



Tracker for IBM i  
Operations Guide



**Dynamic Solutions**  
INTERNATIONAL

Version 2 Release 5 Modification 0  
Dynamic Solutions International  
Highlands Ranch, Colorado

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Tracker for IBM I – User Guide

Version 2 Release 5 Modification 0

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## Preface

IBM i customers using IBM's integrated backup and restore capabilities, either directly or thru vendor-provided software, generally are responsible for managing their critical backup data and media via manual methods or custom-built, manually managed mechanisms.

Tracker was developed specifically for physical- and/or virtual-library usage for non-managed-media environments. It provides all the capabilities required to manage recovery and/or archival data and media. Tracker does not replace your existing IBM i backup operations but works along with IBM-based save processes to provide an effective solution for comprehensive media management.

This solution includes media categorization, media expiration/retention and media movement capabilities as well as the optional ability to track/search media content and perform simple restorations of library, object, member, DLO and/or IFS data, right from the Tracker interface.

When combined with DSI's Conductor product and a DSI virtual library, the two applications can work together to completely automate all virtual media and data management requirements, including:

- Automated Virtual Inventory management
  - Create new virtual inventory automatically when needed, based on simple configurations.
  - Re-create missing virtual tapes.
  - Error correction – automatically corrects synchronization issues between the library and the Tracker media manager.
- Automated, Schedulable Policy-Drive Media Duplication
  - \*ARCHIVE – export virtual tapes to physical via a VTL-attached library device.
  - \*STACK – consolidate small tapes onto physical media via a VTL-attached library device.
  - \*DUPLICATE – DUPTAP to either a library device or a stand-alone tape drive, where the device is IBM-attached (device configured).
- Media movement – move virtual tapes to and from the vault automatically, securing live volumes away from the IBM host; manage movement activities for physical media.

Managing the preservation and security of retention media is a simple task using DSI's Tracker for IBM i.

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## Product Introduction

Tracker for IBM i provides comprehensive media management and optionally, data restoration capabilities for your existing physical library/media and/or your new virtual library and its virtual media.

Tracker is ideal for the following scenarios:

1. GO SAVE options are used to back up the system.
2. Custom software is used to backup systems.
3. Vendor-supplied software is used to perform data backups.
4. Combinations of vendor-supplied and IBM system backups are executed.

Tracker provides the following capabilities using simple, rule-based configurations:

**Media Usage/Expiration/Categorization Management:** Based on user-defined media categories and rules, save media will automatically be managed with respect to usage and retention. Upon tape expiration, the return of retained media to scratch media pools is automated, saving the operator the steps required to reclassify virtual media manually as it expires or to employ manual virtual media location management that may be required otherwise. Virtual media is automatically re-initialized at expiration, ensuring the virtual device is not wasting a byte of space on non-relevant data.

**Virtual/Physical Media Movement:** Where data security strategies involve moving virtual media in and out of the “virtual vault” or managing storage of physical media, Tracker is ready. Simple rule-based movement activities can be managed automatically by Tracker and are easily implemented by the Admin. Virtual media movement is fully automated when Tracker is integrated with Conductor.

**Media Content Management and Object Restoration Capabilities:** Customers can choose to retain IBM SAV\* command output information into the Tracker databases/files; using this data, Tracker provides both powerful media content search capabilities as well as restoration capabilities enabled within the application. Media containing libraries, objects, members (where applicable), DLO folders/documents and IFS directories/objects can all be located and restored quickly directly from the Tracker user interfaces.

**Media Operations:** Create, move, and delete media on your VTL device directly from Tracker when matched with DSI’s **Conductor** software. Conductor can fully automate your media operations, from creating media on-demand as needed to moving virtual media to correcting human errors that might cause Tracker/Library synchronization issues – and possibly backup failures!

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## System Requirements

### Hardware Requirements

- An IBM PowerX or other compatible server/partition running IBM i version V7R1M0 or higher.
- One or more IBM-compatible DSI Virtual Tape Library Devices (optional)
  - Build 9310 or higher
  - Virtual Libraries of type TS3500\* emulation (L22, L32)
- A compatible physical media library (optional)
  - DSI's **Conductor** product required for physical tape management.
  - Host-attached, VTL-attached, or both are allowed.
- A host-attached physical drive (optional) for duplications to stand-alone drives.

### Software Requirements

- VTL Tracker
- VTL Conductor (optional; enables automated virtual media creation/movement, policy-driven media duplication and host-enabled management of the virtual appliance)
- VTL Agent V2.03.010 or higher (VTL-Agent runs on the DSI VTL Server).

### Licensing Requirements

- Tracker is licensed using \*KEYED, \*REGISTERED licenses; licensing is required to utilize the software. No grace periods are provided, and licenses are term limited.
- For integration with Conductor, a Conductor \*BASE license is required.



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## 1. IBM i5 SAV\* Command Integration Considerations

### 1.1 Planning for Tracker

IBM i5 provides a tape categorization capability. IBM provides a variety of default tape categories (e.g. \*NOSHARE, \*SHARE400, \*IPL, etc.) that can be used to create one or more pools of media. User-defined categories can be created to categorize tapes that contain live data. Tape categorization prevents the media library from loading these tapes for output operations until they have been reclassified into a scratch category.

Depending on the data security plan in place, an installation may require one or more user-defined categories to which media can be assigned upon usage. These user-defined categories allow Tracker to identify and apply varying retention/move requirements for various media usages and provide an important qualifier for **Conductor** automated policy definitions.

Assume “Mike’s Pharmacy” runs the following backups with the indicated retention requirements:

<u>Backup Type</u>	<u>Retention</u>
SAVSYS (every time the system/config changes):	6 months
Daily backups of *NONSYS, DLO, IFS:	65 days
Monthly backups of *NONSYS, DLO, IFS:	1 year

This simple plan would require the creation of three user-defined media categories (“retention categories”); one might select “SYSTEM”, “DAILY” and “MONTHLY” as names for the new categories. If these virtual media are to be exported to physical tape via **Conductor** automation, an additional set of categories named “SYSTEMP”, “DAILYP” and “MONTHLYP” might be created to discriminate between virtual and physical media usage/requirements.

Once defined, category rules can then be created in Tracker that identify how to manage newly written media assigned into these categories.

Before beginning the software configuration process, the retention media categories required to support the data security strategy should be considered and created. Categories can be reviewed and created using IBM commands or via the Tracker user interface.

### 1.2 Media Content Management Considerations

IBM SAV\* commands provide the opportunity to export media save data to either streaming files (IFS/SAV command) or to database tables (all others). Tracker for IBM i takes advantage of this

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capability in order to allow for powerful media content search options as well as to provide internal restoration capabilities.

If having access to media content information and the ability to perform restorations directly from the Tracker interface offers value to the customer, it is recommended the SAV\* commands in use be adapted as indicated below. An example save CL program is provided in the appendix.

**SAV** (Integrated File System saves): use the \*OUTPUT parameter to specify the following file path to which to write media content data: “/dsi/tracker/INF\_IFS”.

**SAVDLO** (Save Document Library Objects): Use the \*OUTPUT parameter with the \*OUTFILE option, specifying to \*ADD data to table “DSISYS/QAOJSVOD”.

**All other SAV\* commands:** Use the \*OUTPUT option parameter with the \*OUTFILE option, specifying to \*ADD data to table “DSISYS/QASAVOBJD”. Where applicable, use the “type of output information” (INFTYPE parameter) to designate which level of save data is retained (\*LIB, \*OBJ, \*MBR). Use of the \*ERR option is not recommended.

## 1.3 Integrating IBM SAV\* activities with Tracker

One of the following methods may satisfy the requirement for Tracker integration to your IBM SAV\* or vendor-provided backup activities:

**GETEXPVOL/GETEXPVOLP usage:** GETEXPVOL/GETEXPVOLP are APIs provided with Tracker to allow for the retrieval of an expired volume serial number as well as the re-categorization of the selected volume. The selected volume can be categorized according to Tracker schedules (see below) or the desired category into which to assign the volume may be provided via the caller. These APIs are intended for integration with existing backup software and/or CLPs to automate media selection and categorization for backup activities. See section 7 – **Tracker APIs and Commands** for more information. See section 8.2.2 **GETEXPVOL Usage** for an implementation example; see section 8.2.3 **GETEXPVOLP Usage** for an implementation example.

**SETTAPCGY usage:** This IBM command can be used to configure the virtual library device to automatically load scratch volumes as requested from a backup command when the command is using the \*MOUNTED option for the volume serial parameter. It may be used to both identify the scratch pool from which to source media and the target retention category to which the save media should be assigned. SAV\* commands should then reference the keyword “\*MOUNTED” on the volume parameter to automatically load volumes from the desired scratch category.

The IBM SETTAPCGY command may be executed from the command line or may be embedded into your customer backup software code. See the IBM Command Reference applicable to your version of i5 for more information.

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Be sure to use the \*DEMOUNTED option of the SETTAPCGY command when your backups are complete or in-between saves to different volumes where the volumes have different retention requirements. If you fail to do this, the daily post-save STRMNTDSI command will demount any mounted categories. See the commands section for information on daily STRMNTDSI usage.

Alternatively, Tracker provides a command called **SETCGYDSI** that provides calendar-like ability to automate which retention categories are to be used on specific dates and assign those categories to selected media automatically. For more information on the automated use of the IBM SETTAPCGY command via the DSI SETCGYDSI command, see section **3.6 - Managing Media Category Rules**.

**Note:** *Both IBM's SETTAPCGY and DSI's SETCGYDSI methods support individual, single-drive backups. If multiple drives will be utilized via a media definition or if multiple backups will run to the same library device simultaneously, the GETEXPVOL/GETEXPVOLP APIs should be utilized to select volumes for output operations.*

## 1.4 Tracker in High-Availability or DR Scenarios

Tracker can manage media needs for production and its backing HA/DR servers, when applicable. Follow the recommendations below to ensure seamless transitions between host servers in HA/DR scenarios.

1. Ensure each distinct virtual or physical library in use on any server uses a unique device ID. This ensures media from different systems cannot be mixed. For example:
  - a. PROD = TAPMLB01
  - b. HA = TAPMLB01 (if using the same virtual library as PROD) or TAPMLB02 (if not using the same virtual library as PROD)
  - c. DR = TAPMLB03 (presumes a different virtual device than used by PROD and/or HA).
2. Enable/disable libraries in Tracker option 1 as necessary when moving between servers.
3. When integrated with Conductor, Conductor will auto-detect a host change and automatically enable the correct relationships to execute for the host, when properly configured. See the Conductor documentation for information on "LPAR/Library Relationship Serialization".

## 2. Tracker Software Installation

Please see the document “**DSI Conductor V2R1.pdf**” for software installation or upgrade instructions.

Tracker may be licensed for stand-alone usage. Adding a Conductor license enables the admin to integrate the media management automation capabilities of Conductor with the Tracker software.

## 3. Configuring the Tracker for IBM i Software

Once Tracker is installed/licensed and your required “retention categories” have been identified for your virtual (and optionally, physical) media, Tracker is ready to be configured. Follow the steps in the order presented to initialize your environment. If Conductor has also been installed, complete the Tracker configuration before beginning the Conductor configuration.

### 3.1 The Tracker Main Menu

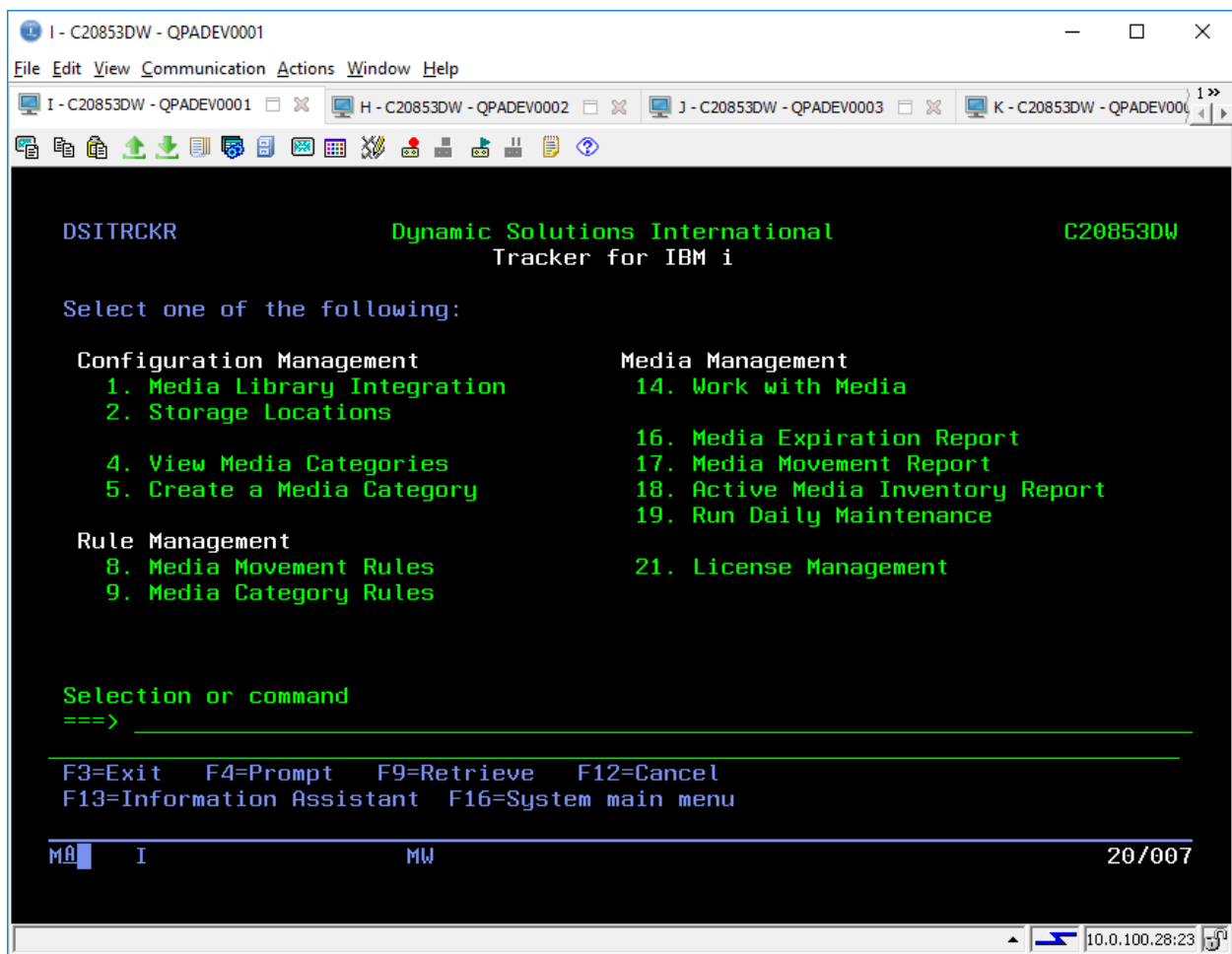


Figure 1: The Tracker Main Menu

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The VTL Tracker System Management Menu consists of three application groups:

1. **Configuration Management:** Identify the virtual/physical library or libraries to integrate; define media storage locations; view and add new media categories (“scratch” and/or “retention categories”).
2. **Rule Management:** Create/maintain media movement and category retention rules for defined “retention categories”.
3. **Media Management:** Provides access to virtual and physical media information and status, including media searches and restoration capabilities; on-demand media expiration, movement and inventory reporting; and on-demand daily media maintenance activities.

### 3.2 Integrating Virtual and Physical Libraries with Tracker

Tracker needs to know which libraries are to be managed. These can be virtual and/or physical libraries. Each library device known to the IBM host will be presented in the image shown below, presented upon selection of the “Media Library Integration” option from the main menu. The user can choose to enable libraries as physical or virtual devices by using the appropriate option.

In the image shown below, library TAPMLB04 is to be enabled within Tracker as a virtual library:

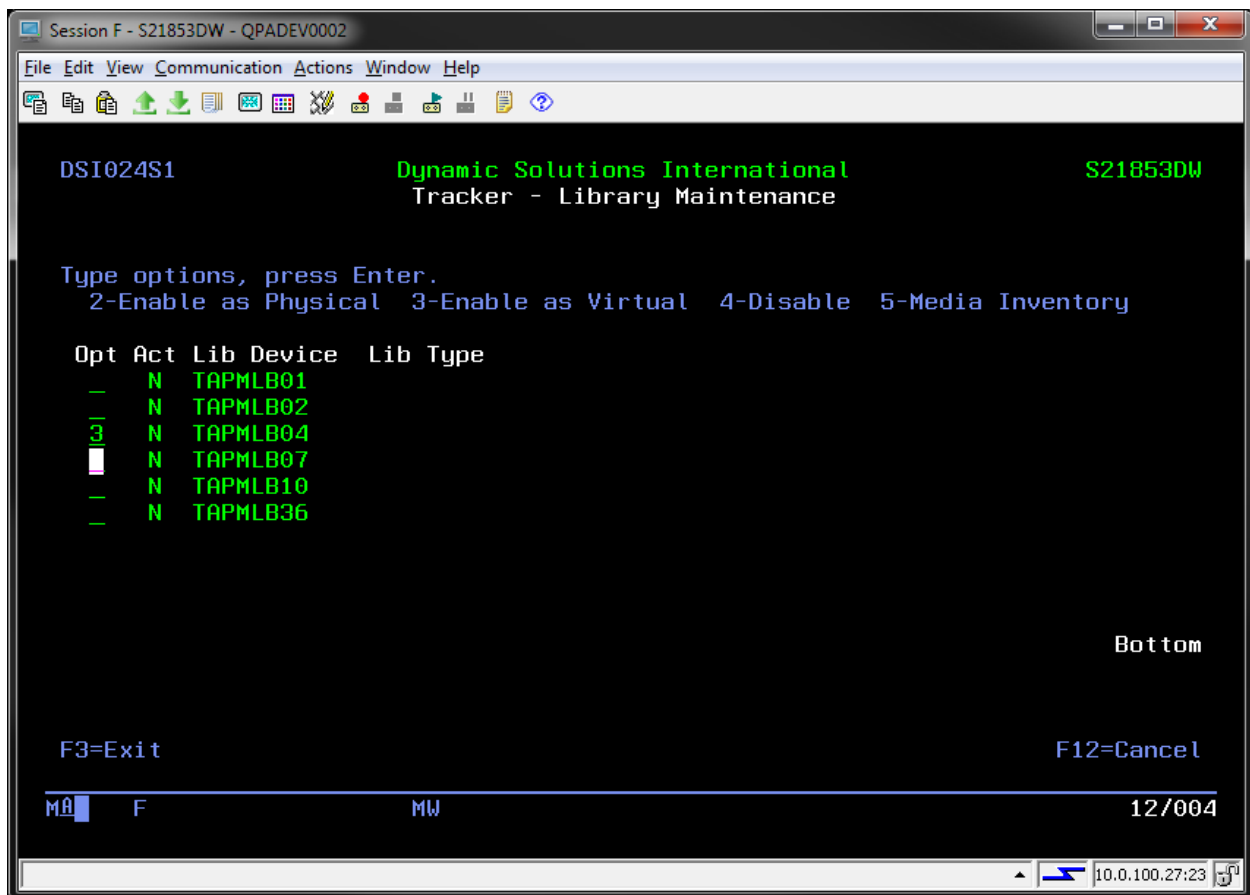


Figure 2: Integrating Library Devices

Once the Enter key has been pressed and the selection processed, the display will change to indicate that the library has been integrated as a virtual library, as shown in the following image:

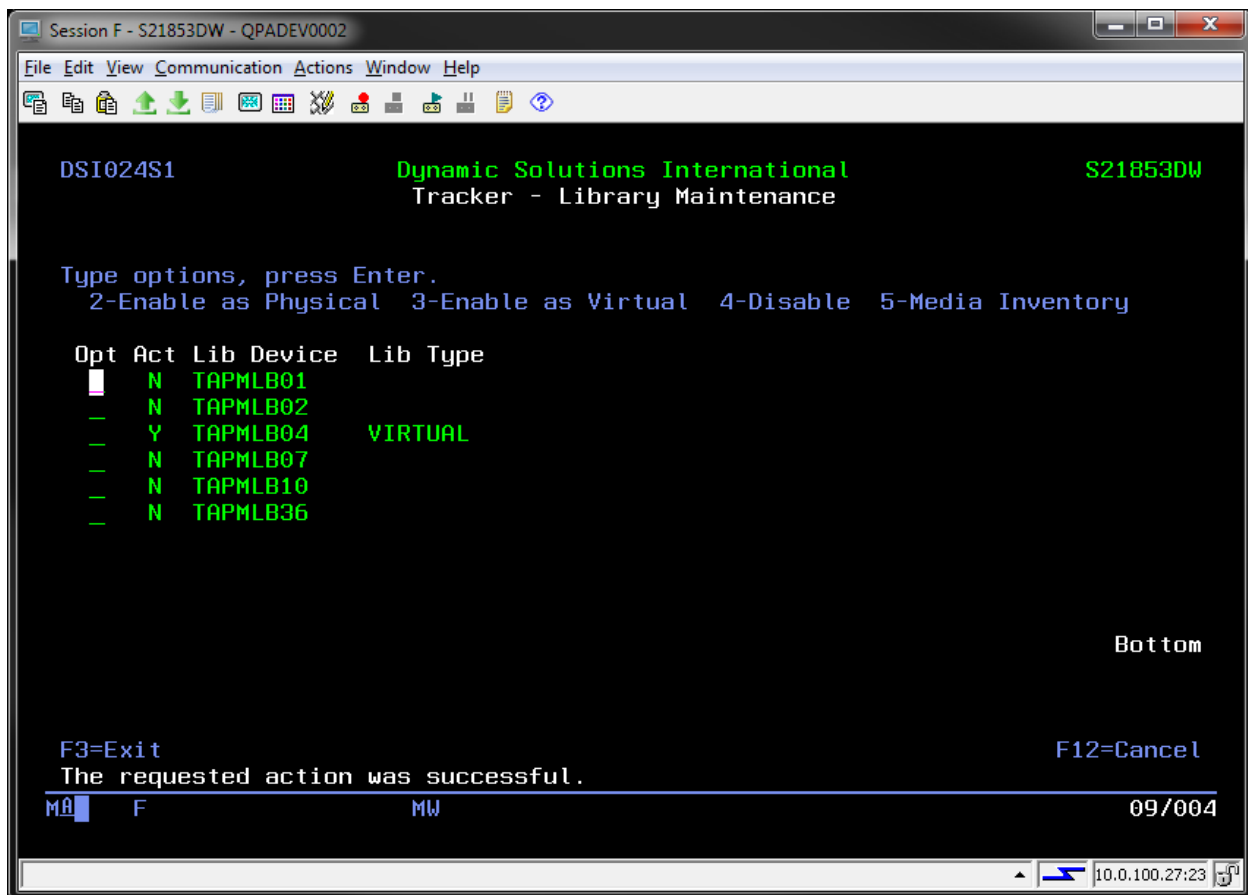


Figure 3: Enabling a Virtual Library

Once the library or libraries to be managed by Tracker have been integrated, automated activities for a library can be suspended/re-enabled by using the 2/3-Enable and 4-Disable options.

### 3.3 Defining Media Storage Locations

In the virtual world, the concept of the virtual vault exists to support both automated device duplication capabilities as well as provide a secure location for live virtual media.

When taking advantage of the security of the virtual vault location or when supporting automated exports to physical tape via the VTL software, virtual tapes will need to be moved to the virtual vault.

Tracker comes with the VAULT location predefined, as shown below; this locations can be used in movement rules (see the “Maintaining Media Movement Rules” section below) to alert the Admin when a tape should be moved into the Virtual Vault and later, when that tape should return to the virtual library.

Note the “Offsite” location has been manually added to represent a physical media offsite location.

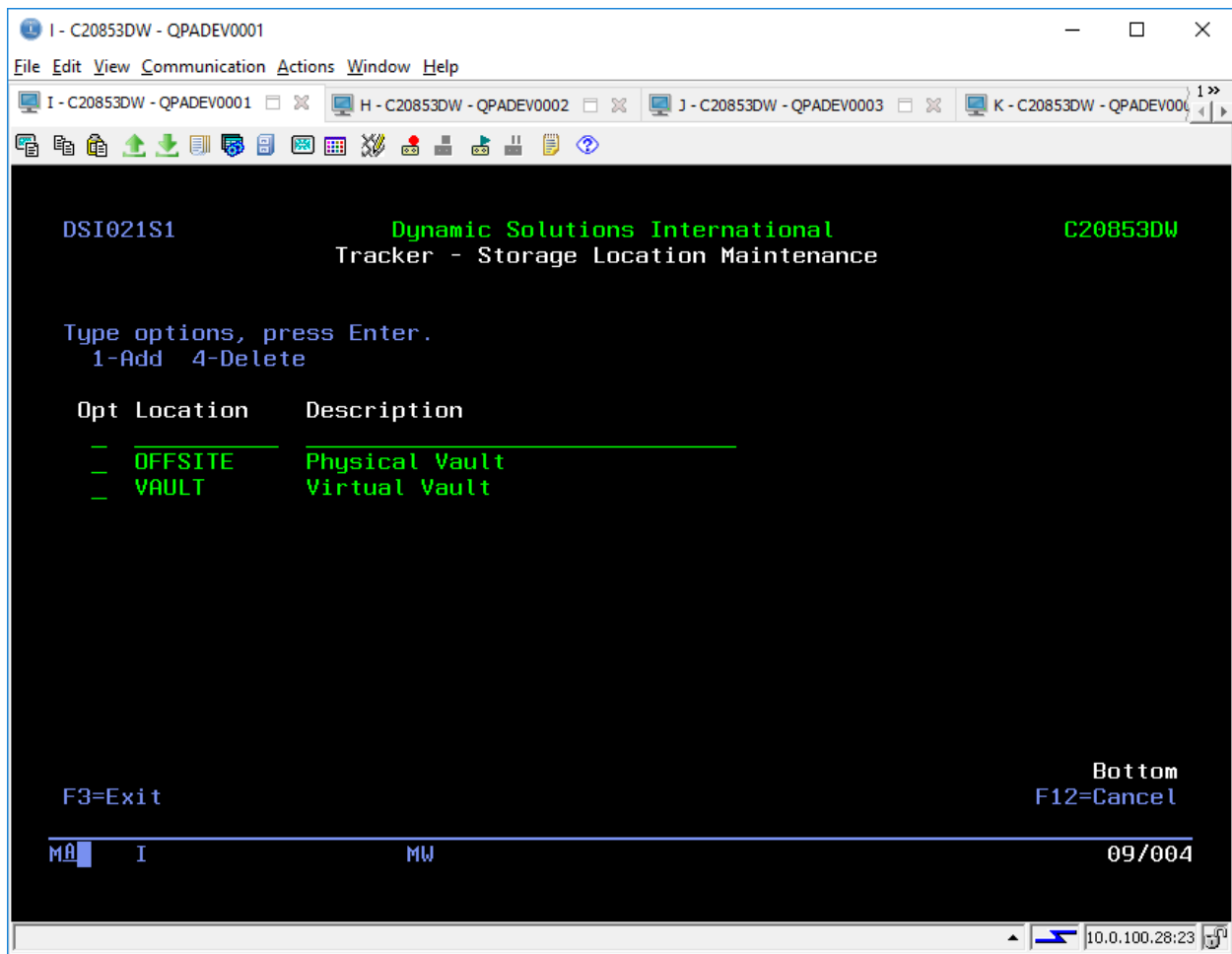


Figure 4: Storage Location Maintenance

The “VAULT” location is the only alternate location required for virtual media. When Tracker is combined with **Conductor** and where exporting virtual media to physical media, one or more physical media locations representing potential media storage locations should be created. Do not use virtual locations in physical move rules; do not use physical locations in virtual movement rules.

For example, an OFFSITE location might represent storage at an offsite facility; RACK1 may indicate a media storage rack with identifier “1”.

Create physical media locations as indicated in the image shown below, in which “OFFSITE” is being created:



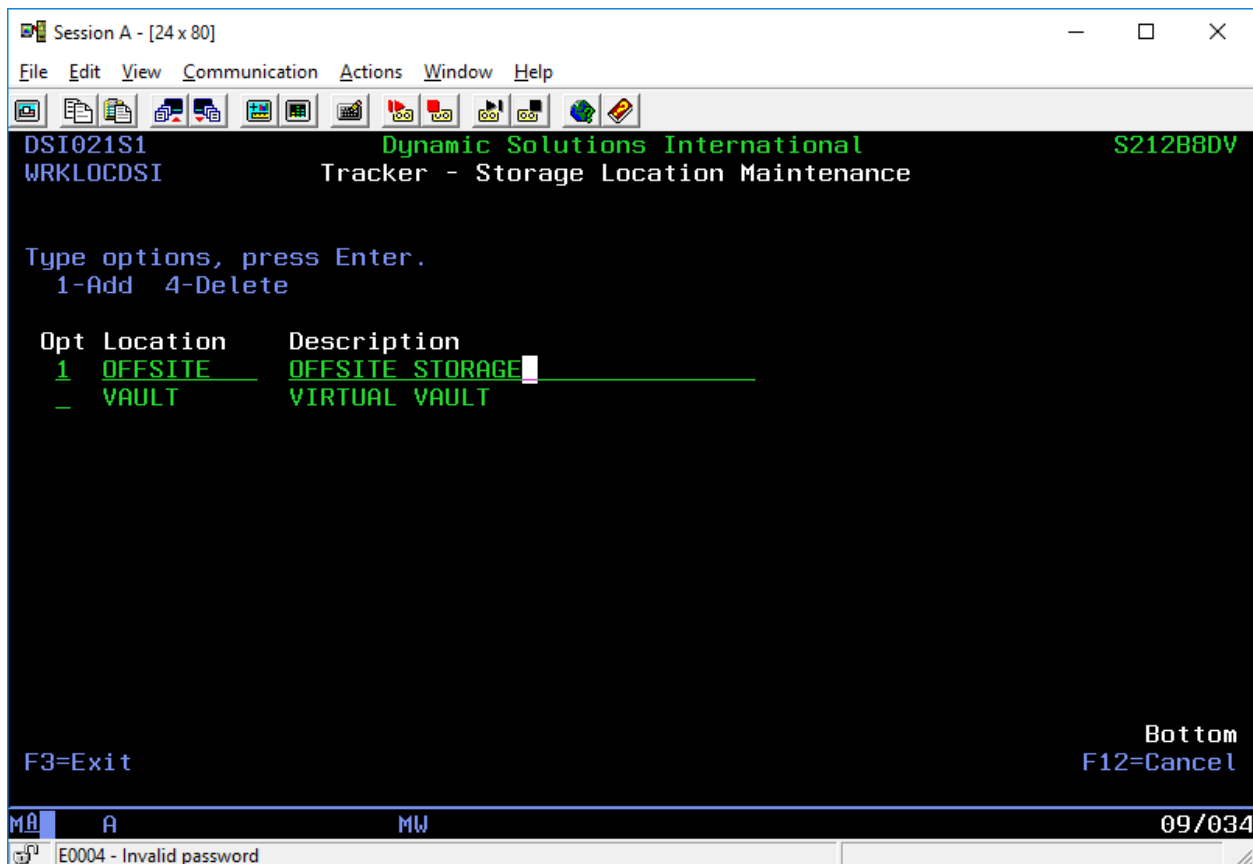


Figure 5: Creating a Storage Location

Upon pressing ENTER, the location will be added to the Tracker database.

Use option 4-Delete to delete a storage location. Locations cannot be deleted if media are currently assigned to the location and/or if the location is associated with a move rule.

**Note:** Device names will be considered locations by default for media belonging to those devices. They do not need to be added to the location database.

### 3.4 Viewing/Adding Media Categories

Viewing and adding Media Categories are IBM functions you can call directly from the command line (WRKTAPCGY/ADDTAPCGY) or that can be accessed from the Tracker main menu.

Using option **4-View Media Categories** presents the IBM command for the action. In the image below, the system-defined categories (\*) and two user-defined “retain” categories (VRTRETAIN, PHYRETAIN) are available to be assigned to media:

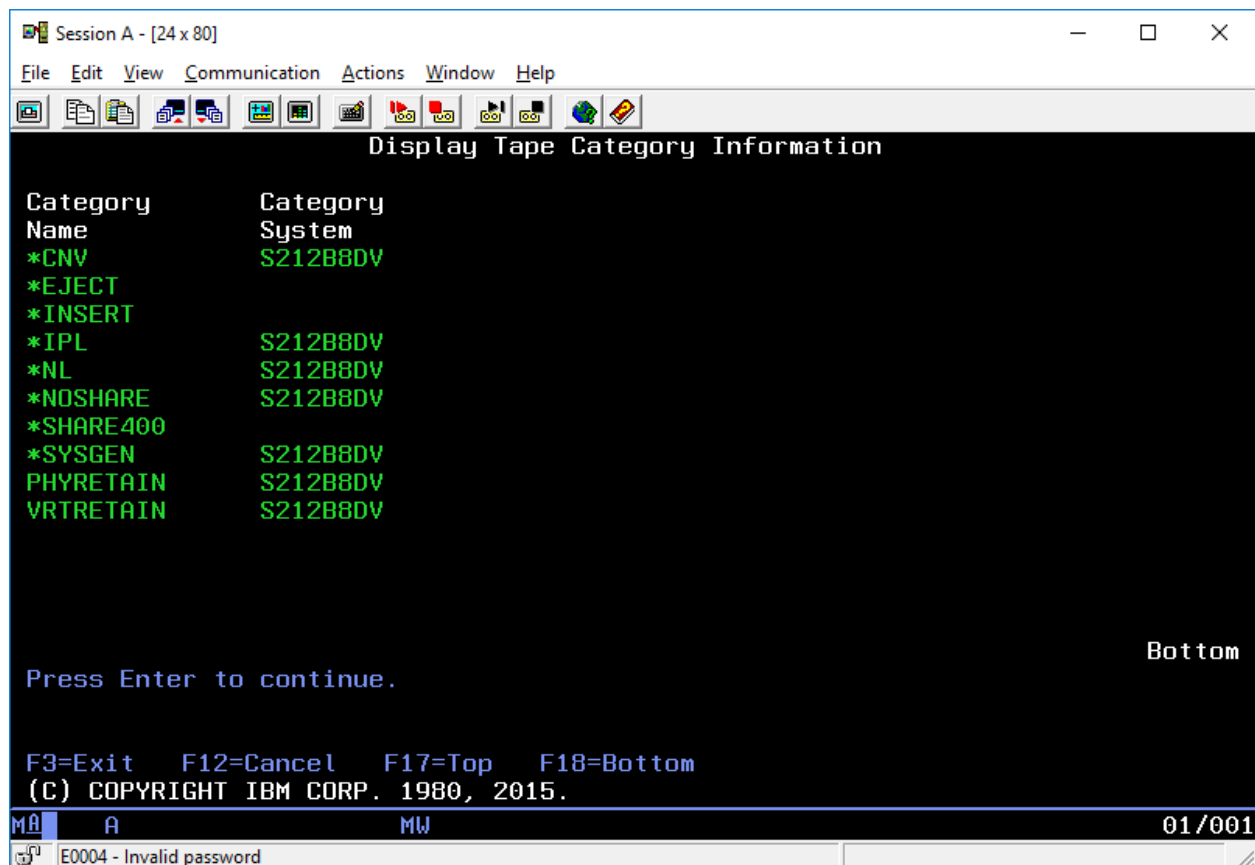


Figure 6: View Media Categories

To create a new “retention category” for use by Tracker, use option **5-Create a Media Category** to present the following panel. In this example a new category called “NEWCGY” is being created for the \*CURRENT system (categories can only be created on the \*CURRENT system):

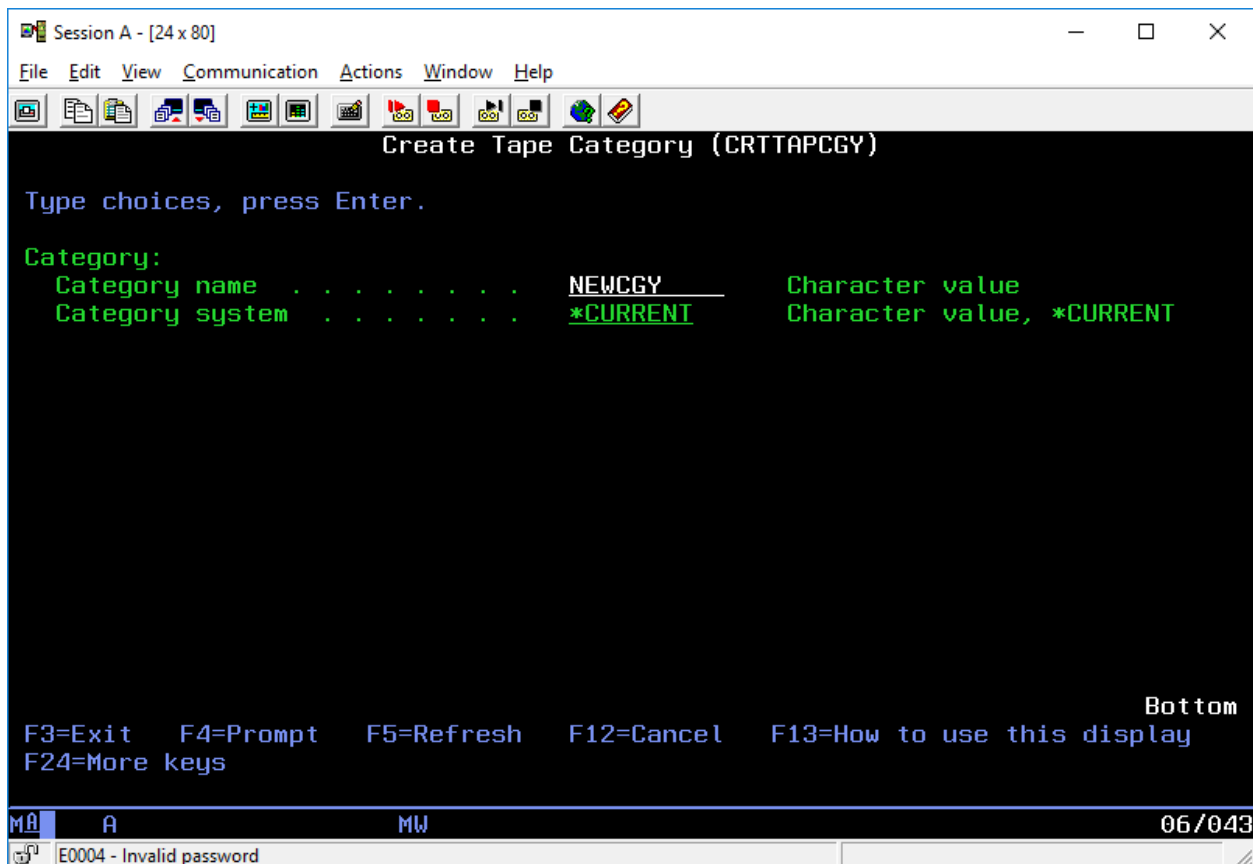


Figure 7: Creating a new Media Category

### 3.5 Managing Media Movement Rules

Media movement rules define the destination locations and durations for both virtual and physical media.

Virtual media movement generally consists of a move to the virtual vault after a save and/or duplication activity has completed, with a return to the library location just before media expiration.

Physical media movement may model moves thru one or more storage locations, eventually back into the physical library.

To manage media movement rules, use option 8 from the main menu. The following panel appears, with values provided for a move rule named "VIRTUAL" to be created:

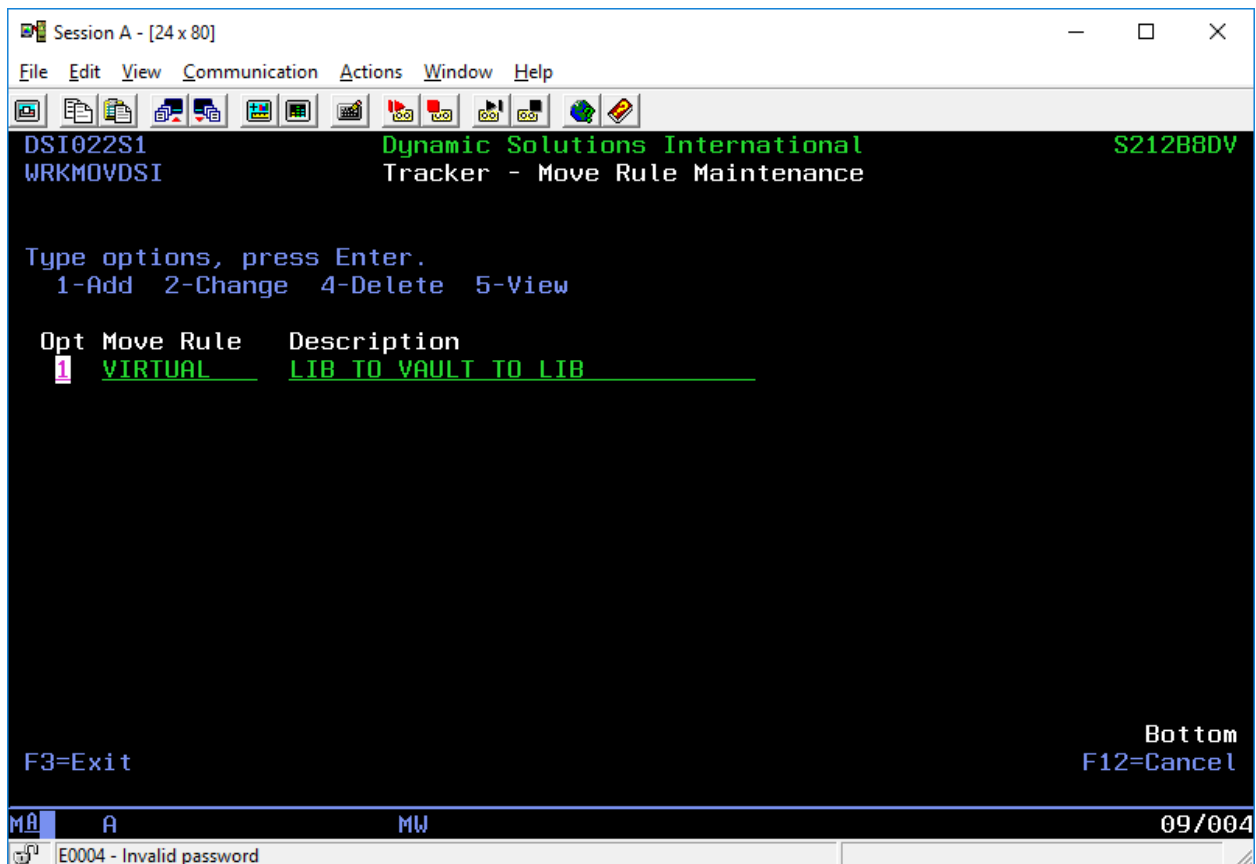


Figure 8: Creating a new Move Rule

Use Option 1 (as shown) to create a new move rule.

Use Option 2 to alter an existing move rule.

Use Option 4 to delete an existing move rule. Move rules must be removed from Category Rules before they can be deleted (see "Managing Category Rules" below).

Use Option 5 to review the selected move rule(s).

Upon pressing Enter on the above panel, the image below is presented (our first entry is keyed and ready for processing:

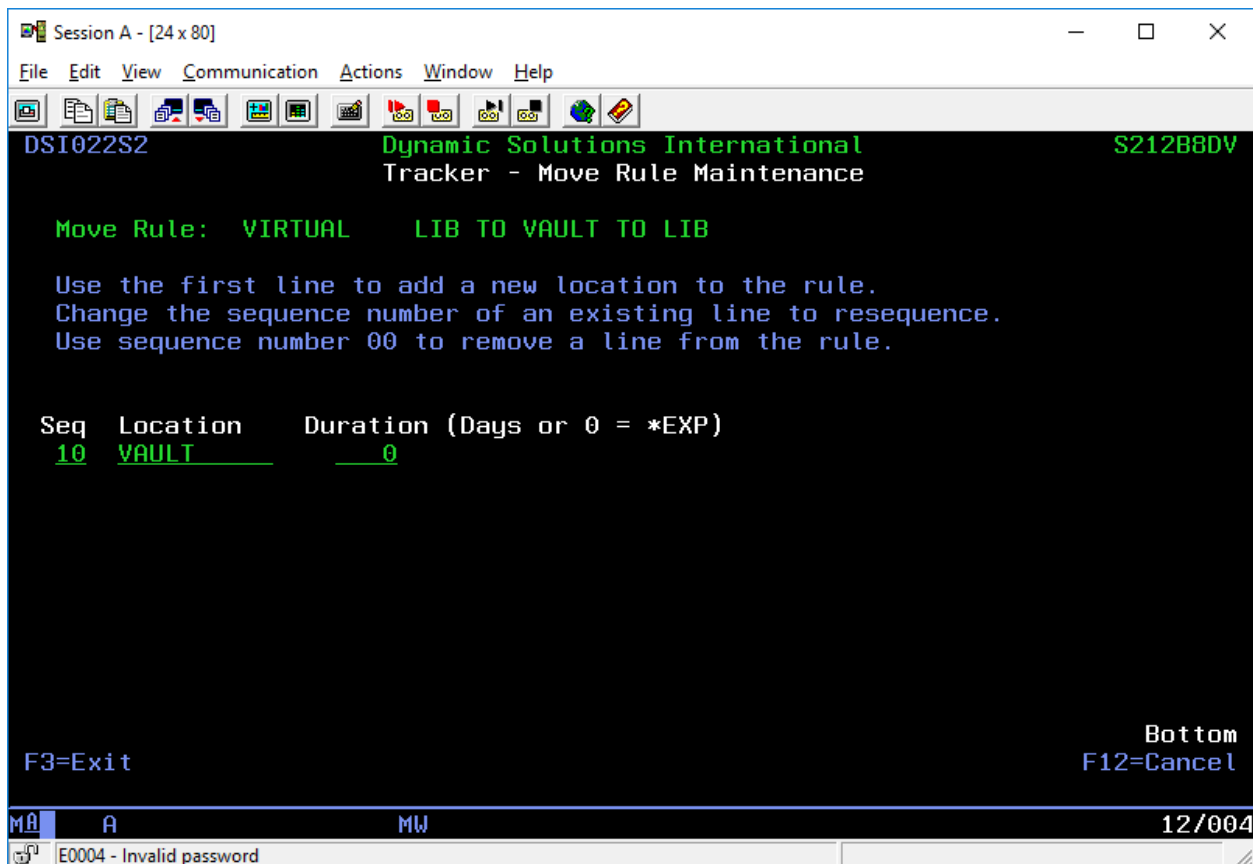


Figure 9: Defining Move Rules

In the image above, this rule for virtual media indicates newly used media should move into the virtual vault and remain there until the media expires. At expiration time, the daily maintenance job will produce a report of virtual and physical tapes that require movement (see the Appendix for report examples).

**Note:** When using the '0' option to indicate the tape should move at expiration time, the Tracker software will configure the move for the day prior to media expiration. This ensures the media can be initialized upon expiration.

Upon pressing Enter, the panel changes as shown in the image below. If additional locations are required for the move plan, they can be added similarly.

Once locations are added to a rule, the following options can be applied:

- To re-sequence locations, change the sequence numbers as required.
- To delete a location from the plan, change the sequence number to 00.

**Note:** It is recommended the move rule for a category returns the media to its library location upon expiration to ensure scratch pools are adequately stocked.

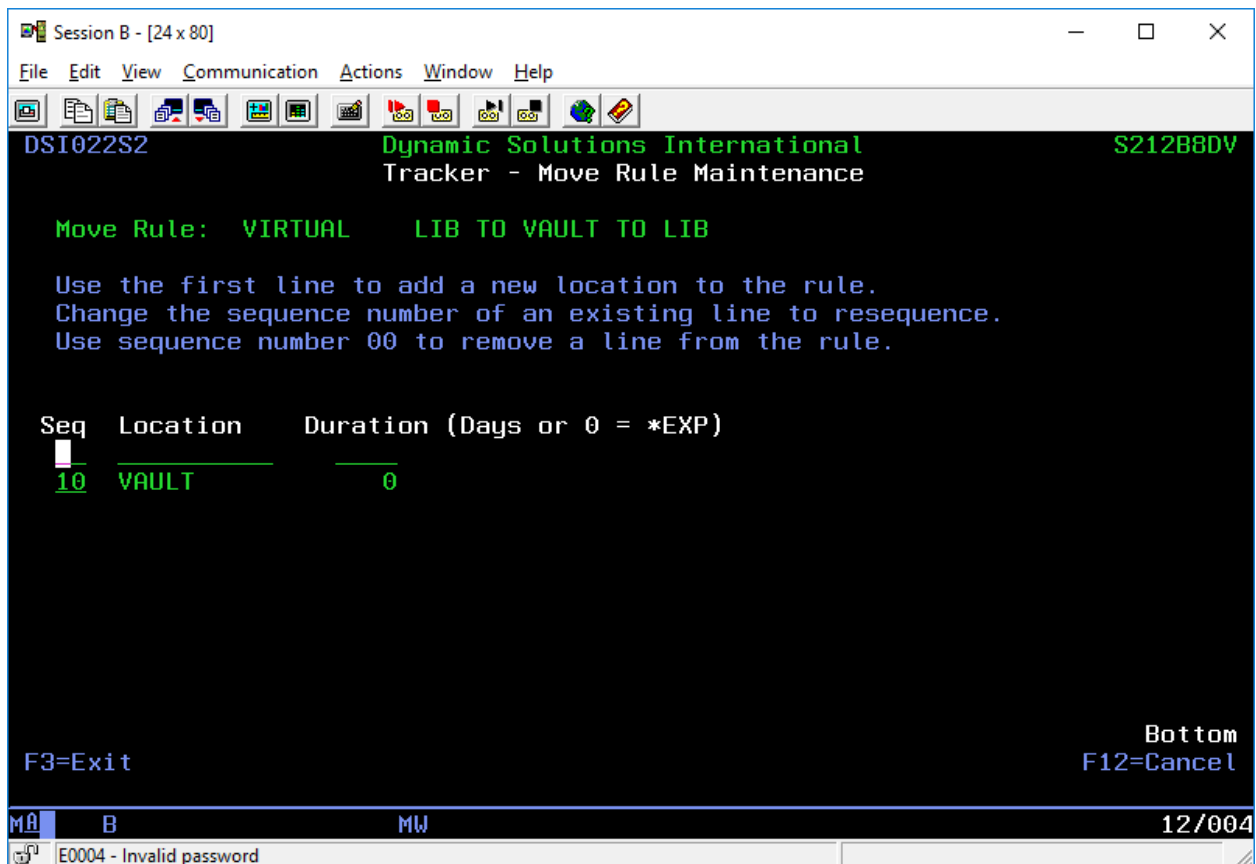
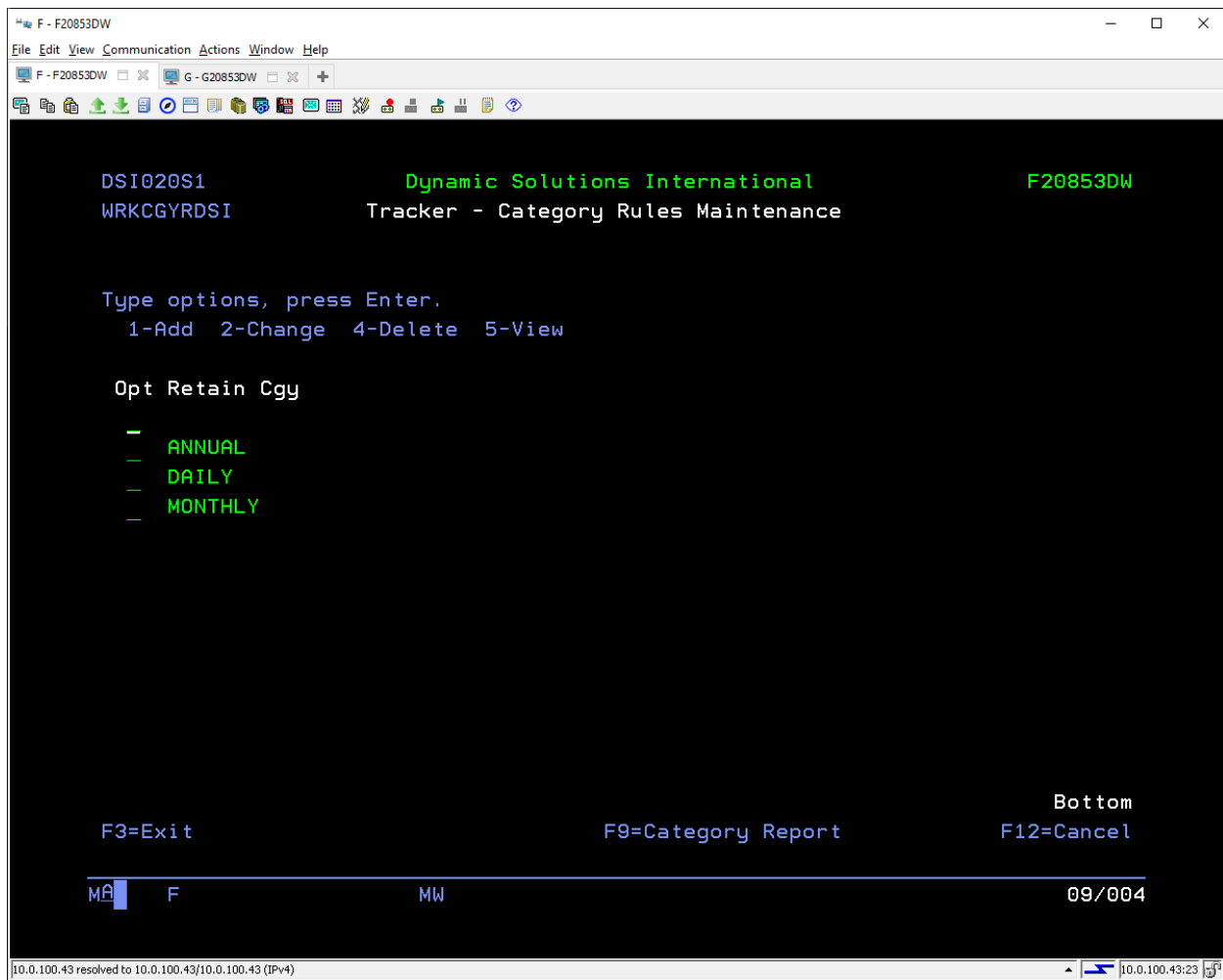


Figure 10: A single-location move rule

### 3.6 Managing Media Category Rules

Media category rules define how to retain media and apply optional media movement rules.

To manage media category rules, use option 9 from the main menu. The following panel appears, showing a variety of possible “retention categories” that have already been defined to Tracker:



**Figure 11: Category Rule Maintenance**

Use option 1 to create a new Category Rule.

Use option 2 to modify the properties of an existing Category Rule.

Use option 4 to delete an existing Category Rule.

Use option 5 to View the properties of an existing Category Rule.

Command Key F9 can be used to produce a \*SPLF with detailed category configuration and usage information. See Section 8.1 Sample Reports for an example of a category report.

Upon pressing Enter with option 1 selected on the first line, the following panel appears (example values provided):

Session F - S21853DW - QPADEV0002

File Edit View Communication Actions Window Help

DSI020F2      **Dynamic Solutions International**      S21853DW  
**Tracker - Category Rule Maintenance**

Type choices, press ENTER.

IBM Media Category . . . . . NEWCGY      Category Name, F4  
Retention Selection . . . . . 2      1-Date 2-Number of Days 3-\*PERM  
Retention Value . . . . . 000007      YYMMDD, Number of Days  
Move Rule . . . . . VIRTUAL      \*NONE, Move Rule Name, F4  
Default Category . . . . .         Y-Yes, N-No

Non-Default Values:

Category Usage Period . . . . .                 Category Period, F4

F3=Exit    F4=Prompt      F12=Cancel

MA    F      MW      14/035

10.0.100.27:23

Figure 12: Category Rule Definition

#### Fields:

**IBM Media Category:** The “retention category” for which this category rule applies (“NEWCGY” is the name of a user-defined media category).

**Retention Selection:**

- 1 – Assigns a specific date
- 2- Calculates expiration based on the number of days entered
- 3- \*PERM (manual expiration)

**Retention Value:**

- For selection 1, enter the desired date in YYMMDD format.
- For selection 2, enter the number of days to retain the media.
- For selection 3, this value is meaningless.

**Move Rule (optional):** The applicable move rule to apply to media of this category (or \*NONE).



---

**Default Category:** This field indicates which retention category is treated as the default category.

When not using Tracker calendars to manage daily media categorization, leave this value blank for all categories.

When using Tracker calendars with either of DSI's SETCGYDSI command or GETEXPVOL API, this value will be set to 'Y' for the category used most often (e.g. DAILY) and 'N' for the lesser used categories.

"Y" indicates that this category is the "default" category and will be used when no overriding category information is found for the processing date.

"N" indicates that this category is not the default. Non-default categories require entry of the "Category Usage Period" (for V2R1, only \*DATES is allowed) and subsequent entry of the dates for which the category is to be applied is required for each save-retention category.

**Note:** *Specific date entry is only required on backup media retention categories. Categories that represent duplication target media do not require date entries but will still require the "N" default setting and \*DATE value be entered.*

In the example below, the "NEWCGY" category, when applicable, will retain media for seven days, applies the VIRTUAL move rule, indicates the category is not the default-use category and thusly requires one or more date entries in order for the Tracker software to apply this "retention" category on those specific dates.

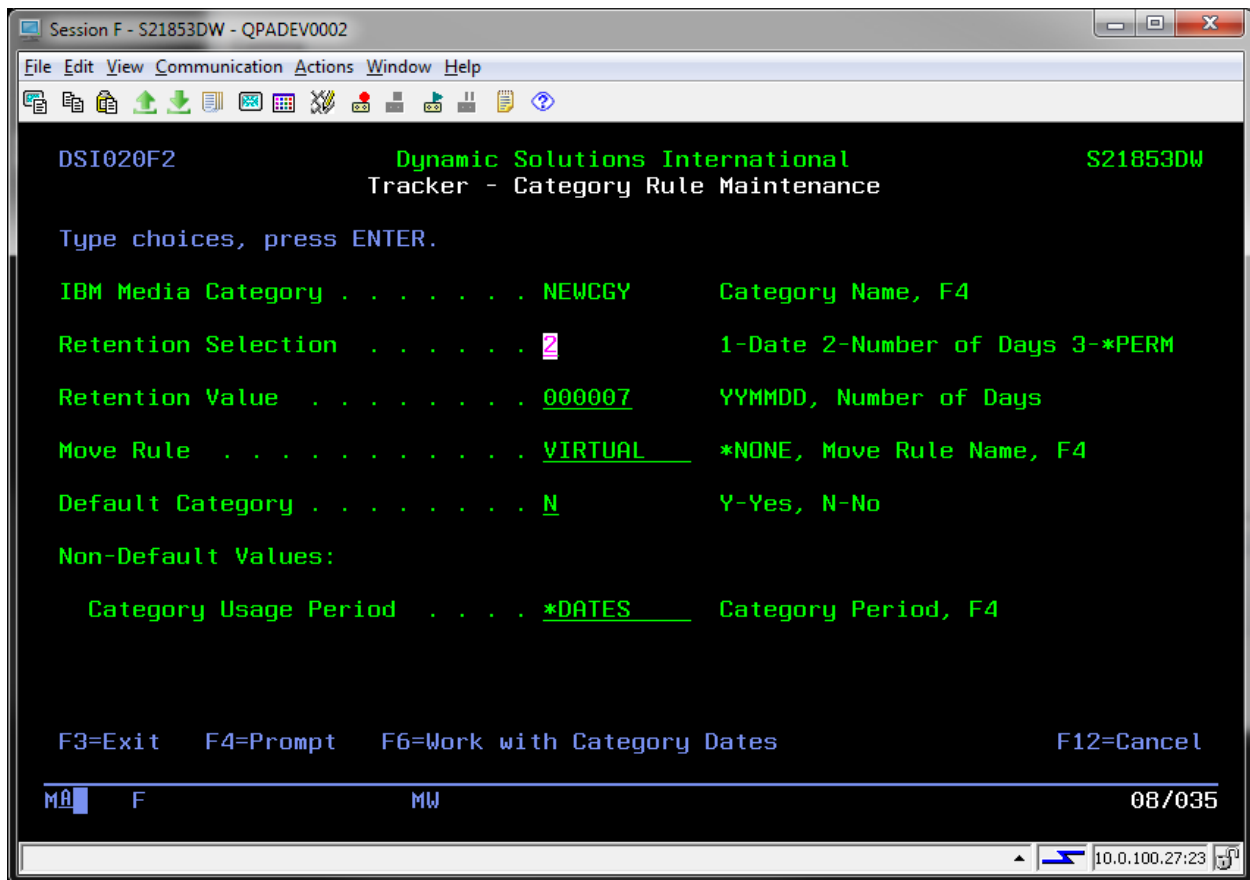


Figure 13: Configuring a Move Rule for date-specific usage

Upon pressing Enter and the entries provided have been validated and saved, the F6-Work with Category Dates command key is presented. Use this key to provide the applicable dates the non-default retention category is to be used. The next image indicates how to make individual date entries for a particular category (first sample entry shown):

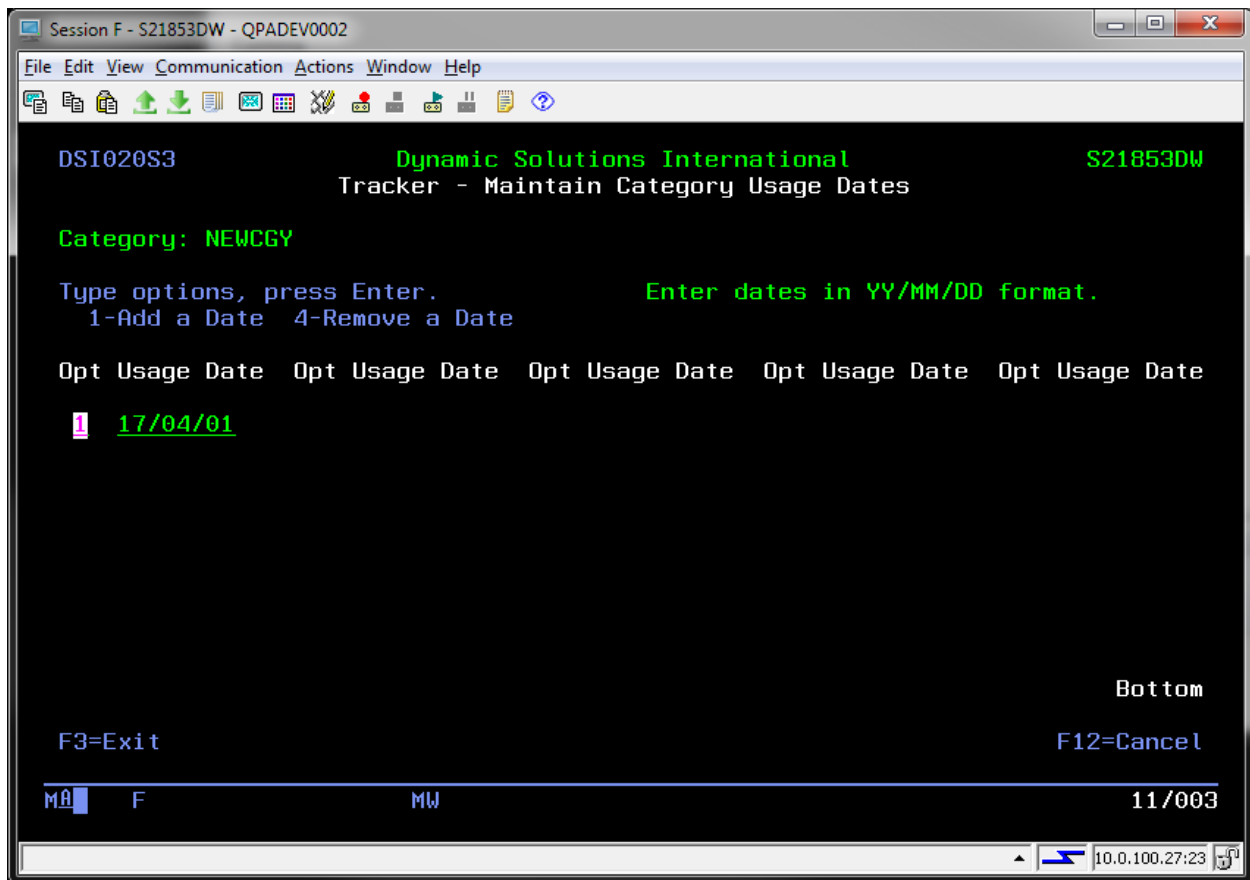


Figure 14: Adding a Usage Date to a Category Rule

Upon pressing enter, the date is validated; if the date is valid and not currently assigned to another category, the display will change to record the successful entry of the new date as shown below. Enter as many dates as necessary to support the category usage.

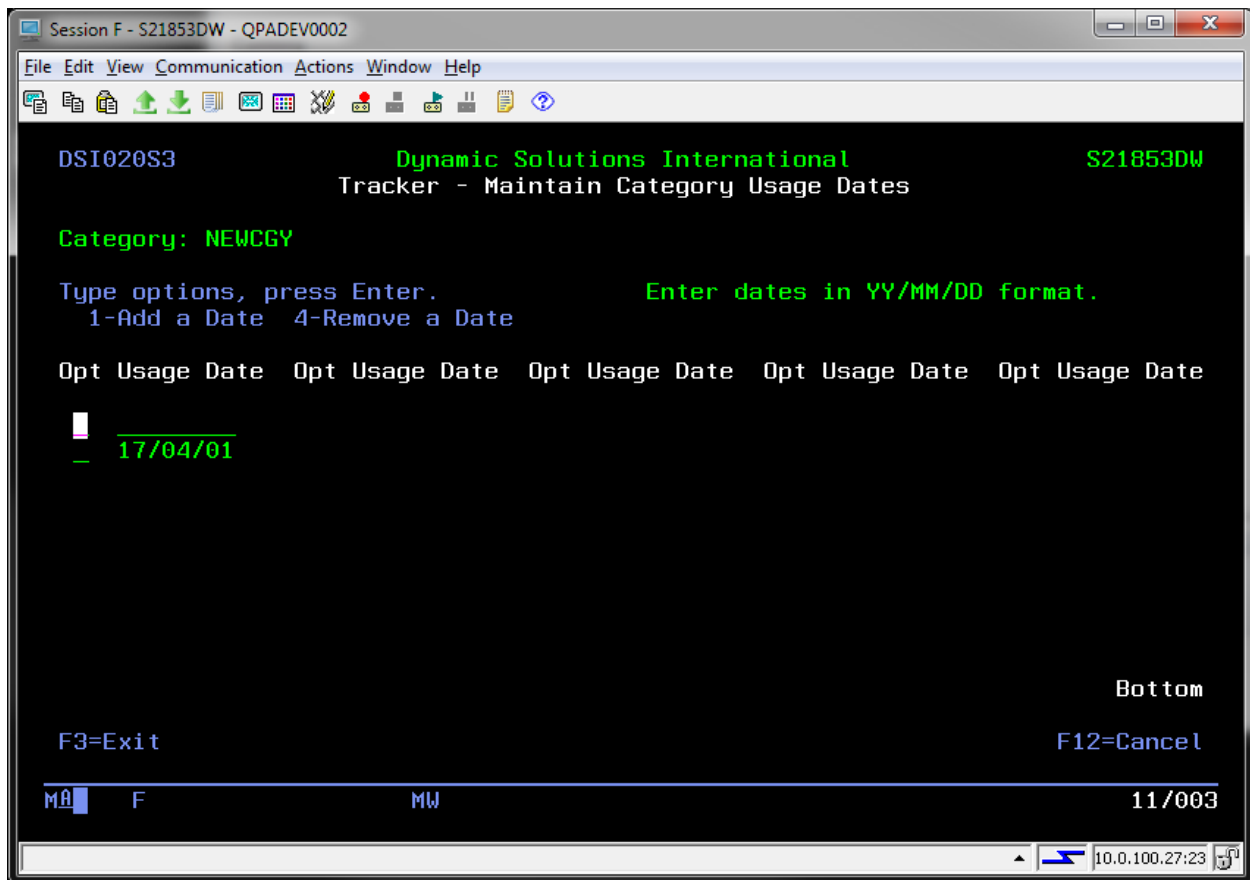


Figure 15: A successfully recorded usage date for category "NEWCGY".

---

## 4. Media Management

The Media Management section of the menu contains the applications discussed below.

### 4.1 Work with Media

The “Work with Media” application presents a list of all virtual and physical media known to Tracker. From this application, the current state of media can be reviewed; searches can be run across your virtual/physical media to help locate the tapes containing desired objects; media content can be reviewed tape-by-tape and a full set of object restoration capabilities are made available (optional, requires adjustments to the IBM SAV\* commands as discussed earlier in this document).

**Note:** *Search, inquiry and restoration capabilities require the modification of save commands as described in section 1.2 Media Content Management Considerations.*

Use option 14-Work with Media from the main menu to access the media inventory, as shown below:

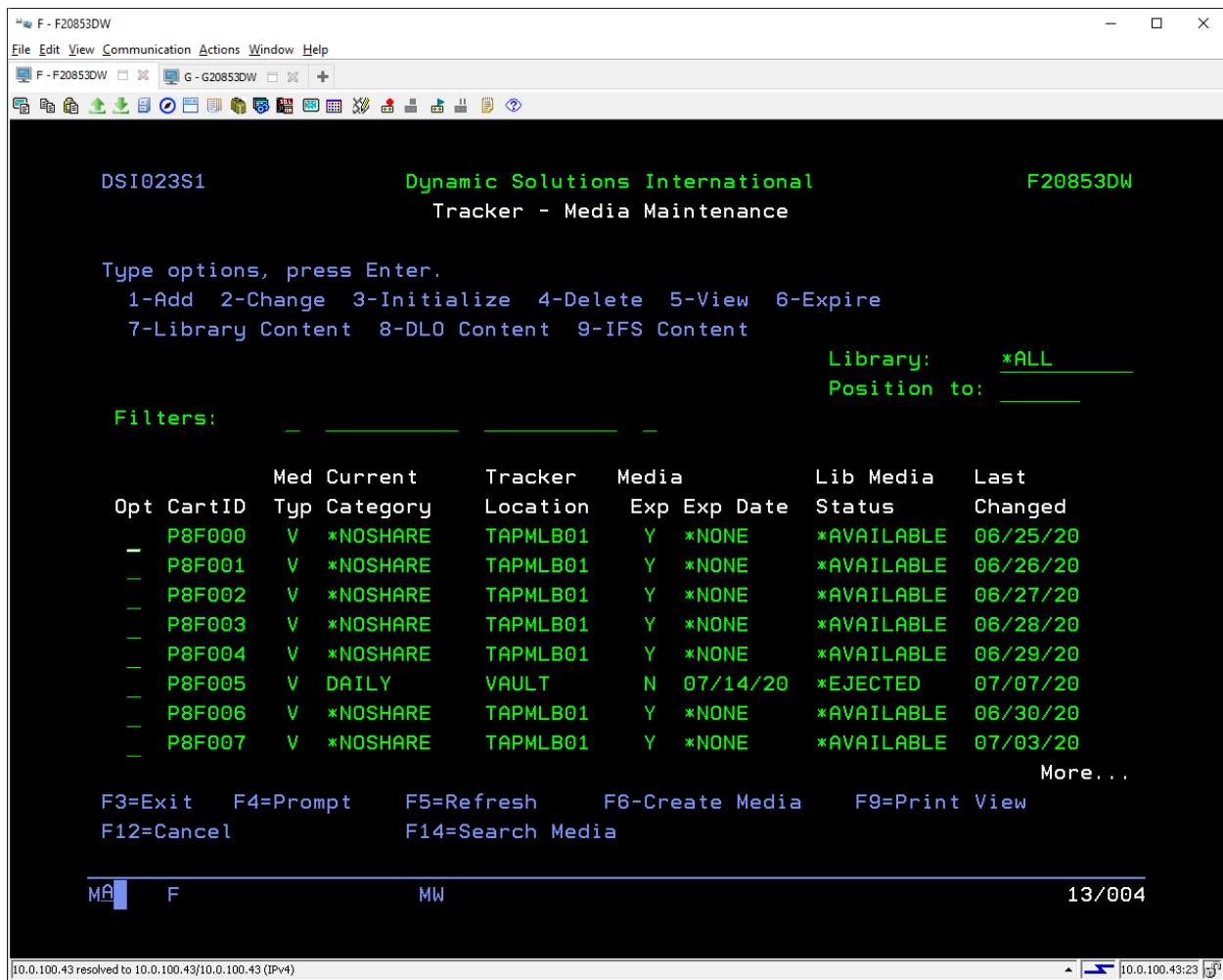


Figure 16: Media Inventory View

In the image above, a virtual-only environment is represented. If DSI's **Conductor** is installed and physical tape exports are managed via the DSI VTL and DSI's **Conductor** software this panel will display VTL-managed physical media as well.

**Note:** *Tracker offers the ability to discretely manage virtual and physical media sharing the same barcode when using device-attached physical libraries.*

When multiple libraries are configured, this list can be filtered by using the "Library" field; in high-tape-volume installations, the "Begin Volume" can be used to position the list display to the page containing the specified volume.

The "filter" values (above the "Med Typ", "Current Category", "Tracker Location" and "Media Exp" columns) may be provided to limit the list contents.

The F9=Print View command key will produce a \*SPLF containing media information for the current view selection. See section 8.1 **Sample Reports** for an example of this output.

---

### List options:

- 1- Add. This command allows a tape in \*INSERT status to be added to the media library. Tapes with a current category of \*INSERT (new tapes) will be initialized.
- 2- Change. Change the Scratch Category, Current Category, Location and/or expiration status of a volume.
- 3- Initialize. Initialize an expired tape (the tape must have a library status of \*AVAILABLE).
- 4- Delete. Removes media records and may remove virtual media from a virtual library.
  - a. When Tracker is operating alongside of **Conductor**, deleting a virtual volume from this panel will remove the volume from the virtual library.
  - b. When Tracker is operating without **Conductor**, this option will remove the media records from the Tracker database. If the media remains in the virtual and/or physical libraries, those media records will be recreated.
- 5- View. View the current properties of the selected media.
- 6- Expire. Expires an active tape. Will automatically re-assign the tape's current category to its scratch category. The tape must be \*AVAILABLE to the media library.
- 7- Library Content. Review library information saved on the media. Drill down into object and member level data. Perform restorations of libraries, objects and/or members (where applicable).
- 8- DLO Content. Review Document Library Object folders/documents. Restore folders/documents.
- 9- IFS Content. Search the IFS for directory paths; restore entire directories and/or objects within directories.

### 4.1.1 Creating Virtual Media

#### 4.1.1.1 Creating media from the VTL Console – Conductor not installed

When Tracker is installed without DSI's **Conductor** software, media must first be created using the VTL Console software. Once created, Tracker is used to import/categorize/initialize media into the library. New media will default to the "\*NOSHARE" category. DSI recommends a single scratch pool be used in virtual environments. This is required when using automated category maintenance as described in the previous sections.

When creating virtual media from the VTL Console software that comes with the VTL device, please follow the steps below. The same steps may be used when adding physical media to a Tracker-managed physical library.

- Create the required virtual media using the VTL console.
- Open the Tracker Media Management application (shown below).

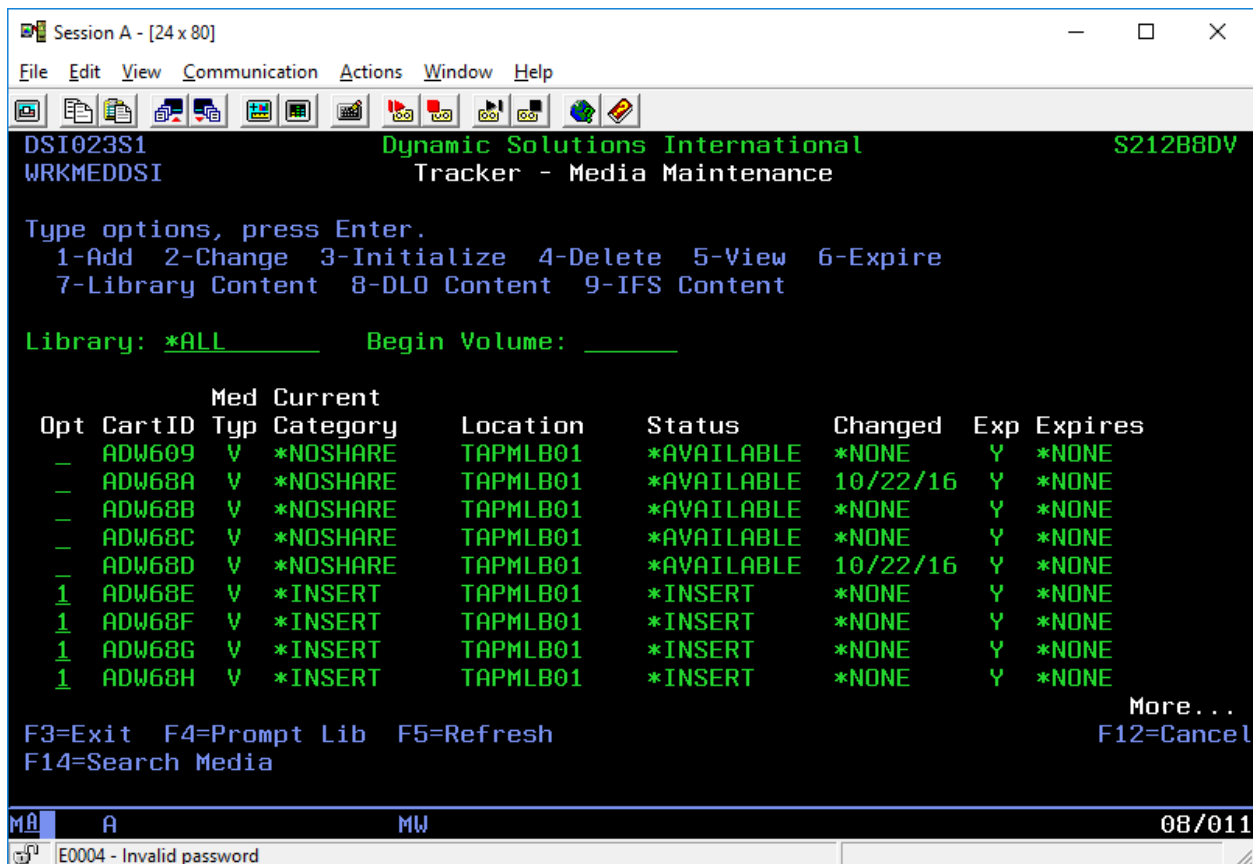


Figure 17: Adding Media created from the Console

**Note:** Tracker V2R1 does not yet allow for shared library usage; for this reason, \*NOSHARE is the scratch category into which new tapes will be assigned by default.

- Locate the newly created volumes (they will have a current category of \*INSERT and a status of \*INSERT).
- Use option 1 on each volume as shown above. Press Enter.
- Media will be added to the library, categorized and initialized.

If media is to be added into a category other than \*NOSHARE (e.g. to add media to be used via a device outside of the Tracker environment), after adding the new media to the VTL via the console use the IBM WRKTAPCTG command to identify and categorize media to a category other than \*NOSHARE. Then use the instructions above to add the categorized media to the library. This will prevent Tracker from using physical media intended for direct device access outside of the Tracker environment when performing exports. Media can also be re-categorized using the 2-Change option from the panel in the image above.

#### 4.1.1.2 Creating media from Tracker (when Conductor is installed)



**Service Managed LPARS:** Creating media from the Tracker interface may be disabled by your service provider.

When Tracker is installed with DSI's **Conductor** software, virtual media may be created and/or deleted from the Tracker Media Management application.

**Note:** Conductor can be configured to automatically create and maintain the virtual media inventory, saving the Admin from this task. See the Conductor documentation for details.

To create new media from the Tracker application, use the F6=Create New Virtual Media function key to display the "Create New Virtual Media" window:

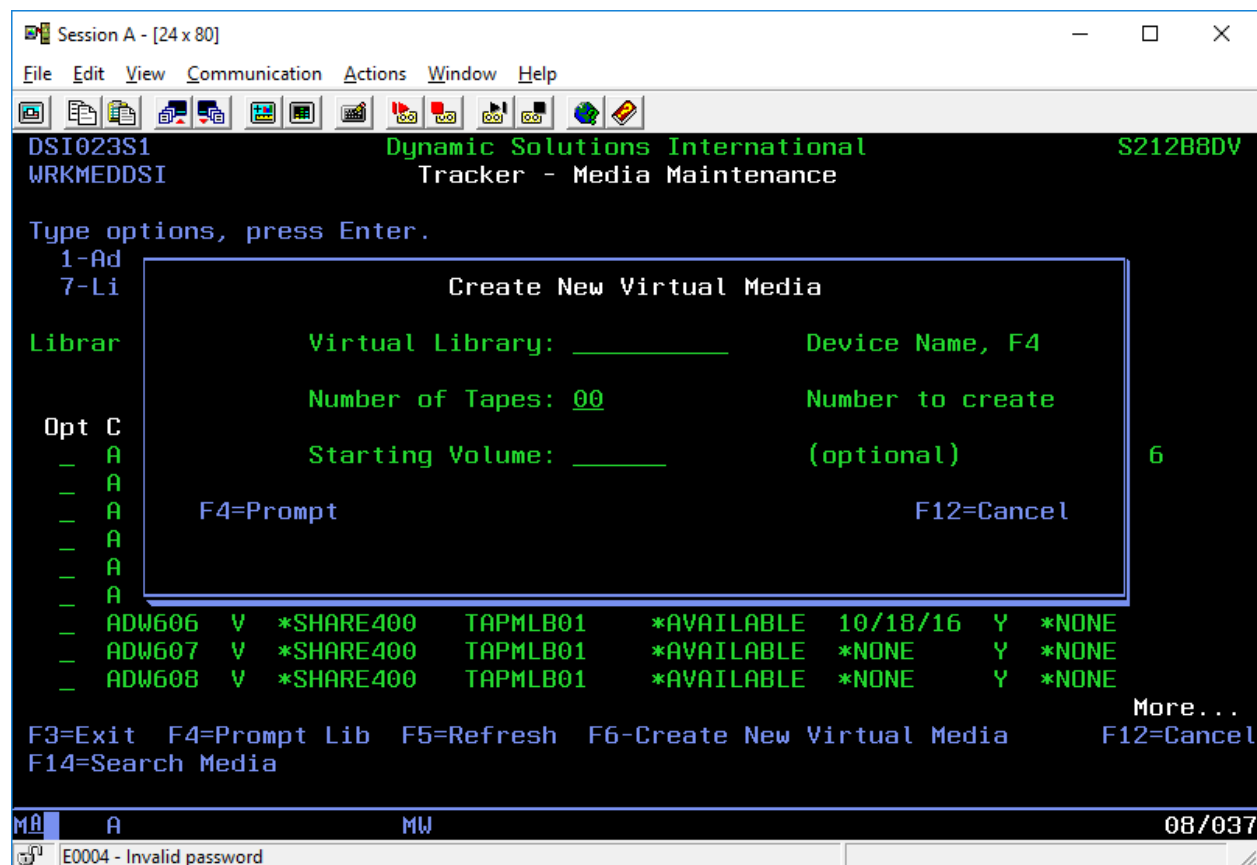


Figure 18: Creating New Virtual Media

Enter the target virtual library device name, the number of volumes to create and optionally, the starting volume number. Upon pressing enter, messages will be sent to the VTL instructing the library to create the indicated tapes. Processing of these messages may take some number of seconds to complete. As the tapes are created, they'll automatically be added to the library, categorized and initialized.

If using a starting volume value, the volume should have numeric values in the last three positions (e.g. "ABC001", not "ABCDEF"). The number of volumes requested will be created starting with the first

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available barcode  $\geq$  the starting value. If the number of volumes requested exceeds the number of volumes that can be created given the starting volume value, only the number of media that can be created will be created by Tracker.

For example, if you ask to create 20 volumes and your starting barcode is “ABC985”, presumably 14 volumes will be created (ABC986 to ABC999), assuming no volumes already exist in the ABC986-ABC999 range.

When not entering a starting volume, the VTL device will determine the barcodes to add to the system. This is the preferred method for creating tapes via Conductor/Tracker.

#### *4.1.1.2 Creating media from the VTL Console when Conductor is installed*

When Tracker is installed with DSI’s **Conductor** software, you can still add media to the system from the VTL console. In this scenario, as the **Conductor** software detects new media has been created, it will automatically categorize, insert and initialize the newly detected media into the library.

## **4.2 Work with Media Attributes**

Options 2 and 5 open the media properties window, shown in the following image:

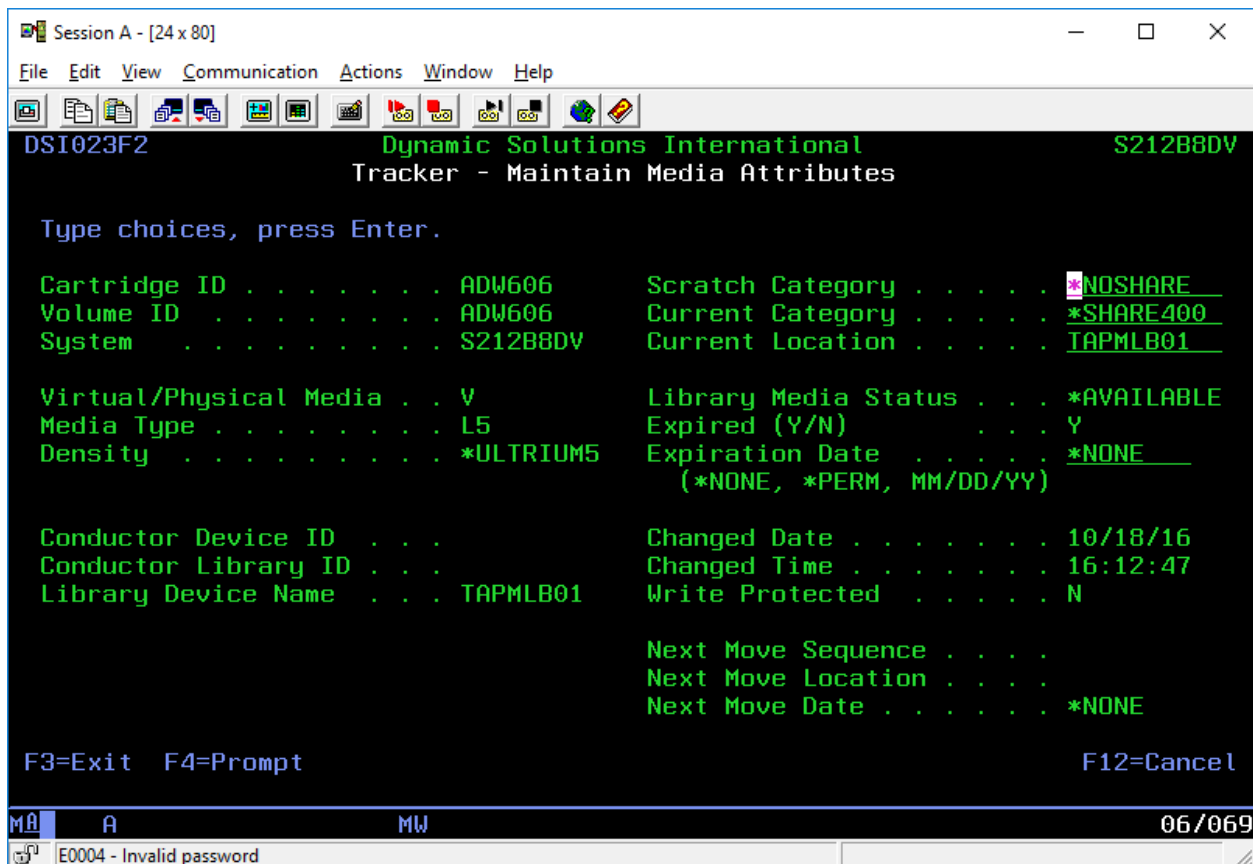


Figure 19: Media Properties

Various properties of the selected media are described below. Those fields that can be modified via the 2-Change option are displayed in **bold**:

- Cartridge ID: the barcode of the media being reviewed.
- Volume ID: the volume ID of the tape label, where applicable. For physical media containing copies of virtual media produced by a backend \*ARCHIVE job, this will be the virtual media barcode from which the data was copied.
- System: the system name to which the media belongs. For future use.
- Virtual/Physical Media: Indicator for the media type.
- Media type: the media type reported by the library.
- Density: the media density reported by the library.
- **Conductor** Device ID: the identification code for the indicated device from the **Conductor** system (if installed)
- **Conductor** Library ID: the virtual library identification code for the indicated device (if installed)
- Library Device Name: the device name for the library to which the media belongs.
- **Scratch Category**: the scratch pool into which expired media is delivered. This value may be modified.

- 
- **Current Category:** the current category of the media. This value may be modified. If changed to the SCRATCH CATEGORY value, the media will be expired if necessary.
  - **Current Location:** the current location of the media.
  - **Library Media Status:** the state of the library media.
  - **Expired (Y/N):** expiration indicator.
  - **Expiration Date:** \*NONE (expired), \*PERM (manual expiration) or the expiration date. This field can be changed to alter the expiration status and date.
  - **Changed Date:** the last reported write date.
  - **Changed Time:** the last reported write time.
  - **Write protected:** whether write protection is applicable to the volume
  - **Next Move Sequence:** the next move sequence for the volume (from Move Rules).
  - **Next Move Location:** the next location for the media.
  - **Next Move Date:** the date the next move will/should take place.

## 4.3 Work with Media Content

When the applicable IBM SAV\* commands have been adjusted to write media information to the Tracker tables/files, Tracker provides two methods of interrogating media content and the ability to prepare and present restore commands to the user.

**Note:** *To ensure data is available at your desired level be sure to use the INFTYPE keyword that best meets your requirements when adapting your save commands ("OUTPUT (SAV) or \*OUTFILE command properties).*

### 4.3.1 Searching Media Content

Using the F14 key on the media inventory list display (see figure 10) presents the media search window as displayed below.

Searching media requires the entry of the earliest save date for which media should be searched along with either the name of the save command to locate (SAVSYS, SAVCFG, etc.) or a library name optionally combined with an object and or an object/member name.

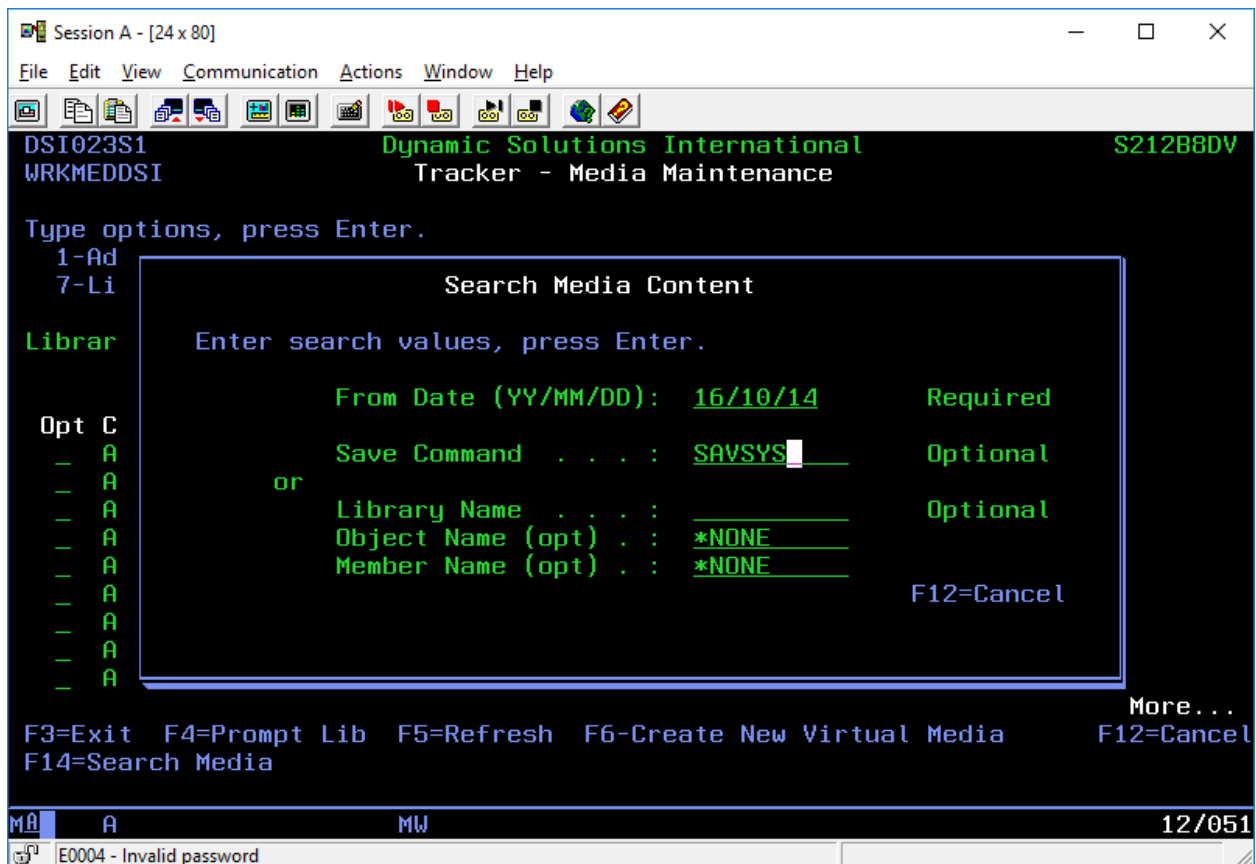


Figure 20: The Media Content Search Window

In the example above, a search is to be executed for tapes containing a SAVSYS label written on or after October 14, 2016.

Search results will be presented in a filtered view of the media inventory window. To return to the full media inventory view, use the F5=Refresh option.

### 4.3.2 Media Content Inquiries

Media content can be viewed directly by using one of the inquiry options: 7-Library Content; 8-DLO Content; and 9-IFS Content. Each allows for data restoration at the expected levels for each type.

**Note:** When using **Conductor** and managing physical media, restorations can be requested from physical volumes. This should only be attempted via a library device if the physical cartridge ID matches the magnetic volume ID.

*In general, non-matched physical media should be imported back to the original virtual volume first and then restored from the virtual volume. In cases where this is impractical, vary off the library device, then*

attempt then restore from a library drive device (or use another stand-alone device). If a virtual volume exists with the same cartridge ID as the physical magnetic volume ID, that virtual volume should be moved into the virtual vault before attempting the restore. Return the volume to the library after the restore has completed.

#### 4.3.2.1 Library System Inquiries

Using option 7-Library Content on a media item presents the panel shown in the next image:

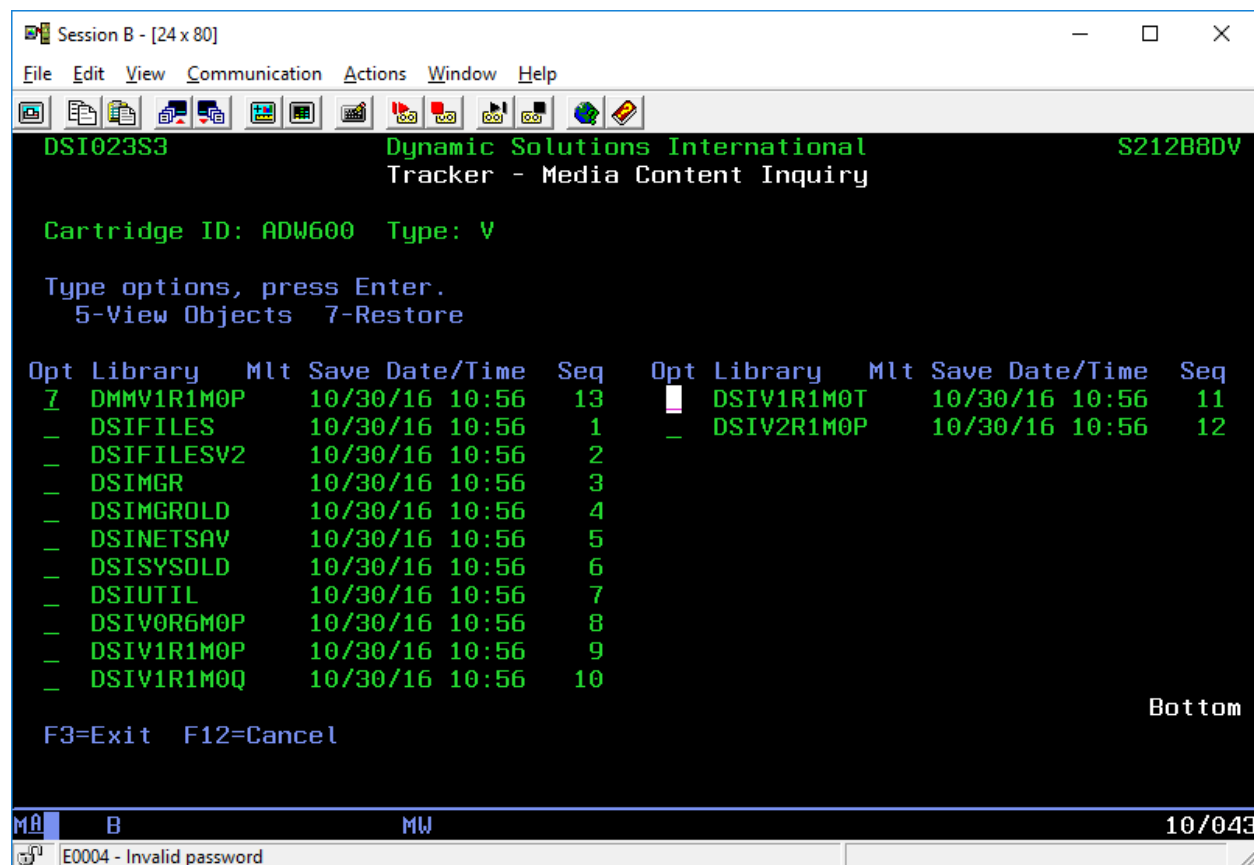


Figure 21: Viewing Media Library Content

Note: the "Mlt" column indicates an object spans across volumes with the add character ('+').

From this panel users may choose to drill into Library objects (next topic) or may request Tracker format and present a RSTLIB command for the selected library, as shown above for library "DSIV1R1M0P". The RSTLIB command presented is shown in the image below.

**Note:** the RSTLIB command is presented with default values; user-entered modifications may be required to meet specific restoration needs (e.g. restoring to an alternate library).

**Note:** When selecting restoration options from physical media, Tracker will leave the device ID field of the applicable restoration command panel blank. It is up to the user to identify and enter the correct device. Stand-alone drives may require source tapes be loaded in advance of attempting the execution of the restoration.

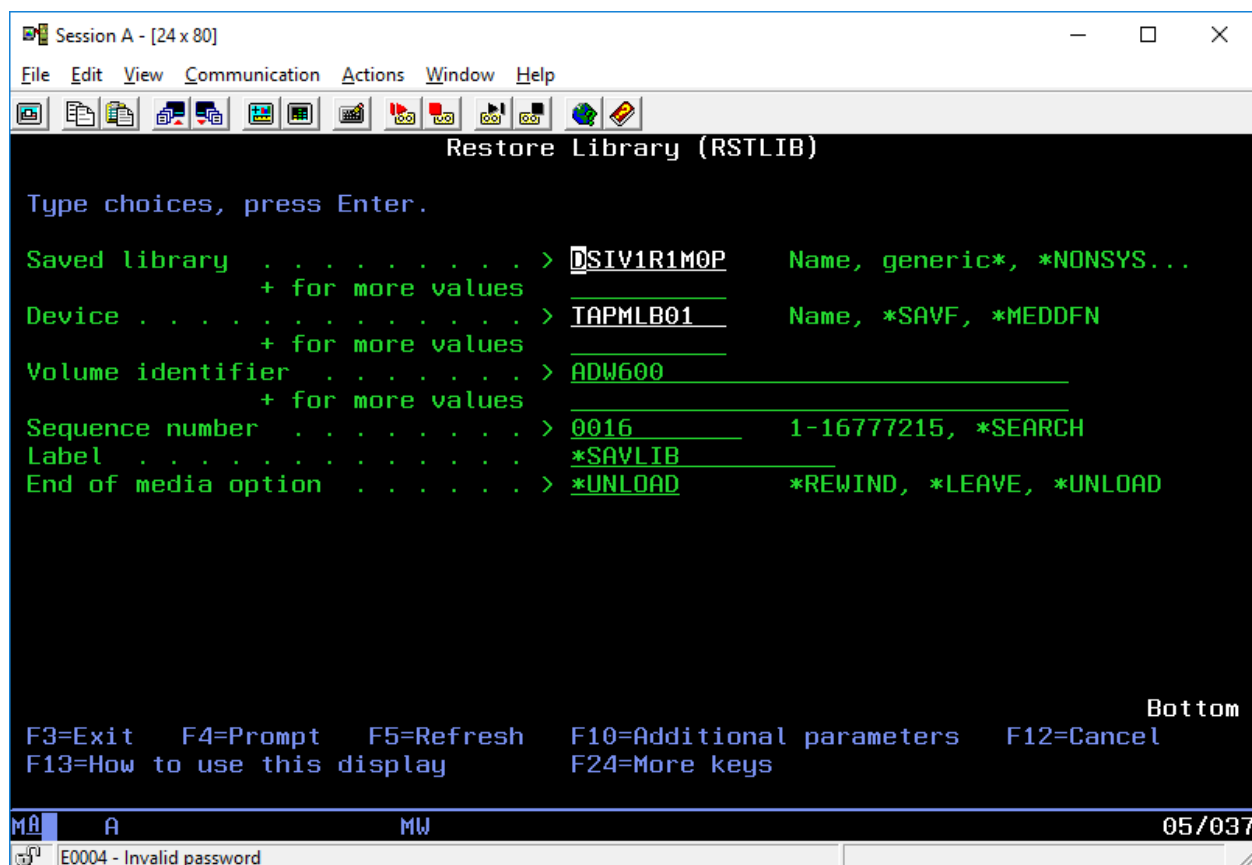


Figure 22: The formatted RSTLIB Command

After pressing Enter, the RSTLIB command is executed. Results will be presented when the command completes.

Using option 5-View Objects from the library view panel drills down into the library object list, where available:

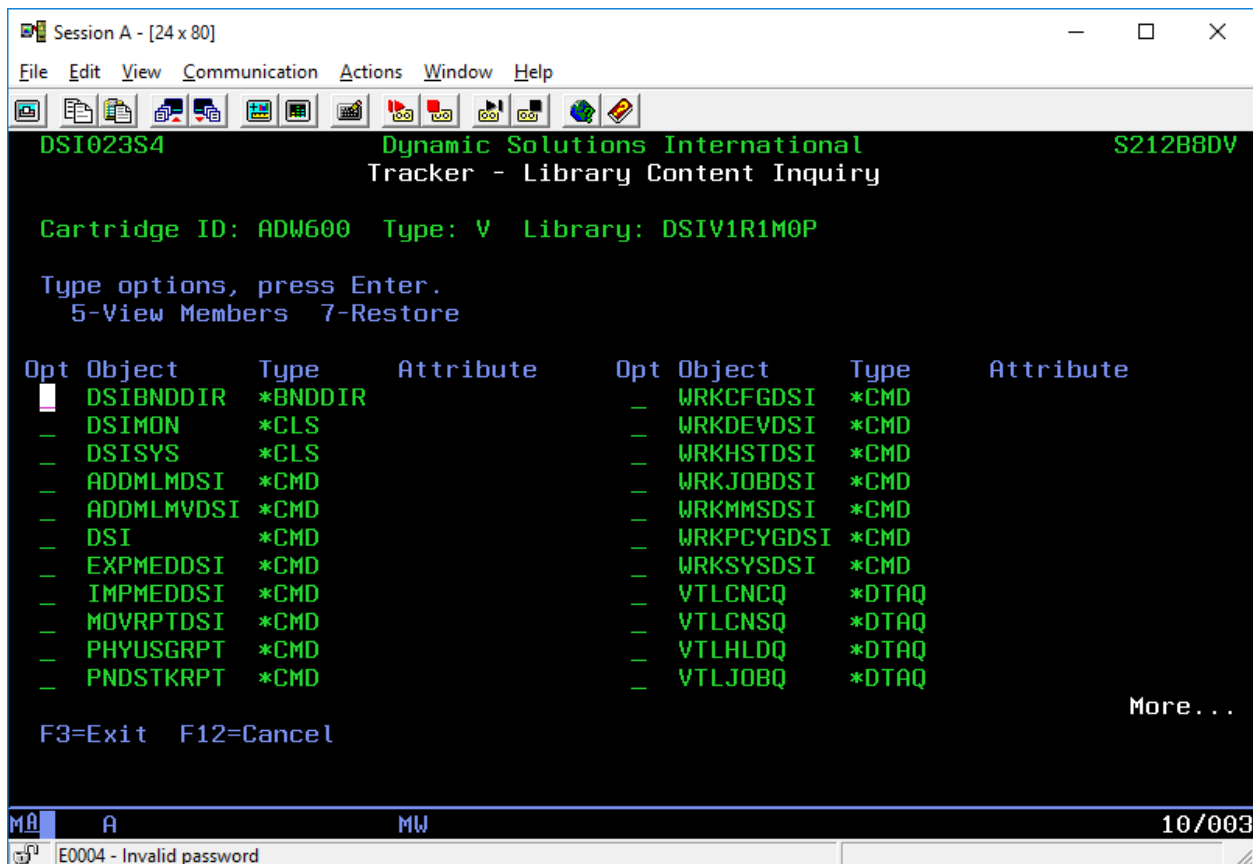


Figure 23: Library Object Inquiry

From this panel users may choose to drill into object members (where applicable, next topic) or may request Tracker format and present a RSTOBJ command for the selected object, as shown above for the \*BNDDIR object "DSIBNDDIR". The RSTOBJ command presented is shown in the image below.

**Note:** the RSTOBJ command is presented with default values; user-entered modifications may be required to complete the command entry.



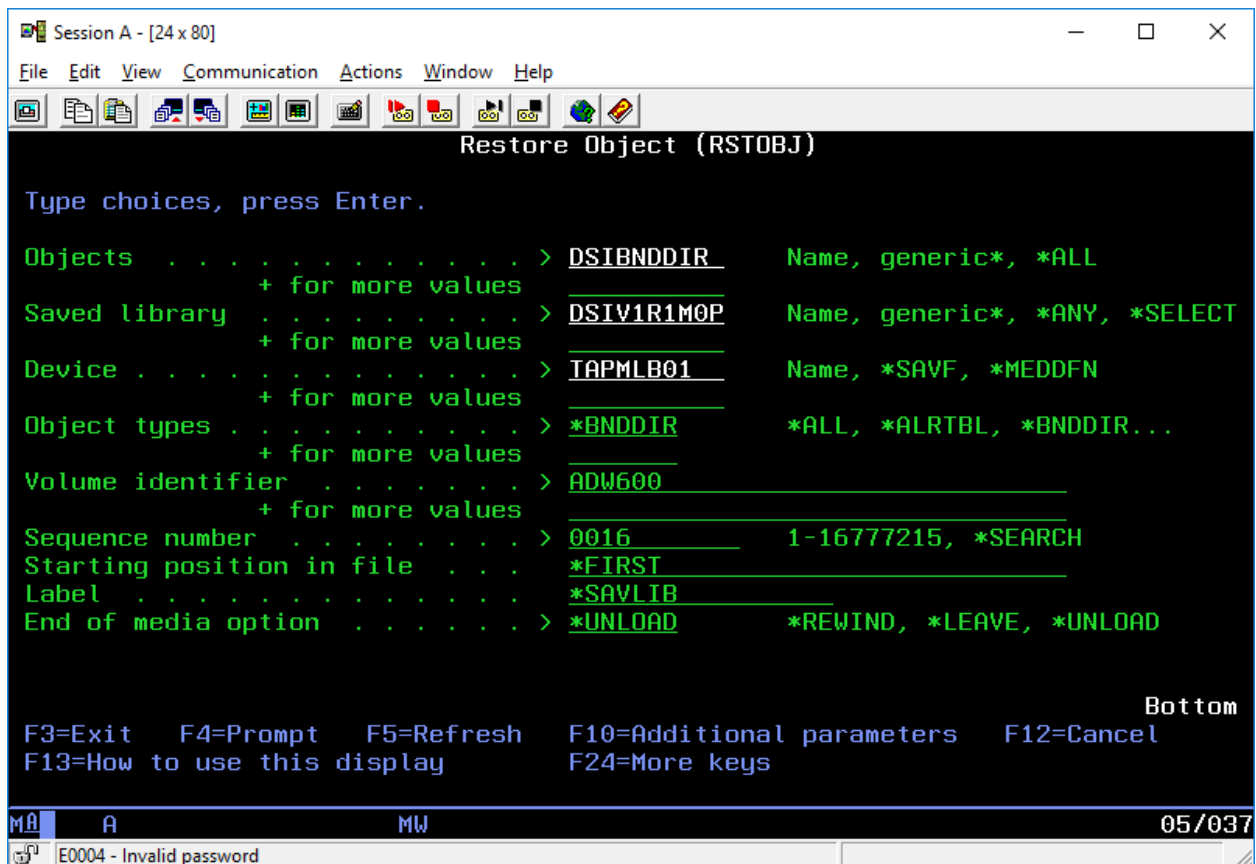


Figure 24: RSTOBJ command example

After pressing Enter, the RSTOBJ command is executed. Results will be presented when the command completes.

Using option 5-View Members from the library view panel drills down into the object member list, where available:

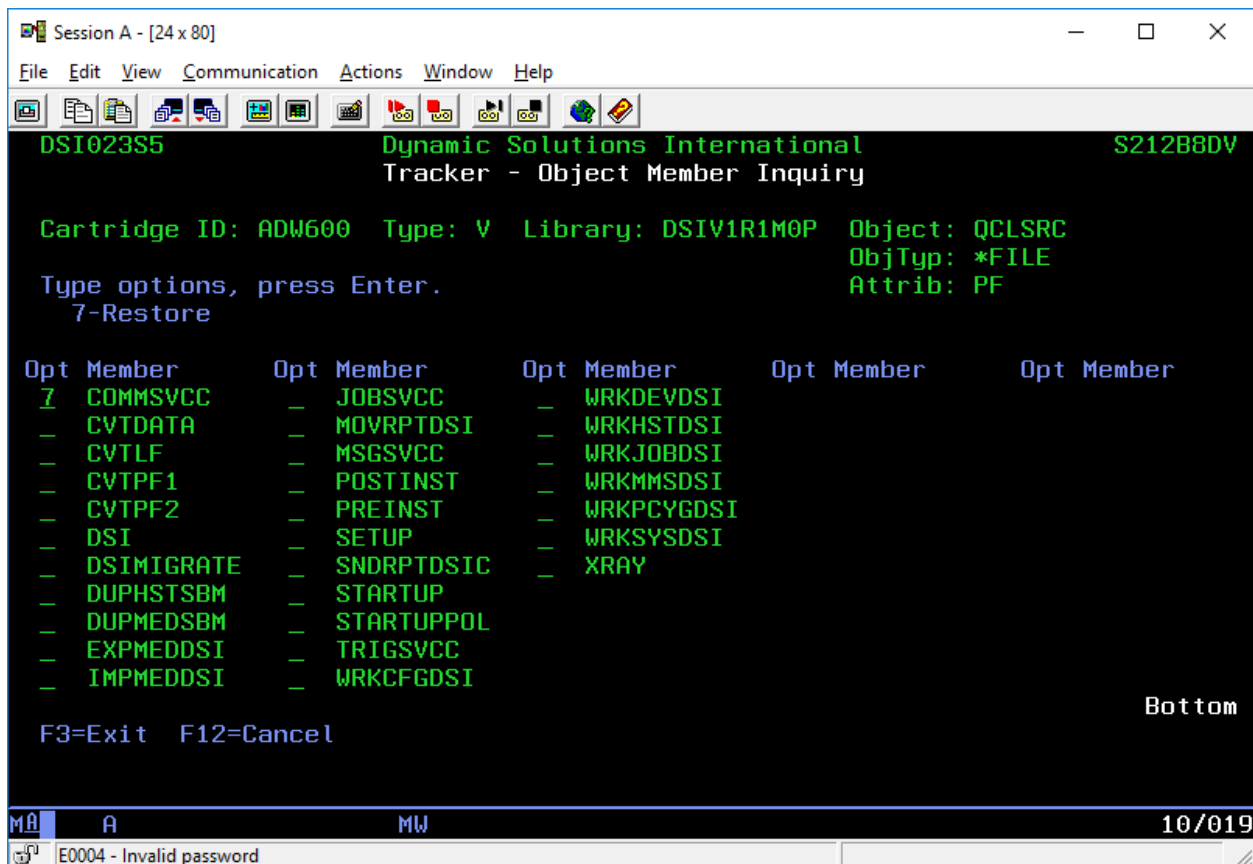


Figure 25: Object Member List

To restore a member from an object, use option 7 as shown above on member "COMMSVCC". The RSTOBJ command is presented with values defaulted as shown on the following images:

**Note:** the "data base member option" of the RSTOBJ command will need to be modified to meet your specific need (e.g. replacing an existing member, restoring a missing member, etc.)

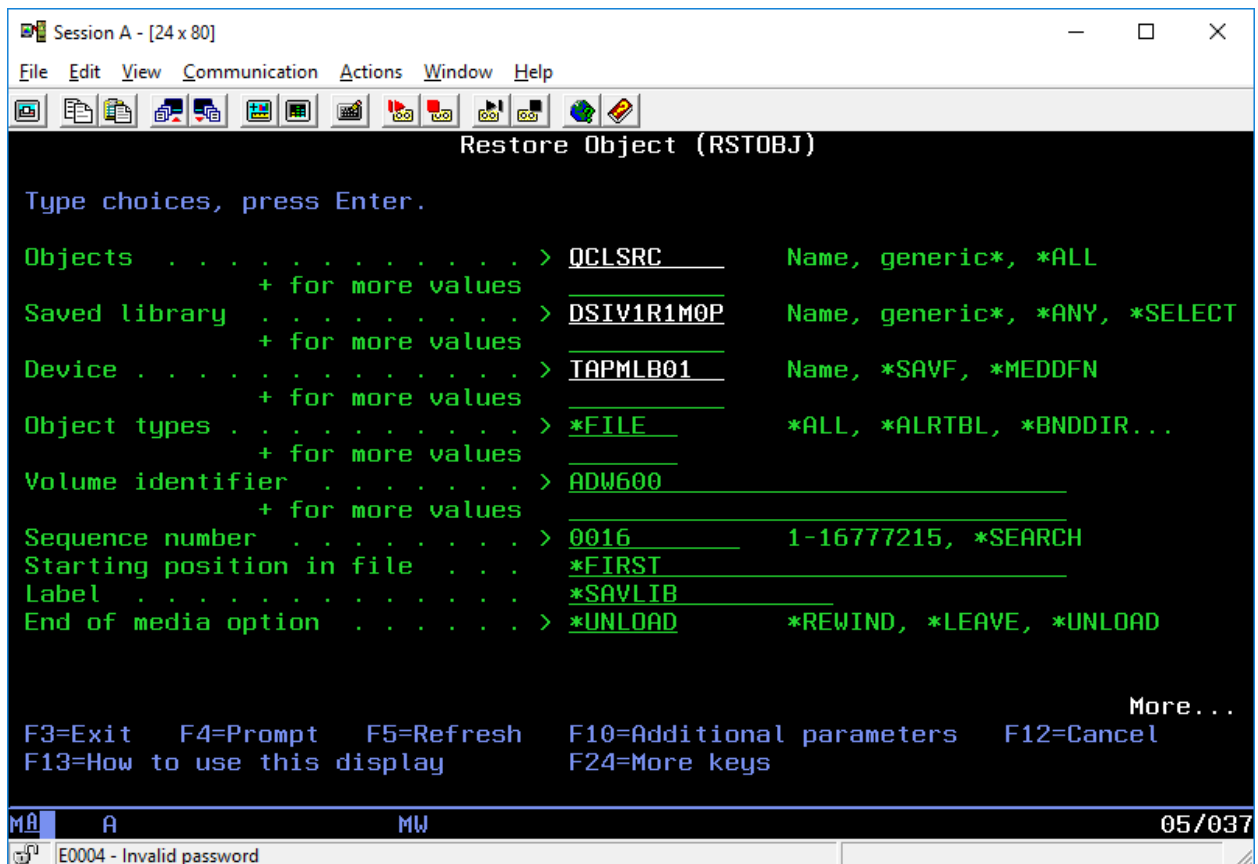


Figure 26: Member Restoration, panel 1

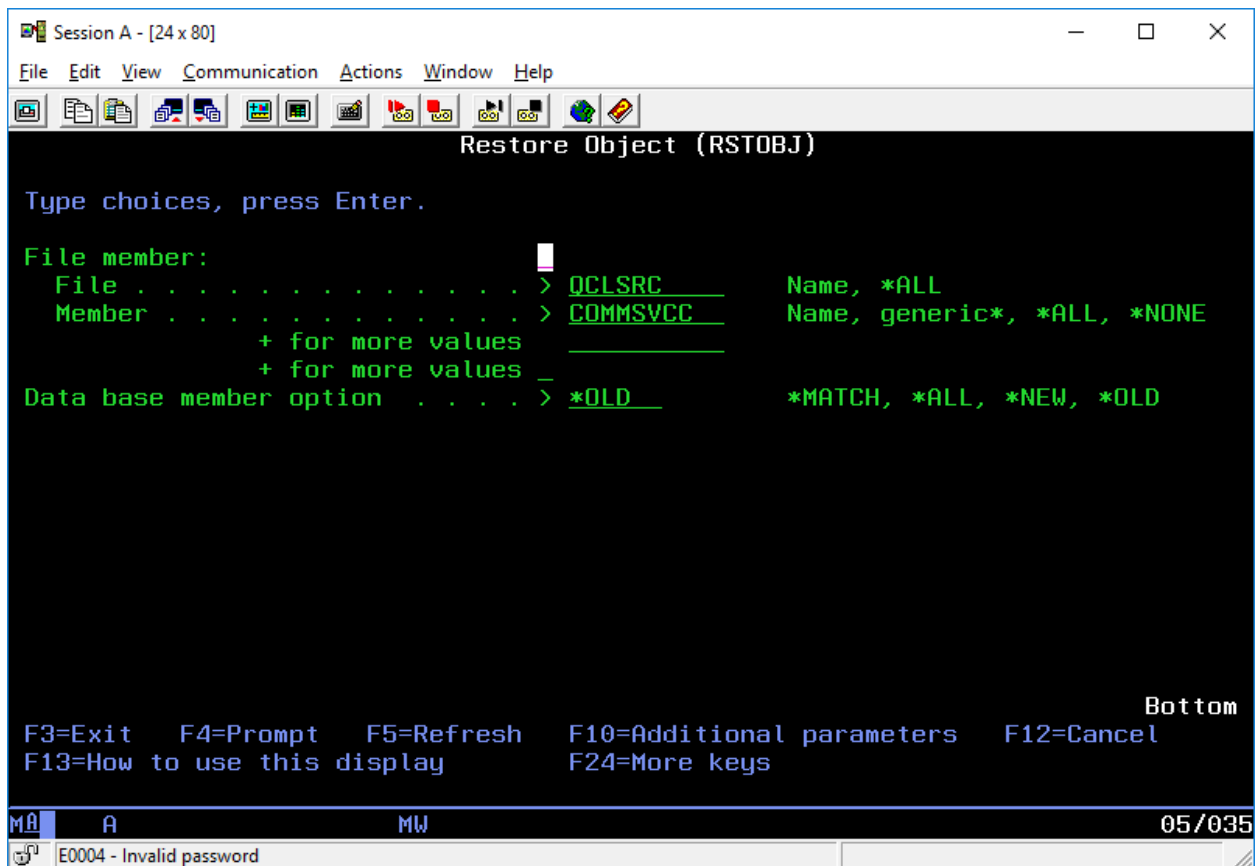


Figure 27: Member Restoration, panel 2

#### 4.3.2.2 DLO System Inquiries

To review DLO folders and documents, use option 8-DLO Content on the desired volume. The DLO folder view appears:

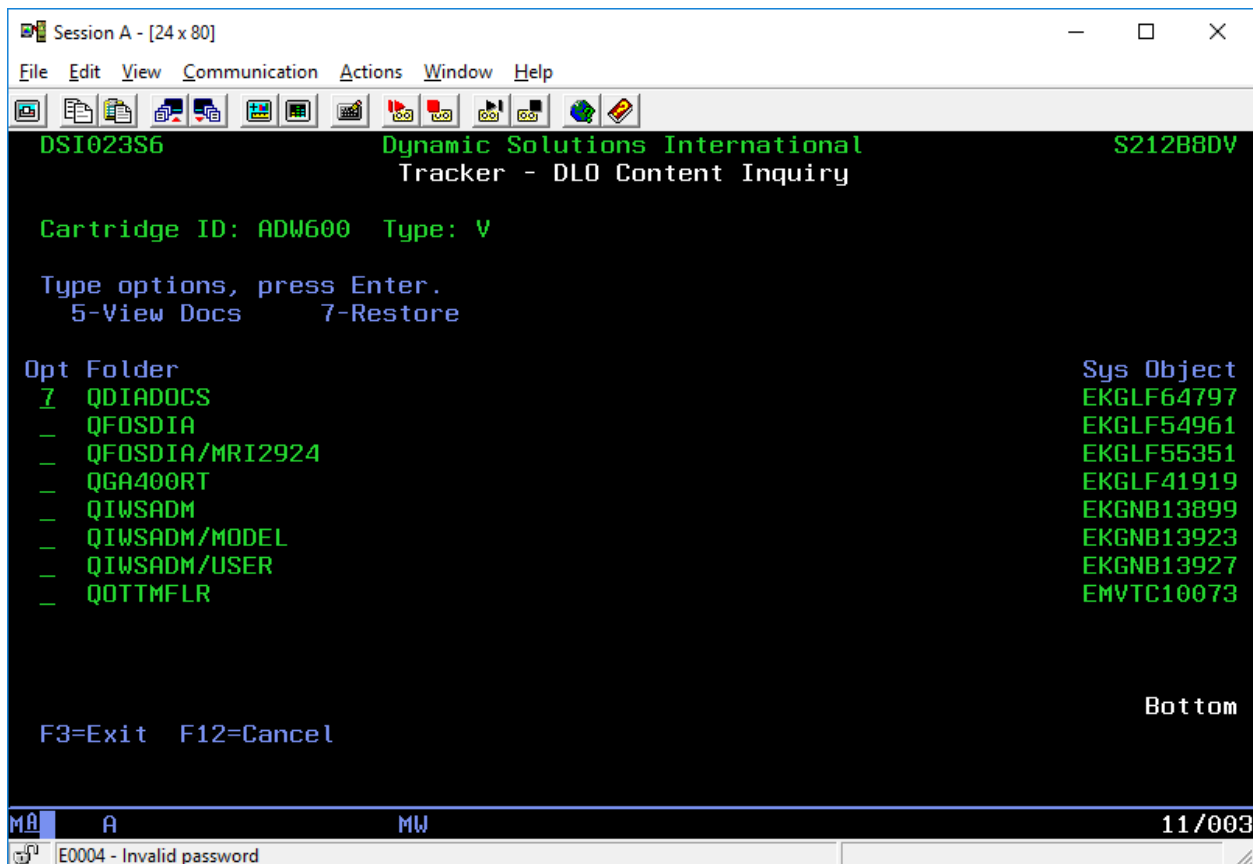


Figure 28: DLO Folder view

From this panel users may choose to drill into folder documents (where applicable, next topic) or may request Tracker format and present a RSTDLO command for the selected folder, as shown above for the "QDIADOCs" folder. The RSTDLO command presented is shown in the images below.

**Note:** the RSTDLO command is presented with default values; user-entered modifications may be required to complete the command entry for non-standard restorations.

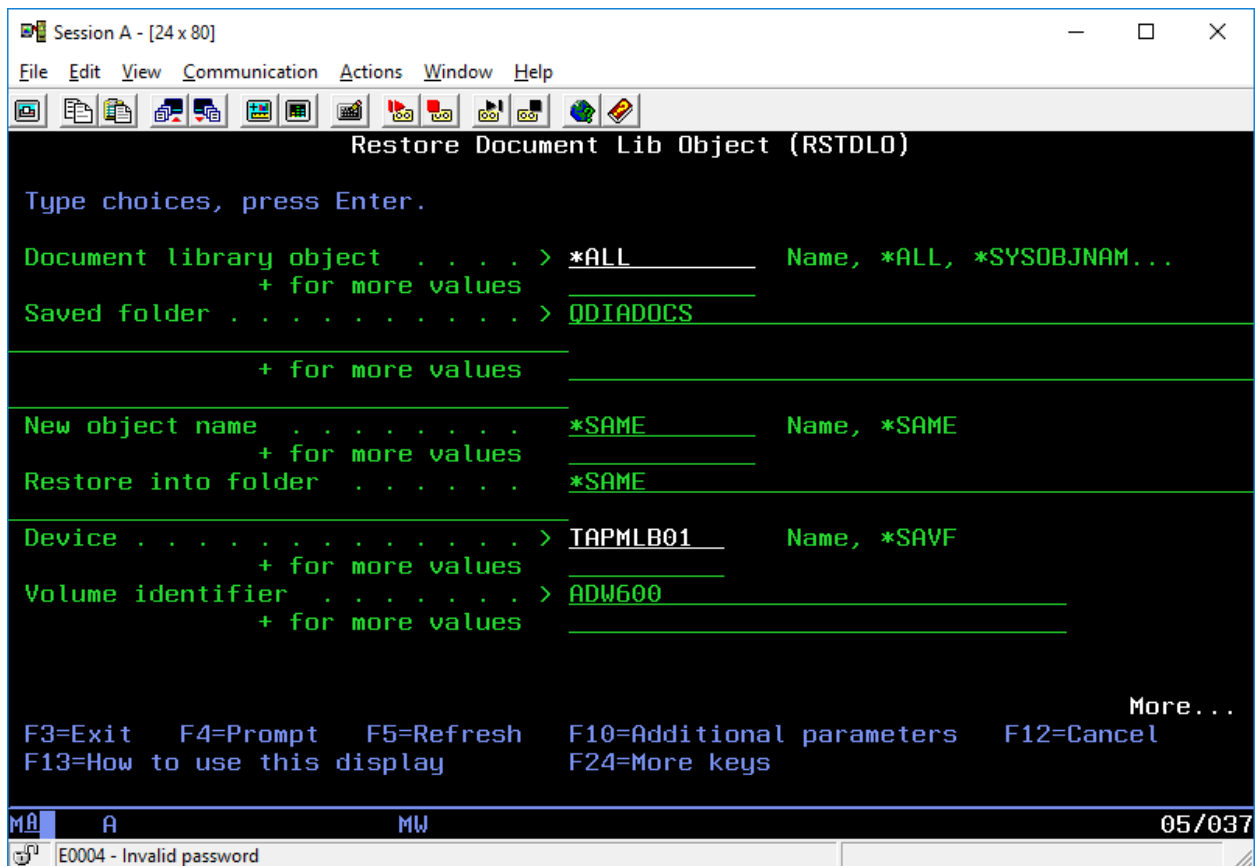


Figure 29: RSTDLO Command, panel 1

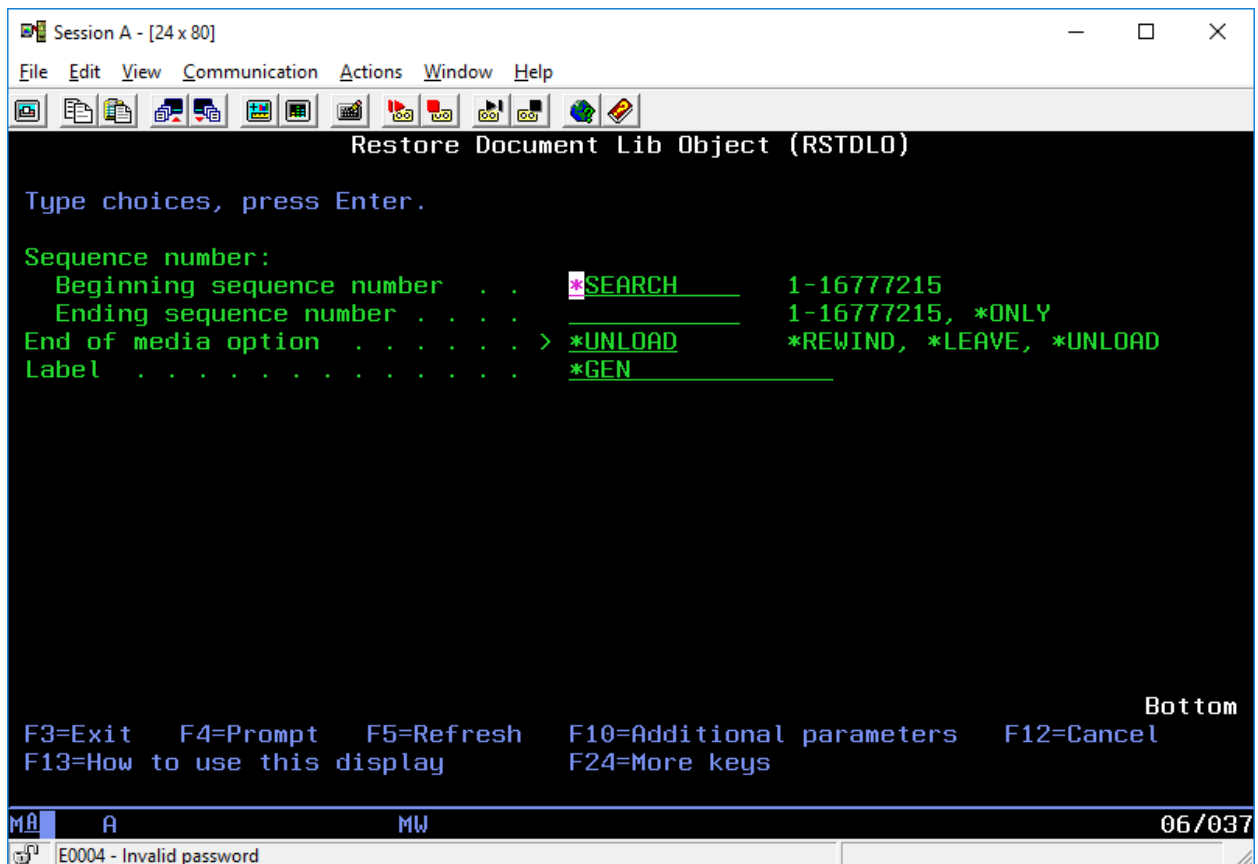


Figure 30: RSTDLO command, panel 2

Folder content can be viewed by using option 5 from the DLO inquiry panel. The next panel shows that panel for the same QIADOCS folder selected above:

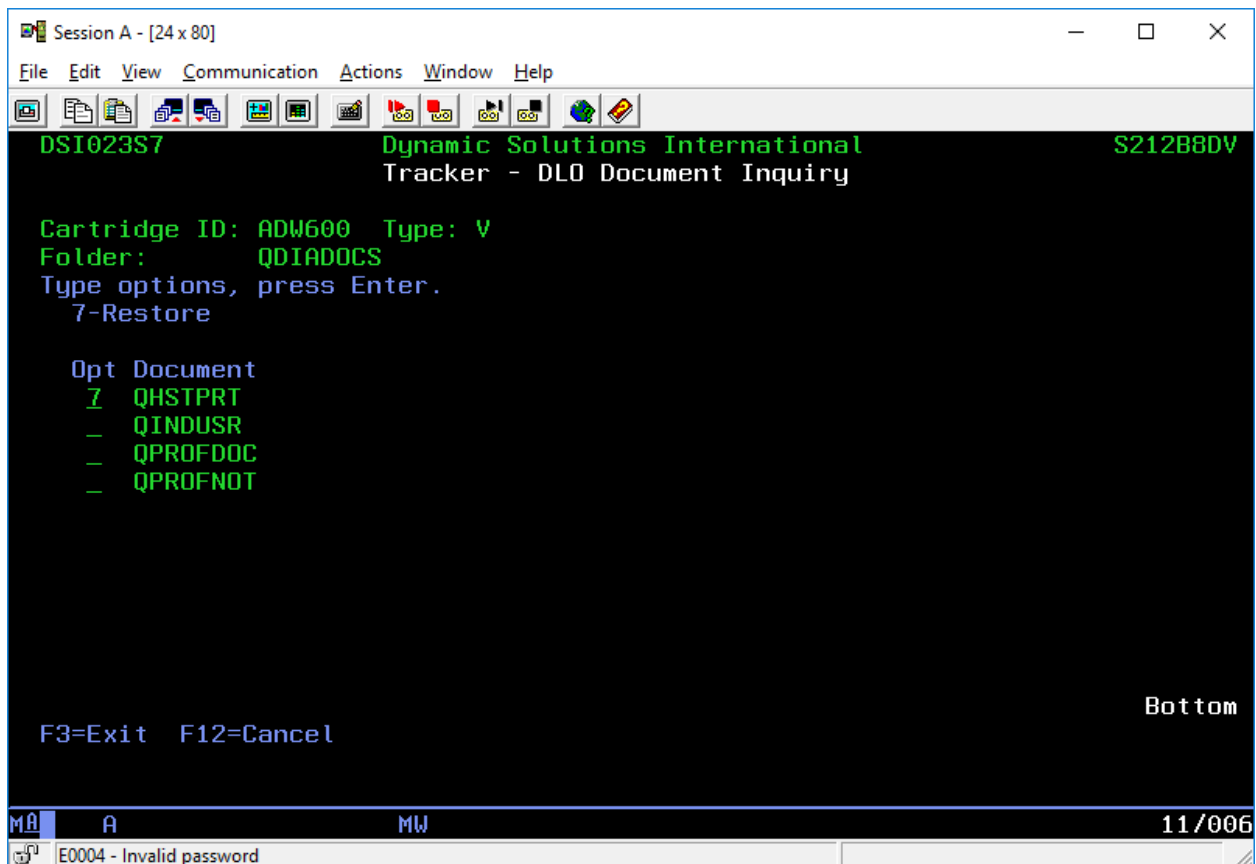


Figure 31: DLO Document View

Using option 7 from this panel prepares and displays a RSTDLO command for the selected document, as shown in the image below:

**Note:** As with the other pre-formatted restore commands, alterations to the provided parameters may be required to meet specific restoration requirements.



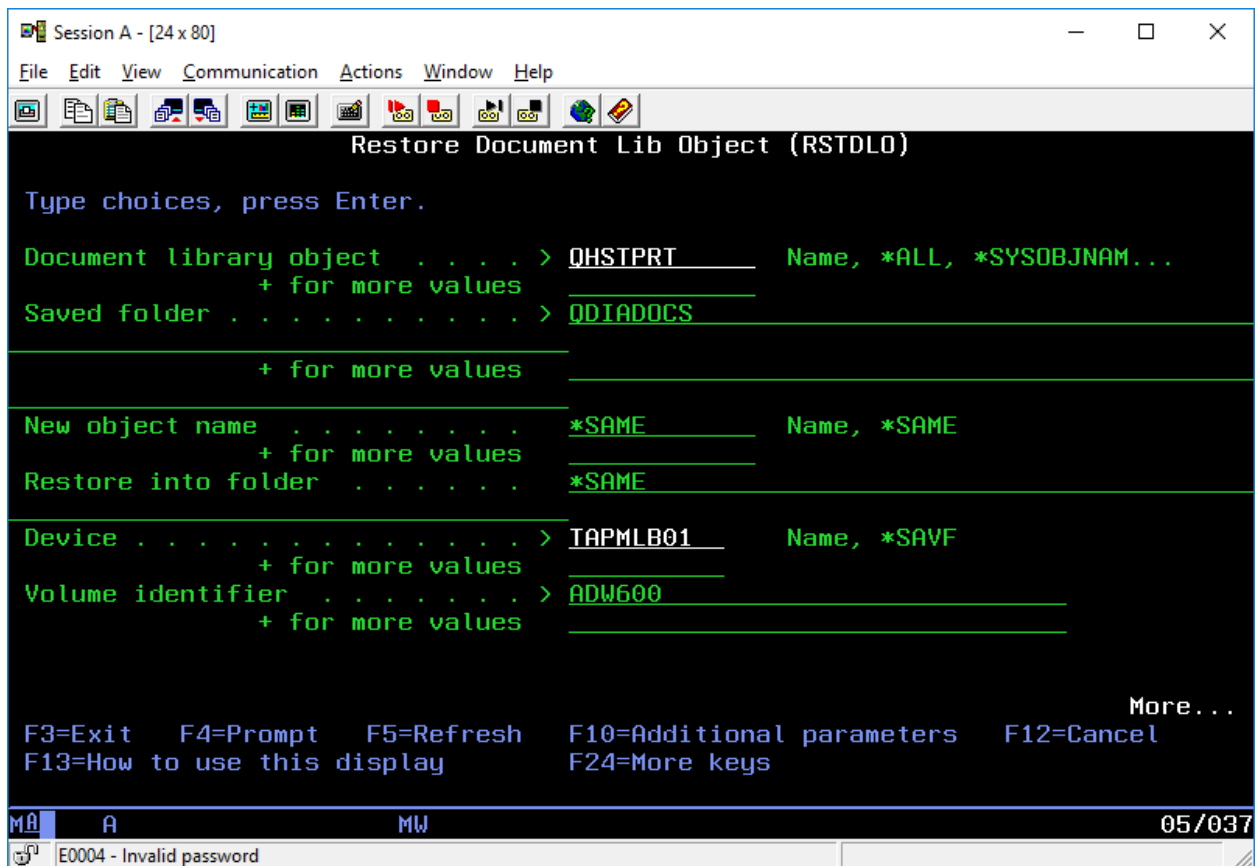


Figure 32: Restore a document

#### 4.3.2.3 Integrated File System Inquiries

To review media IFS content, use option 9-IFS Content on the desired volume. The panel shown below is presented:

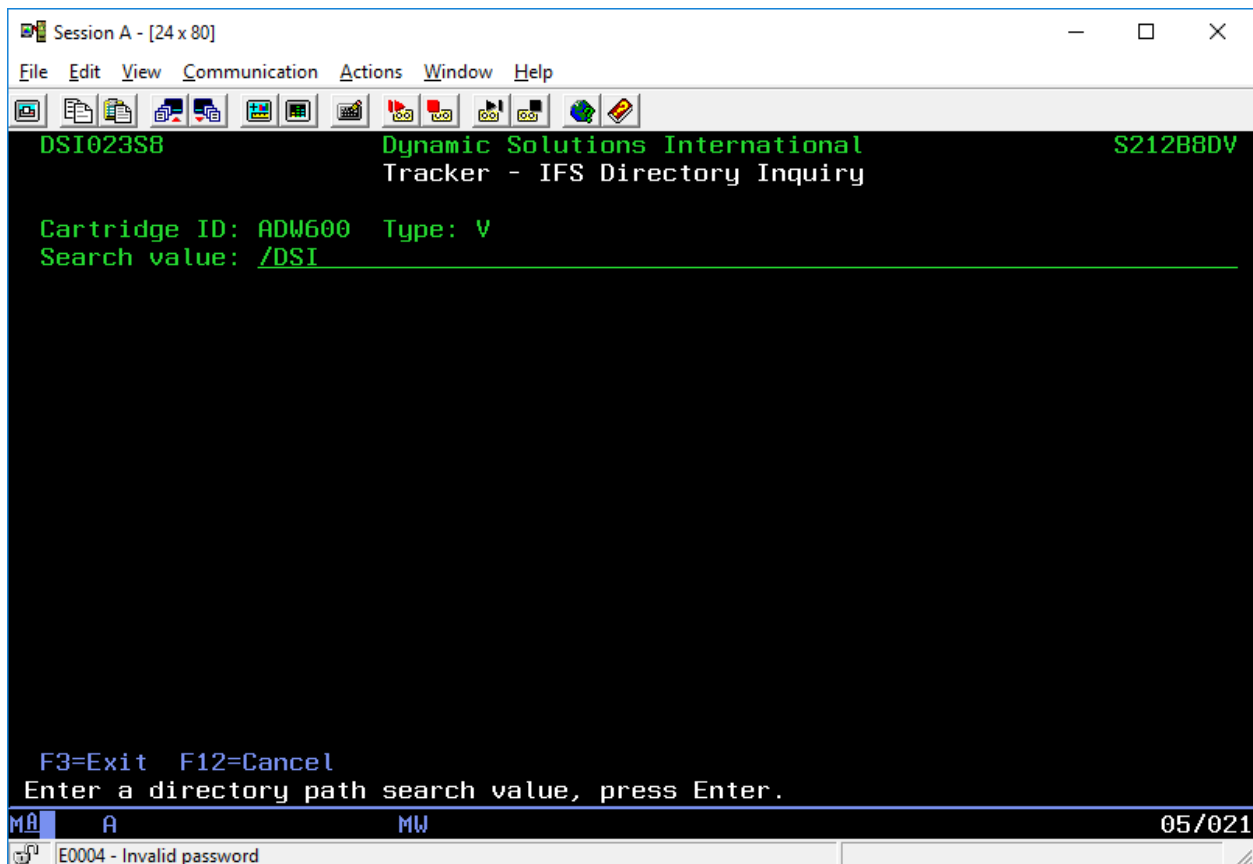


Figure 33: Searching IFS Content

To locate a specific directory, enter a directory search string that uniquely identifies the path to be interrogated. In the above example, the /DSI path is our target. Upon pressing Enter, the results panel is presented, as shown below.

**Note:** the search value is entered in CAPS; the search is not case-sensitive. Searching for /Java will return paths containing /JAVA, /Java, /java or any other combination of upper/lower case characters.

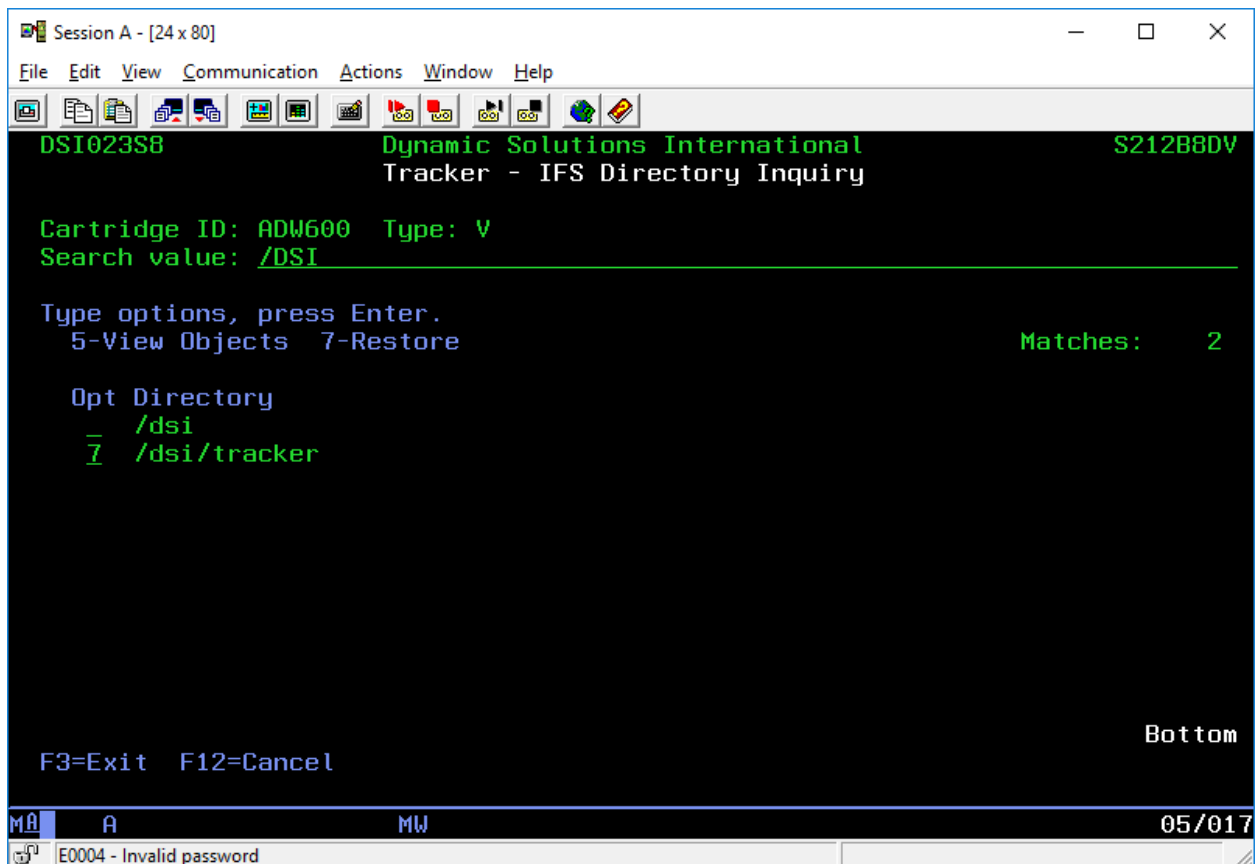


Figure 34: IFS directory search results

Each path that contains the search string will be displayed along with a count of matches. From this panel, users can either drill into directory files (discussed below) or select to restore the selected directory as shown in the image above for directory `/dsi/tracker`. The RST command for the selected path is displayed in the following image:

**Note:** *As with the other pre-formatted restore commands, alterations to the provided parameters may be required to meet specific restoration requirements.*

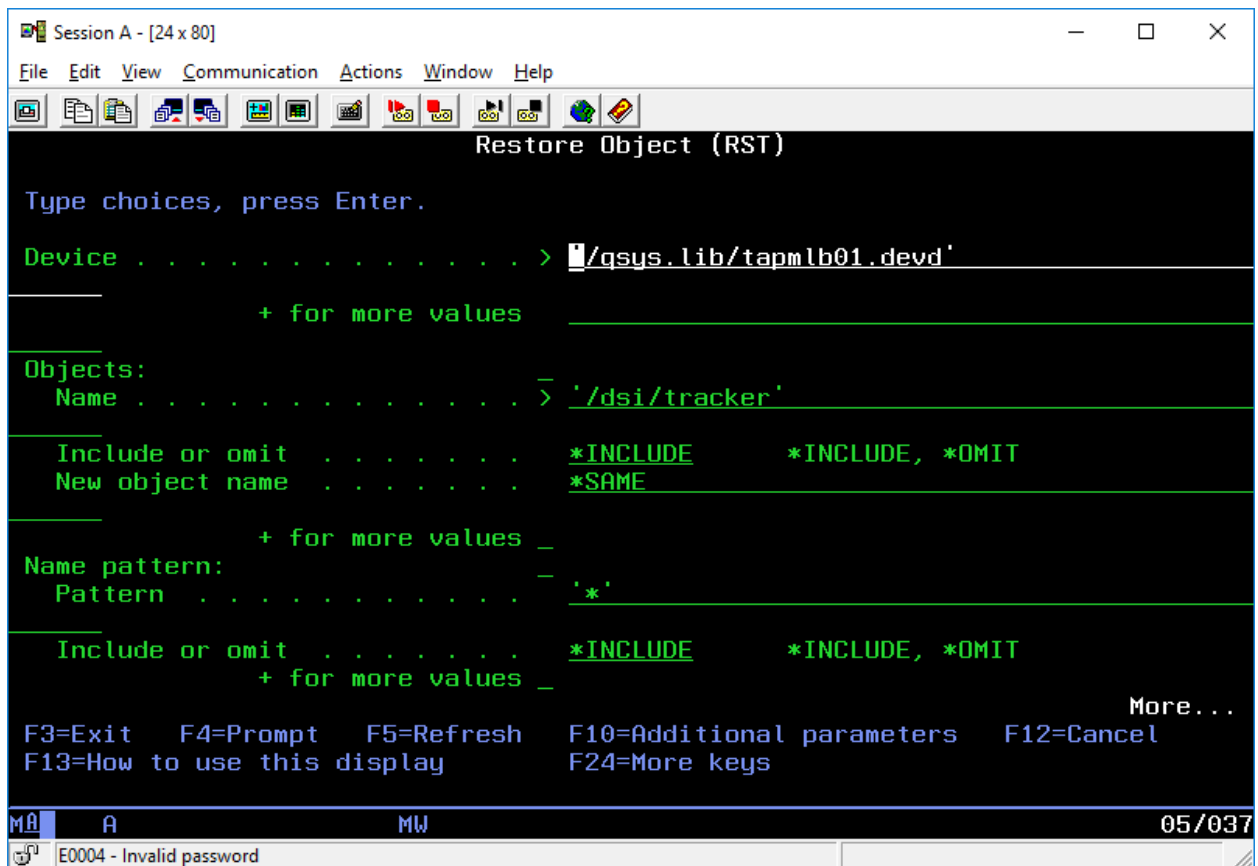


Figure 35: Restoring a Directory

To view the objects within a directory, use the 5-View option from the search results list. The following display appears:

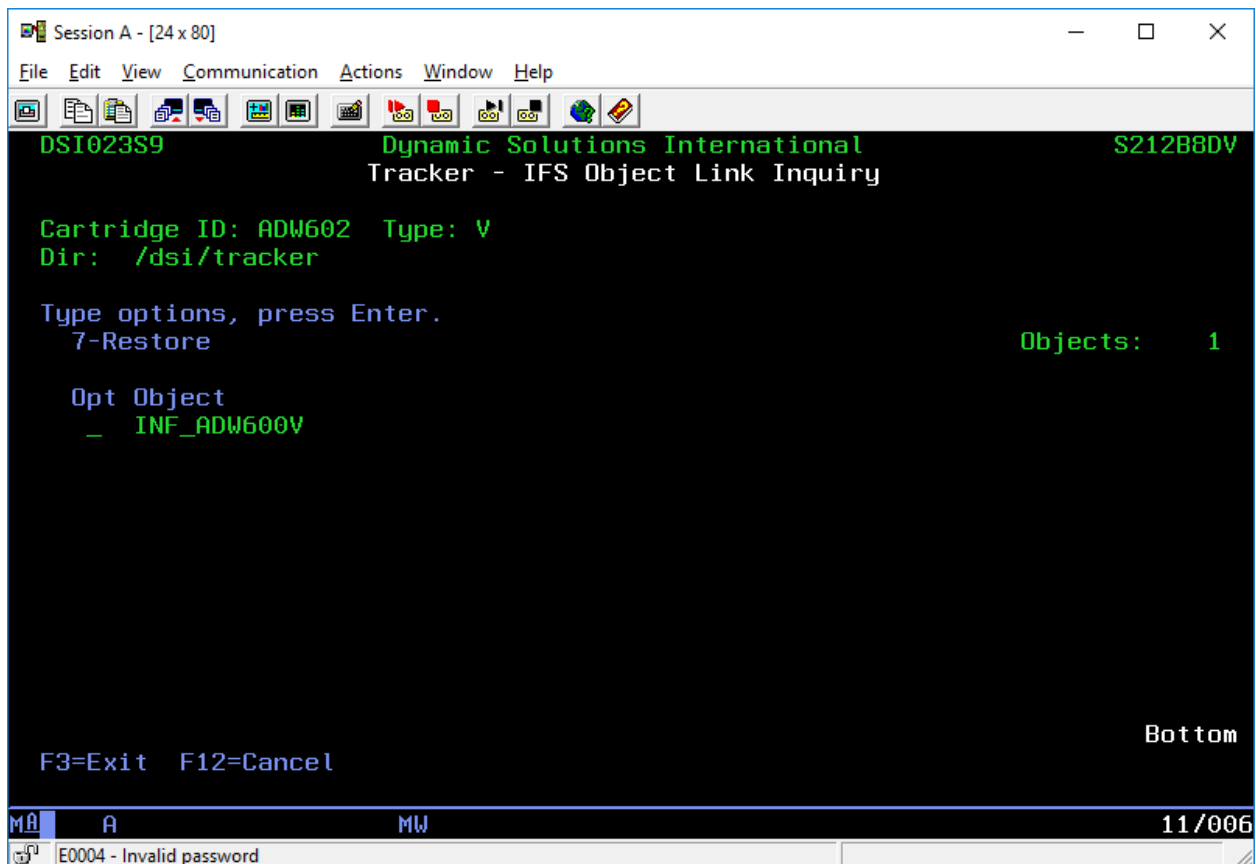


Figure 36: Directory Object View

Using option 7 from this panel produces an RST command for the specified object, as shown in the following images.

**Note:** As with the other pre-formatted restore commands, alterations to the provided parameters may be required to meet specific restoration requirements.

**Note:** Only directory objects that were successfully saved to the indicated volume will be presented. Objects that did not save are ignored.

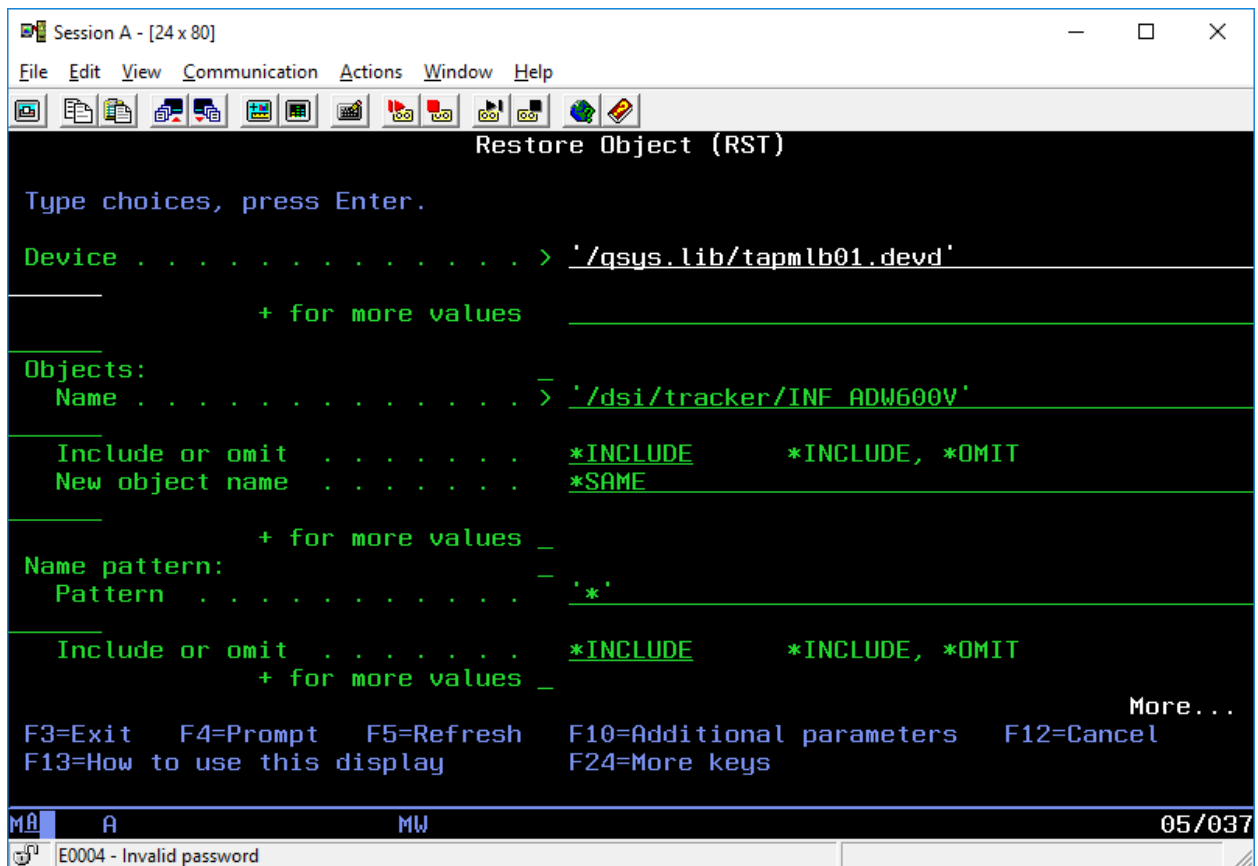


Figure 37: Directory Object Restoration, panel 1

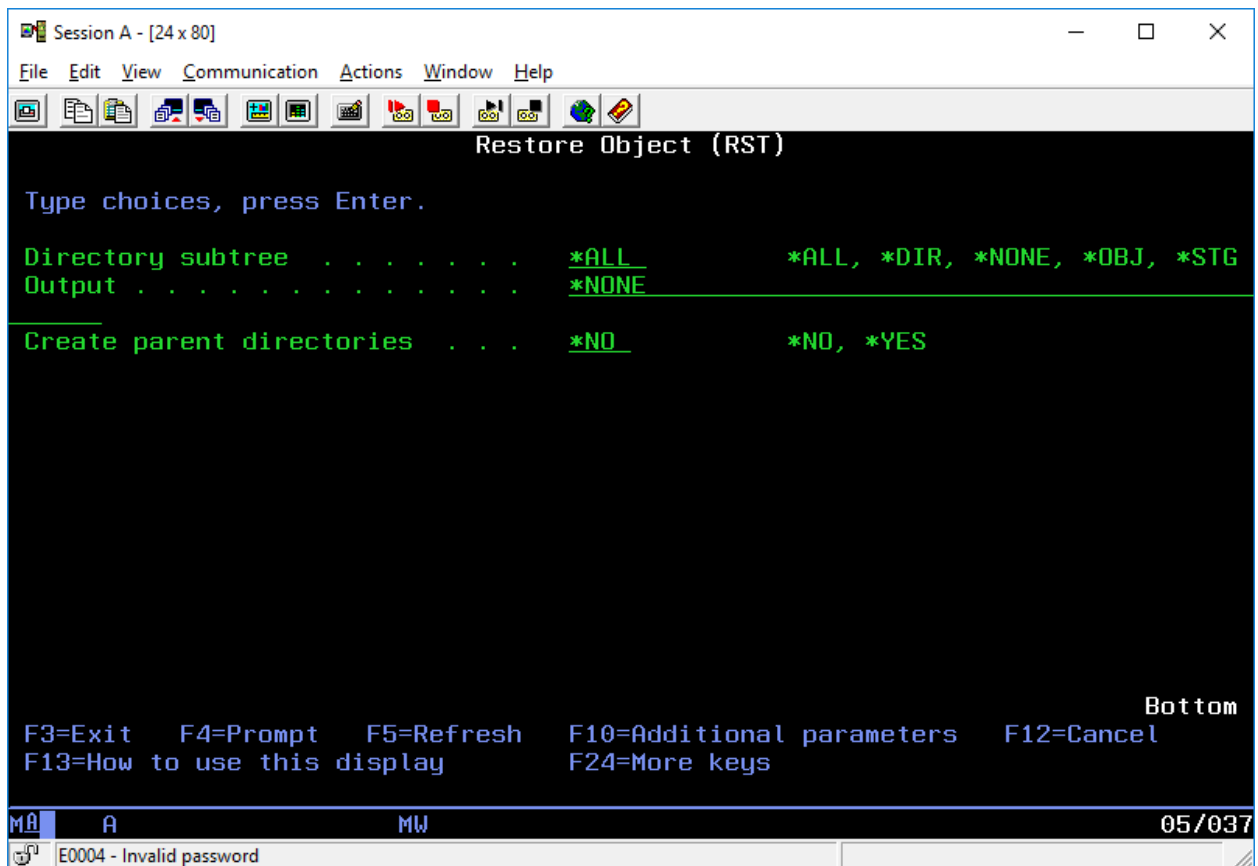


Figure 38: Directory Object Restoration, panel 2

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## 5. Media Reports

Tracker provides three media report types than can be run on-demand from the Tracker menu:

1. Media Expiration Reports
2. Media Movement Reports
3. Active Media Inventory Reports

### 5.1 Media Expiration Reports

Selecting option 16-Media Expiration Report displays the following command panel:

Session A - [24 x 80]

File Edit View Communication Actions Window Help

Expiration Report Options (EXPRPTDSI)

Type choices, press Enter.

Library Device Name . . . . . APMLB01 Character value  
Report Option . . . . . 2 1-All Pending, 2-Today Only

Bottom  
F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display  
F24=More keys

MA A MW 05/037

E0004 - Invalid password

Figure 39: Expiration Report Options

Identify the library device for which the report is to be run and the content option. This report can be generated to produce a list of all media due to expire “today”, or the report can be requested to include all media with a pending expiration date.

This report can also be run on demand from the command line or embedded in software using the form



<your Tracker library >/EXPRPTDSI LIBRARY(TAPMLBxx) OPT(1 or 2)

See the “Report Samples” section for examples of the Expiration reports.

**Note:** The daily version of this report is produced when the STRMNTDSI command is configured to run daily. See the “Commands” section for more information on the STRMNTDSI command.

## 5.2 Media Movement Reports

Selecting option 17-Media Movement Report displays the following command panel:

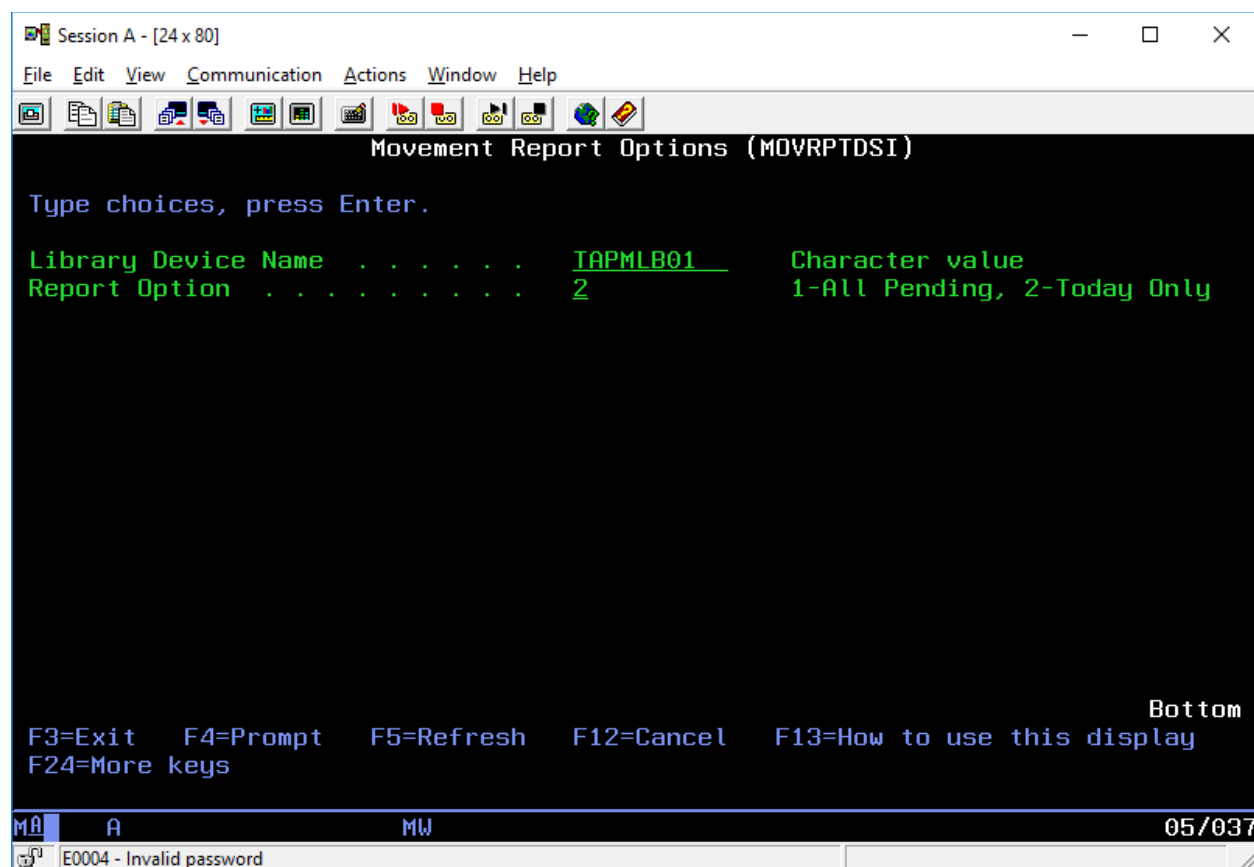


Figure 42: Movement Report Options

Identify the library device for which the report is to be run and the content option. This report can be generated to produce a list of all media due to move “today”, or the report can be requested to include all media with a pending movement date.

This report can also be run on demand from the command line or embedded in software using the form

<your Tracker library >/MOVRPTDSI LIBRARY(TAPMLBxx) OPT(1 or 2)

See the “Report Samples” section for examples of the Movement reports.

**Note:** The daily version of this report is produced when the STRMNTDSI command is configured to run daily. See the “Commands” section for more information on the STRMNTDSI command.

## 5.3 Active Media Inventory Report

Selecting option 18-Media Inventory Report displays the following command panel:

Session F - S21853DW - QPADEV0002

File Edit View Communication Actions Window Help

Media Inventory Report Options (INVRPTDSI)

Type choices, press Enter.

Library Device Name . . . . .	TAPMLB01	Character value
Sequencing . . . . .	3	1-Cart ID, 2-Type, 3-Crt Date
Current Location . . . . .	ALL	Character value

Bottom

F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display  
F24=More keys

MA F MW 07/037

10.0.100.27:23

Figure 40: Movement Report Options

Identify the library device for which the report is to be run, the desired sequence (by Cartridge ID, Media Type/Cartridge ID or by created date) and qualify the location to report.

This report can be generated to produce a list of all active library media or active media in specific locations.

---

See the “Report Samples” section for examples of the Inventory reports.

## 6. Daily Maintenance

The following command should be executed after each backup job completes.

### 6.2 Daily Maintenance Command – STRMNTDSI

The command “DSISYS/STRMNTDSI” must be executed or scheduled daily to run after the execution of daily backup job(s) in order for Tracker to resolve the backup activity and properly manage media.

When using Conductor to perform media duplications to physical media, it must be run twice; once after the backup, and once after all duplication activities have completed. If the media duplication was performed via an IBM-device configured physical library, then the command must be run for the physical library device as well after duplications complete.

This command identifies any media pending expiration and/or movement, performs data maintenance related to those activities and produces daily Media Expiration and Media Movement reports for the specified library. It also identifies and processes information for newly used media.

When Tracker is not integrated with Conductor, it is the responsibility of the user to ensure the moves indicated by the move reports occur. This is very important in ensuring scratch pools have enough expired media available to support the backup strategy.

**Command line form:** DSISYS/STRMNTDSI LIBRARY(TAPMLBxx) EXP(\*YES) MOV(\*YES)

This command can be:

- added to your Job Scheduler to run at a time after the daily backup job(s) has run, or
- embedded into and executed after the end of save commands via custom backup software that may be in place.

**Note:** *This command can be ‘split’ to run daily expiration and daily movement activities at different times, when applicable.*

**Note:** *When integrating Tracker with Conductor, and where Conductor is using automated policies to manage virtual media duplication/replication, this command should be run once post-backup without the expiration and movement options to allow tracker to determine media usage and apply category rules. At some point after the post-save duplication activities have occurred, the command should then be re-executed with the expiration and movement options to complete daily processing.*

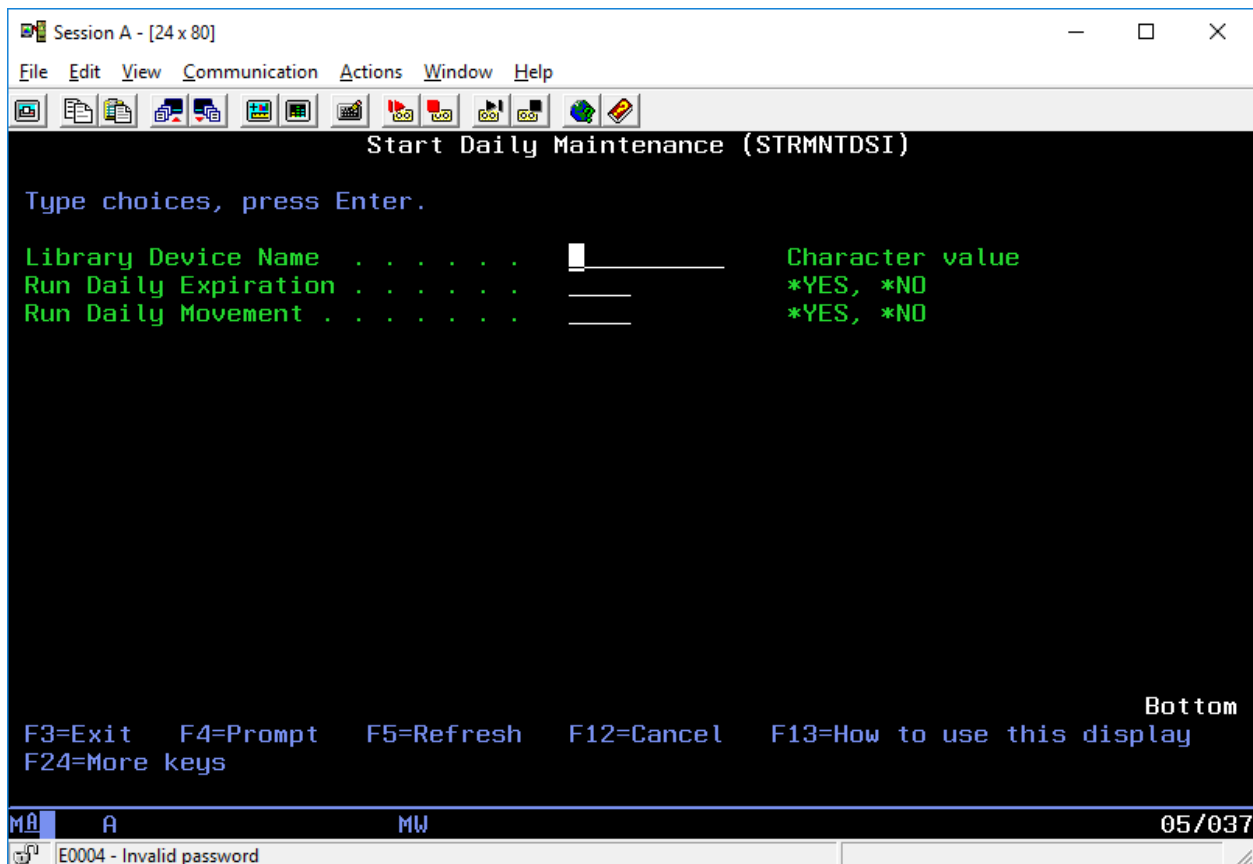


Figure 41: STRMNTDSI command prompt

## 7. Tracker APIs and Commands

Information about the commands/APIs described earlier in this document is presented here.

### 7.1 APIs

**GETEXPVOL:** The GETEXPVOL API selects an expired volume from the \*NOSHARE category, assigns the selected volume to the Tracker calendar-determined category or to the override category provided via the CATEGORY parameter and returns the selected volume serial number to the caller.

In addition, two temporary media content tables are created for each tape returned via this API. The first table listed below can be used as the target of the SAV\* command's OUTPUT option of the IBM SAV\* command (all but SAVDLO); the second table is used with the same OUTPUT parameter of the SAVDLO command. When utilizing the OUTPUT command of the applicable SAV\* command, IBM will write media content information to these files as applicable. Upon running Tracker's STRMNTDSI (daily

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maintenance) and media content information found in these files will be migrated to the media content tracking tables.

DSISYS/'SL' + VOLUME + TYPE (assuming virtual volume AAA999, save command output for library-system saves would be targeted to DSISYS/SLAAA999V.

DSISYS/'SD' + VOLUME + TYPE (e.g. DSISYS/SDAAA999V using the volume from the above example) would be the target for the SAVDLO command.

For IFS saves (i.e. the SAV command), direct the output of the command to the following file:

/dsi/tracker/INF\_AAA999V (using the AAA999 virtual volume in this example).

Usage examples of this API are available in section **8.2.2 GETEXPVOL Usage**.

**Parameters:**

DEVICE	in CHAR 10	The IBM/Tracker device name from which to select media
TYPE	in CHAR 1	The media type to select (V=Virtual, P-Physical)
CATEGORY	in CHAR 10	The Category to assign to the selected media. If blank, Tracker calendar-based categorization will be used, where available. If not, an error will be returned.
VOLSER	out CHAR 6	The volume serial selected by the API.
RETURNCODE	out CHAR1	The return value for the request: '0' - Request successful, VOLSER is returned '1' - The device name is invalid or not known to Tracker '2' - The device is not managed by Tracker. '3' - The TYPE parameter is not 'P' or 'V'. '4' - The passed TYPE does not match the library type. '5' - The passed CATEGORY is invalid. '6' - Unable to determine the Tracker daily category. '7' - Error updating media database '8' - Failed to assign Category to Media ( check the device ) '9' - No expired *NOSHARE media is available 'A' - The API was unable to add the required library to the library list. 'B' - One or more of the parameters are missing references. 'C' - Unable to Lock API 'D' - Resource unavailable

**Usage:** CALL DSISYS/GETEXPVOL PARM(&DEVICE &TYPE &CATEGORY &VOLSER &RETURNCODE)

**GETEXPVOLP:** The GETEXPVOLP API extends the GETEXPVOL API by allowing the user to select the scratch pool from which media will be selected. Apart from this additional parameter, it functions

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exactly as the GETEXPVOL API. It selects an expired volume from the desired scratch category, assigns the selected volume to the Tracker calendar-determined category or to the override category provided via the CATEGORY parameter and returns the selected volume serial number to the caller.

In addition, two temporary media content tables are created for each tape returned via this API. The first table listed below can be used as the target of the SAV\* command's OUTPUT option of the IBM SAV\* command (all but SAVDLO); the second table is used with the same OUTPUT parameter of the SAVDLO command. When utilizing the OUTPUT command of the applicable SAV\* command, IBM will write media content information to these files as applicable. Upon running Tracker's STRMNTDSI (daily maintenance) and media content information found in these files will be migrated to the media content tracking tables.

DSISYS/'SL' + VOLUME + TYPE (assuming virtual volume AAA999, save command output for library-system saves would be targeted to DSISYS/SLAAA999V.

DSISYS/'SD' + VOLUME + TYPE (e.g. DSISYS/SDAAA999V using the volume from the above example) would be the target for the SAVDLO command.

For IFS saves (i.e. the SAV command), direct the output of the command to the following file:  
/dsi/tracker/INF\_AAA999V (using the AAA999 virtual volume in this example).

Usage examples of this API are available in section **8.2.3 GETEXPVOLP Usage**.

**Parameters:**

DEVICE	in CHAR 10	The IBM/Tracker device name from which to select media
TYPE	in CHAR 1	The media type to select (V=Virtual, P-Physical)
SCATEGORY	in CHAR 10	The scratch category from which media will be selected.
CATEGORY	in CHAR 10	The Category to assign to the selected media. If blank, Tracker calendar-based categorization will be used, where available. If not, an error will be returned.
VOLSER	out CHAR 6	The volume serial selected by the API.
RETURNCODE	out CHAR1	The return value for the request: '0' - Request successful, VOLSER is returned '1' - The device name is invalid or not known to Tracker '2' - The device is not managed by Tracker. '3' - The TYPE parameter is not 'P' or 'V'. '4' - The passed TYPE does not match the library type. '5' - The passed CATEGORY is invalid. '6' - Unable to determine the Tracker daily category. '7' - Error updating media database '8' - Failed to assign Category to Media ( check the device )

---

'9' – No expired \*NOSHARE media is available  
'A' - The API was unable to add the required library to the library list.  
'B' – One or more of the parameters are missing references.  
'C' - Unable to Lock API  
'D' - Resource unavailable

**Usage:** CALL DSISYS/GETEXPVOLP PARM(&DEVICE &TYPE &SCATEGORY &CATEGORY &VOLSER  
&RETURNCODE)

## 7.2 Commands

Command-produced reports will be delivered to the OUTQ defined for the job running the report.

**EXPRPTDSI** – Produce the daily or comprehensive media expiration report.

Form: DSISYS/EXPRTPDSI LIBRARY(TAPMLBxx) OPT(x)

Where:

LIBRARY:        your library device name.

OPT:            1 indicates all media pending expiration should be reported; 2 indicates only media expiring “today” are reported. If an invalid option is presented, the software will default to option 2.

\*ESCAPE messages:

ERR1019: The library device specified does not exist or is not current active.

**INVRPTDSI** – Produce the Active Media Inventory Report.

Form: DSISYS/INVRPTDSI LIBRARY(TAPMLBxx) SEQUENCE(x) LOCATION(xxxxxxxxxx)

Where:

LIBRARY:        your library device name.

SEQUENCE:      1 – Cart ID 2- Media Type, Cart ID 3-Create Date. If an invalid sequence code is presented, the software will default to sequence 2.

---

LOCATION:      \*ALL to indicate all media locations; use a specific location to filter the report.

\*ESCAPE messages:

ERR1019: The library device specified does not exist or is not current active.

ERR1021: The location must be \*ALL or a defined location.

## **MOVRPTDSI** – Produce the Media Movement Report.

Form: DSISYS/EXPRTDPSI LIBRARY(TAPMLBxx) OPT(x)

Where:

LIBRARY:      your library device name.

OPT:            1 indicates all media pending expiration should be reported; 2 indicates only media moving “today” are reported. If an invalid option is presented, the software will default to option 2.

\*ESCAPE messages:

ERR1019: The library device specified does not exist or is not current active.

**SETCGYDSI** – When using default/non-default settings in the Category Rules definition, the SETCGYDSI command should be executed once prior to the beginning of daily backup activities. It is critical this command be scheduled to run the same date as the subsequent backup job or activity is to occur. For example, if backups are scheduled to run exactly at 00:00 (Midnight), then the backups should be pushed back a minute or two and a new scheduled job to execute this command should be run on or just after midnight.

Form: DSISYS/SETCGYDSI LIBRARY(TAPMLBxx) (use your device name for the library to be managed in the “library” prompt.

**Note:** *If manual use of the library with the categorization capability is desired while the SETCGYDSI is scheduled and active, use of the \*DEMOUNTED and then \*MOUNTED options of the IBM SETTAPCGY command should be executed manually before the ad-hoc save activity occurs.*



---

**Note:** *If this command is executed without default/non-default categories having been configured, it will take no action and issue messages to the caller and to the \*SYSOPR message queue indicating an invalid usage has been specified.*

\*ESCAPE messages:

ERR1019: The library device specified does not exist or is not current active (in Tracker).

**STRMNTDSI** – This command executes daily maintenance activities related to media expiration and media movement.

When **Conductor** is installed, to ensure **Conductor**-produced physical media moves the day it is created, execute this command after **Conductor**'s post-processing has completed, where applicable. Tracker will not move media that has pending **Conductor** activity.

**Note:** *this command can be scheduled or executed to do expiration and movement processing at different times.*

Form: DSISYS/STRMNTDSI LIBRARY(TAPMLBxx) EXP(yyyy) MOV(yyyy)

Where:

LIBRARY:        your library device name.

EXP:            \*YES – run media expiration processing/reports; \*NO – do not run processing/reports.

MOV:            \*YES – run media movement processing/reports; \*NO – do not run processing/reports.

\*ESCAPE messages:

None anticipated.

## 8. Appendix

### 8.1. Sample Reports

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There are three printed report types available from the Tracker application: expiration reports, movement reports and the inventory report.

**Media Pending Expiration Report:** This report can be requested to run to identify media expiring today or for all media pending expiration. Each report is specific to a library. Daily expiration reporting is created automatically when using the STRMNTDSI command to perform expiration activities.

```
MEDEXPRPT                      DSI MEDIA TRACKER                      Run Date: 10/28/16
                                MEDIA PENDING EXPIRATION REPORT      Run Time: 10:59:49
DEVICE: TAPMLB01                                           Page Nbr: 0001

Cartridge ID Media Type Scratch Category Current Category Chg Date Exp Date
ADW606        V          *NOSHARE          VRTRETAIN      10/28/16  10/31/16
*** End of Report ***
```

Figure 42: Expiration Report Example

**Media Pending Movement Report:** This report can be requested to run to identify media moving today or for all media pending movement. Each report is specific to a library. Daily movement reporting is created automatically when using the STRMNTDSI command to perform movement activities.

```
MEIMOVPRPT                      DSI MEDIA TRACKER                      Run Date: 10/28/16
                                DAILY MEDIA MOVEMENT REPORT        Run Time: 10:59:49
DEVICE: TAPMLB01                                           Page Nbr: 0001

Cartridge ID Media Type Current Category Chg Date Expired? Exp Date Curr Locn Next Locn Move Date Locn End Date Move Type
ADW606        V          VRTRETAIN      10/28/16      N      10/31/16 TAPMLB01 VAULT      10/28/16  10/31/16 *MANUAL
*** End of Report ***
```

Figure 43: Movement Report Example

**Media Inventory Report:** This report lists the current state of all active media for a library, with the most recently used media shown at the top of the report.

MEDINVRPT		DSI MEDIA TRACKER				Run Date: 10/28/16			
		LIBRARY MEDIA INVENTORY REPORT				Run Time: 11:10:04			
DEVICE: TARM1B01		SEQUENCE: Media Type		LOCATION: *ALL		Page Nbr: 0001			
Cart ID	Volume ID	Media Type	Home Category	Current Category	Chg Date	Expired?	Exp Date	Curr Locn	Media Status
ADW600	ADW600	V	*NOSHARE	*NOSHARE	10/27/16	Y	*NONE	TARM1B01	*AVAILABLE
ADW601	ADW601	V	*NOSHARE	*NOSHARE	10/27/16	Y	*NONE	TARM1B01	*AVAILABLE
ADW602	ADW602	V	*NOSHARE	*NOSHARE	10/27/16	Y	*NONE	TARM1B01	*AVAILABLE
ADW603	ADW603	V	*NOSHARE	*NOSHARE	10/27/16	Y	*NONE	TARM1B01	*AVAILABLE
ADW604	ADW604	V	*NOSHARE	*NOSHARE	10/28/16	Y	*NONE	TARM1B01	*AVAILABLE
ADW605	ADW605	V	*NOSHARE	*NOSHARE	10/28/16	Y	*NONE	TARM1B01	*AVAILABLE
ADW606	ADW606	V	*NOSHARE	VRTRETAIN	10/28/16	N	10/31/16	VAULT	*AVAILABLE
ADW607	ADW607	V	*NOSHARE	*NOSHARE	10/28/16	Y	*NONE	TARM1B01	*AVAILABLE
ADW608	ADW608	V	*NOSHARE	*NOSHARE	10/28/16	Y	*NONE	TARM1B01	*AVAILABLE
ADW609	ADW609	V	*NOSHARE	*NOSHARE	10/28/16	Y	*NONE	TARM1B01	*AVAILABLE
*** End of Report ***									

Figure 44: Inventory Report Example

**Category Property Report:** This report provided usage and other properties of media categories, including scheduling information for retention categories, when applicable.

MEDCGYRPT		Dynamic Solutions International				Run Date: 7/10/20			
QSECOFR		Media Category Report				Run Time:			
Category	Usage	Cur Count	Pool Count	Ret Type/Value	Move Rule	Dft Category	Category Dates		
*CNV	*SCRATCH								
*EJECT	*SCRATCH								
*INSERT	*SCRATCH								
*IPL	*SCRATCH								
*NL	*SCRATCH								
*NOSHARE	*SCRATCH	25	17						
*SHARE400	*SCRATCH								
*SYSGEN	*SCRATCH								
ANNUAL	*RETAIN			*DAYS 000365		N			
DAILY	*RETAIN		7	*DAYS 000007		Y			
MONTHLY	*RETAIN		1	*DAYS 000032		N			
							2020-07-31	2020-08-31	2020-09-30
							2020-10-31	2020-11-30	2020-12-31

**Media Information Report:** This report provides media attributes for the current media view in the Media Maintenance UI.

Selection Criteria:

Library: *ALL		Media Type: *ALL		Location: *ALL		Current Category: *ALL		Expired: *ALL	
<u>Cart ID</u>	<u>Volume</u>	<u>Media Type</u>	<u>Changed</u>	<u>Expires</u>	<u>Scratch Cgy</u>	<u>Current Cgy</u>	<u>Location</u>	<u>Next Location/Date</u>	
P8F000	P8F000	*VIRTUAL	20/06/25	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F001	P8F001	*VIRTUAL	20/06/26	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F002	P8F002	*VIRTUAL	20/06/27	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F003	P8F003	*VIRTUAL	20/06/28	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F004	P8F004	*VIRTUAL	20/06/29	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F005	P8F005	*VIRTUAL	20/07/07	20/07/14	*NOSHARE	DAILY	VAULT	TAPMLB01	20/07/13
P8F006	P8F006	*VIRTUAL	20/06/30	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F007	P8F007	*VIRTUAL	20/07/03	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F008	P8F008	*VIRTUAL	20/07/01	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F009	P8F009	*VIRTUAL	20/07/02	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F010	P8F010	*VIRTUAL	20/07/03	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F011	P8F011	*VIRTUAL	20/07/08	20/07/15	*NOSHARE	DAILY	VAULT	TAPMLB01	20/07/14
P8F012	P8F012	*VIRTUAL	20/07/04	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F013	P8F013	*VIRTUAL	20/07/05	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F014	P8F014	*VIRTUAL	20/07/06	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F015	P8F015	*VIRTUAL	20/07/07	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F016	P8F016	*VIRTUAL	20/07/09	20/07/16	*NOSHARE	DAILY	VAULT	TAPMLB01	20/07/15
P8F017	P8F017	*VIRTUAL	20/07/10	20/07/17	*NOSHARE	DAILY	VAULT	TAPMLB01	20/07/16
P8F018	P8F018	*VIRTUAL	20/06/23	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F019	P8F019	*VIRTUAL	20/07/01	20/08/02	*NOSHARE	MONTHLY	VAULT	TAPMLB01	20/08/01
P8F020	P8F020	*VIRTUAL	20/07/09	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F021	P8F021	*VIRTUAL	20/07/10	*NONE	*NOSHARE	*NOSHARE	TAPMLB01	*NONE	*NONE
P8F022	P8F022	*VIRTUAL	20/07/04	20/07/11	*NOSHARE	DAILY	TAPMLB01	*NONE	*NONE
P8F023	P8F023	*VIRTUAL	20/07/05	20/07/12	*NOSHARE	DAILY	VAULT	TAPMLB01	20/07/11
P8F024	P8F024	*VIRTUAL	20/07/06	20/07/13	*NOSHARE	DAILY	VAULT	TAPMLB01	20/07/12

\*\*\* End of Report \*\*\*

## 8.2 Tracker Usage Examples

### 8.2.1 SETCGYDSI usage

The following source code represents a CLLE program that indicates how to:

1. Use the SETTAPCGY command to manage the virtual library and media
  - a. See the IBM i command reference for more information on use of the SETTAPCGY command.
2. Use DSI's SETCGYDSI command to automate media categorization as per configuration.
3. Alter the various SAV\* commands to write save information to the tracker database/IFS directory;
4. Execute the STRMNTDSI command after the backup completes to process newly written media.

```
/* **** */
/* Sample program source indicating how to adapt IBM SAV* commands */
/* and integrate Tracker commands into save activities. */
/* **** */
```

---

```

/* SETCGYDSI/STRMNTDSI commands may also be scheduled or executed */
/* on-demand via the command line */
/*****

    PGM          PARM(&LIBRARY)

    DCL          VAR(&LIBRARY) TYPE(*CHAR) LEN(10)

    /* SAVSYS: Load Media from the *NOSHARE category */
    /* Assign selected media to the *IPL category */
    /* Retrieve media in cart seq if possible */

    SETTAPCGY    DEV(&LIBRARY) OPTION(*MOUNTED) +
                CGY(*NOSHARE) CTGORDER(*NEXTAVAIL) +
                TGTCGY(*IPL)

    /* Sample SAVSYS media content output example */

    SAVSYS       DEV(&LIBRARY) ENDOPT(*UNLOAD) +
                OUTPUT(*OUTFILE) +
                OUTFILE(DSISYS/QASAVOBJD) OUTMBR(*FIRST +
                *ADD)

    /* DE-MOUNT THE *IPL CATEGORY */

    SETTAPCGY    DEV(&LIBRARY) OPTION(*DEMOUNTED)

    /* Mount the *NOSHARE category */
    /* Assign selected media to the VRTRETAIN category */
    /* Select media in the order it was added to the cgy */

    SETTAPCGY    DEV(&LIBRARY) OPTION(*MOUNTED) CGY(*NOSHARE) +
                CTGORDER(*SEQ) TGTCGY(VRTRETAIN)

    /* Alternative: Use the SETCGYDSI command */
    /* When using category dates in category rules defs */
    /* to auto-mount the daily category */

    SETCGYDSI    DEV(&LIBRARY)

    /* SAVLIB media content output example */

    SAVLIB       LIB(*NONSYS) DEV(&LIBRARY) +
                ENDOPT(*LEAVE) +
                OUTPUT(*OUTFILE) +
                OUTFILE(DSISYS/QASAVOBJD) OUTMBR(*FIRST +
                *ADD) INFTYPE(*MBR)

    /* Note all SAV* commands excepting the SAVDLO and SAV */
    /* use the same target content table ( QASAVOBJD ) */

    /* DLO media content output example */
    /* NOTE DLO output to a different target file */

```

---

```

SAVDLO      DLO(*ALL) DEV(&LIBRARY) ENDOPT(*LEAVE) +
            OUTPUT(*OUTFILE) +
            OUTFILE(DSISYS/QAOJSAVOD) OUTMBR(*FIRST +
            *ADD)

/* IFS media content example          */
/* output written to binary streamfile */
/* /dsi/tracker/INF_IFS                */

SAV  DEV('/qsys.lib/' *CAT &LIBRARY *TCAT '.devd') OBJ(('/' *') +
      ('/QDLS' *OMIT) ('/QSYS.LIB' *OMIT)) +
      OUTPUT('/dsi/tracker/INF_IFS') +
      ENDOPT(*UNLOAD)

/* De-mount the *NOSHARE Category      */

SETTAPCGY  DEV(&LIBRARY) OPTION(*DEMOUNTED)

/* Tracker Maintenance Integration      */

/* Executes media expiration and movement */
/* Produces expiration and movement rpts */
/* Identifies/processes newly used media */

/* When CONDUCTOR is installed and is    */
/* managing the library the command will  */
/* automate virtual media movement, if    */
/* applicable.                            */

/* When CONDUCTOR is installed, is        */
/* managing the library and there are      */
/* automated duplication policies defined  */
/* for applicable categories, movement     */
/* for media of those categories cannot    */
/* not be performed until Conductor has    */
/* completed post-processing activities.    */
/* The command should be re-executed for   */
/* movement after post-processing has      */
/* completed to ensure virtual and/or     */
/* physical media produced "today" move    */
/* "today".                                */

DSISYS/STRMNTDSI LIBRARY(&LIBRARY) EXP(*YES) MOV(*YES)

END:      ENDPGM

```

## 8.2.2 GETEXPVOL usage

The following source code represents a CLLE program that indicates how to:

1. Use the GETEXPVOL API to select, categorize and return a volume to be used by a backup script.

2. Alter the various SAV\* commands to write save information to the tracker database/IFS directory and use the selected media;
3. Execute the STRMNTDSI command after the backup completes to process newly written media.

Note: This API will always attempt to retrieve an expired volume from the \*NOSHARE category.

```

/*****
/* Sample program source indicating how to adapt IBM SAV* commands */
/* and integrate Tracker commands into save activities. */
/*
/* The GETEXPVOL API must be run from within a program */
*****/

      PGM          PARM(&LIBRARY &CATEGORY)

      DCL          VAR(&LIBRARY)  TYPE(*CHAR)  LEN(10)
      DCL          VAR(&CATEGORY) TYPE(*CHAR)  LEN(10)
      DCL          VAR(&TYPE)     TYPE(*CHAR)  LEN(1)  VALUE('V')
      DCL          VAR(&VOLSER)   TYPE(*CHAR)  LEN(6)
      DCL          VAR(&RETCOD)   TYPE(*CHAR)  LEN(1)

      /* SAVSYS: Load Media from the *NOSHARE category */
      /* Assign selected media to the passed category */
      /* If passed CATEGORY blank, use daily category */

      CALL          PGM(DSISYS/GETEXPVOL) PARM(&LIBRARY &TYPE +
                                          &CATEGORY &VOLSER &RETCOD)

      IF COND(&RETCOD *NE '0') THEN(DO)
      /* some error handling */
      SNDMSG MSG('Unable to locate a *NOSHARE volume in +
                  expired status. Function returned' *CAT +
                  &RETCOD *CAT '.') TOUSR(*SYSOPR)
      GOTO CMDLBL(END)
      ENDDO

      /* Sample SAVSYS w/media content output example */

      SAVSYS        DEV(TAPMBL01) VOL(&VOLSER) ENDOPT(*LEAVE) +
                  OUTPUT(*OUTFILE) OUTFILE(DSISYS/('SL' +
                  *CAT &VOLSER *CAT &TYPE))

      /* SAVLIB media content output example */

      SAVLIB        LIB(*NONSYS) DEV(&LIBRARY) +
                  VOL(&VOLSER) ENDOPT(*LEAVE) +
                  OUTPUT(*OUTFILE) +
                  OUTFILE(DSISYS/('SL' +

```

---

```

        *CAT &VOLSER *CAT &TYPE)) OUTMBR(*FIRST +
        *ADD) INFTYPE(*MBR)

/* DLO media content output example */
/* NOTE DLO output to a different target file */

SAVDLO      DLO(*ALL) DEV(&LIBRARY) ENDOPT(*LEAVE) +
             OUTPUT(*OUTFILE) VOL(&VOLSER) +
             OUTFILE(DSYS/('SD' +
             *CAT &VOLSER *CAT &TYPE)) OUTMBR(*FIRST +
             *ADD)

/* IFS media content example          */
/* output written to binary streamfile */
/* /dsi/tracker/INF_VOL+TYPE          */

SAV          DEV('/qsys.lib/' *CAT &LIBRARY *TCAT +
                '.DEV') OBJ('/*' ('/QDLS' *OMIT) +
                ('/QSYS.LIB' *OMIT)) SAVACT(*YES) +
                OUTPUT('/dsi/tracker/INF_' *CAT &VOLSER +
                *CAT &TYPE) VOL(&VOLSER) ENDOPT(*UNLOAD)

/* Tracker Command Integration        */

/* Executes media expiration and movement */
/* Produces expiration and movement rpts */
/* Identifies/processes newly used media */

/* When CONDUCTOR is installed and is    */
/* managing the library, the command will */
/* automate virtual media movement, if    */
/* applicable.                            */

/* When CONDUCTOR is installed, is        */
/* managing the library and there are      */
/* automated duplication policies defined */
/* for applicable categories, movement    */
/* for media of those categories cannot   */
/* not be performed until Conductor has   */
/* completed post-processing activities.   */
/* This command should be re-executed for */
/* movement after post-processing has     */
/* completed to ensure virtual and/or     */
/* physical media produced "today" move   */
/* "today".                               */

/* When running concurrent backups using */
/* this API, it is recommended that the   */
/* STRMNTDSI command be executed once at  */
/* the end of the backup window instead   */
/* of inline, as shown here               */

DSISYS/STRMNTDSI LIBRARY(&LIBRARY) EXP(*YES) MOV(*YES)

END:      ENDPGM

```

---



---

### 8.2.3 GETEXPVOLP usage

The following source code represents a CLLE program that indicates how to:

1. Use the GETEXPVOLP API to select, categorize and return a volume to be used by a backup script. The scratch pool from which tapes will be selected is passed in &SCATEGORY; the retention category to assign to the tape will be found in &CATEGORY
  - a. If &CATEGORY is blank, the API will attempt to assign the Tracker-defined daily category to the selected media.
2. Alter the various SAV\* commands to write save information to the tracker database/IFS directory and use the selected media;
3. Execute the STRMNTDSI command after the backup completes to process newly written media.

```
/* **** */
/* Sample program source indicating how to adapt IBM SAV* commands */
/* and integrate Tracker commands into save activities. */
/* **** */
/* The GETEXPVOL API must be run from within a program */
/* **** */

PGM          PARM(&LIBRARY &SCATEGORY &CATEGORY)

DCL          VAR(&LIBRARY)  TYPE(*CHAR)  LEN(10)
DCL          VAR(&SCATEGORY) TYPE(*CHAR)  LEN(10)
DCL          VAR(&CATEGORY) TYPE(*CHAR)  LEN(10)
DCL          VAR(&TYPE)     TYPE(*CHAR)  LEN(1)  VALUE('V')
DCL          VAR(&VOLSER)   TYPE(*CHAR)  LEN(6)
DCL          VAR(&RETCOD)   TYPE(*CHAR)  LEN(1)

/* SAVSYS: Load Media from the &SCATEGORY category */
/* Assign selected media to the &CATEGORY category */
/* If passed &CATEGORY blank, use daily category */

CALL         PGM(DSISYS/GETEXPVOLP) PARM(&LIBRARY &TYPE +
                                         &SCATEGORY &CATEGORY &VOLSER &RETCOD)

IF COND(&RETCOD *NE '0') THEN(DO)
/* some error handling */
  SNDMSG MSG('Unable to locate a volume in +
              expired status. Function returned' *CAT +
              &RETCOD *CAT '.') TOUSR(*SYSOPR)
  GOTO CMDLBL(END)
ENDDO

/* Sample SAVSYS w/media content output example */

SAVSYS      DEV(TAPMBL01) VOL(&VOLSER) ENDOPT(*LEAVE) +
```

---

```

        OUTPUT(*OUTFILE)  OUTFILE(DSISYS/('SL' +
        *CAT &VOLSER *CAT &TYPE))

/* SAVLIB media content output example */

SAVLIB      LIB(*NONSYS) DEV(&LIBRARY) +
            VOL(&VOLSER) ENDOPT(*LEAVE) +
            OUTPUT(*OUTFILE) +
            OUTFILE(DSISYS/('SL' +
            *CAT &VOLSER *CAT &TYPE)) OUTMBR(*FIRST +
            *ADD) INFTYPE(*MBR)

/* DLO media content output example */
/* NOTE DLO output to a different target file */

SAVDLO      DLO(*ALL) DEV(&LIBRARY) ENDOPT(*LEAVE) +
            OUTPUT(*OUTFILE) VOL(&VOLSER) +
            OUTFILE(DSISYS/('SD' +
            *CAT &VOLSER *CAT &TYPE)) OUTMBR(*FIRST +
            *ADD)

/* IFS media content example          */
/* output written to binary streamfile */
/* /dsi/tracker/INF_VOL+TYPE          */

SAV          DEV('/qsys.lib/' *CAT &LIBRARY *TCAT +
            '.DEV') OBJ('//*') ('/QDLS' *OMIT) +
            ('/QSYS.LIB' *OMIT) SAVACT(*YES) +
            OUTPUT('/dsi/tracker/INF_' *CAT &VOLSER +
            *CAT &TYPE) VOL(&VOLSER) ENDOPT(*UNLOAD)

/* Tracker Command Integration          */

/* Executes media expiration and movement */
/* Produces expiration and movement rpts */
/* Identifies/processes newly used media */

/* When CONDUCTOR is installed and is */
/* managing the library, the command will */
/* automate virtual media movement, if */
/* applicable.                          */

/* When CONDUCTOR is installed, is */
/* managing the library and there are */
/* automated duplication policies defined */
/* for applicable categories, movement */
/* for media of those categories cannot */
/* not be performed until Conductor has */
/* completed post-processing activities. */
/* This command should be re-executed for */
/* movement after post-processing has */
/* completed to ensure virtual and/or */
/* physical media produced "today" move */
/* "today".                            */

```

---

---

```
/* When running concurrent backups using */  
/* this API, it is recommended that the */  
/* STRMNTDSI command be executed once at */  
/* the end of the backup window instead */  
/* of inline, as shown here */
```

```
DSISYS/STRMNTDSI LIBRARY(&LIBRARY) EXP(*YES) MOV(*YES)
```

```
END:      ENDPGM
```