

BARCODE MAGICIAN® 1.5.1

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Table of Contents

LIST OF DIAGRAMS AND SCREENS	5
SECTION 1 - INTRODUCTION.....	7
<i>BARCODE MAGICIAN</i>® OVERVIEW	8
NEW <i>BARCODE MAGICIAN</i> FEATURES	10
SYSTEM REQUIREMENTS.....	11
BAR CODE READER REQUIREMENTS	11
SECTION 2 - INSTALLATION	13
INSTALLING THE 32 BIT SYBASE 5.5 CLIENT FOR MET/TRACK 6.x	14
Installation on Windows 98/Millineum	14
Installation on Windows NT, Windows 2000, and Windows XP.....	14
Complete the Sybase Client Installation.....	14
CONFIGURING THE SYBASE 5.5 ODBC – MET/TRACK 6.x.....	15
CONFIGURING THE SYBASE 8 ODBC – MET/TRACK 7.x.....	17
INSTALLING <i>BARCODE MAGICIAN</i>	19
USING THE REGISTRATION PROGRAM.....	19
UPGRADING AN EXISTING <i>BARCODE MAGICIAN</i> SYSTEM? – PLEASE READ FIRST!	20
Upgrading from Barcode Magician 1.2, 1.3, or 1.4	20
Upgrading <i>Barcode Magician</i> from MET/CAL version 6.x to MET/CAL version 7.x	21
Upgrading <i>Barcode Magician</i> 1.5 to this version – Please Read.....	21
SECTION 3 – <i>BARCODE MAGICIAN</i>® CONFIGURATION	23
THE WORKSTATION CONFIGURATION PROGRAM.....	24
Setting the ODBC Database Connection	24
Configuring the Work Station License	24
Configuring Miscellaneous Features	25
Selecting Action Codes to Operate with the Workstation – <i>New Feature</i>.....	26
THE USER'S DATABASE	27
Example User Entry.....	28
Using Search	28
SYSTEM CONFIGURATION	29
Run Time Display	30
Logging Options	31
Security	31
Users Options	32
Aliasing.....	33
Change System Password	33
Default System Password	33
ACTION CODE EDITOR	34
What is an Action Code?	34
General.....	35
Criteria	36
Contains	38
Does not Contain.....	38
Is Empty	38
Is not Empty.....	38
Is Equal to	38
Is not Equal to.....	38
Is Greater Than	39
Is Greater Than or Equal to.....	39
Is Less Than	39

- SQL Statements (New in Version 1.5.1)39**
- Criteria – System Variables for SQL statements.....40**
- Messages.....41**
- Warnings.....42**
- Pre-Defined43**
- How to Copy Forward45**
- Dialog Boxes46**
- Restricted Database Fields47**
- THE RUN TIME PROGRAM.....48**
- Guest Option51**
- Updating User Information from Run Time – *New Feature*.....51**
- Criteria Check Failure.....52**
- Dialog Box Entry52**
- CUSTOM LABELS AND PHRASES.....53**

- CRYSTAL REPORTS® AND *BARCODE MAGICIAN*®55**
- USING CRYSTAL REPORTS® WITH *BARCODE MAGICIAN*®56**
- Getting Started56**

- APPENDIX.....63**
- APPENDIX A – ALTERNATIVE RUNTIME CONFIGURATIONS.....64**
- Error Handling with SQL Statements.....64**
- Using the SQLLOG Switch65**
- Setting up alternative ODBC Sources65**
- APPENDIX B – ADVANCED SQL INPUT/OUTPUT STATEMENTS.....66**
- Output of Data Using SQL Statements.....66**
- Input of Data Using SQL Statements.....67**
- Executing SQL Statements without Using Files.....67**

List of Diagrams and Screens

MET/TRACK AND SYBASE BLOCK DIAGRAM	8
BARCODE MAGICIAN OPERATIONAL BLOCK DIAGRAM	9
32 BIT ODBC DATA SOURCE LISTING	15
SELECTING THE SYBASE DRIVERS (WIN2000)	15
ODBC DATA SOURCE CONFIGURATION	16
ODBC OPTIONS CONFIGURATION	16
32 BIT ODBC DATA SOURCE LISTING	17
SELECTING THE SYBASE DRIVERS	17
ODBC CONFIGURATION FOR SYBASE 8	18
ODBC SYBASE 8 NETWORK OPTIONS	18
BARCODE MAGICIAN REGISTRATION SYSTEM	19
WORKSTATION CONFIGURATION PROGRAM	24
SELECTING A CRYSTAL REPORT TO BE PRINTED FROM RUNTIME	25
ASSOCIATING ACTION CODES TO A REPORT	26
ASSIGNING ACTION CODES TO A WORKSTATION	26
USER'S DATABASE SCREEN IN VIEW MODE	27
SEARCHING THE USERS DATABASE	29
SYSTEM CONFIGURATION SCREEN	29
WORK ORDERS	30
CONFIGURING RUN TIME DISPLAY	30
CONFIGURING LOGGING OPTIONS	31
CONFIGURING SECURITY	31
CONFIGURING USERS OPTIONS	32
CONFIGURING ALIASING OPTIONS	33
ACTION CODE EDITOR - GENERAL	34
ADDING AN ACTION CODE	35
CRITERIA CHECKING – EXPRESSION ONE	36
CRITERIA CHECKING – EXPRESSION TWO	36
CRITERIA CHECKING – EXPRESSION THREE	37
CRITERIA – USING "CONTAINS"	38
CRITERIA – USING "DOES NOT CONTAIN"	38
CRITERIA – USING "IS EMPTY"	38
CRITERIA – USING "IS NOT EMPTY"	38
CRITERIA – USING "IS EQUAL TO"	38
CRITERIA – USING "IS NOT EQUAL TO"	38
CRITERIA – USING "IS GREATER THAN"	39
CRITERIA – USING "IS GREATER THAN OR EQUAL TO"	39
CRITERIA – USING "IS LESS THAN"	39
CRITERIA – USING "IS LESS THAN OR EQUAL TO"	39
CRITERIA – USING AN SQL STATEMENT WITH SELECT	39
CRITERIA – USING AN SQL STATEMENT WITH CALL	40
CRITERIA CHECKING MESSAGES	41
WARNINGS	42
PRE-DEFINED	43
CUSTOM MODS	44
UPDATING CUSTOM MODS – STEP 1	44
UPDATING CUSTOM MODS – STEP 2	44
UPDATING CUSTOM MODS – STEP 3	45
USING THE COPY FORWARD FEATURE	45
CREATING CUSTOM DIALOG INPUTS	46
UPDATING CUSTOM MODS FROM A DIALOG BOX	47
RUN TIME PROGRAM ENTRY SCREEN	48

RUN TIME PROGRAM AFTER ENTERING USER ID48
ENTERING AN ACTION CODE.....49
ENTERING THE INSTRUMENTS TO BE PROCESSED49
REMOVING ASSETS FROM THE LIST.....50
PROCESSING THE INSTRUMENTS IN THE LIST50
ENTERING A NEW USER IN THE RUN TIME PROGRAM WITHOUT PASSWORDS.....51
ENTERING A NEW USER IN THE RUN TIME PROGRAM WITH PASSWORDS51
CHANGING USER INFO FROM RUN TIME.....51
CRITERIA CHECK FAILURE52
ENTERING DATA IN A DIALOG BOX.....52
ERROR MESSAGE - BCMPHRASES.TXT IS NOT AVAILABLE TO *BARCODE MAGICIAN*.....53
CRYSTAL REPORT – SELECT DATA TYPE.....56
STANDARD REPORT EXPERT – SQL/ODBC56
SELECT DATA SOURCE.....57
SELECTING AN SQL TABLE57
VISUAL LINKING EXPERT – DEFAULT SETUP.....58
VISUAL LINKING EXPERT – UPDATING TABLE LINKS58
VISUAL LINKING EXPERT – UPDATING JOIN TYPES59
ADDING FIELDS TO THE REPORT59
SAVING THE FORMULA IN THE FORMULA EDITOR.....60
ADDING FORMULAS60
EDIT SELECTION FORMULA EDITOR60
SQL ERROR MESSAGE IN RUN TIME64
EXAMPLE SQL LOG FORMAT FOR TROUBLESHOOTING65
CREATING AN ACTION CODE TO OUTPUT DATA FILES66
CREATING AN ACTION CODE TO INPUT DATA FILES67

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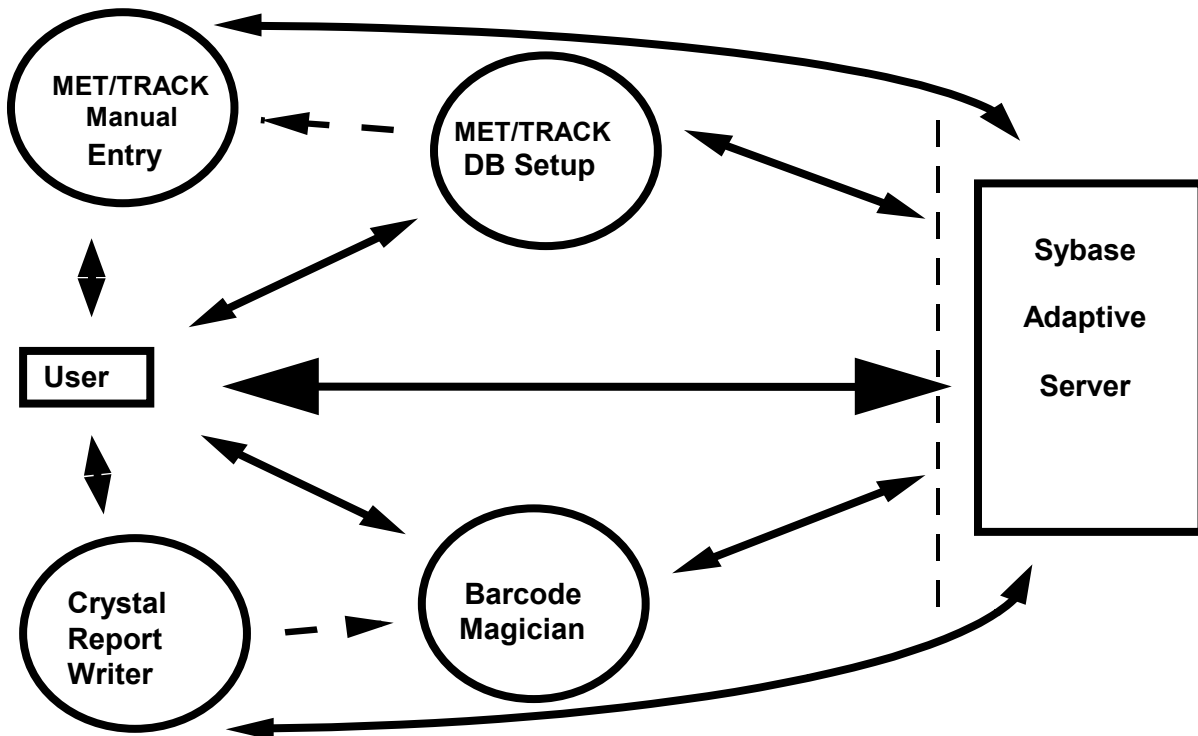
SECTION 1 - INTRODUCTION

Barcode Magician® Overview

Welcome to *Barcode Magician®* for MET/TRACK®. Barcodes and a barcode reader are NOT required to use this program. This document will guide you through an easy way to track your assets CONSISTENTLY. *Barcode Magician®* is divided into 6 programs. This section describes the operation of *Barcode Magician®* and how the programs interact with the database version of MET/CAL and MET/TRACK. Here is a definition of terms:

- **MET/TRACK** refers to the Manual Entry and Database configuration functions.
- **MET/CAL** refers to editing and executing the actual calibration procedures

First, we need to illustrate the relationship of *Barcode Magician®* and MET/TRACK.



MET/TRACK AND SYBASE BLOCK DIAGRAM

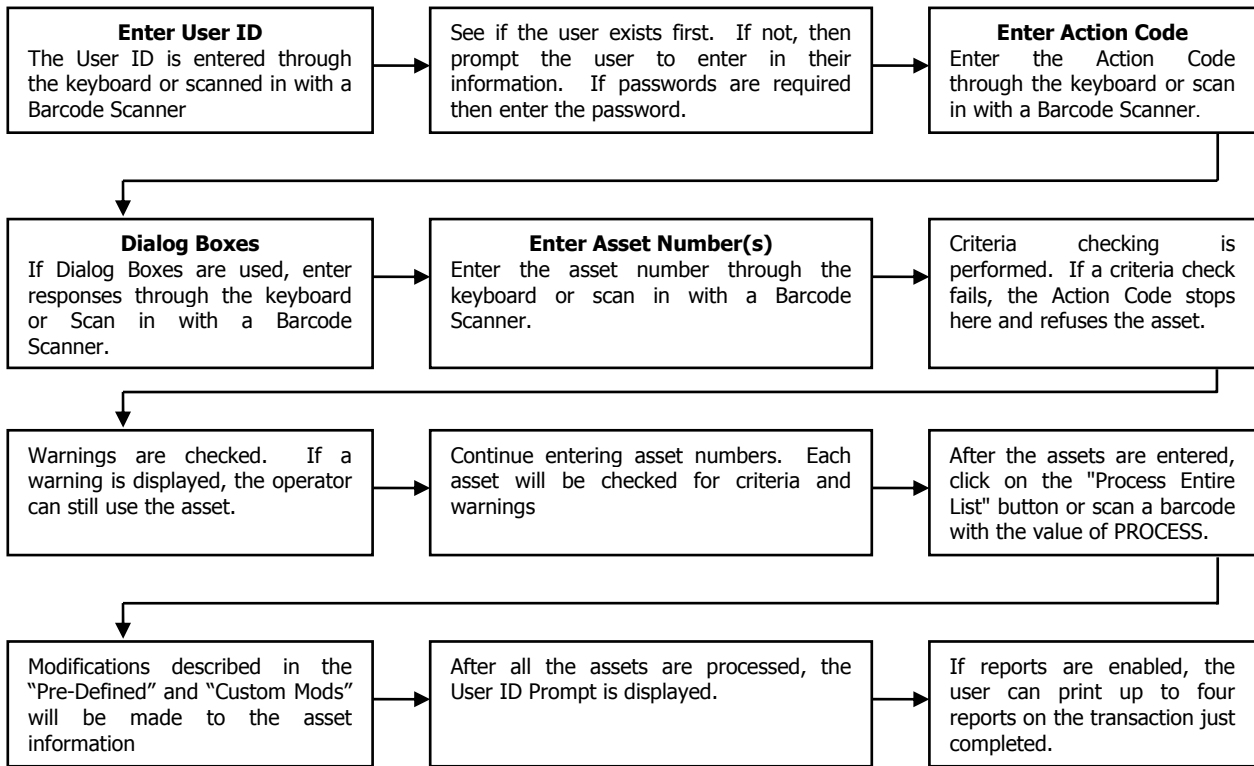
The Sybase SQL database server manages the MET/TRACK database. This server manages all the transactions into the database thereby minimizing errors. Other databases usually have shared files that can sometimes become corrupted. Sybase provides a very robust system that has good security and very little chance of being corrupted. The MET/TRACK components read and write to the Sybase database via ODBC (Open Data Base Connectivity). The MET/TRACK components, Manual Entry and DB Setup, all act as the front end for the database and provide the user with an easy way to manipulate the database. Crystal Reports is a separate report writer used to design the reports that are later called from the MET/TRACK Manual Entry Program and *Barcode Magician*.

It should be noted that the DB Setup and Manual Entry Program are a single combined program for MET/TRACK version 7. For the purposes of documentation and to be compatible with version 6.x, we will refer to these programs separately.

Barcode Magician is a separate group of programs that communicate with the MET/TRACK database via ODBC. During the installation process, additional tables are inserted into the MET/TRACK database that keep track of action codes, users, logs, and system settings.

There are many operations in the management of any metrology database requiring numerous changes to the status of several assets. Many companies have discovered that *Barcode Magician* is a great tool for use in tool cribs to generate location history. Instead of the user having to repetitively type in information to change an existing asset, the user can change the information of several assets at once by executing a macro called an Action Code. Action Codes are very easy to create and are not limited in number. You can further automate the system by utilizing barcode scanners and printers to increase efficiency.

The following is a block diagram that illustrates the process *Barcode Magician* goes through to process an instrument in the database.



BARCODE MAGICIAN OPERATIONAL BLOCK DIAGRAM

New Barcode Magician features

If you are upgrading from an earlier version of *Barcode Magician*, there are some new features that you may want to utilize. Some of the features are:

- SQL Statements used in criteria checking and "Custom Mods", including Stored Procedure calls.
- Unlimited number of user database entries.
- Unlimited number of Custom Modifications.
- Combined Check In and Check Out with one action code.
- Increased Crystal Reports with up to four different reports per workstation.
- Improved system throughput.
- *Barcode Magician* can now use fixed workstation licenses or floating concurrent licenses.
- Compatibility with MET/TRACK version 6.x and 7.x.
- Validation available in dialog boxes when updating a validated MET/TRACK field, Ver 6.x and higher.
- Custom Phrase File allowing the editing of all the labels and captions. These phrases can also be translated into other languages.
- Required Dialog Box entries.
- Action Code Pick list.
- Added Customers table access and updates.
- New command line start options for Run Time
- Masked user identification option.
- Allow mixed case or force upper case data entry option.
- Users can be purged automatically after a period of inactivity.
- Users can change their own profiles/passwords from the Run Time Program.
- A workstation can have specific action codes assigned to the workstation. The system administrator sets this.
- A new function in the Action Code Editor allows for Input/Output of data using SQL commands to/from external files.

System Requirements

Barcode Magician requires that you have a successful implementation of MET/TRACK 6.x or 7.x. MET/CAL and MET/TRACK Version 6.x utilizes the 32 Bit Sybase 5.5 Network Requester that is supplied with MET/CAL and MET/TRACK version 6.x, or one is provided on the CD. This link must be operational before starting the software or ODBC must be configured properly to start up the Network Requester automatically. MET/CAL Version 7.x utilizes Sybase Adaptive Server 8 and a description of the configuration is described in this manual. The network requester is not visible with Sybase version 8 like it is with Sybase version 5.5.

The PC should be running Windows 98/Millineum, Windows NT Workstation 4.0 (Service Pack 4 or higher), Windows 2000, or Windows XP. You may want to make sure the PC has at least 64 MB of memory. More memory enhances performance. The system requires at least a VGA Color Monitor. Required hard drive space on each client should be less than 30 Mbytes.

Bar Code Reader Requirements

(NOT A REQUIREMENT FOR *BARCODE MAGICIAN* TO OPERATE)

Barcode reader requirements are very simple. *Barcode Magician* requires that the bar code reader perform as a keyboard emulator. (A wedge type reader inserts between the keyboard and the computer and emulates keyboard inputs.) There are many available models and we can help you select one if you need help. If using a bar code reader through the RS-232 port, then you must have keyboard emulation software. *Barcode Magician* additionally requires that the reader add a **CARRIAGE RETURN** suffix to the code reading. This allows the user to move through the Run Time fields without pressing any tab keys. Most readers have a programming feature that allows you to easily set up the carriage return suffix.

Many other programs use a carriage return suffix, and this is usually considered a normal implementation of the barcode reader. You may also want to make up a bar code label called PROCESS. This is a key word used in the Run Time module which when scanned, will automatically process the list of instruments. Thus, the operator has a hands free system.

ON TIME SUPPORT has several Barcode Readers to choose from. Please contact ON TIME SUPPORT for more information.

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SECTION 2 - Installation

Installing the 32 Bit Sybase 5.5 Client for MET/TRACK 6.x

If you are using MET/BASE version 6.x, then you will need to install the 32-Bit Sybase database client in order for the *Barcode Magician* programs and the OTS registration manager to connect to the database (all are 32-bit programs).

IMPORTANT NOTE: If you are using version 6.x and are installing *Barcode Magician* on a client that already has MET/CAL or MET/TRACK installed, this step should not be necessary and you can use the existing ODBC configuration.

Installation on Windows 98/Millineum

The Sybase client should be installed from the METCAL\CLIENT\SYBASE folder on the server. You may have to map a drive letter to the METCAL directory on your server. For installation on Windows 98/Millineum run the **SETUP.EXE** program from the METCAL\CLIENT\SYBASE\WIN95 directory. You can also run the SETUP.EXE program from the *Barcode Magician* installation CD. The directory on the CD is **\SybaseASA55\Win95_98**.

Installation on Windows NT, Windows 2000, and Windows XP

NOTE: Be sure to log on with Administrator privileges.

The Sybase client should be installed from the METCAL\CLIENT\SYBASE folder on the server. You may have to map a drive letter to the METCAL directory on your server. For installation on Windows NT/2000/XP run the **SETUP.EXE** program from the METCAL\CLIENT\SYBASE\WINNT directory. You can also run the SETUP.EXE program from the *Barcode Magician* installation CD. The directory on the CD is **\SybaseASA55\WinNT_2K**.

Complete the Sybase Client Installation

Select (or leave selected) "Install the software" and click on OK.

The default installation directories are normally acceptable, but if you choose to install to a different drive/directory, remember what it is for future reference. To save drive space, you may de-select "Install Sybase SQL Central" (not required by *Barcode Magician*) when presented with a list of optional components to install.

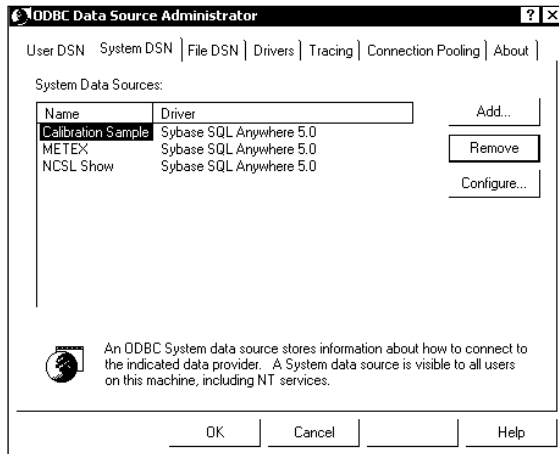
The installation program will confirm changes to the registry for Windows NT/2000/XP or Autoexec.bat/config.sys files for Windows 98/Millennium. Click on **OK**. You must reboot the computer for the programs to register properly.

Don't forget to create a 32-bit ODBC data source with parameters appropriate for connection to your database. If you are unsure how to create an ODBC data source, refer to the section of the *Barcode Magician* manual titled "Configuring the Sybase 5.5 ODBC-MET/TRACK 6.x" for instructions on creating a data source.

Configuring the Sybase 5.5 ODBC – MET/TRACK 6.x

NOTE: it is only necessary to perform this step if ODBC has not been configured for the client computer.

This step configures the 32-Bit ODBC Datasource for use by *Barcode Magician*. To start the configuration for Windows 95, 98, and NT, select **Start** | **Settings** | **Control Panel** | **32-Bit ODBC**. If you are using Windows 2000 or XP select **Start** | **Settings** | **Control Panel** | **Administrative Tools** | **Data Sources (ODBC)**. If the 32-Bit ODBC icon is not visible, close the Control Panel and select **Start** followed by RUN, and enter "odbcad32.exe". The following example is shown with Win2000.

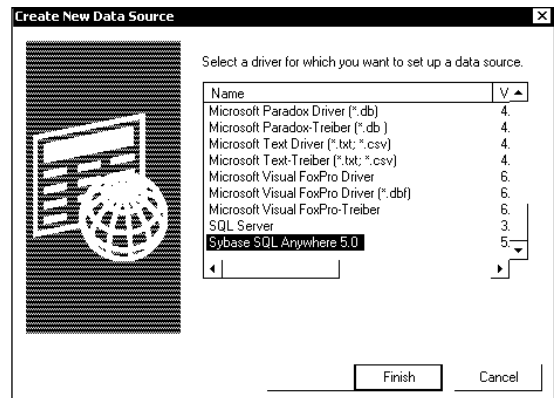


32 BIT ODBC DATA SOURCE LISTING

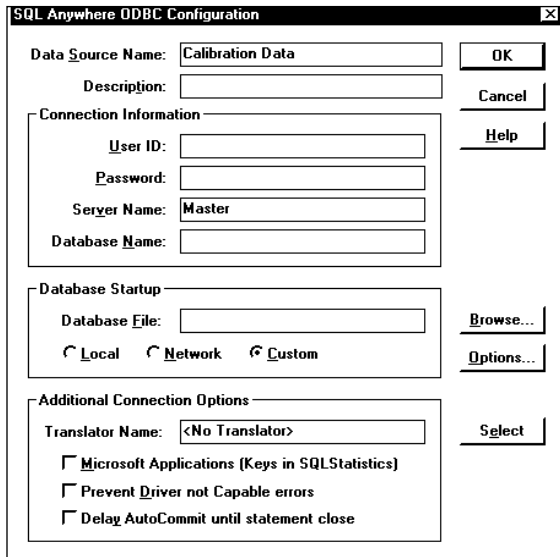
You should see the screen at right: (may be different for various versions of the operating system). You need to select the data source driver that is Sybase SQL Anywhere 5.5.

These instructions assume that the 32 Bit Sybase SQL Anywhere 5.5 drivers have been installed.

Select **System DSN** and you should have a screen like the one at left. Select **Add** and then double-click on Sybase SQL Anywhere 5.0.



SELECTING THE SYBASE DRIVERS (WIN2000)



For **Data Source Name** enter "Calibration Data". NOTE: It is possible to use another data source name, especially when more than one database has been configured.

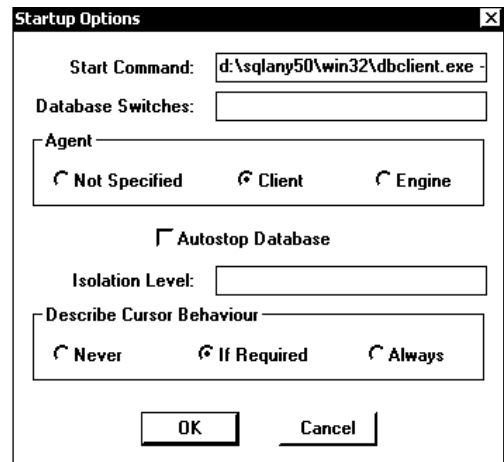
For Server Name replace "<default>" with the name of your MET/BASE database engine. Traditionally it is named **mtrack**. However, most database installations will have an alias name assigned to the database. If in doubt, and if there is another MET/TRACK client that is operational, start that MET/TRACK client and select the database client icon in the taskbar and look at the title of the window. The window title is the same as the engine name. In our example we used "**Master**" as our server name. If you are running only one database the Database Name should be blank.

Select **Options**.

ODBC DATA SOURCE CONFIGURATION

A screen similar to the one at right is displayed. Enter **c:\sqlany50\win32\dbclient.exe -x tcpip{HOST=*actual network name of server*}** in the Start Command box. If you using Windows 2000 or XP you may want to use the following: **c:\sqlany50\win32\dbclient.exe -x tcpip{HOST=*actual network name of server*;DOBROADCAST=NO}**. The DOBROADCAST command will solve certain communication problems with Sybase 5.5 when using Windows 2000 or XP on a network.

Replace C: with the drive letter that the Sybase software is installed on. If you are using IPX, then use -x IPX instead of -x tcpip. Most systems now use tcpip for the network transport protocol.



ODBC OPTIONS CONFIGURATION

Be sure to select **Client** as the agent and uncheck **Autostop Database**. If **Autostop Database** is checked, it will take longer for the program to load due to the requester needing to start each time.

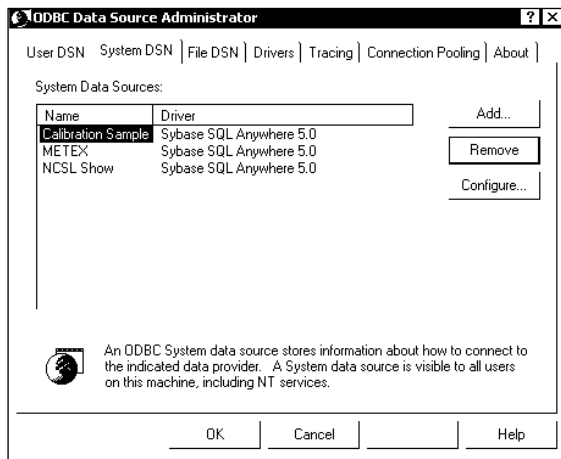
Select **OK** then select **OK** then select **OK** again to exit the ODBC configuration. You should now have the ODBC portion configured properly.

Configuring the Sybase 8 ODBC – MET/TRACK 7.x

IMPORTANT: The Sybase 8 ODBC drivers are automatically installed on the client machine during the installation of *Barcode Magician* from the CD. These drivers are installed even if the system uses the Sybase 5.5 drivers. If your system is configured for MET/TRACK 7.x, you only have to configure ODBC if it has not already been configured.

NOTE: it is only necessary to perform this step if ODBC has not been configured for the client computer.

This step configures the 32-Bit ODBC for use by *Barcode Magician*. To start the configuration for Windows 95, 98, and NT, select **Start** | **Settings** | **Control Panel** | **32-Bit ODBC**. If you are using Windows 2000 or XP select **Start** | **Settings** | **Control Panel** | **Administrative Tools** | **Data Sources (ODBC)**. If the 32-Bit ODBC icon is not visible, close the Control Panel and select **Start** followed by RUN, and enter "odbcad32.exe". The following example is shown with Win2000.

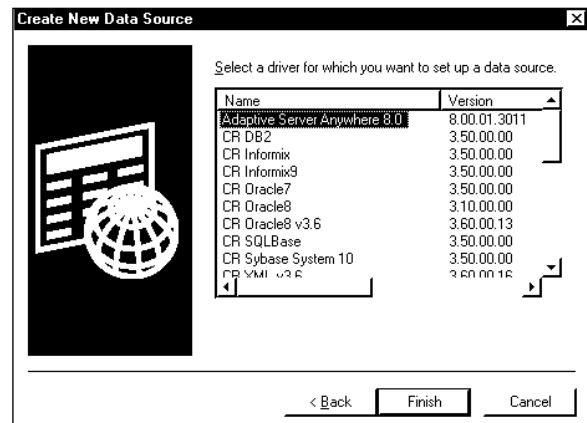


32 BIT ODBC DATA SOURCE LISTING

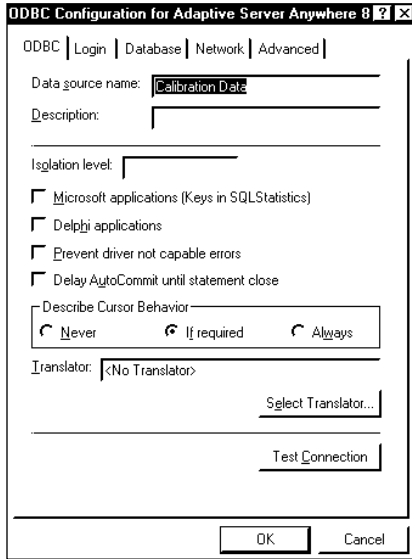
You should see the screen at right: (may be different for various versions of the operating system). You need to select the data source driver that is Adaptive Server Anywhere 8.0.

These instructions assume that the 32 Bit Sybase Adaptive Server Anywhere 8.0 drivers have been installed.

Select **System DSN** and you should have a screen like the one at left. Select **Add** and then double-click on Adaptive Server Anywhere 8.0.

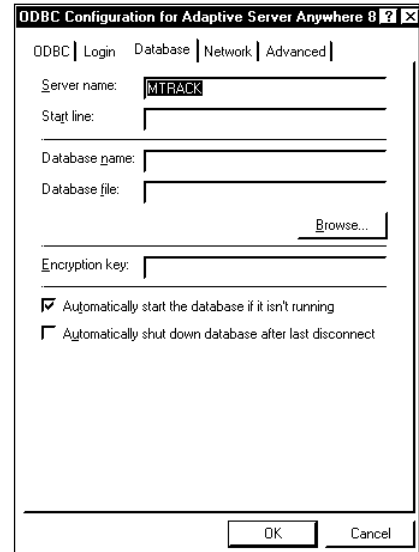


SELECTING THE SYBASE DRIVERS

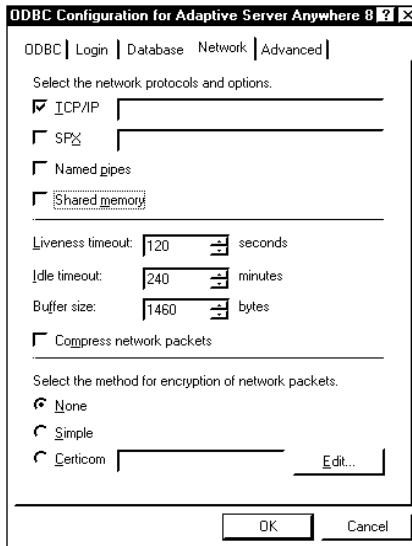


For **Data Source Name** enter "Calibration Data". NOTE: It is possible to use another data source name, especially when more than one database has been configured. Click on the '*Database*' Tab

For **Server Name** replace "<default>" with the name of your MET/BASE database engine. Traditionally it is named **mtrack**. However, most database installations will have an alias name assigned to the database.



ODBC CONFIGURATION FOR SYBASE 8



Click on the '*Network*' Tab. A screen similar to the one at left is displayed. This screen is used to configure network options. In our example, we have selected TCP/IP for our network communication. It may be necessary to identify the database server to the Sybase Client. The Sybase Adaptive Server Anywhere does not have a separate network requester like the earlier versions of Sybase. The network requester is actually part of the ODBC driver. You can identify the network server with the following command:

HOST= actual network name of server.

This configuration will be entered adjacent to the checked TCP/IP option. If the network uses SPX, then enter the server options next to the SPX option. Refer to the Sybase documentation for more information on configuring the ODBC settings.

ODBC SYBASE 8 NETWORK OPTIONS

Click on the '*ODBC*' Tab. There is a **Test Connection** button that will allow you to test the network connection to the database. This is a useful tool for troubleshooting connections.

Select **OK** and then select **OK** again to exit the ODBC configuration. You should now have the ODBC portion configured properly.

Installing *Barcode Magician*

NOTE: If installing on several stations, you may want to consider installing to a network drive. It is easier to support multiple installations from one location. When performing the installation procedure, be sure to log onto the client computer with administrator privileges because the installation procedure may need to modify system files.

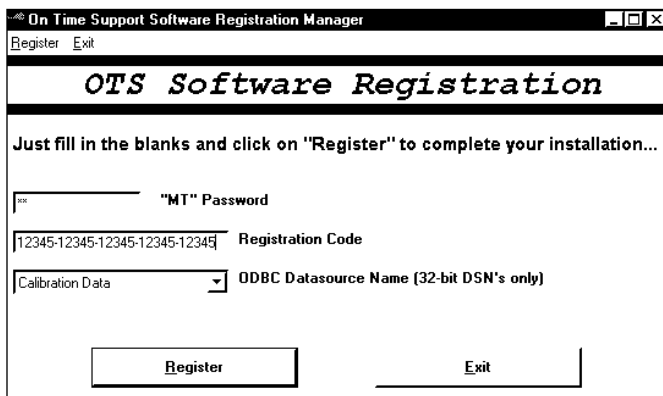
Insert the *Barcode Magician* CD. From within your system select Run, type "D:\BCM15\SETUP" and press Enter. 'D:\' will represent the drive letter of the CD Drive in this example. If necessary, use a different letter for your CD Drive. The installation program will prompt you for the directory to install the program files. You may select a network drive for installation, but make sure the network drive is shared out to the client computer(s). The installation program will also prompt you for a typical installation with the programs to be installed on c:\METCAL\MTBCM15. There are different installation types, but using "Typical" is the default. If you are installing to a network server, you can add a sub directory to the METCAL directory, for example:

M:\METCAL\MTBCM15

All the *Barcode Magician* programs are installed in the MTBCM151 sub directory. Follow the installation program instructions to perform the installation. If you have successfully configured ODBC, then you are ready to run the OTS Software Registration Program. The *Barcode Magician* registration program will now begin. It is not necessary to run the registration program at this time if the administrator needs to configure ODBC first. The registration program can be run at any time.

Using the Registration Program

The registration program can be executed at any time by running the OTS Registration Manager from the Barcode Magician 1.5.1 Group. The icon for the registration program looks like a key.



You will need to enter your "MT" Password, your 25 digit key code from ON TIME SUPPORT, and select the database (ODBC Source) you are connecting to. Click **Register**, and the program will add the necessary tables to your MET/TRACK system. **If this is a first time *Barcode Magician* installation, your default *Barcode Magician* system password is MT.** If you have problems during the installation process, contact OTS for support.

BARCODE MAGICIAN REGISTRATION SYSTEM

NOTE: If you have more than one *Barcode Magician* license you will need to run the registration program for each license. You can install all the licenses from the same client computer.

If you do not have a license, please contact ON TIME SUPPORT.

Upgrading an Existing *Barcode Magician* System? – Please Read First!

Note: Before upgrading your existing *Barcode Magician* installation, be sure to back up your database first. Read this document carefully and if you have any questions about this procedure, please contact ON TIME SUPPORT.

Upgrading from Barcode Magician 1.2, 1.3, or 1.4

Barcode Magician version 1.5.1 has many new features that have made it necessary to change the table structure in the database. There are some things that you must know about this process:

- When installing *Barcode Magician* 1.5.1, a new action code table, user table, and system tables are automatically created. The registration process "initially copies" the Action Code and Users data from the old tables (1.3 and 1.4). You can continue to run the older version (1.3 and 1.4) while you evaluate the new version (1.5.1). Do not try to run a system with version 1.3/1.4 and 1.5.1 workstations for very long. A configuration of this type may yield inconsistent results. You should upgrade all of the workstations to version 1.5.1 and it is necessary to run the migration script to finalize the installation.
- The migration script is run from the ISQL editor. Start the ISQL editor and click on "File" and then click on "Open" and load **migrate.sql**. This file is located in the MTBCM15 directory. If you are running ISQL for Sybase 5.5 click on Execute. If you are running ISQL for Sybase 8 click on "File" and then click on "Run Script". Wait for the script to complete execution. When you run the **migrate.sql** script from the ISQL editor, this script WILL DELETE the entries in the 1.5.1 version Action Code and Users Tables only if the Action Codes and Users have the same names as in the old version 1.3/1.4 tables. New entries will not be deleted in the 1.5.1 tables. After this deletion occurs, the migrate script will RE-COPY the old data from the version 1.3/1.4 tables to the new 1.5.1 tables. The older version tables will be deleted. This means that once you have run the migrate script, the earlier versions of *Barcode Magician* will not work because the old tables will have been deleted. If you have been evaluating the demo and have modified existing Action Codes that have the same name in the older version, you can rename these Action Codes and not lose any work. After running the "migrate script" you may want to delete migrate.sql to avoid being used again.
- If you have been running reports from earlier versions of *Barcode Magician*, your existing reports will run only after the **migrate script** has been executed. The migrate script actually drops the old tables, but creates new views so that your reports will still work. If you add reports, use the new tables in *Barcode Magician*. You will also need to configure your existing reports in the Workstation Configuration program. There are several new functions in the program, and you should review the Work Station Configuration Program in this manual.

Default values have been removed from "Check Out" and "Check In" in the Pre-Defined function in *Barcode Magician*.

- If you use the Check Out Function, *Barcode Magician* no longer puts the user name in L2801 or the date in L2806. It still inserts the date and time in fields L2809 and L2810. The reason for this is that the MET/TRACK database has new text and date fields that may be more useful for customers. If you are using the *Barcode Magician* Predefined function to insert L2801 or L2806, add these fields to the "Custom Mods" section.
- If you use the Check In Function, *Barcode Magician* no longer puts a date into field L2807. You must edit your Action Code and configure the date field you want Check-In to update. You do not have to use the Check-In function and you can have the "Custom Mods" section add the date in the location history.

The system configuration program has several changes. In previous versions of *Barcode Magician* if the default value before purging users was set at 999 days, then the guest would not expire. This value has been changed to 0 if a guest is not to expire on the system. The system administrator should review these settings and update the configuration.

Users of previous *Barcode Magician* products will appreciate the many new features and enhanced execution speed. If you have any questions about this upgrade process, feel free to call ON TIME SUPPORT or E-Mail us for help at inquiries@ontimesupport.com.

Upgrading *Barcode Magician* from MET/CAL version 6.x to MET/CAL version 7.x

If you install *Barcode Magician* 1.5.1 on a MET/CAL 6.x system and later upgrade to MET/CAL 7.x, you will need to re-register one of your *Barcode Magician* licenses. Everything will then work as before.

Upgrading *Barcode Magician* 1.5 to this version – Please Read

If you have a previous version of *Barcode Magician* 1.5 then you will need to install the clients and then re-register *Barcode Magician* with one of your existing version 1.5 licenses. This will activate the new features for *Barcode Magician*.

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SECTION 3 – *Barcode Magician*® CONFIGURATION

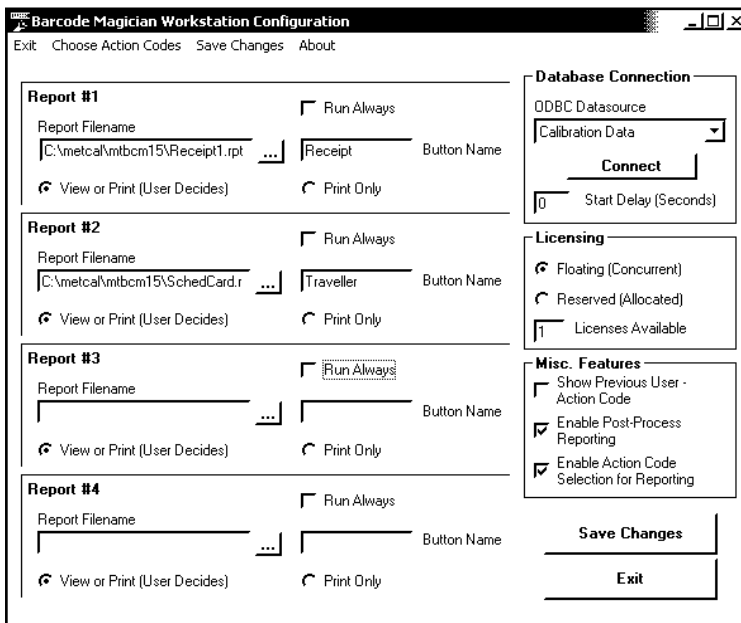
The Workstation Configuration Program

NOTE: Even if you make no changes to *Barcode Magician* Workstation Configuration, you must select "Save Changes" in this application before any other BCM application will run on this workstation. After configuring the *Barcode Magician* Workstation, you must restart the *Barcode Magician* Run Time Program for the changes to take effect. These configuration settings have to be configured for each *Barcode Magician* workstation. These are not global settings for all of the Workstations.

The Work Station Configuration Program for *Barcode Magician* 1.5.1 has been completely changed. The local workstation configuration settings are stored in the operating system registry instead of an INI file. The Workstation Configuration Program also configures up to 4 Crystal Reports to run on a workstation. In previous versions of the program, only two print buttons could be configured on the Run Time Program screen. *Barcode Magician* allows each individual workstation to configure the workstation properties.

Setting the ODBC Database Connection

From the *Barcode Magician* Program group, select the *Barcode Magician* Workstation Configuration Program.



WORKSTATION CONFIGURATION PROGRAM

Starting at the top right of the screen, you will see the ODBC Data Source. This Data Source must be configured for each workstation. **The default data source is 'Calibration Data'.** After you select the ODBC Data Source, click **Connect** to connect to the database. All the fields will be grayed out until the Workstation Program successfully connects to the database. You will be prompted to enter the administrator password.

A startup delay can also be set. If you have configured ODBC properly, leave the value set at zero. If you want to have the Sybase network requester and the *Barcode Magician* Runtime in the startup group, you have the option of creating a delay for the startup of *Barcode Magician*. As stated earlier, this is normally unnecessary.

Configuring the Work Station License

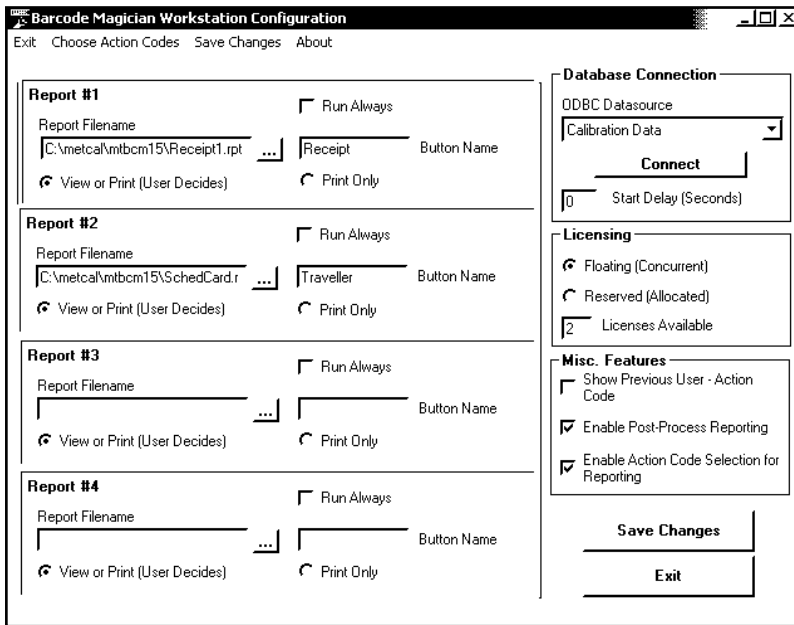
Starting with Version 1.5, *Barcode Magician* also has a new licensing system. Licenses can be assigned to each workstation as a reserved license or they can be left as a Floating or Concurrent License. Selecting a reserved license will always dedicate a *Barcode Magician* license to the workstation. Selecting a floating license will allow the workstation to select a license from a 'pool' of licenses, assuming that more than one *Barcode Magician* license is assigned to a database. If there are 10 installed *Barcode Magician* stations and only 5 licenses are available, and they are all 'Floating (Concurrent) licenses', then any 5 of these stations can operate at one time. The default is set at 'Floating'. The total number of *Barcode Magician* licenses is displayed also. The license count only displays the number of licenses that are available. Demo licenses are not counted and cannot be reserved for a station. If you have a critical *Barcode Magician* station, then you may want to select 'Reserved' for the workstation license. In our previous example using the 10 workstations, a license would be assigned to the critical workstation and there would be 4 floating licenses left for the other 9 stations.

Configuring Miscellaneous Features

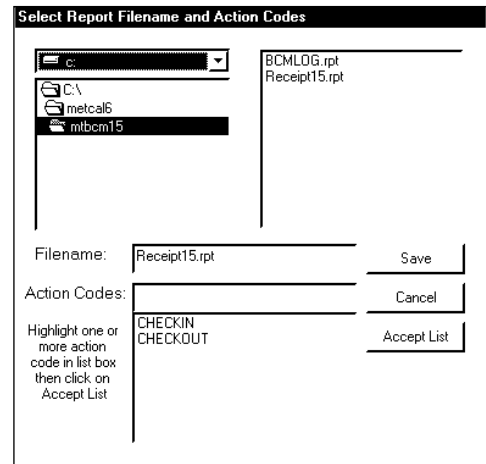
There are also selections available for showing the Previous User/Previous Action Code, Enable Post Process Reporting, and Enable Action Code Selection for Reporting. Selecting the 'Previous User/Previous Action Code' box will leave the last User and Action Code displayed on the Run Time screen after the transaction has been processed. If the box is not checked, then the last User and Action code will be erased after each Run Time transaction.

If the Barcode Magician Workstation is going to print reports after the execution of an Action Code, then 'Enable Post Processing' has to be selected. There is a new feature to select called 'Enable Action Code Selection for Reporting'. If you want to configure certain Crystal Reports for a particular Action Code, then 'Enable Action Code Selection for Reporting' should be selected. We will discuss how to configure a report for an Action Code later in this document.

The Workstation Configuration program will allow each workstation to execute up to four Crystal Reports. Depending on where the Run Time station is located, you may want to print a receipt, a shipping label, or maybe some kind of Barcode traveler that may go with the equipment. If you want to print reports, you must first create the report for Barcode Magician to call. We will discuss how to create reports utilizing some new tables in a later section of this manual. After the report has been created, we need to tell Barcode Magician where these reports are located. There are four sections for reports that are identical.



The process of selecting a report is easy. Click on the [...] button and the screen below will be displayed.

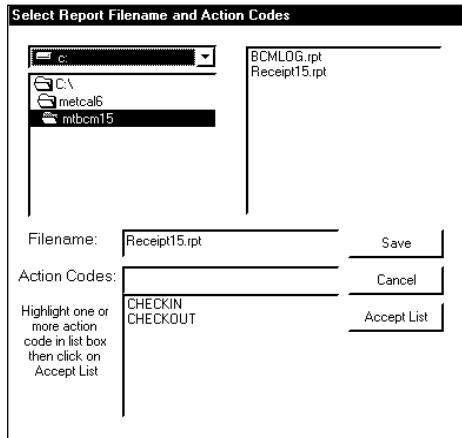


SELECTING A CRYSTAL REPORT TO BE PRINTED FROM RUNTIME

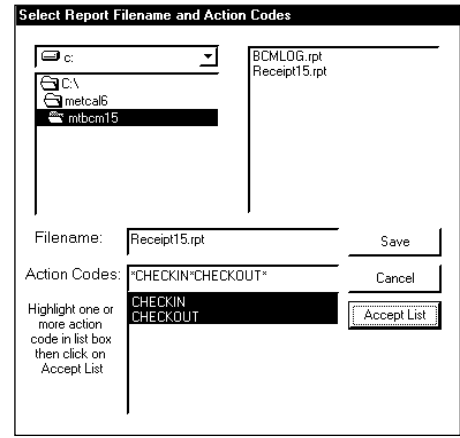
You can browse for the report you want to select. Just click on the filename. Remember that these files have to be Crystal Reports. Please read the section on the process of creating a Crystal Report for Barcode Magician.

You will also notice that there is another selection in the filename selection screen. You can assign Action Codes to a specific report.

NOTE: If you do not assign any Action Codes to a report, then the default is to let any Action Code run with the selected report.



If you want to select an Action Code to work with a specific report, then click on each Action Code in the list box. You can select more than one Action Code for a report. This will limit a report to be associated with the selected Action Code(s). Click on **Accept List**. Click on **Save** to save the configuration.



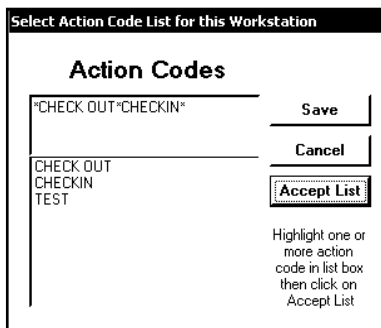
ASSOCIATING ACTION CODES TO A REPORT

Each report group has the option to run the report on every transaction. There is also a choice of viewing the report before printing or printing only. Check one of these boxes. Using the print only option will be faster if you usually print the reports anyway. If you view first, then the Crystal Report Run Time engine has to load the viewer and you still have to manually print the report from the viewer.

Be sure to note that reports created for the purpose of printing from the *Barcode Magician* Run Time screen should not have any prompts. We will discuss this more later on. After the changes are made, click on **Save Changes** and then **Exit**.

Selecting Action Codes to Operate with the Workstation – New Feature

A new feature of *Barcode Magician* 1.5.1 is the ability to allow the system administrator to select which Action Codes can be executed from a specific workstation. The system administrator can restrict the Action Codes on a per workstation basis.

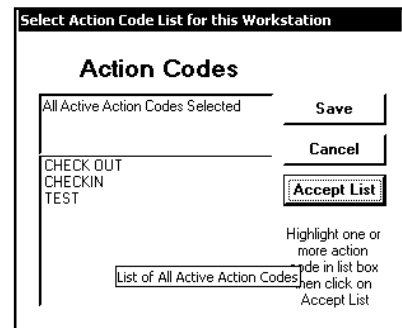


Click on **Choose Action Codes** from the Menu Bar. A form similar to the one at left is displayed. In our example at left, we have two Action Codes, CHECK OUT and CHECKIN selected. After selecting the Action Codes, click on **Accept List**. In our example, only CHECK OUT and CHECKIN will operate on our workstation. The TEST Action Code will not.

You can also delete the Action Codes you selected by deleting them with the Delete Key. The default condition is to allow the workstation to execute any active Action Code.

ASSIGNING ACTION CODES TO A WORKSTATION

The example at right has all of the Active Action Codes activated for the workstation. The message "All Active Action Codes Selected" will be displayed if no Action Codes are selected. This feature may be seldom used, but for large systems that have several *Barcode Magician* stations, there may be a need to restrict Action Code Access for a particular station(s).



The User's Database

Barcode Magician adds a separate Users Database to the MET/TRACK system. The Users Database includes 6 user-defined entries that can be modified to describe the User. The default field descriptions are Division, Building, Department, Shop, Office, and Phone Number.

The screenshot shows a software window titled "MET/TRACK Barcode Magician Users Database". At the top left, there are "Exit" and "About" menu options. The "Data Source" is set to "Calibration Data". The "User" section contains two input fields: "User Name" with the value "JOHN DOE" and "User ID" with the value "123123". To the right of these fields are "Search" and "Show All Users" buttons. Below this is the "User Information" section, which includes a "Password" field, a "ReEnter Password" field, and a "Guest Account Expires On" field with the value "No Expiration". A "Notes" field contains the text "JOHN WORKS IN THE TOOL CRIB". There are six more input fields arranged in two rows: "Division" (23), "Building" (N17), "Department" (MGF) in the first row; and "Shop" (RM210), "Office" (EWRS), "Phone Number" (1-911) in the second row. At the bottom of the window is a "Movement and Editing Controls" bar with buttons for "First", "Previous", "Next", "Last", "Add New", "Cancel", "Save", "Delete", and "Exit". The very bottom status bar displays "Current User: 123123 (5 of 5)", a "View" button, the time "4:37 PM", and the date "Sunday - November 3, 2002".

Default fields can be renamed in the **System Configuration** tool that will be described later. At the very bottom of the screen are the status messages. Each component of the software has a similar status bar. The number of users is displayed at the bottom left hand corner of the screen. At the bottom of the screen is the status mode. The example at the left is in the 'View' mode. **To change to the 'Edit' mode, click in any field and the word 'Edit' appears at the bottom of the screen.** The Time and Date are displayed at the lower right hand corner of the screen.

USER'S DATABASE SCREEN IN VIEW MODE

There is a row of buttons near the bottom of the screen for moving through the users. **First** moves the user database pointer to the first position in the database. **Previous** displays the previous user in relation to the current user displayed and lets you move backward through the database one user at a time. **Next** lets you move forward through the database one user at a time. **Last** moves to the very last User entry in the Database. **Add New** allows the entry of a new user. **Cancel** allows you to Cancel editing a user or adding a new user. Clicking on the **Save** button will save an entry that is being added or edited. **Delete** allows you to remove users one at a time. Clicking on the **Exit** button will exit the program. The users are listed alphabetically in the database by user name.

Normally, the full name is entered in 'User Name'. The 'User ID' could be the actual barcode value on the employee badge for the user. This value might be an employee number. For example this particular user would have a barcode value of 123123 on his/her badge. If the system administrator determines that a password is required, then the password will be entered in the 'Password' field.

An optional field is available for guests called 'Guest Account Expires On:', it is automatically calculated from the Run Time Module by using the system date and "purge guests after x days" in "System Configuration". You may enter a date if you wish to have the user treated as a guest. Because people move around and change job functions, the guest function is a great way to keep your User's Database current. You may want to set the guest to expire after 180 days. If this occurs, and the user has to re-enter their information through the Run Time screen, then the database will have all the updated information on that user. This is a real time saver when performing house-cleaning on the database.

Example User Entry

Let's set up an entry into the User Database....

Step 1: Start the Users Database program from the *Barcode Magician* group/folder. When prompted for the password, enter the system password. (The system password was created at the time of system installation. Refer to the System Configuration section for more information on passwords, and how to change the system password.)

Step 2: After the program completes loading, click on **Add New**. All the buttons will be grayed out except for **Save** and **Cancel**. Click on the 'User Name' field and enter the User's actual name. Press tab to move to the next field.

Step 3: Next, Enter the 'User ID'. This is the ID the user will log into *Barcode Magician* with. This may be an employee number or any assigned alphanumeric value. Tab over to the 'Password' field.

Step 4: If the user is required to use a password, enter it in the 'Password' field. You will have to re-enter the password for verification. Press Tab and re-enter the password again for verification. Press tab to move to the 'Expiration Date'.

Step 5: For the user to have a guest (temporary) account, enter an 'Expiration Date (format is mm/dd/yy). To establish a permanent account, leave this field blank. Tab to the Notes field.

Step 6: Enter any miscellaneous data into the 'Notes' field that may be useful. This is basically a large comment field. Tab to the next field.

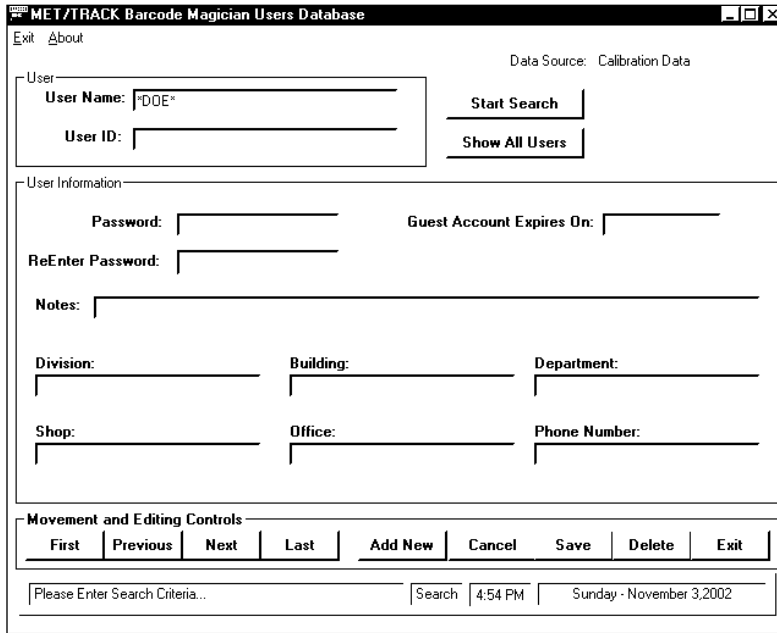
Step 7: The next six fields are used to enter information about the user. The default field names are 'Division', 'Building', 'Department', 'Shop', 'Office', and 'Phone Number'. These fields are customizable through the System Configuration program. If these fields are required and have no data, then the system will prompt you when **Save** is clicked. For more information regarding customizing these fields or making them required entries, refer to the System Configuration section.

Step 8: Click on **Save**. When the data is correctly entered, the 'Changes Saved' message box will be displayed. Congratulations, the first user is completed!

Using Search

Search is a very powerful tool for quickly locating users in the database. Click on **Start Search**. All the fields will blank out on the form. Enter the search criteria and click **Search**.

You can search on a single field, or on a group of fields. If you use more than one field, then the search criteria "AND's" all the fields together. What does AND mean in this case? If you search and use more than one field for your search, then the data returned would be for records that only have the same data in those fields. The example on the following page searches for any user name containing "DOE". The "*" is a wildcard character which searches for any characters where it is placed in the search string. The Search Screen also supports the "?" character which searches for a single character in the string. For example, a search string with "John D?e", will return a string with a single wildcard character. This search example returns "John Doe".



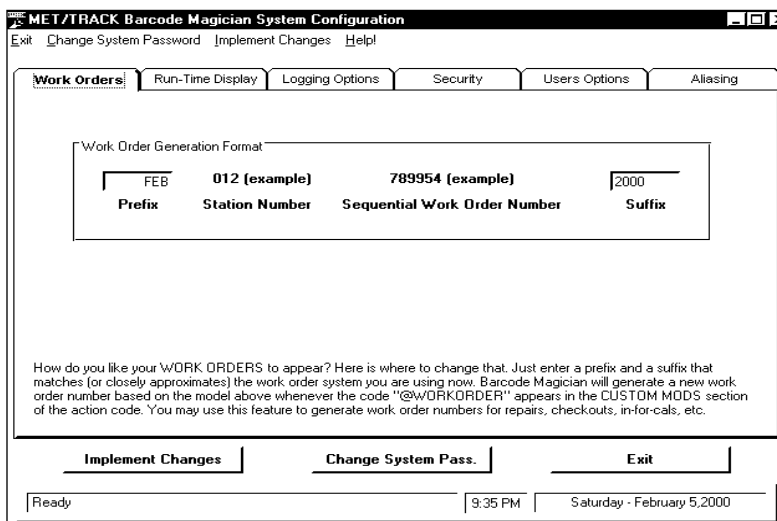
The completed search function will show how many matches were found and display this information in the lower left-hand corner of the screen. The message will display "Current User" and the quantity. If more than one user is returned in the search, you can use the movement buttons to look through the users that were located. To search through all the users, click **Show All Users**.

SEARCHING THE USERS DATABASE

You can also start the User's Editor in read only mode. The installation program will install an icon for the view only mode, or you can start the program with a `-viewonly` switch. For example, the command might look like `C:\metcal6\mtbcm15\bcmusrdb.exe -viewonly`. You can look and search, but not make any changes. There may be situations where this program may be more appropriate for users.

System Configuration

System Configuration allows you to configure your system for special operations. We will go through each tab and describe the operation on the screen. First let's take a look at the screen after logging in. Enter the system password to get started.



You will notice that there are six tabs at the top in the screen at left. Click the tab to select it. We will go through these in order from left to right.

SYSTEM CONFIGURATION SCREEN

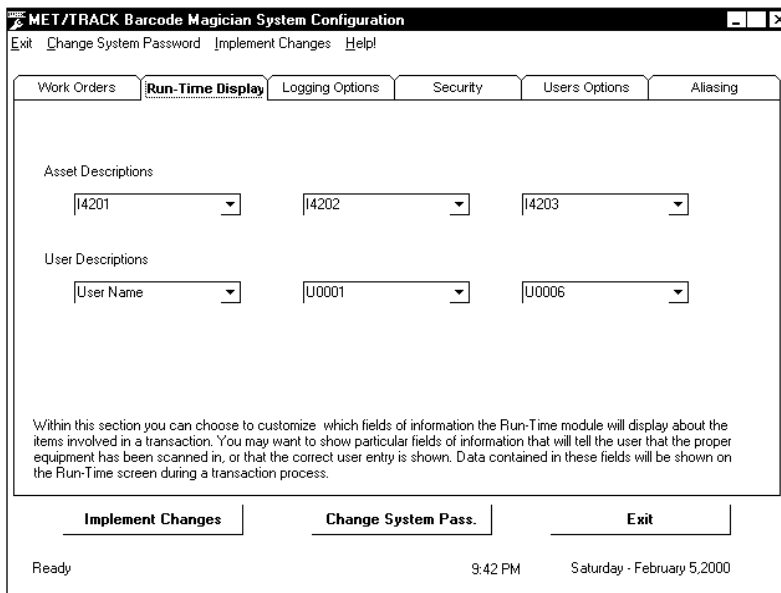
WORK ORDERS

Barcode Magician has an automatic work order generation feature built in. In the screen on the previous page, you will notice the 'Work Order' generation format. The user does not have control of the actual value generated by *Barcode Magician*. The serial number, date, and other criteria within the system calculate this value. It is practically impossible to have any duplicate values generated by the system. You can enter a prefix and suffix of you're choosing to the Work Order value. In our example we have a prefix of "JAN" and a suffix of "2000". In this example, when *Barcode Magician* generates the work order, the month will be added at the beginning of the work order and the year will be added at the end. This could be used to search for all work orders in a particular month and year. The system administrator will have to change the work order prefix/suffix values at the beginning of each month if this method is used.

NOTE: When the work order function is used, a separate unique work order is generated for each instrument that is processed.

(We will discuss how to implement the Work Order value in the Action Code Editor section.) Be sure to click on 'Implement Changes' to save the changes. You will need to double click in any field to re-enter edit mode to make entries or changes on this tab or any other tab in System Configuration

Run Time Display

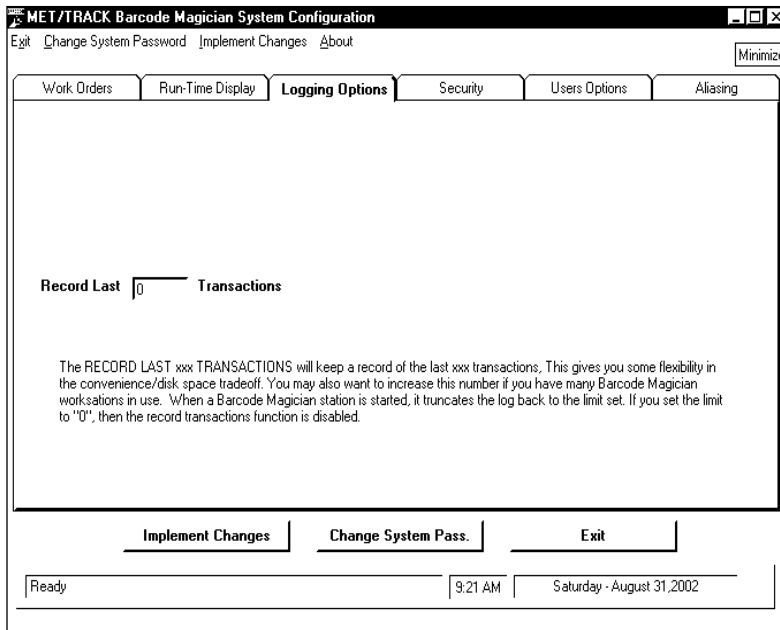


In the figure at left, we have three fields for the Asset Description and three fields for the User Description that are displayed in the Run Time module. The down arrows allow the administrator to select whatever fields are desired. The fields in the Asset Description are the actual MET/TRACK fields. You may want to consult the MET/TRACK field definition description to determine which fields you want to use. The default is I4201 (Asset Number), I4202 (Manufacturer), and I4204 (Description).

CONFIGURING RUN TIME DISPLAY

The User fields are defined in the User's section of the System Configuration (Users Options). The default user selections are User Name, U0001 (Building), and U0002 (Office). The system administrator can determine how to set up these fields.

Logging Options



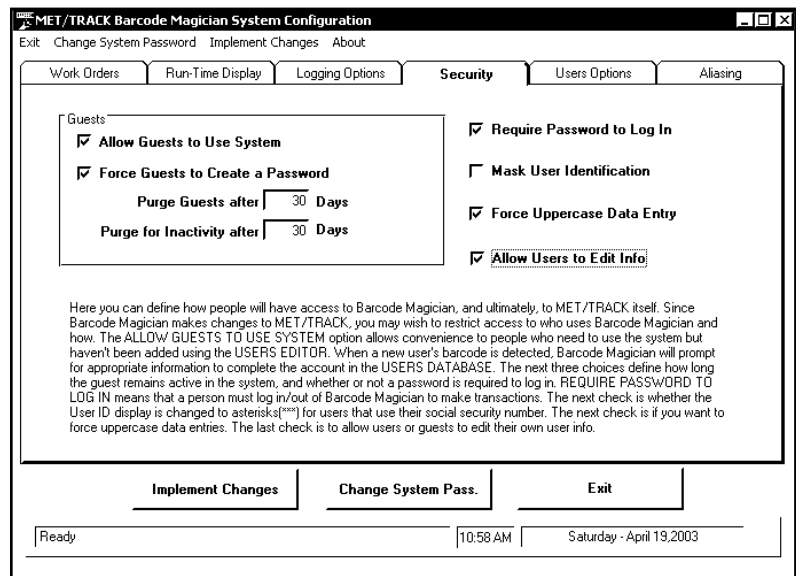
Barcode Magician has the capability of storing a number of transactions. The administrator defines the number. Keeping a log allows the administrator to go back through the system and check on a transaction via a Crystal Report. If the administrator does not want to record transactions, then enter a value of zero for the number of transactions to record and the information will not be saved. The default value is 0 transactions. If you decide to **not** use the Transaction Record feature, then please turn this feature off by entering "0" in this field. Your system will perform more efficiently without having to store the transaction statements.

CONFIGURING LOGGING OPTIONS

Security

Barcode Magician allows the administrator to determine the security system. A system password must be used to access all the programs except for the Installation, User Database View Only, and Run Time Programs. There is only one system password and you cannot turn it off.

The System Administrator can require the user to log in with a password before using the Run Time program. Because the Run Time Program in *Barcode Magician* makes changes to the MET/TRACK database, it may be necessary to require password protection. There may be several factors in making this decision.



CONFIGURING SECURITY

When running a transaction, the user is required to log in and the user must be listed in the Users Database. If 'Require Password to Log In' is checked, then the user will have to use a password to record a transaction. If the User is not in the Database, then they must be added. This can be a time consuming task when someone wants to pick up an instrument and the system administrator has to stop and add the user. A guest is a user that is not currently listed in the User Database.

If the **'Allow Guests to Use System'** box is checked, then a user that is not presently in the user database will be allowed to enter their user information through the Run Time Program. You can also make the password entry line required when a new guest is entering for the first time by checking the **'Force Guests to Create a Password'** box (This box is automatically checked when **'Require Password to Login'** is checked). They will be prompted to enter a password and re-enter the password for verification. The administrator can also determine how long a guest will stay resident on the system. The default value is 0 days. If **0** is entered, then the user will be entered as a permanent entry into the database with no expiration date. *Barcode Magician* 1.5.1 has a new feature that will allow the administrator to configure for inactivity. After a period of inactivity, the user will be purged. Setting a value of **0** will not purge any guests for inactivity. In our example, we have set the **Purge Guest** and the **Purge Guest Inactivity** to 30 days.

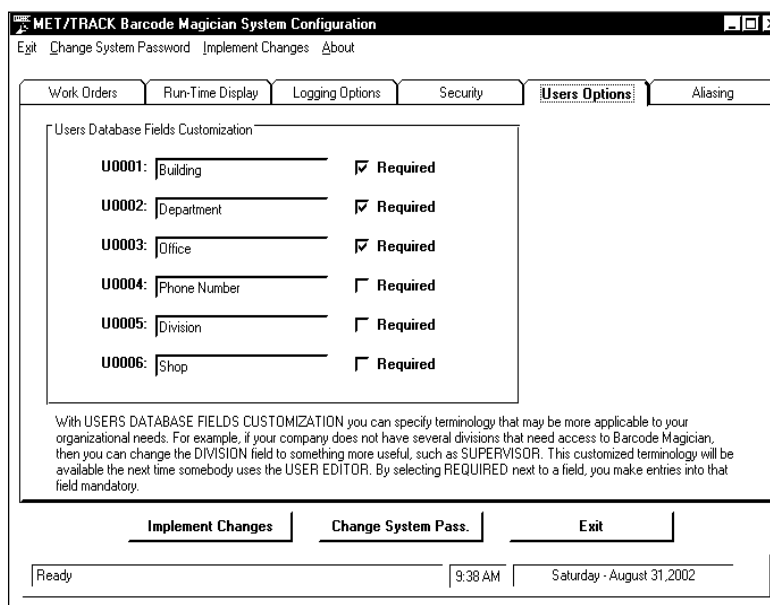
Some administrators have used the guest feature to help keep their Users Database current. Companies are always moving people and changing departments. It is almost impossible to keep up with all the personnel movements. Some companies use the Guest Feature with an expiration date as a way to keep the User Database up to date. For example, you could set the User Database to purge users after they have been in the system 90 days. If someone is dropped from the database after 90 days, they would be prompted to re-enter their information the next time they use *Barcode Magician*. This way the database stays up to date for at least 90 days. Whether the time expires for Inactivity or a Guest Timeout, the condition that occurs first will delete the user. Individual administrators can decide how they want to handle this.

Another new feature is **'Allow Users to Edit Info'**. If this is selected, the user can update his or her own information and password without having to contact the system administrator. The default has this option deselected. For systems with a large number of users, this can make it easier to update the user information. This is a global setting and not configurable on a per user basis.

Barcode Magician 1.5.1 has two new features: You can select **Mask User Identification** to mask the user's ID when processing instruments in the Run Time Program. This is useful if a company uses Social Security numbers for the user ID, and some individuals may consider this information sensitive. The other new option is **Force Uppercase Data Entry**. Previous versions of *Barcode Magician* only stored data in upper case. Now the system administrator can decide on mixed case or upper case storage of data.

After making the changes, click on **Implement Changes** to save work.

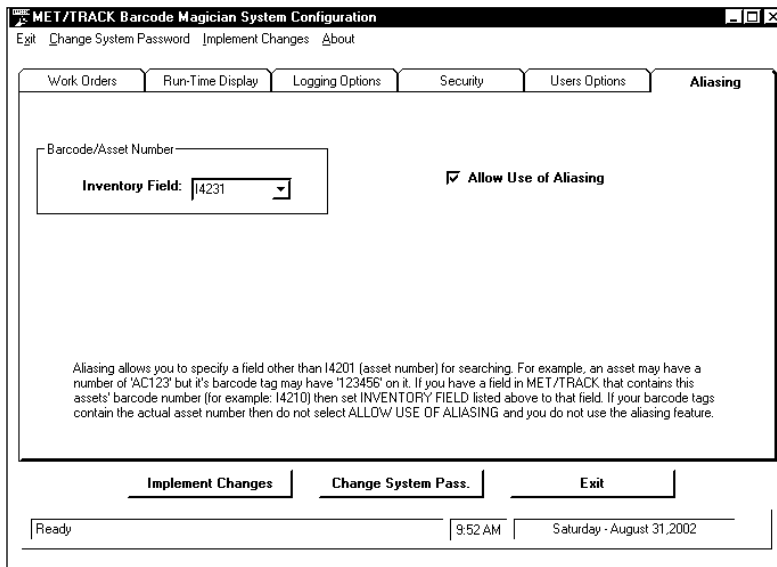
Users Options



Barcode Magician will allow you to customize which User Database fields are displayed in the Run Time Program. You can rename the Users fields to reflect your company's organization. These fields may also be required entries by clicking the 'Required' box. Required entries help keep your User's Database consistent. For example, the administrator can require the phone number to be entered. If a new user processes an instrument in the Run Time Program, the user will be prompted to enter their information. Required fields will be marked with a red label. After making the changes, click on **Implement Changes** to save work.

CONFIGURING USERS OPTIONS

Aliasing



“Aliasing” allows the system to use a different field for the Barcode or asset number instead of the I4201 field that is the required MET/TRACK asset # field. In the example at left, the system has been configured to use MET/TRACK field I4231 as the Barcode tag. Some companies will buy a sheet of Barcode tags and just stick them on as instruments come in for service. It is usually more expensive and time consuming to print the actual asset number as a Barcode, but it is the preferred method. If your company uses long asset numbers, it may be more efficient to assign a barcode field with fewer characters for your assets.

CONFIGURING ALIASING OPTIONS

Barcode scanners sometimes have problems scanning long asset numbers. A barcode field with five characters will provide over 90,000 unique possibilities.

Aliasing allows flexibility to let the administrator decide how to set up the Barcode tags. If you want to use I4201 as the asset # field for barcodes, do not check 'Allow Use of Aliasing'.

After making the changes to the system configuration then click **Implement Changes** to save the new configuration.

Change System Password

If you want to change the system administrator’s password, then click **Change System Pass.** The program will prompt you for the new password and will also verify the password change. You may want to periodically change the system password.

Default System Password

NOTE: The default system password is set to MT.

Action Code Editor

The Action Code Editor is the heart of *Barcode Magician*. This program tells the Run Time program where and how to make the changes to the MET/TRACK database. **Warning: This program will cause the Run Time Module to insert data into the MET/TRACK database as specified by the Action Code. Be sure to verify the operation and changes to each Action Code.** It is a good idea to have a dummy asset number in the database to test the Action Codes with first.

What is an Action Code?

An Action Code is like a macro. It is basically a set of instructions for the Run Time program to execute. You may want to create a Barcode tag for each Action Code. You can have as many Action Codes as you want, but always try to keep the system operation simple. An Action Code is able to perform up to 4 levels of criteria testing. **For Example:** Let's assume that the system is going to be used in a tool crib. We want to allow users to check out equipment, but we want to verify that the asset is not overdue for calibration, the instrument must be an active asset, and the instrument has been previously checked in first. Can you imagine trying to do this manually? In our example we will have the system create a new location record with the user name and department, and we will have the system update the inventory arrive date and status fields. Let's start by taking a look at the Action Code Editor.

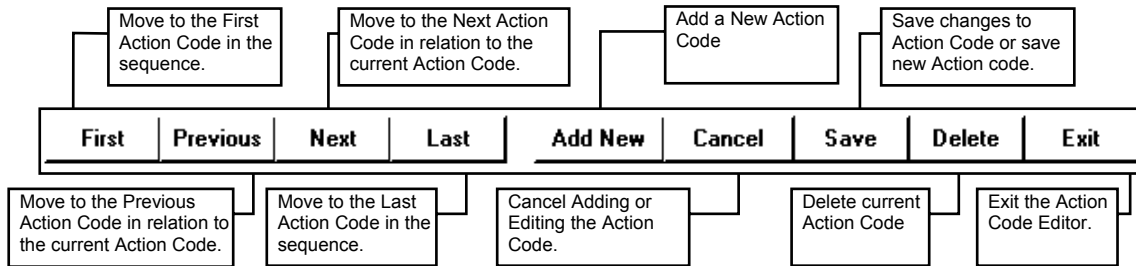
The screenshot shows the 'MET/TRACK Barcode Magician Action Code Setup' dialog box. The title bar includes 'Exit' and 'About' buttons. The 'Data Source' is set to 'Calibration Data'. The 'General' tab is selected, with other tabs for 'Criteria', 'Messages', 'Warnings', and 'Pre-Defined'. The 'Information' section contains fields for 'Action Code Name' (CHECKIN), 'Date of Last Edit' (10/28/2002), and 'Revision' (1). There are also fields for 'Action Code Description (Optional)' and 'Notes'. Two checkboxes are checked: 'Action Code Is Active' and 'Action Code Listed in Validation Pick List'. The 'Movement and Editing Controls' section features a 'Search for Action Code' dropdown menu with 'CHECKIN' selected, an 'OK' button, and a row of buttons: 'First', 'Previous', 'Next', 'Last', 'Add New', 'Cancel', 'Save', 'Delete', and 'Exit'. The status bar at the bottom shows 'Current Code: CHECKIN (1 of 3)', 'View', '3', '5:15 PM', and 'Sunday - November 3, 2002'.

The Action Code editor operates in the same fashion as the Users Database Editor. At the very bottom of the screen are the status messages. The number of Action Codes is displayed at the bottom left hand corner of the screen. Also, located on the bottom of the screen is the status mode. The example at left is in the **View** mode. To change to the **Edit** mode, click in any field and the word 'Edit' will appear at the bottom of the screen. The Time and Date are displayed at the lower right hand corner of the screen. There are a row of buttons near the bottom of the screen for moving through the Action Codes and saving data.

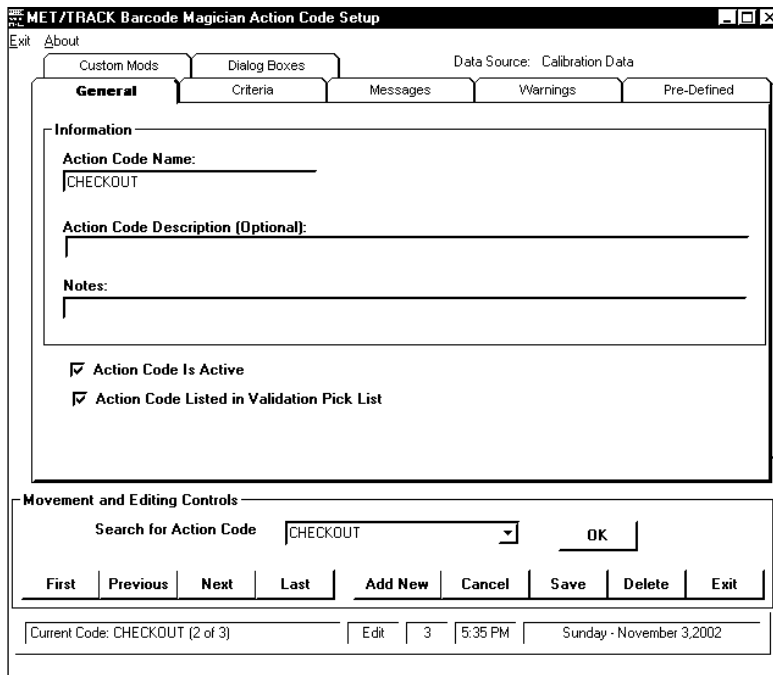
ACTION CODE EDITOR - GENERAL

A new feature has been added to version 1.5.1 with the addition of a Search function. Instead of having to use the controls to cycle through each Action Code, you can select from a drop down list, click **OK**, and go directly to a specific Action Code.

Let's take a look at the movement and editing buttons:



General



In our example we are going to create a new action code called CHECKOUT. This will be used in our tool crib example. First click **Add New** to enter the new Action Code. We entered CHECKOUT into the 'Action Code Name' field. The system automatically keeps track of the 'Date of Last Edit' and 'Revision'. In our example we also clicked the 'Action Code is Active' box. You can also make existing Action Codes inactive and save them for a special use. Version 1.5.1 has a new function called 'Action Code Listed in Validation Pick List'. This function allows the name of the Action Code to be listed in the drop list when entering an Action Code in the Run Time program.

ADDING AN ACTION CODE

You can enter a description of the Action Code and additional notes if desired. These are optional fields and are not required. However, entering a description or note may be useful documentation for future reference.

We have now started the process of entering a new action code. Next, we will add three criteria checks to make sure the instrument meets certain criteria. When creating Action Codes two things should be noted:

- If a criterion fails, the instrument will not be processed. The criteria failure will have to be corrected first
- If a warning fails, the program will display a warning, but will allow the operator to continue processing the instrument.

Criteria

The screenshot shows the 'Criteria' tab of the 'MET/TRACK Barcode Magician Action Code Setup' window. The 'Criteria' sub-tab is selected. Under 'Expression One', the 'Active' checkbox is checked. The expression is configured as: 'Next Due-Date - C2303' (left), 'Is Greater Than' (center), and '@Today's Date' (right). Below this are four other expression fields, all with their 'Active' checkboxes unchecked. At the bottom, there are 'Movement and Editing Controls' including a search field for 'CHECKOUT', and buttons for 'First', 'Previous', 'Next', 'Last', 'Add New', 'Cancel', 'Save', 'Delete', and 'Exit'. The status bar shows 'Current Code: CHECKOUT (2 of 3)', 'Edit 3', '5:41 PM', and 'Sunday - November 3, 2002'.

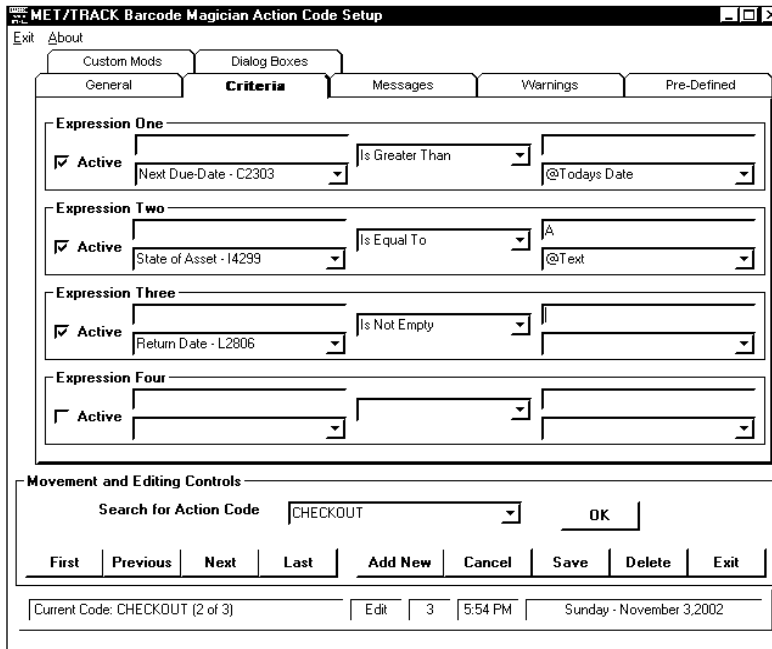
CRITERIA CHECKING – EXPRESSION ONE

Next we will click on the Criteria Tab and move to the Criteria screen. As stated before we are going to check and make sure the instrument is not overdue. In 'Expression One', we will click on the down arrow and scroll down through the list and find the expression '**Due-Date - C2303**'. Moving to the center column, select the expression '**Is Greater Than**'. In the right-hand column of 'Expression One' select **@Today's Date**. Our expression now reads, Due Date is Greater Than Today's Date. If Today is greater than the due date then the instrument is overdue for calibration and should not be checked out. Next we will check the 'Active' box and make the expression active.

Next, we are going to verify the instrument is active. In 'Expression Two', click on the down arrow in the left-hand column and scroll down through the list to find the Expression **State of Asset- I4299**. The field can only have a value of A, I, or D (Active, Inactive, Delete). This is defined in MET/TRACK. In the center column, select the expression **Is Equal To**. In the right-hand column of **Expression Two** we will select **@Text**, a special field. In the field right above **@Text**, enter text. We will enter an 'A' for Active. The expression should now read, the I4299 State field must equal A for Active. Next check the **Active** box and make the expression active

The screenshot shows the 'Criteria' tab of the 'MET/TRACK Barcode Magician Action Code Setup' window. The 'Criteria' sub-tab is selected. Under 'Expression Two', the 'Active' checkbox is checked. The expression is configured as: 'State of Asset - I4299' (left), 'Is Equal To' (center), and '@Text' (right). The field above '@Text' contains the letter 'A'. Below this are four other expression fields, all with their 'Active' checkboxes unchecked. At the bottom, there are 'Movement and Editing Controls' including a search field for 'CHECKOUT', and buttons for 'First', 'Previous', 'Next', 'Last', 'Add New', 'Cancel', 'Save', 'Delete', and 'Exit'. The status bar shows 'Current Code: CHECKOUT (2 of 3)', 'Edit 3', '5:49 PM', and 'Sunday - November 3, 2002'.

CRITERIA CHECKING – EXPRESSION TWO



Now, we are going to ensure the instrument has been checked in before it is checked out. In **Expression Three**, we will click on the down arrow in the left-hand column and scroll down through the list and find the expression **Return Date - L2806**. This field is part of the location history. We want to make sure it is not blank when an instrument is checked out, which means it has not been properly checked in first. There should be an entry in the field. Moving to the center column, we will select the expression **Is Not Empty**. In the right-hand column we do not need an expression to compare to because we are only interested in an empty field.

CRITERIA CHECKING – EXPRESSION THREE

Next, We will click in the **Active** box and make our expression Active. The expression now reads, the Return Date field is not empty. We then have three active criteria to compare to. This helps to keep the transactions consistent. When the Run Time module processes this action code, every one of these three criteria expressions must pass in order for the transaction to be processed!.

Let's take a moment here to consider some rules. ***When comparing things in the computer world always compare Dates to Dates, Text to Text, and Numbers to Numbers.*** For Example, you will get inconsistent responses when comparing Dates to Numbers. The date format is mm/dd/yy.

When selecting Criteria in the expression editor, you will notice that the system has adapted to your MET/TRACK customization. This makes it easier for the administrator to make changes. There are special fields with the "@" character in the description. These fields are system variables that can be used for criteria comparisons.

There are also the User Database variables, which will refer to the logged in user who is checking the equipment out. For example, you could make sure that only a certain department has access to special equipment. We left this open for you to use. The following is a short description of each criterion.

Contains

When using "Contains" in a criteria check, this means that it is looking for characters that may or may not be in another string.

Expression Four		
<input checked="" type="checkbox"/> Active	Status - I4225	Contains LOAN
		@Text

In this example, the field I4225 must at least contain the word 'LOAN' in order to pass the criteria.

CRITERIA – USING "CONTAINS"

Does not Contain

Expression Four		
<input checked="" type="checkbox"/> Active	Status - I4225	Does Not Contain LOANED
		@Text

In this example, the field I4225 must not contain the word LOANED in order to pass the criteria.

CRITERIA – USING "DOES NOT CONTAIN"

Is Empty

Expression Three		
<input type="checkbox"/> Active	Rel-date - L2807	Is Empty

In this example, the field L2807 must be empty in order to pass the criteria.

CRITERIA – USING "IS EMPTY"

Is not Empty

Expression Three		
<input type="checkbox"/> Active	Rel-date - L2807	Is Not Empty

In this example, the field L2807 must NOT be empty in order to pass the criteria.

CRITERIA – USING "IS NOT EMPTY"

Is Equal to

Expression Two		
<input checked="" type="checkbox"/> Active	State - I4299	Is Equal To A
		@Text

In this example, the field I4299 must be equal to an "A" in order to pass the criteria.

CRITERIA – USING "IS EQUAL TO"

Is not Equal to

Expression Two		
<input checked="" type="checkbox"/> Active	State - I4299	Is Not Equal To A
		@Text

In this example, the field I4299 must not be equal to an "A" in order to pass the criteria

CRITERIA – USING "IS NOT EQUAL TO"

Is Greater Than

Expression One		
<input checked="" type="checkbox"/> Active	@Todays Date	Is Greater Than
		Due-Date - C2303

In this example, today's date must be greater than C2303 Due Date to pass the criteria.

CRITERIA – USING "IS GREATER THAN"

Is Greater Than or Equal to

Expression One		
<input checked="" type="checkbox"/> Active	@Todays Date	Is Greater Than or Equal
		Due-Date - C2303

In this example, today's date must be greater than or equal to C2303 Due Date.

CRITERIA – USING "IS GREATER THAN OR EQUAL TO"

Is Less Than

Expression One		
<input checked="" type="checkbox"/> Active	@Todays Date	Is Less Than
		Due-Date - C2303

In this example, today's date must be Less Than C2303 Due Date to pass the criteria.

CRITERIA – USING "IS LESS THAN"

Is Less Than or Equal to

Expression One		
<input checked="" type="checkbox"/> Active	@Todays Date	Is Less Than or Equal To
		Due-Date - C2303

In this example, today's date must be Less Than or Equal To C2303 Due Date to pass the criteria

CRITERIA – USING "IS LESS THAN OR EQUAL TO"

SQL Statements (New in Version 1.5.1)

Expression One		
<input checked="" type="checkbox"/> Active	select i4201 from mt.inventory, mt.c	
	@SQL	

In this example, we used an SQL statement to determine if the instrument is overdue.

CRITERIA – USING AN SQL STATEMENT WITH SELECT

The following is our SQL statement:

```
select i4201 from mt.inventory, mt.calibration where c2303 > '$TODAY$' and c2339=1 and mt.inventory.mtag=mt.calibration.mtag and i4201 = '$ASSET$'
```

Using the system variables, the same result can be achieved with the following statement:

```
select i4201 from mt.inventory, mt.calibration where c2303 > '$TODAY$' and ctag='$CTAG$' and i4201='$ASSET$'
```

Both statements verify that the asset in question is not overdue for calibration. I4201 is the asset number. C2303 is the Due Date. C2339 is the flag for the most recent record. The question is, what happens if there is an asset that does not have a calibration record or a calibration record without a due date. Both previous statements will fail the asset.

The following statement is an example of checking instruments with a valid calibration record with a due date, a calibration record without a due date, and an asset without a calibration record.

```
SELECT I4201 FROM mt.Inventory Inventory LEFT OUTER JOIN mt.Calibration Calibration ON
Inventory.MTAG = Calibration.MTAG WHERE (Calibration.C2339 IS NULL OR Calibration.C2339 = 1) AND
(Calibration.C2303 IS NULL OR Calibration.C2303 > '$TODAY$') and I4201 = '$ASSET$'
```

In order for the criteria to pass an asset, the SQL statement should return the asset number of the asset. In our statements there are two system variables that are used, TODAY and ASSET. If you want to use a system variable, you must include "\$" characters on each side of the variable and it must be enclosed in single quotes. When using a SQL statement, only SELECT or CALL are valid statements to use.

Expression One	
<input checked="" type="checkbox"/> Active	call mt.user_bcm_criteria('\$asset\$')
	@SQL

Here is another example calling a stored procedure to perform the due date check.

CRITERIA – USING AN SQL STATEMENT WITH CALL

We used a **Call** statement to call a procedure called: **mt.user_bcm_criteria('\$asset\$')**. We have passed the asset number to the stored procedure. By executing a stored procedure, the program will process our criteria much more quickly. Our stored procedure performs the same function as the previous example using the SELECT statement. This stored procedure has to be created first and given permissions. It is recommended that you adhere to a standard naming convention for any stored procedures that you might create. In our example, we start the name of the procedure with "USER". We added a "BCM" for *Barcode Magician* and then added "CRITERIA" to describe what the procedure does.

```
create procedure MT.USER_BCM_CRITERIA(in asset char(60))
result(I4201 char(60),C2303 date) /* RESULT ( column-name,... ) */
begin
    select I4201,C2303 from mt.Inventory as Inventory left outer join mt.Calibration as Calibration
    on Inventory.MTAG=Calibration.MTAG where(Calibration.C2339 is null or Calibration.C2339=1)
    and(Calibration.C2303 is null or Calibration.C2303>TODAY(*)) and I4201=ASSET
end
```

ON TIME SUPPORT is available to create custom stored procedures. Contact your sales representative for more information.

The following are list of system variables for use with SQL statements.

Criteria – System Variables for SQL statements

ASSET – Asset number I4201 of the asset.
 MTAG – The unique index for the Inventory table.
 CTAG – The unique index for the Calibration table.
 RTAG – The unique index for the Maintenance table.
 LTAG – The unique index for the Location Table.
 KTAG – The unique index for the Customer Table.
 NOW – Returns the current time of day.
 TODAY – Returns the current date.
 LASTDAYTHISMONTH – Returns the last day of the current month.
 FIRSTDAYTHISMONTH – Returns the first day of the current month.
 LASTDAYNEXTMONTH – Returns the last day of the next month.
 FIRSTDAYNEXTMONTH – Returns the first day of the next month.
 LASTDAYLASTMONTH – Returns the last day of the previous month.
 FIRSTDAYLASTMONTH – Returns the first day of the previous month.

LASTDAYTHISWEEK – Returns the last day of the current week (Saturday).

FIRSTDAYTHISWEEK – Returns the first day of the current week (Sunday).

LASTDAYNEXTWEEK – Returns the last day of the next week (Saturday).

FIRSTDAYNEXTWEEK – Returns the first day of the next week (Sunday).

BARCODE_TAG – Returns the Instrument ID entered for the instrument.

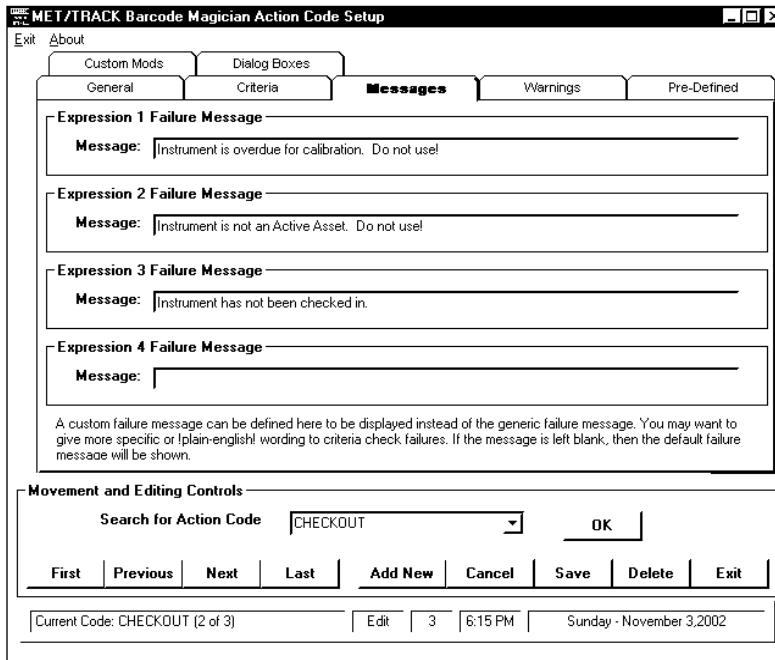
USERID – Returns the user Id of the user that is logged in.

USERNAME – Returns the Username of the user that is logged in.

WSSERIALNUMBER – Returns the serial number from the license registration code for this workstation.

DIALOG_BOX1, DIALOG_BOX2, DIALOG_BOX3, DIALOG_BOX4, DIALOG_BOX5 – Return the values in the dialog boxes.

Messages



Criteria messages are a feature of Barcode Magician allowing a message to be associated with each criterion. If a criterion fails then the corresponding message will be displayed. In our example, we will click on the Messages tab and enter a custom message for each criterion. The four boxes in this screen correspond to the four boxes in the Criteria Screen. We will enter the following Messages:

CRITERIA CHECKING MESSAGES

- 1 - Instrument is overdue for calibration. Do not use!
- 2 – Instrument is not an Active Asset. Do not use!
- 3 - Instrument has not been checked in!

These are very easy to understand messages. In the case of message three, the user would have to check the instrument in first.

If you do not use the Messages screen, then the system will display the error messages in a cryptic format. Our advice is to use messages and keep it friendly.

Warnings

We have entered our selection criteria and think we are ready to set up the database modifications. For example, let's assume someone is checking out an instrument requiring calibration in two days. The person checking out the instrument is taking a field trip to some remote location. So what are you going to do, go to his location and pick up the equipment? How about using the feature called Warnings. Clicking the 'Warnings' tab accesses this feature. There are two expressions per Action Code. This feature has many possible uses. We can use it to alert the user that an instrument only has a certain number of days until the calibration is due.

In our scenario, we are going to use 5 Days. If an instrument is being checked out and is due for calibration within 5 days, then we will display a Warning with a custom message. The user has the choice of checking out a different instrument that will be due at a later time. The format for criteria in warnings is a fixed criterion with a modifier. Take a look at the figure on the left. You will see the selection **Due Within X Days** with the X modifier set at 5 days. Other fixed selections include Due Within X Months, Calibrated Within X Days, Calibrated Within X Months, Instrument Not Returned, Instrument Active, Instrument Inactive, Instrument Not Active, Instrument Deleted, Use Greater Than or Equal To X, Use Less Than or Equal To X, and SQL:. These messages should be self-explanatory.

WARNINGS

We realize there are many other possible warnings that users may want, and the fixed messages may not be detailed enough. We have included a feature to create an SQL statement. The following is an example SQL statement that might be used to perform the same criteria check as in Warning 1. **SQL: Select I4201 from mt.inventory,mt.calibration where mt.inventory.mtag = mt.calibration.mtag and C2339=1 and (C2303-TODAY(*)) <= 5 and (C2303-TODAY(*)) >= 0 and i4201= '\$asset\$'**. This statement would be typed in the function box after selecting SQL: and it must return data from I4201, which is the asset number, in order to display a message. Let's take a look at the SQL statement.

The first part, **Select I4201 from mt.inventory,mt.calibration,** is going to only return I4201 values. The next part of the statement, **where mt.inventory.mtag=mt.calibration.mtag,** links the tables together. Since we are looking at the Calibration table we must link the Calibration table to the Inventory table using MTAG. This is called an equal join.

The next part of the statement, **and C2339=1,** selects only calibration records with an archive flag = 1. This flag identifies the most recent calibration record for an asset that may have several calibration records. The next part of the statement, **and (C2303-TODAY(*)) <= 5,** subtracts today's date from the calibration due date and verifies the value is less than or equal to 5. Next, **and (C2303-TODAY(*)) >= 0** checks to make sure the instrument is not overdue. In our example we only want the warning to be displayed if the instrument is not overdue but will be due for calibration within five days.

Next, **and i4201= '\$asset\$'** uses the \$asset\$ system variable and is compared to I4201 so that only one result is returned. This Warning will not return an overdue instrument. Be careful, an SQL statement can return several items back.

Barcode Magician will try to compare the returned values to the instrument that was scanned in to see if there is a match that will cause the custom Warning message to be displayed. You cannot update the database with this command. It will only accept the Select and Call command. If you want to use commands like Create, Drop, Delete, Update, and other dangerous commands, you will have to use the ISQL editor. We suggest using the ISQL Editor to debug your SQL query prior to entering it as Warning criteria.

Pre-Defined

Now that our criteria/warnings section is complete, click on the **Pre-Defined** tab to move to the next screen. The Pre-defined Actions are listed as follows.

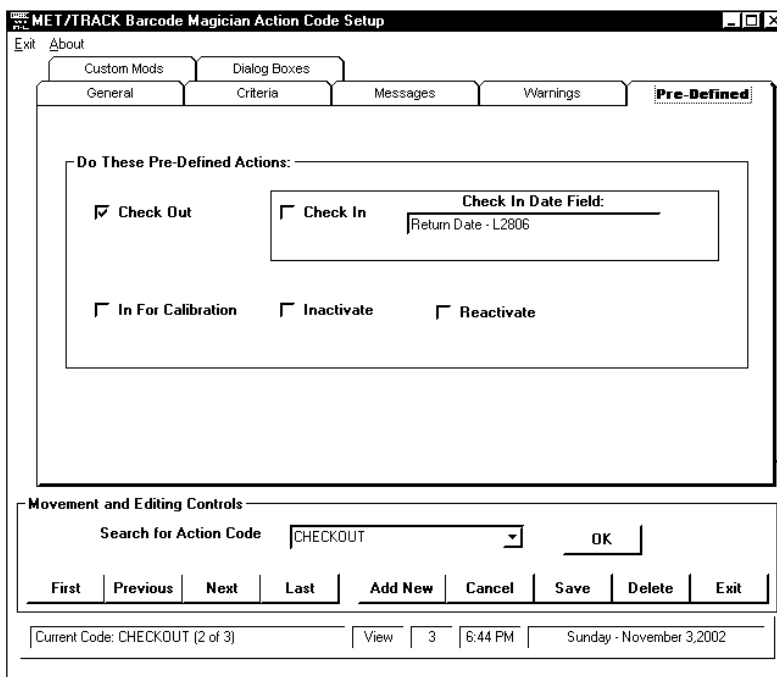
Check Out - This Action creates a new Location history record for an instrument in MET/TRACK. For our example, if an instrument is going to be checked out, and we want a new location history, then we will use the **Check Out** Action. **Check Out is the only action that will create a new location history record.**

Check In - This Action automatically enters the return date in one of the location date fields in the latest location history record. You can select the date field to be updated and can also perform this action from Custom Mods, which is covered later. Use the **Check In** function for checking in instruments.

In For Calibration - This Action automatically inserts the Date in the Arrive Field (I4224) in MET/TRACK.

Inactivate - This Action changes the State Field (I4299) to an "I" for Inactive.

Reactivate - This Action Changes the State Field (I4299) to an "A" for Active.



In our example we are going to check out an instrument, thereby creating a new Location history record. We are going to choose the **Check Out** Pre-Defined action, which will create the Location history record.

NOTE: a new function is available for Version 1.5. You can select the Check In and Check Out functions and use a single action code to check instruments in and out. *Barcode Magician* will update the current history record first with the check in date before creating the new location record.

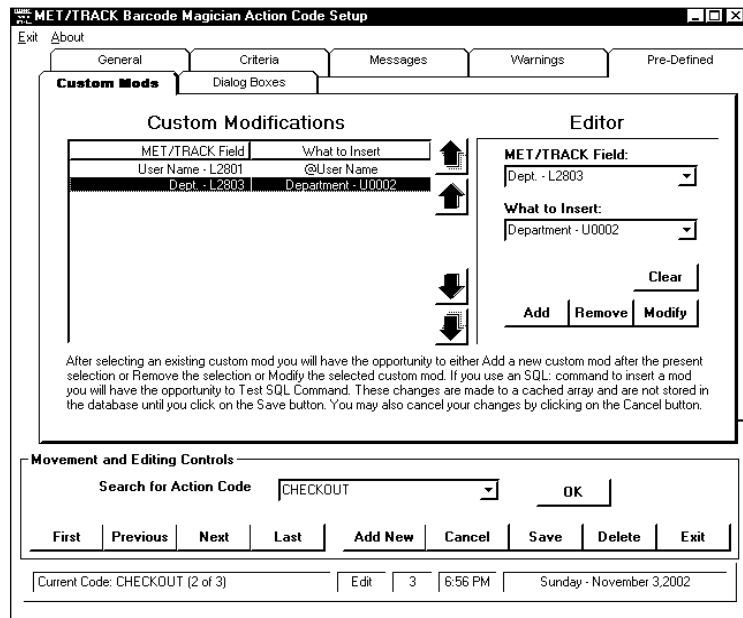
PRE-DEFINED

CUSTOM MODS

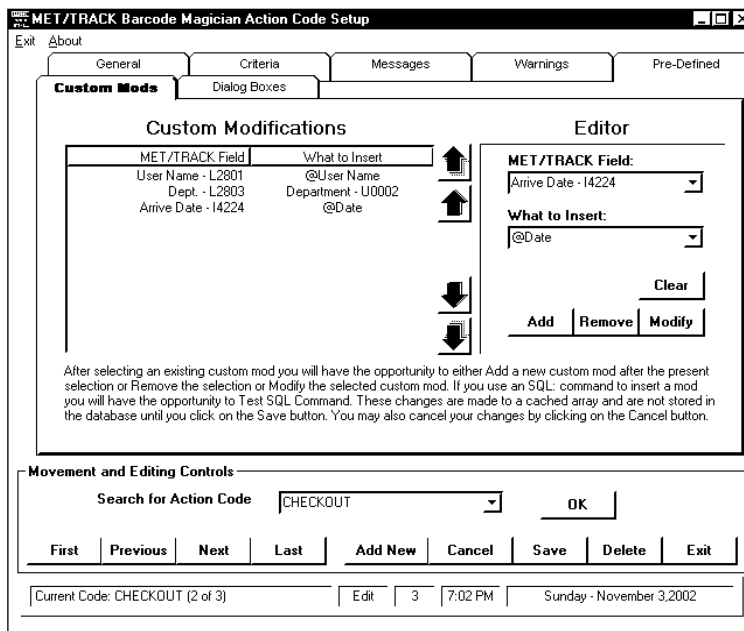
Custom Mods allows the system to insert data into most of the database fields in MET/TRACK. There are some core fields, which have been blocked from being changed. For example, we do not want someone changing the calibration date for an Asset. Use MET/TRACK Manual Entry for these changes. Each Custom Mod section has a MET/TRACK Field and a What to Insert field. The What to Insert field allows the user to select from a list box or type in the value. In our example, we still have four items to insert in the MET/TRACK database, the user in L2801, the department in L2803, the current date in I4224, and the word "LOANED" in I4225.

First, we will insert the User Name in L2801. Make sure you are in the Edit Mode. Click on the MET/TRACK Field and scroll down and select User Name - L2801. Next, click on the What to Insert field and select @User Name. Click Add and the modification will be added to the list. This will automatically insert the User Name for who is logged into Barcode Magician into the location history

Next, we will insert the user's department into the L2803 Field. Click on the MET/TRACK Field and scroll down and select Dept - L2803. Next, click on the What to Insert field and select @Department-U0002. Click Add and the modification will be added to the list.



UPDATING CUSTOM MODS – STEP 1

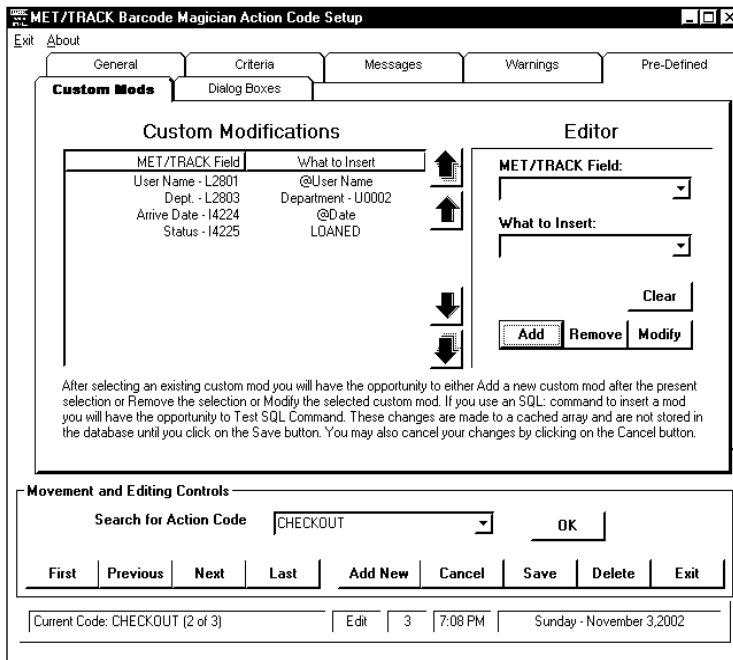


Next, we will insert Today's Date in I4224, which is the Arrive Date field in our MET/TRACK example. By inserting the date into the Inventory field in MET/TRACK, we can make a quick check to see when the instrument was loaned from Inventory, instead of going to the Location form in MET/TRACK.

Click on the MET/TRACK Field, scroll down and select Status Date - I4224. Next, click on the What to Insert field and add @Date. Click Add and the modification will be added to the list.

Take a look at the screen at left to see how this looks.

UPDATING CUSTOM MODS – STEP 2



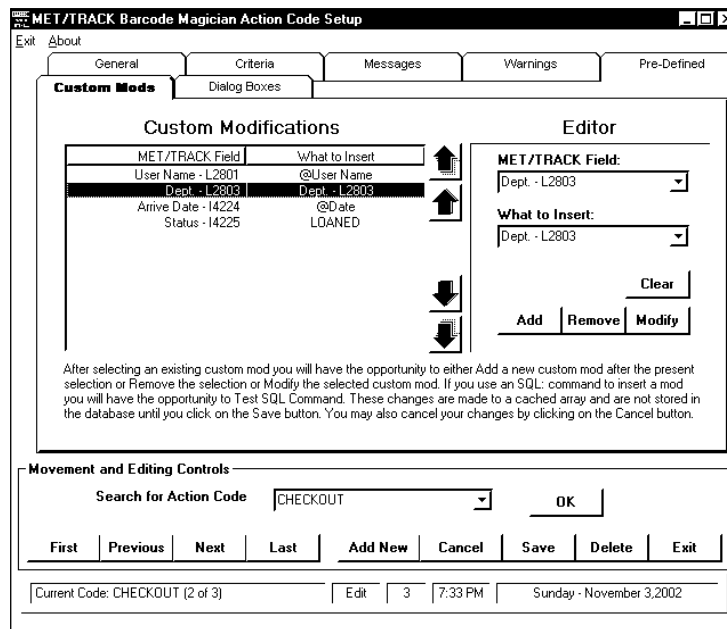
UPDATING CUSTOM MODS – STEP 3

Be sure to refer to the MET/TRACK database map that lists each field, the type, and the length. We have successfully entered our Custom Mods for the example. Please remember, *When comparing things in the computer world, always compare Dates to Dates, Text to Text, and Numbers to Numbers.* For Example, you will get inconsistent responses when inserting a number into a Date field. The date format is mm/dd/yy. We have completed our example. Click on **Save** button to save the action code. You can continue to add more custom mods. *Barcode Magician 1.5.1* does not have a limitation on the number of modifications. Modifications to the database occur in the order listed, top to bottom.

How to Copy Forward

Please be sure to verify the operation of the Custom Mods. There are some areas within the MET/TRACK Manual Entry program that may have the values copied forward from one field to another or from the same field in a previous history record. Very often, we set up certain fields that may copy from the Location History to the Inventory Screen in MET/TRACK. If you want to update a field that is being copied to in MET/TRACK, you should have *Barcode Magician* Update the history field and the field being copied to in order to maintain consistency within your system. Our example copies the previous Dept field in the Location table to the new record created by *Barcode Magician*.

Next, insert the word "LOANED" in I4225, which is the Status field in MET/TRACK. Click on the **MET/TRACK Field**, scroll down and select **Status - I4225**. Then, click on the **What to Insert** field and type the word **LOANED** at the cursor. This will automatically insert the word **LOANED** into I4225. You will notice that you typed in the word instead of selecting it. As long as this is a legal transaction, you can add practically any information. Also make sure you do not exceed the field width. Take a look at the screen at left to see how this looks. You can also use the **Remove** and **Modify** buttons to remove or change the Custom Modification. If you need to clear the data entry boxes, use the **Clear** button. The large arrow buttons will allow you to move the entries into a different order.



USING THE COPY FORWARD FEATURE

A feature in *Barcode Magician* is the ability to copy forward in History. There are times when it is desirable to copy certain information from one history record to another history record. This means that *Barcode Magician* has to look at the existing history record before it can create a new record and copy to it. For location history, you must have the **Check Out** enabled under the **Pre Define** tab. This will create a new location history.

Next you will need to set up the copy forward. In our example in the Custom Mod field we will select L2803 - Dept from the MET/TRACK field to modify and we will select the same field in the What to Insert field. It will copy forward the last history into the next history. Remember, the **Check Out** option must be turned on under the Pre Defined tab.

If you are using the work order number feature described earlier, remember to set up a custom mod to store the work order number in a field in the MET/TRACK database.

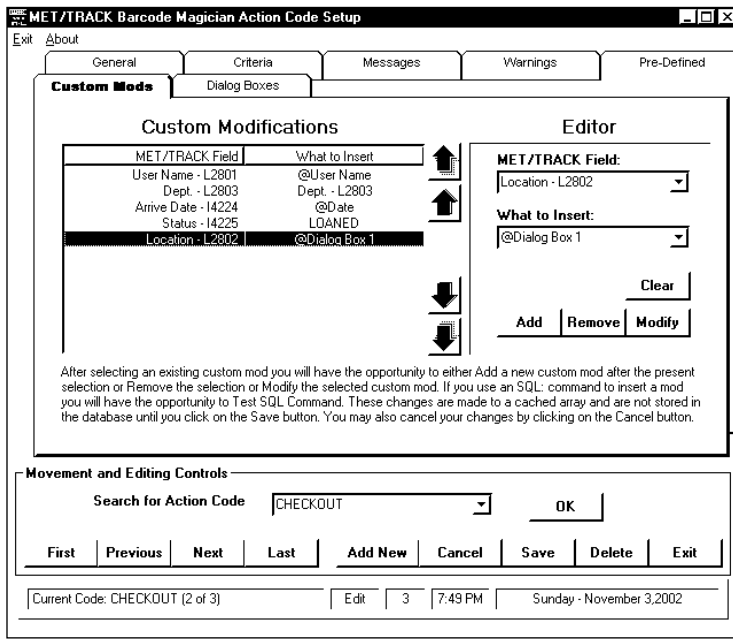
Dialog Boxes

CREATING CUSTOM DIALOG INPUTS

- In the Custom Mods section, select the **MET/TRACK Field** first and scroll through the choices. Next, click on the **What to Insert** field and scroll down to the **@Dialog Box 1**. Information entered through the Dialog Box will be inserted into the MET/TRACK field you selected

For example, we have set up a special prompt for entering data that will be saved into the Location field – L2802. It might be a good idea to put the maximum character length in the message displayed to the operator. *Barcode Magician* has no way of limiting the length of the data entered by the operator at the time of entry. If the data entered into the Dialog Box exceeds the field length, then the program will display an error message and allow the operator to re-enter the data after selecting OK.

Our previous example was very simple. Adding a Dialog Box creates additional flexibility. We will take a look at Dialog Boxes by clicking on the tab **Dialog Boxes**. Dialog Boxes allow additional information to be input from the Run Time program. For example, you may want to prompt for a charge number or enter in other pertinent information that will be stored into the database. Usually, Dialog Boxes are used when there is not a standard method of entering data. You can create up to five Dialog Boxes. They are inserted into the action code through the **Custom Mods** section of the Action Code Editor. You can make a Dialog box “Active” and/or “Required” by checking the boxes for the Dialog Box you are editing.



In the Custom Mod Tab we entered the contents of Dialog Box 1 into the L2802 Filed. You could also use the Dialog Box to enter information on an item requiring Repair. The information entered in the Dialog Box could be displayed in a user defined field in the MET/TRACK Inventory screen. There is a lot of flexibility here, but be careful, and make sure you verify what data is Entered into what field.

UPDATING CUSTOM MODS FROM A DIALOG BOX

There are six important items to consider here when using Dialog Boxes:

- Do not exceed the field length.
- Make sure this is a legal transaction. For example, do not try to insert text into a numeric field.
- Make sure you have made the Dialog Box active by checking the **Active** field.
- You can require that data be entered into the Dialog Box instead of skipping it by checking the **required** field.
- With MET/TRACK version 6.x and 7.x, if the field being modified by the Dialog Box is validated, the validation will be available to the operator. However, *Barcode Magician* does not enforce the validated entry and the operator can type or scan another value.
- MET/TRACK version 6.x and 7.x have a memo field. The Dialog Box function works a little differently and allows you to build a list of items for these special fields. When data is entered into one of these special memo fields, the operator will be able to continue scanning or entering text into the memo field until a blank line or the word "PROCESS" is entered. Using "PROCESS" allows the user to utilize the same Process Barcode that is also used to complete a transaction. There is one memo field available for each of the primary MET/TRACK tables. The memo fields are:

Inventory	I4260
Calibration	C2384
Location	L2836
Repair/Maint	R3253

Restricted Database Fields

The following fields are removed from the list of MET/TRACK fields in the "Custom Mods" section of the Action Code Editor:

- Inventory - I4201, I4209, I4228, I4229, I4230, I4240
- Calibration - C2301, C2302, C2303, C2304, C2331, C2332, C2333, C2334, C2339, C2340

It is possible to modify these fields using an SQL statement calling a stored procedure, but this should be handled very carefully.

The Run Time Program

The Run Time Program is what the user will see when he/she wants to execute Action Codes on an instrument. Three entries are required in the Run Time program, the User ID, the Action Code, and the Asset. All of these items can be entered through the use of a bar code or they can be typed on the keyboard, or both. Example: Check out an instrument. The asset numbers are **100, 1002, and 1003**, the Action Code is **CHECKOUT**, and the User ID is **121212**. We will enter these items into the Run Time screen.

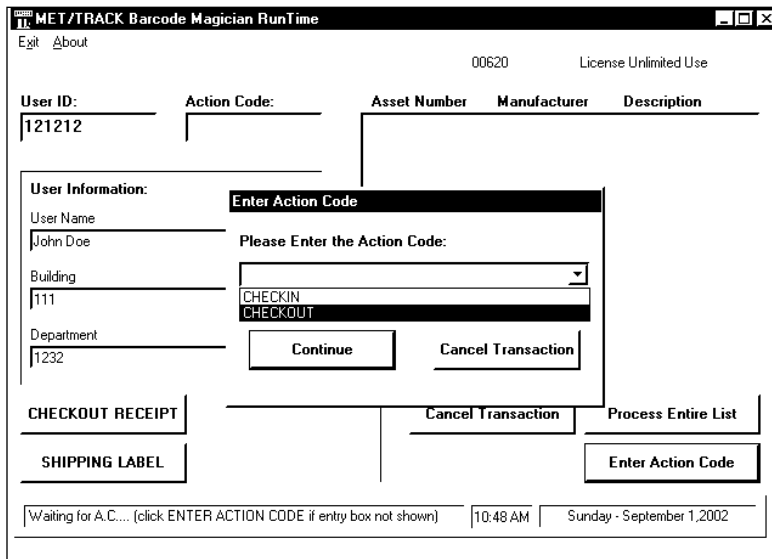
RUN TIME PROGRAM ENTRY SCREEN

Take a look at the screen. There is a Prompt box that appears to move around inside the screen. Like any Windows application, it is possible to 'lose focus' on a screen or Dialog Box. If this happens when the Run Time screen is active, you can click on a button to bring back the Dialog Box. In the screen at left, the system is asking the user to enter their User ID. You will notice there is an **Enter User ID** Button on the main screen. This will 'bring back' the dialog box if it 'gets lost'. When entering an Action Code, or a list of instruments, the Button on the Main Screen will change accordingly.

You will also notice two buttons in our example below for printing reports. We configured one button for printing a **Checkout Receipt** and the other button for a **Shipping Label**. Both buttons will initiate a Crystal report that was configured through the Workstation Configuration program.

In the example, we will enter our User ID, 121212, in the Enter User/Employee ID prompt box. You can press the Enter key or Tab after making an entry. If you are using a barcode reader, it should add a Tab or Carriage Return to the barcode that has been scanned. You will notice that the user's ID is now displayed on the main screen along with the three fields of user information that were configured through the User's Editor and System Configuration programs. If you make a mistake at any time and wish to start over, click **Cancel Transaction**.

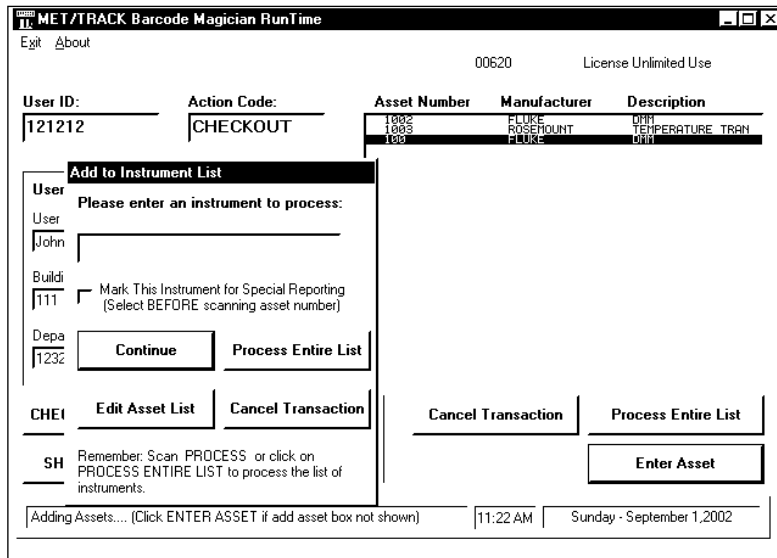
RUN TIME PROGRAM AFTER ENTERING USER ID



Previous versions of *Barcode Magician* allowed the operator to enter the action code using a Barcode Scanner or the Computer Keyboard. With version 1.5.1 there is a new option for entering the Action Code by selecting from a drop down list if the desired Action Code is configured to be in the list. It is possible to configure the Action Code so that it is not listed in the drop down box. This function has been described in the Action Code editor. We are going to use an action code called CHECKOUT for our example. We have decided to select the Action Code from the drop down list.

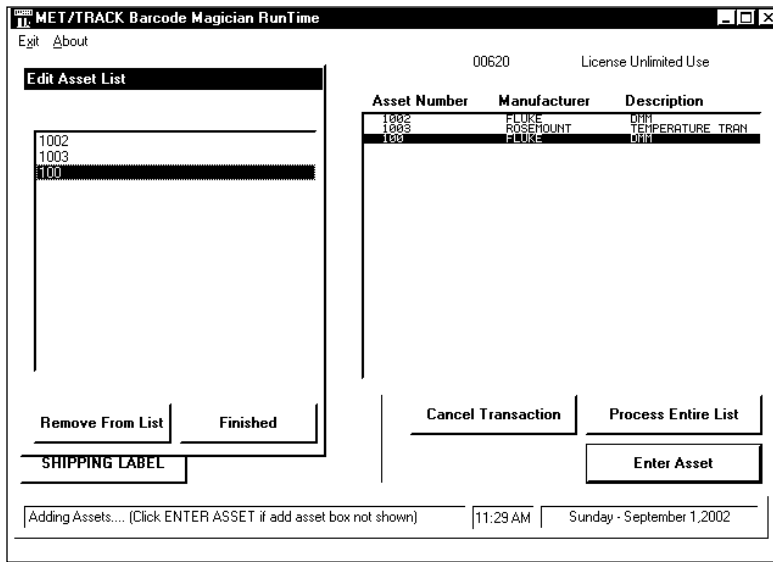
ENTERING AN ACTION CODE

After the Action Code is entered, you will be prompted to enter data for Dialog Boxes (if a Dialog Box is used), then a new prompt box will be displayed for the entry of the assets that are processed with this action code. First we are going to enter 1002 and 1003. You will notice the system performing a criteria check after each Instrument ID is entered to verify that this instrument passes the criteria checks and warnings. Nothing in the database has been changed at this point. Notice the instrument list box on the right with the instruments that passed the criteria as shown in the screen at right.



ENTERING THE INSTRUMENTS TO BE PROCESSED

Note: You will notice a check box labeled **Mark This Instrument for Special Reporting (Select BEFORE scanning asset number)**. For instance, you may have a report that creates barcode labels for instruments in this transaction because the existing barcode label or calibration label is damaged. This report can be configured to create the label(s) if the instruments have been marked.

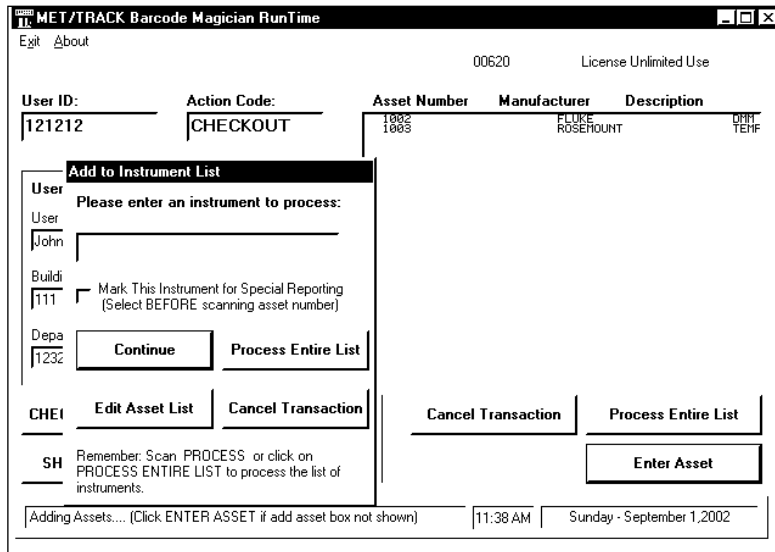


Oops, we made a mistake in our example! We were talking to somebody and accidentally scanned in asset 100 that should be entered with a different Action Code. We will remove it in the next screen. We clicked on **Edit Asset List** and brought up the Edit Asset List box. We have highlighted 100 by clicking on it. Click on **Remove From List** and click on **Finished**. The List box on the right side of the screen will be updated and you can continue entering more assets. At this point you have completed entering the assets.

REMOVING ASSETS FROM THE LIST

At this point we will either click on **Process Entire List** or we will scan a barcode with the value of PROCESS. The Run Time Program will now update the database with the changes.

We have successfully completed a transaction of instruments.



PROCESSING THE INSTRUMENTS IN THE LIST

After the instruments are processed, the Enter User ID prompt will reappear. It should be noted that we are using the default descriptions for the buttons and list boxes in this manual. If the system administrator modifies the 'bcmphrases.txt' file, the actual descriptions will be different.

Guest Option

Guest Entry (New User)- Please fill in the blanks

User ID: 123456

User Name: _____ Required!

Building: _____

Department: _____

Office: _____

Phone Number: _____

Division: _____

Shop: _____

Continue Cancel Transaction

Your User ID was not found in the database! Barcode Magician will add you to its' user list as a GUEST using the information you provide. You may continue with the transaction by filling in all of the blanks and clicking on CONTINUE.

As described in earlier sections of this manual, you can configure *Barcode Magician* to prompt a new user for information from the Run Time Program. The screen at left illustrates how the screen will appear when prompting for user information, if this option is enabled in the System Configuration program. You must enter information in a field with the word 'Required' next to it. In this example, the User Password function is not enabled from the System Configuration program. After completing entry of the information, the system will continue the transaction.

ENTERING A NEW USER IN THE RUN TIME PROGRAM WITHOUT PASSWORDS

The example at right illustrates how the screen will appear if the Guest Option is enabled and a user password is required.

Guest Entry (New User)- Please fill in the blanks

User ID: 123456

User Name: _____ Required!

Building: _____

Department: _____

Office: _____

Phone Number: _____

Division: _____

Shop: _____

Password: _____ Required!

ReEnter Password: _____ Required!

Continue Cancel Transaction

Your User ID was not found in the database! Barcode Magician will add you to its' user list as a GUEST using the information you provide. You may continue with the transaction by filling in at least all of the required blanks and clicking on CONTINUE.

1:24 PM Saturday - April 19, 2003

ENTERING A NEW USER IN THE RUN TIME PROGRAM WITH PASSWORDS

Updating User Information from Run Time – *New Feature*

Enter User/Employee ID

Please Enter Your User/Employee ID:

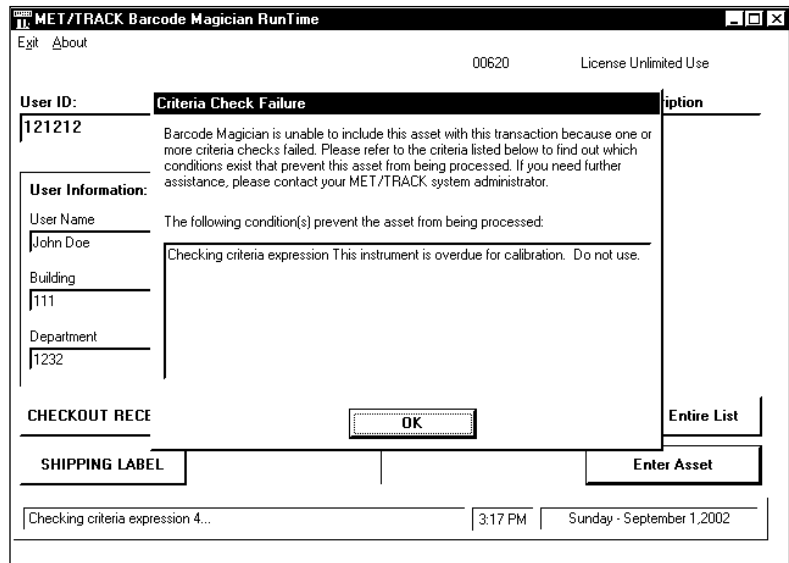
Continue Change User Info

Barcode Magician 1.5.1 has added a new feature that allows the system administrator to give user table access to the individual users. From the Run Time Program, the user enters their user ID. Instead of clicking on **Continue**, the user clicks on **Change User Info**. The guest screen similar to the screen above is displayed. If user passwords are enabled, the user can also change their password. If this feature is not enabled from the System Configuration program **Change User Info** will be grayed out.

CHANGING USER INFO FROM RUN TIME

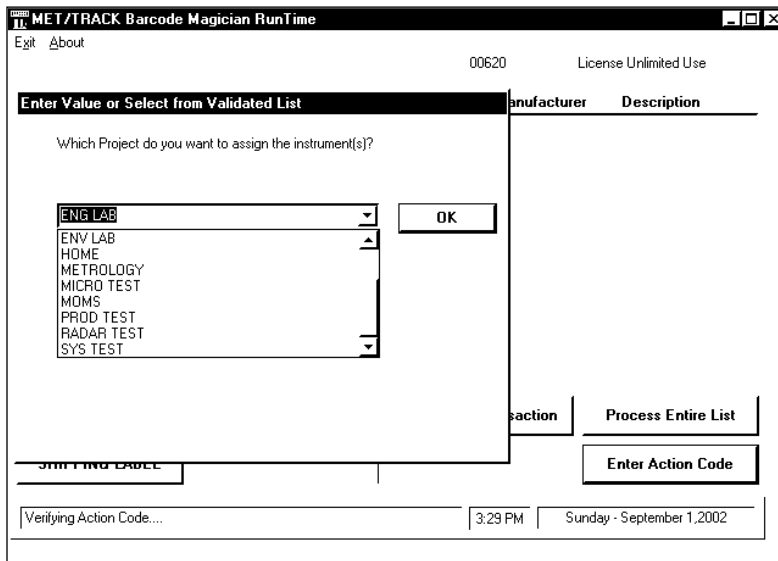
Criteria Check Failure

If an instrument fails a transaction, the error message will be displayed to the operator. The instrument will not be processed. The screen at right shows an example of a failure with the custom error message displayed. If a warning occurs, a similar message will be displayed.



CRITERIA CHECK FAILURE

Dialog Box Entry



ENTERING DATA IN A DIALOG BOX

Another new option for version 1.5.1 is the use of validation for Dialog Boxes. If the database field to be modified is validated in MET/TRACK, then a drop down list box will be available for selecting from the list. **NOTE: Barcode Magician does not force the operator to use the validation drop down list and the operator can type or scan another entry.**

If this is a required entry in the Dialog box and operator does not enter a value, then Barcode Magician will generate an error message and ask for a data entry.

After finishing a transaction, and if the "user defined" report buttons are enabled; you will be able to print up to four reports. These report buttons will be grayed out until a transaction is actually processed. The information on each transaction list is stored in a temporary table and will be overwritten when a new transaction list is started or Barcode Magician Run time is closed.

Custom Labels and Phrases

Barcode Magician has new features that will allow the system administrator to customize all of the program labels. For example instead of having the Run Time Program prompt for "Enter User ID", it might say "Enter Your Employee Number". If there is a need to operate *Barcode Magician* in a different language, then the phrases can be customized for that language.

Barcode Magician utilizes a file called "bcmphrases.txt". It is a simple text file. A default file is provided for *Barcode Magician*. The simple file format is as follows:

- 1 *Barcode Magician*
- 2 RunTime
- 3 MET/TRACK
- 4 *Barcode Magician* is NOT compatible with this version of MET/BASE
- 5 The following internal error has occurred:

The example above is a small section of the "bcmphrases.txt" file. There are a lot of entries (over 400). The format is the line number, a tab character, and then the phrase with no carriage returns or line breaks. Edit the phrase file using the Notepad Editor that comes with MS Windows.

Barcode Magician does not write to the phrase file. You can save this file as read only if there is a concern about it being accidentally edited or deleted. The phrase file must exist in the same directory as the *Barcode Magician* executable programs. If the phrase file is not available, *Barcode Magician* will not start properly and it will display a message stating this:



ERROR MESSAGE - BCMPHRASES.TXT IS NOT AVAILABLE TO *BARCODE MAGICIAN*

Blank Page

CRYSTAL REPORTS® and *Barcode Magician*®

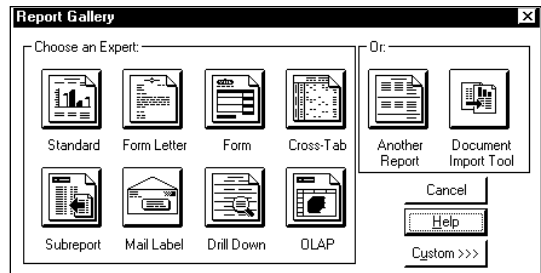
Using Crystal Reports® with *Barcode Magician*®

As discussed earlier, reports can be created for use with *Barcode Magician*. *Barcode Magician* uses a unique table structure for running reports. Since Crystal Reports can take a long time to run a report, a newer method was necessary for creating and running reports. If someone checks out a group of instruments and requires a receipt, they will want the receipt quickly and not have to wait on it. This section outlines how to create a Crystal Report from the beginning. A report called RECEIPT15.RPT is included. This example is created with Crystal Reports version 7. However, Crystal 8 will also work. The example shown here assumes that the report writer has some familiarity with Crystal Reports. We will attempt to clearly explain the example report using Crystal Reports 7 as it is created.

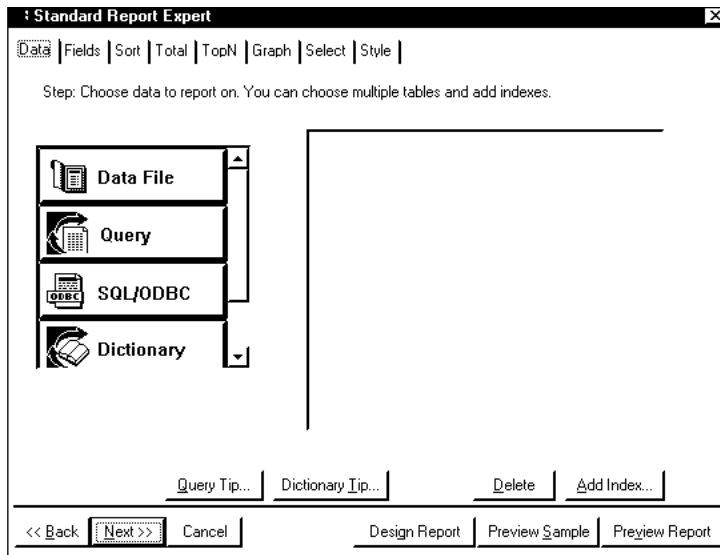
Getting Started

We are going to create a report that prints a receipt. The report uses a temporary table that is created when *Barcode Magician* is registered. This example will show every step on creating the report.

The first step is to open Crystal Reports. Do not have any reports open. We are going to start from the beginning. Click on File and then click on New. The form at right is now displayed in the middle of your screen. Next, click on Standard.



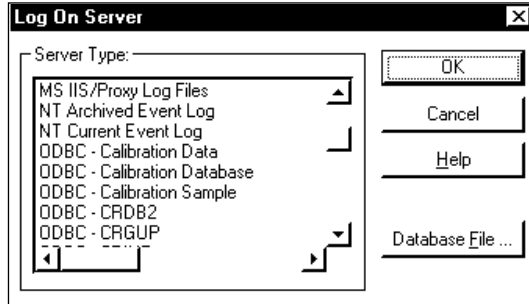
CRYSTAL REPORT – SELECT DATA TYPE



STANDARD REPORT EXPERT – SQL/ODBC

You now have the Standard Report Expert that will prompt you through the process of linking the tables and generating the report. We will go through each screen.

Next click on SQL/ODBC. This will allow us to add tables to our report.

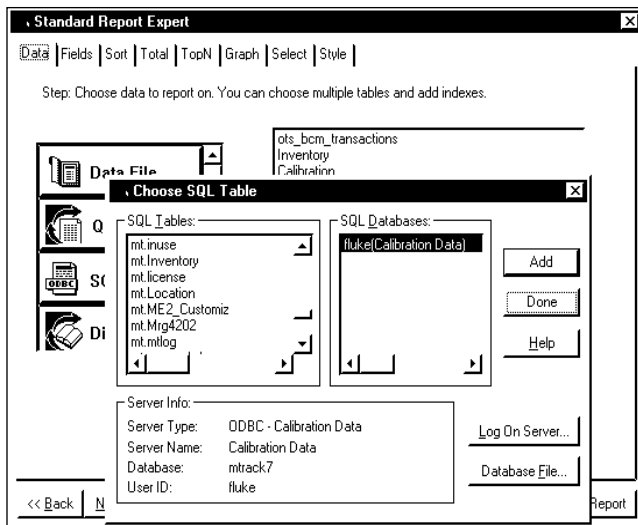


SELECT DATA SOURCE

In the middle of your screen, you will have a screen listing all of your ODBC Data Sources. Click on your Data Source and then click **OK**. In most cases you will use ODBC – Calibration Data which is the default Data Source for MET/TRACK version 6 or 7. Earlier versions of MET/TRACK used ODBC – Calibration Database. Whichever is the case, select the correct Data Source.

If you have previously logged in, this screen will not appear.

After you select the Data Source, you will be prompted to log in. You should use a level 5 password associated with a MT segregate. Remember, the database enforces the rules of segregation and will only display data in that segregate.



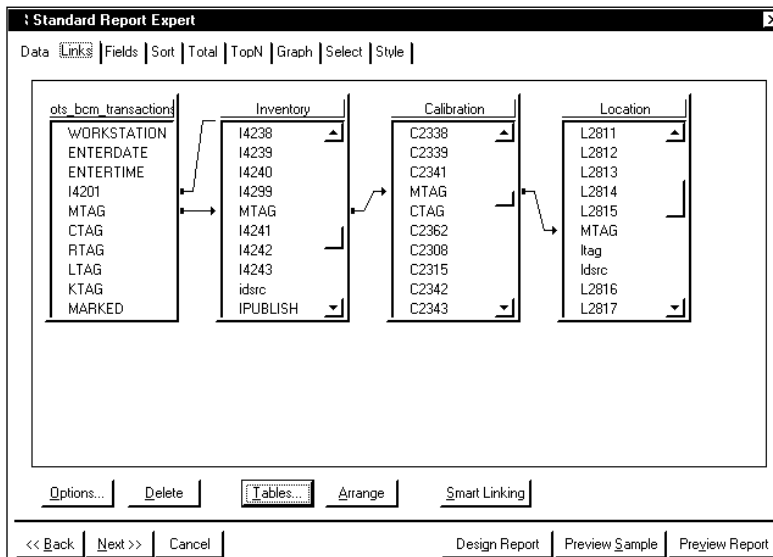
SELECTING AN SQL TABLE

We are now ready to select the first table. Scroll through the SQL Tables list and select **mt.ots_bcm_transactions** and click **Add**. This table is updated every time *Barcode Magician* processes an instrument with the current CTAG, LTAG, and RTAG indexes.

We will have to add the other tables in order to generate a receipt. With the current indexes listed in **mt.ots_bcm_transactions**, the report does not have to perform any searches. Because the report points to a specific index, this makes the report extremely fast.

Next, select the mt.inventory, mt.calibration, and mt.location tables. You will have to click **Add** after selecting each table

You will notice that the screen now shows the 4 tables we have added. As stated earlier, the table mt.ots_bcm_transactions is the key. The other tables will need to be linked to the indexes in mt.ots_bcm_transactions. Next, click **Done**.



VISUAL LINKING EXPERT – DEFAULT SETUP

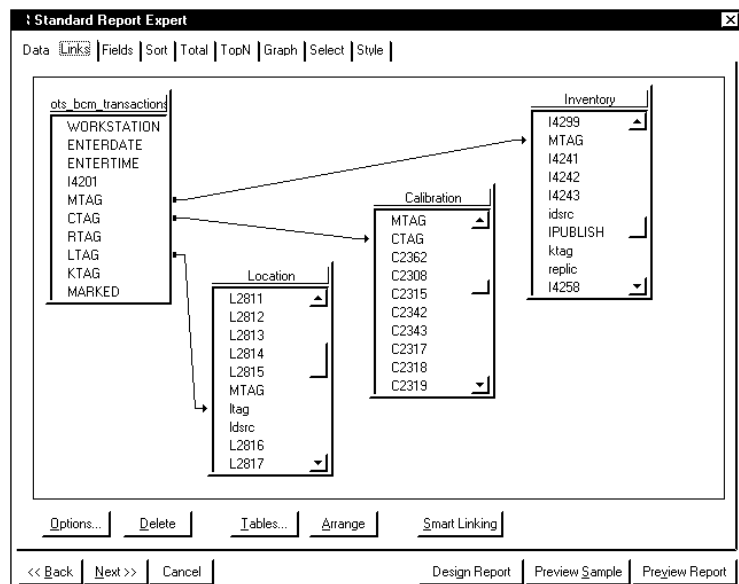
After we finish adding our tables, we now have a display of the Crystal Report Linking Expert.

In this example, the linking is wrong. This happens quite frequently with Crystal Reports when the “Smart Linking” is enabled. You will notice that the Inventory, Calibration, and Location tables are serially linked through the MTAG index. This is wrong and should be changed. The default property for each link is called “Equal Joins”. In this case, the system will not report location and calibration data for the report to display because they are linked to the wrong table.

We will change the linking manually. First, we will delete all the links, except the one connecting MTAG in mt.ots_bcm_transactions to MTAG in Inventory. Click on each link that you want to delete, highlighting the link, and press delete or click on **Delete**.

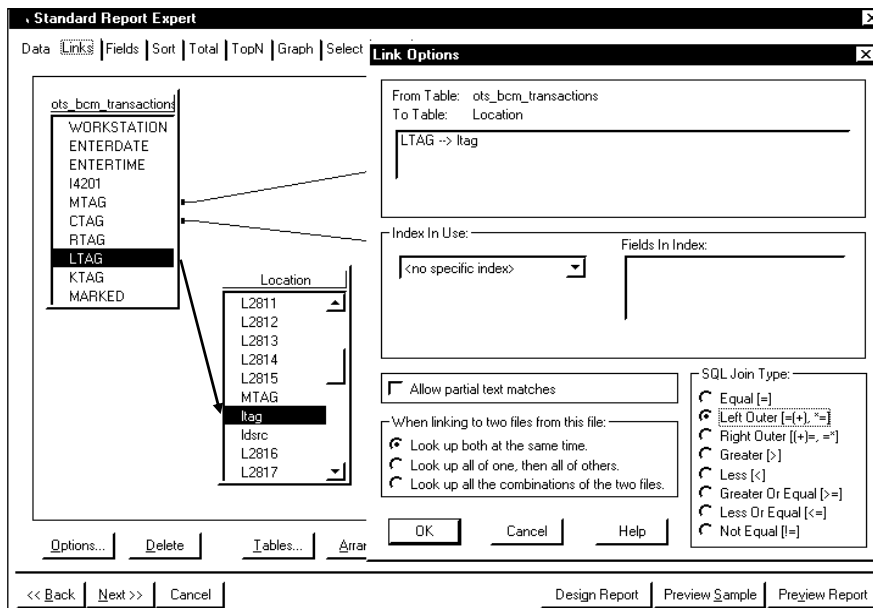
In our example at right, we have linked all the tables to the indexes shown in the mt.ots_bcm_transactions table. We also moved the tables around on the form to make it easier to see the links. Crystal reports will probably display a message indicating the links may not be the same type. This is normal and acknowledge the warning by clicking **OK**.

We still have an issue with the links to each table because they are “Equal Joins”. This means we must have calibration and location data for data to be displayed.



VISUAL LINKING EXPERT – UPDATING TABLE LINKS

This can be a real problem when checking instruments without location or calibration data. *Barcode Magician* is also used to check out tools that do not require calibration and do not have history. Under the configuration in this example, we would not show those tools on the report. We are going to change the properties of the links to a “Left Outer Join”. This type of link will allow the report to display the asset even if it does not have calibration or location history.



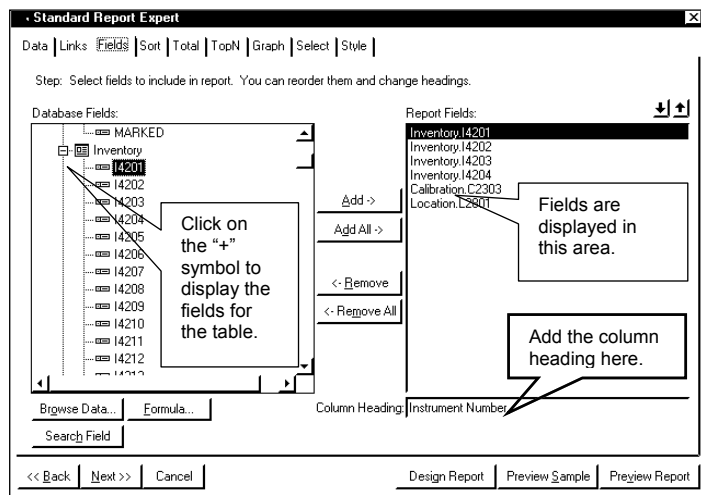
In our example at left, we are modifying the properties of the LTAG link. To change the properties of the link, click on the LTAG link to highlight it. Next, click on **Options**. A pop up screen will be displayed as shown at the left. Under SQL Join Type, click on "Left Outer" and then click on **OK**. Repeat this for the CTAG link and change the link to "Left outer". This will allow an instrument to be processed if there is no calibration or location history.

VISUAL LINKING EXPERT – UPDATING JOIN TYPES

Now that we have the tables linked, we need to select the fields. Click the Fields tab at the top of the report expert. You will see the tables to choose fields from on the left and the fields selected on the right.

The form on the right shows the fields we want to display. Each table has a list of fields under the table name. There is either a "+" or "-" symbol next to the table name. Click "+" displays all of the fields for the table. Click "-" to not display the field names. We want to select the following fields:

Field	Description
I4201	I4201 – Instrument Number
I4202	I4202 - Mfg
I4203	I4203 - Model
I4204	I4204 - Description
C2303	C2303 – Due Date
L2801	L2801 – User Name



ADDING FIELDS TO THE REPORT

Let's add the first field. Under the Inventory table displayed on the left side of the screen, select I4201 by clicking on it one time. Next click on the button labeled Add. Inventory.I4201 will now be shown on the right side of the screen under Report Fields. Next, delete "I4201" in the field 'Column Heading' and type in "Instrument Number". That's it. We have now entered the first field for the report. Continue entering the rest of the fields and descriptions as listed in the table above.

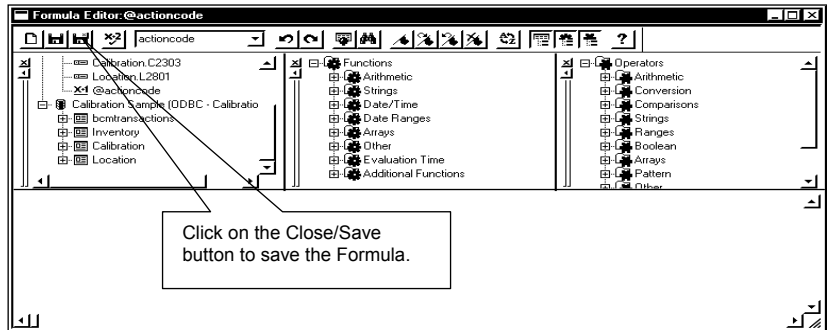
The Crystal Report expert will automatically create the report with the best spacing possible for the fields and will insert the Field Titles in the report header. It will still be necessary to adjust these fields when you actually view the report for the first time, but at least the report has been started for you.

When you have completed adding the fields, the next step is to finish using the Report Expert. Next, click on **Preview Sample**. A dialog box will be displayed asking for the type of preview to list. Select the First 100 records. You may see a blank screen or there may be some data. This does not matter. The report is

in the Preview mode. Click on the Design tab and then click on **File | Save As** on the menu bar and save the report to your shared METCAL directory on your server.

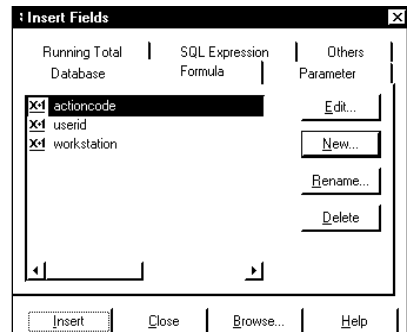
The report is now displayed in Design mode. We need to create three blank formulas for *Barcode Magician* to use. Any report that is used with *Barcode Magician* must have these formulas. A brief explanation is that *Barcode Magician* communicates with the Crystal Report libraries and data is inserted into these libraries. For example, a MET/TRACK database can incorporate several *Barcode Magician* stations. If a user checks out several instruments and wants to print a report, then the report has to only display information checked out for that station. Each *Barcode Magician* station has a unique system ID. Creating these formulas is really easy. We will go through each one.

While in Design mode, click on Insert | Formula Field. The Insert Fields dialog box is now displayed. The Formula tab should be in the front. At this point we should have a blank formula screen. Click on **New**. Type in "actioncode". The formula editor is now displayed. We are not going to add anything here.



SAVING THE FORMULA IN THE FORMULA EDITOR

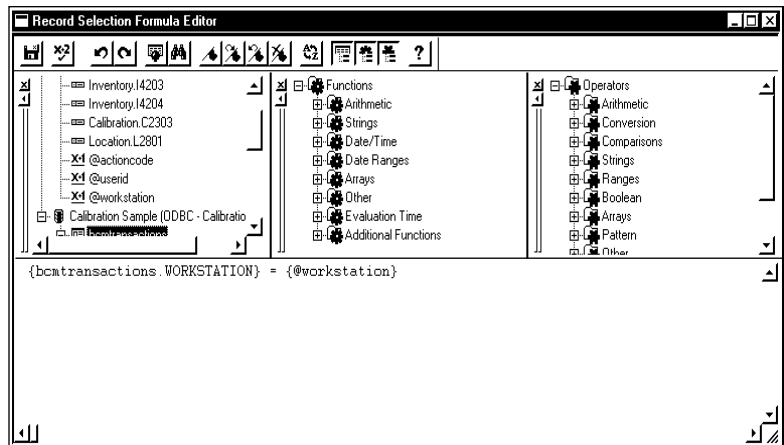
Click on the Save/Close button in the formula editor as shown in the above figure. This is the third button from the upper left of the Formula Editor screen. You have now added the first formula. Now using the exact same process, add two more formulas, "userid" and "workstation". Remember, do not add anything in the Formula Editor. Leave it blank.



ADDING FORMULAS

We now have our three formulas created in the report as shown at the right. We do not have to insert these formulas as fields, but you can do this if you want. It is sometimes useful to use "userid" and "workstation". You can close the Insert Fields dialog box.

At this point we should save our work. Click on **File | Save** on the menu bar. This will save the report. We need to create the Edit Selection Formula. This Formula controls which data is requested from the database. It has a formula editor similar to the Field Formula Editor.



EDIT SELECTION FORMULA EDITOR

At the menu bar click on **Report | Edit Selection Formula | Record**. We need to limit the data displayed to this station using the "workstation" formula. This is not necessary if this is the only *Barcode Magician* station. However, it is a good idea to do this now in case you decide to add more *Barcode Magician* stations later.

With the Editor open you will notice three columns. The column to the left has all the available tables and fields for your report. Scroll through the list of tables and look for the table ots_bcm_transactions. Under ots_bcm_transactions select the field **WORKSTATION** by double clicking on it. Next type in the Equal sign (=). Next select the workstation formula we created earlier. This formula will be displayed with a leading @ symbol. Double click on @workstation and this will be inserted into the edit selection formula. The formula should be **{ots_bcm_transactions.WORKSTATION} = {@workstation}**. This formula will only allow data that has been processed by the same station that processed the instruments. Save the Edit Selection Formula. Our report is complete. You should save the report. This completes our Crystal Report example. You can adjust the report to format it to your liking.

Blank Page

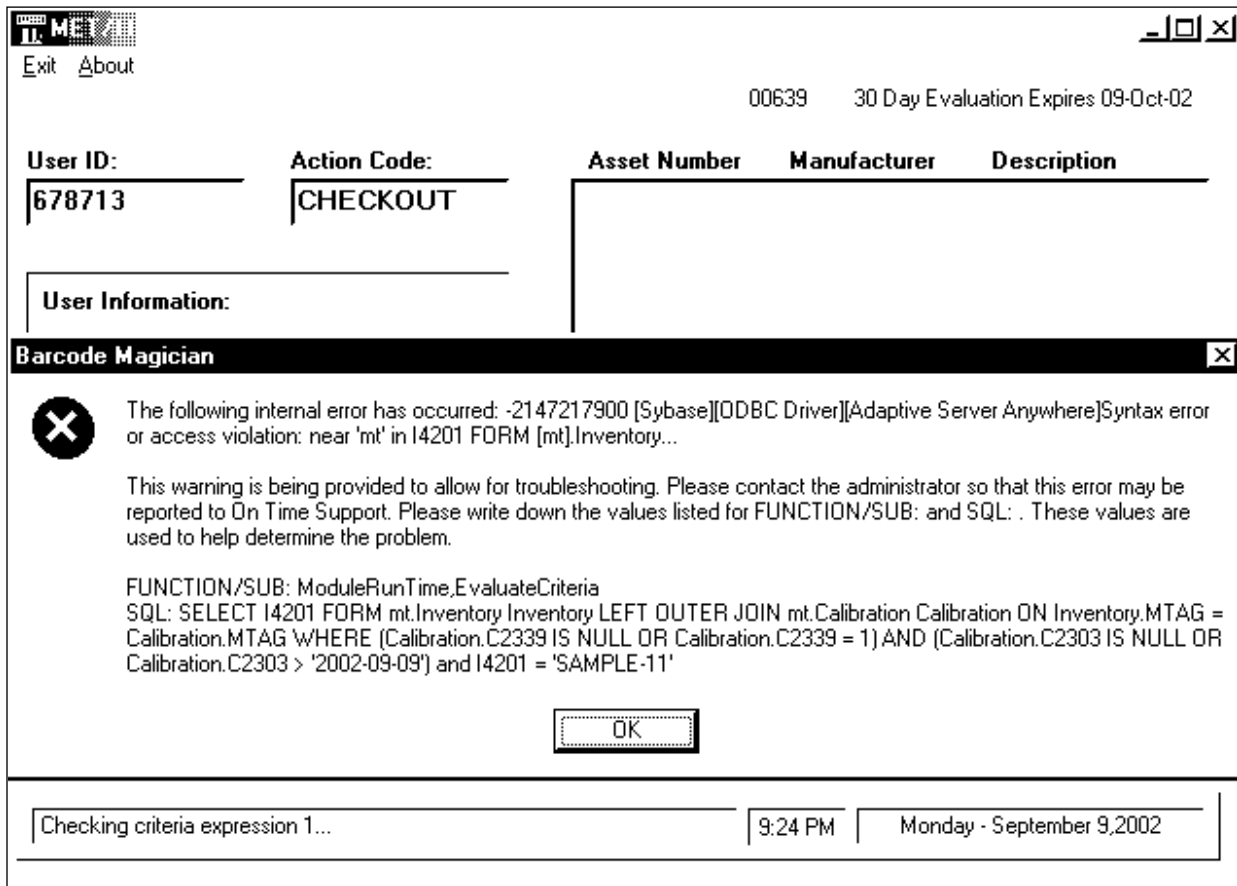
Appendix

Appendix A – Alternative Runtime Configurations

Error Handling with SQL Statements

When developing SQL statements to be used with *Barcode Magician*, some attention needs to be devoted to the error screens that *Barcode Magician* will develop. Earlier, we discussed creating SQL statements in the Action Code Editor section of this manual.

We have an example where we are using the SQL statement in the criteria to verify that the instrument is not overdue for calibration. Let's take a look.



SQL ERROR MESSAGE IN RUN TIME

The first line in the first paragraph of the error message says: "access violation near 'mt' in I4201 FORM [mt].Inventory". You can also see the complete SQL statement in the third paragraph of the error message. The problem with the SQL statement is that it should start with "SELECT I4201 FROM" not "SELECT I4201 FORM". The word FORM is not part of an SQL command. This is an easy mistake to make. When you see this screen, take a look at the statement and analyze it carefully. Also, try executing the statement in the ISQL Editor. This is a good place to troubleshoot SQL statements.

Using the SQLLOG Switch



The *Barcode Magician* Runtime program has another feature, it can be placed in SQL troubleshooting mode. Make a copy of the Run Time Icon and edit the properties of the startup. We renamed our icon "Run Time SQL Mode". This will be a special Run Time Icon. We also have changed the startup properties of the icon to the following:

C:\metcal\mtbcm15\mibcmrtd.exe sqllog

We added the sqllog switch to the program properties. When we run *Barcode Magician* in SQLLOG Mode, we have activated a logging program called **SQLcommand.log**. The following is an example

```
[2002-09-09 22:00:56] **** Barcode Magician ****
[2002-09-09 22:00:56] Evaluate Criteria: 0: SAMPLE-87
[2002-09-09 22:00:56] SELECT I4201 FROM mt.Inventory Inventory LEFT OUTER JOIN mt.Calibration
Calibration ON Inventory.MTAG = Calibration.MTAG WHERE (Calibration.C2339 IS NULL OR
Calibration.C2339 = 1) AND (Calibration.C2303 IS NULL OR Calibration.C2303 > '2002-09-09') and I4201 =
'SAMPLE-87'
[2002-09-09 22:01:02] **** Barcode Magician ****
[2002-09-09 22:01:02] Evaluate Criteria: 1: SAMPLE-11
[2002-09-09 22:01:02] SELECT I4201 FROM mt.Inventory Inventory LEFT OUTER JOIN mt.Calibration
Calibration ON Inventory.MTAG = Calibration.MTAG WHERE (Calibration.C2339 IS NULL OR
Calibration.C2339 = 1) AND (Calibration.C2303 IS NULL OR Calibration.C2303 > '2002-09-09') and I4201 =
'SAMPLE-11'
```

EXAMPLE SQL LOG FORMAT FOR TROUBLESHOOTING

We have tested two assets, SAMPLE-87 and SAMPLE-11. The program generated a date and time stamp and a description of the Evaluation. In this case it was a criteria check. After criteria is a 0 or 1. The 0 means that the criteria failed and a 1 means that it passed. The SQL statement is also displayed. This is a great tool to see how the SQL statement affected the asset in question. It is not recommended to leave the "sqllog" switch on all the time. This will affect the performance of the Run Time program.

These tools are great for troubleshooting. When there is a problem, take your time and carefully evaluate the statement.

Setting up alternative ODBC Sources

The *Barcode Magician* Run Time can be configured to run more than one ODBC data source. The appropriate software licenses should be purchased from ON TIME SUPPORT for each database. For most systems, this is not necessary. However, this can be accomplished by creating additional *Barcode Magician* Run Time icons. For example, consider the following configuration:

C:\metcal\mtbcm15\mibcmrtd.exe dsn=Master Database

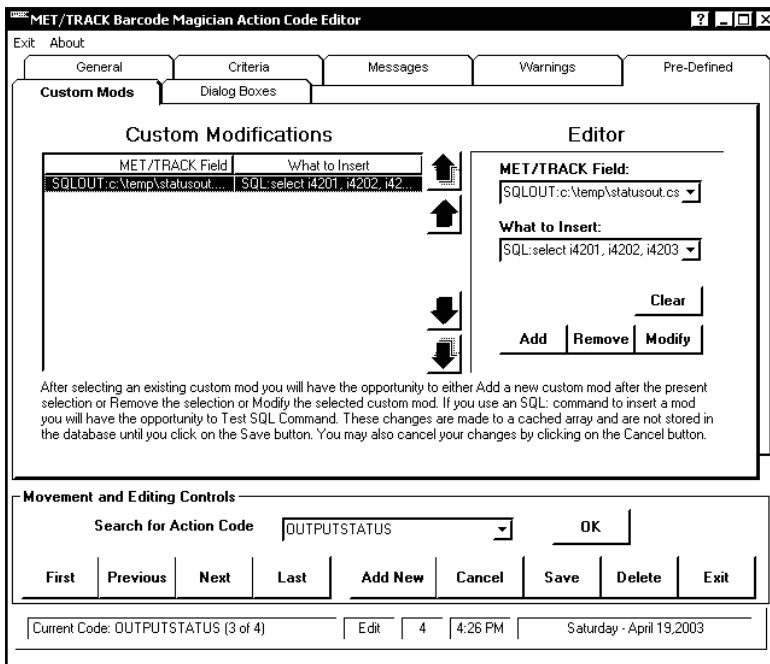
This command will start the *Barcode Magician* Run Time program with the Master Database ODBC Data Source. You can create an icon for each ODBC data source. Remember that the data source is displayed on the *Barcode Magician* programs.

Appendix B – Advanced SQL Input/Output Statements

Barcode Magician 1.5.1 has some additional capabilities that allows for SQL statements to output data into files and input data from files. We will create some examples and demonstrate this new capability. Our example will start with the Action Code Editor.

VERY IMPORTANT NOTE: OTS does not assume any responsibility regarding the use of SQL commands with *Barcode Magician*. While SQL is a very powerful database language, a user that is not properly trained in using SQL can cause damage to their database. OTS can provide assistance with SQL statements over the internet for a nominal fee.

Output of Data Using SQL Statements.



CREATING AN ACTION CODE TO OUTPUT DATA FILES

This is a very simple statement that outputs the asset number, manufacturer, model number, description, serial number, status date, and status. If the status is blank, the record will not be added to the file.

VERY IMPORTANT NOTE:

The SQLOUT: command overwrites the data files if they already exist.

The SQLOUTA: command only appends data to the files. It does not overwrite files.

When data is written out, quotations are not added to the data.

NOTE: The MET/TRACK and What to Insert fields are only 255 characters wide. If you have a long SQL statement, you may want to consider breaking your SQL statement into smaller sections and perform multiple inserts. One other option is to create a stored procedure and call that from Custom Mods.

When executing an Action Code using the SQLOUT: command, you will need to use an instrument as a dummy instrument. When using SQLOUTA:, be careful because if you use more than one instrument in the list, then the SQL statement will be executed for each instrument. The output file is appended, so you will have multiple sets of data.

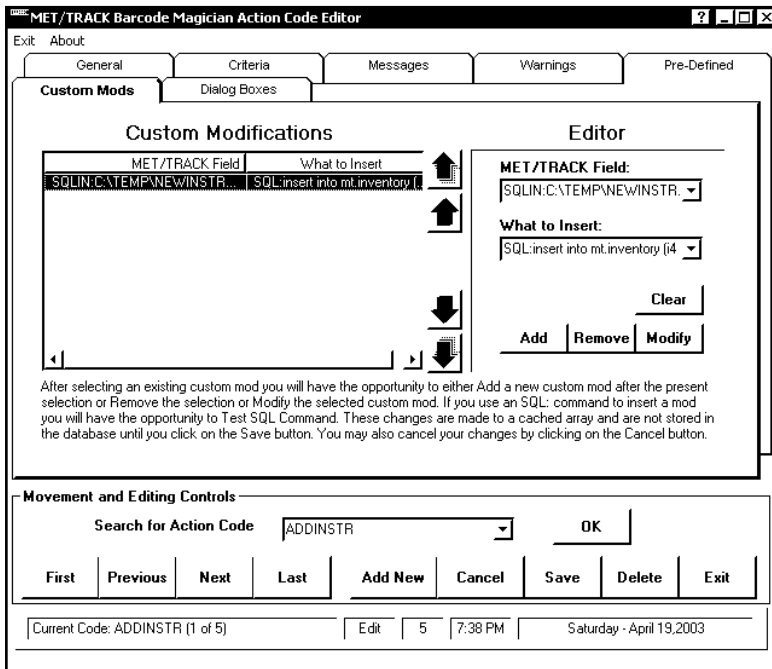
In our example, we are going to output to a file the instruments with a status that is not null. This is a very simple statement. First, we have to create the Action Code. In our example we created an Action Code called "OUTPUTSTATUS".

Second, we have selected the "Custom Mods" tab. Click in the MET/TRACK Field box and select SQLOUT:.. We entered a filename in this box called "C:\temp\statusout.csv". This is our destination file. You will notice that it automatically inserted SQL:SELECT in the What to insert box.

We entered the following SQL statement: "select i4201, i4202, i4203, i4204, i4206, i4224, i4225 from mt.inventory where i4225 is not null".

Input of Data Using SQL Statements

Using the SQLIN: command allows for adding records to your database. We will create an example that creates new Inventory Instrument Records.



In our example, we are going to insert a file with 4 new instruments. Sometimes it will save time if you import instruments from a file instead of typing in each field in MET/TRACK.

First, we have to create the Action Code. In our example we created an Action Code called "ADDINSTR".

Second, we have selected the "Custom Mods" tab. Click in the MET/TRACK Field box and select SQLIN:. We entered a filename in this box called "C:\temp\newinstr.csv". This is our input file. You will notice that it automatically inserted SQL:INSERT in the What to insert box.

CREATING AN ACTION CODE TO INPUT DATA FILES

The following is our SQL Statement:

SQL:insert into mt.inventory (i4201,i4202,i4203,i4204,i4206,i4209, i4229,i4228,i4240) values

The following is the data in our input file "NEWINSTR.CSV". We added a description to the first row in the table below so that you can see how the data corresponds to the SQL statement.

Asset #	Mfg	Model	Serial	Description	Trace	Int	Int Type	DB Subset
'SAMPLE-01'	'FLUKE'	'87'	'1234'	'DMM'	'9'	'12'	'M'	'MT'
'SAMPLE-02'	'FLUKE'	'97'	'2345'	'SCOPE'	'9'	'12'	'M'	'MT'
'SAMPLE-03'	'FLUKE'	'77'	'3456'	'DMM'	'9'	'12'	'M'	'MT'
'SAMPLE-04'	'AGILENT'	'33401'	'4567'	'DMM'	'9'	'12'	'M'	'MT'

Executing SQL Statements without Using Files

It is also possible to execute SQL files in *Barcode Magician* without using files for input or output. In the Custom Mods section under "MET/TRACK Field" select NONE. This is at the bottom of the list. In the What to insert Field, you can insert a general SQL statement. Be careful because you can also delete records with this statement.

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