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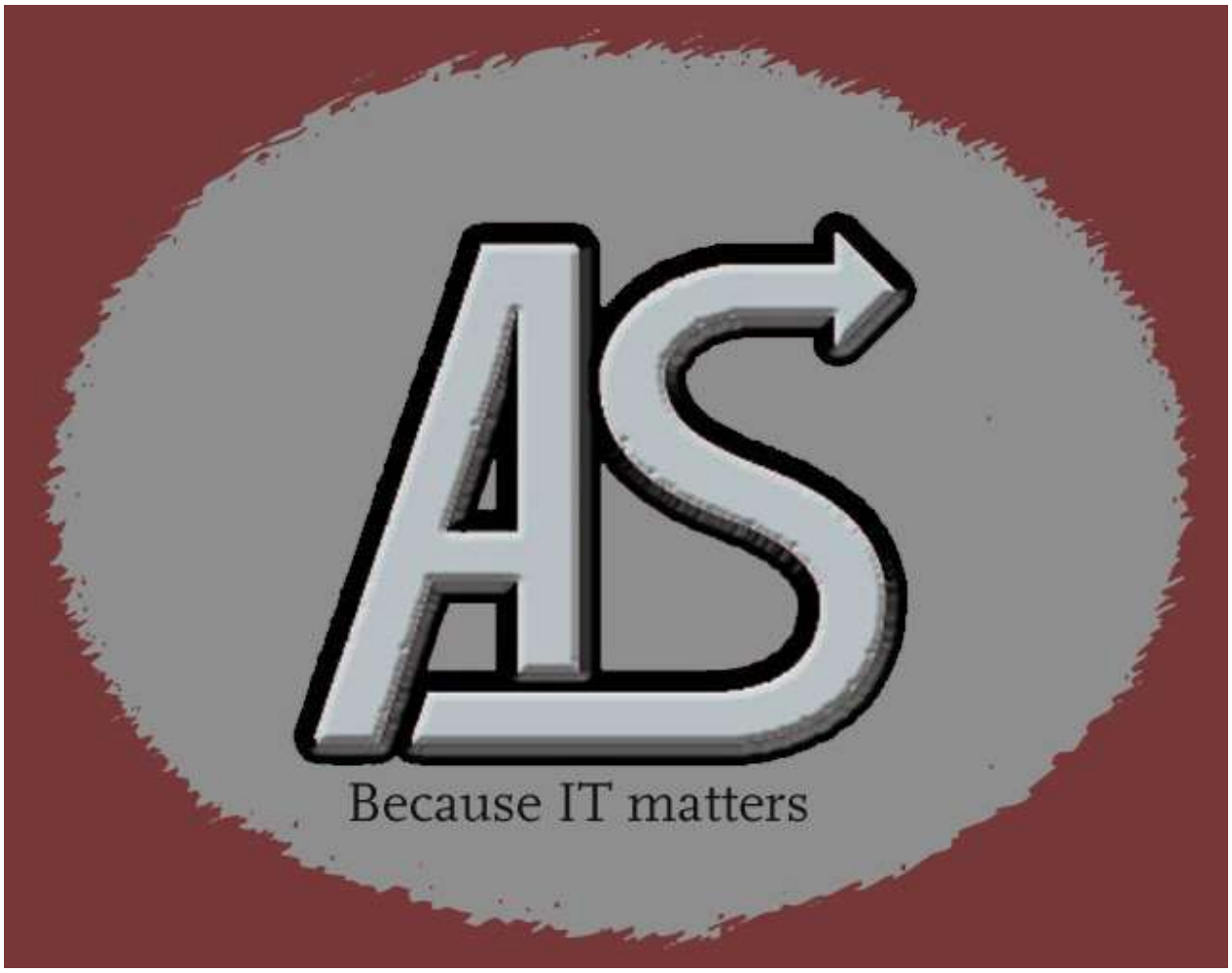

MQERROR

Program Information

E-mail: Support@abbydalesystems.com

Abbydale Systems LLC.
2925 Gulf Freeway South
Suite B #229
LEAGUE CITY
Texas USA
77573

ATTN: K.E.Ferguson
Legal@abbydalesystems.com

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1 Overview

The program, **MQERROR** is an assembler program that can be called whenever an MQ enabled program detects a non-zero MQ reason code.is returned from a MQ API (Application Program Interface) call.

This gives the operators a chance to decide what action to take for the reporting program.

MQERROR gives the programmers and operations a chance to fix the error causing the failure and retry to the program without having to restart the entire job. If the program detecting the error calls this program, then the ability is there to 'retry' the call, wait for a minute and retry the call, stop the job, or cancel the job. By waiting it gives the operators time to correct the issue without having to cancel the job.

When any non-zero MQ reason code is encountered a program calling **MQERROR** has the chance to recover without having to be rerun. It also gives operations a n opportunity to identify and correct any underlying system issues without having to cancel batch jobs.

Well behaving programs handle non-zero return codes in a tidy and efficient manner so as not to impact other applications.

The program is intended to be called by other programs although it can also be used 'stand-alone'.

Important note:

MQERROR is <u>not</u> intended to be used by conversational (especially CICS) programs.

1.1 Passed Parameters

A single parameter can be passed to **MQERROR**. This parameter **must** be less than 53 characters in length and is the text of an error message to be displayed on the system console. If no parameter is passed to **MQERROR** then the default message will be used. Unless this default has been changed by this will be:

```
MQ Call failed. Contact programmer
```

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1.2 Called Programs

MQERROR calls no other programs.

1.3 IBM macros used:

DEVTYPE	DOM	EXTRACT	IEZCIB
IEZCOM	QEDIT	STIMER	WAIT
WTO			

1.4 User macros used:

BEGIN	EOJ

1.5 Assembled User Values

There are no user values to be assembled before using **MQERROR**, however, if you need to increase, or decrease the default wait interval from 60 seconds, or if you wish to change the default message text, then you will need to change it in the source code and then reassemble the program.

2 Installation Procedure

2.1 From XMI File

Note:

If you are installing MQERROR as part of the QMGRWAIT install you can ignore the installation steps described here as the required collateral will be in the QMGRWAIT libraries

The XMI (or XMIT) file is in IBM TSO TRANSMIT format and **must** be transferred to z/OS™ as a fixed blocked 80-byte BINARY file. The disk space requirement for the file is approximately 58 blocks of 3390 disk when blocked at 27920.

The FTP process (if performed in a 3270 emulator) must be performed in TSO READY mode or in option 6 of ISPF™.

The dataset name used as input for the TSO TRANSMIT was ABBYDALE.**MQERROR**.PDS. Unless this is changed by the TSO RECEIVE (Please refer to the IBM RECEIVE command for details on the use of this TSO command) command it will be the name of the dataset created by the RECEIVE command.

Once this dataset has been RECEIVEd you will need to execute the UNPACK member. This will unpack all the TRANSMITTED datasets. You will have the option of changing the high-level qualifier for the datasets to be created.

The UPACK member should unpack three datasets. These are:

Hlq.MQERROR.JCL	Contains the JCL procedure for assembling **MQERROR.** It also contains the JCL for running **MQERROR** and the JCL for assembling the program
Hlq.MQERROR.LOADLIB	Contains the pre-assembled load modules. These are ‘run ready’.
Hlq.MQERROR.SOURCE	Contains the source code for **MQERROR.**

:
Once the ABBYDALE.**MQERROR**.PDS dataset has been received please refer to the $$INSTAL member to complete the installation.

A copy of this document is also available in the **MQERROR**.PDS dataset. This should be transferred to a Windows system as a binary file and saved as a .PDF file.

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3 Using MQERROR

MQERROR can be executed as a standalone program via JCL or called from another program.

MQERROR is 31 bit.

MQERROR has no required DD cards, but if you want it to issue messages then the pertinent DD cards need to be present. **MQERROR** will, by default, issue all user message to the JOBLOG of the job executing it, however, by coding the optional DD card CONSOLE these can be made to be issued to a console. You must investigate how your site routing and descriptor codes are set up and make any changes to **MQERROR** to match your site standards.

MQERROR use the routing and descriptor codes as shipped by IBM as it's default settings.

3.1 Available Parameters

MQERROR expects a message to be passed to it, however if none is provided it will issue a generic message. Unless changed by your site the generic message will be:

```
MQ Call failed. Contact programmer
```

3.2 Application Program Linkage Considerations

As **MQERROR** can be called statically or dynamically the linkage requirements will vary depending on how it is being called. If a static call is requested (via the NODYNAM parameter on the COBOL compile, or by using the CALL macro in assembler) then the binder (LINKAGE editor) execution should include module **MQERROR** from the pertinent load library

e.g.

```
//LINKSTEP EXEC PGM=IEWL,
//         PARM='MAP,XREF,LIST'
//SYSLIN   DD  DISP=(OLD<DELETE),DSN=&&OBJECT
//         DD  DDNAME=SYSIN
//SYSLMOD  DD  DISP=SHR,DSN=your.target.load.library
//QMGRLIB  DD  DISP=SHR,DSN=your.MQERROR.load.library
//SYSUT1   DD  DSN=&&SYSUT1,UNIT=SYSDA,SPACE=(1024,(50,20))
//SYSPRINT DD  SYSOUT=*
//SYSLIB   DD  DISP=SHR,DSN=your.sceelked.library
//SYSIN    DD  *
   INCLUDE QMGRLIB(MQERROR)
   NAME yourprog(R)
//
```

You will need to change this JCL according to your own specific requirements and site standards. The SYSLIN DD refers to the object deck as created by the compile/assembly step that should precede the binder (IEWL) step.

3.3 Required JCL for MQERROR

```
1  //jobname  JOB
2  //stepname EXEC PGM=MQERROR,PARM='message'
3  //STEPLIB  DD  DISP=SHR,DSN=your.load.library
4  //NOWTOR   DD  DUMMY
```

JCL card	Required	Use
1	Yes	JOBCARD (Tailor to your site standards)
2	Yes	EXEC card.
3	Yes	This is the library where **MQERROR** is located. The STEPLIB concatenation can only be removed if the module resides in a LNKLST library.
4	No	The NOWTOR DD card, if present, will tell **MQERROR** to suppress the WTOR and issue the message as a non-delete WTO. If this DD card is specified, then communication to the program is via the operator console.

3.4 Responding to MQERROR

The method of responding to MQERROR depends on if a NOWTOR DD card was specified or not.

An operator modify (F) command is available regardless of the presence of the NOWTOR DD card. If there is no NOWTOR DD card, then a Write to Operator with Reply (WTOR) will be issued and communication to the program can be via the reply to this message.

In all cases a STOP (P) command is allowed and will have the same effect as if CANCEL was the response to the WTOR.

Valid commands/responses are:

RETRY

F jobname,RETRY

This can be issued as either F *jobname*,RETRY or, if the NOWTOR DD card is omitted, by replying R *nn*,RETRY

Issuing the response RETRY will result in an immediate return to the calling program with a condition code of 0.

WAIT

F jobname,WAIT

This can be issued as either F *jobname*,WAIT or, if the NOWTOR DD card is omitted, by replying R *nn*,WAIT

Issuing the response WAIT will result in the program waiting for the default number of seconds (60) before re-issuing the ASLERR04A or ASLERR04I message.

WAIT *nnn*

F jobname,WAIT nnn

Where *nnn* is the number of seconds that the program is to wait before re-issuing the ASLERR04A or ASLERR04I message.

The value of *nnn* must be 999 or less.

This can be issued as either F *jobname*,WAIT *nnn* or, if the NOWTOR DD card is Omitted, by replying R *nn*,WAIT *nnn*

Issuing the response WAIT *nnn* will result in the program waiting for supplied number of seconds before re-issuing the ASLERR04A or ASLERR04I message.

CANCEL

F jobname,CANCEL

This can be issued as either F *jobname*,CANCEL or, if the NOWTOR DD card is omitted, by replying R *nn*,RETRY. The P *jobname* command has the same effect as issuing this command.

Issuing the response CANCEL (Or issuing the stop (P) command) will result in an immediate return to the calling program with a condition code of 8.

STOP

F jobname,STOP

This can be issued as either F *jobname*,CANCEL or, if the NOWTOR DD card is omitted, by replying R *nn*,RETRY. The P *jobname* command has the same effect as issuing this command.

Issuing the response CANCEL (Or issuing the stop (P) command) will result in an immediate return to the calling program with a condition code of 8.

3.5 Return (Condition) Codes

It is recommended that all calling application programs check for condition codes 0, 4, 8 and 16 being returned by **MQERROR.**

Possible condition codes and their meanings and suggested responses are:

Condition Code 0

When a value of zero is returned by **MQERROR** it is an indication that the operator has replied 'RETRY' to ASLERR04A.

It is up to the calling program to determine what is involved in a retry and this would depend on what MQ function determined that it needed to call **MQERROR**.

If the failing action was a MQCONN then simply retrying the MQCONN should suffice.

If the failing action was a MQGET then it may be more involved. For example: you will probably need to reconnect, re-open the queue and retry the MQGET.

Condition Code 4

When a condition code of four is returned, this is an indication that the operator has either replied 'STOP' to ASLERR04A or has issued the STOP jobname command.

It is up to the calling application program to determine the ramifications of this action and how to respond.

Condition Code 8

When a condition code of eight is returned, this is an indication that the operator has either replied 'CANCEL' to ASLERR04A or has issued the STOP jobname command.

It is up to the calling application program to determine the ramifications of this action and how to respond.

Condition Code 16

A condition code of sixteen should always be considered as a calling program logic problem.

It is an indication that either no parameter was passed, or the parameter passed was invalid.

The calling program should be changed to correctly call **MQERROR** and the failing job should be re-run if required.

4 Calling MQERROR

MQERROR has been specifically designed to be called by other programs. This was done to help provide a standard look and feel interface for the operators in the event that a program encounters a non-zero MQ return code.

The program will allow the calling program to make choices based on the operator's responses by means of the return code.

4.1 Coding Examples

The following code snippets demonstrate how to call **MQERROR** from another program. They should be considered just as an example of how to use **MQERROR** within an application programming language and not as fully functional code. The examples are simply to demonstrate how to call **MQERROR**. There is no error recovery coded within the examples

For examples of how **MQERROR** can be used within an application please refer to the sample programs provided later in this document.

4.1.1 From Assembler

```
         MVC   MESSAGE,=C'My test message.'  Move in message
*
TRY_AGAIN DS    0H
*
*
         LINK EP=MQERROR,PARAM=(PARMS_FOR_MQERROR)
         LTR  R15,R15       Return code 0?
         BZ   TRY_AGAIN     Yes - Retry
*
*
**   Storage Definitions
*
PARMS_FOR_MQERROR DS  0F
         DC   H'18'        Length of parms
MESSAGE  DS   CL16
```

Obviously, the code is only for demonstration purposes. Hardcoding the queue manager name is not good coding practice.

In this case the program will put out the following message (if there is no NOWTOR DD).

xx **ASLERR04A :** *jobname* My test message. **Reply 'RETRY','WAIT', 'STOP' or 'CANCEL'**

If a NOWTOR is present, then the message will read:

ASLERR04I : *jobname* My test message.

4.1.2 From COBOL

```
* ------------------------------------------------------------- *
 WORKING-STORAGE SECTION.
* ------------------------------------------------------------- *

 01  W00-RC                    PIC S9(04) BINARY  VALUE ZERO.
 01  PARM-MQERR.
     05  PARM-MQERR-LEN        PIC S9(03) BINARY VALUE +38.
     05  PARM-MQERR-MSG        PIC X(34).

* ------------------------------------------------------------- *
 PROCEDURE DIVISION.
* ------------------------------------------------------------- *
     MOVE 'My test message.' to PARM-MQERR-MSG.

 A-CALL-MQERROR.

     CALL 'MQERROR' USING PARM-WTOR.
     IF RETURN-CODE = 0 THEN
     DISPLAY 'Return code=' RETURN-CODE '. Retrying'
        GO TO A-CALL-MQERROR
     END-IF.

     DISPLAY 'Back from MQERROR. Return code=' RETURN-CODE.

 A-MAIN-END.
```

Obviously, the code is only for demonstration purposes.

In this case the program will put out the following message (if there is no NOWTOR DD).

xx **ASLERR04A :** *jobname* My test message. **Reply 'RETRY','WAIT', 'STOP' or 'CANCEL'**

If a NOWTOR is present, then the message will read:

ASLERR04I : *jobname* My test message.

4.1.3 From REXX

```
Do until WAITRC = 0
      "call 'your.MQERROR.loadlIB(MQERROR)' 'My test message."
      WAITRC = RC
End
```

Obviously, the code is only for demonstration purposes. Hardcoding the queue manager name is not good coding practice.

In this case the program will put out the following message (if there is no NOWTOR DD allocated to the TSO session or job).

xx **ASLERR04A :** *jobname* My test message. **Reply 'RETRY','WAIT', 'STOP' or 'CANCEL'**

If a NOWTOR is present, then the message will read:

ASLERR04I : *jobname* My test message.

Replying ‘CANCEL’ will not cancel the session (or batch execution) but it will cancel the REXX Exec being executed.

The TSO session will be held in a wait state until the reply has been entered.

MQERROR is **not** recommended for conversational programs

5 Coding Considerations

It is incumbent on the programmer to decide the business needs of an application program and code that strategy accordingly, however, all well behaving MQ enabled programs should be coded to handle non-zero MQ reason code.

Regardless of the failure reason code, applications must consider how they will deal with an error situation. **MQERROR** is intended to give the programmer an opportunity to convey the error to the operators and give them the option to decide what action to take.

Obviously, application programs can choose whether to make use of **MQERROR** and if they do then they must also decide what action they want operations to take if the situation arises. Once again, it is a business-driven decision as to how to handle these situations.

It is also important to understand the implications of when the error code is thrown. Different responses may be desired for an error thrown on a MQOPEN as opposed to a MQGET or MQPUT.

This document is not intended to give any recommendations for an error situation. **MQERROR** simply allows communication to the system operations staff to make them aware of an error situation within an application.

6 Messages

ASLERR02E

ASLERR02E : INVALID PARM PASSED. RC=16

Meaning

The program was called with an invalid parameter passed to it. **MQERROR** will end with a return code of 16.

Corrective Action

Call **MQERROR** with the required parameter.

ASLERR03I

ASLERR03I : FREE OF START CIB UNSUCCESSFUL

Meaning

MQERROR issued a QEDIT to free the start CIB for the job but it got a return code other than 0.
.

Corrective Action

This is an informational message only and it may be ignored.

ASLERR04A

ASLERR04A : *jobname* ***has detected that*** *qmgr* ***is quiescing. Reply***
'RETRY', 'WAIT', 'STOP' or 'CANCEL'

Meaning

This message is generated by the program to give the operators an indication that the queue manager name (*qmgr*) passed as a parameter to the program is quiescing.

'*jobname*' will be replaced by the name of the job that called **MQERROR**.

Corrective Action

Check the JOB log for any accompanying error messages.

Respond to this message as directed by the application programmer.

ASLERR04I

ASLERR04I : *jobname* ***has detected that*** *qmgr* ***is quiescing.***

Meaning

This message is generated by the program to give the operators an indication that the queue manager name (*qmgr*) passed as a parameter to the program is quiescing.

'*jobname*' will be replaced by the name of the job that called **MQERROR**.

Corrective Action

Check the JOB log for any accompanying error messages.

Respond to this message as directed by the application programmer.

ASLERR05I

ASLERR05I : RETRY COMMAND ACCEPTED

Meaning

This message is issued in when the reply to the WTOR from the operator was RETRY or when the F *jobname*,RETRY command is entered.

Corrective Action

This is an informational message only and it may be ignored.

ASLERR06E

ASLERR06E : INVALID COMMAND

Meaning

The command entered via the F *jobname*,xxxx method is invalid and is ignored.

Corrective Action

Issue a correct command. Valid commands are RETRY, CANCEL, WAIT or WAIT *sss*. Where *sss* is the number of seconds to wait.

ASLERR07E

ASLERR07E : INVALID WAIT VALUE. SET TO 60 SECONDS

Meaning

The value passed via either the F *jobname*,WAIT sss command or via the WAIT sss reply to the WTOR is invalid.

The default value will be reset to 60 seconds.

Corrective Action

Re-issue the reply/command specifying the correct value for the wait duration.

ASLERR08I

ASLERR08I : *jobname* **JOB CANCELLED**

Meaning

This message is issued in when the reply to the WTOR from the operator was CANCEL or when the F *jobname*,CANCEL command is entered.

Corrective Action

This is an informational message only and it may be ignored.

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7 Summary of Amendments

Date	Version	Fix Id.	Comment
4th June 2022	6.1	n/a	Release version.
24th October 2017	4.0	n/a	Ownership transferred to Abbydale Systems LLC.
7th July 2006	2.2	FIX001	Message ID for ASLERR04A changed to ASLERR04**I** when NOWTOR card is used.
5th July 2006	2.1	n/a	Support for NOWTOR added
28th September 2005	2.0	n/a	Added command interface support
26th September 2005	1.0	n/a	Initial Program written

Obtaining Support

Support for, comments about and suggestions for enhancements for this product can be obtained from our website :

www.abbydalesystems.com

or by emailing us at

support@abbydalesystems.com

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