

Simple Object Replicator

(Version 2 Release 0 Build 0727)

SOR INSTALLATION:

Install the SOR software onto the iSeries system using the RSTLIB command. The library was saved to the save media as library XSOR. Up to two copies of the SOR software may be installed on the same system so that it may operate as both a source and target system concurrently.

The configuration for the target system must be performed first as some parameters specified there will need to be specified for the source system as well. In order to configure SOR, it is recommended that you be signed on as QSECOFR. Library XSOR (or whatever library SOR was restored as) must be in the library list. Issue the command SORCFG *TGT to get the following screen:

```
Simple Object Replicator
Software License Agreement

NOTICE: By choosing the "Accept" option, you are accepting two separate
license agreements as a matter of convenience: 1) Software Evaluation
License Agreement ("SELA") for evaluating the software; and 2) End
User License Agreement ("EULA") that applies only if you acquire a
purchased license key for the software. The complete text of each
of these two license agreements are included.

Software Evaluation License Agreement

THIS AGREEMENT REPLACES ANY PRIOR ORAL OR WRITTEN COMMUNICATIONS BETWEEN
YOU AND MIDRANGE RESOURCES, INC. CONCERNING YOUR USE OF THE SOFTWARE.
BY DOWNLOADING, INSTALLING, COPYING, ACCESSING, OR USING THE SOFTWARE YOU
AGREE TO THE TERMS OF THIS AGREEMENT. IF YOU ARE ACCEPTING THESE TERMS ON
BEHALF OF ANOTHER PERSON OR A COMPANY OR OTHER LEGAL ENTITY, YOU REPRESENT
AND WARRANT THAT YOU HAVE FULL AUTHORITY TO BIND THAT PERSON, COMPANY, OR
More...

F3=Exit   F6=Print   F12=Cancel
```

Before you can begin to configure and use SOR, you must read and accept the appropriate license agreement (SELA or EULA). You **must** page down through the entire agreements before you are given the following screen to enter the software license key and press the F14 key to accept the license agreement:

Simple Object Replicator
Software License Agreement

License Key: _____

Accepted By: _____

F3=Exit F12=Cancel

You must key in the software license key provided to you, along with your name before you are given the option to use F14 to accept the software license and continue with the configuration of the software. If you find that you entered the license key incorrectly, or you receive an update or upgrade to SOR, you can execute the command SORWRKLIC to display the license agreements and return to the screen shown above. The configuration screen for the Target System is shown next:

2.0.0727 Simple Object Replicator MIDRANGE
Target System Configuration

Install Library: XSOR

Source System: *LOCAL _____ (*LOCAL)

Journal Library: XSORJRN

Journal Receiver - Library: XSORRCV ASP: 1

Subsystem: SORSBS User Profile: SORUSR Password: _____

Message Queues: _____

Break Messages: N (Y/N) N (Y/N) N (Y/N) N (Y/N) N (Y/N)

Minimum # days to keep Journal Entries: 1 # Days to keep logs: 30

Minimum # days to keep save info: 3

F3=Exit F12=Cancel

Field descriptions:

- SOR Install Library:* This is the name of the library containing the SOR software from which the SORCFG command is run from. You should verify this value to insure that you are operating upon the correct copy of the installed SOR software.
- Source System:* The name of the source system. For single system installations, the default *LOCAL is used. If a value other than *LOCAL is specified, the relational database directory entries are searched for the value specified. If it is not found, the ADDRDBDIRE command is prompted for you to add the entry. This field can be entered only on the initial configuration session. **This name must match the relational database name for the *LOCAL relational database directory entry found on the source system.** This should also be the system name for the source system as shown on the DSPNETA command in order to avoid confusion and possible DDM/DRDA communication problems.
- Journal Library:* The name of the library to contain the journals created by SOR for use in replication. If you are installing two copies of the SOR software, it is recommended that you suffix the name with "TGT" or "T" to help distinguish it as the journal library for the target configuration. This field can be entered only on the initial configuration session.
- Journal Receiver - Library / ASP:* The name of the library to contain the journal receivers created by SOR for use in replication. If you are installing two copies of the SOR software, it is recommended that you suffix the name with "TGT" or "T" to help distinguish it as the journal receiver library for the target configuration. It is recommended by IBM to place journal receivers into a user ASP if possible in order to minimize the impact journaling may have on the performance of a system. This field can be entered only on the initial configuration session.
- Subsystem:* This is the name of the subsystem in which the SOR software will operate in. If you are installing two copies of the SOR software, it is recommended that you suffix the name with "TGT" or "T" to help distinguish it as the subsystem for the target configuration. The subsystem will be created in the *SOR Install Library*. This field can be entered only on the initial configuration session.
- User Profile:* This is the name of the user profile which the SOR jobs will run under. The user profile is created with the following parameters: USRCLS(*SECOFR), INLPGM(*NONE), INLMNU(*SIGNOFF), SPCAUT(*ALLOBJ, *AUDIT, *JOBCTL, & *SPLCTL), and GRPPRF(QSECOFR). It is recommended that the user profile not be changed in any way in order to insure the SOR software functions as designed. This field can be entered only on the initial configuration session.
- Password:* This is the password to be associated with the *User Profile*. This does not need to be specified for single system installations. If you plan to change the password in the future, it should be changed from here to insure that the server authentication entry is changed as well. If the password is changed on either system, it must be changed on the other system to match it identically.
- Message Queues:* You may specify up to 5 message queues to receive any messages that SOR might issue. All SOR messages are always sent to *SYSOPR message queue. SOR issues messages to notify the user of any errors that might be encountered during the replication process.
- Break Messages:* Specifies whether SOR will send break messages to notify users of the arrival of an SOR message in their message queue. SOR will send break messages to all workstations a user is signed on to if the message queue specified above is a message queue with the name of a user profile.

Minimum # days to keep Journal Entries: SOR registers an exit program with the system to control the deletion of journal receivers to insure that a journal receiver is not deleted before all of its entries have been processed. If you have a reason to keep journal receivers for a longer period of time than what the system or SOR may require, you may specify that time here.

Days to keep SOR logs: SOR keeps a log of many of its functions. Specify the number of days you wish to keep those logs here.

Minimum # days to keep save info: Minimum number of days SOR will keep track of save points on objects not being actively replicated to be used with the SORRSTOBJ command.

Note:

It is recommended that you leave the library names, subsystem name, and user profile at their default values unless they conflict with pre-existing objects on your system, or you are installing two copies of the SOR software on the same system. By leaving these fields at their default values, any technical support you may require will go more smoothly.

The configuration of the source system will be automatically started upon the completion of the target configuration on single system installations. If the source system is different from the target system, you must start the configuration manually, enter the software license key and your name, and accept the license agreement. It is recommended that you be signed on as QSECOFR. Library XSOR (or whatever library SOR was restored as) must be in the library list. Issue the command SORCFG *SRC to get the following screen:

```
2.0.0727                               Simple Object Replicator                               MIDRANGE
                                      Source System Configuration

Install Library:  XSOR                   System Library:  XSORSYS
Target System:   *LOCAL                   (*LOCAL)

Journal Library:  XSORJRN
Journal Receiver - Library:  XSORRCV     ASP:  1     Size:  500000

Target Journal Library:  XSORJRN
Target Journal Receiver Library:  XSORRCV
Remote Journal Delivery Method:  A (A=Async/S=Sync)

Subsystem:  SORSBS           User Profile:  SORUSR           Password:

Message Queues:
Break Messages:  N (Y/N)     N (Y/N)     N (Y/N)     N (Y/N)     N (Y/N)

Journal Both Images:  Y (Y/N)     Include User & Pgm info in Journal:  N (Y/N)
Include Opens & Closes in Journal:  N (Y/N)
# Days to keep logs:  30           Dynamic Replication:  I (N/I/D)

F3=Exit  F12=Cancel
```

Field descriptions:

SOR Install Library: This is the name of the library containing the SOR software from which the SORCFG command is run from. You should verify this value to insure that you are operating upon the correct copy of the installed SOR software.

SOR System Library: This is the name of a library which will be created to contain any duplication of system commands which may be required to assist in the replication of system objects. This library will be added to the top of the system value QSYSLIBL. This field can be entered only on the initial configuration session.

Target System: The name of the target system. For single system installations, the default *LOCAL is used. If a value other than *LOCAL is specified, the relational database directory entries are searched for the value specified. If it is not found, the ADDRDBDIRE command is prompted for you to add the entry. This field is protected from entry on a single system installation. This field can be entered only on the initial configuration session. **This name must match the relational database name for the *LOCAL relational database directory entry found on the target system.** This should also be the system name for the target system as shown on the DSPNETA command in order to avoid confusion and possible DDM/DRDA communication problems.

Journal Library: The name of the library to contain the journals created by SOR for use in replication. If you are installing two copies of the SOR software, it is recommended that you suffix the name with "SRC" or "S" to help distinguish it as the journal library for the source configuration. This field is protected from entry on a single system installation. This field can be entered only on the initial configuration session.

Journal Receiver - Library / ASP: The name of the library to contain the journal receivers created by SOR for use in replication. If you are installing two copies of the SOR software, it is recommended that you suffix the name with "SRC" or "S" to help distinguish it as the journal receiver library for the source configuration. It is recommended by IBM to place journal receivers into a user ASP if possible in order to minimize the impact journaling may have on the performance of a system. This field is protected from entry on a single system installation. This field can be entered only on the initial configuration session.

Size: This is the size of the journal receivers in Kbytes which will be created by SOR. According to an IBM redbook on performance tuning for journaling environments, the journal receivers will be spread across 1 drive arm for each 64MB of size specified. Changes to this value take effect for any new journals that SOR creates and does not affect existing journals. NOTE: If you have the available disk space, specifying a larger Size will spread the journal entries over a larger number of drives which may help improve journaling performance. On the other hand, if you have limited disk space, you may wish to specify a smaller Size in order to keep from filling up your disks.

Target Journal Library: This is the value specified for *Journal Library* on the target configuration. This field is protected from entry on a single system installation. This field can be entered only on the initial configuration session.

Target Journal Receiver Library: This is the value specified for *Journal Receiver - Library* on the target configuration. This field is protected from entry on a single system installation. This field can be entered only on the initial configuration session.

Remote Journal Delivery Method: This is the method of delivery to be used for the remote journals created by SOR for use in replication. This is ignored for single system installations. Changes to this value take effect the next time SOR is started, or when SOR creates a new journal.

- Subsystem:* This is the name of the subsystem in which the SOR software will operate in. If you are installing two copies of the SOR software, it is recommended that you suffix the name with "SRC" or "S" to help distinguish it as the subsystem for the source configuration. The subsystem will be created in the *SOR Install Library*. This field is protected from entry on a single system installation. This field can be entered only on the initial configuration session.
- User Profile:* This is the name of the user profile which the SOR jobs will run under. This must be the same as specified for the Target system. The user profile is created with the following parameters: USRCLS(*SECOFR), INLPGM(*NONE), INLMNU(*SIGNOFF), SPCAUT(*ALLOBJ, *AUDIT, *JOBCTL, & *SPLCTL), and GRPPRF(QSECOFR). It is recommended that the user profile not be changed in any way in order to insure the SOR software functions as designed. This field is protected from entry on a single system installation. This field can be entered only on the initial configuration session.
- Password:* This is the password to be associated with the *User Profile*. This must be the same as specified for the Target system. This does not need to be specified for single system installations. If the password is changed on either system, it must be changed on the other system to match it identically. This field is protected from entry on a single system installation. This field can be entered only on the initial configuration session.
- Message Queues:* You may specify up to 5 message queues to receive any messages that SOR might issue. All SOR messages are always sent to *SYSOPR message queue. SOR issues messages to notify the user of any errors that might be encountered during the replication process.
- Break Messages:* Specifies whether SOR will send break messages to notify users of the arrival of an SOR message in their message queue. SOR will send break messages to all workstations a user is signed on to if the message queue specified above is a message queue with the name of a user profile.
- Journal Both Images:* This specifies whether the journals created by SOR for use in replication will have the before image included in the journal entries. Having the before images included in the journal entries provides a level of integrity checking. If the before image is present in the journal entries, SOR will compare the before image to the image of the current record of the replicated file to verify that they match and report any discrepancies. Changes to this value take effect for any new journals that SOR creates and does not affect existing journals.
- Include User & Pgm info in Journal:* This specifies whether the journals created by SOR for use in replication will have job, user profile, and program information included in the journal entries. Omitting this information from your journals will help minimize the impact journaling will have on your system performance. You may want to consider including this information if you plan to implement any kind of auditing software in the future. Changes to this value take effect for any new journals that SOR creates and does not affect existing journals.
- Include Opens & Closes in Journal:* This specifies whether the journals created by SOR for use in replication will keep record of each file open and close in the journal entries. Omitting this information from your journals will help minimize the impact journaling will have on your system performance. You may want to consider including this information if you plan to implement any kind of auditing software in the future. Changes to this value take effect for any new journals that SOR creates and does not affect existing journals.

Days to keep SOR logs: SOR keeps a log of many of its functions. Specify the number of days you wish to keep those logs here.

Dynamic Replication: This specifies whether SOR will attempt to "dynamically" begin the replication of any newly-created physical files, source files, data areas, or data queues, as well as non-journaled objects such as programs and display files.

N = None. No dynamic replication of objects will occur.

I = Immediate replication. The job in which the new object is created will attempt to start the replication of the newly-created object immediately after the object is created, before control is returned from the create command. If the dynamic replication process is unsuccessful, a delayed replication request will be made. User authorities may prevent this method from being successful.

D = Delayed replication. The job in which the new object is created will send a request to the SORSRC job to perform the dynamic replication process.

Locks on the object may prevent this method from being successful.

In order for dynamic replication to work, the create commands must be used from the *SOR System Library*. This means that any create command that is prefixed with a library name will not be intercepted, and dynamic replication will not be performed on the newly-created object created by such a command. A change to this field from the value "N" to "I" or "D" requires that the *Subsystem* be ended and re-started if it is already active.

Note:

It is recommended that you leave the library names, subsystem name, and user profile at their default values unless they conflict with pre-existing objects on your system, or you are installing two copies of the SOR software on the same system. By leaving these fields at their default values, any technical support you may require will go more smoothly.

Note:

If you are operating SOR between two systems and wish to use the Copy to Target or Dynamic Replication features of the software, there may be some additional configuration required. The Copy to Target and Dynamic Replication features of the software requires that ObjectConnect (option 22 of 5722SS1) be installed and functioning between the source and target systems. A program named SNASETUP is provided as an unsupported tool to aid you in configuring your systems for APPC which is required for Object Connect to operate. Based upon the information supplied during the SOR configuration, SNASETUP will: 1) change the network attributes to allow AnyNet support; 2) create an APPC controller using the name of the Target System; 3) create or change the *APPNRMT configuration list; 4) add communications entry for mode QSOCCT to subsystem QBASE if it is the controlling subsystem; and 5) add a TCP host table entry for the Target System to be used by AnyNet. To verify that ObjectConnect is properly installed and configured, perform a SAVRSTOBJ command on the Source System for a small object to see if it is successfully restored to the Target System.

Note:

SOR 2.0 now requires 5722TC1 to be installed, configured, and operational on each system. SOR utilizes TCP port 767 to communicate between the source and target systems.

Note:

If you find the need to uninstall SOR and start from scratch, you may call the program SORUNINST to accomplish this task. The SORUNINST program will end journaling on all objects that SOR started journaling for, attempt to delete all journals and receivers, attempt to delete the libraries created to hold the journals and receivers, delete all objects SOR created, and clear all database files used by SOR. SORUNINST will, with a few exceptions, restore your system to the state it was in immediately after the SOR software was restored onto it. This will allow you to run the SORCFG command and configure SOR from scratch. **If you had SOR loaded and configured on two systems in a Source/Target configuration, you must run SORUNINST on both systems to scratch both systems at the same time.** You should also check to make sure SORUNINST was able to delete all journals and receivers successfully. If not, you should manually attempt to delete the libraries that were created to contain the journals and receivers.

SOR OPERATION:

To start the SOR software, simply start the subsystem specified in the configuration screens. **After the initial software installation and configuration, it is recommended to start the software on the Target system first before starting the software on the Source system.**

To end the SOR software, simply end the subsystem. **DO NOT USE OPTION (*IMMED) WHEN ENDING THE SUBSYSTEM AS THIS MAY CAUSE CORRUPTION OF DATA IN THE REPLICATED FILES.** The SOR software is written to respond to the endjob, endsbs, and pwrdwsys commands within 30 seconds of the command being executed.

To control the replication of objects, issue the command SORWRKLIB to get a screen similar to the following one:

Simple Object Replicator			MIDRANGE
Library Selection			
Type options, press Enter.			Position to:
1=Select	4=End	7=Suspend	12=Work with
Opt	Library	Type	Text
—	BHLIB	PROD	
—	CGIDEV2	PROD	CGI Development Lib. V2; M. Rothman, GB. Perotti
—	CGIDEV2USP	PROD	User Space library- See pgm CGIDEV2/STATE
—	CGILIB	PROD	
—	CTTMODULES	PROD	
—	CTTOOLS	PROD	
—	CTTOOLSRC	PROD	
—	ISDDSCLNT	PROD	
—	ISDDSDTA	PROD	
—	ISDDSOLD	PROD	Old or replaced objects
—	ISDDSPTF	PROD	
—	ISDDSRUN	PROD	
—	ISDSSRC	PROD	
—	LIBTEST	TEST	
—	NATIONAL	PROD	
—	QGPL	PROD	General Purpose Library
			More...
F3=Exit	F5=Refresh	F12=Cancel	F13=Repeat F17=Subset F18=Options

The *Library Selection* screen displays the libraries requested from the parameter on the SORWRKLIB command. A status indicator is displayed between the option field and the library name. A status of "+" indicates that all objects selected for replication within the library are successfully being replicated. A status of "!" indicates that some objects selected for replication are not currently being replicated. You can quickly position to a specific library in the list by specifying all or part of its name in the *Position to* field.

You may specify option 1 to start replication on all eligible objects found within the library selected. Option 1 will not start replication for objects with the name of *NEW unless the option to do so is specified on the options screen. (*NEW objects are used to designate which object types in which libraries are eligible for dynamic replication). Option 4 ends replication on all objects currently being replicated within the library selected, and also ends journaling for all objects that SOR started journaling for. Option 7 suspends replication for all objects currently being replicated within the library selected. Option 7 does NOT end journaling as option 4 does. Option 12, or the SORWRKOBJ command, allows you to select

individual objects within a library as shown in the following screen:

Simple Object Replicator				MIDRANGE
Object Selection				
Type options, press Enter.			Position to: _____	
1=Start	3=Copy	4=End	7=Suspend	Pos to type: _____
Library: ISDDSDTA				
Opt	Object	Type	Text	
—	*NEW	*DTAARA		
—	*NEW	*DTAQ		
—	*NEW	*FILE		
—	ADR1	*FILE	RA file	
—	ISDXREF	*FILE	Data Dictionary File	
—	LAPVEND	*FILE	A/P Vendor file	
—	LGLDETL	*FILE	G/L Detail file	
—	LOGICAL	*FILE	Outfile for DSPFD TYPE(*ATR) FILEATR(*LF)	
—	PHYSICAL	*FILE	Outfile for DSPFD TYPE(*ATR) FILEATR(*PF)	
—	QDDSSRC	*FILE		
—	RELATE	*FILE	Outfile for DSPDBR	
—	SAVDETL	*FILE	G/L Detail file	
—	SAVLMST	*FILE	G/L chart of accounts	
—	VAPBCTL	*FILE	A/P Voucher Entry Batch Control file	
—	VAPBDET	*FILE	A/P Voucher Entry Batch detail file	
—	VAPBHED	*FILE	A/P Voucher entry Batch header file	
				More...
F3=Exit F5=Refresh F12=Cancel F13=Repeat F17=Subset F18=Options				

The *Object Selection* screen displays the objects eligible for replication within the library selected. The status of an object is represented by a single letter as shown between the option field and the object name. The status codes and their meanings are shown on the *Subset Object List* screen. You can quickly position to a specific object, or object type in the list by specifying all or part of its name in the *Position to* field, and the object type in the *Pos to type* field.

You may specify option 1 to start replication on the selected object(s). Specifying option 1 next to an object named *NEW will signal SOR to perform dynamic replication for that object type within the selected library. Option 3 copies the selected object(s) to the target system and activates replication. For a target of *LOCAL, option 3 uses the CRTDUPOBJ command to accomplish the copy. For actual remote targets, option 3 uses the SAVRSTOBJ command. Option 4 ends replication on the selected object(s), and also ends journaling for the selected object(s) that SOR started journaling for. Specifying option 4 next to an object named *NEW will signal SOR to stop dynamic replication for that object type within the selected library. Option 7 suspends replication for all selected object(s). Option 7 does NOT end journaling as option 4 does.

You can use F13 to repeat an option to the end of the list on both selection screens.

Note:

The SORWRKxxx commands can only be executed by one user at a time, and only operate on a source system. Objects of type *DTAQ are not available for replication on *LOCAL systems because their contents cannot be saved prior to V5R4, and their replication would typically be a waste of system resources. The *NEW object names will only appear if you have configured SOR to used dynamic replication.

The F18 key from the *Library Selection* screen displays the following options screen:

Simple Object Replicator Options	MIDRANGE
Start new journal for each selection group: <u>N</u> (Y/N)	
Start replication for *NEW when library is selected: <u>N</u> (Y/N)	
F3=Exit F12=Cancel	

The F18 key from the *Object Selection* screen displays the following options screen:

Simple Object Replicator Options	MIDRANGE
Start new journal for each selection group: <u>N</u> (Y/N)	
F3=Exit F12=Cancel	

Field descriptions:

Start new journal for each selection group: This option allows you to somewhat control the grouping of objects into different journals. A value of "Y" causes a new journal to be created for each group of objects selected for replication within the same library. The default for this field is "N".

*Start replication for *NEW when library is selected:* This specifies whether the use of option 1 will activate dynamic replication for newly created objects within the selected library. This option is available from within the *Library Selection* screen only.

The F17 key from the *Library Selection* screen displays the following screen:

```

                                     Simple Object Replicator
                                     Subset Library List
                                     MIDRANGE

Type choices, press Enter.

Library:  *ALLUSR      *ALL, *ALLUSR, *SOR, name, generic*
Type:     *ALL        *ALL, PROD, TEST
Text:     *ALL

```

F3=Exit F12=Cancel

Field descriptions:

Library: Specifies the libraries to be displayed on the *Library Selection* screen. The special value of *SOR will display only those libraries that contain objects that have been selected for replication by SOR.

Type: Specifies the type of libraries to be displayed on the *Library Selection* screen.

Text: Specifying all or part of a library description will determine the libraries to be displayed on the *Library Selection* screen.

The F17 key from the *Object Selection* screen displays the following screen:

```

                                Simple Object Replicator
                                Subset Object List
                                MIDRANGE

Type choices, press Enter.

Object:  *ALL          *ALL, name, generic*
Type:    *ALL          *ALL, *FILE, *DTAQ, *DTAARA, *OTHER
Text:    *ALL          _____

Status:  A C D E I R S T _
          A = Actively being replicated
          C = Catch-up phase
          D = Object deleted while being replicated
          E = User ended replication
          I = Object chosen for replication, but not restored to target
          R = Object in process of being restored to target
          S = Object replication suspended due to error
          T = Object replication suspended by user
          blank = Not selected for replication

F3=Exit  F12=Cancel
```

Field descriptions

Object: Specifies the objects to be displayed on the *Object Selection* screen.

Type: Specifies the type of objects to be displayed on the *Object Selection* screen.

Text: Specifying all or part of an object description will determine the objects to be displayed on the *Object Selection* screen.

SOR Status: Specifies which objects are to be displayed on the *Object Selection* screen based upon their status in regards to SOR.

If you are selecting objects for replication through the SORWRKOBJ command, the confirmation screen will display the SOR created journal that will be used for the selected objects. At that point, you have the option to change the journal to another existing SOR created journal by pressing the F4 key and choosing a journal from the list presented to you.

Once an object has been selected for replication, it gets a status of "I" for inactive. In order to change the status to an "A" for replication to actually begin, the user must restore a known save copy of the object onto the target system using the SORRSTOBJ command, or use option 3 to copy selected objects to the target system. Using the Copy to Target method (option 3) is only recommended for use with a few small objects at a time. The Copy to Target function was developed primarily as a means of starting replication on files without members as a known save copy is not possible to determine. A known save copy is a saved version of the object that has occurred after journaling has begun on the object. You use the command SORRSTOBJ to restore objects to the target system for replication to begin. If SOR has a record of any object saves, the command SORRSTOBJ will display a screen similar to the following one:

Simple Object Replicator						MIDRANGE
Restore Objects to target						
Type options, press Enter.				Position to: _____		
4=Remove 10=Restore 12=Work with						
Opt	Library	Redirected	Save Date/Time	Media	Volume ID/Save File	
—	BHLIB	_____	03/23/08 19:29:09	TAPE	BACKUP	
—	ISDDSDTA	_____	03/23/08 19:29:50	TAPE	BACKUP	
—	SRSTEST	_____	03/23/08 19:29:33	TAPE	BACKUP	
—	SRSTEST	_____	03/23/08 19:29:33	TAPE	BACKUP	

Bottom

F3=Exit F5=Refresh F12=Cancel F17=Subset F18=Options

This *Restore to Target* screen displays the most recent save info for all objects selected for replication, but are not actively being replicated. Each entry on the screen represents the save info for objects within a single journal. An asterisk is displayed between the Opt and Object fields for those entries that have already been selected for restore during the current session. You can quickly position to a specific library in the list by specifying all or part of its name in the *Position to* field.

You may specify that the replicated objects be placed into a library with a different name than the original library on the source system by specifying the new library name in the *Redirected* field. If the library does not exist on the system, a CRTLIB command will be prompted to the user. NOTE: The use of the *Redirected* field is mandatory on single system installations.

You may specify option 10 next to a library entry to restore all objects found on the save media for that library, and activate replication for the objects associated with that save entry. NOTE: Even though an option 10 that is specified for a library will restore all objects within that library, it will only activate replication for those objects associated with that save entry. Therefore, this option must be used with care as it may corrupt objects that are currently being actively replicated, or in the catch-up phase of replication. Option 10 may fail due to some errors related to restoring objects that are not selected, or even eligible, for replication. The restore operation must complete successfully for any of the objects associated with the save entry to be actively replicated.

On a single system installation, the use of option 10 to restore objects at the library level is not recommended as this would possibly restore logical files that would not be utilized resulting in unnecessary usage of system resources.

Option 4 can be used to clear records of object saves when you do not intend to restore the object anytime soon. By removing the save records, you allow old journal receivers to be removed from your system sooner.

Note:

The SORRSTOBJ command can only be executed by one user at a time, and only operate on a target system.

You may specify option 12 next to a library entry to select individual objects for restore and activation as shown on the following display:

```

Simple Object Replicator
Restore Objects to target
MIDRANGE

Type options, press Enter.
 4=Remove  10=Restore      Library:  ISDDSDTA      Position to: _____
                          Pos to type:  _____

Opt  Object      Type      Save Date/Time      Media  Volume ID/Save File
---  I VPOIDET    *FILE    03/23/08  19:29:50  TAPE  BACKUP
---  I VPOIHED    *FILE    03/23/08  19:29:50  TAPE  BACKUP
---  I VPORECT    *FILE    03/23/08  19:29:50  TAPE  BACKUP
---  I VPORECTOLD *FILE    03/23/08  19:29:50  TAPE  BACKUP

Bottom
F3=Exit  F5=Refresh  F12=Cancel  F13=Repeat  F17=Subset  F18=Options

```

This *Restore to Target* screen displays the objects associated with the save entry selected from the previous screen. The object's SOR status is shown between the option field and the object name. You can quickly position to a specific object, or object type in the list by specifying all or part of its name in the *Position to* field, and the object type in the *Pos to type* field.

You can specify option 10 for each object you wish to restore to the target system and activate replication for. You may use F13 to repeat the option for up to 300 more objects in the list.

The use of option 10 will result in a RSTOBJ command prompt being presented to the user with OPTION(*NEW) as one of the defaults if all of the selected objects have a status of "I". If the object already exists in the library, you will want to change this to another, more appropriate value. The restore operation must complete successfully for any of the objects associated with the save entry to be actively replicated. Once the restore operation completes successfully, the objects gain an SOR status of "R" or "C" to indicate they are being restored to the target system, or are in the catch-up phase. The catch-up phase is the process in which the journal entries from the save time to the current time are applied to an object. At the end of the catch-up phase, the objects are given an SOR status of "A".

Option 4 can be used to clear records of object saves when you do not intend to restore the object anytime soon. By removing the save records, you allow old journal receivers to be removed from your system sooner.

The F17 key will display Subset screens similar to those found on the SORWRKOBJ command, only with fewer options available.

The F18 key displays the following screen:

Simple Object Replicator		MIDRANGE
Options		
Run in batch	<u>Y</u> (Y/N)	
Job description	<u>QDFTJOED</u>	
Library	<u>*LIBL</u>	

F3=Exit F12=Cancel

Field descriptions:

- Run in batch:* Specifies whether the restore operation will run in batch, or interactively in the current job. The default value for this field is "Y".
- Job description:* Specifies the job description name the batch restore job will run under.
- Library:* Specifies the library for the job description.

It is recommended that you execute the command SORDSPSTS TYPE(*LIB), or SORDSPSTS TYPE(*OBJ) on the target system periodically to keep tabs on the status of data objects being replicated. The report can be displayed on a workstation screen, or sent to a printer as a spool file. An example of the TYPE(*OBJ) report is shown next:

03/23/08		Simple Object Replicator					19:59:47	
*TGT Object Status								
Source System: *LOCAL								
Library	Active	Inactiv	Suspend	Ended	Deleted	Rst/CU	None	
BHLIB	64	0	0	1	0	0	7	
*DTAARA	4	0	0	0	0	0	0	
*DTAQ	0	0	0	0	0	0	7	
*FILE	60	0	0	1	0	0	0	
ISDDSDTA	1204	0	0	0	1	0	0	
*DTAARA	0	0	0	0	0	0	0	
*DTAQ	0	0	0	0	0	0	0	
*FILE	1204	0	0	0	1	0	0	
SRSTEST	12	2	1	0	0	0	2	
*DTAARA	2	2	0	0	0	0	0	
*DTAQ	0	0	0	0	0	0	2	
*FILE	10	0	1	0	0	0	0	

Column descriptions:

- Library:* Displays a library known to SOR for the purpose of replicating objects located within it. For TYPE(*OBJ) output are three lines indented beneath each library name that gives a breakdown by data object type of each column.
- Active:* Displays the number of data objects actively being replicated by SOR.
- Inactiv:* Displays the number of data objects chosen for replication but not yet restored or copied to target. These objects are not yet being replicated.
- Suspend:* Displays the number of data objects suspended from replication. This count includes objects that have been suspended from replication by SOR due to errors encountered, plus objects that were manually suspended by a user. These objects are no longer being replicated.
- Ended:* Displays the number of data objects that have been selected by a user to no longer be replicated by SOR.
- Deleted:* Displays the number of data objects that had been chosen for replication but was later deleted and re-created. These objects are no longer being replicated.
- Rst/CU:* Displays the number of data objects currently being restored to target and/or in the catch-up phase of being actively replicated.
- None:* Displays the number of data objects eligible, but not yet selected, for replication. These objects are not being replicated.

You may want to consider placing the command SORDSPSTS TYPE(*OBJ) OUTPUT (*PRINT) into the job scheduler to run every night. If you are using SOR on two systems, you could optionally submit the job on your Target system in a manner that would cause the output to be spooled into a remote output queue that redirected the spool file to an output queue on your Source System.

SOFTWARE NOTES:

1. SOR is not written to support DBCS. The software is compiled with the English 2924 language feature.
2. DO NOT MOVE OBJECTS FROM A TARGET LIBRARY. DO NOT RENAME A TARGET LIBRARY.
3. If a MOV OBJ is executed against a replicated object on the source system, a library will be created on the target system if needed as a *TEST library. This does not happen on a single system installation.
4. If you use the SAVCHGOBJ command, be aware of the OBJJRN parameter that defaults to *NO. This will prevent replicated objects on the source system from being saved with the SAVCHGOBJ command. Changing the OBJJRN parameter value to *YES will allow the replicated objects to once again be saved with the SAVCHGOBJ command.
5. Numeric data areas are supported up to a maximum length of 15 digits. Of the 15 digits, up to 9 decimal digits are supported.
6. When multiple objects of the same name but different object type exist in the same library, it is recommended that you restore all of the like named objects together, or restore each object individually. This will help to prevent corruption of an object that may already be in the catch-up phase, or even actively being replicated.
7. The SOR software currently only supports the replication of objects using journal entries that contain complete data. This typically means that the size of the data in the journal entry must be approximately 32K in size or less. The exception to this is files that contain a single BLOB or CLOB field. SOR can replicate data for a file so long as it contains only one LOB field in its record format. This is generally not a problem with any object, except for large data queues and IFS objects.
8. If you operate the target system at a different OS release than the source system, object level replication processes may not operate successfully or as expected, even though data level replication may operate successfully.
9. You may modify the SORJOB job description if you do not want full logging to the joblogs of SOR jobs. You may modify the SORCLS class description if you want the SOR jobs to run at a different priority or timeslice. You may modify the SOR subsystem description specified in the configuration screens if you want to allocate a memory pool specifically for the SOR jobs to run in.
10. You may receive messages in QSYSOPR with MSGID CPI70E6. The message states that a journal or journal receiver is not available; reason code 4. Reason code 4 is: Exit program SORDJREP in library XSOR stated that receiver was not eligible for deletion. This is a normal message that merely indicates that SOR is not allowing a journal receiver to be deleted before all of its journal entries have been processed by SOR.
11. The *LOCAL entry in the relational database directory should match the current system name as shown on the DSPNETA command in order to avoid confusion and possible

DDM/DRDA communication problems.

- 12.** The use of option 3 in SORWRKOBJ to copy an object to the target system should be limited to a small number of objects that are small in size. The recommended, preferred method for starting replication on the target system is through the SORRSTOBJ command. Option 3 in SORWRKOBJ was developed primarily as a means of starting replication for physical files that contain no members. A physical file with no members will not show up in SORRSTOBJ due to the fact that there are no journal entries generated for its save operation since the journal entries are associated with the file at the member level.
- 13.** If you use option 3 in SORWRKOBJ to copy an object to the target system, the library name on the target system is assumed to be the same as on the source system. If you wish to redirect the library to another name on the target system, you must first use SORRSTOBJ to restore at least one other object from the same library to the target system and redirect the library name then. Once the library has been redirected through the SORRSTOBJ command, the redirection will be picked up by the option 3 in SORWRKOBJ.
- 14.** When saving physical files for the purpose of restoring to the target system for replication, you must save all members for each file. At this time, SOR only controls replication at the file level, not at the member level since that is how journaling works. If all of the members are not saved, but the file is restored to the target system for replication, an error will likely occur at a later time on a member that was not part of the save, and as a result the entire file will be suspended from replication.
- 15.** Exclude all SOR libraries (XSOR, XSORSYS, XSORJRN, & XSORRCV) when doing backups unless you end the replication jobs first with ENDSBS SBS(SORSBS) OPTION(*CNTRLD).
- 16.** Libraries that begin with the letter 'Q' except for QGPL & QS36F are excluded from all replication processes, as well as library SYSIBM.
- 17.** You must end the replication jobs with ENDSBS SBS(SORSBS) OPTION(*CNTRLD) first before backing up any libraries that contain replicated copies of objects. Otherwise, the backup could cause an I/O error for a replication job and cause it to fail and end abnormally.
- 18.** Do not let the SOR subsystem remain inactive for long periods of time, as data loss or corruption could result.
- 19.** It is recommended that you periodically stop and restart the SORSBS subsystem so that the joblogs for SOR jobs do not grow too large and start to impact their performance.
- 20.** When replicating on a single system (*LOCAL), you may want to consider restoring only those objects being actively replicated into the replication libraries. To restore all objects from the original library into the replicated library will only increase your backup times. Also, having logical files attached to replicated files will consume additional system resources in maintaining the access paths.