



***SMT-Bank**™*

The Comprehensive Item-Banking System
Used and Designed by
Professional Test Developers

Schroeder Measurement Technologies, Inc
Business Development Office.
262 Chapman Road, Suite 108
Newark, DE 19702
302.737.0796
www.smttest.com

INTRODUCTION TO THE *SMT-Bank*[™] ITEM BANKING SYSTEM

SMT-Bank[™] is one of a family of Schroeder Measurement Technologies (SMT) products developed for organizations and specialists who operate professional testing programs. *SMT-Bank* is a state-of-the-art item banking software system designed to provide the most effective tool available for managing professional test development activities. *SMT-Bank* was developed by veteran test development professionals and has been purchased by state agencies, national certification bodies, testing firms, and even foreign governments to support their testing programs. *SMT-Bank* uses Microsoft Word® as a test processor, Microsoft Access® as a database engine, and is programmed in Visual Basic for Windows®.

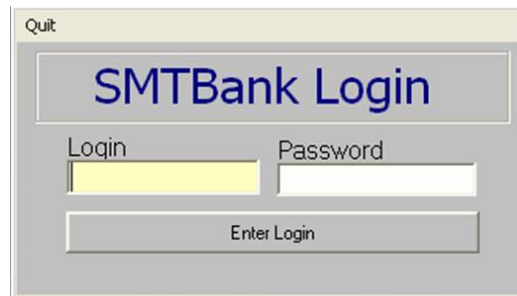
The *SMT-Bank* software system is licensed to purchasers for an initial term of three (3) years, with annual license renewal options for subsequent periods. SMT also offers related support services for organizations who desire assistance with the implementation of the *SMT-Bank* system. These areas of support may typically include assisting with the conversion of items and test forms residing in the prior item banking system, on-site training, loading graphics and other item information, setting up the initial associations between items and their foreign language item counterpart versions, etc. Finally, SMT offers additional software products that interact with the *SMT-Bank* system to effectively manage other aspects of the testing process. These products include *SMT-Score* for scoring and equating tests administered to candidates, *SMT-Item.Net* for facilitating the activities of remote item writers via a secure web-based system, and *SMT-Admin* for managing all administrative testing functions, such as storing candidate records and score histories, generating admission documents and reports, creating invoices, tracking examination fees, tracking continued education units or credits, etc.

The *SMT-Bank* system provides the user with a set of comprehensive tools for:

- ≈ Storing and maintaining test specifications or blueprints
- ≈ Managing the item development process and storing important information about items
- ≈ Constructing tests and managing test form files
- ≈ Managing the item banking system

ACCESSING THE *SMT-Bank* SYSTEM

The *SMT-Bank* system is accessed when the test developer enters an authorized user name and password at the login Prompt. This access control feature helps ensure that only authorized users are able to see and interact with the item bank.



The image shows a dialog box titled "SMTBank Login". It has a "Quit" button in the top-left corner. The main title "SMTBank Login" is centered at the top. Below the title are two input fields: "Login" and "Password". The "Login" field is highlighted in yellow. Below these fields is a button labeled "Enter Login".

Successful login brings the user to the Main Menu. It is from the Main Menu that all the features and capabilities of the *SMT-Bank* software are employed. These features and capabilities are organized into Exam Specification tasks, Item Development tasks, Test Development tasks, and Administrative (Utilities) tasks. Additionally, specific item banks can be accessed from the main menu.



The image shows the "Main Menu" of the SMTBank system. The title bar reads "Main Menu". Below the title bar, there is a menu bar with "Utilities" and "Open With MS Word...". The version number "V2005.07.19" is displayed in the top right corner. The main area features the "SMTBank" logo in large blue letters. On the left, there is a vertical list of icons and labels: "Exam Specifications" (with a ruler icon), "Item Development" (with a pencil icon), "Test Development" (with a document icon), "Utilities" (with a box icon), and "Exit" (with a red arrow icon). At the bottom left, there are two checkboxes: "Password Protection" (checked) and "Enable Control Alt" (unchecked). In the center, there is a "Select A Bank" section with a list box containing "Dummy.bnk", "EFA.bnk", and "Sample.bnk". Below the list box is a "Bank:" label and an input field. Below that is a "Create A New Bank" button and a lock icon. On the right, there is a "Users..." section with a "Refresh" button and a large empty rectangular area.

STORING AND MAINTAINING TEST SPECIFICATIONS

or any testing program, the examination specifications (or blueprints) provide crucial information about what content areas (domains) will be covered, the number of items (emphasis) that will be asked about each content area, and the total number of items that are required. Many examination programs require that content areas be further broken down into sub-areas, sub-sub-areas, etc. The test specifications, therefore, become the basis for not only constructing tests, but also for categorizing or assigning items according to content area, assessing how many items are needed in various areas, and determining how items and domains relate to each other. The *SMT-Bank™* system provides powerful tools for storing and employing the test specifications for these purposes:

- ≈ Reviewing or Creating Content Specifications
- ≈ Adding or Deleting Content Areas
- ≈ Creating or Viewing Up To Five (5) Levels of Content Delineation
- ≈ Printing Content Specifications

Exam Specifications

Print Alternate Edit SpecOut

Param In Use:	Amount/ScoringArea	Alternate # of Quest...
00 Pretest	10	
1A The Prof Inst - Teaching Methods	20	
1B The Prof Inst - Understanding Testing	10	
IIA Class Management - Learning Environment	28	
IIB Class Management - Instructor Qualities	17	

Add

Delete

Add	Add	Add	Add
Delete	Delete	Delete	Delete

Return
 Save
 Print

Amount Of Questions On Exam = 85

Dummy Bank

01 Spec Level 01 Written To SpecUtil.txt

The alternate # of Quest Box searches for an ASCII file in the bank subdirectory with the extension .PRM. The ASCII .PRM file contains the number of questions for each Content Domain Area. (1 number per line in the ASCII file.)

MANAGING THE ITEM DEVELOPMENT PROCESS

All of the tasks associated with managing test questions (items) are supported by the *SMT-Bank* system and accessed from the Item Development Menu.



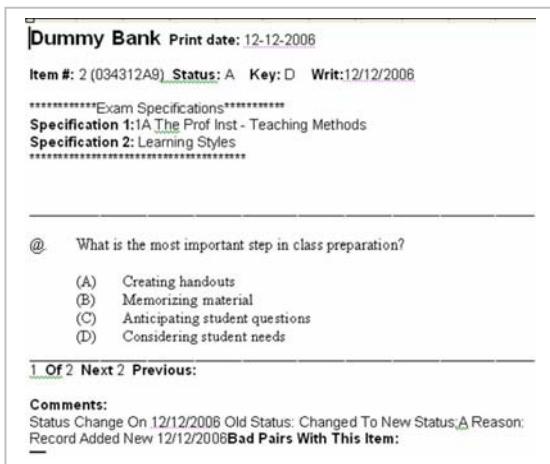
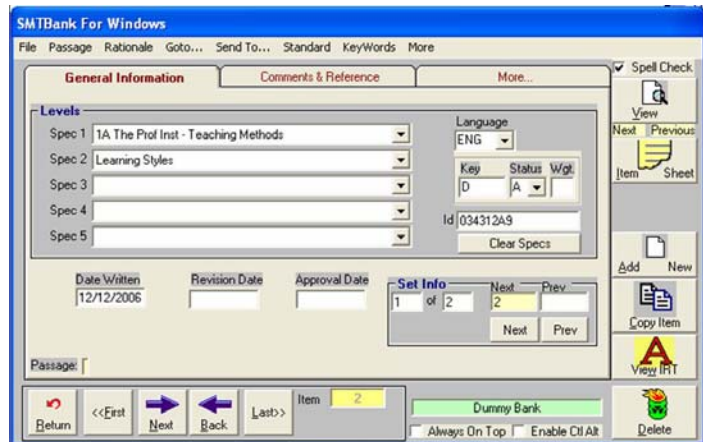
- ≈ *Edit/Data Entry* allows the user to enter new items or edit existing items.
- ≈ *Spec Fit* determines how items fit into specifications.
- ≈ *Status Code Maintenance* is used to designate or review item statistics (e.g., active, pretest, retired, etc.)
- ≈ *Produce Item Sheets* prints individual items with relevant information.
- ≈ *Bad pairs* enables to designate items that may cue another item and should therefore not be used on the same test.
- ≈ *Item Status Report* is a table that displays the number of items of each status within a given content area..
- ≈ *IRT Search Report* searches for items with specific statistical characteristics.

🌊 *Counts by Author* generates a list of authors and the number of items each has written.

🌊 *Key Distribution by Spec* displays the distribution of correct answers (keys).

The *SMT-Bank™* system stores all of the information about each item with that item. When the test developer or user views an item, he or she is able to comprehensively understand the item's attributes and can execute item-related tasks directly from the Item Screen itself.

The information stored with the item includes the Test Specification Designation, the Author, References, Item Status, Status History, Image Pathways (images are stored so that copying them into the item is not necessary, thus maintaining image quality), Item Weight (Default = 1), Item Set Information (if the item is part



of a set), the Rationale for correct and incorrect responses, the Key, any Comments about the item, and Standard Setting Data (for IRT applications).

In addition to storing important information, the user can execute many vital functions from the Item Screen. These include maintaining a list of item writers, conducting searches based upon key words (up to 8 key words may be stored with each item), conducting searches based upon item bank number or other

criteria, creating passages (for example, the user may want to store item exhibits, calculations, or instructions with the item), and printing various outputs. One important output is the Item Sheet. The Item Sheet contains the item text, all relevant information about the item and item statistics, including discrimination index, difficulty index, and the distribution of candidate responses among response options.

CONSTRUCTING TESTS AND MANAGING TEST FORM FILES

Executing the tasks necessary to construct a test and accessing information about a particular test form is made easy with *SMT-Bank*. All of the functions associated with analyzing, creating, editing, formatting, and changing test forms are accessed through the Test Development Menu.

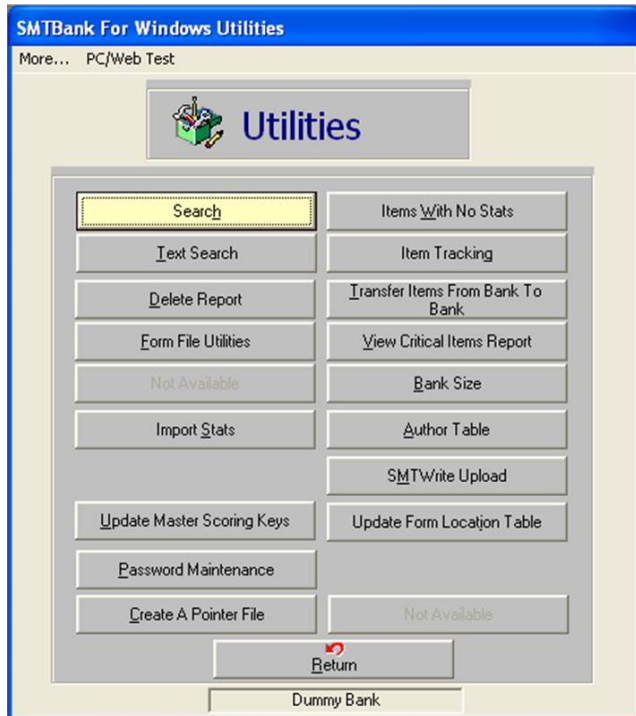


- ≈ Using the *Create/Edit A Form File* feature, the form lists the item bank numbers in accordance to each item's position on an exam. This feature also displays the item's corresponding specification area and key. After the creation of a form file, a user can edit or modify it through this feature..
- ≈ The new test can be printed in hard copy using the *Print Form File* function.
- ≈ The *Form File Test Fit* feature produces a report specifying precisely how well the new test conforms with the test specifications, identifying the content areas that have too many or too few items.
- ≈ The *Review a Test* function enables the user to view each item on a particular test form through a Window into each item's information screen (Item Screen).
- ≈ The *Examination Mean* function provides statistical information about the new test form's overall predicted difficulty level, by furnishing a mean p-value for the item set. This allows the user to understand the degree to which two forms are parallel in difficulty.

- ≈ The *Test Production* feature provides camera-ready copy of the new test form in Microsoft Word for Windows®.
- ≈ The *Item Grid Report* feature furnishes the user with statistical item information, indexed by content area, to assess the statistical balance of the test form
- ≈ The *Check a Key* attribute provides information about how the response options (i.e. A, B, C, D, and/or E) are distributed across the test form.
- ≈ The *AutoForm* feature enables the user to assemble the test form automatically according to the test specifications.
- ≈ The *Test Characteristic Curve* (TCC) function enables the user to view the TCC associated with the test form for testing programs using IRT (Item Response Theory) statistical parameters.
- ≈ The *Common Item* function allows the user to enter two different form numbers and request a list of the items that are in common to the two test forms.
- ≈ Finally, the *Scramble* feature instructs the system to randomly rearrange the items on the test form with the touch of one button, thus creating a second “version” of the test.

ADMINISTRATION OF THE ITEM BANKING SYSTEM

Managing the item banking system overall is accomplished using the Utilities Screen. From this screen, the managerial and administrative functions of maintaining items, statistics, test forms and the *SMT-Bank* system itself are accessed by the user.



≈ The *Search* feature allows the user to list all items that contain a user-defined textual word or phrase, and is very useful when the user needs to update all items within a bank containing specific content.

≈ The *Delete Report* function is used by the user to clear out reports (e.g. an old Item Grid Report) from storage after it is no longer needed or up-to-date.

≈ The *Form File Utilities* feature allows the user to delete old test form files, create and delete pointer files using master item banking numbers for each item, and other maintenance tasks associated with form files.

≈ The *Import Stats* function enables the

user to update the statistics stored with each item in a particular item bank (interacts with *SMT-Score*TM scoring module discussed later).

≈ The *Percent Overlap Report* feature enables the user to obtain percentages of commonality between two particular test forms.

≈ The *Update Master Scoring Keys* attribute enables the user to manage (print, change, and arrange) the keys associated with specific test forms.

≈ The *Password Maintenance* utility allows the system manager to add or remove new user permissions.

≈ A pointer file is a test form file that not only designates the item number or position on that particular test, but also designates the Master Item Bank Number for each of these items. The *Create a Pointer File* feature is used to create, delete and manage pointer files.

≈ The *Items With No Stats* function enables the user to create a list of all the items contained in an item bank or on a test form, which do not contain item statistics. This feature is typically used to identify items which are good candidates for statistical pretesting on active test forms.

≈ The *Item Tracking* and *Transfer Items From Bank To Bank* utilities enable the user to monitor the performance of specific items and to move or copy them from one item bank into

another item bank.

- ≈ The *View Critical Items Report* feature enables the user to enter statistical parameters and request a list of all items meeting these criteria. For example, the user could ask for a list of all items which have Rbis (Biserial Correlation Index) values that are less than .25, or other similar criteria.
- ≈ The *Author Table* feature allows the user to create a comprehensive list of all the authors registered in the system with each individual items.
- ≈ The *SMT-Write™ Upload* utility enables the user to import items into the item bank, having been written by authors at remote locations, without the need to conduct manual typing or re-entry of item text and associated information. *SMT-Write™* is companion software (discussed later) designed to support remote item writers, who can employ the software to store, edit and then submit items to the item bank manager for upload into the *SMT-Bank™* system.
- ≈ Finally, the *IRT Form File Print* function facilitates the management of test forms using IRT statistical parameters.

For licensing information, contact SMT's Business Development department at 302.737.0796 at e-mail info@smttest.com.