WinTOC™ 1020A

Windows® Control Software for the
Model 1020A TOC Analyzer

Operator's Manual

WinTOC

Version 1.1

O·I·Analytical

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Chapter 1
Introduction

WinTOC is a Windows-based software package that allows the operator to control and monitor the operation of the OI Analytical Model 1020A TOC Analyzer. The program also allows the operator to sequence analyses easily, and save and retrieve data for reporting purposes.

Features

- Data acquisition, retrieval, reanalysis, exporting, and storage capability.

- Display screens/panels of run conditions, methods, and sequences.

- Postrun reporting capability.

- Stores methods and sequences.

- Comprehensive on-line help system.

- System monitoring.

- Automatic outlier recognition and reanalysis.

- Reintegration of peaks.

- Storage of data in a noneditable format for GLP compliance.

- Priority programming for immediate sample processing on the fly.

The WinTOC software package includes:

- One floppy disk (3.5")
- One RS-232-C adapter—null modem
- One operator's manual (Part #319407)

Specifications

WinTOC Hardware Requirements

Parameter	Minimum	Recommended
Computer	IBM Compatible	IBM Compatible
Processor/Speed	Pentium® II	Pentium III or better
Memory (RAM)	32 MB	64 MB or greater; Windows 2000–256 MB
Free hard drive space	20 MB	50 MB
Operating System	Windows 95	Windows 95/98/2000/NT
Graphics	1024 x 768	1024 x 768
Monitor	VGA	VGA
Disk Drive	FDD-3.5"	FDD-3.5"
Com ports*	(1) RS-232 (avail)	(1) RS-232 (avail)

Notes:
* Requires one unused 9-pin RS-232 com port or 25-pin RS-232 com port with a 25-to 9-pin adapter. The IRQ associated with this port must not be used by any other device, including the mouse, a modem, or a network card.

Host Software Requirements
- Windows 95/98/2000/NT

Printer Requirements
- WinTOC software is compatible with any printer that is supported by Windows 3.1 or later.

Chapter 2
Installation

This chapter explains installation and configuration of the WinTOC software.

Note: WinTOC is designed to run under Microsoft® Windows. For information on how to use Microsoft Windows, refer to the appropriate Windows documentation.

Installation

Begin installation in the Windows environment using the **Start Menu**.

1. Insert the WinTOC disk into the floppy drive of the host computer that will be used to operate the TOC Analyzer.

2. Click on the **Start Menu** and select **Run**. Type *a:\setup* at the prompt, using the appropriate letter designation for the disk drive, and press [Enter]. A Welcome screen will appear.

3. Click on **Next** to install WinTOC.

4. Follow the instructions on the screen.

Note: The default directory for the installation of WinTOC is c:\WT_1020A. To change the default directory, select the **Set Location** box and enter the new directory path and name.

5. Click on **Next** to begin the installation. During the installation, a status window displays a graphical representation of the available hard drive space, memory, and percentage of installation completed.

6. Exit the installation at any time by selecting **Cancel**.

7. Continue with "Configuration" when WinTOC is successfully installed. WinTOC must be configured before it will operate.

Configuration ▬▬▬▬▬

Note: The Installation program will prompt the operator to the **Configuration Editor**.

1. Access the **Configuration Editor** by selecting the WinTOC Configuration Editor icon.

2. Under **1020A TOC Analyzer**, enter the name(s) of the TOC Analyzer(s) to communicate with WinTOC.

Note: WinTOC can communicate with a maximum of four TOC Analyzers.

3. Under **Serial Port**, enter the number of the serial port based on the communication link options between the TOC Analyzer and the PC with WinTOC. Check with your system administrator if you are not sure which port to specify.

4. Click **OK** to complete the configuration once all the information is entered. A message will appear if there are any entry errors.

Adding a TOC Analyzer After Initial Configuration

Follow the steps below to add a TOC Analyzer after initial configuration has been completed.

1. Double-click on the WinTOC Configuration Editor icon to access the **Configuration Editor**.

2. Enter the information for the new TOC Analyzer (see "Configuration" in this chapter).

3. Click on **OK** when all information is entered.

4. Verify that the system is correctly configured by selecting the icon of the new system. WinTOC will attempt to communicate with the new TOC Analyzer. If communication is established, the WinTOC Status Screen will be displayed. If initialization is not possible, a notice will be displayed and an off-line copy of WinTOC will be initialized.

Removing a TOC Analyzer

1. Double-click on the WinTOC Configuration Editor icon to access the **Configuration Editor**.

2. Click on the **1020A TOC Analyzer** box to be deleted and clear the information across the entire line.

3. Click on **OK**.

Notes

Chapter 3
Introduction to WinTOC

This chapter provides information on the menus, screens, and commands used to control the Model 1020A TOC Analyzer with the WinTOC software. In this configuration, the TOC Analyzer is controlled by using the mouse and entering keystrokes on the PC keyboard. The Model 1020A keyboard and monitor are not used.

WinTOC Screens and Menu System

The screens and menus have been organized for efficiency, with the most used functions being grouped together. There are seven main screens in WinTOC:

- Status Screen
- Configuration Screen
- Methods Screen
- Sequences Screen
- Calibration Screen
- Diagnostics Screen
- TOC Reporter

Table 3.1 shows the complete menu/submenu structure for WinTOC. These menus are accessed from the Status Screen.

Table 3.1. WinTOC Menus/Submenus

Menu	Submenu
File	Printer Setup Exit
Setup	Configuration WinTOC Output Preferences
Databases	Methods Sequences View Methods View Calibration
Instrument	Calibration Diagnostics Settings
Commands	Start Sequence Hold Sequence Abort Sequence Spiral Tray
Utilities	Reporting View Run Log View Last Results Print Last Results Security Archive/Restore Upgrade Firmware
Help	Contents Using Help About

Status Screen

The Status Screen displays real-time conditions and settings for the TOC Analyzer (Figure 3.1). This screen provides the operator with detailed information about the current state of operations on the TOC Analyzer. It also provides information about the sequence that has been programmed, any errors or alarms that exist, and a real-time display of the IR signal.
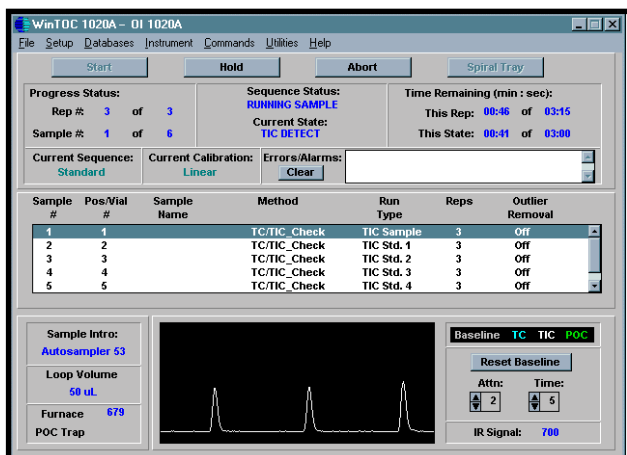
Figure 3.1. Status Screen

Screen displays are color-coded to clearly distinguish the data from the fixed text (see Table 3.2). The display feedback related to the TOC Analyzer will be blank when the unit is not currently running a sequence. Once a sequence is started, the fields will update as the data becomes available.

Table 3.2. Color Codes for Screen Displays

Real-Time IR Graph	Color
Baseline	Gray
IC	Red
TC	Cyan
POC	Green
Text Display	**Color**
Status Feedback	Blue
Errors/Alarms	Red
Sequence Information	Black
Current Sequence Name/Calibration	Aqua-blue

Control Buttons	Provide the ability to control the analysis via the **Start**, **Hold**, and **Abort** buttons. These buttons are ghosted at various times during operation when the respective functions are not available. See "Commands Menu" in this chapter.
Spiral Tray Button	Assists in loading and unloading the optional Model 1051 Autosampler. See "Commands Menu" in this chapter.
Rep # __ of __	Indicates the current replicate of the current sample (ranging from 1 to N, where N is the total number of replicates for the current sample) and the total number of replicates to be run for the current sample.
Sample # __ of __	Indicates the current sample that is running (ranging from 1 to N, where N is the total number of samples defined for the current sequence) and the total number of samples to be run for the current sequence. These numbers are independent of the position/vial number, which is only relevant when used in conjunction with the optional autosampler.
Sequence Status	Indicates the current status of the sequence, such as rinsing, stopped, etc.
Current State	Directly reflects the current state of the TOC Analyzer. As the TOC Analyzer runs a sample, it proceeds through an orderly set of states. The time required and remaining for each state is also displayed on this screen.

Time Remaining This Rep	Indicates (in minutes and seconds) the time remaining to complete the current replicate of the sample. This takes into account the time required to complete the remaining states.
Total Time This Rep	Indicates (in minutes and seconds) the total time required to process the current replicate of the sample. This takes into account the time required to complete every state.
Time Remaining This State	Indicates (in minutes and seconds) the time remaining to complete the current state on the TOC Analyzer.
Total Time This State	Indicates (in minutes and seconds) the total time required to complete the current state on the TOC Analyzer.
Current Sequence	Displays the name of the current sequence that is running or that will run when the **Start** button is selected. To modify the current sequence or select a different sequence, go to the Sequences Screen.
Current Calibration	Displays the name of the current calibration. To modify the current calibration or select a different calibration, go to the Calibration Screen.
Errors/Alarms Listbox	Provides a list of any error or warning conditions that are currently affecting the TOC Analyzer. Messages will continue to display in the listbox until the corresponding condition has been corrected.
Clear	Deletes the messages in the Errors/Alarms Listbox. A listing of these error/warning conditions can be found in Chapter 6.

Current Sequence Data Listbox	Shows the data defined for the current sequence. This is read-only information that is used to determine the sample that is currently running (highlighted), the samples that are already completed, and the samples that are yet to be run.
Sample Intro	Informs the operator how the sample is introduced into the TOC Analyzer.
Loop Volume	Displays the current size of the loop installed in the TOC Analyzer. Options for loop size range from 50 μL to 400 μL.
Furnace	Displays the current actual temperature (°C) of the TC combustion furnace.
POC Trap	Displays the current actual temperature (°C) of the POC trap.
Real-Time IR Graph	Displays the real-time graph of the IR Signal at the bottom of the screen.
Reset Baseline	Allows the graph horizon to be adjusted to the current NDIR signal (i.e., if the graph moves above or below the horizon/ceiling, the **Reset Baseline** button allows the operator to reset the signal view).
Attn	Allows the operator to attenuate the NDIR signal display to enlarge smaller peaks or to reduce larger peaks.
Time	Allows the operator to increase/decrease the length of time shown to increase/decrease the number of peaks displayed.
IR Signal	Shows the current output of the NDIR detector. The signal can vary from a standby value of 500 to 4,000 up to a maximum value of 65,535.

WinTOC Output Screen

The WinTOC Output Screen is accessed from the Status Screen by going to the **Setup** menu and selecting **WinTOC Output**. This screen is used to specify what output is to be generated and saved by WinTOC, in addition to any output being generated on the TOC Analyzer (Figure 3.2).
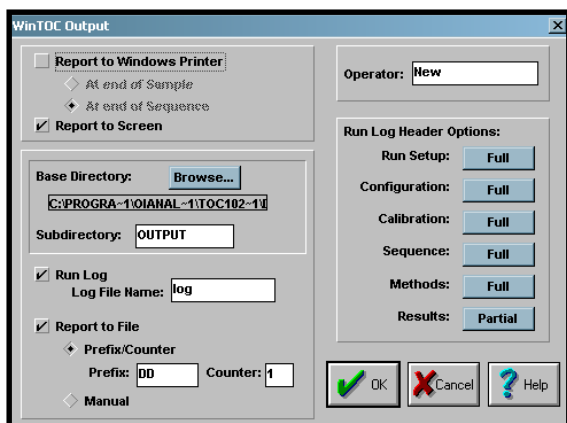
Figure 3.2. WinTOC Output Screen

Report to Windows Printer	Allows the reporting feedback to be automatically sent to the printer attached to the PC that is running WinTOC. The page will print when the sample or the sequence is completed.
Report to Screen	Allows the reporting feedback obtained from each sample replicate to be displayed on the screen for the operator to view.
Base Directory	Allows the operator to change the root directory where the result files and run log are stored.

Subdirectory	Allows the operator to specify the subdirectory or folder where result files for each sequence are stored. If this subdirectory does not exist in the root directory, it will be created at the start of a sequence.
Run Log	Allows the operator to specify that all reporting feedback be directed to a log file. This file is specified by the **Log File Name** field. This run log may be viewed by selecting the **View Run Log** under the **Utilities** menu.
Report to File	Allows the reporting feedback to be saved to a specified data file under a specified subdirectory. The IR data acquired during the sample run is automatically saved with the report and may be analyzed post-run through the TOC Reporter.
Run Log Header Options	Allows the operator to select either full, partial, or no data to be printed under the categories: **Run Setup**, **Configuration**, **Calibration**, **Sequence**, or **Methods**. Partial, tabular, tabular with statistics (Tabular/S), or no data can be selected to print under the **Results** category.

Preferences Screen

The Preferences Screen is accessed from the Status Screen by going to the **Setup** menu and selecting **Preferences**. This screen allows the operator to specify preferences about the operation of the WinTOC software (Figure 3.3). Included in these are the ability to clear the IR display after each sample and set the default number of replicates.
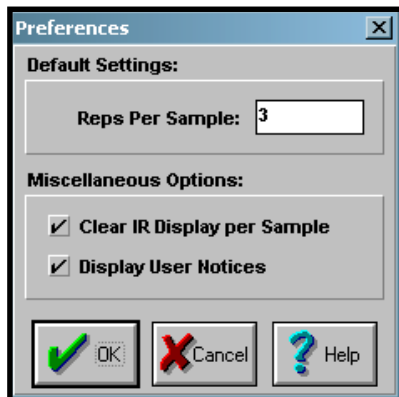
Figure 3.3. Preferences Screen

Reps Per Sample	Used when generating any subsequent sequences. It will be applied to every sample by default when a new sequence is selected or when lines are cleared. The operator may override the defaults when generating the sequence.
Clear IR Display per Sample	When selected, causes the IR graph to be cleared and zeroed following the completion of each sample of a sequence.
Display User Notices	When selected, shows helpful reminders that can be beneficial to the operator.

Settings Screen

The Settings Screen is accessed from the Status Screen by going to the **Instrument** menu and selecting **Settings**. This screen specifies the TOC analyzer output, including the printer and time/date (Figure 3.4).

Attached Printer	Turns on the printer output so that information can be sent to the printer connected to the TOC Analyzer.
Method w/printout	Enables the capability of printing the current method parameters.
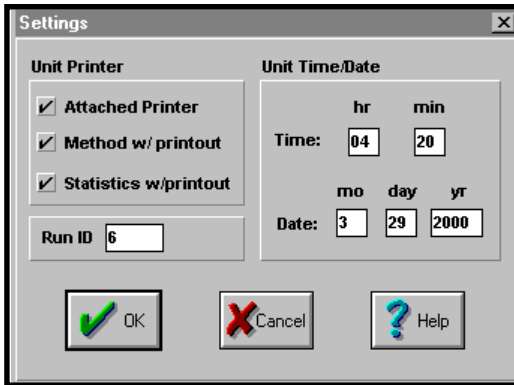
Figure 3.4. Settings Screen

Statistics w/printout	Enables the capability of printing the average and standard deviation of samples and standards.
	Note: All statistics are performed on area counts.
Run ID	This feature is reserved for future expansion.
Unit Time	Displays the current time. This may be edited for correction. When entering time values, it is not necessary to enter a delimiter. Time should be entered on a 24-hour scale.
Unit Date	Displays the current date according to the TOC unit. This may be edited for correction.

Status Screen Menu Descriptions ▬▬
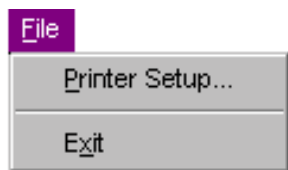
File Menu

Printer Setup allows the operator to select paper source, size and orientation, number of copies, and the printer to be used with WinTOC. (This menu selection does not control the printer attached to the TOC Analyzer. For this option, go to the Settings Screen under the **Instrument** menu.)

Exit closes and exits WinTOC. A warning message will be displayed if WinTOC detects that a sequence may currently be running.

Setup Menu
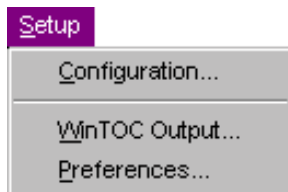
Provides the operator with access to screens to modify the TOC Analyzer configuration, to specify the basic output (at the Windows PC) during sequence runs, and to specify some preferences that can speed up the development of sequences and modify the IR display.

Configuration accesses the Configuration Screen. See "Configuration Screen" in this chapter.

WinTOC Output is used to specify what output is to be generated and saved by WinTOC, in addition to any output being generated on the TOC Analyzer. See "WinTOC Output Screen" in this chapter.

Preferences allows the operator to specify preferences about the operation of the WinTOC software. Included in these are the ability to clear the IR display, set the default number of replicates, and specify the editor for viewing the run log. See "Preferences Screen" in this chapter.

Databases Menu

Provides access to the two critical databases in the WinTOC setup process—the Methods Screen and the Sequences Screen. These databases are maintained from run to run to help standardize operations without manually inputting information.

Methods accesses the Methods Screen. See "Methods Screen" in this chapter.

Sequences accesses the Sequences Screen. See "Sequences Screen" in this chapter.

View Methods allows the operator to view the methods saved. See "Sequences Screen" in this chapter.

View Calibration allows the operator to view the standards saved. See "Sequences Screen" in this chapter.

Instrument Menu
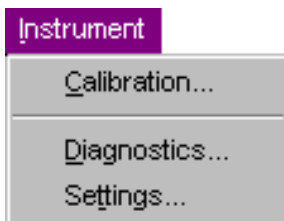
Provides the operator with the capability of directly affecting the operations of the TOC Analyzer. It features the ability to modify the instrument calibration, perform diagnostic functions, and specify instrument parameters used during the sequence.

Calibration accesses the Calibration Screen. See "Calibration Screen" in this chapter.

Diagnostics accesses the Diagnostics Screen. See "Diagnostics Screen" in this chapter.

Settings accesses the Settings Screen. The Settings Screen specifies the TOC Analyzer output, including the printer, alarms, and time/date. See "Settings Screen" in this chapter.

Commands Menu

Consists of four functions that control the analytical progression of the TOC Analyzer and optional autosampler. These functions also can be performed by clicking on the **Start**, **Hold**, **Abort**, and **Spiral Tray** buttons on the Status Screen.

Start Sequence starts a sequence run. This button or menu item is available only when WinTOC is not already running a sequence.

Hold Sequence allows the operator to pause the sequence. To resume the sequence, follow the instructions in the dialog box that appears when **Hold Sequence** is selected.

Abort Sequence allows the operator to abort the sequence. WinTOC will prompt the operator to confirm the abort command. If confirmed, the TOC Analyzer will begin an orderly termination, which may include draining the TOC Analyzer. **Start Pos/Vial #** allows restarting the sequence where it was aborted by entering the vial number.

Spiral Tray assists in loading and unloading samples when using the autosampler. Selecting **Spiral Tray** will cause the autosampler tray to either spiral in or out, depending on its current position. The TOC Analyzer will *not* respond to other commands until the tray has reached the final destination.

Utilities Menu
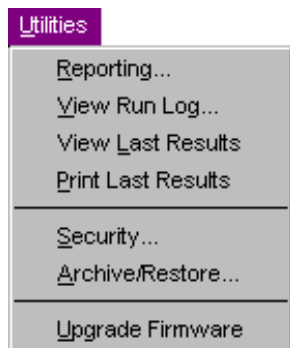
Provides access to utility functions, including reporting and viewing the run log. These options may open separate software programs to complete their tasks.

Reporting accesses the TOC Reporter. See "TOC Reporter" in this chapter for further information.

View Run Log displays the run log (defined in the WinTOC Output Screen), which shows the output reports from the corresponding sequence.

Note: The Run Log Viewer is defined on the Preferences Screen. See "Preferences Screen" in this chapter.

View Last Results displays a summary of the previous sample results. This is the same dialog box that is automatically displayed when **Report to Screen** is selected on the WinTOC Output Screen under the **Setup** menu. The results for the previously run sample are available for viewing until a new sequence is started.

Print Last Results prints a summary of the previous or currently running sample results.

Security provides password-controlled access to the instrumental parameters. When activated, the system will ask for the password at the launch of the program, at the start of the run, or when accessing advanced configuration. Failure to provide the password will result in the termination of the program or run. See "System Security" in Chapter 4.

Archive/Restore allows the operator to back up methods, sequences, and calibrations; and replace existing methods, sequences, and calibrations with archives.

Upgrade Firmware allows the operator to upgrade TOC Firmware. Instructions are displayed on the screen.

Help Menu

Contents opens the Help file and provides access to a list of its contents.

Using Help accesses the Windows "How to Use Help" file.

About provides information such as the WinTOC version number and the TOC firmware version number.

Configuration Screen

The Configuration Screen, accessed from the **Setup** menu, is used to define the run-time configuration of the TOC Analyzer and the Model 1051 Autosampler, if attached (Figure 3.5). Choices are provided for the sample introduction mode, analysis mode, and loop volume to be used. Additional options are provided if an autosampler is specified. Advanced parameters can be accessed, and a loop calibration can be performed.
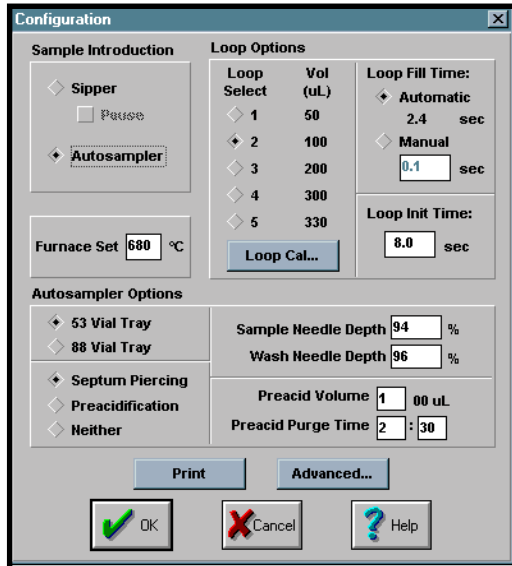
Figure 3.5. Configuration Screen

Sample Introduction Displays the method of sample introduction for the TOC Analyzer. The operator can select the sample introduction mode: **Sipper** or **Autosampler**.

Note: If the autosampler is not electronically interfaced with the TOC Analyzer, an error message will appear. See the *Model 1051 Autosampler Operator's Manual* for more information.

Sipper Allows the samples to be introduced by a sipper tube from a sample bottle. If the TOC Analyzer is performing multiple sample, standard, or check standard analyses, the unit will indicate (via a screen prompt and four beeps) when it is ready for the next sample.

Pause (only for sipper) Allows the operator to hold or pause TOC Analyzer operations after each analysis. When the pause occurs, WinTOC prompts the operator with a dialog box and four beeps to confirm processing of the next sample.

Furnace Set Allows the operator to set the furnace temperature (°C), which the system maintains during analysis and standby.

Autosampler Options Allows the operator to configure the Model 1051 Autosampler. For information on autosampler configuration, refer to the *Model 1051 Autosampler Operator's Manual*.

Loop Select Displays the currently selected (installed) loop volume.

Loop Volume Displays the current volume of the loops defined in the TOC Analyzer. Options for loop volume range between 50 μL and 400 μL.

Loop Fill Time	Allows for automatic or manual fill times to be set for the currently selected loop.
Loop Cal	Accesses the Loop Calibration screen, which allows the operator to choose a loop, calibrate it, and enter the values into WinTOC. No preset volumes exist.
Advanced	Accesses the Advanced Configuration screen, which allows the operator to calibrate the IR and thermocouple, and input the TC blank area counts.

Methods Screen

The Methods Screen, accessed from the **Databases** menu, is used to generate a database of methods, which can be used when defining sequences. Methods cannot be individually uploaded or downloaded to the TOC Analyzer (Figure 3.6).

The operator can open and save methods to help in the process of establishing methods. Methods must be saved in order to run a sequence using that method.
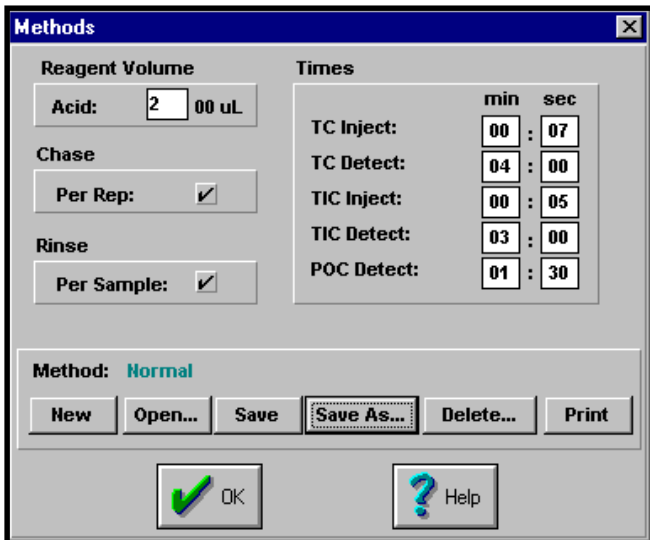

Figure 3.6. Methods Screen

Since the Methods Screen defines parameters related to the run-time operation of the TOC Analyzer, this screen is ghosted once a sequence is started to prevent the overwriting of methods for previously analyzed replicate samples.

Control Buttons	**New**, **Open**, **Save**, **Save As**, and **Delete** buttons are provided to manage the method. A **Print** button is also provided to print the displayed method.
Acid	In the **Reagent Volume** section, **Acid** volume can be set between 0 and 2,000 µL in 100-µL increments. Default is 200 µL.
Chase	The chase flushes the sample lines immediately after a sample injection. This is helpful for sample concentrations above 5 ppm. Default is OFF (unchecked).
Rinse	Rinses can be programmed to occur between samples (per sample). Default is OFF (unchecked).
Times	Allows the operator to set the times used for analysis. **Times** is the total amount of time required to complete a run.
	Note: Consistent times should be used for samples, standards, and check standards to ensure accurate, repeatable analyses.
TC Inject	Allows the operator to set the time that is required to inject the sample from the sample loop into the TC furnace. Default is 00:10.
TC Detect	Allows the operator to set the time that the carbon dioxide from TIC and TOC is released from the sample and detected by the NDIR detector. The range of time is 00:45 to 5:00 min. Default is 03:30.

TIC Inject	Allows the operator to set the time required to inject the sample from the loop into the IC reaction chamber. The range of time is 00:00 to 02:00 min. Default is 00:10.
TIC Detect	Allows the operator to set the time required to convert the TIC to carbon dioxide (using phosphoric acid), purge the carbon dioxide from the sample, and have it detected by the NDIR detector. Default is 03:00.
POC Detect	Allows the operator to set the time required to combust the POC fraction to carbon dioxide and have it detected by the NDIR detector. Default is 02:00.

Sequences Screen ▬▬▬▬▬

The Sequences Screen, accessed through the **Databases** menu, allows the operator to generate a reusable database of sequences that is used to automate the sample testing (Figure 3.7). A sequence is required in order to start any testing. Though this may seem cumbersome when only testing one sample, it is very efficient for testing a series of samples.

The current sequence is shown in the listbox at the top of the screen. All pertinent fields are shown for a quick glance at the samples that are defined. To modify any sample, simply click on that line in the listbox and the corresponding data will be shown in the edit fields below the listbox.
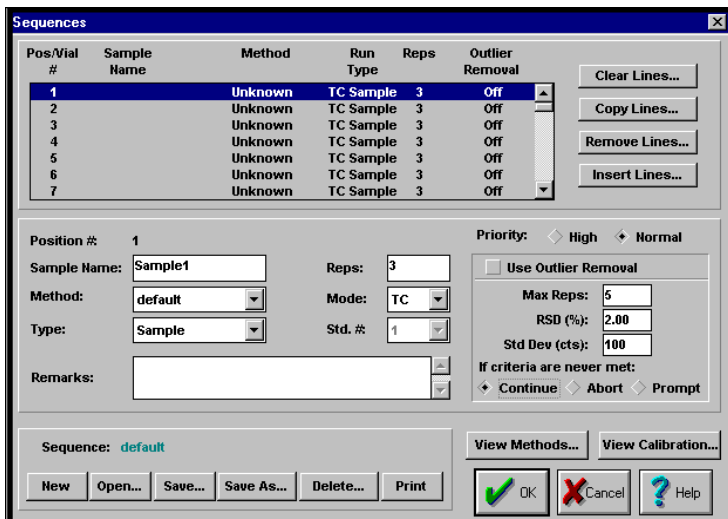
Figure 3.7. Sequences Screen

Position #   The vial position number (**Position #**) serves two purposes. First, it is the mechanism by which the samples are ordered for analysis in a sequence (i.e., **Position 1** will be tested before **Position 2**, etc.). Second, it serves as the vial number when using the optional Model 1051 Autosampler. If a sample is placed in **Position 10** in the autosampler tray, the operator must define the sample information for that sample in **Position 10**. There are a maximum of 88 positions available in any one sequence—enough to support the 88-position autosampler tray.

Note: It is *not* possible to run autosampler vials in a nonsequential fashion. That is, vials cannot be sequenced as 3, 8, 1—the sequence must be 1, 3, 8. It *is* possible to skip and prioritize vials in ascending order.

Sample Name   Allows the operator to define a label for the sample. The maximum number of characters is 15.

Method	Allows a predefined method to be selected for the sample. This list shows only those methods that are defined in the methods database. To add other methods to the list, use the Methods Screen. The default for the **Method** field is **Unknown**, which means that the sample is not defined and will not be used in the sequence.
Type	Defines the type of analysis to be performed (standard, sample, or check standard). Once the run type has been selected, the quantity of runs and replicates can be entered.
Reps	Allows the operator to enter the number of replicates to be analyzed.
Mode	Defines the mode of analysis for the standard or check standard as TC, TIC, or POC and defines the mode of analysis for samples as TOC, TIC, POC, or TC.
Std. #	Correlates to the defined standard in the calibration file.
Remarks	Allows the operator to add comments about the sample being tested.
Control Buttons	**New**, **Open**, **Save**, **Save As**, and **Delete** buttons are provided to manage the sequences. The sequence name specified when exiting the screen will become the current sequence for testing. A **Print** button is also provided to print the displayed sequence.
Priority	Indicates that a sample is high or normal priority. All high priority samples are run before any normal priority samples.

Use Outlier Removal   Allows the operator to select the relative standard deviation and the standard deviation of the area for outlier recognition. One of these conditions must be met for the replicates to be accepted. If neither condition is met and **Max Reps** is set to a number greater than **Reps**, the sample will be reanalyzed to remove the outlier. After each additional replicate, the results are compared. The process is repeated until one of the conditions is met or the maximum number of replicates has been reached.

Note: The value for **Max Reps** will always be greater than or equal to **Reps**. Both fields can be set between 0 and 15.

The operator can set the software to **Continue**, **Abort**, or **Prompt** if the maximum number of replicates is reached and the criteria have not been met.

Clear Lines   Accesses the Clear Lines Box, which is used to reset sample lines in the sequence to defaults. This means that **Sample Name** is cleared, **TOC Method** is set to **Unknown**, and the other fields are set to defaults.

Copy Lines   Accesses the Copy Lines Box, which is used to speed up the sequence generation process when multiple samples are the same or similar. It is possible to copy groups of lines or samples.

View Methods	The **View Methods** button displays all the defined methods that were created from the Methods Screen along with their associated volumes, rinses information, and times.
View Calibration	Displays the calibration standards that are defined for the current calibration. This calibration is created by using standards as the **Type** in sequencing.
	The five standards for each mode (TC, POC, and TIC) that have been defined and their concentration, volume, and status will be displayed. The status indicates whether they are currently being used in the calculation of the response factor.

Calibration Screen ▬▬▬▬▬▬▬▬

The Calibration Screen, accessed through the **Instrument** menu, is used to define the concentrations of the inorganic and organic calibration standards (Figure 3.8). Up to five standards may be entered and selected for each analysis mode: TIC, POC, and TC.

| **"Use" Checkboxes**	Allows the operator to adjust the response factor (RF) by selecting which standards are to be used in the calculation. The response factor is automatically recalculated.
Volume (µL)	Shows the current loop volume or the volume at which the standard had been run.
Area Counts per Rep	Shows the area counts per replicate in the corresponding listbox once the calibration is performed. A response factor will be calculated.
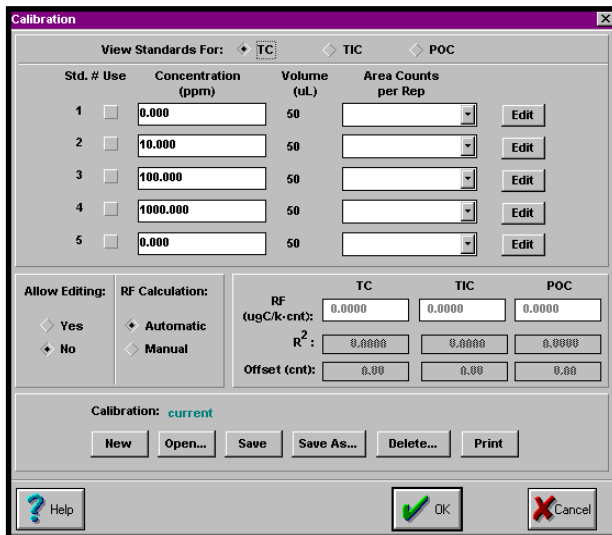
Figure 3.8. Calibration Screen

Allow Editing	Allows the concentration to be edited in the event that a data entry error occurs. Allows access to the **Edit** buttons.
RF Calculation	Specifies if the response factor is to be calculated automatically or set manually.
RF, **R²**, and **Offset**	Displays parameters showing the characteristics of the calibration for the TC, POC, and TIC modes.
Control Buttons	**New**, **Open**, **Save**, **Save As**, and **Delete** buttons are provided to manage the calibrations. A **Print** button is also provided to print the calibrations.

Diagnostics Screen

The Diagnostics Screen, accessed through the **Instrument** menu, is used to manually operate individual mechanisms of the TOC Analyzer (Figure 3.9). It is also helpful when troubleshooting the instrument.
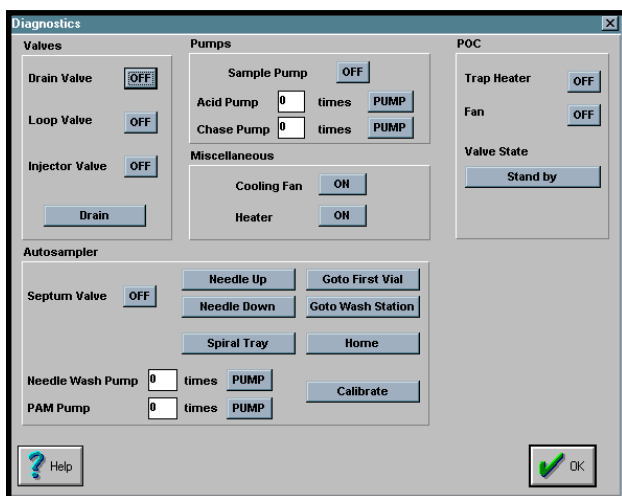

Figure 3.9. Diagnostics Screen

Valves	Allows the operator to manually control the TOC Analyzer to check its functionality and to troubleshoot. Valve actuation is changed by toggling the valves **ON** and **OFF**.
Drain	Provides an untimed drain of the system. To activate and deactivate manual drain, click on the **Drain** button.
Pumps	Allows the operator to prime the acid and chase pumps by entering the quantity of times the pumps are to be activated. The range is 1 to 99. The sample pump can also be activated or deactivated.
POC	Allows the operator to manually activate the trap heater, cooling fan, and valve.

| **Miscellaneous** | Allows the operator to activate or deactivate the cooling fan and the heater. |

| **Autosampler** | The **Autosampler** section controls the functions of the autosampler. The **Septum Valve** can be activated and deactivated by clicking on the **ON** and **OFF** buttons. The **Needle Up**, **Needle Down**, **Spiral Tray**, **Goto First Vial**, **Goto Wash Station**, **Home**, **Needle Wash Pump**, **PAM Pump**, and **Calibrate** can also be activated and deactivated by clicking on the appropriate buttons. See the *Model 1051 Autosampler Operator's Manual* for additional information. |

TOC Reporter ▬▬▬▬▬▬▬▬

The TOC Reporter, accessed through **Reporting** in the **Utilities** menu, is a multipurpose reporting tool used for data obtained from the Model 1010, Model 1020A, and Solids TOC Analyzer (Figure 3.10).

This program allows for data viewing, analysis, report generation, and recalibration. The menus available in TOC Reporter are described below.
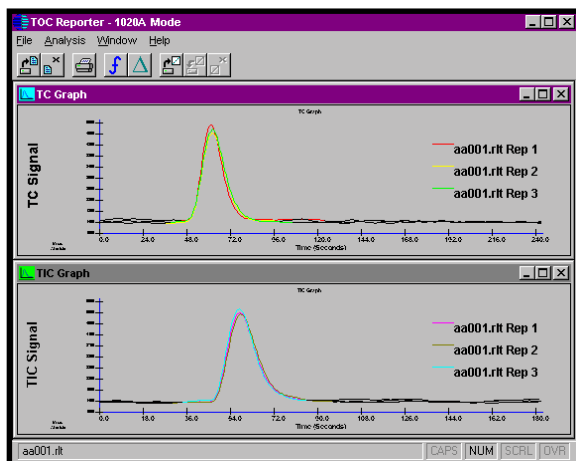

Figure 3.10. TOC Reporter Screen

File Menu

Open allows the operator to select WinTOC data files to load for viewing and modification. Files can be printed and modified but not resaved. Curve labels are displayed in the order of selection and/or loading. This function is also accessed by clicking on .

Note: Only 15 files may be open simultaneously. Each file corresponds to one sample.

Close allows the operator to select WinTOC data files to unload from memory. (All changes are lost.) This function is also accessed by clicking on .

Print brings up a **Print** dialog box with the currently active graph window selected by default. The operator may print one or all of the graphs. This function is also accessed by clicking on .

Print Setup allows the operator to set printing options, including the default printer. Print settings may need to be changed each time the operator opens the program.

Preferences accesses the TOC Reporter Preference Screen. This screen allows the operator to modify the appearance of the active graph window in the TOC Reporter.

The TOC Reporter Preferences Screen is also accessed by clicking on .

Exit closes the TOC Reporter. Upon exiting the TOC Reporter, no settings will be saved.

Analysis Menu
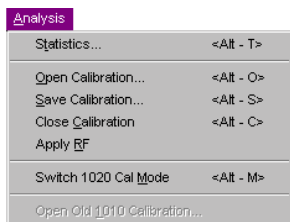
Statistics accesses the **Statistics Screen**, which allows the operator to view areas, mass, and concentration values; to print modified statistics; and to export data. This function is also accessed by clicking on .

Open Calibration loads a calibration file and allows the operator to graphically evaluate outliers for acceptance. This function is also accessed by clicking on .

Save Calibration saves the calibration, either overwriting the existing calibration or saving to a new name. This function is also accessed by clicking on .

Close Calibration closes the existing calibration. This function is also accessed by clicking on .

Apply RF applies the response factor of the current calibration to all open files.

Switch 1020 Cal Mode toggles between the view of the TC, TIC, or POC calibration mode.

Window Menu
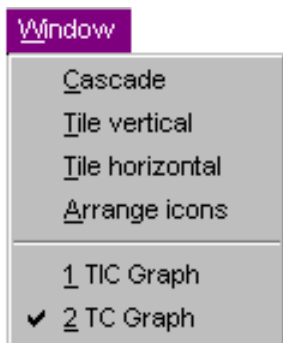
The **Window** menu in the TOC Reporter contains commands that change the appearance of the graph windows. **Cascade**, **Tile Horizontal**, **Tile Vertical**, and **Arrange Icons** affect the size and placement of the graph windows. The TIC, TC, POC, and calibration graph windows can be activated using the **Window** menu by selecting **TIC Graph**, **TC Graph**, **POC Graph**, or **Calibration**.

Toolbar Buttons

Open Data Files

Accesses the **Open Files** dialog box. To open data files, select the files to be opened. The associated graphs will be displayed. When more than one file is open, the data is overlaid to allow comparison of data among files.

Close Data Files

Accesses the **Close** dialog box. To close files, select from the list of open data files in the **Close** dialog box.

Print Peak and/or Calibration Charts

Allows the operator to print peaks or calibration charts recorded.

View Statistics

Accesses the Statistics Screen, which allows the operator to view areas, mass, and concentration values; print modified statistics; and export data.

Change Preferences on Currently Selected Window

Accesses the TOC Reporter Preferences Screen, which allows the operator to modify the appearance of the active graph window.

Open Calibration File

Accesses the **Select Calibration** dialog box.

Save Calibration

Accesses the **Enter Calibration** dialog box where the calibration points from the open calibration file can be saved to a new file.

Close Calibration

Closes the existing calibration.

Notes

Chapter 4
Operation

The OI Analytical Model 1020A TOC Analyzer can be controlled from the keyboard using the firmware provided or from a host computer using the WinTOC software. This chapter outlines the procedures for the operation of the TOC Analyzer using WinTOC. For a complete list of WinTOC commands and a detailed description of the WinTOC screens, refer to Chapter 3, "Introduction to WinTOC." To access additional on-line information, click on the **Help** menu in WinTOC screens or the **Help** button in dialog boxes.

For ease-of-operation, it is recommended that the TOC Analyzer remain on with carrier gas flowing at all times. If the TOC Analyzer is not used on a daily basis, it can be turned off and restarted as required; however, stabilization of the electronics and detector require a 20- to 30-minute warm-up period each time the instrument is powered up.

Note: Operation of the keyboard and monitor while using WinTOC may cause the system to fail. Use WinTOC *or* the keyboard and monitor but not both.

Note: WinTOC is designed to run under Microsoft Windows version 3.1 or later. For information on how to use Microsoft Windows, refer to the appropriate Windows documentation.

Theory of Operation ■■■■■

The OI Analytical Model 1020A TOC Analyzer calculates total organic carbon content from the difference between measured total carbon and measured inorganic carbon. The instrument can be operated in TC, TIC, TOC, or POC mode. Before operation, it is important to develop both the TC and inorganic carbon (IC) calibration curves. Each measured analysis has a react and a detect time that is set to a default parameter for general analysis but can be optimized for specific analytical conditions. The TOC Analyzer will first perform replicate analyses of TC, then replicate analyses of TIC. The TOC concentration is calculated using the average of each value.

Equations 4.1–4.3 are used to calculate the mass and carbon concentrations in samples and check standards:

EQUATION 4.1

$$\text{Sample Mass (µgC)} = (\text{Area Counts} - \text{TC Blank}) \times \boxed{\frac{RF}{1000}}$$

EQUATION 4.2

$$\text{Check Standard Mass (µgC)} = (\text{Area Counts} - \text{Offset Area}) \times \boxed{\frac{RF}{1000}}$$

EQUATION 4.3

$$\text{Carbon Concentration (ppmC)} = \boxed{\frac{\text{Mass (µgC)} \times 1000}{\text{Sample Volume (µL)}}}$$


Sample Introduction

The sample is introduced into the TOC Analyzer through a fixed volume sample loop to ensure reproducible replicates. The loop can be filled either from the sipper tube or from the autosampler. Following sample introduction, the analysis for TC, TIC, or POC begins.

Total Carbon (TC) Analysis

TC analysis consists of a two-step process: TC Inject and TC Detect. During the TC Inject stage, the sample is transferred from the sample loop to the furnace, where all of the carbon is combusted to form carbon dioxide. The flow upset generated by the expansion of water from liquid to gas phase is allowed to return to a constant flow rate by means of an expansion tube prior to detection of the carbon dioxide by the NDIR detector. The carbon dioxide is transferred to the detector through a permeation tube to remove all of the water from the sample. Carbon dioxide is then measured by the detector during the TC Detect stage and is vented to the atmosphere.

Total Inorganic Carbon (TIC) Analysis

TIC analysis consists of a two-step process: TIC Inject and TIC Detect. During the TIC Inject stage, the sample is transferred from the sample loop to the IC reaction chamber, where the sample is acidified with phosphoric acid (H_3PO_4). Acidification of the sample shifts the chemical equilibrium toward the production of carbon dioxide:

$$CO_3^{2-} (aq) + H^+ \leftrightarrow HCO_3^- (aq)$$
$$HCO_3^- + H^+ \leftrightarrow H_2O + CO_2 (g)$$
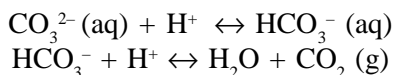
During the TIC Detect stage, the inorganic carbon dioxide is purged from the sample and transferred to the NDIR detector where it is detected and then vented to the atmosphere.

Total Organic Carbon (TOC) Analysis

TOC values are obtained by subtracting the average TIC value from the average TC value (see Equation 4.4).

EQUATION 4.4

$$TOC = TC - TIC$$

Purgeable Organic Carbon (POC) Analysis

The sample is transferred from the sample loop to the IC reaction chamber, where the sample is acidified with phosphoric acid (H_3PO_4). Acidification of the sample releases the inorganic carbon in the form of carbon dioxide. The POC fraction of the sample and the inorganic carbon dioxide are transferred to the POC Module, where the POC fraction is collected on the trap. The inorganic carbon dioxide is not trapped and continues to the NDIR detector, where TIC is detected (see "Total Inorganic Carbon (TIC) Analysis" in this chapter). The trap is then heated, releasing the POC fraction. The POC is then transferred to the furnace, where all the carbon is combusted to carbon dioxide. This carbon dioxide fraction is transferred to the NDIR detector through a permeation tube to remove all of the water from the sample. The carbon dioxide is then measured by the detector during the POC Detect stage and is vented to the atmosphere.

Waste Drain

At the waste drain stage, the carbon from the sample and the water vapor from the TC mode is vented to the atmosphere. The system will drain the residual water from the IC reaction chamber and perform any rinses mandated in the sequence.

Operational Parameters ▬▬▬

The OI Analytical Model 1020A TOC Analyzer initiates using a default method of parameters for analysis at 680°C using a platinum catalyst bed in the reaction chamber. These settings are summarized in Table 4.1.

Table 4.1. Default Operational Parameters

Parameter	Default Setting
Sample Mode	TC
Standard Mode	TC
TC Inject	0:10
TC Detect	3:30
TIC Inject	0:10
TIC Detect	3:00
POC Detect	2:00
Sample ID	000
Sample Introduction	Sipper
Furnace Temperature	680°C
Sample Volume	100 μL
Acid Volume	200 μL
Rinse per Sample	OFF
Chase per Rep	OFF

These settings can be modified for samples that are difficult to oxidize through the Methods Screen. For more information, see "Methods Screen" in Chapter 3.

The first step for the operation of the TOC Analyzer is setting up the software preferences and settings. The next step is the development of a calibration curve. The analyzer default settings are for a standard curve with TC standards of 1, 10, 100, 500, and 1,000 ppm; however, other concentrations can be used by the operator.

Starting Up the Model 1020A ▬▬▬

1. Install WinTOC as described in Chapter 2, "Installation."

2. Turn on the power switch on the back panel of the Model 1020A.

3. During the TOC Analyzer's boot-up, a series of audible beeps will indicate the status of the instrument (see Table 4.2).

Table 4.2. Status Indicators

Signal	Indicates
1 beep	System start-up
2 beeps	CMOS check passed
3 beeps	Firmware ready (start WinTOC communication)

Starting WinTOC ▬▬▬

1. Double-click on the WinTOC icon or select WinTOC from the Windows Start menu.

2. Select the WinTOC system that will be used. Click on **Start**. If WinTOC is not configured, see "Configuration" in Chapter 2.

3. If password protection is enabled for program start-up, enter the password and click on **OK**. For more information on password protection, see "System Security" in this chapter.

System Security ▬

System security is provided to reduce unauthorized access or use of WinTOC. It provides simple, password-protected access to the software and some of its features.

Password protection is accomplished using a single, operator-specified password that can be used to validate starting WinTOC, starting a run, and accessing advanced configuration. A password is **always** required to access the Security window.

If the system password is lost, contact OI Analytical Technical Support at (800) 336-1911 or (979) 690-1711.

1. From the Status Screen, go to the **Utilities** menu and select **Security**. The Password dialog box will appear (Figure 4.1).

2. Type in the password and click on **OK**. This will access the Security window (Figure 4.2). **For a new installation or after an upgrade, the password is defaulted to "WinTOC".**
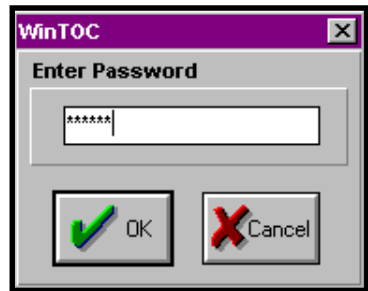

Figure 4.1. Password Dialog Box

Note: The system password is case sensitive.

Figure 4.2. Security Window

3. Enable or disable the Security Options by clicking on their corresponding boxes.

   • If **Check Password at Launch** is enabled, the operator will be prompted for a password each time WinTOC is started in the on-line mode. The Status Screen will not be accessible until the correct password is entered. This does not prevent starting WinTOC off-line.

   • If **Check Password at Start Run** is enabled, the operator will be prompted for a password each time a run is prompted to start.

   • If **Check Password at Advanced Configuration** is enabled, the operator will be prompted for a password when clicking on the **Advanced** button in the Configuration Screen.

Changing the System Password

1. From the Security window, click on the **Change Password** button.

2. Enter in the new password, and click on **OK**.

3. Confirm the new password by reentering it, and click on **OK**.

If an error occurs while entering in the new password, click on **Cancel** to exit without changing the password.

Defining Sample Loop Size ▬▬▬▬

Prior to operation, the sample loop size must be defined in the WinTOC software.

1. Go to the **Setup** menu and select **Configuration**. This will access the Configuration Screen. Click on **Loop Cal**. This will access the Loop Calibration Screen (Figure 4.3).

2. Click on the **Actual Loop Volumes** field.

3. Enter the loop values previously recorded from the sample loops during installation (see Chapter 3, "Installation," in the *Model 1020A Operator's Manual*). Click on **OK** after all the values are entered.

> **Example:** For 53-µL, 91-µL, and 202-µL loops, type:
>
> 53 [Tab]
> 91 [Tab]
> 202 [Tab]
> Click on **OK**.
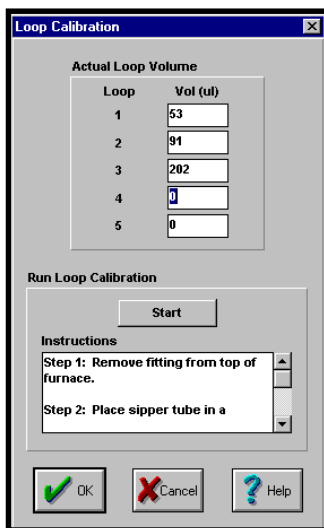
Figure 4.3. Loop Calibration Screen

Defining the Configuration ▬▬▬

Before operation, the operational parameters of the TOC Analyzer must be defined and saved.

Preferences

The Preferences Screen is used to specify WinTOC operation preferences. For a description of the Preferences Screen options, see "Preferences Screen" in Chapter 3.

1. From the Status Screen, go to the **Setup** menu and select **Preferences**. This will access the Preferences Screen (Figure 4.4).

Figure 4.4. Preferences Screen

2. Enter in the number of **Reps Per Sample**.

3. Enable/disable the **Miscellaneous Options**.

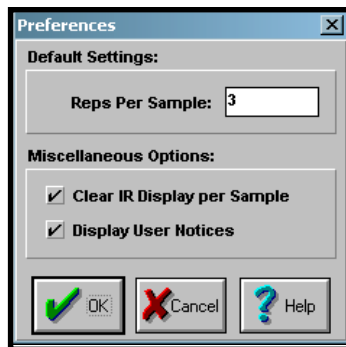4. Click on **OK** to save the preferences and exit the Preferences Screen. To exit the screen without saving the changes, click on **Cancel**.

Output Settings

The WinTOC Output Screen is used to specify what output is generated and saved in WinTOC. The Settings Screen is used to specify TOC Analyzer output. For a description of the WinTOC Output Screen and Settings Screen options, see "WinTOC Output Screen" and "Settings Screen" in Chapter 3.

1. From the Status Screen, go to the **Setup** menu and select **WinTOC Output**. This will access the WinTOC Output Screen (Figure 4.5).
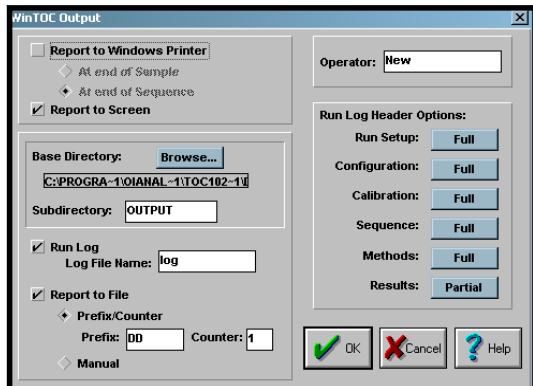

Figure 4.5. WinTOC Output Screen

2. Select if the report should be sent to the printer and/or the screen.

3. Select whether or not to save the report to a log file. If **Run Log** is selected, select the **Run Log Header Options**.

4. Click on **OK** to save the output settings and exit the WinTOC Output Screen. To exit the screen without saving the changes, click on **Cancel**.

5. From the Status Screen, go to the **Instrument** menu and select **Settings**. This will access the Settings Screen.

6. Select the **Unit Printer** options.

7. Verify that the **Unit Time/Date** is correct. If incorrect, enter in the correct time/date.

8. Click on **OK** to save the settings and exit the Settings Screen. To exit the screen without saving the changes, click on **Cancel**.

Setting up the Printer ■■■■■■■

1. From the Status Screen, go to the **File** menu and select **Printer Setup**.

2. Enter the requested information, including paper source, size, and orientation.

3. Click on **OK**.

Calibrating the Autosampler ■■■■■■

If using a Model 1051 Autosampler, the autosampler carousel home position must be calibrated so that each vial is centered directly below the needle assembly. The carousel home position for the Model 1051 Autosampler must be set when:

• the Autosampler is used for the first time;
• the carousel tray is changed; or
• the Autosampler does not perform correctly.

Setting the home position will ensure that the needle consistently lines up with the center of each vial during programmed analyses and prevents needle damage and analysis errors.

From WinTOC, calibrate the Autosampler as follows:

1. Verify that the TOC Analyzer and the Autosampler are not running.

2. Remove the carousel cover and place an open vial (without septum) in Position 1.

3. Replace the carousel cover.

4. Go to the **Instrument** menu and select **Diagnostics**. This will access the Diagnostics Screen.

5. Click on the **Home** button to rotate the carousel to the home position.

6. Center the needle above the vial by manually moving the platter under the carousel (see Figure 4.6).

7. Click on the **Calibrate** button to set the new position.

8. Use the **Needle Up** and **Needle Down** buttons to verify the calibration. (Adjust **Needle Down** to 15% to observe the needle position relative to the vial's center.)

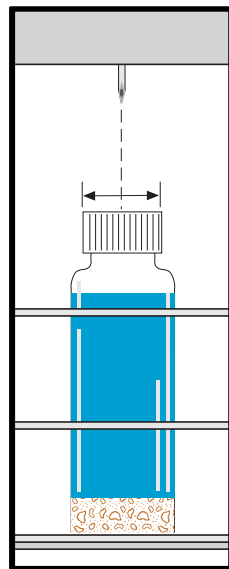9. When calibration is complete, click on **OK**.

Figure 4.6. Needle Alignment

Calibrating the TOC Analyzer ▬▬▬

A calibration curve must be developed. The analyzer default settings are for a standard curve with TC standards of 1, 10, 100, 500, and 1,000 ppm; however, other concentrations can be used.

Note: TC standards can be prepared using dried potassium hydrogen phthalate (KHP) in reagent water. The default is analyzed in TC mode only because of the negligible content of inorganic carbon in KHP. Since the NDIR detector is selective to carbon dioxide, the introduction of carbon to the analyzer may be organic, inorganic, or a combination of the two. Organic KHP is recommended for ease-of-use.

Setting Standard Concentrations

1. From the Status Screen, go to the **Instrument** menu and select **Calibration**. This will access the Calibration Screen.

2. Modify the existing concentration's information, click on the **New** button for a new calibration file, or click on the **Open** button to open an existing calibration file.

3. Select the **Calibration Mode**. Click on **TC**, **TIC**, or **POC**.

4. Modify the standard concentration values in the **Concentration (ppm)** listbox.

5. Select the other mode (**TC**, **TIC**, or **POC**) and repeat step 4.

6. Click on **Save** or **Save As** to save the new calibration information.

7. Click on the **OK** button to exit calibration.

Running a Calibration Sequence

Separate TIC, TC, and POC calibration curves must be constructed prior to instrument operation. This can be done in the same sequence; however, it is important to analyze TC standards, TIC standards, and POC standards separately.

1. From the Status Screen, go to the **Databases** menu and select **Sequences**. This will access the Sequences Screen (Figure 4.7).
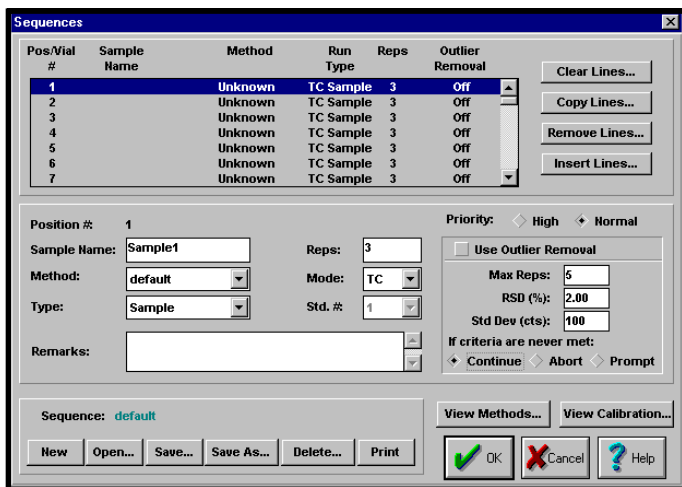

Figure 4.7. Sequences Screen

2. Under **Position #1**, enter the **Sample Name**.

3. Select the **Method** name from the listbox for that field.

Note: If the **Method** name is **Unknown**, that position is *not* analyzed.

4. Select the **Type** of analysis as Standard, Check Standard, or Sample.

5. Enter the number of **Reps**.

6. Select the **Mode** as TC , TIC, or POC.

7. Enter the **Standard Number** that corresponds with the desired concentration in the calibration table.

8. Repeat steps 2–7 until all standards to be analyzed are entered into the sequence.

9. Click on **Save** or **Save As** to save the sequence.

10. Click on the **OK** button to return to the Status Screen.

Note: If the sequence is not saved, it cannot be run.

11. Click on the **Start** button in the Status Screen to run the sequence.

Note: The response factor for an acceptable calibration should be in the range of 0.13–0.21 µgC/k counts.

Running Check Standards

Running check standards allows the operator to run a known standard to verify the calibration of the TOC Analyzer without affecting the calibration. Check standards values will have the calibration offset value subtracted. Check standards are the same standards used to generate the calibration curve. For low-level samples, use reagent water for the check standard.

1. From the Status Screen, go to the **Databases** menu and select **Sequences**. This will access the Sequences Screen (Figure 4.7).

2. For **Position #1**, enter the **Sample Name**.

3. Select the **Method** name from the listbox for that field.

Note: If the **Method** name is **Unknown**, that position will *not* be analyzed.

4. Under **Type**, choose **Check Standard**.

5. Enter the number of **Reps**.

6. Select the **Mode** (TC, TIC, or POC) and **Std #** (corresponding to the same **Std #** in the calibration curve).

7. Repeat the steps 2–6 until all standards to be analyzed are entered into the sequence.

8. Click on **Save** or **Save As** to save the sequence.

9. Click on the **OK** button to return to the Status Screen.

Note: If the sequence is not saved, it cannot be run.

10. From the Status Screen, click on the **Start** button to run the sequence.

Determining a TC Blank Value ▬▬▬▬

The following procedure is used to establish a TC blank value. It is recommended that a new blank value be determined each time the instrument is calibrated. In order to obtain the most accurate and representative value of the background carbon level, the use of ASTM Type I water or its equivalent is recommended.

1. In the WinTOC Status Screen, check the sample loop size used and ensure that it is the size that will subsequently be used in calibration and sample analysis.

2. From the Status Screen, go to the **Setup** menu and select **Configuration**.

3. Select **Sipper** to put the instrument in the Sipper mode.

4. Fill a clean vessel with reagent water and cover with Parafilm® to prevent absorption of carbon dioxide from the atmosphere.

5. From the Status Screen, go to the **Databases** menu and select **Sequences**. This will access the Sequences Screen (Figure 4.7).

6. For **Position #1**, enter the **Sample Name**, for example, "TC Blank." Select the **Method** of analysis from the listbox.

7. For **Type**, choose **Sample**.

8. Enter the number of **Reps** to be analyzed. TC blanks can usually be determined within 5–10 reps.

9. For **Mode**, select **TC**.

10. Click on **Save** or **Save As** to save the sequence.

Note: If the sequence is not saved, it cannot be run.

11. Click on the **OK** button to return to the Status Screen.

12. Click on the **Start** button to run the sequence.

13. At the end of the sequence, determine if the blank area counts have stabilized. A difference of <40–50 area counts is usually sufficient. If the baseline is not stable, repeat steps 5–12.

14. When the area counts have stabilized, average the last 3–5 values to obtain the TC blank value.

15. From the Status Screen, go to the **Setup** menu and select **Configuration**. Click on **Advanced**.

16. In the Advanced Configuration screen, enter the TC blank value determined in step 14. The acceptable range of values is from 1–2,500. Blank values >1,000 will elicit a warning message indicating possible decreased catalyst performance.

17. Click **OK** to return to the Configuration Screen.

18. Click **OK** to return to the Status Screen.

Creating a Sequence

In order to run the TOC Analyzer, a sequence must be defined and saved.

1. From the Status Screen, go to the **Databases** menu and select **Sequences**. This will access the Sequences Screen (Figure 4.7).

2. To define a new sequence, click on **New**. This will reset the sequence values. If a sequence has already been loaded, a dialog box will appear asking whether or not to save the sequence.

3. To open a previously saved sequence, click on **Open**. Select the desired sequence and click on **OK**. This will load the selected sequence to the Sequences Screen.

4. For **Position #1**, enter the **Sample Name** and choose the **Method** of analysis. The **default** method is optimized for most analyses. For more information, see "Methods Screen" in Chapter 3.

Note: If the **Method** name is **unknown**, that position will *not* be analyzed.

5. Select **Type**.

6. Enter the number of **Reps** to be analyzed.

7. Select the **Mode**.

8. Repeat steps 4–6 until all samples to be analyzed are entered in the sequence. The **Clear Lines**, **Copy Lines**, **Remove Lines**, and **Insert Lines** buttons can be used to simplify creating the sequence.

Clear Lines

The **Clear Lines** button is used to reset sample lines in the sequence to default. This means that the **Sample Name** is cleared, the **Method** is set to **unknown**, and the other fields are set to default.

To clear lines, specify the line start and end lines in their respective **From** and **To** fields. For example, to clear lines 3 through 6, enter "3" in the **"From**" field and "6" in the "**To**" field (see Figure 4.8).
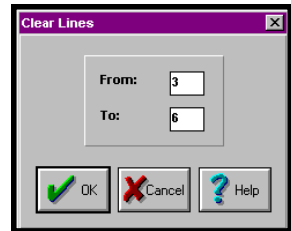
Figure 4.8. Clear Lines

Copy Lines

The **Copy Lines** button is used to speed up the sequence generation process when multiple samples are the same or similar. It is possible to copy groups of lines or samples.

To copy lines, specify the **Source** start and end lines in their respective **From** and **To** fields. Specify the **Destination** start and end lines in their respective **From** and **To** fields. For example, to copy lines 2 through 4 to lines 5 through 7, enter "2" and "4" in the **Source From** and To fields and "5" and "7" in the **Destination From** and **To** fields (see Figure 4.9).
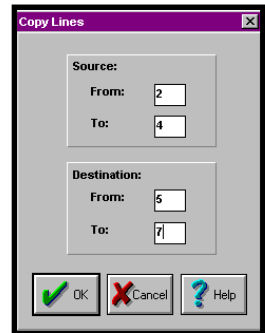
Figure 4.9. Copy Lines

Remove Lines and Insert Lines

The **Remove Lines** and **Insert Lines** allows the operator to insert or remove a specified number of lines from a particular place in the sequence.

9. Select **Use Outlier Removal** to automatically verify the relative standard deviation (RSD) or the standard deviation as less than the required percentage. If both values are higher and **Max Reps** is set greater than **Reps**, another analysis will be performed and the values compared again. The operator can select what action should occur (continue, abort, or prompt) if the values do not fall below the required percentage before the maximum number of replicates has run.

10. Click on **Save** or **Save As** to save the sequence. If the sequence is not saved, it cannot be run.

11. Click on the **OK** button to return to the Status Screen.

Sequence Example

The following is an example of the steps used to prepare a four-point calibration sequence of 1, 10, 50, and 100 ppm TC and then to run five samples in triplicate, a 50-ppm check standard in duplicate, and three more samples in triplicate. When using an autosampler, the carousel home position must first be calibrated (see "Calibrating the Autosampler" in this chapter).

1. From the Status Screen, go to the **Databases** menu and select **Sequences**. This will access the Sequences Screen.

2. a. Name the 1.00 ppm standard.
    - *Highlight Position 1 under **Pos/Vial #** by clicking in that row.*
    - *In the **Sample Name** field, type "1 ppm std" and press [Tab].*

    b. Set the method to default.
    - *Select "default" from the **Method** pull-down menu and press [Tab].*

    c. Identify this as a Standard.
    - *Select "Std." from the **Type** pull-down menu and press [Tab].*

d. Set the number of replicates to 3.
   • *Type "3" under Reps.*

e. Set the mode to TC.
   • *Select "TC" from the Mode pull-down menu.*

3. a. Enter the 10.00 ppm standard.
   • *Highlight Position 2 under Pos/Vial # by clicking in that row.*
   • *In the Sample Name field, type "10 ppm std" and press [Tab].*

   b. Set the method to default.
   • *Select "default" from the pull-down menu for Method and press [Tab].*

   c. Identify this as a Standard.
   • *Select "Std." from the Type pull-down menu and press [Tab].*

   d. Set the number of replicates to 3.
   • *Type "3" under Reps.*

   e. Set the mode to TC.
   • *Select "TC" from the Mode pull-down menu.*

   f. Identify this as standard 2.
   • *Select "2" from the Std.# pull-down menu.*

4. Repeat step 3 for the 50 ppm standard in Position 3.
   • *Type "50 ppm std" [Tab] [default] [Tab] [Std.] [Tab] [3].*
   • *Select "3" from the Std.# pull-down menu.*

5. Repeat step 3 for the 100 ppm standard in Position 4.
   • *Type "100 ppm std" [Tab] [default] [Tab] [Std.] [Tab] [3].*
   • *Select "4" from the Std.# pull-down menu.*

6. Set up the first of the five samples to be run in Position 5.
   • *Highlight Position 5 under Pos/Vial # and type "Sample" [Tab] [default] [Tab] [Sample] [Tab] [3].*

7. Copy the sample setup in step 6 and paste it into Positions 6, 7, 8, and 9.
   - *Click on the **Copy Lines...** button to access that screen.*
   - *Starting in the **Source From** field, type [5] [Tab] [5] [Tab] [6] [Tab] [9] [Enter].*

8. Enter the 50 ppm check standard to be run in duplicate.
   - *Highlight Position 10 under **Pos/Vial #** and type "50 ppm check" [Tab] [default] [Tab] [Chk.] [Tab] [2] [Enter].*
   - *Select "4" from the **Std.#** pull-down menu.*

9. Enter the final three samples to be run in triplicate.
   - *Click on the **Copy Lines...** button to access that screen.*
   - *Starting in the **Source From** field, type [5] [Tab] [5] [Tab] [11] [Tab] [13] [Enter].*

10. Name and save the sequence.
    - *Click on **Save As** and type "Samples" in the highlighted field.*
    - *Click on **OK** to close the dialog box.*

The sequence should look similar to the one in Figure 4.10.
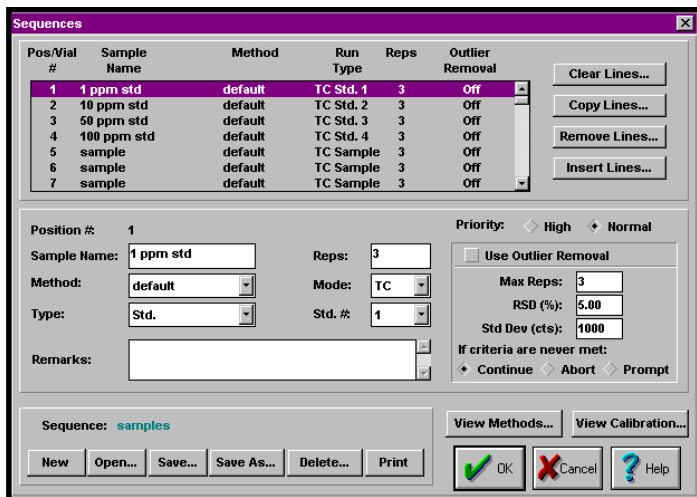

Figure 4.10. Sequence Screen Example

Printing a Sequence

- To print the current sequence, click on the **Print** button. Select the destination, number of copies, etc. Click on **OK**.

The sequence file will be sent to the destination specified in the print screen. See "Setting up the Printer" in this chapter.

Running a Sequence ▅▅▅▅▅▅▅

Running samples allows the operator to analyze an unknown and compare its response to known standard values. A sequence must be created before samples can be run. See "Creating a Sequence" in this chapter.

Starting a Sequence

1. If using a sipper, go to the **Setup** menu and select **Configuration** to access the Configuration Screen. Select **Sipper** and **Pause**. This will cause the system to give an alert when it is time to change the bottle. Click on **OK**. Place the sipper tube into the first vial.

2. Start the sequence by doing one of the following:

   - From the Status Screen, go to the **Commands** menu and select **Start Sequence**.

   - From the Status Screen, click on the **Start** button.

The sequence file will then be downloaded to the TOC Analyzer, and the TOC Analyzer will begin the sequence.

Holding a Sequence

To hold (pause) a sequence, do one of the following:

- From the Status Screen, go to the **Commands** menu and select **Hold Sequence**.

- From the Status Screen, click on the **Hold** button.

Any sample that is running at the time that hold is selected will be completed. The sequence can be resumed by clicking on the **Start** button.

Aborting a Sequence

To abort a sequence, do one of the following:

- From the Status Screen, go to the **Commands** menu and select **Abort Sequence**.

- From the Status Screen, click on the **Abort** button.

Any sample that is running at the time that abort is selected will be interrupted and cannot be resumed.

Using TOC Reporter ▬▬▬▬▬▬▬

TOC Reporter is a data management system that allows the operator to collect statistical information and provide graphical representation of the results (Figure 4.11).
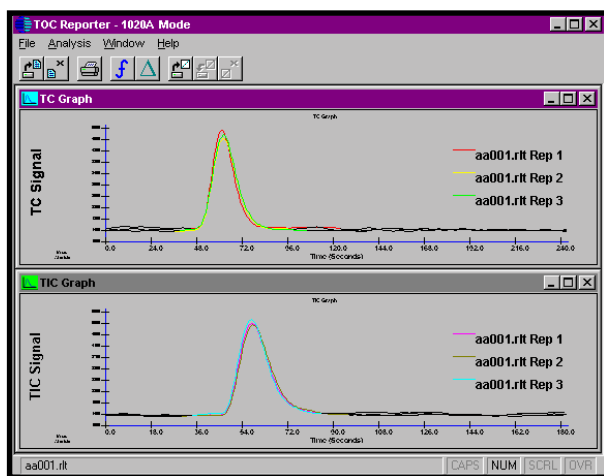

Figure 4.11. TOC Reporter Screen with TC and TIC
Signal

Up to 15 files at can be open at one time. TOC Reporter allows the operator to export the data to spreadsheets or other Windows-based programs. The data may be reintegrated and manipulated for presentation purposes while the original data is kept secure, as required for GLP compliance.

TOC Reporter is accessed through the Status Screen **Utilities** menu. The toolbar buttons at the top of the TOC Reporter Screen can be used for the following features:

 = Open data files

 = Close data files

 = Print peak and/or calibration charts

 = View statistics

 = Change preferences on currently selected window

 = Open calibration file

 = Save calibration

 = Close calibration

For a description of TOC Reporter and its menus, see "TOC Reporter" in Chapter 3.

Working with Data Files

1. From the Status Screen, go to the **Utilities** menu and select **Reporting**. This will access TOC Reporter.

2. Go to the **File** menu and select **Open**.

3. Select the data file (*.rlt) to open and click **OK**. This will load the selected data file into TOC Reporter.

4. Repeat steps 2–3 until all the desired data files are open. TOC Reporter allows up to 15 data files to be open at one time. Use the **Window** menu to arrange the graphs on the screen.

5. To change the graph's appearance, go to the **File** menu and select **Preferences**. This will access the TOC Reporter Preferences Screen (see Figure 4.12). The TOC Reporter Preferences Screen allows operator to modify the appearance of the active (selected) graph window in the TOC Reporter Screen.
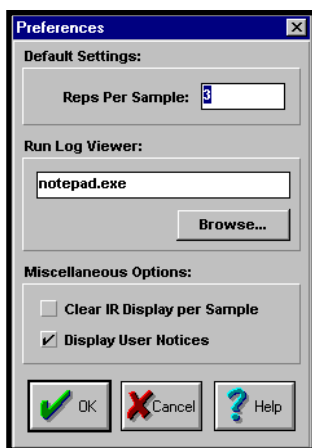

Figure 4.12. TOC Reporter Preferences Screen

6. To open a calibration file, go to the **Analysis** menu and select **Open Calibration**. Select the calibration file to open and click on **OK**.

Working with Statistics

The TOC Reporter Statistics Screen allows the operator to view areas, mass, and concentration values; print modified statistics; and export data. See Figure 4.13.
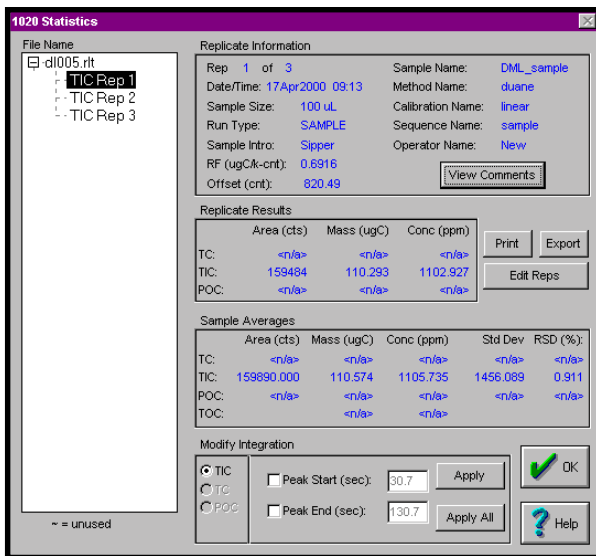
Figure 4.13. TOC Reporter Statistics Screen

Replicate Information contains general information, including **Rep #**, **Date** and **Time** of the run, **Sample Size**, **Run Type**, **Sample Name**, **Method Name**, **Calibration Name**, **Sequence Name**, **RF**, and **Offset**.

View Comments displays the operator-defined comments for the sample highlighted in the listbox.

Replicate Results contains statistical information including **Area**, **Mass**, and **Concentration** for both TC and TIC.

Export exports data into spreadsheets and/or LIMS systems. See "Exporting Data" in this chapter.

Edit Reps allows the operator to mark replicates as used or unused. Unused replicates will be marked with a tilde (~) under **File Name**.

Sample Averages contains additional statistical information including the average **Area**, **Mass**, **Concentration**, **Standard Deviation**, and **RSD** for TC and TIC. TOC is determined after TC and TIC, thus RSD for TOC is not required.

Modify Integration allows the operator to modify integration by clicking on the box next to **Peak Start** and/or **Peak End** for either TIC or TC and changing the values in the corresponding edit boxes. To apply the operator-specified values, click on the **Apply** button. **Apply All** sets the same limits for all open files.

Exporting Data ▬▬▬▬▬

Data can be exported from the WinTOC Output Screen or through the TOC Reporter.

Exporting from the WinTOC Output Screen

Follow the procedure below to export data using the WinTOC Output Screen. Refer to Chapter 3, "Introduction to WinTOC," for a detailed description of the screen.

1. Go to the **Setup** menu and select **WinTOC Output**. This will access the WinTOC Output Screen.

2. Specify the root directory where the result files and run log can be saved.

3. Specify the subdirectory or folder within the root directory where the result files for a sequence can be stored. If this subdirectory does not already exist, it will be created at the start of a sequence.

4. Set the **Run Log Header Options** to the settings shown in Figure 4.14 by clicking on the corresponding buttons until the desired settings are displayed.

Note: It is important to set the **Results** field to **Tabular/S** (tabular with statistics).

The file specified will contain the results in text format that can then be imported to other programs in a space-delimited text format (*.txt).
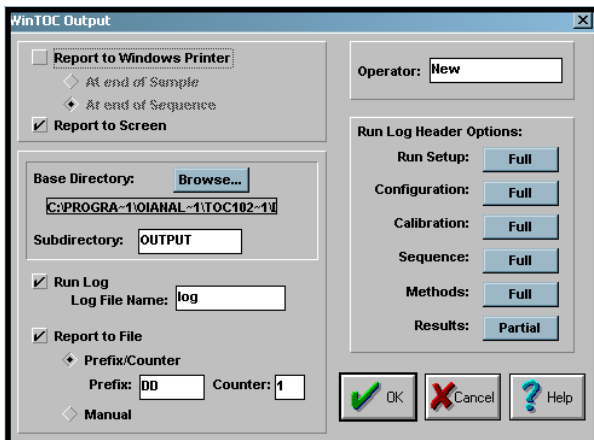
Figure 4.14. Output Screen Settings for Export

Exporting from TOC Reporter

Follow the procedure below to export data using TOC Reporter.

1. From the Status Screen, go to the **Utilities** menu and select **Reporting**. This will access TOC Reporter.

2. From TOC Reporter, go to the **File** menu and select **Open** to open the files to export. A maximum of 15 files can be open at one time.

3. View the files for export.

4. Go to the **Analysis** menu and select **Statistics**. This will access the Statistics Screen (Figure 4.13). Click on the **Export** button.

5. Select the delimiter (**Comma** is recommended) and click on **OK**.

Note: The **Exporting Data Points** option will export the raw data points as well as processed results saved as a *.csv file in the specified directory.

6. Enter a name and destination for the file. The WinTOC direc-
    tory is the default.

Following the export, a dialog box will appear saying that the
export is complete.

Importing Data to Another Program

Follow the procedure below to import data that was exported using
the TOC Reporter into a program such as Microsoft Excel.

1. Select the **Open** command from the **File Menu**.

2. Select "Text Files" as the type of file to open.

3. Look in the appropriate directory and select the name of the
    text file to open.

Upgrading Firmware ■■■■■■

1. From the Status Screen, go to the **Utilities** menu and select
    Upgrade Firmware.

2. Insert the new firmware disk into the computer's floppy drive.

3. Select the floppy drive from the pull-down menu.

4. Click on **Upgrade Firmware**.

Shutting Down the Model 1020A ▬

The following procedure should be followed to allow the components to properly cool and to minimize contamination.

1. Stop all runs on the TOC Analyzer by pressing **Abort** on the Status Screen.

2. Go to the **File** menu and select **Exit** to close WinTOC.

3. Turn off the Model 1020A power switch.

4. Allow the instrument to cool for 10 minutes with the carrier flowing.

5. Turn off the carrier gas supply.

Notes

Chapter 5
Maintenance

This chapter discusses only scheduled and nonscheduled maintenance of the Model 1020A TOC Analyzer that are performed using the WinTOC software. For a complete maintenance schedule and details, see the *Model 1020A Operator's Manual*.

NDIR Zero

The NDIR detector zero (baseline) will fluctuate up or down during periods of nonuse. This is due to environmental factors such as operating temperature, how long the NDIR purge has been on (to expel ambient carbon dioxide), or purity of gases (especially if nitrogen is being used for POC analysis). However, under routine operating conditions, the baseline reading should be set between 4,000 and 8,000 for optimum range and linearity response. This adjustment should be checked after every 100 hours of operation (corresponding to gas service maintenance).

Caution: If NDIR baseline cannot be adjusted to the desired range, then problems other than zero offset are likely. Contact OI Analytical Technical Support.

Caution: Do not make adjustments with the GAIN potentiometer as this will affect the NDIR detector linearity.

To adjust the NDIR zero:

1. Go to the Status Screen.

2. Verify that the TOC Analyzer is in the Standby State.

3. Slowly turn the NDIR Zero OFFSET adjustment (on the NDIR detector enclosure) (see Figure 5.1) clockwise to increase baseline (positive shift) or clockwise to decrease baseline (negative shift) and set output between 500 and 1,000.

4. Allow the TOC analyzer to perform several automated analyses and recheck the baseline with the TOC analyzer in the Standby State. Make any necessary adjustments as described above.
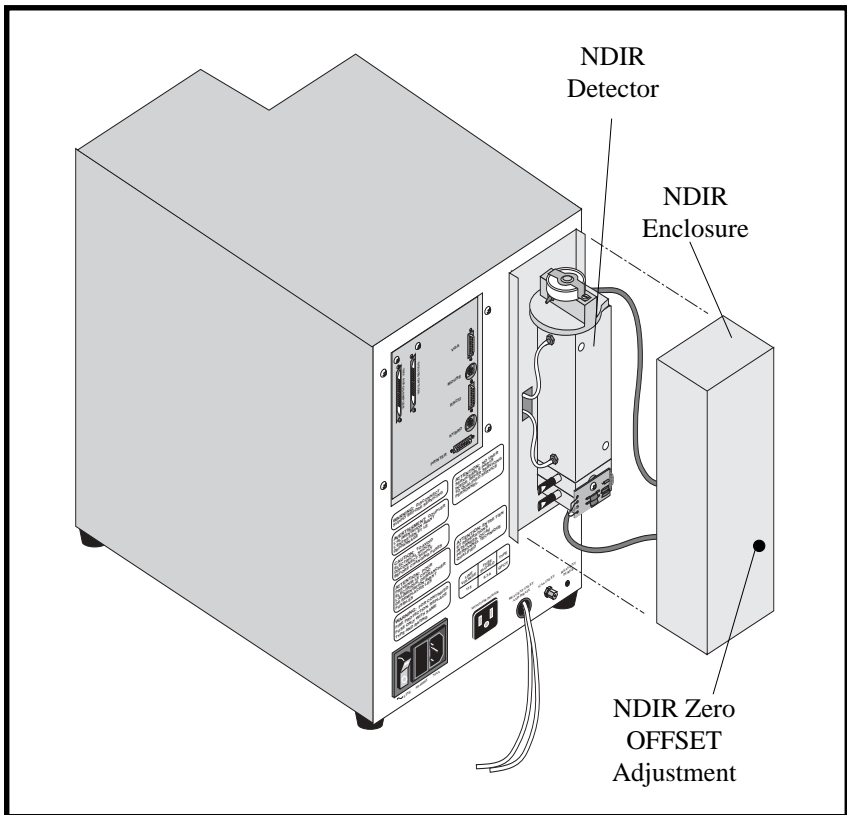

Figure 5.1. Nondispersive Infrared (NDIR) Detector

Sample Pump

This procedure applies to the peristaltic pump mounted inside the left bay (see Figure 3.1 in the *Model 1020A Operator's Manual*). It is used to aspirate samples through the loop sampling inlet and the sample loop. The pump housing contains a length of tubing mounted in the housing. The tubing is considered expendable because the tubing will eventually wear out.

The tubing should be inspected after every 2,000 hours of operation. More frequent inspections may be necessary if you are running samples containing strong acids, solvents, or bases.

1. Remove the left bay cover.

2. Remove the plastic barbed fitting from the end of the outlet leg (closest to the outside of the left bay) of the silicone tube.

3. With a small, flat-blade screwdriver, carefully pry apart the teeth of the plastic retaining clamp on the inlet leg of the silicone tube and remove the retaining clamp from the end of the tubing.

4. From the Status Screen, go to the **Instrument** menu and select **Diagnostics**. This will access the Diagnostics Screen.

5. Under the **Pumps** section, turn **ON** the **Sample Pump**.

6. While the pump is turning, pull the sample outlet leg to remove the tubing from the pump housing.

7. Under the **Pumps** section, turn **OFF** the **Sample Pump**.

8. Inspect the tubing for excessive wear, holes, or cracks, and replace if signs of these are evident. If the outside of the tube is dry or a replacement tube is being installed, lightly coat the outside wall that will be exposed to the pump housing with a silicone grease lubricant. Installation of the tubing into the pump housing is the reverse of the above procedure.

9. Replace the left bay cover.

Calibrating the Acid Pump ■■■■■

This calibration applies to the acid pump, which can be identified by the red fittings.

1. Remove the left bay cover.

2. Loosen the 18-mm nut on the IC chamber, and remove the IC chamber glassware.

3. Verify that the acid bottle is filled and that the acid line has been properly primed.

4. Place the end of the ⅛" red acid line tubing into a measuring vessel.

5. From the Status Screen, go to the **Instrument** menu and select **Diagnostics**. This will access the Diagnostics Screen.

6. Under the **Pumps** section, program **Acid Pump** for 10 times and click on **PUMP**.

7. When the pump stops pumping, use a 2-mL syringe to measure the volume of the contents in the vessel.

8. To adjust the pump volume, loosen the ½" locknut on the threaded shaft at the bottom of the pump.

9. If the volume in the vessel is more than 1.0 mL, turn the shaft (¼") below the pump clockwise. If the volume in the vessel is less than 1.0 mL, turn the shaft counterclockwise.

10. Repeat the above steps until the volume dispensed for 10 strokes is between 0.95 mL and 1.05 mL.

11. Tighten the locknut and check the volume again.

12. Reinstall the IC chamber glassware, and tighten the 18-mm nut.

13. Replace the left bay cover.

Calibrating the Chase Pump ▬▬▬

This calibration applies to the chase pump, which can be identified by the tan PEEK® fittings.

1. Remove the left bay cover.

2. Loosen the 18-mm nut on the IC chamber, and remove the IC chamber glassware.

3. Verify that the water bottle is filled.

4. Place the end of the ⅛" green chase line tubing into a measuring vessel.

5. From the Status Screen, go to the **Instrument** menu and select **Diagnostics**. This will access the Diagnostics Screen.

6. Under the **Pumps** section, program **Chase Pump** for 10 times and click on **PUMP**.

7. When the pump stops pumping, use a 2-mL syringe to measure the volume of the contents in the vessel.

8. To adjust the pump volume, loosen the ½" locknut on the threaded shaft at the bottom of the pump.

9. If the volume in the vessel is more than 0.5 mL, turn the shaft (¼") below the pump clockwise. If the volume in the vessel is less than 0.5 mL, turn the shaft counterclockwise.

10. Repeat the above steps until the volume dispensed for 10 strokes is between 0.45 mL and 0.55 mL.

11. Tighten the locknut and check the volume again.

12. Reinstall the IC chamber glassware, and tighten the 18-mm nut.

13. Replace the left bay cover.

Changing Sample Loops

The TOC Analyzer contains a sample loop valve with a sample loop attached. To convert to other loop sizes, the current loop is removed and another loop is attached to the valve.

1. Remove the left bay cover.

2. Locate the sample loop on the sample loop valve. See Figure 3.1 in the *Model 1020A Operator's Manual*.

3. Remove the sample loop by unscrewing the fittings on the loop.

4. Install the new sample loop by screwing the fittings on the loop into the sample loop valve.

5. Replace the left bay cover.

6. Go to the **Setup** menu and select **Configuration**. Select the appropriate loop volume.

Calibrating Sample Loops

1. From the Status Screen, go to the **Setup** menu and select **Con-figuration**. This will access the Configuration Screen.

2. Under the **Sample Introduction** section, select **Sipper**.

3. From the Configuration Screen, click on the **Loop Cal** button to access the Loop Calibration screen.

4. Follow the instructions on the screen.

5. Once the specification is met, enter the loop volume in the appropriate location in the **Actual Loop Volumes** section.

Chapter 6
Troubleshooting

This chapter lists messages that may be displayed while operating WinTOC for the Model 1020A and their possible causes and solutions.

WinTOC 1020A Messages ▬▬▬▬▬

WinTOC messages that may be displayed are divided into four categories: User Notices, General Messages, Miscellaneous Messages, TOC Reporter Messages.

User Notices

These messages are intended as helpful reminders for novice users and may be enabled/disabled on the **Preferences Screen**. These messages do not necessarily indicate that a problem has occurred. All messages in this category will have the title "User Notice." The body of the message will be followed by the user notice number. This number is intended to aid in tracking customer problem reports.

Note: When displayed in WinTOC 1020A, all message numbers begin with a "20-" for tracking purposes. The following message list has the "20-" removed for clarity.

Message	Explanation
50 - "Message Not Found (Msg 20-50)"	Indicates an internal program error. Exit and restart WinTOC. If necessary, exit and restart Windows and reboot the TOC Analyzer.
51 - "Turning off user notices disables a number of informational messages that may be helpful to novice WinTOC users. If you would like to continue seeing these messages, turn this option back on. (Msg 20-51)"	Displayed when User Notices are turned OFF in the Preferences Screen. Informational only.
52 - "Preacidification is on. Remove septum caps from vials and check for correct needle. (Msg 20-52)"	Displayed when preacidification is turned on in the Configuration Screen. The correct vial caps and needle must be used for this option to work correctly.
53 - "Septum piercing is on. Place septum caps on vials and check for correct needle. (Msg 20-53)"	Displayed when septum piercing is turned on in the Configuration Screen. The correct vial caps and needle must be used for this option to work correctly.
54 - "The loop size has been changed. Verify that the correct loop is installed. (Msg 20-54)"	Displayed when the loop size is changed in the Configuration Screen. This is just a reminder to make sure that the hardware installed matches the configuration chosen.
55 - "Pause between samples is on. WinTOC will pause for user confirmation before each sample. (Msg 20-55)"	Displayed when the Pause option is turned on in the Configuration Screen (available only for Sipper). Informational only.
56 - "Pause between samples is off. WinTOC will proceed from sample to sample without pausing. (Msg 20-56)"	Displayed when the Pause option is turned off in the Configuration Screen (available only for Sipper). Informational only.

Message	Explanation
57 - "The sample needle depth is less than 95%. This may reduce the amount of sample that may be successfully drawn from the vial. (Msg 20-57)"	Displayed when the sample needle depth is set to a small value. This could cause the TOC Analyzer to not be able to draw enough sample, even if enough liquid is actually present in the vial. However, this setting may be correct if the sample contains sediments.
58 - "The wash needle depth is less than 95%. This may reduce the amount of rinse water that may be successfully drawn from the wash station. (Msg 20-58)"	Displayed when the wash needle depth is changed to a small value. This could cause the TOC Analyzer to be unable to draw enough rinse water, even if enough liquid is actually present in the vial.
59 - "The Response Factor has been changed. The new value is outside the normal range of 0.15–0.25. (Msg 20-59)"	Displayed when the response factor is manually set to a number outside the normal range. *An incorrect setting could cause poor results.*
60 - "The Loop Volume has been changed. The new value is outside the normal range of 1μL–420 μL. (Msg 20-60)"	Displayed when the loop volume is set to a number outside the normal range.
61 - "Manual naming is on. Running the current sequence will prompt for each data filename. The name should be entered before the next replicate completes. Either change the output setting or be present to enter the name. (Msg 20-61)"	Displayed when Data File Naming is set to Manual in the WinTOC Output Screen. If the operator does not enter a name before the next replicate completes, *results information will be lost.*
62 - "All WinTOC outputs are off. WinTOC will produce no output for any runs. (Msg 20-62)"	Displayed when all the output options have been disabled in the WinTOC Output Screen If the operator does not select an output option, no data will be saved.

Message	Explanation
63 - "At least one sample in the sequence has user-entered values for reps/name but the method name is Unknown. These samples will not be run. (Msg 20-63)"	Displayed when saving a sequence that contains at least one sample with the method selected as "unknown." If the operator does not change the method name, the sample will not be run.
64 - "Allow Editing has been set to 'Yes'. This will allow changes to the calibration which can result in different response factor than the one generated by the unit from the standards actually run. (Msg 20-64)"	Displayed when Allow Editing is selected on the Calibration Screen.
65 - "A standard concentration has been changed. This will result in a different response factor than the one generated by the unit from the standards actually run. (Msg 20-65)"	
66 - "A standard has been manually specified as 'used' or 'unused'. This will result in a different response factor than the one generated by the unit from the standards actually run. (Msg 20-66)"	
67 - "Making changes in the Edit Reps dialog will result in a different response factor than the one generated by the unit from the standards actually run. (Msg 20-67)"	
68 - "The unit printer options have been changed. This will affect the output of the printer directly attached to the unit, not the printer attached to the Windows computer. (Msg 20-68)"	

Message	Explanation
69 - "The date and/or time on the unit differs significantly from the date and/or time on the Windows computer. (Msg 20-69)"	Displayed when the time is changed in the Settings dialog or a run is started if the difference between the Windows computer time and the unit time is more than **one** hour. Upon connection, WinTOC automatically sets the unit date/time to match the Windows computer. This will normally only be displayed if the operator sets the unit time and makes a mistake. If this message appears in other circumstances, the unit's motherboard may have a malfunctioning clock.
70 - "Manual RF has been turned on. This allows for a manual override of the calculated response factor. (Msg 20-70)"	Displayed in the Calibration dialog when the indicated condition occurs. This means that the operator can manually set the response factor to a specific value. Informational only.
71 - "Manual RF has been turned off. The unit will automatically recalculate the response factor. (Msg 20-71)"	Displayed in the Calibration dialog when the indicated condition occurs. This means that the response factor will be calculated automatically by the unit. Informational only.
73 - "Rinses Per Sample has been turned off. Rinses Per Sample should always be used to help prevent carryover.(Msg 20-73)"	Displayed when **Rinses Per Sample** is turned off. Not rinsing can cause carryover, which can cause poor reproducibility.
74 - "This sequence contains vial positions that are not available in the selected autosampler. These samples will not be run. (Msg 20-74)"	Displayed when a sequence is started that specifies vials that do not exist on the current autosampler. For example, the sequence may specify vial 50, which does not exist on the 12-vial autosampler. WinTOC will simply ignore the invalid vials.

Message	Explanation
75 - "The Start Sample # entered is out of range and has been adjusted. (Msg 20-75)"	The value entered on the Start Sequence screen for the starting position was not an allowed value and has been changed to an allowed value. The value must be greater than zero, no less than the position number of the first sample in the sequence table, and no greater than the stop position.
76 - "The Stop Sample # entered is out of range and has been adjusted. (Msg 20-76)"	The value entered on the Start Sequence screen for the stopping position was not an allowed value and has been changed to an allowed value. The value must be no greater than 88, no greater than the position number of the last sample in the sequence table, and no less than the start position number.
77 - "Manual Loop-fill-time has been turned on. This allows for a manual override of the calculated loop fill time. (Msg 20-77)"	By default, loop-fill-times are calculated automatically based on loop volume. If the operator requires a fill-time differing from the default, manual override can be selected followed by entering the desired time in the accompanying edit box. For reference, the default time is still displayed and updated if a new loop volume is selected.
78 - "Manual Loop-fill-time has been turned off. The unit will automatically recalculate the loop fill time. (Msg 20-78)"	The loop-fill-time is no longer specified by the operator but will be calculated automatically based on the current loop volume.
79 - "PAM is enabled and TIC or TC/TIC/TOC mode is selected. This may cause the reported TIC value to be lower than expected. (Msg 20-79)"	

Message	Explanation
80 - "The Run Results window is nearing its capacity. The oldest results from this run will be removed from the display."	
81 - "TC blank area counts greater than 1000 may indicate decreased catalyst performance. Refer to the TOC 1020A manual for catalyst cleaning or replacement procedures."	

General Messages

These messages are used to indicate a variety of conditions, including error conditions, informational messages, etc. These messages cannot be turned off. The messages in this category have various titles, but the body of the message will be followed by the general message number. This number is intended to aid in tracking customer problem reports.

Message	Explanation
250 - "Message Not Found (Msg 20-250)"	Indicates an internal program error. Exit and restart WinTOC. Additional steps would be to restart Windows and reboot the TOC Analyzer.
251 - "There is not enough memory to perform the requested operation. Try closing any other open applications. (Msg 20-251)"	Displayed in a variety of situations if there is insufficient memory available. It may be necessary to close other application and/or reboot the WinTOC computer.
252 - "Unable to completely transmit commands. (Msg 20-252)"	Displayed in a variety of situations if there are communications problems during a transmit. Confirm all serial cable connections and check for other software competing for the com port.
253 - "Unrecognized Autosampler Type (Msg 20-253)"	Indicates an internal program error. Close WinTOC, delete the CF?_1020.WTC file, restart WinTOC, and re-enter all configuration information.
254 - "Changes have been made. Save before continuing? (Msg 20-254)"	Displayed for methods, calibrations, and sequences if the operator closes the dialog after making changes but has not saved. If "Yes" is chosen, the software will prompt for a filename.

Message	Explanation
255 - "Could not open the current calibration. Check the name in the Edit Calibration dialog. (Msg 20-255)"	The last calibration that the operator said **OK** to is no longer present. Select **Calibration** on the **Instrument Menu**, open a calibration, and click **OK**.
256 - "The TOC firmware in this device is an older release that is not compatible with this version of WinTOC. Please call OI Analytical at 1-800-336-1911 to arrange a firmware upgrade. (Msg 20-256)"	The WinTOC and firmware versions do not match. Matching firmware or WinTOC is needed.
257 - "The value in the 'To:' field must be greater than or equal to the value in the 'From:' field. (Msg 20-257)"	In the Sequences Screen, an improper Clear or Copy command is being attempted. WinTOC requires that the starting and ending lines be entered in ascending numerical order.
258 - "The input values must be no less than one and no greater than eighty-eight. (Msg 20-258)"	In the Sequences Screen, a Clear or Copy command is being attempted with a line number that does not exist.
259 - "The input values may not define overlapping blocks. (Msg 20-259)"	In the Sequences Screen, an improper Copy command is being attempted. WinTOC requires that the blocks do not overlap. For example, it is not possible to copy lines 1–3 to lines 2–4, but is it possible to copy to lines 4–6.

Message	**Explanation**
260 - "The input values must either define blocks of identical size, or the Source 'To:' field and the Source 'From:' field must be equal. (Msg 20-260)"	In the Sequences Screen, an improper Copy command is being attempted. WinTOC requires that the blocks be of the same size or the source block be of size one. In this special case, the single source line is copied to all lines of the destination block. This is to allow very quick duplication of a general pattern.
261 - "There are currently no methods to open. (Msg 20-261)"	An attempt was made to open a method when none existed. The operator must create a method.
262 - "There are currently no methods to delete. (Msg 20-262)"	An attempt was made to delete a method when none existed.
263 - "The specified method already exists. Do you want to overwrite it? (Msg 20-263)"	The operator selected Save As and specified an existing name.
264 - "Are you sure you want to permanently delete this method? (Msg 20-264)"	The operator is about to delete a method. If "Yes" is chosen, the method will be deleted. If a method is accidentally deleted, an auto-backup file (*.$tc) is created by WinTOC. The method may be restored using the Archive/Restore facility.
265 - "There are currently no sequences to open. (Msg 20-265)"	An attempt was made to open a sequence when none existed. The operator must create a sequence.
266 - "There are currently no sequences to delete. (Msg 20-266)"	An attempt was made to delete a sequence when none existed.
267 - "The specified sequence already exists. Do you want to overwrite it? (Msg 20-267)"	The operator selected Save As and specified an existing name.

Message	Explanation
268 - "Are you sure you want to permanently delete this sequence? (Msg 20-268)"	The operator is about to delete a sequence. If "Yes" is chosen, the sequence will be deleted. If a sequence is accidentally deleted, an auto-backup file (*.$tc) is created by WinTOC. The sequence may be restored using the Archive/Restore facility.
269 - "There are currently no calibrations to open. (Msg 20-269)"	An attempt was made to open a calibration when none existed. The operator must create a calibration.
270 - "There are currently no calibrations to delete. (Msg 20-270)"	An attempt was made to delete a calibration when none exist.
271 - "The specified calibration already exists. Do you want to overwrite it? (Msg 20-271)"	The operator selected Save As and specified an existing name.
272 - "Are you sure you want to permanently delete this calibration? (Msg 20-272)"	The operator is about to delete a calibration. If "Yes" is chosen, the calibration will be deleted. If a calibration is accidentally deleted, an auto-backup file (*.$tc) is created by WinTOC. The calibration may be restored using the Archive/Restore facility.
273 - "The current file is corrupt and cannot be read. This file should be deleted and recreated. (Msg 20-273)"	A method, sequence, or calibration file is unrecoverably damaged. First, try restoring the appropriate *.$tc auto-backup file. If that fails, try restoring the last archive (if available). If all else fails, delete the appropriate *.wtc file from the hard drive (unfortunately, the operator will have to manually re-enter all information in this case).

Message	Explanation
274 - "File error. Could not open file. (Msg 20-274)"	A method, sequence, or calibration file is locked. Normally, exiting and restarting Windows will correct this problem.
275 - "File error - this contains corrupt header information and should be recreated. (Msg 20-275)"	A method, sequence, or calibration file is unrecoverably damaged. First, try restoring the appropriate *.$tc auto-backup file. If that fails, try restoring the last archive (if available). If all else fails, delete the appropriate *.wtc file from the hard drive. Be sure to try all other alternatives first; deleting *.wtc files means that all information will have to be manually re-entered.
276 - "File error - this file was created by a newer version of WinTOC and may not function properly. Please contact OI Analytical to receive a newer version of WinTOC. (Msg 20-276)"	This indicates that both a new and an old version of WinTOC probably exist on the hard drive and the old version is being used to access data from the new version. Use the new version instead.
277 - "You must enter a name before you click OK. (Msg 20-277)"	This prevents saving a method, calibration, or sequence without a unique name.
278 - "Could not allocate data block. (Msg 20-278)"	Memory-related error. Restart Windows.
279 - "Could not lock data add record memory block. (Msg 20-279)"	Memory-related error. Restart Windows.
280 - "Could not lock data get record memory block. (Msg 20-280)"	Memory-related error. Restart Windows.
281 - "Could not free data memory block. (Msg 20-281)"	Memory-related error. Restart Windows.

Message	Explanation
282 - "Manually position tray with needle over first vial and click OK to calibrate, or Cancel to abort. (Msg 20-282)"	Displayed when Calibrate is clicked in the Diagnostics Screen to calibrate the autosampler.
283 - "You must stop the current operation before closing this dialog. (Msg 20-283)"	The Diagnostics Screen cannot be closed while a Drain operation is in progress. Click the 'Drain' button again to stop the operation, then close the Diagnostics Screen.
284 - "Print Fault: Unable to print. Check printer installation. (Msg 20-284)"	The Windows printer is incorrectly configured. Correct the printer configuration using the Print Manager (Win 3.1x) or Printers (Win 95) dialog from the Control Panel in Windows.
285 - "Could not lock memory block. (Msg 20-285)"	Memory-related error. Restart Windows.
286 - "Could not lock allocate block. (Msg 20-286)"	Memory-related error. Restart Windows.
287 - "WinTOC could not load the default method 'default'. (Msg 20-287)"	The default method must have been deleted, either through the WinTOC delete functionality, or by deleting the MTH_20.WTC file. Save a new method by the name "default" and this message will go away.
288 - "No more timers are available. Try closing any other open applications and restarting the sequence. (Msg 20-288)"	First, close all open applications. If that fails, exit and restart Windows.
289 - "Could not find the method specified in the sequence. The current method on the unit will be used instead. (Msg 20-289)"	A method in the sequence is no longer present. Modify the sequence to use an existing method.

Message	Explanation
290- "Move the sipper tube to the correct sample, then click OK to continue. (Msg 20-290)"	Displayed before the first rep of a sample if the sample intro mode is Sipper and Pause is on.
291 - "Unable to create the directory for the WinTOC data. (Msg 20-291)"	Usually indicates that the operator manually modified directories in File Manager or Explorer. Verify that a directory called "DATA20" exists below the directory that WinTOC is installed in, and create one if it does not. (e.g., C:\WINTOC\DATA20)
292 - "When Run Log is checked, you must enter a Log File Name. (Msg 20-292)"	It is necessary to specify a Run Log filename when using the Run Log option.
293 - "Could not allocate QUEUE data area. WinTOC will start in Offline mode. Close all applications and restart Windows. (Msg 20-293)"	Memory-related error. Restart Windows.
294 - "Could not lock add QUEUE record memory block. WinTOC will switch to Offline mode. Close all applications and restart Windows. (Msg 20-294)"	Memory-related error. Restart Windows.
295 - "Could not lock QUEUE get record memory block. WinTOC will switch to Offline mode. Close all applications and restart Windows. (Msg 20-295)"	Memory-related error. Restart Windows.
296 - "Could not free QUEUE memory block. Close all applications and restart Windows. (Msg 20-296)"	Memory-related error. Restart Windows.

Message	Explanation
297 - "Communications with the attached device have failed. WinTOC will switch to Offline mode. (Msg 20-297)"	Check all serial cable connections. Verify that no other software is using the WinTOC com port. If necessary, exit WinTOC, reboot the solids unit and restart WinTOC.
298 - "The Sequence table is empty. You must set the Current Sequence by entering the Sequence dialog, opening a sequence, and clicking OK. (Msg 20-298)"	Displayed when no current sequence is selected. Select or create a new sequence.
299 - "Could not find any methods to view. (Msg 20-299)"	View Methods was selected but no methods existed to view.
300 - "Could not unlock and free a memory block. Save all open work and restart Windows. (Msg 20-300)"	Memory-related error. Restart Windows.
301 - "Cannot load the SPIN.DLL Dynamic Link Library. If this problem persists, reinstall WinTOC. (Msg 20-301)"	This is a necessary file for WinTOC. The SPIN.DLL file should be in the Windows directory.
302 - "Unable to write to the specified calibration. Check the name in the Edit Calibration dialog. (Msg 20-302)"	The current calibration that was chosen now cannot be found.
303 - "At least one total volume (sample volume times reps) in the current sequence is above the vial size for this autosampler. This must be corrected before the sequence can be started. (Msg 20-303)"	This message is currently disabled and should not be seen.

Message	Explanation
304 - "The IR signal is currently above the maximum allowed baseline (10000). (Msg 20-304)"	The unit's IR may need time to stabilize. If the power was just turned on and the baseline is dropping, it should settle out fairly quickly. Otherwise, the baseline may need to be adjusted manually. (See the appropriate section in this manual for adjusting the IR baseline.)
305 - "Running the current sequence with Datafile Auto-naming will overwrite at least one data file. WinTOC will prompt for a name when this occurs. The name must be entered before the next replicate completes. Either change the output settings or be present to enter the name. (Msg 20-305)"	Automatic naming is selected, but data files already exist with the names that will be created. Change the filename prefix and index settings in the WinTOC Output Screen.
306 - "There is currently a hardware error as identified in the Errors/Alarms box on the Status screen. The currently running sequence will be aborted. (Msg 20-306)"	An error occurred that invalidates the results. See the WinTOC Status Screen (errors/alarms section) for which error occurred and take appropriate action to correct.
307 - "There is currently a hardware error as identified in the Errors/Alarms box on the Status screen. You must correct this error before starting a sequence. (Msg 20-307)"	An error occurred that would invalidate future results. See the WinTOC Status Screen (errors/alarms section) for which error occurred and take appropriate action to correct.
308 - "Do you really want to abort the sequence? (Msg 20-308)"	Abort confirmation message.
309 - "Select OK to resume the sequence or Cancel to abort. (Msg 20-309)"	Only displayed while the sequence is paused. Choose desired action.

Message	Explanation
310 - "WinTOC cannot communicate with the 1020A Analyzer. Check your cable and retry. Choose Yes to run Offline, or No to close WinTOC. (Msg 20-310)"	Check all serial cable connections. Verify that no other software is using the WinTOC com port. If necessary, exit WinTOC, reboot the solids unit and restart WinTOC.
311 - "This will end your WinTOC session. (Msg 20-311)"	Exit confirmation message.
312 - "The attached device is not in state 'STANDBY' and may be performing an operation. Are you sure you want to close WinTOC? If you choose 'Yes', any run in progress will be Aborted. (Msg 20-312)"	An attempt is being made to close WinTOC while a run is in progress. Allow the sequence to complete normally or Abort — then exit.
313 - "The string 'Untitled' is reserved for indicating unnamed items. Enter a different name. (Msg 20-313)"	The name "Untitled" may not be specified by the operator for methods, sequences, or calibrations.
314 - "WinTOC could not load the specified Run Log Viewer. Check the viewer name in the Preferences dialog. (Msg 20-314)"	The Run Log Viewer specified does not exist. Reenter the name. In general, use NOTEPAD.EXE or WRITE.EXE as the viewer.
315 - "WinTOC could not load the TOC Reporter. Close all open programs and restart Windows. (Msg 20-315)"	The file REPORT.EXE must be in the same directory as WINTOC20.EXE. Please verify.
316 - "This disk does not contain a Firmware executable. Choose OK to continue, or cancel to insert another disk. (Msg 20-316)"	Verify that the correct disk is being used and retry the upgrade process.
317 - "Firmware upgraded successfully. To complete the process, insert the firmware disk in the 1020A, and cycle the power switch. Then, restart WinTOC in on-line mode. (Msg 20-317)"	The firmware upgrade process completed successfully. Completely power down the unit and boot off the upgraded floppy. Also close WinTOC and restart normally.

Message	Explanation
318 - "An error has occurred during the upgrade process. Please try again. (Msg 20-318)"	Verify that the correct disk is being used, and that the disk is not write-protected, and retry the upgrade process.
319 - "WinTOC could not start the replicate. Continue retrying? (Msg 20-319)"	WinTOC requested that a sequence be started, but the instrument did not start. Confirm all serial cable connections. If the problem persists, restart the unit.
320 - "A timeout has occurred while waiting for rsd checking results. Choose Yes to continue waiting or No to skip rsd checking for this sample. (Msg 20-320)"	Probably means communication failure and results are lost. If this reoccurs, check the RS-232 cables.
321 - "The rsd was over the specified value for all allowed retries. Choose Yes to continue the sequence and No to abort the sequence. (Msg 20-321)"	
322 - "Adjust autosampler vials and click OK to continue the sequence. (Msg 20-322)"	After closing a sequence on-the-fly in autosampler mode.
323 - "Communications between WinTOC and the TOC are marginal. Close WinTOC, check all communications cables and settings, then restart WinTOC. (Msg 20-323)"	

Miscellaneous Messages

These are similar to General Messages but are not followed by a number. These messages cannot be turned off. These messages typically have situation dependent information, such as a filename or error code, inserted as part of the message. This information will be represented as "XXX" in the descriptions that follow.

Message	Explanation
"The firmware in this device (revision XXX) is incompatible with this version of WinTOC. Please call OI Analytical at 1-800-336-1911 to arrange an upgrade."	A mismatched version is currently installed. Install the current WinTOC version from diskette, or upgrade the firmware "Upgrade Firmware" from the WinTOC Utilities menu.
"The XXX data file already exists. Choose 'Yes' to overwrite, 'No' to enter a new name for this file, or 'Cancel' to skip saving data for this rep."	Select a new datafile name before the next replicate completes or data will be lost.
"Error Creating Data File. Error Code = XXX."	A file error occurred. Check the settings in the WinTOC Output Screen first, then try restarting WinTOC, then try restarting Windows.
"Error Creating Report Log File: XXX. Error Code = XXX."	A file error occurred. Check the settings in the WinTOC Output Screen first, then try restarting WinTOC, then try restarting Windows.
"WinTOC file 'XXX' was archived to 'XXX'."	Confirmation message. Displayed when an archive operation is performed.
"Are you sure you want to restore? If you say 'Yes', all information in WinTOC file XXX will be overwritten with information from the selected archive."	Confirmation message displayed when a restore operation is specified.

Message	Explanation
"Archive file 'XXX' was restored to 'XXX'."	Confirmation message. Displayed after an archive operation is performed.
"Could not open file XXX. The operation cannot proceed."	Displayed if an error occurs during an archive. This will happen if an attempt was made to restore a WinTOC file over itself. *This is not advisable!*
"The type of the selected archive does not match the type of the file to be restored (XXX vs. XXX). This archive cannot be restored over this file."	An attempt was made to restore an incompatible file. For example, the operator attempted to restore methods over sequences.
"The version of the selected archive does not match the type of the file to be restored (XXX vs. XXX). WinTOC may not be able to read the information from this archive. Are you sure you want to restore?"	An attempt was made to mix files from different versions of WinTOC.
"WinTOC is unable to transmit an initialization command. Make sure no other applications are using COM XXX."	The port is already in use. Normally, this means the operator is trying to use the port the mouse is using.
"Configuration Error: WinTOC is not configured for an instrument number XXX. Use the WinTOC Configuration Editor to configure a new instrument."	The operator may need to run the **Configuration Editor**. Also can occur if the instrument number on the command line for their icon/ shortcut is incorrect.
"NOTICE: WinTOC XXX is already running."	The operator tried to start two copies of WinTOC by the same instrument number. If this message is displayed for no apparent reason, restart Windows.

TOC Reporter

These are similar to Miscellaneous Messages but are displayed by the TOC Reporter, rather than WinTOC 1020A itself.

Message	Explanation
"The file XXX is already loaded."	The operator tried to open a data file that is already open.
"The file XXX does not match the current instrument type and will not be opened."	Only one type of file may be open at a time—1010, 1020, or Solids.
"Could not create replicate - unrecognized type."	An error occurred reading the data file. This file is probably unrecoverably damaged.
"Could not create replicate - insufficient memory."	Memory-related error. Restart Windows.
"Could not create calibration - unrecognized type."	An error occurred reading the data file. This file is probably unrecoverably damaged.
"Could not create calibration - insufficient memory"	Memory-related error. Restart Windows.
"Could not load font."	System-related error. Restart Windows.
"Could not load pen."	System-related error. Restart Windows.
"There are currently no 1020 calibrations to open.", "Info"	An attempt was made to open a 1020 calibration, but none existed.
"The specified 1020 calibration already exists. Do you want to overwrite it?"	The operator chose to save a calibration and entered an existing name. This message just confirms that the operator wants to replace the original information with the modified information.

Message	Explanation
"The string 'Untitled' is reserved for indicating unnamed items. Enter a different name."	The name "Untitled" may not be specified for calibrations.
"The current file is corrupt and cannot be read. This file should be deleted and recreated."	Take the actions suggested for the WinTOC message of the same name.
"File error. Could not open file."	Take the actions suggested for the WinTOC message of the same name.
"File error - this contains corrupt header information and should be recreated."	Take the actions suggested for the WinTOC message of the same name.
"File error - this file was created by a newer version of WinTOC and may not function properly. Please contact OI Analytical to receive a newer version of WinTOC."	An attempt was made to access a data file from a newer version of WinTOC. Use the newer version or select a different file.
"You must enter a name before you click OK."	Enter a valid filename, then click "OK".
"Old cal files do not exist for this instrument type."	This should never occur.
"Could not allocate enough memory to redraw screen."	Memory-related error. Restart Windows.
"Too Many DataFiles"	Only 15 data files are allowed to be open at once in the TOC Reporter.
"Only fifteen data files may be loaded at one time."	Only 15 data files are allowed to be open at once in the TOC Reporter.
"The TOC Reporter cannot print. There is no printer installed."	The Windows printer is incorrectly configured. Make sure that a printer is installed in the Windows Print Manager.

Message	Explanation
"Printer configuration error XXX."	The Windows printer is incorrectly configured. Correct the printer configuration using the Print Manager (Win 3.1x) or Printers (Win '95) dialog from the Control Panel in Windows.
"Exit TOC Reporter?"	Exit confirmation message.
"Could not find Statistics dialog"	An internal error occurred. Restart Windows.
"Apply current Response Factor to all open files?"	Confirmation message. Note: because data files are not resaved, nothing permanent is changed here.
"Unable to Locate or Open File XXX. Please check that no other programs have this file loaded."	Close other applications, restart TOC Reporter, or restart the Windows.
"File XXX is not a WinTOC data file."	Some other applications also use the extension DAT. This message may be displayed if the operator inadvertently tried to open another application's file. Otherwise, the file is probably unrecoverably corrupted.
"Unable to allocate global memory. Please close any other open applications."	Memory-related error. Restart Windows.
"Unable to lock memory."	Memory-related error. Restart Windows.
"Unexpected end of file. File XXX may be corrupted."	Some other applications also use the extension DAT. This message may be displayed if the operator inadvertently tried to open another application's file. Otherwise, the file is probably unrecoverably corrupted.

Message	Explanation
"File XXX was not loaded."	General message when a specific file error cannot be determined. Verify the filename.
"The export is complete."	Confirmation that the export is finished.
"Cannot open file. Please try another filename or restart Windows."	The file specified to export to could not be opened. A common cause is that the file is already in use by a spreadsheet program.

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