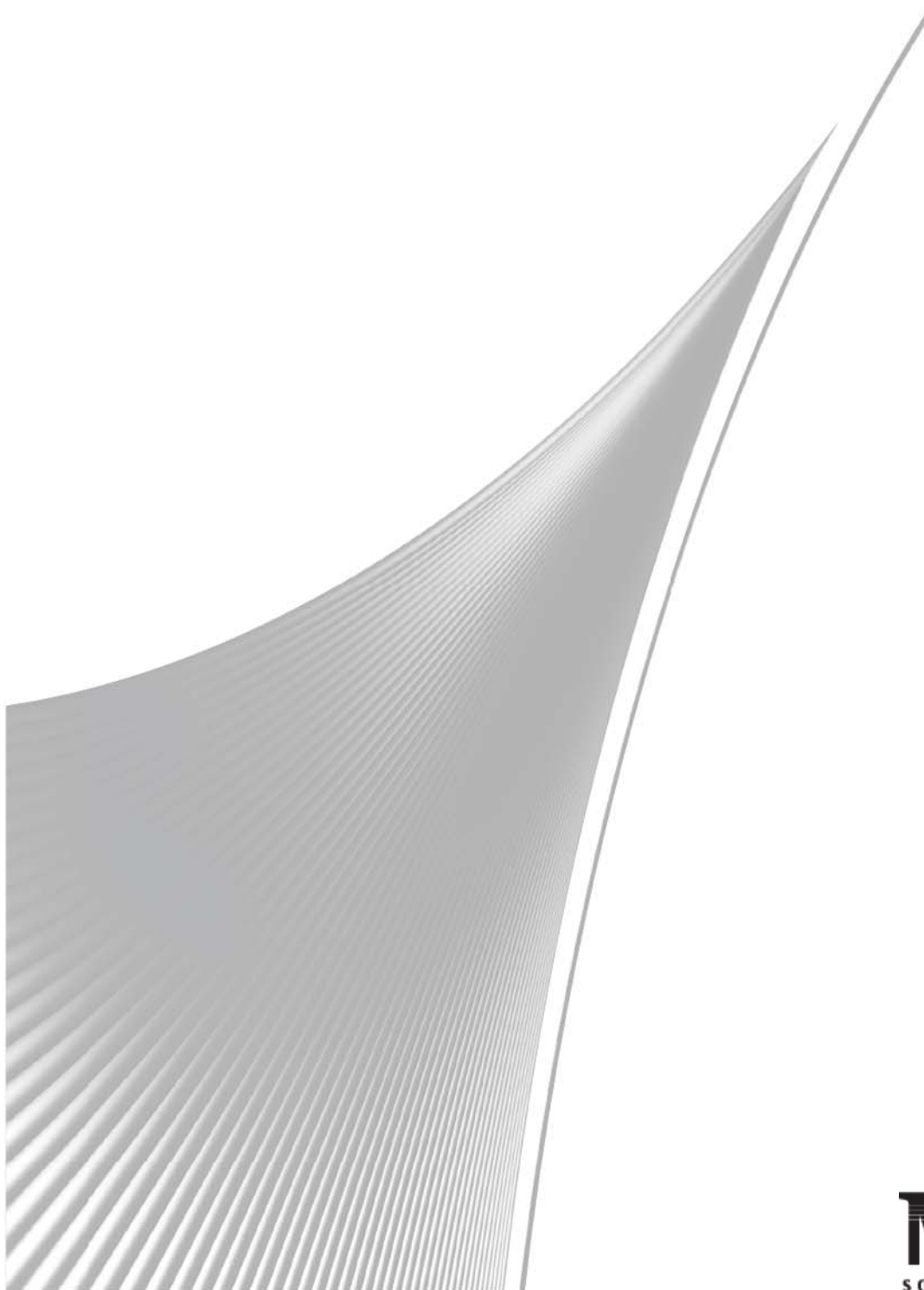


ThruPut
Manager[®]

Exits

System Programming Guide



MVS
solutions inc.

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About This Manual

This manual provides information for systems programmers involved in designing and implementing ThruPut Manager exits.

This manual is organized as follows:

- “Chapter 1. [Introduction to Installation Exits](#)” provides you with an overview of the exits available, the support facilities, and the purpose of the exits.
- “Chapter 2. [Designing Installation Exits](#)” provides you with a detailed description of the environment that is provided for the exits to run. The parameters that are applicable to all exits are also described.
- “Chapter 3. [Installing, Activating, and Tracing Installation Exits](#)” provides you with a description of the facilities available for the implementation and testing of the exits.
- “Chapter 4. [Inter-Exit Communication](#)” describes the facilities available for inter-exit communication.
- “Chapter 5. [Exit Reference Section](#)” presents all the exits in numerical order. Exit specific parameter list are described in detail. The return codes as well as a summary of the environment is provided for each exit.
- “Chapter 6. [Macros](#)” documents the macros provided to simplify the development of installation exits.
- “Chapter 7. [JBS Binding From Exits](#)” describes the facilities that allow you to associate Binding Agents with a job by using exits.
- “Appendix A. [Sample Installation Exit](#)” provides a sample of the linkages and conventions required. The source for the sample exit and its associated macros are also provided in machine readable form with the installation tape.

There are five system programming manuals as listed below. Information described in other manuals is referred to by guide name and chapter as a quick and easy cross reference.

- Base Product: System Programming Guide
- Dataset Contention Services (DCS): System Programming Guide
- Drive Booking Services (DBS) System Programming Guide
- Job Binding Services (JBS) System Programming Guide
- User Control Services (UCS) System Programming Guide

Summary of Changes

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Chapter 1. Introduction to Installation Exits

This chapter introduces the ThruPut Manager installation exits and outlines the types available. The facilities available for exit support are described and possible uses are summarized. Summaries of exit points by type are also included.

Installation Exit Characteristics

ThruPut Manager installation exits enable you to accommodate virtually any special circumstances. Interfaces to accounting, security, and media library systems can be implemented easily through these facilities. Also, in the unlikely event that Job Action Language (JAL) cannot handle all your requirements for batch jobs, the exits provide the ability to incorporate special processing.

User Descriptors are provided that can be given values in Pre-JAL exits and tested in your JAL logic. Both numeric and character string User Descriptors are provided.

There are two type of exits:

- Job-related exits invoked from the Job Analyzer.
- Function-related exits invoked from TMSS.

Job-related Exits

Exits from the Job Analyzer are *job-related*, which means that they get control in synchronization with a job being processed. A job-related exit is LOADED each time a job is processed by the Job Analyzer. Job-related exits get called either before or after JAL is used to classify the job. If you intend to influence the decisions to be made through JAL, you must use one of the Pre-JAL exits.

The table below shows a summary of the job related exits available.

JOB-RELATED EXITS				
No.	Description	Timing	Invocation per Job	Page
1	Job Statement — receives control when ThruPut Manager has finished processing the JCL for a job, and is about to start analysis of the job.	Pre-JAL	Once	52
2	EXEC Statement — receives control for each occurrence of an executable step in the job (every EXEC statement).	Pre-JAL	Multiple	55
3	DD Statement — receives control for each occurrence of a DD statement in the job.	Pre-JAL	Multiple	58
4	Unit Name/Device Type — receives control each time the Job Analyzer encounters a unique unit name, device type, or device number, and must decide how to classify the name, number, or type for resource purposes.	Pre-JAL	Multiple	63
5	Volume Status — receives control each time the Job Analyzer encounters a unique volume serial number, including catalog volumes.	Pre-JAL	Multiple	67
6	Job Action Modification — receives control after the Job Analyzer has classified a job using the JAL supplied by the installation.	Post-JAL	Once	70
7	Job Information Collection — receives control when ThruPut Manager is ready to store all the information collected about a job.	Post-JAL	Once	77
8	Requeue Message — receives control for each requeue message inserted into the job's system messages dataset or sent to the operator.	Post-JAL	Multiple	80
9	Job Termination — receives control when the Job Analyzer has completed processing of the job and the job has been requeued.	Post-JAL	Once	82
19	JECL Statement — receives control for each JES2 control statement that your installation wants to inspect.	Pre-JAL	Multiple	95

Function-related Exits

Exits from TMSS are usually function-related, which means that they receive control asynchronously from job processing. A function-related exit is LOADED at TMSS start up time. A function-related exit is invoked each time TMSS performs the related action, such as processing an operator command. Depending on its nature, it can be called several times for a single function. For example, the JVL Format Exit (Exit 14) is called once per display line on a JVL.

Function-related Exits		
No.	Description	Page
10	TMSS Initialization — receives control when the TMSS address space is started, after initialization statements have been processed.	84
11	TMSS Termination — receives control when the operator requests that the TMSS address space terminate processing.	86
12	TMOS Command Inspection — receives control when ThruPut Manager Operator Services (TMOS) has been given an operator command and is about to process it.	88
13	Display Job — receives control when ThruPut Manager Operator Services (TMOS) is processing a JOB DISPLAY command.	90
14	JVL Format — receives control when ThruPut Manager is processing a JVL request as the result of a JVL being printed for a job, when the operator enters a JVL DISPLAY command, or a JVL REGENERATE command.	92
18	VIF Search Volume — receives control when a VIF search finds that a volume serial number matches one already in the VIF.	95
20	User Volume Key Add — receives control when a volume is added to the VIF.	97
21	RVL Format — receives control just before a line is printed on an RVL.	99
24	FVL Format — receives control just before a line is printed on an FVL.	102
31	CVL Print — allows modification of the output generated by the CVL GEN command. This exit receives control when a CVL display line is being generated.	104

Exit Support Facilities

A number of facilities are provided to assist you in the development and implementation of installation exits. This section outlines them:

- A TM EXIT initialization statement which you can use to specify:
 - Which exit points are enabled.
 - The exit's initial status (inactive, active, or permanently active).
 - The name of the module to be given control.
- A TM TRACE initialization statement to activate tracing of exits.
- A TM EXIT command and TM TRACE command that allow you to activate and deactivate exits and to start and stop tracing.
- Standard installation exit parameter lists, including the mapping macros used by the exit interface code when constructing parameter lists. These macros simplify maintenance by incorporating any parameter list changes through simple re-assembly of your installation exits.
- User Descriptors, which can be assigned values by installation exits and then used to make decisions in your JAL.
- User data areas to extend the information kept for each job.
- User data area for each volume stored in the VIF.
- Tracing of exit parameter lists, to aid in development and debugging.
- Common user data areas, to allow exits to communicate with each other.

Purpose of Installation Exits

- Interfaces to external tape library and security systems such as RACF, ACF2, and TLMS.
- User decision making, which can override the decisions made by ThruPut Manager. Examples include esoteric unit name handling and the status of DASD volumes.
- Extending the Job Information kept by ThruPut Manager and display of this additional data as part of JVLs or CVLs, or with the JOB DISPLAY command.
- Insertion of data into VIF records.
- Providing values for User Descriptors.

Exits

- Alteration of job-related data.
- Implementation of installation-specific standards.
- A way to handle any exceptional requirements which cannot be incorporated through JAL.

Chapter 2. Designing Installation Exits

This chapter describes the considerations affecting the design of a ThruPut Manager installation exit.

Introduction

This chapter describes the environment provided by ThruPut Manager to help in the development and installation of exits. Before developing an exit, an understanding of the linkages and conventions used is necessary. The conventions are different for the two types of exits:

1. Job-related Exits.
2. Function-related Exits.

Job-related Exits

- They are invoked by the Job Analyzer.
- There is a direct relationship between the job being analyzed and the particular exit.
- They are called in protect key 0 supervisor state and are not holding any locks.
- The AMODE statement can be used to control the addressing mode of the exit. Unless there are specific reasons to do otherwise, use “AMODE 31”.
- A number of exits are called prior to the execution of JAL. These Pre-JAL exits can influence the decisions made during JAL execution.
- Other exits are called after the execution of JAL. Their main purpose is for clean-up. It is possible to override JAL decisions from these Post-JAL exits.
- For the purpose of inter-exit communication, the job-related exits are treated as a set. That is, you can pass data from one exit to the next for a particular job by using User Descriptors. See the section “[User Descriptors](#)” in this chapter and “[Chapter 4. Inter-Exit Communication](#)” for more information.

Once the analyzing of a job is completed, the process starts all over again for the next job.

- Some exits can be called more than once for a job. For example, the DD Exit is invoked as many times as there are DDs in a job.

- Some exits might not be called if the job is flushed by a prior exit, or failed on a JCL error by Early Scan.

Function-related Exits

- They are invoked by TMSS.
- They are asynchronous from job processing.
- They are called in protect key 8.
- They can be called more than once, depending on the nature of the exit.
- They are independent of each other, so they do not have access to the same user data areas.

Exit Environment

Exit Definition

- Exits are defined using the [TM EXIT](#) initialization statement.
- If you want to use an Exit, you must define it. That is, you cannot dynamically activate it if it has not been defined.
- You can define exits as:
 - Active
 - Inactive
- The *inactive* mode is provided for testing purposes. This allows you to activate the exit dynamically through the [TM EXIT](#) command when you are ready to test.
- The [TM EXIT](#) initialization statement is explained in detail in “Chapter 3. [Installing, Activating, and Tracing Installation Exits.](#)”
- The [TM EXIT](#) operator command is explained in detail in “Chapter 3. [Installing, Activating, and Tracing Installation Exits.](#)”

LOADing the Exits

Job Analyzer exits are LOAded by the Job Analyzer each time a job is processed. These exits are serialized for a job.

TMSS exits are LOAded by the appropriate TMSS tasks (main task, CPS task, Operator Services) only when the task is attached. An exit point is serialized at the task level, but not across tasks.

If the exit cannot be found, the LOAD receives a system 806 abend, and that component terminates.

Invocation of Exits

The following characteristics apply to all exits:

- All installation exits are invoked in supervisor state, *and* must return control in supervisor state.
- Installation exits are invoked using the AMODE specified (or defaulted to) when they are written.

The next 4 sections document conventions for:

1. Registers—Exit invocation.
2. Registers—Exit return.
3. Addressing mode.
4. Parameter list.

Registers — Exit invocation

When the exit gets control, the registers are set up as shown below.

REGISTERS AT EXIT INVOCATION	
Registers	Description of Contents
0	Zeroed.
1	The address of a list of pointers as described below. The addresses of all data areas are full words, and can be used in either 24 or 31-bit addressing modes.
2 - 12	Zeroed.
13	Points to a 4096 byte area reserved for use by the exit as a work area. The 4K work area makes it very easy to write reentrant code and avoid doing GETMAINS or FREEMAINS.
14	Contains the return address in ThruPut Manager and the addressing mode.
15	Contains the entry point address of the exit and the addressing mode.

Registers — Exit Return

When the exit returns control:

REGISTERS AT EXIT RETURN	
Registers	Description of Contents
0 - 14	Restored by ThruPut Manager
15	Return code from your exit. ThruPut Manager acts upon it.

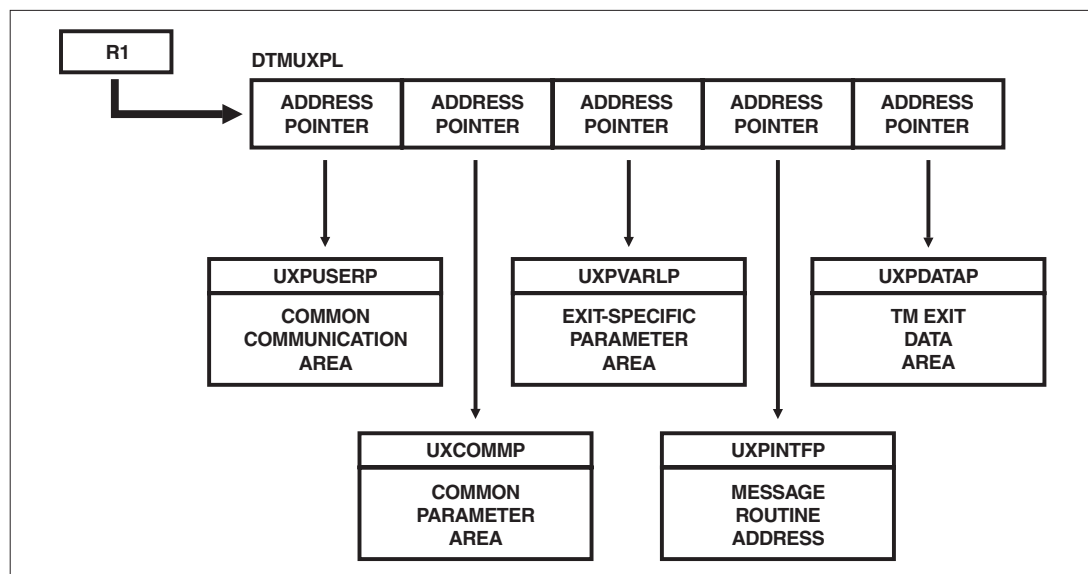
You must also ensure that control is returned in supervisor state.

Addressing Mode

You can control the addressing mode of your exits by using the `AMODE` assembler statement. Unless you have specific, well-understood reasons for using 24-bit addressing, you should use 31-bit addressing.

Parameter List

Upon entry to your exit module, register 1 is loaded with a pointer to a five word list of pointers, mapped by the `DTMUXPL` macro, shown in the following diagram:



Block diagram of areas pointed to by DTMUXPL

PARAMETER LIST POINTED BY R1			
MACRO NAME: DTMUXPL			
Name	Type	Length	Description
UXPUSERP	address	4	Pointer to exit communication area.
UXPCOMMP	address	4	Pointer to exit common parameter area.
UXPVARLP	address	4	Pointer to exit-specific parameter area.
UXPINTFP	address	4	Pointer to service routine address list.
UXPDATAP	address	4	Pointer to data provided with the DATA keyword in TM EXIT control statement.

UXPUSERP—Common Communication Area

The first word of the parameter list contains a pointer to an installation exit communication area. This is a 16 byte area with an initial value of binary zeroes. ***It can only be updated by Exit 10*** (TMSS Initialization). The values are then passed to any other exit routines. Its main purpose is to anchor user tables or other type of similar data.

UXPCOMMP—Common Parameter Area

The second word of the parameter list contains the address of a block of data that is common to all exits.

If data is not available or does not apply, the corresponding field is blank or zero.


This data is mapped by the DTMUXCP macro. Refer to the next page for a list of the available fields. Note that this is *not* a mapping of the parameter area. For details of the mapping, refer to an expansion of the macro.

SECOND POINTER IN PARAMETER LIST				
MACRO NAME: DTMUXCP				
Name	Type	Length	Description	Modify?
UXCEXIT#	binary	4	Installation exit number. This lets you differentiate between exit point calls if the same module is given control.	No
UXCJOBNM	char	8	Job name.	No
UXCRDRON	binary	8	Reader 'on' time and date in the same format as the TIME SVC (8 bytes, time in binary hundredths of a second, packed decimal date).	Yes
UXCEJOB#	char	5	JES2 5 character job number. (JES2 V3)	No
UXCJOB#	char	4	JES2 4 character job number.	No
UXCISYS	binary	1	SID where the job was read.	No
UXCTSCAN	char	1	TYPRUN=SCAN. Values can be: N No Y Yes Available only to Job Analyzer exits 1-9 and 19.	No
UXCPGMRN	char	20	Programmer name.	Yes
UXCACCT#	char	20	First 20 bytes of first account field from JOB statement (padded on the right with blanks).	Yes
UXCROOM#	char	4	JES2 room number (might be zero if user did not code one).	Yes
UXCRACFG	char	8	RACF group name.	Yes
UXCRACFU	char	7	RACF userid.	Yes
UXCNOTFY	char	7	TSO NOTIFY userid.	Yes
UXCNJEU	char	8	NJE NOTIFY userid.	Yes
UXCOCLAS	char	1	Original job input class.	Yes
UXCCCLAS	char	1	Current job input class.	Yes
(Continued)				

Exits

SECOND POINTER IN PARAMETER LIST				
MACRO NAME: DTMUXCP				
Name	Type	Length	Description	Modify?
UXCORGND	char	8	Originating node name.	Yes
UXCORGRM	char	8	Originating remote name.	Yes
UXCINDEV	char	8	Input device name.	Yes
UXCORGNN	binary	2	Originating node number.	Yes
UXCORGRN	binary	2	Originating remote number.	Yes
UXCSYSMF	char	4	SMF system id.	Yes
UXCJSTAT	char	4	Job status. Values can be: OKAY - processed okay so far. FAIL - failed by installation exit or Early Scan. FLSH - flushed by installation exit.	No
UXCACCTP	address	4	Pointer to JOB statement account fields. These fields are mapped by the UXP02ACF DSECT generated by the DTMUXP02 macro: UXP02AFN One byte binary number of account fields. UXP02AFL 144 byte account field area as described below. The field UXP02AFL mapped by this DSECT contains a variable number of fields in the form: (# of fields),(length-1),(field-1), (length 2),(field-2), ... The number of fields counter and the field lengths are one byte binary numbers. If a length is x'00', the field is absent (coded as ',,'). The length of a field does not include the byte with the length descriptor. Note: This field contains an address for <i>Job-related exits</i> . For the <i>Function-related exits</i> , this field contains binary zeroes	No
UXCSMFXP	address	4	Pointer to SMF common exit parameter area.	No
UXCUJDSC	address	4	Pointer to User Descriptors.	No
UXCRACF8	char	8	8-character RACF user id (available only in exits 1-9 and 19).	Yes
UXCJOBID	char	8	JES2 Job ID.	No

Most of the data in the common parameter list can be modified by the JOB Statement installation exit (Exit 1).

 **Any modifications are only for the purpose of influencing ThruPut Manager processing. The real fields are not altered. This facility is provided to cover situations where the installation, through system modifications, alters these fields after ThruPut Manager has processed a job. Using this mechanism, it is possible for the installation to present ThruPut Manager with the same alterations.**

UXPVARLP — Exit-specific Parameter Area

The third word points to a block of data that varies depending on the exit. Naturally, this block varies in size from exit to exit.

The detailed description for each of these exit-specific data blocks is contained in the descriptions for each of the exits.

UXPINTFP — Communication Routines

The fourth word points to two addresses which you can use to invoke the ThruPut Manager message routines available *in job-related exits*. These two routines are provided to allow you to insert messages during job analysis.

If the exit is function-related, no routines are available and the pointer contains zeros.

This list of routine addresses is mapped by the DTMUXIL macro. See below.

FOURTH POINTER IN PARAMETER LIST			
MACRO NAME: DTMUXIL			
Name	Type	Length	Description
UXILSYSM	address	4	Address of the routine to insert messages into the job's System Messages dataset.
UXILJOBM	address	4	Address of the routine to insert messages into the job's JOBLOG.

Calls to these routines must be made in supervisor state, but can be in any AMODE.

These routines run in 31-bit addressing mode, therefore all addresses of data passed to them must be 31-bit addresses.

Control is returned in the caller's AMODE.

UXILSYSM — System Message Routine

The System Messages routine allows an installation exit to issue a message and have it appear in the system messages dataset of a job being processed by the Job Analyzer. This routine is necessary because ThruPut Manager normally suppresses any messages being generated for the system messages dataset.

Registers upon entry to the routine must be as follows:

SYSTEM MESSAGE ROUTINE CONVENTIONS	
Register	Description of Contents
1	Address of the data block that contains the message to be written. The data block contains a record descriptor word (RDW) followed by the message text and is formatted as follows: <ul style="list-style-type: none">• Halfword length of the message block including the RDW.• Halfword field of zeroes.• Message text to be written to system messages dataset. Text can have a maximum length of 133 (if exceeded, the message is truncated). Any use of carriage control is ignored.
13	Is expected to point at a caller-provided standard z/OS save area.
14	Address to which the caller expects control to be returned.
15	Must contain the address of the routine.

All other registers are preserved across the call.

When control is returned to the caller, register 15 contains a return code of zero.

UXILJOBM — JOBLOG Messages Routine

The JOBLOG Messages routine allows an installation exit to issue a message to the operator using a WTO, and have it appear in the JOBLOG dataset of a job being processed by the Job Analyzer.

This routine is necessary because ThruPut Manager normally suppresses logging of WTO messages in the JOBLOG dataset by JES2 during the Job Analysis phase.

Registers upon entry to the routine must be as follows:

JOBLOG MESSAGE COMMUNICATION ROUTINE CONVENTIONS	
Register	Description of Contents
0	Is assumed to contain any data associated with the WTO that is to be issued, such as connect id or UCM console id.
1	Address of the message to be issued. The message must be in WTO list format (i.e. generated with MF=L in the caller's routine).
13	Is expected to point at a caller-provided standard z/OS save area.
14	Address to which the caller expects control to be returned.
15	Must contain the address of the routine.

All other registers are preserved across the call.

Upon return from the routine, register 15 contains the return code from the WTO SVC.

Registers 0 and 1 contain any data returned by the WTO (such as the connect id).

Return Codes

Your exit can influence further ThruPut Manager processing by setting a return code in register 15.

RETURN CODE CONVENTIONS FOR JOB-RELATED EXITS	
RC	Meaning
0	Continue processing with the job
4	Installation exit has altered the data passed to it. ThruPut Manager is to use the modified data.
8	Installation exit requests that the job or request be failed. When a job is <i>failed</i> , ThruPut Manager continues to process it, but upon completion, the Job Analyzer fails the job with a JCL error, and queues it for output.

Exits

RETURN CODE CONVENTIONS FOR JOB-RELATED EXITS	
RC	Meaning
12	Installation exit requests that the job or request be flushed or terminated immediately. The flush capability might be used when a job fails job level security checking, and further processing is not desirable. When a job is <i>flushed</i> during Job Analyzer processing: <ul style="list-style-type: none">• No further processing of the job is performed.• The job is failed with a JCL error.• Only exits 1, 6, 7, 8, and 9 are invoked.

RETURN CODE CONVENTIONS FOR FUNCTION-RELATED EXITS	
RC	Meaning
0	Continue processing as if the exit had not been called.
4	Depends on the particular exit
8	Depends on the particular exit.
12	Depends on the particular exit.

These return codes are strictly enforced by ThruPut Manager. Any other return code results in a message to the operator:

```
DTM3200I      INVALID RETURN CODE rc, FROM THRUPUT MANAGER USER EXIT nn
```

Where:

rc

Is the return code passed back in register 15.

nn

Is the number of the exit producing the invalid return code.

This message is followed by a User 3200 abend, and the component terminates.


Exit Abends


If an installation exit abends during its execution, an SVC dump is generated.

The dump title contains:

- The number of the installation exit.
- The PSW.
- The abend code.

 ***An abend in an exit does not cause the exit to be marked “inactive”.***

 ***An abend in a Job Analyzer exit causes the Job Analyzer initiator and address space to terminate. The job being processed is queued to the same class in which it was being processed, and is held.***

 ***An abend in a TMSS task causes the task to terminate and be reattached, unless the internal ThruPut Manager error retry count is exceeded. This is provided to prevent an endless number of exit abends.***

User Descriptors

ThruPut Manager provides several User Descriptors that can be used in any way your installation desires. Normally, User Descriptors are given values by your Pre-JAL installation exit(s). These values can then be tested in your JAL and therefore can influence the handling of the job being processed. The meaning of a User Descriptor is left entirely to you.

User Descriptor Types

There are two types of User Descriptor available in exits:

- Numeric descriptors. Each numeric descriptor is a fullword. There are 99 numeric User Descriptors, named USERN1 through USERN99. Numeric descriptors are initialized to binary zeros.
- Character descriptors. Each character descriptor is 50 bytes long. There are 99 character User Descriptors, named USERC1 through USERC99. Character descriptors are initialized with blanks.

User Descriptor Availability

User Descriptors are available in job-related exits. They are initialized to binary zeroes or blanks each time a new job is processed. The following table indicates the Pre-JAL exits which have access to User Descriptors.

Exits

PRE-JAL EXITS		
No.	Description	Page
1	Job Statement	52
2	EXEC Statement	55
3	DD Statement	58
4	Unit Name/Device Type	63
5	Volume Status	67
19	JECL Inspection	95

User Descriptors are also available to Post-JAL exits. In this case they are normally used to influence the Job Information collection or some clean-up process if necessary. All the Post-JAL exits have access to User Descriptors.

POST-JAL EXITS		
No.	Description	Page
6	Job Action Modification	70
7	Job Information	77
8	Requeue Message	80
9	Job Termination	82

Locating User Descriptors

User Descriptors are pointed to by the address contained in the UXCUJDSC field in the common parameter list mapped by DTMUXCP macro.

The DTMUJDSC macro maps the area pointed to by this address, as shown below.

MACRO NAME: DTMUJDSC			
USER DESCRIPTORS			
Name	Type	Length	Description
USERN1	binary	4	Numeric descriptor 1.
USERN2	binary	4	Numeric descriptor 2.
...			
USERN99	binary	4	Numeric descriptor 99.
USERC1	char	50	Character descriptor 1.
USERC2	char	50	Character descriptor 2.
...			
USERC99	char	50	Character descriptor 99.

Design Considerations

Some points you should keep in mind when writing installation exits:

- Installation exits have mapping macros associated with them to make using their parameter lists easier. These mapping macros represent the most current documentation for the parameters. The mappings shown in this guide are intended to illustrate the fields and data available, and are not intended to be definitive. Consult the macro expansion for actual mappings.



If there is a discrepancy between this manual and the macro, the macro is correct.

- *Installation exits should be reentrant.* The 4K work area pointed to by register 13 is provided to simplify the task.

Exits

- Installation exit routines can have any desired name.
- A single installation exit module can serve multiple exit points. For example, module XYZ can receive control as exits 1, 2 and 6. It is then the responsibility of the module to determine the exit point for the particular invocation. The exit number is provided as part of the common data block.
- Unless you have specific, well-understood reasons to do otherwise, you should use 31-bit addressing for your exits. This allows some control blocks to be allocated “above the line”, and results in more efficient use of storage. Note that it is your responsibility to switch to 24-bit addressing when performing such functions as QSAM I/O.

“Appendix A. [Sample Installation Exit](#)” contains a listing of a sample installation exit, showing the exit linkage and how to assign a value to a User Descriptor.

Chapter 3. Installing, Activating, and Tracing Installation Exits

This chapter summarizes the steps needed to install and trace a ThruPut Manager installation exit.

Summary of Installation Steps

The following steps summarize the installation of a ThruPut Manager exit:

1. Link the exit into the appropriate library, making sure that it has the correct attributes as described below.
2. Insert a TM EXIT initialization statement in the TMSS initialization stream, specifying the name of the module and the initial status of the exit (active or inactive). See below.
3. Restart ThruPut Manager to include the exit.

Where Exits Should Reside

When installing exits you must consider the following points:

- Installation exits must reside in an z/OS authorized library, since ThruPut Manager must be authorized.
- Reentrant exit load modules are **LOAD**ed in protect key 0.
- Installation exits can run in 31-bit addressing mode and use any RMODE.
- Exits can reside in the Extended LPA.
- For Job Analyzer exits:
 - They must be located in LPA or a LNKLST dataset such as SYS1.LINKLIB.
 - Since they are re**LOAD**ed for each job processed, an installation with a high batch job rate might wish to place the exits in the Link Pack Area.



LLA must be refreshed to load a new version.


If the modules are in LPA, unless you give a different name to the new modules and alter the TM EXIT statement, the new copies are not picked up until the system is re-IPLed.

Exit Tracing

To assist in development and debugging, ThruPut Manager provides a means of tracing the installation exit parameter lists. Tracing should be done with caution, since it can be CPU intensive and impact overall system performance.

Exits are designated as eligible for tracing through the TMSS initialization statement `TM EXIT` or the `/TM EXIT` operator command.

Once exits have been marked eligible, tracing is initiated through the `/TM TRACE` operator command or the `TM TRACE` initialization statement.

 **Both the `/TM TRACE` command (or `TMSS` initialization statement) and the `/TM EXIT` command (or `TMSS` initialization statement) must be issued to enable tracing for a specific installation exit.**

Tracing Methods

Job Analyzer exits and TMSS exits require different tracing methods. For TMSS exits there is no job's system messages dataset for tracing data to be displayed, so an alternate method through GTF is provided.

Tracing Exits From Job Analyzer

For Job Analyzer exits the job's system messages data set is used to print the tracing data. The exit parameters and installation data areas are printed as a hexadecimal and EBCDIC dump of each data area on the job's system messages dataset.

A delimiter header is provided to separate the tracing data produced by each exit. This header contains:

- The exit number.
- The exit return code, if any, formatted in hexadecimal.
- Following the header, the installation exit parameters and data areas are formatted.

Each formatted data area is preceded by an identification line containing the data area's four character mnemonic, its address, its length, and its storage key. The data areas formatted for all Job Analyzer exits are:

UXPL

The installation exit parameter list.

UXCP

The installation exit common parameters.

UXP#

The variable parameters for this installation exit.

UCOM

The 16 byte user communication area.

UJDS

The set of User Descriptors.

In addition, the following data areas are dumped for some exits:

ACCT

For Exit 2.

The accounting fields from the EXEC statement ACCT field are dumped if present for the EXEC Statement exit.

PARM

For Exit 2.

The EXEC statement PARM field is dumped for the EXEC Statement exit.

JFCB

For Exit 3.

The job file control block is dumped for the DD Statement exit.

JFCE

For Exit 3.

The job file control block extension is dumped if present for the DD Statement exit.

VLST

For Exit 3 and Exit 7.

The DD statement volume list is dumped for the DD Statement exit (exit 3), and the entire list of volumes for the job is dumped for the Job Information Collection exit (exit 7).

USER

For Exit 5, Exit 7 and Exit 8.

The volume user data field is dumped for the Volume Status exit (exit 5), and the job user data segment is dumped for the Job Information Collection exit (exit 7) and the Requeue exit (exit 8).

SRM

For Exit 6.

The Step Resource Matrix is dumped for the Job Action Modification exit.

Since Job Analyzer exit calls are associated directly with specific jobs, it is also possible to limit tracing to only certain jobs. This is accomplished by using options of the /TM TRACE command or the TM TRACE TMSS initialization statement, described below.

Tracing Exits From TMSS

For TMSS exits, the exit parameters are traced via GTF using the GTRACE macro instruction. This produces GTF USR records with an event identifier of 249.

GTF must be active to trace TMSS exits. The GTF trace options must include tracing for USR event number 249.

You must use AMDPRDMP to format and print these records. TMSS exits result in at least two GTF records for each installation exit call and return. More than one record is required because the length of a GTF USR record is limited to 256 bytes.

The first 8 bytes of each GTF record contain an identification field to relate the all of the records from one exit call or return event. In hexadecimal, this field has the following format:

cttttttt tttttss

Where:

c

Is 0 for an exit call and 8 for an exit return.

ttt...

Is the value of the system Time of Day Clock.

ss

Is the record sequence number for the current event.

All of the records for one event have the same value in the first 7 bytes of this field, while the sequence number identifies the specific contents of the record.

The remainder of a record with sequence number 01 contains the following fields:

- The return code from the exit or zero for an exit call (4 bytes).
- The address of the installation exit parameter list (4 bytes).
- The installation exit parameter list (16 bytes).
- The installation exit communication fields (16 bytes).
- The installation exit common parameters (144 bytes).

The remainder of a record with sequence number 02 contains the installation exit variable parameters. The length of this record depends on the length of the variable parameter area.

It is not possible to limit tracing to specific jobs for TMSS exit calls, since jobs processing and TMSS exit calls occur asynchronously.

TMSS Initialization Statements

To implement an exit, a TMSS initialization statement is needed.

Activation of exit tracing can be started either through the TMSS initialization statement `TM TRACE` or a command `/TM TRACE`. The initialization statements `TM EXIT` and `TM TRACE` are documented below. They are also documented in the ***Base Product: System Programming Guide*** publication.

The `TM USER` initialization statement is needed to define user areas. The user areas allow you to extend the job information collected for each job. The actual data placed in these areas is up to you.

TM EXIT

Define an Installation Exit

This statement specifies which installation exits are to receive control, and their initial status.

TM EXIT	<code>nn module-name [ACTIVE INACTIVE PERMACTIVE] [DATA(character-string)] [TRACE NOTRACE]</code>
---------	---

nn

Is an exit number, from 1 to14, 19, 20, 21, 24, or 31.

module-name

Specifies the name of the module to be given control at the exit point indicated by *nn*.

ACTIVE

Specifies that the exit is loaded and its initial state is active.

This is the default.

INACTIVE

Specifies that the exit is loaded but its initial state is inactive. It remains inactive until activated through an operator command.

PERMACTIVE

Specifies that the exit is loaded and its state is permanently active. It cannot be deactivated through the use of the TM EXIT operator command.

DATA(character-string)

This keyword allows you to specify a character string that is passed to the exit at exit invocation time.

character-string

A character string up to 255 characters long. If it includes special characters or blanks, it must be enclosed within single apostrophes.

TRACE

Sets the initial status of this exit as being eligible for tracing.

NOTRACE

Sets the initial status of this exit as not being eligible for tracing.

This is the default.

Exits

Notes:

The same module name can be specified for more than one exit point.

Specifying a TM EXIT statement more than once for the same exit number causes an error.

TM EXIT statement processor enforces the requirement that Job Analyzer exits must come from LPA or a LINKLIST dataset.

The TRACE/NOTRACE keywords of the TM EXIT statement determine the eligibility of the exit for tracing. No tracing is actually done unless there is also a TM TRACE initialization statement, or a TM TRACE command is issued. See the description of the TM TRACE statement or the TM TRACE operator command in this chapter.

The TRACE/NOTRACE keywords establish the *initial* status of the exit's trace eligibility. This status can be altered after TMSS is started by using the TM EXIT command.

TM TRACE

Enable/Disable Tracing

This statement activates and deactivates the ThruPut Manager tracing facility. The options described here allow you to trace installation exit activity. The trace facility can also be used to gather data for problem reporting, but these options should only be activated on the explicit instructions of Customer Support, therefore they are not documented here. If there is a need for this capability, Customer Support will provide the specific commands you should use.

TM TRACE	ON EXITS
----------	----------

ON EXITS

Required keywords to enable tracing of ThruPut Manager installation exits.

Notes:

Tracing for Job Analyzer exits (1 through 9, and 19) goes to the job's SYSMSGs dataset.

Tracing for TMSS exits (10 through 18, 30, and 31) goes to GTF; therefore, GTF must be active and the GTF trace options include tracing for USR event number 249.

An installation exit must be made eligible for tracing, either through the TM EXIT statement or the TM EXIT command. See the TM EXIT statement description or the TM EXIT command description in this chapter.

If exit tracing is active for an exit when analysis of a job starts, all calls to that exit for that job are traced, even if an operator command disables tracing before the analysis is finished.

If more than one TM TRACE statement is specified for a system, ***the last statement is effective***. A different TM TRACE statement can be applied to each system by using a FOR group.

TM USER

Define User Areas

This statement defines user areas that can be associated with each job. Space is then provided for you to place data. ***This statement is not accepted within a FOR GROUP.***

TM USER	[JOB (nnn)] [VOLUME (nn)]
---------	------------------------------

JOB (nnn)

Indicates that you want a user area allocated to each job.

The default value is 100.

nnn

Represents the number of bytes to be allocated. It can be from 1 to 255.

VOLUME (nn)

Indicates that you want a user area allocated to each volume that is referenced by a job.

The default value is 12.

nn

Represents the number of bytes to be allocated. It can be from 1 to 99.

Notes:

If you are using the SPOOL File, changing this statement will require a SPOOL cold start.

If more than one TM USER statement is specified, ***the last one is effective.***

Commands

Two commands are provided to help in the installation of exits. These commands are TM EXIT and TM TRACE. They are similar to the TMSS initialization statements TM EXIT and TM TRACE. There is one significant difference:

 ***You cannot introduce a new exit with the TM EXIT operator command. Exits must be defined at TMSS startup time with the TM EXIT statement.***

The commands are documented below. They are also documented in the *Operating Guide* publication.

TM EXIT

Activate or Deactivate Installation Exits

This command activates or deactivates ThruPut Manager installation exits.

Scope: *System*

Duration: Until next TMSS restart.

TM EXIT	[? HELP] <u>DISPLAY</u> nn ACTIVATE nn ACTIVATE DATA(data) nn ACTIVATE NODATA nn ACTIVATE NOTRACE nn ACTIVATE NOTRACE DATA(data) nn ACTIVATE NOTRACE NODATA nn ACTIVATE TRACE nn ACTIVATE TRACE DATA(data) nn ACTIVATE TRACE NODATA nn DEACTIVATE nn <u>DISPLAY</u> nn NOTRACE nn TRACE
---------	---

? | HELP

Requests the command syntax from HELP.

nn

Exit number. "nn" is 1 or 2 digits and must be a valid ThruPut Manager installation exit number.

ACTIVATE

Activates the exit.

The short form for this keyword is A.

DATA

Specifies installation data to be passed to the exit at invocation, and can be 1-255 characters. If the data includes special characters or blanks, it must be enclosed in apostrophes('). To represent an apostrophe, code two consecutive apostrophes (").

DEACTIVATE

Deactivates the exit.

The short form of this keyword is DEACT.

DISPLAY

Displays the status of the specified exit.

If no exit number has been specified, the status of all the exits is displayed.

This is the default.

The short form of this keyword is D.

NODATA

Specifies that no data is to be passed to the exit at invocation. This can be used to remove the effects of a previous DATA keyword.

NOTRACE

Disables tracing for this exit.

The short form of this keyword is N.

TRACE

Enables tracing for this exit.

The short form of this keyword is T.

Example:

```
/TM EXIT 12 ACTIVATE TRACE
```

This command activates Exit 12 with tracing.

```
/TM EXIT 1 DISPLAY
```

This command produces a display of the status of Exit 1:

```
DTM0330I TM EXIT DISPLAY
EXIT ---STATUS--- -MODULE- TRACE LEN -----PARM DATA-----
  1  ACTIVATED(P) DTMUXTST  ON    15 012345678901234
```

Notes:

The exit must have been specified during TMSS initialization using the TM EXIT statement.

Those exits which have been marked as permanently active cannot be disabled using this command.

Tracing of exits requires both this command with the TRACE keyword and the TM TRACE command.

TM TRACE | TM T

Activate or Deactivate ThruPut Manager Tracing

This command activates and deactivates the ThruPut Manager tracing facility. The trace facility is provided to allow you to trace installation exit activity. Tracing can also be used to gather data for problem reporting to Customer Support, but these options should only be activated on the explicit recommendation of Customer Support, and therefore are not documented here. If there is a need for this capability, Customer Support will provide the specific commands you should use.

Scope: *System*

Duration: Until next IPL.

TM TRACE TM T	[? HELP] ADD IDENTIFIER(id) [JOBNAME(jobname)] DELETE [IDENTIFIER(id)] <u>DISPLAY</u> ON OFF
--------------------------------	--

? | HELP

Requests the command syntax from HELP.

ADD

Adds the specified trace request to the tracing queue for the job name supplied. Tracing is performed only if the Job Analyzer processes a job that has the same job name.

The short form for this keyword is A.

DELETE

Deletes the specified trace request from the tracing queue. If no ID is specified, *all* trace requests are deleted.

DISPLAY

Display the status of exits. This is the default.

IDENTIFIER(id)

Specifies the trace identification value. For an ADD, this identifier is needed if the trace request is to be deleted later.

The short form for this keyword is ID.

id

A one to four character trace identification.

JOBNAME (jobname)

Indicates that a job is to be traced. Tracing begins when this jobname is processed by the Job Analyzer. This option is effective only for Job Analyzer exits.

jobname

Name of the job to be traced.

ON

Activates global tracing for all exits and all jobs.

OFF

Deactivates tracing.

Examples:

```
/TM TRACE ADD ID(T1) JOBNAME(MYJOB)
/TM TRACE DELETE ID(T1)
/TM TRACE ON
```

Notes:

Job Analyzer exit tracing can be enabled with either the TM TRACE ADD or the TM TRACE ON command. Using the ADD option allows you to trace specific jobs.

Both the TM TRACE command with the ON keyword *and* the TM EXIT command with the TRACE keyword must be issued to enable tracing for a specific installation exit.

Tracing for Job Analyzer exits goes to the job's SYSMSGSGS dataset.

GTF must be active to trace TMSS exits. The GTF trace options must include tracing for USR event number 249.

Chapter 4. Inter-Exit Communication

This section outlines the mechanism available for exits to pass information to each other.

Introduction

ThruPut Manager provides a number of facilities for inter-exit communication. This chapter shows the relationships among the different data areas that are available.

ThruPut Manager Services

Common to All Exits

The Installation Exit Communication area (UXPUSERP) is provided as a means of global communication. This 16-byte area and its addressability are described in “Chapter 2. [Designing Installation Exits.](#)”

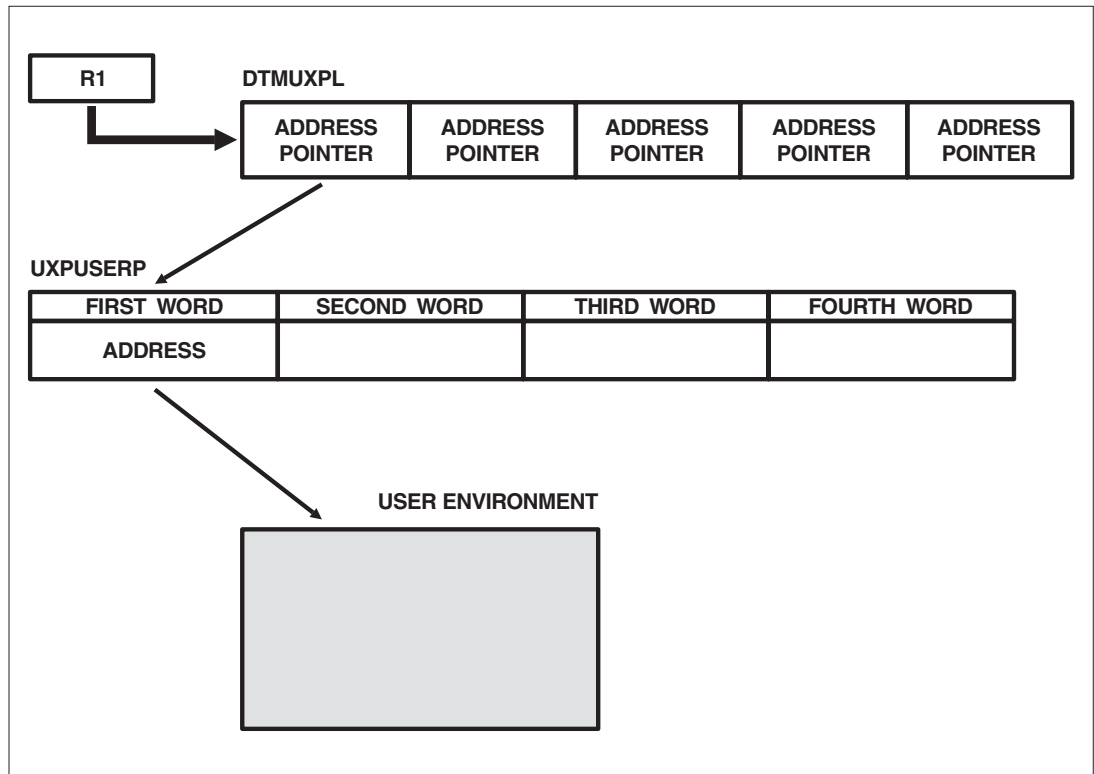
The purpose of this area is to anchor your storage area or to set flags for all exits. An example is the best way to illustrate its use.

Exit 10 (TMSS Initialization) could be used to establish an environment to be used by all your exits. ThruPut Manager invokes this exit only once; therefore, it is a good place to do this.

In this example, Exit 10 gets the storage required and, once the environment is built, stores its address in the first word of the Communication Area.

 **Only Exit 10 can alter this area. All the other Exits have access to it in “read mode”.**

The next page shows a diagram with the addressing structure.



Sample of Communication Area Usage

Any exit can now locate and make use of this environment. Normally Exit 11 (TMSS termination) will be used to free the allocated storage.

Job-related Exits

An area is provided to store and manipulate User Descriptors. An explanation of these Descriptors is provided in “Chapter 2. [Designing Installation Exits.](#)” The User Descriptors can be used for one of two purposes (not mutually exclusive):

1. To influence the decisions made by JAL.
2. To pass information for a given job to all the job-related exits.

The following Pre-JAL exits can influence the JAL:

- Exit 1—JOB Statement.
- Exit 2—EXEC Statement.
- Exit 3—DD Statement.
- Exit 4—Unit Name/Device Name.

Exit 5—Volume Status.

Exit 19—JECL Inspection.

For an explanation on how to use User Descriptors with JAL, refer to the *ThruPut Manager Job Action Language User Guide*.

All the job-related exits (1, 2, 3, 4, 5, 6, 7, 8, 9 and 19) can communicate with each other using User Descriptors.

You can simply choose a Character User Descriptor, for example USERC9, and use the 50-byte area as a common communication area.

Note that this allows you to pass information for a *given job*. This mechanism does not allow you to pass information across jobs.

User Data Services

ThruPut Manager provides you with two mechanisms for User Data:

- You can provide data to exits at TMSS startup time, via the DATA keyword in the TM EXIT control Statement.
- You can define User Fields. These fields can be used to store installation data that is accessible to exits that perform related functions.

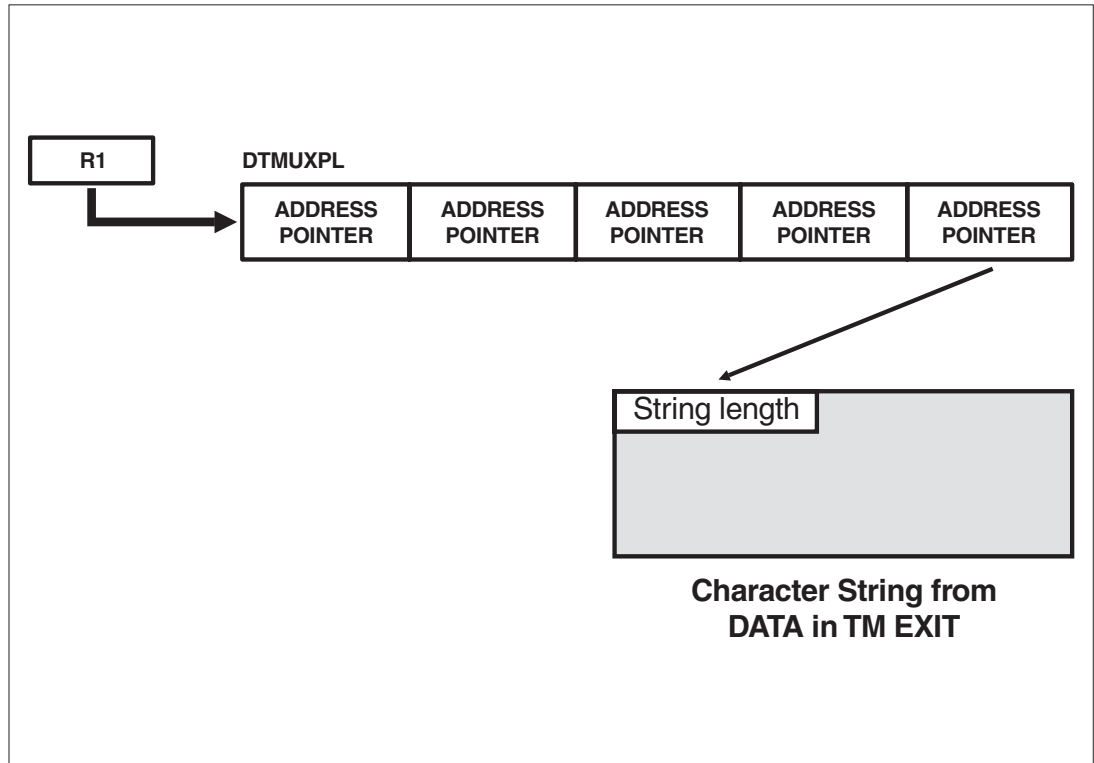
The user data fields provided are:

- Job User Data Field.
- Volume User Data Field.
- User Volume Key.

These services are described below.

DATA from TM EXIT

For each exit you can provide a 255-character string with the DATA keyword in the TMSS control statement TM EXIT. A pointer to a halfword containing the data length, followed by the user data, is passed at the time the exit is invoked. This is shown in the diagram below:



TM EXIT data string

Job User Data Field

Associated with:

Job Information Data Block.

What is it?:

An area associated with *each job* processed by ThruPut Manager. You can use it to store job-related information pertinent to your installation.

How to request it:

- 100 bytes are provided by default.
- If you want a different size you must code the `TM USER JOB(nnn)` initialization statement described in “Chapter 3. [Installing, Activating, and Tracing Installation Exits.](#)”

Available to:

All Job-related Exits.: 1, 2, 3, 4, 5, 6, 7, 8, 9, and 19.
Exit 13—JOB DISPLAY Command (Read Only).
Exit 14—JVL Format (Read Only).

Volume User Data Field

Associated with:

Job Information Data Block.

What is it?:

A user field provided with each volume that is referenced by a job. Normally this field is used for volume location purposes, such as volumes that are filed by “bin” number.

How to request it:

- 12 bytes are provided for each volume by default.
- If you want a different size you must code the `TM USER VOL(nn)` initialization statement described in “Chapter 3. [Installing, Activating, and Tracing Installation Exits.](#)”

Available to:

Exit 5—Volume Status (Read/Write).
Exit 7—Job Information Collection (Read/Write).
Exit 13—Display Job (Read Only).
Exit 14—JVL Format (Read Only).
Exit 20—User Volume Key (Read Only).

User Volume Key

Associated with:

CVL Processing.
FVL Processing.
JVL Processing.
RVL Processing.

What is it:

A 6-byte field that can be used for installation purposes, for example to simplify the process of sorting volumes. When volumes are added to the VIF, using Exit 20 you can provide a sorting key and indicate how this key is to be used to sort volumes. You can also indicate whether or not you want the key printed on Volume Lists.

How to request it:

A 6-byte field is automatically provided for each volume added to the VIF. A flag byte is also provided to indicate how you want this key used.

Available to:

- Exit 20—User Volume Key Add (Read/Write).
- Exit 21—RVL Format (Read/Write).
- Exit 31—CVL Print (Read Only).

NOTE :

If you specify a length of zero for any user definable area, then the pointer to the area contains zeroes.

This applies to any Exit parameter list that includes a user field with a zero length.

The user definable areas are:

- The Job User Data Field.
- The Volume User Data Field.

This note applies to any of these areas.

Chapter 5. Exit Reference Section

This chapter lists the available ThruPut Manager installation exits and provides details of the parameters for each exit.

Description Format

In this chapter each exit is described in detail. They are presented in numerical order. For a cross reference table of exit numbers, a brief description, and where the detailed description can be found, refer to “Chapter 1. [Introduction to Installation Exits.](#)”

Programming considerations for the exit are included where necessary. The exit is identified by type (job or function-related, and whether the exit is from the Job Analyzer or TMSS) and a summary of the environment is provided. A table showing the full exit-specific parameter list is also included.

In these tables, the following data types are used:

address

A fullword containing a memory address.

binary

A binary number, usually a fullword containing an unsigned integer.

char

A field of any length containing printable characters.

flags

A one byte field in which each bit is a flag. Flags are mapped using EQUs.

offset

A fullword containing the offset needed to locate a field from the starting address of a block of data.



In the following exit descriptions, the Specific Parameter List for each exit is provided as a summary only, so that you can see what is available to you when planning your exits. When coding, please rely on the macro expansion for the correct mapping and offsets.

Exit 1

Job Statement

Description:

This is a job-related exit, called before JAL processing.

This exit receives control when the Job Analyzer has finished processing the JCL for a job, and is about to start analysis.

This exit is the first one that can be called by the Job Analyzer, and is always called if active.

This exit can modify most of the fields provided in the common parameter list, mapped by macro DTMUXCP. (See “Chapter 2. [Designing Installation Exits.](#)”)

This exit can also modify the ACF2 fields. In either case, use return code 4 to indicate that data has been changed.

Purpose:

Acquiring and initializing control blocks for subsequent exits.

Establishing the security environment. An example is RACINIT.

Performing job-related security checking, such as password checking or remote checking.

Failing or flushing the job if needed.

Performing any other job-related initialization functions.

ENVIRONMENT			
Mapping macro:	DTMUXP01	Called by:	Job Analyzer
When:	Pre-JAL	Related to:	Jobs
Protect key:	0	User Descriptors:	Available

Exits

RETURN CODES	
RC	Action
0	Continue processing the job.
4	Installation exit has changed data fields.
8	Job is to be failed at end of JAL processing.
12	Job is to be flushed immediately.

EXIT 1 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP01 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP01JUP	address	4	Address of Job User Data Field.
UXP01JUL	binary	4	Length of Job User Data Field.
UXP01PSW	char	8	Job password.
UXP01CPU	binary	4	Job CPU time limit.
UXP01REG	binary	4	Job region size (in K). For z/OS/XA, this value can exceed 16384 (for example, a user codes REGION=24M).
UXP01ERR	binary	1	Statement error code (always 0).
UXP01REA	binary	1	Error reason code (always 0).
UXP01ACL	char	8	ACF2 logon id (modifiable).
UXP01ACS	char	8	ACF2 source id (modifiable).
(Continued)			

EXIT 1 SPECIFIC PARAMETER LIST

**For specific mapping, refer to macro DTMUXP01
For [Common Parameter List information](#), see Chapter 2.**

Name	Type	Length	Description
UXP01ACU	char	24	ACF2 user id (modifiable). If ACF2 is not installed, this field contains: 'ACF2NOTINSTALLED' If ACF2 is not active, and the operator allows ThruPut Manager to continue processing, this field contains: 'ACF2NOTACTIVE BYPASSMODE' If an ACF2 error is found, this field is set to: 'ACF2ERRORxxxxxxx' In this case, 'xxxxxxx' is the ACF2 message id (first 8 bytes of the message) .
UXP01ACR	address	4	Address of ACF2 LogonID record.
UXP01JCT	address	4	Address of z/OS JCT (not to be confused with the JES2 JCT).
UXP01CA7	char	1	CA7 submission status. Value can be either `Y' (submitted by CA7) or `N' (not submitted by CA7).
UXP01BRA	address	4	Address of Bind Request Area.

Exit 2

EXEC Statement

Description:

This is a job-related exit, called before JAL processing.

This exit receives control for each occurrence of an executable step in the job (every EXEC statement). The exit does *not* receive control:

- For EXEC statements that invoke a cataloged procedure.
- If the job has been flushed by a prior installation exit, or the job had JCL errors detected by the Early Scan facility.
- For EXEC statements prior to the one named in a RESTART parameter on a JOB statement, if any.

Purpose:

Verify EXEC statement parameters.

Perform your installation's own resource consumption calculations.

Examine the parameters passed to programs.

Notes:

This exit can be called more than once per job.

This exit might not be called if the job is flushed by an installation exit or failed on a JCL error by Early Scan.

This exit might not gain control in numerical sequence.

ENVIRONMENT			
Mapping macro:	DTMUXP02	Called by:	Job Analyzer
When:	Pre-JAL	Related to:	Jobs
Protect key:	0	User Descriptors:	Available

RETURN CODES	
RC	Action
0	Continue processing the job.
4	Treated as 0.
8	Job is to be failed at end of JAL processing.
12	Job is to be flushed immediately.

EXIT 2 SPECIFIC PARAMETER LIST			
<p>For specific mapping, refer to macro DTMUXP02 For Common Parameter List information, see Chapter 2.</p>			
Name	Type	Length	Description
UXP02JUP	address	4	Address of Job User Data Field.
UXP02JUL	binary	4	Length of Job User Data Field.
UXP02STN	char	8	Step name.
UXP02REG	binary	4	Step region size in K bytes. For z/OS/XA, this value can exceed 16384 (for example, a user codes REGION=24M).
UXP02CPU	binary	4	Step CPU time in seconds.
UXP02ACT	address	4	Pointer to EXEC statement account fields. This field is mapped by the UXP02ACF DSECT generated by the DTMUXP02 macro: UXP02AFN One byte binary number of account fields. UXP02AFL 144 byte account field area as described below. The field UXP02AFL mapped by this DSECT contains a variable number of fields in the form: (# of fields),(length-1),(field-1),(length-2),(field-2), ... The number of fields counter and the field lengths are one byte binary numbers. If a length is x'00', the field is absent (coded as ',,'). The length of a field does not include the byte with the length descriptor.
(Continued)			

Exits

EXIT 2 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP02 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP02PRM	address	4	<p>Pointer to parm field. Contains the address of the length of the parameter string supplied by the PARM keyword on the EXEC statement, and the string itself. This field is mapped by the UXP02PRF DSECT generated by the DTMUXP02 macro, as follows:</p> <p>UXP02PRL Two byte length of PARM field data. UXP02PRD 100 bytes of data passed by the PARM field of the EXEC statement.</p>
UXP02PGM	char	8	Name of program to be executed.
UXP02RGT	char	1	Region type indicator. Value is either 'R' for real, or 'V' for virtual.
UXP02ERR	binary	1	Statement error code (always 0).
UXP02REA	binary	1	Error reason code (always 0).
UXP02SCT	address	4	Address of SCT.
UXP02BRA	address	4	Address of Bind Request Area.
UXP02SIO	address	4	Address of first SIOT for step.

Exit 3

DD Statement

Description:

This is a job-related exit, called before JAL processing.

This exit receives control for each occurrence of a DD statement in the job. Much of the data collected by ThruPut Manager is available in the form of a Job File Control Block (JFCB) and its extension. Refer to the IBM macro IEFJFCBN for more information.

The exit also does not gain control if the job is flushed by a prior installation exit or the job had JCL errors detected by Early Scan.



The field UXP03ERR contains error indications as follows:

Error code 4: ThruPut Manager detected a possible error which could cause the job to fail upon execution.

Error code 8: The job has been failed by ThruPut Manager.

The statement error reason code (UXP03REA) contains a value which indicates the precise reason. See the expansion of the DTMUXP03 macro for more information.

In the case of Error Code 4, this can be used to decide whether or not the job should be failed.



UXP03VLN contains the number of entries in the volume list.

UXP03VLP points to the volume list.

The UXP03VLE DSECT generated by the DTMUXP03 macro maps a volume entry.

Volumes are those coded using VOL=SER=, or found in the catalog.

Purpose:

Verify DD statement parameters.

Perform security checking on dataset names and volumes.

Enforce installation standards for dataset names and dataset disposition.

Interface with library systems to determine volume status.

Fail jobs using DISP=OLD/SHR for datasets that cannot be located in the catalog.

Restrict usage of BLP processing.

Notes:

This exit can be called more than once per job.

This exit might not gain control in numerical sequence.

Exits

ENVIRONMENT			
Mapping macro:	DTMUXP03	Called by:	Job Analyzer
When:	Pre-JAL	Related to:	Jobs
Protect key:	0	User Descriptors:	Available

RETURN CODES	
RC	Action
0	Continue processing the job.
4	Treated as 0.
8	Job is to be failed at end of Job Analyzer processing.
12	Job is to be flushed immediately.

EXIT 3 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP03 For Common Parameter List information, see Chapter 2.			
Name	Type	Length	Description
UXP03JUP	address	4	Address of Job User Data Field.
UXP03JUL	binary	4	Length of Job User Data Field.
UXP03STN	char	8	Step name (name in EXEC PGM= statement).
UXP03STP	char	8	Procstep name (name in EXEC procname statement)..
UXP03DDN	char	8	DDname.
UXP03CC#	binary	2	Concatenation number. This value is non-zero for DD statements that are concatenated (the second DD statement has a value of X'0001').
(Continued)			

EXIT 3 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP03 For Common Parameter List information, see Chapter 2.			
Name	Type	Length	Description
UXP03DDT	char	1	Indicators for DD type. The dataset type indicator is a single character. The possible values and their equated names are: UXP03QNM 'Q' for QNAME= UXP03DMY 'D' for DUMMY. UXP03HFS 'H' for HFS. UXP03SYN 'I' for SYSIN. UXP03SOU 'O' for SYSOUT. UXP03OTH X'00' for anything else.
UXP03ERR	binary	1	Statement error code. The statement error code can have any one of these values: X'00' No errors found. X'04' Warning, could cause errors. X'08' Error, job is failed. X'0C' Another exit detected an error.
UXP03REA	binary	1	Statement error reason code. See mapping macro for reason codes.
UXP03FL1	binary	1	Flags UXP03FHD B'1... ..' SYSOUT HOLD=YES UXP03FM B'.1..' Dataset considered to be migrated UXP03EXP B'..1.' EXPDT specified UXP03RTP B'...1' RETPD specified UXP034DY B'.... 1...' EXPDT=CCYY/DDD format UXP03AFF B'.... .1..' UNIT=AFF specified UXP03UNM B'.... ..1.' UNIT name specified UXP03SER B'.... ...1' VOL=SER specified
UXP03JFC	address	4	Address of JFCB.
UXP03JFE	address	4	Address of JFCB extension.
(Continued)			

Exits

EXIT 3 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP03 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP03VLP	address	4	Volume list pointer. This contains the number of entries indicated by UXP03VLN. The UXP03VLE DSECT generated by the DTMUXP03 macro maps a volume entry. Volumes are those coded using VOL=SER=, or found in the catalog. The entries are in this format: UXP03VOL 6 byte volume serial number. UXP03VDV 4 byte device type in volume entry. UXP03VUP 4 byte pointer to user volume data.
UXP03VLN	binary	4	Number of entries in volume list.
UXP03VUL	binary	4	Length of user data in a volume list entry.
UXP03UNT	char	8	Unit name or device number.
UXP03DEV	binary	4	Device type.
UXP03UCT	binary	1	Unit count.
UXP03DSP	char	1	Normal disposition. This field contains a one character indicator showing the disposition coded as DISP=(,disp). The possible values and their equated names are: UXP03PAS 'P' for PASS. UXP03KEP 'K' for KEEP. UXP03DEL 'D' for DELETE. UXP03CAT 'C' for CATLG. UXP03UNC 'U' for UNCATLG.
UXP03CDP	char	1	Abnormal disposition. See above field for contents.
UXP03CLS	char	1	SYSOUT class.
UXP03FRM	char	4	SYSOUT form number.
UXP03WTR	char	8	SYSOUT writer name.
UXP03CNM	char	44	Dataset name of catalog in which the dataset was located if a catalog search was performed.
UXP03CVL	char	6	Catalog volser.
(Continued)			

EXIT 3 SPECIFIC PARAMETER LIST

**For specific mapping, refer to macro DTMUXP03
For [Common Parameter List information](#), see Chapter 2.**

Name	Type	Length	Description
UXP03CDV	binary	4	Catalog volume device type.
UXP03SSN	char	4	The DD SUBSYS name, if coded. Otherwise blanks.
UXP03SSP	address	4	A pointer to the subsystem workarea.
UXP03SIP	address	4	A pointer to the SIOT.
UXP03BRA	address	4	Address of Bind Request Area.
UXP03ANM	address	4	Address of dataset alias if specified
UXP03PAP	address	4	Address of value for the PATH keyword.
UXP03FDA	char	1	Value of the FILEDATA keyword. For mapping, see the IBM macro IEFSJDKY.
UXP03PDN	char	1	Value for the NORMAL disposition. For mapping, see the IBM macro IEFSJDKY.
UXP03PDA	char	1	Value for the ABNORMAL disposition. For mapping, see the IBM macro IEFSJDKY.
UXP03PMO	char	4	Value for the PATHMODE keyword. For mapping, see the IBM macro IEFSJDKY.
UXO03POP	char	4	Value for the PATHOPTS keyword. For mapping, see the IBM macro IEFSJDKY.

Exit 4

Unit Name/Device Type


Description:


This is a job-related exit, called before JAL processing.

This exit receives control each time the Job Analyzer is processing a unit name, device type, or device number. Unit names and device numbers come from UNIT= coded on DD statements, and device types come from catalog searches or a specific unit request (e.g, UNIT=123).

This exit is also called when the Job Analyzer is about to allocate a catalog to search for a dataset requested by the job. (See also Exit 5.) You can determine if that is the case by inspecting the flag UXP04ICT.

The exit gains control after the Job Analyzer has done an initial classification. You can influence the final resource classification by altering certain values.

 ***UXP04FL2 can be altered by the exit to indicate whether or not a tape request should be treated as a cartridge (3480 or 3490) or non-cartridge (3420 reel).***

 ***If the device is DASD or tape, then at least one of UXP04VTP, UXP04VDA, and UXP04VVD must be set, and at least one of UXP04RES and UXP04MNT must also be set.***

Purpose:

Verify access to requested unit name or device type.

Decide how ThruPut Manager should treat the request (tape, mountable DASD, permanently resident DASD, MSS, other).

Notes:

By altering the Job Analyzer's interpretation, you can influence the later classing decisions made by ThruPut Manager.

This exit can be called more than once per job.

This exit might not be called if the job is flushed by an installation exit or failed on a JCL error by Early Scan.

This exit might not gain control in numerical sequence.

ENVIRONMENT			
Mapping macro:	DTMUXP04	Called by:	Job Analyzer
When:	Pre-JAL	Related to:	Jobs
Protect key:	0	User Descriptors:	Available

RETURN CODES	
RC	Action
0	Continue processing the job.
4	Installation exit has changed data fields.
8	Job is to be failed at end of JAL processing.
12	Job is to be flushed immediately.

EXIT 4 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP04 For Common Parameter List information, see Chapter 2.			
Name	Type	Length	Description
UXP04JUP	address	4	Address of Job User Data Field.
UXP04JUL	binary	4	Length of Job User Data Field.
UXP04UNT	char	8	Unit name or device number.
UXP04DEV	binary	4	z/OS device type.
(Continued)			

Exits

EXIT 4 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP04 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP04FL2	flags	1	<p>Miscellaneous flags. The equated names and the possible values are:</p> <p>UXP04VIO B'1...' VIO eligible unit name. UXP04DMD B'.1..' Unit name is a device number (demand allocation). UXP04IDV B'..1.' If this flag is set, the device type (UXP04DEV) came from the catalog or a reference to another DD statement, and the unit name is derived from it. If not set, the unit name (UXP04UNT) came from the current DD statement. UXP04ICT B'...1' Unit Type for a catalog request. Note that Exit 5 will also be invoked. UXP04VTC B'.... 1...' Some of the devices are 3480s. <i>The exit can set or reset this flag.</i> If this flag is on, then UXP04VTP must also be on. UXP04ACS B'.... .1..' Esoteric Unit Name for an ACS/ATL AUTOMATED unit. UPX04MAN B'.... ...1' Esoteric Unit Name for a MANUAL unit.</p>
UXP04FL1	flags	1	<p>Device class and status flags, indicating the current determination of how the unit name/device type is to be treated. The equated names and possible values are:</p> <p style="text-align: center;">DEVICE CLASS FLAGS</p> <p>UXP04VTP B'1...' Tape device. UXP04VDA B'.1..' DASD device (non-MSS). UXP04VVD B'..1.' MSS virtual device (3330V). VOLUME STATUS FLAGS UXP04RES B'...1' Resident volume. UXP04MNT B'.... 1...' Mountable volume.</p> <p>These flags can be modified. The Device Class Flag and the Volume Status Flag must be set.</p>
(Continued)			

EXIT 4 SPECIFIC PARAMETER LIST

For specific mapping, refer to macro DTMUXP04
 For **Common Parameter List information**, see Chapter 2.

Name	Type	Length	Description
UXP04FL3	flags	1	Miscellaneous flags. The equated names and possible values are: UXP04T90 B'1...' 3490 tape device. UXP04T35 B'.1..' 3590 tape device.
UXP04BRA	address	4	Address of Bind Request Area.

Exit 5

Volume Status

Description:

This is a job-related exit, called before JAL processing.

This exit receives control each time the Job Analyzer encounters a *unique volume serial number*. The Job Analyzer has done an initial classification of the volume using its algorithms and the status of system tables. Through this exit you can influence the final classification.

The Job Analyzer invokes this volume exit for one of two reasons:

- It is in the process of deciding the classification of the volume.
- It is about to allocate a catalog in its normal process of searching for datasets.

In the first case, volume serial numbers come from VOL=SER= coded on DD statements, or as the result of successful catalog searches.



To indicate the status of a volume properly, only one of UXP05VTP, UXP05VDA, UXP05VVD, or UXP05VTS must be on, and only one of UXP05RES, UXP05MNT, UXP05NAV, or UXP05NFD must also be on.

Purpose:

Set the MIGRATE attribute for any volume.

Indicate that a volume is UNAVAILABLE.

Verify access to the requested volume.

Decide how ThruPut Manager should treat the request (tape, mountable DASD, permanently resident DASD, MSS, HSM, other).

Deny access to a catalog by a particular job, or to a volume containing a catalog.

Notes:

By altering the Job Analyzer's interpretation, you can influence the later classing decisions made by ThruPut Manager, as well as the contents of the JVL.

This exit can be called more than once per job.

This exit might not be called if the job is flushed by an installation exit or failed on a JCL error by Early Scan.

This exit might not gain control in numerical sequence.

ENVIRONMENT			
Mapping macro:	DTMUXP05	Called by:	Job Analyzer
When:	Pre-JAL	Related to:	Jobs
Protect key:	0	User Descriptors:	Available

RETURN CODES	
RC	Action
0	Continue processing the job.
4	Installation exit has changed data fields.
8	Job is to be failed at end of JAL processing.
12	Job is to be flushed immediately.

EXIT 5 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP05 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP05JUP	address	4	Address of Job User Data Field.
UXP05JUL	binary	4	Length of Job User Data Field.
UXP05VUP	address	4	Address of Volume User Data Field.
UXP05VUL	binary	4	Length of Volume User Data Field.
UXP05VOL	char	6	Volume serial number.
UXP05UNT	char	8	Unit name.
UXP05DEV	binary	4	z/OS device type
(Continued)			

Exits

EXIT 5 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP05 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP05FL1	flags	1	<p style="text-align: center;">VOLUME TYPE FLAGS</p> <p>NOTE: One and only one must be on.</p> <p>UXP05VTP B'1...' Tape device. UXP05VDA B'.1..' DASD device (non-MSS). UXP05VVD B'..1.' MSS virtual device . UXP05VTS B'.... ...1' Virtual Tape device.</p> <p style="text-align: center;">VOLUME STATUS FLAGS</p> <p>NOTE: One and only one must be on.</p> <p>UXP05RES B'...1' Resident volume. UXP05MNT B'.... 1... ' Mountable volume. UXP05NAV B'.... .1.. ' Unavailable Volume UXP05NFD B'.... ..1.' Not Found Volume</p> <p style="text-align: center;">These flags can be modified.</p>
UXP05FL2	flags	1	<p>Miscellaneous flags. The equated names and the possible values are:</p> <p>UXP05ICT B'...1' This flag is set for a catalog request. If the volume is marked "unavailable", then an "unavailable catalog" condition is recognized.</p> <p>UXP05VTC B'.... 1... ' This flag is on if the volume could be a cartridge (3480/3490). <i>The exit can set/reset this flag.</i></p> <p>UXP05MIG B'.... .1.. ' This flag is on if the volume was set as migrated via the VOL init statement/command. <i>The exit can set/reset this flag.</i></p> <p>UXP05ACS B'.... ..1.' Volume is managed by an Automated Cartridge System. <i>The exit can set/reset this flag.</i></p>
UXP05BRA	address	4	Address of Bind Request Area.

Exit 6

Job Action Modification

Description:

This is a job-related exit, called after JAL has been processed.

This Job Analyzer exit receives control after the Job Analyzer has classified a job using the JAL supplied by the installation, or by using its internal defaults. This exit always gains control if active, even if the job has already been failed or flushed.

The exit cannot alter the status of a job once it has been failed or flushed.

Purpose:

You can use this exit to override JAL decisions should such an extraordinary action be required. All data collected for the JAL decision is available through the Step Resource Matrix (SRM) provided in this exit. Should details of the SRM be required, contact ThruPut Manager Customer Support.

Notes:

Before developing code for Exit 6 to override JAL, contact ThruPut Manager Customer Support. If your requirements have general application it might be feasible to incorporate them into the product.

ENVIRONMENT			
Mapping macro:	DTMUXP06	Called by:	Job Analyzer
When:	Post-JAL	Related to:	Jobs
Protect key:	0	User Descriptors:	Available <i>Cannot Influence JAL actions</i>

RETURN CODES	
RC	Action
0	Continue processing the job.
4	Installation exit has changed data fields.
8	Job is to be failed at end of JAL processing.
12	Job is to be flushed immediately.

Exits

EXIT 6 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP06 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP06JUP	address	4	Address of Job User Data Field.
UXP06JUL	binary	4	Length of Job User Data Field.
UXP06ELT	binary	4	Elapsed time (in minutes).
UXP06CPU	binary	4	Sum of CPU time coded (in seconds).
UXP06REG	binary	4	Maximum region size (in K).
UXP06MSS	binary	4	Number of MSS volume requests.
UXP06TAP	binary	4	Number of tape setup volumes.
UXP06DAS	binary	4	Number of DASD setup volumes.
UXP06MXT	binary	4	Maximum tape units (one step).
UXP06MXD	binary	4	Maximum mountable DASD units (one step).
UXP06HSM	binary	4	Number of HSM recalls required. (See also UXP06HSD and UXP06HST.)
UXP06SCR	binary	4	Minimum number of scratch tapes.
UXP06TPR	binary	4	Number of tape volumes (reels).
UXP06TPC	binary	4	Number of tape volumes (cartridges).
UXP06MTR	binary	4	Maximum number of tape units (reels).
UXP06MTC	binary	4	Maximum number of tape units (cartridges).
UXP06SR	binary	4	Number of scratch tapes (reels).
UXP06SC	binary	4	Number of scratch tapes (cartridges).
UXP06PRT	binary	4	Estimated lines (in thousands).
UXP06PUN	binary	4	Estimated cards.
(Continued)			

EXIT 6 SPECIFIC PARAMETER LIST

**For specific mapping, refer to macro DTMUXP06
For [Common Parameter List information](#), see Chapter 2.**

Name	Type	Length	Description
UXP06PAG	binary	4	Estimated pages.
UXP06BYT	binary	4	Estimated bytes (in thousands).
UXP06TS	binary	4	Total DASD space (in megabytes).
UXP06TP	binary	4	Total permanent DASD space (in megabytes).
UXP06PPS	binary	4	Permanent primary DASD space (in megabytes).
UXP06PSS	binary	4	Permanent secondary DASD space (in megabytes).
UXP06TT	binary	4	Total temporary DASD space (in megabytes).
UXP06TPS	binary	4	Temporary primary DASD space (in megabytes).
UXP06TSS	binary	4	Temporary secondary DASD space (in megabytes).
UXP06TPA	binary	4	Number of Automated Volumes.
UXP06MTA	binary	4	Maximum number of Automated drives.
UXP06SA	binary	4	Number of scratch Automated cartridges.
UXP06ALS	binary	4	Number of cartridges OUT-OF-ALS (Automated Library System).
UXP06TEM	binary	4	Maximum number of Manual 3490 drives.
UXP06TEA	binary	4	Maximum number of Automated 3490 drives.
UXP06TET	binary	4	Maximum number of 3490 tape units.
UXP06T8M	binary	4	Maximum number of Manual 3480 drives.
UXP06T8A	binary	4	Maximum number of Automated 3480 drives.
UXP06T8T	binary	4	Maximum number of 3480 tape units.
UXP06HSD	binary	4	Number of DFHSM recalls for datasets migrated to DASD.

(Continued)

Exits

EXIT 6 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP06 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP06HST	binary	4	Number of DFHSM recalls for datasets migrated to tape.
UXP06RTA	binary	4	Maximum number of PREFER Automated drives in a step.
UXP06R8A	binary	4	Maximum number of PREFER 3480 Automated drives in a step.
UXP06REA	binary	4	Maximum number of PREFER 3490E Automated drives in a step.
UXP06RTM	binary	4	Maximum number of PREFER Manual drives in a step.
UXP06R8M	binary	4	Maximum number of PREFER 3480 Manual drives in a step.
UXP06REM	binary	4	Maximum number of PREFER 3490E Manual drives in a step.
UXP06RVA	binary	4	Number of PREFER Automated volumes in a step.
UXP06RVM	binary	4	Number of PREFER Manual volumes in a step.
UXP06RVJ	binary	4	Number of PREFER volumes to eject.
UXP06RVN	binary	4	Number of PREFER volumes to enter.
UXP06RSA	binary	4	Number of PREFER Automated scratch volumes.
UXO06RSM	binary	4	Number of PREFER Manual scratch volumes.
UXP06ETA	binary	4	Maximum number of ENSURE Automated drives in a step.
UXP06E8A	binary	4	Maximum number of ENSURE 3480 Automated drives in a step.
UXP06EEA	binary	4	Maximum number of ENSURE 3490E Automated drives in a step.
UXP06ETM	binary	4	Maximum number of ENSURE Manual drives in a step.
UXP06E8M	binary	4	Maximum number of ENSURE 3480 Manual drives in a step.
UXP06EEM	binary	4	Maximum number of ENSURE 3490E Manual drives in a step.
UXP06EVA	binary	4	Number of ENSURE Automated volumes in a step.
(Continued)			

EXIT 6 SPECIFIC PARAMETER LIST

**For specific mapping, refer to macro DTMUXP06
For [Common Parameter List information](#), see Chapter 2.**

Name	Type	Length	Description
UXP06EVM	binary	4	Number of ENSURE Manual volumes in a step.
UXP06EVJ	binary	4	Number of ENSURE volumes to eject.
UXP06EVN	binary	4	Number of ENSURE volumes to enter.
UXP06ESA	binary	4	Number of ENSURE Automated scratch volumes.
UXO06ESM	binary	4	Number of ENSURE Manual scratch volumes.
UXP06T9M	binary	4	Maximum number of 3590 Manual drives in a step.
UXP06T9A	binary	4	Maximum number of 3590 Automated drives in a step.
UXP06T9T	binary	4	Maximum number of 3590 drives in a step.
UXP06R9A	binary	4	Maximum number of PREFER 3590 Automated drives in a step.
UXP06R9M	binary	4	Maximum number of PREFER 3590 Manual drives in a step.
UXP06E9A	binary	4	Maximum number of ENSURE 3590 Automated drives in a step.
UXP06E9M	binary	4	Maximum number of ENSURE 3590 Manual drives in a step.
UXP06VTS	binary	4	Number of VTS scratch volumes.
UXP06VTU	binary	4	Maximum number of VTS units.
UXP06VTV	binary	4	Number of VTS volumes.
UXP06SRM	address	4	Address of Step Resource Matrix (SRM). The SRM contains the resource counters for each step in the job in the form of a matrix.
UXP06ST#	binary	4	Number of steps in the matrix.
UXP06STL	binary	4	Length of an SRM row.
	offset	114	Offsets to fields in SRM. For details of the SRM offset mappings and address calculations, refer to the mapping macro for this exit (DTMUXP06).

(Continued)

Exits

EXIT 6 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP06 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP06JTN	char	20	Requeue label assigned by JAL.
UXP06JTC	char	1	Requeue class from JAL.
UXP06JTP	binary	1	Requeue priority from JAL.
UXP06JTJ	char	1	JVL indicator. Value can be either 'Y' (produce a JVL) or 'N' (do not produce a JVL).
UXP06JTH	char	1	JES2 hold indicator. Value can be either 'Y' (hold this job) or 'N' (do not hold this job).
UXP06JTD	char	8	Destination.
UXP06JTR	char	1	Recall indicator. Value can be either 'Y' to request recalls or 'N' to suppress them.
UXP06JTT	binary	4	Time for CPU capping (in seconds).
UXP06JTX	char	1	Normalization indicator. Value can be 'Y' to request normalization, or 'N' to suppress it.
UXP06RQL	char	20	Requeue label assigned by JAL (modifiable).
UXP06RQC	char	1	Class into which the job is requeued at the end of Job Analyzer processing (modifiable). Must be a valid class (A-Z, 0-9). A job which has already been marked as failed or flushed cannot be altered.
UXP06RQP	binary	1	Requeue priority at end of Job Analyzer processing (modifiable). Ignored for failed or flushed jobs.
UXP06RQD	char	8	Destination after JAL processing (modifiable).
UXP06RQT	binary	4	Time (in seconds) for CPU cap of requeued job (modifiable).
(Continued)			

EXIT 6 SPECIFIC PARAMETER LIST

For specific mapping, refer to macro DTMUXP06
 For [Common Parameter List information](#), see Chapter 2.

Name	Type	Length	Description
UXP06FL1	flags	1	<p>Requeue flags. This field indicates the requeue characteristics of the current job.</p> <p>The exit can alter this field in order to return its decision to ThruPut Manager.</p> <p>The equated flag names and their values are:</p> <p>UXP06RQJ B'1...' Produce a Volume List..</p> <p>UXP06RQH B'.1..' Hold the job (JES2 hold).</p> <p>UXP06RQR B'...1' RECALL requested.</p> <p>UXP06RQN B'.... 1...' Normalization requested.</p> <p>UXP06TMP B'.... .1..' Requeue class is Job Analysis class.</p> <p>UXP06TMS B'.... ..1.' Requeue class is a Deferred Class.</p> <p>UXP06TMQ B'.... ...1' Don't hold if job is requeued to same class or Job Analysis class.</p>
UXP06HR	flags	1	<p>Hold request flag. This flag byte indicates the hold reason for a job. The equated names and possible values are:</p> <p>UXP06HCE B'1...' Catalog error.</p> <p>UXP06HUC B'.1..' Catalog unavailable.</p> <p>UXP06HUV B'...1' Volume unavailable.</p> <p>UXP06HTM B'...1' Requeue is same as a Job Analysis class or job's current class.</p> <p>UXP06HJT B'.... 1...' JAL requested hold.</p> <p>UXP06HTR B'.... .1..' TYPRUN=HOLD specified.</p> <p>UXP06HTH B'.... ..1.' Operator replied HOLD to DTM3800I message (fatal processing error).</p>

Exit 7

Job Information Collection

Description:

This is a job-related exit, called after JAL processing.

This exit receives control when ThruPut Manager is ready to save all the information collected for a job.

The exit is provided for the installation to add its own data.

For the purpose of adding installation data, ThruPut Manager provides the following facilities:

- **A user header section:** This is provided for each job. The default size is 100 bytes.
- **A volume user data section:** This is provided for each volume associated with a job. The default size is 12 bytes.

You can alter the size of the user areas with the TMSS initialization statement TM USER

ENVIRONMENT			
Mapping macro:	DTMUXP07	Called by:	Job Analyzer
When:	Post-JAL	Related to:	Jobs
Protect key:	0	User Descriptors:	Available <i>Cannot influence JAL actions.</i>

RETURN CODES	
RC	Action
0	Continue processing the job.
4	Installation exit has changed data fields.
8	Job is to be failed at end of JAL processing.
12	Job is to be flushed immediately.

EXIT 7 SPECIFIC PARAMETER LIST			
MAPPING MACRO : DTMUXP07			
For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP07JUP	address	4	Address of Job User Data Field.
UXP07JUL	binary	4	Length of the Job User Data Field.
UXP07RQL	char	20	Requeue label assigned by JAL.
UXP07RQC	char	1	Requeue job class.
UXP07RQP	binary	1	Requeue job priority.
UXP07RQD	char	8	Destination code.
UXP07FL1	flags	1	Requeue flags. The equated names and possible values for the flags are: UXP07RQJ B'1...' Produce a Volume List. UXP07RQH B'.1..' HOLD the job. UXP07RQR B'...1' RECALL=YES specified. UXP07RQN B'.... 1...' NORMALIZE=YES specified.
UXP07VLP	address	4	Address of first volume entry.
UXP07VLN	binary	4	Number of volumes in volume list.
UXP07VEL	binary	4	Length of a volume entry.
UXP07VSO	offset	4	Offset to 6 byte volser.
UXP07UNO	offset	4	Offset to the 8 byte unit name.
UXP07DTO	offset	4	Offset to the 4 byte device type.
UXP07VUO	offset	4	Offset to Volume User Data area.
UXP07VUL	binary	4	Length of a Volume User Data area.
(Continued)			

Exits

EXIT 7 SPECIFIC PARAMETER LIST			
MAPPING MACRO : DTMUXP07			
For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP07F1O	offset	4	<p>Offset to flag 1 in volume entry. The equated names and possible values for the flag byte are:</p> <p>UXP07VTP B'1...' Tape device. UXP07VDA B'.1..' DASD device (non-MSS). UXP07VVD B'..1.' MSS virtual device. UXP07RES B'...1' Resident volume. UXP07MNT B'.... 1... ' Mountable volume. UXP07NAV B'.... .1.. ' Volume not available. UXP07NFD B'.... ..1.' Volume not found.</p>
UXP07F2O	offset	4	<p>Offset to flag 2 in volume entry. The equated names and possible values for the flag byte are:</p> <p>UXP07RNG B'1...' Write ring was requested. UXP07CTU B'.1..' Unit information came from the catalog. UXP07DMD B'..1.' Unit name is a device number or address.</p>
UXP07CPU	binary	4	Time (in seconds) for CPU cap of queued job.

Exit 8

Requeue Message

Description:

This is a job-related exit, called after JAL processing.

This exit receives control for each requeue message inserted into the job's system messages dataset or sent to the operator.

The exit can be used to:

- Alter the text of the message or replace it with your own text.
- Bypass issuing a message.

ENVIRONMENT			
Mapping macro:	DTMUXP08	Called by:	Job Analyzer
When:	Post-JAL	Related to:	Jobs
Protect key:	0	User Descriptors:	Available <i>Cannot influence JAL processing.</i>

RETURN CODES	
RC	Action
0	Continue processing the job.
4	Installation exit has changed data fields.
8	Requeue message is to be suppressed.
12	Treated as 8.

Exits

EXIT 8 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP08 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP08JUP	address	4	Address of Job User Data Field.
UXP08JUL	binary	4	Length of Job User Data Field.
UXP08RQC	char	1	Class into which the job is requeued at the end of Job Analyzer processing (not modifiable).
UXP08RQP	binary	1	Requeue priority (not modifiable).
UXP08RQD	char	8	Destination.
UXP08FL1	flags	1	Requeue flags (not modifiable). UXP08RQJ B'1...' Produce a JVL. UXP08RQH B'.1..' Hold the job.
UXP08LLN	binary	2	Length of the message text (modifiable, must not exceed 126).
UXP08LIN	char	126	Message text area (modifiable). Carriage control is ignored. This area contains the message text.
UXP08AM1	flags	1	Applications managing the job (not modifiable). UXP08JBM B'1...' JBS UXP08JCM B'.1..' JCS UXP08JLM B'..1.' JLS UXP08JSM B'...1' JSS UXP08JTM B'.... 1... ' JTS
UXP08AH1	flags	1	Applications holding the job (not modifiable). UXP08JBH B'1...' JBS UXP08JCH B'.1..' JCS UXP08JLH B'..1.' JLS UXP08JSH B'...1' JSS UXP08JTH B'.... 1... ' JTS

Exit 9

End of Job Analysis

Description:

This is a job-related exit, called after JAL processing.

This exit receives control when the Job Analyzer has completed processing of the job, and the job has been requeued. This exit always receives control if active.

Notes:

The exit can be used to:

- Perform any cleanup needed on behalf of other installation exits, such as deleting the RACF environment.
- Perform job accounting; for example, writing an SMF record.

ENVIRONMENT			
Mapping macro:	DTMUXP09	Called by:	Job Analyzer
When:	Post-JAL	Related to:	Jobs
Protect key:	0	User Descriptors:	Available <i>Cannot influence JAL actions.</i>

RETURN CODES	
RC	Action
0	Continue processing the job.
4	Treated as 0.
8	Treated as 0.
12	Treated as 0.

Exits

EXIT 9 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP09 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP09JUP	address	4	Address of Job User Data Field.
UXP09JUL	binary	4	Length of Job User Data Field.
UXP09RQC	char	1	Class into which the job is requeued at the end of Job Analyzer processing (A-Z, 0-9).
UXP09RQP	binary	1	Requeue priority. Ignored for failed or flushed jobs.
UXP09RQD	char	8	Destination.
UXP09FL1	flags	1	Requeue flags UXP09RQJ B'1...' Produce a JVL. UXP09RQH B'.1..' Hold the job.
UXP09JAC	binary	4	CPU time used by Job Analyzer (in milliseconds).
UXP09LOC	binary	4	Number of catalog locates required.
UXP09ALC	binary	4	Number of catalogs allocated.
UXP09NJV	binary	4	Number of volumes contained in the record.
UXP09JAE	binary	4	Elapsed time required (in milliseconds).

Exit 10

TMSS Initialization

Description:

This is a function-related exit.

This exit receives control when the TMSS address space is started, after initialization statements have been processed. This exit is always given control if specified during initialization.

This exit must not be specified on the EXIT statement as “inactive” because an operator command cannot enable it.

The data in the common parameter area is blanks or zeros for this exit.

Purpose:

The exit can be used to:

- Perform any initialization activities desired by your installation. For example, reading of tables to be used later by other exits.
- Deny ThruPut Manager startup.

ENVIRONMENT			
Mapping macro:	DTMUXP10	Called by:	TMSS
When:	At TMSS start up.	Related to:	Function
Protect key:	8	User Descriptors:	Not available

RETURN CODES	
RC	Action
0	Continue initialization with existing options.
4	Treated as 0.
8	TMSS should be terminated immediately.
12	Treated as 8.



A return code higher than 4 is used as the TMSS completion code.

Exits

EXIT 10 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP10 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP10SYS	char	4	Subsystem name under which TMSS runs.

Exit 11

TMSS Termination

Description:

This is a function-related exit.

This exit receives control when the operator requests that the TMSS address space terminate processing.

The data in the common parameter area is blanks or zeros for this exit.

Purpose:

The exit can be used to:

- Perform any required termination activities.

ENVIRONMENT			
Mapping macro:	DTMUXP11	Called by:	TMSS
When:	At TMSS termination	Related to:	Function
Protect key:	8	User Descriptors:	Not available

RETURN CODES	
RC	Action
0	Continue termination processing.
4	Treated as 0.
8	Treated as 0.
12	Treated as 0.



The return code from this exit is used as the TMSS completion code.

Exits

EXIT 11 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP1 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP11SYS	char	4	Name of subsystem under which TMSS runs.

Exit 12

TMOS Command Inspection

Description:

This is a function-related exit.

This exit receives control when ThruPut Manager Operator Services (TMOS) has been given an operator command and is about to process it.

The data in the common parameter area is blanks or zeros for this exit.

Purpose:

The exit can be used to:

- Verify the use of ThruPut Manager operator commands.
- Modify a command prior to it being processed by ThruPut Manager.
- Suppress the command with or without a message.
- Support additional installation dependent commands or options on commands.

ENVIRONMENT			
Mapping macro:	DTMUXP12	Called by:	TMOS
When:	For each command	Related to:	Command Function
Protect key:	8	User Descriptors:	Not available

RETURN CODES	
RC	Action
0	Continue normal processing including standard command authority checks.
4	Process the command unconditionally.
8	Ignore the command without issuing any messages.
12	Suppress the command and issue a message indicating that the installation exit has rejected the command.

Exits

EXIT 12 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP12 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP12ASN	binary	2	Normal value is zero, indicating a console command was issued. If non-zero, a TSO user issued the command. This field then contains the address space id of issuer of command. For direct responses you have to use cross-memory TPUT.
UXP12CON	binary	1	If the previous field was zero, then this field has the UCM id of the console that issue the command. Direct responses should be issued via "WTO MCSFLAG=REG0" with this UCM id in register 0. If the console id is greater than 99, then the 4 byte console id from UXP12CID must be used.
UXP12AUT	flags	1	Command authority flag byte, indicates what level of authority the issuing console had. The values and their equated names are: UXP12SCG B'1...' System command group. UXP12ICG B'.1..' I/O command group. UXP12CCG B'..1.' Console command group. UXP12MST B'.... ...1' Master console.
UXP12UCM	address	4	Address of UCM control block. This field contains zeroes if command is from TSO.
UXP12CML	binary	4	Length of command text (modifiable).
UXP12CMD	char	128	Command text area (modifiable). Command text must not exceed 128 bytes, and must be padded on the right with blanks If the length is changed, UXP12CML field must be updated. If altered, TMOS processes the command using the altered values.
UXP12CID	address	4	Console id of issuing console. This field contains zeros if command is from TSO, or if extended console support is not installed.

Exit 13

JOB Display Command.

Description:

This is a function-related exit.

This exit receives control when ThruPut Manager Operator Services (TMOS) is processing a JOB DISPLAY command.

The exit receives control for each line of output that the JOB DISPLAY command generates in response to the options that were specified on the command.

Purpose:

The exit can be used to:

- Modify the output of the /JOB DISPLAY command.
- Insert or delete command response lines.
- Generate your own output based on the user data contained in the header area.

ENVIRONMENT			
Mapping macro:	DTMUXP13	Called by:	JOB Information
When:	For every JOB DISPLAY command line of output.	Related to:	JOB Function
Protect key:	8	User Descriptors:	Not available

RETURN CODES	
RC	Action
0	Display the line and generate the next one (if any).
4	Display the line and call the exit again without generating any more output lines.
8	Display line is to be suppressed
12	Display the line and do not call the exit again for this request.

Exits

EXIT 13 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP13 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP13JUP	address	4	Address of the Job User Data Field.
UXP13JUL	binary	4	Length of the Job User Data Field.
UXP13SEC	char	1	Current section type that is being displayed in DISPLAY JOB response. Values can be: 'H' Header section. 'S' Job status section. 'I' Installation data. 'U' UNAVAILABLE volumes. 'M' Mountable volumes. 'R' Resident volumes. 'X' Virtual Tape volumes. 'Z' No volumes message.
UXP13LTP	char	1	Current line type (modifiable). Can be used to control the multi-line WTO line type for the current line. Values can be either 'L', for a label line, or 'D', indicating a data line.
UXP13CNT	binary	2	Number of lines written so far. The exit can use this to gauge where it is in a given section of DISPLAY JOB output.
UXP13LLN	binary	2	Length of message text (modifiable, must not exceed 70).
UXP13LIN	char	70	Message text area (modifiable). Carriage control is ignored. This can contain the message text generated by the command processor, or additional display lines generated by the exit. Maximum length for this field is 70 characters.

Exit 14

JVL Format

Description:

This is a function-related exit. It is called before each line of the JVL is printed or displayed.

This exit receives control when ThruPut Manager is processing:

- JAL requesting a JVL for a job.
- A JVL REGENERATE command.
- A JVL DISPLAY command.

The exit receives control for each line that is generated.

Purpose:

The exit can be used to:

- Modify the output of the JVL DISPLAY command or JVLs generated by the Job Analyzer during job analysis.
- Insert or delete lines.
- Generate your own command output.
- Suppress JVLs job by job.

ENVIRONMENT			
Mapping macro:	DTMUXP14	Called by:	CPS or SPS
When:	For each line of a JVL	Related to:	JVL Function
Protect key:	8	User Descriptors:	Not available

RETURN CODES	
RC	Action
0	Print the current line and generate the next one (if any).
4	Print the current line and call the exit again before generating another line. Used when inserting a line.
8	Do not print the current line, but generate the next line (if any). Used to delete a line.
12	Print the current line and do not call the exit again for this JVL.

Exits

EXIT 14 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP14 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP14JUP	address	4	Address of Job User Data Field.
UXP14JUL	binary	4	Length of the Job User Data Field.
UXP14FMT	char	1	JVL format indicator. 'D' display format request 'P' print requests (real JVLs).
UXP14LTP	char	1	Most recent line type. This is a single character which indicates the current type of line on the JVL. Values can be: ' ' Blank line. 'A' Title line. 'B' First header line. 'C' Second header line. 'V' Volume line. 'Z' Totals line.
UXP14RQC	char	1	Class into which the job is requeued at the end of Job Analyzer processing.
UXP14RQP	binary	1	Job requeue priority.
UXP14VUP	address	4	For type "V" lines: The address of current Volume User Data area.
UXP14VUL	binary	4	For type "V" lines: Length of Volume User Data field.
UXP14LLN	binary	2	Length of message text (modifiable, must not exceed 70).
UXP14LIN	char	70	Message text area (modifiable). Carriage control is ignored. This can contain: The line most recently generated by the JVL processor or If return code 4 was used, then the last user generated line.
UXP14WTR	char	8	CPS Writer name, or if SPS is being used, this field contains '\$SYSOUT'.
(Continued)			

EXIT 14 SPECIFIC PARAMETER LIST

**For specific mapping, refer to macro DTMUXP14
For [Common Parameter List information](#), see Chapter 2.**

Name	Type	Length	Description
UXP14DST	char	8	Destination.
UXP14PGL	binary	2	Page length.
UXP14TML	binary	2	Top margin length.
UXP14BML	binary	2	Bottom margin length.

Exit 19

JECL Statement Inspection

Description:

This is a job related exit. It is called by the Job Analyzer.

This exit receives control when a JES2 control statement that ***your installation has defined*** is detected by the Job Analyzer. The JECL statements to be presented to this exit are defined with the TMPARM initialization statement. For a description of this statement refer to the ***Base Product: System Programming Guide***.

This Exit is designed to allow you to do one of the following:

- To totally ignore existing JECL statements.
- To process a JECL statement to collect values to be passed to JAL in User Descriptors.
- To map your installation JECL statements into ThruPut Manager JECL statements.



You cannot map your JECL statements into non-ThruPut Manager JECL statements.

You can convert one of your installation JECL statements into more than one ThruPut Manager statement. A return code of 16 gives you that opportunity.

The statement or statements that you construct should follow the format `/*function ...!`.

Purpose:

To allow an installation to convert their own JES2 JECL statements to ThruPut Manager statements.

ENVIRONMENT			
Mapping macro:	DTMUXP19	Called by:	Job Analyzer
When:	For every JECL statement defined by installation with the TMPARM initialization statement	Related to:	Job
Protect key:	0	User Descriptors:	Available

RETURN CODES	
RC	Action
0	Ignore JECL Statement. Continue Processing.
4	Continue processing with the JECL statement in UXP19STM.
8	Fail job at the end of JAL processing.
12	Flush the job immediately.
16	Continue processing using replacement JECL and then <i>call this exit again</i> . (For example, allows you to convert one of your control statements into more than one JECL statement.)

EXIT 19 SPECIFIC PARAMETER LIST			
<p>For specific mapping, refer to macro DTMUXP19 For Common Parameter List information, see Chapter 2.</p>			
Name	Type	Length	Description
UXP19JUP	address	4	Address of Job User Data Field.
UXP19JUL	binary	4	Length of Job User Data Field.
UXP19STM	char	80	At first invocation, this area contains the JECL statement that caused the exit to be invoked. The first two characters are always '/'* regardless of how the original statement was coded. If you re-drive the exit via a return code 16, this area will contain the JECL statement that your exit constructed. If you need to know what the original statement was, then you must save the original JECL. The next field is provided for that purpose.
UXP19WRK	binary	80	On initial invocation of exit contains binary zeros. If the exit is re-invoked via a return code 16, this field is left unmodified. Provides a work area in situations where a user statement results in multiple invocations of the exit. Normally used to store the original JECL statement.

Exits

Exit 20

User Volume Key Add

Description:

This is a function-related exit. It is called by the VIF processor.

This exit receives control whenever a volume serial number is added to the VIF.

Purpose:

To add a six character User Volume Key to the volume record in the VIF.

ENVIRONMENT			
Mapping macro:	DTMUXP20	Called by:	VIF
When:	For each volume added to the VIF	Related to:	VIF Function
Protect key:	8	User Descriptors:	Not available

RETURN CODES	
RC	Action
0	Normal continuation
4	User exit has modified fields

EXIT 20 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP20 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP20VUP	binary	4	Pointer to Volume User Data.
UXP20VUL	binary	4	Length of Volume User Data area.
UXP20VOL	char	6	Volume serial number.
(Continued)			

EXIT 20 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP20 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP20UNT	char	8	Unit name.
UXP20UVK	char	6	User Volume Key (UVK) (modifiable) .
UXP20GRP	binary	1	Volume group.
UXP20VRU	char	8	Preferred/current robotic unit.
UXP20FLG	flags	1	UVK flags (modifiable) . The values and their equated names are: UXP20PFX B'1...' Use UVK as sort key prefix. UXP20SFX B'.1..' Use UVK as sort key suffix. UXP20DAT B'..1.' Use UVK as data. UXP20NPR B'...1' Do not print UVK.
UXP20FL1	flags	1	VOLUME TYPE FLAGS NOTE: One and only one must be on. UXP20VTP B'1...' Tape device. UXP20VDA B'.1..' DASD device (non-MSS). UXP20VVD B'..1.' MSS virtual device . VOLUME STATUS FLAGS NOTE: One and only one must be on. UXP20RES B'...1' Resident volume. UXP20MNY B'.... 1... ' Mountable volume. UXP20NAV B'.... .1..' Unavailable volume.
UXP20FL2	flags	1	VOLUME ATTRIBUTES UXP20RNG B'1...' Volume requires ring. UXP20JCL B'.1..' Volume coded in JCL. B'..1.' Reserved for future use. UXP20T59 B'...1' 3590 cartridge. UXP20T80 B'.... 1... ' 3480 cartridge. UXP20T90 B'.... .1..' 3490 cartridge. UXP20RSS B'.... ..1.' Volume managed by RSS. UXP20ACS B'.... ...1' Automated volume.

Exit 21

RVL Format

Description:

This is a function-related exit. It is called by the RVL GENERATE command processor.

This exit receives control just before printing a line on an RVL.

Purpose:

- Insert or delete lines from the RVL.
- Modify existing lines in an RVL.

ENVIRONMENT			
Mapping macro:	DTMUXP21	Called by:	CPS or SPS
When:	For each line of an RVL	Related to:	RVL Function
Protect key:	8	User Descriptors:	Not available

RETURN CODES	
RC	Action
0	Print the current line and generate the next one (if any).
4	Print the current line and call the exit again before generating another line. Used when inserting a line.
8	Do not print the current line, but generate the next line (if any). Used to delete a line.
12	Print the current line and do not call the exit again for this RVL.

EXIT 21 SPECIFIC PARAMETER LIST

For specific mapping, refer to macro DTMUXP21
 For **Common Parameter List information**, see Chapter 2.

Name	Type	Length	Description
UXP21LTP	char	1	Most recent line type. This is a single character which indicates the current type of line on the RVL. Values can be: ' ' Blank line. 'T' Title line. 'H' Header line. 'I' Instruction line. 'J' 1st column heading line. 'K' 2nd column heading line. 'V' Volume line. 'Z' Totals line.
UXP21LLN	binary	2	Length of message text (modifiable).
UXP21LIN	char	70	Message text area (modifiable). Carriage control is ignored. This can contain: The line most recently generated by the RVL processor. or If return code 4 was used, then the last user generated line.
UXP21UVK	char	6	For type `V' lines: The user volume key (UVK).
UXP21FLG	flags	1	RVL flags. The values and their equated names are: UXP21ENT B'1... ..' ENTER RVL being formatted. UXP21EJC B'.1..' EJECT RVL being formatted. UXP21PFX B'..1.' Use UVK as sort key prefix. UXP21SFX B'...1' Use UVK as sort key suffix. UXP21DAT B'.... 1...' Use UVK as user data, do not influence sort. UXP21NPR B'.... .1..' Do not print UVK on RVL.
UXP21WTR	char	8	CPS Writer name, or if SPS is used, then this field contains \$SYSOUT.
UXP21DST	char	8	Destination.
UXP21PGL	binary	2	Page length.

(Continued)

Exits

EXIT 21 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP21 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP21TML	binary	2	Top margin length.
UXP21BML	binary	2	Bottom margin length.

Exit 24

FVL Format

Description:

This is a function-related exit. It is called by the FVL GENERATE command processor.

This exit receives control just before printing a line on an FVL.

Purpose:

- Insert or delete lines from the FVL.
- Modify existing lines on an FVL.

ENVIRONMENT			
Mapping macro:	DTMUXP24	Called by:	CPS or SPS
When:	For each line of an FVL	Related to:	FVL Function
Protect key:	8	User Descriptors:	Not available

RETURN CODES	
RC	Action
0	Print the current line and generate the next one (if any).
4	Print the current line and call the exit again before generating another line. Used when inserting a line.
8	Do not print the current line, but generate the next line (if any). Used to delete a line.
12	Print the current line and do not call the exit again for this FVL.

Exits

EXIT 24 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP24 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP24LTP	char	1	Most recent line type. This is a single character which indicates the current type of line on the FVL. Values can be: ' ' Blank line. 'T' Title line. 'H' Header line. 'V' Volume line. 'Z' Totals line.
UXP24LLN	binary	2	Length of message text (modifiable).
UXP24LIN	char	70	Message text area (modifiable). Carriage control is ignored. This can contain: The line most recently generated by the FVL processor. or If return code 4 was used, then the last user generated line.
UXP24UVK	char	6	For type 'V' lines: The user volume key (UVK).
UXP24FLG	flags	1	FVL flags. The values and their equated names are: UXP24ENT B'1...' ENTER FVL being formatted. UXP24EJC B'.1..' EJECT FVL being formatted. UXP24PFX B'..1.' Use UVK as sort key prefix. UXP24SFX B'...1' Use UVK as sort key suffix. UXP24DAT B'.... 1...' Use UVK as user data, do not influence sort. UXP24NPR B'.... .1..' Do not print UVK on FVL.
UXP24WTR	char	8	CPS Writer name, or if SPS is used, then this field contains \$SYSOUT.
UXP24DST	char	8	Destination.
UXP24PGL	binary	2	Page length.
UXP24TML	binary	2	Top margin length.
UXP24BML	binary	2	Bottom margin length.

Exit 31

CVL Print

Description:

This is a function-related exit. It is invoked by CPS or SPS.

This exit allows modification of the output generated by the CVL GENERATE and CVL REGENERATE commands.

This exit receives control when a CVL print line is being generated.

Purpose:

This exit can be used to insert, alter, or delete lines on a CVL.

ENVIRONMENT			
Mapping macro:	DTMUXP31	Called by:	CPS or SPS
When:	For each generated line of a CVL	Related to:	CVL Function
Protect key:	8	User Descriptors:	Not available

RETURN CODES	
RC	Action
0	Print the current line and generate the next one (if any).
4	Print the current line and call the exit again before generating another line. Used when inserting a line.
8	Do not print the current line, but generate the next line (if any). Used to delete a line.
12	Print the current line and do not call the exit again for this CVL.

Exits

EXIT 31 SPECIFIC PARAMETER LIST			
For specific mapping, refer to macro DTMUXP31 For Common Parameter List information , see Chapter 2.			
Name	Type	Length	Description
UXP31LTP	char	1	Most recent line type, indicating the current type of line on the CVL. Values can be: ' ' Blank line. 'T' Title line. 'H' Header line. 'V' Volume line. 'Z' Totals line.
UXP31LLN	binary	2	Length of text (modifiable, must not exceed 70).
UXP31LIN	char	70	Text area (modifiable). Carriage control is ignored. Contains: The text of the last line generated. or If return code 4 for previous invocation, then user text.
UXP31UVK	address	4	Pointer to user volume key.
UXP31FLG	flags	1	CVL flags, indicating how the User Volume Key (UVK) is handled. Possible values and their equated names are: UXP31PFX B'1... ..' Use UVK as a sort key prefix. UXP31SFX B'.1.. ..' Use UVK as a sort key suffix. UXP31DAT B'..1.' Use UVK as data. UXP31NPR B'...1' Do not print UVK on the CVL.
UXP31WTR	char	8	CPS Writer name, or if SPS is used, then this field contains "\$SYSOUT".
UXP31DST	char	8	Destination.
UXP31PGL	binary	2	Page length.
UXP31TML	binary	2	Top margin length.
UXP31BML	binary	2	Bottom margin length.

Chapter 6. Macros

This section describes the macros provided to help in the development of user exits.

Introduction

Some macros are provided to help in the development of user exits. With the inclusion of Job User Descriptors as part of the Job Action Language, the process to further customize ThruPut Manager has been made much simpler. In many cases, a single exit to set a value in a Job User Descriptor is all that is needed to be able to take installation unique actions with the Job Action Language. The macros provided make this type of action a simple exercise.

Considerations

The following macros are provided:

DTMSTART: Provides addressability and register usage.

DTMSTOP: Terminates exit processing.

DTMBWA: Begins dynamic work-area definitions.

DTMEWA: Ends dynamic work-area definitions and generates DSECT mappings.

These macros are designed to provide the following programming structure:

```
DTMSTART
    your code
DTMSTOP
    your static storage definitions (constants)
DTMBWA
    your dynamic storage definitions
DTMEWA
    your DSECTS (if any)
```



These macros are not automatically installed. To restore them, please refer to the Installer's Guide documentation.

DTMBWA

Begin Work Area

Description:

This macro defines the beginning of the work-area DSECT mapping.

The macro expansion causes a LTORG to be generated (if requested) followed by a DSECT definition.

Two save areas are generated following the DSECT definition to be used as save areas for this module.

DTMBWA	[LTORG=YES] [PATCH=YES]
---------------	------------------------------------

LTORG=YES

Causes a LTORG to be generated.

PATCH=YES

Causes a 50-byte patch area to be generated.

25 half-words are defined.

Note:



All your work area field definitions must follow this macro.

DTMEWA

End Work Area

Description

This macro generates an equate to define the work area length. It also generates the DTM DSECTS.

DTMEWA,	
---------	--

This macro does not require operands.

DTMSTART

Macro to provide addressability and register usage

Description:

This macro provides addressability to the following ThruPut Manager areas:

- UXPCOMMP Common Parameter list.
- UXPUSERP Common Communication Area.
- UXPVARLP Exit-specific Parameter Area.
- UXPIINTFP Message Routine Address List.
- UXCUJDSC User Job Descriptor Area.
- UXP nn JUP Job User Data Field (nn represents the exit number).

This macro also generates the code to perform standard IBM save area linkage.

name1 DTMSTART	<pre>[DEFAULT={YES NO}] [,BASE={R12 Ra}] [,COMP={R10 Rb}] [,USERP={R9 Rc}] [,VARLP={R8 Rd}] [,INTFP={R7 Re}] [,USERJD={R6 Rf}] [,USERJP={R5 Rg}] [,WKDSECT=name-of-DSECT] [,XITNUM=nn]</pre>
----------------	--

name1

CSECT name for the module. ***This must be specified.***

DEFAULT

Use to indicate whether or not you want all the above areas mapped automatically.

YES

Any of the above areas that you do not code will be mapped using the default register.

This is the default.

XITNUM must be coded if YES is used.

NO

Only the areas specifically coded will be mapped.

Exits

COMMP

Requests addressability to Common Parameter Area UXPCOMMP.

Ra

A unique general purpose register from R2 to R12.

USERP

Requests addressability to Common Communication Area UXPUERP.

Rb

A unique general purpose register from R2 to R12.

VARLP

Requests addressability to Exit-specific Parameter Area UXPVARLP.

Rc

A unique general purpose register from R2 to R12.

If this keyword is coded and DEFAULT=NO is coded, then XITNUM must also be specified.

INTFP

Requests addressability to Message Routine Address List UXPIINTFP.

Rd

A unique general purpose register from R2 to R12.

USERJD

Requests addressability to User Job Descriptors UXCUJDSC.

Re

A unique general purpose register from R2 to R12.

USERJP

Requests addressability to Job User Data Field UXnnJUP.

Rf

A unique general purpose register from R2 to R12.

If this keyword is coded and DEFAULT=NO is coded, then VARLP and XITNUM must be coded.

WKDSECT

Allows you to name the DSECT that is to map the work area.

name-of-DSECT

Self-explanatory.



This keyword must be specified if DTMBWA and DTMEWA macros are coded.

XITNUM

Require to map the exit-specific parameter area.

This keyword must be coded if DEFAULT=YES is coded (or defaulted).

nn

The exit number.

It is used to create the name of the Exit-Specific Parameter Area DSECT, as well as the name of the Job User Data Area.

Notes:



The TM Exit Data Area pointed to by UXPDATAP is not defined in this macro. If you are providing data to your exits using the DATA keyword it is your responsibility to load the address of this field in your exit logic.

On entry the register usage is as follows:

R1	UXPL pointer
R13	4K work area
R14	Return address
R15	Base register

The Job User Data Field pointer is applicable to the following exits:

- All Job-related Exits: 1, 2, 3, 4, 5, 6, 7, 8, 9, and 19.
- Exit 13—JOB DISPLAY Command.
- Exit 14—JVL Format.

The User Job Descriptors pointer is applicable to the following exits:

- All Job-related Exits: 1, 2, 3, 4, 5, 6, 7, 8, 9, and 19.

The defaults for register usage can simply be overridden by specifying the keyword with the register you want to use.

Example:

```
MYMODULE DTMSTART DEFAULT=YES,WKDSECT=TMAREA,VARLP=R2,XITNUM=03
```

This will result in all areas being mapped. Your workarea will be named TMAREA. Default registers for addressability will be used with the exception of the Exit-specific Parameter Area. Register 2 will be used instead of 8.

DTMSTOP

Stop Exit Processing

Description:

This macro causes restoration of the callers registers and sets a return code prior to returning to caller.

DTMSTOP	[{RC=value (Rn)}]
----------------	----------------------------

RC

Indicates that the return code is to be provided as an operand.

value

A return code value.

Values of 0, 2, 4 and 12 are valid return codes.

Exit 19 also accepts a value of 16.

Rn

Indicates the general purpose register where the return code is to be found.

Note:

If no keyword is coded with this macro, a return code of 0 is generated (R15 is zeroed out).

Chapter 7. JBS Binding From Exits

This chapter explains how to associate JBS Binding Agents with a job by using a ThruPut Manager exit.

JBS ONLY

Eligible Exits

Certain exits can be used to associate Binding Agents with a job. These are the pre-JAL job-related exits:

- Exit 1—Job Statement
- Exit 2—EXEC Statement
- Exit 3—DD Statement
- Exit 4—Unit Name/Device Type
- Exit 5—Volume Status
- Exit 19—JECL Statement

Inserting Agents Using Exits

The parameter lists passed to exits eligible to associate Binding Agents with a job each contain an address pointer to a Bind Request Area. This pointer is identified by a label of the form:

UXPnnBRA

where **nn** represents the exit number.

The Bind Request Area defines storage for up to 24 JBS Bind requests, with each request specifying up to four Agents. These fields are mapped by the DTMUXBRA macro. Refer to an expansion of the macro for the specific mapping of the Bind Request Area.

A Bind request specified through an exit is identical to a JECL or JAL Bind request. To associate an Agent with a job, your exit should simply insert valid Agent names in the area reserved for any Bind request.

- JBS Agent names must be complete, including the period separating the levels.
- JBS Agent names must be padded on the right with blanks.

Note that you can place requests in any of the 24 areas. They do not have to be contiguous. When the Bind requests are processed, the entire Bind Request Area is checked, and blank entries are simply ignored.

Multiple Agents inserted for a particular Bind request indicate an **OR** condition, that is, any of the specified Agents will satisfy the Bind request. Up to four Agents can be inserted for a single Bind Statement.

Multiple Bind requests indicate an **AND** condition. At least one of the Agents from each Bind request must be active to satisfy the request.

Requirements for Using Binding Agents from Exits

In order to make use of the Binding Agents you have associated with the job in your exit(s), you must indicate in your JAL that the job is bound to Agents through the use of exits. This is done using by including the following statement in your JAL:

```
JBS BIND FROM_EXITS
```

The Agents inserted by the exit(s) are added to any Agents inserted with JBS ADD BIND requests in your JAL. The maximum number of Agents that can be associated with the job *from both sources combined* is 24.

Note that while Agents inserted through exits are included in the count towards the maximum number of Agents you can insert through JAL, any JBS REPLACE BIND or JBS DELETE BIND request in JAL *does not affect* Agents inserted through exits.

Appendix A. Sample Installation Exit

The listing included here demonstrates the linkage required for a ThruPut Manager installation exit as well as an example of the use of a User Descriptor.

Implementing a User Descriptor in Exit 1

```

TMEXIT1TITLE 'THRUPUT MANAGER EXIT 1 - JOB STATEMENT PROCESSING '
*****
*           *
*  T M E X I T 1  *  TMEXIT1 - THRUPUT MANAGER JOB ANALYZER          *
*           *           JOB STATEMENT EXIT (EXIT 1).                *
*****
*
*  ENTRY: TMEXIT1
*
*  FUNCTION:
*      THIS MODULE RECEIVES CONTROL FROM THE THRUPUT MANAGER
*      JOB ANALYZER EACH TIME A JOB STATEMENT IS ENCOUNTERED.
*      CONTROL IS PASSED AFTER A JOB PROFILE IS ASSEMBLED AND
*      BEFORE JAL IS EXECUTED.
*
*      THIS EXIT SETS A CHARACTER USER DESCRIPTOR TO THE VALUE
*      'TEST'.
*
*  ATTRIBUTES:
*      AMODE(31), RMODE(ANY)
*      SUPERVISOR STATE, PROTECT KEY 0
*      RE-ENTRANT, RE-USABLE
*
*  ENTRY PARAMETERS:
*      R1 - ADDRESS OF UXPL
*      R13 - ADDRESS OF 4K WORK AREA PROVIDED BY TM
*      R14 - RETURN ADDRESS
*      R15 - ENTRY POINT ADDRESS
*
*  EXIT PARAMETERS:
*      NONE:

```

```

*
* REGISTER USAGE:
*   R0 - WORK
*   R1 - INPUT PARAMETER LIST, WORK
*   R2 - NOT USED
*   R3 - NOT USED
*   R4 - NOT USED
*   R5 - BASE FOR JOB USER DATA FIELD
*   R6 - BASE FOR USER JOB DESCRIPTORS
*   R7 - ADDRESS OF SERVICE ROUTINE INTERFACE LIST
*   R8 - ADDRESS OF EXIT-SPECIFIC PARAMETER LIST
*   R9 - BASE OF EXIT COMMUNICATION ADDRESS LIST
*   R10 - ADDRESS OF EXIT COMMON PARAMETER LIST
*   R11 - NOT USED
*   R12 - BASE REGISTER
*   R13 - SAVE-AREA/WORK-AREA BASE
*   R14 - RETURN ADDRESS, WORK
*   R15 - ENTRY POINT ADDRESS, WORK, RETURN CODE
*
* CONTROL BLOCK DEPENDENCIES:
*   UXPL - THRUPUT MANAGER EXIT PARAMETER LIST
*   UXCP - THRUPUT MANAGER EXIT COMMON PARAMETERS
*   UXIL - THRUPUT MANAGER EXIT COMMUNICATIONS INTERFACE LIST
*   UJDS - THRUPUT MANAGER USER DESCRIPTOR LIST
*   UXPO1 - THRUPUT MANAGER EXIT 1 SPECIFIC PARAMETERS
*
* RETURN CODES:
*   0 - CONTINUE PROCESSING
*   4 - EXIT HAS ALTERED DATA (NOT USED)
*   8 - REQUEST JOB BE FAILED (NOT USED)
*   12 - REQUEST IMMEDIATE FLUSH (NOT USED)
*
* MESSAGES:
*   NONE.
*
* PATCH AREA:
*   LOCATED AT LABEL 'PATCH'
*
* HISTORY: MAY 1989 - INITIALLY WRITTEN BY MVS SOLUTIONS INC.
*           FOR DOCUMENTATION
*****

```

Exits

TITLE 'THRUPUT MANAGER EXIT 1 - JOB STATEMENT PROCESSING '

```
*****
*
*      I N I T I A L I Z A T I O N
*
*      ESTABLISH R12 AS THE LOCAL BASE REGISTER, AND R13 AS
*      THE SAVE AREA POINTER AND BASE REGISTER FOR THE 4K WORK AREA
*      PASSED TO THE EXIT BY THRUPUT MANAGER
*
*****
TMEXIT1  AMODE  31
TMEXIT1  AMODE  ANY
TMEXIT1  DTMSTART WKDSECT=WKAREA,XITNUM=01
```

```
*-----
*
*      SET THE CHARACTER USER DESCRIPTOR USERC1 TO 'TEST'
*
*-----
MVC  USERC1(4),=C'TEST'      INITIALIZE USERC1
EJECT
```

 *Insert your "logic" code here*

```
*****
*      RESTORE THRUPUT MANAGER'S REGISTERS, THEN RETURN TO IT.
*
*****
EXIT  DS      OH
      DTMSTOP,          RESTORE CALLER'S REGISTERS - RC=0 (DEFAULT)
*****
*      DEFINE THE STATIC STORAGE DEFINITIONS USED IN THIS PROGRAM
*      ALSO MAP THE WORK AREA PROVIDED BY THRUPUT MANAGER
*
*****
DTMBWA  LTOrg=YES,PATCH=YES          BEGIN WORK AREA DEFINITION
```

 *Insert your work area definitions here*

```
DTMEWA ,          END WORK AREA DEFINITION
```

 *Insert your DSECT mappings here*

```
END
```


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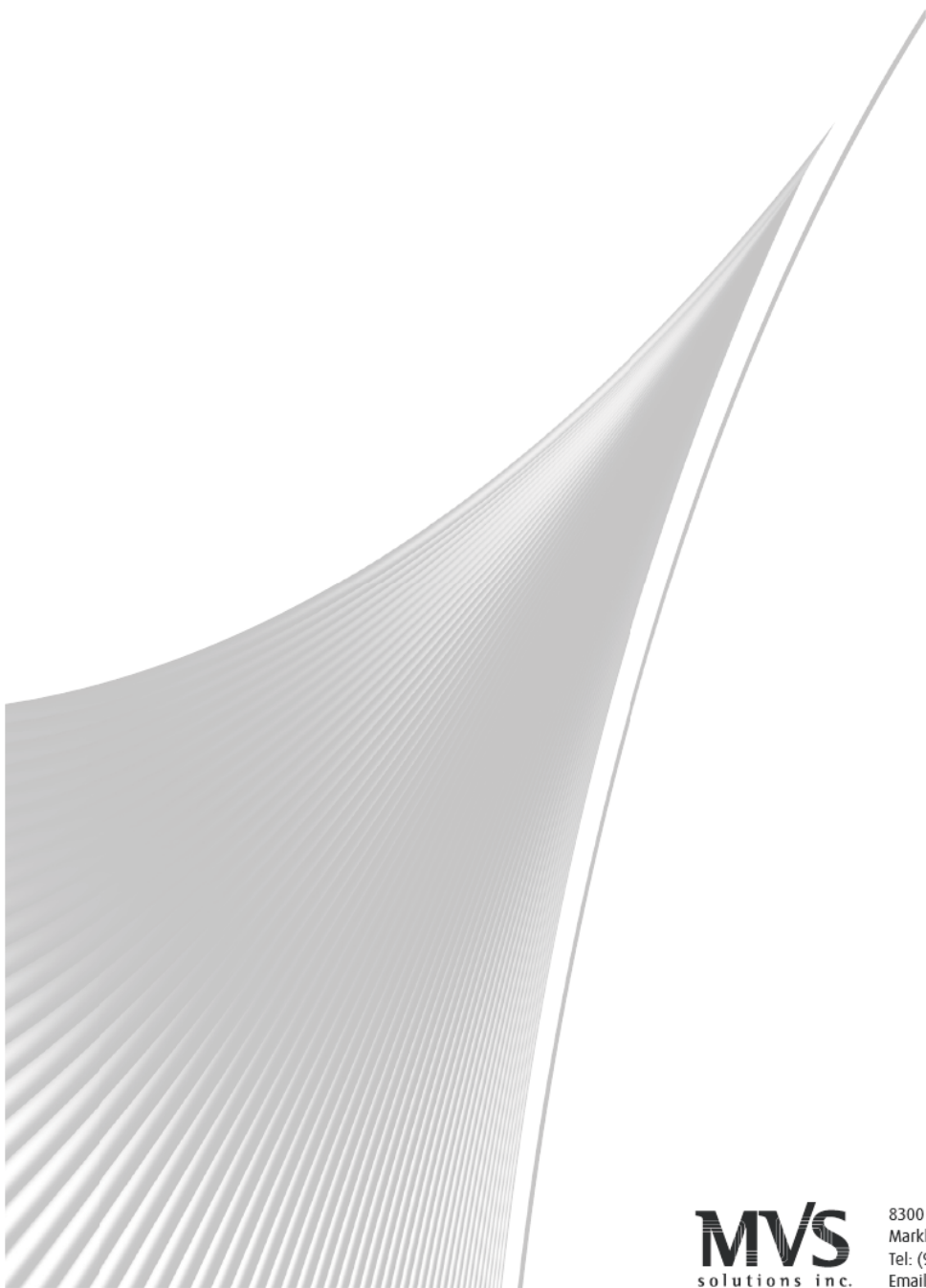
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