Technical Enterprises

Release Notes

WITE32

Version 3.22

05/27/2005

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CHAPTER 1 INTRODUCTION

The release 3.22 of WITE32 incorporates new features and bug fixes introduced after the release 3.21. This document uses the release notes for WITE32 version 3.21 as a base line for comparison.

CHAPTER 2 NEW HARDWARE SUPPORTED IN WITE32

2.1 New MR-5L Current-Sense Low-Impedance Head Amplifiers for TMR Heads

Guzik MR-5L head amplifier is designed to work with high impedance TMR heads. The impedance of such heads can be as high as ***1000 Ohm***, so it is impossible to achieve a high bandwidth with a high impedance amplifier. ***MR-5L*** is a current-sense low-impedance amplifier with voltage bias.

Specifications:

- **Bandwidth:** DC to 2GHz at –3dB

  Note: The bandwidth is measured with a high impedance calibrator with differential impedance 2 kOhm.

- **MR Impedance range:** 100 to 1000 Ohm
- **Input voltage noise:** 1.6 $nV/\sqrt{Hz}$
- **Input impedance:** 80 Ohm differential (typical)
- **Write-to-read recovery time:** 100 nsec (typical)
- **TMR Bias voltage:** ±400 mV
- **Amplification:** 31 dB (typical)

Two low-impedance head amplifiers are supported for the first time in WITE32 version 3.22:

- MR5ML_H
- MR5ML_C

2.2 New Commercial Head Amplifiers

The following head amplifiers are supported for the first time in WITE32 version 3.22:

- 81G204M
- PA7517
- SR1647
- SR1852BAA
- SR1984BAA
- SR1665ABA

2.3 New Head Stacks

The following head stacks, designed to work with UP8, are supported for the first time in WITE32 version 3.22:

- SR1651AAA

- A141AC
- SR1651BAA

2.4 New PRML Chip Adapters

A new chip adapter M6300 for Chip Adapter Interface 4000 (P/N S23-326230) is initially supported in WITE32 version 3.22.

Please contact sales@guzik.com for more information.

2.5 New V2002 Tooling Types

The *Y- Limit Adjustment* test for the V2002 spinstand supports the cartridge and media sets listed in Table 1 starting from WITE32 revision 3.22:

Cartridge Part Number	*Media Size*
80-702919 / 702920	2.5 Inch
80-702985 / 702986	1.8 Inch
80-703014 / 730015	70 mm
80_703083 / 703084	2.5 Inch
84-800557	1 Inch
84-800567	3.5 Inch
84-800577	2.5 Inch

Table 1: New Cartridge and Media Sets Supported for Guzik V2002 Spinstand

2.6 RC2002 Board Revisions "H" and Later for RWA-2000 Series

WITE32 version 3.22 supports the Read Channel board revisions "H" and later that are not supported in the previous versions of WITE32.

If you start WITE32 version 3.21 or earlier with an RWA equipped with the new Read Channel board, the following error message appears on the computer display *"Download error: Read Channel 2002: There's no valid configuration file matching mask "31805_??-??" in directory <WITE32 root directory>".*

CHAPTER 3 NEW FEATURES INTRODUCED IN WITE32

3.1 Servo Closed-Loop Operation Mode for Micro Actuator Heads

Starting from WITE32 version 3.22, the Guzik V2002 spinstand supports the closed-loop operation mode for Micro Actuator heads (heads with piezo on suspension).

3.1.1 Hardware Requirements

The hardware requirements are listed below:

- All requirements for Micro Actuator mechanical tests (see *Micro Actuator Tests User's Guide* P/N 02-107264-01).
- RWA-2000 series equipped with servo revision 3.
- Guzik V2002 spinstand with the *Servo Controller 4* board P/N 321840.

3.1.2 Micro Actuator Closed-Loop Tests

The following new Micro Actuator closed-loop tests are implemented in WITE32 version 3.22:

- *Micro Actuator Loop Setup.* This test adjusts the servo closed loop for Micro Actuator.
- *Micro Actuator Loop Frequency Response.* This test builds a Bode plot of the servo closed loop to verify the adjustment.

For a detailed description of the available tests please see the *Micro Actuator Tests User's Guide*.

3.1.3 Enabling Micro Actuator Servo Loop

The *MA Enable* check box in the *Servo Control* configuration dialog box (*Control* | *Servo* menu), introduced in WITE32 version 3.11, is now enabled if hardware supports Micro Actuator (see Figure 1).

There are two servo modes available for a Guzik V2002 spinstand equipped with Micro Actuator:

- High-bandwidth Micro Actuator servo loop mode. In this mode the actuation is performed by a piezo on suspension, feedback comes from embedded servo written on the media.
- Regular V2002 piezo actuator servo loop mode. In this mode position actuation is performed by a V2002 micro-positioner piezo, feedback comes from embedded servo written on the media.

To switch between these two modes, use the *MA Enable* check box. If Micro Actuator is not supported by hardware this check box is grayed.

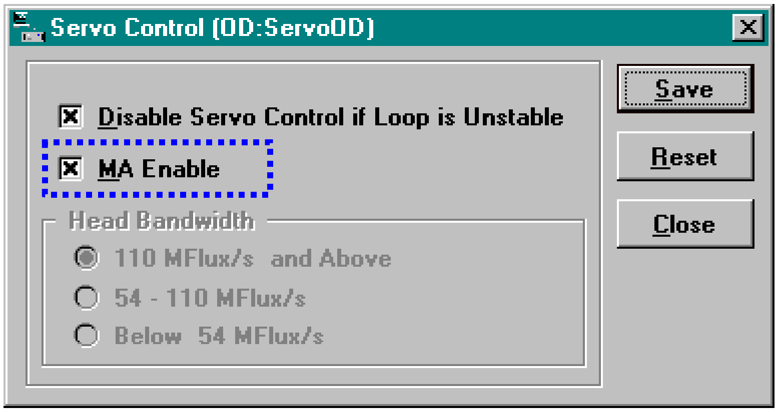


Figure 1: *MA Enable* Check Box

When the *MA Enable* option is checked, the Micro Actuator servo loop mode becomes active during the *Servo ON* operation and the engineering dashboard servo mode indicator appears as described in 3.1.4

Note: Micro Actuator Closed Loop mode should be adjusted properly using the Micro Actuator Loop Setup test prior to enabling it. For further details see Micro Actuator Tests User's Guide P/N 02-107264-03

3.1.4 Indicator of Micro Actuator Servo Mode on WITE32 Dashboard

The symbol μ on the green servo mode indicator (see Table 2) shows that the Micro Actuator closed-loop servo mode is active. The indicator is located in the bottom right corner of the *WITE32 Engineering Dashboard*.

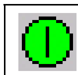
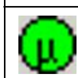
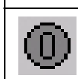
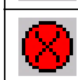
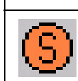
	*Servo ON*	The servo is written and is functioning correctly. The servo is working in the regular V2002 piezo actuator servo loop mode. Green color and the symbol “I” indicate this status.
	*Micro Actuator ON*	The servo is written and is functioning correctly. The servo is working in the high-bandwidth Micro Actuator servo loop mode. Green color and the symbol “µ” indicate this status.
	*Servo OFF*	The servo is disabled. Gray color and the symbol “0” indicate this status.
	*Servo Error*	The servo is not written correctly, or the servo loop is unable to stabilize. Red color and the symbol “X” indicate this status.
	*Servo Suspended*	The servo has been temporarily switched off. Light brown color and the symbol “S” indicate this status. Note: The typical situation when the servo becomes suspended occurs when the head offset is specified outside the servo zone.

Table 2: Meanings of Servo Mode Indicator

3.2 Spinstand EEPROM Viewer

A new application, *Spinstand EEPROM Viewer* (see Figure 2), has been added to WITE32 software starting from WITE32 version 3.22. Now WITE32 installation creates two EEPROM view shortcuts in the WITE32 program group in Microsoft Windows:

- *Spinstand EEPROM Viewer* application displays the information saved in the EEPROM chips of the boards located inside spinstand Frames and Control Boxes for Guzik V2002 and 1701B spinstands,

- *RWA EEPROM Viewer* application shows the EEPROM information for the RWA, Analog box, analog front end, and computer boards

To start the *Spinstand EEPROM Viewer* application click the *Spinstand EEPROM Viewer* shortcut, or run *EEPROM_View.exe* from the WITE32 folder with the option -DRV2002 for V2002 spinstand or -DRV1701B for 1701B spinstand.

The *Spinstand EEPROM Viewer* application has the same user interface as the *EEPROM Dump* test in WDCP2002 (WDCP for 1701B). The dialog box is shown below. Please refer to the *Spinstand V2002 User's Manual* (P/N *02-107200-01*), section *5.14 EEPROM Dump Dialog Box* for detailed description.

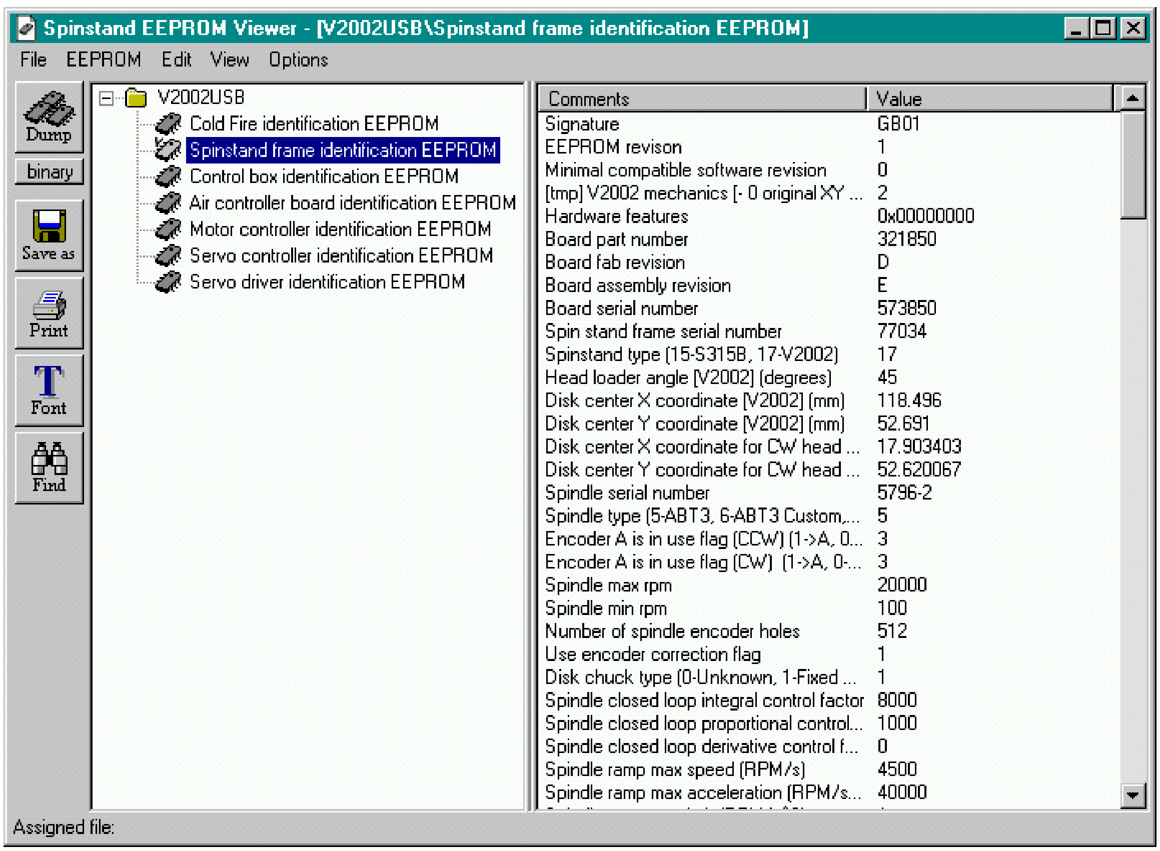


Figure 2: Spinstand EEPROM Viewer Dialog Box

The *Spinstand EEPROM Viewer* extends the EEPROM Dump functionality of WDCP2002 version 3.21. It allows uploading new content into a single EEPROM chip. You may need to upload the EEPROM images for the particular board serial number that you receive from Guzik Technical Enterprises. To upload a new image, do the following:

1. Select the EEPROM chip to be uploaded from the left pane.

2. Click the *File* | *Load* menu item – the *Open* dialog opens up.

3. Select the file with the binary image (extension EPR, provided by Guzik) and press the *Open* button. If a spinstand board serial number matches with one from the file, the following message pops up: *"Do you really want to overwrite the <board name> EEPROM S/N <number> with image from <file name> file? The backup copy of current EEPROM image will be saved in <file name>.bak file."* Press the *Yes* button to proceed uploading. The message *"The < board name> S/N <number> has been updated"* confirms that uploading has completed successfully.

4. Close the *Spinstand EEPROM Viewer* application – the message *"Spinstand EEPROM was changed. Do you want to perform reset operation?"* pops up. Press the *OK* button to reset the spinstand.

CHAPTER 4
WITE32 MODIFICATIONS

4.1 Head Electromotive Force Measurement

A new option for reporting the electromotive force of a head as a result of a TAA measurement is introduced in WITE32 version 3.22. To enable the option, open the *Universal Preamp Configure* dialog box using menu *Configure* | *Preamp* (see Figure 3), and select the *Head Electromotive Force (EMF)* option in the *TAA Results* frame.

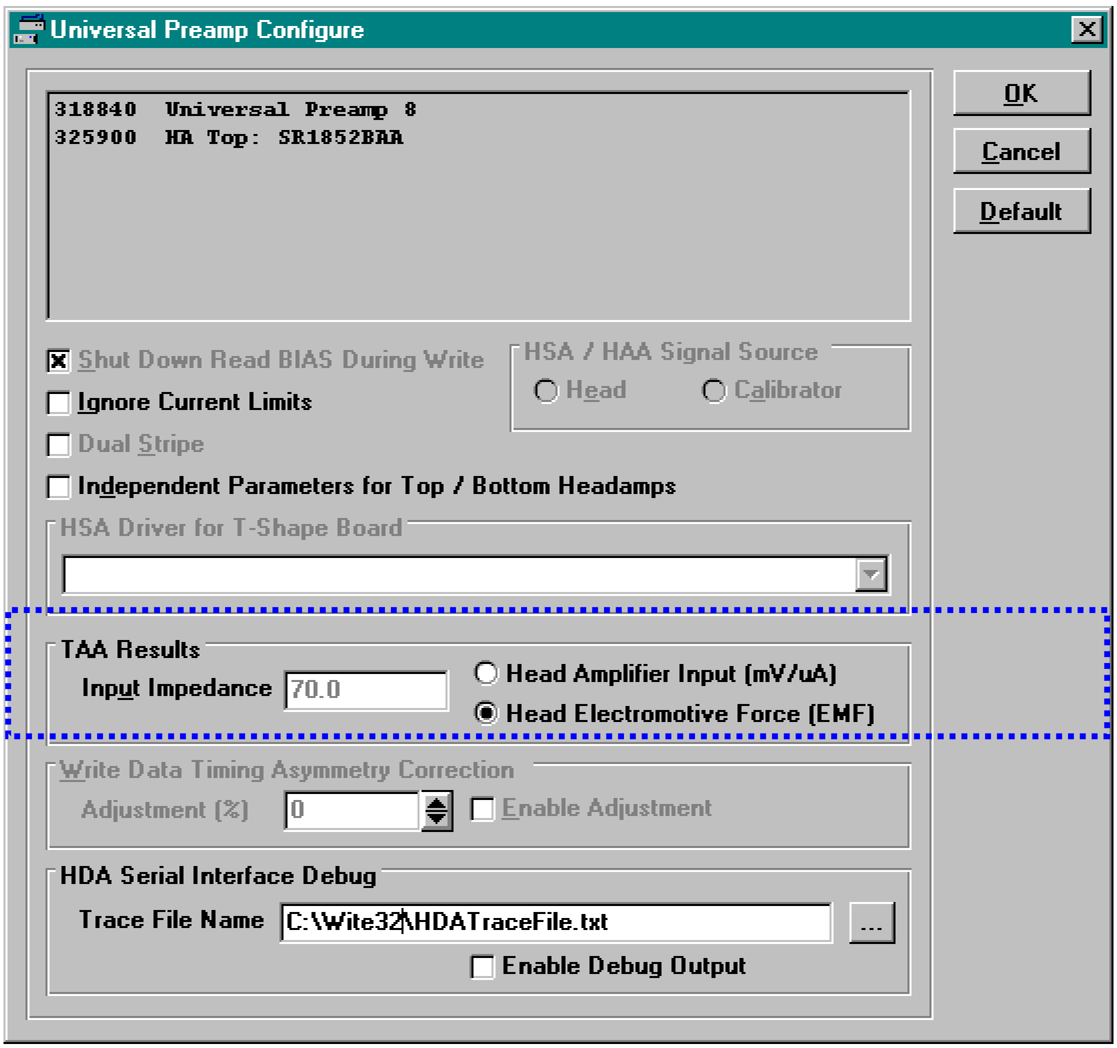


Figure 3: *Universal Preamp Configure* Dialog Box

The *TAA Results* frame replaces the *Current Sensitive HA* frame, available in WITE32 3.21 and earlier versions of WITE32 (see Figure 4). Two states checked and unchecked of the *Convert Results to mV* option correspond to either of radio button selection:

- Unchecked *Convert Results to mV - Head Amplifier Input (mV/µA)*
- Checked *Convert Results to mV - Head Electromotive Force (EMF)*

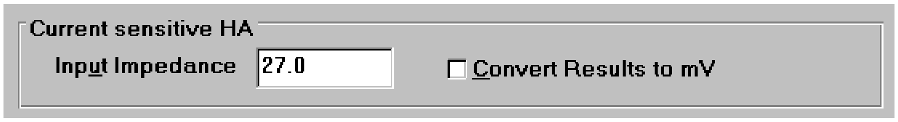


Figure 4: *Current-sensitive HA* Frame with *Convert Results to mV* Option

When the *Head Amplifier input (mV/µA)* option is selected, all TAA results are reported as the signal amplitude measured at the input of a head amplifier. WITE32 version 3.22 measures and reports TAA the same way as all previous versions of WITE32. For voltage-sense amplifiers, the TAA results are reported as voltage on the amplifier input in millivolts; for current-sense amplifiers, they are reported as a current across input of an amplifier in microamperes.

When the *Head Electromotive Force (EMF)* option is selected, all results of TAA measurement in WITE32 are reported as the electromotive force of the head in millivolts, see section 4.1.1.

4.1.1 Head Electromotive Force Calculation

Figure 5 shows the head (or calibrator) connected to a head amplifier with input impedance R_{in}. A head (or a calibrator with injected signal) can be represented as an ideal voltage source *G* with an output impedance $R_{out.}$

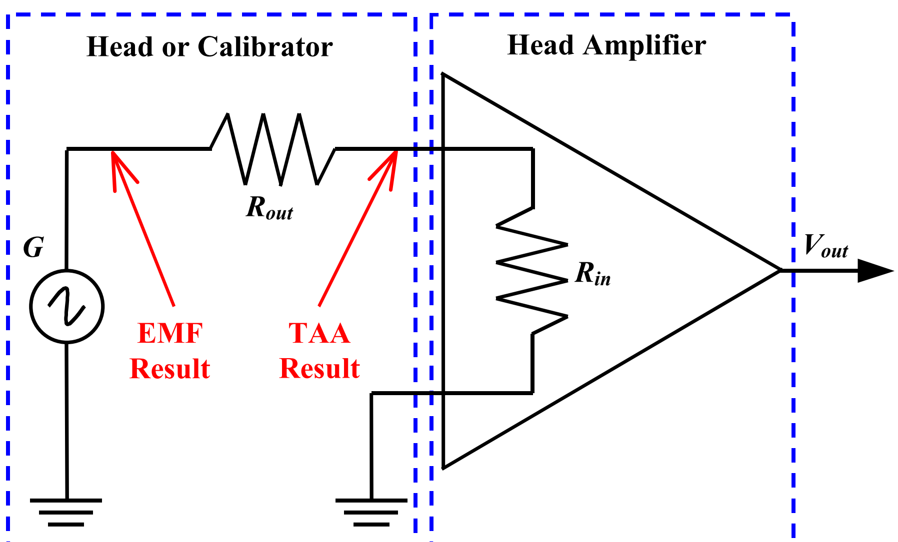


Figure 5: EMF and TAA Result Reference Points

To calculate the EMF results, the following equations are used:

(1) $EMF(mV) = TAA(mV) * \frac{R_{out} + R_{in}}{R_{in}}$ – for voltage-sense head amplifiers

(2) $EMF(mV) = \frac{TAA(\mu A)}{1000} * (R_{out} + R_{in})$ – for current-sense head amplifiers

For the head installed, the *Rout* result is measured by the MR Impedance measurement. The input impedance of an amplifier R_{in} is taken from the head amplifier driver. If a head amplifier driver for a voltage sense head amplifier does not report the input impedance value, the default value, 1000000000, is taken as head amplifier input impedance. This high impedance makes equal the TAA values reported by measurement in *TAA* and *EMF* modes.

There are two main differences between the TAA and EMF results:

- The TAA is measured directly by the peak detector, while the EMF value depends on the TAA result, the head (MR) impedance, and the head amplifier input impedance. Thus the accuracy of the EMF result is affected by the accuracy of TAA, MR impedance, and amplifier input impedance measurements.

- The EMF value reflects the ability of a head to generate a signal. The EMF results for a specific head should match when measured with different head amplifiers that support the EMF mode, while TAA depends on the R_{in} / *Rout* ratio.

4.1.2 Head Amplifier Drivers that Support the EMF Mode

The following head amplifiers support EMF conversion:

Head Amplifiers that Support EMF Conversion			
MR5M	MR5ML	MR5ML_H	PA7501
PA7517	PA7550	SR1647	SR1651BAA
SR1665ABA	SR1852BAA	SR1970	SR1970L
SR1971	SR1972	TC7547	TLS26A954AC

Table 3: Head Amplifiers Supporting EMF Mode

Note: All other head amplifiers report TAA even though the EMF mode is selected.

4.1.3 Support of EMF Mode in TAA Calibration

The *TAA Calib* dialog box has been modified to support calibration of the TAA to the specific value of the EMF. See Figure 6 and Figure 7 to compare the dialog boxes from different WITE32 revisions.

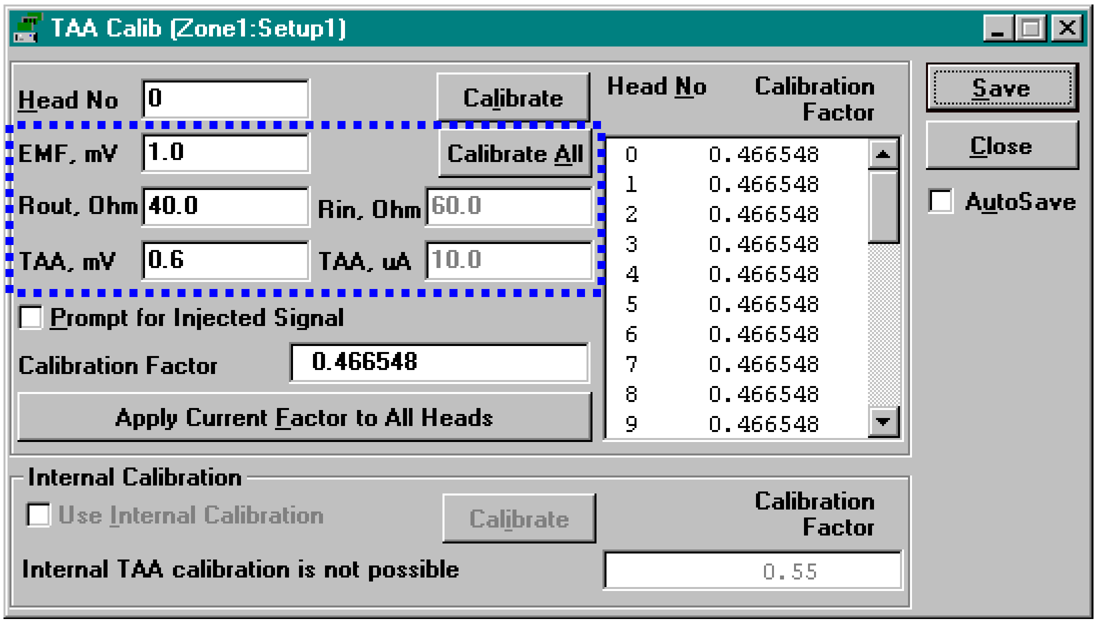


Figure 6: *TAA Calib* Dialog Box of WITE32 Version 3.22

The following controls are added or renamed in the *TAA Calib* dialog box:

- *EMF, mV* – Head electromotive force in millivolts
- *Rout, Ohm* – Output impedance of the calibrator board, specify the value written on the label on the top of the calibrator in Ohms.
- *Rin, Ohm* – Read-only field displaying the input impedance of the head amplifier as provided by a head amplifier driver, or 1000000000 if the head amplifier driver does not support the EMF mode (see Table 3 for a list of head amplifiers with drivers that support the EMF mode).
- *TAA, mV* – TAA reference for voltage-sense head amplifiers, called *Amplitude (mV)* in WITE32 version 3.21 and earlier. Enabled for voltage-sense head amplifiers only.
- *TAA, uA* – TAA reference for current-sense head amplifiers, called *Amplitude (µA)* in WITE32 version 3.21 and earlier. Enabled for current-sense head amplifiers only.

When you change *TAA, mV, TAA, µA*, or *Rout, Ohm* values, the *EMF, mV* value is recalculated according to formula (1) or (2) (see section 4.1.1). If you change the *EMF, mV* value, *TAA, mV (TAA, µA)* values are recalculated. WITE32 does not store the EMF value in the database, so it recalculates this value based on the *TAA*, *Rin*, and *Rout* values on opening the *TAA Calib* dialog box.

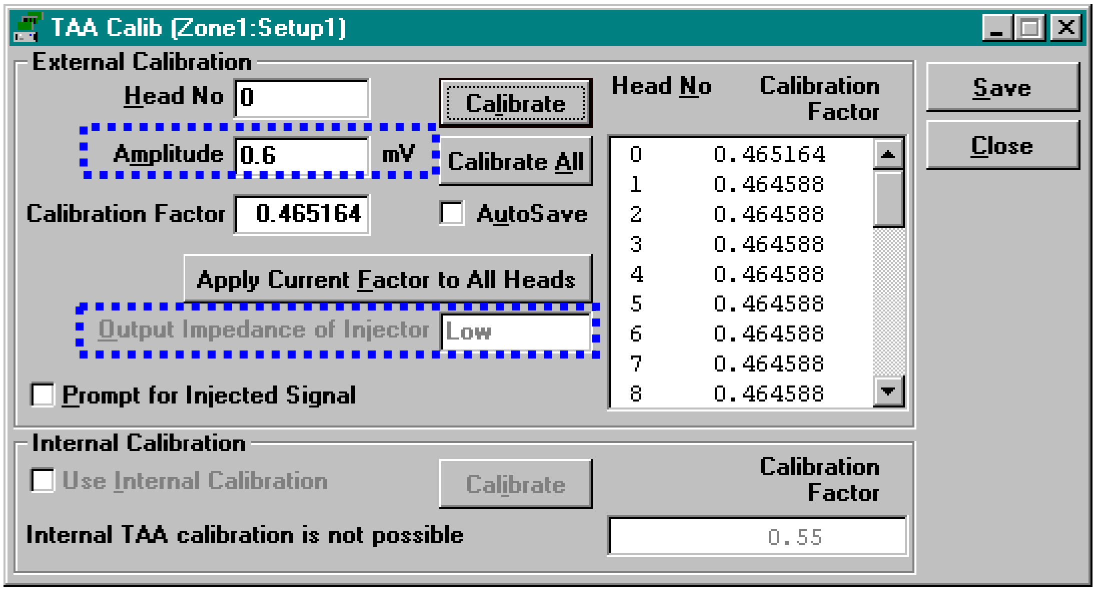


Figure 7: *TAA Calib* Dialog Box in WITE32 Version 3.21 and Earlier Versions

The algorithm of the *TAA Calibration* test is not changed. It performs calibration to the value specified in the *TAA, mV* or the *TAA, µA* edit box (*Amplitude* edit box in the old dialog) the same way as in the previous revisions of WITE32. For the low-impedance head amplifiers, however, *TAA, mV* or *TAA, µA* has to be calculated according to formulae below

$$TAA(mV) = EMF(mV) * \frac{R_{in}}{R_{out} + R_{in}}$$

$$TAA(\mu A) = EMF(mV)\frac{1000}{(R_{out} + R_{in})}$$

Where *EMF (mV)* is EMF of the signal source, *Rout* is the impedance of the calibrator board, and *Rin* is the impedance reported by the head-amplifier driver. For such head amplifiers you can specify *EMF, mV* and *Rout, Ohm.,* and perform calibration to the automatically calculated *TAA, mV* or the *TAA, µA* value. For the high impedance head amplifiers *EMF, mV* is set to be equal to *TAA, mV*.

To use the new EMF calibration, do the following:

- Make sure that the amplifier currently installed on your system supports the EMF mode. In particular, ensure that the value displayed in the *Rin, Ohm* field, is not 1000000000.
- Enter the output impedance of the calibrator board, as specified on the label on the top of the board, into the *Rout, Ohm* edit box.
- Specify the peak-to-peak amplitude of the injected signal in the *EMF, mV* edit box. The amplitude can be measured by any device with high input impedance or calculated as signal amplitude on the input of the calibrator board minus attenuation of the calibrator as written on the label, and converted to millivolts. For example, if you have -16dBm coming out from a signal generator injected into the

calibrator with 40 dB attenuation, the EMF should be set to 1.0mV, as (-16dBm - 40dB) = -56dBm = 1mV for the sine wave signal on 50Ohm output.

4.1.4 RMR Result in TAA Test

The *TAA* test reports the *Rmr (Ohm)* result for voltage-sense head amplifiers if the EMF measurement mode is selected (see Figure 8). *Rmr* was reported only for current-sense head amplifiers in the previous revisions of WITE32 (see section 4.1 for the EMF measurement description).

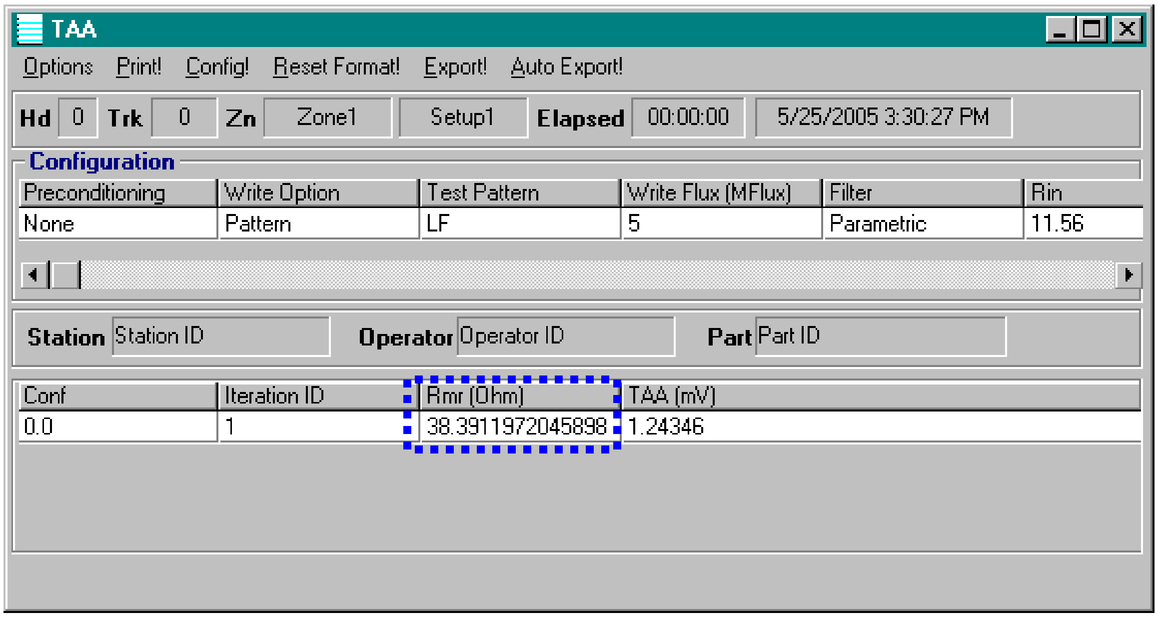


Figure 8: *TAA* Test Results for EMF Measurements

4.2 Spectrum Analyzer Test Output for Current-Sense Amplifiers

The *µA* and *dBµA* unit labels are added in the *Spectrum Analyzer* setup dialog box of WITE32 version 3.22 for current-sense head amplifiers (see Figure 9).

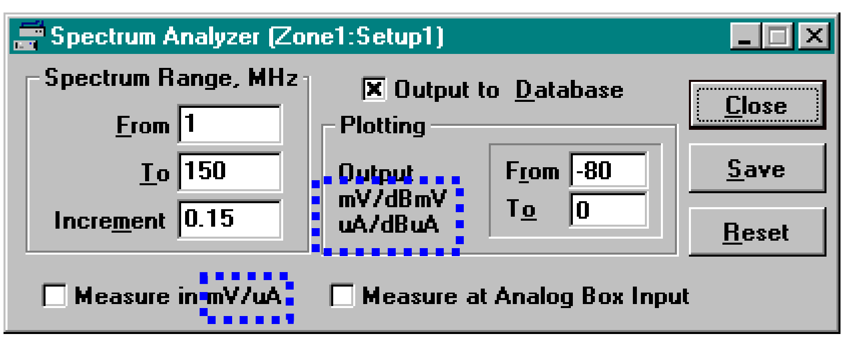


Figure 9: Spectrum Analyzer Dialog Box

The *Spectrum Analyzer* test results report dBµA and µA (µA - in case of *Measure in mV/uA* option is checked on the test setup) units for current-sense head amplifiers (see Figure 10 and Figure 11), if the *Head Amplifier Input (mV/µA)* option (*TAA Result* frame) is selected in the *Configure | Preamp…* menu.

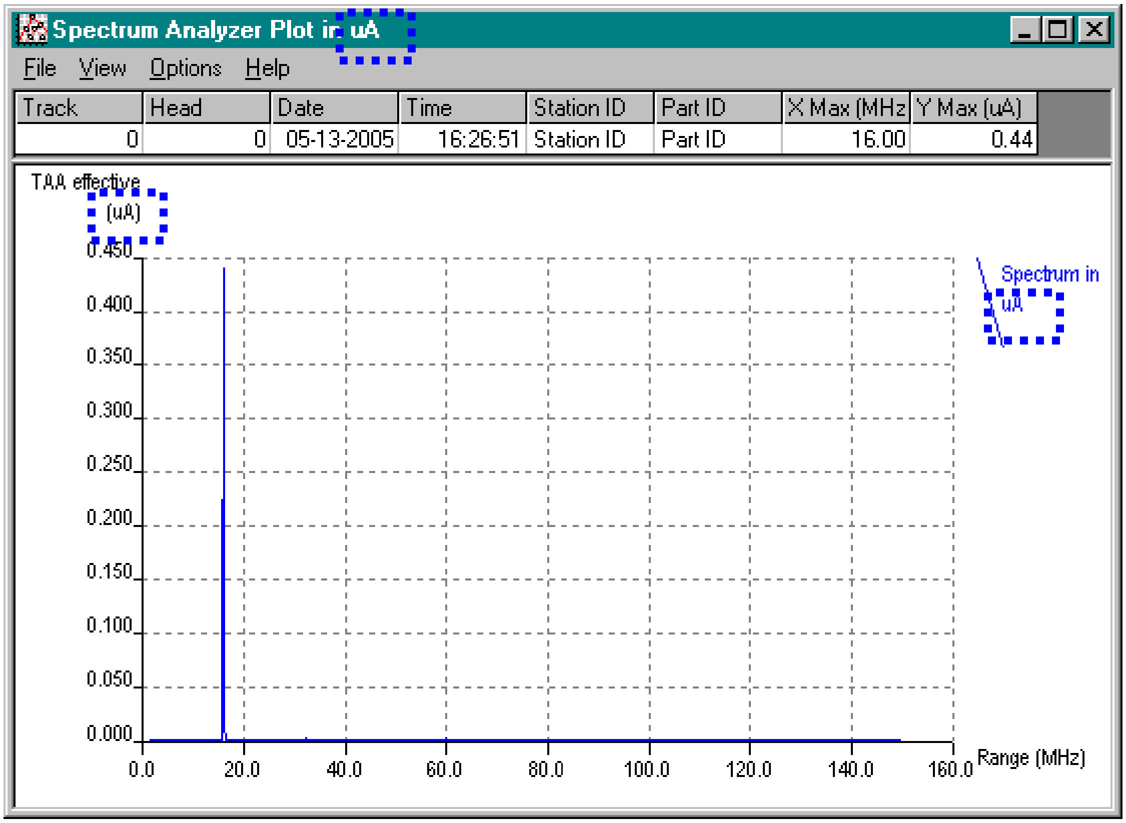


Figure 10: *Spectrum Analyzer* Plot for Current-sense Head Amplifier

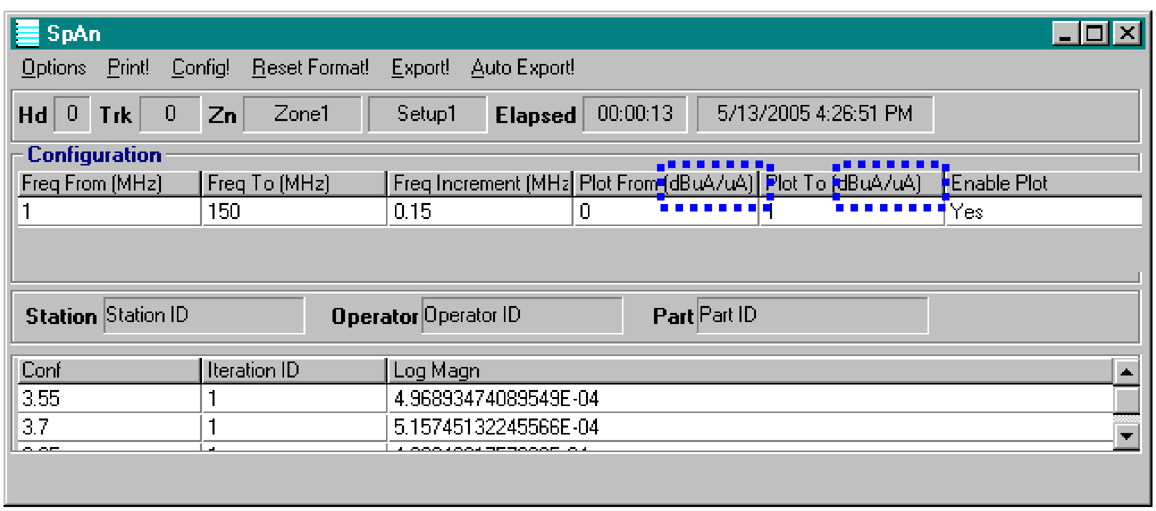


Figure 11: *Spectrum Analyzer* Test Results for Current-sense Head Amplifier

4.3 Spectral Integral SNR Test Results for Current-Sense Amplifiers

The *Spectral Integral SNR* test reports µA instead of mV units for current-sense head amplifiers (see Figure 12), if the *Head Amplifier Input (mV/µA)* option is selected in the *Configure | Preamp…* menu:

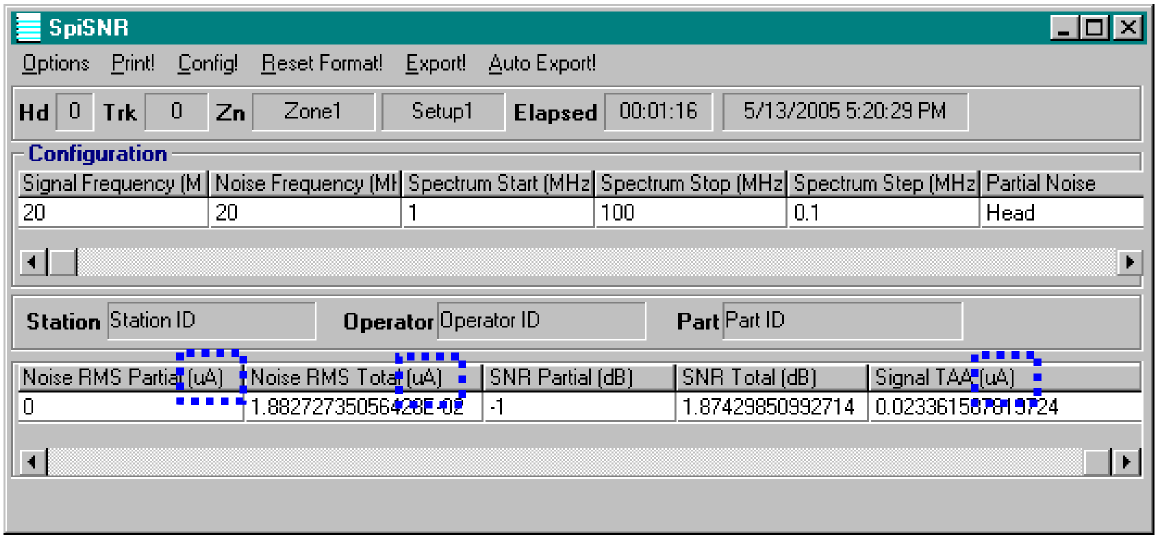


Figure 12: *Spectral Integral SNR* Test Results for Current-sense Head Amplifier

4.4 Setup Analysis Tool for PRML Channels

WITE32 version 3.22 provides a new *Setup Analysis* tool for comparing the current state of the PRML channel with the one saved in the file generated by *File | Save Registers to File* command. This tool is available for the following PRML chips:

- M7500M for Chip Adapter Interface 2000 (P/N S23-318704)
- RC6600 for Chip Adapter Interface 2000 (P/N S23-322220)
- M7500M for Chip Adapter Interface 4000 (P/N S23-322870)
- M7500P for Chip Adapter Interface 4000 (P/NS23-322870)
- Tiger for Chip Adapter Interface 4000 (P/NS23-325460)
- M6300 for Chip Adapter Interface 4000 (P/N S23-326230)

The tool is also available for custom PRML chip drivers that are developed using DDK (see *PRML Chip Driver Development Kit* P/N *02-107273-02*).

The *Setup Analysis* interactive tool displays a list of PRML channel registers and bit fields that differ from the state saved in the file. It also allows applying saved values to the channel and comparing the channel quality for the changed settings with the previously measured quality using the selected metric function. To perform the analysis, do the following:

1. Open the *Chip Config* dialog box
2. Configure the channel, perform optimization
3. Save current chip state to a file using *File | Save Registers to File…*
4. Modify channel settings

5. Open the *Setup Analysis* tool using *File | Compare Registers with File…*

The *Setup Analysis* dialog box appears (see Figure 13).

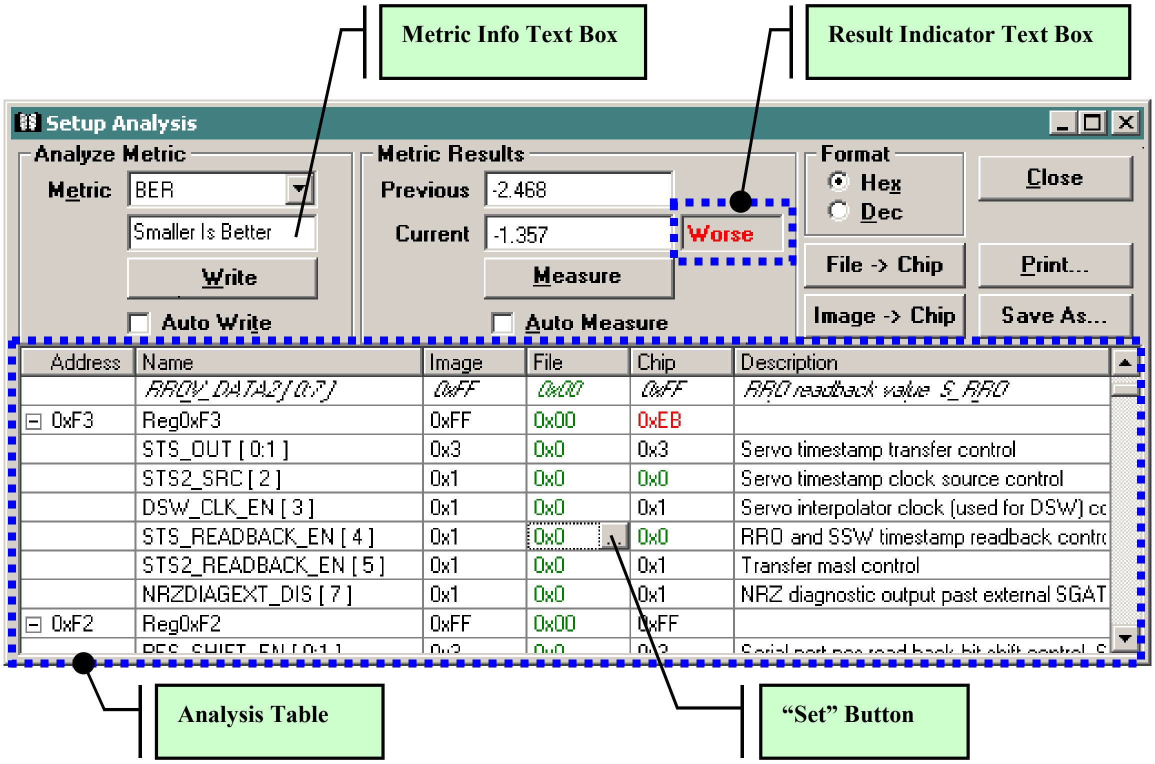


Figure 13: *Setup Analysis* Dialog Box

The *Setup Analysis* dialog box has the following controls:

- The *Analyze Metric* frame configures a metric to analyze changes of channel registers and bit fields:

Metric	Selects the metric for chip performance analysis. The list of choices in this text box depends upon the PRML driver. For example: *BER*, *Pulse Width*, *QM*.
Metric Info	The text box displays the metric target information: • *Bigger is Better* – the larger the metric result, the better the channel performance • *Smaller is Better* – the smaller the metric result, the better the channel performance • *Equal to Zero* – the closer to zero, the better the channel performance
Write	Click this button to write the pattern for optimization.
Auto Write	Select this check box to write the pattern for optimization before each metric measurement.

- The *Metric Result* frame shows the results of metric measurements.

  The metric is measured after:

  1. Clicking the *Measure* button
  2. Clicking the *Set Button* in the *Analysis Table* with the *Auto Measure* check box checked

  The *Current* text box shows the result of the last measurement. The previous value of the *Current* moves to the *Previous* text box.

Previous	The text box shows the result of the previous metric measurement.
Current	The text box shows the result of the last metric measurement.
Result Indicator	The text box shows the result of a comparison of the previous and the current measurements in terms of the metric target. For example: the *Result Indicator* displays *"Worse"*, when the value in the *Current* is larger than in the *Previous* and the selected metric target is the *Smaller is Better* (see Figure 13).
Measure	Click this button to measure the selected metric.
Auto Measure	Select this check box to automatically remeasure the selected metric whenever a register/bit field is changed in the *Analysis Table*.

- The *Analysis Table* displays a list of those PRML channel registers and bit fields that differ from the state saved to the file. Read-only registers or bit fields are displayed in italics. The table consists of the following columns:

Address	The column displays the physical address of a register.
Name	The column shows the register name for a row representing a register. When a row displays a bit field, the column displays the bit field name followed by the bit numbers defined for a bit field in the following format: • **[Starting bit number: Ending bit number]** – for a bit field with multiple bits. • **[Bit number]** – for a bit field consisting of one bit only
Image	This column shows the register or bit-field value taken from the software image when the dialog box is opened. A software image is a copy of register value in PRML driver memory.
File	The column shows the register or bit-field value saved in the file.
Chip	The column shows the register or bit field value currently set in the chip. The color of a value indicates where the value is taken from: • **Black** – the value is taken from the image column • **Green** – the value is taken from the file column • **Red** – (for register only) the value is a combination of image and file column values for bit fields within the register

Description — The column shows the description for a register or a bit field.

(*"Set"* Button) — The button appears on the right side of a text field after the field has been selected in the *Image* or in the *File* column. Click this button to program the value from the selected column to the chip register or the bit field.

Note: The same operation can be executed by double-clicking on the field.

The button remains hidden until you select an item in the *Image* or the *File* column. Select an item to access the button.

Note: If the *Auto Measure* check box is selected, a metric will be measured automatically after you modify the value in a field.

- The *Format* frame selects the format for the register and bit field value representation.

Hex — Select this radio button to display all values in the analysis table using hexadecimal format.

Dec — Select this radio button to display all values in the analysis table using decimal format.

- The *Setup Analysis* dialog box has five buttons:

File -> Chip — Click this button to reprogram all registers with the values from the file column.

Image -> Chip — Click this button to reprogram all registers with the values from image column.

Save As … — Click this button to save analysis table as a file in the coma-delimited format.

Print — Click this button to print the analysis table. The printout is sent to the default printer.

Close — Click this button to close the dialog box.

Note: All changes will be programmed to the PRML chip. The original file remains unmodified.

4.5 Modified Dialog Box of Amplitude Asymmetry Test for Perpendicular Parametric Module

The *Amplitude Asymmetry* test is a part of the *Perpendicular Parametric* module. Figure 14 displays the dialog box of the test in WITE32 version 3.22. Figure 15 shows the test dialog box layout as it was in WITE32 version 3.21. The blue border marks the modified areas. The following sections describe the modifications.

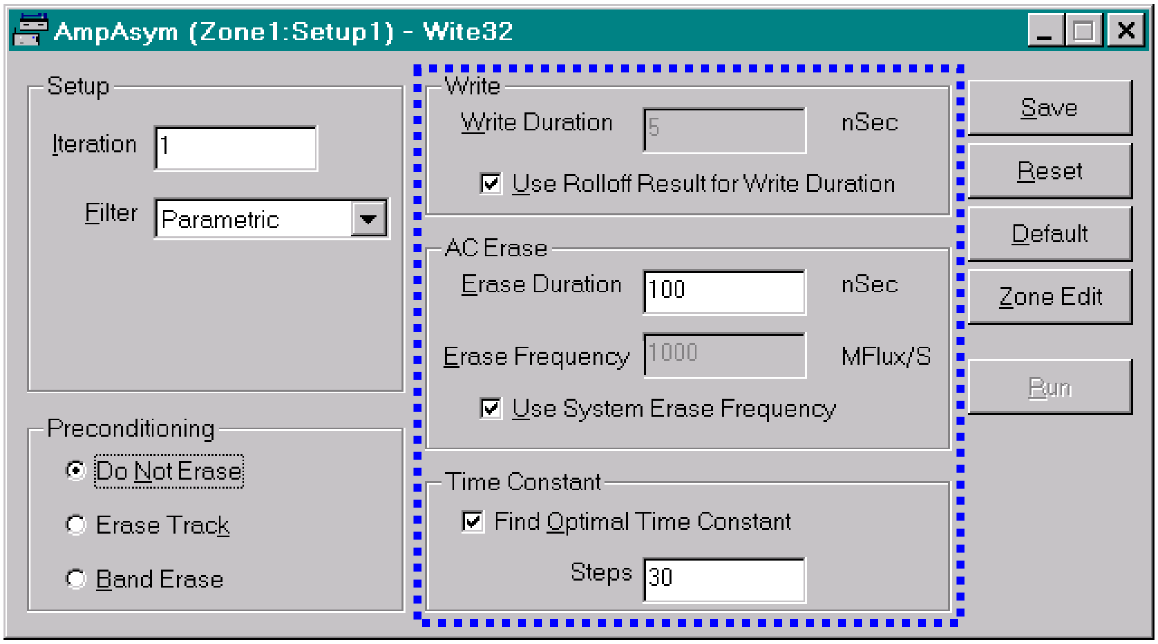


Figure 14: *Amplitude Asym* Dialog Box in WITE32 Version 3.22

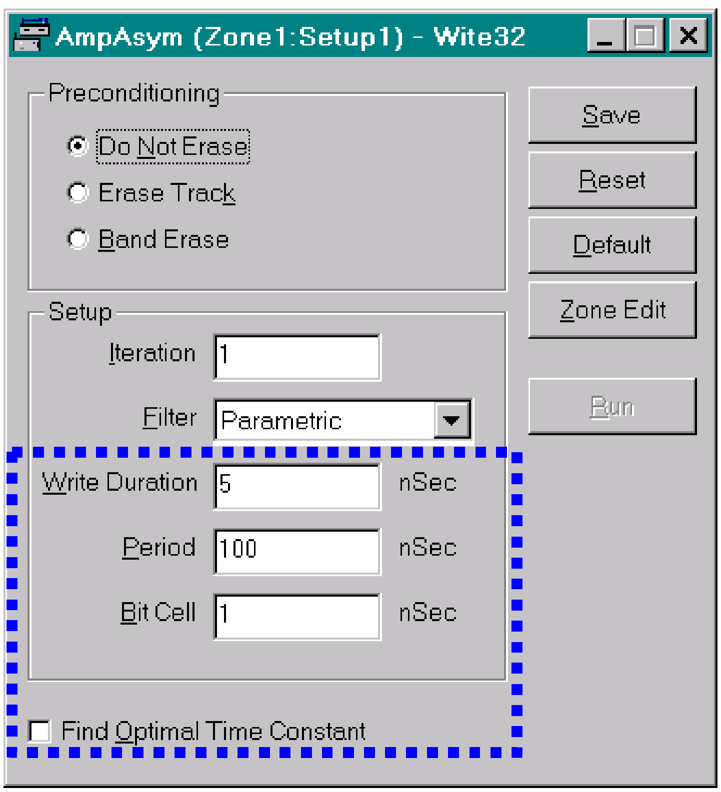


Figure 15: *Amplitude Asym* Dialog Box in WITE32 Version 3.21 and Earlier Versions

4.5.1 Write Frame and Write Duration Parameter

WITE32 version 3.22 has the new frame called *Write* in the dialog box of the *Amplitude Asymmetry* test.

You can choose one of the following techniques to set write duration:

- If the *Use Rolloff Result for Write Duration* option is not selected, you can specify the write duration in nanoseconds directly in the *Write Duration* edit box.

- If the *Use Rolloff Result for Write Duration* option is checked, the test adapts the write duration value from the saved result of $F_{100\%}$ of the previous run of the *Rolloff* test. In this case the *Write Duration* edit box is disabled.

Note: Refer to the *Perpendicular Parametric Measurements Test Descriptions Engineer's Reference* (P/N 02-107279-02) for a description of the *Rolloff* test and the definition of $F_{100\%}$).

4.5.2 AC Erase Frame

The *Period* parameter is renamed to *Erase Duration*.

The *Bitcell* parameter is replaced by the *Erase Frequency* parameter. The *Erase Frequency* parameter specifies the signal frequency used for AC erasure, calculated as (1/*Bitcell**1000) MFlux/S. When the *Use System Erase Frequency* option is unchecked, you can specify it in the *Erase Frequency* edit box.

When the *Use System Erase Frequency* option is checked, the *Erase Frequency* is set to that in *Control | System Band Erase*. In this case, the *Erase Frequency* edit box is disabled.

4.5.3 Time Constant Frame

The *Time Constant* frame contains options that are used when the test is looking for the optimal time constant. When the *Find Optimal Time Constant* option is checked, the test implements several measurements of the amplitude asymmetry level while changing the peak detector time constant value. The time constant corresponding to the minimum of the ratio (A_{Pos}/A_{Neg}) is reported it as the optimal time constant.

The *Steps* parameter defines the number of measurements to perform for the optimal time constant search. In the first step, the test measures with the minimum allowed peak detector time constant. In the last step, the test measures with the maximum allowed peak detector time constant. The remaining steps select logarithmically distributed time constants. When the *Find Optimal Time Constant* option is unchecked, the *Steps* edit box is disabled.

Note: The *Time Constant* frame is disabled when the *Digital Parametric* option in the *Measurements* frame in the *Digital Measurements* dialog is checked. In this case the optimal time constant search is not performed.

4.5.4 Optimal Time Constant Result in Amplitude Asymmetry Test

The *Amplitude Asymmetry* test in WITE32 version 3.22 reports an additional result of the optimal time constant search. The new result name is *OptTC (uSec)*.

4.6 Miscellaneous

1. When executing WITE32 tests that involve a comparator error rate measurement, and when the test pattern is not a PRML pattern, an error message is produced. The previous unclear error message *"VFO board isn't installed: cannot execute test in Peak-Detection-mode"* has been changed to *"The PRML pattern needs to be selected in order to execute <test>"*.

2. The EEPROM Viewer application is renamed RWA EEPROM Viewer

3. Starting from WITE32 version 3.22 the *Direction* option in the *Rotation* frame is disabled in the WDCP2002 spinstand *Product Parameters* dialog box. The spinstand rotation direction is defined by the WITE32 head selection for *V2002 Head Loader* and *V2002 Comb Head Loader*, or by the type of the *V2002 Head Stack*.

Figure 16: Rotation Frame Inside Product Parameters Dialog Box

CHAPTER 5
FIXED BUGS

The following bugs were discovered in WITE32 version 3.21 or earlier, and fixed in WITE32 version 3.22. The description below explains the bug behavior as it appears in WITE32 version 3.21.

5.1 Guzik V2002 Spinstand and Servo

1. The V2002 Comb Loader tooling does not perform head loading in the correct sequence for the following tests and operations:

   - Spectral Integral SNR test when noise measurement with unloaded head is selected
   - Head Loading operation assigned to WITE32 Dashboard buttons or inserted in a Production sequence
   - Head Loading operation invoked from the *Exercise* test of WDCP2002
   - Calls to WDK32 function **HeadLoad()** from custom modules

   When loading the heads, the comb is retracted first, and then the head loader platform loads the head. This can cause damage to the head and media.

2. V2002 spinstands fail to set lower RPM (100-3000) after higher RPM. An error message *"Current-Encoder loop stabilization timeout. RPM is unstable"* pops up in this case.

3. When the V2002 spinstand RPM is changed from a low value to a high value, for example from 2000 to 7500, WITE32 hangs.

4. WITE32 displays an error message *"Hardware timeout detected. Wait for index/sector time out"* and hangs if RPM is changed from a low value to a high value, for example, from 2000 to 7500. It happens if the spinstand model is V2002 or 1701B, and *RWA Control* board is of revision "R" or later.

5. Servo operations may fail on Guzik Servo-2 and Servo-3 RWAs for the heads, which have a write width significantly larger than a read width (Write Width > 2*Read Width).

6. The *Head Alignment rev.2* test is modified to improve the stability of detecting a service track for the case when the track is written by one head and read by another head, and these two heads have very different signal levels.

7. The *Servo ON* operation may fail if the *Main Gain* changes significantly after servo data has been written.

8. If the V2002.DDT file contains at least one parameter that is out of range (for example, ID Radius is 10 Inch) the *Spinstand Product Parameters* dialog box displays the default values for some other product parameters without displaying a warning message. If you press the OK button to close the dialog box, the wrong (default) values will overwrite the previously saved values in the DDT file.

9. The spinstand *Product Parameters* dialog box displays the HSA tooling parameters wrongly when you open the WDCP2002 dialog from WITE32 (*Configure* | *Device* | *Run Alignment Program*) the very

first time after loading WITE32. It displays the parameters from the DDT file instead of the proper values from the HSA Identification EEPROM.

10. If there is no cartridge installed on the V2002 head loader, and the production test is started from the *Operator Panel*, WITE32 displays multiple error messages and hangs.

11. The *Head Loader Type* combo box in the *Tooling* Tab of the *Spinstand Parameters* dialog box contains the unsupported item *Head Gimbal Assembly.* This item has been removed.

12. The false crash protection emergency is reported on the V2002 spinstand reset for the following combination of hardware: Comb Loader revision 2, Rear Interface board P/N 318700, and Comb Loader HSA board P/N 324250 revisions “D” or “G”.

13. A delay of up to two minutes occurs during closing of WDCP2002 application intermittently.

14. An error may occur when the *Available Add-Ins* or *Loaded Add-Ins* lists are empty, and you press the *OK* button on WDCP2002 *Add-Ins Manager* dialog box.

15. The *Servo On* operation in some cases displays the *“Servo control is being enabled while servo erased or was not written. Do you want to proceed?”* warning message. This message, unlike the standard Guzik error message, waits for the operator’s input. The *Production* test cannot proceed until the operator presses *OK* or *Cancel.* To make the *Servo On* operation not to interrupt a production sequence in any case, the warning message is replaced by a standard Guzik error message box that reads: *"Servo might have been erased or not written. Do you want to proceed?"* This error message can be suppressed if you enable the *Error at the Test End* option in the *Configure* | *Test Options* dialog box.

5.2 Miscellaneous

1. For testers with ANA-2000A (equipped with a Chip Adapter Interface 4000 board), tests run longer if the external test module is selected as an executable (as it was described in the *Known Issues in the WITE32 version 3.21 Release Notes, Section 5.3*).

2. The MR-Impedance calibration procedure applies the calibration coefficients to the measured MR-Impedance values if the *Use External Calibration* option is selected. Thus the MR-Impedance calibration is done properly only when it is performed the first time. The second and all subsequent runs of the MR-Impedance calibration are wrong.

3. The *Head Amplifiers Connect* and *Head Amplifiers Disconnect* operations apply 0.5 second delay even for non-sliding head amplifiers.

4. The spectral tests (*Spectrum Analyzer* and *Spectral Integral SNR*) do not apply µA to mV conversion (if enabled in the *Configure* | *Preamp* dialog). For the *Spectral Integral SNR* test, this bug causes wrong SNR results if the *TAA* is selected as the *Signal Defined as* option in the *Measurement* frame of the test setup.

5. If the result window is left open, and you run the *Select Head* test from the *Operator Panel*, WITE32 hangs.

6. Two menu items: *Edit* | *Copy* and *Edit* | *Copy All,* in the *RWA EEPROM Viewer* application do not copy underlined or all lines in the clipboard.

CHAPTER 6
KNOWN ISSUES

6.1 Windows XP Service Pack 2 Compatibility with V2002 Spinstand

If Windows XP is upgraded to Service Pack 2, V2002 spinstand operation might be slower than without Service Pack 2. We strongly recommend not installing Service Pack 2 if working with the V2002 spinstand. We will fix this issue in future releases of WITE32.

6.2 Sector Number Limitation in Partial Revolution Mode

If you select the *Partial Revolution Mode* option in the *Enhanced Performance Mode* frame of the *Configure/Measurement Option* dialog box, you can only specify up to 255 sectors in the *Gate and Track Format* dialog box. If you select 256 or more sectors, not all sectors will be enabled for writing and reading. There is no such limitation in the full revolution mode (when you select the *None* option in the *Enhanced Performance Mode* frame of the *Configure/Measurement Option* dialog box).

6.3 Intermittent Crash of WITE32 External EXE Modules.

The WITE32 external modules in EXE format sometimes crash on WITE32 exit.