

NJE38

(NJE for MVS 3.8)

Installation and Use Guide

Version 1.00

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Introduction to NJE38

NJE38 provides a mechanism to bring NJE data transmission into MVS 3.8. NJE38 can connect to other NJE capable hosts whether they are MVS-, VM-, or DOS-based, and receive file data from these systems and send file data to them.

NJE38 provides connectivity to other systems via binary-synchronous communication (BSC) lines. These lines are emulated in a Hercules environment by the use of the TCPNJE device driver in Hercules. The system on the other end of the connection also uses emulated BSC lines, or for certain operating systems that appeared after MVS 3.8, a choice of emulated BSC lines or NJE over TCP/IP in order to connect back to NJE38.

NJE38 does not provide a JES-based NJE environment like that of later MVS releases. The NJE capability provided by NJE38 is similar to JES-based NJE, but remains a subset of later capabilities. There are a variety of reasons for only having a subset of the possible capabilities and a major one is that system security mechanisms employed by MVS 3.8 do not provide the necessary features to fully implement certain NJE capabilities. Nevertheless, NJE38 provides significant capability and will serve to get data files into and out of MVS 3.8 over an NJE network, including job streams, listings, sequential and partitioned datasets, and more.

NJE38's core networking support is provided partly by an old component of VM/370 RSCS, a communication product associated with that operating system. The old RSCS is freely available in currently circulating Hercules-related VM/370 distributions. RSCS contains a line driver that communicates with remote job entry (RJE) devices. This RJE line driver was considerably modified by Peter Coghlan into a new RSCS line driver that provides NJE capability. The modified line driver uses emulated BSC lines in conjunction with the TCPNJE device driver in Hercules. The TCPNJE device driver was also created by Mr. Coghlan. It was created out of a modified version of the Hercules emulated BSC line driver. As a result of Mr. Coghlan's efforts, many in the VM community are presently enjoying NJE capabilities between their systems across the internet.

NJE38 capitalizes on this prior work to bring NJE into MVS 3.8. A copy of Mr. Coghlan's modified NJE RSCS line driver was brought over to MVS and further modified by myself to operate in an MVS environment. Not all of RSCS was brought into MVS; just the NJE line driver. The rest of NJE38's programming provides the environment, operator control, and user capabilities.

With the exception of the components identified above (namely, the VM/370 RSCS line driver and its subsequent modifications for NJE capability), all of the NJE38 programming is my creation and I am the sole author.

Bob Polmanter
February 2020

Requirements

The following are the requirements that must be met in order to install and operate NJE38:

- A working MVS 3.8 operating system. The MVS 3.8J TK4- system is recommended because it contains a variety of relevant system utilities and security modifications. However, the MVS 3.8J TK3 system is acceptable.
- A Hercules emulator built with the TCPNJE device support is required. Any Hercules or Hyperion release that runs MVS 3.8J is acceptable, but the emulator must contain the TCPNJE device support. Information on how to build a Hercules emulator to include TCPNJE device support is beyond the scope of this document.
- Another NJE capable operating system with which to connect. This can be another MVS 3.8 system running on a different platform, or multiple MVS 3.8 systems running as guests of VM, or the VM system itself via its own RSCS, and so on.
- A minimum of approximately 50 cylinders of available 3350 or 3380 DASD space to contain NJE38 and its components.
- It is assumed that the reader has knowledge of how to add device statements to the Hercules configuration file, or to a live system via the 'attach' command, as well as how to edit certain MVS system datasets such as SYS1.PARMLIB and SYS1.PROCLIB.

Installation Steps

Below is a summary of the installation steps required:

1. Load the NJE38 distribution tape to your system
2. Authorize the NJE38 load library with APF
3. Define BSC connections in Hercules to connect with a remote NJE partner.
4. Re-IPL your system for APF authorization to take effect
5. Define the NJE38 spool dataset
6. Format the spool dataset
7. Add the NJE38 started task procedure to a system PROCLIB
8. Set up the NJE38 NJE local node and links configuration
9. Start NJE38

Installing NJE38 for the first time?

Perform all of the installation steps starting on the next page.

Installing NJE38 over an existing NJE38 installation?

Many of the install steps can be skipped, depending on the choices you make. Generally, if you use the same dataset names and intend to use the same network configuration, most of the steps can be skipped. Consult the paragraph and table below for a guide to installing NJE38 over an existing installation.

Before starting the installation, it is recommended that you copy your NJE38 configuration member (member CONFIG in the NJE38 SAMPLIB dataset) to another location so that you do not have to rebuild it. If NJE38 is active, it should be stopped completely. The existing NJE38 AUTHLIB and SAMPLIB datasets can be renamed or deleted, in order to make way for the new datasets with the same names to be created. Then consult the table below to determine which steps must be performed and which steps can be skipped.

Step	Consideration	Action
1	Loading the distribution tape must always be performed.	Perform step
2	If you are not changing the NJE38 AUTHLIB dataset name:	Skip step
3	If you are not changing the Hercules BSC connections or addresses:	Skip step
4	Re-ipling system; if step 2 is skipped, then:	Skip step
5	Your existing NJE38 spool dataset is reusable. Skip step unless you wish to change its size.	Skip step
6	Format the spool; perform this step if you performed step 5, otherwise skip.	Decide
7	The NJE38 PROC has not changed.	Skip step
8	If you saved your NJE38 configuration member, copy it back to its NJE38 SAMPLIB location and re-run JOB030 to rebuild the configuration. Or, build a new configuration and run JOB030.	Perform step (see note* below)
9	Start NJE38.	Perform step

***Note: You must run job JOB030 in the NJE38 SAMPLIB dataset to rebuild the configuration even if you did not change your CONFIG member in any way, or NJE38 will not be able to start connections.**

Detailed Step-by-Step

1. Load the NJE38 distribution tape to your system.

The distribution tape consists of three tape files on a standard label .aws tape image. The first file is a JCL dataset containing sample members and installation JCL. The second file is the NJE38 load library. The third file is a single load module to be placed in SYS2.CMDLIB for TSO use.

To get started, there is a small job stream contained with the **nje38v100.zip** file. The job stream is called **job000.txt**. Use this job to load contents of the **nje38v100.aws** tape image. The JCL is also shown in Appendix B of this document.

Cut and paste the JCL within **job000.txt** into an appropriate editor on your system, and review the JCL for any changes you may wish to make. Specify a specific volume for the NJE38 datasets to reside because you will need to know the volume name in the next step. You may change any dataset names that are created if you wish, but using the default names is strongly recommended for consistency. Submit the job to create the datasets and load the tape.

If for some reason you are unable to view or cut/paste the **job000.txt** file, please see Appendix B.

2. Authorize the NJE38 load library.

Edit the IEAAPFxx member of SYS1.PARMLIB in order to add the dataset name of the NJE38.AUTHLIB to the authorization list. On most systems, this member is named IEAAPF00.

Add the new name anywhere within the list, specifying the dsname and volume of where the dataset was created. Here is an example of a correctly added entry to IEAAPF00:

```
SYS1.VTAMLIB MVSRES,  
SYS2.LINKLIB PUB000,  
NJE38.AUTHLIB PUB000,  
EXH.EXHLIB PUB012,  
EXH.ESPLIB PUB012
```

Your IEAAPF00 member may appear differently than that shown above.

3. Define BSC connections in Hercules to connect with a remote NJE partner.

BSC lines are required to use NJE38 in MVS 3.8. These lines must be defined to Hercules so that they will appear as 2703 devices to MVS. The TK4- version of MVS 3.8 has BSC lines generated into the system at these addresses:

```
090-097  
670-677  
680-687
```

Note that some of these addresses are already defined for use by JES2 as RJE lines. However, if the RJE devices are not activated in JES2, then the lines are available to other tasks in the system. If you use RJE

lines, you may wish to find an address from the list above that does not conflict with any JES2 RJE devices.

In order to set up a connection, you will need to provide the following information for each side of the connection: NJE node name, IP address, port number, and BSC line address. In addition, your Hercules emulator must have the TCPNJE device driver support built into the emulator.

For the purposes of providing an example of setting up the BSC connection to a remote NJE partner, let us make the following assumptions: two MVS 3.8 systems to be connected together via NJE. Let's call them MVSA and MVSB.

System MVSA

NJE node name: MVSA

IP address of the host computer that Hercules is running: 192.168.1.20

Port number assigned to TCPNJE: 1175

BSC line address: 090

System MVSB

NJE node name: MVSB

IP address of the host computer that Hercules is running: 192.168.1.21

Port number assigned to TCPNJE: 1175

BSC line address: 094

Given the above information, here are the Hercules device definitions required; these should be placed in each Hercules configuration file:

Hercules A, where system MVSA will run:

0090 tcpnje 2703 lnode=MVSA rnode=MVSB lport=1175 rport=1175 rhost=192.168.1.21

Hercules B, where system MVSB will run:

0094 tcpnje 2703 lnode=MVSB rnode=MVSA lport=1175 rport=1175 rhost=192.168.1.20

Make the appropriate changes to your Hercules configuration and proceed to the next step.

4. Re-IPL your system for APF authorization to take effect.

You must re-IPL MVS in order for the APF authorization of NJE38 to take effect. If you added BSC connections to Hercules in its configuration file, this would be a good time to restart Hercules as well.

5. Define the NJE38 spool dataset.

JOB010 in the SAMPLIB dataset contains JCL to create the spool dataset. NJE38 requires a VSAM dataset to be used as a spooling mechanism. This is a dataset that is used to hold files queued for transmission to another system, or to hold files that have been received while waiting for a user to retrieve them.

The size of the NJE38 spool dataset in terms of DASD space requires some consideration. At a minimum, the size must be slightly larger than the largest file you expect to transmit or receive. Beyond that

however, be aware that there may be other files in the spool awaiting transmission. In a configuration with more than two nodes, there could also be file(s) of unknown size transiting *through* your system on the way to another node. These will occupy spool space until the transmissions are completed.

A good start would be something in the 50 to 100 cylinder range for a spool size. The absolute minimum recommended size would be about 30 cylinders. Create the spool on a 3380 volume (recommended) or a 3350 volume. If the spool size proves insufficient later, you can always delete the dataset and define a larger one.

Review the JCL for changes as well as your desired cylinder size and submit the job.

6. Format the spool dataset

Use JOB020 in the SAMPLIB dataset to format the new spool space. VSAM RRDS datasets require formatting before general use. Formatting also builds the spool's internal directory and free space map.

Review the JCL for dataset name changes and submit the job. The job may run for several seconds especially if the dataset is large or if you have a slower host computer. Review the output for any errors; otherwise a completion code of 0 is success.

If you attempt to format the spool dataset at any time after it has been previously formatted, you will be given a chance to confirm on the system console, as formatting will erase and remove all existing data, if any, in the spool dataset. Only run the formatting program when the NJE38 started task is not active.

7. Add the NJE38 started task procedure to a system PROCLIB

Use member NJE38 of the SAMPLIB dataset for the started-task JCL procedure. Review the procedure JCL for dataset name changes, and then copy the procedure to a system procedure library, such as SYS1.PROCLIB. The recommended member name of the procedure is NJE38.

8. Set up the NJE38 NJE local node and links configuration

An example NJE38 configuration is contained in the SAMPLIB dataset as member name CONFIG. This configuration member is set up to operate with the two-system example configuration from step 3. The CONFIG member is for the MVSA system. For comparison, the figure below shows the configurations required for system MVSA and system MVSB.

NJE38 Configuration for MVSA	NJE38 Configuration for MVSB
* LOCAL ID=MVSA	* LOCAL ID=MVSB
* LINK ID=MVSB,LINE=090,AUTO=YES	* LINK ID=MVSA,LINE=090,AUTO=YES
* LINK TYPE=FINAL	* LINK TYPE=FINAL
* ROUTE MVSX,NONE	* ROUTE MVSX,NONE
* ROUTE TYPE=FINAL	* ROUTE TYPE=FINAL
* AUTH TYPE=FINAL	* AUTH TYPE=FINAL
* END	* END

The configuration member must consist of a single LOCAL entry, which must be first. Then add as many LINK entries as required for the configuration. Finish all of the link entries with a required LINK TYPE=FINAL statement. In a two-node configuration like the one above, routes are meaningless and so it is commented out. The ROUTE TYPE=FINAL is still required and must follow any routes and must be present even if there are no routes. The AUTH TYPE=FINAL statement is required and must be present even if no other AUTH statements are coded. These statements and the entire configuration are discussed later in this document.

Edit the CONFIG member in the SAMPLIB to match your desired configuration and node name. Then use JOB030 to process and build the final configuration for NJE38.

9. Start NJE38

NJE38 is started at the MVS system console by an operator START command: S NJE38

NJE38 or equivalent NJE capable software (such as RSCS) should also be started on the other end of the connection. Assuming that MVSB is on the other end as per the examples, below is an example of NJE38 start-up from the console messages, and a file transmission:

```
- s nje38
- STC 2789 $HASP100 NJE38 ON STCINRDR
- STC 2789 $HASP373 NJE38 STARTED
- STC 2789 IEF403I NJE38 - STARTED - TIME=18.04.29
- STC 2789 NJE000I NJE38 v1.00
- STC 2789 NJE001I Initialization complete for local node MVSA
- STC 2789 NJE002I Activating link MVSB
- STC 2789 NJE141I Line 091 ready for connection to link MVSB
- STC 2789 NJE142I Link MVSB line 091 connected
- STC 2789 NJE905I Signon of link MVSB complete, buffer size=800
- STC 2789 From MVSB: Signon of link MVSA complete, buffer size=800
- STC 2789 NJE146I Sending: file 0042 on link MVSB, rec 00000242
- STC 2789 NJE147I Sent: file 0042 on link MVSB
```

```
IEE152I ENTER CANCEL D C,K
```

```
IEE163I MODE= RD
```

NJE38 supports a suite of commands to control links and spool files; these are discussed in the Commands and Control chapter.

In order to shut down and stop NJE38, issue a standard MVS operator stop command: P NJE38. NJE38 should terminate all of its links and come down in 2-30 seconds depending on various link status. As a general rule, NEVER cancel NJE38 by an operator cancel command. It is very important that NJE38 come down normally and be allowed to close the spool file properly and update internal pointers.

The installation of NJE38 is completed.

Commands and Control

NJE38 presently supports several commands to control its operation and to provide information. All of the commands can be issued from the MVS operator console. Subject to authorization restrictions, some or all of the commands may be issued by TSO users from the local node, or from remote users at other nodes.

NJE38 Supported Commands

The following commands are presently supported by NJE38.

Command	AUTH	Function
D T		Display the local time and date
D F		Display the files in the NJE38 spool
D NODES		Display the node connection status
D ROUTES		Display the routing table
D AUTH		Display the authorized user table
D A		Display the active address spaces
C <i>filenum</i>	Yes	Cancel (purge) spool file number <i>filenum</i>
C <i>filenum1-filenum2</i>	Yes	Cancel (purge) all spool files from <i>filenum1</i> through <i>filenum2</i>
CPQ CPLEVEL		Display system level
CMD <i>nodeid command-text</i>		Issue a command to a remote node
MSG <i>nodeid userid message-text</i> M		Send a message to <i>userid</i> at <i>nodeid</i>
ROUTE <i>nodeid</i> TO <i>link</i>	Yes	Add or update <i>nodeid</i> in routing table
ROUTE <i>nodeid</i> OFF	Yes	Remove route for <i>nodeid</i> from routing table
AUTH <i>userid</i> AT <i>nodeid</i>	Yes	Add a <i>userid</i> at the specified node to the authorization table
UNAUTH <i>userid</i> AT <i>nodeid</i>	Yes	Delete a <i>userid</i> at the specified node from the authorization table
S <i>nodeid</i>	Yes	Start the link to another node
P <i>nodeid</i>	Yes	Stop (drain) the link to another node

Commands that appear with a “Yes” in the AUTH column require that the userid/nodeid of the issuer be present in the authorization table (see NJE38 Configuration). The system operator console of the local node is always authorized for every command.

Whether commands are issued from the system console or from a TSO user, the command-text format is the same. Commands are always issued to the local node unless the command text is prefixed by ‘CMD’. Operator messages can be issued to remote users only and the full nodeid/userid specification is required for the MSG command. The MSG command may be abbreviated as M.

Special note on the “C” Cancel command: Users whether local or remote can always cancel their own files, even if they are not explicitly authorized by the authorization table. To be considered a file owner, a user (whether local or remote) must either be the sender of the file (the origin user and node), or must be the recipient of the file (destination user and node). If the user does not meet the owner criteria, then that user must be explicitly authorized in order to cancel spool files.

Issuing Commands from the MVS System Console

Commands entered from a system console must be entered via the MVS operator command MODIFY. The short form of the MODIFY command is F. The format of the command is:

MODIFY *procname*,*text*
or
F *procname*,*text*

Where *procname* is the name of the NJE38 started task procedure, and *text* is the command that you wish NJE38 to process. The command itself and the text are not case sensitive. Blanks in the command text are acceptable and no apostrophes or quotes should be entered. Responses to a command entered on the console will be displayed on the console.

Examples of possible operator commands:

F NJE38,D NODES	Display node status at the local node
F NJE38,CMD MVSB D NODES	Display node status of the MVSB remote node
F NJE38,S MVSB	Start the local node’s link to MVSB
F NJE38,M MVSB HERC01 Hello from MVSA!	Send a message to user HERC01 at node MVSB
F NJE38,ROUTE MVSC TO MVSB	Add a routing table entry to MVSC via link MVSB
F NJE38,ROUTE MVSD OFF	Nullify (turn off) the route to MVSD
F NJE38,AUTH OP AT MVSB	Make MVSB operator console an authorized user
F NJE38,C 48-53	Delete NJE38 spool files 48 through 53

Issuing Commands and Messages from TSO Terminals

TSO users can issue commands and receive responses at their terminal via the TSO command module 'NJE38'. The NJE38 command can be issued from the TSO ready prompt or from inside RPF via the TSO command line option 6. ISPF users have two choices: command line option 6 or via the TSO prefix from other panels. TSO users also have the option to use an asterisk character in place of the local node name where a node name is required.

When using the NJE38 command, if you receive a message that says “The NJE38 command is not APF-authorized” please refer to Appendix C in this document.

The format of the TSO NJE38 command is:

NJE38 command-text

Examples of the TSO NJE38 command usage:

NJE38 D NODES	Display node status at the local node
NJE38 CMD * D NODES	Same as above; another way of specifying
NJE38 CMD MVSB D NODES	Display node status of the MVSB remote node
NJE38 M * HERC02 please resubmit your job	Send a message to user HERC02 on the local node
NJE38 M MVSB HERC01 Hello !	Send a message to user HERC01 at node MVSB
NJE38 C 71	Delete spool file 71*

* Issuing user must be the file sender or file recipient; or must be explicitly authorized.

For users that prefer a consistent command format (for example, to use NJE38 inside a CLIST), you may use the CMD command to send commands to the local node as well, thereby allowing all use of the NJE38 command to have the same format: e.g., “NJE38 CMD *nodeid command-text*” regardless of whether the command is destined for the local or remote node. Optionally, specify ‘*’ for the local nodeid to avoid the need to know what the local nodeid is.

Users should note that when commands are issued there is a slight delay while the command is transmitted, executed by the destination node, and the results transmitted back to your terminal. Therefore, the user should wait a few moments and press Enter at the TSO terminal in order to receive the results.

RSCS Users

Remote RSCS users can issue a command to a remote NJE38 via the usual method familiar to RSCS NJE users:

CP SMSG RSCS CMD *nodeid text*

CP SMSG RSCS MSG *nodeid userid text*

For example:

CP SMSG RSCS CMD MVSA D NODES

CP SMSG RSCS MSG MVSA HERC02 I sent your file

Example Commands and Responses

The system operator wants to query the connection status for NJE38:

```
- f nje38,d nodes
- STC 2800 NJE012I Node status
- STC 2800 Name      Status      Type      Addr
- STC 2800 MVS      Connect     NJE       090
- STC 2800 MVSC      Inactive    NJE       091
```

A number of files are queued for destination MVSC but the link is currently inactive. A file has arrived from node MVS8 destined for MVSA (this node), but the user 'HERC02' on the MVSA system has not yet retrieved it. Display the file status:

```
- f nje38,d f
- STC 2800 NJE014I File status
- STC 2800 File Origin Origin Dest Dest
- STC 2800 ID Node Userid Node Userid CL Records
- STC 2800 0035 MVS8 HERC02 MVSC HERC01 A 193
- STC 2800 0036 MVS8 HERC02 MVSC HERC01 A 193
- STC 2800 0037 VM1 MAINT MVSC HERC01 A 2,351
- STC 2800 0038 MVSA HERC01 MVSC HERC01 A 22
- STC 2800 0040 MVS8 HERC01 MVSA HERC02 K 77
```

The MVSA operator realizes files 0035 and 0036 are duplicates, so he deletes one of them.

```
- f nje38,c 36
- STC 2800 NJE015I File(0036) purged
```

A TSO user at node MVS8 issues a NJE38 style 'D F' command to see if the HERC02 user at MVSA has retrieved his file yet:

```
NJE38 CMD MVSA D F
***
From MVSA: NJE014I File status
From MVSA: File Origin Origin Dest Dest
From MVSA: ID Node Userid Node Userid CL Records
From MVSA: 0035 MVS8 HERC02 MVSC HERC01 A 193
From MVSA: 0037 VM1 MAINT MVSC HERC01 A 2,351
From MVSA: 0038 MVSA HERC01 MVSC HERC01 A 22
From MVSA: 0040 MVS8 HERC01 MVSA HERC02 K 77
```

The MVS operator wants to stop the link to node MVS8:

```
- f nje38,p mvs8
- STC 2800 NJE570I Link MVS8 now set to deactivate
- STC 2800 NJE143I Link MVS8 line 090 disconnected
- STC 2800 NJE010I Line 090 is drained
```

NJE38 Configuration File

The NJE38 configuration file specifies the node name for the system as well as all of your remote connections and routing information used to reach nodes beyond your connections, if any.

LOCAL Statement

The configuration member must consist of a single LOCAL entry, which must be first.

The format of the LOCAL statement is:

```
LOCAL ID=nodeid
```

Choose the *nodeid* carefully, because it is rather painful to have every remote connection change their configurations as well to accommodate. All node names in this and other statements in the configuration must be valid NJE node names, 1-8 uppercase characters starting with letter A-Z. The rest of the name can contain the characters A-Z, 0-9. The LOCAL statement MUST BE FIRST in the configuration.

LINK Statement

After the LOCAL statement, specify one or more LINK statements to define your remote connections. The remote connections can be other MVS systems, or VM systems, or other types of NJE communications programming.

The format of the LINK statement is:

```
LINK ID=remotenameid,LINE=cuu,BUFF=size|1012,AUTO=YES|NO
```

Where:

ID=*remotenameid* is the name of the system on the remote end of the connection (what would be on its own LOCAL statement, or equivalent).

LINE=*cuu* is the device address of the MVS defined 2703 communication line. This address corresponds to the same device address of a Hercules TCPNJE configuration statement also defining this connection.

BUFF=*size* is the maximum buffer size that NJE38 is to use in negotiations with the remote node during connection. The allowable value for *size* is 300 to 1012. The default value if BUFF is not coded is 1012. The default value is also the recommended value. Sizes up to 4096 can be specified, however values above 1012 are not specifically supported. Please refer to the Limitations section for more information on larger BUFF sizes.

AUTO defines whether or not the link is automatically activated by NJE38 upon start up. Of course, the other end of the connection must also be started (via AUTO or by command) before there can be a successful connection. Default if not coded: NO

After all LINK statements are defined, finish the LINK specifications with a required:

```
LINK TYPE=FINAL
```

statement. See the CONFIG member in the SAMPLIB dataset for an example.

ROUTE Statement

Routes are required to reach nodes that may be beyond any links you have direct connections with. Specify as many routes as are needed or desired to enable paths to other nodes. These other nodes will also need routes back to your system to be effective. The ROUTE statement(s) must follow the LINK TYPE=FINAL statement.

The format of a ROUTE statement is:

```
ROUTE remotenodeid,vianodeid
```

Where:

remotenodeid is the name of a distant remote node (that is, not a node specified by your LINK statements).

vianodeid is the nodeid of a LINK in your configuration that is along the path to *remotenodeid*.

After all ROUTE statements are defined, finish the ROUTE specifications with a required:

```
ROUTE TYPE=FINAL
```

statement. You must code ROUTE TYPE=FINAL even if no other ROUTE statements are coded.

As example, assume a network that looks like this one:

MVSA—MVSB—MVSC—MVSD

System MVSA only has a direct connection to system MVSB via a LINK statement. Routes will be required in order to send commands or files to nodes MVSC and MVSD. Correspondingly, systems MVSC and MVSD must have routes back to MVSA in their configurations. System MVSB also needs routes to reach MVSD. These example routes help to illustrate:

System MVSA	System MVSB	System MVSC	System MVSD
ROUTE MVSC,MVSB ROUTE MVSD,MVSB ROUTE TYPE=FINAL	ROUTE MVSD,MVSC ROUTE TYPE=FINAL	ROUTE MVSA,MVSB ROUTE TYPE=FINAL	ROUTE MVSA,MVSC ROUTE MVSB,MVSC ROUTE TYPE=FINAL

Routes may also be dynamically added, updated, or removed from the routing table that is defined by the ROUTE statements. This can be done at the operator console via the F NJE38,ROUTE command. Routing table alterations done dynamically take effect immediately. However, remember to update the permanent configuration file, as dynamic modifications will fall off if NJE38 is restarted.

AUTH Statement

Optional AUTH statements may be coded in order to authorize remote users at other nodes, or TSO users at the local node, so that they will be able to issue restricted NJE38 commands. Code as many AUTH statements as needed to define the users you wish to be authorized, up to a maximum of 256 AUTH statements. Even if you code no AUTH statements you must code the AUTH TYPE=FINAL statement as described below.

The format of the AUTH statement is:

```
AUTH USER=userid,NODE=nodeid
```

Where:

USER=*userid* is the userid of a local or remote user you wish to have authorized status.

NODE=*nodeid* is the node name of the authorized user. If USER= specifies a TSO userid for the local node, specify the local node name for *nodeid*.

After all AUTH statements are defined, finish the AUTH specifications with a required:

```
AUTH TYPE=FINAL
```

statement. You must code AUTH TYPE=FINAL even if no other AUTH statements are coded.

AUTH Statement Special Considerations

- The MVS operator console of the local node is always authorized for all commands; no AUTH statement is required.
- MVS operator consoles belonging to remote nodes must explicitly be authorized if you wish them to have command authority on your local node. To specify an operator console, code USER=OP at the desired node. For example:

```
AUTH USER=OP,NODE=MVSC
```

- If you wish to authorize a remote VM system console, specify that system's operator userid in the USER=parameter of AUTH.
- If you wish to authorize a remote RSCS virtual machine console, do not code USER= and only code the NODE= parameter of that system. For example, to authorize commands issued to your local node from the RSCS virtual machine on remote node VMSYS1, code:

```
AUTH NODE=VMSYS1
```

- Otherwise, code all other AUTH statements as needed with actual userids and node names.

Authorizations may also be dynamically added or removed from the authorization table that is defined by the AUTH statements. This can be done at the operator console via the F NJE38,AUTH and UNAUTH commands. Authorization table alterations done dynamically take effect immediately. However, remember to update the permanent configuration file, as dynamic modifications will fall off if NJE38 is restarted.

Transmitting and Receiving Files with NJE38

NJE38 is not JES2 based, nor is it like RSCS running in a VM environment. But its internal data transmission mechanisms are compatible with NJE on other operating systems thereby allowing NJE38 to connect with these systems.

If instead of NJE38 you were using a JES2-based NJE connection, or a RSCS-based NJE connection, whatever data file you wish to be transmitted must first be written to the JES2 spool, or the VM spool, respectively, before it can be transmitted. This is what the TSO TRANSMIT, or VM PRINT/PUNCH/SENDFILE commands do. Once the file is fully contained within the spool, the file will be transmitted by JES2 or RSCS as the case may be, over NJE. Correspondingly, inbound files are placed in the respective spool as they are received and made available to the destination user once the receiving transmission has completed.

With NJE38, the concept is the same. The file must be placed into the NJE38 spool before it can be transmitted. Files being received will be placed in the NJE38 spool awaiting retrieval by the destination user. What is different for NJE38 when compared to JES2 or RSCS, is the mechanism used to place files into, or retrieve files from, the NJE38 spool.

In NJE38, the mechanism used to get files into and out of the spool are similar to the more modern TSO TRANSMIT and RECEIVE commands, except that for NJE38 they are simple batch jobs.

Using the NJ38XMIT and NJ38RECV Utilities

NOTE: all utilities and utility jobs mentioned below are located in the NJE38 SAMPLIB dataset.

Whether you simply want to use NJ38XMIT and NJ38RECV to operate on simple card image data and listings, or want to transmit more complex data such as entire partitioned datasets, you must use these two utilities for at least part of the transmit and receive process. They are the sole method to get data into, and out of, the NJE38 spool.

NJ38XMIT is responsible for reading the data you wish to have transmitted and to write it out to the NJE38 spool, and then to notify NJE38 that a new spool file is ready for transmission. NJ38XMIT must be executed from an APF-authorized library or it will be unable to notify NJE38 about the new file.

NJ38XMIT (only) needs to know the node id and userid of where the file's destination. This information is placed in the PARM field of the EXEC JCL statement. Specify the node id followed by the userid, separated by a blank, period, or comma. The PARM field must be from 3 to 17 bytes in size and otherwise follow the rules for a JCL PARM parameter. These examples are valid PARM fields:

```
//S1 EXEC PGM=NJ38XMIT,PARM=(MVSA,HERC01)
//S2 EXEC PGM=NJ38XMIT,PARM='MVSB HERC02'
//S3 EXEC PGM=NJ38XMIT,PARM=(VM1.MAINT)
```

NJ38RECV is responsible for retrieving data from the spool that has arrived at the destination node. The user that is expecting the file data should prepare a job to execute NJ38RECV to retrieve the file data from the spool and place the file data into a dataset as designated by the JCL. NJ38RECV does not require any PARM parameter in the JCL.

The following DD statements are required by the two utilities:

DDNAME	Use
STEPLIB	Identifies the AUTHLIB dataset containing NJE38 programs.
SYSPRINT	SYSOUT; for messages pertaining to the execution success or failure of the utility.
SYSUT1	NJ38XMIT only; identifies the <i>input</i> dataset that will be written to the NJE38 spool and queued for transmission.
SYSUT2	NJ38RECV only; identifies the <i>output</i> dataset that will contain the file data received by NJE38 over NJE.

For SYSUT1 datasets, the DCB attributes used are those of the dataset, unless overridden in JCL. For SYSUT2, DCB attributes should be specified in the JCL if creating the dataset as NEW. If SYSUT2 refers to an existing dataset, the DCB attributes will be those of the dataset if no overriding values are coded in JCL.

For both utilities, the dataset name of the NJE38 spool dataset is obtained from NJE38. However, if NJE38 is not active, then the dataset name cannot be obtained. Either start NJE38 (Links do not necessarily have to be started; rather NJE38 just needs to be active), or alternately, code a NETSPOOL DD statement to point to the spool dataset defined in Step 5 of the installation:

```
//NETSPOOL DD DSN=NJE38.NETSPOOL,DISP=SHR
```

Sample Jobs for Transmitting and Receiving Files

The following job streams are provided in the NJE38 SAMPLIB dataset;

Desired Function	Sample Job Member Name
Transmit basic 80-byte records (e.g., a source code member, a copybook, a macro), or 121/132/133-byte records (e.g., a listing or printout)	XMIT
Retrieve basic 80-byte records (e.g., a source code member, a copybook, a macro), or 121/132/133-byte records (e.g., a listing or printout)	RECV
Transmit a sequential dataset *	XMITSEQL
Retrieve a sequential dataset previously transmitted by XMITSEQL	RECVSEQL
Transmit a PDS *	XMITPDS1
Source and LOADLIB examples provided	XMITPDS2
Retrieve a PDS previously transmitted by XMITPDS	RECVPDS1
Source and LOADLIB examples provided	RECVPDS2

* The dataset format (LRECL/RECFM) must be supported by the XMIT370/RECV370 utilities.

Once a file is written to the spool by NJ38XMIT, it is queued for execution. If the link to the destination node, or along a path to the destination node is connected, NJE38 will begin transmission immediately if the link is available or as soon as other traffic completes. Once a file is received at the destination, the user at that end can query the spool (using the NJE38 'D F' command) to see if the file has arrived and/or view the system console messages to see that it has arrived. At that time, the user can execute a NJ38RECV job to retrieve the transmitted file data and place it into a user-designated dataset.

Transmitting Entire Datasets

In order to transmit sequential datasets with record sizes that do not readily fit into the 80 or 132 byte NJE standard, you must use a utility that will convert the file into a format suitable for NJE transmission. In JES2-based NJE systems, this conversion is done automatically by TSO TRANSMIT. In VM-based NJE, it is done by the SENDFILE command (and not by CMS PRINT and PUNCH). NJE38 presently has no programming to convert data like TRANSMIT or SENDFILE. However, existing utilities to do this are distributed with MVS 3.8 TK4-: XMIT370 and RECV370.

XMIT370 and RECV370 do not transmit or receive anything, despite that inference from their names. Likewise, TSO TRANSMIT and RECEIVE, or VM SENDFILE or RECEIVE also do not transmit or receive anything either. The actual transmission is left up to JES2 or RSCS. So it is the same once again with NJE38. Instead, XMIT370 is used in a batch job to convert a dataset to 80-byte records and a subsequent step in the same (or different) job uses NJ38XMIT to write it to the NJE38 spool. Then NJE38 will queue the file for transmission. Upon receipt, NJ38RECV is first used to retrieve the 80-byte file records from the NJE38 spool, and a subsequent step in the same (or different) job uses RECV370 to unconvert the received data back to its original form. At the successful conclusion of this process, you have transmitted a sequential or partitioned dataset to another node!

Sample jobs XMITSEQL, RECVSEQL, and XMITPDS, RECVPDS provide working examples. Each combines a conversion step with an NJE38 utility to write or retrieve from the spool.

Important notes about using XMIT370 and RECV370

Describing how to use these utilities and documenting everything about them is beyond the scope of this document. However, it is important to understand some basic things about these utilities that will make things so much easier if you know about them, so it will be mentioned here.

These utilities are rather finicky with regard to DCB attributes. Generally, it does not appear to use the attributes from the dataset DSCB; they must be specified in JCL in order to make the utility work correctly. Specifying the DSORG parameter is extremely important. If you do not have the DCB attributes specified or if they are specified incorrectly, the utilities can fail with odd looking abend codes and no descriptive messages indicating the problem.

Like NJ38XMIT and NJ38RECV, which use SYSUT1 as input and SYSUT2 as output respectively, XMIT370 and RECV370 do the same. But there is confusion when processing PDS datasets. In this case, the other SYSUTx DDNAME is used to point to a work file. In other words, XMIT370 uses SYSUT1 as the input file, so SYSUT2 is used as a work file. Correspondingly, RECV370 uses SYSUT2 as the output file, so SYSUT1 now has to be used as the work file. The sample jobs provided have it set up correctly.

And finally, if using sequential files to be converted with XMIT370 / RECV370, the SYSUT1 dataset is used for input (for XMIT370) and for output (for RECV370). This is contrary to XMIT370/RECV370's own documentation. These inconsistencies led to having separate example jobs in the SAMPLIB dataset specific to sequential datasets.

Caution is advised, and care should be taken with all DDNAMEs and DCB parameters with XMIT370/RECV370 JCL.

Finally, the conversion format used by XMIT370/RECV370 (called NETDATA format), is not compatible with the NETDATA format that is used on later versions of VM or MVS (this is documented by the XMIT370/RECV370 developer). This author is not sure if it is a bug in these utilities, or a subtle change in the NETDATA format over the years. This means that a modern TSO TRANSMIT and RECEIVE, or a VM SENDFILE and RECEIVE may not be able to process data from these utilities. Nevertheless, these utilities will serve well to pass datasets between MVS 3.8 systems.

Miscellaneous Tips

In no particular order:

- NJE38 is designed to stay active all of the time, like JES2 and VTAM and TSO. Once satisfied with its operation, consider placing it in an appropriate list to be automatically started after IPL.
- Sometimes links do not connect even after both sides have been started. If this occurs, stop the link on one side and after it is completely stopped, then restart the link with a command. On rare occasions you may have to do this more than once. Sometimes, you'll need the other end to do the same. This does not appear to be a bug in NJE38; RSCS connections have the same issue. It seems to occur when the TCPNJE device driver in Hercules is left in an uncertain state. The best mitigation seems to be to always stop your links before shutting down your system. When they stop normally in this manner and issue the NJE signoff, they rarely have trouble starting again later. Note: stopping NJE38 itself ("P NJE38" operator command), automatically and properly stops the links before terminating.
- If you are sending data to another MVS 3.8 system, the XMITSEQL/RECVSEQL, or XMITPDS/RECVPDS jobs are better choices than trying to send flat files via jobs XMIT/RECV.
- If you are sending or receiving data to/from a VM system, you MUST use jobs XMIT or RECV, because the data formats used by the XMITSEQL/XMITPDS jobs are not compatible with VM. The job XMIT will send data to VM as a PRT or PUN file in the destination user's virtual reader (which type depends on the original dataset's LRECL and RECFM). Likewise, data coming from VM (always a PRT or PUN file) will be received properly by RECV (use the DCB attributes on the receiving dataset to specify your intention).
- Protect your spool data! It is always prudent to run IDCAMS VERIFY against the spool dataset if NJE38 or any of its utilities shouldabend. See job VERIFY in the SAMPLIB dataset.
- NJE38 can connect to other NJE compatible software that does not necessarily operate under a typical mainframe-based operating system. Linux-based Funetnje is one example.
- Operator use of the 'MODIFY NJE38' console command can be enhanced by assigning a partially completed command image to a console PF Key. The operator would only need to press the designated PF Key and then enter the text of the NJE38 command without the MODIFY portion each time. For example, to assign PF8 to this purpose, enter this command at the system console:

```
K N,PFK=(08,CMD='f nje38,_'),CON=Y
```

By placing an underscore character as shown above, the cursor will be positioned for the operator to type in the command text directly after pressing the PF key.

Limitations and Known Issues

At present, the following are limitations in NJE38 (in no particular order). Some or all of these limitations may be lifted in future releases.

Commands Limitations

- There are no commands at present to dynamically add, delete or alter links in the configuration.
- Local and remote users may issue link START and STOP commands to an NJE38 node (if authorized). However, any status messages generated by the command will still be directed to the system console of the NJE38 node that the command was directed to. For now, the issuing user could issue the D NODES command to determine the link status.
- All commands entered by local and remote users to an NJE38 node will have the command displayed on the node's system console and identify the issuer. In the case where the user issues an authorized command even though the user is not in the authorization table, the attempt to execute the command will be displayed on the node's system console, but the command is not executed.
- TSO users issuing local or remote message traffic via the TSO NJE38 command please note: when using NJE38 from inside RPF (e.g., TSO commands option 6), the message text is uppercased by RPF and not by the NJE38 command. This can be demonstrated by issuing NJE38 from a TSO READY prompt instead.
- Due to size limitations in the use of the MVS SEND command, messages sent to TSO users whether they are from other local or remote users or are responses to commands, are limited to 107 characters per message line. Messages that exceed this size are truncated and there is no indication to the user that this occurred.

Spool Limitations

- No mechanism exists to change the order of files queued for transmission or the order they will be retrieved by the user once received. However, due to the way the spool's directory is managed, the order of the files will almost always be first-in first-out (FIFO) ordering.
- JCL jobstreams received via NJE are never submitted for execution; likewise, no job output is ever automatically transmitted.
- No files received via NJE are ever printed or punched directly on a JES2 device, even if that was the sender's intention (for example a VM user PRINTing a listing to come off on MVS's printer). If you want to print the output on receipt, run NJ38RECV and direct SYSUT2 DD to SYSOUT as appropriate.
- Spool classes are not used by NJE38. There is no difference to NJE38 in a file received as class A vs. any other class. Files originated at the local NJE38 node are always class A. Files received from elsewhere that have a specific spool class will retain that spool class when passed through an NJE38 node on their way somewhere else.

Other Limitations and Known Issues

- The console operator cannot send messages to local TSO users using the Modify NJE38 command. However, the operator can use the MVS SEND operator command for this purpose.
- Some error messages resulting from an action by a local or remote user are not returned to the originating user but instead show on the MVS console. Some minor error messages may not appear at all. For example, sending a command or message to a link that is inactive will not necessarily result in a link-not-active message being returned to the sender.
-

Other Limitations and Known Issues (continued)

- Buffer sizes above 1012 bytes for line connections to remote nodes are not supported. Nevertheless, the BUFF parameter on the NJE38 configuration file's LINK statement allows sizes above the supported 1012 value, up to 4096. Sizes above 1012 should be considered "experimental". In most cases, large sizes work fine, so try it at your own risk. However, any problems, abends, aborted transmissions, loops, or other oddities encountered while using NJE38 with one or more links defined with a size over 1012 will not be supported.
- Once a link connection is established, the buffer size negotiated with the remote node becomes the new maximum buffer size for the link for the life of that link task.
- Because NJE38 is based on the RSCS Version 1 line driver, multi-streaming is not supported and only a single stream is supported per line. This means that if you are connecting NJE38 to more advanced RSCS or JES2 nodes, you must specify within their connection parameters to use only one stream for any lines directly connecting to an NJE38 node. For RSCS, this generally means specifying the SStreams=1 and TA=0 parameters for the line. For JES2, this usually means limiting the number of job and sysout transmitters and receivers to 1. Consult the appropriate documentation for your advanced systems for the exact parameter settings. Failure to limit the streams can result in loops or stalled transmissions within NJE38.

Providing Debugging Information

Should any NJE38 utility programs NJ38XMIT, NJ38RECV, or NJEFMT abend, a dump is desired in order to best diagnose the problem. A SYSUDUMP DD statement is very adequate:

```
//SYSUDUMP DD SYSOUT=*
```

Simply add the DD statement to the failing job and recreate the failure. You can leave a SYSUDUMP DD statement in the JCL at all times if you prefer.

For started task NJE38 failures, no SYSUDUMP DD is required. NJE38 uses an ESTAE exit and SDUMP facilities to dump the necessary storage to one of the SYS1.DUMP datasets. The SYS1.DUMP datasets should be kept cleared of any old dumps from other unrelated system failures in the past. You can clear the dump datasets with this JCL, below. Note that completion code 12 is a normal completion for the clearing operation. You should run the job to clear all of your SYS1.DUMP datasets, e.g., SYS1.DUMP00, SYS1.DUMP01, etc., so they are always available when any abend occurs.

```
//CLEAR      EXEC PGM=IEBGENER  
//SYSPRINT  DD SYSOUT=*  
//SYSIN     DD DUMMY  
//SYSUT1    DD DUMMY  
//SYSUT2    DD DSN=SYS1.DUMP00,DISP=SHR  
//
```

If a NJE38 dump is taken to one of the DUMP datasets, messages such as these will appear on the MVS console:

```
NJE38      LINK MVSA      ABEND S0C4  
PSW 078D1000 00099852 ILC 06 INTC 0004  
DATA NEAR PSW 0009984A 1B77D203 F0181610 41606001 07FEC3D7  
GR 0-3 C0000000 C0000027 000C205C 000C208C  
GR 4-7 0009F1A0 00000002 000BD85C 00000000  
GR 8-11 0009D070 000BD000 000C2000 000B2470  
GR 12-15 00099000 000C2440 A0099396 00000002
```

This information should be cut and pasted into a text file and provided along with the dump. The dump dataset can be printed with job PRDMP in the SAMPLIB dataset. Upon successful printing of the dump, clear the dump dataset that was used for the next use. The text file and the Hercules printout file can then be provided for analysis.

NJE38 Version History

18 Mar 2020 – v1.00

- Support for authorizing local and remote users for certain NJE38 commands
- Dynamic additions and deletions to the authorization table.
- Delete multiple spool files via “C” Cancel command.
- Confirmation of signon sent to the remote node.
- Bug fixes.

4 Mar 2020 – v0.90 beta

- Dynamic adjustment of the routing table;
 - o New command D ROUTES
 - o New command ROUTE
- Several bugs fixed, including a storage overlay within NJE38 and messaging issues.

20 Feb 2020 – v0.85 beta

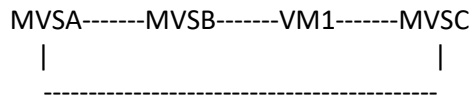
- Support for TSO user NJE commands and messages
- The system operator can send/receive text messages from remote users
- The system operator can issue commands to remote nodes
- Prevent S 522 wait time limit exceeded abends when no lines active
- Experimental and optional larger transmission buffer size
- Minor bug fixes

29 Jan 2020 – v0.80 beta

- First Beta release

Appendix A: Advanced Configuration Example

An example of a more advanced NJE configuration is presented, to illustrate how the various components should be defined. Assume a slightly more complex arrangement from that presented in the installation instructions: four systems connected together in a ring. Conceptually, it looks like this:



Below are the particulars for each system.

System MVSA

NJE node name: MVSA

IP address of the host computer that Hercules is running: 192.168.1.20

Port number assigned to TCPNJE: 1175

BSC line addresses: 090, 091

System MVSB

NJE node name: MVSB

IP address of the host computer that Hercules is running: 192.168.1.21

Port number assigned to TCPNJE: 1175

BSC line address: 094, 096

System VM1 (a VM/370 system using RSCS V1)

NJE node name: VM1

IP address of the host computer that Hercules is running: 192.168.1.30

Port number assigned to TCPNJE: 1175

BSC line address: 040, 041

System MVSC

NJE node name: MVSC

IP address of the host computer that Hercules is running: 192.168.1.22

Port number assigned to TCPNJE: 1175

BSC line address: 091, 670

The Hercules TCPNJE device statements and the NJE38 configuration statements are shown on the next page.

Given the above information, here are the Hercules device definitions required; these should be placed in each Hercules configuration file:

Hercules A, where system MVSA will run:

0090 tcpnje 2703 lnode=MVSA rnode=MVSB lport=1175 rport=1175 rhost=192.168.1.21

0091 tcpnje 2703 lnode=MVSA rnode=MVSC lport=1175 rport=1175 rhost=192.168.1.22

Hercules B, where system MVSB will run:

0094 tcpnje 2703 lnode=MVSB rnode=MVSA lport=1175 rport=1175 rhost=192.168.1.20

0096 tcpnje 2703 lnode=MVSB rnode=VM1 lport=1175 rport=1175 rhost=192.168.1.30

Hercules 1, where system VM1 will run:

0040 tcpnje 2703 lnode=VM1 rnode=MVSB lport=1175 rport=1175 rhost=192.168.1.21

0041 tcpnje 2703 lnode=VM1 rnode=MVSC lport=1175 rport=1175 rhost=192.168.1.22

Hercules C, where system MVSC will run:

0091 tcpnje 2703 lnode=MVSC rnode=VM1 lport=1175 rport=1175 rhost=192.168.1.30

0670 tcpnje 2703 lnode=MVSC rnode=MVSA lport=1175 rport=1175 rhost=192.168.1.20

Here are the NJE38 configuration statements, and for completeness, a part of the VM/370 RSCS configuration statements are also shown.

NJE38 Configuration for MVSA	NJE38 Configuration for MVSB
* LOCAL ID=MVSA LINK ID=MVSB,LINE=090,AUTO=YES LINK ID=MVSC,LINE=091,AUTO=YES LINK TYPE=FINAL * ROUTE VM1,MVSB ROUTE TYPE=FINAL AUTH TYPE=FINAL END	* LOCAL ID=MVSB LINK ID=MVSA,LINE=094,AUTO=YES LINK ID=VM1,LINE=096,AUTO=YES LINK TYPE=FINAL * ROUTE MVSC,MVSA ROUTE TYPE=FINAL AUTH TYPE=FINAL END

RSCS Configuration for VM1	NJE38 Configuration for MVSC
GENLINK ID=VM1,TYPE=LOCAL * GENLINK ID=MVSB,LINE=040,TYPE=DMTYJB,.. GENLINK ID=MVSC,LINE=041,TYPE=DMTYJB,.. * GENROUTE MVSA,MVSB END	* LOCAL ID=MVSC LINK ID=MVSA,LINE=670,AUTO=YES LINK ID=VM1,LINE=091,AUTO=YES LINK TYPE=FINAL ROUTE MVSB,VM1 ROUTE TYPE=FINAL AUTH TYPE=FINAL END

The choice of direction for the routes in a ring configuration is arbitrary. Alternate routing is not presently supported by either NJE38 or VM/370 RSCS.

Appendix B: Sample Job to Unload the Tape

If you are unable to cut and paste the sample job **job000.txt** included in the distribution .zip file used to unload the tape image in step 1 of the installation, you may also try to cut/paste the JCL below, or key it in manually if formatting is lost.

```
//HERC01A JOB CLASS=A,MSGCLASS=X
//*
//* JOB000
//* THIS JOB UNLOADS THE NJE38 DISTRIBUTION TAPE
//*
//UNLOAD   PROC VOL=PUB000,                                <== VERIFY
//          SAMPLIB='NJE38.SAMPLIB',                        <== VERIFY
//          AUTHLIB='NJE38.AUTHLIB',                         <== VERIFY
//          CMDLIB='SYS2.CMDLIB'                             <== VERIFY
//
//CPY      EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//SYSUT3   DD UNIT=VIO,SPACE=(CYL,5)
//SYSUT4   DD UNIT=VIO,SPACE=(CYL,5)
//IN1      DD UNIT=TAPE,DSN=N38.SAMPLIB,DISP=(OLD,KEEP),
//          VOL=(,RETAIN,SER=NJE38),LABEL=(1,SL)
//IN2      DD UNIT=TAPE,DSN=N38.AUTHLIB,DISP=(OLD,KEEP),
//          VOL=(,RETAIN,SER=NJE38),LABEL=(2,SL)
//IN3      DD UNIT=TAPE,DSN=N38.CMDLIB,DISP=(OLD,KEEP),
//          VOL=(,RETAIN,SER=NJE38),LABEL=(3,SL)
//
//OUT1     DD DISP=(NEW,CATLG),DSN=&SAMPLIB,
//          SPACE=(CYL,(1,1,5)),UNIT=SYSDA,VOL=SER=&VOL,
//          DCB=(BLKSIZE=3120,LRECL=80,RECFM=FB)
//OUT2     DD DISP=(NEW,CATLG),DSN=&AUTHLIB,VOL=SER=&VOL,
//          SPACE=(CYL,(1,1,5)),UNIT=SYSDA,
//          DCB=(BLKSIZE=6144,RECFM=U)
//OUT3     DD DISP=SHR,DSN=&CMDLIB
//          PEND
//RUN      EXEC UNLOAD
//CPY.SYSIN DD *
COPY INDD=IN1,OUTDD=OUT1
COPY INDD=IN2,OUTDD=OUT2
COPY INDD=(IN3,R),OUTDD=OUT3
/*
```

Appendix C: Authorizing the NJE38 TSO Command

The TSO command NJE38 presents a special case because it must run APF-authorized in order to communicate with the started-task NJE38, but TSO itself is normally an unauthorized environment. Several other commands and programs fall into this category, such as RPF, QUEUE, IEBCOPY and several others.

The command name “NJE38” must be placed into a table and linked into a TSO load module in order to allow the NJE38 command to run APF-authorized. Depending on several factors outlined below, you may not need to do anything else, or you may need to run a provided job stream to add NJE38 to the authorized commands table. Determine if your situation falls into one of the cases below and decide if you need to run the job to update the table. If you need to run the job, details are provided below.

If you are using the TK4- build of MVS 3.8, and:

- If you primarily use only the HERC01/HERC02 userids for TSO: no further action required. This case probably represents most users.
- If you use or have users that use other TSO userids besides HERC01/HERC02: run the job.

If you are using the TK3 Turnkey MVS 3.8 system: run the job.

If you are using a MVS 3.8 system that you have generated and customized yourself: run the job.

Running the TSOAUTH Job

Within the NJE38 SAMPLIB dataset is a member named TSOAUTH. This job is used to add NJE38 to the list of commands that should be authorized under TSO. NJE38 has already been added to the list for you. Run the job in order to assemble the new list and link it into the system. After the job is completed, **YOU MUST RE-IPL WITH THE CLPA OPTION** in order for this change to take effect.

TK4- users could alternately run the job that is in SYS1.SYSGEN.CNTL(SG0350) which essentially performs the same function. This job was used to add the other necessary commands to the table when TK4- was built. This is probably the preferred method for TK4- use because it uses SMP in order to apply the change. However, for the purposes of this document and to stay on target where NJE38 is the subject at hand, the TSOAUTH job was provided as an alternative because it should work on all versions of MVS 3.8.

Note that the next scheduled update of the TK4- MVS system is slated to have the NJE38 command already within the authorized commands list, as well as having the NJE38 AUTHLIB dataset already added to IEAAPF00 in SYS1.PARMLIB.

Appendix D: Loading the NJE38 Optional Source Materials

The source code for NJE38 is provided on the installation tape image in files 4 and 5. The source code is not required in order to use NJE38. If you wish to load the optional source materials, use JOB040 in the NJE38 SAMPLIB dataset to retrieve them from the tape. JOB040 will create two additional datasets: NJE38.ASMSRC and NJE38.MACLIB. Within NJE38.ASMSRC is a member named ASM. This is the JCL used to assemble and link all of the NJE38 components.