

Special DD Characters

Running a Simple Job

Lesson 3: Special DD Parameters

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1-3: 1

Spooled Datasets

- DD statements have parameters which can be used for describing datasets on tape and disk.
- Parameters for slow I/O devices like readers and printers can be invaluable in improving system throughput.
- The z/OS operating system uses the spool to hold jobs awaiting execution and to control the printing of the JCL listing.
- It can also use the spool to store data files for a program.

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1-3: 2

Spooled Datasets

- Input data is read from the reader and stored on the spool before the program executes.
- Similarly, files to be printed are also kept on the spool.
 - These files are printed after the program finishes.
- This permits a program to write many reports at once, even though only a single printer will be available to print them.
- On the newer z/OS systems, the location of datasets is determined by the SMS: Storage Management Services subsystem.

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1-3: 3

* Parameter

- The * parameter describes an in-stream dataset.
 - An in-stream dataset is a group of data records which are included in the job stream.
 - A DD * statement precedes the data in order to differentiate it from the JCL.
 - The * parameter is positional and must immediately follow the DD operator:

Example:

```
//INPUT DD *
```

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1-3: 4

* Parameter

- The data records for that file must immediately follow the DD * statement.
- All subsequent records are part of the data file until one of these three things happens:
 - A delimiter (/*) is read.
 - Another JCL (//) statement is read.
 - The reader runs out of records.

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1-3: 5

* Parameter

- This example is an in-stream dataset terminated by a delimiter statement.

```
//INPUT DD *  
data record 1  
data record 2  
.  
.  
data record n  
/*  
//NEXT DD ...
```

- By using a different ddname for each file, any number of in-stream sets in a step can be used.

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1-3: 6

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SYSOUT Parameter

- The SYSOUT parameter assigns a dataset to be printed or punched to an output class.
- The format is:
`SYSOUT=class`

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1-3: 7

SYSOUT Parameter

- The class can be an alphanumeric character:
`A-Z, 0-9, or *`
- The output classes set up at an installation are the same as the MSGCLASS parameter on the JOB statement.
`//REPORT DD SYSOUT=L`
- This directs z/OS to store the print file called REPORT in output class L.
- If the installation uses the output class definitions stated previously, REPORT will be directed to a laser printer.

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1-3: 8

SYSOUT Parameter

- An asterisk (*) in the SYSOUT parameter directs z/OS to write the output to the same class specified for MSGCLASS on the job statement.
 - Using SYSOUT=* simplifies changing the output classes for the entire job.
 - Only the MSGCLASS parameter on the JOB statement has to be changed.
- Otherwise, it will be necessary to change each individual SYSOUT parameter.

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1-3: 9

SYSOUT Parameter

```
//TESTJOB JOB T22,WILSON
// MSGCLASS=T
//PRTEST EXEC PGM=PRINTGEN
//PRINT1 DD SYSOUT=F
//PRINT2 DD SYSOUT=*
//PRINT3 DD SYSOUT=*
```

- The JCL listing and files PRINT2 and PRINT3 are all written to output class T, as specified by MSGCLASS.
- PRINT1, however, is specifically written to class F.
- By changing the MSGCLASS from T to A, PRINT2 and PRINT3 also are changed to class A.
- PRINT1 still goes to class F.

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1-3: 10

Dummy Parameter

- In certain instances, there will be a requirement not to use a dataset.
 - A program may have defined several input files, but only have data for a single file.
- There also may be a requirement to avoid the creation of a long print out created by the program.
- However, when a program executes, it expects to use all of its files.
 - The DUMMY parameter allows the program to execute, but not use a particular dataset.
 - DUMMY is a positional parameter and must be the first parameter on the DD statement.
`//SYSIN DD DUMMY`

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1-3: 11

Dummy Parameter

- If a program needs to be tested, however, the decision has been made not to print the output file, the DUMMY parameter on the output DD statement can be used.
- **Example:**
`//STEP1 EXEC PGM=LOADCDS`
`//CARDIN DD *`
`(input records)`
`//PRINTOUT DD DUMMY`
- The input file, CARDIN, will be read when the program LOADCDS executes; the PRINTOUT file will not be created.

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1-3: 12

Special DD Characters

Running a Simple Job

Utility Programs

- z/OS provides a number of utility programs for performing common tasks, such as copying files.
 - These utilities are available on all systems.
- Most utilities operate in a similar manner.
 - This consistency makes them easy to learn and interpret.
- The JCL statements common to most utilities are:
 - EXEC
 - SYSIN
 - SYSPRINT
 - SYSUT1
 - SYSUT2

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1-3: 13

Utility Programs

- EXEC:
 - The statement that names the utility program.
- SYSIN:
 - The DD statement defining control statements for the utility.
- SYSPRINT:
 - The DD statement indicating where utility messages should be printed.
- SYSUT1:
 - The DD statement that points to the input dataset.
- SYSUT2:
 - The DD statement that points to the output dataset.

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1-3: 14

IEBGENER Utility

- The IEBGENER utility is used primarily for copying one dataset to another.
- This JCL copies an in-stream dataset to the printer.

```
//COPY          EXEC PGM=IEBGENER
//SYSIN         DD DUMMY
//SYSPRINT     DD SYSOUT=*
//SYSUT1       DD *
               [data]
//SYSUT2       DD SYSOUT=*
```

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1-3: 15

IEBGENER Utility

- The EXEC statement designates the program IEBGENER to be executed.
 - IEBGENER copies the input to the SYSUT2 DD statement.
- No control statements are needed to perform a straight copy, but IEBGENER still expects the SYSIN DD statement to be present.
 - Therefore, specify a DUMMY dataset for SYSIN.

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1-3: 16

IEBGENER Utility

- IEBGENER produces messages indicating whether or not it has run successfully.
 - These messages are written to the SYSPRINT DD statement, which is printed to the same SYSOUT class as the MSGCLASS parameter on the JOB statement.
- SYSUT1 describes the input dataset.
 - The DD * indicates the data records are part of the job stream and follow immediately.

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1-3: 17

JCL Listings

- For every job that is run, a listing is produced which shows what transpired while the job was in the system.
- JCL listings typically will include the following parts:
 - Separator sheet
 - JES log
 - JCL statements
 - Allocation messages
 - Termination messages
 - Utility messages

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1-3: 18

Special DD Characters

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JCL Listings

- The JES job log provides a summary of the job's activity in the system.
 - The format of the log differs slightly between JES2 and JES3.
 - However, both contain similar information.
- Time stamps indicate the time the job enters the system, begins executing, and so forth.
- The log includes all messages sent to the operator about the job.
 - The log also includes statistics on the JES activity for the job.

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1-3: 19

Separator Sheet

- This is a typical separator sheet.

JOB #6001A

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1-3: 20

JES Log

```
AT6140 JOB ORIGIN FROM GROUP=ANYLOCAL, DSP=IR , DEVICE=INTRDR , 0000
08:27:20 ---- IAT6853 THE CURRENT DATE IS WEDNESDAY, 12 JAN 2011 ----
08:27:20 IAT2000 JOB #6001A (JOB44395) SELECTED SYS2 SRVCLASS=MATCH
08:27:20 TSS7000I #6001 Last-Used 12 Jan 11 07:59 System=5100 Facility=TSO
08:27:20 TSS7000I Count=02139 Mode=Impl Locktime=None Name=INSTRUCTOR1
08:27:20 SSA001I #6001A JORNO=44395 ASID=031E SYSTEM=SYS2 SYSR1=XIC1T1
08:27:20 IEF403I #6001A - STARTED - TIME=08.27.20 DATE=01/12/2011.012
08:27:21 IEF404I #6001A - ENDED - TIME=08.27.21 DATE=01/12/2011.012
```

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1-3: 21

JCL Statements

```

//#6001A JOB NOTIFY=#6001                                00010002
/* FIRST STEP TO COPY A DATASET                          00011001
//STEP01 EXEC PGM=IEBGENER                               00020001
//SYSPRINT DD SYSOUT=*                                   00030001
//SYSIN DD *                                             00040001
//SYSUT1 DD DSN=#6001.BENEFIT.DATA,DISP=SHR             00050002
//SYSUT2 DD DSN=#6001.BENEFIT.BK,DISP=(,CATLG),          00060002
//                                                    00070002
1 //#6001A JOB NOTIFY=#6001                               00010002
/* FIRST STEP TO COPY A DATASET                          00011001
2 //STEP01 EXEC PGM=IEBGENER                               00020001
3 //SYSPRINT DD SYSOUT=*                                   00030001
4 //SYSIN DD *                                             00040001
5 //SYSUT1 DD DSN=#6001.BENEFIT.DATA,DISP=SHR             00050002
6 //SYSUT2 DD DSN=#6001.BENEFIT.BK,DISP=(,CATLG),          00060002
//                                                    00070002
SPACE=(TRK,(5,1)),UNIT=SYSDA
```

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1-3: 22

JCL Statement Listing

- The printout lists the JCL statements submitted in the job.
- Each statement is numbered in the left column.
 - If any errors have been found, they are listed at the bottom of the listing with the number of the appropriate statement.

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1-3: 23

Allocation and Termination Messages

- Allocation messages for each step show the location of the datasets needed by that step.
 - There is a message for each DD statement in the step.
 - There also may be messages for other datasets the system needs to run the program.

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1-3: 24

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Running a Simple Job

Allocation and Termination Messages

- Termination messages are produced at the end of each step.
- The condition code indicates whether or not the program completed successfully.
 - Messages present the disposition of all the datasets allocated for that step.
 - Termination messages present the system resources, such as virtual storage and processor time, used by the step.
- At the end of the job, additional messages provide similar information on the job as a whole.

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1-3: 25

Allocation and Termination Messages

```
TSS7000I #6001 Last-Used 12 Jan 11 07:59 System=5100 Facility=TSO
TSS7001I Count=02139 Mode=Impl Locktime=None Name=INSTRUCTOR1
IEF236I ALLOC. FOR #6001A STEP01
IEF237I JES3 ALLOCATED TO SYSPRINT
IEF237I JES3 ALLOCATED TO SYSIN
IGD103I SMS ALLOCATED TO DDNAME SYSUT1
IGD101I SMS ALLOCATED TO DDNAME (SYSUT2 )
      DSN (#6001.BENEFIT.BK          )
      STORCLAS (WRKSTOR) MGMTCLAS (MCWRKSTD) DATACLAS (      )
      VOL SER NOS= WRK009
IEF142I #6001A STEP01 - STEP WAS EXECUTED - COND CODE 0000
```

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1-3: 26

Allocation and Termination Messages

```
IEF285I #6001.#6001A.JOB44395.D000000A.?      SYSOUT
IEF285I #6001.#6001A.JOB44395.D0000009.?      SYSIN
IGD104I #6001.BENEFIT.DATA                    RETAINED, DDNAME=SYSUT1
IGD104I #6001.BENEFIT.BK                      RETAINED, DDNAME=SYSUT2
IEF373I STEP/STEP01 /START 2011012.0827
IEF374I STEP/STEP01 /STOP 2011012.0827 CPU      0MIN 00.01SEC SRB      0MIN
00.00SEC VIRT 420K SYS 268K EXT 12K SYS 9852K
IEF375I JOB/#6001A /START 2011012.0827
IEF376I JOB/#6001A /STOP 2011012.0827 CPU      0MIN 00.01SEC SRB      0MIN
00.00SEC
```

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1-3: 27

Utility Messages

- Some utility programs produce messages which also appear in the listing.
- This message has been produced by the IEBGENER utility.

```
DATA SET UTILITY GENERATE          PAGE 0001
PROCESSING ENDED AT EOD
```
- Messages generated by IBM utility programs begin with a line identifying the utility program.
- Additional messages follow which provide information on the execution of the program.
- "PROCESSING ENDED AT EOD", indicates that IEBGENER has reached the end of the input data.

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1-3: 28