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Systems

Operator's Library: OS/VS2 MVS JES2 Commands

JES2 Release 4.1

Second Edition (January 1979)

This is a major revision of, and obsoletes GC23-0007-0. It incorporates and obsoletes supplement GC23-0055 and TNL GN25-0150. JES2 Release 4.1 runs with OS/VS2 MVS Release 3.7 and all subsequent releases until otherwise indicated in new editions or technical newsletters. This publication is intended to be used with *Operator's Library: OS/VS2 MVS System Commands*, GC38-0229, which documents the use of the system commands that are used in conjunction with the JES2 commands. Changes are continually made to the information herein; before using this publication in connection with the operating of IBM Systems, consult the latest *System/370 Bibliography*, GC20-0001, for the editions that are applicable and current.

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PREFACE

This publication provides the JES2 information required for a system console operator to effectively control a System/370 running under OS/VS2 with the Job Entry Subsystem 2 (JES2). This publication is intended to be used with *Operator's Library: OS/VS2 MVS System Commands,* which provides the basic OS/VS2 system information used in conjunction with JES2.

This publication contains 7 chapters and one appendix:

- Chapter 1, "Introduction," provides a general overview of JES2 and information common to the rest of this publication.
- Chapter 2, "Starting, Stopping, and Restarting JES2," provides information necessary for the specification of JES2 options; starting, stopping, and restarting JES2; withdrawing JES2 from the system; and JES2 involvement in restarting the system. Chapter 2 also includes information for configuring and reconfiguring in a multiprocessor environment.
- Chapter 3, "Controlling System Input, Initiators, and Output," provides information on readers and initiators relative to starting, stopping, and assigning attributes to output devices and details the extent of control the operator has over printers and punches.
- Chapter 4, "Remote Job Entry," describes the remote job entry feature and how to use this feature to start a line, restart a line, stop a line, diagnose line problems, assign a password to a line, and to communicate with JES2 remote terminals.
- Chapter 5, "Controlling the System," describes the commands needed to control the system. The types of control that can be exercised are changing a system's operational mode, control of messages, use of automatic command processing, and the display of system and JES2 information relevant to control of the system.
- Chapter 6, "Controlling Jobs," describes how to control jobs through the use of JES2 commands. These commands allow you to set internal JES2 job numbers; change the system's affinity for jobs; control job queues; change a job's class, scheduling priority, or system identifier; display information about jobs; and hold, release, cancel, or stop a job.
- Chapter 7, "Controlling Job Output," describes the control of job output through the use of the following capabilities: listing job output information, routing job output, controlling held output data sets, and stopping output data sets.

Following Chapter 7, the appendix presents a summary of JES2 commands which are cross-referenced, by function performed, to the main body of the book. This appendix can be used for quick reference purposes

Associated Publications

The following publications should be used in conjunction with this manual:

TITLE	ORDER NUMBER
Operator's Library: OS/VS2 Remote Terminals (JES2)	GC38-0225
Operator's Library: VTAM Network Operating Procedures	GC27-0027
OS/VS Message Library: VS2 System Codes	GC38-1008
OS/VS Message Library: VS2 System Messages	GC38-1002
OS/VS2 System Programming Library: Initialization and Tuning Guide	GC28-0681
OS/VS2 MVS System Programming Library: JES2	GC23-0002
OS/VS2 JCL	GC28-0692
Operator's Library: OS/VS2 MVS System Commands	GC38-0229
Operator's Library: OS/VS2 MVS JES2 Command Language Reference Summary	GX23-0005

In addition, the operator's library contains publications that should be selected based upon your installation's specific system configuration:

OS/VS2 System Management Facilities (SMF)	GC28-0706
Operator's Library: IBM 3850 Mass Storage System (MSS) Under OS/VS	GC35-0014
OS/VS2 SPL: Supervisor	GC28-0628
OS/VS2 SPL: Service Aids	GC28-0674
OS/VS Dynamic Support System	GC28-0640
OS/VS2 SPL: SYS1.LOGREC Error Recording	GC28-0677
Operator's Library: OS/VS TCAM Level 10	GC30-3037
OS/VS2 Multiprocessing: An Introduction and Guide to Writing Operating and Recovery Procedures	GC28-0952

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Summary of Amendments for GC23-0007-1 OS/VS2 MVS Release 3.8 JES2 Release 4.1

Changes have been made throughout this publication to reflect the OS/VS2 MVS Release 3.8 maintenance release of JES2 Release 4.1, and to incorporate all past supplements and technical newsletters into this major revision.

In addition, new information has been added to Chapter 2 describing the hardware and software considerations for running in a multiprocessor environment and how to alter that environment.

CHAPTER 1. INTRODUCTION

JES2 is a job entry subsystem which has assumed many of the functions formerly performed by the job scheduler and HASP II under previous releases of the Operating System (OS/MVT, and OS/VS2 Release 1). These include:

- Receiving jobs from local devices, tasks currently operating in the system, and remote locations.
- Maintaining all data submitted with jobs.
- Controlling initiators.
- Validating JCL before job processing.
- Job scheduling.
- SYSOUT processing.
- Routing of SYSOUT data sets to remote devices.
- Warmstarting jobs after system restarts.

Under usual processing, jobs go through six JES2 phases:

1. Input – Each job, consisting of JCL and, optionally, input data, enters the system and is saved on direct-access storage spool volumes for subsequent high-speed retrieval.
2. Conversion – After a job completes the input phase, the JCL is merged with the procedure library, checked for correct syntax, and converted to an internal format.
3. Execution – Batch jobs are selected for execution by class and priority. During execution, JES2 provides JCL in internal form to the initiator, passes input data to the executing program, and collects system messages and output data on the spool volumes.
4. Output – After execution, each job's SYSOUT data sets are grouped in accordance with their output characteristics (such as forms, UCS, and FCB) and queued by class, routing, and priority for output by the output devices.
5. Hardcopy – The job log and system messages data sets are written on the devices assigned to the MSGCLASS output class. Print and punch data sets are written on the devices assigned to the corresponding SYSOUT class, or can optionally be rerouted by an operator command.
6. Purge – All jobs, upon completion, are removed from the system. The spool volume space and all other resources associated with the job are released.

Time-sharing, which is an integral part of OS/VS2 Release 3, gives users access to the system through remote terminals. Each user has his own virtual address space, just as each background user does. JES2 provides an internal reader facility that permits the time-sharing user to introduce his jobs directly into the job stream.

The RJE facility allows remote workstations to use the capabilities of the system even though they are not located at the central installation. These remote workstations communicate with the central computer by means of an access method (for example, RTAM or VTAM). JES2 controls the remote unit record devices as if they were local readers, printers, and punches. The system can simultaneously operate local devices, read jobs from remote readers into the queues to await processing, and print and punch the results of processing at the remote site.

MULTI-ACCESS SPOOL CAPABILITY

The multi-access spool capability of JES2 allows from two to seven systems to access the JES2 input, job and output queues through the use of shared DASD. This feature may be used to share the workload or a pool of JES2-controlled devices among processors. Jobs may be routed to any specific system or all systems in this multi-access spool configuration. Furthermore, JES2-controlled unit record and remote devices need not be attached to each processor, but rather, may be concentrated on a single processor. JES2 will still be able to print or punch jobs that are processed on processors that do not have JES2 devices attached to them.

Another function supplied by JES2 in the shared processor support is the ability to isolate a processor for testing purposes. A processor may be designated as operating in independent mode, and as such, it will only process jobs that are both routed to it and are themselves designated to execute on a processor in independent mode. The spool volumes are still shared with the other processors in the multi-access spool configuration. This function allows an installation to test a new system or modifications to an existing system without disrupting the other processors or their workload.

Furthermore, non-independent mode jobs that attempt to execute on an independent mode processor will not do so until you have taken that processor out of independent mode. Each processor in the JES2 multi-access spool configuration is known by a four-character alphameric identifier (system-id) that must be the same as the System Management Facilities (SMF) identifier. This name is used in all operator references to the processor in the configuration.

The operator command set for the JES2 multi-access spool processor allow you to add, delete, or explicitly identify the system affinity (routing) of jobs; display active and queued jobs for any processor or group of processors in the configuration; add, delete, or explicitly identify the system affinity of jobs associated with a specific processor in the configuration; and place a system in the configuration into or out of independent mode.

COMMAND SYNTAX CONVENTIONS

When entering operator JES2 commands, follow the syntax rules in Figure 1-1 unless specifically indicated otherwise.

Notation	Description	Example	
		Book Syntax	Sample Entry
$	The command is a JES2 command.* Enter the $ as shown.	$S In[-n]	$S I3-7
Apos-trophes	Must be entered as shown.	$D Mn[-n],'message'	$D M2-33,'ok'
Brackets	The enclosed parameter(s) is optional. Do not enter the brackets.	$S I[n[-n]]	$ s i3
Comma	Must be entered as shown.	$T I[n[-n]],classes	$t i2-4,abc
Ellipsis (...)	The parameter can be repeated. Do not enter the ellipsis.	$Z PRTn[,PRTn]...	$Z PRT2,PRT3,PRT4
Lower Case	A parameter must be substituted. You can enter the parameter in either upper or lower case.	$T LNEn,P=[password]	$T LNE4,P=SECRET or $t lne4,p=secret
Paren-theses	Must be entered as shown.	Not used in JES2.	Not used in JES2.
Stacked items in braces	*One* of the alternatives must be entered.	$D O [,L={a / cc / cca}]	$D O,L=12
Under-score	The underscored parameter is the system default. If you do not enter any of the parameters, the system will supply the underscored parameter.	$T {OSCn / Rn.CON} [,D={T / J / M}]	$t osc 12
Upper Case	The parameter must be spelled as shown. You can enter the parameter in either upper or lower case.	$C A	$C A or $c a

* Since the JES2 command identifier is determined by your installation, it may be some character other than $. You must specify the character defined by your installation when entering JES2 commands.

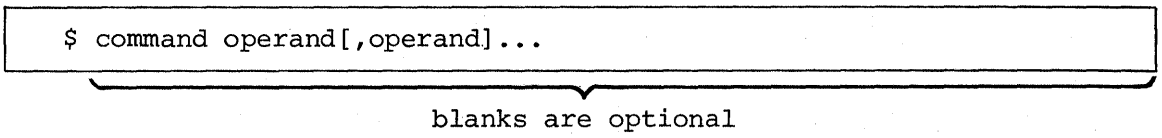
Figure 1-1. Command Syntax Conventions

JES2 COMMAND FORMAT

Operator commands can be entered in uppercase or lowercase. Lowercase letters are converted to uppercase and blanks are eliminated unless enclosed by apostrophes. Therefore, when a lowercase response is required, you must enclose the text in apostrophes. Also, when an apostrophe appears in the text of a command and the text is enclosed in apostrophes, you must enter two apostrophes in the text. For example, you would enter:

```
$DMR1, 'your job''s done'
```

Commands can be entered either through the input stream (card reader) or the system console. Examples in this publication illustrate the format for entering commands through the console. To enter commands through the card reader, enter a /* (slash asterisk) in card columns one and two immediately preceding the command verb. The command format for entering JES2 commands is as follows:



JES2 is designed to accept superfluous characters within a command if they are not essential to syntax analysis. Specifically, additional characters following an alphabetic operand are ignored.

The JES2 command identification character is determined by your installation at JES2 initialization. $ will be used throughout this publication to indicate the JES2 command identifier, although this character may vary at your installation. You must enter the JES2 command identifier specified at your installation.

An operator at a remote work station may abbreviate device specifications for devices that are attached to the work station at which the commands are entered:

Specification	Abbreviation
Rnnn. RDn	RDn
Rnnn. PRn	PRn
Rnnn. PUn	PUn

You can enter multiple JES2 commands on one line as long as you:

- Enter only one JES2 identifier.
- Separate them with a semicolon.
- Do not exceed the maximum number of characters allowed, which is 120 characters from a console and 80 characters through a card reader.

Example:

```
$da;du;dn
```

The maximum number of operands varies with the individual command but can never be more than twenty.

ROUTING JES2 COMMAND RESPONSES

The system will acknowledge all JES2 commands. Since JES2 allows multiple commands per line, you can enter the L=cca operand to route command responses for:

- A single command.
- All commands.
- Certain commands to specified active MCS consoles and the remaining responses to an alternate active MCS console.

To route command responses for a single command, enter the L=cca parameter as an operand of the command.

Example:

```
$DJ1-5,L=12;DS1-5;DT1-5
```

The job information will be routed to console 12 while the responses for the remaining commands will be routed to the default console.

To route command responses for all commands, enter a semicolon and the L=cca operand after the last command.

Example:

```
$DJ1-5;DS1-5;DT1-5;L=12
```

The job, system task, and time-sharing information will be displayed on console 12 rather than on the default console.

To route certain command responses to a specified destination and the remaining responses to another, enter:

- The L=cca parameter with the commands to have specially routed responses.
- A semicolon and L=cca to route all commands not requiring specially routed responses.

Example:

```
$DJ1-5,L=12;DS1-5;DT1-5;L=4A
```

The job information will appear on console 12 while the system task and time-sharing information will be routed to area A of console 4.

Note: *The L=cca operand is invalid if entered via the card or internal readers. This restriction does not apply to L=cca operands that are normally enclosed in apostrophes.*

Example:

```
$TA,I=30,'DA,L=01',L=01  is invalid
$TA,I=30,'DA,L=01'       is valid
```

ENTERING SYSTEM COMMANDS VIA JES2

Use the $VS command to submit a system command from a console with JES2 system authority.

$VS	,'command'[,'command']...

'command'
The system command to be submitted via JES2.

Example:

```
$vs,'v (234,235,236),offline','d a'
```

The VARY and DISPLAY commands will be submitted to the system for processing.

The $VS command is normally entered from a local, authorized (for system authority) JES2 card reader. The responses to commands entered via the $VS command appear at the master console on the issuing system.

REPLYING TO SYSTEM INFORMATION REQUESTS

Use the abbreviated format REPLY command to answer requests for system information when JES2 is fully active.

	id,{'text' / text}

id
The identification number (0-99) of the message requesting information. Leading zeros can be omitted.

'text'
The response to the message. The apostrophes are optional and need only be included if your answer contains uppercase and lowercase characters or a comment. If you include the apostrophes and your answer contains an apostrophe, two apostrophes must be used in the message text.

A blank or EOB entered immediately after the identification number indicates a null reply. Comments can be included following the blank in a null reply.

When using this abbreviated form you *must* omit the REPLY or R command verb and you cannot include any comments unless the reply entry is bounded by apostrophes. For example: 3,'U'.

The abbreviated form also allows you to:

- Omit the comma. For example 3'U'.
- Omit the apostrophes. For example: 3U or 3,U.
- Omit the leading zero. However, when the first text character is numeric you must enter a comma, apostrophe, or blank between the identifier and the text. For example, you can enter 3,3, 3'3', or 3 3, but not 33.

Note: *Do not use the JES2 abbreviated form when specifying secure information since the reply will be placed on the hardcopy log.*

JES2 COMMAND ENTRY BACKSPACE FACILITY

When you are using a non-graphic console that does not have a backspace key, you must correct typing errors made before JES2 is active by canceling the entry and reentering the entire command. During JES2 job processing, however, the subsystem provides a logical backspace editing facility. This facility is available only to system consoles and cannot be used on JES2 controlled devices; however, it may be used when entering system as well as JES2 commands.

Since most keyboards do not have the backspace key, the facility is simulated through a substitute backspace character defined at JES2 initialization. Although entering the backspace character does not physically move the print position backward, the incorrect character and the backspace character are removed from the internal image of the command. The rules concerning the backspace character are as follows:

- The backspace character is exclusive; you cannot use it as part of the text of a command or message.
- Enter one backspace character for each character to be replaced. You cannot backspace beyond the beginning of a line.

For example: if, after JES2 is active, you typed $DN when you meant to type $DQ, you would enter the backspace character defined by your installation, (in this example ¬) followed by the correct character. The entry would appear as follows:

```
$DN¬Q
```

but the system would recognize:

```
$DQ
```

CHAPTER 2. STARTING, STOPPING, AND RESTARTING JES2

Once the system has been initialized, JES2 is invoked either automatically by the system or by you via the START command. The following sections discuss the JES2 initialization process.

SPECIFYING JES2 OPTIONS

The system will automatically start JES2 if your installation has provided for this capability. You may receive the following message:

```
* id $HASP426 SPECIFY OPTIONS - subsystem identification
```

If you respond to this message using the system REPLY command, enter the JES2 options specified by your installation procedures (the system response format should be used in response). The following is a list of valid JES2 options and their definitions.

Option	Meaning
NOFMT	No spool volume is to be formatted unless JES2 determines that formatting is necessary.
FORMAT	All spool volumes are to be formatted. This request is honored only if all other processors in the JES2 multi-access spool configuration are inactive. If other processors in the configuration are active, the request is denied.
WARM	JES2 is to continue processing where it left off. If the system to be warmstarted is in a JES2 multi-access spool configuration, and other processors are active, the warmstart is performed only for the warmstarted processor. If all other processors in the configuration appear to JES2 to be inactive, you are prompted for a request to warmstart all jobs that were active in the configuration.
COLD	All job data on the spool volumes is to be ignored. This request is honored only if all other processors in the JES2 multi-access spool configuration are inactive. If other processors in the configuration are active, the request is denied.
REQ	JES2 is to stop and request a $S command before beginning job processing.
NOREQ	JES2 is to begin job processing when ready to do so.
LIST	JES2 is to list, on a designated printer, any error flags, replacement cards, and initialization parameters.
NOLIST	JES2 is not to list error flags, replacement cards, or initialization parameters.

Option	Meaning
{ HASPPARM= ddname / HASPPARM }	The JES2 initialization parameters contained in the specified library are to be used. The HASPPARM library is the default if no other library is specified.
{ LOG / NOLOG }	JES2 is to allow logging (on the system log) of any initialization parameter statements which follow a LOG statement. JES2 is not to honor the LOG initialization parameter statement.
{ NONE / U }	All default (underlined) options are taken.

If you respond to message $HASP426 with $PJES2, JES2 will terminate.

All options may be entered in upper or lower case and must be separated by commas. If two options are entered that are considered opposite, the latter option will override the former.

Note: *If FORMAT is specified, the system will be cold started even though WARM is also specified.*

JES2 must be started and completely initialized before initiators will start successfully allowing work to be done.

JES2 is now ready to process jobs. If you specified NOREQ, the subsystem will automatically start processing. Otherwise, you will receive the following message:

```
$HASP400 ENTER REQUESTS
```

You should respond by entering the following $S command to start system activity.

$S	

STOPPING JES2

Before stopping the system, you should stop all JES2 processing by entering the $P command.

$P	

System initiators, printers, and punches will not accept any new work and will become inactive after completing their current activity. However, new jobs will be accepted through input devices.

Once the system notifies you that all system activity has completed, you can issue the HALT EOD command to ensure that important statistics and data records in storage are not permanently lost. Refer to *Operator's Library: OS/VS2 MVS System Commands*, GC38-0229, for further information regarding system action.

WITHDRAWING JES2 FROM THE SYSTEM

Use the $P command to withdraw JES2 from the system to which the entering console is attached.

$P	JES2

JES2 will be removed from the system to which the entering console is attached. JES2 can be returned to the system by a START command which invokes a procedure from SYS1.PROCLIB that contains the JCL necessary to start JES2.

Note: *If any jobs are being processed, or any devices are active, JES2 cannot be removed from the system. In this case, the JES2 operand is ignored, and the $P command merely stops JES2 (which can be restarted by $S) and drains JES2 work from the system. Activity may be displayed by use of the $DA or $DU commands.*

RESTARTING JES2

When restarting or warmstarting the system, you must be certain that all spool volumes available to the system during the previous session are still available. However, it is not necessary that they be mounted on the same devices. If a new spool volume is present, JES2 will determine if formatting is necessary and perform this function.

After the initial program load, respond to system messages as you did when coldstarting the system. However, when asked to specify JES2 options reply 'U' or include 'WARM,REQ' in your reply. ('WARM,REQ' is recommended, although 'WARM,NOREQ' is also valid.) This will allow you to determine which jobs are to be rerun before resuming processing.

Any jobs being read into the system when it failed must be resubmitted. Those jobs awaiting execution and completed jobs awaiting output processing are unaffected by the system failure.

After 'WARM,REQ', the system will examine all interrupted jobs to determine which ones can be restarted. All jobs that cannot be rerun will be terminated. You will receive the following message for each job that can be restarted:

```
* id IEF225D SHOULD jobname.stepname.procedure [checkid]
      RESTART
```

If you reply:

- YES, the job will be restarted.
- NO, the job will be canceled and the output purged.
- HOLD, the job will be held. You must enter a $A command to release the job.

All jobs in output processing when they were terminated will be restarted at the interrupted data set. Print output will be backspaced to the last JES2 checkpoint. Punch output will be restarted at the last JES2 checkpoint.

Once you have determined that the system is ready to resume processing, enter the $S command (unless 'WARM,NOREQ' was specified).

$S	

RESTARTING A JES2 SUBSYSTEM IN THE COMPLEX

Use the $E command to reclaim the job processing which was being performed upon the named system in a multi-access spool configuration.

$E	SYS,system-id

SYS
The system to which the entering console is attached is to restart all job processing for the indicated system identification.

system-id
The four-character alphameric identifier of the system within a multi-access spool configuration which is to be reclaimed.

Example:

```
$E SYS,H158
```

Assuming that the console from which this $E command was entered is attached to H168, this command will cause the H168 system to restart all job processing that was being done on the H158 system.

MULTIPROCESSOR CONFIGURATIONS

Some configuration options are available during any JES2 IPL if any processor in your present configuration is a multiprocessor. These options allow you to:

- Perform an IPL in multiprocessor mode and start JES2.
- Perform an IPL in uniprocessor mode and start JES2. You can then bring the other processor online by reconfiguring it to multiprocessor mode and varying the CPU online.

Configuration changes such as the ones previously mentioned can be needed as a result of your installation's requirements changing or because of a hardware failure.

Your installation should have reconfiguration procedures established for as many situations as possible. Use the information in this manual together with that in *OS/VS2 MVS Multiprocessing: An Introduction and Guide to Writing Operating and Recovery Procedures*, GC28-0952. The following discussion covers both planned and unplanned reconfiguration situations.

To reconfigure a running multiprocessor into two uniprocessors, the MVS IPL of the multiprocessor must have specified for it, an IEASYS00 or IEASYSxx for which a nonzero value was coded in its reconfigurable storage units (RSU) keyword. There are at least three stages needed to complete the reconfiguration.

1. For the JES2 environment, special attention must be given to JES2 processor requirements.
2. For the MVS environment, you must logically reconfigure MVS to a uniprocessor.
3. For the hardware environment, you must reconfigure storage and I/O to meet new requirements.

JES2 Environment Reconfiguration – General: When reconfiguring from multiprocessor mode to uniprocessor mode, the following items should be considered.

1. When reconfiguring processors, if the processor was defined as a multiprocessor you may reconfigure to uniprocessor on either side of the multiprocessor.
2. When reconfiguring devices and lines, the remaining processor must have paths to all online devices (that you desire to use) that were previously accessible through the processor that was just disconnected. Devices of particular importance are: printers, punches, RJE lines, transmission control units, spool volumes, and any device allocated to JES2 via the starting procedure.
3. When reconfiguration of processors involves reconfiguration of asymmetrically connected devices you may need to stop I/O activity directed to those devices if it is from programs and subsystems (e.g., CICS, IMS) other than JES2. This can prevent bringing the other subsystems down when reconfiguring.

JES2 Environment – Planned Reconfiguration: Planned reconfiguration may be necessary due to a change in your installation's requirements, preventative maintenance, or in response to a system problem that was anticipated and that had reconfiguration procedures preplanned.

When determining procedures for a planned reconfiguration the following should be considered.

1. Is hardcopy routed to the proper CPU. If not, reroute the hardcopy to the proper CPU.
2. Do you want output in progress to be restarted at the beginning of the data set or restarted at a checkpoint. This is especially important for long strings of output.

The following discussion illustrates how to reconfigure lines and devices during a planned reconfiguration.

To reconfigure an RJE line the following procedure should be used.

$P LNExxx	drain line of all but work in progress
$E Rn.PUn	immediately stop work in progress on the device. This will cause the entire data set to be requeued.
or	
$E LNExx	immediately stop work in progress on the line. This will cause work to be later resumed at a checkpoint rather than at the beginning of the data set.

Switch the device to the desired CPU via an appropriate switching mechanism

V PATH(xxx<–yyy>,0),ONLINE	vary new path online
V PATH(xxx<–yyy>,1),OFFLINE	vary old path offline
$S LNExxx	start the new line

The above procedure for activating the new line can be used with either the IBM System/370 Model 158 or Model 168 that do not have channel reconfiguration hardware (CRH) activated at SYSGEN. It is also valid for an unplanned reconfiguration of a Model 168 with CRH activated at SYSGEN.

To reconfigure a printer or punch use the following procedures.

$P PRTx	prevent the device from accepting additional work
$I PRTx	interrupt the device; the data set will be resumed at a checkpoint
or	
$E PRTx	stop the device; the data set will be requeued for printing

Switch the device to the desired CPU via an appropriate switching mechanism

V PATH(xxx<–yyy>,0),ONLINE	vary the new path online
V PATH(xxx<–yyy>,1),OFFLINE	vary the old path offline
$S PRTx	start the printer

To reconfigure a card reader, use the following procedures:

$P RDRx	stop the card reader
Switch the device to the desired CPU via an appropriate switching mechanism	
V PATH(xxx<–yyy>,0),ONLINE	vary the new path online
V PATH(xxx<–yyy>,1),OFFLINE	vary the old path offline
$S RDRx	start the card reader

JES2 Environment – Unplanned Reconfiguration: There are several considerations when doing an unplanned reconfiguration on multiprocessors with JES2 resident. Unplanned reconfiguration may be necessary due to a machine check or due to JES2 coming down (e.g., a JES2 ESTAE is entered) during alternate reconfiguration recovery (ACR) processing in MPs. When this happens you must take the following steps.

1. reenter input
2. restart the log, if required, using the MVS command W START

Output will be restarted from the checkpoint.

Note: *If HASPSSSM failed, the user that invoked HASPSSSM will probably come down rather than JES2.*

To reconfigure devices and lines in an unplanned reconfiguration, the method used depends upon the device and, in some cases, the system being reconfigured.

To reconfigure an RJE line attached to an IBM System/370 Model 158 or Model 168 that do not have channel reconfiguration hardware (CRH) activated at SYSGEN you must:

1. activate an alternate IBM 2914 path
2. vary the path online using VARY
3. start the line using $S LNExx

To reconfigure a printer, punch, or reader without CRH activated, you must:

1. activate an alternate IBM 2914 path
2. vary the path online using VARY
3. start the device using the appropriate $S command

For an unplanned reconfiguration of a Model 168 with CRH activated, see the previous discussion on planned reconfigurations in a JES2 environment.

MVS Environment: If you intend to reconfigure to two uniprocessors, you should decide how much storage, if any, is to be transferred to the second processor. To display and identify which storage units are reconfigurable, issue the MVS command: D M=STOR.

After determining storage requirements for the second processor, you may remove some or all of the reconfigurable storage from the multiprocessor by varying the storage offline as follows:

V STOR (appropriate parameters),OFFLINE

MVS will notify you when the request is fulfilled. (This may require some time.)

After storage has been varied offline, you can vary the second processor offline with the MVS command:

V CPU(x),OFFLINE[,UNCOND]

MVS will notify you when the request is fulfilled. (This may require some time.)

Note: *Any jobs having affinity to the processor to be varied offline, will run to completion. The VARY command is not acceptable if it removes the last path to any unallocated device unless UNCOND is specified. Furthermore, the VARY command is never acceptable if it removes the last path to an allocated device. This means you may have to vary channels and paths online to the remaining processor as well as taking some hardware environmental actions before executing the V CPU . . . command.*

Varying a processor and storage offline allows you to: reconfigure storage and devices at the multiprocessor's configuration control panel, change mode from MP to UP, and effect the reconfiguration by pressing the ENTER CNFG pushbutton. Until you press the ENTER CNFG pushbutton, the system being taken offline remains in the multiprocessor mode and no attempt should be made to perform an IPL on it, or otherwise change its status.

Hardware Environment: Reconfiguration may involve hardware switching of I/O devices by means of an IBM 2914 or similar switching device. When switching via the IBM 2914, the processor to which you switch should be in the STOP state unless the IBM 2914 has the Interlock Feature (RPQ Number 8PO300). Failure to observe this precaution could result in an unpredictable abnormal termination in the processor to which you switch.

CHAPTER 3. CONTROLLING SYSTEM INPUT, INITIATORS, AND OUTPUT

JES2 is responsible for controlling system input devices, initiators, and output devices, with the exception of those devices controlled by the external writer and programs interfacing with JES2 via an internal reader. The JES2 initiator and device control commands, with the exception of the $T command for devices, can be used to control several devices simultaneously. While you can specify input and output devices by either their full name or abbreviated name, the abbreviated name will be used throughout this book. The device names and their abbreviations are as follows:

Device Name	Abbreviation	Explanation
LINEn	LNEn	RJE line
LOGONI	LGNI	JES2/VTAM interface
OSCn		system console
PRINTERn	PRTn	local printers 1-9
PRINTRnn*	PRTnn	local printers 10-99
PUNn		local punches
RDI		internal readers
READERn	RDRn	local readers
Rn.CON		remote console
Rn.PRn		remote printers
Rn.PUn		remote punches
Rn.RDn		remote readers

* This name must be used when there are more than nine printers on the system.

You can enter up to 20 operands on a single JES2 initiator or device control command.

All JES2 input devices, initiators, and output devices will be in one of several states:

- ACTIVE – The device or initiator is actively performing a function.
- INACTIVE – The device or initiator is available to perform a function but no jobs are available.
- DRAINING – The device or initiator is performing a function, but will not begin any new activity upon completion of the current function.
- DRAINED – The device or initiator is inactive and will not become active until you enter a $S command for the device or initiator.
- HALTING – The initiator is active but will not select another job after completing the current function.
- HALTED (initiator) – The initiator is inactive and will not become active until you enter a $S command. This differs from DRAINED in that the system does not free the resources associated with the initiator.
- HALTED (device) – The device has been halted by a $Z device command or by a requirement for you to perform an action such as changing the forms, carriage tape, or print train. A $S device command will allow the device to continue.

- PAUSED – The local printer or punch has paused between data set groups. It can be restarted by entering a $S command or by resetting it from a not-ready to a ready state.

You will want to keep the following in mind when entering JES2 device control commands:

- Devices generally perform the requested operation after the response to the command.
- Many commands will accept operands as valid, even though the devices are unable to perform the requested function.
- When you receive an error message for a device command, the action requested by the previous operands will be attempted, but the operand in error and those following it will be ignored.
- Operators at JES2 remote stations can normally control only the devices attached to their stations.

SYSTEM INPUT – READERS

The following sections discuss the commands you use to control system input readers and internal readers. See the section "Controlling Job Queues," in Chapter 6, for a discussion of holding and releasing jobs processed by a reader.

Each reader is assigned a JES2 number from 1 to 99 at system initialization. The operator uses these names, in conjunction with the subsystem commands, to control the various readers. Use the $DU command to request a list of the JES2 device assigned to each device address.

A system input reader is a physical device which reads system and subsystem commands, control cards, and user jobs to be processed by the operating system. There are three ways to start an input reader:

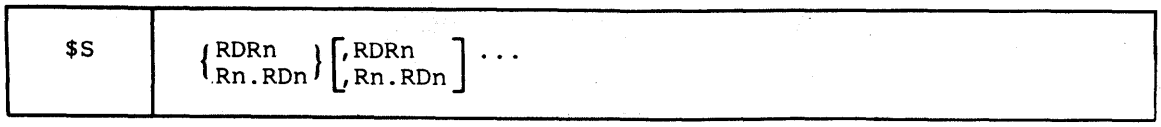
1. Enter the $S reader command when the device is halted, drained, or inactive.
2. Ready the reader with cards prior to replying to the initialization message.
3. If your installation has selected the Automatic Starting Reader feature, ready the reader with cards at any time, unless the $P reader command is in effect.

An internal reader is a logical device. It is a special SYSOUT data set, available to problem programs, that allows jobs to be entered directly into the job stream from some other program operating in the system, for example, from a time sharing user. Although the operator controls the internal reader much the same as an input reader, it is not a real device. JES2 will automatically start internal readers when they are required.

Devices not supported by JES2 are supported via utilities which interface with the JES2 internal reader. Refer to *Operator's Library: OS/VS2 MVS System Commands* for further information regarding this subject.

Starting a Reader

Use the $S command to start a system input reader.



RDRn
The local system input reader to be started.

Rn.RDn
The remote reader to be started.

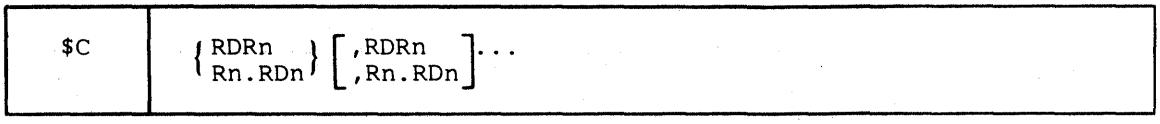
Example:

```
$s rdr1,r1.rd2
```

The system will start local reader 1 and reader 2 at remote station 1 and will attempt to process job streams.

Canceling Reader Activity

Use the $C command to cancel current reader activity.



RDRn
The local system input reader to be affected. The job currently being read is to be flushed and the reader is to continue reading when it encounters the next valid job card.

Rn.RDn
The remote reader to be affected.

Example:

```
$c rdr1
```

Reader 1 will flush the job currently being read and will continue reading at the next valid job card.

Halting a Reader

Use the $Z command to temporarily halt reader activity.

$Z	RDRn[,RDRn . . .]

RDRn
The local reader to be halted. Reader activity will stop immediately and will resume at the same point when a subsequent $S RDRn command is issued.

Example:

```
$z rdr1,rdr2
```

Readers 1 and 2 are to be stopped immediately.

Stopping a Reader

Use the $P command to stop a reader.

$P	{RDRn / Rn.RDn} [,RDRn / ,Rn.RDn]...

RDRn
The local reader to be stopped. The specified devices will be drained, and the associated system resources will be freed, after the current job is read.

Rn.RDn
The remote reader to be drained.

Example:

```
$p rdr1,rdr2,rdr3
```

Readers 1, 2, and 3 will complete their current activity and become drained.

Assigning Command Authority for a Reader

Use the $T command to specify the command authority of a reader. A reader may not be used to set the command authority for any local reader device. This command can be issued only by a console with device and system authority.

$T	{RDRn / RDI},A=n

RDRn
The local reader to be assigned the specified authority.

RDI
All internal readers are to be assigned the specified authority.

A = n
The command authority for the specified reader. That is, the JES2 command groups that the reader is authorized to enter. (Figure 3-1 relates JES2 command groups to system command groups.) The values and their definitions are:

0 – display only
1 – system control
2 – device control
3 – system and device control
4 – job control
5 – system and job control
6 – device and job control
7 – system, device, and job control

Example:

```
$T rdr3,A=6
```

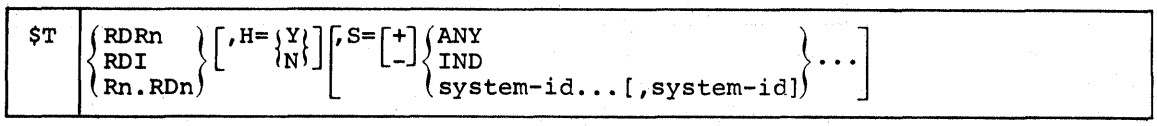
Reader 3 will be authorized to enter device and job control commands.

System Command Group	JES2 Command Group
INFO	DISPLAY ONLY
SYS	JOB CONTROL
IO	DEVICE CONTROL
CONS (Master Console only)	SYSTEM CONTROL

Figure 3-1. Command Group Summary

Assigning System Affinity to a Reader

The $T command is also used to set the default system affinity for all jobs read by the specified reader in a multi-access spool JES2 configuration. The $T command may further be used to hold all jobs read by the specified reader.



RDRn
The system input reader to be affected.

RDI
All internal readers are to be affected.

Rn.RDn
The remote reader to be affected.

H = Y or N
All jobs read by the reader are to be placed in hold status (Y) or reset to normal reading and queueing procedures (N). If held, these jobs can be released by a $A command that specifies the individual job.

S =
The subsequent ANY, IND, or system-id is to be affected.

+ or –
The subsequent ANY, IND, or system-ids are to be added (+) to or deleted (–) from the current list of systems which are eligible to process jobs read by the specified reader. If neither + nor – is specified, the routings of the jobs read by the reader are set explicitly to the specified systems. Note that + or – *must* be specified if IND appears by itself.

ANY, IND, or system-id...,system-id

ANY indicates that the jobs' system affinities include any system in the multi-access spool JES2 configuration. (A + or − means nothing when used with ANY.) IND indicates that the entering jobs must be added to the list of jobs eligible to run on independent mode processors (+), deleted from the list of jobs eligible to run on independent mode processors (−), or, if neither + nor − is specified, IND system affinity is explicitly set. System-id indicates the four-character alphameric identifier of the system in the multi-access spool JES2 configuration is to be added to, deleted from or explicitly set as the system affinity for all jobs read by the specified reader.

Examples:

```
$t rdr2,h=n
```

Reader 2 will be reset to normal reading and queueing procedures.

```
$t rdr1,h=y,S=IND,H158
```

All jobs read by reader 1 will be placed in hold status and will be eligible to run only on H158 only if H158 is operating in an independent mode.

```
$t rdr3,h=n,S=+H168
```

Reader 3 will be reset to normal reading and queueing procedures and H168 will be added to the list of systems which are eligible to process jobs read by reader 3.

Assigning Job and Message Classes to a Reader

Use the $T command to set the default job and message classes to be assigned to jobs being processed by a reader. This command requires device authority.

$T	{ RDRn | RDI | Rn.RDn } [,C=class][,Q=class]

RDRn

The local reader to be assigned the default job and/or message class.

RDI

All internal readers are to be assigned the default job class (Q = class is invalid with this operand).

Rn.RDn

The remote reader to be assigned the default job and/or message class.

C = class

The one character job execution class, A-Z or 0-9, to be assigned to jobs submitted through the specified reader which do not specify a job execution class.

Q = class

The one-character message output class, A-Z or 0-9, to be assigned to jobs submitted through the specified reader which do not specify message output class.

Example:

```
$T RDR1,C=C,Q=A
```

All jobs processed by reader 1, not specifying job and/or message output classes, will be assigned to job class C and message class A.

INITIATORS

Each initiator is assigned either an alphabetic or numeric identifier at subsystem initialization. Use these identifiers, in conjunction with the subsystem commands, to control the initiators.

When the subsystem finishes reading a job, the job is placed in one of the execution queues according to its job class. The appropriate job class is determined by:

- The CLASS = class parameter on the JOB card.
- The subsystem command $T JOBn,C=class. This command is issued by the operator to change the job class after the job has been read and queued.
- The default class. If the CLASS parameter is not specified and the operator did not alter the job class, the job will be assigned to the default job class for that particular reader.

Jobs are placed on the queues in priority sequence. Jobs of the same priority are selected on a first-in first-out basis. A job's priority is determined by:

- The subsystem command $T JOBn,P=priority. This command is issued by the operator to change the job's priority after the job has been read and queued.
- The /*PRIORITY control card.
- The job characteristic information (time, line, card estimates) on the JOB card or JOBPARM card.

When an initiator runs out of work, it will search its assigned queues for a job to process. The initiator processes jobs in priority order; for example, if the initiator is assigned classes A, B, and X, it will initiate only class A jobs as long as there are class A jobs ready for execution. When no class A jobs are available, the initiator will select only class B jobs or, if no class A or B jobs are available, class X. (If there are no jobs available in the assigned classes, the initiator becomes inactive until such jobs are available.)

This process is repeated each time an initiator attempts to select a job. An exception to this order of selecting jobs occurs when an execution batch monitor is active. In this case, the execution batch monitor class becomes highest priority temporarily, for as long as the execution batch monitor remains active, thus reducing the overhead of bringing an execution batch monitor in and out of the system.

Starting an Initiator

Use the $S command to start initiators. This command requires system authority.

$S	I[n[-n]]

In-n
The initiator(s) to be started. If the initiator identifier (n) is omitted, only those initiators stopped by a prior $Z I or $P I command will be started.

Example:

```
$s i3
```

Initiator 3 will begin processing jobs from the job classes assigned to it.

Displaying Initiator Information

Use the $D command to display the status of an initiator and the job classes assigned to it. This command requires display authority.

$D	I[n[-n]]

In-n
The initiator(s) to be displayed. If the initiator identifier number (n) is not specified, information about all initiators is displayed.

Example:

```
$d i
```

The status and the identifier of any active job and job classes assigned to all initiators will be displayed. The system will also display the name of any active execution batch processing programs if the initiator is inactive.

Assigning Initiator Job Classes

Use the $T command to assign the job classes an initiator is to process. This command requires system authority.

$T	I[n[-n]],classes

In-n
The initiator(s) to be assigned the specified job classes. If the initiator identification number (n) is not specified, all initiators will be assigned the indicated job class.

classes
The job class or list of job classes, in priority sequence, the initiator is to process. The maximum number of classes that can be specified is determined by your installation at JES2 initialization.

Example:

```
$t i2-4,abc
```

Initiators 2, 3, and 4 will, first, process all class A jobs. When there are no class A jobs available, they will process class B jobs. After all class A and B jobs have been processed, the initiators will process class C jobs.

Stopping an Initiator

You can use either the $P command to stop initiators or the $Z command to halt initiators. $P will cause the specified initiators to terminate and free the associated system resources. $Z causes the initiators to halt processing but remain in the system. Use $Z when you want to suspend processing for a short period of time. Both $P and $Z require system authority (see "Assigning Command Authority for a Reader" earlier in this chapter).

`$P`	`I[n[-n]]`

In-n
The initiator(s) to be stopped. If the specified initiator is currently processing, it will be stopped at the completion of the job. If the initiator identifier (n) is not specified, all initiators will be stopped after completing their current activity.

Example:

```
$p i3-5
```

Initiators 3, 4, and 5 will be stopped after completing the jobs they are currently processing and the associated system resources will be freed.

`$Z`	`I[n[-n]]`

In-n
The initiator(s) to be halted after completing their current activity. If the initiator identifier (n) is not specified, all initiators will be halted.

Example:

```
$Z I4-10
```

Initiators 4, 5, 6, 7, 8, 9, and 10 will not start any new jobs after completing their current activity, but they will remain in the system.

JES2 OUTPUT PROCESSING

Once a job has finished executing, the output is processed by either the JES2 output processor or the external writer. While it is generally more efficient to use the JES2 output processor, you will occasionally want to use the external writer; for example, when you want to put your output on magnetic tape or disk. For further information refer to *Operator's Library: OS/VS2 MVS System Commands,* GC38-0229.

Your installation, depending on its needs, can group SYSOUT data into as many as 36 different classes. Each class consists of all system messages and SYSOUT data sets the system associates with that class name, permitting the grouping of output data with a common characteristic.

JES2 assigns a numeric identifier between 1 and 99 to each local printer and punch at system initialization time. You use these identifiers to control the associated devices. If you are uncertain of the status or characteristics assigned to a device, enter the $DU command. When a job has finished executing, it is passed to the output processor, its output requirements are scanned, and it is placed on an output queue. There are thirty-six possible output classes: A-Z and 0-9. Each output device can be set to process any combination of classes in any order. Each output device operates in either automatic or controlled mode. During system initialization, any device can be set to start in either mode; however, the operator can change any device to controlled mode by issuing the $T device,F=form command.

Automatic mode provides satisfactory work selection for local devices. This minimizes operator intervention by:

- First, processing all work specifying the current setup, that is, the current forms, carriage control tape, and train.
- Next, processing all work with a setup not currently being used on a similar local device.
- Then, processing work requiring the standard setup.

Operator-controlled mode provides for processing of only that work requiring the following options specified in the $T device, F=form command: forms, FCB, and UCS for impact printers; and forms, forms overlay frame, and burster specification for the IBM 3800 Printing Subsystem. When no work with that specified setup is available, the device will become inactive even though there is other work queued in the system. You should use the $DF command to display the backlog of work for output devices.

If a JES2 device becomes inoperative and you fail to get a system response when you enter a $C, $I, or $E command, re-enter the command. This double entry of the command will cause the output processor to abort the specified job. The output will be handled as it normally is for the particular command entered.

The central system is always several lines or cards ahead of the physical output at a remote station. You should take this into consideration when attempting to control a remote device.

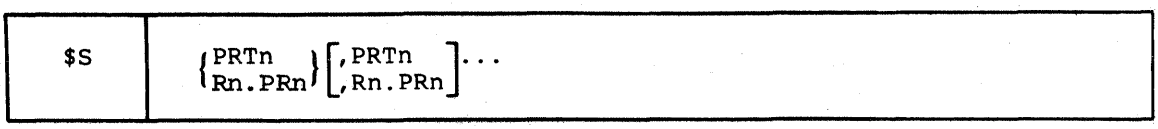
CONTROLLING PRINTERS

The following sections discuss the subsystem commands used for:

- Starting a printer
- Restarting printer activity
- Setting printer characteristics
- Setting printer options
- Assigning printer output classes
- Repeating printer output
- Interrupting printer activity
- Logically backspacing a printer
- Logically forward-spacing a printer
- Canceling printer output
- Halting printer activity
- Stopping a printer

Starting a Printer

Use the $S command to start a printer.



PRTn
The local printer to be started.

Rn.PRn
The remote printer to be started.

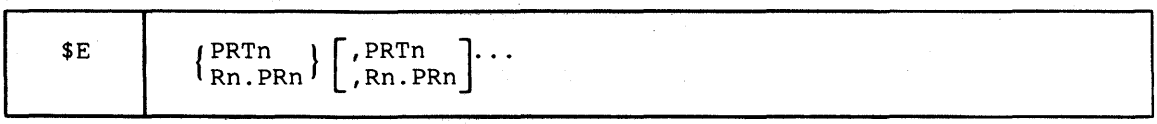
Example:

```
$s prtl,rl.prl
```

Local printer 1 and printer 1 at remote station 1 will begin printing job output.

Restarting Printer Activity

Use the $E command to discontinue the current printing of a data set group. The data set group is returned to the appropriate print queue, according to its job priority, for later processing.



PRTn
The local printer to be restarted. The current activity on the specified printer is to be stopped and the output is to be returned to the output queue. When the output is again selected for processing, printing will resume at the beginning of the data set group.

Rn.PRn
The remote printer to be restarted.

Example:

```
$e prt2
```

Printer 2 will stop printing and the output will be returned to the output queue in priority sequence. Printer 2 will then process the next available work.

Setting Printer Characteristics

If you are uncertain of the controls in effect, enter the $DU command for the printer in question. You can use the $T command to:

- Specify printer characteristics at JES2 initialization, when they deviate from the system default.
- Override a system request for a setup you are unable to fulfill.

The setting of forms, trains, and carriage controls is valid only when the specified device is inactive, pausing, or awaiting operator action.

Note: *You should either issue a $P PRTn command and wait for the device to drain before entering the $T command or issue the $T command while the system is waiting for forms to be loaded. Because no setup message is issued for a printer that does not require operator intervention to change the carriage control, the requested image cannot be overridden unless there is an error.*

$T	{PRTn / Rn.PRn}[,C={id / RESET}][,T=id][,F=form][,F=AUTOM][,B={Y / N}][,O={name / RESET}]

PRTn
The local printer for which you are establishing characteristics.

Rn.PRn
The remote printer to be set in the specified mode.

C = id or RESET
The identifier (id) – 1-4 alphameric characters – for the carriage tape for a printer without a forms control buffer (FCB) feature, or the FCB image for a printer having the FCB feature. If an FCB image is specified, it must be available in SYS1.IMAGELIB. If loading is required for Rn.PRn, it must be done by the operator at the JES2 remote station unless the workstation is a System/360 or System/370 MULTI-LEAVING workstation with FCB-loading capability. RESET can be specified only for the 3800 printer. It indicates that the 3800 is to construct a 6 lpi (lines per inch) FCB based on the forms loaded in the printer. *This operand can be used to correct the problem indicated by the $HASP180 load error message.*

T = id

For impact printers, the 1-4 alphameric character train identifier, available in SYS1.IMAGELIB, for the train to be used in the specified printer. The indicated printer must have the UCS feature. If loading is required for Rn.PRn, it must be done by the operator at the JES2 remote station. For the 3800 printer, T specifies the identifier, 1-4 alphameric characters, of the character set to be used in the specified 3800 printer. This identifier must be available in SYS1.IMAGELIB.

F = form

The form identifier, 1-4 alphameric characters, for the forms that are currently in the printer. The printer is to be put in operator-controlled mode.

F = AUTOM

The specified printer is to be put in automatic mode.

Notes:

1. *If a 3800 printer is in automatic mode and the burster (B=Y) and a forms overlay frame (O=name) are specified, the operator will be notified by means of a message when he needs to change forms.*
2. *Automatic mode should not be used for printers at remote workstations from which JES2 commands cannot be entered.*
3. *Except for SNA terminals, printers connected to terminals without MULTI-LEAVING support should be operated in operator-controlled mode.*

B = Y

The paper for output stacking for the specified 3800 printer will be threaded through the Burster-Trimmer-Stacker.

B = N

The paper for output stacking for the specified 3800 printer will be threaded for continuous forms stacking.

O = name

The identifier, 1-4 alphameric characters, for the forms overlay frame for the specified 3800 printer.

O = RESET

Any forms overlay that was previously specified for the specified 3800 printer is to be disabled.

Examples:

```
$T PRT2,F=3456,F=AUTOM
```

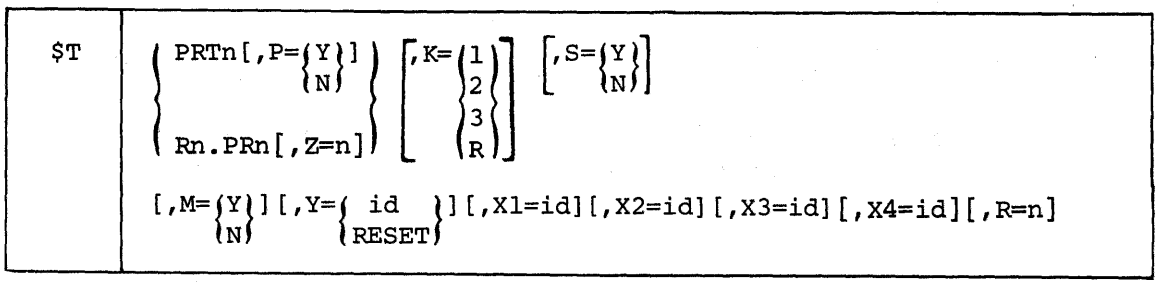
Printer 2 will first process all output requiring form number 3456. If there are no data sets requiring form 3456, the printer will switch to automatic mode and will process data sets requiring other forms. If you enter the two F=operands in the reverse order, the F=form operand will negate the F=AUTOM operand.

```
$t prt2,T=pn,F=1234
```

Printer 2 will print only jobs queued for form 1234. The printer is loaded with a PN train.

Setting Printer Options

Use the $T command to specify printer options, such as double spacing, separator pages, and pausing between data sets.



PRTn
The local printer to be affected.

P = Y
The specified local printer is to pause between data sets. The device can be restarted by changing it from a not-ready to a ready state or by entering a $S command to the device.

P = N
The specified local printer will not pause between data sets.

Rn.PRn
The remote printer to be affected.

Z = n
The specified compaction table (n) is to be used to decompact data for this remote printer.

K = 1, 2, or 3
The specified printer is to be single, double, or triple spaced, regardless of the problem program specifications. When the end of the data set is encountered or when a $T PRTn,K=R command is entered, the printer will revert to problem program specifications.

K = R
The specified printer is to be reset to the problem program specified spacing.

S = Y
Separator pages are to be placed between data set groups.

S = N
No separator pages are to be placed between data set groups and operator messages are not to be printed on this remote printer. Operator messages to remote users normally transmitted between print data sets to the remotes, will not be transmitted when S=N is in effect.

M = Y
For the specified 3800 printer, the edge of the separator page will be marked.

M = N
For the specified 3800 printer, the edge of the separator page will not be marked.

Y = id
The copy modification module identifier, 1-4 alphameric characters, available in SYS1.IMAGELIB, for the specified 3800 printer.

Y = RESET
For the specified 3800 printer, and copy modification that is active is to be canceled.

X1 = id, . . .,X4 = id
The identifiers, 1-4 alphameric characters, available in SYS1.IMAGELIB, for the first through fourth character arrangement tables, respectively, to be used in the specified 3800 printer.

Note: *This Xn operand should be specified only when the operator receives an error message that a character arrangement table was not found.*

R = n
The route code (n) of the jobs this device is to process.

Examples:

```
$T PRT5,K=2,S=Y,P=Y
```

Printer 5 will:

- Double space the current data set.
- Place separator pages between data set groups.
- Pause between data set groups.

```
$T PRT6,K=R,M=Y,Y=CM01,X1=GF10,X2=FM15
```

Printer 6 will:

- Be reset to the program-specified spacing.
- Use edge marking for separator pages.
- Use copy modification module CM01.
- Use character arrangement tables GF10 and FM15.

Assigning Printer Output Classes

Use the $T command to assign the output classes a printer is to process.

`$T`	`{PRTn },Q=classes` `{Rn.PRn}`

PRTn
The local printer to process the specified classes.

Rn.PRn
The remote printer to process the specified classes.

Q = classes

The output classes, specified in priority sequence, the printer is to process. The maximum number of classes you can specify is determined by your installation at JES2 generation.

Example:

```
$t prt3,Q=ACB
```

Printer 3 will first process all available class A output, then all available class C output, then all available class B output. However, if printer 3 is in automatic mode, it will process jobs requiring a similar setup first, and then select job output by class and priority.

Repeating Printer Output

Use the $N command to repeat the printing of job output.

$N	{PRTn / Rn.PRn} [,PRTn / ,Rn.PRn]...

PRTn

The local device currently printing the output to be repeated. For SYSOUT data sets, use of the $N command does not result in a new physical copy of the data set to be printed; only a copy-count field is incremented. Therefore, if a spin data set is intentionally or unintentionally canceled or deleted, all further copies are lost. Previously issued $N commands for spin data sets are lost during warmstart. When you want to print several copies of an output data set group, wait for the PRINTER REPEATED message to appear between the scheduling of each reprint.

Rn.PRn

The remote device currently printing the output to be repeated.

Example:

```
$n prt3
```

The output being printed on printer 3 will be printed again.

Interrupting Printer Activity

Use the $I command to interrupt the printing of a data set group.

$I	{PRTn / Rn.PRn} [,PRTn / ,Rn.PRn]...

PRTn
The local printer to be interrupted. The current activity on the specified printer is terminated and the output is returned to the output queue. When the data set is again selected for processing, the printer will backspace one or more pages and resume printing. A page is defined as:

- The last page eject (skip to channel 1) supplied by JES2 (&LINECT value) when the programmer did not supply any page ejects (skip to channel commands). The &LINECT value (system default page value) is specified at JES2 initialization.
- The entire data set, if the programmer supplied LINECT = 0 on the JOBPARM card or in the accounting field on the JOB card.
- The last page eject (skip to any channel) supplied by the programmer, if that eject is not further back than the value of the LINECT parameter specified by the programmer on the JOB or JOBPARM card or the &LINECT value specified at JES2 initialization.

Rn.PRn
The remote printer to be interrupted.

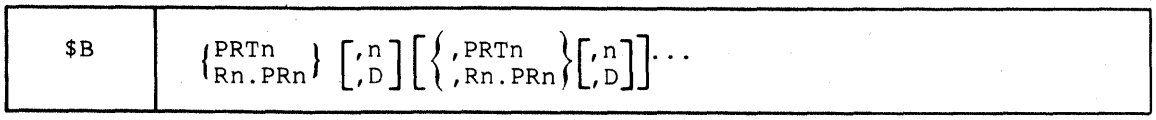
Example:

```
$i prt2,prt4
```

Printers 2 and 4 will stop printing and the work will be returned to the output queue.

Logically Backspacing a Printer

Use the $B command to backspace printer output a number of pages or to the beginning of the data set.



PRTn
The local device printing the output to be backspaced.

Rn.PRn
The remote device printing the output to be backspaced.

n
The number (1-9999) of pages the output is to be backspaced. This operand is optional only for the last printer specified. If it is omitted, one page is assumed. (See "Interrupting Printer Activity" earlier in this chapter for a definition of a page.)

D
The specified printer is to be backspaced to the beginning of the data set.

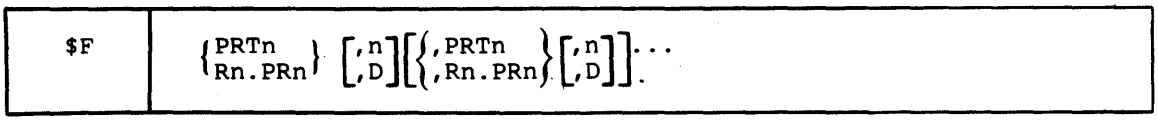
Example:

```
$b prt3,10,prt4
```

The output being printed on printer 3 will be backspaced 10 pages and the output on printer 4 will be backspaced one page.

Logically Forward-Spacing a Printer

Use the $F command to forward-space printer output a number of pages or to the end of the data set.



PRTn
The local device printing the output to be forward-spaced.

Rn.PRn
The remote device printing the output to be forward-spaced.

n
The number (1-9999) of pages the output is to be forward-spaced. This operand is optional only for the last printer specified. If it is omitted, one page is assumed. (See "Interrupting Printer Activity" earlier in this chapter for a definition of a page.)

D
The specified printer is to be forward-spaced to the end of the data set.

Example:

```
$f prt3,d,prt4
```

The output being printed on printer 3 will be forward-spaced to the end of the data set and the output on printer 4 will be forward-spaced one page.

Canceling Printer Output

Use the $C command to cancel the output currently being printed.

PRTn
The local device currently printing the output to be canceled.

Rn.PRn
The remote device currently printing the output to be canceled.

Note: *If the $C command is used following a $N command and the data set to be repeated has the FREE=CLOSE attribute, all copies of the data set will be lost.*

Example:

```
$c prt5
```

Printer 5 will stop printing the currently active data set and the output will be purged. Printer 5 will resume printing the next highest priority job available to it.

Halting Printing Activity

Use the $Z command to temporarily halt printer activity.

$Z	PRTn [,PRTn . . .]

PRTn
The local printer to be halted.

Example:

```
$z prt3,prt5
```

Printers 3 and 5 will stop printing immediately. Printing will be resumed at the same point when a $S PRT command is entered for the printers.

Stopping a Printer

Use the $P command to prevent a printer from selecting additional work after it completes the output it is currently processing.

$P	{PRTn / Rn.PRn} [,PRTn / ,Rn.PRn]. . .

PRTn
The local printer to be stopped, with a freeing of associated system resources, after completion of the current output.

Rn.PRn
The remote printer to be stopped after completion of the current output.

Example:

```
$p prt4,prt6,prt8,prt9
```

Printers 4, 6, 8, and 9 will become inactive after completing the output they are currently printing.

CONTROLLING PUNCHES

The following sections discuss the subsystem commands used to:

- Starting a punch
- Discontinuing punch activity
- Setting punch controls
- Assigning punch output classes
- Repeating punch output
- Interrupting punch activity
- Logically backspacing punch output
- Logically forward-spacing punch output
- Canceling punch output
- Halting punch activity
- Stopping a punch

Starting a Punch

Use the $S command to start a punch.

PUNn
The local punch to be started.

Rn.PUn
The remote punch to be started.

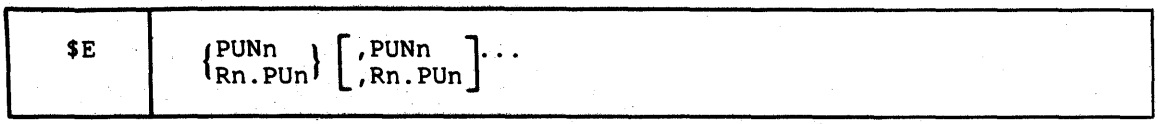
Example:

```
$s punl,rl.pul
```

Local punch 1 and punch 1 at remote station 1 will become active.

Discontinuing Punch Activity

Use the $E command to discontinue the current punching of a data set group. The data set group is returned to the appropriate punch queue, according to its job priority, for later processing.



PUNn
The local punch to be discontinued. The current activity on the specified punch is to be stopped and the output is to be returned to the output queue. When the data set group is again selected for processing, punching will resume at the beginning of the data set group.

Rn.PUn
The remote punch to be discontinued.

Example:

```
$e pun3
```

Punch 3 will stop punching and the output will be returned to the output queue in priority sequence. Punch 3 will then select the next available data set for processing.

Setting Punch Controls

Use the $T command to identify the forms a punch is using and to control the punching of job identification cards. **Note:** *This command is valid only when the specified device is inactive.* You should enter a $P PUNn command for the device and wait for it to become inactive before entering the $T command.

$T	{PUNn [,P={Y|N}] | Rn.PUn[,Z=n]} [,S={Y|N}] [,F=form][,F=AUTOM][,R=n]

PUNn
The local punch for which you are establishing controls.

Rn.PUn
The remote punch for which you are establishing controls.

Z=n
The specified compaction table (n) is to be used to decompact data for this remote punch.

P = Y
The specified local punch is to pause between data set groups. The device can be restarted by changing it from a non-ready state to a ready state or by entering a $S command to the device.

P = N
The specified local punch should not pause between data sets.

S = Y
The system is to provide identification cards between data set groups.

S = N
Identification cards are not to be provided between data set groups.

F = form
The form identifier, 1-4 alphameric characters, for the forms currently in the punch. The specified punch is to be put in operator-controlled mode.

F = AUTOM
The punch is to be put in automatic mode.

Note: *Automatic mode should not be used for punches at remote terminals from which JES2 commands cannot be entered while the device is active.*

R = n
The route code number (n) of the jobs this device is to process.

Example:

```
$t punl,f=1234,f=autom
```

Punch 1 will first process all output requiring form number 1234. If there are no data sets requiring form 1234, the punch will switch to automatic mode and will process data sets requiring other forms.

```
$t punl,f=4732
```

The punch will process only those data sets specifying form 4732.

Assigning Punch Output Classes

Use the $T command to assign the output classes a punch is to process.

$T	{PUNn / Rn.PUn},Q=classes

PUNn
The local punch to process the specified classes.

Rn.PUn
The remote punch to process the specified classes.

Q = classes
The output classes, A-Z or 0-9, specified in priority sequence, the punch is to process. The number of output classes you can specify is determined by your installation.

Example:

```
$t pun4,Q=AKZ
```

Punch 4 will first process all available class A output, then all available class K output, then all available class Z output. However, if punch 4 is in automatic mode, output requiring similar forms will be processed first, then work will be selected by class priority.

Repeating Punch Output

Use the $N command to repeat the punching of a data set group.

$N	{PUNn / Rn.PUn} [,PUNn / ,Rn.PUn]...

PUNn
The local device currently punching the output to be repeated. The data set group is placed back on the output queue to be punched again.

Rn.PUn
The remote device currently punching the output to be repeated. When you want to punch several copies of an output data set group, wait for the PUNCH REPEATED message to appear between the scheduling of each punching.

Example:

```
$n pun2
```

The data set being punched on punch 2 will be put back on the output queue to be repunched.

Interrupting Punch Activity

Use the $I command to interrupt the punching of a data set group.

PUNn
The local device to be interrupted. The current activity on the specified punch is terminated and the job is returned to the output queue. When the job is again selected for processing, the punch will resume at the last JES2 checkpoint.

Rn.PUn
The remote device to be interrupted.

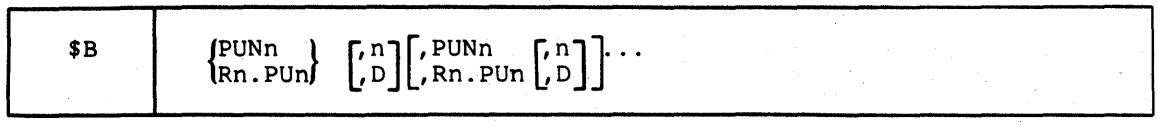
Example:

```
$i pun3
```

Punch 3 will stop punching and the data set group will be returned to the output queue.

Logically Backspacing Punch Output

Use the $B command to backspace the current punching of a data set group.



PUNn
The local punch to be backspaced.

Rn.PUn
The remote punch to be backspaced.

n
The number, 1-9999, of cards the output is to be backspaced. This operand is optional only for the last punch specified. If it is omitted, one card is assumed.

D
The specified punch is to be backspaced to the beginning of the data set.

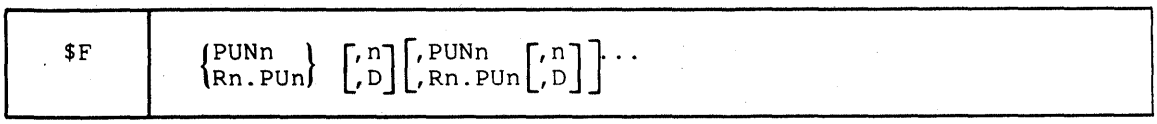
Example:

```
$b pun2,10
```

Punch 2 will be backspaced 10 cards.

Logically Forward-Spacing Punch Output

Use the $F command to forward-space the punching of a data set group.



PUNn
The local punch to be forward-spaced.

Rn.PUn
The remote punch to be forward-spaced.

n
The number, 1-9999, of cards the output is to be forward-spaced. This operand is optional only for the last device specified. If it is omitted, one card is assumed.

D
The specified punch is to be forward-spaced to the end of the data set.

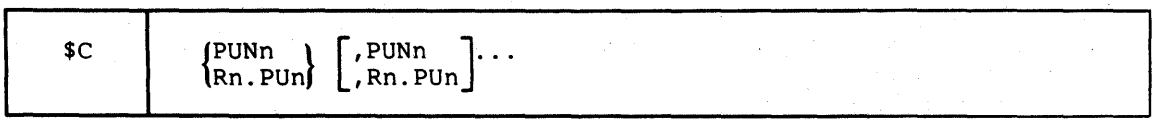
Example:

```
$f pun4,d,pun5
```

Punch 4 will be forward-spaced to the end of the data set and punch 5 will be forward-spaced one card.

Canceling Punch Output

Use the $C command to cancel the output currently being processed.



PUNn
The local device punching the output to be discontinued.

Rn.PUn
The remote device punching the output to be discontinued.

Example:

```
$c pun4
```

Punch 4 will stop punching and the output will be purged. Punch 4 will then begin punching the next available data set group.

Halting Punch Activity

Use the $Z command to interrupt punch activity.

$Z	PUNn [,PUNn . . .]

PUNn
The local device to be halted.

Example:

```
$z pun5,pun6
```

Punches 5 and 6 will immediately stop punching. Processing will be resumed at the same point when a $S PUN command is issued for these punches.

Stopping a Punch

Use the $P command to prevent a punch from selecting additional work after completing the data set group it is currently processing.

$P	{PUNn / Rn.PUn} [,PUNn / ,Rn.PUn]. . .

PUNn
The local punch to be stopped, with freeing of associated system resources, after completion of the current data set group.

Rn.PUn
The remote punch to be stopped after completion of the current data set group.

Example:

```
$p pun1
```

Punch 1 will be stopped after completing the current output.

CHAPTER 4. REMOTE JOB ENTRY

Through the remote job entry (RJE) feature, a user located in a remote area can use the capabilities of the central installation. The unit record devices at the remote station are logically operated by the subsystem as if they were local readers, printers, and punches. JES2 can simultaneously operate all local unit record devices, read jobs from several remote readers, and print and punch the results of processing at the remote site. JES2 supports both SNA (systems network architecture) remote workstations and BSC (binary synchronous communication) remote workstations. The SNA remote workstations are those that use the facilities of an SNA network, gaining access to JES2 through VTAM.

The following sections discuss the JES2 commands for controlling RJE lines for both SNA and BSC remote workstations. (Refer to *Operator's Library: OS/VS2 Remote Terminals (JES2)*, GC38-0225, for further information on this subject for BSC remote workstations.)

STARTING A LINE

Use the $S command to start remote job entry lines. Note that to start a line for an SNA remote workstation, you must know how the system programmer defined your RJE network (the terminals and lines) in the JES2 initialization procedure; that is, you must know which remote workstations can use which lines. Ask the system programmer for this information.

$S	LNEn[,LNEn]...

LNEn
The name assigned to the RJE line to be started.

Example:

```
$S lne1,lne2
```

Lines 1 and 2 will become active, if they are not already active.

STARTING THE JES2/VTAM INTERFACE

For SNA remote workstations, use the $S LGN1 command to start the JES2/VTAM interface. Issuing this command allows JES2 to begin processing connection requests from SNA remote workstations.

Before you issue $S LGN1, VTAM should be started. When VTAM is started, both the network controllers or communication links needed to establish a path to the remote workstation and the physical unit and logical unit associated with the workstation must be activated. This activation is accomplished by means of the VTAM VARY command or by an automatic activation specified in the VTAM network definition.

$S	LGN1

For information on starting VTAM and activating the network, refer to *Operator's Library: VTAM Network Operating Procedures*, GC27-0027.

ASSIGNING A PASSWORD TO A LINE

Use the $T command to assign or delete a password for a line. You must be certain to make a note of those passwords assigned, since there is no facility for displaying the passwords in effect. This command requires system authority.

$T	LNEn,P=[password]

LNEn
The line to be assigned the password.

P = password
The security password, 0-8 alphameric characters, used to reject unauthorized terminals attempting to use the line. If you omit the password, the previously assigned password is deleted.

Examples:

```
$t lne4,p=secret
```

The password for line 4 will be "secret."

```
$t lne4,p=
```

The password for line 4 will be deleted and no password will be required.

ASSIGNING A PASSWORD AND ID TO THE JES2/VTAM INTERFACE

Use the $T LGN1 command to assign a password and an application ID to the JES2/VTAM interface. You must be certain to make note of the password assigned because there is no facility for displaying the password in effect.

Note: *The password and application ID assigned to the JES2/VTAM interface must also be defined to VTAM.*

$T	LGN1,P=[password],A=applid

P = password
The security password, 1-8 alphameric characters, used to reject unauthorized terminals attempting to use the JES2/VTAM interface. If you omit the password, the previously assigned password is deleted.

A = applid
The name, 1-8 alphameric characters, assigned to JES2 to identify JES2 as an application program to VTAM.

Examples:

```
$t lgn1,p=user
```

The password for the JES2/VTAM interface will be "user"; the application ID will not change.

```
$t lgn1,p=,a=pgm1
```

The password for the JES2/VTAM interface will be deleted and no password will be required; the application ID will be "pgm1".

DIAGNOSING LINE PROBLEMS

Use the $T command when you suspect there is a problem on a line. For BSC lines this command causes the system to issue a diagnostic message on the master console every time a channel end is detected on the specified line. For SNA lines this command causes the system to issue a diagnostic message on the master console for each event detected on the specified line. This command requires system authority and should be used only at the direction of your system programmer.

$T	LNEn,E={Y / N}

LNEn
The line to be affected.

E = Y
The system is to monitor the specified line for channel end completions or SNA events.

E = N
The system is to discontinue the monitoring of channel end completions or SNA events.

Example:

```
$T lne5,e=y
```

A diagnostic message will be issued for each channel end completion or SNA event detected on line 5.

DIAGNOSING SNA PROBLEMS

Use the $T command to record SNA events on the master console as an aid in diagnosing SNA problems.

$T	LGN1,E={Y / N}

LGN1
The JES2/VTAM interface affected.

E = Y
The system is to monitor the JES2/VTAM interface and record all SNA events.

E = N
The system is to discontinue monitoring SNA events.

Note: *When the JES2/VTAM interface is monitored, activity on all SNA lines is monitored.*

Example:

```
$t lgnl,e=y
```

A diagnostic message will be issued for each SNA event on both the JES2/VTAM interface and any SNA line.

COMMUNICATING WITH JES2 REMOTE TERMINALS

Use the $D command to send a message to a remote terminal operator.

$D	MRn[-n],'message'

MRn-Rn
The number or range of numbers (0-255) identifying the remote terminals to receive the message.

Note: *Specifying R0 indicates any local device with normal routing.*

message
The text of the message to be sent to the specified terminals. If the apostrophes are not included, all blanks in the message will be removed.

Example:

```
$d mrl-255,'Jobs remaining after 5 PM will be purged.'
```

The above message will be sent to all remote terminal operators.

RESTARTING LINE ACTIVITY

Use the $E command to restart the current activity on a line.

$E	LNEn[,LNEn]...

LNEn
The line to be restarted. Any input currently being transmitted over the specified line will immediately stop and the partial input will be purged. Any output being transmitted over the line will be placed on the output queue. When the job is again selected for printing, the printer will be backspaced one page before resuming processing. When the job is again selected for punching, punching resumes at the last JES2 checkpoint.

The JES2 remote workstation currently signed onto the restarted line is disconnected. If the line was in the ACTIVE status, new JES2 remote workstations can sign onto the line. If the line was in the DRAINING status (for example, after $P LNEn), it becomes drained and unusable for JES2 I/O until the operator starts it again.

Example:

```
$E lne2
```

Line 2 will immediately terminate all activity.

RESTARTING THE JES2/VTAM INTERFACE

Use the $E LGN1 command to restart the JES2/VTAM interface on a logical line. When you issue this command, data currently being transmitted immediately stops, and the partial input is purged. Any output being transmitted is placed on the output queue. When data is transmitted again, the output is transmitted from the point where it was stopped.

$E	LGN1

SETTING A TERMINAL TO AUTOMATICALLY CONNECT

Use the $T command to set the specified remote terminal (RMTnnn) to the automatic connect mode. The terminal will automatically be connected whenever output is to be printed or punched at that terminal. To be successful, a JES2 line must be available and started (use the $S command to start a line) and the maximum number of sessions specified at initialization (using &MAXSESS) must not be exceeded.

$T	RMTnnn [,A={Y|N}][,D=nnnn]

RMTnnn
The 1- to 3-digit remote terminal identifier corresponding to the logical unit name as defined by the RMTnnn initialization parameter. The correct LUNAME= subparameter must have been specified for the RMTnnn parameter for the automatic connection to work.

A = Y
Put automatic connection into effect.

A = N
Turn off automatic connection.

D = nnnn
The specified disconnect time interval (in seconds) after which an automatic disconnect will occur if there has been no session activity. The valid range is 0 to 8160 (rounded up to multiples of 32), where zero means an infinite time interval.

Example:

```
$t rmtl25,a=y,d=96
```

Remote terminal 125 is put in the automatic connection mode. The terminal will automatically disconnect after 96 seconds if no session activity has taken place.

AUTOMATICALLY CONNECTING A REMOTE TERMINAL

Use the $S command to automatically log onto the specified (RMTnnn) remote terminal. The logon will take place depending upon when system resources (e.g., lines) become available. Refer to *OS/VS2 System Programming Library: JES2* for further information.

$S	RMTnnn

RMTnnn
The 1- to 3-digit remote terminal identifier corresponding to the logical unit name as defined by the RMTnnn parameter at initialization. The correct LUNAME= subparameter must have been specified for the RMTnnn parameter for the automatic logon to work.

Example:

```
$s rmtl25
```

The system will automatically connect remote terminal 125.

DISCONNECTING A LINE

Use the $T command to disconnect a line. The $T command differs from the $E command in that, when you issue $T, the current input on the line is not purged, and a signoff is transmitted to the workstation.

You can use the $T command to restart a remote job entry line immediately or to restart the line when all data set communications over the line cease. When the line is restarted immediately, a signoff record is sent to a MULTI-LEAVING workstation; thus, the workstation can expect the shutdown of the line. When the line is restarted after communications cease, the restarting occurs as though the remote operator had signed off.

$T	LNEn [,D={I|Q}]

LNEn
The line that is affected.

D = I or Q
Specifies whether the line is to be disconnected immediately (I) or after the data set transmission quiesces (Q).

STOPPING THE JES2/VTAM INTERFACE

For SNA remote workstations, use the $P LGN1 command to stop the JES2/VTAM interface. When you issue this command, all logon requests are rejected. Sessions that are already established are allowed to finish normally.

$P	LGN1

STOPPING A LINE

Use the $P command to stop a remote job entry line.

$P	LNEn[,LNEn]...

LNEn
The RJE line to be stopped. The specified line will not start any new activity and will stop upon completion of its current activity.

Example:

```
$p lne2
```

Line 2 will complete its current activity and become inactive.

TERMINATING A REMOTE TERMINAL CONNECTION

Use the $P command to terminate the connection of a specific remote terminal. If the remote terminal is already connected when the command is issued, it will finish all printing and punching already in progress and then disconnect. If the remote terminal is not connected, but the operator has requested its connection via the $S RMTnnn command, the connection request will be canceled.

$P	RMTnnn

RMTnnn
The 1- to 3-digit remote terminal identifier as defined by the RMTnnn parameter at initialization.

Example:

```
$p rmt 121
```

The system will terminate remote terminal 121.

CHAPTER 5. CONTROLLING THE SYSTEM

You must use subsystem commands to display system information and control the various subsystem functions. The following sections discuss the required commands and operands for each function you want to perform.

CHANGING A SYSTEM'S OPERATIONAL MODE

Use the $T command to set or reset independent mode status of a system within a multi-access spool configuration so that it may operate independent of the configuration.

$T	SYS,IND= {Y / N}

SYS
The system is to set or reset independent mode status for the system to which the entering console is attached.

IND = Y or N
Set or reset this system to normal operational mode within the multi-access spool configuration.

Example:

```
$T SYS,IND=Y
```

The system to which the entering console is attached will be placed in independent mode.

CONTROLLING CONSOLE MESSAGE OUTPUT AND ROUTING

During normal job processing, JES2 offers you the following additional output control.

JES2 messages are assigned levels of importance and normally JES2 displays all messages to the console as determined by the system or JES2 code of the message (see Figure 5-1). JES2 can be caused to selectively omit displaying nonessential messages by specifying the importance level of the messages you want displayed with the $T command.

Messages displayed on operating system consoles (not the hardcopy log) normally show only the message text and flag portion of a message. You may cause hardcopy consoles to display job identification and time stamps in addition to the normal display information through the use of commands discussed in this section. Note that JES2 remote workstation consoles normally display job identification and time stamp information but may be altered in a manner similar to the system consoles.

System Code	JES2 Codes	Definition
none	LOG	Hardcopy log
1	MAIN	Master console action
2	MAIN	Master console information
3	TAPE	Tape pool
4	TAPE	Direct access pool
5	TAPE	Tape library
6	TAPE	Disk library
7	UR	Unit record pool
8	TP	Teleprocessing control
9		System security
10	ERROR	System error/maintenance
11		Programmer information
12		Emulators
13		Reserved for customer use
14		Reserved for customer use
15		Reserved for customer use
16		Reserved for future expansion

Figure 5-1. Message Routing Codes

Interpreting Hardcopy Log Messages

The hardcopy log provides a permanent record of system activities including:

- Operator commands.
- Command responses.
- System requests.
- Operator responses to system requests.
- Most messages occurring on active consoles.

Figures 5-2 and 5-3 give the format for the single-line and multi-line messages, respectively.

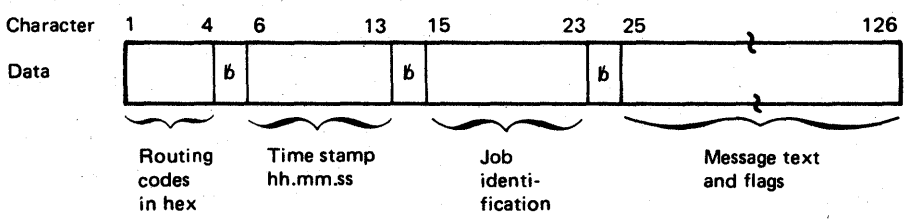


Figure 5-2. Single-Line Hardcopy Log Message Format

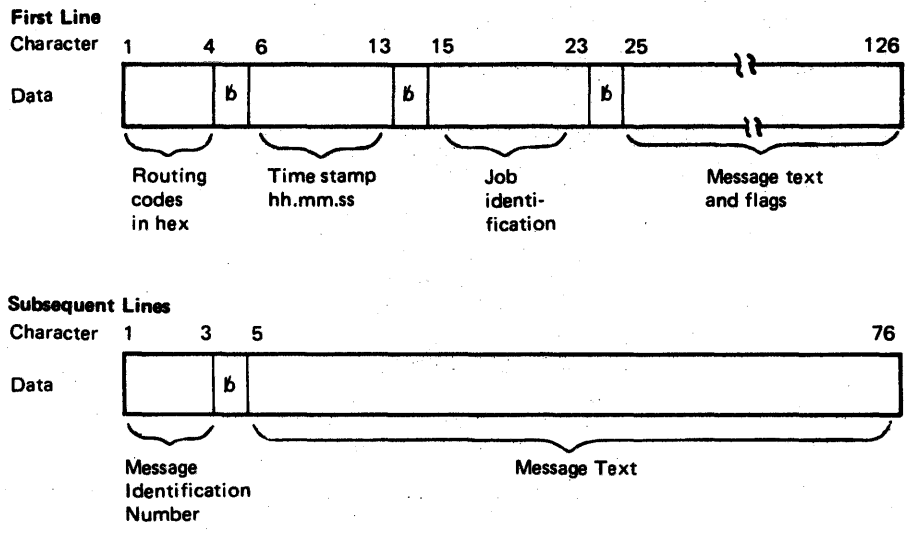


Figure 5-3. Multi-Line Hardcopy Log Message Format

Altering System Message Output

Use the $T command to specify the amount of information to be displayed in system and JES2 remote operator console messages for a specified console. Unless altered by the $T command, system consoles will receive only the message text, while remote consoles will receive the time stamp and job identification number along with all system messages. This command cannot be used to alter message information for SNA remote consoles.

$T	{OSCn / Rn.CON} [,D={T / J / M}]

OSCn
The system console for which you want to alter message information. If you are uncertain of the console identification number, enter the DISPLAY CONSOLES command.

Rn.CON
The remote console for which you want to alter message information.

D = T
The system is to display the time and job identification number on all system messages.

D = J
The system is to display the job identification number on all system messages.

D = M
The system is to display only the message text on all system messages.

Example:

```
$t oscl2,d=j
```

The system will display the job identification number on all system messages displayed on console 12.

JES2 Message Routing

Use the $T command to control the volume of JES2 message output to a console.

$T	C,importance-level,routecode[,routecode]...

C

The message routing defaults for the specified message levels are to be changed.

importance-level

A number from 0 to 15. This operand indicates that only messages of the specified route code with an importance level above this number are to be displayed on the console. Messages for the specified route codes below or equal to this importance level will not be displayed. Messages of other route codes will not be affected. Only messages of the specified route codes will not be displayed. If multiple route codes exist for a message, all of them must be listed in the $T command to prevent the message from being displayed at any console. If 0 is specified, all messages of the specified route code will be displayed. A value of 15 eliminates all JES2 messages below level 8 for the specified route code. The subsystem importance message levels are:

1 – non-essential messages
3 – normal messages
5 – messages requiring delayed operator action
7 – essential messages
8 – messages requiring immediate operator action
(Refer to the *OS/VS Message Library: VS2 System Messages*, GC38-1002, for the level of each individual message.)

routecode

The subsystem message routing code for which you want to change the default message routing. See Figure 5-1 for a list of the subsystem message routing codes.

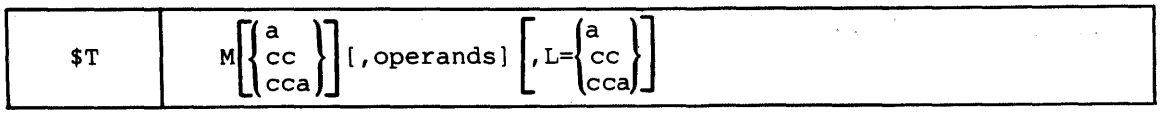
Example:

```
$t c,4,main,log
```

Only those main operator and log console messages with a message level of five and above are to be displayed.

Routing JES2 Status Information

Use the JES2 $T command to establish default routing values for certain $D operands. This command can be entered only through a console with system command authority.



M
The output produced by the specified $D command(s) is to be routed to an alternate console.

a, cc, or cca
The area (a), console identification (cc), or both (cca) of the active MCS console at which the specified output is to appear. If only a is specified, the output will appear in the indicated area of the default console. If a is omitted, area z is assumed.

operands
The $D operands to be affected. The output of the specified operands is to be directed to an alternate console rather than the console entering or specifying the $TM command. The valid $D operands and their definitions are:

Operand	Command Output Routed
A	$D A
F	$D F
I	$D I
J	$D J, $D S, $D T, $D 'jobname'
N	$D N
O	$D O
Q	$D Q
U	$D U

If operands is omitted, you will receive a list of that console's settings for all $D commands.

L = a, cc, or cca
The area (a), console identifier (cc), or both (cca) of the active MCS console to which the display caused by the $T M command is to be directed. This operand is also used to specify the console entering the $D command to be rerouted, if it is not the entry console. For example, you want to direct the output of $DA commands entered by console 3 to area A of console 2. Console 3 cannot enter the command. Therefore, an operator from an authorized console would enter $TM2A,A,L=3. Note that only the output from the entry console or the console specified in the $TM command will be rerouted. Likewise, only the output from the specified $D operand will be rerouted. For example, if the operator at console 1, the master console, enters $TM2A,AQN he instructs that every time JES2 receives a $D A, $D Q, or $D N command from console 1, the output be directed to area A of console 2. This command from console 1 does not affect entries of $D F, $D I, $D J, or $D U. Also, it does not affect $D A, $D Q, or $D N output of commands entered on any other console, including console 2.

Example:

```
$tm2b,fqn
```

The output from $D F, $D Q, and $D N commands is to be rerouted to area B of console 2.

AUTOMATIC COMMAND PROCESSING

The automatic command processing facility allows an installation to enter a JES2 command or a series of JES2 commands through a system console or a local reader to be executed at a specified time or at a periodic interval. For example, your installation could set up a daily procedure consisting of a set of automatic commands to start, stop, and set initiators, start and stop RJE lines, and release scheduled jobs run on a daily basis.

The console authority required to display, modify, or delete automatic command entries is determined by the console of entry. For example, a command entry submitted by a console with system authority can be displayed, modified, and deleted only by a console with system authority, regardless of the authority required by the command specified in the entry.

Starting Automatic Command Processing

Use the $S command to start automatic command processing. This command requires system authority.

$S	A

A
The system is to start processing any commands entered for automatic processing via the $S A command.

Displaying, Specifying, and Respecifying Automatic Commands

Use the $T command to:

- Display the automatic commands currently in effect.
- Specify a new command or series of commands for automatic processing.
- Modify an existing automatic command entry. The maximum length of an automatic command entry is 80 characters.

$T	A[cccc][{,I=ssss / ,T=hh.mm},'command[;command]...'][,L={a / cc / cca}]

A
The system is to include or modify the specified automatic command entry. If you enter only $T A, all automatic command entries you are authorized to see will be displayed. If you enter only $T Acccc, the specified command entry will be displayed.

cccc
The four-character identifier assigned or to be assigned to the automatic command entry. If an automatic command entry with the specified identifier already exists, the entry will be modified. If there is no entry with the specified identifier, a new command entry will be generated. If you omit this operand and this is not a display-only request, the system will assign an identifier for you.

I = ssss
The interval, in seconds, at which the command or commands are to be repeated. Thirty seconds is the minimum value. Leading zeros may be omitted.

T = hh.mm
The time of day, in hours and minutes from the last midnight, the specified command or commands are to be issued. The maximum value is 99.59 (99 hours, 59 minutes). A leading zero can be omitted.

command
The JES2 command(s) to be automatically issued. The response messages associated with these commands can be routed by specifying the L = cca operand. Apostrophes within the command text must be doubled.

Example:

```
$ta,i=30,'$d''joba'''
```

Note: *The validity of, and the authority for, these commands are verified at command execution time, not when the $T command is entered.*

L = a, cc, or cca
The area (a), console identifier (cc), or both (cca) of the active MCS console at which the response messages are to appear. If this operand is omitted, the console of entry is assumed. If the automatic commands are entered through a card or internal reader, console 1 is assumed.

Examples:

```
$t a,i=30,'$da,l=la'
```

The system will issue a $DA command every 30 seconds with the information displayed in area A of console 1.

```
$ta6,t=11.15,'$slne4',L=12
```

The system will create a new automatic command entry, number 6, or modify the existing entry 6, which will automatically start line 4 at 11:15 a.m. The response to this command will be directed to console 12.

Deleting an Automatic Command Entry

Use the $T command to delete an automatic command entry.

$T	A[cccc],CANCEL

A
An automatic command entry is to be deleted.

cccc
The four-character identifier of the command entry to be deleted.

CANCEL
The specified command entry is to be deleted.

Example:

```
$ta4,cancel
```

Automatic command entry 4 will be deleted.

Deleting All Automatic Commands

Use the $C command to cancel all automatic command processing and delete all command entries. This command requires system authority.

$C	A

A
The system is to cancel all automatic command entries.

Halting Automatic Command Processing

Use the $Z command to halt automatic command processing. The system will automatically issue a $Z A command when:

- A backlog exists which prevents JES2 from issuing an automatic command for five minutes.
- You alter the time forward by more than 24 hours or backwards past midnight.
- Automatic command processing is left dormant for more than 24 hours.

To restart automatic command processing, enter the $S A command. This command requires system authority.

$Z	A

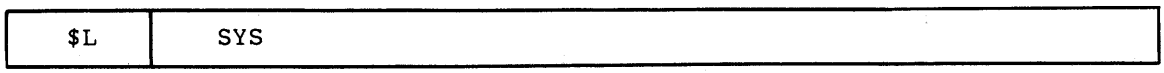
A
The system will suspend all automatic command processing.

DISPLAYING SYSTEM AND JES2 INFORMATION

In order to run the system efficiently, you must be aware of the system status at all times. The following describes the subsystem commands for displaying information.

Listing the Current System Identifier Status

Use the $L command to list each system in a multi-access spool configuration and its status.



SYS
The system is to display the four-character alphameric identifier for each system in a multi-access spool configuration and indicate whether it is active, inactive, restarting, or running in independent mode.

Example:

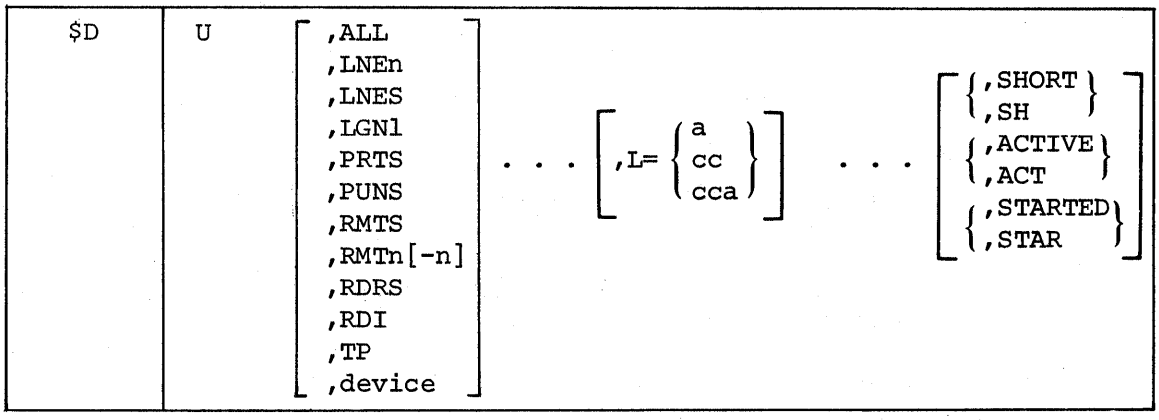
```
$L SYS
```

The system will list all system identifiers for a multi-access spool configuration along with the status of each system.

Displaying the Status of JES2-Controlled Devices

Use the $D command to display the status of JES2-controlled non-direct access devices. This command allows you to display either the status of all devices or detailed information about specific devices. The detailed information consists of:

- Status.
- Job name, if the device is processing.
- Job number, if the device is processing.
- Job or output class assigned to the device.
- Setup characteristics, if applicable.



U
When used with no device operands, specifies the status of all, or those specified, local JES2-controlled devices is to be displayed.

ALL
The system is to display detailed information about all local JES2-controlled devices, active remotes, and internal readers.

LNEn
The system is to display detailed information about the line and any remote terminals connected to the specified line.

LNES
The system is to display detailed information about all lines and any active remotes.

LGN1
The system is to display detailed information about the JES2/VTAM interface.

PRTS
The system is to display detailed information about all local printers.

PUNS
The system is to display detailed information about all local punches.

RMTS
The system is to display detailed information about all active remote terminals and any lines to which a remote is connected.

RMTn[-n]
The system is to display detailed information about the specified remote terminal(s), and, providing it is active, the line to which it is attached.

RDRS
The system is to display detailed information about all local readers.

RDI
The system is to display detailed information about all internal readers.

TP
The system is to display information about all lines and the status of the JES2/VTAM interface.

devices
The system is to display detailed information about the specified devices. You can specify any combination of the following devices:

Device	Definition
PRTn	a local printer
PUNn	a local punch
RDRn	a local reader
Rn.PRn	a printer connected to remote terminal n
Rn.PUn	a punch connected to remote terminal n
Rn.RDn	a reader connected to remote terminal n

L = a, cc, or cca

The area (a), console (cc), or both (cca) of the active MCS console at which the requested display is to appear. Note that if you specify lines, remotes, or the JES2/VTAM interface, the system is to display information not only about the lines or remotes, but also about the location and status of the session(s) on the logical (SNA) line(s).

The following modifier operands may be used in conjunction with any other operand. Because the modifier operands have the effect of limiting the scope of information displayed (for example, only active device information is displayed if ACTIVE is specified), they may be used in any combination. For example, if you wanted only the short form of information displayed about devices that were started and active, all three modifier operands would be specified.

SHORT or SH

The system is to display limited status information (device name, unit assignment, and status) for devices or lines (as specified by the device operands).

ACTIVE or ACT

The system is to display the status of devices currently performing work and the status of lines currently connected.

STARTED or STAR

The system is to display information only for started devices or lines (as specified by the device operands).

Examples:

```
$DU,LNE4
```

The system will display detailed information about all remote terminals connected to line 4.

```
$du,prts,L=3
```

The system will display detailed information about all local printers on console 3.

```
$DU,R1.PR1,PRT4,PUN4
```

The system will display detailed information about printer 1 connected to remote terminal 1, local printer 4, and local punch 4.

```
$DU R1.PR1,PRT4,PUN4,SHORT,ACTIVE
```

The system will display the short-form information about the specified devices only if the devices are currently performing work.

Displaying Subsystem Operator Requests

Use the $D command to display a list of JES2 operator requests that have not been fulfilled.

O

The system is to display a list of unanswered JES2 requests.

L = a, cc, or cca

The area (a), console identifier (cc) or both (cca) of the active MCS console at which the system is to display the requested information.

Example:

```
$d o,l=12a
```

The system is to display a list of subsystem requests on area A of console 12.

CHAPTER 6. CONTROLLING JOBS

The following is a discussion of the commands you use to control the starting and stopping of jobs and the flow of work through the system via JES2 commands.

SETTING THE JES2 INTERNAL JOB NUMBERS

Use the $T command to set or reset the base JES2 job numbers.

Jn
The base number, from 1 to 9999, for automatic batch job number assignment.

Sn
The base number, from 1 to 9999, for automatic system task number assignment.

Tn
The base number, from 1 to 9999, for automatic time sharing user number assignment.

The next job assigned a job number will be assigned the n value unless there is currently a job in the system with that value. If there is a job in the system with a job number of n, the new job will be assigned the first number beyond n that is not assigned.

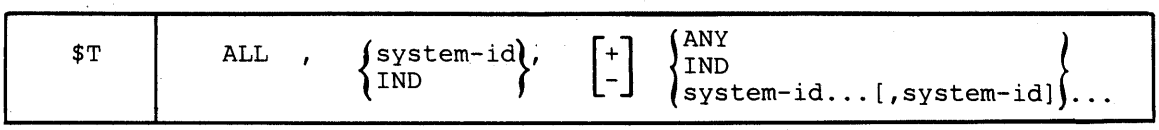
Example:

```
$t J1
```

The next job in the system will be assigned job number 1. If there is currently a job 1 in the system, but there is not a job 2, the job will be assigned job number 2.

CHANGING JES2 SYSTEM AFFINITY FOR WORK

Use the $T command to route all of a named system's jobs (or all jobs that are independently routed) to the specified system in the multi-access spool configuration.



ALL
Change all jobs whose affinity include the specified system.

system-id
The alphameric name of a system in the multi-access spool configuration whose jobs' affinity is to be changed.

IND
All jobs with independent mode routines are to be changed regardless of system affinity.

+ or –
The subsequent ANY, IND or system-ids are to be added to (+) or deleted from (–) the jobs' current affinity. If neither + nor – is specified, the routings of the jobs are set explicitly to specified systems. + or – *must* be used if IND appears by itself.

ANY, IND, or system-id...,system-id
ANY indicates that jobs are to have affinity to any system in the multi-access spool configuration. (A + or – means nothing when used with ANY.) IND indicates that all jobs that have the indicated system among their system affinities be placed in (+), removed from (–), or, if neither + nor – is specified, explicitly set to the dependent mode of selection. System-id indicates the four-character alphameric identifier of the system in the multi-access spool configuration that is to be added to (+), deleted from (–), or explicitly set (neither + nor –) the jobs' current affinity.

Examples:

```
$T ALL,H155,-H155
```

All jobs that have H155 among their system affinities will have that system affinity removed from their total system affinity.

```
$T ALL,H168,+IND
```

All jobs that have H168 among their system affinities will be placed in the independent mode of selection.

```
$T ALL,H168,ANY
```

All jobs that have H168 among their system affinities will have their system affinities changed to ANY.

CONTROLLING JOB QUEUES

Jobs being processed or waiting to be processed are kept on a job queue in priority sequence. The following sections discuss the subsystem commands that control these job queues.

Holding All Jobs

Use the $H command to hold all jobs currently in a system. In a multi-access spool configuration you, additionally, may:

- Hold all jobs associated with a specific system within the configuration (those jobs that have the specific system as an affinity for the job).
- Hold all jobs within the entire multi-access spool configuration.
- Hold all jobs that have the system through which the command is entered as an affinity.

A
All jobs currently in the system will be placed in hold status. These jobs can be released by a $A command. Any new jobs read into the system after this command is entered will not be held.

system-id or ALL
System-id is the four-character alphameric identifier of a system in the multi-access spool configuration. All jobs whose total system routings include this system will be held. ALL indicates that all jobs are to be placed in the hold status regardless of the jobs' system affinity. If neither is specified, the system to which the entering console is attached is assumed.

Example:

```
$h a
```

All jobs currently in the system will be held. If the system is a multi-access spool configuration, all jobs that have the system through which the command is entered as an affinity will be held.

Releasing All Jobs

Use the $A command to release all jobs in the system whose system affinities include the affinity of the system to which the entering console is attached, in the specified system, or in all active systems which are in the multi-access spool configuration. The $A command only releases jobs which were held by a $H A command.

A
All jobs held by the $H A command will be allowed to process.

system-id or ALL
System-id is the four-character alphameric system identifier of a system in a multi-access spool configuration. All jobs that have the specified system affinity among their total system routing will be released. ALL indicates that all jobs, regardless of their system affinities will be released. If neither is specified, the system to which the entering console is attached is assumed.

Example:

```
$a a
```

All held jobs originally held by a $H A command that are currently in the system will be released. If the system is a multi-access spool configuration, all jobs originally held by a $H A command that have the system through which the command is entered as an affinity will be released.

Holding Job Queues

Use the $H command to keep jobs in specified job queues or all job queues from being executed.

`$H`	`Q[,classes]`

Q
All job queues or the specified job queues are to be held. While jobs currently in the system and those jobs entering the system are not considered held, they will not be processed until the job queue is released.

classes
The one-character job class (A-Z or 0-9) for each job queue to be held.

Example:

```
$h q,df8
```

Job queues D, F, and 8 will be held.

Releasing Job Queues

Use the $A command to release job queues held by a $H Q command.

`$A`	`Q[,classes]`

Q
All job queues or the specified job queues are to be released and all jobs in that queue will be allowed to process.

classes
The one-character job class (A-Z or 0-9) for each job queue to be released.

Example:

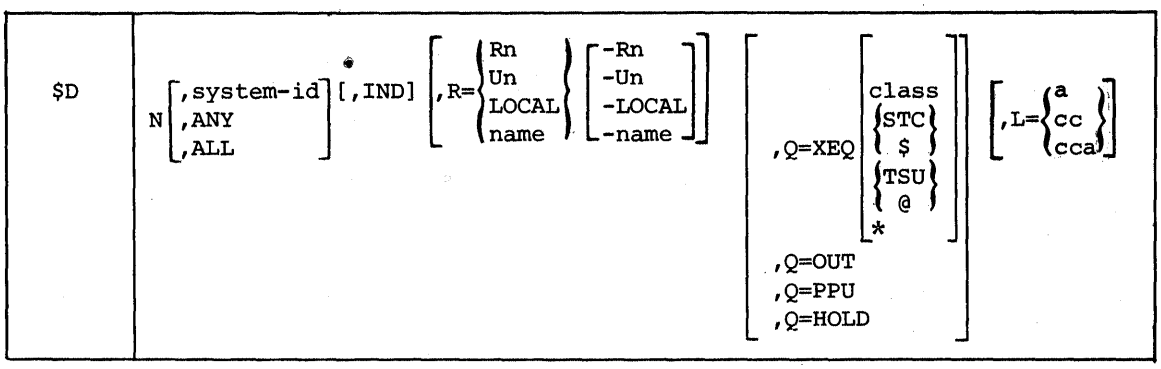
```
$a q,df8
```

Job queues D, F, and 8 will be released and the jobs in these queues will be allowed to process.

Displaying Job Queue Information

Use the $D command to display the following job information:

- Job number.
- Job name.
- Job status.
- Job class.
- Job priority.
- Job's system affinities.
- Percentage of spool disk utilization.



N

The system is to display the above job information.

system-id

The system is to display the above job information for all jobs whose queued system affinity includes the specified four-character system identifier.

ANY

The system is to display the above job information for all jobs whose queued system affinity is for ANY system.

ALL

The system is to display the above job information for all systems that are defined in the multi-access spool configuration. If a job is queued for more than one system, it will only be displayed once.

IND

The system is to display the above job information for all jobs whose system routing is for systems operating in the independent mode of operation.

R = Rn,Un,LOCAL, or name

The destination or destination range (low to high) for which the above job information is to be displayed. (Rn is a specific remote device; Un, a local device with special routing; LOCAL, all local devices with normal routing; and name, an installation-defined destination.) You can specify a single terminal, such as terminal R5, or a range of terminals, such as R14-R53. The range may include any combination of the parameters specified (Rn, Un, LOCAL, or name) as long as the range sequence is Un (to LOCAL) to Rn. (LOCAL is equivalent to R0.) The reverse sequence (Rn to Un) is not valid. If Rn-Un is specified, JES2 recognizes only the last value.

If Rn-Rn is specified, the display is only of jobs routed to those stations. If omitted, and the console is a remote console, the jobs routed to the remote station to which the console is attached are displayed.

Q = XEQ

The above information is to be displayed for jobs waiting for execution and/or conversion.

class

Specifies the class of execution (A-Z or 0-9) for which the display is desired.

STC or $

STC specifies the display is for system tasks being prepared for execution; this operand can be abbreviated $.

TSU or @

TSU specifies the display is for time sharing users waiting for execution; this operand can be abbreviated @.

*

Specifies the display is for jobs waiting for conversion.

Q = OUT

The above job information is to be displayed for all jobs waiting for output processing.

Q = PPU

The above information is to be displayed for jobs waiting for print/punch processing. When job status is displayed for a job awaiting print/punch processing, only the default print and punch routings are listed. This does not necessarily mean the job has any output data sets awaiting print and/or punch for the default destination; there may be one or more specially routed data sets awaiting output. The $DN display does not provide this type of job output information.

Q = HOLD

The above information is to be displayed for jobs waiting for any activity and in hold status.

L = a, cc, or cca

The area (a), console identifier (cc), or both (cca) of the active MCS console at which the requested information is to be displayed.

Note: ***$D N is a command whose first two operands are positional in nature. That is, they must be entered in the indicated order.***

If only $DN is entered, you will get job information for all jobs whose queued system routing includes the system from which the command was entered. The job information will be displayed for jobs in the following categories:

- All jobs queued for conversion.
- All jobs queued for execution (every class and STCs and TSUs as well).

- All jobs queued for the output processor.
- All jobs queued for print/punch.

Examples:

`$D n,H168,R=LOCAL-R2,Q=XEQ*`

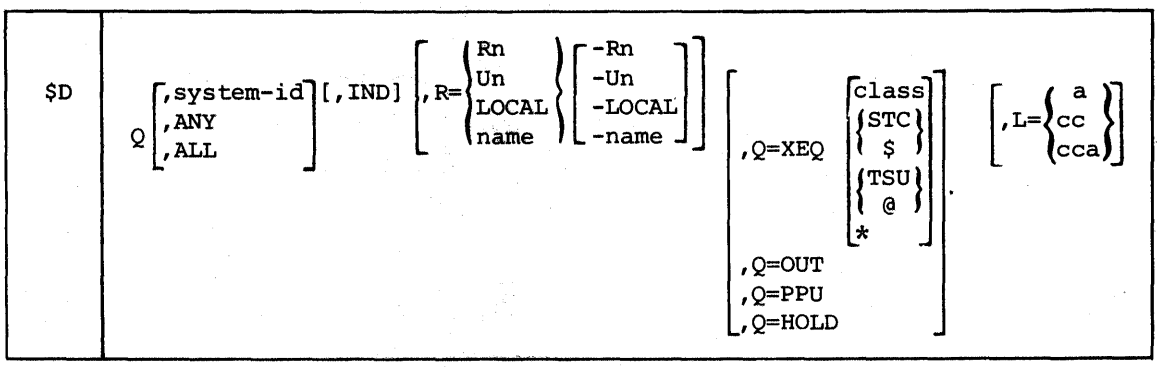
The system will display job information for jobs waiting for conversion whose queued system affinity includes the system known as H168 (the system whose system-id is H168). This job information will be displayed only for jobs whose output routings are either local, remote 1, or remote 2 devices (assuming default system initialization parameters for JES2).

`$D n,ANY`

The system will display job information for all jobs queued for any phase of JES2 processing whose system affinity is for *any* system in the multi-access spool configuration.

Displaying the Number of Jobs Queued

Use the $D command to display the number of jobs in a particular queue and the percent of spool disk utilization.



Q

The system is to display the number of jobs on the specified job queue.

system-id

The system is to display the number of jobs awaiting the specified stages of activity. The jobs will be *included* in the count only if their queued system affinity *includes* the specified four-character system identifier.

ANY

The system is to display the number of jobs awaiting the specified stages of activity. The jobs will be included in the counts only if their queued system affinity routing is for any system in the multi-access spool configuration.

ALL

The system is to display the number of jobs awaiting the specified stages of activity. The counts will be given for each system in the multi-access spool configuration. A job will be counted multiple times if its queued system routing includes multiple systems.

IND
The system is to display the number of jobs awaiting the specified stages of activity. The jobs will be included in the counts only if they are to execute on the systems that are to be operating in independent mode.

R = Rn,Un,LOCAL, or name
The destination or destination range (low to high) for which the number of jobs is to be displayed. (Rn indicates a specific remote device; Un, a local device with special routing; LOCAL, all local devices with normal routing; and name, a destination with an installation-defined name.) You can specify a single terminal, such as remote terminal R24, or a range of terminals, such as R24-R83. The range may include any combination of the parameters specified (Rn, Un, LOCAL, or name) as long as the range sequence is Un (to LOCAL) to Rn. (LOCAL is equivalent to R0.) The reverse sequence (Rn to Un) is not valid; if Rn-Un is specified, JES2 recognizes only the last value.

If Rn-Rn is specified, the display is only of jobs routed to those stations. If omitted, and the console is a remote console, the jobs routed to the remote station to which the console is attached are displayed.

Q = XEQ
The number of jobs waiting execution is to be displayed.

class
The class of execution (A-Z and 0-9) that is to be displayed.

STC or $
STC specifies the number of system tasks queued for execution is to be displayed; this operand can be abbreviated $.

TSU or @
TSU specifies the number of time sharing users queued for execution is to be displayed; this operand can be abbreviated @.

*
The number of jobs queued for conversion is to be displayed.

Q = OUT
The number of jobs waiting output processing is to be displayed.

Q = PPU
The number of jobs waiting print/punch is to be displayed.

Q = HOLD
The above information is to be displayed for jobs waiting for any activity and in the hold status.

L = a, cc, or cca
The area (a), console identifier (cc), or both (cca) of the active MCS console at which the requested information is to be displayed.

The operands of the $DQ command are sensitive to order but not to position. When an operand is omitted, its position is not held by a comma as is traditional with positional operands; operands chosen appear in the order of their definition in the command prototype, separated by commas. For example:

- $D Q
- $D Q,H168
- $D Q,Q=PPU
- $D Q,R=LOCAL-R2
- $D Q,H168,R=LOCAL-R2,Q=PPU

Example:

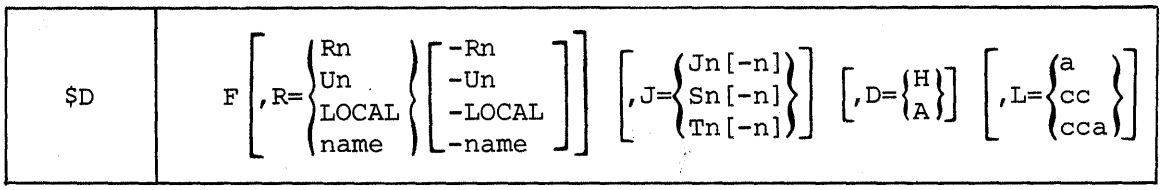
```
$D Q,H168,R=R1-R2,Q=XEQA
```

The number of jobs waiting execution in class A whose system affinities include H168 and with output routed to remote devices 1 and 2 will be displayed.

Displaying the Job Output Forms Queue

Use the $D command to display the following information about data set groups queued for output:

- Route code.
- Forms required.
- Carriage required.
- Train required.
- Forms overlay frame, if required.
- Bursting, if required.
- Number of jobs queued for each output class.



F

The system is to display the number of data sets queued for output.

R=Rn,Un,LOCAL, or name

The destination or destination range (low to high) for which job output information is to be displayed. (Rn indicates a specific remote device; Un, a local device with special routing; LOCAL, all local devices with normal routing; and name, a destination with an installation-defined name.) You can specify a single location, such as terminal R5, or a range of terminals, such as R31-R76. The range may include any combination of the parameters specified (Rn, Un, LOCAL, or name) as long as the range sequence is Un (to LOCAL) to Rn. (LOCAL is equivalent to R0.) The reverse sequence (Rn to Un) is not valid; if Rn-Un is specified, JES2 recognizes only the last value.

If you omit this operand, the system displays the information concerning output queued for the system or remote terminal at which the command was entered.

J = Jn-n
The jobs for which job output information is to be displayed. You can specify a single job number, such as J3, or a range of jobs, such as J4-17. However, the second value must be equal to or greater than the first.

J = Sn-n
The system task or range of system tasks for which the output information is to be displayed.

J = Tn-n
The time sharing user or range of time sharing users for which output information is to be displayed.

D = H
Job information for jobs in hold status is to be displayed.

D = A
Job output information for jobs both in hold and release status is to be displayed.

If H and A are both omitted, job output information for jobs in release status only will be displayed.

L = a, cc, or cca
The area (a), console identifier (cc), or both (cca) of the active MCS console at which the requested job output information is to be displayed.

Example:

```
$df,r=r1-r12
```

Job output information for released jobs that route their output to remote terminals 1 through 12 is to be displayed.

DISPLAYING INFORMATION ABOUT CURRENTLY ACTIVE JOBS

Use the $DA command to display information about:

- Active batch jobs.
- Active system tasks.
- Active time-sharing users.
- Jobs being processed on unit record devices.

$D	A [,JOB] [,STC] [,TSU] [,XEQ] [,DEV] [,system-id] [,L={a / cc / cca}]

A

The system is to display the job number, name, status, class, priority, and active system name for each type of job requested, active in the JES2 process requested, on the requested system.

JOB

The system is to display the above information for active batch jobs. JOB may be abbreviated as J.

STC

The system is to display the above information for active system tasks. STC may be abbreviated as S.

TSU

The system is to display the above information for active time-sharing users. TSU may be abbreviated as T.

Note: *If neither JOB, STC, nor TSU is specified, JOB is assumed.*

XEQ

The system is to display the above information for executing jobs. XEQ may be abbreviated as X.

DEV

The system is to display the above information for jobs currently being processed on each unit record device. DEV may be abbreviated as D.

Note: *If neither XEQ nor DEV is specified and JOB is specified, both are assumed. If neither JOB, STC, or TSU is specified but either XEQ or DEV is specified, then JOB, STC, and TSU are assumed. If nothing is specified, then JOB, XEQ, and DEV are assumed.*

system-id

The system is to display the above information for the selected groups (JOB, STC, TSU, DEV, or XEQ) on the designated system. System-id is the four-character alphameric identifier of a system in a multi-access spool configuration. Only one system-id can be named in one $D A command. If none is specified, the system to which the entering console is attached is assumed.

L = a, cc, or cca

The area (a), console identifier (cc), or both (cca) of the active MCS console at which the requested display is to appear.

Examples:

```
$D A,H158,DEV,L=4a
```

The system will display the job number, name, status, class, priority and active system name for all jobs active on unit record devices on the system whose identifier (system-id) is H158 on console 4, area A.

```
$D A,JOB,XEQ,ALL
```

The system will display all batched jobs in execution on any processor.

```
$D A
```

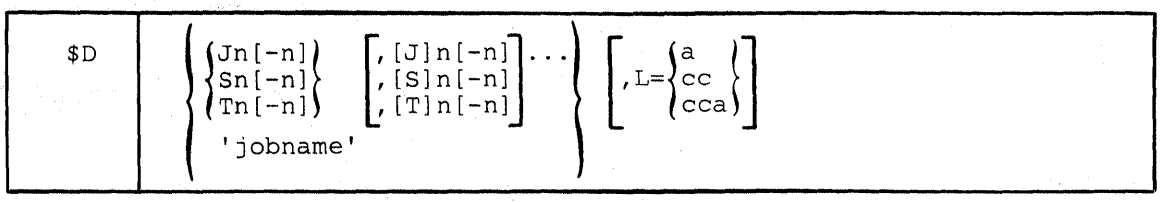
This is the default option. The system will display the job number, name, class, status, priority, and active system name for all batch jobs that are active on the system to which the entering console is attached.

DISPLAYING INFORMATION ON SPECIFIED JOBS

Use the $D command to display the following job information for a specified job:

- Number
- Name
- Status
- Class
- Priority

Note: *An asterisk (*) will appear if the job is not queued by class.*



Jn-n
The batch job number or range of batch job numbers for which information is to be displayed.

Sn-n
The system task or range of system tasks for which the above information is to be displayed.

Tn-n
The time sharing user or range of time sharing users for which the above information is to be displayed.

'jobname'
The name of the job for which information is to be displayed. The name must be enclosed in apostrophes and must not include blanks. If there is more than one job with this name, the job information will be displayed for each of them.

L = a, cc, or cca
The area (a), console identifier (cc), or both (cca) of the active MCS console at which the requested job information is to be displayed.

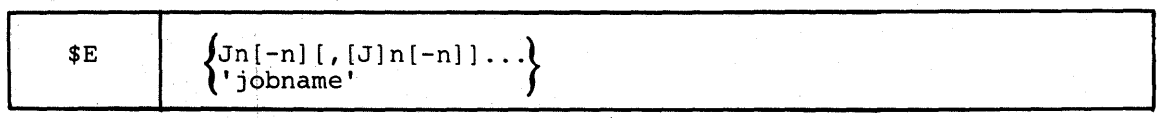
Example:

```
$d 'myjob'
```

The system will display job information concerning all jobs with the name MYJOB.

RESTARTING SPECIFIED JOBS IN EXECUTION

Use the $E command to restart execution of a job or jobs currently in execution.



Jn-n
The job number or range of job numbers to be restarted.

'jobname'
The name of a batch job to be restarted. This must be the name coded on the JOB card, enclosed in apostrophes. No action is taken if there is more than one job on the queue with this name.

This command can be entered only by those consoles with job and system authority.

Example:

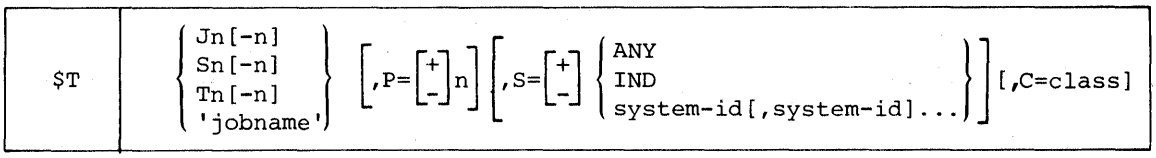
```
$e j2-5
```

Jobs 2, 3, 4, and 5 will be flagged to restart upon completion of execution.

Note: *If you wish to restart a job but do not want it to execute at this time, first use the $H command (hold) on the job and then the $E command. If you wish to restart a job in execution, you should follow a $E command with the MVS CANCEL or REPLY commands.*

CHANGING A JOB'S CLASS, SCHEDULING PRIORITY, OR SYSTEM IDENTIFIER

Use the $T command to change the class, priority, or eligible system identifiers of a specified job or list of jobs.



Jn-n
The job number or range of job numbers for which the class, priority, and/or eligible system identifiers are to be set or reset.

Sn-n
The system task or range of system tasks for which the class, priority, and/or eligible system identifiers are to be set or reset.

Tn-n
The time sharing user or range of time sharing users for which the class, priority, and/or eligible system identifiers are to be set or reset.

'jobname'
The name of the job for which the class, priority, and/or eligible system identifiers are to be set or reset.

P = n, +n or −n

The new priority (0-15) for the specified job (n) or the value to be added to (+n) or subtracted from (−n) the present priority for the specified job.

Note: *If the job is being actively processed by any JES2 function, its priority cannot be changed.*

C = class

The single character (A-Z or 0-9) representing the new class to be assigned to the specified job. A job's class can only be changed if the job is awaiting execution in a class queue. An execution batch monitor job's class cannot be changed.

S = + or −

Add to (+) or delete (−) the following systems to or from the current list of systems which are eligible to process this job or specify (neither + nor −) the system or systems which are eligible to process this job.

Note: *If neither + nor − is specified, the system identifier for these jobs is set explicitly to the specified systems.*

ANY, IND, or system-id...,system-id

ANY indicates that any active system in the multi-access spool configuration be allowed to process this job. IND indicates that the specified systems in the multi-access spool configuration be allowed to process this job only if they are operating in independent mode. System-id indicates the four-character identifier of the system in a multi-access spool configuration. STC and TSU jobs cannot have their system affinity changed unless they are in the output processor queue.

If the job priority is adjusted to a value smaller than 0 or greater than 15, 0 or 15, respectively, is assumed.

Jobs in the execution-batch-processing class may not be moved to a nonexecution-batch-processing classes and vice versa.

The response to the $T command appears the same as if you entered a $D command. Check this response to determine whether the desired changes took place.

Example:

```
$T J1-10,S=-H155
```

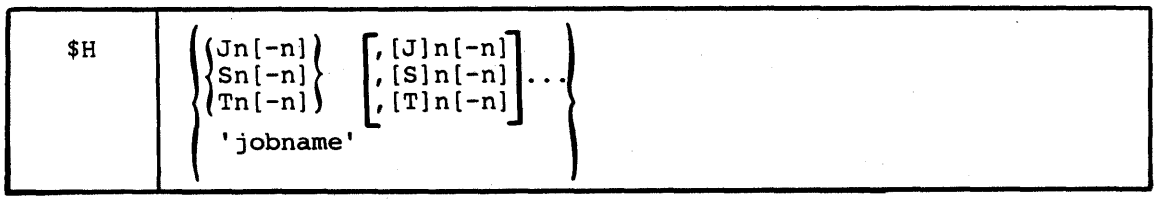
Jobs 1 through 10 will have H155 removed from their system affinities.

```
$T J1,S=+IND,H155
```

H155 is to be added to the system affinity of job 1 and job 1 is to be set so that it can only execute on a system that is in independent mode.

HOLDING SPECIFIED JOBS

Use the $H command to place specific jobs in hold status.



Jn-n
The job number or range of job numbers of the jobs to be placed in hold status.

Sn-n
The system task or range of system tasks to be held.

Tn-n
The time sharing user or range of time sharing users to be held.

'jobname'
The name of the job to be held. This name must appear as coded on the JOB card and must be enclosed in apostrophes. If there is more than one job with the specified job name, no action will be taken.

Example:

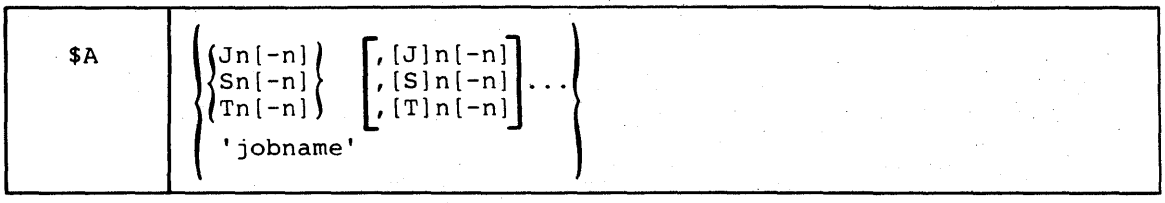
```
$h j5-8
```

Jobs 5, 6, 7, and 8 will be placed in hold status.

RELEASING SPECIFIED JOBS

Use the $A command to release jobs held with:

- $H ALL commands.
- $H JOB commands.
- TYPRUN=HOLD JCL parameters.
- SETUP control cards
- $T RDRn, H=Y commands.



Jn-n
The job number or range of job numbers of those jobs to be released for execution.

Sn-n
The system task or range of system tasks to be released for execution.

Tn-n
The time sharing user or range of time sharing users to be released.

'jobname'
The name of the job to be released. This name must appear as coded on the JOB card and must be enclosed in apostrophes. No action is taken if more than one job exists with this name.

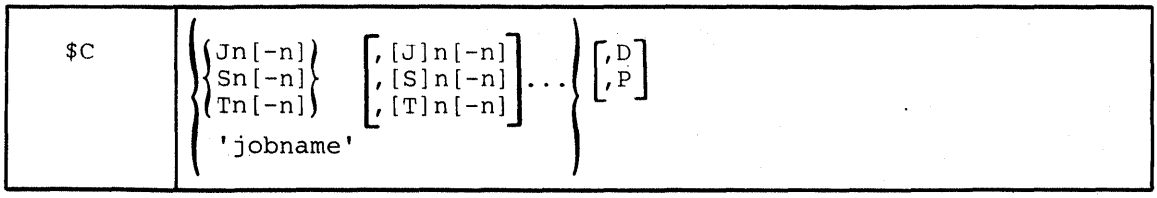
Example:

```
$a 'payroll'
```

The job named PAYROLL is taken out of hold status and is available for processing.

CANCELING A JOB

Use the $C command to immediately terminate the scheduling or execution of a job and provide a storage dump if desired. The $C command allows you to cancel a range of jobs as well as a single one, and cancel job output as well as the job itself. The system command CANCEL may also be used to cancel jobs in execution but the use of $C gives you more flexibility.



Jn-n
The job number or range of job numbers of the job(s) to be canceled.

Sn-n
The system task or range of system tasks to be canceled.

Tn-n
The time sharing user or range of time sharing users to be canceled.

'jobname'
The name of the job, as it appears on the JOB card, to be canceled. The name must be enclosed in apostrophes. If there is another job by this name, no action will be taken.

D
A storage dump is to be provided if the job is in execution.

P
The job output is to be canceled.

The following considerations should be noted when using $C:
- $C is ignored for jobs that are already in the output phase, unless the P operand is specified.
- System tasks and time sharing users can only be canceled after they have completed execution.
- Batch jobs that have the noncancelable attribute are not eligible for cancel during execution.
- $C cannot cancel a job executing on another member of a shared-spool configuration during the job's execution. The job will be canceled after the execution phase is complete.
- If the job does not cancel, reenter the command.

Examples:

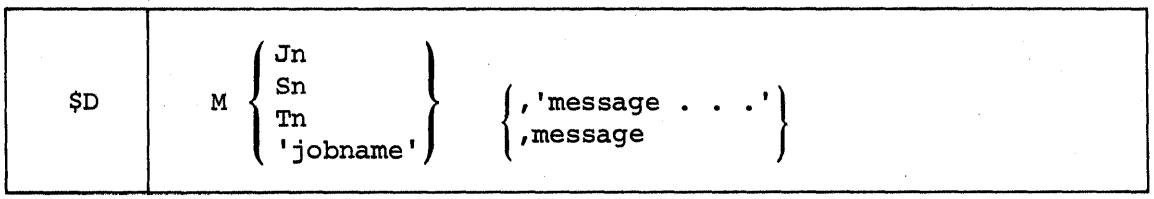
```
$c j3
```
Processing for job 3 will be terminated.

```
$c 'payroll',dump
```
The job PAYROLL, which is currently in execution, will be canceled and a storage dump will be taken.

For additional capabilities, refer to the description of system commands, CANCEL and STOP, in *Operator's Library: OS/VS2 MVS System Commands,* GC38-0229.

SENDING A MESSAGE TO AN EXECUTING JOB'S JES2 LOG

For a job in execution, use the $D command to write a message to the job's JES2 job log.



Jn
The job number of the job whose job log is to receive the message.

Sn
The job number of the system task whose job log is to receive the message.

Tn
The job number of the time sharing user whose job log is to receive the message.

'jobname'
The name of the job, system task, or time sharing user whose job log is to receive the message.

'message' or message

The text of the message. If apostrophes are not included, the message is compressed by removing all blanks. Use double apostrophes if an apostrophe is desired within the text.

When using the $DM command:

- The specified job, STC, or TSU must be in execution on the system on which the command was issued, not awaiting execution or output.
- The messages entered by the command will not be printed if the job's submitter specified that no job log was to be printed (NOLOG), or if the attributes specified at JES2 initialization for the job's execution class indicate that no job log is to be generated.
- Use the system SEND command to send a message directly to a time-sharing user's terminal.

Examples:

```
$dm j29,'could not find your tape'
```

The message COULD NOT FIND YOUR TAPE will be written on job 29's job log.

```
$dm 'nauga','next time please increase your output estimate'
```

The message NEXT TIME PLEASE INCREASE YOUR OUTPUT ESTIMATE will be written on the job log for the job whose name is NAUGA.

STOPPING A JOB

Use the $P command to stop a job, cancel its output, and remove all traces of it from the system after the current activity is complete.

```
$P   { {Jn[-n]}  [,[J]n[-n]]  }
     { {Sn[-n]}  [,[S]n[-n]]...} [Q=classes]
     { {Tn[-n]}  [,[T]n[-n]]   }
     { 'jobname'               }
```

Jn-n

The job number or range of job numbers of the jobs to be stopped after completion of their current activity.

Sn-n

The system tasks or range of system tasks to be stopped after completion of their current activity.

Tn-n

The time sharing user or range of time sharing users to be stopped after completion of their current activity.

Note: *Started tasks and time sharing users can only be stopped after they have completed execution. To cancel such jobs during execution, use the system CANCEL command. Batch jobs that have the non-cancelable attribute cannot be canceled during execution.*

'jobname'

The name of the job to be stopped after completion of its current activity. This name must appear as coded on the JOB statement and must be enclosed in apostrophes. If more than one job with the specified name is found, no action is taken. Only one 'jobname' may be specified per $P command and no job number ranges may be specified with a 'jobname' parameter.

Q = classes

Cancel all output queued in the specified output classes (from 1 to 8 classes may be specified at one time). The job will not be canceled from the system if data in other output classes remains queued for output. The Q= operand is ignored if no output is queued for the specified jobs.

Examples:

```
$p job3
```

Job 3 will be terminated after completion of its current activity; its output will be canceled, and all traces of it will be removed from the system.

```
$P j3,q=x
```

All data sets in class x for job 3 will be canceled.

```
$P T3,Q=A
```

The system will delete all output queued in class A for time-sharing user 3.

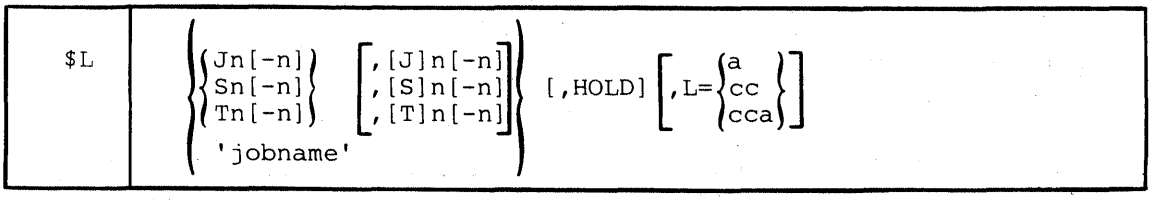
To allow stopping and restarting of a job between execution phases, first use the $E command on the job to allow restarting. You can then stop the job using the system command STOP.

CHAPTER 7. CONTROLLING JOB OUTPUT

The following commands are used to control the output of jobs via JES2 commands. They are useful for displaying job information and for releasing, canceling, and stopping job output.

LISTING JOB OUTPUT INFORMATION

Use the $L command to display the amount of output for a job or jobs in either the held or released output classes.



Jn-n
The job number or range of job numbers for which the output is to be displayed.

Sn-n
The system task or range of system tasks for which the output is to be displayed.

Tn-n
The time sharing user or range of time sharing users for which the output is to be displayed.

'jobname'
The name of the job, as it appears on the JOB statement, for which the output is to be displayed. Only one 'jobname' can be specified per $L command and no job number ranges can be specified with a 'jobname'.

HOLD
The amount of output in the hold status for jobs in the system is to be displayed. HOLD may be abbreviated as H. Any job number lists following the HOLD operand will be ignored.

Note: *HOLD lists only held data sets. If omitted, only non-held data sets are listed. You cannot list both held and non-held data sets with one command.*

L = a, cc, or cca
The area (a), console identifier (cc), or both (cca) of the active MCS console at which the requested display is to appear.

The system will first list the number of output elements waiting to be processed in each released queue, then the number of elements in each held queue.

Example:

```
$1 j3-6,t22
```

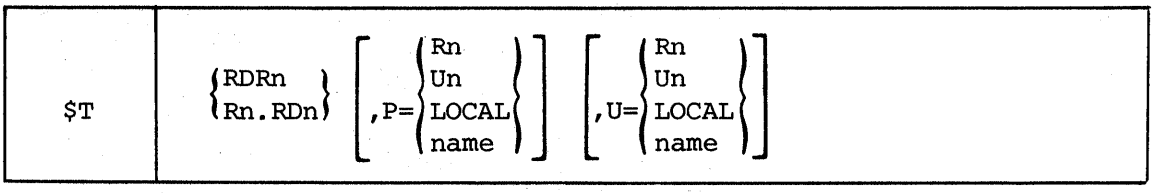
The system will display the number of released output elements for jobs 3, 4, 5, and 6 and for time sharing user 22 by output class.

ROUTING JOB OUTPUT

Job output may be normal or specially routed output. Normal output is output sent to any available local device that has normal routing assigned (that is, no specific route code). Specially routed output is output sent to a device that has special routing assigned (that is, a specific route code).

ASSIGNING DEFAULT ROUTING TO A READER

Use the $T command to reset the default destination routings for jobs entered in a local or remote reader. If a job does not indicate an output destination, it is assigned a default destination. This default destination, set at system initialization, is normally either a local printer or punch device, for the output of jobs read at a local reader, or a remote workstation's printer or punch, for the output of jobs read at the remote workstation's reader. By setting other default destination routings with the $T command, you can alter this initial default setting so that the output of the jobs read is routed to an alternate remote or local destination.



RDRn
The local reader that is affected.

Rn.RDn
The remote reader that is affected.

P=Rn, Un, LOCAL, or name
The print output for all jobs read by the specified reader is to be routed to this default destination: a remote workstation (Rn), a local device with special routing (Un), any local device with normal routing (LOCAL or R0), or a destination with a symbolic name (name) that has been equated to one of the other options at JES2 initialization.

U=Rn, Un, LOCAL, or name
The punch output for all jobs read by the specified reader is to be routed to this default destination: a remote workstation (Rn), a local device with special routing (Un), any local device with normal routing (LOCAL or R0), or a destination with a symbolic name (name) that has been equated to one of the other options at JES2 initialization.

Examples:

```
$T RDR1,P=U1
```

The print output of any job read at local reader 1 will be routed to local devices with routing set to 1.

```
$T R4.RD1,U=LOCAL
```

The punch output of any job read at reader 1 in remote workstation 4 will be routed to local devices with normal routing.

ASSIGNING PRINTER DESTINATIONS

Use the $T command to alter the route code of a printer device. Altering the route code allows the printer to print a job's output that is scheduled to be routed to another specified destination; thus, if necessary, a printer can be directed to take over the workload of another local or remote printer.

$T	{PRTn / Rn.PRn} ,R={Rn / Un / LOCAL / name}

PRTn
The local printer that is affected.

Rn.PRn
The remote printer that is affected.

R=Rn, Un, LOCAL, or name
The output queued for this destination – remote workstation (Rn), a local device with special routing (Un), any local device with normal routing (LOCAL or R0), or a destination with a symbolic name (name) equated to one of the other options at JES2 initialization – is now to be processed by the specified printer.

Examples:

```
$T PRT1,R=U1
```

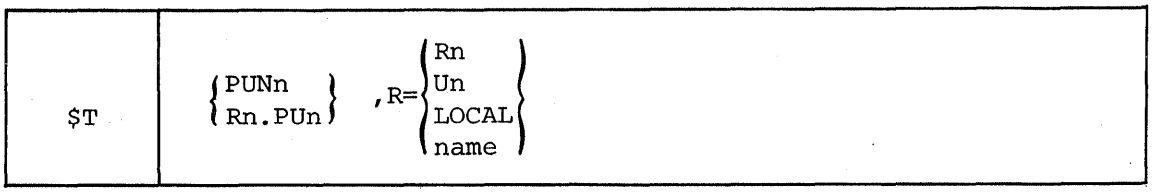
Local printer 1 will print the output that was to be routed to local devices with routing set to 1.

```
$T R2.PR1,R=R4
```

Remote printer 1 at workstation 2 will print the output that was to be routed to remote printer 4.

ASSIGNING PUNCH DESTINATIONS

Use the $T command to alter the route code of a punch device. Altering the route code allows the punch device to punch a job's output that is scheduled to be routed to another specified destination; thus, if necessary, the punch can be directed to take over the work of another local or remote punch.



PUNn
The local punch that is affected.

Rn.PUn
The remote punch that is affected.

R=Rn, Un, LOCAL, or name
The output queued for this destination – remote workstation (Rn), a local device with special routing (Un), any local device with normal routing (LOCAL or R0), or a destination with a symbolic name (name) equated to one of the other options at JES2 initialization – is now to be processed by the specified punch device.

Examples:

```
$T PUN1,R=U1
```

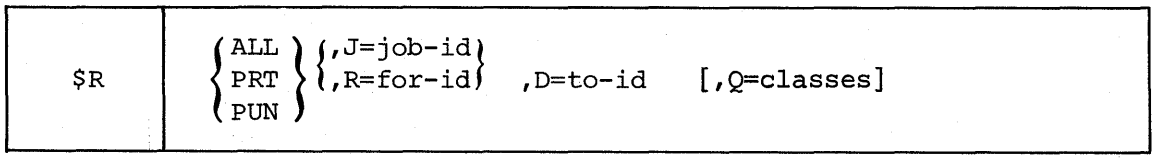
Local punch 1 will punch the output that was to be routed to local devices with routing set to 1.

```
$T R2.PU1,R=R4
```

Remote punch 1 at workstation 2 will punch the output that was to be routed to remote device 4.

CHANGING OUTPUT ROUTING

Use the $R command to route both normal and specially routed output for a job or jobs to an alternate location. A programmer can, by means of the DEST parameter, request that certain data sets be routed to an alternate location. This specially routed output is independent of the normal job output which is unaffected.



ALL
All the output designated by J=job-id or all the output designated by R=for-id is to be rerouted to the D=to-id location. When this parameter is specified, all data sets given explicit routing via JCL are routed along with the rest of the job output.

PRT
Only normal (default) print output for the specified job is to be rerouted.

PUN
Only normal punch output for the specified job is to be rerouted.

J=job-id
Replace "job-id" with one of the following:

Jn
The number of the job whose output is to be rerouted.

Sn
The number of the system task whose output is to be rerouted.

Tn
The number of the time sharing user whose output is to be rerouted.

R=for-id
Replace "for-id" with one of the following:

Rn
The job output for this remote terminal is to be rerouted.

Un
The job output for this local device, which has special routing assigned, is to be rerouted.

LOCAL
The output for all jobs currently in the system and queued for local devices that have normal routing assigned (LOCAL or R0) is to be rerouted.

name
The job output for the destination with this installation-defined name is to be rerouted. (The system programmer should tell you what names you can use.)

D=to-id
Replace "to-id" with one of the following:

Rn
The specified job output is to be rerouted to this remote terminal.

Un
The job output is to be routed to this local device, which has special routing assigned. This operand is useful only if you assign special routings to printer and punch devices by means of the $T device, R= command or if the installation has set devices to the routing.

LOCAL
The specified job output is to be rerouted to any local device that has normal routing assigned (LOCAL or R0).

name
The specified job output is to be rerouted to the destination with this installation-defined name. (The system programmer should tell you what names you can use.)

Q=classes
The character(s) representing the output class or classes (A-Z or 0-9) to be rerouted. When R is specified as LOCAL or Rn, this parameter applies only to specially routed output. However, when J=job-id is specified, the job's output in the specified class becomes specially routed output. This operand is only valid when ALL is specified.

Examples:

```
$r ALL,j=j3,d=r6,Q=C
```

The normal and specially routed class C output for job 3 will be rerouted to remote terminal 6.

```
$R ALL,R=R6,D=R3,Q=A
```

All class A specially routed output routed to remote 6 will be rerouted to remote 3. Normal output will be unaffected.

RELEASING OR CANCELING HELD OUTPUT DATA SETS

Use the $O command to release or cancel held output data sets.

```
$O  { Q          }  [,Q=classes] [,C]  [,R={ Rn    }][,D={yyddd}]
    { Jn[-n]     }                       { Un    }      { nn    }
    { Sn[-n]     }                       { LOCAL }
    { Tn[-n]     }                       { name  }
    { 'jobname'  }
```

Q
All held output data sets in the system are to be affected by this command.

Jn-n
The job number or range of job numbers for which the held output is to be released or canceled.

Sn-n
The system task or range of system tasks for which the held output is to be released or canceled.

Tn-n
The time sharing user or range of time sharing users for which the held output is to be released or canceled.

'jobname'
The name of the job, as it appears on the JOB card, for which the output is to be released or canceled.

Q=classes
The output class or classes A-Z or 0-9. The system is to release or cancel the output in the specified class or classes for the specified job or jobs. If this operand is omitted, all output classes will be released or canceled.

C
The system is to cancel all of the selected held output or, if Q=classes is specified, the output in certain output classes.

R=Rn,Un,LOCAL, or name
The data sets are to be released to the specified destination (where Rn indicates a specific remote device; Un, a local device with special routing; LOCAL (or R0), any local device with normal routing; and name, a destination with an installation-defined name). This operand is ignored if C is specified.

D=yyddd or nn
The system is to release or cancel only the held output created on or before yyddd (Julian date) or which was created at least nn days ago. The valid range for nn is 0 to 99.

Examples:

```
$O 'payroll',q=abc,r=r2
```

The class A, B, and C output elements for the job PAYROLL will be released to remote terminal 2. Output in other output classes will be unaffected.

```
$O Q
```

All held output data sets in the system are released with the same routing that they currently have.

```
$O q,c,q=tab
```

All held output data sets of classes T, A, and B in the system will be canceled.

```
$O Q,q=abjk
```

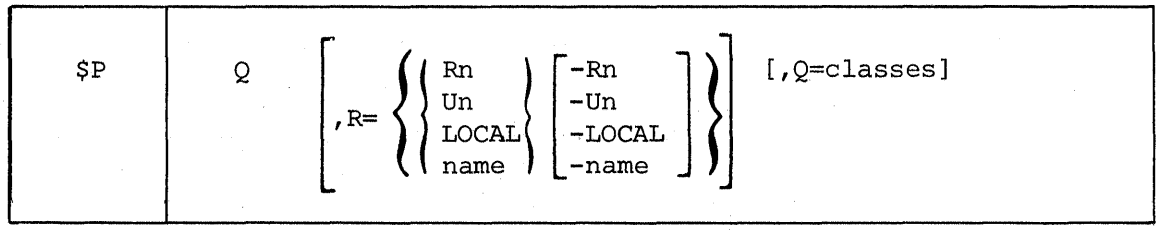
The system will release all held output for the classes A, B, J, and K.

```
$O J1-22,D=5
```

All held output for jobs 1-22, which are at least 5 days old, will be released.

CANCELING OUTPUT DATA SETS

Use the $P command to cancel ready output data sets on a class and/or routing basis.



Q
All queued output data sets not currently active on an output device will be affected.

R=Rn,Un,LOCAL, or name
Only data sets that are routed to the remote terminal (Rn), a local device with special routing (Un), any local device with normal routing (LOCAL or R0), or installation-defined destination (name) are canceled. If more than one routing is specified in the command, the last routing is used.

Q = classes
The output classes (A-Z and 0-9). The system is to cancel all queued output data sets in the specified classes. If more than one Q= operand is specified, the last Q= operand entered will be used. Up to 8 classes may be specified.

Examples:

```
$P Q,q=b,r=rl
```
Cancel all queued output of class B whose routing is to be remote terminal 1.

```
$P Q,r=r2
```
Cancel all output that is routed to remote terminal 2.

```
$P Q,q=bk,r=r6
```
The system will delete all output data sets of classes B and K whose routing is to remote station 6.

APPENDIX. JES2 COMMAND SUMMARY

Command	Function	Page	Authority Required	Restrictions at Remote Workstations
$A	Release all jobs in the system whose system affinities include the affinity of the system to which the entering console is attached.	6-3	Job	Prohibited
	Release job queues held by a $H Q command	6-4	Job	Prohibited
	Release specified jobs	6-15	Job	Owner
$B	Backspace printer output a number of pages or to the beginning of the data set	3-18	Device	(Notes 1 and 2)
	Backspace the current punching of a data set group	3-24	Device	(Notes 1 and 2)
$C	Cancel current reader activity	3-3	Device	Owner
	Cancel the output currently being printed	3-19	Device	(Notes 1 and 2)
	Cancel the output currently being processed	3-25	Device	(Note 1)
	Cancel all automatic command processing and delete all command entries	5-8	System	Prohibited
	Immediately terminate the scheduling or execution of a job and provide a storage dump if desired	6-16	Job (Note 3)	Owner
$D	Display the status of an initiator and the job classes assigned to it	3-9	None	None
	Send a message for display on the job log of an executing job.	6-17	Display	None
	Send a message to a remote terminal operator	4-4	None	None
	Display the status of JES2-controlled non-direct-access devices	5-9	None	None

Notes:

1. "Prohibited" on local devices, but "owner" on remote workstations.
2. When a non-MULTI-LEAVING remote device is in command input mode, output devices on that remote device are not active.
3. $C may not be used to cancel a system task (STC) or time-sharing user (TSU) job before that job completes execution. $C will not cancel a job that is not executing on the system from which the command was entered.

Command	Function	Page	Authority Required	Restrictions at Remote Workstations
$D (cont.)	Display a list of JES2 operator requests that have not been fulfilled.	5-11	None	None
	Display a job's number, name, status, class, priority, system affinities, and/or percentage of spool disk utilization	6-5	None	None, except for "owner" or "job name"
	Display the number of jobs in a particular queue and the percent of spool disk utilization	6-7	None	None
	Display information about data set groups queued for output	6-9	None	None
	Display information about active batch jobs, active system tasks, active time-sharing users, and/or jobs being processed on unit record devices	6-10	None	None
	Display job information (number, name, status, class, and/or priority	6-12	None	None
$E	Reclaim the job processing which was being performed upon the named system in a multi-access spool configuration	2-4	System	Prohibited
	Discontinue the current printing of a data set group	3-12	Device	Owner (Note 1)
	Discontinue the current punching of a data set group	3-21	Device	(Note 2)
	Restart the current activity on a line	4-4	Device	Prohibited
	Restart the JES2/VTAM interface on a logical line	4-5	System	Prohibited
	Restart execution of a job or jobs currently in execution	6-12	Job and System (Note 3)	Prohibited

Notes:

1. When a non-MULTI-LEAVING remote device is in command input mode, output devices on that remote device are not active.
2. "Prohibited" on local devices, but "owner" on remote workstations.
3. $E may not be used to restart execution of a system task (STC) or time-sharing user (TSU) job. $E will not restart a job that is not executing on the system from which the command was entered.

Command	Function	Page	Authority Required	Restrictions at Remote Workstations
$F	Forward-space printer output a number of pages or to the end of the data set	3-19	Device	(Notes 1 and 2)
	Forward-space the punching of a data set group	3-25	Device	(Note 1)
$H	Hold all jobs currently in a system, those associated with a specific system, those within the entire multi-access spool configuration, or those that have the system through which the command is entered as an affinity	6-3	Job	Owner
	Keep jobs in specified job queues, or all job queues, from being executed	6-4	Job	Prohibited
	Place specific jobs in hold status	6-15	Job	Owner
$I	Interrupt the printing of a data set group	3-17	Device	(Notes 1 and 2)
	Interrupt the punching of a data set group	3-24	Device	(Note 1)
$L	List each system in a multi-access spool configuration and its status	5-9	System	Prohibited
	Display the amount of output for a job or jobs in either held or released output classes	7-1	None	Owner
$N	Repeat the printing of job output	3-17	Device	(Notes 1 and 2)
	Repeat the punching of a data set group	3-23	Device	(Note 1)
$O	Release or cancel held output data sets	7-6	Job	Prohibited
$P	Stop all JES2 processing	2-2	System	Prohibited
	Withdraw JES2 from the system to which the entering console is attached	2-3	System	Prohibited

Notes:

1. "Prohibited" on local devices, but "owner" on remote workstations.
2. When a non-MULTI-LEAVING remote device is in command input mode, output devices on that remote device are not active.

Command	Function	Page	Authority Required	Restrictions at Remote Workstations
$P (cont.)	Stop a reader	3-4	Device	Prohibited
	Stop initiators; will cause the specified initiators to terminate and free the associated system resources	3-10	System	Prohibited
	Prevent a printer from selecting additional work after it completes the output it is currently processing	3-20	Device	Owner (Note 1)
	Prevent a punch from selecting additional work after completing the data set group it is currently processing	3-26	Device	(Note 2)
	Stop the JES2/VTAM interface	4-7	System	Prohibited
	Stop a remote job entry line	4-7	Device	Prohibited
	Terminates a remote terminal connection	4-8	Device	(Note 2)
	Stop a job, cancel its output, and remove all traces of it from the system after the current activity is complete	6-18	Job	Owner
	Cancel ready output data sets on a class and/or routing basis	7-8	Job	Prohibited
$R	Route both normal and specially routed output for a job or jobs to an alternate location	7-4	Job	Owner (Note 3)
$S	Start system activity	2-2	System	Prohibited
	Start a system input reader	3-3	Device	(Note 2)
	Start initiators	3-9	System	Prohibited
	Start a printer	3-12	Device	Owner
	Start a punch	3-21	Device	(Note 2)
	Start remote job entry lines	4-1	Device	Prohibited
	Start JES2/VTAM interface	4-1	System	Prohibited
	Automatically connect a remote terminal	4-6	Device	(Note 2)
	Start automatic command processing	5-6	System	Prohibited

Notes:

1. When a non-MULTI-LEAVING remote device is in command input mode, output devices on that remote device are not active.
2. "Prohibited" on local devices, but "owner" on remote workstations.
3. $R requires that the job to be routed belong to the JES2 remote workstation; for example, normal print or normal punch must be routed to that station.

Command	Function	Page	Authority Required	Restrictions at Remote Workstations
$T	Specify the command authority of a reader	3-5	Device and System	Prohibited (Note 1)
	Set the default system affinity for all jobs read by the specified reader in a multi-access spool JES2 configuration; may further be used to hold all jobs read by the specified reader.	3-6	Device and System	Prohibited (Note 1)
	Set the default job and message classes to be assigned to jobs being processed by a reader	3-7	Device	Prohibited (Note 1)
	Assign the job classes an initiator is to process	3-9	System	Prohibited
	Specify printer characteristics at JES2 initialization or override a system request for a setup you are unable to fulfill	3-13	Device	(Notes 2 and 3)
	Specify printer options	3-15	Device	(Note 2)
	Assign the output classes a printer is to process	3-16	Device	(Note 2)
	Identify the forms a punch is using and to control the punching of job identification cards	3-22	Device	(Note 2)
	Assign the output classes a punch is to process	3-23	Device	(Note 2)
	Assign or delete a password for a line	4-2	System	Prohibited
	Assign a password and an application ID to the JES2/VTAM interface	4-2	System	Prohibited
	Diagnose a problem on a line	4-3	System	Prohibited
	Diagnose SNA problems	4-3	System	Prohibited
|	Disconnect a line; restart a remote job entry line immediately or restart the line when all data set communications over the line cease	4-6	System	Prohibited

Notes:

1. $T RDI affects all internal readers generated and cannot be used to control a single internal reader.
2. "Prohibited" on local devices, but "owner" on remote workstations.
3. When a non-MULTI-LEAVING remote device is in command input mode, output devices on that remote device are not active.

Command	Function	Page	Authority Required	Restrictions at Remote Workstations
$T (cont.)	Set terminal to automatically connect	4-5	Device	(Note 2)
	Set or reset independent mode status of a system within a multi-access spool configuration	5-1	System	Prohibited
	Specify the amount of information to be displayed in system and JES2 remote operator console messages for a specified console	5-3	Device	Owner
	Control the volume of JES2 message output to a console	5-4	None	Prohibited
	Establish default routing values for certain $D operands	5-4	System (Note 1)	Prohibited
	Display the automatic commands currently in effect; specify a new command or series of commands for automatic processing; modify an existing automatic command entry	5-6	(Note 2)	Prohibited
	Delete an automatic command entry	5-7	(Note 2)	Prohibited
	Set or reset the base JES2 job numbers	6-1	Job	Prohibited (Note 3)
	Route all of a named system's jobs to the specified system in the multi-access spool configuration	6-1	System	Prohibited
	Change the class, priority, or eligible system identifiers of a specified job or list of jobs	6-13	Job	Prohibited
	Reset the default destination routings for jobs entered in a local or remote reader	7-2	Device	(Note 4)
	Alter the route code of a printer device	7-3	Device	(Note 4)
	Alter the route code of a punch device	7-4	Device	(Note 4)
$VS	Submit a system command from a console with JES2 system authority	1-6	System	Prohibited

Notes:

1. $TM must be entered from a system-controlled console unless it is the "text" operand of a $TA command.
2. When $TA creates a command element, it requires a console of at least equal authority to reference it with another $TA command.
3. If there is only one operand, $T resets the automatic job-id assignment base value to the number specified.
4. "Prohibited" on local devices, but "owner" on remote workstations.

Command	Function	Page	Authority Required	Restrictions at Remote Workstations
$Z	Temporarily halt reader activity	3-4	Device	Prohibited
	Halt initiators; causes the initiators to halt processing but remain in the system	3-10	System	Prohibited
	Temporarily halt printer activity	3-20	Device	Prohibited
	Temporarily halt punch activity	3-26	Device	Prohibited
	Halt automatic command processing	5-8	System	Prohibited

Glossary

If the term you are seeking does not appear in this glossary, refer to *Data Processing Glossary*, GC20-1699.

IBM is grateful to the American National Standards Institute (ANSI) for permission to reprint its definitions from the American National Standard Vocabulary for Information Processing, which was prepared by Subcommittee X3K5 on Terminology and Glossary of American National Standards Committee X3.

ABEND. Abnormal end of task.

abnormal end of task (ABEND). Termination of a task prior to its completion because of an error condition that cannot be resolved by recovery facilities while the task is executing.

accepting. The process by which a terminal obtains a message transmitted to it from the computer. Contrast with *entering*. See also *receiving, sending.*

activate. In VTAM, to connect a node to another node, or to make the node available for connection.

active line. A line that is currently available for transmission of data.

address. (1) * An identification, as represented by a name, label, or number, for a register, location in storage, or any other data source or destination such as the location of a station in a communication network. (2) * Loosely, any part of an instruction that specifies the location of an operand for the instruction.

address space. The complete range of addresses that is available to a programmer. See also *virtual address space.*

address stop. A capability to specify at the system console an address which when encountered causes a halt in processing.

allocate. To assign a resource for use in performing a specific task.

* **allocation.** See *storage allocation.*

allocation of data sets. The process of assigning auxiliary storage space to a data set. See also *dynamic data set definition.*

alphabetic character. A letter or other symbol, excluding digits, used in a language.

* **alphameric.** Same as *alphanumeric.*

alphameric characters. In programming, usually the characters A through Z, digits 0 through 9, and #, $, and @.

* **alphanumeric.** Pertaining to a character set that contains letters, digits, and usually other characters, such as punctuation marks. Synonymous with *alphameric.*

alternate routing. A secondary or backup communications path; used if normal routing is not possible.

American National Standard labels. Magnetic tape labels that conform to the conventions established by the Americal National Standards Institute. Synonymous with ASCII label.

attribute. A characteristic; for example, attributes of data include record length, record format, data set name, associated device type and volume identification, use, and creation date.

automatic mode. The setup and selection of jobs on a printer is to be controlled by JES as opposed to being controlled by the operator through the use of operator commands.

automatic restart. A restart that takes place during the current run, that is, without resubmitting the job. An automatic restart can occur within a job step or at the beginning of a job step. Contrast with *deferred restart.*

automatic volume recognition (AVR). A feature that allows the operator to mount labeled volumes on available I/O devices before the volumes are needed by a job step.

auxiliary storage. (1) Data storage other than main storage; for example, storage on magnetic tape or direct access devices. Synonymous with external storage, secondary storage. (2) * A storage that supplements another storage. Contrast with *main storage.*

availability. The degree to which a system or resource is ready when needed to process data.

AVR. Automatic volume recognition.

background. (1) In multiprogramming, the environment in which low-priority programs are executed. (2) Under TSO, the environment in which jobs submitted through the SUBMIT command or SYSIN are executed. One job step at a time is assigned to a region of main storage, and remains in main storage to completion. Contrast with *foreground.*

background job. (1) A low-priority job, usually a batched or noninteractive job. (2) Under TSO, a job entered through the SUBMIT command or through SYSIN. Contrast with *foreground job.*

* **backspace.** To move back the reading or display position according to a prescribed format. Contrast with *space* (4).

* **backspace character.** A format effector that causes the location of the printing or display position to be moved backward one printing or display space.

batch processing. (1) * Pertaining to the technique of executing a set of computer programs such that each is completed before the next program of the set is started. (2) * Pertaining to the sequential input of computer programs or data. (3) * Loosely, the execution of computer programs serially. (4) Under TSO, the processing of one job step in a region, so called because jobs are submitted in a group or batch. (5) See also *execution batch processing.*

*American National Standard Definition

batched job. (1) A job that is grouped with other jobs as input to a computing system. (2) A job whose job control statements are grouped with job control statements of other jobs as input to a computing system.

* **beginning-of-tape marker.** A marker on a magnetic tape used to indicate the beginning of the permissible recording area, for example, a photo-reflective strip, a transparent section of tape.

blank. (1) * A part of a medium in which no characters are recorded. (2) On a CRT display device, to turn off the electron beam so that no glow is produced on the face of the screen.

* **blank character.** Same as *space character.*

broadcast. The simultaneous dissemination of information to a number of stations.

broadcast data set. Under TSO, a system data set containing messages and notices from the system operator, administrators, and other users. Its contents are displayed to each terminal user when he logs on the system, unless suppressed by the user.

buffer. (1) * A routine or storage used to compensate for a difference in rate of flow of data, or time of occurrence of events, when transmitting data from one device to another. (2) An area of storage that is temporarily reserved for use in performing an input/output operation, into which data is read or from which data is written.

byte. (1) * A sequence of adjacent binary digits operated upon as a unit and usually shorter than a computer word. (2) The representation of a character. (3) In System/360 and System/370, a sequence of eight adjacent binary digits that are operated upon as a unit and that constitute the smallest addressable unit in the system.

card punch. A device to record information in cards by punching holes in the cards to represent letters, digits, and special characters.

card reader. A device that senses and translates into machine code the holes in punched cards.

* **carriage control tape.** A tape that contains line feed control data for a printing device.

catalog. (1) * An ordered compilation of item descriptions and sufficient information to afford access to the items. (2) The collection of all data set indexes that are used by the control program to locate a volume containing a specific data set. (3) To include the volume identification of a data set in the catalog.

cataloged data set. A data set that is represented in an index, or hierarchy of indexes, that provide the means for locating it.

cataloged procedure. A set of job control statements that has been placed in a partitioned data set called the procedure library, and can be retrieved by naming it in an execute (EXEC) statement or started by the START command.

cathode ray tube. An electronic vacuum tube, such as a television picture tube, that can be used to display graphic images.

* **central processing unit (CPU).** A unit of a computer that includes the circuits controlling the interpretation and execution of instructions. Synonymous with *main frame.*

* **chain printer.** A printer in which the type slugs are carried by the links of a revolving chain. Contrast with *train printer.*

channel. (1) A path along which signals can be sent, for example, data channel, output channel. (2) The portion of a storage medium that is accessible to a given reading or writing station, for example, track, band. (3) In communication, a means of one-way transmission. Several channels may share common equipment. For example, in frequency multiplexing carrier systems, each channel uses a particular frequency band that is reserved for it. (4) A hardware device that connects the CPU and main storage with the I/O control units.

Channel Reconfiguration Hardware (CRH). That hardware in the MP frame of the 168 IBM Model MP that allows one CPU to access paths attached to the other CPU. This is a recovery feature designed to allow access to all I/O devices of a 168 MP system even though one of the CPUs is offline either through a machine check or as a result of a VARY CPU offline command.

channel-to-channel adapter (CTC). A hardware device that can be used to connect two channels on the same computing system or on different systems.

* **character.** A letter, digit, or other symbol that is used as a part of the organization, control, or representation of data.

character position. Same as *display position.*

character row. Same as *display line.*

* **character string.** A string consisting solely of characters.

checkpoint. (1) * A place in a routine where a check, or a recording of data for restart purposes, is performed. (2) A point at which information about the status of a job and the system can be recorded so that the job step can be later restarted. (3) To record such information.

checkpoint data set. A sequential or partitioned data set containing a collection of checkpoint entries. If a checkpoint data set is a partitioned data set, each checkpoint entry is a member.

checkpoint restart. The process of resuming a job at a checkpoint within the job step that caused abnormal termination. The restart may be automatic or deferred, where deferred restart involves resubmitting the job. See also *automatic restart, deferred restart.* Contrast with *step restart.*

checkpoint/restart facility. (1) A facility for restarting execution of a program at some point other than at the beginning, after the program was terminated due to a program or system failure. A restart can begin at a checkpoint or from the beginning of a job step, and uses checkpoint records to reinitialize the system. (2) Under TCAM, a facility that records the status of the teleprocessing network at designated intervals or following certain events. Following system failure, the system can be restarted and continue without loss of messages.

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*American National Standard Definition

* **clear.** To place one or more storage locations into a prescribed state, usually zero or the space character. Contrast with *set.*
* **clock.** (1) A device that generates periodic signals used for synchronization. (2) A device that measures and indicates time. (3) A register or storage area whose contents change at regular intervals in such a way as to measure time.

cold start. Same as *initial program load.*

command name. The first term in a command, usually followed by operands.

command processing. The reading, analyzing, and performing of commands issued via a console or through an input stream.

communication. Transmission of intelligence between points of origin and reception without alteration of sequence or structure of the information content.

communication line. Any medium, such as a wire or a telephone circuit, that connects a remote station with a computer.

component. (1) In teleprocessing, one or more input/output devices attached to a single control unit, and together making up one remote terminal or station. (2) A point in a communications system at which data can enter or leave; an input/output device. A component is always attached to a terminal control unit.

* **computer.** (1) A data processor that can perform substantial computation, including numerous arithmetic or logic operations, without intervention by a human operator during the run.
* **computer network.** A complex consisting of two or more interconnected computing units.
* **computer program.** A series of instructions or statements, in a form acceptable to a computer, prepared in order to achieve a certain result.

computer word. (1) * A sequence of bits or characters treated as a unit and capable of being stored in one computer location. (2) In System/360 and System/370, 32 bits or 4 bytes.

computing system. A central processing unit, with main storage, input/output channels, control units, direct access storage devices, and input/output devices connected to it.

configuration. The group of machines, devices, and programs that make up a data processing system.

* **console.** That part of a computer used for communication between the operator or maintenance engineer and the computer.
* **control panel.** A part of a computer console that contains manual controls.

control program. A program that is designed to schedule and supervise the performance of data processing work by a computing system.

control unit. A device that controls input/output operations at one or more devices.

conversational. Pertaining to a program or a system that carries on a dialog with a terminal user, alternately accepting input and then responding to the input quickly enough for the user to maintain his train of thought.

* **CPU.** *Central processing unit.*
* **CRT display.** Cathode ray tube display.

CRT display device. A display device on which images are produced on a cathode ray tube.

cursor. A movable spot of light on a cathode ray tube unit that indicates where the next character will be entered

DASD. *Direct access storage device.*

* **data.** (1) A representation of facts, concepts, or instructions in a formalized manner suitable for communication, interpretation, or processing by humans or automatic means. (2) Any representations such as characters or analog quantities to which meaning is, or might be, assigned.

data attribute. See *attribute.*

data definition name. The name of a data definition (DD) statement, which corresponds to a data control block that contains the same name. Abbreviated ddname.

data definition (DD) statement. A job control statement that describes a data set associated with a particular job step.

data set. The major unit of data storage and retrieval in the operating system, consisting of a collection of data in one of several prescribed arrangements and described by control information to which the system has access.

data set label. (1) A collection of information that describes the attributes of a data set and is normally stored on the same volume as the data set. (2) A general term for data set control blocks and tape data set labels.

data set name. The term or phrase used to identify a data set.

ddname. *Data definition name.*

DD statement. *Data definition statement.*

DDR. *Dynamic device reconfiguration.*

deallocate. To release a resource that is assigned to a specific task.

* **decimal.** (1) Pertaining to a characteristic or property involving a selection, choice, or condition in which there are ten possibilities. (2) Pertaining to the number representation system with a radix of ten.
* **decimal digit.** In decimal notation, one of the characters 0 through 9.

default value. The choice among exclusive alternatives made by the system when no explicit choice is specified by the user.

deferred restart. A restart performed by the system on resubmission of a job by the programmer. The operator submits the restart deck to the system through a system input reader. Contrast with *automatic restart.*

*American National Standard Definition

demount. To remove a volume from a tape unit or a direct access device.

destination station. A station to which a message is directed.

device. A machanical, electrical, or electronic contrivance with a specific purpose.

device control unit. A hardware device that controls the reading, writing, or display of data at one or more input/output devices or terminals.

device number. (1) The reference number assigned to any external device. (2) A part of an external page address that refers to a particular paging device. In OS/VS2, together with a group number and a slot number, it identifies the location of a page in external page storage.

device type. The general name for a kind of device; for example, 2311, 2400, 2400-1.

* **diagnostic.** Pertaining to the detection and isolation of a malfunction or mistake.

digit. A symbol that represents one of the non-negative integers smaller than the radix. For example, in decimal notation, a digit is one of the characters from 0 through 9. Synonymous with *numeric character.*

direct access. (1) Retrieval or storage of data by a reference to its location on a volume, rather than relative to the previously retrieved or stored data. (2) * Pertaining to the process of obtaining data from, or placing data into, storage where the time required for such access is independent of the location of the data most recently obtained or placed in storage. (3) * Pertaining to a storage device in which the access time is effectively independent of the location of the data.

direct access storage device (DASD). A device in which the access time is effectively independent of the location of the data.

disk. (1) Loosely, a *disk storage device.* (2) See *magnetic disk.*

disk pack. A removable direct access storage volume containing magnetic disks on which data is stored. Disk packs are mounted on a disk storage drive, such as the IBM 2314 Disk Storage Drive.

disk storage. Storage on direct access devices that record data magnetically on rotating disks.

dismount. See *demount.*

* **display.** A visual presentation of data.

display line. On a display device, the series of character locations that constitute a horizontal line on the display surface. Synonymous with *character row.*

display position. On a display device, the series of character locations that constitute a vertical line on the display surface.

* **display tube.** A tube, usually a cathode ray tube, used to display data.

* **drive.** See *tape drive.*

* **drum.** See *magnetic drum.*

drum storage. A direct access storage device that records data magnetically on a rotating cylinder. A type of addressable auxiliary storage associated with some computers.

* **dump.** (1) To copy the contents of all or part of a storage, usually from an internal storage into an external storage. (2) A process as in (1). (3) The data resulting from the process as in (1).

duplex channel. A channel providing simultaneous transmission in both directions.

duplexed system. In communications, a system with two distinct and separate sets of facilities, each of which is capable of assuming the system function while the other assumes a standby status. Usually, the sets are identical.

dynamic allocation. Assignment of system resources to a program at the time the program is executed rather than at the time it is loaded into main storage.

dynamic data set definition. The process of defining a data set and allocating auxiliary storage space for it during job step execution rather than before job step execution.

dynamic device reconfiguration (DDR). A facility that allows a demountable volume to be moved, and repositioned if necessary, without abnormally terminating the job or repeating the initial program load procedure.

* **dynamic dump.** A dump that is performed during the execution of a computer program.

* **dynamic storage allocation.** A storage allocation technique in which the location of computer programs and data is determined by criteria applied at the moment of need.

EBCDIC. *Extended binary coded decimal interchange code.*

end of block (EOB). A code that marks the end of a block of data.

end-of-file mark (EOF). A code which signals that the last record of a file has been read.

* **end of tape marker.** A marker on a magnetic tape used to indicate the end of the permissible recording area, for example, a photo-reflective strip, a transparent section of tape, or a particular bit pattern.

entering. The process in which a terminal places on the line a message to be transmitted to the computer. Contrast with *accepting.* See also *receiving, sending.*

environmental recording, editing, and printing. See *EREP.*

EOB. *End of block.*

EOF. *End of file mark.*

EOV. End of volume.

* **erase.** To obliterate information from a storage medium, for example, to clear, to overwrite.

EREP. The environmental recording, editing, and printing program that makes the data contained on the system recorder file available for further analysis.

*American National Standard Definition

error condition. The state that results from an attempt to execute instructions in a computer program that are invalid or that operate on invalid data.

* **error message.** An indication that an error has been detected.

execute (EXEC) statement. A job control language (JCL) statement that marks the beginning of a job step and identifies the program to be executed or the cataloged or in-stream procedure to be used.

execution batch processing. The concatenation of jobs or transactions that come from possibly different input sources and have possibly different output routings, and the execution of these jobs or transactions as if they were one continuous input stream. The purpose is to improve system performance by reducing the overhead of bringing different batch processors in and out of the system.

execution priority. A rank assigned to a task that determines its precedence in being selected for execution.

extended binary coded decimal interchange code (EBCDIC). A set of 256 characters, each represented by eight bits.

external interruption. An interruption caused by a signal from the interruption key on the system console panel, from the timer, or from another computing system.

external writer. In OS/VS2, a program that supports the ability to write SYSOUT data in ways and to devices not supported by the job entry subsystem.

facility. (1) A feature of an operating system, designed to serve a particular purpose, for example, the checkpoint/restart facility. (2) A measure of how easy it is to use a data processing system. Together with system performance, a major factor on which the total productivity of an installation depends. (3) Anything used or available for use in furnishing communication service. Commonly, a general term for communications paths.

* **field.** In a record, a specified area used for a particular category of data, for example, a group of card columns used to represent a wage rate or a set of bit locations in a computer word used to express the address of the operand.

fixed page. In System/370 virtual storage systems, a page in real storage that is not to be paged-out.

* **fixed storage.** Storage whose contents are not alterable by computer instructions, for example, magnetic core storage with a lockout feature, photographic disk. Synonymous with nonerasable storage, *permanent storage,* read-only storage.

* **flag.** (1) Any of various types of indicators used for identification, for example, a wordmark. (2) A character that signals the occurrence of some condition, such as the end of a word.

foreground. (1) In multiprogramming, the environment in which high-priority programs are executed. (2) Under TSO, the environment in which programs are swapped in and out of main storage to allow CPU time to be shared among terminal users. All command processor programs execute in the foreground. Contrast with *background.*

foreground job. (1) A high-priority job, usually a real-time job. (2) A teleprocessing or graphic display job that has an indefinite running time during which communication is established with one or more users at local or remote terminals. (3) Under TSO, any job executing in a swapped region of main storage, such as a command processor or a terminal user's program. Contrast with *background job.*

* **format.** The arrangement of data.

fullword. See *computer word.*

generalized trace facility. An optional OS/VS service program that records significant system events (such as supervisor calls and start I/O operations) for the purpose of problem determination. Abbreviated GTF.

general register. A register used for operations such as binary additon, subtraction, multiplication, and division. General registers are used primarily to compute and modify addresses in a program.

* **graphic.** A symbol produced by a process such as handwriting, drawing, or printing.

* **graphic character.** A character normally represented by a graphic.

Greenwich mean time (GMT). The mean solar time of the meridian of Greenwich used as the prime basis of standard time throughout the world. See also *TOD clock.*

GTF. *Generalized trace facility.*

* **halfword.** A contiguous sequence of bits or characters which comprises half a computer word and is capable of being addressed as a unit.

hard copy. A printed copy of machine output in a visually readable form; for example, printed reports, listings, documents, and summaries. See also *display (1).*

hardcopy log. In systems with multiple console support or a graphic console, a permanent record of system activity.

* **hardware.** Physical equipment, as opposed to the computer program or method of use, for example, mechanical, magnetic, electrical, or electronic devices. Contrast with *software.*

HASP. An extension to the System/360 Operating System that provides supplementary job management, data management, and task management functions such as control of job flow, ordering of tasks, and spooling.

hexadecimal. Pertaining to a number system with a base of 16; valid digits range from 0 through F, where F represents the highest units position (15).

high local date. The highest valid local date that can be specified. (On most systems, 99.365, that is, December 31, 1999.)

host-id. The unique ten-digit CPU identification made up of the six-digit CPU serial number followed by a four-digit model number.

IBM System/370. An upward-compatible extension of the IBM System/360, offering new function and improved price/performance.

* **identifier.** A symbol whose purpose is to identify, indicate or name a body of data.

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*American National Standard Definition

independent mode. A means of isolating a processor for testing purposes. A processor so designated will only process jobs that are both routed to it and are themselves designated to execute on a processor in independent mode.

* **initialize.** To set counters, switches, and addresses to zero or other starting values at the beginning of, or at prescribed points in, a computer routine. Synonymous with *prestore.*

initial program load (IPL). The initialization procedure that causes an operating system to commence operation.

* **initial program loader (IPL).** The procedure that causes the initial part of an operating system or other program to be loaded such that the program can then proceed under its own control.

initiating task. The job management task that controls the selection of a job and the preparation of the steps of that job for execution.

initiator/terminator. The job scheduler function that selects jobs and job steps to be executed, allocates input/output devices for them, places them under task control, and at completion of the job, supplies control information for writing job output on a system output unit.

* **input.** (1) Pertaining to a device, process, or channel involved in the insertion of data or states, or to the data or states involved. (2) One, or a sequence of, input states. (3) Same as *input device.*

* **input device.** The device or collective set of devices used for conveying data into another device. Synonymous with input (3).

input job queue. Same as *input work queue.*

input/output (1) * Pertaining to either input or output, or both. (2) A general term for the equipment used to communicate with a computer, commonly called I/O. (3) The data involved in such communication. (4) The media carrying the data for input/output.

input/output interruption. *See I/O interruption.*

input queue. Same as *input work queue.*

input reader. *See reader (2).*

input stream. The sequence of job control statements and data submitted to an operating system on an input unit especially activated for this purpose by the operator. Synonymous with input job stream, *job input stream.*

input stream control. Same as *JES reader.*

input work queue. In OS/360 and OS/VS, a queue (waiting list) of job definitions in direct access storage assigned to a job class and arranged in order of assigned priority. Synonymous with *input queue, input job queue, job queue.*

installation. A particular computing system, in terms of the work it does and the people who manage it, operate it, apply it to problems, service it, and use the results it produces.

* **instruction counter.** A counter that indicates the location of the next computer instruction to be interpreted.

internal reader. A facility that allows HASP, JES2, or JES3 to accept commands, control cards, and jobs from a program as though they were submitted through a card reader supported by HASP or JES.

interrupt. (1) * To stop a process in such a way that it can be resumed. (2) In data transmission, to take an action at a receiving station that causes the transmitting station to terminate a transmission.

interruption. A break in the normal sequence of instruction execution. It causes an automatic transfer to a preset storage location where appropriate action is taken. See also *external interruption, I/O interruption, machine check interruption, program check interruption, SVC interruption.*

* **I/O.** *input/output.*

I/O interruption. An interruption caused by the termination of an I/O operation or by operator intervention at the I/O device.

IPL. (1) * *Initial program loader.* (2) *Initial program load.*

JCL. *Job control language.*

JES. *Job entry subsystem.*

JES reader. In OS/VS, the part of the job entry subsystem that controls the input stream and its associated job control statements. Synonymous with *input stream control.*

JES writer. In OS/VS, the part of the job entry subsystem that controls the output of specified data sets. Synonymous with *output stream control.*

job. (1) * A specified group of tasks prescribed as a unit of work for a computer. By extension, a job usually includes all necessary computer programs, linkages, files, and instructions to the operating system. (2) A collection of related problem programs, identified in the input stream by a JOB statement followed by one or more EXEC and DD statements. (3) See also *batched job, background job, foreground job.*

job class. Any one of a number of job categories that can be defined under an MFT or MVT control program configuration. By classifying jobs and directing initiator/terminators to initiate specific classes of jobs, it is possible to control the mixture of jobs that are performed concurrently.

job control language (JCL). A programming language used to code job control statements.

* **job control statement.** A statement in a job that is used in identifying the job or describing its requirements to the operating system.

job entry subsystem. In OS/VS, a system facility for spooling, job queueing, and managing the scheduler work area. Abbreviated JES.

job input device. A device assigned by the operator to read job definitions and any accompanying input data.

job input stream. Same as *input stream.*

jobname. The name assigned to a JOB statement; it identifies the job to the system.

job output device. A device assigned by the operator for common use in recording output data for a series of jobs.

job output element. Information that describes a unit of work for the HASP or JES2 output processor and represents that unit of work for queuing purposes.

job output stream. Same as *output stream.*

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*American National Standard Definition

job pack area. Under MVT and OS/VS2, the two subpools in a region into which executable programs are loaded.

job priority. Under MVT and OS/VS2, a value assigned to a job that, together with an assigned job class, determines the priority to be used in scheduling the job and allocating resources to it.

job processing. The reading of job control statements and data from an input stream, the initiating of job steps defined in the statements, and the writing of system output messages.

job queue. Same as *input work queue.*

job (JOB) statement. The job control statement that identifies the beginning of a job. It contains such information as the name of the job, an account number, and the class and priority assigned to the job.

job step. (1) * The execution of a computer program explicitly identified by a job control statement. A job may specify that several job steps be executed. (2) A unit of work associated with one processing program or one cataloged procedure and related data. A job consists of one or more job steps.

job step initiation. The process of selecting job steps for execution and allocating input/output devices for them.

job step restart. Same as *step restart.*

job step task. A task that is initiated by an initiator/terminator in the job scheduler in accordance with specifications in an execute (EXEC) statement.

job stream. See *input stream, output stream.*

JOE. *Job output element.*

JPA. *Region job pack area.*

K. 1024 bytes; used in referring to storage capacity.

keyboard. A device for the encoding of data by key depression, which causes the generation of the selected code element.

keyword. A part of a command operand that consists of a specific character string (such as DSNAME=).

keyword parameter. A parameter that consists of a keyword, followed by one or more values. Contrast with *positional parameter.*

label. (1) * One or more characters used to identify a statement or an item of data in a computer program. (2)An identification record for a tape or disk file.

library. (1) * A collection of organized information used for study and reference. (2) * A collection of related files. For example, one line of an invoice may form an item, a complete invoice may form a record, the complete set of such records may form a file, the collection of inventory control files may form a library, and the libraries used by an organization are known as its data bank. (3) In OS/360 and OS/VS, any partitioned data set.

light pen attention. An interruption generated by a light pen when it senses light on the screen of a CRT display device. Synonymous with *selector pen attention.*

line. (1) On a terminal, one or more characters entered before a return to the first printing or display position. (2) A string of characters accepted by the system as a single block of input from a terminal, for example, all characters entered before a carriage return or all characters entered before the terminal user hits the attention key. (3) In communications, same as channel, circuit.

line number. (1) A number associated with a line in a printout or display. (2) In systems with time sharing, a number associated with a line in a line data set.

link pack area. In OS/VS2, an area of virtual storage containing reenterable routines that are loaded at IPL time and can be used concurrently by all tasks in the system. Abbreviated LPA.

listing. A printout, usually prepared by a language translator, that lists the source language statements and contents of a program.

* **load.** In programming, to enter data into storage or working registers.

local date. The local year and day of the year. See *high local date.* Contrast with *TOD clock.*

local system queue area (LSQA). In OS/VS2, one or more segments associated with each virtual storage region that contain job-related system control blocks.

* **location.** Any place in which data may be stored.

logical unit. The combination of programming and hardware of a teleprocessing subsystem that functions like a terminal to VTAM.

logon. The procedure by which a user begins a terminal session.

logoff. The procedure by which a user ends a terminal session.

* **loop.** A sequence of instructions that is executed repeatedly until a terminal condition prevails.

LPA. *Link pack area.*

LSQA. *Local system queue area.*

machine check interruption. An interruption that occurs as a result of an equipment malfunction or error.

* **magnetic disk.** A flat circular plate with a magnetic surface on which data can be stored by selective magnetization of portions of the flat surface.

* **magnetic drum.** A right circular cylinder with a magnetic surface on which data can be stored by selective magnetization of portions of the curved surface.

* **magnetic tape.** A tape with a magnetic surface on which data can be stored by selective polarization of portions of the surface.

magnetic tape label. One or more records at the beginning of a magnetic tape that identifies and describes the data recorded on the tape and contains other information, such as the serial number of the tape reel.

* **main frame.** Same as *central processing unit.*

main storage. (1) * The general purpose storage of a computer. Usually, main storage can be accessed directly by the operating registers. Contrast with *auxiliary storage.* (2) All program-addressable storage from which instructions may be executed and from which data can be loaded directly into registers. (3) See also *real storage, virtual storage.*

*American National Standard Definition

master console. In a system with multiple consoles, the basic console used for communication between the operator and the system.

master scheduler. A control program routine that responds to operator commands and initiates the requested actions.

MCS. *Multiple console support.*

memory. * Same as *storage.*

message. (1) * An arbitrary amount of information whose beginning and end are defined or implied. (2) In telecommunications, a combination of characters and symbols transmitted from one point to another on a network. (3) * See *error message, operator message.*

message queue. A queue of messages that are awaiting processing or waiting to be sent to a terminal.

message routing. The process of selecting the correct circuit path for a message.

message text. The part of a message consisting of the actual information that is routed to a user at a terminal or to a program.

* **monitor.** Software or hardware that observes, supervises, controls or verifies the operations of a system.

MSS. Mass Storage System.

MSC. Mass Storage Controller.

Multi-Access Spool complex. Two to seven systems sharing the JES2 input, job and output queues through the use of shared DASD.

Multi-Access Spool multiprocessing. Two or more computing systems interconnected by an I/O channel-to-channel adapter. The CPUs can be different types and have their own unique configurations.

multiple console support. A feature of OS/VS2 that permits selective message routing to up to 32 operator's consoles. Abbreviated MCS.

multiprocessing. (1) * Pertaining to the simultaneous execution of two or more computer programs or sequences of instructions by a computer network. (2) * Loosely, parallel processing. (3) Simultaneous execution of two or more sequences of instructions by a multiprocessor.

multiprocessing system. A computing system employing two or more interconnected processing units to execute programs simultaneously.

multiprocessor. (1) * A computer employing two or more processing units under integrated control. (2) A system consisting of two or more CPUs (or ALUs, or processors) that can communicate without manual intervention.

name. A 1-to-8 character alphameric term that identifies a data set, a control statement, or program, or a cataloged procedure. The first character of the name must be alphabetic.

network. In teleprocessing, a number of communication lines connecting a computer with remote terminals.

network operator. (1) The person responsible for controlling the operation of a telecommunication network. (2) A VTAM application program authorized to issue network operator commands.

NIP. *Nucleus initialization program.*

node. An addressable point in a telecommunication system defined to VTAM by a symbolic name.

* **nonpageable dynamic area** In OS/VS, an area of virtual storage whose virtual addresses are identical to real addresses; it is used for programs or parts of programs that are not to be paged during execution. Synonymous with *V=R dynamic area.*

nonpageable region. In OS/VS2, a subdivision of the nonpageable dynamic area that is allocated to a job step or system task that is not to be paged during execution. In a nonpageable region, each virtual address is identical to its real address. Synonymous with V=R region.

nonstandard labels. Labels that do not conform to American National Standard or IBM System/360 and System/370 standard label conventions.

nontemporary data set. A data set that exists after the job that created it terminates. Contrast with *temporary data set.*

nucleus. That portion of a control program that always remains in main storage.

nucleus initialization program (NIP). The program that initializes the resident control program; it allows the operator to request last minute changes to certain options specified during system generation.

* **null character.** A control character that serves to accomplish media fill or time fill, for example, in ASCII the all zeroes character (not numeric zero). Null characters may be inserted into or removed from a sequence of characters without affecting the meaning of the sequence, but control of equipment or the format may be affected. Abbreviated NUL. Contrast with *space character.*

* **number.** (1) A mathematical entity that may indicate quantity or amount of units. (2) Loosely, a numeral.

* **numeric.** Pertaining to numerals or to representation by means of numerals.

* **numeric character.** Same as *digit.*

* **offline.** Pertaining to equipment or devices not under control of the central processing unit.

* **offline storage.** Storage not under control of the central processing unit.

* **online.** (1) Pertaining to equipment or devices under control of the central processing unit. (2) Pertaining to a user's ability to interact with a computer.

* **online storage.** Storage under the control of the central processing unit.

operand. (1) * That which is operated upon. An operand is usually identified by an address part of an instruction. (2) Information entered with a command name to define the data on which a command processor operates and to control the execution of the command processor.

* **operating system (OS).** Software which controls the execution of computer programs and which may provide scheduling, debugging, input/output control, accounting, compilation, storage assignment, data management, and related services.

*American National Standard Definition

Operating System/Virtual Storage (OS/VS). A compatible extension of the IBM System/360 Operating System that supports relocation hardware and the extended control facilities of System/370.

operator. (1) * In the description of a process, that which indicates the action to be performed on operands. (2) * A person who operates a machine.

operator command. A statement to the control program, issued via a console device, or control terminal, that causes the control program to provide requested information, alter normal operations, initiate new operations, or terminate existing operations.

operator control station. Under TCAM, any station that is eligible to enter the operator commands.

operator message. A message from the operating system or a problem program directing the operator to perform a specific function, such as mounting a tape reel, or informing him of specific conditions within the system, such as an error condition.

OS/VS. Operating System/Virtual Storage.

* **output.** (1) Pertaining to a device, process, or channel involved in an output process, or to the data or states involved. (2) One, or a sequence of, output states. (3) Same as *output device* (4) Same as *output process.*

output class. Under MFT, MVT, and OS/VS, any one of up to 36 different categories, defined at an installation, to which output data produced during a job step can be assigned. When an output writer is started, it can be directed to process from one to eight different classes of output data.

* **output device.** The device or collective set of devices used for conveying data out of another device. Synonymous with *output* (3).

* **output process.** The process of delivering data by a system, subsystem, or device. Synonymous with *output* (4).

output queue. See *output work queue.*

output stream. Diagnostic messages and other output data issued by an operating system or a processing program on output devices especially activated for this purpose by the operator. Synonymous with *job output stream.*

output stream control. Same as *JES writer.*

output work queue. A queue of control information describing system output data sets, that specifies to an output writer the location and disposition of system output.

output writer. A part of the job scheduler that transcribes specified output data sets onto a system output device independently of the program that produced the data sets.

page. (1) In virtual storage systems, a fixed-length block of instructions, data, or both, that can be transferred between real storage and external page storage. (2) To transfer instructions, data, or both, between real storage and external page storage.

pageable region. In OS/VS2, a subdivision of the pageable dynamic area that is allocated to a job step or a system task that can be paged during execution. Synonymous with V = V region.

page data set. In System/370 virtual storage systems, a data set in external page storage in which pages are stored.

page fault. In System/370 virtual storage systems, a program interruption that occurs when a page that is marked "not in real storage" is referred to by an active page.

paging. In System/370 virtual storage systems, the process of transferring pages between real storage and external page storage.

paging device. In System/370 virtual storage systems, a direct access storage device on which pages (and possibly other data) are stored.

parameter. (1) * A variable that is given a constant value for a specific purpose or process. (2) See *keyword parameter, positional parameter.*

password. (1) A unique string of characters that a program, computer operator, or user must supply to meet security requirements before gaining access to data. (2) In systems with time sharing, a one-to eight-character symbol that the user may be required to supply at the time the user logs on the system. The password is confidential, as opposed to the user identification.

path. In VTAM, the intervening nodes and lines connecting a terminal and an application program in the host CPU.

* **permanent storage.** Same as *fixed storage.*

physical unit. (1) The control unit or cluster controller of an SNA terminal. (2) The part of the control unit or cluster controller that fulfills the role of a physical unit as defined by systems network architecture.

positional parameter. A parameter that must appear in a specified location, relative to other parameters. Contrast with *keyword parameter.*

* **postmortem dump.** A static dump, used for debugging purposes, performed at the end of a machine run.

* **prestore.** Same as *initialize.*

* **preventive maintenance.** Maintenance specifically intended to prevent faults from occurring during subsequent operation.

printer. (1) A device that writes output data from a system on paper or other media. (2) * See *chain printer; train printer.*

priority. A rank assigned to a task that determines its precedence in receiving system resources. See also *job priority.*

private library. A user-owned library that is separate and distinct from the system library.

private volume. In OS/360 and OS/VS, a mounted volume that the system can allocate only to an output data set for which a specific volume request is made. A private volume is demounted after its last use in a job step. Contrast with *public volume.*

problem program. Any program that is executed when the central processing unit is in the problem state; that is, any program that does not contain privileged instructions. This includes IBM-distributed programs, such as language translators and service programs, as well as programs written by a user.

*American National Standard Definition

procedure. (1) * The course of action taken for the solution of a problem. (2) In a procedure oriented language, an independent, named block of statements that defines a specific portion of a program.

procedure library. A program library in direct access storage containing job definitions. The reader/interpreter can be directed to read and interpret a particular job definition by an execute statement in the input stream.

processing unit. See *central processing unit.*

processor storage. General purpose storage that is part of a central processing unit. Synonymous with *real storage.*

PROC statement. A job control statement used in cataloged or in-stream procedures. It can be used to assign default values for symbolic parameters contained in a procedure. For in-stream procedures, it is used to mark the beginning of the procedure.

* **program.** (1) A series of actions proposed in order to achieve a certain result. (2) Loosely, a routine. (3) To design, write and test a program as in (1). (4) Loosely, to write a routine. (5) See computer program.

program check interruption. An interruption caused by unusual conditions encountered in a program, such as incorrect operands.

program interruption. *See interruption, program check interruption.*

* **program library.** A collection of available computer programs and routines.

* **programmed check.** A check procedure designed by the programmer and implemented specifically as a part of his program.

program status word (PSW). A doubleword in main storage used to control the order in which instructions are executed, and to hold and indicate the status of the computing system in relation to a particular program.

PSW. *Program status word.*

public volume. In OS/360 and OS/VS, a mounted volume that the system can allocate to an output data set for which a nonspecific volume request is made. A public volume remains mounted until the device on which it is mounted is required for another volume. Contrast with *private volume.*

* **punch.** A perforation, as in a punched card or paper tape.

queue. (1) A waiting line or list formed by items in a system waiting for service; for example, tasks to be performed or messages to be transmitted in a message switching system. (2) To arrange in, or form, a queue.

* **quiescing.** (1) The process of bringing a device or a system to a halt by rejection of new requests for work. (2) The process of bringing a system to a halt by rejection of new jobs.

* **range.** (1) The set of values that a quantity or function may assume. (2) The difference between the highest and lowest value that a quantity or function may assume.

* **read.** To acquire or interpret data from a storage device, a data medium, or any other source.

reader. (1) A device that converts information in one form of storage to information in another form of storage. (2) A part of the scheduler that reads an input stream into the system.

reader/interpreter. A part of job management that reads and interprets a series of job definitions from an input stream.

real address. In virtual storage systems, the address of a location in real storage.

real storage. (1) In System/370 virtual storage systems, the storage of a System/370 computing system from which the central processing unit can directly obtain instructions and data, and to which it can directly return results. (2) Same as *processor storage.*

receiving. The process by which a computer obtains a message from a line. Contrast with *sending.* See also *accepting, entering.*

recoverable ABEND. An error in which control is passed to a specified routine that allows continued execution of the program. Contrast with *unrecoverable ABEND.*

recoverable error. An error condition that allows continued execution of a program.

reel. A mounting for a roll of tape.

region job pack area. In OS/VS2, an area in a virtual storage region that contains modules that are not in the link pack area but are needed for the execution of jobs. Abbreviated JPA.

* **register.** A device capable of storing a specified amount of data such as one word.

remote device. A device attached to a remote station for sending input and receiving output.

remote job entry. Submission of job control statements and data from a remote terminal, causing the jobs described to be scheduled and executed as though encountered in the input stream.

* **remote station.** Data terminal equipment for communicating with a data processing system from a location that is time, space, or electrically distant.

remote terminal. An input/output control unit and one or more input/output devices attached to a system through a transmission control unit.

* **rerun.** A repeat of a machine run, usually because of a correction, an interruption, or a false start.

* **reset.** (1) To restore a storage device to a prescribed initial state, not necessarily that denoting zero. (2) To place a binary cell into the state denoting zero.

resident. Pertaining to a program that is permanently located in storage. For example, the nucleus in main storage or a system library on direct access storage.

resource. Any facility of the computing system or operating system required by a job or task, and including main storage, input/output devices, the central processing unit, data sets, and control or processing programs.

* **restart.** To reestablish the execution of a routine, using the data recorded at a checkpoint.

*American National Standard Definition

rewind. To return a magnetic or paper tape to its beginning.

* **routine.** An ordered set of instructions that may have some general or frequent use.

routing. The assignment of the communications path by which a message or telephone call will reach its destination.

routing code. A code assigned to an operator message and used, in systems with multiple console support (MCS), to route the message to the proper console.

* **scheduled maintenance.** Maintenance carried out in accordance with an established plan.

secondary console. In a system with multiple consoles, any console except the master console. The secondary console handles one or more assigned functions on the multiple console system.

secondary storage. Same as *auxiliary storage.*

security. Prevention of access to or use of data or programs without authorization.

* **selective dump.** A dump of one or more specified storage locations.

selector pen attention. Same as *light pen attention.*

sending. The process by which the central computer places a message on a line for transmission to a terminal. Contrast with *receiving.* See also *accepting, entering.*

sequence. (1) * An arrangement of items according to a specified set of rules. (2) In sorting, a group of records whose control fields are in ascending or descending order, according to the collating sequence.

* **sequential.** Pertaining to the occurrence of events in time sequence, with little or no simultaneity or overlap of events.

Session. The period of time during which a user engages in a dialog with a conversational time sharing system; the elapsed time from when a terminal user logs on the system until he logs off the system; in VTAM, the period of time during which a node is connected to an application program.

* **set.** (1) A collection. (2) To place a storage device into a specified state, usually other than that denoting zero or space character. Contrast with *clear.*

setup. The preparation of a computing system to perform a job or job step. Setup is usually performed by an operator and often involves performing routine functions, such as mounting tape reels and loading card decks.

shared DASD option. An OS/360 and OS/VS option that enables independently operating computing systems to jointly use common data residing on shared direct access storage devices.

shared file. A direct access device that may be used by two systems at the same time; a shared file may link two systems.

shared main storage multiprocessing. A mode of operation in which two processing units have access to all of main storage.

* **sharing.** See *time sharing.*

SMF. *System management facilities.*

SNA. *Systems network architecture.*

* **software.** A set of programs, procedures, and possibly associated documentation concerned with the operation of a data processing system. For example, compilers, library routines, manuals, circuit diagrams. Contrast with *hardware.*

space. (1) * A site intended for the storage of data, for example, a site on a printed page or location in a storage medium. (2) * A basic unit of area, usually the size of a single character. (3) * One or more space characters. (4) * To advance the reading or display position according to a prescribed format, for example, to advance the printing or display position horizontally to the right or vertically down. Contrast with *backspace.*

* **space character.** A normally nonprinting graphic character used to separate words. The space character is also a format effector which controls the movement of the printing or display position, one position forward. The space character may also be considered in the hierarchy of information separators. Abbreviated SP. Synonymous with *blank character.* Contrast with *null character.*

* **special character.** A graphic character that is neither a letter, nor a digit, nor a space character.

spooled data set. A data set written on an auxiliary storage device.

spooling. The reading and writing of input and output streams on auxiliary storage devices, concurrently with job execution, in a format convenient for later processing or output operations.

SQA. *System queue area.*

standard job. A JES3 job that consists of input service, main service, output service, and purge performed in that order.

* **step.** (1) One operation in a computer routine. (2) To cause a computer to execute one operation. (3) See *job step.*

step restart. A restart that begins at the beginning of a job step. The restart may be automatic or deferred, where deferral involves resubmitting the job. Contrast with *checkpoint restart.*

* **storage.** (1) Pertaining to a device into which data can be entered, in which they can be held, and from which they can be retrieved at a later time. (2) Loosely, any device that can store data. See *auxiliary storage, fixed storage, main storage, permanent storage, real storage, virtual storage, volatile storage.*

* **storage allocation.** (1) The assignment of blocks of data to specified blocks of storage. (2) See *dynamic storage allocation.*

* **storage device.** A device into which data can be inserted, in which they can be retained, and from which they can be retrieved.

storage reconfiguration. A function that makes an area of defective storage unavailable and frees any system resources associated with it.

* **store.** To enter data into a storage device. (2) To retain data in a storage device. (3) A storage device.

*American National Standard Definition

subsystem. A secondary or subordinate system, usually capable of operating independently of, or asynchronously with, a controlling system.

subsystem-id. The three-digit address of a specific MSS device. These devices are part of the MSS subsystem and do not have a unit control block in the host system.

supervisor. The part of a control program that coordinates the use of resources and maintains the flow of CPU operations.

SVC interruption. An interruption caused by the execution of a supervisor call instruction, causing control to be passed to the supervisor.

swap. (1) In systems with time sharing, to write the main storage image of a job to auxiliary storage and read the image of another job into main storage. (2) Under OS/VS2 with TSO, to write the active pages of a job to external page storage and read pages of another job from external page storage into real storage.

swap data set. A data set dedicated to the swapping operation.

swapping. (1) In systems with time sharing, a process that writes a job's main storage image to auxiliary storage, and reads another job's main storage image into main storage. (2) Under OS/VS2 with TSO, a paging technique that writes the active pages of a job to external page storage and reads pages of another job from external page storage into real storage.

symbol. (1) * A representation of something by reason of relationship, association, or convention. (2) In OS/360 and OS/VS, any group of eight or less alphameric and national characters that begins with an alphabetic or national (#,@,$) character.

* **symbolic address.** An address expressed in symbols convenient to the computer programmer.

* **syntax.** (1) The structure of expressions in a language. (2) The rules governing the structure of a language.

SYSGEN. *System generation.*

SYSIN. A system input stream; also, the name used as the data definition name of a data set in the input stream.

SYSLOG. *System log.*

SYSOUT. A system output stream; also, an indicator used in data definition statements to signify that a data set is to be written on a system output unit.

* **system.** (1) An assembly of methods, procedures, or techniques united by regulated interaction to form an organized whole. (2) An organized collection of people, machines, and methods required to accomplish a set of specific functions.

system generation (SYSGEN). The process of using an operating system to assemble and link together all of the parts that constitute another operating system.

system input device. A device specified as the source of an input stream.

system library. A collection of data sets in which the various parts of an operating system are stored.

system log. A data set in which job-related information, operational data, descriptions of unusual occurrences, commands, and messages to or from the operator may be stored. Abbreviated SYSLOG.

system management facilities (SMF). An optional control program feature of OS/360 and OS/VS that provides the means for gathering and recording information that can be used to evaluate system usage.

system output device. A device assigned to record output data for a series of jobs.

system output writer. A job scheduler function that transcribes specified output data sets onto a system output unit, independently of the program that produced the data sets.

system programmer. (1) A programmer who plans, generates, maintains, extends, and controls the use of an operating system with the aim of improving the overall productivity of an installation. (2) A programmer who designs programming systems and other applications.

system queue area (SQA). In OS/VS, an area of virtual storage reserved for system-related control blocks.

system residence volume. The volume on which the nucleus of the operating system and the highest-level index of the catalog are located.

system resource. Any facility of the computing system that may be allocated to a task.

system restart. (1) A restart that allows reuse of previously-initialized input and output work queues. Synonymous with *warm start.* (2) A restart that allows reuse of a previously-initialized link pack area. Synonymous with quick start.

system task. A control program function that is performed under the control of a task control block.

systems network architecture (SNA). The total description of the logical structure, formats, protocols, and operational sequences for transmitting information units through a communication system.

* **tape drive.** A device that moves tape past a head.

* **tape unit.** A device containing a tape drive, together with reading and writing heads and associated controls.

task. A unit of work for the central processing unit; therefore, the basic multiprogramming unit under the control program.

TCAM. *Telecommunications access method.*

telecommunications. (1) * Pertaining to the transmission of signals over long distances, such as by telegraph, radio, or television. (2) Data transmission between a computing system and remotely located devices via a unit that performs the necessary format conversion and controls the rate of transmission.

telecommunications access method (TCAM). A method used to transfer data between main storage and remote or local terminals. Application programs use either GET and PUT or READ and WRITE macro instructions to request the transfer of data, which is performed by a message control program. The message control program synchronizes the transfer, thus eliminating delays for terminal input/output operations.

*American National Standard Definition

teleprocessing. The processing of data that is received from or sent to remote locations by way of telecommunication lines.

temporary data set. A data set that is created and deleted in the same job. Contrast with *nontemporary data set.*

terminal. A device, usually equipped with a keyboard and some kind of display, capable of sending and receiving information over a communication channel.

terminal user. In systems with time sharing, anyone who is eligible to log on.

text. The data portion of a telecommunications message.

tightly-coupled multiprocessing. Two computing systems operating simultaneously under one control program while sharing resources.

time sharing. (1) * Pertaining to the interleaved use of the time of a device. (2) A method of using a computing system that allows a number of users to execute programs concurrently and to interact with the programs during execution.

TOD clock. A binary counter that measures the time elapsed at Greenwich, England, in microseconds, since 0 hours, 0 minutes, 0 seconds, January 1, 1900. See also *Greenwich mean time.*

trace. (1) The record of a series of events. (2) To record a series of a events as they occur.

* **tracing routine.** A routine that provides a historical record of specified events in the execution of a program.

train printer. A printer in which the type slugs are assembled in a train that moves along a track. Contrast with *chain printer.*

unallocate. See *deallocate.*

* **unit.** (1) A device having a special function. (2) A basic element. (3) See *central processing unit, control unit.*

unit address. The three-character address of a particular device, specified at the time a system is installed; for example, 191 or 293.

universal character set (UCS). A printer feature that permits the use of a variety of character arrays.

unrecoverable ABEND. An error condition that results in abnormal termination of a program. Contrast with *recoverable ABEND.*

unrecoverable error. An error that results in abnormal termination of a program.

update. To modify a master file with current information according to a specified procedure.

user. Anyone who requires the services of a computing system. See also *terminal user.*

user exit. A point in an IBM-supplied program at which a user exit routine may be given control.

user exit routine. A routine written by a user to take control at a user exit of a program supplied by IBM.

USERID. *User identification.*

user identification (USERID). A one-to-eight-character symbol identifying a system user.

utility program. A problem program designed to perform an everyday task, such as transcribing data from one storage device to another.

* **variable.** A quantity that can assume any of a given set of values.

virtual address. In virtual storage systems, an address that refers to virtual storage and must, therefore, be translated into a real storage address when it is used.

virtual address space. In virtual storage systems, the virtual storage assigned to a job, terminal user, or system task.

virtual equals real (V = R) storage. Same as *nonpageable dynamic area.*

virtual region. In OS/VS2, a subdivision of the dynamic area that is allocated (in segment-size blocks) to a job step or a system task.

virtual storage. Addressable space that appears to the user as real storage, from which instructions and data are mapped into real storage locations. The size of virtual storage is limited by the addressing scheme of the computing system (or virtual machine) and by the amount of auxiliary storage available, rather than by the actual number of real storage locations.

virtual storage region. See *virtual region.*

virtual telecommunications access method (VTAM). A set of IBM programs that control communication between terminals and application programs running under DOS/VS, OS/VS1, and OS/VS2.

* **volatile storage.** A storage device in which stored data are lost when the applied power is removed, for example, an acoustic delay line.

volume. (1) That portion of a single unit of storage which is accessible to a single read/write mechanism, for example, a drum, a disk pack, or part of a disk storage module. (2) A recording medium that is mounted and demounted as a unit, for example, a reel of magnetic tape, a disk pack, a data cell.

volume serial number. A number in a volume label that is assigned when a volume is prepared for use in the system.

volume table of contents (VTOC). A table on a direct access volume, that describes each data set on the volume.

V = R dynamic area. Same as *nonpageable dynamic area.*

V = R storage. Same as *nonpageable dynamic area.*

VTAM. *Virtual Telecommunications Access Method.*

VTOC. *Volume table of contents.*

wait state. (1) the condition of a task that is dependent on one or more events in order to enter the ready condition. (2) The condition of a central processing unit when all operations are suspended.

warm start. Same as *system restart (1).*

*American National Standard Definition

warning message. An indication that a possible error has been detected. Contrast with *error message.*

work file. (1) In sorting, an intermediate file used for temporary storage of data between phases. (2) See also *work volume.*

work volume. A volume made available to the system to provide storage space for temporary fields or data sets at peak loads.

* **write.** To record data in a storage device or a data medium. The recording need not be permanent, such as the writing on a cathode ray tube display device.

writer. See *output writer.*

writing task. In OS/360, the job management task that controls the transfer of system messages and SYSOUT data sets from the direct access volume on which they were initially written to a specified output device.

*American National Standard Definition

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