Release Notes

WITE32

Version 3.20

01/06/2005

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CHAPTER 1
INTRODUCTION

The release 3.20 of WITE32 incorporates the new features and the bug fixes introduced after the release 3.11. This document uses the release notes for the WITE32 version 3.11 as a base line for a comparison.

1.1 Updated PRML Chip Drivers

With the WITE32 version 3.20 you must use only the version 3.20 of the drivers for RC6600, 88C7500P PRML channels (Chip Adapter 2000 board), and 88C7500M PRML channel (Chip Adapter 4000 board). These new drivers are shipped on a separate CD. Please contact Guzik customer support to request the drivers.

Note: Do not install any previous versions of the RC6600, 88C7500P, and 88C7500M chip adapter drivers when you already have installed the WITE32 version 3.20. The obsolete drivers will overwrite the WITE32 version 3.20 modules, and make your installation inconsistent.

1.2 Updated Revision Numbers of Head Amplifier and Head Stack Drivers

In WITE32 version 3.20, the Guzik head amplifier and head stack driver revisions are updated from 3.*xx* to 4.*xx*, where *xx* is a two-digit number. If WITE32 version 3.20 detects a head amplifier or a head stack driver with revision 3.*xx*, it displays an error message (see Figure 1). When you install the WITE32 version 3.20, the Guzik drivers with updated revision numbers automatically substitute the Guzik drivers with the revisions 3.*xx*. The driver replacement does not require any additional actions except the cases described below:

- If WITE32 displays the error message (see Figure 1) *"HDL: The old revision of Head Amplifier driver is detected. Please contact a Customer Support department of your Head Amplifier manufacturer to get the newer revision of <driver name>"*, you must contact the driver manufacturer and request the driver with the updated revision number.
- If you use a Canon spinstand with Canon head amplifiers, contact the Canon Customer Support department to request an updated driver.
- If you designed your own head amplifier driver or head stack driver, and the revision number of this driver starts with digit 3 (revision 3.10 for example), you must change this first digit to 4 and recompile the driver.

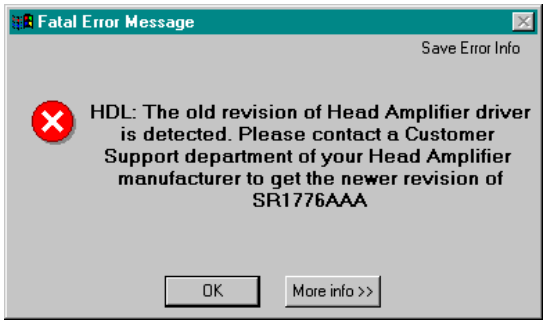

Figure 1: Error Message: *Old Revision of Head Amplifier Driver is Detected*

CHAPTER 2

NEW HARDWARE SUPPORTED IN WITE32

2.1 Spinstand Control Box Models SCB-V2002A and SCB-V2002B

Two new spinstand control box models are supported starting from WITE32 version 3.20. The SCB-V2002A and SCB-V2002B control boxes function with any Guzik V2002 spinstand. The new control boxes are interchangeable with the previous control box model SCB-V2002, use the same external cable connection diagrams, and are similar in operation. The control boxes differ by the type of the spindle motor driver control and the maximum level of the output driver current (see Table 1).

Control Box Model	*Type of Spindle Driver*	*Maximum Level of Output Driver Current*	*Required WITE32 Version*
SCB-V2002	Trapezoidal	4.5 A p-p	3.10
SCB-V2002A	Sinusoidal	8 A p-p (5.7 A rms)	3.20
SCB-V2002B	Sinusoidal	15 A p-p (10.6 A rms)	3.20

Table 1: SCB-V2002, SCB-V2002A, and SCB-V2002B Specifications[1]

2.2 Analog Box ANA-2000A Series

New ANA-2000A series of Guzik Analog Box are supported starting from WITE32 version 3.20. The new series include ANA-2002A, ANA-2003A, and ANA-2004A. These Analog Boxes are created for Guzik RWA-2000 series and have a Chip Adapter Interface 4000 board (Guzik P/N 23-322490). The board supports the new family of the Guzik Chip Adapter 4000 boards featuring the PRML channels with the data rate up to 4 Gbit/sec.

The ANA-2000A series Analog Boxes are interchangeable with the Analog Boxes of the Guzik ANA-2000 series. The new Analog Boxes use the same external cable connection diagram but have four additional cables on the front panel (see Figure 2). The software selectable scope points *CA SCOPE1* and *CA SCOPE2* are also added on the front panel for user convenience. See Section 2.4 of the *Chip Adapter 4000 User Interface* manual for the external cable connection and scope point description.

The upgrade of existing ANA-2000 series with the new ANA-2000A series is available. Please contact sales@guzik.com for more information.

[1] All specifications are subject to change without notice

Figure 2: ANA 2002A Analog Box

2.3 High Pass and Band Pass Filters for RWA-2000 Series

The WITE32 version 3.20 supports two new types of the filters for RWA-2000 series: high pass filters and band pass filters (see Table 2). The band pass filter is the combination of a high pass filter and a low pass filter.

High Pass Filters			
HP 3P BTR	HP 3P BSL	HP 5P BTR	HP 5P BSL
Band Pass Filters			
HP 3P BTR / LP 3P BTR	HP 3P BTR / LP 3P BSL	HP 3P BTR / LP 5P BTR	HP 3P BTR / LP 5P BSL
HP 3P BSL / LP 3P BTR	HP 3P BSL / LP 3P BSL	HP 3P BSL / LP 5P BTR	HP 3P BSL / LP 5P BSL
HP 5P BTR / LP 3P BTR	HP 5P BTR / LP 3P BSL	HP 5P BTR / LP 5P BTR	HP 5P BTR / LP 5P BSL
HP 5P BSL / LP 3P BTR	HP 5P BSL / LP 3P BSL	HP 5P BSL / LP 5P BTR	HP 5P BSL / LP 5P BSL
HP 1P / LP 3P BTR	HP 1P / LP 3P BSL	HP 1P / LP 5P BTR	HP 1P / LP 5P BSL

Table 2: High Pass and Band Pass Filters for RWA-2000 Series

2.4 New PG2002 Board Revisions for RWA-2000 Series

The WITE32 version 3.20 supports two new revisions of the Pattern Generator board: PG2002 revision "E" and PG2002-MAX revision "B". Both these revisions were not supported in the previous versions of WITE32.

If you start the WITE32 revision 3.11 or earlier on RWA equipped with either one of these new PG boards, the error message appears on the computer display:

- *"The board (PG2002 P/N 318130) can not work with the current module revision 1. Please upgrade to revision >= 2."* – in the case of PG2002 revision "E"
- *"No pattern generator board found"* – in the case of PG2002-MAX revision "B"

2.5 New Head Amplifiers

The following head amplifiers are initially supported in WITE32 version 3.20:

New Head Amplifiers			
SR1970	SR1971	81G5114P	SR1641
SR1644	SR1670	SR1673	SR1970
TLS26A954AA	SR1972	TC7547 (not compatible with WITE32 version less than 3.20)	

2.6 New Head Stacks

The following new head stacks are initially supported in WITE32 version 3.20:

New Head Stacks		
81G214M - MAGELLAN_81G214M	PA7540B - NOVA_PA7540B	WABASH3
PA7550 – PUMA_80_PA7550	81G5114D – PUMA_80_5114D	81G5114P – P80_5114P

2.7 Head Stack Tooling for V2002 Spinstand

The following new models of the head stack tooling for V2002 spinstand are supported starting from WITE32 version 3.20:

- Head stack tooling P/N 84-800537
- Head stack tooling P/N 84-800547

CHAPTER 3

NEW FEATURES INTRODUCED IN WITE32

3.1 Guzik Servo Revision 3

Starting from the WITE32 version 3.20, the RWA of the 2000 series equipped with the Servo Revision 3 hardware operates only in Servo Revision 3 mode. Refer to the manual *Guzik Servo Revision 3 For RWA-2000 Series* (P/N 02-107283-03) for the description of the Guzik Servo Revision 3.

WITE32 version 3.20 does not support a combination of Servo-3 RWA and Servo-2 spinstand. The following error message is displayed if WITE32 software detects such configuration: "*Servo-2 spinstand and Servo-3 RWA are incompatible. Please, contact Guzik technical support*".

The previous version of WITE32 software does not support the Servo Revision 3 mode. The test system equipped with an RWA of the 2000 series with the Servo Revision 3 hardware and WITE32 version 3.11 was able to work in the Servo Revision 2 mode only.

To verify the servo revision supported by your test system, open the *Hardware Features* dialog box. To do this, select *Info* | *Hardware Features…* menu item on the main menu of the *WITE32 Engineering Dashboard*.

3.2 Perpendicular Parametric Test Module

The *Perpendicular Parametric Measurements* test module is available starting from the WITE32 version 3.20. This test module requires an additional license. Contact Guzik Sales department for quotation. See "*WITE32 Perpendicular Parametric Measurements Test Descriptions Engineer's Reference*" (P/N 02-107279-02) for the module description.

3.3 Guzik V2002 Spinstand

The following new features are introduced for Guzik V2002 spinstand:

- The *Head Recovery* procedure for comb loader and head stack tooling (see Section 3.3.1)
- The *Head Alignment Revision 2* (see Section 3.3.2)
- The *Lock Motors* mode (see Section 3.3.3)
- The *Disk Chuck Type* test box in the *V2002 Spinstand Parameters* dialog box (see Section 3.3.4)

3.3.1 Head Recovery Procedure for Comb Loader and Head Stack Tooling

In the case of emergency on the V2002 spinstand with a head comb loader or a head stack tooling, the tested head or a head stack remains on a disk and needs to be unloaded manually. The head or head stack must be unloaded if one of the following occurs:

- Air pressure is low in the air supply line
- Air pressure is low in the spindle line
- A failure is detected in vacuum supply line
- The crash protector is hit
- The HSA acoustic sensor alert occurs

If one of the emergencies listed above occurs, the system automatically launches the *Head Recovery* procedure. This procedure is designed to assist with the manual head or the head stack unloading.

Note: You can also start the *Head Recovery* procedure using the *Spinstand Tests* menu item on the menu bar of the *WDCP2002* dialog box.

To unload the head safely, follow the instructions displayed in the *WDCP2002* dialog box (see Figure 3 and Figure 4). The title of the recommended step is marked by a blue color. The *Head Recovery* procedure selects the first step after checking the spinstand conditions. You have to complete all actions required at the selected step. After that the procedure verifies if the conditions are acceptable and selects the next recovery step.

EXAMPLE

Assume an air pressure failure is detected, and the current recovery step is *Step 3*.

1. The procedure is on *Step 3* – the title of this step becomes blue. *Step 3* recommends you to fix the air pressure and confirm that it is normal by selecting the *Confirm Air Pressure* checkbox.
2. After you fixed the air pressure and selected the *Confirm Air Pressure* checkbox, the procedure verifies if the pressure level is acceptable.
3. If the air pressure is normal, the title of the next recovery step becomes blue, which means you have to go to *Step 4* now. If the pressure level is not acceptable, the procedure clears the *Confirm Air Pressure* check box. It means that *Step 3* is not completed and you must repeat the operations requested at this step once again.

The *Head Recovery* procedures for a head comb loader and a head stack tooling have some different steps. The Section 3.3.1.1 describes the procedure for a head comb loader. The Section 3.3.1.2 describes the procedure in case of a head stack tooling.

3.3.1.1 Head Recovery Procedure for Head Comb Loader

The Head Recovery tab of the WDCP2002 dialog box has two frames: the *Configuration* frame and the *Emergency Head Unloading Instructions* frame.

- The *Configuration* frame contains the *Head Recovery Procedure For* read-only field, which displays the type of the head loading mechanism currently installed on the spinstand.

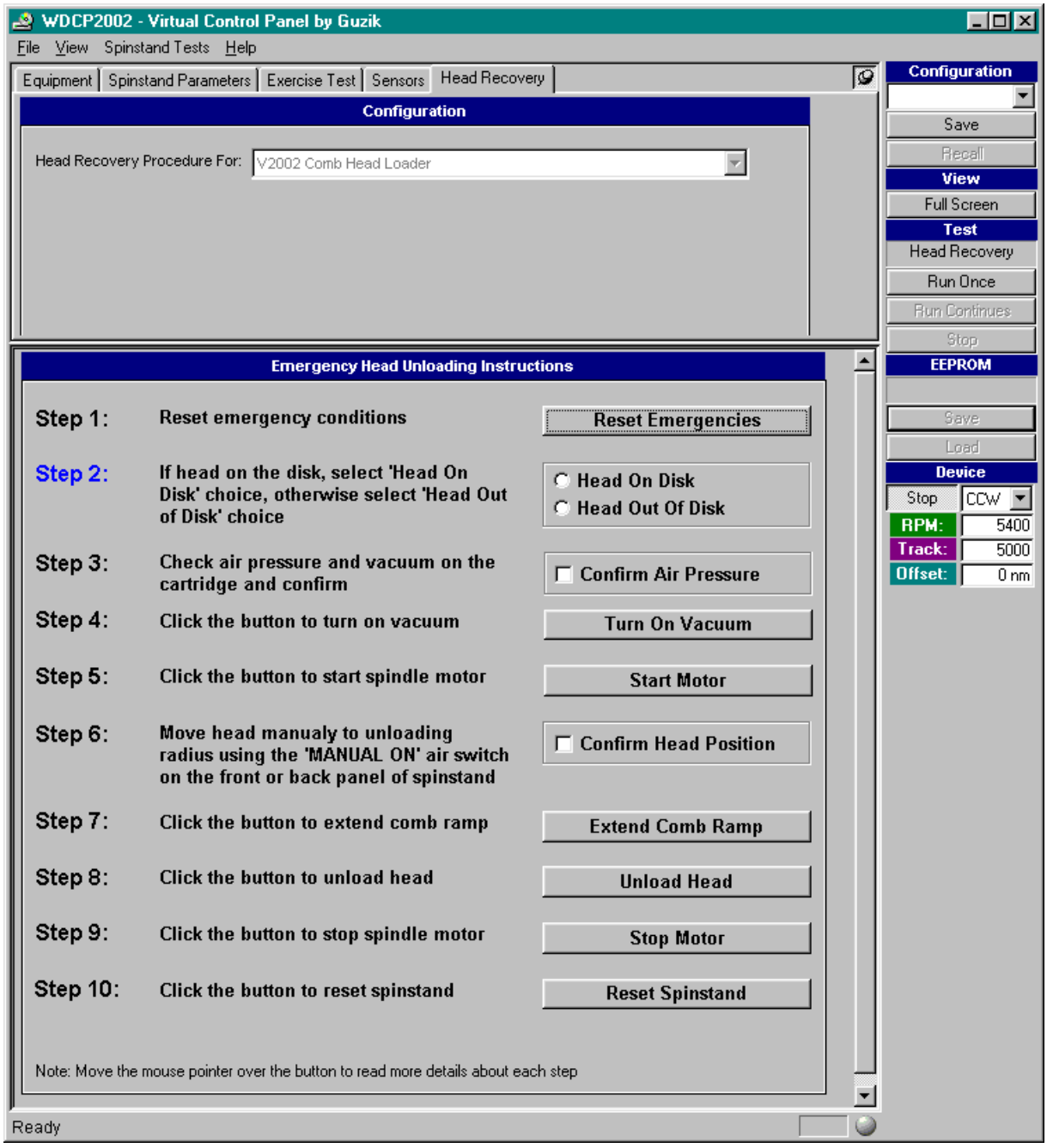

Figure 3: Head Recovery Procedure for Head Comb Loader

- The *Emergency Head Unloading Instructions* frame displays the recovery instructions with the corresponding control items, which let you to confirm the instruction completion:

Step 1	Reset emergency conditions.
	Press the *Reset Emergencies* button to clear a crash emergency and an air emergency.
Step 2	If the head is on the disk, select the *Head On Disk* radio button. Otherwise select the *Head Out of Disk* radio button.
	Select the radio button, which matches the observed head position. If a head lies on the disk, select the *Head On Disk* radio button. Otherwise select the *Head Out Of Disk* radio button.
Step 3	Check the air pressure level and the vacuum level on the cartridge and confirm.
	Check if the air pressure indicator on the spinstand back panel shows the nominal value. If the pressure level is low, find the problem and fix it. After that check the *Confirm Air Pressure* check box. (Refer to *Spinstand V2002. User's Manual* P/N 02-107200-01 for air pressure indicator locations and the recommended air pressure levels)
Step 4	Click the button to turn on vacuum.
	Press the *Turn On Vacuum* button. Check if the corresponding CW or CCW vacuum indicator on the spinstand back panel shows the nominal value. (Refer to *Spinstand V2002. User's Manual* P/N 02-107200-01 for the vacuum indicator locations and the recommended air pressure levels)
Step 5	Click the button to start spindle motor.
	Press the *Start Motor* button to start the spindle motor.
Step 6	Move head manually to unloading radius using the 'MANUAL ON' air switch on the front or back panel of spinstand.
	Turn the *X-Stage Air* switch to the *MANUAL ON* position. (The *X-Stage Air* switch is located either on the back or on the front panel of the spinstand frame, depending on the V2002 modification). Move the spinstand X/Y stages very carefully to position the head to unloading radius. A head has to be on a disk close to the disk edge. In this case a comb will not hit a disk when extended. Then turn the *X-Stage Air* switch to the *AUTO* position and check the *Confirm Head Position* check box.
Step 7	Click the button to extend comb ramp.
	Press the *Extend Comb Ramp* button to lift the head above the disk.
Step 8	Click the button to unload head.
	Press the *Unload Head* button to lift the head loader, turn vacuum off, and disconnect the head amplifier.
Step 9	Click the button to stop spindle motor.
	Press the *Stop Motor* button to stop the spindle.
Step 10	Click the button to reset spinstand.
	Press the *Reset Spinstand* button to start the procedure, which resets all spinstand components and moves a head loader to the reset position where you can safely remove a cartridge with a head from the head loader.

3.3.1.2 Head Recovery Procedure for Head Stack

The Head Recovery tab of the WDCP2002 dialog box has two frames: the *Configuration* frame and the *Emergency Head Unloading Instructions* frame.

- The *Configuration* frame contains one read-only text box. The *Head Recovery Procedure For* text box displays the type of the head loading mechanism currently installed on the spinstand.

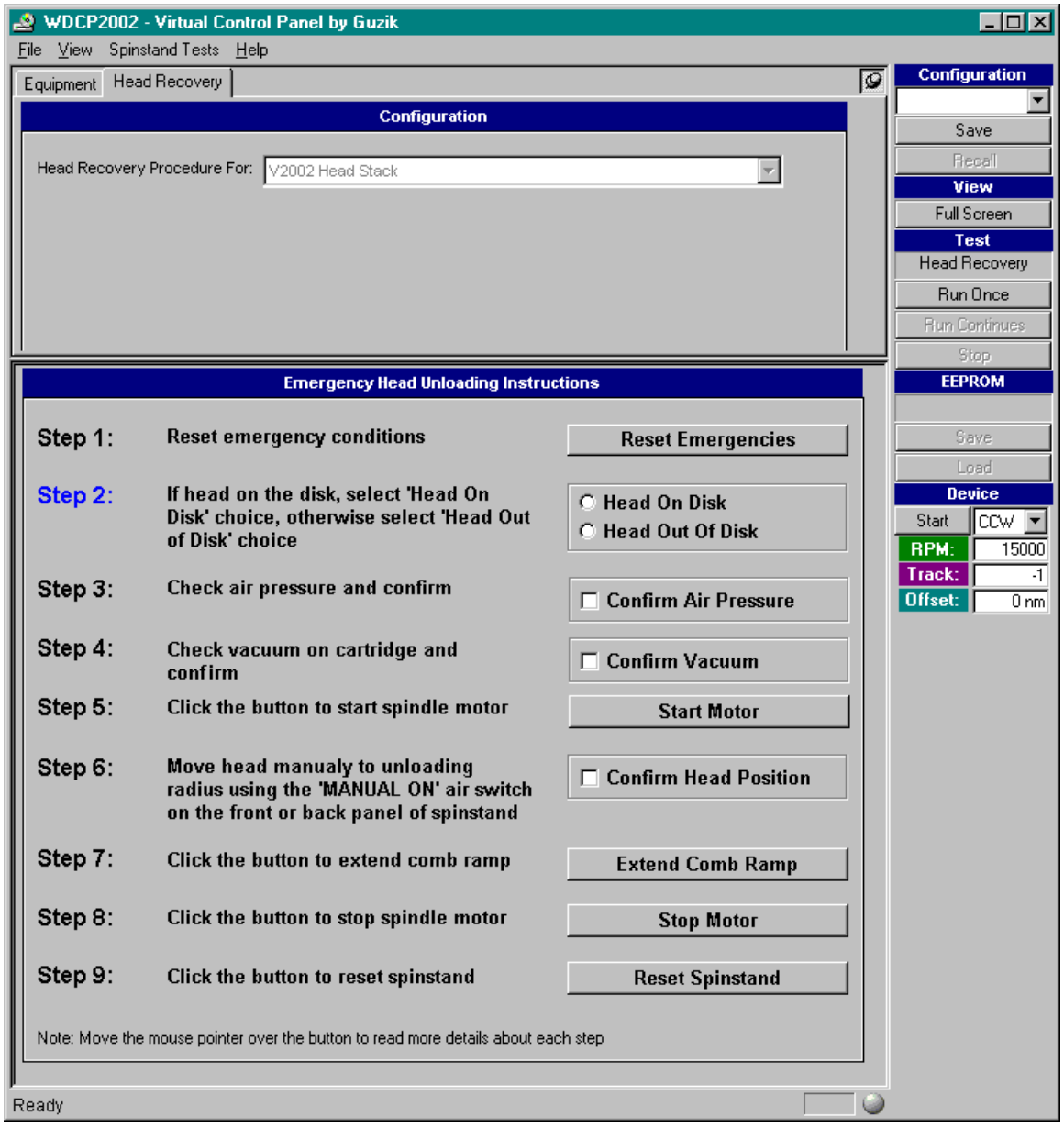

Figure 4: Head Recovery Procedure for Head Stack

- The *Emergency Head Unloading Instructions* frame displays the recovery instructions with the corresponding control items, which let you to confirm the instruction completion:

Step 1	Reset emergency conditions
	Press the *Reset Emergencies* button to clear a crash emergency and an air emergency.
Step 2	If head on the disk, select Head On Disk choice, otherwise select Head Out of Disk choice.
	Select one of the two proposed options accordingly to the observed head stack position. If heads lie on a disk, select the *Head On Disk* option in all other cases select the *Head Out Of Disk* option.
Step 3	Check the air pressure and confirm
	Check if the air pressure indicator on the spinstand back panel shows the nominal value. If the pressure level is low, find the problem and fix it. After that check the *Confirm Air Pressure* check box. (Refer to *Spinstand V2002. User's Manual* P/N 02-107200-01 for air pressure indicator locations and the recommended air pressure levels)
Step 4	Check the vacuum level in the cartridge line and confirm
	Check if the CCW vacuum indicator on the spinstand back panel shows the nominal value. (Refer to *Spinstand V2002. User's Manual* P/N 02-107200-01 for the vacuum indicator location and the recommended air pressure levels). After that check the *Confirm Vacuum* check box.
Step 5	Click the button to start spindle motor
	Press the *Start Motor* button to start the spindle motor.
Step 6	Move head manually to unloading radius using the 'MANUAL ON' air switch on the front or back panel of spinstand
	Turn the *X-Stage Air* switch to the *MANUAL ON* position. (The *X-Stage Air* switch is located either on the back or on the front panel of the spinstand frame). Move the spinstand X/Y stages very carefully to position the head stack to the unloading radius. A head stack has to be on a disk close to the disk edge. In this case a comb will not hit a disk when extended. Then turn the *X-Stage Air* switch to the *AUTO* position and check the *Confirm Head Position* check box.
Step 7	Click the button to extend the comb ramp
	Press the *Extend Comb Ramp* button to lift the heads above the disk.
Step 8	Click the button to stop spindle motor
	Press the *Stop Motor* button to stop the spindle. Important: install the head stack shipping comb before performing *Step 9*. Note: The head stack shipping comb is a plastic part, supplied with the head stack, which securely fixes all heads in place, preventing them to stick together. You need to install the shipping comb before performing the spinstand reset procedure to avoid accidental damage of the head stack, because the head comb loader may retract during the spinstand reset.
Step 9	Click the button to reset spinstand
	Press the *Reset Spinstand* button to start the procedure, which resets all spinstand components and moves the head stack tooling to the reset position, where you can safely remove the head stack from the head stack loader.

3.3.2 Revision 2 of V2002 Spinstand Head Alignment

The new revision of the *Head Alignment* test for the V2002 spinstand is implemented in the WITE32 version 3.20. The *Head Alignment Revision 2* calculates the coordinates of the disk center more accurately. The new test finds the track, written by a reference head, with the accuracy improved from 100 µm to 10µm.

Note: The *Head Alignment Revision 2* can be used with Servo Revision 3 RWA only. If you have an RWA equipped with Servo Revision 2, WITE32 will use the first revision of the *Head Alignment* test.

If you use an RWA equipped with Servo 3 and your production sequence includes the *Head Alignment* test, you do not need to modify the production sequence. You still need to open the *Head Alignment Rev.2* dialog box, however, (see Figure 5) to specify the parameters of the head alignment.

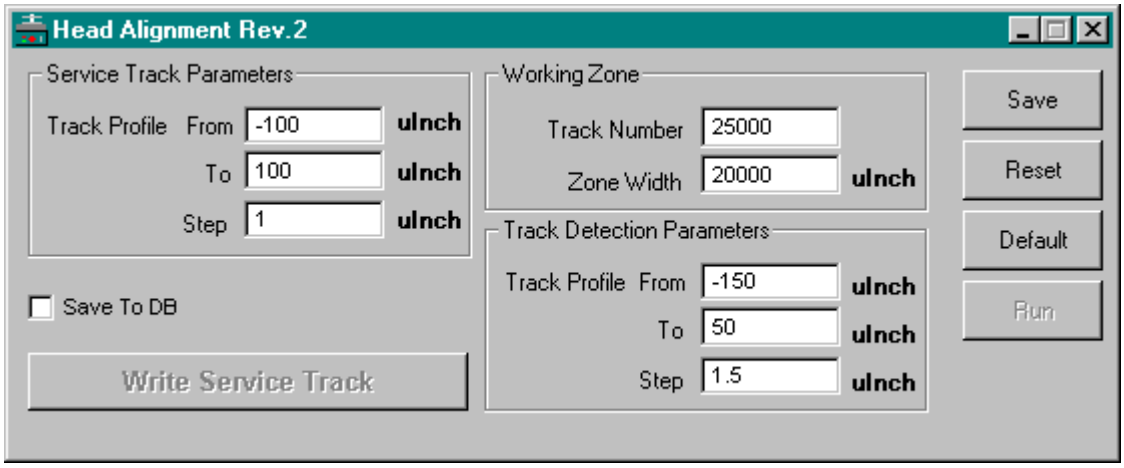

Figure 5: *Head Alignment Rev.2* Dialog Box

The following controls are located in the *Head Alignment Rev.2* dialog box:

- The *Service Track Parameters* frame allows you to specify the track profile range and the step being used to measure the head parameters (such as *Track Width* and *WR Offset*).

The *From* text box	Specifies the starting offset of the track profile. The absolute value cannot exceed the maximum offset.
The *To* text box	Specifies the final offset of the track profile. The absolute value cannot exceed the maximum offset.
The *Step* text box	Specifies the step by which the head is moved between offsets to build a track profile. This value cannot be smaller than the device step.

- The *Working Zone* frame allows you to specify a working zone to be erased and the position where the service track will be written.

The *Track Number* text box	Specifies the track number, where service track will be written.
The *Zone Width* text box	Specifies the width of the working zone of the test. This zone will be erased and then used for the track detection stroke movements.

- The *Track Detection Parameters* frame allows you to specify the track profile parameters needed to calculate the precise track radius after the track detection stroke movements.

The *From* text box	Specifies the starting offset of the track profile. The absolute value cannot exceed the maximum offset.
The *To* text box	Specifies the final offset of the track profile. The absolute value cannot exceed the maximum offset.
The *Step* text box	Specifies the step by which the head is moved between offsets to build the track profile. This value cannot be smaller than the device step.

- The *Save to DB* check box, if enabled, saves the test results to a database.
- The *Write Service Track* button allows you to write the service track, which will be used for alignment.
- The *Save* button saves all modified parameters to a database.
- The *Reset* button restores all the parameters, which were early saved to the database.
- The *Default* button restores the default values for all parameters.
- The *Run* button starts the test execution.

3.3.3 Lock Motors Mode

The *Lock Motors* mode is implemented for V2002 spinstand as a positioning mode for troubleshooting. In this mode the linear motors are locked, so the spinstand does not move the X and Y stages during any spinstand operations. The micro positioning system still can move the head, when the spinstand is in this mode.

You can use the *Lock Motors* mode, for example, if you need to position the head over the media manually, start the device, perform measurements, and stop the device without moving the stages. This feature is also helpful when you cannot perform *XY Alignment* and/or *Start Device* for some reason. It may occur when there is no signal from the head or the signal is weak.

To switch the *Lock Motors* mode on or off, select or clear the *Enable Lock Motors Mode* check box on the *Motor Params* tab. This tab is a part of the *Spinstand Parameters* tab set of the *WDCP2002* dialog box (see Figure 6).

Note: If you perform the reset, when the *Lock Motors* mode is enabled, the software will show the warning message "Linear Motors are locked by software". You need to switch the *Lock Motors* mode off in order to reset the spinstand.

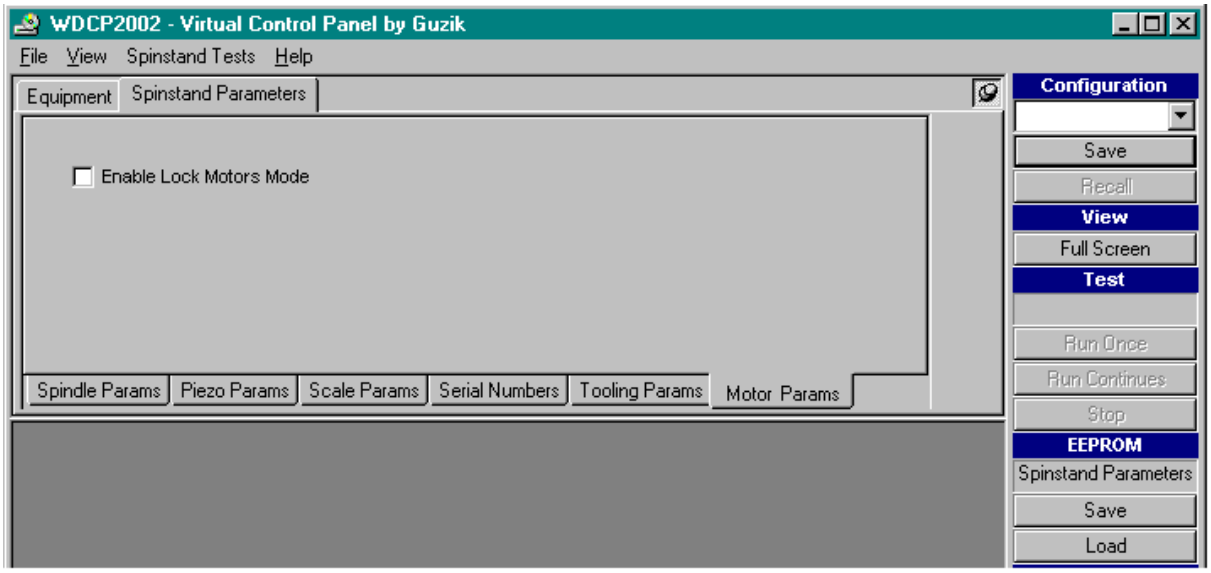

Figure 6: *Motor Params* Tab of *Spinstand Parameters* Tab Set (WDCP2002)

3.3.4 Selecting Disk Chuck Type in WDCP2002

To support the disk chucks with the different types of clamping, the new *Disk Chuck Type* text box with the drop-down list is added on the *Spindle Params* tab. This tab is a part of the *Spinstand Parameters* tab set of the *WDCP2002* dialog box (see Figure 7).

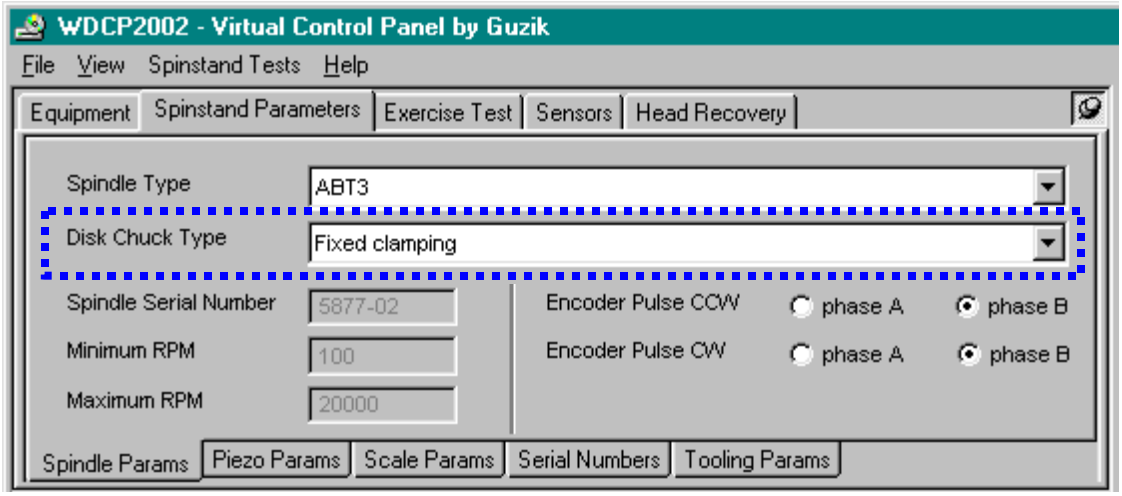

Figure 7: *Disk Chuck Type* Text Box on *Spindle Params* Tab (WDCP2002)

In the WITE32 version 3.20, four following items are displayed on the drop-down list in the *Disk Chuck Type* dialog box:

- *Unknown disk chuck*
- *Fixed clamping*
- *Vacuum clamping*
- *Air clamping*

You must select the disk chuck, which is installed on your spinstand before you will start the machine.

Note: Only the chuck with the fixed clamping was supported in the WITE32 version 3.11.

3.4 PRML Chip Adapter Software

New architecture of the PRML channel software is introduced in the WITE32 version 3.20. According to the new architecture the PRML software consists from three parts:

- Driver for a PRML chip
- Driver for the Guzik chip adapter board, developed for the chip
- Universal Chip Adapter user interface.

The customers can develop their own PRML chip drivers using the Driver Development Kit (DDK) provided by Guzik Technical Enterprises. The DDK includes all necessary tools, software libraries and documentation for developers. The drivers for Guzik chip adapter boards are included in WITE32 installation.

Note: Please contact Guzik Technical Enterprises sales department for the documentation on DDK.

Three of the latest PRML drivers for the RC6600, and 88C7500P channels on Chip Adapter 2000, and the 88C7500M channel on Chip Adapter 4000 are developed using the new DDK.

Please request the chip drivers for these channels from Guzik customer support. Do not install beta versions of the chip drivers (see section 1.1 for addition information about updated PRML chip drivers).

Note: This does not affect the driver for the 88C7500M channel on Chip Adapter Interface 2000, since this driver is not based on the DDK.

3.5 Chip Adapter User Interface

The *Chip Config* dialog (see Figure 8) is the universal user interface to control PRML channels, which are designed using the DDK technology.

To open the *Chip Config* dialog box select the *Tests* | *PRML Chip Config* | *PRML Chip Config* menu item from the WITE32 *Engineering Dashboard* main menu. The *PRML Chip Opt* item is assigned to the last WITE32 Dashboard soft button. Click on the *S* button to the left of the last soft button to invoke the *Chip Config* dialog box.

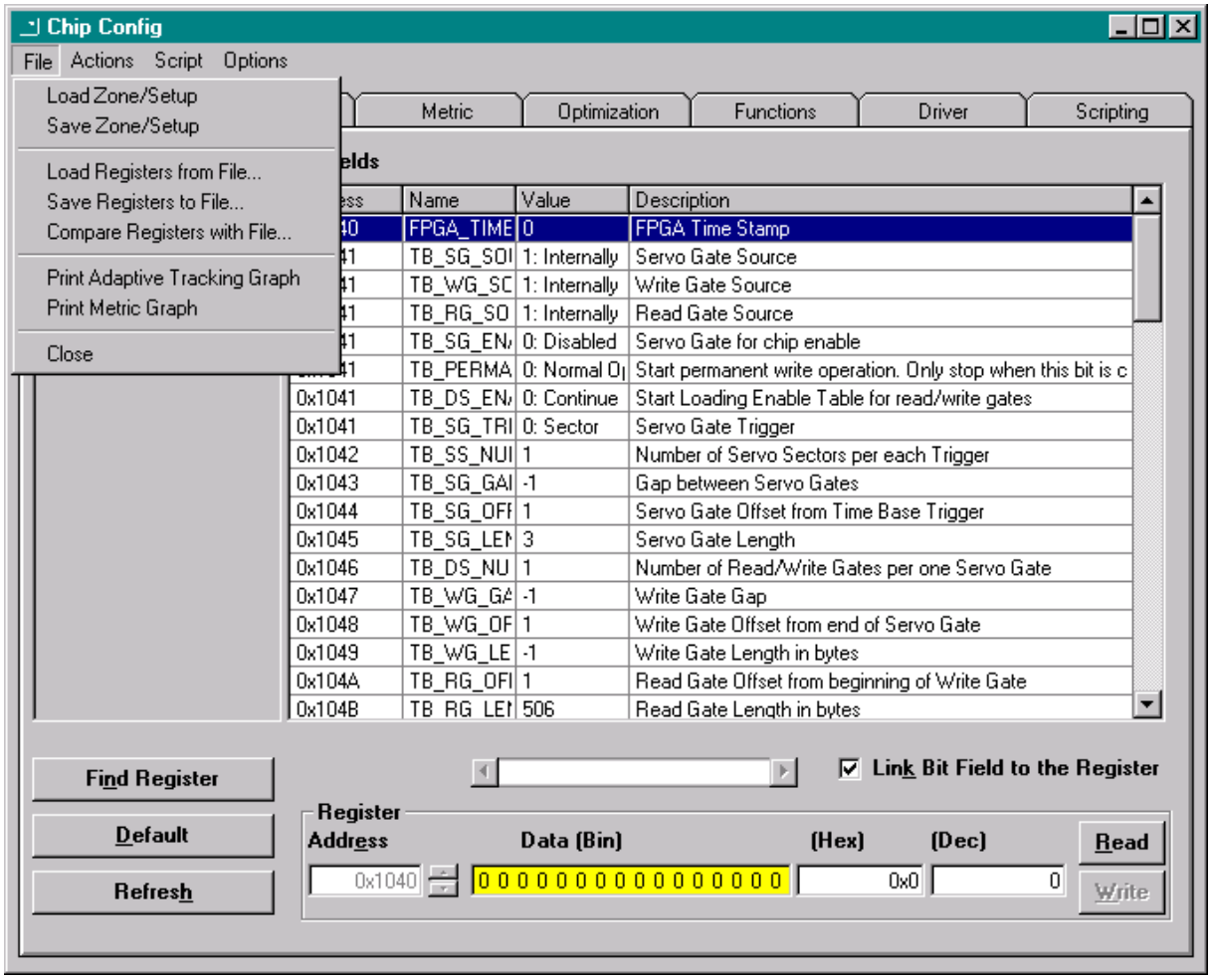

Figure 8: Chip Adapter User Interface

The control items in the *Chip Config* dialog are combined on seven tabs and on a menu bar.

3.5.1 Main Menu Bar

The menu bar of the *Chip Config* dialog box includes the following menus:

- The *File* menu
- The *Actions* menu
- The *Script* menu
- The *Options* menu

The *File* pull-down menu includes the following commands:

The *Load Zone/Setup* command	Loads zone setup parameters of the PRML chip from the WITE32 database.

The *Save Zone/Setup* command	Saves zone setup parameters of the PRML chip to the WITE32 database.
The *Load Registers from File* command	Loads register values from the file, created by the *Save Registers to File* command.
The *Save Registers to File* command	Saves current register values to a file.
The *Compare Registers with File* command	Compares current register values with the register values saved in the file, created by the *Save Registers to File* command.
The *Print Adaptive Tracking Graph* command	Prints the *Adaptive Tracking* graph on the *Adaptives* tab.
The *Print Bit Field Sweep Graph* command	Prints the *Bit Field Sweep* graph on the *Metric* tab.
The *Close* command	Closes the *Chip Config* dialog box.

The *Actions* pull-down menu includes the following commands:

The *Find Register* command	Opens the *Find Bit Field* dialog box (see section 3.5.4).
The *Default Registers* command	Loads to the chip default values of all bit-fields. These values are specified in the chip driver
The *Refresh Registers* command	Reads all registers from the chip and updates the bit-field values.
The *Reset Adaptives* command	Reloads the recent values of the registers selected on the *Adaptives* tab to the chip (see section 3.5.2.2).
The *Set Adaptives to Average* command	Loads the average values of the registers selected on the *Adaptives* tab to the chip (see section 3.5.2.2).
The *Read Operation* command	Performs the read operation for the number of sectors specified in the *Sector to Read* text box on the *Adaptives* tab and updates the *Adaptive Tracking* graph (see section 3.5.2.2).

The *Sweep Metric* command	Varies the bit field value and measures the metric selected on the *Metric* tab. Displays the measurement results in a graphical form on the *Bit Field Sweep* graph (see section 3.5.2.3).
The *Run Default Optimization* command	Executes the default optimization sequence specified in the chip driver (see section 3.5.2.4).
The *Custom Optimization* command	Executes the custom optimization sequence configured on the *Optimization* tab (see section 3.5.2.4).

The commands from the *Script* pull-down menu are applicable for the *Scripting* tab only (see section 3.5.2.7). The menu includes the following commands:

The *New* command	Creates a new script file.
The *Open* command	Opens an existing script file.
The *Save* command	Saves an existing script file.
The *Save As* command	Saves an existing script file under a different file name.
The *Print Script* command	Prints an existing script.
The *Print Log* command	Prints the contents of the *Script Output* panel.
The *Save Log to File* command	Saves the contents of the *Script Output* panel to a file.
The *Clear Log Before Running* command	Check this command and the program will clear the contents of the *Output* panel before executing the script file.
The *Run Scripting* command	Executes the script.
The *Stop Scripting* command	Terminates the script execution.

The *Options* pull-down menu includes the following commands:

The *Adaptive Tracking Graph* command	Opens the *Properties* dialog box for the *Adaptive Tracking* graph.
The *Bit Sweep Graph* command	Opens the *Properties* dialog box for of the *Bit Sweep* graph.

The *Pages* menu	Shows and hides the following tabs: • The *Adaptive* tab • The *Metric* tab • The *Optimization* tab • The *Functions* tab • The *Driver* tab • The *Scripting* tab

3.5.2 Control Tabs

Use the controls located on the following tabs to configure the PRML chip parameters, to analyze the PRML chip response, to optimize the PRML chip performance, and to create a Visual Basic script.

The *Chip Config* dialog box has the following tabs:

- The *Bit Fields* tab for the access to the PRML chip bit fields and registers
- The *Adaptives* tab for the analysis of the adaptive register response during a read operation
- The *Metric* tab for sweeping the registers and measuring the metrics
- The *Optimization* tab for the PRML chip optimization
- The *Functions* tab for configuring the PRML chip custom functions
- The *Driver* tab for controlling and configuring parameters of the PRML chip and the chip driver
- The *Scripting* tab for creating and running a Visual Basic script

From the *Chip Config* dialog box you can also open the *Find Bit Field* dialog box. The *Find Bit Field* dialog box simplifies a bit field search.

3.5.2.1 Bit Fields Tab

On the *Bit Fields* tab (see Figure 9) you can monitor and modify the chip register values in two formats: as *a register view* in the *Register* frame and as *a bit field view* on the *Bit Fields* panel. The register view is a direct representation of a physical register, so you can access each chip register as a single unit. The *bit field* view is a logical representation of the chip register structure, where each bit field is a group of bits associated with a logical register. You can select for displaying all bit fields or a particular bit field group by choosing the items from the list on the *Bit Field Group* panel.

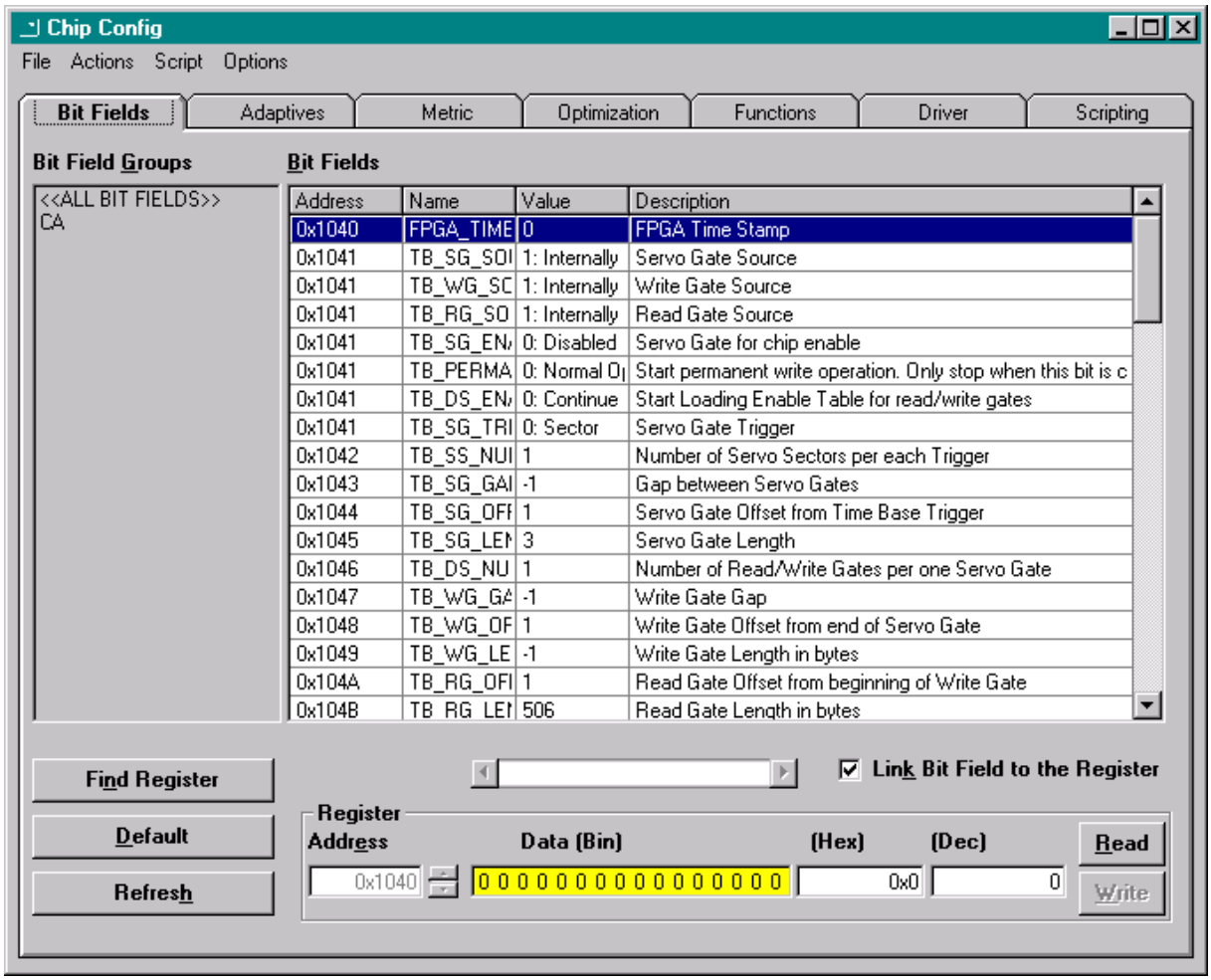

Figure 9 *Bit Fields* Tab in *Chip Config* Dialog Box

The following items are on the *Bit Fields* tab:

The *Bit Field Groups* panel	Use the list shown in this panel to select the bit field group you want to be displayed on the *Bit Fields* panel. Note: The <<ALL BIT FIELDS>> item is not a group name. When you select it, all bit fields are displayed on the *Bit Fields* panel simultaneously.
The *Bit Fields* panel	Displays all bit fields from the bit field group selected on the *Bit Field Groups* panel. • The *Address* column shows the register physical address in a hexadecimal format. • The *Name* column shows the bit field names. • The *Value* column displays the bit field values. This is the only the column, where you can change a value. Note: To change a bit field value, switch to the edit mode by double clicking the value of the selected bit field. You can also adjust a bit field value using the scroll bar beneath the *Bit Fields* grid. • The *Description* column provides a commentary to the corresponding bit field. Note: You can reorganize the table on the *Bit Fields* panel by sorting the entries in one of the columns in ascending or descending order. Click the column header. The column will be sorted and a small up-arrow indicating the ascending order or down-arrow indicating the descending order appears next to the header. To change the order, click the column header once again.
The bit field value scroll bar at the bottom of the bit field list	Move the scroll bar to the left to decrease the value, or to the right to increase it.
The *Link Bit Field to the Register* check box	Select this check box and the *Register* frame will also show the register data for the bit field currently selected on the *Bit Fields* panel.
The *Find Register* button	Click the button to open the *Find Bit Field* dialog box (see Section 3.5.4).
The *Default* button	Click the button to load the default values of all bit fields specified in the chip driver into the chip. The bit fields, controlling the Data Rate and the Encoding Ratio are not affected.
The *Refresh* button	Click the button to update the bit field values displayed on the *Bit Fields* panel.

The *Register* frame provides the control over the chip registers and contains the following items:

The *Address* text box	Use this box to specify the register physical address in either decimal of hexadecimal format. Note: A numeric value with 0x prefix will be assumed as a hexadecimal. Otherwise it will be assumed as a decimal value.
The *Address* scroll buttons	Click one of the buttons to increment or decrement by one the value in the *Address* text box.
The *Data(Bin)* text box	Use this box to specify the register value in binary format. Note: If the current bit field is linked to the register, the bits included in the field are highlighted by yellow. Note: The *Data(Bin)*, *(Hex)* and *(Dec)* text boxes show the same value in three different formats and all three are synchronized together. Therefore, changing the parameter in one of these text boxes will automatically modify the values displayed in two others.
The *(Hex)* text box	Use this box to specify the register value in hexadecimal format.
The *(Dec)* text box	Use this box to specify the register value in decimal format.
The *Read* button	Click this button to read the register value from the chip.
The *Write* button	Click this button to write the register value displayed in the *Data(Bin)*, *(Hex)* and *(Dec)* text boxes into the chip register.

3.5.2.2 Adaptives Tab

The *Adaptives* tab (see Figure 10) displays in a graphical form how the values of one or more adaptive registers change from sector to sector during the read operation. It allows you to analyze the chip adaptation circuit behavior in dynamics.

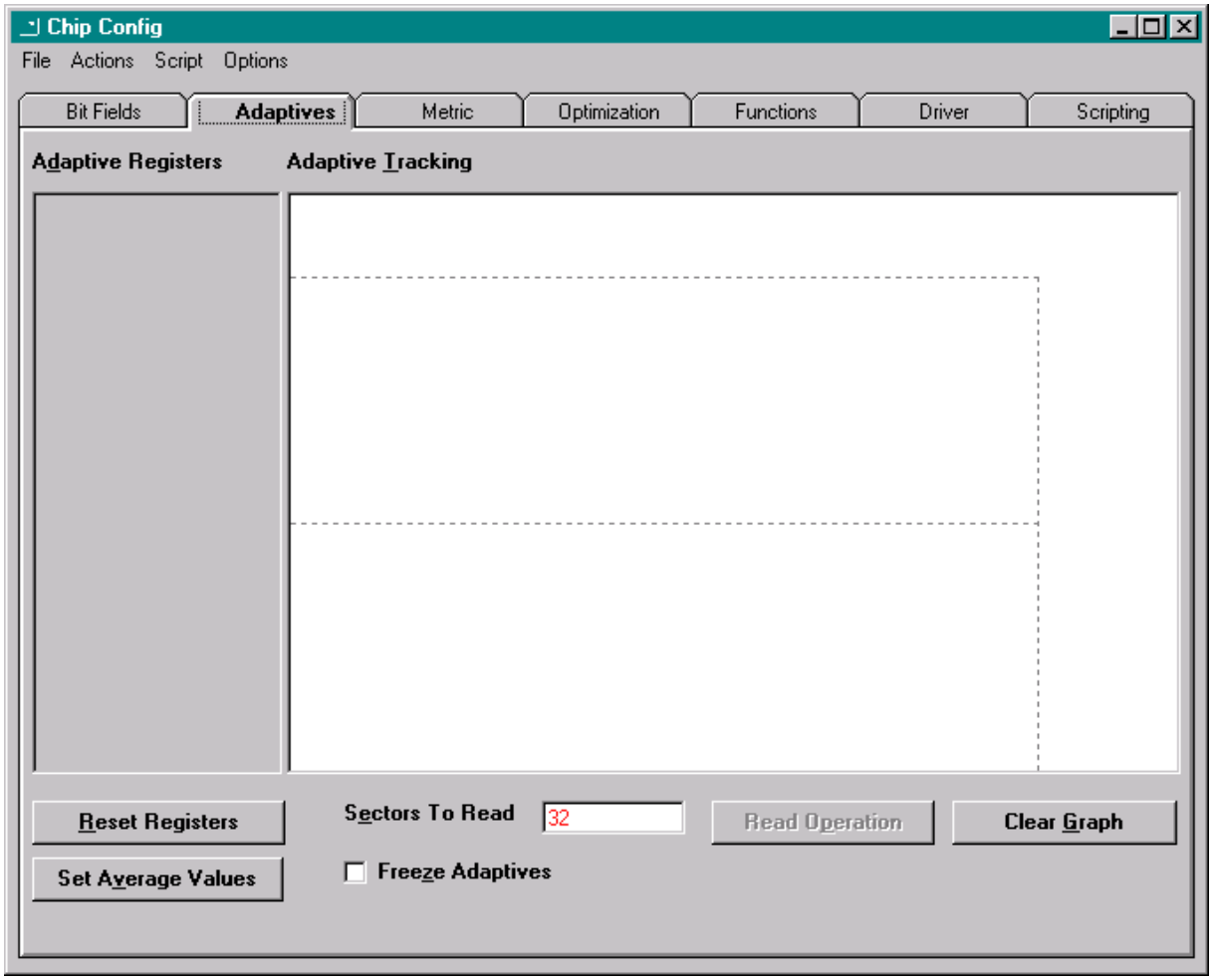

Figure 10: *Adaptives* Tab

The following items are on the *Adaptives* tab:

The *Adaptive Registers* panel	Shows the list of all adaptive registers defined by the chip driver. In this list you select one or several registers, which values to be displayed in the graph. You select multiple registers by pressing the *Ctrl* or *Shift* key and simultaneously clicking the list item.
The *Adaptive Tracking* graph	Displays how the values of adaptive registers selected on the *Adaptive Registers* panel change from sector to sector during the read operation.

The *Reset Registers* button	Click this button to reload the current values of the registers selected on the *Adaptive Registers* panel to the chip.
The *Set Average Values* button	Click this button to load the mid-value of the registers selected on the *Adaptive Registers* panel to the chip. A mid-value is defined as an arithmetic average of the minimum and the maximum register values. EXAMPLE: For a four-bit register with a range 0…15 the mid-value is 7.
The *Sectors to Read* text box	Type in this box, how many sectors to read during the read operation.
The *Freeze Adaptives* check box	Select this box to disable the chip adaptation.
The *Read Operation* button	Click this button to perform the read operation for the number of sectors specified in the *Sectors to Read* text box. The selected adaptive register values will be read from the chip and displayed in the *Adaptive Tracking* graph.
The *Clear Graph* button	Click this button to clear the *Adaptive Tracking* graph.

3.5.2.3 Metric Tab

The *Metric* tab (see Figure 11) provides you with a plot of the metric result versus values of a selected bit field. The *metric* is a special function, which reflects the quality of a particular system setting. By using a metric you can evaluate the system performance and find the best configuration for the specific range of parameters. See the *WITE32 PRML Chip Driver Development Kit Programmer's Guide* for more information.

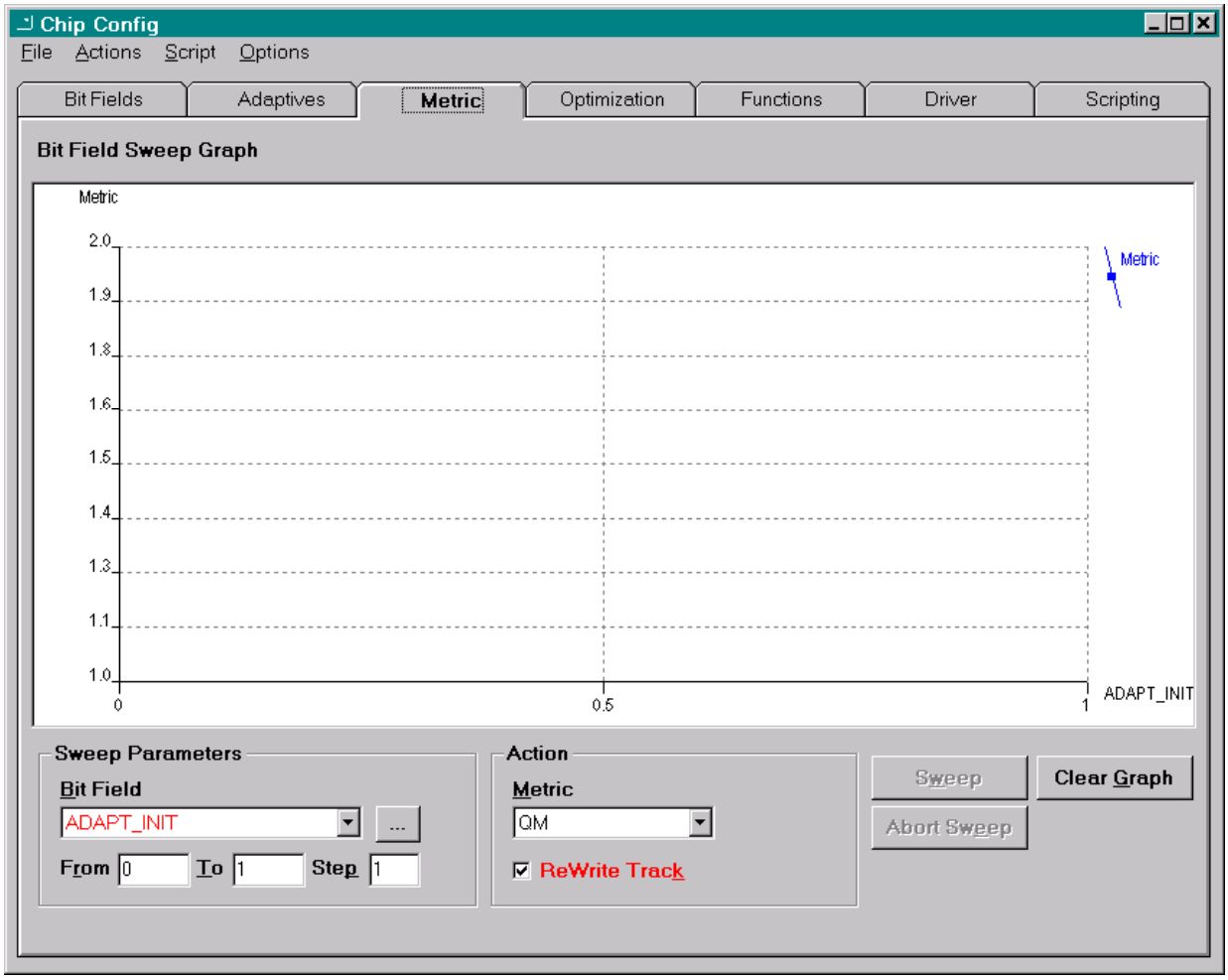

Figure 11: *Metric* Tab

The following items are on the *Metric* tab:

The *Bit Field Sweep Graph* panel displays the metric results versus different bit field values.

The *Sweep Parameters* frame contains the following items:

The *Bit Fields* text box Select which bit field to analyze from the drop-down list in this box.

The "... " button	Click this button to open the *Find Bit Field* dialog box (see Section 3.5.4).
The *From* text box	In this box enter the bit field starting value.
The *To* text box	In this box enter the bit field ending value.
The *Step* text box	In this box enter the bit field value increment step.

The *Action* frame contains the following items:

The *Metric* combo box	Select the metric from the drop-down list in this box. The metric will be measured for all different values of the selected bit field.
The *ReWrite Track* check box	Check this box to rewrite the track before each metric measurement. The pattern currently selected in WITE32 is used for writing.
The *Sweep* button	Click this button to measure the metric for each bit field value in the specified range and to plot the result on the *Bit Field Sweep Graph* panel.
The *Abort Sweep* button	Click this button to abort the current measurement.
The *Clear Graph* button	Click this button to clear the *Bit Field Sweep Graph*.

3.5.2.4 Optimization Tab

On the *Optimization* tab (see Figure 12) you can optimize the chip for the best performance. The optimization procedure is a sequence of optimization blocks, which are implemented in the chip driver. See the *WITE32 PRML Chip Driver Development Kit Programmer's Guide* for more information.

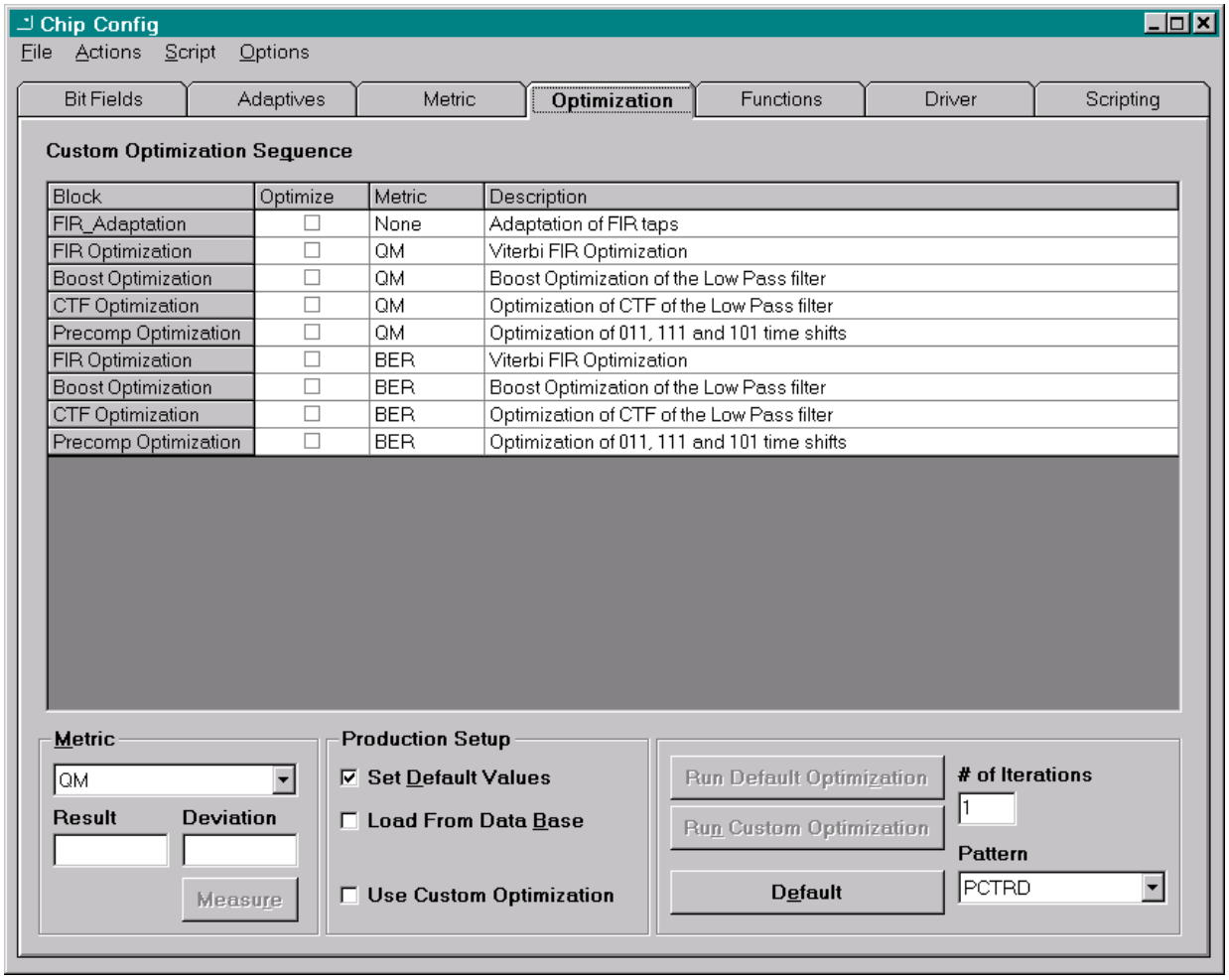

Figure 12: *Optimization* Tab

The following items are on the *Optimization* tab:

The *Custom Optimization Sequence* table	The table includes the following columns: • The *Block* column displays the names of the optimization blocks defined by the chip driver • The *Optimize* column specifies whether the block will be included in the optimization sequence or not. To include a block in the optimization sequence, in the *Optimize* column select the check box corresponding to the block. • The *Metric* column displays the metric used as the block optimization target. The metric is specified in the driver and cannot be modified by the user. • The *Description* column provides a commentary to the corresponding block. Note: A user can rearrange the order of the blocks for the custom optimization by dragging-and-dropping a block name.

The *Metric* frame allows you to measure a metric. The frame contains the following items:

The metric selection combo box	Select from the drop-down menu in this box, which metric to use for the measurement.
The *Result* text box	Displays the value of the metric measurement.
The *Deviation* text box	Displays the deviation value of the metric measurement.
The *Measure* button	Click this button to perform the measurement and display the results in the *Value* and *Deviation* text boxes.

The *Production Setup* frame allows you to select the initial values for chip registers and choose an optimization sequence. This setup affects the execution of the PRML chip optimization from the WITE32 production test.

The frame contains the following items:

The *Set Default Values* option	Select this option to load the default register values before the optimization.
The *Load From Data Base* option	Select this option to load the register values from the *WITE32 Zone/Setup* database before the optimization.
The *Use Custom Optimization* option	Select this option to use the Custom Optimization Sequence, configured in the *Custom Optimization Sequence* table described above. In opposite case, the Default Optimization Sequence defined in the chip driver is been used.
The *Default* button	Click this button to load the default values of all bit fields defined by the chip driver to the chip.

The *Run Default Optimization* button	Click this button to execute the *Default Optimization Sequence* specified in the chip driver
The *Run Custom Optimization* button	Click this button to execute a Custom Optimization Sequence.
The *# of Iterations* edit box	Specify the number of iterations for execution of the Optimization Sequence.
The *Pattern* combo box	Select the pattern to write before an Optimization Sequence is executed, and after any parameter of the write channel is changed during the optimization. Note: Only PRML patterns are available in the combo box

3.5.2.5 Functions Tab

Using the *Functions* tab (see Figure 13) you can select a custom functions defined by the chip driver, specify its parameters, execute the function, and see results. See the *WITE32 PRML Chip Driver Development Kit Programmer's Guide* for more information.

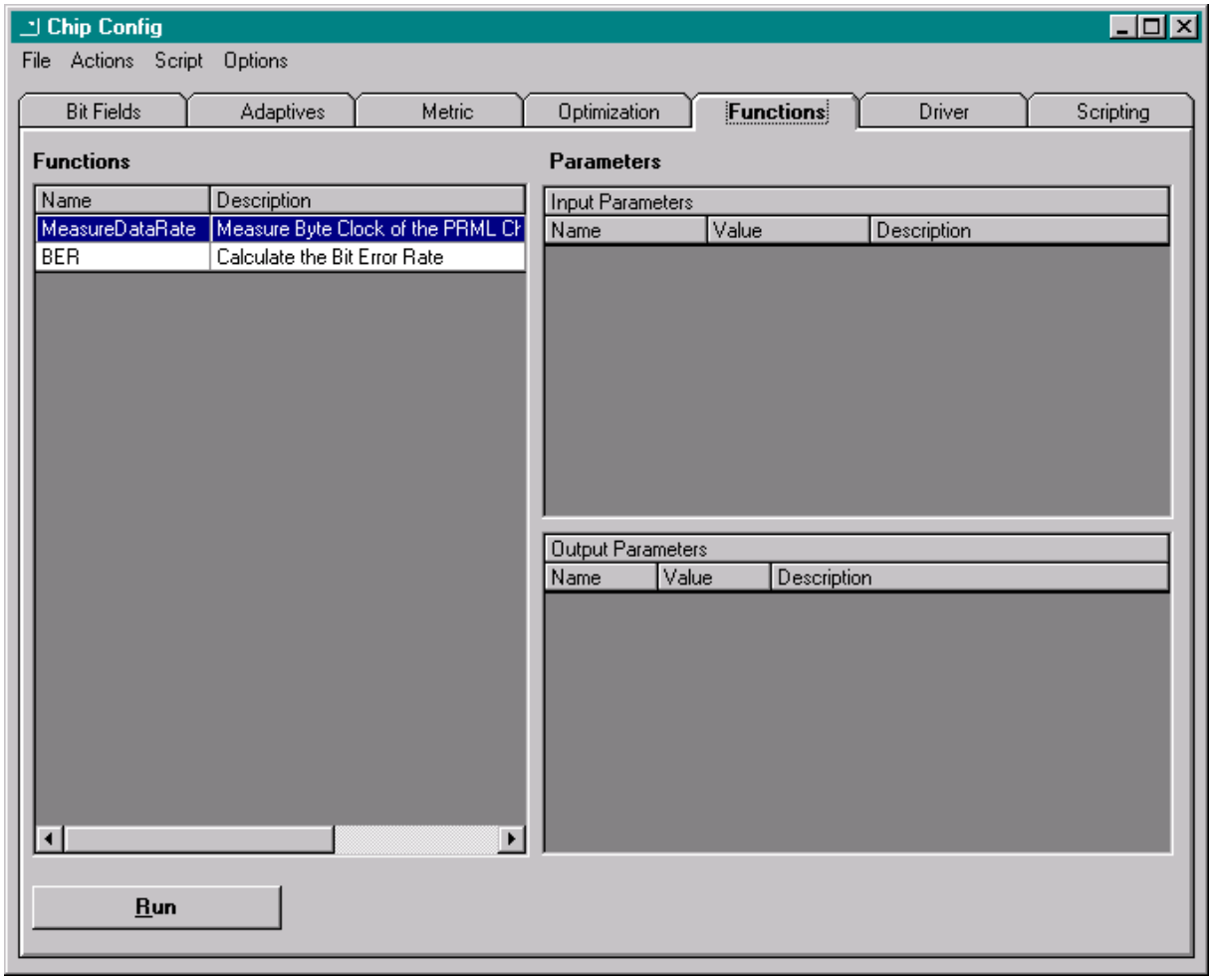

Figure 13: *Functions* Tab

The following items are on the *Functions* tab:

The *Functions* panel — Displays the custom functions defined by the chip driver

- The *Name* column shows the function names.
- The *Description* column provides a commentary to the functions.

The *Parameters*: *Input Parameters* panel	Displays the input parameters for the function selected on the *Functions* panel. • The *Name* column shows the parameter names. • The *Value* column shows the parameter values. This is the only column, where you can change the value. Note: To change a value, switch to the edit mode by double clicking the value. • The *Description* column provides a commentary to the parameters.
The *Parameters*: *Output Parameter* panel	After an execution, displays the output parameters for the function selected on the *Functions* panel. • The *Name* column shows the parameter names. • The *Value* column shows the parameter values. • The *Description* column provides a commentary to the parameters.
The *Run* button	Click this button to execute the function selected on the *Functions* panel and display the results on the *Output Parameter* panel.

Note: The panels may not have enough space to show a complete description. When you move the mouse over a function or a parameter line, the complete description for that line will appear as an on-screen tip.

3.5.2.6 Driver Tab

On the *Driver* tab (see Figure 14) you can check the driver and device information and configure some of the system parameters.

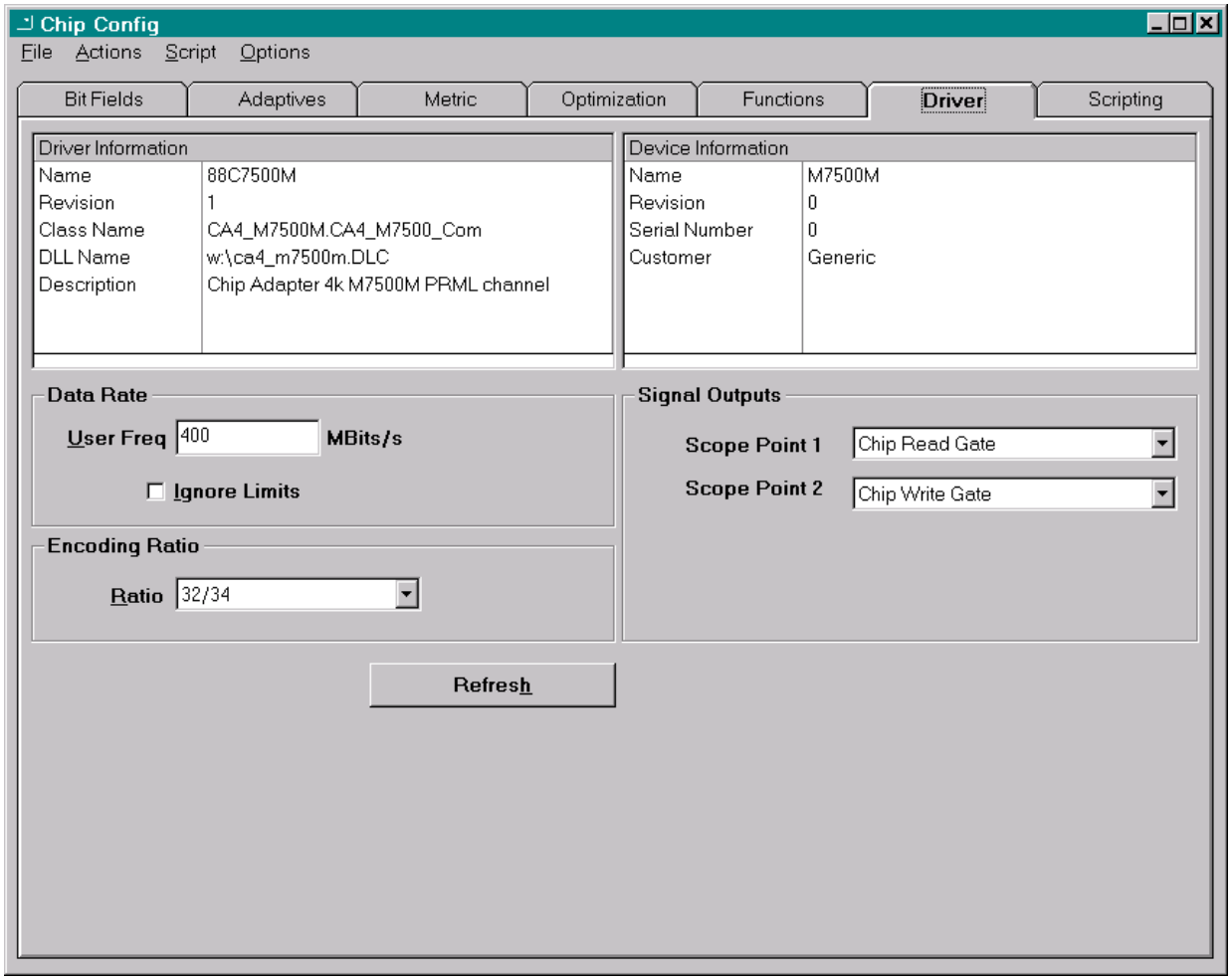

Figure 14: *Driver* Tab

The following items are on the *Driver* tab:

The *Driver Information* panel	Displays the chip driver information.
The *Device Information* panel	Displays the chip adapter board information.

The *Data Rate* frame contains the following items:

The *User Freq* text box	In this text box you enter the data rate that the system has to apply.
The *Ignore Limits* check box	Checked this box to disable the data rate limitations, applied by the chip driver software, when setting the data rate.

The *Encoding Ratio* frame contains the following control:

The *Ratio* combo box	Select from the drop-down list in this box, which encoding ratio the system have to apply.

The *Signal Outputs* frame contains the following items:

The *Scope Point 1* combo box	Select from the drop-down list in this box, which signal you want to observe at the Scope Point 1 BNC connector of the Analog Box 2002A front panel.
The *Scope Point 2* combo box	Select from the drop-down list in this box, which signal you want to observe at the Scope Point 2 BNC connector of the Analog Box 2002A front panel.
The *Refresh* button	Click this button to read and display the parameters specified in the driver

3.5.2.7 Scripting Tab

On the *Scripting* tab (see Figure 15) you can develop and run Visual Basic script.

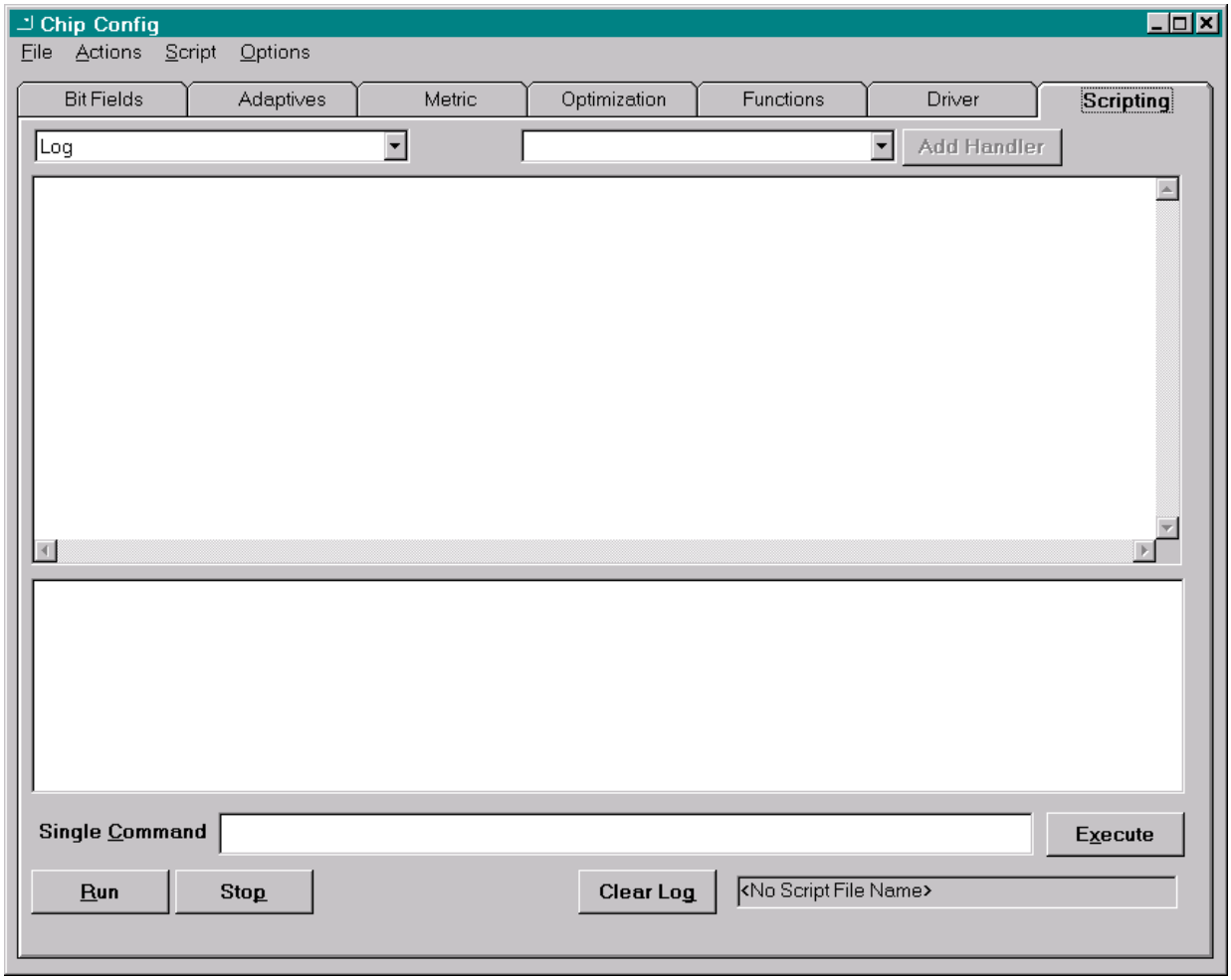

Figure 15: *Scripting* Tab

The following items are on the *Scripting* tab:

The Software Object selection combo box at the top-left side	Shows the list of all Software Objects, registered in the scripting environment and accessible from a script. Each object provides a list of methods and events for programmatic access.
The Object Event selection combo box at the top-middle side	Shows the list of all Events available for the selected Software Object.
The *Add Handler* button	Adds the handler for the selected Events of the selected Software Object to the script body.
The Script File Editor panel	Shows the content of a script file. You can edit the script file content on this panel.
The Output panel located below the Script File Editor	Shows the output information during the script execution.
The *Single Command* text box	Type in this box a script command you need to execute.
The *Execute* button	Click this button to execute the script command typed in the *Single Command* text box.
The *Run* button	Click this button to execute the entire script file, which is currently open. Note: If the opened script file has been modified but not saved, the file will be saved first.
The Stop button	Click this button to stop the script execution, and clear the context of the script engine.
The Clear Log button	Click this button to clear the Output panel.
The Script File Name text box	Displays the name with the path of the currently open script file.

3.5.3 Visual Basic Script Engine

You can run any Visual Basic (VB) script with the script engine embedded in the WITE32 software. The script may use any VB statements and can access two dedicated software objects:

- The *Log* object to report any information to the *Output* panel.

  This object has the following methods:

  ```
  Sub LogMsg(ByVal sMsg As String)
  ```

  Log the *sMsg* message to the *Output* panel.

  ```
  Sub ClearMsg()
  ```

Clear the *Output* panel content.

- The *PRML_CHIP_ADAPTER* object to access all chip interfaces (see the *PRML Chip Driver Development Kit. Software Interfaces* manual for the description of available *PRML_CHIP_ADAPTER* object interfaces)

3.5.4 Find Bit Field Dialog Box

You can use the *Find Bit Field* dialog box (see Figure 16) to quickly locate a specific bit field on the tabs. To open this dialog box click the *Find Register* button on the *Bit Fields* tab or the *"..."* button on the Metric tab.

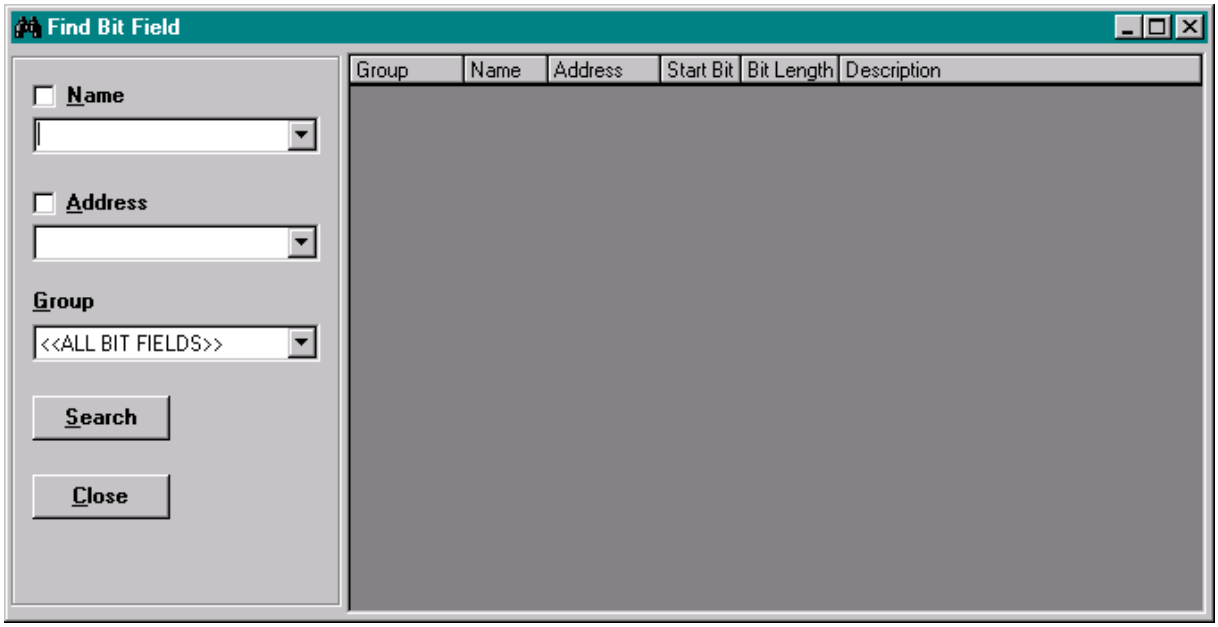

Figure 16: *Find Bit Field* Dialog Box

The following items are in the *Find Bit Field* dialog box:

The *Name* check box	Check this box to use the text in the *Name* text box as one of the criteria for a bit field searching.
The *Name* text box	Select from the drop-down list or enter in this box a text template for searching a bit field by the name. The software will find all bit fields, which have the selected combination of letters as a part of the name. EXAMPLE: The entry "***gug"*** selected in this box on Figure 16 matches GRAY**GUG**S, **GUG**ACQS and VGAAV**GUG**. Note: The entry in this box is not case sensitive.
The *Address* check box	Check this box to use the address in the *Address* text box as one of the criteria for a bit field searching.

The *Address* text box	Select from the drop-down list or type in this box, the address for searching a bit field by the address. Note: A numeric entry without 0x prefix will be treated as a decimal value.
The *Group* text box	You can use a group name as one of the criteria for a bit field searching. To do this, select from the drop-down menu here or type in this box, the name of the bit field group you want to look for the bit filed. Note: The item <<ALL BIT FIELDS>> in the drop-down menu here is not a group name, but a placeholder for all bit field group names.
The *Search* button	Click this button to search for bit fields matching all selected search criteria.
The Bit Fields panel on the right side	Displays the table of the bit fields matching the enabled search criteria: • The *Group* column shows the bit field groups that the bit fields belong to. • The *Name* column shows the bit field names. • The *Address* column shows the physical register addresses in hexadecimal format. • The *Start Bit* column shows the zero-based starting bit numbers of the bit fields in registers. • The *Bit Length* column shows the number of the bits constituting the bit fields. • The *Description* column provides a commentary to the bit fields. When the *Bit Fields* tab or the *Metric* tab is active in the *Chip Config* dialog box, you can select a bit field on these tabs by double clicking the same bit field on the *Bit Fields* panel. Note: You can reorganize the table on the *Bit Fields* panel by sorting the entries in one of the columns in ascending or descending order. Click the column header. The column will be sorted and a small up-arrow indicating the ascending order or down-arrow indicating the descending order appears next to the header. To change the order, click the column header once again. Note: To rearrange a column order in the table, drag-and-drop the column header.
The *Close* button	Click this button to close the dialog box.

CHAPTER 4
WITE32 MODIFICATIONS

4.1 Guzik V2002 Spinstand

The following tests and features are modified in the WITE32 version 3.20

- The *XY Alignment* test (see Section 4.1.1)
- The *Y-Limit Adjustment* test (see Section 4.1.2)
- The *Spinstand Parameters* dialog box (see Section 4.1.3)
- The *Product Parameters* dialog box and the procedure for editing the product parameters (see Section 4.1.4)
- The product parameters of the head stack for V2002 spinstand (see Section 4.1.5)
- The *Micro Actuators* tab in the *Product Parameters* dialog box (see Section 4.1.6)
- The track-to-track positioning trajectory (see Section 4.1.7)
- The spindle balancing procedure (see Section 4.1.8)

4.1.1 XY Alignment Test

The graphical output dialog box of the *XY Alignment* test (see Figure 17) now shows the detected track as a complete circle instead of an arc. The graph also displays:

- The outer and the inner diameters – as they are specified in the *Product Parameter* dialog box
- The minimum, the maximum, and the zero skew angles – as they are specified in the *XY Alignment* dialog box

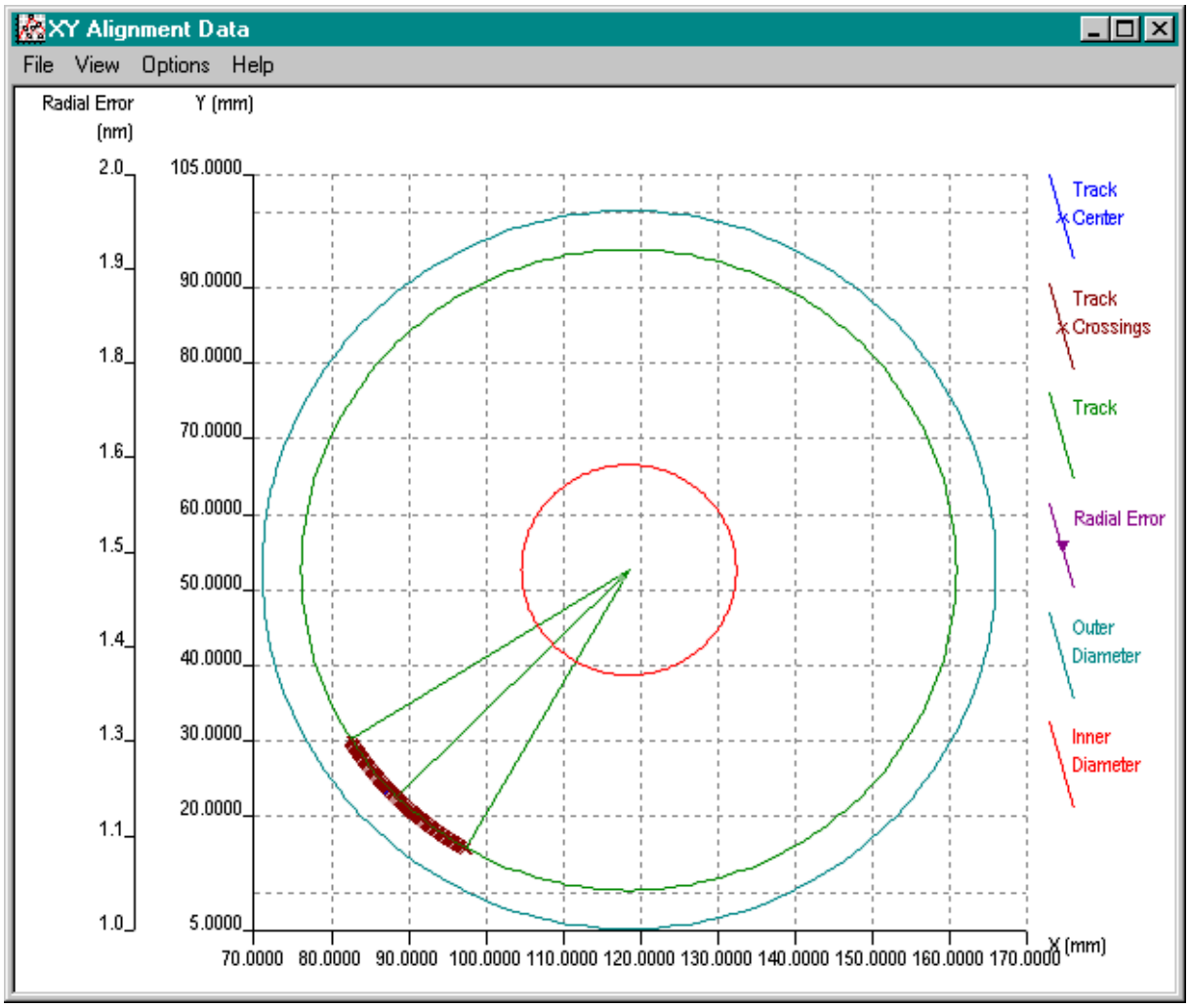

Figure 17: Graphical Output of XY Alignment Test

4.1.2 Y-Limit Adjustment Test

Starting from the WITE32 version 3.20:

1. The *Y-Screw Limit Adjustment* test for V2002 spinstand supports the cartridge and media sets listed in Table 3:

Cartridge Part Number	*Media Size (Inch)*
80-701773 / 701774	1.0
80-701838 / 701839	2.5, 3.5
80-702057 / 702058	1.0, 2.5
80-702138	2.5
80-702191 / 702192	3.5
80-702210 / 702211	3.0
80-702313 / 702314	1.0, 2.5
80-702315 / 702316	1.0, 2.5
80-702356 / 702357	1.0, 2.5
80-702366 / 702367	2.5
80-702450 / 702451	3.5
80-702574 / 702575	2.5
80-702585 / 702586	2.5
80-702606 / 702607	3.5
80-702617 / 702618	1.0
80-702643 / 702644	3.5
80-702690 / 702691	3.5
80-702731 / 702732	2.5
84-800537	2.5
84-800547	3.5

Table 3: Cartridge and Media Sets Supported by Y-Limit Adjustment Test

2. A new step is added to the *Y-Screw Limit Adjustment* procedure (see Figure 18). The new step *Moving Y-Stage From Spindle* helps you to move the Y-stage manually away from the spindle and do not hit the sensors limiting the stage movement. If the Y-stage touches any one of these sensors, the spinstand is not able to perform a reset. The step is the last one in the procedure. The *Y-Screw Limit Adjustment* test does not finish the alignment unless the Y-stage position allows the spinstand perform the reset.

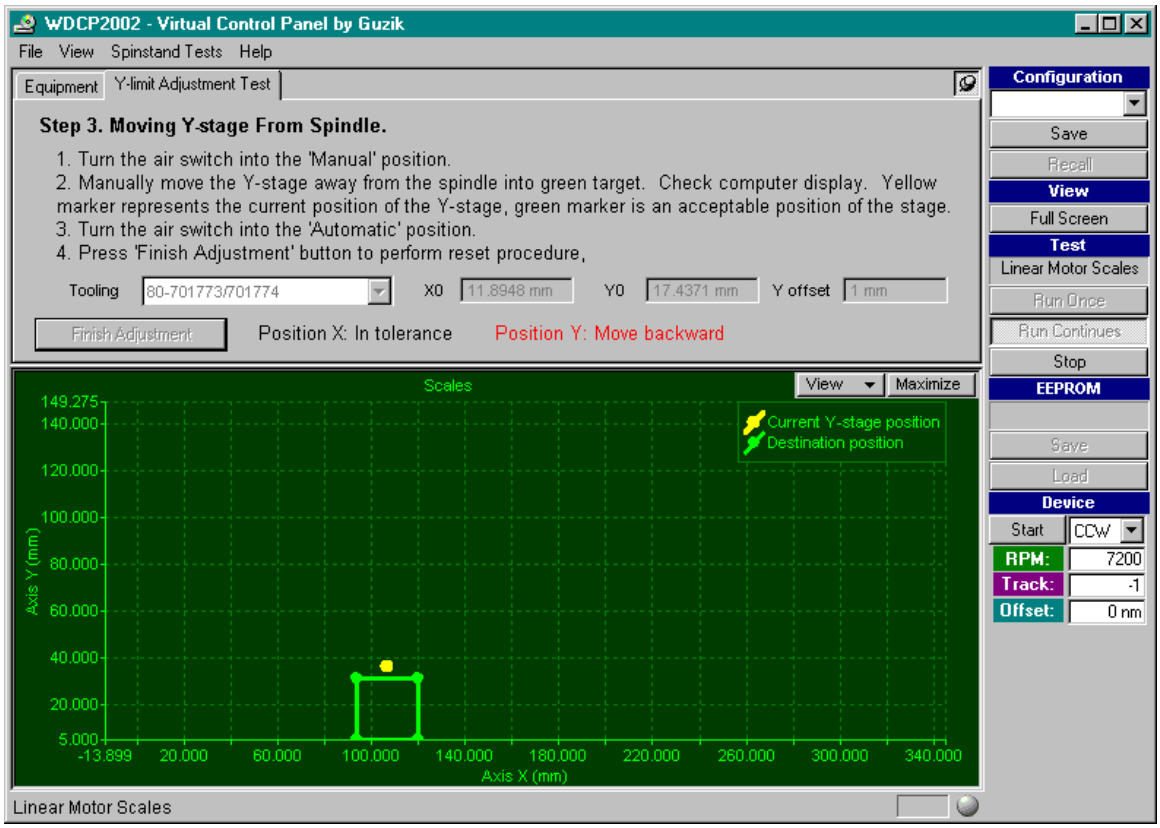

Figure 18: New Step of Y-Limit Adjustment Procedure (*Moving Y-Stage From Spindle*)

4.1.3 Spinstand Parameters Dialog Box

The spindle type *Custom* in the *Spinstand Parameters* dialog box of V2002 spinstand is renamed to *None/Custom*. This spindle type allows you to work without any spindle or with the spindle controlled externally.

4.1.4 Product Parameters Dialog Box

Starting from the WITE32 version 3.20:

1. WDCP2002 allows opening the file **V2002.DDT** (*spinstand product parameters*) in *Edit Mode*. To open the DDT file in the *Edit Mode* you need to start WDCP2002 as a stand-alone application, press the *Load* button to select and load the file, and press the *Edit Product Parameters* button to open the *Product Parameters* dialog box, where you can modify this file. To save the changes made to the DDT file press the *OK* button in the *Product Parameters* dialog box.

2. The *Disk Product Parameters* frame in the *Spinstand Product Parameters* dialog box has a new layout (see Figure 19). All controls in this frame are the same as they were in the WITE32 version 3.11.

3. The parameters of 3.5 Inch media will be used for the product parameters initialization when the DDT file is not found or not specified.

4.1.5 V2002 Head Stack Product Parameters

The *Product Parameters* dialog box displays the same control items for both a V2002 head stack tooling and a standard HLM-V2002. However, some text boxes, content of which you can edit in case of the HLM-V2002, are the read-only text boxes in the *Product Parameters* dialog box of the head stack tooling (see Figure 19). These read-only text boxes show the parameters, which are programmed at Guzik Technical Enterprises, stored in the EEPROM on the head stack tooling, and cannot be altered by the user.

The text boxes for the following head stack tolling parameters are the read-only items:

- *Loading Radius*
- *Unloading Radius*
- *ID Radius*
- *OD Radius*
- *Angle on ID Radius*
- *ID Radius for Angle*
- *Angle on OD Radius*
- *OD Radius for Angle*

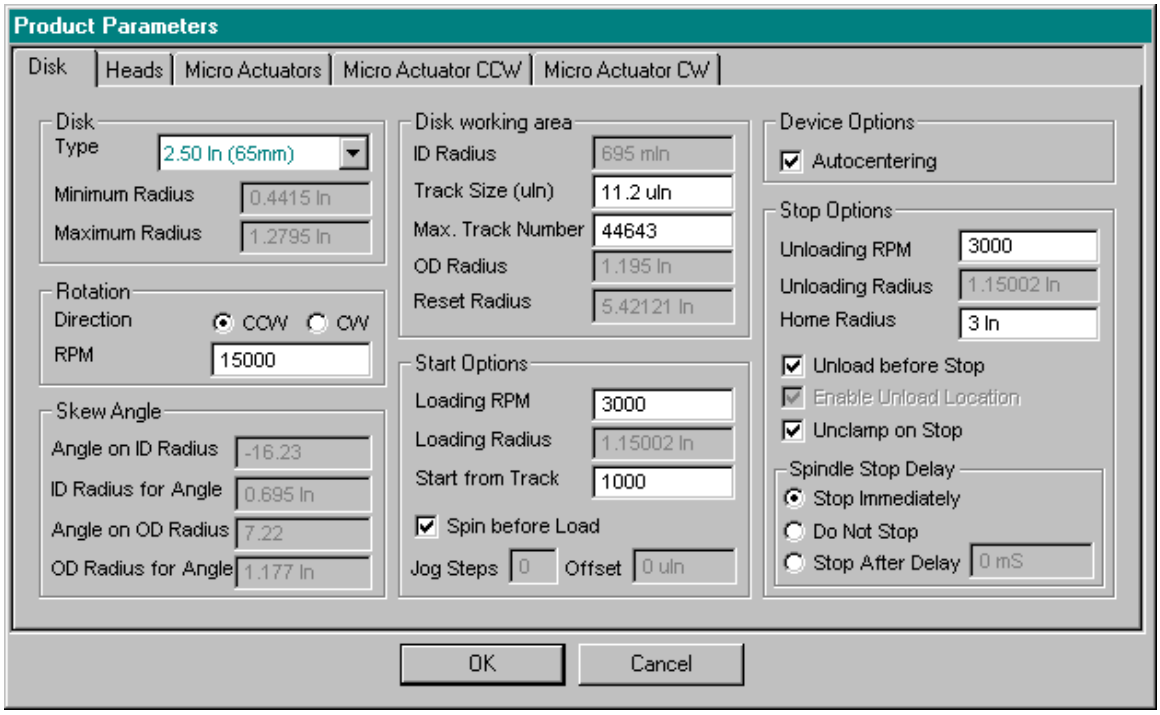

Figure 19: *Product Parameters* Dialog Box for V2002 Head Stack

4.1.6 Micro Actuators Tab in V2002 Product Parameters Dialog Box

In order to clarify the meaning of the micro actuator parameters, the *Micro Actuators* configuration tab is redesigned. In addition to the previously available controls, it contains the micro actuator connection diagram and two new text boxes.

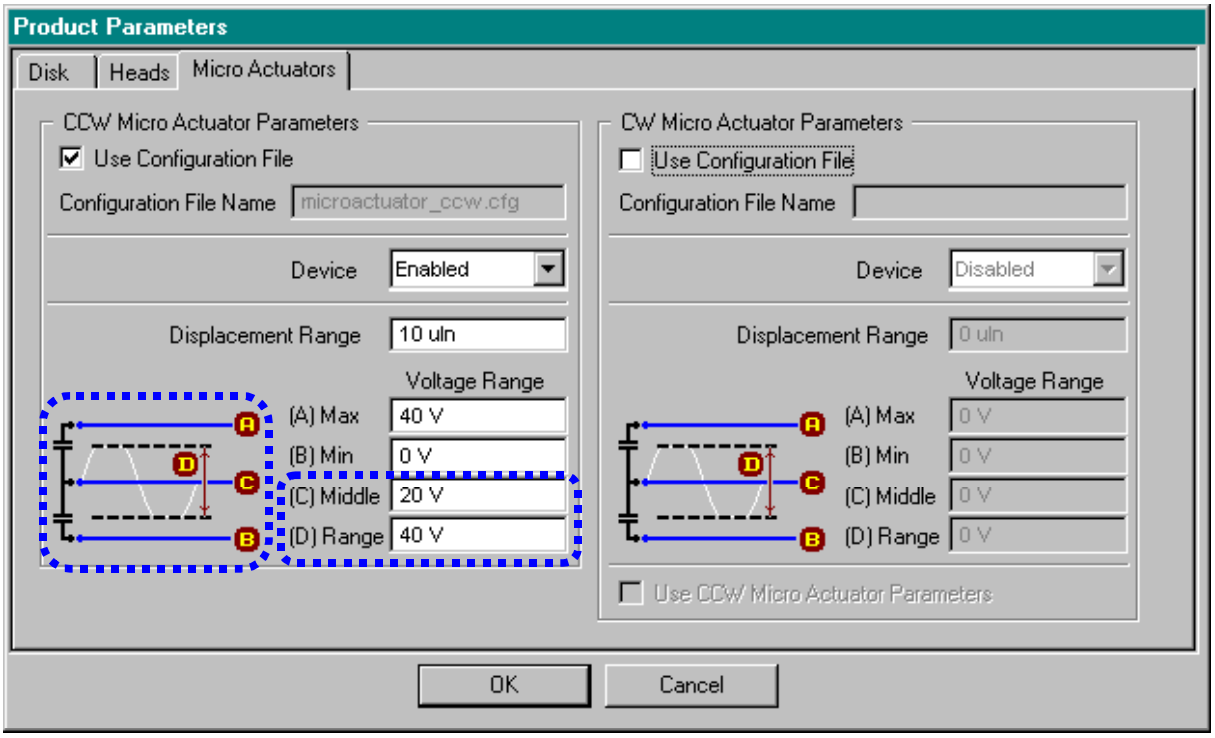

Figure 20: Micro Actuator Parameters in the V2002 Product Parameters Dialog Box

The parameters of the CCW and CW micro actuators can be configured independently. The *Micro Actuator* configuration controls are grouped inside two frames – *CCW Micro Actuator Parameters* and *CW Micro Actuator Parameters*.

The following parameters are configured for each actuator:

- The *Use Configuration File* check box, when checked, indicates that a configuration file for corresponding Micro Actuator exists and product parameters file (**V2002.DDT**) contains a reference to the file. When the *Use Configuration File* checkbox is not checked, it means that product configuration file does not have a reference to a Micro Actuator configuration file and support for Micro Actuator is disabled.

- The read-only *Configuration File Name* text box shows the name of the corresponding Micro Actuator file in the current product folder. You cannot modify the name of the file; it is shown for your reference only.

- The *Device* combo box enables or disables the hardware control of the Micro Actuator for the current product configuration. If you choose to disable the device, the hardware will not apply voltage to the Micro Actuator when the spinstand is started, and therefore the Micro Actuator tests will not be available.

- The *Displacement Range* text box specifies expected peak-to-peak displacement range of the micro actuator. This value is needed in the *Micro Actuator Frequency Response* test. Please specify an approximate range in

this entry. This entry can be automatically updated by the *Micro Actuator Stroke* test, which measures the actual range.

- The *Voltage Range (A) Max* text box specifies the positive voltage applied to a Micro Actuator device.
- The *Voltage Range (B) Min* text box specifies the negative voltage applied to a Micro Actuator device.
- The *Voltage Range (C) Middle* text box specifies the middle point voltage (in Volts). Bipolar micro actuator control voltage is applied in reference to this point.
- The *Voltage Range (D) Range* text box specifies the maximum control voltage range (in Volts) allowed to be applied to a Micro Actuator device middle point. Control voltage saturates if it goes above Range/2 or below –Range/2.

4.1.7 Track-to-Track Head Positioning

Starting from the WITE32 version 3.20, the trajectory of the head movement from the initial to the destination track during the track-to-track head positioning simulates the trajectory in a hard drive. The head skew angle is calculated at each trajectory point according to the skew angle configuration defined in the product parameters. In previous revisions of WITE32 the head skew angle was calculated only for the initial and the destination tracks, and the spinstand used a linear trajectory to move the head from one track to another.

4.1.8 Balancing

In WDCP2002 for the previous WITE32 versions, the *Screw Calibration* tab was disabled for the *Custom 3 Screws* and *Custom 6 Screws* balancing types and the screw calibration was always the first step in the balancing procedure for both these types. In the WITE32 version 3.20, the *Screw Calibration* tab is enabled for these two balancing types. Now, you can calibrate the screws only once – after the balancing cup installation.

4.2 Guzik Servo

The following modifications of Guzik Servo are implemented in the WITE32 version 3.20:

- *Head Bandwidth* selection for the RWA models with Servo-3 is added (see Section 4.2.1).
- *Reset Index Skew* control in the *Servo Erase Configuration* dialog box (see Section 4.2.2).
- Modifications in the *Servo Calibration* dialog box (see Section 4.2.3).
- Cool down delay in the *Servo Calibration* operation (see Section 4.2.4).

4.2.1 Head Bandwidth Selection for RWA Models With Servo-3

In order to support Servo-3 for low frequency heads the head bandwidth selection feature is introduced. To specify the head bandwidth the *Head Bandwidth* frame is added to the *Servo Control* dialog box (*Control | Servo*). This frame has the following three options:

- *110 MFlux/s and Above*
- *54-110 MFlux/s*
- *Below 54 MFlux/s*

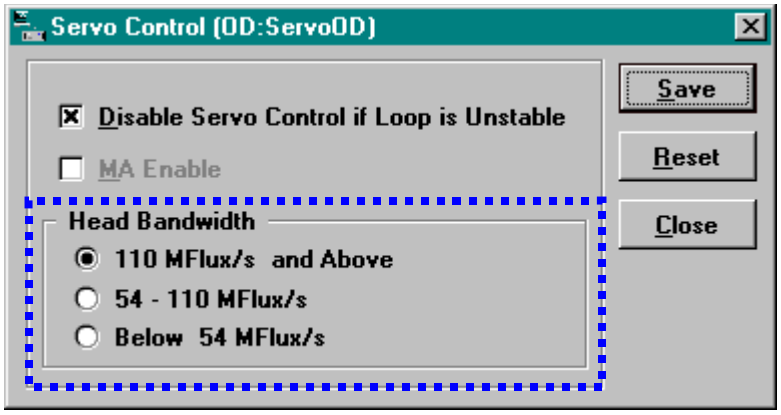

Figure 21: Head Bandwidth Selection

You select the appropriate head bandwidth range depending on the maximum frequency of the non-degraded signal, which the head under test can deliver. For example, if the head under test can reliably write and read signals only up to 100 MFlux/s frequency, then you select the *54-110 MFlux/s* head bandwidth option.

If the servo calibration procedure detects that the optimal servo frequency is lower than the selected head bandwidth range, it terminates with the following error message: *"The measured optimal servo frequency <value1> is lower then minimal frequency <value2>. Please, check the "Head Bandwidth" setting in the "Servo Control" dialog box"*.

If the optimal servo frequency is higher than the selected head bandwidth range, the servo calibration procedure finishes, but displays the following warning message in the status bar of the *Servo Calibration* dialog box: *"The head has higher bandwidth than selected in Servo Control dialog box"* (see Figure 22).

Note: Lower head bandwidth selection increases the size of the servo area (the portion of the track occupied by the servo data).

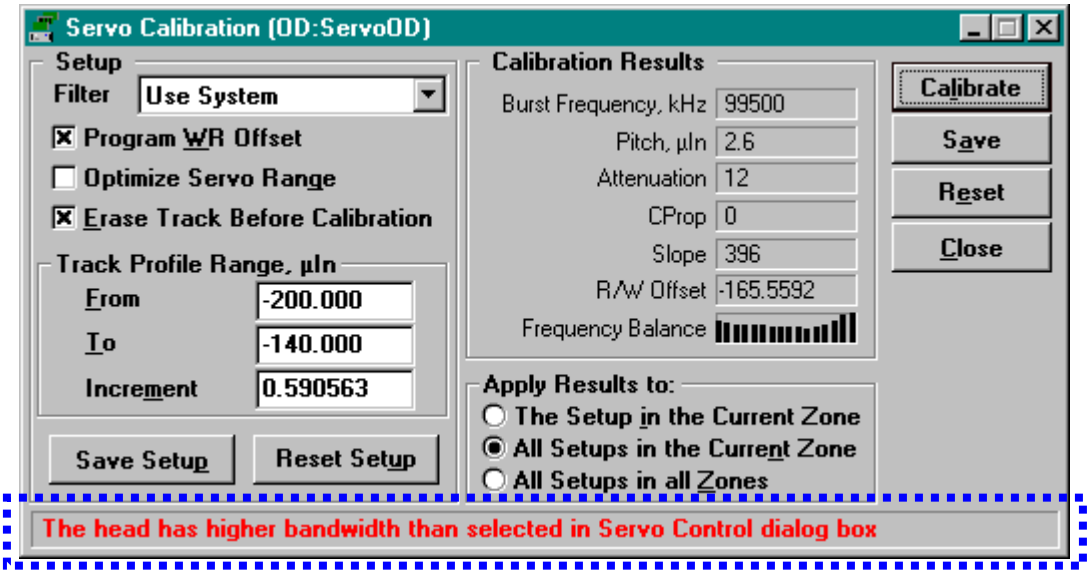

Figure 22: Incorrect Head Bandwidth Warning During Servo Calibration

4.2.2 Reset Index Skew Control in the Servo Erase Configuration Dialog Box

A new control *Reset Index Skew* check box is added to the *Erase Servo Configuration* dialog box (see Figure 23). The index skew is the delay between the spinstand index and internally generated RWA index (refer to *WITE32 System Configuration User's Guide* for detailed information about the index skew feature). When the *Reset Index Skew* check box is checked, the index skew value is automatically set to zero in the beginning of the execution of the servo erase procedure.

Note: The control over the index skew is available in the *Gate and Track Format* dialog box in the *Skew Index* frame.

This feature is implemented to avoid the servo writing with non-zero index skew. This is mainly relates to the split head testing. As a result of the execution, the split head test sets the new value of the index skew. Several consecutive executions of the split head test and the servo writing procedure may cause the accumulation of the index skew value. To prevent this accumulation it is recommended to check the *Reset Index Skew* check box.

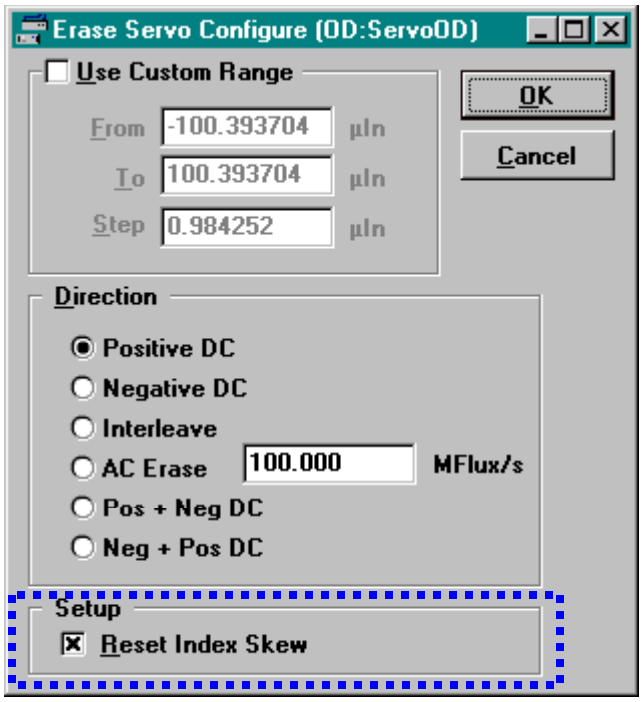

Figure 23: Reset Index Skew

4.2.3 Servo Calibration Dialog Box Modifications

The *Servo Calibration* dialog box is changed in the WITE32 version 3.20. Figure 24 shows the *Servo Calibration* dialog box as it was in WITE32 version 3.11. Figure 25 shows the same dialog box of WITE32 version 3.20. The differences between the old and the new dialog boxes are highlighted and enumerated by the reference numbers. The following changes has been made:

- The *Calibrate Main Servo* checkbox in the *Main Servo* frame (refer to reference number 1) and the *Micro Actuator* frame with all its controls (refer to reference number 2) are removed as obsolete.

- The *Program WR Offset* and *Optimize Servo Range* checkboxes (refer to reference number 3) are moved from the *Main Servo* frame to the *Setup* frame.

- New control the *Filter* combo box is added to the *Setup* frame (refer to reference number 4). This control defines which filter has to be used in servo calibration procedure. This control is required for systems with heads and media designed for perpendicular recording. For such systems you have to use a programmable differentiator for servo calibration, while the current system filter might be a low pass filter.

- An appearance of the *Frequency Balance* text box is changed for the Servo-3 test systems (refer to reference number 5). For such systems this control shows a row of 16 columns instead of one coefficient for Servo-2 systems. These columns graphically represent ratios for 16 frequencies relative to the maximum frequency amplitude.

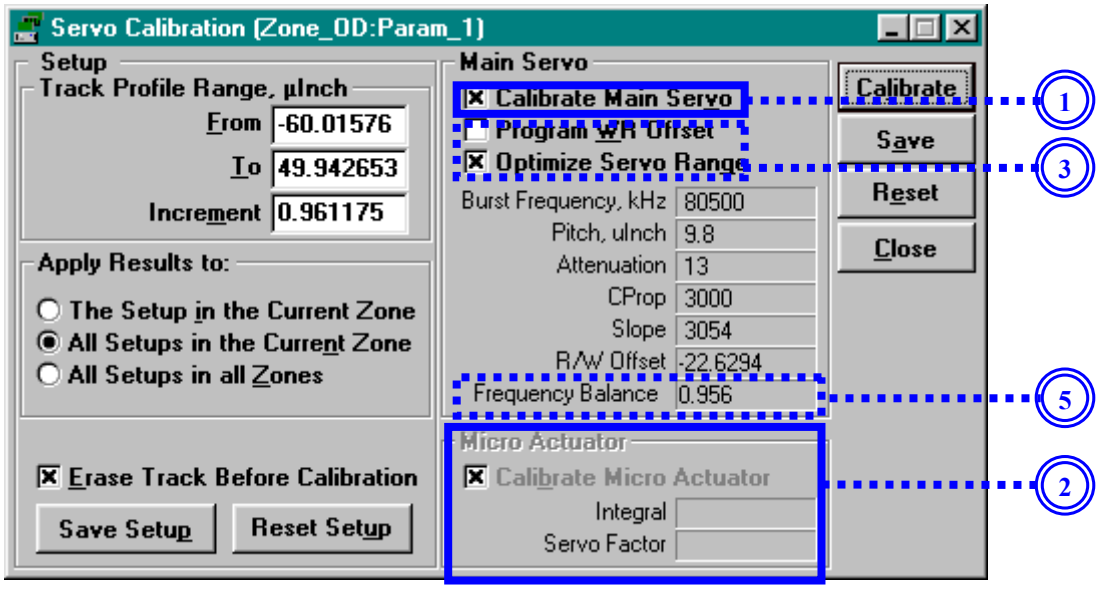

Figure 24: Old Servo Calibration Dialog Box

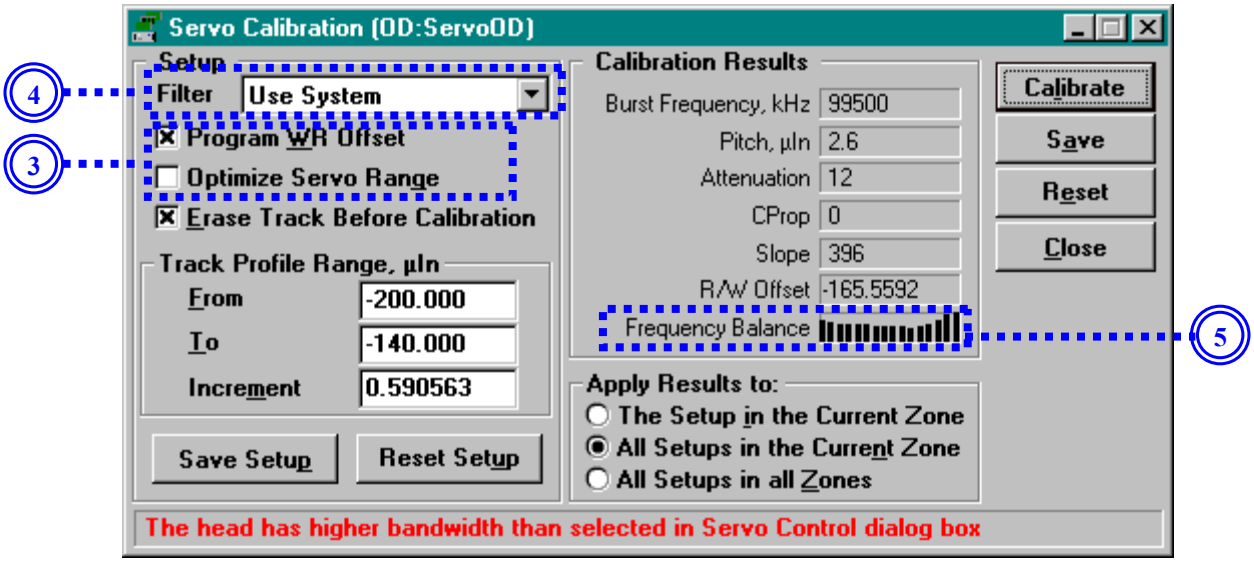

Figure 25: New Servo Calibration Dialog Box

4.2.4 Cool Down Delay in Servo Calibration

A cool down delay is added between the band erase operation and the measurements in the *Servo Calibration* operation if the *Erase Track Before Calibration* option is enabled. Without this timeout, a continuous write operation performed during the band erase overheats the head amplifier and the head cartridge. The thermal expansion of a cartridge influences the measurements and might impair the calibration especially in the case of narrow heads with small W/R offset.

4.3 Guzik 1701 Spinstand Family

The following modifications were implemented for Guzik 1701A+ and 1701B spinstands:

- Spindle Rotation Direction Warning on 1701A+ (see Section 4.3.1)
- Disabling Linear Scale Correction for Guzik 1701B Spinstand (see Section 4.3.2)

4.3.1 Spindle Rotation Direction Warning on 1701A+

If the direction of the spindle rotation, specified in the *Spinstand Parameters* dialog box of the *Spinstand Alignment Program* (WDCP), does not correspond to the direction of the rotation, specified in the *Product Parameters* dialog box, the error message *"Direction of rotation specified in setup Spinstand Parameters doesn't correspond to direction of rotation specified in setup Product Parameters"* appears after you press the *Start Device* button.

4.3.2 Disabling Linear Scale Correction for Guzik 1701B Spinstand

To disable the *Linear Scale Correction* feature, a new *Disable* button is added to the *Scale Correction* test configuration setup:

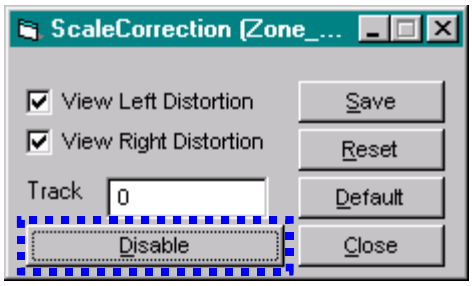

Figure 26: New Button to Disable Scale Correction

This button, if pressed, disables the *Scale Correction* and the following prompt message shows up. The message is closed automatically after Spinstand resets.

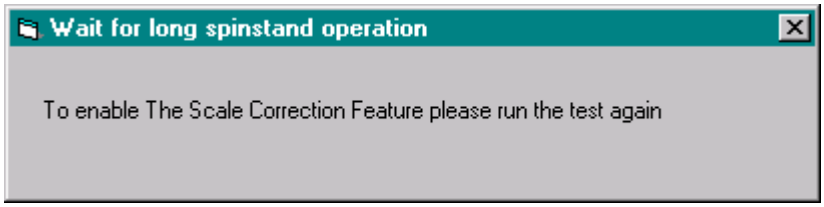

Figure 27: Information Message after Disabling the Scale Correction

4.4 2 MFlux/s Lower Limit of System Frequency for RWA 2000 Series

The WITE32 version 3.20 supports new lower limit of the system frequency for RWA-2000 series. The new limit is 2 MFlux/s or 500 nsec for bit cell period instead of 10 MFlux/s in the previous revisions of WITE32. This new limit is applicable for all testers of RWA-2000 series regardless of their hardware options.

4.5 Alternative Overwrite Test Modifications

In the WITE32 version 3.20, the *Alternative Overwrite* test has some new features designed to make measurements suitable for Perpendicular Recording. Both the test algorithm and the test setup dialog box are changed. Figure 28 shows the *Alternative Overwrite* test dialog box as it was in WITE32 version 3.11. Figure 29 shows the same dialog box of WITE32 version 3.20.

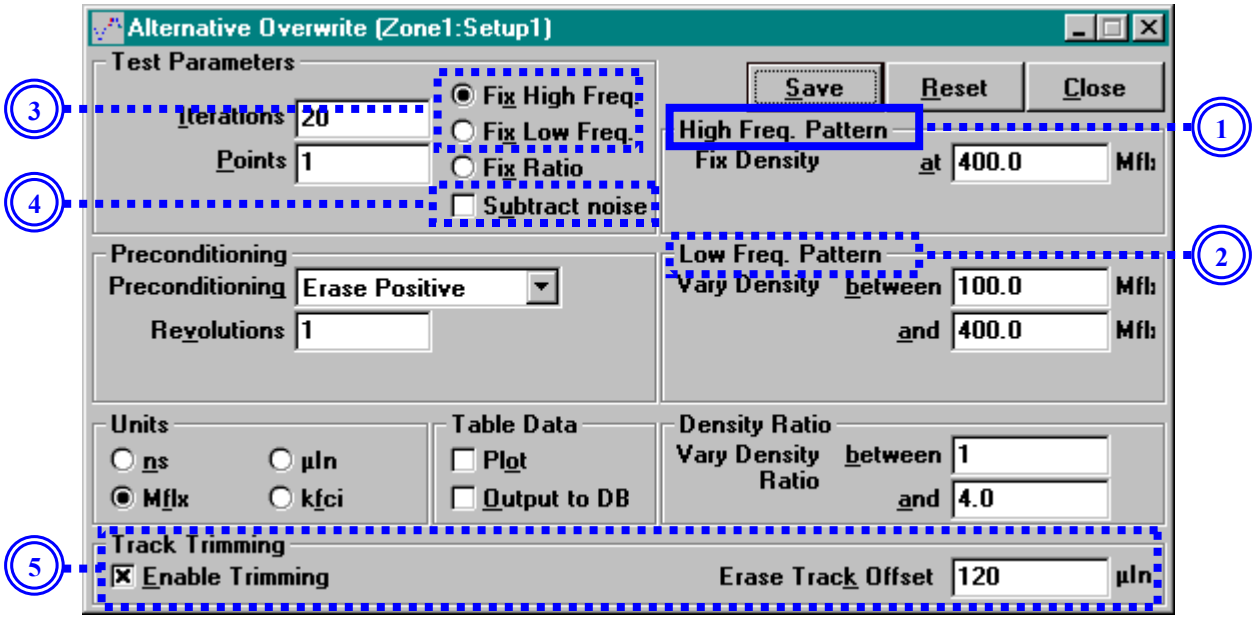

Figure 28: Alternative Overwrite Dialog Box in WITE32 Version 3.11

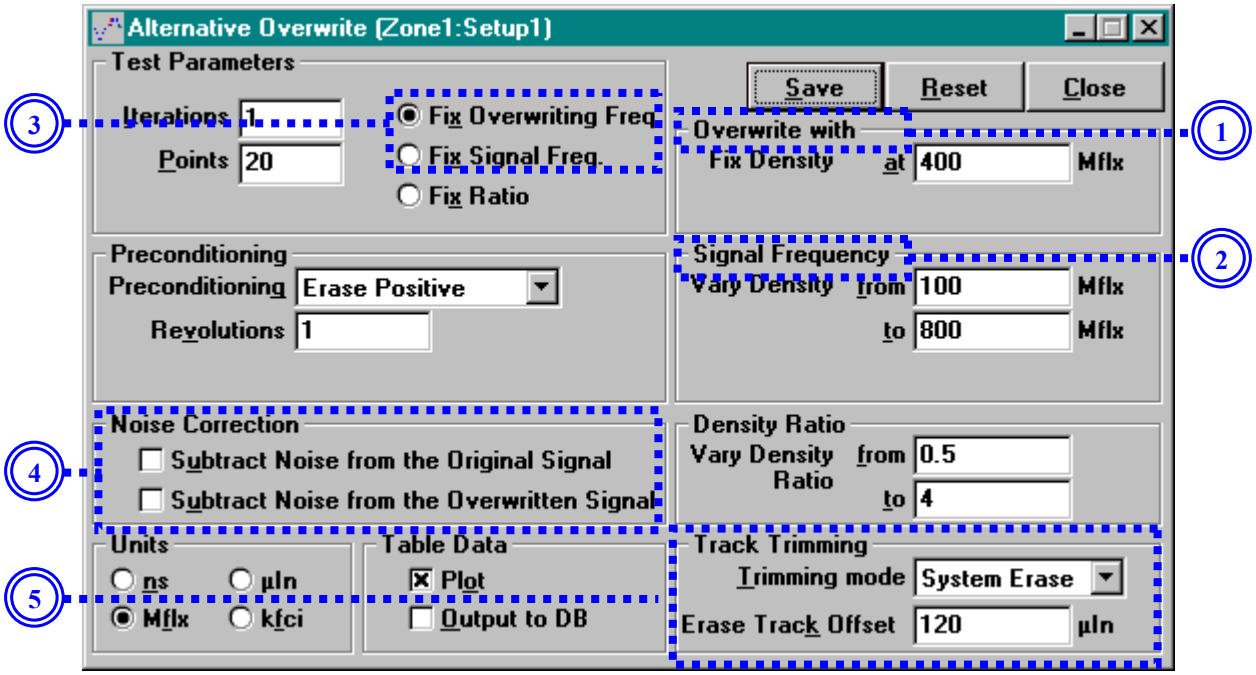

Figure 29: New Alternative Overwrite Dialog Box in Version 3.20

The differences between the old and the new dialog boxes are highlighted and enumerated by the reference numbers. The following sections describe the modifications in order of increasing the reference numbers.

4.5.1 Relaxing Frequency Limitations

The frequency of the overwriting signal (formerly called the High Frequency or HF signal) no longer needs to be higher than the frequency of the signal it overwrites (original signal, formerly called the Low Frequency or LF signal).

The titles of the frequency control panels changed from *High Freq. Pattern* and *Low Freq. Pattern* to *Overwrite with* and *Signal Frequency* (refer to reference numbers 1 and 2). Similarly, the names of the frequency sweep options were changed from *Fix High Freq.* and *Fix Low Freq.* to *Fix Overwriting Freq.* and *Fix Signal Freq* (refer to reference number 3).

The text boxes in the frequency control panels no longer impose the frequency comparison limitation. The values in the text boxes in the *Density Ratio* panel may be greater than 1.

4.5.2 Noise Correction of Original and Overwritten Signals

In WITE32 versions prior to the version 3.20 the noise correction was performed for overwritten signal when *Subtract noise* check box was selected (refer to Figure 28, reference number 4):

$$TAA_{overwritten,corrected} = \sqrt{TAA^2_{overwritten} - TAA^2_{noise,overwritten}}$$

Here $TAA_{overwritten\ corrected}$ is the amplitude of the overwritten signal used in the Overwrite computations, $TAA_{overwritten}$ is the amplitude of the overwritten signal measured on the original signal frequency and $TAA_{noise,overwritten}$ is the amplitude measured on the erased and overwritten track on the original signal frequency.

This correction is still performed in WITE32 version 3.20 if *Subtract Noise from the Overwritten Signal* check box is checked (refer to Figure 29, reference number 4).

WITE32 version 3.20 adds noise correction for the original signal:

$$TAA_{original,corrected} = \sqrt{TAA^2_{original} - TAA^2_{noise}}$$

Here $TAA_{original,corrected}$ is the amplitude of the original (non-overwritten) signal used in the Overwrite computations, $TAA_{original}$ is the measured amplitude of the original signal and $TAA_{noise,verwritten}$ is the amplitude measured on the erased on the original signal frequency.

This correction is performed if *Subtract Noise from the Original Signal* check box is checked (refer to Figure 29, reference number 4).

4.5.3 System Erase as Trimming Mode Option

In WITE32 versions prior to 3.20 track trimming in the *Alternative Overwrite* test was performed only by positive erase if *Enable Trimming* check box was selected (refer to Figure 28, reference number 5). In WITE32 version 3.20 the *Trimming mode* combo box offers four options (refer to Figure 29, reference number 5):

- *Do Not Trim* — do not perform track trimming.
- *Erase Positive* — perform track trimming by positive erasure, as in prior WITE32 versions.
- *Erase Negative* — perform track trimming by negative erasure.
- *System Erase* — perform track trimming using system erase options, which are accessible through the *Control | Band Erase* dialog. For perpendicular recording system erase must be set *AC Erase*, thus enabling AC erasure for track trimming.

4.5.4 Head Movement Minimization

1. In WITE32 versions prior to 3.20 the sequence of actions during the *Alternative Overwrite* measurement was as follows:
   - Erase track (perform preconditioning).
   - Write the original signal.
   - Measure $TAA_{original}$.
   - Overwrite the track by the overwrite frequency.
   - Measure $TAA_{overwritten}$.
2. This algorithm invoked head movements from and back to the write position between writing and overwriting the signal. This could decrease the precision of the measurement because the offsets on which the signal was written and overwritten could slightly differ.
3. In WITE32 version 3.20 a different algorithm is used in case *Do Not Trim* is selected as the track trimming mode:
   - Erase track (perform preconditioning).
   - Write the original signal.
   - Overwrite the track by the overwrite frequency.
   - Measure $TAA_{overwritten}$.
   - Erase track.
   - Write the original signal.
   - Measure $TAA_{original}$.
4. This algorithm is already used in the WITE32 *Overwrite* test. Now the *Alternative Overwrite* is implemented similar way.

4.6 Save Error Info Menu in WITE32 Error Message Dialog Box

The WITE32 standard error message dialog box is modified (see Figure 30). The new dialog now features the *Save Error Info* pull-down menu, which allows saving the detailed error information to different destinations.

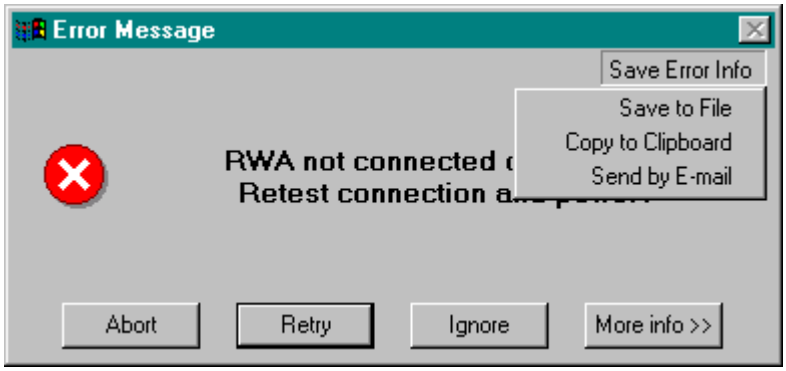

Figure 30: *Save Error Info* Pull-Down Menu in WITE32 Error Message Dialog Box

The *Save Error Info* pull-down menu has the following three menu items:

Save to File — Allow you to save the detailed error information into a text file. When this menu item is selected, the Windows standard file selection dialog appears. In this dialog you can specify the file name, in which you want to save the error information.

Copy to Clipboard — Allow you to save the detailed error information into the Windows clipboard as a text. After selecting this menu item the detailed error information is copied into the clipboard. Then you may paste the clipboard contents into any Windows application, which supports clipboard operations, such as Notepad.

Send by E-mail — Allow you to send the detailed error information via e-mail. After selecting this menu item the default e-mail client application is loaded and the new e-mail is created. The detailed error information is then copied into the e-mail body. The *To:* field of the e-mail is support@guzik.com, the *Subject:* field is "Error Message".

4.7 New Pulse Width Results in Parametric Test

In addition to the average pulse width result, the *Parametric* test in WITE32 version 3.20 reports separate positive and negative pulse width results. The new result names are:

- Pos Pulse Width 50 (nSec)
- Neg Pulse Width 50 (nSec)
- Pos Pulse Width 50 (uInch)
- Neg Pulse Width 50 (uInch)

4.8 Two-letter FAB and Assembly Revisions

Two-letter board Fab and Assembly revisions are supported in the current version of WITE32. The EEPROM Viewer application is modified to display the two-letter Fab and Assembly revisions.

4.9 Tests and Modules no Longer Supported in WITE32

1. The RCE32 module is discontinued and removed from the WITE32 version 3.20. Its functionality is implemented in the newest PRML channel drivers (see sections 3.4 and 3.5). Please, contact Guzik Technical Support for details.

2. The obsolete *747 Servo Track Profile Test* is removed from the *747 Test* module.

4.10 WITE32 Installation Procedure Modifications

The WITE32 installation is modified in the following way:

- The PRML chip drivers, the spinstand drivers and the Signal Display module are always installed in the *Typical* or *Custom* mode. The corresponding *PRML drivers, Device*, and *Signal Display* options are removed from the *Select Components* dialog.

- Two new modules – *Perpendicular Parametric* and *Split* tests are added to the WITE32 installation. (See Sections 3.2) The corresponding *PerpParam* and *WSPLIT* options are added to the *Select Components* dialog.

- A special precaution is made to avoid mixing up modules form different WITE32 revisions in the case of partial WITE32 installation over the existing one. All modules included in the WITE32 installation are always copied to the destination location. The *Select Components* dialog allows you to enter the module licenses in the process of installation rather then to select the modules to be installed. The dialog title and the prompt message are changed accordingly. They now read: *Select Components for Licensing* and *Select the components, for which you would like to specify the license*.

- Following the new PRML channel software structure for the latest PRML chip drivers (see Section 3.4), the Guzik Chip Adapter board driver, and the user interface module are included in the WITE32 installation.

  Note: This is applicable to the three latest PRML drivers for the RC6600, and 88C7500P channels for Chip Adapter 2000, and the 88C7500M channel for Chip Adapter 4000.

4.11 Miscellaneous

1. A special feature is implemented in the WR Offset test to help you to select the better Track Profile Range parameters. If the test is unable to measure the WR Offset or/and the Track Width, it calculates the Track Profile Range parameters (*From*, *To*, and *Step*) based on the preliminary profile measurements. The test displays a message with the suggested *From*, *To*, and *Step* values. However, if the track profile area is not properly erased (preliminary profile has more than one peak), or the track profile range is completely wrong and misses the signal, the suggested parameters are calculated incorrectly. If the suggested parameters do not look reasonable, we recommend running the Track Profile test to select the optimal From, To, and Step values for the WR Offset test.

2. The Servo Erase Operation mode list is modified such that it matches the mode list of the Servo Erase setup on the Dashboard. The following items are available in the selection list:

    - *Positive DC* – DC erasure in positive direction
    - *Negative DC* – DC erasure in negative direction
    - *Interleave* – DC erasure in positive direction at first offset position, followed by negative direction at second offset position, followed by positive direction at third offset position and so on.
    - *AC Erase* – AC erasure with specified frequency.
    - *Pos + Neg DC* – DC erasure in positive direction in the first revolution, followed by negative direction in the second revolution.
    - *Neg + Pos DC* – DC erasure in negative direction in the first revolution, followed by positive direction in the second revolution.

3. Three fields - *Track*, *Head* and *µInch Offset* on the *Engineering Dashboard* are updated after pressing the *Enter* key on the keyboard to confirm the entered data.

4. The system band erase operation is modified to improve the execution time.

5. A new parameter *Write Repetitions* is added to the *Adjacent Track* frame in the *Standard Setup* of the *747 Comparator Error* test. This parameter specifies the exact number of write pattern operations to be executed while writing each adjacent track. Previously *747 Comparator Error Test* performed a single write pattern operation for each adjacent track. The *Write Repetitions* parameter has effect only in the case, when the *Adjacent Track Operation* is set to *Write Pattern*.

6. The *Plot Data* checkbox is added to the *Popcorn test* configuration setup. If this control is enabled, and the *Sweep* option is *Write Current* or *Read Bias*, the Popcorn test displays a plot when it finishes. If this control is disabled, the test does not display any graphic output.

7. The accuracy and stability of PW measurements were improved for all WITE32 tests if the RWA input signal is noisy and asymmetrical. This improvement is done for RWA-2000 series.

8. A new option *Hide* Grading *Result Window* is added to the *Grading* system.

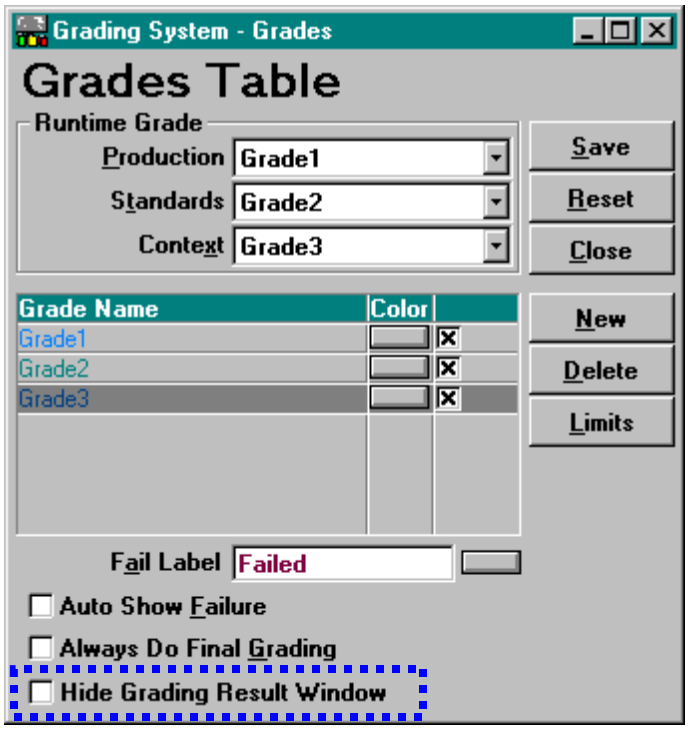

Figure 31: Hide Grading Result Window Check Box

The *Hide Grading Result Window* check box	When it is checked, the final grading result window will not be displayed at the end of the production test.

CHAPTER 5
FIXED BUGS

The following bugs were discovered in WITE32 version 3.11 or earlier, and fixed in WITE32 version 3.20. The description below explains the bug behavior as it appears in WITE32 version 3.11.

5.1 V2002 Spinstand

1. The *XY Alignment* test may hit Y-limit sensor (screw).

2. The *XY Alignment* test may fail if head negative and position skew angles are not the same.

3. The *XY Alignment* test may fail if a tooling has non zero angle.

4. The *XY Alignment* test intermittently displays the error message *"The measured Track Width is <big value> uInch, while the Track Size parameter specified in product parameters is <value> uInch. Do you want to continue?"*. The error message appears because of intermittent failure of the track width measurement.

5. It is possible to set *Track Size* product parameter to zero in the *Spinstand Product Parameters* dialog box.

6. The *Edit Product Parameters* button remains disabled when the spinstand reset procedure fails.

7. If you make some modification to any of the parameters stored in the spinstand EEPROM and do not save it, spinstand shows the *Save EEPROM* dialog box when you close WDCP2002. The *Cancel* button in the *Save EEPROM* dialog box works incorrectly. Even if you press the *Cancel* button to prevent WDCP2002 from closing, the WDCP2002 will be closed and all EEPROM modification will be lost.

8. When you save WDCP2002 configuration by pressing the *Save* button and then restore it by pressing the *Recall* button, the *Y Offset* configuration parameter of the *Y-Limit Adjustment* test resets to zero.

9. If during Start Device the stage hits the Y Limit protection a spinstand displays the wrong error message *"Device emergency detected. Y motor is overloaded"* instead of correct message *"Device emergency detected. Y In Limit Switch"*.

5.2 1701 Family of Spinstands

1. The *Jog* buttons in the *Emergency Recovery Procedure* dialog box do not work for 1701 family of spinstands.

2. A head comb of a Head Stack crashes into the disk if Stop Device is performed after Y-in limit sensor has been reached. This bug affects 1701B spinstands only.

3. When 1701B spinstand detects an *Acoustic Sensor* alarm, it immediately opens the *Emergency Recovery Procedure* dialog box. The operator has to unload the Head Stack. Intended behavior is: software should stop operation, unload Head Stack, and display the "*Acoustic Sensor detect*" error message. This bug affects 1701B spinstands only.

4. WDCP crashes after the following sequence of actions:
   - Select *Head Stack* check box in the *Spinstand Parameters* dialog box (*Parameters* | *Spinstand Parameters…* menu item of the Spinstand Alignment Program WDCP).
   - Press *Save Data in EPROM* button.
   - Close WDCP and reset spinstand.
   - Run WDCP in standalone mode.
5. For *1701 family Spinstands* pressing the *Optical / Zero Angle* button does not allow to start *Manual Zero Angle Alignment* when is not possible to perform *Video Alignment*.

5.3 Servo

1. The *Servo Calibration* procedure can be run even if the *Servo Area* check box in the *Gate and Track Format* dialog is disabled. In this case the procedure fails, but changes the system Read and Write gates.
2. In the *Servo Erase operation*, only the *DC positive* and *DC negative* selection in the erase direction are executed correctly. The other selections use wrong direction for erasure.
3. It is impossible to open *Zone/Setup* editing from the *Servo Calibration* dialog box after modification of any *Servo Calibration* parameters unless the *Save Setup* button is pressed.

5.4 Analog Front End

1. TAA calibration factors are not updated in the *Calibration* | *TAA…* window if a zone/setup is loaded where TAA calibration has never been performed.
2. If a test sets head amplifier properties before starting device, the head amplifier properties are not loaded along with other zone/setup parameters.
3. The *Calib TAA* operation included in the Production test intermittently returns wrong coefficients when run in servo mode with UP7.
4. If two current sensitive head amplifiers are installed, TAA measurements return wrong results if TAA is converted to mV. That is the *Convert results to mV* option in the *Configure* | *Preamp* dialog is enabled.
5. WITE32 does not measure MR-Impedance to use for TAA conversion from µA to mV after the head is changed. That can lead to not proper TAA result for the new head.
6. In the case of the *Multiple Headstack* front-end configuration is installed, the *Reload* button in the *Control* | *Head Amp...* dialog box does not load a driver selected from a list. The current Head Stack driver is reloaded instead. The *Reload* button is disabled in the current revision of WITE32 for the *Multiple Headstack* front-end configuration to avoid confusion.

Note: For the *Multiple Headstack* front-end configuration you can select a Head Stack driver from the *HSA Driver for T-Shape Board* list box in the *Configure* | *Preamp* dialog box.

5.5 Tests and Measurements

1. The Spectral Integral SNR test does not use Load/Unload Parameters defined in the spinstand setup when the *Use Spin Stand Load/Unload Parameters* option is selected in the test setup. The test loads/unloads a head on the OD radius for measuring an unloaded head noise.

2. The Spectral Integral SNR test may give wrong results if the non-sector mode is selected, and the *Enhanced Performance Mode* is set to *None* in the *Configure* | *Measurement Options* dialog.

3. For RWA-2550/2585 family, the SNR test might measure the Crest factor value larger the 100% when the full size write gate and read gate are enabled.

4. The Track Profile test might crash if the *File Path* in the *Auto ASCII Export* frame (*Configure* | *Configure Result Processor*) is empty.

5. The Track Profile test does not report any results (even –9999 values) if measurements fail.

6. In the Alternative Overwrite test signal frequencies specified in nanoseconds are interpreted as micro inches and micro inches as nanoseconds.

7. The ATI test does not check that the Write With Retries Operation is enabled.

8. The result names for R/O Parametric test are changed to ROP_PWN and ROP_TAA instead of Pulse Width and TAA, for differentiating them from the results of TAA and PWN tests.

9. On a fast computer, Digital Parametric measurements performed for a long acquisition length (*Maximum possible* acquisition time setting in the *Control* | *Digital Measurements* dialog box) can give a timeout error message or produce unstable results.

10. For RWA 2000 series, if a programmable differentiator is installed in slot 0 (which is used for TAA calibration), no error message is issued. Measurement results may be distorted. In the WITE32 version 3.20 the following error message is displayed in this case: *"Improper hardware connection. No filter in the slot #0. Calibration is not possible"*.

11. The 747 Comparator Error Rate test does not display any warnings if the Overwrite filter is selected. Now it shows a message *"You cannot use the Overwrite filter. The Parametric filter will be used instead"*.

12. The 747 Comparator Error Rate test does not set the selected in the 747 test (*Standard Setup) Bit Cell* period for the *Side Track* and the *Adjacent Track* to the PRML chip if a PRML chip pattern is selected. In this case both the *Side Track* and the *Adjacent Track* are written with the system *Bit Cell Period (Control* | *System* dialog).

    Note: If the *Bit Cell* period for the *Side Track* or the *Adjacent Track* in your product is out of the PRML chip frequency range, an error message *"System setup/configuration error. Chip data rate out of range"* pops up in WITE32 version 3.20.

13. The Popcorn test intermittently produces wrong results when executed just after the first device start.

14. In the Gated Stability mode the Amplitude Stability and the Pulse Width Stability tests set the write gate wrongly – full size instead of 50% of a full size – if the *Always Full Size* option is enabled in the *Control* | *Gate and Track Format* dialog.

15. The Spectrum Analyzer frequency response correction was applied only to the Spectrum Analyzer, Spectral SNR, and Spectral Integral SNR tests. The Spectrum Analyzer frequency response correction was not applied to the TAA, TAA Asymmetry, Track Profile, and Triple Track tests, when they were configured to use the overwrite filter. Now all tests, which perform TAA measurements through the Spectrum Analyzer, utilize the Spectrum Analyzer frequency response correction.

    Note: The Spectrum Analyzer frequency response correction is designed to compensate the non-flatness of the spectrum analyzer frequency response in the range of working frequencies. When engaged, it automatically multiplies the results of the amplitude measurements performed through the spectrum analyzer by the correction coefficient, which corresponds to the current spectrum analyzer working frequency.

5.6 Miscellaneous

1. In the *Serial Numbers* dialog box the previous shortcuts are restored: *"Alt + H"* for Heads and *"Alt + E"* for Head Stacks.

2. The *Filter* configuration form (*Control* | *Filter*) displays the last eight positions of a cutoff frequency value for programmable filters. If the value has many digits after the decimal point, the *Cutoff Freq* textbox truncates the most significant digits**.** In the current revision of WITE32 the *Cutoff Freq* value for low path filters or programmable differentiators is rounded to four digits after the decimal point.

3. It is possible to disable all sectors in the *Control* | *Gate and Track Format* dialog. No measurements can be preformed in this case.

4. Pattern Editor (PE32.EXE) application cannot import a file, which name contains spaces, when the file name is passed as a parameter in a command line.

5. Pattern Editor (PE32.EXE) application: in the case of multi-line error message, only the first line of error message is displayed

6. When WRESULT.EXE module runs as a standalone application to show history database content, statistic results are displayed as raw results.

7. If an executable external module takes a long time to complete the initialization, WITE32 terminates the module.

8. Custom written WDK executable modules do not apply *MR-Impedance* calibration (*Calibration* | *MR-Impedance…*) for MR-Impedance measurement.

9. If the *Dashboard Band Erase* configuration is changed, WITE32 does not prompt user to save configuration during termination.

10. If the *Use System Setup* option in the Dashboard *Band Erase* configuration is enabled, the band erase *Setup* button on the Dashboard becomes disabled. Hence, there is no way to change the settings.

11. An error message *"Download error: PLO4000: no acknowledgment of successful program download*" pops up intermittently on WITE32 loading.

12. An error message "*PG: Cannot load FPGA for 318130 Fab: X Assy: X* " pops up intermittently on WITE32 loading.

13. WITE32 does not turn off head amplifier power for testers with UP7 if you close WITE32 without stop device or run single test (not production sequence) from soft button on the *Operator Panel*.

CHAPTER 6
KNOWN ISSUES

6.1 Servo-3 RWA and Servo-2 Spinstand Incompatibility Notification

WITE32 version 3.20 does not support a combination of Servo-3 RWA and Servo-2 spinstand. The following error message is displayed if WITE32 software detects such configuration: "*Servo-2 spinstand and Servo-3 RWA are incompatible. Please, contact Guzik technical support*".

6.2 Perpendicular Recording Module Limitation

The only programmable differentiator (P/N 315000) available for RWA-2550/2585 families of testers has the amplitude response, which is different from the response described in Chapter 3 of *"WITE32 Perpendicular Parametric Measurements Test Description Engineer's Reference"*. Consequently, the *Differentiator Optimization* test from the *Perpendicular Parametric Measurements* test package will produce wrong results if run with such filter. Note that if the cutoff frequency for such filter is set manually, then other Guzik tests, such as PWN measurement and PRML tests can still be applied for perpendicular recording using this filter. As a workaround for not using the *Differentiator Optimization* test, we suggest to always select the maximum cutoff frequency (400 MHz) for this model of programmable differentiator (P/N 315000).

6.3 A False Error Message on Updating RWARSLT.MDB

If there is no record in the RWARSLT.MDB table, an error message *"Object variable or block variable not set"* may pop up on the database updating. It is safe to press the *Ignore* button. The database is upgraded correctly.

6.4 Filter Selection for the XY Alignment Test for Perpendicular Systems

In the case of perpendicular recording systems, you have to select a programmable differentiator as a system filter (in the *Control | Filter* dialog box) before running the XY Alignment test. Otherwise a misleading message "*The measured optimal servo frequency (value1) is lower than minimal frequency (value2). Please, check the "Head Bandwidth" setting in the "Servo Control" dialog box.*" may pop up, and the test is interrupted.