StarBat Option

VERSION 7.4

Getting Started Guide

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TRADEMARKS

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ABOUT THIS BOOK

Serena™ StarTool® FDM StarBat Option is a part of the Serena™ StarTool® family of products; it is a batch program that is normally used for repetitive, bulk data processing tasks. This manual contains detailed information on the use of the StarBat.

This document describes Serena™ StarTool® FDM StarBat Option, Version 7.4, a product of Serena™ Software Inc. This product, previously called, StarBat for StarTool®, has recently undergone a name change. The new name more clearly reflects the role of the product within the Serena™ family of products.

The product may also be referred to as File and Data Manager or FDM.

Note that the old product name, as well as variants of the new product name, are used in this document.

Note:

StarTool, with its StarBat option, is designed to provide a superior file and data management solution for application developers and system programmers at a more attractive price than major competitors. StarBat is not a drop in replacement for File-AID/Batch MVS and there is no guarantee that StarBat MVS has all the functionality of File-AID/Batch MVS. StarTool provides many features and functionality not found in File-AID MVS.

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OBJECTIVES

Use this book to learn the functionality available in the StarBat Option of StarTool FDM.

SUPPORT

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- Report new issues.
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- View a knowledge base of frequently asked questions and helpful product hints.
- Query the call tracking database to obtain the current status of an open issue.
- Access our FTP server to download product fixes and documentation in PDF format.
- Subscribe to one of our mailing list servers (LISTSERVE) to receive the latest product information by e-mail.

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INTRODUCTION 1

StarBat is an MVS batch program using standard MVS JCL to manipulate data files. StarBat supports data in character, hexadecimal, packed, and binary formats on disk or on tape.

Using StarBat, you can copy, update, or print an entire file or specific records within the file that satisfy certain conditions. You can also use StarBat to process numeric data, modify dates, and convert date formats.

In this introduction, we briefly describe the main functions that StarBat provides. We introduce the major functions and explain how to combine the functions and parameters into a job to modify a data file.

FEATURES

There are two main uses for StarBat.

- **Manipulate members of a data set**

  Different StarBat functions can copy, print and update members of a data set. These functions are COPYMBR, PRINTMBR, PRINTCHRMBR, PRINTHEXMBR, and UPDATEMBR.

- **Manipulate records in a member or data set**

  This is by far the most common use of StarBat. This allows for the copying, deleting, and inserting of records. Additionally, records can be printed as text, hexadecimal, or both. The data in the records can be totaled and reformatted in a variety of ways. The functions used here are COPYALL, COPYREC, COPYREV, COPYSOME, EXCLUDEREC, MULTICOPY, PRINT, PRINTALL, PRINTCHR, PRINTCHRALL, PRINTCHRREV, PRINTHEX, PRINHEXALL, PRINTHEXREV, PRINTREV, SKIP, SKIPREV, TOTAL, UPDATEALL, and UPDATEREC.

If we look at the functions themselves, they fall into five categories.

- **Copying data**

  There are many occasions when it is required to create a subset of a data file and, by combining the various copy functions, the exclude function and the conditional parameters, it is possible to develop sophisticated jobs to manipulate records to create new data files.

- **Deleting data**

  Whether it's deleting bad records or dropping records because they are no longer required, StarBat has the ability to do this effortlessly. Again, in combination with conditional parameters, it is possible to edit a file in batch mode without having to create a special purpose program to do it.

- **Inserting data**

  In addition to copying and deleting records, StarBat can insert new records if required. This allows new record types to be added, for example, to a test data file so that new functionality in a program can be tested.

- **Printing data**

  StarBat allows for data sets and members to be printed in text mode, which is suitable for source files for example, and in hexadecimal mode, which is more suited to data files. This is invaluable in testing a program because it clearly shows the exact contents of the files.

- **Changing data**

  One of the most powerful features of StarBat is its ability to modify the content of a record. Using commands similar to ISPF edit commands, it is possible to change whole files or individual records according to some defined pattern. These changes include the ability to increase the size of a field, as might be needed with converting a date format from MMDDYY to YYYYMMDD.

TYPES OF DATA SET PROCESSING

StarBat can process disk files with partitioned (PDS), partitioned extended (PDSE), sequential, VSAM, or direct organization; it can process tape files with sequential organization. Any record format is acceptable; StarBat assumes that any partitioned data set with record format U is a load library and that other libraries are usually called source libraries.

NEW FEATURES

Some of StarBat's new features are:

- Records can be copied in whole or in part from any data set of any type to any other data set of the same or a different type
- Records can be printed in text or vertical hexadecimal
- Data items within records can be replaced with larger or smaller data items
- An entire data set can be processed at one time, or records can be processed selectively
- Totals can be created for particular data within the data set
- Data or date fields can be warped

Note: you will be able to use StarTool FDM and StarBat Option features only if you are licensed to use both products. Please contact SERENA Software sales if you want to arrange a trial of the other product.

SOFTWARE ENVIRONMENT

StarBat runs under the major IBM operating systems:

- MVS/ESA *(any release)*
- OS/390 *(any release)*
- z/OS *(any release)*

In addition, the following environments should be available:

- ISPF and ISPF/PDF *(Version 4.0 or above)*
- TSO/E *(any release or any version)*

STARBAT INITIALIZATION

When StarBat is invoked, license information is normally displayed as shown below to identify the program, release number and release date.

```
PDS100I StarBat/Both -- Version 7.4.0  2000.350

Proprietary software product of SERENA Software
Phone (877)696-1850 OR FAX (650)522-1776
LICENSED TO: your corporate name/trial offer expires ...
             your city, state, zip/agent to contact for license ...
All other rights reserved - use of this software
product by unauthorized persons is prohibited.
```

PRODUCT OVERVIEW 2

StarBat is a program designed to perform a variety of data manipulation tasks in a background environment.

You can use StarBat to copy selected records or portions of records from one data set type to another, print data in different formats, add or enlarge data fields in records, warp date fields, and process data set members selectively.

StarBat is a MVS batch program that is controlled with standard MVS JCL. You provide control statements to specify the functions you want performed in your JCL or in a data set pointed to by the SYSIN DD statement.

For StarBat, functions are defined to process data sets to your specifications. Parameters specified on these function statements limit the parts of the data set to be processed and control secondary processes.

FUNCTIONS AND MODIFIERS

Following is a brief description of each supported function.

Function	Short	Description
COPYALL	CA	Copies all records of a data set
COPYMBR	CM	Copies members conditionally based on contents
COPYREC	CR	Copies data and reports record totals
COPYREV	CPR	Copies data in reverse order
COPYSOME	CS	Copies selected records but applies all changes like COPYALL
EXCLUDEREC	XR	Eliminates unwanted records in a copy
MULTICOPY	MC	Copies data to one or more output data sets

Function	Short	Description
PRINT	P	Prints records in alphanumeric format with record statistics
PRINTALL	PA	Prints all records of a data set
PRINTCHR	PC	Prints records in alphanumeric format
PRINTCHRALL	PCA	Prints all records of a data set
PRINTCHRMBR	PCM	Prints members conditionally based on contents
PRINTCHRREV	PCR	Prints records in alphanumeric format and reverse order
PRINTHEX	PH	Prints records in vertical hexadecimal format
PRINTHEXALL	PHA	Prints all records of a data set
PRINTHEXMBR	PHM	Prints members conditionally based on contents
PRINTHEXREV	PHR	Prints records in vertical hexadecimal format and reverse order
PRINTMBR	PM	Prints members conditionally based on contents
PRINTREV	PRR	Prints records in alphanumeric format and reverse order
SKIP	S	Moves the current record pointer forward
SKIPREV	SKR	Moves the current record pointer backward
TOTAL	T	Reads input records processing all parameter groups for SUM
UPDATEALL	UA	Updates all records of a data set
UPDATEMBR	UM	Updates members conditionally based on contents
UPDATEREC	UR	Updates records in place

PARAMETER DESCRIPTIONS

Parameters are code words or keywords that control processing actions.

Following is a brief description of each supported parameter.

Parameter	Short	Description
ABEND	AB	Controls EOJ processing when abnormal condition occurs
AND	IF	Creates a logical AND condition check (used with IF)
CHANGE	C	Changes only the first instance of data in a record
CHANGEALL	CA	Changes all occurrences of data in a record
COPYOVER	CO	Controls the replacement of identically named output members
EXCLUDEREC	XR	Controls the # of records to bypass in an EXCLUDEREC function
EXPAND	EX	Expands records at a specified location
IF	AND	Selects records to process based on data contents
MAXRECIN	MRI	Controls the number of records to input
MAXRECOUT	MRO	Controls the maximum number of records to output
MEMBER	M	Specifies a member name to process in a PDS
MEMBERS	MS	Specifies a group of members to process in a PDS with a mask
MOVE	MV	Moves data into the record
NEWMBR	NM	Gives a new name to an output PDS member
NEWMBRS	NMS	Names multiple new members of an output PDS using a mask
OPTIONS	OP	Controls StarBat processing options
OR	(none)	Used with the IF parameter to indicate an OR condition

Parameter	Short	Description
OVERALL	OA	Replaces all occurrences of data in a record with other data
OVERLAY	OL	Replaces the first instance of data in a record with new data
PADCHAR	PAD	Specifies a padding character for uninitialized parts of a record
PRINT	P	Prints records in alphanumeric format with record statistics
PRINTCHR	PC	Prints records in alphanumeric format
PRINTHEX	PH	Prints records in vertical hexadecimal format
PRINTLPI	PL	Specifies the number of lines per inch for print output pages
RBA	(none)	Processes VSAM data beginning at a relative byte address
RDW	(none)	Controls the inclusion of the record descriptor word
SELECT	S	Processes every nth record
STARTKEY	SK	Processes VSAM data beginning with a generic key
STOPIF	ST	Stops processing a function when a record satisfies a condition
SUM	(none)	Accumulates the contents of specified fields
WRITE	W	Writes a record to one or more output files

DATA SETS 3

StarBat supports sequential, direct, VSAM, and partitioned data sets. ISAM data sets are not supported.

SEQUENTIAL DATA SETS

StarBat can create any type of sequential data set as output. Input concatenated data sets on unlike devices are supported but these data sets must have similar characteristics. When processing concatenated input data sets, StarBat treats all of these data sets as one logical input data set and no reports are provided on the individual data sets in the concatenation aside from a record count for each concatenated data set.

DIRECT DATA SETS

StarBat uses BSAM to read direct data sets. If RKP is greater than zero, you do not need to perform any special action to copy the data and the imbedded keys. However, if RKP is zero, you will need to use a MOVE parameter with a negative relative location to reference the key portion because the key is not also present in the data.

For example, if you have a record with a 20 byte key and a 80 byte data portion, use the following MOVE parameter to copy both the key and data portion of the record to an output record:

```
DD01   COPYREC    MOVE=(1,100,-20)
```

VSAM DATA SETS

StarBat supports RRDS, KSDS, and ESDS data sets. Linear VSAM data sets are supported but the CISIZE has to be 4K.

PARTITIONED DATA SETS

StarBat supports PDS and PDSEs. To process a specific member, use the MEMBER parameter. To process multiple members, either use multiple control statements with the MEMBER parameter (only one MEMBER parameter is allowed for each control statement), or use the MEMBERS parameter specifying a member mask.
To process the entire data set, do not specify any MEMBER or MEMBERS parameter.

If the PDS and PDSEs are concatenated as input and if the MEMBER parameter is used, StarBat processes each data set in the order of concatenation and stops processing the function as soon as the member is found.

There are a few restrictions when processing load library members:

- Load PDSE members cannot be used as output in a copy.
- The MULTICOPY function does not support scatter-loaded, overlay, or note-listed modules.
- The block size of the input data set must be equal to or less than the output data set.
- The main module associated with an alias member is always copied at the same time an alias is copied.

STARBAT JCL AND DDNAMES

A sample of JCL to execute StarBat follows.

```
//StarBat1 JOB  (JOB CARD PARAMETERS)
//A   EXEC PGM=StarBat,REGION=2048K
//STEPLIB  DD  DSN=STEPLIB.DATA.SET,DISP=SHR
//DD03     DD  DSN=SAMPLE.INPUT.DATA.SET,DISP=SHR
//DD03O    DD  DSN=SAMPLE.OUTPUT.DATA.SET,DISP=SHR
//SYSPRINT DD  SYSOUT=*
//SYSLIST  DD  SYSOUT=*
//SYSTOTAL DD  SYSOUT=*
//SYSIN    DD  *
DD03 COPYALL=(1,0,C'PGM=TESTPROG',C'PGM=PRODPROG'),
           PRINTCHR=100
```

The StarBat job looks like any other MVS job. The usual rules for EXEC and DD statements apply.

The **EXEC** statement tells the operating system the name of the program to be executed. A two-megabyte region is usually sufficient for StarBat.

A **STEPLIB** or **JOBLIB** statement is required unless StarBat is present in your system's link list.

A **DD*xx*** statement is required to describe input data sets to StarBat. The *xx* value can be any number from 00 through 99 that matches a control statement name like **DD*xx***. Note that input data sets may be concatenated.

A **DD*xx*O** statement is required for **COPYREC** or **EXCLUDEREC** functions. The xx value must match the *xx* value in the input data set defined on the corresponding **DD*xx*** JCL statement. If necessary, basic DCB information such as RECFM, LRECL, and BLKSIZE will be copied from the input data set to the output data set when the data set is opened.

Additional output DD statements with any desired name may be specified for the **MULTICOPY** function; the WRITE parameter names the output DD statement and causes output records to be written when it is processed.

StarBat primary output is directed to the **SYSPRINT** DD statement. This statement is optional; it will be dynamically allocated if it is not present. StarBat echoes control statements and error, status, and completion messages to this DD name. StarBat expects this to be a data set with standard attributes for a listing file namely: RECFM=FBA, LRECL=133, and BLKSIZE a multiple of 133. Note that an LRECL of 80 through 132 will work but will truncate some print lines.

If you specify the PRINT or PRINTHEX options, the **SYSLIST** DD statement should be included. If it is omitted, it is dynamically allocated if needed. This data set has the same DCB attributes as the SYSPRINT data set.

If you specify the SUM option, the **SYSTOTAL** DD statement should be included. If it is omitted, all SYSTOTAL output is re-directed to the SYSPRINT data set. This data set also has the same DCB attributes as the SYSPRINT data set.

The **SYSIN** statement provides control statements for StarBat. Control cards must be in standard 80-character format and all 80 columns may be used. If no control cards are found, StarBat defaults to a COPYREC function for every pair of matching input and output data sets (**`//DD`*`xx`*** and **`//DD`*`xx`*`O`**).

CONTROL STATEMENTS 4

StarBat control statements consist of a data set identifier, a function name, and one or more parameters separated by commas. Comments are preceded by one or more blanks following a parameter.

In the following example, **DD01** is the data set identifier. **PRINTCHR** is the function name, **IF=(10,EQ,C'A')** is the parameter and the remainder of the statement is comments.

```
DD01 PRINTCHR IF=(10,EQ,C'A')  prints records containing character 'A' in column 10.
```

DATA SET IDENTIFIER

The data set identifier identifies which data set in the JCL DD statement is being processed. The format of the data set identifier is DD*xx* where *xx* is from 00 to 99. The number references the //DD*xx* DD statement, which specifies the input data set to be processed. DD*xx* must begin in column 1 of the control statement. If the function is **COPY** or **EXCLUDEREC**, DD*xx* is also used to reference the //DD*xx*O DD statement representing the output data set.

FUNCTION IDENTIFIER

The function identifier identifies the action that you want to perform on the data. It is always positioned after the data set identifier with one or more spaces.

PARAMETERS

Parameters are conditions defining the scope of the function; they are positioned after the function identifier and one or more spaces. Each parameter is followed by an equal sign and one or more elements containing a combination of start, length, operator, and data fields. There can be one or more parameters separated by commas.

Start

A start location indicates the location where data can be found in the input record. A start location may be coded in one of two ways: actual start location and relative start location.

Actual start location is the exact column number where the data in the record is positioned. The number can be from 1 to 32767, but it cannot be larger than the record size.

Relative start location indicates the position relative to the current location. StarBat supports both input relative start location and output relative start location.

When an input record is first read by StarBat, the relative location is set to the beginning of the record. Parameters such as IF, CHANGE, and OVERLAY change this location value. A relative start location can be specified by placing a plus sign or a minus sign before a number. For example, to reference a location 10 bytes before the current location, use –10; to reference a location 5 bytes after the current location, use +5. Output relative location is supported when using the MOVE parameter with the COPY or MULTICOPY functions. When data is moved to an output location, the output relative location moves to the next available output position.

Operator

Operators are EQ, NE, GT, LT, GE, and LE. They are used to compare data with an input record.

StarBat also supports bit value comparisons using operators AO (all ones), AZ (all zeroes), NO (not ones), and MX (mixed ones and zeroes) with the IF, OR, CHANGE, or OVERLAY parameters.

Length

When the exact location of the compare data is unknown, the length element may be used in place of the operator element. In this case, an equal comparison is assumed.

To scan the entire input record, use a length of 0. Otherwise, the length value must be at least one greater than the length of the compare data; also, the sum of the current input location and the length value must be less than or equal to the record length. Length cannot be greater than 255.

Note that the IF, OR, CHANGE and OVERLAY parameters are changed to scanning parameters when the length element is used. Therefore, they will change the relative start input position as previously mentioned.

Data

StarBat supports character, hexadecimal, binary, and packed data. The data element can be used as compare data, as replacement data, or as literal data.

Character data may be enclosed in single or double quotes. When used as compare data, more than one value can be entered with commas in between, indicating an OR condition, as long as they are enclosed in single quotes. For example, IF=(10,EQ, C'TEST,PROD') checks if the record contains the characters TEST or PROD in column 10. A duplication factor may be used to avoid coding repetitive data elements. For example, instead of coding C'TEST,PROD,TEST,PROD,', you could code 2C'TEST,PROD,'.

Alphanumeric data is case-sensitive and is not translated to upper case. To search for data in both upper and lower case, use the T character string. For example, to search for PROD, Prod, or proD, use T'Prod'.

Note that all character data must fit into a single control statement because continuations are not supported.

Packed data can be entered with any valid length that fits on a single control statement (continuations are not supported). You must enclose all numeric digits in single quotes. StarBat calculates the data length using the data entered. You may enter a plus or minus before each string of numbers; an unsigned packed number is considered positive. For example, P'12' and P'+12' are equivalent.

Binary data can be entered with a beginning H character for halfword binary numbers or an F character for fullword binary numbers. You must enclose all numeric digits in single quotes. You may enter a plus or minus before each string of numbers; an unsigned binary number is considered positive. For example, F'12' and H'-12'.

Hexadecimal data can be entered with any length that fits on a single control statement (continuations are not supported). You must enclose all hexadecimal digits in single quotes. StarBat calculates the data length using the data entered and it must always have an even number of digits. You may also use a numeric duplication factor to avoid coding repetitive data elements. For example, 3X'003F' and X'003F003F003F' are equivalent.

Comments

Comments may be coded after a parameter or a parameter with a comma as long as there are one or more blanks between them. A comment may also be coded as a standalone statement provided that the statement begins with an *. In this case, the comment will also be output in the SYSTOTAL data set.

Three comments are coded in the following example:

```
DD03 COPYREC MAXRECIN=10, COMMENT#1
             COPYOVER=YES COMMENT#2
* COMMENT#3
```

FUNCTIONS 5

Following is a brief description of each supported function.

Function	Short	Description
COPYALL	**CA**	Copies all records of a data set
COPYMBR	**CM**	Copies members conditionally based on contents
COPYREC	**CR**	Copies data and reports records copied
COPYREV	**CPR**	Copies data in reverse order
COPYSOME	**CS**	Copies selected records but applies all changes like COPYALL
EXCLUDEREC	**XR**	Eliminates unwanted records in a copy
MULTICOPY	**MC**	Copies data to one or more output data sets
PRINT	**P**	Prints records in alphanumeric format with record statistics
PRINTALL	**PA**	Prints all records of a data set
PRINTCHR	**PC**	Prints records in alphanumeric format
PRINTCHRALL	**PCA**	Prints all records of a data set
PRINTCHRMBR	**PCM**	Prints members conditionally based on contents
PRINTCHRREV	**PCR**	Prints records in alphanumeric format and reverse order
PRINTHEX	**PH**	Prints records in vertical hexadecimal format
PRINTHEXALL	**PHA**	Prints all records of a data set
PRINTHEXMBR	**PHM**	Prints members conditionally based on contents

Function	Short	Description
PRINTHEXREV	**PHR**	Prints records in vertical hexadecimal format and reverse order
PRINTMBR	**PM**	Prints members conditionally based on contents
PRINTREV	**PRR**	Prints records in alphanumeric format and reverse order
SKIP	**S**	Moves the current record pointer forward
SKIPREV	**SKR**	Moves the current record pointer backward
TOTAL	**T**	Reads input records processing all parameter groups for SUM
UPDATEALL	**UA**	Updates all records of a data set
UPDATEMBR	**UM**	Updates members conditionally based on contents
UPDATEREC	**UR**	Updates records in place

StarBat function names can be abbreviated as shown in the title lines in the following pages.

COPYREC, COPYALL, COPYMBR, AND COPYSOME

Copies data and reports records output. If it is required to copy records from one data set into another, the **COPYREC** (or **CR**) function is used. With the addition of qualifiers it is possible to control the records selected for copying. Additionally, in the process of copying, the data can be modified by expanding or contracting fields and changing the data within fields.

Use **COPYMBR** (or **CM**) to copy members based on their contents and use **COPYALL** (or **CA**) to process multiple conditional updates (IF OVERLAY, IF CHANGE, IF MOVE, IF EXPAND, IF WARP) while copying all records. Use the **COPYSOME** (or **CS**) function to process multiple conditional updates like **COPYALL** while copying selected records like **COPYREC**.

The following example will copy up to *1000* records that contain *USA* anywhere after position 256:

```
DD01 COPYREC IF=(256,0,C'USA'),MAXRECOUT=1000
```

The following example will copy the input data set and replace the first *USA* in the first three positions with *DOM*:

```
DD01 COPYREC OVERLAY=(1,3,C'USA',C'DOM')
```

The following example will copy every other record that contains *USA* in the first three positions:

```
DD01 COPYREC SELECT=2,IF=(1,3,C'USA')
```

The following example will copy all members whose names begin with STAR containing *USA* anywhere in the member:

```
DD01 COPYMBR MEMBERS=STAR-,IF=(1,0,C'USA')
```

The following example will copy records containing an 8 or 9 and warp each record with YYDDD or YYMMDD format. Note that if a record has both formats, only the YYDDD format will be warped.

```
DD01 COPYREC   IF=(12,EQ,C'8'),
               WARP=(16,C,YYDDD,ADD=5Y),
               IF=(22,EQ,C'9),
               WARP=(26,C,YYMMDD,ADD=5Y)
```

The following example will copy all records and warp all 8 and 9 dates:

```
DD01 COPYALL   IF=(12,EQ,C'8'),
               WARP=(16,C,YYDDD,ADD=5Y),
               IF=(22,EQ,C'9),
               WARP=(26,C,YYMMDD,ADD=5Y)
```

The following example will copy records containing an 8 or 9 and warp all dates on these records:

```
DD01 COPYSOME  IF=(12,EQ,C'8'),
               WARP=(16,C,YYDDD,ADD=5Y),
               IF=(22,EQ,C'9),
               WARP=(26,C,YYMMDD,ADD=5Y)
```

COPYREV

The **COPYREV** or **CR** function copies records from a sequential or VSAM data set in reverse order. This means that the first record copied will be the last record from the input data set followed by other records from the input data set moving toward the front of the data set.

The following example will copy records except those containing *RED* anywhere in reverse order:

```
DD01 COPYREV IF=(1,0,C'RED')
```

The following example will copy up to 1000 records that contain *USA* anywhere after position 256 in reverse order:

```
DD01 COPYREV IF=(256,0,C'USA'),MAXRECOUT=1000
```

EXCLUDEREC

The **EXCLUDEREC** or **XR** function excludes (or eliminates) records during a copy; **EXCLUDEREC** selects records that would be bypassed by **COPYREC**.

The following example will copy all records except those containing *RED* anywhere:

```
DD01 EXCLUDEREC IF=(1,0,C'RED')
```

The following example will copy all records except the first *100* containing *RED* anywhere:

```
DD01 EXCLUDEREC IF=(1,0,C'RED'),EXCLUDEREC=100
```

The following example will copy the input data set and drop any record that contains an A in position 1 or contains a value higher than *CAA* in location *112*. Processing stops after copying *20* records:

```
DD01 EXCLUDEREC IF=(1,EQ,C'A'),OR=(112,GT,C'AA'),MAXRECOUT=20
```

MULTICOPY

The **MULTICOPY** or **MC** function copies data to one or more output data sets. With the **MULTICOPY** function, you can direct output records to several output data sets and add, delete, or modify records being copied to the output data sets at the same time.

In order to control the destination of the records, the **WRITE** parameter is used to specify the output DDNAME.

Output records for **MULTICOPY** are created piece by piece with MOVE or by copying the input record. If the MOVE parameter is used, the output area is initialized to the PADCHAR value and not reset between different WRITE parameters.

There are several restrictions on the data that can be output with a **MULTICOPY** function:

Output to load members is supported; however, JCL indicating PDS(MEMBER) notation is not supported. Instead, use only the PDS name in the JCL and indicate the member name with the MEMBER, MEMBERS, NEWMBR, or NEWMBRS parameters.

Overlay, scatter-loaded, and note-listed load members are not supported.

The following example shows how to create two identical output data sets in *//OUT1* and *//OUT2:*

```
DD01 MULTICOPY WRITE=(OUT1,OUT2)
```

The following example will copy a file, repeat any record with a *C'5'* and change it to a *C'6':*

```
DD01 MULTICOPY WRITE=OUT1,IF=(20,EQ,C'5'),MOVE=(1,0,1),
            MOVE=(20,C'6'),WRITE=OUT1
```

The following example will add a STEPLIB JCL statement after any EXEC statement:

```
DD01 MULTICOPY WRITE=NEWJCL,IF=(1,20,C' EXEC '),MOVE=(1,80C' '),
            MOVE=(1,C'//STEPLIB  DD  DISP=SHR,'),
            MOVE=(+0,C'DSN=MYHILEV.MYMIDLEV.MYLOWLEV'),WRITE=NEWJCL
```

PRINT, PRINTALL, PRINTMBR, AND PRINTREV

Print (or **P**) prints a data set or a portion of a data set in alphanumeric format with identifying information such as record number, RBA, and record length. A column scale is normally printed with each record; however, if you request OPTIONS=SHORT, the column scale will be produced only after each page header.

PRINTMBR (or **PM**) prints members based on their contents.

PRINTALL (or **PA**) processes multiple conditional updates (IF OVERLAY, IF CHANGE, IF MOVE, IF WARP) while printing records.

PRINTREV (or **PRR**) prints sequential or VSAM data sets in reverse order.

The following example will print the first 10 records:

```
DD01 PRINT MAXRECOUT=10
```

The following example will print the first 20 records containing RED in position 12 replaced with BLU. Note that the input data set is not actually changed; use this function to see changes before running an **UPDATEREC**:

```
DD01 PRINT OVERLAY=(12,EQ,C'RED',C'BLU'),MAXRECOUT=20
```

The following example will print the first 100 positions of the first 20 records that contain RED in position 12:

```
DD01 PRINT IF=(12,EQ,C'RED'),MAXRECOUT=20,MOVE=(1,100,1)
```

The following example will print the first 100 positions of the last 20 records with RED in position 12 in reverse order:

```
DD01 PRINTREV IF=(12,EQ,C'RED'),MAXRECOUT=20,MOVE=(1,100,1)
```

PRINTCHR, PRINTCHRALL, PRINTCHRMBR AND PRINTCHRREV

PRINTCHR (or **PC**) prints a data set or a portion of a data set in alphanumeric format with no additional record information. If you wish to print a ruler at the top of each page to help identify the columns used, you can specify the **OPTIONS=SHORT** parameter.

PRINTCHRMBR (or **PCM**) prints members based on their contents.

PRINTCHRALL (or **PCA**) processes multiple conditional updates (IF OVERLAY, IF CHANGE, IF EXPAND, IF MOVE, IF WARP) while printing records.

PRINTCHRREV (or **PCR**) prints sequential or VSAM data sets in reverse order.

The following example will list the first *10* records:

```
DD01 PRINTCHR MAXRECOUT=10
```

The following example will list the first *20* records containing *RED* in position *12* replaced with *BLU*. Note that the input data set is not actually changed; use this function to see changes before running an **UPDATEREC**:

```
DD01 PRINTCHR OVERLAY=(12,EQ,C'RED',C'BLU'),MAXRECOUT=20
```

The following example will list the first *100* positions of the first *20* records that contain *RED* in position *12*:

```
DD01 PRINTCHR IF=(12,EQ,C'RED'),MAXRECOUT=20,MOVE=(1,100,1)
```

The following example will list the last *10* records in reverse order:

```
DD01 PRINTCHRREV MAXRECOUT=10
```

PRINTHEX, PRINTHEXALL, PRINTHEXMBR, AND PRINTHEXREV

PRINTHEX (or **PH**) prints records in a vertical hexadecimal format. The report produced also supplies additional useful information such as the record number and the record length. A column scale is normally printed with each record; however, if you request OPTIONS=SHORT, the column scale will only be produced after each page header.

PRINTHEXMBR (or **PHM**) prints members based on their contents.

PRINTHEXALL (or **PHA**) processes multiple conditional updates (IF OVERLAY, IF CHANGE, IF EXPAND, IF MOVE, IF WARP) while printing records.

PRINTHEXREV (or **PHR**) prints sequential or VSAM data sets in reverse order.

To print the first *10* records of a file in vertical hexadecimal:

```
DD01 PRINTHEX MAXRECOUT=10
```

The following example will print, in vertical hexadecimal, the first 20 records containing *RED* in position *12* replaced with *BLU*. Note: the input data set is not actually changed; use this function to see changes before using the update functions.

```
DD01 PRINTHEX OVERLAY=(12,EQ,C'RED',C'BLU'),MAXRECOUT=20
```

This example will print, in vertical hexadecimal, up to *100* positions of the first *20* records with *RED* in position *12*:

```
DD01 PRINTHEX IF=(12,EQ,C'RED'),MAXRECOUT=20,MOVE=(1,100,1)
```

The following example will print, in vertical hexadecimal, the last *10* records in reverse order:

```
DD01 PRINTHEXREV MAXRECOUT=10
```

SKIP AND SKIPREV

SKIP (or **S**) moves the current record pointer forward, and **SKIPREV** (or **SKR**) moves it backward. This allows large groups of records to be excluded from processing.

When using these functions, remember the following:

- You may not follow a **SKIP** function with an **UPDATEREC** function because the data set must be closed and reopened while maintaining data set positioning.
- You can not follow a **SKIP** function with a reverse function like **COPYREV.**
- You can not follow a **SKIPREV** function with a forward operation like **COPYREC**.

The following example will skip the first *100* records before a **PRINT** function:

```
DD01 SKIP MAXRECIN=100
DD01 PRINT IF=(10,EQ,C'RED')
```

The following example will skip the first *100* records before an **UPDATEREC** function:

```
DD01 UPDATEREC  MAXRECIN=100
DD01 UPDATEREC OVERLAY=(10,EQ,C'RED',C'BLU')
```

The following example will skip the last *100* records before a **PRINTREV** function:

```
DD01 SKIPREV MAXRECIN=100
DD01 PRINTREV IF=(10,EQ,C'RED')
```

TOTAL

TOTAL or **T** reads input records processing all parameter groups for SUM. The **TOTAL** function creates simple reports that can be used to validate data in a data set. The results generated from the **TOTAL** function and the SUM parameter are directed to the SYSTOTAL DDNAME if it is present; otherwise, the results are directed to the SYSPRINT data set. Comment statements can also be added to the input control statements and they will be printed with the **TOTAL** function results.

StarBat will produce a two line data set identification message after the comment and before the accumulation with the following output identifier: **`FOLLOWING TOTALS DEVELOPED FROM`** for the first line and the input data set name and volume name on the second line.

The following example will accumulate all packed numbers beginning in column *43*:

```
DD01 TOTAL  SUM=(43,'This is the packed data set total')
```

The following example will accumulate all character numbers beginning in column *43* for type *M* records:

```
DD01 TOTAL  IF=(22,EQ,C'M'),SUM=(43,6,C,'This is the character data set
total')
```

UPDATEREC, UPDATEMBR, AND UPDATEALL

UPDATEREC (or **UR**) updates records in place. This function must be combined with any of the parameters used to modify data such as the CHANGE and OVERLAY parameters.

Note This will update the data set in place. If you wish to preview your changes prior to committing them, use the **PRINT** functions instead to show the changes that will be made and then re-run the job replacing the **PRINT** function with the **UPDATEREC** function.

UPDATEMBR (or **UM**) updates members based on their contents.

UPDATEALL (or **UA**) processes multiple conditional updates (IF OVERLAY, IF CHANGE or IF WARP) while processing all records.

The following example will show potential changes before performing an actual **UPDATEREC**:

```
DD01 PRINT  OVERLAY=(1,0,C'RED',C'BLU')
```

The following example will change the first occurrence of *RED* anywhere in a record to *BLU*:

```
DD01 UPDATEREC OVERLAY=(1,0,C'RED',C'BLU')
```

The following example will change all occurrences of *RED* to *BLU* and all occurrences of *WHI* to *ANY*:

```
DD01 UPDATEALL OVERALL=(1,0,C'RED',C'BLU'),
               OVERALL=(1,0,C'WHI',C'ANY')
```

PARAMETERS 6

Parameters may be specified on function statements to limit the data processed and to control the function.

In this section, the following parameters are described in alphabetical order.

Parameter	Short	Description
ABEND	**AB**	Controls EOJ processing when an abnormal condition occurs
AND	**IF**	Creates a logical AND condition check (used with IF)
CHANGE	**C**	Changes only the first instance of data in a record
CHANGEALL	**CA**	Changes all occurrences of data in a record
COPYOVER	**CO**	Controls the replacement of identically named output members
EXCLUDEREC	**XR**	Controls the # of records to bypass in an EXCLUDEREC function
EXPAND	**EX**	Expands records at a specified location
IF	**AND**	Selects records to process based on data contents
MAXRECIN	**MRI**	Controls the number of records to input
MAXRECOUT	**MRO**	Controls the maximum number of records to output
MEMBER	**M**	Specifies a member name to process in a PDS
MEMBERS	**MS**	Specifies a group of members to process in a PDS with a mask
MOVE	**MV**	Moves data into the record

Parameter	Short	Description
NEWMBR	**NM**	Gives a new name to an output PDS member
NEWMBRS	**NMS**	Names multiple new members of an output PDS using a mask
OPTIONS	**OP**	Controls StarBat processing options
OR	**(none)**	Used with the IF parameter to indicate an OR condition
OVERALL	**OA**	Replaces all occurrences of data in a record with other data
OVERLAY	**OL**	Replaces the first instance of data in a record with new data
PADCHAR	**PAD**	Specifies a padding character for uninitialized parts of a record
PRINT	**P**	Prints records in alphanumeric format with record statistics
PRINTCHR	**PC**	Prints records in alphanumeric format
PRINTHEX	**PH**	Prints records in vertical hexadecimal format
PRINTLPI	**PL**	Specifies the number of lines per inch for print output pages
RBA	**(none)**	Processes VSAM data beginning at a relative byte address
RDW	**(none)**	Controls the inclusion of the record descriptor word
SELECT	**S**	Processes every nth record
STARTKEY	**SK**	Processes VSAM data beginning with a generic key
STOPIF	**ST**	Stops processing a function when a record satisfies a condition
SUM	**(none)**	Accumulates the contents of specified fields
WRITE	**W**	Writes a record to one or more output files

Parameters are grouped according to type as follows:

- **Action** Changes data (CHANGE, EXPAND, MOVE, OVERLAY, OVERALL, SUM, WARP and WRITE)
- **Limit** Specifies record count limits (EXCLUDEREC, MAXRECIN, MAXRECOUT and SELECT)
- **Print** Prints records as they are processed (PRINT, PRINTCHR and PRINTHEX).
- **Selection** Selects records based on their contents (AND, IF, and OR)
- **Control** Defines basic conditions during execution (all other parameters such as ABEND and STOPIF)

Several restrictions on parameter and function combinations should be noted:

- The EXCLUDEREC parameter can only be used with the **EXCLUDEREC** function.
- The WRITE parameter can only be used with the **MULTICOPY** function.
- The PRINTHEX, PRINTCHR and PRINT parameters should not be used with the **PRINT** functions.
- The EXPAND, MOVE and MAXRECOUT parameters can not be used with the **UPDATE** functions.
- The NEWMBR, NEWMBRS and COPYOVER parameters can not be used with **PRINT** functions, **SKIP, SKIPREV** or **UPDATEREC**.

Many StarBat parameters process numeric character data and packed decimal data. Numeric characters must be in zoned decimal (hexadecimal X'F0' through X'F9') and the last byte can be signed positive (X'C0'), negative (X'D0') or unsigned (X'F0'). Packed decimal numbers must contain valid numeric numbers and the sign must be positive (with either X'0C' or X'0F') or negative (X'0D'). In most cases, you can enter a data length of 0 for packed decimal numbers and StarBat will determine the length dynamically by scanning for the sign digit in each field as it is processing each record.

ABEND

The ABEND or AB parameter controls how the end of job processing should be handled when an abnormal condition occurs during job execution.

```
ABEND=0/1/2
```

ABEND=0 Issues a return code at normal end of job.

ABEND=1 Issues a U0012 abend dump when an I/O error occurs. This is the default.

ABEND=2 Issues a user abend when a non-zero return code is encountered.

In the following example, a user abend of U0008 will occur if the character string '*ALIAS-*' is not found in the input data set and no records are written to the output data set.

```
DD01 MULTICOPY ABEND=2,IF=(1,0,C'ALIAS-').MOVE=(19,0,80),WRITE=FILE1
```

AND

The AND parameter selects records to be processed by the function being executed. The AND parameter and the IF parameter have identical meanings and format. AND is normally used after an IF parameter to improve readability.

For additional details, see *"IF" on page 42*.

CHANGE

The CHANGE or C parameter works like the CHANGE command in ISPF edit. It replaces the value in *string-1* with the value in *string-2*. *String-1* and *string-2* can be different lengths and the data will be shifted left or right depending on the size of the second string (see NOTE: below). CHANGE will only modify the first occurrence of the matching data in the record, as with ISPF. If you wish to change multiple occurrences, use the similar CHANGEALL parameter (*page 40*).

```
CHANGE=(start,length/operator,string-1,string-2)
```

start defines the position of the record where the search is to begin. The first byte of the record is position 1.

length specifies how many characters to search. Specify 0 if you want to search the remainder of the record.

operator an alternative to length is to specify a relational operator (such as EQ).

string-1 is a binary, character, hexadecimal or packed string representing data to be searched for at this location.

string-2 is a binary, character, hexadecimal or packed string representing data to be replaced at this location.

NOTE: When CHANGE replaces a data field by a shorter field, StarBat shifts contiguous characters to the left until a blank character is found and inserts blanks to adjust for the missing characters. If no blanks are found, blanks are inserted at the end of the record.

For example,

with **`CHANGE=(1,5,C'1234',C'X')`**

```
Record 1: 12345 AB1234GH
Record 2: 123456ABCDEFGH
```

would become:

```
Record 1: X5    AB1234GH
Record 2: X56ABCDEFGH
```

When CHANGE replaces a data field by a longer field, StarBat shifts contiguous characters to the right compressing multiple blanks to single blanks until all characters fit into the record. Note: if no blanks are found using the **COPYREC** or **MULTICOPY** function for fixed length output records or using the **UPDATE** functions, truncation will occur if the data extends beyond the record boundary.

For example,

with **CHANGE=(11,3,C'USA',C'DOMESTIC')**

```
Record 1: AA19980101USA       CA94010-1904
Record 2: AA19880101USA  CA94010-1904
```

would become:

```
Record 1: AA19980101DOMESTIC  CA94010-1904
Record 2: AA19880101DOMESTIC CA94010-1904
```

It is important to remember when using the **CHANGE** (or **OVERLAY**) parameters that they operate on the input data records. Therefore, you should specify any MOVE functions after the **CHANGE** (or **OVERLAY**) parameter because **MOVE** operates on the output record.

CHANGEALL

The CHANGEALL or CA parameter is the same as the CHANGE parameter except that all occurrences are modified and the second parameter must be a length value (not an operator like EQ). See *"CHANGE" on page 39* for additional details.

```
CHANGEALL=(start,length,string-1,string-2)
```

start defines the position of the record where the search is to begin. The first byte of the record is position 1.

length specifies how many characters to search. Specify 0 if you want to search the remainder of the record.

string-1 is a binary, character, hexadecimal or packed string representing data to be searched for at this location.

string-2 is a binary, character, hexadecimal or packed string representing data to be replaced at this location.

COPYOVER

The COPYOVER or CO parameter may be used to specify if identically named output members are to be replaced when copying from one PDS to another.

```
COPYOVER=YES/NO
```

COPYOVER=YES Default, replaces the output PDS member if it already exists.

COPYOVER=NO Do not replace the output PDS member if it already exists.

The following example specifies that existing members are not to be replaced:

```
DD01 COPYREC COPYOVER=NO
```

EXCLUDEREC

The EXCLUDEREC or XR parameter is used with the **EXCLUDEREC** function to control the number of records to exclude.

```
EXCLUDEREC=n
```

n is a number from 1 to 999999999. It represents the number of records to be excluded.

The following example replaces all occurrences of '*MAIL*' with *'IMA1*' and omits the first record that contains '*IMA1-M*'.

```
DD01 EXCLUDEREC OVERALL=(1,0,C'MAIL',C'IMA1'),IF=(1,EQ,C'IMA1-M'),EXCLUDEREC=1
```

EXPAND

The EXPAND or EX parameter is used to expand date and data fields. EXPAND is similar to MOVE but the original record is preserved to the extent possible. Character type is normally used for date expansions of any format because after a date is padded on the right with blanks; StarBat can still read it using its input picture and rewrite it with a new picture.

Column numbers referred to by EXPAND are the original column numbers in the data; similarly, references to column numbers by other StarBat parameters should also reference the original column numbers because StarBat will adjust these column numbers dynamically.

```
EXPAND=(column,type,size,newsize)
```

column is the location where the data item begins. Any valid actual or relative location may be used.

type is **B** for binary, **P** for packed, **C** for character or **N** for character numeric. Character type pads the original item on the right with blanks; other types of field expansion add numeric padding to the left.

size is the number of bytes used by the original data item.

newsize is the number of bytes to be used by this data item. **Newsize** can be smaller or larger than **size**.

The following example will expand a packed data field and accumulate the next character field:

```
DD01 COPYREC  EXPAND=(21,P,4,8),SUM=(25,5,C,'The next field')
```

The following example will expand a date field and convert a character date format from YYDDD to CCYYDDD:

```
DD01 COPYREC  EXPAND=(21,C,5,7),WARP=(21,C,YYDDD,OUTPIC=CCYYDDD)
```

The following example will expand a date field and convert a packed date format from YYDDD to CCYYDDD:

```
DD01 COPYREC  EXPAND=(21,C,3,4),WARP=(21,P,YYDDD,OUTPIC=CCYYDDD)
```

The following example will expand a binary field and a numeric character field and accumulate the fields:

```
DD01 COPYREC
EXPAND=(12,B,2,4),EXPAND=(21,N,4,9),SUM=(12,4,B),SUM=(21,9,C)
```

IF

The IF parameter selects records to be processed by the function being executed. The IF parameter and the AND parameter have identical meanings and format. AND is normally used after an IF parameter to improve readability.

There are two IF syntax forms to test for data contents or valid numerics:

```
IF=(start,length/operator,string,...)     /* data content test   */
IF=(start,length,[duplicate]type,...)     /* valid numeric test  */
```

start defines the position of the record where the search is to begin. The first byte of the record is position 1.

length specifies how many characters to search. Specify 0 if you want to search the remainder of the record.

operator an alternative to length is to specify a relational operator (such as EQ).

string is a binary, character, hexadecimal or packed string representing data to be searched for at this location.

[*duplicate*]type is an optional duplication number followed by **EQN** and **EQP** to check for valid numeric character or packed decimal or **NEN** and **NEP** to check for invalid numeric character or packed decimal.

Note You may enter multiple parameter sets in an IF parameter separated by commas to obtain multiple logical OR tests.

In the following example, all records without a hex '*F0F1*' in column 1 are written to file *FILE1.*

```
DD01 MULTICOPY IF=(1,NE,X'F0F1'),WRITE=FILE1
```

The following example copies all records, but in those records having an '*ME*' in position 1 AND a '*QE*' in column 3, position 10 will be replaced with a '*P*'.

```
DD01 COPYALL IF=(1,EQ,T'ME'),IF=(3,EQ,C'QE'),OVERLAY=(10,C'P')
```

The example above can also be coded using the AND parameter.

```
DD01 COPYALL IF=(1,EQ,T'ME'),AND=(3,EQ,C'QE'),OVERLAY=(10,C'P')
```

The following example directly updates the input data set. If the data at position *60* for a length of *5* is not numeric, position *60* will be replaced with five zeros.

```
DD01 UPDATEREC IF=(60,5,NEN),OVERLAY=(60,C'00000')
```

In the following example, all records with invalid packed numbers will be copied to the output data set:

```
DD01 COPYREC IF=(44,0,NEP),PRINTHEX=4
```

This example will copy input records with a *1* in position *10* and a *2* in position *20*, or an *A* in position *3* and a *B* in position *6*. Since it is a COPYREC, only position *30* would be warped; COPYSOME or COPYALL would warp both positions.

```
DD01 COPYREC IF=(10,EQ,C'1'),AND=(20,EQ,C'2'),WARP=(30,C,CCYYMMDD,ADD=5Y),PRINT=3,
            IF=(3,EQ,C'A'),AND=(6,EQ,C'B'),WARP=(40,C,CCYYMMDD,ADD=10D),MAXRECOUT=30
```

The following example will print, in vertical hex, all records that contain odd EBCDIC numbers in column *14*:

```
DD01 PRINTHEX IF=(14,AO,X'F1')
```

The following example will print, in vertical hex, all records that contain even EBCDIC numbers in column *14*:

```
DD01 PRINTHEX IF=(14,GE,X'F0'),IF=(14,NO,X'01')
```

The following example will print, in vertical hex, all records that contain an EBCDIC *0, 4* or *8* in column *14*:

```
DD01 PRINTHEX IF=(14,AO,X'F0'),IF=(14,AZ,X'03')
```

MAXRECIN

The MAXRECIN or MRI parameter specifies the number of input records to be read before terminating function processing.

```
MAXRECIN=n
```

n is the maximum records to be input. Any number from 0 to 999999999 can be used where 0 is all records.

The following example will copy the first *100* records from the input data set to the output data set:

```
DD01 COPYREC MAXRECIN=100
```

MAXRECOUT

The MAXRECOUT or MRO parameter controls the number or records to be printed or written before processing stops. MAXRECOUT can be used to limit the number of output records or extend the number of printed records past the default of 250. Note that the MAXRECOUT parameter is ignored for the update functions.

```
MAXRECOUT=n
```

n is the maximum records to output. Any number from 0 through 999999999 may be used where 0 is all records.

The following example will print, in vertical hex, the first *30* records that contain the string TEST RECORD in column *23*:

```
DD01 PRINTHEX IF=(23,EQ,C'TEST RECORD'),MAXRECOUT=30
```

MEMBER

The MEMBER or M parameter specifies a member name to process in a PDS. If neither MEMBER nor MEMBERS is specified for a PDS, all members of the data set will be processed.

```
MEMBER=memname/(member1,member2,…)
```

memname specifies the member to be processed. To specify multiple members, use parentheses with MEMBER; use the MEMBERS parameter; or use multiple control statements with MEMBER and the same **DD*xx*** name.

The following example will copy a single member.

```
DD01 COPYREC MEMBER=MEMBERA
```

The following example will print three different members in vertical hex.

```
DD01 PRINTHEX MEMBER=MEMBERA
DD01 PRINTHEX MEMBER=MEMBERB
DD01 PRINTHEX MEMBER=MEMBERC
```

The following example will print three different members in vertical hex.

```
DD01 PRINTHEX MEMBER=(MEMBERA,MEMBERB,MEMBERC)
```

MEMBERS

The MEMBERS or MS parameter specifies a group of members to process in a PDS with a mask. If neither MEMBER nor MEMBERS is specified for a PDS, all members of the data set will be processed.

```
MEMBERS=ALL/maskname
```

ALL specifies that all members are to be selected.

maskname specifies the members to be processed using a mask of up to eight characters which is matched with member names from the data set. Several mask examples are shown below; for more information, see *"Member Name Forms" in the StarTool FDM Reference Guide.*

The following example will copy all members whose names begin with *STAR*.

```
DD01 COPYREC MEMBERS=STAR
```

Dash: Copy all members whose names begin with STAR and contain 98 in positions seven and eight.

```
DD01 COPYREC MEMBERS=STAR--98
```

Combination: Copy all members whose names begin with STAR and contain 98 elsewhere.

```
DD01 COPYREC MEMBERS=STAR*98
```

Range: Copy all members in the alphabetic range whose names begin with *ABC* through *DEF999999*.

```
DD01 COPYREC MEMBERS=ABC:DEF
```

Pattern: Copy all members whose names contain *STAR* and *98* anywhere.

```
DD01 COPYREC MEMBERS=STAR/98
```

MOVE

The MOVE or MV parameter builds an output record by moving data to it. Data from control statements or from input records can be used depending on which form of the MOVE parameter is used. Note: MOVE can not be used with the update functions.

There are two MOVE syntax forms that move data from a control statement or from an input record:

```
MOVE=(toposition,data)                 Comment: data from control statement
MOVE=(toposition,length,from-loc)    Comment: data from input record
```

toposition defines the starting position in the output record to which the data is to be moved. Absolute and relative positions can be used. ‘n’ means at position ‘n’, ‘+n’ means ‘n’ bytes further down the record, ‘-n’ means ‘n’ bytes previous in the record and ‘+0’ means in the next available position.

data is a binary, character, hexadecimal or packed string representing data to be moved to the output record.

length defines the number of bytes to be moved. The number can be in the range 1 to 255. A value of 0 indicates that the remainder of the input record is to be moved.

fromposition defines the starting position in the input record from which the data is to be moved. Absolute and relative positions can be used as for toposition; ‘+0’ references the input relative location or the last scan position.

The output record area is initially set to X’00’ by default but this can be overridden by the PADCHAR parameter. A data value set in the output record remains set until new data is placed there; the output record does not need to be reinitialized.

The following example will move *REDRED* to the first six positions of an output record.

```
DD01 COPYREC MOVE=(1,2C'RED')
```

The following example will print the first *100* characters of each input record.

```
DD01 PRINT MOVE=(+0,100,+0)
```

The following example will substitute *RED* for the first three positions of each record.

```
DD01 COPYREC MOVE=(1,C'RED'),MOVE=(+0,0,4)
```

NEWMBR

NEWMBR or NM names a new member of an output PDS.

```
NEWMBR=memname
```

memname specifies a new name to be assigned to the copied member.

The following example will copy *MEMBERA* to an output data set and rename it to *MEMBERCC*.

```
DD01 COPYREC MEMBER=MEMBERA,NEWMBR=MEMBERCC
```

Note that an existing member will be replaced unless the COPYOVER=NO parameter is specified.

```
DD01 COPYREC MEMBER=MEMBERA,NEWMBR=MEMBERCC,COPYOVER=NO
```

NEWMBRS

NEWMBRS or NMS assigns new names to a group of output PDS members.using a mask.

```
NEWMBRS=maskname
```

maskname The maskname can be from 1 to 8 characters long. Characters in the member name are replaced by characters from the maskname unless the character in the maskname contains a minus sign; the character in that position will be retained. Any blanks in the resulting member names are discarded.

The following example selects all members prefixed with TST and renames them to SYS..A. For example, member *TST3333* will get renamed to *SYS33A3*. Members that contain the same name in the output data set will not be replaced.

```
DD01 COPYMBR MEMBERS=TST,NEWMBRS=SYS--A,COPYOVER=NO
```

This example will copy those members prefixed with TST and containing '*ALPHA*' in column 1 in the data, and renames the selected members to PARM…

```
DD01 COPYMBR MEMBERS=TST,IF=(1,EQ,C'ALPHA'),NEWMBRS=PARM
```

OPTIONS

OPTIONS or OP controls StarBat processing options.

```
OPTIONS=LONG/SHORT/JCL/MULTI/NOMULTI
```

OPTIONS=LONG default, a column scale is to be printed for PRINT and PRINTHEX after each data record.

OPTIONS=SHORT a column scale is only to be printed at the top of each PRINT, PRINTCHR and PRINTHEX page.

OPTIONS=JCL logical JCL processing is desired for DD, EXEC, JOB, PROC and SET JCL statements.

OPTIONS=MULTI after an end of file condition, a function with the same DDNAME is to reread the data set.

OPTIONS=NOMULTI default; after an end of file condition, another read will note another end of data set condition.

The following example will print a column scale only on each page.

```
DD01 COPYREC OPTIONS=SHORT,MEMBER=MEMBERA,PRINTHEX=500
```

The following example will utilize logical JCL processing for this control statement group.

```
DD01 COPYREC
OPTIONS=JCL,IF=(1,0,C'VOL=SER='),CHANGE=(1,0,C'UNIT=TAPE3',C'UNIT=TAPE77')
```

The following example will cause StarBat to reread the data set if the end of the data set was encountered.

```
DD01 COPYREC OPTIONS=MULTI,PRINTHEX=500
```

OR

Provides for those situations where a number of conditions need to be grouped together with the OR operator. There are two OR syntax forms to test for data contents or valid numerics:

```
OR=(start,length/operator,string,...)     /* data content test   */
OR=(start,length,[duplicate]type,...)     /* valid numeric test  */
```

start defines the position of the record where the search is to begin. The first byte of the record is position 1.

length specifies how many characters to search. Specify 0 if you want to search the remainder of the record.

operator an alternative to length is to specify a relational operator (such as EQ).

string is a binary, character, hexadecimal or packed string representing data to be searched for at this location.

[*duplicate*]type is an optional duplication number followed by **EQN** and **EQP** to check for valid numeric character or packed decimal or **NEN** and **NEP** to check for invalid numeric character or packed decimal.

Note You may enter multiple parameter sets separated by commas in an OR parameter to obtain multiple logical OR tests.

In this example, if position *40* contains *'COPYRIGHT'* or '*247B'* anywhere from column *2* through the end of the record, copy the record to the file identified in the JCL by *FILEA*.

```
DD01 MULTICOPY IF=(40,EQ,C'COPYRIGHT'),OR=(2,0,C'247B'),WRITE=FILEA
```

This example copies all records that contain a packed '*117400477*' or '*516988271*' in position *11*.

```
DD01 COPYREC IF=(11,EQ,{'117400477'),OR=(11,EQ,P'516988271'),MAXRECOUT=0
```

This example copies all records, but if column 1 contains a hex *'22722D'* OR a hex *'28888C'*, replace column 1 with a hex *'99999C'*.

```
DD01 COPYALL IF=(1,EQ,X'22722D',1,EQ'X'28888C'),OVERLAY=(1,X'99999C')
```

The example above is equivalent to

```
DD01 COPYALL IF=(1,EQ,X'22722D'),OR=(1,EQ,X'28888C'),OVERLAY=(1,X'99999C')
```

The following example will copy all type *1* records or records with invalid packed numbers to the output data set:

```
DD01 COPYREC IF=(12,EQ,C'1'),OR=(44,0,NEP),PRINTHEX=4
```

This example will copy input records with a *1* in position *10* and a *2* in position *20* or an *A* in position *3* and a *B* in position *6.* Since it is a COPYREC, only position *30* would be warped; COPYSOME or COPYALL would warp both positions.

```
DD01 COPYREC IF=(10,EQ,C'1'),AND=(20,EQ,C'2'),WARP=(30,C,CCYYMMDD,ADD=5Y),PRINT=3,
          IF=(3,EQ,C'A'),AND=(6,EQ,C'B'),WARP=(40,C,CCYYMMDD,ADD=10D),MAXRECOUT=30
```

OVERLAY

The OVERLAY or OL parameter replaces data at a particular location with new data in a variety of ways. Data in one location can be overlaid with literal data unconditionally, according to some conditional data content in a location, or according to some conditional data content in another separate location.

There are three OVERLAY syntax forms:

```
OVERLAY=(position,newstring)                                    Replace by location
OVERLAY=(position,length/operator,string-1,string-2)            Replace by condition
OVERLAY=(position,length/operator,string-1,toposition,string-2) Replace at alternate loc
```

position defines the starting position in the output record to which the data is to be moved. Absolute and relative positions can be used. ‘n’ means at position ‘n’, ‘+n’ means ‘n’ bytes further down the record, ‘-n’ means ‘n’ bytes previous in the record and ‘+0’ means in the next available position.

newstring is a binary, character, hexadecimal or packed string representing data to be placed in the specified location.

length specifies how many characters to search. Specify 0 if you want to search the remainder of the record.

operator an alternative to length is to specify a relational operator (such as EQ).

string-1 is a binary, character, hexadecimal or packed string representing data to be searched for at this location.

toposition defines the starting position in the output record to which the data is to be moved. Absolute and relative positions can be used. ‘n’ means at position ‘n’, ‘+n’ means ‘n’ bytes further down the record, ‘-n’ means ‘n’ bytes previous in the record and ‘+0’ means in the next available position.

string-2 is a binary, character, hexadecimal or packed string representing data to be replaced at this location.

!!Caution!! OVERLAY replaces existing data with the new data at the specified location without shifting data.

Note that bit operations can be indicated by specifying a modifier as the first character of **string-2**; **O** indicates an OR, **M** indicates NOT-AND or binary minus, **A** indicates AND and **E** indicates an exclusive OR.

The following example will copy all records and place *REDRED* in the first 6 positions of each record.

```
DD01 COPYREC OVERLAY=(1,2C'RED')
```

The following example will replace the first A found in column *10* through *19* with a *B*.

```
DD01 COPYREC OVERLAY=(10,10,C'A',C'B')
```

The following example will find *RED* beginning in position *6* and overlay position *10* with an asterisk.

```
DD01 COPYREC OVERLAY=(6,EQ,C'RED',10,C'*')
```

The following example will clear the zone digits where ABCD is found with an AND bit operation.

```
DD01 COPYREC OVERLAY=(23,20,C'ABCD',AX'0F0F0F0F')
```

OVERALL

The OVERALL or OA parameter replaces data at a particular location in the same way as OVERLAY does; however, OVERALL replaces all occurrences of the string and it only supports a length field. For more information, see OVERLAY.

There are two OVERALL syntax forms:

```
OVERLAY=(position,length,string-1,string-2)              Note: Replace by condition
OVERLAY=(position,length,string-1,toposition,string-2)   Note: Replace at alternate loc
```

position defines the starting position in the output record to which the data is to be moved. Absolute and relative positions can be used. ‘n’ means at position ‘n’, ‘+n’ means ‘n’ bytes further down the record, ‘-n’ means ‘n’ bytes previous in the record and ‘+0’ means in the next available position.

length specifies how many characters to search. Specify 0 if you want to search the remainder of the record.

string-1 is a binary, character, hexadecimal or packed string representing data to be searched for at this location.

toposition defines the starting position in the output record to which the data is to be moved. Absolute and relative positions can be used. ‘n’ means at position ‘n’, ‘+n’ means ‘n’ bytes further down the record, ‘-n’ means ‘n’ bytes previous in the record and ‘+0’ means in the next available position.

string-2 is a binary, character, hexadecimal or packed string representing data to be replaced at this location.

The following example will replace all *RED's* found in columns *10* through *19* with *BLU*'s.

```
DD01 COPYREC OVERALL=(10,10,C'RED',C'BLU')
```

PADCHAR

The PADCHAR or PAD parameter is used to initialize an output area with the specified character. The default is binary zeros (X’00’).

```
PADCHAR=C’c’/X’nn’
```

C’*c*’ *c* is any single character value.

X’*nn*’ *nn* is any valid hexadecimal value.

If a record has *10* blanks beginning in position *11*, move the indicated data and pad the end of the records with periods.

```
DD01 COPYREC IF=(11,EQ,10C’ ‘),MOVE=(1,5,28),PADCHAR=C’.’
```

PRINT

The PRINT or P parameter prints a specified number of records in a simple character format. Note: the PRINT parameter is not intended for use with the print functions; it should be used with any of the other functions that process the data set.

```
PRINT=n
```

n Any number from 0 to 999999999. Specify 0 to print all records.

The following example will print the first *10* records that contain the string *RED* anywhere.

```
DD01 COPYREC IF=(1,0,C'RED'),PRINT=10
```

PRINTCHR

The PRINTCHR or PC parameter prints a specified number of records in an alphanumeric format.

Note PRINTCHR is not intended for use with the print functions; it should be used with any of the other functions that process the data set.

```
PRINTCHR=n
```

n Any number from 0 to 999999999 can be used. Specify 0 to print all records.

The following example will print the first *10* records that contain the string *RED* anywhere.

```
DD01 COPYREC IF=(1,0,C'RED'),PRINTCHR=10
```

PRINTHEX

The PRINTHEX or PH parameter prints a specified number of records in vertical hexadecimal format. Note: PRINTHEX is not intended for use with the print functions; it should be used with any of the other functions that process the data set.

```
PRINTHEX=n
```

n Any number from 0 to 999999999. Specify 0 to print all records.

The following example will print in vertical hex the first *10* records that contain the string *RED* anywhere.

```
DD01 COPYREC IF=(1,0,C'RED'),PRINTHEX=10
```

PRINTLPI

The PRINTLPI or PL parameter controls the number of lines written to a page for the SYSLIST output data set.

```
PRINTLPI=6/8
```

PRINTLPI=6 default, specifies 6 lines to an inch and allows up to 58 lines in a SYSLIST output.

PRINTLPI=8 specifies 8 lines to an inch and allows up to 78 lines in a SYSLIST output.

The following example will print the first *10* records containing the string *RED* with as many as *78* lines on a page.

```
DD01 PRINTHEX IF=(1,0,C'RED'),PRINTCHR=10,PRINTLPI=8
```

RBA

The RBA parameter is used for VSAM data sets. For ESDS and KSDS, this defines the Relative Byte Address. For RRDS, this defines the Relative Record Number.

```
RBA=nn/X'nn'
```

nn *nn* is any decimal value.

X'*nn*' *nn* is any valid hexadecimal value.

The example below lists records beginning at relative byte address *800*. The relative byte address of *800* can also be specified in hex as X'*320*'.

```
DD01 PRINTCHR RBA=800
```

RDW

The RDW (Record Descriptor Word) parameter specifies how to address the RECFM=V RDW word.

```
RDW=0/1/2/3
```

RDW=0 default, the **RDW** word is to be included for record processing and output displays.

RDW=1 the **RDW** word is to be included for record processing but not for output displays.

RDW=2 the **RDW** word is not to be included for record processing but is to be shown for output displays.

RDW=3 the **RDW** word is not to be included for record processing and not to be shown for output displays.

The following example lists the first *10* records that contain *RED* in the first data position and the *RDW* word is to be included for record processing and output:

```
DD01 PRINTCHR RDW=0,MAXRECOUT=10,IF=(5,EQ,C'RED')
```

The following example is similar, looking for records with *RED* in the first data position. Note that the *RDW* word is not to be displayed in the output:

```
DD01 PRINTCHR RDW=3,MAXRECOUT=10,IF=(1,EQ,C'RED')
```

SELECT

The SELECT or S parameter may be used to select every nth occurrence of a record for processing.

```
SELECT=n
```

n is the number of records in an interval. Any number from 1 to 999999999 may be used.

The following example copies all records and tests every third record for a '*PBCE*' in column 3. If a match is found, '*PBCE*' is replaced by four zeroes.

```
DD01 COPYALL SELECT=3,OVERLAY=(3,EQ,C'PBCE',C'0000')
```

The following example only processes records containing '*Z145*' in column 3. Every third record satisfying the conditional statement will be copied and have '*Z145*' replaced with '*ZZZZ*'.

```
DD01 COPYREC IF=(3,EQ,C'Z145'),SELECT=3,OVERLAY=(3,C'ZZZZ')
```

In this example, every third record is selected, and if the selected record contains a '*PBCE*' in column *3*, copy the record and replace '*PBCE'* with *'ZZZZ*'.

```
DD01 COPYREC SELECT=3,IF=(3,EQ,C'PBCE'),OVERLAY=(3,C'ZZZZ')
```

STARTKEY

The STARTKEY or SK parameter can be specified to initiate VSAM KSDS processing at a specific or generic key.

```
STARTKEY=C'cc'/X'hh'
```

STARTKEY=C'*cc*' is any character string that specifies the beginning KSDS key value.

STARTKEY=X'*hh'* is any hexadecimal string that specifies the beginning KSDS key value.

The following example will copy VSAM records after positioning to generic key *RED*:

```
DD01 COPYREC STARTKEY=C'RED'
```

STOPIF

Use the STOPIF or ST parameter if you want to terminate processing before the end of data. STOPIF will end execution of the current process if the condition associated with the parameter is satisfied.

```
STOPIF=(start,length/operator,string,...)
```

start defines the position of the record where the search is to begin. The first byte of the record is position 1.

length specifies how many characters to search. Specify 0 if you want to search the remainder of the record.

operator an alternative to length is to specify a relational operator (such as EQ).

string is a binary, character, hexadecimal or packed string representing data to be searched for at this location.

Note You may code multiple conditions within one STOPIF parameter; these are evaluated using logical OR tests. Multiple contiguous STOPIF parameters result in logical AND tests for STOPIF conditions.

The following example will copy all records until '*RECORDS READ*' is found in position 8. The record containing '*RECORDS READ*' is not copied.

```
DD01 COPYREC STOPIF=(8,EQ,C'RECORDS READ')
```

In this example, the first DD01 control statement will copy records until *VOL001* is found in column 1. The second DD01 control statement will begin with the *VOL001* record and stop copying records with *VOL300*.

```
DD01 COPYREC STOPIF=(1,EQ,C'VOL001')
DD01 COPYREC STOPIF=(1,EQ,C'VOL300')
```

The following example will skip to the record containing a hex '*033198*' in column 1 or '*IMAGE*' in column 12. This record and all records after it are copied.

```
DD01 SKIP STOPIF=(1,EQ,X'033198',12,EQ,C'IMAGE')
DD01 COPYREC
```

SUM

The SUM parameter is used to add up any fields containing character, packed, or binary numbers. If there is a SYSTOTAL data set, then the totals will go to that data set. Otherwise, they will go to the SYSPRINT data set

```
SUM=(position[,'description])                  /* for packed decimal data      */
SUM=(position,length,datatype[,'description'])  /* for character or binary data */
```

position The beginning position of the data. This can be an actual or a relative start position.

length The length of the data to be totaled. For character data, specify a length of 1 to 15; for binary data, specify a length of 1 to 4; for packed data, its length is calculated by StarBat.

datatype The type of data. For character data, specify **C**; for binary data, specify **B**; for packed data, you do not need to specify the type.

description This is optional. A maximum of 25 characters enclosed in single quotes can be entered. If a description is present, it will be displayed as report headers; otherwise, the control statement will be used as a report header.

The following example selects records that contain a packed decimal *'9802'* in position *5*, then adds the packed field at position *12.* These selected records are printed in vertical format in hex.

```
DD01 PRINTHEX IF=(5,EQ,P'9802'),SUM=(12,'HIST TOTAL')
```

The example below begins processing a VSAM KSDS data set with the record at location *x'00433C'* and then adds the data at position *73*. Processing stops if the key is greater than *x'00433C'*.

```
DD01 TOTAL KEY=X'00433C',
          STOPIF=(1,GT,X'00433C'),
          SUM=(073,8,C,'TRAVEL EXPENSE REPORT')
```

WRITE

The WRITE or W parameter is used only by the **MULTICOPY** function to control when output is written to the named DD statements. The WRITE parameter can direct output to any number of output DD statements; if the same DDNAME is used more than once, multiple copies of the output record will be written.

There are several restrictions on the data that can be output with a **MULTICOPY** function:

Output to load members is supported; however JCL indicating PDS(MEMBER) notation is not supported. Instead, use only the PDS name in the JCL and indicate the member name with the MEMBER, MEMBERS, NEWMBR or NEWMBRS parameters.

Overlay, scatter-loaded and note-listed load members are not supported.

```
WRITE=ddname1/(ddname1,ddname2,...)
```

ddnamex the DDNAME in the JCL containing the name of the output data set.

The following example shows how to create two identical output data sets in **//OUT1** and **//OUT2**:

```
DD01 MULTICOPY WRITE=(OUT1,OUT2)
```

The following example will copy a file and repeat any record with a *C'5*' and change it to a *C'6*':

```
DD01 MULTICOPY WRITE=OUT1,IF=(20,EQ,C'5'),MOVE=(1,0,1),
            MOVE=(20,C'6'),WRITE=OUT1
```

The following example will add a STEPLIB JCL statement after any EXEC statement:

```
DD01 MULTICOPY WRITE=NEWJCL,IF=(1,20,C' EXEC '),MOVE=(1,80C' '),
            MOVE=(1,C'//STEPLIB  DD  DISP=SHR,'),
            MOVE=(+0,C'DSN=MYHILEV.MYMIDLEV.MYLOWLEV'),WRITE=NEWJCL
```

LOGIC 7

LOGICAL AND CONDITIONS

Consecutive IF parameters represent a logical AND condition. In other words, `IF=(1,EQ,C'A'),AND=(10,EQ,C'B')` has the same effect as `IF=(1,EQ,C'A'),IF=(10,EQ,C'B')`.

This example will copy all records containing *TEST RECORD* in position *23* and *RED* anywhere after position *10*:

```
DD01 COPYREC IF=(23,EQ,C'TEST RECORD'),IF=(10,0,C'RED')
```

This example is equivalent because AND and IF are identical in meaning:

```
DD01 COPYREC IF=(23,EQ,C'TEST RECORD'),AND=(10,0,C'RED')
```

LOGICAL OR CONDITIONS

Multiple data comparisons can be coded within an IF, AND, or OR parameter. A logical OR condition is assumed between multiple data comparisons; logical OR conditions can be coded in multiple different formats as shown below.

The following example will copy all records containing *TEST RECORD* in position *23* or *RED* anywhere after position *10:*

```
DD01 COPYREC IF=(23,EQ,C'TEST RECORD',10,0,C'RED')
```

The following example is identical in effect to the previous example:

```
DD01 COPYREC IF=(23,EQ,C'TEST RECORD'),OR=(10,0,C'RED')
```

The following example will copy up to *10* records containing *TEST RECORD* in position *23* and *RED* anywhere after position *10* or the first *20* records containing *A* in position *3* and *B* in position *6*:

```
DD01 COPYREC IF=(23,EQ,C'TEST RECORD'),AND=(10,10,C'RED'),MAXRECOUT=10,
             IF=(3,EQ,C'A'),AND=(6,EQ,C'B'),MAXRECOUT=20
```

PROCESSING MULTIPLE SELECTION PARAMETERS

The IF, AND, and OR parameters are called selection parameters because they are used to select records to be processed. Limit parameters like MAXRECIN and MAXRECOUT can follow the selection parameters to apply processing record limits and action parameters like CHANGE or WARP may be specified to modify or inspect data fields. In addition, print parameters like PRINTHEX may be specified to selectively print records and control parameters like ABEND or STARTKEY can be used to select basic execution choices.

Complex selection criteria can be specified using multiple selection parameters. Multiple selection parameters are handled in groups where a group of selection parameters starts with the first selection parameter and ends after any associated limit, action and print parameters that follow the selection parameters.

For example;

```
DD01 COPYREC IF=(10,EQ,C'1'),AND=(20,EQ,C'2'),WARP=(30,C,CCYYMMDD,ADD=5Y),PRINT=3,
             IF=(3,EQ,C'A'),AND=(6,EQ,C'B'),WARP=(40,C,CCYYMMDD,ADD=10D),MAXRECOUT=30
```

In this example, there are two groups of selection parameters. The first group consists of the first IF parameter and the
first AND parameter and is followed by the first WARP action parameter and the PRINT parameter. The second group consists of the second IF parameter and the second AND parameter and is followed by the second WARP action parameter and the MAXRECOUT limit parameter.

A logical OR condition is assumed between groups of selection parameters that are followed by limit, action or print parameters. This means that if an input record contains data that matches any one of the groups of selection parameters then that input record is selected for processing. In the example above, records that contain a 1 in column 10 and a 2 in column 20 are copied as well as records that contain an A in column 3 and a B in column 6.

If an input record contains data that matches with a group of selection parameters, then the limit, action and print parameters that follow that group are processed and StarBat skips to the next processing group. Whether StarBat actually processes those parameters depends on the name of the current function. If the function has an **ALL** or **SOME** suffix as a part of its name (for example, **COPYSOME** or **COPYALL** versus **COPYREC**), StarBat will process all selection groups. Otherwise, any subsequent selection groups will be bypassed after the first selection group is satisfied.

In the example above, since **COPYREC** is the function, if an input record had a 1 in column 10 and a 2 in column 20 and an A in column 3 and a B in column 6, then the record would be copied, but only column 30 would be warped. If **COPYSOME** or **COPYALL** were used then both column 30 and column 40 would be warped.

SELECTING MEMBERS BY CONTENT

Members can be selected by their contents. Use a **MBR** form of a function name (for example, **COPYMBR**, **PRINTMBR**, **PRINTHEXMBR**, **PRINTCHRMBR** or **UPDATEMBR**) and members that meet the selection criteria will be processed by the function.

The following example will copy all members that have *TEST RECORD* in position *23* in one or more records:

```
DD01 COPYMBR IF=(23,EQ,C'TEST RECORD')
```

SELECTING MEMBERS BY NAME

Members of a PDS can be selected by their name or by a mask that represents their name. The MEMBER and MEMBERS parameter is used to achieve this.

The MEMBER parameter can only be entered once on a control statement. To specify multiple members, use parentheses with MEMBER; use the MEMBERS parameter; or use multiple control statements with MEMBER and the same **DD*xx*** name.

The following example will copy a single member.

```
DD01 COPYREC MEMBER=MEMBERA
```

The following example will print two different members.

```
DD01 PRINTHEX MEMBER=MEMBERA
DD01 PRINTHEX MEMBER=MEMBERC
```

The following example will print two different members.

```
DD01 PRINTHEX MEMBER=(MEMBERA,MEMBERB)
```

The following example will copy all members whose names begin with *STAR*.

```
DD01 COPYREC MEMBERS=STAR
```

The following example will print all members whose names begin with *STAR* and contain Z in position eight.

```
DD01 PRINTHEX MEMBERS=STAR---Z
```

OPTIONS=JCL PROCESSING

StarBat supports **OPTIONS=JCL.** This means that StarBat can determine JCL control statements and continuations; and each statement can be processed logically. StarBat recognizes DD, EXEC, JCLLIB, JOB, OUTPUT, PROC, SET JCL statements and their logical continuations.

If a line in the member is not one of these statements or its continuation, StarBat will use normal change and update processing rules for that single line. Following lines can then be searched or changed in either JCL or normal mode. JCL statements must begin with a // in column 1 and comment statements are considered a part of the concatenation.

Thus, the following would be considered a single statement:

```
//STEPABC  EXEC  PGM=StarBat,PARM='BATCH',
//* THIS IS A COMMENT IN THE MIDDLE OF A CONTINUED STATEMENT
//  TIME=4,REGION=4096K
```

To search a JCL structure, use the IF or OR statements. You can also search and update JCL statements with the CHANGE, CHANGEALL, OVERLAY and OVERALL statements. Be sure to use a length of zero for the search length of these parameters if you wish to search the entire JCL statement.

The OVERLAY and OVERALL parameters update data but do not shift data columns so they can be used without problems by any of the COPY operations, MULTICOPY or the UPDATE operations.

CHANGE and CHANGEALL can cause data shifting if the search and replacement strings differ in length. If the string is shortened, StarBat follows normal JCL rules and is able to update any of the COPY, MULTICOPY or UPDATE operations. If the string is expanded, StarBat adjusts the JCL statement to fit the statement in the new string using normal JCL rules.

JCL expansion is performed using the following logic to minimize changes in JCL statements:

1. If the string will fit, the JCL text is expanded to the right on the changed JCL line.
2. If it does not fit and the string will fit, the JCL text is added after shifting the changed JCL line left and right.
3. If both of the above expansions fail, the JCL line to be changed is split at the previous comma and continued on another line and the added line is expanded as needed. The new JCL line is indented to match the split JCL line.

4. If the above expansion fails because there is not a previous parameter, StarBat scans for the next comma to the right and splits the JCL statement after that parameter. Again, the new JCL line is indented to match the split JCL line.

StarBat can not split a JCL line for UPDATE operations. In this case, an expansion error will be indicated and the return code for the job will be set to eight.

Restrictions:

- A JCL statement may contain up to 50 JCL lines.
- OPTIONS=JCL and MOVE from input to output is not supported.
- The JCL is assumed to be syntactically correct; however, StarBat does not issue syntax messages for incorrect JCL.
- To be considered JCL, the statements must reside in a PDS member and the data set must have a fixed record format with 80 character records.
- Only data between columns 1 through 71 are considered for determining control statement boundaries and continuations.

EXAMPLES

8

The examples in this section illustrate various uses of StarBat functions and parameters.

Example 1: This example will copy all records and test every third record for a ‘PBCE’ in column 3. If a match is found, ‘PBCE’ will be replaced with 4 zeroes.

```
DD01 COPYALL SELECT=3,OVERYLAY=(3,EQ,C’PBCE’,C’0000’)
```

Example 2: This example will replace ‘VOL’ with 3 blanks if ‘DUMP’ is found anywhere in columns 1 through 6 AND if ’VOL’ is found 6 relative positions from the location of the character ‘D’ in ‘DUMP’. The record will then be copied to the output data set.

```
DD01 COPYREC IF=(1,6,C’DUMP’),IF=(+6,EQ,C’VOL’),OVERLAY=(+0,3C’ ’)
```

Example 3: This example will build new records by moving data with MOVE parameters. The first 5 records are printed in hexadecimal format.

```
DD01 COPYREC MOVE=(1,10,5),MOVE=(11,10,20),PRINTHEX=5
```

Example 4: The first DD01 control statement will copy records until ‘VOL001’ is found. The second DD01 control statement begins with the ‘VOL001’ record and stops copying when 'VOL300’ is found.

```
DD01 COPYREC STOPIF=(1,EQ,C’VOL001’)
DD01 COPYREC STOPIF=(1,EQ,C’VOL300’)
```

Example 5: This example will add one year to the date with format YYMMDD in the specified position if a record contains ‘APP1’ or ‘APP3’ in the first 9 positions. Only these selected records are written to the output data set.

```
DD01 COPYREC RDW=3,MAXDATERR=100,PIVOTYR=70,
    IF=(1,9,C’APP1’),
        OR=(1,9,C’APP3’),
    WARP=(10,C,YYMMDD,ADD=1Y)
```

Example 6: This example will copy records containing an 8 or 9 and will warp each record with YYDDD or YYMMDD data format. If a record has both formats, only the YYDDD format is warped.

```
DD01 COPYREC IF=(12,EQ,C'8'),
       WARP=(16,C,YYDDD,ADD=5Y),
       IF=(22,EQ,C'9'),
       WARP=(26,C,YYMMDD,ADD=5Y)
```

Example 7: This example will copy all records and warp all 8 and 9 dates.

```
DD01 COPYALL IF=(12,EQ,C'8'),
       WARP=(15,C,YYDDD,ADD=5Y),
       IF=(22,EQ,C'9'),
       WARP=(26,C,YYMMDD,ADD=5Y)
```

Example 8: This example will copy records containing an 8 or 9 and warp all dates on these records.

```
DD01 COPYSOME IF=(12,EQ,C'8'),
        WARP=(16,C,YYDDD,ADD=5Y),
        IF=(22,EQ,C'9'),
        WARP=(26,C,YYMMDD,ADD=5Y)
```

Example 9: Any record containing a '111' anywhere in the record will be replaced with 'ZZZ'. Any record containing a 'DDD' in column 1 will be replaced with a '---'. Any record containing 'ZZZZ' in column 1 will not be written to the output file.

```
DD01 EXCLUDEREC OVERALL=(1,0,C'111', C'ZZZ'),
          OVERLAY=(1,EQ,C'DDD',C'---'),
          IF=(1,EQ,C'ZZZZ'),MAXRECOUT=0
```

Example 10: This example will select every fifth record, and, if it contains a '241104' or a '181022' in position 25, will output the record. A maximum of 5 records can be written to the output data set identified by DD5.

```
DD01 MULTICOPY SELECT=5,IF=(25,EQ,C'241104,181022'),WRITE=DD5,MAXRECOUT=5
```

Example 11: This example will write all records having '011' in column 9 and '01' in column 1 to the data set identified by DD OUT1. It will write all records having '011' in column 9 and not having a "U" or a "V" in column 1 to the data set identified by DD OUT2. It will write all records not having a '011' in column 9 to OUT2.

```
DD01 MULTICOPY IF=(9,EQ,C'011'),IF=(1,EQ,C'01'),WRITE=OUT1,
             IF=(9,EQ,C'011'),IF=(1,NE,X'E4,E7'),WRITE=OUT2,
             IF=(9,NE,C'011'),WRITE=OUT2
```

Example 12: This example will insert a JOBLIB DD statement after the jobcard in all members prefixed with PRS. These members will be written to a new data set identified in the JCL by DD NEWJCL.

```
DD01 MULTICOPY MEMBERS=PRS,OPTIONS=JCL,WRITE=NEWJCL,
         IF=(3,0,C' JOB '),MOVE=(1,80C' '),
         MOVE=(1,C'//JOBLIB DD DISP=SHR'),
         MOVE=(+0,C',DSN=JOBLIB.DSN'),WRITE=NEWJCL
```

Example 13: This example will process three input data sets and write the results to a single output file identified by DD DD02O. Control statement DD02 selects a member called C123.

```
DD01 MULTICOPY WRITE=DD02O
DD02 COPYMBR MEMBER=C123
DD03 MULTICOPY WRITE=DD02O
```

Example 14: If two blanks are found in column 1, they will be changed to '**'. Changed records will be written to the output file identified by OUTPUTA in the JCL. Processing will stop when 'END' is found in column 1.

```
DD01 MULTICOPY CHANGE=(1,EQ,C'
',C'**'),STOPIF=(1,EQ,C'END'),WRITE=OUTPUTA
```

Example 15: This example will write 'CATALOG NAME=' to the output buffer followed by the 15 bytes 11 relative positions after the 'I' in 'IN-CAT' when 'IN-CAT' is found anywhere in the record. It will write the 15 bytes to the current relative position in the output buffer. Then, it will write the record to the output data set specified by CATREPT.

```
DD01 MULTICOPY PADCHAR=C' ',
            IF=(1,0,C'IN-CAT'),
          MOVE=(1,C'CATALOG NAME='),
          MOVE=(+0,15,+11),
          WRITE=CATREPT,MAXRECOUT=0
```

Example 16: This example will replace the first occurrence of text string 'CYCLE' with blanks and will print the record if text string '** AAAA' is found anywhere in a record.

```
DD01 PRINTCHR IF=(1,0,T'** AAAA'),
           OVERLAY=(1,0,T'cycle',5C' '),MAXRECOUT=0
```

Example 17: This example will list the contents of all members in the partitioned data set that match the member mask specified. For example, members that match the member mask include TEST111 and TESTAB1.

```
DD01 PRINTCHRMBR MEMBERS=TEST--1
```

Example 18: This example will process the input data set twice, once for each PRINTHEX control statement. Records containing ‘EDIT’ or ‘A99’ in position 19 will be printed in hexadecimal format.

```
DD01 PRINTHEX OPTIONS=MULTI,IF=(19,EQ,C’EDIT’)
DD01 PRINTHEX IF=(19,EQ,C’A99’)
```

Example 19: This example will change the ‘SYS001’ to a ‘SYSTST’ for members containing a ‘SYS001’ anywhere in the first 20 positions of the record.

```
DD01 UPDATEMBR CHANGE=(1,20,’SYS001’,C’SYSTST’)
```

Example 20: This example will change all occurrences of hex ‘98365C’ to hex ‘99365C’ if a hex ‘98365C’ is found anywhere in the record. The second IF parameter statement is logically OR’d with the first. In the second IF parameter, if a hex ‘98000C’ is found anywhere in the record, all occurrences of hex ‘98000C’ will be changed to hex ‘99000C’.

```
DD01 UPDATEREC IF=(1,0,X’98365C’),OVERALL=(1,0,X’98365C’,X’98365C’)
               IF=(1,0,X’98000C’),OVERALL=(1,0,X’98000C’,X’99000C’)
```

Example 21: This example will update the data set in place and replace all occurrences of a ‘!’ or a ‘:’ or a ‘?’ with a blank.

```
DD01 UPDATEREC REPLALL=(1,0,C’!,:,?’,C’ ’)
```

Example 22: This example will skip records 1 though 10, output records 11 through 20, skip records 21 through 25, then output records 26 through 45.

```
DD01 SKIP MAXRECIN=10
DD01 COPYREC MAXRECIN=10,MAXRECOUT=10
DD01 SKIP MAXRECIN=5
DD01 COPYREC MAXRECIN=20,MAXRECOUT=20
```

Example 23: This example will skip the last two records beginning at the end of a sequential data set. Any remaining records that have ‘01SER20’ in column 1 will be printed in reverse order.

```
DD01 SKIPREV MAXRECIN=2
DD01 PRINTREV IF=(1,EQ,C’01SER20’)
```

SAMPLE EXECUTION 9

The following example illustrates several StarBat facilities.

StarBat JCL and Control Facilities

```
//SAMPLEA  JOB ...
//PRINT1 EXEC PGM=StarBat,TIME=1,REGION=2M
//SYSPRINT DD SYSOUT=(,)
//SYSLIST  DD SYSOUT=(,)
//SYSTOTAL DD SYSOUT=(,)
//DD01      DD DSN=SAMPLE.LIB.PDSE(StarBatT),DISP=SHR
//DD01O     DD DSN=SAMPLE.LIB.ASM(StarBatT),DISP=SHR
//SYSIN     DD *
DD01 COPYSOME  IF=(1,EQ,C'1800'),
            WARP=(6,C,YYDDD,ADD=5Y),PRINTHEX=1,
            SUM=(26,4,C,C'The 1800 totals'),
            IF=(12,EQ,C'1900'),
            WARP=(17,C,YY,ADD=2Y),PRINTHEX=1,
            SUM=(42,3,C)
//
```

Sample SYSPRINT Output

```
PDS100I StarBat/Both -- Version 7.4.0  2000.350

Proprietary software product of SERENA Software
Phone (650)696-1800 Support 696-1850 startool@serena.com
LICENSED TO: StarTool will not work after Dec 31, 1998
             To extend, contact SERENA at (650)696-1800
All other rights reserved - use of this software
product by unauthorized persons is strictly prohibited.

DD01 COPYSOME  IF=(1,EQ,C'1800'),
            WARP=(6,C,YYDDD,ADD=5Y),PRINTHEX=1,
```

```
            SUM=(26,4,C,C'The 1800 totals'),
            IF=(12,EQ,C'1900'),
            WARP=(17,C,YY,ADD=2Y),PRINTHEX=1,
            SUM=(42,3,C)
 *** End of control statement

PDS220I //DD01      DD  DSN=SAMPLE.LIB.PDSE,DISP=SHR,UNIT=3380,
PDS220I //  DCB=(RECFM=FB,LRECL=80,BLKSIZE=11440,DSORG=PX),VOL=SER=SER003,
PDS220I //  SPACE=(CYL,(420,20))                 /*FREE TRK=1029*/

STRB01I BSAM input is in use
STRB05I DDNAME=SYS00001 DSN=SAMPLE.LIB.ASM opened for BSAM output
STRB05I DCB=(RECFM=FB,LRECL=80,BLKSIZE=11440),VOL=SER=SER003
--- STRB75E WARP= Invalid character number at column 0006;
hex=X'F6F9F1C1F3';
                                              char=C'691A3'; at record 7
Text:             WARP=(6,C,YYDDD,ADD=5Y)

-- STRB80E SUM= invalid numeric character; char=C'00X0'; at record 7
TEXT:             SUM=(26,4,C,C'The 1800 totals')


Actions taken for:      IF=(1,EQ,C'1800')              --------7 --------4
Actions taken for:  WARP=(6,C,YYDDD,ADD=5Y)            --------4 --------3
Actions taken for:  SUM=(26,4,C,C'The 1800 totals')      --------4 -------
-3
Actions taken for:  IF=(12,EQ,C'1900')                 --------6 --------3
Actions taken for:  WARP=(17,C,YY,ADD=2Y)              --------3 --------3
Actions taken for:  SUM=(42,3,C)                       --------3 --------3
```

Sample SYSLIST Output

```
StarBat Version 7.4.0;  Jan  5, 2001;  DD01=SAMPLE.LIB.PDSE(StarBatT)        VOL=SER003  PAGE   1

RECORD      2 DATA    80   CHAR 1800+74123-1900-98-2----+0034+----+----4-123+----5...7----+----8
   ***C H A N G E D***     ZONE FFFF4FFFFF6FFFF6FF6F66664FFFF4666646666F6FFF46666F666F666646666F
                           NUMR 1800E74123019000980200 0E0034E0000E000040123E0000500070000E00008
                                ----+----1----+----2----+----3----+----4----+----5...7----+----8

RECORD      2 DATA    80   CHAR 1800+74123-1900-00-2----+0034+----+----4-123+----5...7----+----8
   ***C H A N G E D***     ZONE FFFF4FFFFF6FFFF6FF6F66664FFFF4666646666F6FFF46666F666F666646666F
                           NUMR 1800E74123019000000200 0E0034E0000E000040123E0000500070000E00008
                                ----+----1----+----2----+----3----+----4----+----5...7----+----8

RECORD      7 DATA    80   CHAR 1800+691A3-1900-A8-2----+00X0+-*ERROR--4-00X+----5...7----+----8
   *****E R R O R*****     ZONE FFFF4FFFCF6FFFF6CF6F66664FFEF465CDDDD66F6FFE46666F666F666646666F
                           NUMR 1800E69113019000180200 0E0070E0C599690040007E0000500070000E00008
                                ----+----1----+----2----+----3----+----4----+----5...7----+----8

RECORD      7 DATA    80   CHAR 1800+691A3-1900-A8-2----+00X0+-*ERROR--4-00X+----5...7----+----8
   *****E R R O R*****     ZONE FFFF4FFFCF6FFFF6CF6F66664FFEF465CDDDD66F6FFE46666F666F666646666F
                           NUMR 1800E69113019000180200 0E0070E0C599690040007E0000500070000E00008
                                ----+----1----+----2----+----3----+----4----+----5...7----+----8
```

Sample SYSTOTAL Output

```
SYSTOTAL Report

                                Following totals developed from
                                SAMPLE.LIB.PDSE  VOL=SER003

'The 1800 totals                                 ----------          155
           SUM=(42,3,C)                          ----------          458
```

MESSAGES AND CODES 10

StarBat issues the following return codes to indicate the results of job execution:

Return Code	Description
0	All functions completed successfully
4	An error was found in decoding a control card; all control statement processing is terminated.
8	No user records were copied to an output data set during a **COPYREC**, **COPYALL**, **COPYMBR**, **COPYREV**, **EXCLUDEREC** or **MULTICOPY** function.
12	An input or output master file could not be opened; StarBat terminates all processing.

StarBat issues many STRB*nnx* and PDS*nnnx* format messages that can be found in the Serena™ StarTool® FDM *Messages Guide*.

The following unnumbered messages are unique to StarBat and are documented here.

UNNUMBERED MESSAGES

*** End of control statement

The last parameter on a function has been input; the function can now be executed.

*** Last of control statements

The last input record has been input in the control statement data set; the end of file was reached.

*** EXCLUDEREC= parameter has been satisfied

The EXCLUDEREC parameter has been satisfied; this **EXCLUDEREC** function is complete.

*** MAXRECIN= parameter satisfied

The MAXRECIN parameter has been satisfied; this function is complete.

*** MAXRECOUT= parameter has been satisfied

The MAXRECOUT parameter has been satisfied; this function is complete.

*** STOPIF= parameter has been satisfied

The STOPIF parameter has been satisfied; this function is complete

*** MAXDATERR= parameter has been satisfied

Too many invalid dates have been encountered; this function is complete

*** No //SYSIN DD statement

No SYSIN DD statement was entered; all corresponding **//DD*xx*** data sets will be copied to **//DD*xx*O** data sets.

*** No //SYSIN DD controls

The SYSIN DD data set contained no StarBat control statements; all corresponding **//DD*xx*** data sets will be copied to //DDxxO data sets.

DD*xx* COPYREC (generated statement)

Matching **//DD*xx*** and **//DD*xx*O** data sets have been found and the input data set is being copied to the output data set.

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