scale Correction* test graphic output for the left scale.

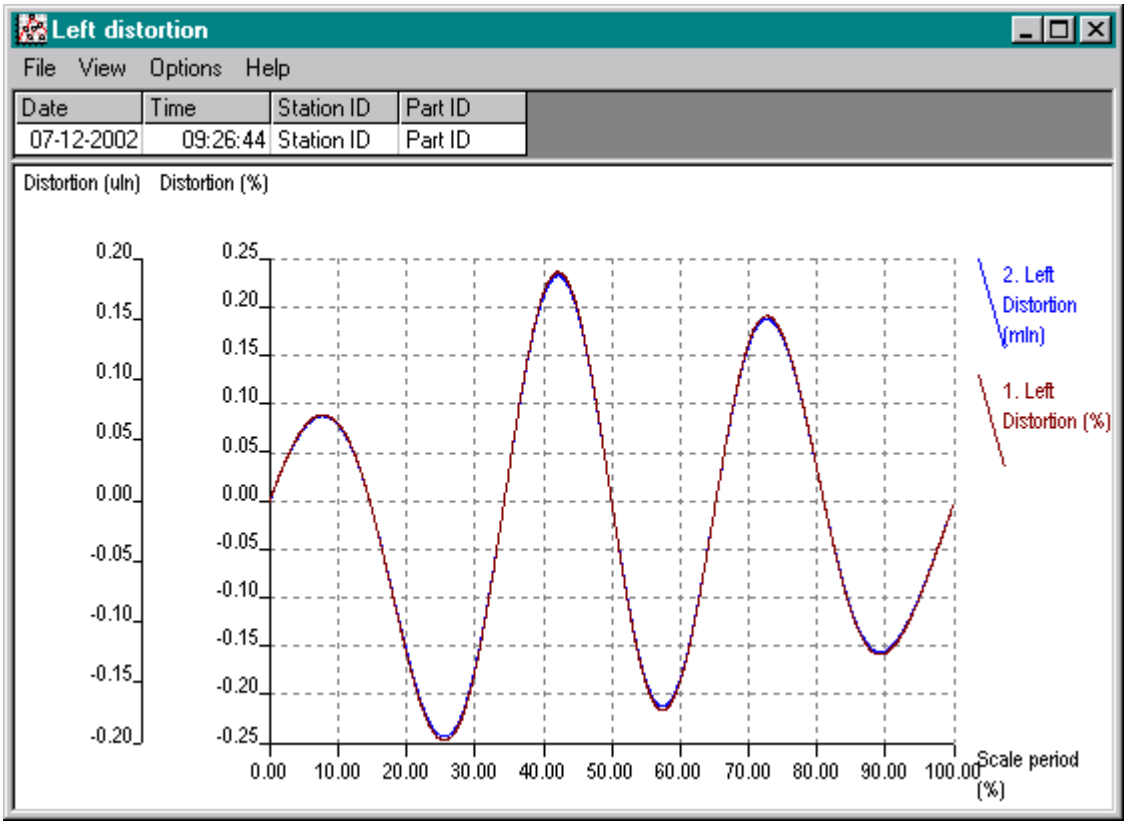

Figure 7: Scale Correction, Left Distortion Plot

3.4 Servo Position Error Signal (PES) Acquisition and Analysis Test

3.4.1 Test Overview

The PES signal (Position Error Signal) is derived from the Guzik Servo information, written on the media at the beginning of each sector. The signal is the value of position error calculated as a difference between current offset specified in WITE32 and the actual position of the head measured by servo in µInch. The Spinstand provides one value of the PES in every sector.

The *Servo Position Error Signal Acquisition and Analysis (PES Analysis)* test uses the Servo data written on the track at the beginning of each sector to measure the actual head position along the track.

3.4.2 Definitions

The following definitions are used in the *PES Analysis* test description:

- PES Instantaneous Runout (IRO) is the instantaneous PES value measured for each sector during a revolution. The system calculates IRO using the PES received from the spinstand. The abbreviation IRO_r^s designates instantaneous runout value for sector ***s*** in revolution ***r***.

- Raw PES data consists of series of PES IRO. The size of an acquisition depends upon the number of revolutions and the number of sectors on a track. The maximum acquisition size is limited by 254912 IRO (for instance, 3893 disk revolutions in 64 sector mode).

- The acquisition may be as big as 254912 IRO (for instance, 3893 disk revolutions in 64 sector mode).

- Sector Maximum Runout (SectorMaxRO) is a maximum deviation of the IRO values calculated for ***R*** revolutions in the specified sector ***s***.

  SectorMaxRO is calculated as:

$$SectorMaxRO_s = \max(IRO^s_{r=1..R}) - \min(IRO^s_{r=1..R})$$

- Sector Repeatable Runout (SectorRRO) is the average of the IRO values calculated for ***R*** revolutions in the specified sector ***s***.

  SectorRRO is calculated as:

$$SectorRRO_s = \frac{\sum_{r=1}^{R} IRO_r^s}{R}$$

- Sector Non-Repeatable Runout (SectorNRRO) is a standard deviation of the IRO values calculated for ***R*** revolutions in the specified sector ***s***.

  SectorNRRO is calculated as:

$$SectorNRRO_s = \sqrt{\frac{\sum_{r=1}^{R} (IRO_r^s - SectorRRO)^2}{R-1}}$$

- Track Maximum Runout (TrackMaxRO) is a maximum deviation of the IRO values during the entire PES acquisition.

  TrackMaxRO is calculated as:

$$TrackMaxRO = \max(IRO_r^s) - \min(IRO_r^s)$$

- Track Repeatable Runout (TrackRRO) is the average of the SectorRRO values calculated for ***S*** sectors along the track. The TrackRRO value equal to zero means the average position of the magnetic head is on the track.

  TrackRRO is calculated as:

$$TrackRRO = \frac{\sum_{s=1}^{S} SectorRRO_s}{S}$$

- Track Non-Repeatable Runout (TrackNRRO) is a standard deviation of the Sector RRO values calculated for ***S*** sectors along the track. The TrackNRRO value equal to zero means the trajectory of the head along the track is a circle.

  TrackNRRO is calculated as:

$$TrackNRRO = \sqrt{\frac{\sum_{s=1}^{S} (SectorNRRO_s - TrackRRO)^2}{S-1}}$$

3.4.3 Test Algorithm

The test performs the following operations:

1. Receives the PES signal from the Servo during specified number of revolutions.
2. Saves the (Raw) PES data received from the Servo to a file, if the *Output Raw PES Data from Acquisition to File* option is selected.
3. For each Sector calculates the sector statistics:
   - Sector Repeatable Runout (RRO)
   - Maximum Runout (MaxRO)
   - Sector Non-Repeatable Runout (NRRO)
4. Calculates the track statistics:
   - Track Repeatable Runout
   - Track Non-Repeatable Runout
   - Maximum Track Runout
5. Displays in the graphic output dialog box:
   - The Raw PES data received during the entire acquisition

- The sector statistics (RRO, NRRO, MaxRO)
- The Spectrum of PES based on entire acquisition
- The Sector Raw PES data for a selected sector
- The histogram based on specified Sector Raw PES data

While running the *PES Analysis* test, you can:

- Start a new acquisition.
- Use the Raw PES data, once saved to a database, many times for the different types of analysis.

The *PES Analysis* test can repeat an acquisition a number of times. The results of such consecutive acquisitions will be added to a specified file one after one. The file content can be easily converted to the Microsoft Excel format.

3.4.4 PES Analysis Test Configuration Dialog Box

To assign the *PES Analysis* test to one of the *Configurable test buttons (Soft buttons)* on the *Engineering Dashboard* dialog box, position the mouse pointer over the *Configurable Test Button* where you want to assign the test and right-click the mouse. The list of all available tests appears. Select the *PES Analysis* test in the list and the button becomes labeled “PES Analysis”.

To configure the *PES Analysis* test, press the *S (Setup)* button to the left of the *Configurable test button (Soft button)* labeled “PES Analysis”.

The *PES Analysis* dialog box appears:

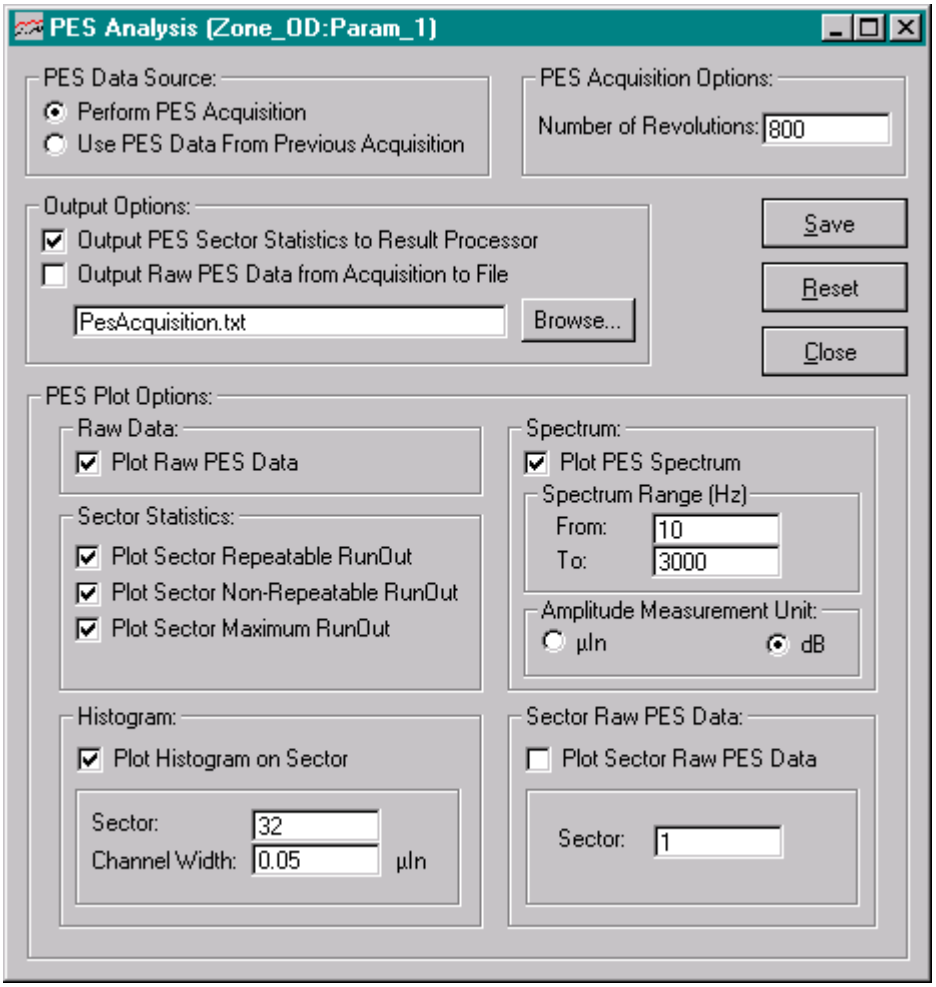

Figure 8: PES Analysis Configuration Dialog Box

There are the following items in the dialog box:

- Three radio buttons in the *PES Data Source* frame give you the ability to start a new PES acquisition or use the data from a PES acquisition which was done early.

The *Perform PES Acquisition* radio button	Select this radio button to perform a new PES acquisition from Servo source.
The *Use PES Data From Previous Acquisition* radio button	Select this radio button to use the data from a previous acquisition.

Note: On a very first run the WITE32 can not execute the *PES Analysis* test when the *PES Data from Previous Acquisition* radio button is selected in the *PES Data Source* frame.

- The *Number of Revolutions* text box in the *PES Acquisition Options* frame allows you to specify the number of revolutions to be done during a single PES acquisition. The actual acquisition size will be equal to the number of revolutions multiplied by the number of sectors.

- The items in the *Output Options* frame control the data output process.

The *Output PES Sector Statistics to Result Processor* check box	Select this box to enable output of the Sector RRO, Sector NRRO, and Sector MaxRO calculated values for all sectors to the Result Processor.
The *Output Raw PES Data from Acquisition to File* check box	Select this box to enable output of the Raw PES data in a text format to the selected file. Use the text box and the browse button also located in this frame to specify the output file. • If the file does not exist, it will be created. • If the file has been already created, the PES data from an acquisition will be appended to the end of the file.
The text box and the *Browse* button	Use these items to browse throughout the file system and specify the file for the output of the Raw PES data

- The items in the *PES Plot Options* frame give you the control over the *PES Analysis* test graphic output configuration.

  - Select the *Plot Raw PES Data* check box in the *Raw Data* frame to enable the IRO plotting in the graphic output dialog box during the entire PES acquisition.

  - Use the items in the *Sector Statistics* frame for configuring the Sector Statistics diagram in the graphic output dialog box.

The *Plot Sector Repeatable RunOut* check box	Select this box to display the calculated Sector RRO for each disk sector.
The *Plot Sector Non-Repeatable RunOut* check box	Select this box to display the calculated NRRO for each disk sector.
The *Plot Sector Maximum RunOut* check box	Select this box to display the calculated Sector MaxRO for each disk sector.

- Use the items in the *Histogram* frame for specifying the parameters of the histogram in the graphic output dialog box.

The *Plot Histogram on Sector* check box	Check this box to enable displaying the plot of the PES distribution for selected sector during the entire acquisition.
The *Sector* text box	Type the sector number in this box.
The *Channel Width* text box	Type the width of the histogram channel (µInches) in this box.

- Use the items in the *Spectrum* frame to specify parameters of the spectrum diagram in the graphic output dialog box.

The *Plot PES Spectrum* check box	Check this box to enable displaying the PES Spectrum plot in the graphic output dialog box.
The *From* text box and the *To* text box in the *Spectrum Range (Hz)* frame	Use these text boxes to specify the range of the PES spectrum.

- Click one of the two radio buttons in the *Amplitude Measurement Unit* frame to select the unit for the amplitude measurement.

The *µIn* radio button	Select this to set µInch.
The *dB* radio button	Select this to set dB.

- Use the items in the *Sector Raw PES Data* frame for specifying the parameters of the Sector Raw PES data diagram in the graphic output dialog box.

The *Plot Sector Raw PES Data* check box	Check this box to enable displaying the plot of the Sector Raw PES data for a selected sector.
The *Sector* text box	Type the sector number in this box.

The *Close* button closes the dialog box. If the *Save* button hasn't been pressed after any changes in the dialog box, the program prompts you to save the parameters, or abandon the changes.

The *Save* button saves parameters to a database.

The *Reset* button restores the parameters from a database.

3.4.5 Configuration Area of Result Processor for PES Analysis Test

There is a *Configuration* area definition for the *PES Analysis* test:

Name of Field	*Comments*
Number of Revolutions	Specify here the number of revolutions for which the PES Acquisition needs to be done.

3.4.6 Test Results Area of Result Processor for PES Analysis Test

There is a *Test Results* area definition for the *PES Analysis* test:

Name of Field	*Comments*
Conf	Configuration number (Not used, always equal to 0.)
Iteration ID	Iteration ID.
Statistic Type	The statistic types of the results.
Track MaxRO	Track Max Run Out (µInches).
Track NRRO	Track Non-Repeatable Run Out (µInches).
Track RRO	Track Repeatable Run Out (µInches).
SectorRRO	Sector Repeatable Run Out
SectorMaxRO	Sector Maximum Run Out
SectorNRRO	Sector Non-Repeatable Run Out

3.4.7 Examples of Graphic Output for PES Analysis Test

The figures below present the examples of the *PES Analysis* test graphic output for the different data types.

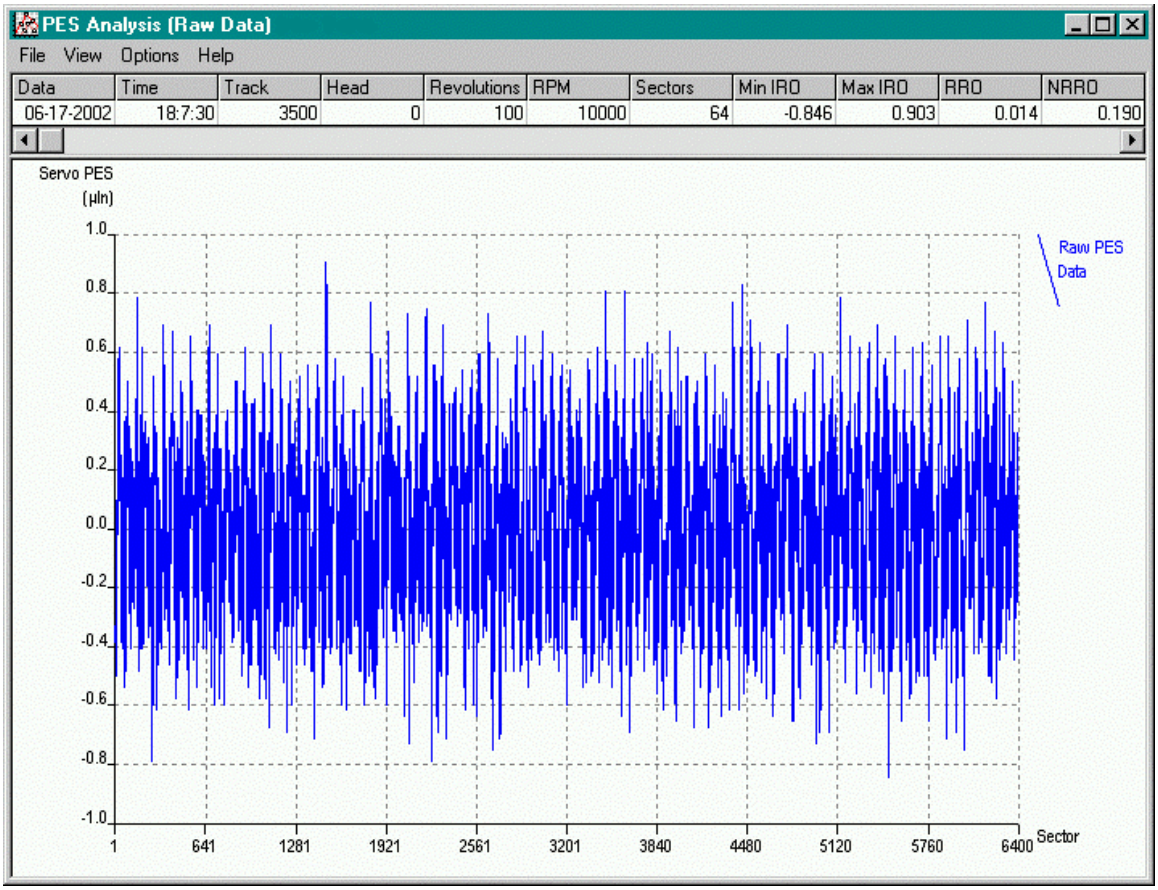

Figure 9: PES Analysis, Graphic Output Dialog Box Displaying Raw PES Data

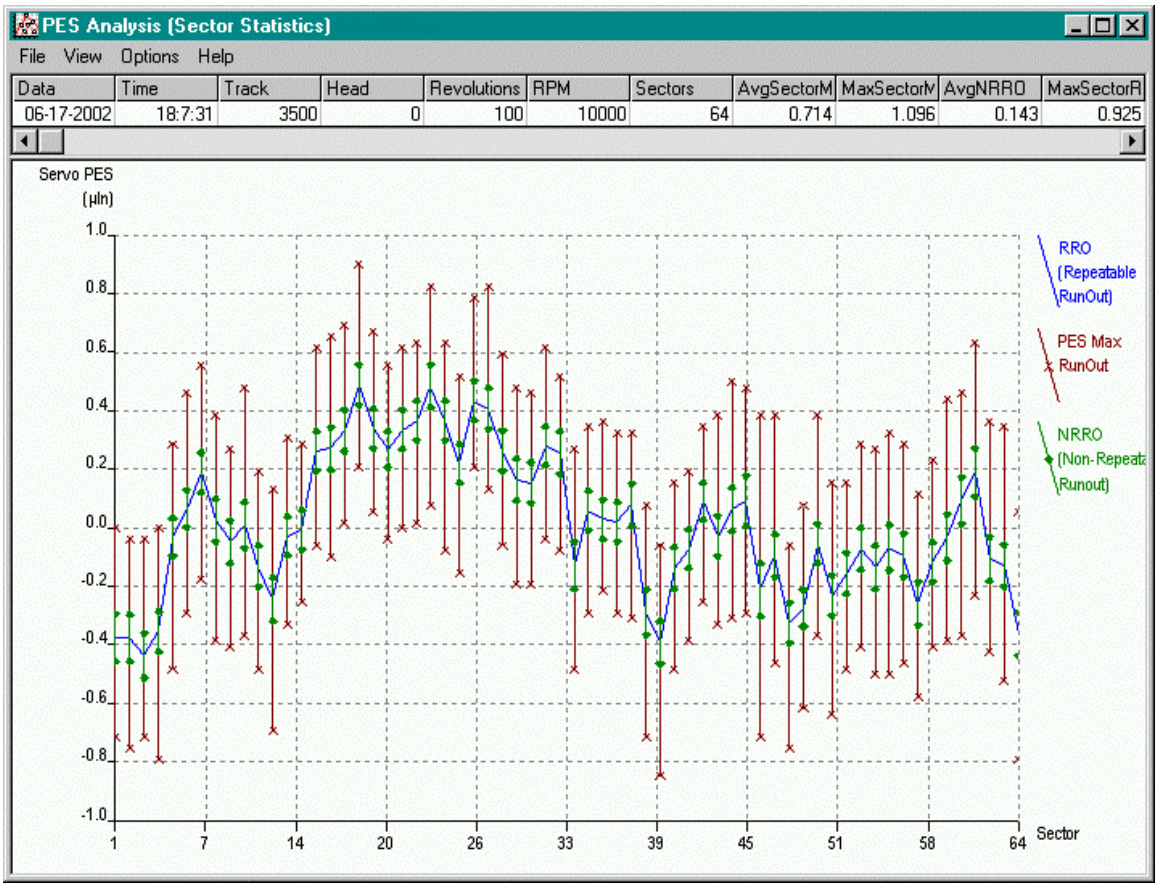

Figure 10: PES Analysis, Graphic Output Dialog Box Displaying Sector Statistics

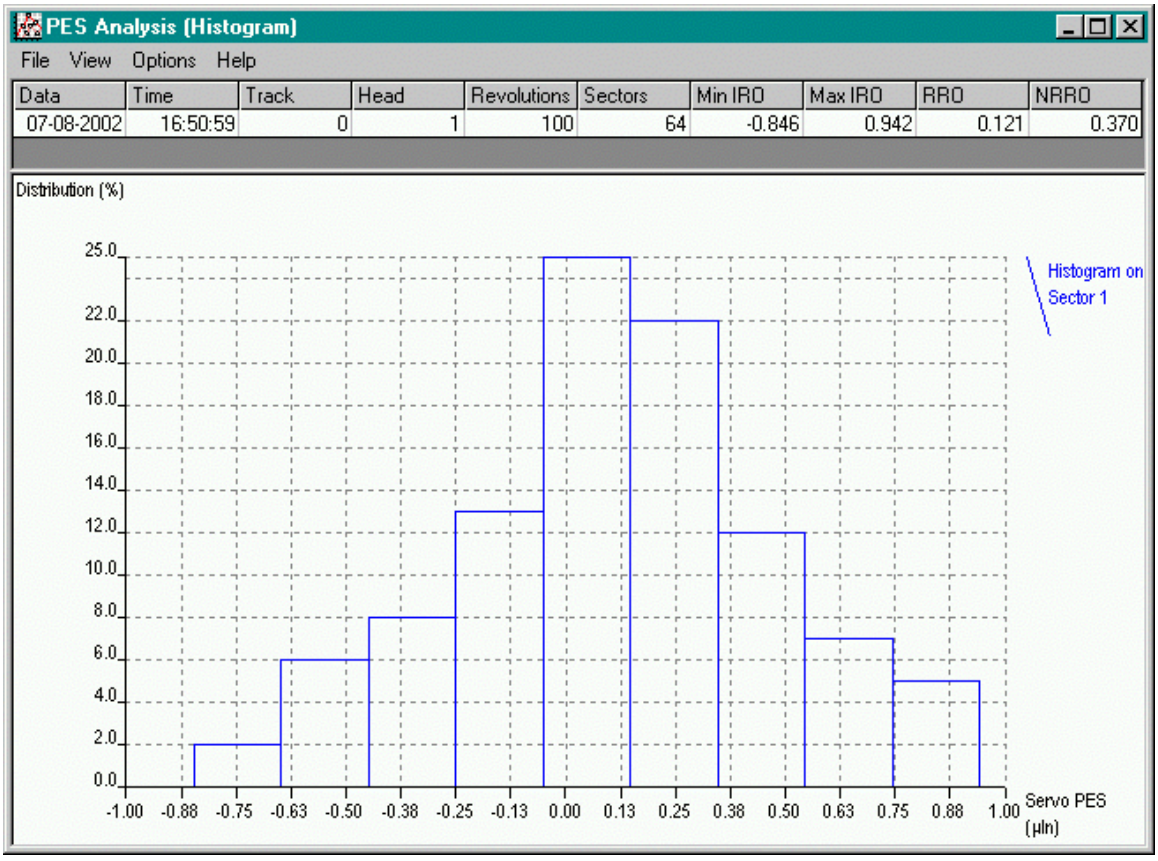

Figure 11: PES Analysis, Graphic Output Dialog Box Displaying Sector Histogram

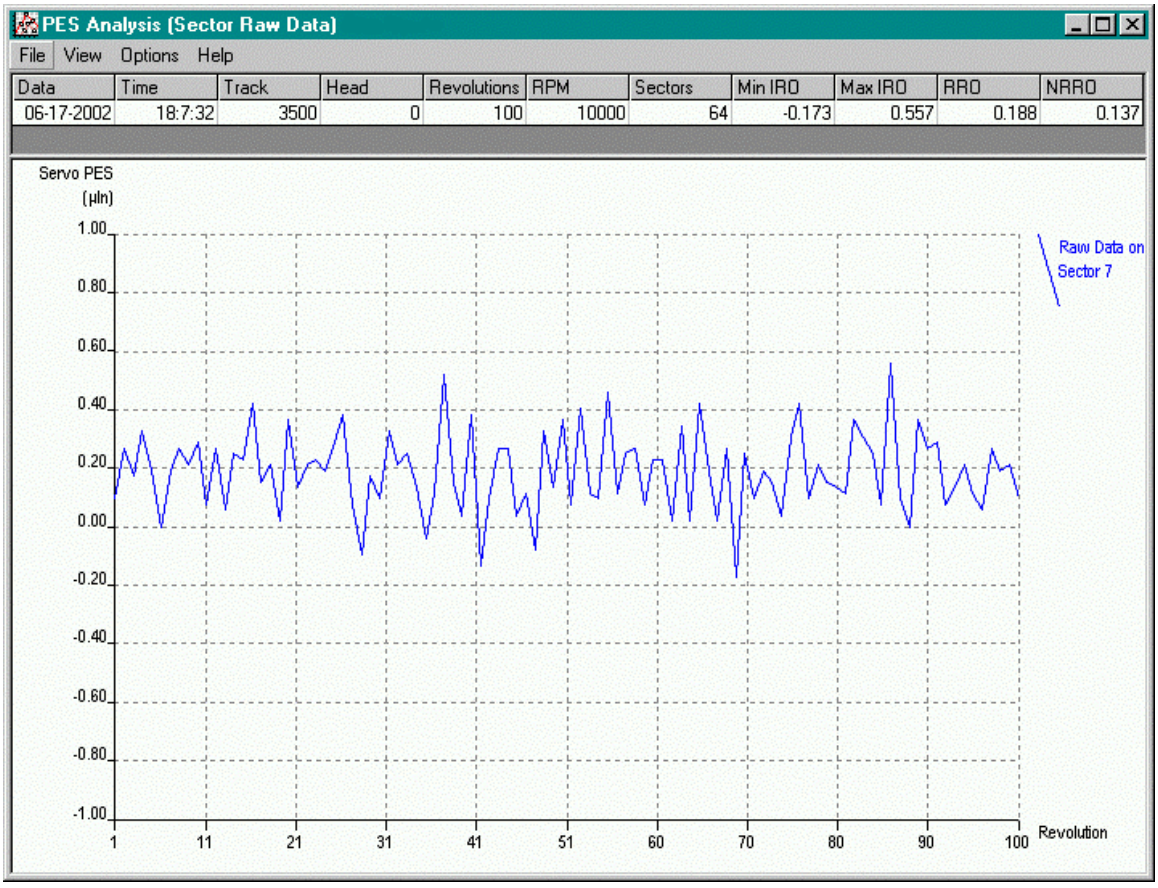

Figure 12: PES Analysis, Graphic Output Dialog Box Displaying Sector Raw PES Data

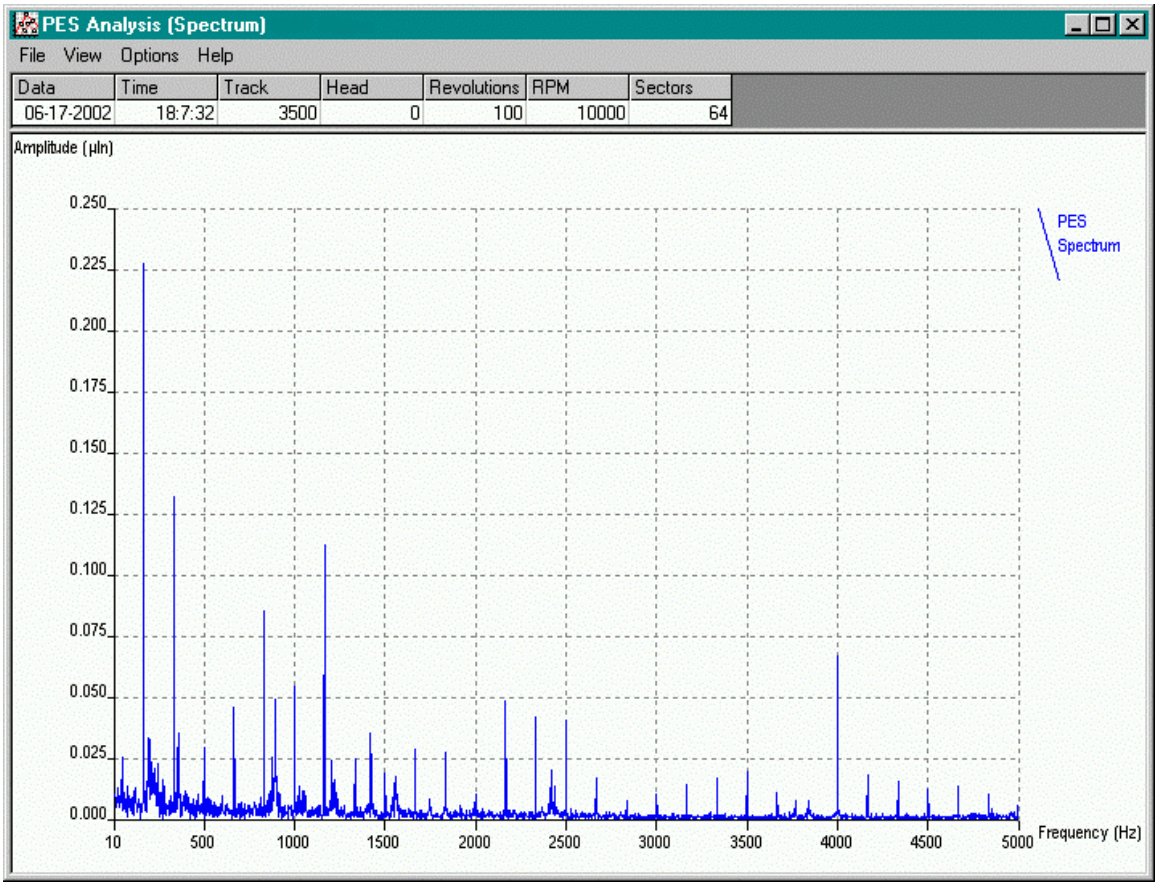

Figure 13: PES Analysis, Graphic Output Dialog Box Displaying PES Spectrum

3.5 Off-Track Modulation Test

The *Off-Track Modulation* test measures TAA and TAA Modulation with the head located in the position with a specified offset from the center of the track.

3.5.1 Off-Track Modulation Test Algorithm

The test performs the following sequence of actions:

1. Disables applying the W/R offset.
2. Performs one of the following operations:
   - If the *Disable Write Operation* check box is selected in the *Write Option* frame, does not perform writing operation at all.
   - If the *Pattern* check box is selected in the *Write Option* frame, writes the pattern for a revolution
   - If the *Flux* check box is selected in the *Write Option* frame, writes the fluxes for a revolution
3. Moves the head to the off-track position with a specified offset.
4. Measures the TAA with the system filter and calculates the positive signal modulation and the negative signal modulation.
5. Return the head back to the track.
6. Enables applying the W/R offset.

3.5.2 Off-Track Modulation Test Configuration Dialog Box

To assign the *Off-Track Modulation* test to one of the *Configurable test buttons (Soft buttons)* on the *Engineering Dashboard* dialog box, position the mouse pointer over the *Configurable Test Button* where you want to assign the test and right-click the mouse. The list of all available tests appears. Select the *Off-Track Modulation* test in the list and the button becomes labeled “Off-Track Modulation”.

To configure the *Off-Track Modulation* test, press the *S (Setup)* button to the left of the *Configurable test button (Soft button)* labeled “Off-Track Modulation”.

The *OffTrkMod* dialog box appears:

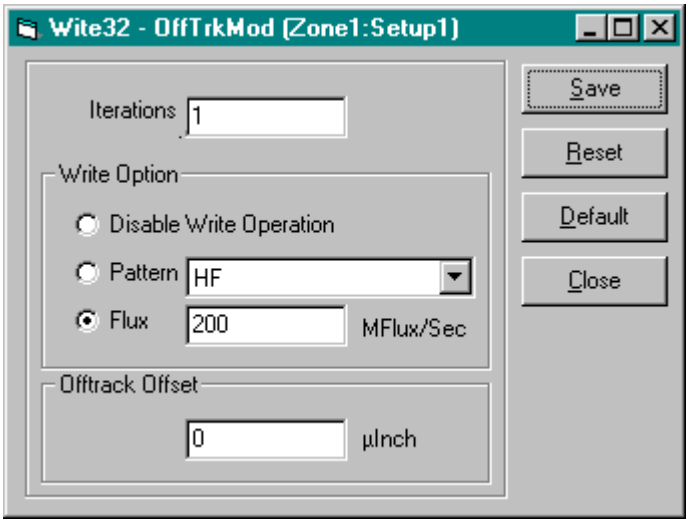

Figure 14: OffTrkMod Dialog Box

There are the following items in the dialog box:

- The *Iterations* text box is the area, where you can specify how many times the TAA has to be measured. To do this, type the number of iterations in the box.
- The *Write Option* frame allows you to configure the write operation.

The *Disable Write Operation* radio button	Select this button to disable writing before measurements.
The *Pattern* radio button and the drop down list.	Click this button and the system will write the pattern selected in the *Pattern* drop down list.
The *Flux* radio button and the text box	Select this button and type the flux frequency value (MFlux per second) in the text box to write the flux frequency.

- The text field in the *Offtrack Offset* frame is the area, where you can type the off-track offset value (µInch) to specify the position for the measurements.
- The control buttons:

1. The *Save* button saves parameters to a database.
2. The *Reset* button restores parameters from a database.
3. The *Default* button sets all parameters in the dialog box to a default value.
4. The *Close* button closes the dialog box. If the Save button hasn't been pressed after any changes in the dialog box; the program prompts you to save the parameters, or abandon the changes.

3.5.3 Test Results Area of Result Processor for Off-Track Modulation Test

There is a *Test Results* area definition for the *Off-Track Modulation* test.

Note: Not all fields are displayed. The actual field configuration depends upon the test configuration.

Name of the Field	*Comments*
Conf	Number of configurations, which is always equal to 1 (not in use)
Statistic Type	The statistic types of the results.
Iteration ID	The iteration ID.
Offtrack TAA (mV)	The TAA value of the test signal on specified offset.
Offtrack PosMod (%)	The positive modulation value on specified offset.
Offtrack NegMod (%)	The negative modulation value on specified offset.