

# **CD-ROM Premastering on iSeries**

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IBM eServer iSeries

September 2000

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## Introduction

All IBM ^ iSeries and AS/400 RISC machines have an optical device that is capable of reading a CD-ROM. This is important because CD-ROM provides a common media format on which software developers can standardize as a distribution media. Application developers no longer need to purchase, or have access to, a wide variety of tape formats for software on CD-ROM. The term *premastering* describes the assembly of the data into the “layout” that should appear on the CD-ROM in accordance with the ISO 9960 file structure (a standard established by the [International Organization of Standards](#). This is done prior to actually writing any code to the CD-ROM. (See the end of this white paper for Web references that provide further information.)

The process for creating an iSeries-installable CD-ROM can be confusing due to the many choices and formats for the final product. For instance, Objects on the CD-ROM that are to be restored as a part of the product installation, using OS/400 restore commands, must be saved as if the restore will be from a tape device. This requires a few extra steps to create the proper “tape-like” format for the CD. This process can often be an advantage to those migrating from iSeries or AS/400 tape installation methods to CD installation methods, but is confusing to those familiar with a CD installation process on other platforms. (Creating a tape-like CD-ROM format will be discussed more extensively later in this white paper.)

A mix of CD-ROM mastering methods may be used, depending on the complexity of the application. The decision for what type of format to use should be based foremost on what will produce the smoothest and most familiar install process for the users, not the creation method that is easiest for the application developer. This white paper describes several CD-ROM mastering methods and provides an example of the most common method, *Load and Run* (LODRUN).

This white paper is organized so that the reader can, first, become familiar with the basics of CD-mastering on iSeries systems. That is, the hardware and software prerequisites for CD-mastering will be learned. Then, the five methods available for creating CDs will be discussed. And, the reader will learn the importance of naming conventions when building CDs. In the last section of this white paper, helpful CD-mastering APIs will be discussed, and the reader will even get to see a step-by-step example (including code) of how to structure the mastering of a CD. There are also three helpful appendices. *Appendix A* provides some helpful definitions related to this topic. *Appendix B* contains information related to another useful process, the CDRST command source (Enable/Disable CD Mastering State). *Appendix C* provides additional Web sites that can be helpful during the first CD mastering process.

## CD Mastering Basics on iSeries

### Hardware and Software Requirements

The first consideration is rather basic. Here is the software and hardware needed to master CD-ROM for iSeries systems:

- OS/400 release V3R6M0, or later,
- iSeries or AS/400 tape drive,
- PC networked to an iSeries or AS/400 system,
- CD writer attached to the PC, and
- CD writing software installed on the PC

Once it has been determined that the required hardware and software is available to distribute software on CD-ROM, the type of data and objects that must be used to distribute the application must be decided upon.

### Data Type Options

There are two main ways to handle OS/400 data intended for CD-ROM: Save/Restore data for OS/400 or byte-stream data.

#### Save/Restore data

Save/Restore data is the result of a save command, such as *Save Object* (SAVOBJ). These commands save data to a specified save device (for example, a tape or a save file), and include a data wrapper that allows OS/400 to restore it later with the correct attributes. A corresponding restore command, such as *Restore Object* (RSTOBJ), must be used to operate on the data on a save device. It is important to note that native OS/400 object types, such as libraries and programs, *must* be saved before being transferred to the CD.

Save commands include *Save Object* (SAVOBJ), *Save Library* (SAVLIB), *Save Document Library Object* (SAVDLO), *Save Licensed Program* (SAVLICPGM), and *Save Object* (SAV). If save commands are used to prepare the data, the user must be instructed to run the proper restore commands to retrieve the data (such as: *Restore Object* (RSTOBJ), *Restore Library* (RSTLIB), *Restore Document Library Object* (RSTDLO), *Restore Object* (RST), or *Restore Licensed Program* (RSTLICPGM)). A more user-friendly method is to provide a program that performs these commands for the user.

## **Byte-stream data**

Byte-stream data is data that can be accessed or operated on via the OS/400 integrated file system (IFS) APIs. This type of data can be transferred pretty much transparently between a PC, a UNIX host, and the OS/400 IFS. Typical byte-stream data includes PC programs, multimedia files, and image data. The developer can choose to perform a save operation on this data or copy the data as-is.

## **What kind of CD do I want to build?**

As mentioned, the process used to master CD-ROMs depends on the type of data the application requires and the desired end product. The most important factor is what steps should be required of the end user to install the product from CD-ROM. The following five general methods can be used to install an application from CD-ROM on iSeries systems:

### **LODRUN method**

With this method, the user inserts the CD-ROM into the iSeries CD-ROM drive and types "LODRUN \*OPT". (The command accesses the default optical device named "OPT01." Alternate devices can be used by specifying the device name on the LODRUN command, such as "LODRUN OPT02".)

The LODRUN command restores and calls a CL program provided by the developer on the CD-ROM — this CL program must be called QINSTAPP and must be located in library QTEMP. QINSTAPP can either do the work for the install, or can restore and call other programs that have been prepared. Using the LODRUN method requires at least some of the objects (including the QINSTAPP program itself) to be saved to tape first, using APIs that create the special format for CD-ROM (described below, under "*Tips for using Tape*").

LODRUN is a good choice for several reasons. First, it is both simple and familiar to users. Second, if the software was previously distributed on iSeries or AS/400 tape, the existing CL install programs can be reused. LODRUN can be used for both licensed programs and for applications made up of a variety of OS/400 object types.

### **Restore method**

This method requires a similar process as LODRUN, except there is no need to prepare the special QINSTAPP CL program. Instead, simply provide the user with install instructions specific to the application. This can be a set of restore and copy commands, or instructions for restoring and calling a program or programs provided that perform multiple instructions. This method can be more work for the end user, as they will need to type and run several commands rather than simply typing the LODRUN command. However, it can be sufficient for applications with simple install instructions.

## Copy method

In this method, users copy files from the CD to the iSeries disk drive, rather than using restore commands. All of the objects must be stream files (or save files) that have been copied directly to the CD by the application developer. During install, some objects (such as \*PGMs) needed for the application installation must be rebuilt by the user, either by following the instructions, or by running an installation program provided by the developer. To the end user, this process is similar to the restore method in that the install instructions or a program to perform the install is provided. However, this method is easier for the application developer since there is no need to prepare the files on the CD using the special tape-like formatting needed by the restore commands. The IFS path name to the object which is of the form '/QOPT/volumename/pathname' is all that needs to be known.

## RSTLICPGM method

The *Restore Licensed Program* (RSTLICPGM) command is a special restore command used to restore licensed programs which were saved using the *Save Licensed Program* (SAVLICPGM) command. It requires more work to prepare the files than other methods, and is most commonly used by large Solution Developers (SDs). For more information about creating a licensed program, see the manual: [AS/400 Advanced Series Central Site Distribution Guide](#). (See the end of this white paper for Web references that provide further information.)

## SYSTEM BACKUP (SAVSYS) method

This method creates a system backup CD that can be used for an initial system load. A special setup must be used to create a SAVSYS tape, and then to build a "bootable" CD-ROM image. This process is not discussed in detail in this white paper, however, for more information, refer to the [AS/400 Advanced Series Central Site Distribution Guide](#), SC41-4308, to create CD-ROMs that do initial loads. (See the end of this white paper for Web references that provide further information.)

## Tips for Using Tape

As mentioned above, some iSeries CD-ROM premastering methods require the use of iSeries or AS/400 tape. Many service providers who provide CD mastering accept tape media containing OS/400 Save/Restore formatted data as input for their CD manufacturing process. Before creating an iSeries or AS/400 tape, confirm the input requirements as specified by the chosen CD-ROM manufacturer.

If available, use a tape with a capacity of 650 MB or larger. Use a tape initialized for Standard Label (NEWVOL parameter specified on INZTAP command) for best results. To keep naming conventions simple, give the tape the same Volume ID (NEWVOL parameter on the INZTAP command) that the CD-ROM will have. This volume name will be seen by the user as the second level

directory under '/QOPT' when the he or she is doing the installation — so it is helpful to select something specific to the application.

iSeries and AS/400 tapes are generally written with Tape Write Error Processing (TWERP) data. TWERP data prevents having to restart a long-running save operation. When generating the tape for a CD-ROM, the TWERP needs to be disabled using the CD-ROM premastering APIs described below, under “*CD-ROM Premastering APIs.*”

During the premastering process that uses tape, data goes through several different formats. “OS/400 Save/Restore data” is the format understood by the iSeries system. “Standard label” tape format refers to how the data is laid out on a tape. Finally, the “ISO 9660 file structure” format is the file system used in accessing a CD. Data is saved to a tape in OS/400 Save/Restore format. iSeries systems support the restore of data saved to tape in this format from either CD or tape. OS/400 Save/Restore formatted data from the standard label tape format is converted to ISO 9660 file and data structure format when placed on the CD.

NOTE: A number of [vendors](#) provide CD mastering software that specialize in migrating existing tape install programs to CD install programs. (See the end of this white paper for Web references that provide further information.)

## Keeping Track of Names

Because of the several data formats utilized in a premastering process which uses iSeries or AS/400 tape, several naming conventions must also be adhered to. Occasionally, the original object, the object on tape, and the final object placed on the CD have different names. In order to restore the saved object, each name must be tracked.

The OS/400 save and restore commands (such as *Save Library* (SAVLIB), *Save Object* (SAVOBJ), *Restore Library* (RSTLIB), and *Restore Object* (RSTOBJ)) contain a parameter called OPTFILE to support CD-ROM premastering. This parameter, which specifies an optical file name for a restore operation, begins with the root directory of the volume. (This is in addition to the LABEL and SEQNBR (sequence number) parameters, which also identify the save or restore file.) The OPTFILE parameter on a restore command defaults to the name of the library from which the object was saved. Use this parameter when the name of the object as saved on the CD is not the same as the library name from which the object was originally saved. Also, use this parameter if the object that is being saved will be placed in a subdirectory on the CD.

The OS/400 optical file system can read the ISO 9660 file structure on a CD-ROM. The files on the CD-ROM are known by pathnames which are subject to the rules of the OS/400 file systems, the file systems on the system where the premastering is accomplished (for example Windows 95/98/2000/NT), and the ISO 9660 Standard. The tape labels from the standard label tape might not

be usable as pathnames for the CD-ROM. For example, a period, ".", can appear at almost point in a tape label on iSeries or AS/400, but in ISO 9660, a period is restricted for use only as a separator between the file name element of the pathname and the file extension. In this case, the OPTFILE parameter can be used on the restore operation to indicate the renamed object.

A map of the tape label file names to the CD-ROM path/file names is used, typically for RSTLICPGM, to identify the names to be used on the OPTFILE parameter and target object names on restore operations. This map is called a distribution set map (DSETMAP) and is created using the CD-ROM premastering APIs described below, under "*CD-ROM Premastering APIs*."

A straightforward way to handle the mapping between tape and CD-ROM naming is to use the tape label as a starting point for deciding the pathname to be used on the OPTFILE parameter. This can be simple for tape labels that happen to be eight characters or shorter. For longer labels, it can be done with media replication service providers that don't use the DOS file structure (which limits the file and directory names in pathnames to eight characters or less). For example, for a software offering distributed in a single library is named "MYPRDLIB" and saved to tape with the LABEL parameter passed as \*SAVLIB, the pathname is "/MYPRDLIB".

## CD-ROM Premastering APIs

When using save and restore commands as a part of the CD-ROM premastering process, programs need to be written to invoke the OS/400 CD-ROM Premastering APIs, QlpHandleCdState(), and QlpGenCdPremasteringInfo().

The [QlpHandleCdState\(\) API](#) puts the job that invoked it into or out of CD premastering state. Any save operations performed in a job that is running in the premastering state produce output suitable for writing to a CD-ROM. While the CD premastering state is in effect, tape write error processing data is suppressed, and everything saved on the media and its size is recorded. For a system backup (SAVSYS command and the system save operation), an initial media load file suitable for initial load from CD rather than from tape is generated. (See the end of this white paper for Web references that provide further information.)

The [QlpGenCdPremasteringInfo\(\) API](#) keeps track of the CD pathnames of any RSTLICPGM-enabled software saved while the API is in effect. It also keeps track of the LICPGM menu and automatic install-enabled products saved, and lists them in a distribution set map structure that can be included on the media to support the use of LICPGM menu and automatic install procedures for these products. Information is also recorded for objects saved using SAVSYS. (See the end of this white paper for Web references that provide further information.)

## Steps to Premastering a CD

Following is an overview of the steps required to premaster a CD-ROM for iSeries software distribution:

1. Decide or understand how the user will get the software off the CD and into the system.
2. Decide or understand what pathnames will be used for the files on the install CD being created.
3. Update or create the install procedures or programs to use these pathnames on the OPTFILE parameter on the RSTOBJ, RSTLIB, RSTDLO and RST commands if these commands are used in the installation of the software.
4. Decide what to do, if anything, to minimize the media or system space occupied by the software offering (such as data compression).
5. If the process requires the use of tape media to create the CD install images, prepare the input tape media so that it is usable for the process of manufacturing CD media for the distribution and installation of the data.
  - a. Use the QlpHandleCdState() API to enable the CD-ROM mastering state.
  - b. Save the data to tape in the premastering-enabled tape production job.
  - c. Create a distribution set map file, if required, by the process being used, by invoking the QlpGenCdPremasteringInfo() API.
  - d. Take the job out of the premastering state using QlpHandleCdState() API.
  - e. Use the tape information as input for the CD-ROM mastering process. Either read the tape directly onto a system that supports CD mastering applications, or copy the objects back from the tape into OS/400 physical files — then transfer the files to such a system.
6. After transferring the premastered files to a system, such as a PC or workstation that supports a CD mastering application, generate the CD image from the data files using the CD pathnames.
7. Verify the installation of the software from a prototype CD-R written from the image.
8. Make additional CD-R copies or have CD-ROMs manufactured and distribute it to the customers with appropriate install instructions.

## LODRUN Premastering Example

Because the Load and Run Media Program ([LODRUN](#)) command is one of the most popular ways to package an application on iSeries systems, the example presented here will use this method and point out differences to the other methods where appropriate. [Complete examples](#) of other methods are available online. (See the end of this white paper for Web references that provide further information.)

The LODRUN command restores a user-written program object, called QINSTAPP, from tape or CD-ROM into the library QTEMP. The system passes the device name to the QINSTAPP program and then transfers control to the program. The program contains commands to move the rest of the data from the CD-ROM to the iSeries system or to attached clients via iSeries systems. LODRUN can be used to restore Licensed Programs as well as applications containing a variety of OS/400 object and data types. As with all CD mastering processes, the data and program storage the application needs causes the process to vary.

The following outlines the steps for a simple example showing the process to create a LODRUN-capable install image for an application containing several different OS/400 object types. If an install image needs to be created for a licensed program, see the other examples at the [CD-ROM Premastering Examples](#) Web site. For a licensed program or a large complex LODRUN-capable application install, a distribution set map will need to be created. This step occurs between part 1 and 2 in this example. (See the end of this white paper for Web references that provide further information.)

### Part 1: Creating the tape images

This step is needed for all methods except the Copy method. Any method using OS/400 save/restore-formatted data requires the use of tape.

- Initialize the tape:  
INZTAP DEV(TAP01) NEWVOL(MYVOL) NEWOWNID(MYOWNER)  
CHECK(\*NO) DENSITY(\*QIC2GB)
- Prepare the LODRUN install program. For other methods, an installation program, similar to QINSTAPP, may need to be provided, and similar steps will need to be performed here. The source for the LODRUN program for this example would look something like the following:

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```

QSYS/PGM    (&DEV)

DCL &DEV      *CHAR LEN(10)

/*****
/*   Next, delete existing product objects.           */
/*   One could check and fail if the objects already exist. Here */
/*   we assume we just want to delete them.         */
*****/
DLTLIB MYPROD
MONMSG CPF0000

RMVLNK OBJLNK('/MYPROD/*')
MONMSG CPF0000

RMDIR DIR('/PAMSPROD')
MONMSG CPF0000
/*****
/*   Now, restore the product's components           */
*****/
RSTLIB SAVLIB(MYPROD) DEV(&DEV)
MONMSG CPF0000
CRTDIR ('/MYPROD')
CPY OBJ('/QOPT/MYVOL/FILEA') +
TOOBJ('/MYPROD/FILEA')
CPY OBJ('/QOPT/MYVOL/FILEB') +
TOOBJ('/MYPROD/FILEB')
CPY OBJ('/QOPT/MYVOL/FILEC') +
TOOBJ('/MYPROD/FILEC')
CPY OBJ('/QOPT/MYVOL/FILED') +
TOOBJ('/MYPROD/FILED')

QSYS/ENDPGM

```

- Copy the QINSTAPP CL program into the QTEMP Library. (This is the required location for this special program)  
 CPY OBJ('/qsys.lib/myprod.lib/qinstapp.pgm') TODIR('/qsys.lib/qtemp.lib')
- Change the owner to QSYS. (This is required for the QINSTAPP program and is a good idea for other install programs as well)  
 CHGOBJOWN OBJ(QTEMP/QINSTAPP) OBJTYPE(\*PGM)  
 NEWOWN(QSYS)
- Turn on the CD mastering state. The [QlpHandleCdState\(\)](#) API (or the QLPCDRST program) must be called before (and after, to turn off the state) performing any save operations for objects that will be placed in their restored state on the CD-ROM. This API does several things, such as store away information about the sizes of the tape files, to be used when distribution set maps are required, and turn off tape-write error protection. (See the end of this white paper for Web references that provide further information.)

To simplify this call, this example uses a command created to call the API. The source for this command and a description of its parameters is included in Appendix B of this white paper.

```
CDRST REQSTATE(1)
```

The command defaults to REQSTATE(1) so the REQSTATE parameter is not needed here, but it is included for clarification. A distribution set map is not

needed for this simple example, so the set map name does not need to be specified here. See the RSTLICPGM example to create a set map.

- Save the objects for the application:  
First, save the QINSTAPP program using Save Object (SAVOBJ):  
SAVOBJ OBJ(QINSTAPP) LIB(QTEMP) DEV(TAP01) ENDOPT(\*LEAVE)  
DTACPR(\*NO)  
  
Next save the library:  
SAVLIB LIB(MYPROD) DEV(TAP01) DTACPR(\*NO)
- Turn off the CD mastering state. This example uses the same user-defined command explained previously:  
CDRST REQSTATE(0)

## Part 2: Copy tape files back to OS/400 files

- Create a physical file to receive the tape files  
CRTPF FILE(MYTEMP/MYFILE) RCDLEN(28672) MBR(\*NONE) TEXT('My Product Mastering File') MAXMBRS(\*NOMAX)
- Copy the files on the tape back to OS/400 into physical file members  
Get QINSTAPP: (Should be Sequence #1 because we saved it first)  
CPYFRMTAP FROMFILE(QTAPE) TOFILE(MYTEMP/MYFILE)  
FROMSEQNBR(1)  
TOMBR(QTEMP) FROMDEV(TAP01) FROMREELS(\*SL)  
FROMRCDLEN(28672)  
FROMENDOPT(\*LEAVE) MBROPT(\*REPLACE) FROMBLKLEN(28672)  
Get MYPROD Library:  
CPYFRMTAP FROMFILE(QTAPE) TOFILE(MYTEMP/MYFILE)  
FROMSEQNBR(2)  
TOMBR(MYPROD) FROMDEV(TAP01) FROMREELS(\*SL)  
FROMRCDLEN(28672) FROMENDOPT(\*LEAVE) MBROPT(\*REPLACE)  
FROMBLKLEN(28672)

## Part 3: Transfer the files to a PC

FTP the saved files to the PC in binary mode so that they become stream files. The following files need to be transferred in this example:

```
/qsys.lib/mytemp.lib/myfile.file/myprod.mbr
/qsys.lib/mytemp.lib/myfile.file/qtemp.mbr (this must be called qtemp on the CD
as well)
```

FTP the stream files.

```
/myprod/filea
/myprod/fileb
/myprod/filec
/myprod/filed
```

## Step 4: Create the CD

At this point, the files are on the PC and it is just a matter of writing them to the CD using whatever software is preferred, or, providing the images to a vendor

who prepares CDs. Remember to test CD images by attempting to install the product from a test CD before mastering multiple copies.

## Summary

Many of the basics related to CD mastering on iSeries systems should be familiar to the reader. As this paper has shown, the hardware and software requirements are straightforward. Five methods for writing CDs were reviewed showing the features, advantages and disadvantages of each. Naming conventions have been reviewed, and it was shown that they are critical to the smooth flowing process not only of building the CD (on the developer's part), but also to an effortless installation (on the part of the user). A step-by-step example of how the process of CD-mastering might flow, including code that can be referenced and imitated for the developer's own efforts, was shown. Don't forget to review the appendices included at the end of the paper to further assist in your efforts. Good luck in "mastering" the process of "CD-mastering."

## Appendix A: CD-ROM terms and definitions

**650 MB:** Nominal data capacity of CD-ROM using Mode 1 format.

**CD-ROM MODE 1:** CD-ROM has many logical formats that are allowed for the storing of data on the disc. iSeries and AS/400 discs require data to be in MODE 1, also known as Red Book, and to follow the ISO 9660 Volume and File Structure Standard.

**CD-R:** CD-Recordable is a “write-once, read-many” flavor of the CD-ROM technology. It is popular due to its low initial investment cost and the advantage it provides for one-off testing.

**image:** A common term that refers to a byte-stream of the contiguous sectors of the whole CD-ROM. An image is the output of the premastering process.

**ISO 9660:** The Volume and File structure standard that nearly all CD-ROMs are made with to allow interchange at the volume and file level. The OS/400 QOPT file system is implemented to the ISO 9660 standard. For more information on the International Organization of Standards, visit: <http://www.iso.ch/> .

**one-off:** A test CD-ROM of which there is only one copy. One-offs are typically produced via CD-R.

**premastering:** The assembly of the data into the layout in which it should appear on the CD-ROM, in accordance with the file structure (ISO 9660). This is done in preparation for writing a CD-R, or as a precedent to the mastering process of CD-ROM manufacturing.

**stamper** or **stamping:** A common term that refers to the CD-ROM manufacturing process. This term is inherited from the phonograph record industry, CD-ROM manufacturing, though, is actually an injection mold process.

## Appendix B: CDRST (enable/Disable CD Mastering State) Command

Developers have the choice of using the command line call or they can write their own program.

If the choice is made to “write your own,” the Enable/Disable CD Mastering State (CDRST) command which calls the QLPCDRST program to handle the CD-ROM premastering state should be used. This process is actually similar in manner to the QlpHandleCdState API.

The QLPCDRST program turns the Premastering state on and off. This command is intended as a simplification of the API or program call. See the [QlpHandleCdState\(\) API](#) and [QlpGenCdPremasteringInfo\(\) API](#) documentation for more detailed descriptions of these parameters. (See the end of this white paper for Web references that provide further information.) Alternatively, the program can be called from the command line similar to the following:

```
CALL PGM(QLPCDRST)
  PARM('          ' 'x'00000000' 'x'00000001'
        'CD 'x'00000000' x'00000000')
```

Notes:

- 1) The parameters have to be filled out to their proper lengths
- 2) The Setmap ID parameter has to be capitalized
- 3) The numbers are in bin4 so they have to have 8 characters

```
/****** START OF SPECIFICATION******/
/* CDRST: THIS COMMAND IS INTENDED TO BE USED WITH THE */
/* PROGRAM QLPCDRST for CD-ROM Premastering */
/* */
/* There are three parameters you can input to this command: */
/* REQSTATE: Requested CD-ROM Premastering State */
/* SETMAPID: Distribution Set Map ID Name */
/* OPTION: Create new CD-ROM information, or add to existing */
/* */
/* To Build this command in library "MYLIB": */
/* Put the source in a member called CDRST in file QCMDSRC in */
/* library MYLIB and perform the following command: */
/* CRTCMD CMD(MYLIB/CDRST) PGM(QSYS/QLPCDRST) */
/* SRCFILE(MYLIB/QCMDSRC) TEXT(*CMDPMT) */
/* PMTFILE(QCPFPMT) AUT(*EXCLUDE) */
/* */
/*******/
```

```
CMD PROMPT('CD Mastering State ON/OFF')
```

```
/* The user space that can receive a list of tape files and the */
/* library in which it is located. Because in our examples we */
/* don't request output information, we always pass blanks */
/* */
PARM KWD(USRSPC) +
      TYPE(*CHAR) +
      LEN(20) +
```

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```

CONSTANT('          ')

/* The format name is always blank for our examples because we */
/* are not asking for information to be returned.                */
PARM KWD(FORMAT) +
    TYPE(*CHAR) +
    LEN(8) +
    CONSTANT('          ')

/* The current CD-ROM premastering state is passed as 0, because*/
/* we are not requesting the current state to be returned      */
PARM KWD(CURSTATE) +
    TYPE(*INT4) +
    CONSTANT(0)

/* The distribution set map identifier is blank because we are */
/* not requesting this information to be returned in out       */
/* examples                                                    */

PARM KWD(SETMAPO) +
    TYPE(*CHAR) +
    LEN(10) +
    CONSTANT('          ')

/* The CD-ROM premastering state being requested                */
/* 0 = disable, save tape file information                       */
/* 1 = enable                                                    */
/* 2 = disable and destroy or clear tape file information      */
PARM KWD(REQSTATE) +
    TYPE(*INT4) +
    RSTD(*NO) +
    DFT(1) +
    RANGE(0 2) +
    PROMPT('Req State 0=OFF 1=ON 2=OFF/CLR')

/* Distribution set map identifier input                          */
PARM KWD(SETMAPID) +
    TYPE(*CHAR) +
    LEN(10) +
    DFT('          ') +
    PROMPT('DISTRIBUTION SET MAP ID')

/* When setting the state to 1 (on), specifies whether to     */
/* create new set map information or to continue and add      */
/* information to an existing set map                          */
/* 0 = add                                                      */
/* 1 = new                                                       */
PARM KWD(OPTION) +
    TYPE(*INT4) +
    RSTD(*NO) +
    DFT(0) +
    RANGE(0 1) +
    PROMPT('OPTION')

/* Error code structure for the program, not used for our     */
/* command                                                       */
PARM KWD(ERROR) +
    TYPE(*INT4) +

```

CONSTANT ( 0 )

## Appendix C: References

### **Web sites: Vendors offering CD-ROM mastering solutions:**

- [www.as400.ibm.com/developer/factory/solution.html#Installation](http://www.as400.ibm.com/developer/factory/solution.html#Installation)
- Additional CD-ROM and optical information:  
[www.as400.ibm.com/optical/](http://www.as400.ibm.com/optical/)
- Additional CD-ROM Premastering Examples:  
[www.as400.ibm.com/optical/cdrom/cddist.htm#Section\\_5.1.7](http://www.as400.ibm.com/optical/cdrom/cddist.htm#Section_5.1.7)

### **OS/400 Online Information:**

- **AS/400 Advanced Series Central Site Distribution Guide**  
[publib.boulder.ibm.com:80/cgi-bin/bookmgr/bookmgr.cmd/BOOKS/QB3ALI01/CCONTENTS](http://publib.boulder.ibm.com:80/cgi-bin/bookmgr/bookmgr.cmd/BOOKS/QB3ALI01/CCONTENTS)
- **OS/400 Software Product APIs**  
[publib.boulder.ibm.com/pubs/html/as400/v4r5/ic2924/info/apis/sw1.htm](http://publib.boulder.ibm.com/pubs/html/as400/v4r5/ic2924/info/apis/sw1.htm)
- **Optical Support, SC41-5310**  
[publib.boulder.ibm.com:80/cgi-bin/bookmgr/BOOKS/QB3AL801/CCONTENTS](http://publib.boulder.ibm.com:80/cgi-bin/bookmgr/BOOKS/QB3AL801/CCONTENTS)
- **Software Installation, SC41-4120**  
[publib.boulder.ibm.com:80/cgi-bin/bookmgr/BOOKS/QB3AWG04/CCONTENTS](http://publib.boulder.ibm.com:80/cgi-bin/bookmgr/BOOKS/QB3AWG04/CCONTENTS)

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<http://www.ibm.com/eserver/series/developer/porting/>