

**MA17: WebSphere MQ Simple Message Handler for z/OS  
User Guide  
Version 2.0**

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**Take Note!**

Before using this User Guide and the product it supports, be sure to read the general information under "Notices".

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This edition applies to Version 2.0 of *WebSphere MQ Simple Message Handler for z/OS* and to all subsequent releases and modifications until otherwise indicated in new editions.

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## Chapter 1. About This SupportPac

This book describes how to operate the sample program *WebSphere MQ Simple Message Handler for z/OS* and to install and run the handler on z/OS.

The sample message handler is design to allow the user to browse messages on a queue using ISPF panels on z/OS. The message handler is designed to format out the message descriptor (which is always included with a message on Websphere MQ) and shows the message in hexadecimal and EBIDIC notation. The handler also provides the facility to either delete or forward a message to another queue.

The SupportPac contains two versions of the code that drives the same ISPF panels; these are in COBOL and C. Both perform the same job and are included to give the system administrator the choice of which to use.

If the handler sees that there is MQ headers that it can format out it will do so until a header is not recognized or the beginning of the message data is found. The Websphere MQ headers that will be formatted out are: -

- MQMD - Message Descriptor
- MQDLH - Dead Letter Header
- MQXQH - Transmission Queue Header
- MQTM - Trigger Message
- MQTMC2 - Trigger Message Character Format
- MQWIH - Work Information Header

### **Summary of Changes**

This SupportPac describes the *MQ Simple Message Handler for z/OS* version 2.0. The difference between version 1.0 and version 2.0 are: -

- Updated the headers that have been changed and updated since the release of version 1.0.
- Resolved the problem with the C version not compiling with Websphere MQ v5.3.1 or greater.
- Added support for formatting the following headers: -
  - MQTM
  - MQTMC2
  - MQWIH

## ***Restrictions***

- Only local or alias queues which resolve to a local queue can be used.
- The maximum number of messages stored in the list is 99. If there are more messages on the queue then the current queue depth is also displayed.
- The message buffer will show a maximum of 32,768 bytes, if the message is longer than this the first 32,768 will only be shown. This may be shorter if the message has Websphere MQ headers which it can format are found.
- No application can get from or browse the queue when this SupportPac is browsing the queue.
- When forwarding a message, the COBOL version of the code will truncate the message if it is longer than 32,768 bytes, whereas the C version will forward the entire message.

## Chapter 2. Installation

### ***WebSphere MQ Simple Message Handler for z/OS Pre-requisites***

This SupportPac will run with Websphere MQ V5.3.1 or greater.

### ***How to Install the SupportPac***

Follow the steps below to install this SupportPac.

1. On the PC workstation use the appropriate INFOZIP unzip program to unpack the MA17.ZIP file. The following files should be produced:

- MA17.doc - this manual
- ma17.cli - Clist library
- ma17.cbs - Cobol source library
- ma17.csr - C source library
- ma17.pen - Panel library

2. The library files need to be transferred to the destination TSO system as a sequential binary file with a record format of FB 80. Use one of the following methods to accomplish this:

- To send them via ftp ensure the BINARY option is set then use the following commands:

```
binary
```

```
quote site fixrecfm 80
```

```
put ma17.cli ma17.clistseq
```

```
put ma17.cbs ma17.cbsrcseq
```

```
put ma17.csr ma17.csrcseq
```

```
put ma17.pen ma17.penuseq
```

- To send to TSO using IBM Personal Communications, use the "Send Files to Host" option under the Transfer menu item

PC File	ma17.cli etc
Host File	ma1a.clistseq etc
Transfer Type	pdslib

The Transfer type of "pdslib" will need to be correctly setup. To do this, use the "Setup.Define Transfer Types" option under the Transfer menu item and create the "pdslib" type with the ASCII, CRLF and Append checkboxes all unselected, the Fixed radio button selected and the LRECL set to 80.

3. On TSO, issue the following commands to unload these sequential files into TSO partitioned datasets:

```
receive indsnam(ma17.clistseq)
when prompted for a filename, reply
dsn(ma17.clist)
```

```
receive indsnam(ma17.cbsrcseq)
when prompted for a filename, reply
dsn(ma17.cobsrc)
```

```
receive indsnam(ma17.csrcseq)
when prompted for a filename, reply
dsn(ma17.csrc)
```

```
receive indsnam(ma17.penuseq)
when prompted for a filename, reply
dsn(ma17.isppenu)
```

4. The following members should be present in each of the datasets:

- MA17.CLIST

CSQ4RCH1 - CLIST to run the application

- MA17.COBSRC

CSQ4TVH0 - COBOL Copy Book  
CSQ4TVH1 - COBOL source code  
CSQ4TVH2 - COBOL source code  
CSQ4TVH3 - COBOL source code



- MA17.CSRC

- CSQ4TCH0 - C header File
  - CSQ4TCH1 - C source code
  - CSQ4TCH2 - C source code
  - CSQ4TCH3 - C source code

- MA17.ISPPENU

- CSQ4CHP1 - ISPF Panel Source
  - CSQ4CHP2 - ISPF Panel Source
  - CSQ4CHP3 - ISPF Panel Source
  - CSQ4CHP9 - ISPF Panel Source

## 5. COMPILATION AND LINKAGE

The COBOL and C versions should be prepared as described in the Websphere MQ Application Program Guide, Chapter 26 'Building your program on z/OS'. The examples below show what should be in the linkage section of the JCL.

- C linkage

- INCLUDE SCSQLOAD(CSQBSTUB)
  - MODE AMODE(31) RMODE(ANY)
  - NAME CSQ4TCHn(R)

- COBOL linkage

- ENTRY CSQ4TVHn
  - MODE AMODE(31),RMODE(ANY)
  - INCLUDE SCSQLOAD(CSQBSTUB)
  - NAME CSQ4TVHn(R)

## ***Configuring CSQ4RCH1***

The CSQ4RCH1 member in the MA17.CLIST dataset is the script that first runs to load the message handler. This is the stage where the program language version is selected (either C or COBOL). To alter the version replace ++LANGUAGE++ by CSQ4TCH1 for C or CSQ4TVH1 for COBOL in the line: -

```
ISPEXEC SELECT PGM(++LANGUAGE++)
```

Also the following lines have to be modified by replacing ++HLQ++ by the MQ high level qualifier and ++EXECLIB++ is the dataset containing the compiled C and/or COBOL code.

```
ISPEXEC LIBDEF ISPLLIB DATASET ID('VB.MARKW1.V000.OUT.SSAMPLES')
ISPEXEC LIBDEF ISPPLIB DATASET ID('++MQHLQ++.SCSQPNLE')
ISPEXEC LIBDEF ISPMLIB DATASET ID('++MQHLQ++.SCSQMSG')'
```

## ***Quick Beginnings***

To run the WebSphere MQ Simple Message Handler on z/OS type the following command into the TSO panel, where ++HLQ++ is the high level qualifier of library containing the clist CSQ4RCH1: -

```
EX '++HLQ++(CSQ4RCH1)'
```

## ***How to Uninstall the SupportPac***

To uninstall the SupportPac from the default installation, just delete the following datasets (where ++HLQ++ is the high level qualifier of the SupportPac): -

- ++HLQ++.CLIST
- ++HLQ++.CSRC
- ++HLQ++.COBSRC
- ++HLQ++.ISPPENU

Also remember to delete the executable files that were compiled. The location of these can be found in one of the datasets pointed to by the ISPEXEC LIBDEF ISPLLIB DATASET ID('++DSN+') statements (where ++DSN++ is the dataset name to search) in the ++HLQ++.CLIST(CSQ4RCH1) data member (where ++HLQ++ is the high level qualifier of the SupportPac)

If the default installation of the SupportPac was not used (as described in 'How to Install the SupportPac'), the individual data members will have to be deleted manually. Also see the paragraph above about deleting the executables above

## Chapter 3. Using the Websphere MQ Simple Message Handler for z/OS

The message handler sample can be used to browse, delete and forward messages on a chosen queue. The program uses 4 different ISPF panels (CSQ4CHP1, CSQ4CHP2, CSQ4CHP3 and CSQ4CHP9) to perform its function.

### ***First Panel - CSQ4CHP1***

This is designed to request the queue manager name and queue name (shown in the figure 1 below).

```
----- Websphere MQ for z/OS - Samples -----
COMMAND ==>
User Id : MARKW1
Version : 2.0

Enter information. Press ENTER :

Queue Manager Name : _____ :
Queue Name         : _____ :

F1=HELP      F2=SPLIT  F3=END      F4=RETURN   F5=RFIND    F6=RCHANGE
F7=UP        F8=DOWN    F9=SWAP NEX F10=LEFT    F11=RIGHT   F12=RETRIEVE
```

*Figure 1 – The first panel –requesting the queue manager name and queue name.*

If no queue manager name is specified the handler will attempt to use the default queue manager (providing that a default queue manager name facility is set-up). For more information about setting up a default queue manger please refer to the manual Websphere MQ for z/OS System Setup Guide, Chapter 2. Customizing your queue managers, Task 19: Set up Batch, TSO, and RRS adapters.

In the top right corner of this panel the version number has been added this version of the panels to assist identifying the version of the code which is running. If the version isn't shown it means that the version 1.0 of the panels is being run even though the underlining code may be version 2.0. This combination will still work but it will be harder to see what version of the SupportPac is actually being executed. Check the path of the ISSPLIB system parameter if the version is expected to be shown but isn't.

If connection to the queue manager couldn't be made or the queue couldn't be opened for some reason an error message will be displayed below the queue name entry in white text. This will consist of a brief explanation of the error, the completion code (MQCC) and the reason code (MQRC) will be shown. For more information on the error look up the reason code in the manual WebSphere MQ for z/OS Messages and Codes, Appendix A. API completion and reason codes.

If the connection to the queue manger and the open of the queue are successful the second panel (CSQ4CHP2) will be shown.

## Second Panel - CSQ4CHP2

This panel displays a list the messages on the specified queue (shown in the figure 2 below).

```

----- Websphere MQ for z/OS - Samples ----- Row 1 to 7 of 7
COMMAND ==>

Queue Manager : MQ25
Queue         : MA17

Message number 01 of 07

Msg  Put Date  Put Time  Format   User   Put Application
No   MM/DD/YY  HH:MM:SS Name    Identifier Type    Name
01   10/07/05  14:05:44 MQSTR   MARKW1 00000002 MPWPUT
02   10/07/05  14:05:44 MQSTR   MARKW1 00000002 MPWPUT
03   10/07/05  14:05:44 MQDEAD  MARKW1 00000002 MPWPUT
04   10/07/05  14:05:44 MQXMIT  MARKW1 00000002 MPWPUT
05   10/07/05  14:05:44 MQTRIG  MARKW1 00000002 MPWPUT
06   10/07/05  14:05:44 MQTRIG  MARKW1 00000002 MPWPUT
07   10/07/05  14:05:44 MQHWIH  MARKW1 00000002 MPWPUT
***** Bottom of data *****

F1=HELP      F2=SPLIT    F3=END      F4=RETURN   F5=RFIND    F6=RCHANGE
F7=UP        F8=DOWN     F9=SWAP    F10=LEFT    F11=RIGHT   F12=RETRIEVE

```

Figure 2 – The second panel –listing the messages on the selected queue

This panel displays a list of the messages which are on the chosen queue.

The maximum number of messages stored in the list is 99. If there are more messages on the queue than 99 then the current queue depth is also displayed in the top right-hand corner.

To select a message to display, the message number can be typed into the entry field. The default message number is 01 (leading zero is necessary). If an invalid entry is made for the message number then an appropriate error message will be displayed. If a valid entry is displayed the third panel (CSQ4CHP3) will be shown.

### Third Panel - CSQ4CHP3

This panel displays a specific message on the specified queue (shown in the figure 3 below).

```

.----- IBM WebSphere MQ for z/OS -- Sample Programs - Row 1 to 44 of 56 .
. COMMAND ==> .
.
. Queue Manager : MQ25 .
. Queue : MA17 .
. Forward to Q Mgr : MQ25 .
. Forward to Queue : _____ .
.
. Action : _ : (D)elete (F)orward .
.
. Message Content :
.-----
. Message Descriptor
. StructId : 'MD '
. Version : 00000002
. Report : 00000000
. MsgType : 00000008
. Expiry : -00000001
. Feedback : 00000000
. Encoding : 00000785
. CodedCharSetId : 00000500
. Format : 'MQSTR '
. Priority : 00000000
. Persistence : 00000000
. MsgId : 'C3E2D84004D8F2F54040404040404040B0B85C417219E448'X
. CorrelId : '0000000000000000000000000000000000000000000000000000000000000000'X
. BackoutCount : 00000000
. ReplyToQ : ' '
. ReplyToQMgr : 'MQ25 '
. UserIdentifier : 'MARKW1 '
. AccountingToken :
. '07C1C3C3D6E4D5E3000000000000000000000000000000000000000000000000'X
. ApplIdentityData :
. PutApplType : 00000002
. PutAppName : 'MPWPUT '
. PutDate : '20051006'
. PutTime : '12581080'
. ApplOriginData :
. GroupId : '0000000000000000000000000000000000000000000000000000000000'X
. MsgSeqNumber : 00000001
. Offset : 00000000
. MsgFlags : 00000000
. OriginalLength : -00000001
.
. Message Buffer : 360 byte(s)
. 00000000 : C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 'AAAAAAAAAAAAAAAA'
. 00000010 : C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 'AAAAAAAAAAAAAAAA'
. 00000020 : C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 'AAAAAAAAAAAAAAAA'
. 00000030 : C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 'AAAAAAAAAAAAAAAA'
. 00000040 : C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 'AAAAAAAAAAAAAAAA'
. 00000050 : C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 'AAAAAAAAAAAAAAAA'
. 00000060 : C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 'AAAAAAAAAAAAAAAA'
. 00000070 : C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 'AAAAAAAAAAAAAAAA'
. 00000080 : C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 'AAAAAAAAAAAAAAAA'
. 00000090 : C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 'AAAAAAAAAAAAAAAA'
. 000000A0 : C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 C1C1 'AAAAAAAAAAAAAAAA'
.
. F1=HELP F2=SPLIT F3=END F4=RETURN F5=RFIND F6=RCHANGE
. F7=UP F8=DOWN F9=SWAP NEX F10=LEFT F11=RIGHT F12=RETRIEVE
.
. File Edit Edit_Settings Menu Utilities Compilers Test Help
.
. EDIT MARKW1.C.JCL(MA17PUT) - 01.99 Columns 00001 00000
    
```

Figure 3 - A panel showing a specific message on the specified queue.

The contents are formatted for clarity and are split into two main parts; the message descriptor and any known headers plus the message buffer.

The message descriptor is displayed first, with the contents of each field being displayed on a separate line.

How the message buffer is formatted depends on the contents. If the buffer holds known headers to the message handler, these will be displayed in order of their appearance in the message buffer. Following this the remainder of the message buffer will be shown. The known Websphere MQ headers that the handler will format are: -

- MQMD - Message Descriptor
- MQDLH - Dead Letter Header
- MQXQH - Transmission Queue Header
- MQTM\* - Trigger Message
- MQTMC2\* - Trigger Message Character Format
- MQWIH - Work Information Header

\* No buffer will follow.

The handler will then look at the format field in the message description and if it is a format that the handlers knows about it will format out that header with the contents of each field being displayed on a separate line. It will then look at the format field on the current header and format that out if it can. (An example of this is shown in figure 4.)



```

. ----- Websphere MQ for z/OS - Samples -- Row 1 to 47 of 2,089
. COMMAND ==>
.
. Queue Manager      : MQ25
. Queue             : MA17
. Forward to Q Mgr  : MQ25
. Forward to Queue  :
.
. Action : _ : (D)elete (F)orward
.
. Message Content :
. -----
. Message Descriptor
. StrucId           : 'MD '
. Version          : 00000002
. Report           : 00000000
. MsgType          : 00000008
. Expiry           : -00000001
. Feedback         : 00000000
. Encoding         : 000000785
. CodedCharSetId  : 00000500
. Format           : 'MQXMIT '
. Priority          : 00000000
. Persistence      : 00000000
. MsgId            : 'C3E2D840D4D8F2F54040404040404040BDB9AD388DB3A444'X
. CorrelId         : '000000000000000000000000000000000000000000000000'X
. BackoutCount     : 00000000
. ReplyToQ         :
. ReplyToQMgr     : 'MQ25'
. UserIdentifier   : 'MARKU1'
. AccountingToken  :
. '07C1C3C3D6E4D5E300000000000000000000000000000000000000000000'X
. ApplIdentityData :
. PutApplType      : 00000002
. PutApplName     : 'MPMPUT'
. PutDate         : '20051007'
. PutTime         : '14054422'
. ApplOriginData  :
. GroupId         : '000000000000000000000000000000000000000000000000'X
. MsgSeqNumber    : 00000001
. Offset          : 00000000
. MsgFlags        : 00000000
. OriginalLength  : -00000001
.
. Transmission Queue Header
. StrucId         : 'XQH '
. Version        : 00000001
. RemoteQName    :
. RemoteQMgrName :
.
. Original
. Message Descriptor
. StrucId       : 'MD '
. Version      : 00000001
. Report       : 00000000
. MsgType     : 00000008
. Expiry      : -00000001
. Feedback    : 00000000
. Encoding    : 000000785
.
. F1=HELP      F2=SPLIT    F3=END      F4=RETURN   F5=RFIND   F6=RCHANGE
. F7=UP        F8=DOWN     F9=SWAP   NEX F10=LEFT   F11=RIGHT  F12=RETRIEVE
.

```

Figure 4 - A panel showing a specific message on the specified queue with part of a transmission header formatted.

Before the actual buffer data is formatted a title line is printed with the length of the buffer in bytes. The maximum buffer size is 32,768 bytes. If the message on the queue is longer than this then it will be truncated. The full size of the buffer will be displayed along with a 'message is truncated' message in white text under the action options.

The buffer data is formatted in two ways. After the offset into the buffer is printed the buffer data is displayed in HEX. Finally the buffer data is re-displayed as EBCDIC values. If any EBCDIC value is unprintable then a '.' is printed instead.

An action may be entered in the action field.

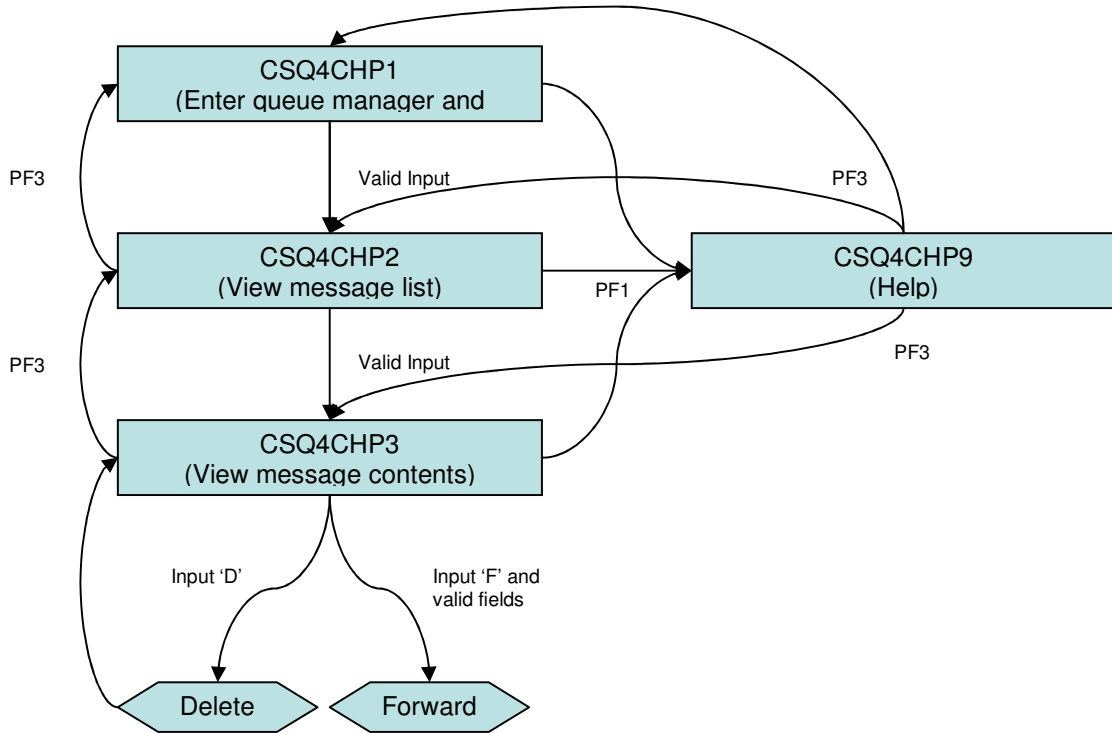
The chosen message may be deleted ('D') or forwarded ('F'). If the forward action is chosen then the forward to queue and queue manager name fields must not be blank. The defaults for these fields are read from the message descriptor ReplyToQ and ReplyToQMgr fields. When a message is forwarded any header block stored in the buffer is striped. If forwarding is successful the message is deleted from the original queue. In the COBOL version if the message is longer than the 32,768 bytes the truncated message will be forwarded, in the C version the entire message will be forwarded.

Any invalid actions will cause relevant error messages to be displayed.



## Appendix A – Page Flow Diagram

This diagram shows the entry fields that affect the order of pages.



## **Appendix B – Further References**

For further WebSphere MQ application programming information see...

- Websphere MQ Application Programming Guide Version 6.0 (SC34-6596-00)
- Websphere MQ Application Programming Guide Reference Version 6.0 (SC34-6599-00)
- Websphere MQ for z/OS System Setup Guide Version 6.0 (SC34-6583-00)
- Websphere MQ for z/OS Messages and Codes Version 6.0 (GC34-6602-00)