MVS

# Remote Workstation Generation

GC28-1433-00

MVS

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GC28-1433-00

**Note**

Before using this information and the product it supports, be sure to read the general information under “Notices” on page vi.

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This edition applies to Version 5 Release 1 of MVS/ESA System Product (5655-068 or 5655-069) and to all subsequent versions, releases, and modifications until otherwise indicated in new editions or technical newsletters.

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# About This Book

If you are running remote workstations under MVS/ESA*, this book provides the information that you need to:

- Initialize remote workstations
- Generate multi-leaving remote terminal programs (RTPs) for remote job entry workstations.

## Who Should Use This Book

This book is intended for job entry subsystem (JES) system programmers/or for anyone responsible for initializing and generating multi-leaving remote terminal programs for remote job entry workstations. Refer to either *MVS/ESA SP V5 JES2 Initialization and Tuning Guide* or *MVS/ESA SP V5 JES3 Initialization and Tuning Guide* for further information concerning **Remote Job Entry** (RJE) and **Remote Job Processing** (RJP) concepts and remote work station processing. Note that RJE (for JES2) is equivalent to RJP (for JES3). This book is solely concerned with **Remote Workstation Generation** processes.

## How to Use This Book

The organization and content of each chapter are as follows:

- Chapter 1, “Remote Workstation Generation”, briefly describes remote job entry (RJE) concepts, terminology, binary synchronous communication (BSC) RJE considerations, information about remote devices supported by JES, and the remote (RMT) generation procedure (including the RMT statements and RMT generation).
- Chapter 2, “Remote Terminal Processor Statement Descriptions”, describes the remote terminal initialization statements for System/360, System/360 (model 20), and 2922 remote terminal workstation.
- Chapter 3, “Remote Generation Messages”, presents the $HASP900 series messages issued from the two remote generation utilities: REMOTGEN and GENRMT.

Note specifically that Chapter 2 “Remote Terminal Processor Statement Descriptions” is expected to be used as quick reference-type chapter; therefore, the information is summarized in tabular form at the beginning of each section for each work station type, and the statements are listed in alphabetical order for easy reference.

## Where to Find More Information

The following table lists books that contain information related to the information contained in this book.

The list of publications pertains to MVS/ESA SP 5.1. If you are using a different version or release of MVS, refer to the appropriate library guide for the correct titles and order numbers.

When this book references information in other books, the shortened version of the book title is used. The following table shows the shortened titles, complete titles, and order numbers of the books that you might need while you are using this book.

| Short Title Used in This Book | Title | Order Number |
|---|---|---|
| *MVS/ESA SP V5 JES2 Initialization and Tuning Guide* | *MVS/ESA JES2 Initialization and Tuning Guide* | SC28-1453 |
| *MVS/ESA SP V5 JES2 Initialization and Tuning Reference* | *MVS/ESA JES2 Initialization and Tuning Reference* | SC28-1454 |
| *MVS/ESA SP V5 JES3 Initialization and Tuning Guide* | *MVS/ESA JES3 Initialization and Tuning Guide* | SC28-1455 |
| *MVS/ESA SP V5 JES3 Initialization and Tuning Reference* | *MVS/ESA SP V5 JES3 Initialization and Tuning Reference* | SC28-1456 |
| *MVS/ESA SP V5 JCL Reference* | *MVS/ESA JCL Reference* | GC28-1479 |
| *MVS/ESA SP V5 System Messages, Vol 1 (ABA-ASA)* | *MVS/ESA System Messages, Volume 1 (ABA-ASA)* | GC28-1480 |
| *MVS/ESA SP V5 System Messages, Vol 2 (ASB-EWX)* | *MVS/ESA System Messages, Volume 2 (ASB-EWX)* | GC28-1481 |
| *MVS/ESA SP V5 System Messages, Vol 3 (GDE-IEB)* | *MVS/ESA System Messages, Volume 3 (GDE-IEB)* | GC28-1482 |
| *MVS/ESA SP V5 System Messages, Vol 4 (IEC-IFD)* | *MVS/ESA System Messages, Volume 4 (IEC-IFD)* | GC28-1483 |
| *MVS/ESA SP V5 System Messages, Vol 5 (IGD-IZP)* | *MVS/ESA System Messages, Volume 5 (IGD-IZP)* | GC28-1484 |
| *MVS/ESA SP V5 System Codes* | *MVS/ESA System Codes* | GC28-1486 |
| *MVS/ESA SP V5 JES2 Program Reference* | *MVS/ESA JES2 Program Reference* | LY28-1867 |
| *MVS/ESA SP V5 JES3 Diagnosis* | *MVS/ESA JES3 Diagnosis Reference* | LY28-1855 |
| *MVS/ESA SP V5 JES2 Messages* | *MVS/ESA JES2 Messages* | GC28-1488 |

# Summary of Changes

**Summary of Changes**
**for GC28-1433-00**
**as Updated June, 1994**

This book contains information previously presented in *MVS/ESA Remote Workstation Generation*, GC28-1613-01, which supports MVS/ESA System Product Version 4 Release 3.

# Chapter 1. Remote Workstation Generation

The remote job entry (RJE) facility of JES2 and JES3 allows remote workstations to use the job entry subsystem. JES processes remote jobs in the same manner as those received from local readers and via networking with a few functional differences.

This book describes the characteristics of selected remote devices supported by JES and the remote generation procedure for generating remote terminal processors (RTPs) (including the parameters used and the processing of the generation).

Remote job entry provides the ability to submit jobs and receive system output at remote facilities as if the jobs had been submitted at a local facility. JES2 and JES3 support both systems network architecture (SNA) and binary synchronous communication (BSC) remote stations as RJE facilities. The remote facilities may be attached to JES by synchronous data link control (SDLC) or by a BSC communication link. The remote facility becomes a logical extension of the local computer facility, and JES expects the remote facility to be under the control of a remote operator.

Communication between the local processor and BSC remote workstations uses a JES facility, called **multi-leaving**, which allows multiple print and punch streams to be transmitted, and JES to receive multiple console messages and input streams concurrently. With multi-leaving, several operations can take place concurrently. Operators at remote terminals and at workstations that have no console can enter commands into the input stream in the normal manner. Command replies are scheduled back to the remote station for printing on a remote printer.

There are two types of remote facilities. The first type is a ***remote terminal*** that does not have a processor. A remote terminal, for example, a 2780 or 2770, can be used for entering jobs into and receiving data from JES. The second type is a ***remote workstation*** that does have a processor. A processor, for example, System/370*, executes a JES-generated program that allows the processor to send jobs to and receive data from JES. Also part of the workstation are printers, punches, card readers, and a console. A remote workstation is established by a JES program, RMTGEN, during or after system generation (see “RMT Generation” later in this chapter for a description of the procedure and Chapter 2 for the statements used).

## Related JES Initialization Statement Descriptions

Remote workstations are defined to JES through several initialization statements. Note the following important considerations when specifying the RJE-related initialization statements. The individual statement descriptions and their syntax are described in detail in *MVS/ESA SP V5 JES2 Initialization and Tuning Reference* and *MVS/ESA SP V5 JES3 Initialization and Tuning Reference*.

### JES2 Statements

You define a remote terminal to JES2 by using RMT(nnnn) statements. If there is no RMT(nnnn) statement for a specific remote terminal, or the RMT(nnnn) statement coded for a specific remote terminal does not provide printers, punches or readers through the specific device parameters, then that remote terminal is undefined to the system.

Note that RMT(nnnn) statements without any parameters may be used to define a remote terminal with the default attributes.

You can define a remote terminal on one or more members of a multi-access spool complex; they need not be defined on all members. (Refer to the Routecde= parameter on the Rnnnn.PRm and Rnnnn.PUm initialization statements in *MVS/ESA SP V5 JES2 Initialization and Tuning Reference* for further information.)

### JES3 Statements

You define a remote terminal in JES3 by using RJPTERM statements. If there is no RJPTERM statement for a specific remote terminal, or the RJPTERM statement coded for a specific remote terminal does not provide printers, punches or readers through the specific device parameters, then that remote terminal is undefined to the system.

Note that RJPTERM statements without any parameters may be used to define a remote terminal with the default attributes.

## Programmable Workstation Support

JES provides remote station multi-leaving support for the following programmable workstations:

- IBM* System/360* Model 20 (Submodels 2, 4, 5, and 6) and the 2922 Remote Work Station RTP with the following selectable options:
  - 1403 Printer
  - 1442 Card Punch
  - 2152 Printer-Keyboard
  - 2203 Printer
  - 2501 Card Reader
  - 2520 Card Read Punch
  - 2560 Multi-Function Card Machine
- IBM System/360 (Models 22 and up) and System/370 (Models 115, 125, 135, 145, 148, 155, 158, 165, 168, and 195) with the following selectable options:
  - 1052 Printer-Keyboard
  - 1403 Printer
  - 1442 Card Read Punch

- 1443 Printer
- 2501 Card Reader
- 2520 Card Read Punch
- 2540 Card Read Punch
- 3203 Printer (supports 3203-1 through 3203-4)
- 3210/3215 Printer-Keyboard (supported as a 1052)
- 3211 Printer
- 3504 Card Reader (supported as a 2501)
- 3505 Card Reader (supported as a 2501)
- 3525 Card Punch (supported as a 1442)
- 5203 Printer
- 5313 Console for the Model 125 (requires 1052 compatibility feature)

## Installing Remote Workstation Programs

After you have installed either JES2 or JES3, you can install the multi-leaving remote terminal programs (RTPs) for job entry from remote terminals. The programs available for installation are:

- System/360 and System/370 binary synchronous communication (BSC) RTP
- System/360 Model 20 BSC RTP program (including the 2922 RTP)

You can also invoke the RMTGEN procedure to help you install the RTP:

- REMOTGEN: Invoked from the RMTGEN procedure, REMOTGEN acts as a monitor linking to other remote terminal utility programs and to the assembler during an RMT generation.
- GENRMT: Invoked from the REMOTGEN utility to read the card input stream during RMT generation for the RTP identification, select the appropriate standard option list RTP to be generated, print the parameter default values, and update the source modules with the changes read from the RMT parameters.

**Note: RTPs, when run on any processor used as a terminal, are stand-alone programs.**

## RMT Generation

RMT generation is the JES procedure for generating multi-leaving remote terminal programs (RTPs) for remote job entry from programmable remote workstations. These programs allow multi-leaving workstations (see the previous list of workstations) to operate as JES remotes.

The following sections describe the RMT parameters used and the processing involved in an RMT generation.

## RMT Statements

If RTPs are to be generated, statements that define those programs must also be specified. Also, if changes are to be made to the RTP source modules, these changes must be specified in control statements.

For an RMT generation, the input deck contains one or more RTP descriptions. Each terminal program to be generated is described by card entries in the following order.

1. JES remote terminal processor program identification
2. RMT generation statement cards
3. $.UPDATE control card (optional)
4. Update cards if $.UPDATE is specified
5. $.RMTEND end of RMT generation description

Each statement is coded, beginning in column 1, in the format:

```
statement=value      [ optional comments ]
```

where:

- statement -- represents a valid option specified in the appropriate RTP options section (see “RMT Statement Descriptions” later in this chapter).
- value -- represents a character string of up to 17 characters.

The statement cannot have embedded blanks. Comments can be included in a statement, but they must be separated from the value by one or more blanks.

RMT generation statements can appear in any order after the RTP identification card. If the same statement occurs more than once in the input deck, the last occurrence determines the statement value.

## RMT Control Cards

The first card in the RMT generation input deck is a JES remote terminal processor program identification card. It serves two functions:

1. Selects the appropriate standard options group and source member
2. Sets the remote terminal identification number

The general format for RMT control cards is:

| Columns | Field | Description |
|---|---|---|
| 1-2 | $. | Control card identification |
| 3-71 | operands | Variable length, separated by a comma and containing no embedded blanks (the last operand must be followed by a blank) |
| 73-80 | ignored | |

The card format is:

$.name,nnnn

**name**
The name of the RTP to be generated (see Figure 1-1).

**nnnn**
A terminal number, 1-4 digits, that specifies the remote sign-on number (the first digit cannot be 0). This number must be followed by a blank.

| *Figure 1-1. RTP Identification Cards* | |
|---|---|
| **JES RTP Processor For** | **Terminal Program ID Card (First Card of Each Remote Description)** |
| System/360 Model 20,2922 | $.RMTM20,nnnn † |
| System/360 (other than Model 20) or System/370 | $.RMT360,nnnn |
| **Note:** † nnnn is the remote sign-on number | |

There are two additional control cards:

**$.UPDATE**
The $.UPDATE control card sets the update mode and causes the cards following this card to be used to modify the RTP source module for the current generation description.

**$.RMTEND**
The $.RMTEND control card is required to signal the end of the RMT generation description.

## RMT Generation Under a Production Batch System

An RMT generation may be executed as part of a batch job stream. Figure 1-2 shows a sample job stream for a batch RMT generation.

RTP modules usually write messages to the SYSPRINT data set using record format FBM with a record length of 121. The data set may be changed to SYSLIST by including a SYSLIST DD statement in the RMTGEN step. This will cause the listings from the REMOTGEN utility and assembler to be placed on separate data sets. For example:

```
//GENJOB    JOB      ...
//STEP     EXEC      RMTGEN
//RMTGEN.OPTIONS     DD     *
    .
    .
    .
/*
```

```
//RMTGENJB  JOB   (0000,0000), 'GEN REMOTE PROGRAMS',
//                MSGLEVEL=1
//RMTGEN    EXEC  RMTGEN
//RMTGEN.SYSLIST    DD     SYSOUT=A
//SYSPUNCH          DD     SYSOUT=B
//RMTGEN.OPTIONS    DD  *
$.RMTM20,2
&RDEV(1)=2560
&RADR(1)=2
&UDEV(1)=2560
&UADR(1)=2
&WDEV(1)=2152
&NUMTANK=5
$.RMTEND
$.RMT360,3
&CMPTYPE=3
&PDEV(2)=1403
&ADAPT=030
&WADR(1)=009
&NUMTANK=7
&CORESIZ=16
$.RMTEND
```

*Figure 1-2. Sample Input Data Set for a Batch RMT Generation.*

## Completion Codes

During both the JES and RMT generations, the success of the generation process is determined and a completion code is returned. Refer to *MVS/ESA SP V5 System Codes* and *MVS/ESA SP V5 System Messages, Vol 3 (GDE-IEB)* and *MVS/ESA SP V5 System Messages, Vol 4 (IEC-IFD)* for a discussion of the completion codes that are returned by the system.

## Output

The output from an RMT generation is a data set for each RMT program generated. Also, the GENRMT utility prints an information listing, the RMT statement default values, and the statement values you specified. Also, a listing of each assembly is produced.

All listings produced by the GENRMT utility and the assembler have the remote terminal sign-on identification number at the top of each page, and all object deck cards have the identification number punched in columns 74 through 76.

## Input Deck for an RMT Generation

The following is an example of the generation of RTPs for a System/360 Model 20 workstation and for a System/360 (other than a Model 20) or System/370 workstation:

```
$.RMTM20,2
&RDEV(1)=2560
&RADR(1)=2
&UDEV(1)=2560
&UADR(1)=2
&WDEV(1)=2152
&NUMTANK=5
$.RMTEND
$.RMT360,3
&CMPTYPE=3
&PDEV(2)=1403
&ADAPT=030
&WADR(1)=009
&NUMTANK=7
&CORESIZ=16
$.RMTEND
```

# Chapter 2. Remote Terminal Processor Statements

## RMT Statement Descriptions

This section describes the statements for each of four types of RMT generations:

- System/360 Model 20 BSC RTP (including the 2922)
- System/360 (models other than Model 20) RTP and System/370 BSC RTP

Refer to the overview at the beginning of this chapter for the devices that are supported by each type of remote workstation.

## Statement Syntax

The RMT statements for each RTP are discussed alphamerically. All RMT statements are prefixed by an & (ampersand).

The following syntax conventions are used in this section for the RMT statements:

- **UPPERCASE** -- statement names and their specifications shown in uppercase, must be coded exactly as shown.
- **lowercase** -- characters presented in lowercase represent variables for which you must substitute specific information or specific values.
- **UNDERLINE** -- an underline designates a default value. This value is used automatically if the statement is not specified.
- **|** -- the **OR** bar specifies that there is more than one option available. YES | NO specifies that either YES or NO must be specified, but not both. The OR bar ( | ) is never coded.

## The System/360 Model 20 BSC Remote Terminal Program

This section describes the statements used to specify the machine configuration and programming options required in the assembly of the System/360 Model 20 BSC remote terminal processor (RTP) program for JES multi-leaving remote job entry. Figure 2-1 lists the parameters, range of valid specifications, and default values for the System/360 Model 20 BSC RTP.

*Figure 2-1. System/360 Model 20 BSC RTP Initialization Statements, Range of Valid Specifications, and Default Values*

| INITIALIZATION STATEMENT | SPECIFICATION | RANGE | DEFAULT |
|---|---|---|---|
| &CCT= | nn | 3-31 | 4 |
| &CMPTYPE= | 1 \| 2 \| 3 | 1-3 | 2 |
| &CORESIZ= | nn | 8-32 | 8 |
| &ERRMSGN= | nn | 8-nn † | 10 |
| &LINESPD= | nnnn | n-nnnn † | 2000 |
| &MLBFSIZ= | nnn | n-nnn † | 400 |
| &NUMBUFS= | n | 1-9 | 8 |
| &NUMTANK= | n | 2-9 | 8 |
| &PDEV(1)= | 1403 \| 2203 | N/A | 2203 |
| &PRTCONS= | 0 \| 1 \| 2 | N/A | 0 |
| &PRTSIZE= | nnn | ‡ | 120 |
| &RADR(1)= | 1 \| 2 | N/A | 1 |
| &RDEV(1)= | 2501 \| 2520 \| 2560 | N/A | 2501 |
| &SUBMOD= | n | n † | 2 |
| &UADR(1)= | 2 \| 3 | N/A | 3 |
| &UDEV(1)= | 1442 \| 2520 \| 2260 \| 0 | N/A | 1442 |
| &WDEV(1)= | 0 \| 2152 | N/A | 0 |
| &WTOSIZE= | nnn | 0-120 | 0 |
| &XPARENT= | NO \| YES | N/A | YES |

**Note:**

† Acceptable values are dependent upon the specific hardware for your RTP workstation. Refer to the specific hardware manual for an appropriate value for this statement.

‡ See full description of this statement.

**&CCT =nn | 4**

The &CCT statement specifies a number (3-31) (for all text compression except trailing blank compression) the minimum number of characters to be compressed. A duplicate character string of fewer than the number specified is treated as a string of non-duplicate characters for compression purposes. If a small value is specified, efficiency of communication line usage is increased at the expense of the compute time that is required for compression. If the &CMPTYPE statement is specified as 1, this statement is ignored.

**Default:** 4

**&CMPTYPE =1 | 2 | 3**

The &CMPTYPE statement specifies the type of compression to be applied to all data transmitted from the Model 20 to JES. Only the values 1, 2, or 3 are valid, where:

**1** specifies trailing blank compression.
**2** specifies compression of leading, embedded, and trailing blanks.
**3** specifies compression of all duplicate character strings.

If this statement is specified as 1, the &CCT statement is ignored.

**Default:** 2

**&CORESIZ =nn | 8**

The &CORESIZ statement specifies the size in 1K bytes (8-32) of Model 20 main storage (1K bytes equals 1024 bytes). This statement must never be greater than the actual storage size of the object machine.

**Note:** It is possible to specify combinations of statement values such that the resulting workstation program is too large for the available storage (&CORESIZ=255). Such a program will fail to load into the object machine.

**Default:** 8

**&ERRMSGN =nn | 10**

The &ERRMSGN statement specifies the number of 4-byte entries to be assembled in the Model 20 RTP as an error message log table. This value must be greater than or equal to 8.

**Default:** 10

**&LINESPD =nnnn | 2000**

The &LINESPD statement specifies the speed, in bits per second, of the communication line to be used between the Model 20 and JES.

**Default:** 2000

**&MLBFSIZ =nnn | 400**

The &MLBFSIZ statement specifies the size, in bytes, of each JES multi-leaving buffer. If operating under JES2, this value must match the MBUFSIZE= parameter specification on the TPDEF initialization statement or the BUFSIZE= parameter specification on the RMTnnnn initialization statement. If operating under JES3, this value must match the B= parameter on the JES3 RJPTERM initialization statement. (The TPDEF, RMTnnnn, and RJPTERM statements are further described in *MVS/ESA SP V5 JES2 Initialization and Tuning Reference* and *MVS/ESA SP V5 JES3 Initialization and Tuning Reference*, respectively.)

**Default:** 400

**&NUMBUFS =n | 8**

The &NUMBUFS statement specifies the number of teleprocessing buffers to be constructed by the Model 20 RTP. The specification must be an integer:

≥**3** if either a 2520 or a 2560 is to be used as both a reader and a punch
≥**1** if a 2520 or a 2560 is not to be used as both a reader and a punch

The length of each buffer is the value specified on the MBUFSIZE= parameter on the TPDEF statement for JES2 and the B= parameter on the RJPTERM statement for JES3 plus 5 bytes (rounded upward to the next full word). If this statement specifies more buffers than can be built in available storage, the RTP builds as many buffers as it can. It is recommended that at least two buffers be provided for each output device and for the communication adapter.

**Default:** 8

**&NUMTANK =n | 8**

The &NUMTANK statement specifies the number of decompression buffers to be assembled in the Model 20 RTP. This number must be an integer greater than or equal to 2. It is recommended that at least two buffers be provided for each printer and punch. The length of each decompression buffer is the value specified in the &PRTSIZE statement plus 6.

For an 8K Model 20, specifying this value greater than 8 may cause the RTP to assemble more than X'1F00' bytes (8K-256). If this occurs, the resultant program will fail to load.

**Default:** 8

**&PDEV(1) =1403 | 2203**

The &PDEV(1) statement specifies the device type for the Model 20 printer.

**Default:** 2203

**&PRTCONS =0 | 1 | 2**

The &PRTCONS statement specifies the usage of the printer as an output console. This value is dependent upon the specifications (given during JES initialization) that pertain to the handling of messages for the remote station.

If JES2 is informed, by means of the RMT(nnnn) statement or JES3 is informed by means of the RJPTERM statement that the remote station has a console; &PRTCONS should be specified as one of the following:

**0** specifies that error logging and display are suppressed and that operator messages created while the remote is on-line to JES are discarded.

**1** specifies that the printer is to be used as an output console when sufficient operator messages from JES have been queued for output at the remote. If the printer is busy with job stream output, that output is interrupted for the printing of operator messages from JES and from the remote error log. When the console queue is empty, job stream output continues.

**2** specifies that the printer is to be used as an output console but will not interrupt the printing of jobs. Operator messages received from JES while jobs are being printed are discarded.

If JES is informed, by means of the RMT(nnnn) or RJPTERM initialization statement that the remote station does not have a console, &PRTCONS should be specified as follows:

**0** specifies that error logging and display are to be suppressed (JES will not return operator messages to the workstation).

**1 or 2** specifies that error log messages are to be displayed when the printer is free to print them and no job's printed output will be interrupted.

If JES2 is informed, by means of the RMT(nnnn) initialization statement that the remote does not have a console and if JES2 has message spooling capability, &PRTCONS should be specified as if the remote did not have a console (the second specification, above). The definitions are the same, but with an additional function: the capability to print operator messages that are queued for the remote station by JES2 and that are transmitted to the remote station when the printer is free and set to receive messages. If &WDEV(1) is not specified as 0, &PRTCONS should be set to 0. Regardless of the settings of &WDEV(1) and &PRTCONS, error messages resulting from loggable errors detected by the remote station are discarded when the errors occur at a rate that is faster than the output device can display them. Refer to the &WDEV(1) statement (in this section) for additional information.

**Default:** 0

**&PRTSIZE =nnn | 120**

The &PRTSIZE statement specifies the length, in bytes, of the text portion of each decompression buffer. Each buffer must be long enough to hold a maximum-length output record for either the printer, the punch, or the operator console. The specification must be an integer that is the largest of 80, if &UDEV(1) is not 0; 120, if &WDEV(1) is not 0; or the line width of the printer.

**Default:** 120

**&RADR(1) =1 | 2**

The &RADR statement specifies the unit address of the Model 20 card reader. The specification must correspond to the specification for the &RDEV(1) statement as follows:

```
&RDEV(1)   &RADR(1)
  2501        1
  2520        2
  2560        2
```

This statement value should not be altered when generating a 2922 workstation program.

**Default:** 1

**&RDEV(1) =2501 | 2520 | 2560**

The &RDEV(1) statement specifies the device type for the Model 20 card reader. The specification must be either 2501, 2520, or 2560. This value should not be altered when generating a 2922 workstation program. (Refer to the &RADR(1) statement for additional information).

**Default:** 2501

**&SUBMOD =n | 2**

The &SUBMOD statement specifies the submodel number of the Model 20 for the specified remote terminal. The specification must be a valid System/360 Model 20 submodel number. This statement should not be altered when generating a 2922 workstation program.

**Default:** 2

**&UADR(1) =2 | 3**

The &UADR(1) statement specifies the unit address of the Model 20 card punch. The specification must correspond to the specification of &UDEV(1) as follows:

```
&UDEV(1)    &UADR(1)
  1442         3
  2520         2
  2560         2
  0          Not present
```

**Default:** 3

**&UDEV(1) =1442 | 2520 | 2560 | 0**

The &UDEV(1) statement specifies the device type for the Model 20 card punch. The specification must be either 1442, 2520, 2560, or 0. Specify 0 when the Model 20 does not include a card punch. Specify &UDEV(1)=0 for the 2922, unless the RPQ punch is included, in which case &UDEV(1) should not be altered. (Refer to the &UADR(1) statement for additional information).

**Default:** 1442

**&WDEV(1) =0 | 2152**

The &WDEV(1) statement specifies the device type for the Model 20 console. The specification must be either 2152, if a console is present; or 0, if a console is not present. If a console is present, console support should be indicated for this remote terminal during JES initialization.

**Default:** 0

**&WTOSIZE =nnn | 0**

The &WTOSIZE statement specifies the maximum length (0-120), in bytes, of a JES2 operator command to be transmitted from the Model 20 to the central computer. If &WDEV(1) is specified as 0, this statement is ignored.

**Default:** 0

**&XPARENT =NO | YES**

The &XPARENT statement specifies the inclusion or exclusion of support for the text-transparency feature. If the BSC adapters at both the Model 20 and the central computer have the text-transparency feature, the default should be used; otherwise, NO should be specified.

**Default:** YES

## RMT Statements for the 2922 Remote Workstation RTP

This section describes the statements used to specify the machine configuration and program options required in the assembly of the 2922 remote terminal processor program for JES multi-leaving remote job entry.

To install a 2922 RTP, the statements and procedures for the System/360 Model 20 BSC should be used, subject to the following specific statement value settings:

```
&LINESPD=xxx    (where xxx is the actual line speed used)
&PDEV(1)=1403
&PRTSIZE=132
&UDEV(1)=0
&WDEV(1)=2152    (if the optional typewriter console is installed)
&XPARENT=NO    (if the optional text transparency feature is not installed)
```

Use the default values for the following statements:

```
&CORESIZ=8
&RADR(1)=1
&RDEV(1)=2501
&SUBMOD=2
```

The remaining Model 20 BSC statements may be allowed to default or may be changed.

## The System/360 (Except Model 20) and System/370 BSC Remote Terminal

This section describes the statements used to specify the machine configuration and program options required in the assembly of the System/360 and System/370 BSC remote terminal processor program for JES multi-leaving remote job entry. Figure 2-2 lists the statements, range of valid specifications, and default values for the System/360 (Except Model 20) and System/370 RTP.

*Figure 2-2. S/360 (Except Model 20) and S/370 RTP Initialization Statements, Range of Valid Specifications, and Default Values*

| INITIALIZATION STATEMENT | SPECIFICATION | RANGE | DEFAULT |
|---|---|---|---|
| &ADAPT= | nnn | N/A | 020 |
| &CCT= | nn | 3-31 | 4 |
| &CMPTYPE= | 1 \| 2 \| 3 | N/A | 2 |
| &CORESIZ= | nn | 8-32 | 8 |
| &ERRMSGN= | nn | 8-nn † | 10 |
| &LINESPD= | nnnn | † | 2000 |
| &MACHINE= | nn | N/A | 30 |
| &MLBFSIZ= | nnnn | nnnn † | 400 |
| &NUMBUFS= | nn | 1-nn † | 8 |
| &NUMTANK= | nn | ‡ | 5 |
| &PADR(n)= | n<br>nnn | 1-7<br>000-FFF | None. Must specify<br>(1)=00E<br>(2)=00F<br>(3...7)=FFF |
| &PDEV(n)= | n<br>nnn | 1-7<br>1403 \| 1443 \| 3211 \| 3203 \| 5203 \| 0 | None. Must specify<br>(1)=1403<br>(2...7)=0 |
| &PRTSIZE= | nnn | 120-nnn † | 132 |
| &RADR(n)= | n<br>nnn | 1-7<br>000 \| FFF | None. Must specify<br>(1)=00C<br>(2...7)=FFF |
| &RDEV(n)= | n<br>nnn | 1-7<br>1442 \| 2501 \| 2520 \| 2540 \| 0 | None. Must specify<br>(1)=2540<br>(2...7)=0 |
| &UADR(n)= | n<br>nnn | 1-7<br>000 \| FFF | None. Must specify<br>(1)=00D<br>(2...7)=FFF |
| &UDEV(n)= | n<br>nnn | 1-7<br>1442 \| 2520 \| 2540 \| 0 | None. Must specify<br>(1)=2540<br>(2...7)=0 |
| &WADR(1)= | nnn | 000-FFF | 01F |
| &WTOSIZE= | nnn | 0-120 | 120 |
| &XPARENT= | NO \| YES | N/A | YES |

**Note:**

† Acceptable values are dependent upon the specific hardware for your RTP workstation. Refer to the specific hardware manual for an appropriate value for this statement.

‡ See full description of this statement.

**&ADAPT =nnn | 020**

The &ADAPT statement specifies the unit address of the BSC adapter used by the System/360 or System/370 remote terminal to communicate with JES at the central computer. The specification must be a valid unit address.

**Default:** 020

**&CCT =nn | 4**

The &CCT statement specifies an integer (3-31), for all text compression (except trailing blank compression), the minimum number of characters to be compressed. A duplicate character string of fewer than the number specified is treated as a string of non-duplicate characters for compression purposes. If a small value is specified, efficiency of communication line usage is increased at the expense of the compute time that is required for compression. If the &CMPTYPE statement is specified as 1, this statement is ignored.

**Default:** 4

**&CMPTYPE =1 | 2 | 3**

The &CMPTYPE statement specifies the type of compression to be applied to all data transmitted from the System/360 or System/370 remote terminal to JES2, where:

**1** specifies trailing blank compression.
**2** specifies compression of leading, embedded, and trailing blanks.
**3** specifies compression of all duplicate character strings.

If this statement is specified as 1, the &CCT statement is ignored.

**Default:** 2

**&CORESIZ =nn | 8**

The &CORESIZ statement specifies an integer (8-32) that defines the size of main storage for the System/360 or System/370 remote terminal in 1K bytes (1K bytes equals 1024 bytes). If the System/360 or System/370 remote terminal is larger than 32K bytes, this statement must be specified as 32.

**Default:** 8

**&ERRMSGN =nn | 10**

The &ERRMSGN statement specifies a value greater than or equal to 8 that defines the number of 4-byte entries to be assembled as an error message log table in the System/360 or System/370 remote terminal.

**Default:** 10

**&LINESPD =nnnn | 2000**

The &LINESPD statement specifies an integer that defines the speed, in bits per second, of the communication line to be used between the System/360 or System/370 remote terminal and JES.

**Default:** 2000

**&MACHINE =nn | 30**

The &MACHINE statement specifies the model number of the System/360 or System/370 to be used as a JES remote terminal. The specification must be a valid number for a System/360 or System/370 that includes the standard instruction set and the decimal instruction set.

**Default:** 30

**&MLBFSIZ =nnnn | 400**

The &MLBFSIZ statement specifies the size, in bytes, of each JES multi-leaving buffer. In a JES2 environment, this value must match the MBUFSIZE= parameter on the TPDEF statement or the BUFSIZE= parameter specification on the RMTnnnn initialization statement. If operating in a JES3 environment, this value must match the B= parameter on the RJPTERM statement value used by the JES2 program operating with the controlling MVS system. (The TPDEF and RJPTERM statements are described in *MVS/ESA SP V5 JES2 Initialization and Tuning Reference* and *MVS/ESA SP V5 JES3 Initialization and Tuning Reference*, respectively.) The length of each buffer is the value specified in the MBUFSIZE parameter on the TPDEF statement or the B= parameter on the RJPTERM statement plus 5 bytes (rounded upward to the next fullword).

If this statement specifies more buffers than can be built in available storage, the RTP will build as many buffers as it can.

It is recommended that at least two buffers be provided for each output device and for the communication adapter.

**Default:** 400

**&NUMBUFS =nn | 8**

The &NUMBUFS statement specifies the number of teleprocessing buffers to be constructed by the System/360 or System/370 remote terminal program. The specification must be an integer no less than 2X + 1, where:

**X=n** the number of 2520 or 1442 units to be used as both readers and punches

**X=0** if neither a 2520 nor a 1442 is to be used as both a reader and a punch

**Default:** 8

**&NUMTANK =nn | 5**

The &NUMTANK statement specifies the number of decompression buffers to be assembled in the System/360 or System/370 RTP. The length of each decompression buffer is the value specified in the &PRTSIZE, plus 6.

It is recommended that at least two decompression buffers be provided for each printer and each punch (three buffers for a 2540 punch).

**Default:** 5

**&PADR(n) =nnn**

The &PADR(n) statement specifies the unit address of each remote terminal printer defined by the &PDEV(n) statement, where n is a sequential number (1-7) that you code to identify each device being specified. For each &PDEV(n) statement that is not specified as 0, the corresponding &PADR(n) statement must specify the device's 3-character hexadecimal unit address. All devices at the remote terminal workstation must be on separate non-shared subchannels (that is, all I/O devices must be capable of running simultaneously).

**Default:** If this statement is not specified, the following values are used as defaults:

```
&PADR(1)=00E
&PADR(2)=00F
&PADR(3)=FFF
&PADR(4)=FFF
&PADR(5)=FFF
&PADR(6)=FFF
&PADR(7)=FFF
```

**&PDEV(n) =nnnn**

The &PDEV(n) statement specifies the existence and device type of each remote terminal printer. The specification must be either 1403, 1443, 3211, 3203, 5203, or 0. A specification of 0 indicates that the associated printer does not exist. The value of n is a sequential number (1-7) that you code to identify each device being specified.

**Default:** If this statement is not specified, the following values are used as defaults:

```
&PDEV(1)=1403
&PDEV(2)=0
&PDEV(3)=0
&PDEV(4)=0
&PDEV(5)=0
&PDEV(6)=0
&PDEV(7)=0
```

&PDEV(1) must not be specified as 0. If &PDEV(n+1) is specified as a device type, &PDEV(n) must be specified as a device type. If PDEV(n) is specified as device type, &UDEV(8-n) must be specified as 0. If more than one printer is specified, more than one printer should also be specified in the RMT(nnnn) or RJPTERM statements at JES2 or JES3 initialization, respectively.

**&PRTSIZE =nnn | 132**

The &PRTSIZE statement specifies the length, in bytes, of the text portion of each decompression buffer. Each buffer must be long enough to hold a maximum-length output record for either a printer, a punch, or the operator console. The specification must be an integer that is the larger of 120 or the line width of the widest printer.

**Default:** 132

**&RADR(n) =nnn**

The &RADR(n) statement specifies the unit address of each remote terminal card reader defined by the &RDEV(n) statement. The value of n is a sequential number (1-7) that you code to identify each device being specified. For each &RDEV(n) statement that is not specified as 0, a corresponding &RADR(n) statement must specify the device's 3-character hexadecimal unit address. All devices at the remote terminal workstation must be on separate non-shared subchannels (that is, all I/O devices must be capable of running simultaneously.)

**Default:** If this statement is not specified, the following values are used as defaults:

```
&RADR(1)=00C
&RADR(2)=FFF
&RADR(3)=FFF
&RADR(4)=FFF
&RADR(5)=FFF
&RADR(6)=FFF
&RADR(7)=FFF
```

**&RDEV(n) =nnnn**

The &RDEV(n) statement specifies the existence and device type of each remote terminal card reader. Each specification must be either 1442, 2501, 2520, 2540, or 0. A specification of 0 indicates that the associated remote terminal card reader does not exist. The value of n is a sequential number (1-7) that you code to identify each device being specified.

**Default:** If this statement is not specified, the following values are used as defaults:

```
&RDEV(1)=2540
&RDEV(2)=0
&RDEV(3)=0
&RDEV(4)=0
&RDEV(5)=0
&RDEV(6)=0
&RDEV(7)=0
```

&RDEV(1) must not be specified as 0. If &RDEV(n+1) is specified as a device type, &RDEV(n) must be specified as a device type. If more than one reader is specified, more than one reader should also be specified in the RMT(nnnn) or RJPTERM statements at JES2 or JES3 initialization, respectively.

**&UADR(n) =nnn**

The &UADR(n) statement specifies the unit address of each remote terminal punch defined by the &UDEV(n) statement. The value of n is a sequential number (1-7) that you code to identify each device being specified. For each &UDEV(n) statement that is not specified as 0, the corresponding statement &UADR(n) must specify the device's 3-character hexadecimal unit address. All devices at the remote terminal work station must be on separate non-shared subchannels (that is, all I/O devices must be capable of running simultaneously).

**Default:** If this statement is not specified, the following values are used as defaults:

```
&UADR(1)=00D
&UADR(2)=FFF
&UADR(3)=FFF
&UADR(4)=FFF
&UADR(5)=FFF
&UADR(6)=FFF
&UADR(7)=FFF
```

**&UDEV(n) =nnnn**

The &UDEV(n) statement specifies the existence and device type of each remote terminal punch. The specification must be either 1442, 2520, 2540, or 0. A specification of 0 indicates that the associated punch does not exist. The value of n is a sequential number (1-7) that you code to identify each device being specified.

**Default:** If this statement is not specified, the following values are used as defaults:

```
&UDEV(1)=2540
&UDEV(2)=0
&UDEV(3)=0
&UDEV(4)=0
&UDEV(5)=0
&UDEV(6)=0
&UDEV(7)=0
```

If &UDEV(n+1) is specified as a device type, &UDEV(n) must be specified as a device type. If &UDEV(n) is specified as a device type, &PDEV(8-n) must be specified as 0. If more than one punch is specified, more than one punch should also be specified in the RMT(nnnn) statement or RJPTERM statement at JES2 or JES3 initialization, respectively.

**&WADR(1) =nnn | 01F**

The &WADR(1) statement specifies the unit address of the 1052 or 1052-compatible operator console on the System/360 or System/370 remote terminal. The specification must be a 3-character hexadecimal unit address.

**Default:** 01F

**&WTOSIZE =nnn | 120**

The &WTOSIZE statement specifies an integer (0-120) that defines the maximum length, in bytes, of a JES operator command to be transmitted from the System/360 or System/370 remote terminal to JES.

**Default:** 120

**&XPARENT =NO | YES**

The &XPARENT statement specifies the inclusion or exclusion of support for the text transparency feature. If the BSC adapters at both the System/360 or System/370 remote terminal and the central computer have the text-transparency feature, the default value should be used; otherwise, NO should be specified.

**Default:** YES

## Initialization Processing

During initialization processing, parameter cards are read from reader 1. Two types of parameter cards are recognized: REP (replacement cards, and initialization variable cards.

REP (replacement) cards are read for possible modifications to the program. The format of the REP card is as follows:

| Column | Description |
|---|---|
| 2-4 | REP |
| 9-12 | Replacement address; hexadecimal address of the first halfword of storage to replace (if blank, the previous REP card is continued) |
| 17-n | xxxx,xxxx,...xxxx replacement data; one or more halfword groups of hexadecimal data separated by commas |
| n+1 | Blank; terminator for the replacement data |
| N+2-80 | Comments; any text |

Two variables may be set by initialization variable cards. These are:

| Column | Description |
|---|---|
| 1-9 | &MLBFSIZ= |
| 10 | nnn |

This card specifies the JES multi-leaving buffer size. It must match the size specified in the MBUFSIZE= parameter on the JES2 TPDEF initialization statement or the B= parameter on the JES3 RJPTERM initialization statement.

| Column | Description |
|---|---|
| 1-9 | &NUMBUFS= |
| 10- | nnn |

This card overrides the &NUMBUFS specification during RMTGEN. It specifies the number of teleprocessing buffers to be constructed.

Each parameter card is printed on PRINTER 1 when read as a record or program modification. Parameter card reading is terminated when either a blank card (blank in columns 1-5) or a /*SIGNON card is encountered.

# Chapter 3. Remote Generation Messages

Although the messages issued by the remote workstation utility modules, REMOTGEN and GENRMT, are prefixed by $HASP (typically indicating a JES2 message), if you have generated remote work stations under JES3, your installation can also receive the following series of $HASP900 messages.

**$HASP955 INCOMPATIBLE RMTGEN MODULES**

**Explanation:** A module has attempted to read logical records beyond the end-of-file on the CARDIN data set and encountered an end-of-file condition without replacing the EODAD exit address in the DCB.

**System Action:** RMTGEN abnormally terminates with a user code of 20.

**Programmer Response:** Restore the JES2 or JES3 generation modules using the correct version of the GENRMT module.

**$HASP965 ****INVALID SELECTION CARD****

**Explanation:** A JES2 or JES3 remote work station generation selection card is invalid for one of the following reasons:

- The program identification card named an unsupported remote.
- The format of the identification card was incorrect.
- The numeric field was not numeric.

The card in error is displayed preceding the error message, and the generation of the requested remote is suppressed.

**System Action:** The generation of the remote is suppressed.

**Operator Response:** Report this message to the system programmer.

**Programmer Response:** Correct the selection card and resubmit the remote generation job.

**$HASP966 ****OPTION SPECIFICATION ERROR****

**Explanation:** A JES2 or JES3 remote work station generation option specification error occurred for one of the following reasons:

- The specified RMTGEN parameter was misspelled.
- The format of the card was incorrect.
- Card sequence numbers were not in ascending order.
- An invalid ./ card was encountered.
- A $. card, other than $.RMTEND, was encountered during the update process.
- A /* card was encountered within a remote description deck.

**System Action:** The card in error is displayed preceding the error message, and the generation of the requested remote is suppressed.

**Operator Response:** Report this message to the system programmer.

**Programmer Response:** Correct the JES2 or JES3 remote work station generation deck and resubmit the job.

**$HASP967 ****JES2 SOURCE LIBRARY ERROR****

**Explanation:** A JES2 source library error occurred during a JES2 remote work station program generation for one of the following reasons:

- An internal control card on the GENPDS data set member HRTPOPTS was incorrect or missing.
- An overflow of the GENRMT standard options table has occurred.

**System Action:** The generation of the requested remote is suppressed.

**Programmer Response:** Check the spelling on the selection card and, if spelling is correct, recreate the JES2 or JES3 generation modules and source.

**$HASP968 ****UNEXPECTED END OF CARD INPUT****

**Explanation:** The last card of the CARDIN data set for a JES remote work station program generation was not $.RMTEND, or in the case of updating operations ./ENDUP.

**System Action:** The generation of the requested remote is suppressed.

**Programmer Response:** Supply a $.RMTEND card.

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# Communicating Your Comments to IBM

MVS
Remote Workstation Generation

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