



Global Media Management for the HP NonStop OS

Qtos Automated Media Management

QTOSCOM

User Interface

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PREFACE

This book is intended primarily for the operators of the QTOS Tape Management and operations system.

Some highlights discussed in this manual are:

- Starting and Stopping QTOS
- Performing Backups and Restores
- Queuing jobs for Backup or Restore
- Allocating tapes and DATA SETS to job run outside of QTOS
- Displaying Status of tape drives
- Displaying status of jobs
- Performing Backups and Restores on OSS and SQL/MX objects

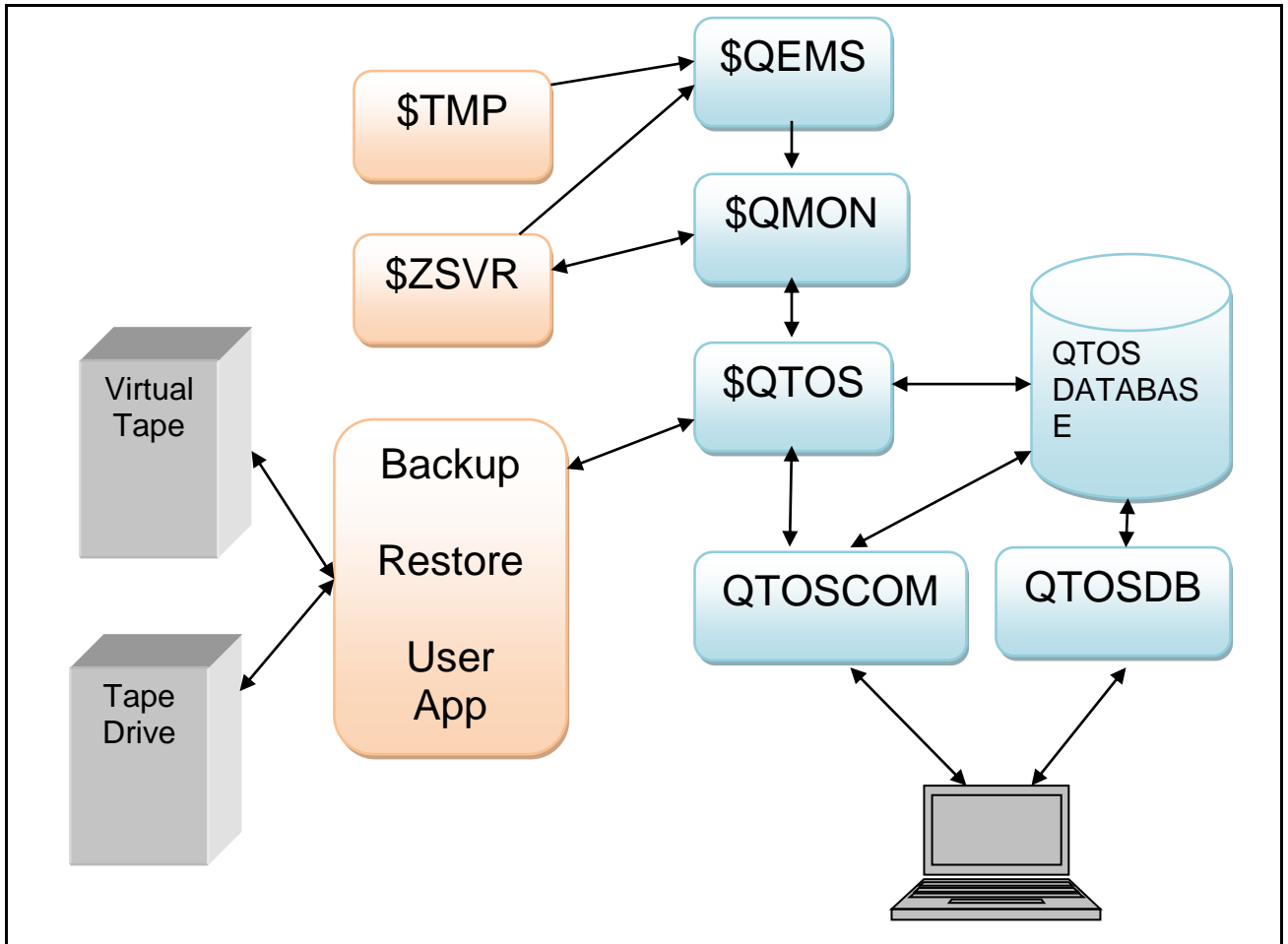
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QTOSCOM OVERVIEW



QTOS PROCESS FLOW

QTOSCOM is the user interface to \$QTOS.

The functions performed through QTOSCOM are:

1. Start and stop the Qtos subsystem.
2. Start and control processes that read or write tapes (physical or virtual), such as Backup, Restore, Pak and User Apps.
3. Control access to Tape Resources.
4. Display status of processes, mount requests and Qtos internal components.
5. Search and display the Qtos database records.

QTOSCOM can be used as a line mode utility to initiate ad hoc commands or it can be used in a batch file to control the scheduling of backups. When used as an element in a batch job, qtoscom doesn't return control until the operation, usually backup, is completed. Qtoscom passes the completion code to the calling batch process to indicate success or failure when the backup process ends.

TMF/QTOS INTERFACE

QTOS is configured to trace TMF tapes by updating the CATALOG TMF field of the SYSTEM CONTROL screen in QTOSDB. QTOS monitors TMF activity through its EMS filter and the \$QMON process. Whenever QTOS is informed that the TMF tape audit dump process has started, it tracks the process until it has completed the dump. Then QTOS starts the LOADTMF program which updates the QTOS catalog to sync with the current TMF database. Any new dumps cause QTOS to generate a Pick List indicating which vault location tapes are to be moved to, and if slot processing is enabled, which slot to place the tapes in.

QTOS TAPE MOUNT SCENARIO

The format of the backup command is identical to TANDEM's except that the DATA SET NAME is entered following the BACKUP command surrounded by parenthesis.

ANY SCRATCH TAPE BACKUP - Qtos accepts any valid tape volume mounted on the specified tape drive.

1. The user issues a BACKUP command from QTOSCOM:

```
TACL > QTOSCOM
```

```
QTOSCOM->BACKUP (MONTHLY) /OUT $$.#BACKUP/ $TAPE, $$SYSTEM.*.*, LISTALL, OPEN, AUDITED
```

2. \$QTOS verifies that the requested DATA SET NAME is valid. Then a new version of the requested DATA SET is created and the BACKUP request command stream is written to the database.
3. \$QTOS starts the BACKUP process and informs the operator via EMS message:
QTOS: BACKUP PROCESS (\$Zxxx) STARTED FOR MONTHLY(1) ON \$TAPE
4. \$QTOS searches the database for a suitable scratch tape that satisfies the DATA SET requirements and prompts the operator to mount a specific tape volume. The operator has the option to mount another scratch tape, as long as it meets the requirements of the requested DATA SET (prefix, density, label type, etc.) If the tape volume is valid, the tape is accepted.

QTOS Mount Request Example:

```
QTOS: MOUNT SCRATCH TAPE XXXXXX FOR BACKUP ON $TAPE FOR BACKUP PROCESS
QTOS: SCRATCH TAPE XXXXXX ACCEPTED ON $TAPE FOR MONTHLY (1)
ZSRV: STATUS - 1504 XXXXXX OPENED ON $TAPE
QTOS: TAPE XXXXXX OPENED ON $TAPE FOR MONTHLY (1)
ZSRV: STATUS - 1512 XXXXXX DISMOUNTED FROM DRIVE $TAPE
QTOS: FILES DUMPED = 14 FILES NOT DUMPED = 0 FOR MONTHLY (1)
QTOS: PROCESS ($ZXXX) COMPLETED NORMALLY FOR MONTHLY (1)
```

ANY TAPE DRIVE (AUTO VOLUME RECOGNITION) TAPE BACKUP

To use AVR the tape drive name in the backup command is replace by an asterisk (*). This lets QTOS know that specific tapes will have to be supplied to the operating system. QTOS retrieves the requested number of tapes (configured in the dataset) and includes them in the define. This allows the labeled tape process, zserver, to search for and use the specific tapes where ever they are mounted.

```
QTOSCOM->BACKUP (MONTHLY) /OUT $$.#BACKUP/ *, $$SYSTEM.*.*, LISTALL, OPEN, AUDITED
```

The user can query the status of processes and drives with the following commands.

```
QTOSCOM-> STATUS PROCS
```

REF	PROCESS	TYPE	DSN	DRIVE	PROC STATE
01	\$ZXXX	BACKUP	MONTHLY(1)	\$TAPE	WAIT MOUNT

QTOSCOM-> STATUS DRIVES

TAPE DRIVE	STATE	VOLUME ID	PROCESS	DEFINE
(U) \$TAPE	PROCESS/OPEN	D00572	\$Z0X3	=QTOS01
(U) \$TAPE1	CLOSED			

This example of STATUS DRIVES is in open unsecured mode. If QTOS is in secured mode, QTOS has control of the Drives and the state message will be OPEN/SECURE. To execute external processes using secured drives the FREE command must be issued thru QTOSCOM.

5. If the tape volume MOUNTED is not valid, the tape is unloaded and a message is sent to the operator.
QTOS: VOLUME ID (XXXXXX) IS ALREADY ASSIGNED TO A DATA SET
QTOS: - UNLOADING TAPE XXXXXX ON \$TAPE (ASSIGNED TO A DATA SET)
6. \$QTOS allocates the mounted tape to the new DATA SET version and activates the BACKUP process. If the optional label printer is designated, a paper label is printed. The BACKUP resumes until it generates the next tape request. If the DATA SET specified on-line listing, \$QTOS will update the database with the file listing records.
7. When the BACKUP completes successfully, \$QTOS emits an EMS message:

It will also include information if there were any errors or warnings. The summary status is written to the database indicating the number of files that was successfully backed up and the number of files that weren't backed up.

If the BACKUP abends or is stopped by the operator, an EMS message will be emitted stating:

QTOS: PROCESS (\$ZXXX) TERMINATED ABNORMALLY

In this case, \$QTOS will start the scratch process to back out all the associated catalog information.

If the process abends and AUTORESTART was enabled for the requested DATA SET, QTOS will send the following messages to the console:

QTOS: - SCRATCH PROCESS STARTED TO CLEAN UP AFTER ABORTED PROCESS

(this only backs out file listing records for the tape in error.)

QTOS: - BACKUP PROCESS FOR DSN DAILY-BACKUP(33) HAS ABENDED

QTOS: - AUTO RESTART IS ENABLED. WHEN YOU ARE READY TO RESTART

QTOS: - ENTER THE RESTART COMMAND

The user then uses QTOSCOM to command QTOS to restart the job. QTOS will then flag the tape in error as bad, back out the listing records for the bad tape and restart the job, starting with the last good file on the last good tape and track this restarted BACKUP as part of the same DATA SET version.

QTOS OPERATIONS

STARTING QTOS

QTOS should normally be started in the system startup obey file when the system is brought up. The following line should be placed in the startup obey file :

QTOS displays the following banner on the system console and also on the optional operator console.

```
TACL>          QTOSCOM START QTOS
                QTOSCOM VER5.10 - (C) 1991 - 2012 QSA ENTERPRISES, LLC
                QTOS NOT RUNNING
                QTOS MONITOR ($QMON)STARTED
                QTOS STARTED
```

QTOS can also be started interactively.

```
TACL >         QTOSCOM

                QTOSCOM VER 5.10 - (C) 1991 - 2012 QSA ENTERPRISES, LLC
                QTOS NOT RUNNING
                QTOSCOM ->START QTOS
                QTOS MONITOR ($QMON)STARTED
                QTOS STARTED
```

STOPPING QTOS

QTOS should be stopped in an orderly manner before the system is taken down. QTOS will finish all activity before it stops, but will not allow any new processes to be started.

The following command should be placed in the system shutdown file:

QTOSCOM STOP QTOS

The three QTOS processes \$QTOS, \$QMON and \$QEMS will all stop.

QTOS can also be stopped interactively.

```
TACL > QTOSCOM
QTOSCOM -> STOP QTOS
QTOS SHUTTING DOWN
QTOSCOM -> EXIT
```

BACKING UP FILES

Files are BACKED UP through QTOS using the HP NonStop BACKUP program for guardian files and using the HP NonStop BRCOM program for OSS and SQL/MX objects.

When the BACKUP command (BACKUP2 for OSS, SQL/MX) is issued from QTOSCOM, \$QTOS starts the backup process. The process is then monitored to manage and record tape volume changes and to record objects that have been backed up. Pertinent events are saved in the database keyed by the dataset name and version and the backup process is tracked to verify completion status.

QTOS creates the DEFINE needed for labeled tape operations.

BACKING UP GUARDIAN FILES

The syntax of the backup command is identical to that of the NONSTOP command except for the insertion of the DATA SET NAME, enclosed in parenthesis, following the BACKUP command. Process name, cpu and priority is passed from QTOSCOM to QTOS for use in starting the BACKUP process. The following are examples of a Backup command thru QTOSCOM.

Backup the \$SYSTEM.TMF subvolume and assign it to the MONTHLY-TMF dataset using \$TAPE1. Also send the listing to \$\$.#MONTH.TMF, name the backup process \$MT1 and run the process in CPU 0 at a PRIORITY of 140.

```
QTOSCOM 7> BACKUP (MONTHLY-TMF) /OUT $$.#MONTH.TMF, NAME $MT1, CPU 0, PRI 140/ $TAPE1, $SYSTEM.TMF.*, LISTALL, OPEN
```

Backup the \$DATA volume and assign it to the DAILY-DATA dataset using any tape drive (AVR). Also send the listing to \$\$.#DAILY, let the operating system create a process name and run the process in the default processor at the default priority.

```
QTOSCOM 8> BACKUP (DAILY-DATA) /OUT $$.#DAILY/ $TAPE1, $DATA.*.*, LISTALL, OPEN, AUDITED
```

BACKING UP OSS & SQL/MX FILES

The QTOSCOM backup2 command is implemented in the same way as the backup for guardian files. The syntax mirrors that of the BRCOM command except where the dataset name is inserted. The complete syntax options can be found in the BACKUP and RESTORE 2 Manual published by HP. QTOS starts the BRCOM process and issues the backup command. All of the associated processes started and used by BRCOM are monitored and/or interacted with to produce the metadata stored on the QTOS database. QTOS creates the DEFINE for this function. Below are examples of the BACKUP2 command.

Backup several OSS objects and assign it to the OSS-TEST dataset using any tape drive. Use the defaults for all of the run options.

```
QTOSCOM 7> BACKUP2 (OSS-TEST) *, OSS (/usr/bin, "/x/space delimited dirname", /home/sv/myfile,/usr/local/bin);
```

Backup the SQL/MX catalog cat1 and assign it to the SQLMX-TEST dataset using \$TAPE1. Also send the listing to \$\$.#SQLMX, name the backup process \$SM1 and run the process in CPU 0 at a PRIORITY of 140.

```
QTOSCOM 7> BACKUP2 (SQLMX-TEST) /OUT $$.#SQLMX, NAME $SM1, CPU 0, PRI 140/ $TAPE1, MX CATALOG cat1
```

RESTORING FILES

Files are RESTORED through QTOS using the HP NonStop RESTORE program for guardian files and using the HP NonStop BRCOM program for OSS and SQL/MX objects.

When the RESTORE command (RESTORE2 for OSS, SQL/MX) is issued from QTOSCOM, \$QTOS starts the restore process. QTOS creates the define to let the labeled tape processing subsystem (zserver) know which tapes will be needed for the restore. The process is then tracked to verify completion status.

The syntax of the restore command is identical to that of the NONSTOP command except for the insertion of the DATA SET NAME, enclosed in parenthesis, following the RESTORE command. Process name, cpu and priority is passed from QTOSCOM to QTOS for use in starting the RESTORE process.

QTOS supports several means of restoring files.

RESTORING FILES USING DATASET NAME

The dataset name can be entered in 3 ways.

1. Dataset name only (WEEKLY-DATA) - will restore the most recently backed up copy of the file within the stated dataset. QTOS finds the correct tape volume and flags it for use in the restore.
2. Dataset name and version (WEEKLY-DATA(27)) - will restore the file from the backup associated with the specified version of the dataset. The restore will read tapes starting with the first tape and continue until the file(s) is found and restored.
3. Dataset name and version and starting tape number (WEEKLY-DATA(27,3)) - will restore the file the same as in the dataset name and version method, but will start searching for the file on the tape sequence defined in the command.

TACL > QTOSCOM

```
QTOSCOM -> RESTORE(WEEKLY)/OUT $$.#RESTORE/$TAPE,$FRED.MUSIC.DATA,LISTALL
```

```
QTOSCOM -> EXIT
```

The operator will receive the following messages:

```
QTOS: RESTORE PROCESS ($Z001)STARTED FOR MONTHLY (1) ON $TAPE
```

```
ZSVR: XXXX MOUNT G00573 ON $TAPE NO RING
```

```
QTOS: MOUNT VOLUME G00573 ON $TAPE FOR DSN MONTHLY (1)
```

```
ZSVR: XXXX VOLUME G00573 MOUNTED
```

OR

```
QTOSCOM -> RESTORE(WEEKLY(5,3))/OUT $$.#RESTORE/$TAPE,$FRED.MUSIC.DATA,LISTALL
```

RESTORING FILES SELECTED USING QTOSDB

If listings are maintained in the QTOS database (online), files can be restored by selecting them from the File Locator Screen. The users selections are stored in a file named RESTFLE in the QTOS database. This list is maintained until the user clears the file from the RESTORE FILE SCREEN under the FILE LOCATOR screen in QTOSDB. This allows the user to enter and leave the QTOSDB database program without losing earlier selections.

To restore the files, the user enters QTOSCOM and issues a standard RESTORE command but specifies FILE as the file list. This informs QTOSCOM to read the RESTFLE.

If the user has selected files from several different backups, QTOSCOM will identify the backups and queue as many restores as are needed to restore the selected files.

```
TACL > QTOSCOM
```

```
QTOSCOM -> RESTORE/OUT $$.#RESTORE/$TAPE,FILE ,VOL $$SYSTEM,AUDITED
```

```
QTOSCOM -> EXIT
```

RESTORING OSS AND SQL/MX FILES

The QTOSCOM restore2 command is implemented in the same way as the restore for guardian files. The syntax mirrors that of the BRCOM command except where the dataset name is inserted. The complete syntax options can be found in the BACKUP and RESTORE 2 Manual published by HP. QTOS starts the BRCOM process and issues the restore command, using the DEFINE that is created by QTOS. All of the associated processes started and used by BRCOM are monitored to report and react to process completion. Below are examples of the RESTORE2 command.

Restore several OSS objects from the WEEKLY-OSS dataset, version 12, using any tape drive. Only restore those objects with a mod time after January 17 2012 and use the defaults for all of the run options.

```
QTOSCOM 4> RESTORE2(WEEKLY-OSS(12)) *, OSS (/etc/rc, /var/x) WHERE MODTIME AFTER JAN 17 2012
```

Restore all sql/mx catalogs from the FRIDAY-SQLMX dataset, version 573, using any tape drive. Send the listing to \$\$FRIDAY.RESTORE and use the defaults for all of the other run options.

```
QTOSCOM 41> RESTORE2 /OUT $$.#FRIDAY.RESTORE/ (FRIDAY-SQLMX(573)) *, MX CATALOG *
```

QUICK RESTORES

Quick Restore

The Quick Restore feature, Q/Restore, provides fast access to Backup data, normally reducing the restore time by more than 85%. Q/Restore acts as a tape server that positions the tape to the location containing the requested fileset(s) and then feeds the data from the tape to a Restore process.

Starting a Q/Restore through Q/Tos is syntactically the same as starting a Restore process, except the command is QRESTORE instead of RESTORE. When the QRESTORE command is executed, a qrestore process is started. The qrestore process then starts a restore process, thus becoming the central hub for communication between the restore process, the tape subsystem and Q/Tos.

When the restore operation starts, a request is made to mount the correct tape on the tape drive. This is the first tape that contains the requested fileset(s). After the tape is mounted, it is then positioned to the region of the tape that contains the requested data. Q/Restore then passes the file data to the restore process which handles the disk I/O.

Your syntax will be the same as if you were doing a normal restore:

```
QTOSCOM 24> QRESTORE (WEEKLY-TEST(35)) $TAPE, ($DATA.MUSTKEEP.*,$DATA1.NEEDED.*),  
LISTALL, OPEN
```

OR

You can go into your database under FILE FINDER and select the files (F6) you want to restore and then enter Qtoscom for syntax:

```
QTOSCOM 13> QRESTORE *, FILE, LISTALL, OPEN
```

USING QTOSCOM UPDATE

The UPDATE command is useful in cataloging backups and adding file listings to the database for tapes created before the installation of QTOS.

There are several ways to use the UPDATE command.

- 1) DSN version and tape volumes are already in the database.
- 2) Only tape volumes are in database.

If the DSN version is supplied, it is assumed that there are tape volumes in the database that are owned by that DSN version. In this case QTOSCOM retrieves the volume ids and passes them to QTOS. QTOS then prompts the operator to mount the appropriate volume when needed. The tapes are read to determine the files that are backed up and the database is updated with this information.

If the version is not supplied, a new version is created by QTOS and that one is used to UPDATE the tape volume records.

If listing is not wanted, the database is UPDATED with the new DSN version in the DSN file, tapes file and slot file if slot processing is enabled. Otherwise, each tape must be mounted to populate that part of the database.

Examples:

The DSN version does not exist but the volume ids have been entered into the database.

```
UPDATE(MONTHLY-BACKUP)/OUT $$.#MONTH.UPDATE/$TAPE  
ENTER VOLIDS OF TAPES, TYPE CTRL Y WHEN FINISH  
ENTER VOLID OF TAPE: Q00101  
VOLUME Q00101 ALLOCATED AS TAPE NUMBER 1 FOR DSN MONTHLY-BACKUP (1)  
PLACE VOLUME Q00101 IN SLOT NUMBER 22 IN VAULT QSA
```

Starts a restore (listonly) process and prompts the operator to mount volume ids. The listing generated by restore is analyzed and the database is UPDATED with the file information, tape volumes, slots (if configured) and DATASET.

The DSN version exists (from a previous backup or UPDATE operation) but the file information is not in the database.

```
UPDATE(MONTHLY-BACKUP(3))/OUT $$.#MONTH.UPDATE/$TAPE
```

Starts a restore (listonly) process and prompts the operator to mount the volume ids associated with the DSN version. The listing generated by restore is analyzed and the database is UPDATED with the file information.

The DSN version does not exist but the volume ids have been entered into the database. The file information is not wanted.

```
UPDATE(MONTHLY-BACKUP)/OUT $$.#MONTH.UPDATE/NOLIST  
ENTER VOLIDS OF TAPES, TYPE CTRL Y WHEN FINISH  
ENTER VOLID OF TAPE: Q00101  
VOLUME Q00101 ALLOCATED AS TAPE NUMBER 1 FOR DSN MONTHLY-BACKUP (1)  
PLACE VOLUME Q00101 IN SLOT NUMBER 22 IN VAULT QSA
```

A restore process is not started (since we don't need the file information). The result on the database is exactly that of the first example except that the file information is not entered into the database. The operator is prompted for volume ids until <control y> is pressed.

USER APPLICATIONS

User applications that issue output to a tape device are supported through the XMACRO command. All of the ASSIGNS and PARAMS used by the application may be in the data base and accessible using the macro record. QTOS starts the process using the parameters from the macro record and then passes the ASSIGNS and PARAMS.

If the application prompts the user for information (i.e. Country Code), it is handled via the QTOSCOM MOUNTS and REPLY commands. The MOUNTS command displays the mount requests and prompts text messages from the processes that are currently running. When a prompt text message is displayed, it is responded to using the REPLY command.

Example of a user application with a prompt using unlabeled tapes:

Computer display is in upper case and user response in lower case.

```
QTOSCOM 11> xmacro my-appl
QTOSCOM 12> mounts
```

```
1 ENTER THE COUNTRY NAME FOR EXTRACT:
?
```

```
QTOSCOM 13> reply 1 canada
QTOSCOM 14> mounts
```

```
1 USE SCRATCH TAPE B00133 FOR USER PROCESS ON $TAPE FOR DSN COUNTRY-RECS(17)
VERIFY THE TAPE MOUNTED VIA THE ACCEPT COMMAND
```

```
QTOSCOM 15> accept 1 b00133
PLEASE RETYPE THE VOLUME ID: b00133
QTOSCOM 16> status procs
```

REF	PROCESS	TYPE	DSN	DRIVE	PROC STATE
01	\$CTRY	APPL	COUNTRY-RECS(017)	\$TAPE	EXECUTING

```
QTOSCOM 17> EXIT
```


QTOS MACROS

QTOS macro's enable the system operations personnel to have a controlled database of operation parameters for tape functions.

Instead of having in files and obey files that reference disk files, the user can build a database of parameters, file sets and run requests that are referenced by QTOS macros. This helps ensure a consistency of file sets and security of the in files.

The QTOS macro subsystem consists of 4 screens and is accessed through the QTOSDB or QTOS CLIENT program.

PROGRAM MAINTENANCE screen
INFILE screen
PARAMS screen
ASSIGNS screen

PROGRAM MACRO SCREEN

The Program Maintenance Screen functions are:

- Designate the program to be run (Backup, Fup, Restore, user program)
- Designate the Data Set to be used (for defines and allocation of data set versions)
- Designate the infile (required for Backup) (Located Internally to QTOS or Externally in an edit file)
- Designate the name of the option internal ASSIGN parameters (required for user programs to assign the logical tape drive name and file assigns)
- Designate the name of the option internal PARAMS
- Set the optional startup Parameters for the Program

INFILE SCREEN

The INFILE SCREEN is equivalent to a regular "in" file that is used in a run statement from TACL, such as :

```
BACKUP/in $system.system.infile,out $S.#test/  
RUN TAPEPROG/in infile/
```

The QTOS INFILE name can be 16 characters long and can contain special characters.

```
INFILE NAME = DAILY-BACKUP  
PARTIAL^BACKUP  
IRS_91_06_75
```

Line continuations in a QTOS INFILE do not require ampersands "&" but do not break in the middle of words between lines.

ASSIGN SCREEN

The ASSIGN SCREEN is used by the QTOS PROGRAM MACRO'S to designate assigns to be used during startup of the program.

```
TAPE-FILE, $TAPE1
ACCOUNTS-FILE, $DATA.DATABASE.ACCNTS
```

Any number of QTOS program macros can reference the same ASSIGN data.

PARAMS SCREEN

The PARAMS SCREEN is used by the QTOS PROGRAM MACRO'S to designate PARAMS to be used during startup of the program.

PARAMS are optional based on the needs of the user programs,

```
OFFICE-NUMBER 33
DATE-OF-REPORT 061391
```

Any number of QTOS program macros can reference the same PARAMS data.

ASSIGNS and **PARAMS** can be passed from QTOSCOM to users programs. The assigns and params passed by QTOSCOM will override any that are defined in the QTOS program database.

ASSIGNS must be used for user programs to designate the tape drive logical name and any files that are to be accessed. QTOS uses the tape drive assign to know which tape drive to use.

EXECUTING QTOS MACROS

BATCH MODE

```
TACL > QTOSCOM XMACRO DAILY-RUN
```

When the macro is executed in batch mode, QTOSCOM will not complete until the program designated in the macro completes. QTOSCOM will return the completion status code of the program.

QUEUEING JOBS

Multiple jobs can be started thru QTOS.

```
TACL > QTOSCOM
```

```
QTOSCOM 5> XMACRO DAILY-RUN
```

```
QTOSCOM 6> BACKUP (MONTHLY)/OUT $$.#MONTHLY.BK/$TAPE,$DATA.*.*,LISTALL,OPEN
```

```
QTOSCOM 7> BACKUP (WEEKLY)/OUT $$.#WEEKLY.BK/$TAPE,$DATA.*.*,LISTALL,OPEN
```

The MACRO daily-run will be queued to execute on the requested tape drive. If the tape drive is free QTOS will immediately start executing the job.

```
QTOSCOM 8 > EXIT
```

REQUESTING AN ALTERNATE TAPE DRIVE

If the Tape drive that is requested in the macro is not available or the user wants to designate an alternate tape drive, the alternate tape drive can be specified in the XMACRO command.

```
TACL > QTOSCOM XMACRO DAILY-RUN , $TAPE1
```

or

```
TACL > QTOSCOM
```

```
QTOSCOM 1> XMACRO DAILY-RUN, $TAPE1
```

```
QTOSCOM 2> EXIT
```

PASSING ADDITIONAL DEFINE PARAMETERS

The user can specify override or specify additional labeled tape define parameters for a data set (fileid, blocklen, expiration, etc.)

```
TACL > QTOSCOM XMACRO DAILY-RUN {retention = 0,fileid = "testagain"} or
```

```
TACL > QTOSCOM
```

```
QTOSCOM 1> XMACRO DAILY-RUN {retention = 0,fileid = "testagain"}
```

```
QTOSCOM 2> EXIT
```

AUTORESTART

Auto-restart allows the continuation of a backup that has abended. QTOS will automatically re-queue an abended backup starting at the last good file on the last good tape. QTOS will treat the restarted backup as part of the backup that has abended and track all tapes and file listings in a single data set version. The operator then has the option to clean the tape drive and restart the job with the RESTART command or issue the RESTART command and specify an alternate tape drive to be used while the tape drive in error is worked on.

If auto-restart is enabled on the DATA SET RECORD, QTOS forces the listall parameter when starting a backup process. This is done so QTOS knows which file to restart the backup from.

QTOS monitors the progress of the backup process through the listing output. A record of the most recent completed file is maintained as well as a restart point.

If a file starts on one reel and finishes on another, that file is used to restart the backup process. If the file spans more than one reel, the first reel number is used as the restart point.

AUTORESTART SCENARIO

When the process abends, QTOS

1. writes a notice in the DSN comment file
2. starts the scratch process to delete all unwanted file records.
3. resets the status flag of backed out tapes (bad for offending reel,
scratch for all others if needed)
4. places START parameter at end of parameters saved from initial startup
5. formats a message that is sent to the console and is saved as a
response to the QTOSCOM MOUNTS command.
6. waits for the RESTART command from QTOSCOM

Messages similar to those below are sent to the operators console and the systems console.

```
10/22/1991 10:50 - BACKUP PROCESS ($ZXXX) ABENDED
10/22/1991 10:50 - SCRATCH PROCESS STARTED TO CLEAN UP AFTER ABORTED PROCESS
    (this only backs out file listing records for the tape in error)
10/22/1991 10:50 - BACKUP PROCESS FOR DSN DAILY-BACKUP(33) HAS ABENDED
10/22/1991 10:50 - AUTO RESTART IS ENABLED. WHEN YOU ARE READY TO RESTART
10/22/1991 10:50 - ENTER THE RESTART COMMAND
```

The operator has the option to :

- abort the queued restart job
- clean the tape drive that had the problem, and then issue the restart
- issue the restart command and specify another tape drive

The operator then enters QTOSCOM and issues the MOUNTS command.

```
TACL > QTOSCOM
QTOSCOM 1> MOUNTS
```

```
1 BACKUP PROCESS FOR DSN DAILY-BACKUP(33) HAS ABENDED. AUTORESTART IS ENABLED.
WHEN YOU ARE READY TO RESTART ENTER THE RESTART COMMAND
```

IF the operator wishes the backup to restart, they issue the RESTART COMMAND under QTOSCOM.

```
QTOSCOM 2> RESTART 1
  (where 1 is the number returned from the MOUNTS command)
```

IF the operator wishes the backup to restart, but use a different tape drive, they issue the RESTART COMMAND with the tape drive option under QTOSCOM.

```
QTOSCOM 2> RESTART 1 $TAPE2
  (where 1 is the number returned from the MOUNTS command)
```

IF the operator wishes to not restart the backup and back out all records for this backup.

```
QTOSCOM 2> ABORT 1
  (where 1 is the number returned from the MOUNTS command)
```

When the operator issues the RESTART command, QTOS starts a new backup process but maintains the sequence number and the data set version. The tape number of the new backup process is stored in the tapes record. The output of the new backup process is written to the same file as the original backup process.

Once the job has been restarted, QTOS :

- Writes the abend information to DATA SET VERSIONS comment records

- Writes the restart BACKUP command to the DATA SET VERSION comment records

- Continues the listings linked to this DATA SET VERSION

- Catalogs the tapes under this DATA SET VERSION

 - (When you display the tapes under the Data Set Screen or the Tapes Screen they will display 2 sequence numbers, first the tape sequence number under the Data Set version, followed by the tape sequence number recognized backup (ex. SEQ # 5 2)

- Continues the same listing in the spooler, with the restart message.

RESTORING FILES FROM AUTO RESTARTED TAPES

RESTORING FROM QTOSDB FILE SCREEN

When RESTORING files from an auto-restarted data set from the FILE LOCATOR SCREEN, the operator doesn't need to figure out which portion of the backups to use. QTOSCOM will automatically queue as many restore processes as there were autorestarts. These additional restores are triggered by the backup tape number stored in the tapes record. When the backup tape number is equal to 1, it's time to start another restore.

MANUAL RESTORE

If the user is restoring files manually, they must keep in mind that the last tape from the first part of the backup will ask for the next tape to be mounted. At this point a new backup was auto-restarted. The user must terminate that restore and start another one for the reels that were written to by the restarted backup.

Example : The backup abended half way thru tape 3, QTOS backed out all records in the data base for reel 3 and auto-restarted the job. The second backup used 3 tapes. We now have a DATA SET VERSION with 5 tapes. Reels 1 thru 2 are part of the first backup. Reels 3 thru 5 are part of the second backup.

When you restore these tapes manually, the restore program reads thru reel 2 and then requests reel 3 to be mounted. Since reel 3 had an error and was backed out, the user must then terminate this restore and start a new one since reel 3 for the DATA SET is actually reel 1 to backup and restore.

QTOSCOM COMMAND REFERENCE

QTOSCOM COMMANDS

The following is a list of valid QTOSCOM commands and their meaning.

ABORT	- aborts a running process
ACQUIRE	- places tape drive under QTOS control
ARCHIVE	- use PAK to backup files to an archive disk file
BACKCOPY	- runs a Guardian backcopy from QTOSCOM
BACKUP	- runs a Guardian backup from QTOSCOM
BACKUP2	- runs an OSS, SQL/MX backup from QTOSCOM
CANCEL	- cancels a queued process
EXIT	- ends the QTOSCOM session
FC	- edit and execute a previous command
FREE	- removes tape drive from QTOS control
FUP	- runs a FUP process from QTOSCOM
HISTORY	- shows previously issued commands
INFO	- searches and displays qtos database records
LIST	- manipulates the list created by the INFO FILES command
MOUNTS	- lists active mount requests from QTOS
OPEN	- opens QTOS on a remote node
QRESTORE	- restores backed up files using the QUICK RESTORE function
REPLY	- replies to a prompt from a user application
RESTART	- restarts a backup process when auto restart is enabled
RESTORE	- runs a Guardian restore from QTOSCOM
RESTORE2	- runs an OSS, SQL/MX restore from QTOSCOM
START	- starts the QTOS subsystem label printing scratch
STATUS	- provides status of processes and devices
STOP	- stops the QTOS subsystem label printing process
UPDATE	- adds data to the QTOS database from undocumented backups
VTSEXPORT	- tracks tape sets created as a duplicate of a virtual tape set.
XMACRO	-starts a process based on stored database information
!	- repeat a previous command

ABORT

ABORTs a job that is currently executing, using one of the system tape drives.

ABORT < job ref num>

where

<job ref num> - reference number that is acquired via the
MOUNTS and STATUS PROCS commands.

REF	PROCESS	TYPE	DSN	DRIVE	PROC STATE
01	\$ZXXX	BACKUP	DAILY (1)	\$TAPE	WAIT MOUNT
02	\$ZXXX	BACKUP	MONTHLY (2)	\$TAPE	QUEUED/LOCAL
03	\$ZXXX	BACKUP	WEEKLY (1)	\$TAPE	QUEUED/LOCAL

QTOSCOM -> ABORT 1
ABORT INITIATED

QTOSCOM-> STATUS PROCS

REF	PROCESS	TYPE	DSN	DRIVE	PROC STATE
02	\$ZXXX	BACKUP	MONTHLY (2)	\$TAPE	WAIT MOUNT
03	\$ZXXX	BACKUP	WEEKLY (1)	\$TAPE	QUEUED/LOCAL

or

TACL> QTOSCOM ABORT 3

ABORT stops the process identified by the job number and backs out the database transactions associated with it, if applicable. If the job referenced by the job number is not executing, the table entry for that Job position is cleared.

ACQUIRE

When running QTOS in Secured mode the tape drives are under QTOS's control. The tape drives are first acquired when QTOS is started. The ACQUIRE command is used to re-acquire a tape drive that was released from QTOS's control.

```
ACQUIRE <tape drive>

where

<tape drive> - is the tape device that had been previously freed
               to be used outside of QTOS's control.
```

QTOSCOM->STATUS DRIVES

The drives have been released from QTOS control.

TAPE DRIVE	STATE	VOLUME ID	DRIVE	PROCESS	DEFINE
(S) \$TAPE	FREE				
(S) \$TAPE1	FREE				

QTOSCOM -> ACQUIRE \$TAPE1

QTOSCOM -> STATUS DRIVES

TAPE DRIVE	STATE	VOLUME I	DRIVE	PROCESS	DEFINE
(S) \$TAPE	FREE				
(S) \$TAPE1	OPEN/SECURE				=QTOS01HOLD

ACQUIRE tells QTOS to take control of the specified Tape Drive. This is only necessary after the tape drive has been released from QTOS's control by the FREE command. If QTOS is operating in unsecured mode (O), this command has the effect of allowing QTOS use of the drive instead of taking full control of it.

ARCHIVE

Create a backup using the PAK utility to store as a guardian archive file. The location of the archive file is stored in the QTOS database to automate retrieval with the RESTORE command.

```
ARCHIVE <(dataset)>/OUT <out file>/ <archive loc>,<options>
  <(dataset)>      - data set to assign archive file to
  <in file>       - input file containing backup commands
  <out file>      - list file used for backup output
  <archive loc>  - location of archive file in the form of $VOLUME.SUBVOLUME
  <options>      - backup program file set and options
```

QTOS starts a PAK process and passes the parameters after translating them to the proper PAK format. The process is then handled as a BACKUP and the file name is stored in the QTOS database. QTOS then uses the file name when a RESTORE request is made for the dataset and version created by this ARCHIVE command. When this dataset version expires, QTOS deletes the archive file and all references to the file name are removed from the QTOS database.

This command is useful in doing ad hoc backups of a temporary nature to safely keep files that may have to be retrieved later but not as part of the normal backup routine.

Example:

ARCHIVE multiple filesets using dataset BUDD from a QTOSCOM prompt

```
ARCHIVE (CBM-KEEP) /OUT $$.#OPS/$DATA.MYARCS, ($TEST.QTOSTEST.*, $TEST.QRTEST.*),
  LISTALL, OPEN
```

BACKCOPY

Request QTOS to execute the NONSTOP BACKCOPY program using a DATA SETs that designate the QTOS retention, define, and tape information.

The QTOS BACKCOPY command starts a BACKCOPY process, creating the DEFINES for the source and destination tapesets, and catalogs the tapes used and the diskfiles stored on those tape for the destination dataset..

```
BACKCOPY (<source dataset(version)>,<destination dataset>)
  /OUT <out file>/
  ,<source tape drv>
  ,<destination tape drv>
  ,*.*.*
  ,<backcopy options>
  ,KEEPRETENTION
  ,KEEPCREATION
  ,KEEPVERSION

<source dataset(version)> - dataset that provides the
                           tapeset that will be copied.
<destination dataset>    - dataset that will be created
                           and stores the copy of the
                           original dataset.
<out file>                - where the listing will be
                           written to.
*.*.*                    - required syntax for NonStop
                           BACKCOPY
<backcopy options>      - backcopy program options
KEEPRETENTION            - Duplicates the retention
                           attributes and timestamp
                           from the source dataset to
                           the destination dataset.
KEEPCREATION             - Duplicates the creation date
                           timestamp from the source
                           dataset to the destination
                           dataset.
KEEPVERSION              - Duplicates the version number
                           from the source dataset to the
                           destination dataset.
```

Examples:

Backcopy from dataset monthly version 27 to dataset monthly-copy keeping the retention of the original dataset

```
BACKUP (MONTHLY(27),MONTHLY-COPY) /OUT $$.#OPS/$TAPE1,$DAT1,*.*.*
LISTALL,KEEPRETEINTION
```

Backup using a tape drive pool

```
BACKUP (MONTHLY) /OUT $$.#OPS/($TAPE1,$TAPE2,$TAPE3), ($SYSTEM.TMF.*,$DATA.OPS.*),
LISTALL,OPEN,PARTONLY
```

BACKUP

Request QTOS to execute the NONSTOP BACKUP program using a DATA SET that designates the QTOS retention, define, and tape information.

The QTOS BACKUP command follows the same conventions as the NONSTOP BACKUP command. The only difference is the name of the DATA SET immediately following the BACKUP COMMAND.

```
BACKUP (<dsn name>) [/<run options>/], <tape drive>, (<file set>),  
      [backup options]
```

Where:

- dsn name - the name of MASTER DATA SET that this backup is to be stored under. For parallel backups, this is two dsn names delimited by a comma.
- run options - standard guardian process startup run options.
OUT <listing file> - where QTOS routes the listing report.
IN <in file> - optional input command file where QTOS retrieves the backup command details.
- tape drive - the name of the tape drive to be used. This can be:
A specific tape drive. Two for parallel backups.
Ex: \$CART or (\$TAPE, \$TAPE2)
A pool of tape drives. QTOS will start the backup on the first available tape drive in the pool.
Ex: (\$TAPE1, \$TAPE2, \$TAPE3, \$TAPE4)
An asterisk (*) which denotes Auto Volume Recognition (AVR). QTOS assigns specific tape volumes to be used for the backup which can be mounted on any tape drive. This is also used for Tape Libraries and Virtual Tape devices.
- file set - the files to be backed up
- backup options - the options used by TANDEM BACKUP
EX: listall, open, audited, etc.

When QTOSCOM is run in batch (non interactive), QTOSCOM does not complete and return until the backup has completed. The status return code of the BACKUP will be returned to the process executing QTOSCOM.

When not using AVR, QTOS will suggest the most desirable scratch tape in the database. If a different tape is loaded, a consistency check is performed. If the tape is a valid scratch tape, it is accepted and used. If it isn't a valid scratch tape, it is rejected and the user is prompted for an appropriate scratch tape.

For parallel backups, QTOS requires two dataset names. This allows QTOS to track the backups as two separate entities with their own life spans and locations.

With the tape pool option, QTOS queues the backup on each of the included tape drives. When any of these tape drives becomes available QTOS starts the backup using that drive and de-queues the job from the rest of the drives. Of course, if there are any tape drives available when the command is issued QTOS starts the backup on that tape drive.

Partial backups are automated using the XMACRO command to issue the backup. This is explained in the XMACRO description.

Examples:

Backup multiple filesets using dataset MONTHLY from a QTOSCOM prompt

```
BACKUP (MONTHLY) /OUT $$.#OPS/$TAPE1, ($SYSTEM.TMF.*, $DATA.OPS.*),  
LISTALL, OPEN, PARTONLY
```

Same backup as it would appear in a batch script

```
QTOSCOM BACKUP (MONTHLY) /OUT $$.#OPS/$TAPE1, ($SYSTEM.TMF.*, $DATA.OPS.*),  
LISTALL, OPEN, PARTONLY
```

Parallel backup using datasets MONTHLY-1 and MONTHLY-2

```
BACKUP (MONTHLY-1, MONTHLY-2) /OUT $$.#MONTHLY.PARALLEL/($TAPE1, $TAPE2), $DATA.*.*,  
LISTALL, OPEN, PARTONLY
```

Backup using a tape drive pool

```
BACKUP (MONTHLY) /OUT $$.#OPS/($TAPE1, $TAPE2, $TAPE3), ($SYSTEM.TMF.*, $DATA.OPS.*),  
LISTALL, OPEN, PARTONLY
```

BACKUP2

Request QTOS to execute the BRCOM BACKUP program using a DATA SET that designates the QTOS retention, define, and tape information.

The QTOS BACKUP command follows the same conventions as the BRCOM BACKUP command. The only difference is the name of the DATA SET immediately following the BACKUP COMMAND.

```
BACKUP2 (<dsn name>) [/<run options>/], <tape drive>, [backup options]
```

Where:

- dsn name - the name of MASTER DATA SET that this backup is to be stored under. For parallel backups, this is two dsn names delimited by a comma.
- run options - standard guardian process startup run options.
 - OUT <listing file> - where QTOS routes the listing report.
 - IN <in file> - optional input command file where QTOS retrieves the backup command details.
- tape drive - the name of the tape drive to be used. This can be:
 - A specific tape drive. Two for parallel backups.
Ex: \$CART or (\$TAPE, \$TAPE2)
 - A pool of tape drives. QTOS will start the backup on the first available tape drive in the pool.
Ex: (\$TAPE1, \$TAPE2, \$TAPE3, \$TAPE4)
 - An asterisk (*) which denotes Auto Volume Recognition (AVR). QTOS assigns specific tape volumes to be used for the backup which can be mounted on any tape drive. This is also used for Tape Libraries and Virtual Tape devices.
- backup options - the OSS and SQL/MX object names and options used by BRCOM BACKUP. Details can be found in the "Backup and Restore 2 Manual" in the HP NONSTOP library.

When QTOSCOM is run in batch (non interactive), QTOSCOM does not complete and return until the backup has completed. The status return code of the BACKUP will be returned to the process executing QTOSCOM.

When not using AVR, QTOS will suggest the most desirable scratch tape in the database. If a different tape is loaded, a consistency check is performed. If the tape is a valid scratch tape, it is accepted and used. If it isn't a valid scratch tape, it is rejected and the user is prompted for an appropriate scratch tape.

Examples:

Backup several OSS objects and assign it to the OSS-TEST dataset using any tape drive. Use the defaults for all of the run options.

```
QTOSCOM 7> BACKUP2 (OSS-TEST) *, OSS (/usr/bin, "/x/space delimited dirname",  
/home/sv/myfile,/usr/local/bin);
```

Backup the SQL/MX catalog cat1 and assign it to the SQLMX-TEST dataset using \$TAPE1. Also send the listing to \$\$.#SQLMX, name the backup process \$SM1 and run the process in CPU 0 at a PRIORITY of 140.

```
QTOSCOM 7> BACKUP2 (SQLMX-TEST) /OUT $$.#SQLMX, NAME $SM1, CPU 0, PRI 140/ $TAPE1, MX  
CATALOG cat1
```

CANCEL

CANCELs a job that is not currently executing, but is queued to execute.
The executing and queued jobs can be displayed with the STATUS PROCS command.

CANCEL < job ref num> [!]

Where

Job ref num – is the reference number that is shown by the STATUS PROCS command.
- Clears the table entry regardless of its status

```
TACL > QTOSCOM
QTOSCOM -> CANCEL 2
QUEUED PROCESS NUMBER 2 CANCELED BY OPERATOR
```

or

```
TACL> QTOSCOM CANCEL 2
```

CANCEL eliminates a queued job from the queue. If the job is active, cancel will not remove the job. For active jobs use the ABORT command. If CANCEL is used with the ! option, then the queue entry will be removed without checking to see if it is an active job. (This can be used when a guardian process inadvertently gets on the queue and never stops)

EXIT

The EXIT command is used to leave the QTOSCOM program.

```
EXIT
```

```
QTOSCOM -> EXIT  
TACL >
```

FC

Edit and execute a previously entered command.

```
FC <command number>
```

Where:

```
command number - the number of the command to edit. If no number  
is entered the most recent command is edited.
```

QTOSCOM saves a list of previously entered commands that can be repeated. The FC command retrieves the command and allows the user to alter the command text before executing it. This is the standard NONSTOP FC command and all of the same rules apply.

FREE

The FREE command tells QTOS to release the named tape drive from QTOS influence. If the tape drive is in use, it is flagged as free pending and is freed when the current process completes. QTOS will not use a freed drive. It must be acquired to reestablish its accessibility.

The FREE command is used when running QTOS in secured mode to allow external processes to access the drives.

```
FREE <tape drive>

<tape drive> - existing system tape drive
```

TAPE DRIVE	STATE	VOLUME ID	PROCESS	DEFINE
(S) \$TAPE	OPEN/SECURE			=QTOS00HOLD
(S) \$TAPE1	OPEN/SECURE			=QTOS01HOLD

```
QTOSCOM-> FREE $TAPE
QTOSCOM-> FREE $TAPE1
```

```
QTOSCOM-> STATUS DRIVES
```

TAPE DRIVE	STATE	VOLUME ID	PROCESS	DEFINE
(S) \$TAPE	FREE			
(S) \$TAPE1	FREE			

HISTORY

List previously entered commands.

```
HISTORY <number of commands>
```

Where:

Number of commands - the number of commands to display. If no number is entered the last 10 commands are shown.

QTOSCOM saves a list of previously entered commands that can be repeated with the FC and ! commands. History provides a way to list the commands along with their command number.

INFO

The INFO command searches and retrieves records from the QTOS database.

```
INFO /OUT <out file>/<subcommand>
<out file> - spooler location to write the request results
<subcommand> - FILE[2] | VAULT | DATASET | TAPE

INFO retrieves information stored in the Q/Tos database.
FILE[2] = file or object backed up by the backup or backup2 command
VAULT   = tape pool
DATASET = backup tapeset and associated objects
TAPE    = tape volume
```

INFO FILE/FILE2

The INFO FILE/FILE2 command searches and retrieves records of files and objects that have been backed up from the QTOS database. INFO FILE is used to search files backed up by guardian backup and INFO FILE2 is used to search objects backed up from the OSS partition by backup2.

```
INFO /OUT <out file>/FILE | FILE2 <file name>
      [ ,DETAIL
      ,LIST [QUIET] [RESET]
      ,MODIFIED <date> | FROM <date> TO <date>
      ,BACKEDUP <date> | FROM <date> TO <date>
      ,DATASET (version)
      ,TAPE <tape volume>
      ,TYPE <OSS | SQLMX> ]
```

<out file> - spooler location to write the request results
<file name> - file or object name to search for
DETAIL - display a detailed file information
LIST - places the selected records in an internal list that can be manipulated and used in the RESTORE command or to send to a spool file.
QUIET suppresses output to the terminal.
RESET clears the list before items are added.
Items are concatenated if reset is omitted.
MODIFIED - selects records of a specific date modified or a range of dates modified. This can be a specific date (12/24/2007) or it can be a range of dates (FROM 7/9/2007 TO 8/12/2007). Using FROM without TO retrieves records from the date to the present. Using TO without FROM gets all records up to and including the specified date.
BACKEDUP - selects records of a specific date backed up or a range of dates. The usage is the same as for MODIFIED.
DATASET - selects records associated with a specific dataset name. Version can be an asterisk (*) to designate all versions of a dataset or a specific version number or a range of versions (275/300). Wildcards (* & ?) are supported for the dataset name.
TAPE - selects records backed up on a specific tape volume. Wildcards are not allowed in the tape volume name.
TYPE - is required when selecting records backed up using backup2. The value must be OSS when searching for oss objects or SQLMX when searching for sql/mx objects.

Examples:

```
INFO FILE2 /data/ops/procedures, TYPE OSS, DATASET DAILY-BACK(*), DETAIL
INFO FILE2 ADTABLE, TYPE SQLMX, DATASET DAILY-BACK(*), DETAIL
INFO FILE $*.*.DATASYS, DATASET FULL-BACK(*), DETAIL
INFO FILE $*.*.DATASYS, DATASET FULL-BACK(25/35)
INFO FILE $*.*.DATASYS, DATASET FULL-BACK(25/35), LIST RESET QUIET
INFO FILE *, TAPE Z01352
INFO FILE $DATA.QTOSDATA.BKPLIST, MODIFIED FROM 5/13/2006 TO 5/31/2006
```

INFO DATASET

The INFO DATASET command searches and retrieves dataset records from the QTOS database.

```
INFO /OUT <out file>/DATASET <dataset name (version)>
                                [ ,DETAIL
                                ,VAULT (vault name) ]
```

<out file> - spooler location to write the request results
<dataset> - dataset name to search for. Wildcards are allowed.
VERSION - retrieves records of specified dataset versions. If version is omitted the master dataset version is returned. Allowed values for version are an asterisk(*) to retrieve all versions, a specific version (27) or a range of version (112/122).
DETAIL - display a detailed dataset information
VAULT - selects records associated with a specific vault name. Wildcards (* & ?) are supported as part of the vault name.

Examples:

```
INFO DATASET FULL-BKUP(*)
INFO DATASET FULL*
INFO DATASET FULL-BACKUP-PARALLEL(275, DETAIL
INFO DATASET *, VAULT OFFSITE
```

INFO VAULT

The INFO DATASET command searches and retrieves vault records from the QTOS database.

```
INFO /OUT <out file>/VAULT <vault name>
                               [ ,DETAIL ]

<out file> - spooler location to write the request results
<vault>    - vault name to search for. Wildcards are allowed.
DETAIL     - display a detailed vault information
```

Examples:

```
INFO VAULT STOR1,DETAIL
INFO VAULT FULL*
```

INFO TAPE

The INFO TAPE command searches and retrieves tape volume records from the QTOS database.

```
INFO /OUT <out file>/TAPE <tape volume name>
                               [ ,DETAIL
                               ,STATUS <S | B | I | ?>
                               ,VAULT <vault name> ]

<out file> - spooler location to write the request results
<vault>    - vault name to search for. Wildcards are allowed.
DETAIL     - display a detailed tape volume information
STATUS     - selects tape volume records with a specific status.
            S - scratch B - bad I - in use ? - selected
VAULT     - selects records associated with a specific vault name.
            Wildcards are supported as part of the vault name.
```

Examples:

```
INFO TAPE Z00011,DETAIL
INFO TAPE *,VAULT OFFSITE*
INFO TAPE *,VAULT DAILY,STATUS S
INFO TAPE Z*,STATUS B,DETAIL
```


LIST

The LIST command manipulates and displays the list created with the INFO FILE[2] command that retrieves file and object records from the QTOS database.

```
LIST [DELETE <criteria>
      ,KEEP <criteria>
      ,UNDELETE <criteria>
      ,SHOW
      ,RESET

DELETE - removes entries from the list by number or criteria
KEEP   - removes all items that do not meet the criteria
UNDELETE - returns DELETED items to the list
SHOW   - displays the list
RESET  - resets the list to contain no items (purge)

Criteria used for the DELETE, KEEP and UNDELETE subcommands:
  item number - the number of the item as displayed by the SHOW
                command. This can be an individual number, a series
                of numbers separated by commas or a range of numbers
                separated with a slash.

  NEWEST      - the file with the most recent modification date within
                a group of duplicate files.
  ONSITE      - the files whose media is determined to be on site.
  OFFSITE     - the files whose media is determined to be off site.
  ALL or *    - ALL records.
```

Examples:

```
LIST DELETE 3,11,27
LIST KEEP 5/14
```

MOUNTS

The MOUNTS command will display any outstanding mount requests that are pending or any prompts from user programs run through the XMACRO command.

Prompts from user programs are answered with the REPLY command.

```
MOUNTS
```

```
TACL > QTOSCOM  
QTOSCOM -> MOUNTS
```

or

```
QTOSCOM MOUNTS
```

Below are examples of responses to the MOUNTS command for tape mount requests:
(Response from MOUNTS command):

```
1 MOUNT SCRATCH TAPE XXXXXX FOR BACKUP PROCESS ON $TAPE FOR WEEKLY (1)
```

Below are examples of responses to the MOUNTS command with prompts from executing programs:

```
QTOSCOM -> MOUNTS
```

```
1 ENTER THE COUNTRY NAME FOR EXTRACT:  
?
```

```
QTOSCOM -> REPLY 1 CANADA
```

OPEN

The OPEN command is used to open \$QTOS on a remote system and become a local user on that system. The remote system must have remote access enabled in it's system control record and the user must have remote QTOSCOM security.

```
OPEN <remote qtos>
```

```
<remote qtos> - $QTOS on the system opened
```

Example: OPEN\SYS3.\$QTOS

QRESTORE

Starts a RESTORE using the QRESTORE product. QRESTORE recovers guardian files in a bit more than 10% of the time that the standard restore does. The syntax is exactly the same as the RESTORE command. See RESTORE command for details.

Examples:

```
QRESTORE(MONTHLY)/OUT $$.#MONTH.REST/$TAPE,VOL $WORK,LISTALL,LISTALL,OPEN,AUDITED
QRESTORE(MONTHLY(7))/IN $$SYSTEM.RESTORE.MONTHLY,OUT $$.#MONTH.REST/$TAPE,VOL $DATA
QRESTORE(MONTHLY(7,3))/OUT $$.#MONTH.REST/$TAPE,$DATA.MARCH.REVENUE,VOL DATA1,LISTALL,OPEN
```

Restoring from QTOSDB (File Locator) selections in RESTFLE.

```
QRESTORE/OUT $$.#RESTORE/$TAPE,FILE,VOL $$SYSTEM,AUDITED,OPEN (etc.)
QRESTORE/OUT $$.#RESTORE/$TAPE,FILE,LISTALL,OPEN,AUDITED
QRESTORE/OUT $$.#RESTORE/$TAPE,FILE,LISTONLY
```

QTOSCOM will parse the data in RESTFLE and issue and queue as many restores as required for the number of different backups in the restore list.

Restoring from QTOSCOM internal LIST selections.

```
QRESTORE/OUT $$.#RESTORE/$TAPE,LIST,VOL $$SYSTEM,AUDITED,OPEN
QRESTORE/OUT $$.#RESTORE/$TAPE,LIST,LISTALL,OPEN,AUDITED
QRESTORE/OUT $$.#RESTORE/$TAPE,LIST,LISTONLY
```

QTOSCOM will parse the data in the internal LIST and issue and queue as many restores as required for the number of different backups in the restore list.

REPLY

The REPLY command is used to respond to prompts from a user written application. The COBOL library prompt to mount a tape is handled by QTOS.

```
REPLY <job number> <reply text>
```

```
<job number> - reference number that is acquired via  
                the MOUNTS command
```

```
<reply text> - text used to reply to a program prompt
```

If the application prompts the user for information (i.e. Country Code), it is handled via the QTOSCOM MOUNTS and REPLY commands. The MOUNTS command displays the mount requests and prompts text messages from the processes that are currently running. When a prompt text message is displayed, it is responded to using the REPLY command.

Example of a user application with a prompt using unlabeled tapes:

Computer display is in upper case and user response in lower case.

```
QTOSCOM -> xmacro my-appl
```

```
QTOSCOM -> mounts
```

```
1 ENTER THE COUNTRY NAME FOR EXTRACT:
```

```
?
```

```
QTOSCOM -> REPLY 1 CANADA
```

RESTART

Auto-restart allows the continuation of a backup that has abended. QTOS will automatically re-que an abended backup starting at the last good file on the last good tape. QTOS will treat the restarted backup as part of the backup that has abended and track all tapes and file listings in a single data set version. The operator then has the option to clean the tape drive and restart the job with the restart command or issue the restart command and specify an alternate tape drive to be used while the tape drive in error is worked on.

```
RESTART <mount ref #> [tape drive]
```

where

mount ref - the name of MASTER DATA SET that this backup is to be stored under

tape drive - an alternate tape drive can be specified to restart the job on

RESTART informs QTOS to resume a backup job that has abended and has autorestart enabled. This command allows the operator time to clean the offending tape drive before the backup process is restarted, or, to restart it on a different tape drive.

The following messages will be sent to the operator console:

```
10/22/1991 10:50 - BACKUP PROCESS ($ZXXX) ABENDED
```

```
10/22/1991 10:50 - SCRATCH PROCESS STARTED TO CLEAN UP AFTER ABORTED PROCESS
```

```
(this only backs out file listing records for the tape in error)
```

```
10/22/1991 10:50 - BACKUP PROCESS FOR DSN DAILY-BACKUP(33) HAS ABENDED
```

```
10/22/1991 10:50 - AUTO RESTART IS ENABLED. WHEN YOU ARE READY TO RESTART
```

```
10/22/1991 10:50 - ENTER THE RESTART COMMAND
```

```
QTOCOM-> RESTART 01 $TAPE
```

RESTORE

Request QTOS to execute the NONSTOP RESTORE program or the NONSTOP UNPAK program using a DATA SET that designates the QTOS retention, define, and tape information.

The QTOS RESTORE command follows the same conventions as the NONSTOP RESTORE command. The only difference is the name of the DATA SET immediately following the RESTORE COMMAND.

```
RESTORE (<dsn name>) [ /<run options> / ]
           ,<tape drive>,<file set> | FILE <restfle> | LIST
           ,<restore options>
```

Where:

- dsn name - the name of the DATA SET that this backup was stored under.
- run options - standard guardian process startup run options.
OUT <listing file> - where QTOS routes the listing report.
IN <in file> - optional input command file where QTOS retrieves the restore command details.
- tape drive - the name of the tape drive to be used. This can be:
A specific tape drive.
Ex: \$CART
A pool of tape drives. QTOS will start the restore on the first available tape drive in the pool.
Ex: (\$TAPE1,\$TAPE2,\$TAPE3,\$TAPE4)
An asterisk (*) which denotes Auto Volume Recognition (AVR). This is also used for Tape Libraries and Virtual Tape devices.
- file set - the files to be restored up
- FILE - tells QTOSCOM to use the restfle created by QTOSDB
- restfle - QTOSDB restore file selections from the file locator if not specified the default restfle is used.
- LIST - tells QTOSCOM to use the internal LIST created by the INFO FILE command.
- restore options- the options used by NONSTOP RESTORE
EX: listall, open, audited, etc.

If the dsn version is not entered, the most recent version is used for the restore operation. If the start tape is not entered, the restore starts using the first tape in the data set.

QTOSCOM builds the list of volume ids to be used and QTOS prompts the operator to mount the appropriate volume when needed.

If the FILE option is used, QTOS reads the restfle generated by the QTOSDB FileFinder screen to queue as many restore processes as are necessary to perform the retrieval of the files residing in the restfle file.

If the LIST option is used, QTOS uses the internal list created with the INFO FILE command and queues the required number of restores needed to retrieve the files.

Examples:

```
RESTORE(MONTHLY)/OUT $$.#MONTH.REST/$TAPE,VOL $WORK,LISTALL,LISTALL,OPEN,AUDITED
RESTORE(MONTHLY(7))/IN $$SYSTEM.RESTORE.MONTHLY,OUT $$.#MONTH.REST/$TAPE,VOL $DATA
RESTORE(MONTHLY(7,3))/OUT$$.#MONTH.REST/$TAPE,$DATA.MARCH.REVENUE,VOL DATA1,LISTALL,OPEN,AUDITED
```

Restoring from QTOSDB (File Locator) selections in RESTFLE.

```
RESTORE/OUT $$.#RESTORE/$TAPE,FILE,VOL $$SYSTEM,AUDITED,OPEN (etc.)
RESTORE/OUT $$.#RESTORE/$TAPE,FILE,LISTALL,OPEN,AUDITED
RESTORE/OUT $$.#RESTORE/$TAPE,FILE,LISTONLY
```

QTOSCOM will parse the data in RESTFLE and issue and queue as many restores as required for the number of different backups in the restore list.

Restoring from QTOSCOM internal LIST selections.

```
RESTORE/OUT $$.#RESTORE/$TAPE,LIST,VOL $$SYSTEM,AUDITED,OPEN
RESTORE/OUT $$.#RESTORE/$TAPE,LIST,LISTALL,OPEN,AUDITED
RESTORE/OUT $$.#RESTORE/$TAPE,LIST,LISTONLY
```

QTOSCOM will parse the data in the internal LIST and issue and queue as many restores as required for the number of different backups in the restore list.

RESTORE2

Request QTOS to execute the NONSTOP RESTORE program using a DATA SET that designates the QTOS retention, define, and tape information.

The QTOS RESTORE command follows the same conventions as the NONSTOP RESTORE command. The only difference is the name of the DATA SET immediately following the RESTORE COMMAND.

```
RESTORE2 (<dsn name>) [/<run options>/]
           ,<tape drive>,<file set> | LIST
           ,[restore2 options]
```

Where:

dsn name	- the name of the DATA SET that this backup was stored under.
run options	- standard guardian process startup run options. OUT <listing file> - where QTOS routes the listing report, or IN <in file> - optional input command file where QTOS retrieves the restore command details.
tape drive	- the name of the tape drive to be used. This can be: A specific tape drive. Ex: \$CART A pool of tape drives. QTOS will start the restore on the first available tape drive in the pool. Ex: (\$TAPE1,\$TAPE2,\$TAPE3,\$TAPE4) An asterisk (*) which denotes Auto Volume Recognition (AVR). This is also used for Tape Libraries and Virtual Tape devices.
file set	- the files to be restored up
LIST	- tells QTOSCOM to use the internal LIST created by the INFO FILE command for a list of objects to restore.
restore2 options	- the options used by BRCOM RESTORE

If the dsn version is not entered, the most recent version is used for the restore operation. If the start tape is not entered, the restore starts using the first tape in the data set.

QTOSCOM builds the list of volume ids to be used and QTOS prompts the operator to mount the appropriate volume when needed.

If the LIST option is used, QTOS uses the internal list created with the INFO FILE command and queues the required number of restores needed to retrieve the files.

Examples:

Restore several OSS objects from the WEEKLY-OSS dataset, version 12, using any tape drive. Only restore those objects with a mod time after January 17 2012 and use the defaults for all of the run options.

```
QTOSCOM 4> RESTORE2(WEEKLY-OSS(12)) *, OSS (/etc/rc, /var/x) WHERE MODTIME AFTER JAN 17 2012
```

Restore all sql/mx catalogs from the FRIDAY-SQLMX dataset, version 573, using any tape drive. Send the listing to \$\$FRIDAY.RESTORE and use the defaults for all of the other run options.

```
QTOSCOM 41> RESTORE2 /OUT $$.#FRIDAY.RESTORE/ (FRIDAY-SQLMX(573)) *, MX CATALOG *
```

Restoring from QTOSCOM internal LIST selections.

```
RESTORE/OUT $$.#RESTORE/$TAPE,LIST
```

QTOSCOM will parse the data in the internal LIST and issue and queue as many restores as required for the number of different backups in the restore list.

START

The START command is used by QTOSCOM to start the QTOS subsystem and to start the scratch process manually.

```
START | QTOS |  
      | SCRATCH |
```

START QTOS

Starting the QTOS subsystem.

This will start \$QTOS, \$QMON, \$QEMS and \$QLBL.

```
TACL > QTOSCOM  
QTOSCOM -> START QTOS  
QTOSCOM -> EXIT
```

or

```
QTOSCOM START QTOS
```

START SCRATCH

```
QTOSCOM -> START SCRATCH  
SCRATCH PROCESS STARTED
```

This command will manually start the scratch process for any Data Sets that are flagged (S) or (D).

STATUS

The STATUS command is used to display the status of tape drives or processes.

```
STATUS <status type>
```

```
where
```

```
status type - DRIVES - returns the status of the system tape drives.
```

```
- PROCS - returns the status of queued and executing processes.
```

```
- QUEUE - returns the status of the process queue
```

```
- QTOS - returns the license and other info for QTOS
```

STATUS DRIVES COMMAND

```
TACL > QTOSCOM
```

```
QTOSCOM -> STATUS DRIVES
```

TAPE DRIVE	STATE	VOLUME ID	PROCESS	DEFINE
(S) \$TAPE	OPEN/INUSE	Q00110	\$Z062	=QTOS00
(S) \$TAPE1	OPEN/SECURE			=QTOS01HOLD

The STATUS DRIVES command is displaying

```
$TAPE IS INUSE BY PROCESS $Z062 WITH TAPE Q00110 MOUNTED.  
$TAPE1 IS OPEN AND SECURED BY $QTOS.
```

(S) is displayed before the drives when QTOS is started in the secured mode (QTOS owns the tape drives and allocates them only to QTOSCOM requests. When TMF requests a mount and the drive is in the wait mount state a TMF tape can be mounted and it will complete without freeing the drive. If there are no processes queued the drive must be freed using the FREE command to let external processes have access to the drives).

(U) is displayed before the drives when QTOS is started in the open mode (QTOS accesses the tape drives on a first come first serve basis as any other process does on a Tandem system).

STATUS PROCS COMMAND

```
TACL > QTOSCOM  
QTOSCOM -> STATUS PROCS
```

REF	PROCESS	TYPE	DSN	DRIVE	PROC STATE
01	\$ZXXX	BACKUP	MONTHLY-BACKUP(1)	\$TAPE1	WAIT MOUNT
02		BACKUP	WEEKLY(1)	\$TAPE1	QUEUED/LOCAL

The STATUS PROCS command is displaying
Job #1 is a BACKUP using DATA SET MONTHLY-BACKUP on tape drive \$TAPE1 waiting for mount.
Job #2 is a BACKUP for DSN WEEKLY queued for processing.

STATUS QUEUE COMMAND

```
TACL > QTOSCOM  
QTOSCOM -> STATUS QUEUE
```

```
$DAT  
01          BACKUP    MONTHLY-BACKUP(1)  
04          BACKUP    DAILY-DATA(27)
```

The STATUS QUEUE command is displaying
\$DAT has 2 jobs queued
Job #1 is a BACKUP using DATA SET MONTHLY-BACKUP
Job #2 is a BACKUP for DSN DAILY-DATA VERSION 2

STATUS QTOS COMMAND

```
TACL>QTOSCOM  
QTOSCOM -> STATUS QTOS
```

```
Qtoscom Expires 12/20/2021 BR2 Disabled  
Qtos Expires 12/20/2021 BR2 Disabled  
Started 7/12/2012 13:25
```

STOP

The STOP command is used by QTOSCOM to stop the QTOS subsystem.

```
STOP | QTOS |
```

STOP QTOS

To stop the QTOS subsystem.

```
TACL> QTOSCOM  
QTOSCOM -> STOP QTOS  
QTOS SHUTTING DOWN
```

```
QTOSCOM -> EXIT
```

or

```
TACL> QTOSCOM STOP QTOS
```

UPDATE

The UPDATE command allows users to add existing backups to the QTOS database or to add listing records to an existing dataset version.

```
UPDATE (<dsn name(<version>)) | <tape drive> |
                                     | NOLIST |

where

dsn name      - is the DATA SET NAME to either create a version under
                or the data set name with the version to update the
                listing under.

version       - is the optional version number of the DATA SET whose
                tape volumes will be used to read the listing into the
                data base.

tape drive    - is the tape drive that the tapes will be mounted on to
                read the listing into the data base.

nolist        - this specifies that the tapes are not to read and the
                listing will not be added to the data base. In this mode
                only the tapes are prompted for and allocated to a data
                set version. This is not valid for existing dataset
                versions.
```

If the user enters a dataset name with a dataset version, QTOS retrieves the tape volumes used in the backup and emits EMS messages for each tape to be mounted. The tapes are scanned to get the listing information and the QTOS database is updated with that information.

If the user only enters a dataset name, QTOSCOM prompts the user to enter each tape volume in the sequence they were created by the backup process. QTOS creates a new dataset version and links the entered tape volumes to that dataset. If the NOLIST option is used no further action is taken, otherwise the tapes are scanned to get the listing information and the QTOS database is updated with that information.

```
QTOSCOM -> UPDATE(monthly-backup)/out $s.#Month.UPDATE/$tape
ENTER VOLIDS OF TAPES, TYPE CTRL Y WHEN FINISHED
ENTER VOLID OF TAPE: Q00110
ENTER VOLID OF TAPE: Q00127
VOLUME Q00110 ALLOCATED AS TAPE NUMBER 1 FOR DSN MONTHLY-BACKUP (1)
VOLUME Q00127 ALLOCATED AS TAPE NUMBER 2 FOR DSN MONTHLY-BACKUP (1)
  PLACE VOLUME Q00110 IN SLOT NUMBER 30 IN VAULT QSA
  PLACE VOLUME Q00127 IN SLOT NUMBER 31 IN VAULT QSA
```

The DSN version does not exist before the command but the tapes must be present in the database. The operator will be prompted to mount Q00110

QTOSCOM -> UPDATE(monthly-backup(3))/out \$.#Month.UPDATE/\$tape

The dsn version exists (from a previous backup, entered manually, or input through a previous UPDATE operation) but the file listing information is not in the database. This will update the listing data.

QTOSCOM -> UPDATE(monthly-backup)/out \$.#Month.UPDATE/nolist

The dsn version does not exist but the volume ids have been entered into the database. The file information is not wanted. A restore process is not started (since we don't need the file information). The result on the database is exactly that of the first example except that the file information is not entered into the database. The operator is prompted for volume ids until <control y> is pressed.

VTSEXPOR

The VTSEXPOR command allows users to duplicate the attributes of an existing dataset version, created using a virtual tape device, as a new version with its own tape volumes after exporting the virtual tapes to a set of physical tapes.

```
VTSEXPOR <original^dataset(version)>,<new dataset>,<tape1>,<tape2>,<tape...>

  <original^dataset(version)> - dataset version created by the original backup
  <new dataset>                - data set used to track the tape set
                                created by the VTS EXPORT operation
  <tape1>                      - first tape created by the VTS EXPORT operation
  <tape2>                      - second tape created by the VTS EXPORT operation
  <tape...>                   - next tape created by the VTS EXPORT operation
```

Examples:

```
VTSEXPOR MONTHLY-BKUP(275), MONTHLY-BKUP-EXP, M00139, M00115, M00018
```

XMACRO

The XMACRO command allows for a controlled database of operation parameters for backups and other applications that write to tape.

For **Program Maintenance** information and setup see **QTOSDB** Manual.

```
XMACRO <macro name> [<tape drive>]
      <macro name> - name of the macro created as a program record in
                    the database.
      <tape drive> - tape drive on which to queue the
                    process. This overrides the database configuration.
```

The XMACRO command is a shortcut for starting backup, restore or other programs that access tape data, physical or virtual. Execution of the XMACRO command is much like the TACL OBEY command with all of the process information resident in the QTOS database. All of the startup parameters are entered on the PROGRAM MAINTENANCE screen and the ASSIGNS and PARAMS and INFILE screens are accessed from this screen. Configuring processes in this way allows every element of processing to come under the control of the QTOS security environment.

PARTIAL BACKUPS

QTOS automates partial backups through the XMACRO COMMAND. In the PROGRAM MAINTENANCE screen are fields to set up the dataset(s) involved in the partial backups. When a backup is started using the XMACRO command, QTOS checks the TIMESTAMP field of the program record. If this contains a valid date the PARTIAL parameter is included in the backup command along with the date. When the backup completes the partial timestamp is updated to use w the next backup.

QTOSCOM -> XMACRO DAILY-BACKUP

or

TACL > QTOSCOM XMACRO DAILY-BACKUP

To specify an alternate tape drive other than the one specified in the macro

QTOSCOM -> XMACRO DAILY-BACKUP \$TAPE1

!

Repeat a previously entered command.

```
! <command number>
```

Where:

command number - the number of the command to repeat. If no number is entered the most recent command is repeated.

QTOSCOM saves a list of previously entered commands that can be repeated. The ! command repeats the requested command.