

Appendix K

Version Control Library (VCL)

The Version Control Library (VCL) provides an interface to the Polytron Version Control System™ (PVCS) by Intersolv™. PVCS is not required to use AutoMax and is not distributed as part of the AutoMax Programming Executive. However, you must have PVCS Version 5.0 (or later) installed on your network (or local) drive in order to use the VCL features in AutoMax Executive V3.4 and later.

If you have specified in AutoMax Setup that you have PVCS installed, **Version Control Library** will appear as a menu item on the System, Section, and Rack menus in the System Configurator, and on the Tasks menu in the Task Manager. When this menu item is selected, a sub-menu listing two items, **Fetch** and **Snapshot**, will be displayed. These two commands are described in detail in the sections that follow.

As you develop your system, you may find it useful to snapshot all or part of the system, either as milestones are reached, or when files are handed off to another user. You can use VCL to save versions of systems, sections, racks, or tasks. You can view the contents of the Version Control Library and fetch previous versions (or the most current version) of the files contained in the VCL. You can retrieve anything that has been previously stored in the library.

Version Control Library Setup

You must have PVCS installed on your network (or local) drive in order to use the Version Control Library feature in AutoMax V3 and later. In addition, the directory where PVCS is installed must appear in the PATH statement in your AUTOEXEC.BAT file. VCL can then be enabled as part of the AutoMax Setup procedure.

- Step 1. Select **AutoMax** from the Setup menu.
- Step 2. Enter the letter of the drive and the name of the VCL directory in the box labeled "Version Control Library".
- Step 3. Select the PVCS Installed box. If this box is not selected, the Version Control Library selections on the AutoMax menus will be dimmed (inactive).

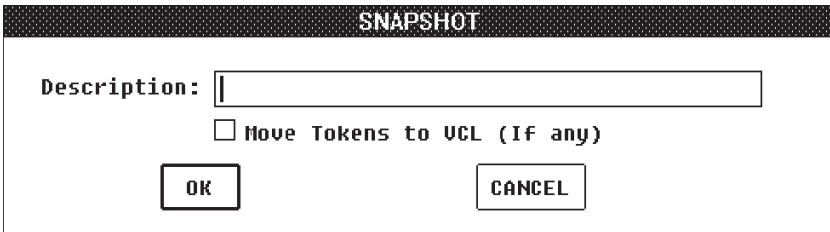
Note that a PVCS configuration file (VCS.CFG) will be generated by AutoMax and will be added to the directory that contains the AutoMax V3 software (default = AMX3). This file is used by PVCS to find configuration parameters for its commands. If the PVCS configuration file is not in this directory, Fetch and Snapshot operations will return errors.

Saving Files to the Version Control Library

The **Snapshot** command allows the user to save current versions of system files to the Version Control Library. Snapshot can be performed at the following levels: system, section, rack, or task. It may be used with a single item selected or multiple items selected. The items saved to the VCL in a multiple snapshot can be fetched separately.

The same procedure is used to snapshot systems, sections, racks, and tasks. In the following procedure, "SSRT" will represent "system, section, rack, or task." Note that the double quotation mark (") is not permitted in the description field for any SSRT.

- Step 1. Select one or more SSRT.
- Step 2. Select **Version Control Library** from the System, Section, or Rack menus in the System Configurator, or from the Tasks menu in the Task Manager.
- Step 3. Select Snapshot from the sub-menu. The following dialog box will be displayed:



The dialog box is titled "SNAPSHOT". It contains a "Description:" label followed by a text input field. Below the input field is a checkbox with the label "Move Tokens to VCL (If any)". At the bottom of the dialog are two buttons: "OK" and "CANCEL".

- Step 4. (Optional) Enter a description of the snapshot (up to 40 characters). The following four characters are not permitted: colon, asterisk, backslash, and dash.

If multiple items have been selected, there will still be only one dialog box and, therefore, only one description for the snapshot. You will, however, be able to fetch each item in a multiple snapshot separately. We suggest that a multiple item snapshot be done only if the single description can pertain to all of the items being snapshot.

- Step 5. Select the Move Tokens to VCL check box if you want to transfer any tokens held by the SSRT to the VCL. Note that the check box will not appear if Tokens is not enabled, or if you are snapshotting at the task level.

AutoMax will not allow you to snapshot over tokens that may already be in the VCL. If you attempt to snapshot over tokens, the screen will display an error message and the snapshot will be aborted. See Appendix J for more information about tokens.

- Step 6. Select OK to begin the snapshot or Cancel to return to the System Configurator (or the Task Manager).

If you selected OK, a dialog box will be displayed that shows what SSRT is being processed. If you are transferring the SSRT token to the VCL, and the token has a password, you will be prompted for the token password before the SSRT will be processed. When processing is complete, a diagram showing the percentage of the snapshot that has been completed will be displayed. When the snapshot is complete, you will return to Windows at the same point as you were before the snapshot (System Configurator or Task Manager). If you are doing a multiple snapshot, the next snapshot operation will begin.

Error Handling during a Snapshot Operation

If an error occurs during the processing of a snapshot operation, an error message will be displayed and the snapshot operation will be aborted. If an error occurs while executing one of the DOS files spawned by the Snapshot command, the user will be returned to Windows and an error message will be displayed. If PVCS fails, the error message will state that PVCS failed and will direct the user to the file PVCS.OUT, which is contained in the AutoMax workspace subdirectory (typically AMXWORK). This file will contain a message describing why PVCS failed. If PVCS did not fail, the user will receive an error message stating only that the snapshot operation failed. The AutoMax library will remain intact, but the VCL may contain only a part of the complete snapshot. If the token was being transferred, it will remain with the source copy of the files unless the snapshot is completed successfully. After determining the cause of the failure, you should execute the snapshot again to ensure that the VCL contains a complete and accurate snapshot.

Tokens and Locking during a Snapshot Operation

If the Move Tokens to VCL check box is selected (checked), then all the tokens in the AutoMax library within the scope of the snapshot will be transferred to the Version Control Library. If the token for the system, section, or rack has a password, the password will be prompted for before the token is transferred to the VCL. However, the user may not write over any tokens already in the Version Control Library. For example, suppose that a user is snapshotting a system with three racks and he has tokens for two of the racks, but the token for the third rack is in the VCL. When he tries to snapshot the system, he will receive an error message telling him that he is trying to write over a system that has its token in the Version Control Library. The snapshot will be aborted before anything is snapshot. The user will need to fetch the third rack from the VCL with the token before he will be allowed to snapshot the system. If the token were held by another user and not the VCL, the snapshot would be successful.

Locks are taken out in the Version Control Library for any system, section(s), rack(s), and task(s) (SSRT) that are being snapshot. For example, if a user is snapshotting a system with two racks that belong to the same section, a lock will be taken out in the Version Control Library for the system, section, and each rack. No one else can snapshot the system, section, or either rack until the first user's snapshot is complete. A lock is also taken out in the AutoMax library so that the SSRT cannot be modified during the snapshot.

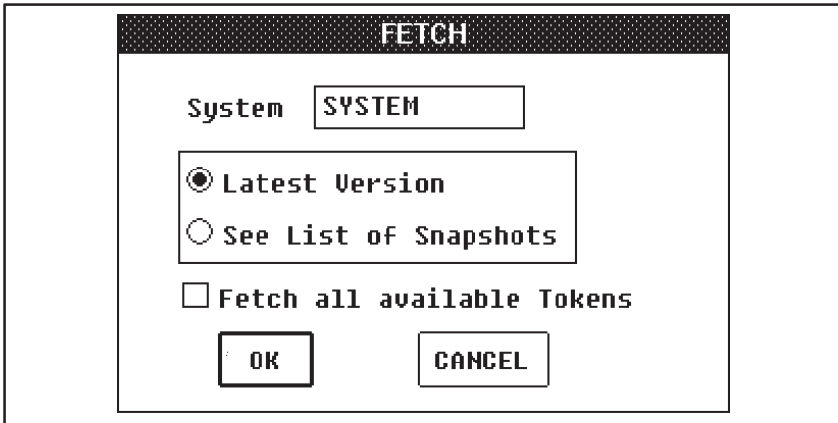
Retrieving Files from the Version Control Library

The Fetch command allows the user to retrieve versions of the system files from the Version Control Library. Fetch can be performed at any level to retrieve a single system, section, rack, or task. Fetch can only be used with no SSRT selected or one SSRT selected. In addition, the user cannot fetch the SSRT unless there is exactly one SSRT selected in the levels above. For example, if two sections are multi-selected, or if no sections are selected, Fetch will be disabled under the Rack menu. This rule applies at all levels except the system level.

The same procedure is used to fetch systems, sections, racks, and tasks. Read the remainder of this section carefully before executing the Fetch command. System, rack, and task database files in the AutoMax library can be modified or deleted by the Fetch command.

- Step 1. Select **Version Control Library** from the System, Section, or Rack menus in the System Configurator, or from the Tasks menu in the Task Manager.
- Step 2. Select Fetch from the sub-menu. The Fetch dialog box will be displayed. If an SSRT was selected, its name will be displayed in the dialog box. If

no SSRT was selected, enter the name of the SSRT you want to fetch. If you are fetching at the task level, you must enter the task name with its extension. See the figure below.



- Step 3. The dialog box contains two option buttons. If you want to fetch the latest version of the SSRT, select the "Latest Version" button. If you want to see a list of the previous snapshots from which you can choose the version of SSRT, select the "See List of Snapshots" button.
- Step 4. The dialog box has a check box for fetching tokens from the Version Control Library. Select this box if you want to fetch all the tokens held by the VCL (within the scope of the fetch) to the AutoMax library. Note that the check box will not appear if tokens are not enabled or if you are fetching at the task level.
- Step 5. Select OK to begin the fetch operation or Cancel to return to the System Configurator (or the Task Manager).

If you selected OK, a dialog box may be displayed that indicates that certain racks are being prepared. This means that the Auto-

Max directories for the racks within the scope of the fetch operation are being emptied of all their AutoMax files. If the directory contains non-AutoMax files, they will remain in the directory. If the directory is empty, it will be deleted. The fetch operation will re-build the AutoMax rack directories with the files contained in the version of the SSRT being fetched. For example, if an AutoMax system contains a section with three racks, and you fetch a version of that section that contains only two racks, the third rack and all its associated task files will be gone.

When empty directories have been deleted, a dialog box will be displayed that shows what SSRT is being processed. When processing is complete, a diagram will be displayed that shows the percentage of the fetch operation that has been completed. When the retrieval of files is complete, you will return to Windows, where a dialog box labeled Rebuilding Databases will be displayed. After the AutoMax databases are rebuilt, a "FETCH COMPLETE" message will appear. You will then return to the same place you were before the fetch operation (System Configurator or Task Manager).

Using the See List of Snapshots Option

If **See List of Snapshots** is selected, the Available Snapshots list box will be displayed before the fetch operation is begun. A sample list box appears below.

AVAILABLE SNAPSHOTS				
SYSTEM	Tue Apr 13	11:03:24	1993	RELEASE BETA
RACK	Tue Apr 13	11:02:39	1993	ANOTHER BUGFIX
RACK	Tue Apr 13	11:01:34	1993	ADDED DOCUMENTATION
SECTION	Tue Apr 13	11:00:38	1993	ADDED A RACK TO THE SECTION
SYSTEM	Tue Apr 13	10:59:39	1993	READY FOR ANOTHER RELEASE
SYSTEM	Tue Apr 13	10:58:39	1993	OR USE NO DESCRIPTION LIKE BELOW
RACK	Tue Apr 13	10:57:36	1993	
RACK	Tue Apr 13	10:56:52	1993	USE ALL OF THE GIVEN FORTY CHARACTERS!!!
RACK	Tue Apr 13	10:55:46	1993	BUGFIX IN A00
SYSTEM	Tue Apr 13	10:53:30	1993	SYSTEM READY FOR RELEASE
RACK	Tue Apr 13	10:52:16	1993	RACK A00 , MILESTONE 3

The list box will display an entry for every complete snapshot containing the SSRT the user is fetching. For example, if the user is fetching a rack, the list will contain all the rack snapshots of that rack. It will also contain all the section snapshots of the section to which the rack belonged at the time of the snapshot and all the system snapshots of the system to which the rack belonged at the time of the snapshot. For the system and section snapshots, the rack must have belonged to them at the time of the snapshot in order for the snapshot to be on the list. Each reference to a snapshot will contain the level of the snapshot, a time/date stamp, and the description given when the snapshot was done. The references will be in reverse chronological order, where the most recent snapshot is at the top of the list and is selected as the default. If the user selects the most recent (top) snapshot from the list, he will receive a warning that this SSRT may not be the latest version of that entity. He will be given the chance to abort the fetch.

To fetch a particular snapshot, the user needs only to select the one he wants and then select OK. The fetch operation will retrieve the SSRT exactly as it was when it was snapshot. Note that the See List option should only be used when you want to fetch an SSRT in order to restore it to its state at the time of the snapshot.

Using the Latest Version Option

The Fetch Latest Version option allows the user to fetch entities (sections, racks, tasks) from different snapshots to get the latest version of each component entity. In order for entities to be included in a fetch of a higher entity, the entity must have been snapshot at one time and all the entities above it must have been snapshot and belong to the latest version of the entity the user is fetching. The examples that follow illustrate the way in which Fetch Latest Version functions:

In a development environment, the Fetch Latest option could be used as illustrated in the following example. Assume that a section that has 10 racks needs to be developed, and 10 different developers will each be working on his own rack. A supervisor is overseeing the development.

The supervisor could do a snapshot of the section when it contain no racks. Then, as each developer finishes some phase of his rack, the developer could snapshot his rack from the rack level. The supervisor, by fetching the latest version of the section, would receive the latest version of all the racks. When the project was ready for release, the supervisor could fetch the latest version of the section and then snapshot it with an appropriate milestone description.

Example 1:

On Monday, section NET_A was snapshot from the section level at a time when it had only one rack, A00. On Tuesday, another rack, A01, was added to section NET_A and then was snapshot from the rack level.

If section NET_A is fetched from the section level using the Latest Version option, section NET_A will contain both racks A00 and A01.

If section NET_A is fetched from the section level using the See List of Snapshots option, and the snapshot from Monday is chosen, section NET_A will contain only rack A00. This is because the See List of Snapshots option restores the fetched entity to its exact state at the time the snapshot was taken. Rack A01 was not part of section NET_A on Monday, so it is not included in the fetch.

Example 2:

On Monday, section NET_A was snapshot from the section level at a time when it contained no racks. On Tuesday, a rack was

added to NET_A and two tasks were added to the new rack. Each task was snapshot from the task level.

If section NET_A is fetched from the section level using the Latest Version option, section NET_A will contain no racks and no tasks because the rack was never snapshot.

If section NET_A is fetched from the section level using the See List of Snapshots option, and the snapshot from Monday is chosen, section NET_A will contain no racks and no tasks (just as it was at the time of the snapshot).

Example 3:

On Monday, section NET_A was snapshot from the section level at a time when it had only one rack, A00, which contained only one task, TASK1.BAS. On Tuesday, another rack, A01, was added to section NET_A, containing two tasks, TASK2.BAS and TASK3.BAS. TASK2.BAS and TASK3.BAS were then snapshot from the task level.

If section NET_A is fetched from the section level using the Latest Version option, section NET_A will contain only rack A00 because rack A01 was never snapshot. TASK1.BAS, belonging to rack A00, will be fetched. TASK2.BAS and TASK3.BAS, belonging to rack A01, will not be fetched. Remember, in order for an entity to be included in a fetch using the Latest Version option, all the entities above it must also have been snapshot and must belong to the latest version of the entity being fetched.

Error Handling During a Fetch Operation

If an error occurs during the processing of a fetch operation, an error message will be displayed and the fetch operation will be aborted. If the error occurs while in DOS, the user will be returned to Windows and one of two error messages will be displayed. If PVCS failed, the message will state that PVCS failed and will direct the user to the file PVCS.OUT, which is contained in the AutoMax workspace directory (typically AMXWORK). A message in this file will describe why PVCS failed. If PVCS did not fail, the user will receive an error message that says only that the fetch failed. The Version Control Library will remain intact, but the AutoMax library may contain only a part of the entity being fetched. If tokens were being transferred, they will remain with the source copy of the files unless the fetch operation is completed successfully. After determining the cause of the failure, you should execute the fetch operation again to clean up the AutoMax library.

Tokens and Locking During a Fetch Operation

If the check box labeled Fetch all available Tokens is selected (checked), then all the tokens in the Version Control Library within the scope of the fetch operation will be transferred to the AutoMax library. If the user wants to write over any files whose tokens are already in the AutoMax library, he may be required to enter the token password.

When using both the See List of Snapshots option and the option to fetch all available tokens, be careful when selecting a snapshot from the list box. There is a chance that modifications that were made to the files in the VCL will be lost. For example:

John and Tim both have a copy of the same system and are using the same Version Control Library. They are both working on system SYS1, which has one section, SECT1, and two racks, RACK1 and RACK2. John has the token for RACK1 and has been making changes to RACK1. Tim has the token for RACK2 and has been making changes to RACK2.

John finishes his changes to RACK1 and does a section snapshot of SECT1. He uses the "Move Tokens to VCL" option because he is done modifying RACK1. (John probably should have only done a rack snapshot since he held the token for RACK1 only.) After the snapshot is complete, the token for RACK1 is held by the Version Control Library.

Tim finishes his changes to RACK2 and does a rack snapshot using the "Move Tokens to VCL" option. He uses the "Move Tokens to VCL" option because he is finished making changes to RACK2. Now the token for RACK2 is held by the Version Control Library.

John decides to fetch SECT1. He chooses the snapshot from above, along with the "Fetch all available Tokens" option. The fetch will retrieve both racks exactly like they were when SECT1 was snapshot, along with both rack tokens. John's copy of RACK2 is now the "current" copy and Tim's changes are lost.

When fetching from the VCL, locks are taken out in the AutoMax library for the appropriate SSRT. For example, if a user is fetching a section, a lock will be taken out in the AutoMax library for that section. No one else can modify the section until the first user's fetch is complete. If the "Fetch Latest" option is being used, locks are also taken out in the VCL so that no one can snapshot anything and modify the "latest" version.