StorageTek®

OS 2200 Client System Component (CSC)

5R1 User Reference Manual

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PREFACE

PURPOSE

This is the *OS 2200 Client System Component (CSC) User Reference Manual.*
This manual is for the end users of the automated tape handling made possible
by the StorageTek tape library and CSC. Automated tape handling is affected by
site-specific selections in configuring the library, CSC, and OS 2200 operating
system. For this reason, there are also sections in this manual for those who
install and administer the library, CSC, and OS 2200.

AUDIENCE

This manual is written for those who use the tape automation facilities of the
StorageTek tape library. It assumes a general knowledge of how to use tape
processing on the Unisys system. It builds on this basic knowledge to describe
how to automate tape handling via CSC and the StorageTek tape library.

This manual also provides background information for those who install the tape
library and those install and administer CSC. The manner in which the tape
library is installed affects how it is viewed by the tape library software. This
connection information combined with the configuration parameters for the
library server software affect the interaction between CSC and the tape library.
The tape library information as well as the CSC configuration parameters dictates
how a tape user would request automation services.

HOW TO USE THIS DOCUMENT

Chapter 1. Introduction

This chapter gives provides an overview of CSC and automated tape processing.

Chapter 2. Server Configuration

This chapter presents high-level information on server configuration choices that determine how the CSC and the library server interact.

Chapter 3. CSC Configuration

This chapter provides high-level information on CSC configuration choices that affect the tape end-user. It also covers OS 2200 settings that affect tape end-users. These settings were originally implemented as part of CSC 1R1.

Chapter 4. Tape User Guidelines

This chapter describes changes and procedures that enable the tape user to take advantage of automated tape handling using CSC and StorageTek tape library.

Back Matter

The manual includes an index.

COMMAND SYNTAX NOTATION

This manual uses the following conventions for representing command syntax notation and message displays:

UPPERCASE	indicates a command or keyword
lowercase italic	indicates a user- or system-supplied variable value. For example, in XX=*userid*, you enter the actual userid for *userid*.
abbreviation	indicates a command that can be abbreviated to its minimum acceptable form. For example, ENAble can be abbreviated to ENA.
vertical bar |	separates operand alternatives. For example, A | B indicates that you must select either A or B.
brackets []	indicate an option that can be omitted. For example, [A | B | C] indicates that you can select A, B, C, or nothing.
braces {}	indicate an option that you *must* choose. For example, {A | B} indicates that you must choose either A or B.

underlining	indicates the system default. If you do not enter a parameter or value, the system will supply the underscored value. For example, A	B	C indicates that if you do not choose an option, the system will default to C.
ellipses ...	indicate that entries can be repeated as often as necessary.
SMALLCAPS	indicate a key, such as XMIT or F1.

RELATED DOCUMENTATION

OS 2200 Client System Component (CSC) Technical Bulletin, Storage Technology Corporation (312537701)

OS 2200 Client System Component (CSC) System Administrator's Guide, Storage Technology Corporation (312537501)

OS 2200 Client System Component (CSC) Operations Guide, Storage Technology Corporation (312537201)

OS 2200 Client System Component (CSC) Installation Guide, Storage Technology Corporation (312537301)

OS 2200 Client System Component User Interface (CSCUI) Programmer's Reference Manual, Storage Technology Corporation (312537401)

OS 2200 Client System Component (CSC) Client Direct Interconnect (CDI) Troubleshooting Guide, Storage Technology Corporation (312537601)

OS 2200 Client System Component (CSC) UNISYS OS 2200 CSC 5R1 VSM Reference, Storage Technology Corporation (312537901)

1. INTRODUCTION

This chapter gives background information on tape operations and on the role of CSC in automating those operations. It also tells about the organization of this document.

BACKGROUND

Tape operations have traditionally been a manual process. A human operator, responding to prompts from the operating system or the tape hardware , manually mounts and dismounts tapes. Humans, often with the programmatic aid, maintain information about the tape library (e.g., tape location, scratch status, write-protect status, etc.).

The Automated Cartridge System (ACS) from StorageTek is a tape storage and retrieval device. It can robotically mount and dismount cartridge tapes onto attached tape transports. The ACS, combined with several software components, automates the handling of tapes.

One of these software components is the library control software. StorageTek provides versions of this software that execute on different hardware platforms. All versions direct the ACS hardware to carry out tape handling operations for client computer systems.

The Client System Component (CSC) is a collection of software components used on the Unisys system that allow it to be a client of the library server. CSC interprets and translates Unisys tape handling needs into library server requests.

NOTE

CSC is the name used by StorageTek to refer to the client software that communicates with their server. CSCs exist for many different hardware platforms. Although not stated, use of the term 'CSC' in this document means Unisys 2200 CSC.

Together, CSC, the library control software, and the ACS enable automation of most tape handling tasks. Mounts and dismounts are addressed in this document. These operations affect the tape user, system operator, and system configurator. Other supporting operations that are automated by CSC are addressed in the appropriate administrative and operator references.

This document describes how customers interact with CSC from two perspectives; as an end user of tapes and as one who tailors CSC for operation at your site. These two views must be coordinated to achieve successful tape automation.

ABOUT THIS DOCUMENT

This document is primarily for the user who must access data on tape. It also contains information about how the CSC and server configuration choices affect the tape user. For this reason it is also useful to those who administer the site's configuration.

Figure 1-1 identifies the tape automation components and the areas of responsibility for the readers of this document. The tape end user submits ECL statements to request tape units and tape volumes. Chapter **4**, "**Tape User Guidelines**," describes the interactions between ECL and automated tape operations. Chapter **3**, "**CSC Configuration**," describes parameters that tailor CSC for your site and also affect how tape automation works for the tape end user. Chapter **2**, "**Server Configuration**," very briefly tells about StorageTek hardware and software customizations that must be coordinated with CSC configuration.
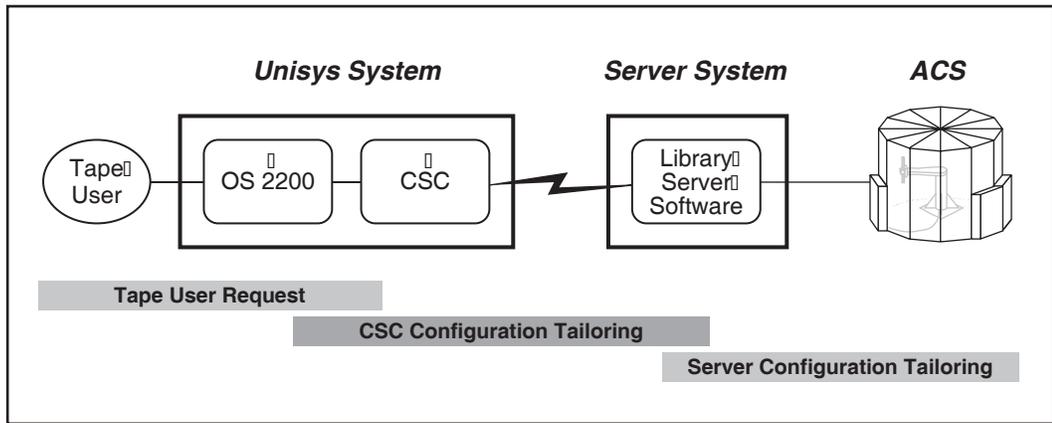
Figure 1-1. Tape Automation Components and User Responsibilities

MULTIPLE CSC CONSIDERATIONS

CSC communicates with OS 2200 using either an Executive Request or the CARTTAPELIB$ extended mode call. At any given time, OS 2200 can support one CSC via the ER interface and up to four CSCs via the CARTTAPELIB$ interface. Each of these CSCs communicates with one library server. Using multiple CSCs introduces the following usage, configuration, and administrative concerns:

1. Each concurrent CSC is a separately licensed product with its own unique installation.

2. If multiple CSC installations include CDI, then each concurrently executed CDI must have a separate CPA.

3. All CSCs can share a single instance of CDI. That instance of CDI exists in only of the CSC installations.

4. Each CSC using CMS or CPCOMM must have a unique TSAM process.

5. Only one CSC can use the STK$ interface.

6. Each CSC that uses the CARTTAPELIB$ interface is identified by a site defined CTL identifier. These CTL ids must be unique among concurrent CSCs.

7. Each CSC must have a unique console keyin.

8. Only one CSC can be installed in mode A. All others must be mode B

9. When OS 2200 queries the server to determine which unit to allocate, it polls the CARTTAPELIB$ connected CSCs first and the ER connected CSC last. The CARTTAPELIB$ CSCs are polled in the order that they appear in the output of the CTL FS console keyin. This order is established by the order in which the CSCs are started.

   When multiple CSCs exist and this document states that CSC will recommend a standalone unit, what actually happens is the next CSC will be given a chance to satisfy the request. A standalone unit will be selected only if none of the active CSCs can satisfy the request.

10. For a blank tape assignment that specifies a CTL pool name, OS 2200 will not query a CSC using the ER interface if another CSC has registered with CARTTAPELIB$.

11. Although each library server is autonomous, care must be taken to ensure that volume identifiers are unique across all libraries. Failure to do so can produce unpredictable results for the duplicated volumes.

2. SERVER CONFIGURATION

This chapter describes parameters of the library server configuration that affect how the server interacts with CSC. These interactions indirectly affect how the tape end-user takes advantage of the automated tape operation.

OVERVIEW

A StorageTek automated tape library, or just library, consists of software and hardware for tape storage and automated tape handling. Each library consists of one or more ACSs and a server running library control software that directs ACS operation.

An ACS is a subsystem of a library consisting of interconnected Library Storage Modules (LSMs) and additional hardware that coordinates ACS operations. Each LSM has tape storage and robotics to move tape volumes. When the tape units are attached to the LSMs, the robotics can perform automated mounting and dismounting of volumes.

Library server control software exists for two different types of server hardware and operating system. Each version accepts tape handling requests from client systems and converts them into the appropriate sequence of commands for the ACS. The items discussed in this chapter are applicable to both versions of the server software.

There is a corresponding CSC configuration item for each server item in this chapter. The server and CSC configurations must be synchronized for proper automated tape operation.

CSC can communicate with only one library server. However, multiple CSCs can be executed simultaneously to allow access to multiple library servers. In an environment with multiple CSCs, the configurations of each paired CSC and server software must be synchronized.

SCRATCH POOLS

The library control software remembers the status of every tape volume in the library. When a request is made to mount a blank tape, the library control software selects and mounts a scratch volume, that is, one that it knows is available for use. Your site can define pools of tapes to guide the server's selection process. Each scratch pool on the server is a collection of tape volumes assumed to have one or more similar attributes. Each mount request to the server for a blank volume identifies which scratch pool is to be used. Although the server software does not know or care about these attributes, the end-user can use a scratch pool specification to control the attributes of blank tapes

Following are the CSC configuration items that reference server scratch pools.

- DEFAULT_LABELED_POOL
- DEFAULT_UNLABELED_POOL
- TRANSLATE_POOL
- UNDEFINED_POOL

Server Differences

In one server software version, the scratch pool is a changeable attribute associated with each tape volume. In the other version, each scratch pool contains a defined set of volumes. It is a site administration duty to define the scratch pools and their attributes. Managing the different server treatment of scratch pools is also a site administration duty.

HARDWARE IDENTIFIERS

The library control software identifies each ACS component by an ordered set of numbers such as 1,2,3. Each of the numbers identifies a unique attribute of the component. Typically, each of these attributes is determined by the hardware relationship of this component to others of the same type. For example, the drive number attribute of the top tape unit in a drive cabinet is 0, the next one down as 1, and so on.

This section discusses the library identifiers needed to request tape mounts and dismounts.

ACS IDs

An ACS identifier is a single number used by the library control software to direct client requests to the correct hardware. From the user's perspective, all volumes and drives in an ACS are in a single location. Any volume in an ACS can be mounted on any drive in that ACS.

Following are the CSC configuration items that reference ACS identifiers

- ACS_MAP
- DEFAULT_LABELED_POOL (ACS id usage is optional)
- DEFAULT_UNLABELED_POOL (ACS id usage is optional)

LSM IDs

An LSM identifier is a two part number of the form x,y. Here, x is the ACS identifier that contains this LSM and y uniquely identifies one LSM within the ACS. LSM identifiers are defined at the time that the LSM hardware is configured.

LSM identifiers are not referenced directly in the CSC configuration. They are, however, part of drive and CAP identifiers.

Drive IDs

The outside walls of LSMs are composed of components called panels. As with other ACS components each panel has an identifier. Certain panels of the LSM can be configured for the attachment of a tape drive cabinet. Tape units in that cabinet are identified by a four part number of the form a,b,c,d where a,b is the LSM identifier, c is the panel identifier, and d is the unit number in the drive cabinet. The top tape unit is 0, the next is 1, and so on.

Following are the CSC configuration items that reference drive identifiers

- DRIVE in CSC$DRIVE

VOLUME MEDIA TYPE AND UNIT TYPES

The library control software maintains a media type for each tape volume and a drive type for each tape unit. Media types are derived from the media code character on the external label of a tape volume. Drive type is defined at the time the LSM hardware is configured.

When presented with a mount request, the library control software ensures that the requested media type and drive type are compatible. When given a request to locate a unit on which to mount a volume, it considers only those units that are compatible with the requested media type.

Following are the CSC configuration items that are sensitive to the volume media type. The media type association is optional for each of these.

- DEFAULT_LABELED_POOL
- DEFAULT_UNLABELED_POOL
- TRANSLATE_POOL

3. CSC CONFIGURATION

This chapter describes parameters of the CSC configuration that affect its interactions with the Library Server and with OS 2200. Many of the OS 2200 interactions have a direct effect on the tape end-user.

OVERVIEW

At the start of its execution, CSC reads parameter statements that tailor its operation. There are three basic types of parameters for CSC; interaction, mapping, and operational. The interaction type defines how the CSC components interact with each other, with OS 2200, with the library server, and with the tape users. The mapping statements define relationships between entities in the 2200 world and those in the library server world. Operational statements control various aspects of how CSC internal functions are carried out.

CSC can communicate with Exec using either an original Executive Request (ER) interface developed for the original CSC, or the CARTTAPELIB$ interface. With the ER interface, there are several settings maintained by Exec that affect the tape user. With the CARTTAPELIB$ interface, CSC is wholly or partially responsible for most of these settings.

This chapter addresses the interaction and mapping parameters that affect tape users. It also describes the Exec settings that affect automated tape operation along with differences in these associated with the CSC-to-OS 2200 interface.

CSC - EXEC INTERFACE

An automated tape handling environment on the Unisys 2200 system requires that Exec communicate with the library automation hardware. Rather than deal with the mechanics of communicating with library hardware, Exec passes its requests and receives responses through an interface program. When CSC version 1 was created as the interface to the StorageTek Automated Cartridge System, an Executive Request was created to provide communication between Exec and CSC. This is referred to as the ER STK$ interface. CSC version 5 and all prior versions can use the ER STK$ interface.

In the past, Unisys supported another tape automation library. This library used an interface program called RoboHost. RoboHost communicated with Exec using an extended mode call interface called CARTTAPELIB$. CSC version 5 can also use the CARTTAPELIB$ interface.

Both of these interfaces exchange information during the allocation of tape units and during a tape mount or dismount. The allocation exchange allows the interface program and automated library to participate in the selection of which tape unit is allocated. When a tape must be mounted or dismounted in an automated library, Exec sends a request to the interface program.

Although the same basic functionality exists in both interfaces, there are differences in the nature of the information that is exchanged and how Exec acts upon this information. The following table lists the major differences when CSC is used with the different interfaces.

Table 3-1. Differences When CSC is used with CARTTAPELIB$ and ER STK$

Operational Area	CARTTAPELIB$	ER STK$
CSC initialization	CSC tells Exec the names of the drives are under its control.	CSC tells Exec the ACS and LSM location of the drives under its control.
Tape unit allocation - Exec's role.	Exec always requests CSC assistance in selecting tape unit.	Exec may not request CSC assistance based on assign parameters and Exec settings for ER STK$.
Tape unit allocation - Exec passes nearly the same information to CSC via each interface.	CSC returns a list of drive names if the requested volume is in the automated tape library.	CSC returns an ACS and LSM preference list if the requested volume is in the automated tape library.
Unlabeled tape reel numbers	CSC receives and responds to the "enter reel number" message. The message is not displayed on the console.	Exec suppresses the "enter reel number" message. CSC returns the reel number in its response to the Exec mount request. Exec simulates answering the "enter reel number" message.
Tape related console messages	CSC receives system messages related to the tape units it controls. When required, CSC returns responses to these messages to Exec.	Standard tape message handling is not affected except for the "enter reel number" message mentioned above,.
Number of CSCs	Exec can communicate with up to 4 CSCs concurrently.	Exec can communicate with only 1 copy of CSC.

EXEC SETTINGS

This section describes parameters that were originally defined for the Executive Request interface between CSC and OS 2200. These parameters enable the site to define default behavior for automated tape operation and to associate names with the ACS identifiers. They also enable the end-user to override these defaults. The concepts also apply to the CARTTAPELIB$ interface.

ACS Names

An ACS name is an alphanumeric string that can be used by the tape user to refer to a specific ACS. The @ACSNAM processor is used to define ACS names to Exec. Once defined, an ACS name can be used in the equipment code field of an @ASG statement to request a unit in that ACS.

The primary use of ACS names in this document is to communicate tape user requirements during tape unit allocation. When the user specifies an ACS name, CSC and Exec must work together to allocate a unit in the desired ACS. From the

tape user's perspective, there is no difference between the CARTTAPELIB$ and the ER interface.

ER Interface Specifics

With the ER interface, all processing related to ACS names is done in the ER code in Exec. When the ACS names are defined with the @ACSNAM processor, each one is paired with the appropriate numeric ACS identifier. When CSC and Exec pass information about an ACS they use the numeric ACS identifier.

CARTTAPELIB$ Interface Specifics

With the CARTTAPELIB$ INTERFACE, Exec and CSC use alphanumeric fields like ACS names and drive names in their communications.

Query Scratch

With the ER interface, Query Scratch is a setting that controls how tape units are allocated for blank volume assignments. The TRUE setting causes Exec to consult with CSC on which units to use for a blank assignment. The FALSE setting causes Exec to perform unit selection for blank volumes without CSC assistance.

The @ACSNAM processor is used to change the Query Scratch setting. The default setting for Query Scratch is FALSE.

ER Interface Specifics

When Query Scratch is TRUE, CSC consults the server about where the greatest number of scratch volumes are that meet the user's requirements. CSC then instructs Exec to allocate a unit in that ACS. A side effect of this is that ACS names specified on the @ASG are ignored.

CARTTAPELIB$ Interface Specifics

OS 2200 always operates as if Query Scratch were TRUE and consults with CSC on where to mount a blank volume. When Query Scratch is FALSE, CSC creates a drive recommendation based on site-defined defaults without consulting the server. This approximates the OS 2200 processing done for the ER interface with Query Scratch set to FALSE. When Query Scratch is TRUE, CSC consults the server and receives a list of units near to greater numbers of scratch volumes that meet the user's requirements. CSC filters this list based on the ACS name specified on the @ASG and returns a unit recommendation list to OS 2200.

Scratch Preference

Scratch Preference is a setting that tells if library attached units or stand alone units will be used as the default for blank volume assignments. This setting only affects assignments that do not include a requirement to use or to not use a library unit.

The @ACSNAM processor is used to change the Scratch Preference setting.

System and Run Default ACS

One characteristic of Unisys ECL is that default settings exist for most fields. With tape automation there is now a default ACS associated with each run. This default is used when an assignment requires an ACS unit and neither the user nor the server give any indication of which ACS should be used.

The initial value of each run default ACS is taken from the system default ACS. The system default ACS exists only to provide this initial setting. The @ACSNAM processor is used to set the system default ACS.

CSC RUNTIME PARAMETERS

This section describes parameters defined by a site for CSC that ultimately affect how the tape end-user requests and receives automated tape operation.

ACS_MAP

The ACS_MAP parameter is only used with the CARTTAPELIB$ interface. It gives the CARTTAPELIB$ interface a capability that is native to the ER interface.

The ACS_MAP parameter sets the mapping of ACS names to server ACS identifiers. The ACS names must also be defined to Exec using the @ACSNAM processor. With the ER interface, the ACS name definition and ACS identifier mapping are both done at the same time.

Following are the configuration items that are paired with the ACS_MAP parameter.

- ACS names set in Exec with the @ACSNAM processor

- ACS identifiers defined on the library server.

DEFAULT_LABELED_POOL, DEFAULT_UNLABELED_POOL

These parameters tell CSC which server scratch pool to use for requests that require a pool specification but do not explicitly identify which pool is to be used. Additional statements of these types with optional fields can be used to define different default pools for each ACS.

Following are the server configuration items that must be paired with the DEFAULT_LABELED_POOL and DEFAULT_UNLABELED_POOL parameters.

- Scratch pool definitions

Following are CSC configuration statements that must agree with the DEFAULT_LABELED_POOL and DEFAULT_UNLABELED_POOL parameters.

- TRANSLATE_POOL (for optional fields only)

DRIVE

The DRIVE parameters tell the mappings of Exec drive names to server drive identifiers. CSC can only control library drives that have a valid mapping. Drives without a valid mapping are considered non-library units by CSC.

Following are the Exec configuration items that must be paired with the DRIVE parameter.

- Configured tape drive names

Following are the server configuration items that must be paired with the DRIVE parameter.

- Drive identifiers

TRANSLATE_POOL

TRANSLATE_POOL parameters define how CTL pool names from Exec are mapped into server scratch pool identifiers. Since the internal label type of all volumes in a server scratch pool should be the same, the TRANSLATE_POOL includes the label type as part of its mapping. This allows one CTL pool name to translate into one server pool for labeled volumes and another pool for unlabeled volumes. It is a site administration function to ensure that all volumes in each scratch pool have the appropriate internal labels.

Following are the server configuration items that are paired with the TRANSLATE_POOL parameter.

- Scratch pool definitions

UNDEFINED_POOL

The UNDEFINED_POOL parameter tells CSC what action to take if a request contains a CTL pool name that does not have a corresponding TRANSLATE_POOL statement. The two options are "reject" the request or use the "default" pool instead. During tape unit allocation, a reject implies that a non-library drive will be used. At tape mount time, a reject setting will result in a mount failure with the status POOL_NOT_FOUND.

4. TAPE USER GUIDELINES

This chapter describes tape operation from the user's perspective. It tells what user specifications affect automated tape assignment. It also lists the most common types of assignments and the combination of specifications that will make that assignment possible.

OVERVIEW

In this document, a tape user is either a person or a program that reads or writes data on tape. In the case of a tape program, the person who prepares the ECL is also considered a tape user.

This chapter provides information on what you as a tape user must do with your tape related ECL and within your runstream to automate the handling of your tape requests. You interact with OS 2200 for all of your tape processing needs. We are going to consider and discuss tape processing in terms of the following elementary tape handling functions:

- Allocate a tape transport

- Mount a tape volume

- Read or write tape data

- Dismount a tape volume

- Deallocate a tape transport

Although several of these elementary functions are often considered together, each operates independently and will be discussed independently. For instance, the tape unit allocation and the mount evoked by a single @ASG are independent operations. Likewise the dismount and mount associated with swapping volumes in a multi-volume set are also independent.

Each tape assignment consist of unit allocation, one or more mount, read/write, dismount sequences, and tape unit deallocation. The mount, read, and write phases all make use of information specified on the @ASG statement.

ALLOCATE A TAPE TRANSPORT

A required step for the tape user is to allocate tape units. This is accomplished using the @ASG statement. Existing parameters on the @ASG statement are used to specify and control the automation aspects of tape unit allocation. There is also one run level value, the run default ACS, that also plays a role in tape unit allocation.

Following are the aspects of tape processing that you may wish to control.

- Type of volume requested (blank or specific volume)
- Type of tape equipment allocated (generic HIC, 9840, etc)
- Tape internal label type (labeled or unlabeled)
- Type of tape media (3480, eecart, etc)
- ACS association (non-ACS, ACS containing the volume, or a specific ACS)
- Server scratch pool for blank assignment

The last two items are used to control automated tape handling and the StorageTek ACS. They tell which, if any, ACS you want to use and which set of scratch tapes within that ACS you want to use.

Following are the ECL fields available for specifying user tape requirements. Details of how these fields interact with and are affected by CSC and server configuration are given in the following sections.

- J option (only usable for labeled versus unlabeled selection)

- Equipment code

- Volume id

- CTL pool

In addition to the ECL parameters, the Library Server may be involved in the process of transport allocation. Its influence is based on the ACS location of the requested volume and the type of physical volume. The server will only recommend transports in the appropriate ACS and of a type that is capable of using the physical cartridge.

J Option

When used with CSC, the J option is one of the factors used to translate your scratch tape pool needs into a form that the library control software understands. Because the server cannot distinguish labeled from unlabeled volumes, they must be placed into different scratch pools. The J option is used in conjunction with the CTL pool field on the @ASG to specify the desired server scratch pool.

Equipment Code

In addition to the standard equipment mnemonics, other values can be used in the equipment code field to request a unit in a specific ACS. These other values are ACS names defined by your site.

Volume ID

From a tape automation perspective, the primary use of the volume identifier is to distinguish blank tape assignments from specific volume assignments. For non-blank assignments, the volume is also used to determine the ACS in which to allocate a unit.

CTL Pool

The CTL pool along with the J option are used to specify the scratch pool requirements for blank assignments. When no CTL pool is specified, the site-defined default pool along with the J option determine the scratch pool.

MOUNT A TAPE VOLUME

After a tape unit is allocated, the tape user must request that a volume be mounted on that unit. The two methods for making this request are by using the @ASG statement without the N option and by using an Executive Request (ER). The TWAP$ ER specifically requests that a volume be mounted. The TINTL$ ER and REW$ function of ER IO$ will request a mount of the first volume of a multi-volume set if it is not already mounted.

Following are the user-defined aspects that affect automated mounting of a volume.

- Volume ID

- Scratch pool

To the best of its knowledge, the Library Server will not mount a tape cartridge on a transport that is incompatible. It makes this determination based on the physical volume type (helical scan, 3480, etc.) and the configured drive type. If these are not compatible, the server will reject the mount request, producing a "mount failed" message on the operator console.

Volume ID

The volume identifier or lack thereof distinguishes a request for a specific volume from one for a blank volume. For specific volume requests, a mount is requested for that volume on the previously allocated unit. For blank volume assignments, mount is requested for a blank volume from a specified or defaulted server scratch pool on the previously allocated unit.

Scratch Pool

The CTL pool along with the J option from the @ASG are used to specify the server scratch pool from which a blank volume assignment will be satisfied.

READ OR WRITE TAPE DATA

The reading and writing of tape data is not affected by tape automation. These operations are not discussed here.

DISMOUNT A TAPE VOLUME

Tape dismounts are not specifically requested in the Unisys 2200 environment. The need for a tape dismount is inferred when a volume is noticed in the unloaded position on a tape unit. The tape automation hardware and software do not "notice" unloaded tape units. They are passed an explicit dismount request from Exec when a volume should be dismounted.

In general, the tape user does not need to be concerned about dismounting tape volumes. It is a side effect of other tape operations. The REWI$ function of ER IO$ is the only explicit request to dismount a tape volume. Dismounts are internally requested as needed for several ERs and as part of processing the @FREE statement.

DEALLOCATE A TAPE TRANSPORT

When the tape user has finished using the volumes of a tape assignment, the tape unit is deallocated. The @FREE ECL statement is the means by which a tape user returns an allocated tape transport to OS 2200. For runs that end with tape units allocated, Exec generates the @FREE statements needed to release those units.

HOW TO ACCOMPLISH WHAT YOU WANT TO DO

Following is a list of the ECL parameters and system definitions that affect tape automation.

- @ASG CTL pool name

- @ASG equipment code

- @ASG J option

- @ASG volume id

- Run default ACS

- Site defined ACS naming

- Site defined query scratch setting

- Site defined scratch pool definitions

- Site defined scratch preference

This section tells what you must do to control the automation of tape processing operations. In each instance one of the parameters above is usually identified as your control point. This control plus all other ECL parameters must be considered to achieve the desired results. Conflicting settings will cause either allocation failures or volume mount failures. An example of this type of conflict would be using an ACS name for the equipment type and the value NONCTL in the CTL pool name field. This allocation will fail because there is no tape unit that is in the requested ACS and not in an automated library.

Following the elementary operation sections is a section telling how to accomplish combinations of these elements.

Do not use automated tape handling

Use one of the following methods if you want to use a tape unit that is not in an automated tape library:

- Use the value NONCTL is a CTL pool name field of the @ASG statement. Exec will then allocate a non-library unit. This is the preferred method.

- Use the value U47NL in the equipment code field of the @ASG statement. This only works if you want a 4780 tape unit that is not in an automated library.

Use site configured defaults for automated operation

If your ECL does not have an equipment code that indicates a library preference and you do not specify a CTL pool name, your assignment will be made using settings defined by your site administration. For specific volume assignments, you will be allocated an appropriate library unit if the requested tape is in a

library. Otherwise you will be allocated a non-library unit. For scratch volume assignments, the setting of the Scratch Preference site parameter determines if you are allocated a library or a non-library unit. If you are allocated a library unit, it will be in default ACS for your run.

Assign a specific volume in a specific ACS

You can use an ACS name as the equipment code of your @ASG statement to allocate a unit in a specific ACS. If you specify a volume and it is in the specified ACS, a subsequent mount of that volume can be handled automatically by the ACS hardware. If the volume is not in the specified ACS, a mount request cannot be completed without human intervention. In this case, each mount request will fail and produce a message on the operator console telling that the requested volume is not in that ACS.

Assign a blank volume in a specific ACS

There are two methods that can be used to allocate a unit in a specific ACS for a blank volume assignment.

- Use an ACS name as equipment code of your @ASG statement.

- Use the @ACSNAM processor to set your run default ACS to the desired ACS. This method works only if the site configuration setting for Scratch Preference is to use library units.

Assign a specific volume in its ACS of residence

One of the major functions of CSC is to assist Exec with allocation decisions for library tape units. Selecting a unit in the same ACS where a volume resides is the default mode of operation. If the volume is not resident in any automated tape library, a stand alone tape unit is allocated.

This default operating mode is overridden by equipment code or CTL pool name settings that specify an ACS preference. This includes equipment codes that are ACS names or values like U47L or U47NL that are significant to Exec. The CTL pool name NONCTL will also override default processing.

Another constraint to successful automated operation is that the ACS in which the requested volume resides must have an attached tape unit that is compatible with that volume. Incompatibilities of this type fail in different ways based on how CSC and Exec are interfaced. With the ER interface, a unit with your specified equipment code is allocated but the library server will not allow the mount due to the incompatibility with the physical tape. With the CARTTAPELIB$ interface, volume type information is available at allocation time and the allocation will fail because there are no compatible units.

Allocate the "right" unit but do not mount a volume

The @ASG statement with the N option causes Exec to allocate a tape unit but not mount any volume. To Exec and CSC this appears to be one of the elemental allocations mentioned above. You have to give them some hints to ensure that you get the "right" unit. Following are the methods you can use to get a tape unit with the desired attributes.

If you want …	You should …
A non-library unit	Use NONCTL as a CTL pool name
A blank volume on any unit	Use a generic equipment code and no volume identifier
a unit in the ACS where a specific volume resides	Use a generic equipment code and use the specific volume on the @ASG
a unit in a specific ACS	use an ACS name in the equipment code field of the @ASG

COMBINATIONS

The following two tables show the various options for blank and specific volume assignments. The tape unit allocations described for blank volume assignments are also applicable to N option assignments that do not specify a volume identifier.

Table 4-1. Options for Blank Volume Assignments

What tape user wants	What tape user specifies	Type of allocated unit and mounted volume
Any blank volume on any unit (use defaults)	Equipment code: generic CTL pool name: no	ACS = run default ACS Unit type = default* based on site-defined OS 2200 configuration Scratch pool = default pool configured in CSC

A blank volume from a specific scratch pool	Equipment code: generic
	
	CTL pool name: yes
		ACS =
		  (w/o QUERYSCRATCH=TRUE) run default ACS
		  (with QUERYSCRATCH=TRUE) first available
		    ACS from the server supplied list
		
		Unit type =
		  (ER STK$) OS 2200 default*
		  (CARTTAPELIB$) OS 2200 default* compatible
		    with volumes in the scratch pool
		
		Scratch pool =
		  User selected via CSC translation of the CTL pool

Any blank volume on a unit in a specific ACS	Equipment code: ACS name CTL pool name: no	ACS = as specified by user unit type = OS 2200 default* for type HIC Scratch pool = CSC supplied default pool
A blank volume from a specific scratch pool on a unit in a specific ACS	Equipment code: ACS name CTL pool name: Yes	ACS = as specified by user unit type = OS 2200 default* for type HIC Scratch pool = User selected pool
Blank assignment in specific ACS selected using the @ACSNAM processor	Equipment code: generic or specific unit type CTL pool name: optional	ACS = as specified using @ACSNAM processor unit type = OS 2200 default* for specified unit type Scratch pool = User selected pool or CSC supplied default based on presence of CTL pool field

Blank assignment on a specific unit type	Equipment code: specific unit type
	
	CTL pool name: optional
		ACS =
		  (w/o QUERYSCRATCH=TRUE) run default ACS
		  (with QUERYSCRATCH=TRUE) first available
		    ACS from the server supplied list
		
		unit type = OS 2200 default*
		
		Scratch pool = User selected pool or CSC supplied default based on presence of CTL pool field

Blank assignment on a specific unit type in a specific ACS	Equipment code: specific unit type	This is not possible because the specific unit type and the ACS name both use the equipment type ECL field.

OS 2200 has a list of specific unit types for each generic equipment code. "Default" here means the first specific equipment type from that list that exists in the selected ACS. With CARTTAPELIB$, units that are not compatible with volumes in the selected scratch pool are not considered for allocation.

Table 4-2. Options for Specific Volume Assignments

What tape user wants	What tape user specifies	Type of allocated unit and mounted volume
A specific volume	Equipment code: generic	ACS = ACS containing the requested volume. If the volume does not reside in an ACS, then a stand-alone unit is allocated. unit type = default* for the specified generic equipment type
A specific volume on a unit in a specific ACS	Equipment code: ACS name	ACS = as specified by user Unit type = OS 2200 default* for type HIC
A specific volume on a specific unit type	Equipment code: specific unit type	ACS = ACS containing the requested volume. If the volume does not reside in an ACS, then a stand-alone unit is allocated. Unit type = user-specified equipment type

* *OS 2200 has a list of specific unit types for each generic equipment code. "Default" here means the first specific equipment type from that list that exists in the selected ACS. With CARTTAPELIB$, units that are not compatible with volumes in the selected scratch pool are not considered for allocation.*

THE ACSNAM (ACS Name) PROCESSOR

ACSNAM is a processor that allows you to list your current ACS configuration and configure the run default ACS.

To list the entire ACS-name table, including the associated ACS-IDs, the current system default ACS-name, and the run default ACS-name, use the "P" option and execute ACSNAM in the following manner:

```
@ACSNAM,P
```

To change the current run default ACS-name, use the "R" option and execute ACSNAM in the following manner:

```
@ACSNAM,R acs-name
```

The following example illustrates how you might use ACSNAM to assign TAPE1 to a unit in the ACS called "LOCAL1." TAPE2 is assigned in REMOTE.

```
@RUN TAPJOB,,,,,
   .
   .
   .
@ACSNAM,R LOCAL1
@ASG,TF TAPE1.,LCART
   .
   .
   .
@ACSNAM,R REMOTE
   .
   .
   .
@ASG,TF TAPE2.,U47L
   .
   .
   .
```

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