

**User's Guide
CMU/SEI-88-UG-1**

ESD-TR-88-030



Carnegie-Mellon University
Software Engineering Institute

An AJPO User's Guide for MH, the Rand Message Handling System

Version 1.1

**Sara E. Moss
Purvis M. Jackson**

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FOR THE COMMANDER



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Typographic Conventions Used in This Guide

The following typefaces and symbols are used in this document to describe aspects of the MH mailer:

1. The names of commands and programs are given in **bold text**:

comp

2. What you must type at the keyboard is presented in **bold typewriter style**:

comp -editor emacs

3. Text giving an example is presented in two styles. Messages generated by the system are presented in typewriter style. What you type is in **bold typewriter style**.

4. Ultrix V1.2A System #2:Tue Aug 25 13:36:51 EDT 1987
You have new mail.
% **inc**
Incorporating new mail into inbox...

5. In examples, a "%" is the UNIX prompt and the text following it is your input.

6. New terms and keywords are introduced in *roman italics*.

current message

7. UNIX¹ pathnames and filenames are given in *regular italics*:

.login

8. Variables are presented in **bold typewriter style** and inside angle brackets. In the following example, you would choose one of the editors available to you and type it in. Do not type the angle brackets.

<editor>

¹UNIX is a trademark of AT&T Bell Laboratories.

An AJPO User's Guide for MH, the Rand Message Handling System Version 1.1

Abstract: The purpose of this document is to provide an introduction to the fundamentals of the Rand Message Handling (MH) system. The document is intended to be a tutorial on and a quick reference to the aspects of MH that are used most frequently. This document does not provide detailed discussions of the technical aspects of MH, nor does it cover all of the topics relevant to advanced use of MH. For more detailed information, see the documents referenced below, or check for UNIX *man* pages online or in the *UNIX Programmer's Manual*.

Parts of this document are based on *MH for Beginners* by Mary Hegardt and Tim Morgan and *The Rand MH Message Handling System: Tutorial* by Marshall T. Rose and Jerry N. Sweet. For more detailed information, we recommend *The Rand MH Message Handling System: User's Manual* by Marshall T. Rose and John L. Romine.

1. The Basics of the MH Mailer

Electronic mail (e-mail) is a quick, convenient way to communicate with people. You can send a message to one or more people, and message recipients can read and reply to the message at their convenience. E-mail is much faster than a paper memo or U.S. mail, and it avoids inconveniences associated with the telephone such as unwanted interruptions and missed phone calls.

An electronic mail message consists of two parts: the *headers* and the *body*. The headers are the lines at the top of the message. They are similar to the top lines of a memo and consist of *fields*: To:, From:, Subject:, Date:, cc:, and so on. The body comes after the headers and consists of the text that the sender types. The body is separated from the headers by a line of dashes or a blank line.

Mail to other users on the AJPO machine at the SEI should be addressed to the person's *user id*. Every user has a unique user id. By convention, the user id is usually the user's initials, although some users have a first or last name as their user id. Before sending mail to someone you should know the correct user id. You may also send mail to users with the *firstname.lastname* format instead of their user ids. For example, the following are two equivalent e-mail addresses to send mail to Sara Moss,:

sara or Sara.Moss

An electronic mail address consists of a *user id* and a *site*. When you are sending mail locally, as described above, the site may be omitted. The user id specifies the person to whom the mail is to be sent. The site specifies the location of the person's account, where

the user receives mail. `ajpo.sei.cmu.edu` is the site name for the AJPO machine at the SEI. The user id and the site name are separated by an @ sign, as in the following example:

```
action@ajpo.sei.cmu.edu
```

The **MH** system is different from many other mail systems. Instead of running one large program that handles all mail functions and keeps messages in one large file, **MH** is a collection of smaller single-purpose programs used to manipulate mail messages that are kept in individual files. You will never type **MB** to enter the mailer as you may have previously with other mailers. The mail commands are invoked just like any other commands you type at your shell prompt. At first, **MH** may seem to be more complicated than other mail systems, but **MH** has been designed to allow you to take full advantage of existing UNIX commands and programs in connection with mail messages. For example, you can make use of the UNIX pipe to pass the output of the **MH** command **scan** through the UNIX **more** program:

```
% scan | more
```

With **MH** you can still use your usual text editor, spelling program, and printer commands. A new user has to learn only a few commands to start using **MH**. The most basic set of commands, which are all described in the following sections, are **Inc**, **show**, **next**, **prev**, **scan**, **comp**, **refile**, **folder**, and **delete**.

2. Reading Mail Messages

When someone sends a mail message to you, it is delivered to a file called the *mail drop* file (which is not in your directory). When a message arrives in the mail drop, you will be notified that mail has arrived. You can check for new messages at any time by typing:

```
% ck
```

When you are ready to read your mail, you will have to incorporate (or *inc*) your mail messages from the mail drop area into your account. To do so, type *inc*:

```
% inc
```

You will have to incorporate all new mail that arrives before you can read it. When you do this the first time, you will be asked if you want to create the inbox folder. You will see a question similar to this:

```
create folder "/usr/sara/inbox"?
```

Respond with

```
yes
```

You will then see a series of statements similar to the following:

```
Incorporating new mail into inbox ...
```

```
1+ 07/14 Sara.Moss@ajpo.s.  Welcome! <<Hello, glad to see yo
2  07/22 siegert@ajpo.sei.  AJPO backup schedule <<The weekl
3  08/11 siegert@ajpo.sei.  AJPO machine is back again <<The
```

This is what a typical *inc* session looks like. The *inc* command copies your mail into your *inbox* (a folder within *Mail* that initially will contain all of your messages). *inc* also assigns a unique number to each new message. These numbers allow you to refer to each message individually. After the *message number*, you see the date the message was sent, the name of the sender, the subject of the message, and a portion of the message if there is enough room left on the line. The *current message* is indicated by a "+" sign.

To read the current message, type *show*.

```
% show
(Message inbox:1)
Date: Thu, 14 Jul 88 17:08:08 EDT
Message-Id: <8707222108.AA03158@ajpo.sei.cmu.edu>
From: sara@ajpo.sei.cmu.edu
To: you
Subject: Welcome!
```

```
Hello, glad to see you are using the AJPO mail system.
We hope you find the MH mailer easy to learn and fun to use.
Enjoy!
```

```
- Sara
```

In this case we see that the current message is number 1. If a message is longer than one

screenful, you will see the word **more** at the bottom of the screen. When you are ready to see more of the message, press the SPACE BAR to see another screenful, or press the RETURN key to see just one more line. When you are done reading the message, if you type **show** again, you will see the same message again.

To see the next message, type **next**. Message number 2 will be shown and become the current message.

```
% next
(Message inbox:2)
Date: Fri, 22 Jul 88 17:08:08 EDT
Message-Id: <8803011414.AA06048@ajpo.sei.cmu.edu>
From: sara@ajpo.sei.cmu.edu
To: you@ajpo.sei.cmu.edu
```

Subject: AJPO backup schedule

The weekly backup schedule will be announced shortly.
It is most likely going to be from 1am to 4am Mondays.

Greg

The **next** command will continue to advance you through your set of messages until you reach the end. Just as the **next** command shows you the message following the current one, the **prev** command shows you the message before the current one. You may use the **prev** command to look back through your messages in sequence. Message 2 is your current message, so to see message 1 again type the following:

```
% prev
```

If you have several messages and only want to read one, type **show**, followed by the message number. For example, if your current message were 1, the **show** command with no arguments would display message 1. However, you could display message 3 by typing the following:

```
% show 3
```

By using the **show** command with the message number, you can read any message at any time. Any time you use **show** the message you show becomes the current message.

2.1. Scanning Message Headers

The **Inc** command creates a *scan listing*, which shows the message number, the date on which the message was sent, the sender, and the subject of the message. If there is sufficient space remaining on the line, the beginning of the text of the message is displayed as well, preceded by two left angle brackets (<<). An example of a scan listing is:

```
4 08/20 Mail Delivery Sub Returned mail: Host unknown
5 08/21 action@ajpo.sei.c For your information <<There are
6 08/24 sara@ajpo.sei.cmu mail test <<This is just a test.
```

Note that all messages have message numbers.

To generate a scan listing, use the **scan** command:

```
% scan
```

This will list all of the messages in the current *folder*. We will discuss folders in Section 4.

By using message arguments with **MH** commands such as **show** and **scan**, you can act upon more than one message at a time. To scan a subset of your messages, you can specify the numbers of the messages you want to scan. For example,

```
% scan 4 6
```

would return the headers for message 4 and message 6.

```
4 08/20 Mail Delivery Sub    Returned mail: Host unknown
6 08/24 sara@ajpo.sei.cmu    mail test <<This is just a test
```

A *message range* can be specified using the form **msg1-msg2** where **msg1** and **msg2** are message numbers or one of the reserved message names described below. For example,

```
% scan 3-6
```

scans messages 3 through 6, inclusive.

```
3 08/11 siegert@ajpo.sei.    AJPO machine is back again<<The
4 08/20 Mail Delivery Sub    Returned mail: Host unknown
5 08/21 siegert@ajpo.sei.    For your information<<There are
6 08/24 sara@ajpo.sei.cmu    mail test <<This is just a test.
```

2.2. Selecting Among Messages

As you have seen, messages can be referred to by their message numbers. In addition, messages may be specified by *message names*. The built-in message names recognized by **MH** are:

<i>cur</i>	The current message (the last one that was handled).
<i>next</i>	The message immediately after the current message.
<i>prev</i>	The message immediately before the current message.
<i>first</i>	The first message in the current folder.
<i>last</i>	The last message in the current folder.
<i>all</i>	All messages in the current folder (first-last)

These message names, like message numbers, can be used as *message* (or *msg*) *arguments*. They can be combined to scan or show more than one message at a time. For example, if you had 12 messages,

```
% scan 7-last
```

would scan messages 7 through the last message, inclusive. Therefore, you would get the scan listing for messages 7 through 12.

Another way to specify a message range is by placing a colon between the beginning message number or message name and a relative number of messages. For example, you could scan the last three messages in your current folder with the command:

```
% scan last:3
```

Similarly, you could scan the first three messages in the current folder with the command:

```
% scan first:3
```

The following command scans the three messages following the current message:

```
% scan next:3
```

Likewise, the following command scans the current message and the two immediately after it:

```
% scan cur:3
```

You can use either message numbers, message names, or a combination of names and numbers to specify a range. The following command scans the first four messages, the last four messages, and messages 8 through 12.

```
% scan first:4 last:4 8-12
```

For all MH commands, if you do not indicate a specific msg argument, the command will act upon the current message.

2.3. Printing Mail Messages

Occasionally, you may want to print a message in hardcopy form to carry away from your terminal or workstation. Although there is no MH command for printing, you can combine UNIX commands with MH commands to do practically anything you want with a message, which is a powerful feature of MH. To print an MH message, you need to **show** the message to a printer. You do this with the UNIX **pipe**, which is the vertical bar (|) on your keyboard. The following command will print the current message on your default printer:

```
% show | lpr
```

You can specify which message you want to print by including the message number. For example, the following command will print message 49:

```
% show 49 | lpr
```

3. Sending Mail Messages

To send someone a message, you start with the **comp** (compose) command.² This command will start an editor for you, in which blank headers are provided for you to fill in. When you finish writing the message, exit the editor as you would normally and you will see the `What now?` prompt.

At the `What now?` prompt you can type a `?` or a RETURN to see what commands you can type next. Here are some of the `What now?` options:

edit <editor>	Edits the message using the editor that you specify. If you do not specify an editor, your default MH editor will be used. If it is not defined in your <code>.mh_profile</code> the MH prompter will be used. Exit the way you normally do in that editor to get back to <code>What now?</code> .
list	Shows the message you just typed.
whom	Shows the list of all recipients in the <code>To:</code> , <code>cc:</code> , and <code>Bcc:</code> fields.
send	Sends the message to the recipients.
push	Sends the message in the background, so you don't have to wait for it to finish. If you try to compose another message before the send has completed, it will ask you what you want to do with the draft. If this happens, quit and wait a minute before trying again.
quit	Quits without sending the message. Saves the text of the message as a draft.
quit -delete	Quit and delete the draft.

When you **quit** after composing a message, you may continue the draft later by using the **comp** command again. You will be informed that there is a draft and asked what you want to do with it with the `Disposition?` prompt. The options are:

- **quit** — Terminate the session.
- **replace** — Throw away the draft and start another.
- **use** — Add to the existing draft.
- **llst** — List the draft on the terminal and return to the `Disposition?` prompt.
- **refile** — File the draft in a folder and start a new draft. (The topic of refiling will be discussed in section 4.2.)

Make sure you are happy with your message before typing **send** or **push**. There is no way to recall a message once it has been sent.

²This discussion assumes you have set a default editor in your `.mh_profile`. If you have not, refer to 5.7, which describes the standard way to send messages with MH.

3.1. Replying to Messages

To reply to a message, use the **repl** command followed by the message number or message name. For example, the following command would create a reply to message number 3:

```
% repl 3
```

If you do not specify a message number, your reply will be to the current message. When you reply, the message headers will appear and you will be able to edit your reply. Here is an example of what the reply header will look like.

```
To: siegert
cc: sam
Fcc: inbox
Subject: re: MH User Guide for AJPO
In-reply-to: Your message of Wed, 11 May 88 14:07:32
```

When you are replying to a message, the name of the sender of the original message will appear in the **To:** field. Any people in the **cc:** field will also be copied on your reply message. When you have finished, exit the file as you would normally and **send** (or another option) at **What now?**.

3.2. Forwarding Messages

If you want to share a message with others, you can forward it using the **forw** command. Typing **forw** will forward the current message. Typing **forw** followed by a message number will forward the specified message. You will see the message displayed below a new set of headers. You can add text between the new headers and the headers of the message you are forwarding. When you finish, exit as you would normally. You can then choose the appropriate option at the **What now?** prompt.

3.3. Resending Messages

Sometimes you may need to resend a message. This happens occasionally when a user makes a mistake in an address or uses the wrong user id. To resend a message, use the **dist** (distribute) command:

```
% dist
```

When you do this, a file containing the following headers will appear on your screen:

```
Resent-to:
Resent-cc:
Resent-Fcc:
```

You can add the appropriate addresses to any of the fields, or you can delete the **cc** and **Fcc** fields if you do not need them. Exit the editor as you would normally and you will see the **What now?** prompt. If you do not specify a message number, the current message will be resent.

4. Managing Mail Messages

Unlike some mailers, MH stores each mail message as a separate file. This provides several advantages. It makes better use of computing resources, and it permits you to manage your mail messages more effectively.

MH mail messages are stored in directories called *folders*. By default, you have one folder, which is called *inbox*. You can create other folders to organize your mail messages. The following section describes methods for creating folders and moving messages among folders. As a rule of thumb, you should consider creating MH folders for managing your mail messages similar to the way you would create subdirectories in UNIX to manage your files.

4.1. Message Folders

The `inc` command sets the current folder to *inbox* by default if you have mail. To create a new folder use the `folder` command with a folder argument. Folder arguments are specified by a + sign followed by the folder name. Hence,

```
% folder +todo
```

creates a new folder called *todo*, if it does not already exist.

If you use the `folder` to create a new folder, the system will ask you if you want to create a new folder with the name you specified. You answer "yes" to create the new folder or "no" if you do not want to create the folder.

Whenever a folder argument is given, that folder becomes the current folder. For example, to make the folder *John* the current folder you would type:

```
% folder +John
```

If you were to do this, *John* would remain your current folder until you changed it or until you included new mail, which returns you to *inbox*. As you create and use new folders, you may occasionally lose track of which is your current folder. To avoid confusion, you may want to develop the habit of returning to *inbox* as your current folder as soon as you finish working in another folder. However, you can find out which folder is current at any time by using the `folder` command with no arguments:

```
% folder
```

To find out useful information about all of your folders, try the command

```
% folders
```

4.2. Moving Messages Among Folders

One nice feature of MH folders is that they permit you to store messages in meaningful groupings. Thus, you might want to keep your messages separated into appropriately named folders. For example, if you have mail pertaining to different projects, you might want to create a folder for each project. This strategy will help you locate particular messages more quickly than you would be able to if the messages were not separated.

The **refile** command moves messages from a *source folder* to one or more *destination folders*. By default, the current message is moved from the current folder (typically *inbox*) to another folder specified as an argument to **refile**. For example,

```
% refile +todo
```

moves the current message in the current folder to the folder named *todo*. If the destination folder doesn't exist yet, you will be asked if it should be created. If you reply yes, then the folder will be created and the message will be placed within it. If you answer no, the command will be aborted and no refile action will take place.

If you want to move a message other than the current message to another folder, you must use the folder command followed by the folder argument and a msg argument. For example, if your current folder were *+inbox* and you wanted to move message number 2 into the *+todo* folder, you would type:

```
% refile +todo 2
```

You may refile as many messages as you like by using message ranges as described in section 2.2. The **refile** command retains the current folder; that is, when you refile a message from your inbox to another folder, *+inbox* remains your current folder.

You may specify multiple folders to the **refile** command. This is very useful when you need to file a message into more than one folder because the subject of the message fits in more than one of your categories. For instance if your current message is from smith and is about something you need to do you might file it like this:

```
refile +smith +todo
```

After deleting messages or refiling messages in a folder, there tend to be gaps in the numbering sequence. To compress the numbers for all the messages in the current folder, type:

```
% folder -pack
```

You can sort the messages in a folder chronologically and renumber all the messages in the folder, filling in the gaps that are left when messages are deleted. To sort the messages in the current folder, type:

```
% sortm
```

4.3. Removing Messages from Folders

To manage your account effectively, you should remove unneeded messages to free up storage space. When you delete a message, it doesn't disappear from your account; it is placed in the *+deleted* folder instead. This step is taken to allow you to recover a message if you delete it by mistake.

To delete a message, use the **delete** command. By default, **delete** removes the current message, but you can give it a list of messages to be removed as well. For example,

```
% delete 1-3
```

deletes messages 1 through 3.

The first time you use the **delete** command, the system will ask you if you want the deleted folder created. You will see a question similar to this:

```
create folder "/usr/sara/Mail/deleted" ?
```

You answer "yes" to create the folder. When messages are 'deleted', they are moved to the *+deleted* folder. (The *+deleted* folder is analogous to the trash can on the Macintosh.) You can retrieve a deleted message by refiling it from the *+deleted* folder to another folder. For instance, if you inadvertently removed a message from your *todo* folder you can retrieve it by switching to the *deleted* folder and scanning for the message to find the message number. You can do that in one step with the **scan** command:

```
% scan +deleted
```

Now the current folder is *deleted*, so by specifying the deleted message number and the destination folder, you can refile it to its proper folder. The following command would move message number 5 from the current folder, which is *+deleted*, to the folder named *+todo*:

```
% refile +todo 5
```

To permanently remove the messages in the *deleted* folder, you will need to take a second step. The **expunge** command permanently removes all deleted messages. (The **expunge** command is analogous to emptying trash on the Macintosh.) Make sure that you only use **expunge** when you want to remove all of the messages in your *+deleted* folder. By expunging your *+deleted* folder periodically, you will free up storage space in your account.

To expunge your *+deleted* folder, type the expunge command at the UNIX prompt:

```
% expunge
```

4.4. Searching for Messages

The **search** command allows you to search your current folder to find messages that contain a certain word. If you want to list all messages from Smith, type:

```
% search -from smith
```

and it will generate a scan listing of all messages from Smith that are in the current folder.

You **search** for messages by using *switches*. For example, by using the switches **-to -from -subj -cc** or **-date** followed by a word, you can search a message according to headers. Or you can search entire messages for a given word with the **-search** switch.

Search's message selection is actually done with the **MH pick** command, so it will accept any of the **pick** switches. The most commonly used switches have been discussed here. To learn about the others, see the **search** and the **pick** man pages.

The **search** command has a side effect that sets an **MH sequence** to the set of messages found. A sequence is a set of messages or a message range that has been named. The sequence set by the **search** command is named *csequence*, which stands for current sequence. The advantage is that after doing a search you can reference the set of messages found. For instance, after you have done the above search for messages from Smith, you may want to do something with those messages such as delete them or refile them. To refile them into a folder called *+smith* you would type the following.

```
% refile csequence +smith
```

If you try to reference *csequence* but it is undefined you will see the message:

```
bad message list csequence
```

4.5. Storing Messages in Named Files

Occasionally, you may want to put a message into a file so that you can edit the message and use it for purposes other than mail communication. You can do so several ways, but the easiest way is to **show** the message to the named file. You do this by using the UNIX **redirect** symbol, which is the "greater than" (>) character on your keyboard. This symbol tells UNIX to send the results of a command to the named file, rather than to the display screen on your terminal.³ For example, the following command will place message 16 in the file named *possum_souffle.mss*:

```
% show 16 > possum_souffle.mss
```

After placing the message in the named file, you can manipulate the file as you would any other file. However, the message headers will be included in the file.

³The terminal screen is called **standard output** in UNIX. By default, the results of UNIX commands are "directed" to standard output. You "redirect" the results of a command with the symbol >.

5. Advanced Features of MH

The remainder of this guide discusses features that are more advanced than the topics in the previous sections.

5.1. Folders Within Folders

With MH, all of your messages are kept in folders. To allow more than one level of organization for your messages, you can put folders within folders. This is called *nesting* folders and it is similar to creating subdirectories in UNIX. When you specify nested folders, separate the folder names with a /. For example, to move the current message to a folder called *thisweek* that is nested within a *todo* folder, you would type:

```
% refile +todo/thisweek
```

There are two ways to reference folders. The first way is to use **+folder** for top level folders relative to *\$HOME/Mail*, as in the previous example. *\$HOME/Mail* is the *Mail* subdirectory in your home directory. If you want to reference a folder that is within your current folder, you can specify it with **@folder**. That indicates that the folder is relative to the current folder instead of relative to *\$HOME/Mail*. For example, if your current folder is *todo* and you want to scan your *thisweek* folder that is nested within it, you could type:

```
% scan @thisweek
```

That is equivalent to typing:

```
% scan +todo/thisweek
```

This comes in handy when you have many levels of nested folders.

5.2. MH Sequences

Sequences can be used to name message ranges within folders. Sequences can be used in any place that a message range can be used. If you find that you frequently search for messages from a particular person, you may want to create a sequence to do the search for you. For example, suppose you frequently received mail from Larry Druffel. You could create a sequence to group those messages with the following command:

```
% pick -from ld -sequence Larry
```

This command defines a sequence (called *Larry*) that would contain all of the messages from *ld*. This sequence could then be used to refer to the selected messages with other MH commands. For example, if you wanted to see all of the headers of the messages in the sequence, you would use the command:

```
% scan Larry
```

If you wanted to refile those messages into a folder called **+meetings**, you would use the command:

```
% refile +meetings Larry
```

Likewise, if you wanted to remove all of those messages, you would use the command:

```
% delete Larry
```

The name used for a sequence can only include letters and numbers (no special characters are allowed in a sequence name).

There are 2 sequences already defined in MH: **Cur** and **Unseen**. **Cur** is (technically) a sequence of 1 message that is manipulated by most MH commands. You should never redefine the **Cur** sequence.

The second defined sequence is **unseen**. This sequence is used automatically by the **inc**, **show**, **prev**, and **next** commands. This sequence keeps track of all messages that have not yet been viewed. You also should not redefine **unseen**, since it is used by other MH commands.

Each folder is allowed up to 10 sequences, including **unseen** and **cur**. If you try to create more than 10 sequences in any one folder, you will receive an error message. A list of all of the defined sequences for a folder, along with the messages associated with that sequence, can be generated with the command:

```
% mark -list +folder
```

For example, if you had a folder called **ld**, you could see a list of its defined sequences with the following command:

```
% mark -list +ld
```

Sequences can be created using either the **pick** or **mark** commands, but they can only be edited (messages added to and deleted from the sequence) using the **mark** command. To add to our existing sequence called **Larry**, we could use the following command:

```
% mark -seq Larry -add -nozero <msgs>
```

If we wanted to replace the sequence called **Larry** with a message range, we could use the following command:

```
% mark -seq Larry -add -zero <msgs>
```

To remove messages from the **Larry** sequence, we could use the following command:

```
% mark -seq Larry -delete -nozero <msgs>
```

To define the sequence of all messages, except those specified, we could use the following command:

```
% mark -seq Larry -delete -zero <msgs>
```

To completely remove the sequence called **Larry**, we could use the following command:

```
% mark -seq Larry -delete all
```

For the mark command, the defaults are -add -nozero, so the command

```
% mark -seq Larry <msgs>
```

is equivalent to the command

```
% mark -seq Larry -add -nozero <msgs>
```

Please refer to the man page for mark(1) and pick(1) for more information about these two commands.

5.3. UNIX Command Line Aliases

MH is a collection of small programs, each of which can be executed directly through UNIX. Therefore, you can establish aliases for any of the MH commands that you type at the UNIX prompt. Such aliases should be placed in your .cshrc file in your home directory. UNIX aliases take the following form:

```
alias <new-name> <old-name>
```

For example, you might want to use an alias to make the repl command execute when you type reply. The following line in your .cshrc does the trick:

```
alias reply repl
```

Remember, any time you make a change to your .cshrc file, you will have to "source" it for UNIX to accept the changes. For example, if you added the above alias, you would need to tell UNIX that you had made the change and to use the new version of the file. You can do that either by logging out and logging back in, or you could use the following command:

```
% source .cshrc
```

However, if you are using multiple windows, you will need to "source" each window in which you want new command aliases to work. When you log out and log back in, all windows will use the new aliases.

You can have more than one alias for a command. For example, you might want to use multiple aliases such as the the following:

```
alias reply repl
alias rep repl
alias r repl
alias answer repl
alias compose comp
alias message comp
alias email comp
alias forward forw
alias resend dist
alias remail dist
```

5.4. The MH Profile

All MH users have a file in their home directory called `.mh_profile`. This file contains a list of user-specified default options for MH commands. Below is an example of an `.mh_profile`:

```
Path: Mail
Editor: emacs
Alternate-Mailboxes: everyone, siegert@ajpo.sei.cmu.edu,
Signature: Greg_Siegert
repl: -nocc me -fcc inbox
Msg-Protect: 600
Folder-Protect: 700
Unseen-Sequence: unseen
Sequence-Negation: not
ali:-alias aliases
whom: -alias aliases
send: -alias aliases
```

To make a change to your `.mh_profile`, edit the file with your editor and add a line for the applicable command. Although there are many options, here are the most useful ones. The first two are already in your `.mh_profile`.

Unseen-Sequence:unseen

Names the sequence that is defined as those messages incorporated with `Inc` but not yet read with `show` or `next`. For example, if you want to see if there are any unseen messages, type:

```
scan unseen
```

Sequence-Negation:not

Defines the string that when prefixed to a sequence name negates the sequence. For example, *notunseen* means all those messages that are not a member of the *unseen* sequence, in other words, all those messages that have been seen.

Path: Mail

This is the only required entry; it names the directory in which MH messages will be stored. Folders are created as subdirectories within the Mail directory.

Editor

Lists the default editor that `comp`, `repl`, `forw`, and `dist` should use. To define an editor you would type the following line in your `.mh_profile`:

```
editor: emacs
```

If you remove this line from your `.mh_profile` your default editor would be the standard MH default editor, `prompter`. For a discussion of the `prompter` editor, see section 5.7.

Alternate-Mailboxes

This is a list of all mail address that can be used for you. For example,

```
everyone, siegert@ajpo.sei.cmu
```

are two different addresses that reference the same person. This is helpful, because it prevents your receiving multiple copies of a message that has been addressed to more than one mailing list with your userid on it.

Signature When **MH** sends mail for you, it looks for this profile entry for your "real world" name. For example,

signature: Sara Moss

The contents of the signature entry in the profile should be a simple phrase, with no embedded periods.

repl: -nocc me -fcc Inbox

This tells **MH** that you do not want to receive a cc of messages to which you reply (-nocc me) but that you want a copy filed in your inbox (fcc inbox). You can change this line so that you receive a cc if you wish, or you can change the fcc folder to be a folder other than inbox. The major difference between fcc and cc is that fcc files the messages and cc sends the message to you. Therefore, you will receive the cc copy through the mail, but the fcc copy will be appended to the end of the specified folder.

Msg-Protect Whenever **MH** creates a message (for example, with **Inc**), this is the octal protection mode with which a message is created. Message protection in **MH** is the same as file protection in UNIX. Our local default is

Msg-Protect: 600

This protection mode prevents anyone else from reading your messages. If you were to remove this line from your *.mh_profile*, your messages would have the same default protection as your files do. Note, however, that changing the mode in the profile does not change the modes of messages that were created previously. Use the UNIX command **chmod** to change the modes of your existing messages.

Folder-Protect Whenever **MH** creates a folder, this is the octal mode for protection with which the folder is created. Folder protection in **MH** is the same as directory protection in UNIX. Our local default is

Folder-Protect: 700

This mode prevents anyone else from reading your folders. If you were to remove this line, your folders would have your default directory protection.

Allases The entries for **all**, **whom**, and **send** in the example profile tell **MH** to look for and use aliases in the file called "aliases" in your "Mail" sub-directory.

The following *.mh_profile* options are not included in the example *.mh_profile*. They are useful for tailoring your profile to your own needs.

<Editor>-next Lists the editor that should be used after the last edit with **Editor**. Hence, if you have a profile entry

prompter-next: emacs

after editing a draft with **prompter**, and being at what now? level, you could say **edit** (instead of **edit emacs**) to continue editing the draft with **emacs**.

<command> Each **MH** command that reads your *.mh_profile* file looks for an entry beginning with the command's own name to determine its initial defaults. For example, if you want the default editor for **repl** to be **emacs**, the line

```
repl: -editor emacs
```

is sufficient. Command line arguments will override profile settings. Given the profile setting for **repl** above, if you invoked **repl** with

```
% repl -editor vi
```

repl would use the **vi** editor instead of **emacs**.

Note that your profile resembles the header portion of a message. Be sure that it is properly formatted by placing a colon after each entry name, and keep each entry on a single line.

5.5. Mailing List Aliases

Using **MH**, you may specify your own private mail *aliases*. This feature allows you to store lists of addresses or long Internet addresses of people with whom you frequently correspond in one file, and then to address them using short mnemonic names. Our local convention is to call this file *aliases* and store it in your **MH** directory, *Mail*. If you want to store it somewhere other than in your **MH** directory you must specify the full path name. The format of this file is simple. The alias is given, followed by a colon, followed by one or more legal mail addresses separated by commas. For example, you might have an alias for the users who support the AJPO mail system, called **support**:

```
support: siegert, sara, poepping
```

If you have an alias defined that references another alias in your file, the alias that is referenced must come **AFTER** the place it is referenced. For instance, you could have another alias that is a superset of the one defined above, called **admin**. This is the order that the two related aliases must be listed:

```
admin: support, marmstro, gaustin
support: siegert, sara, poepping
```

In addition to your *aliases* file, you will need to modify your *.mh_profile* in order to use aliases. You should add the flag **-alias aliases** to the entries for the commands **all**, **whom**, **send**, and **push**, creating entries for these commands if they aren't already in your *.mh_profile*.

```
ali: -alias aliases
send: -alias aliases
whom: -alias aliases
```

The **all** command shows the expanded form of an alias. If you type

```
% ali <alias>
```

all will respond with the expansion of the alias. For example, suppose you had an alias **support**. The following command would return the value of **support**:

```
% ali support
```

All also searches the system aliases file after searching your private one. If there is no alias with the name you use, then the name will be returned. For example, the following command would return the word `mohammed` because there is no alias named `mohammed`:

```
% ali mohammed
```

5.6. Blind Carbon Copies

The `Bcc:` header field allows you to add recipients to your message just like those who are `cc:` field, but the recipients will not see that the Bcc recipients were copied on the message, their replies will not go to the blind recipients, and the blind recipients cannot (easily) reply to the message.

5.7. The Prompter Editor

MH permits users to specify in the `mh_profile` which editor to use when creating messages. If no editor is specified, the default editor will be used. The default is **prompter**, which is a simple line editor that will prompt you to fill in the headers of the message.

Prompter will start when you type the `comp` command. Type in the requested information for each header or hit the RETURN key to omit it. You enter text one line at a time, and you can only backspace along the line the cursor is on at the time. You cannot move the cursor up to a previous line. End the message by typing a CTRL-d at the beginning of a new line. (To type CTRL-d hold down the key marked CTRL and press the d key at the same time). Here's an example:

```
% comp
To: poepping
cc:
Subject: Lunch
-----
Where are we going for lunch today?
      - Sara
CTRL-d
-----
What now? send
```

One of the most useful options at this point is to edit the draft of the message to correct any mistakes. To do this type:

```
What now? edit <editor>
```

This will put you in the `<editor>` to edit the message. If you prefer to use Emacs, type **edit emacs**. When you have finished editing, exit the editor as you would normally, being sure to save the file. You will then get the "What now?" prompt again.

Summary Information

MH Conventions

This list of conventions applies to all **MH** commands, including general rules for specifying messages and folders.

1. Any **MH** command that deals with messages can be given a folder argument to say which folder to use. Folders are specified by **+folder** for folders relative to *\$HOME/Mail* or **@folder** for folders relative to the current folder. Folders within folders can be specified by separating the folder names with slashes, much like with UNIX directories. For instance, if there is a folder called *april* in your *inbox* folder, reference it with **+inbox/april**.
2. A mail message, *msg*, is specified by a *message number* (a whole, positive number) or by *message names* such as **first**, **last**, **cur**, **next**, or **prev**.
A *message range* is specified by **<msg-msg>** including all messages in the range.
A *message sequence* is specified by **<msg:signed-number>** including **<msg>** and the next **<number>** of messages. The signed-number can be positive or negative.
If an **MH** command accepts a *msgs* argument, any number of messages can be given to the command. The **MH** command will expand all the ranges and process each message, starting with the lowest numbered one and working its way to the message with the highest number.
If an **MH** command accepts a *msg* argument, at most one message can be given.
3. Switches to **MH** commands start with a dash. Unlike the standard UNIX convention, each switch consists of more than one character, for example **header**. To minimize typing, only a unique abbreviation of the switch need be typed; thus for **header**, **hea** is probably sufficient, depending on the other switches accepted by the command.
4. All **MH** commands have a **-help** switch, which *must* be spelled out fully. Typing a command with the **-help** switch prints out the syntax of the command, the switches that it accepts, and version information. In the list of switches, parentheses indicate required characters. For example, all **-help** switches will appear as **-(help)**, indicating that no abbreviation is accepted.
5. Many **MH** switches have both on and off forms, such as **format** and **noformat**. In these cases, the last occurrence of the switch on the command line determines the setting of the option.
6. All **MH** commands that read your *.mh_profile* operate the same way. First, the profile is consulted for an entry matching the name with which the command was invoked. Next, if such an entry was found, the command immediately uses the arguments listed. Finally, any arguments on the command line are then interpreted. Since most switches have both on and off forms, it's easy to customize the default options for each **MH** command in your *.mh_profile*, and to override those defaults on the command line.

MH Command Summary

General Notes

- Mail messages, *msgs*, are specified by natural numbers (whole, positive numbers) or message names such as *first*, *last*, *cur*, *next*, or *prev*.
- A message range can be specified in two ways. Messages specified by `<msg1-msg2>` refer to all messages between msg1 and msg2, inclusive. Messages specified by `<msg:signed-number>` refer to msg and the next number of messages if the signed-number is positive, or it refers to the previous number of messages if the signed-number is negative.
- Folders may contain messages and other folders. As command options, folders are specified by `+folder` for folders relative to your *Mail* directory or `@folder` for folders relative to the current folder.
- Most MH commands have a folder option. If one is not specified it defaults to the current folder. Refer to the man pages for specifics.

Getting Help

`man <command>` Online manual pages provide detailed instructions for all commands.

Sending Mail

`comp` Composes a draft message.

When you quit after composing a message, you may continue the draft later by using the `comp` command again. It will inform you there is a draft and ask you what you want to do with it with the `Disposition?` prompt. The options are:

- `quit` — Terminate the session.
- `replace` — Throw away the draft and start another.
- `use` — Add to the existing draft.
- `llst` — List the draft on the terminal and return to the `Disposition?` prompt.
- `refile` — File the draft in a folder and start a new draft.

`forw <msgs>` Prepares a message containing other messages and mail it.

`repl <msg>` Replies to a message.

`What now?` Prompts the user for an action following message composition commands such as `comp`, `dist`, `forw`, and `repl`. Press return at the `What now?` prompt to see the options. The most useful options are:

- `send` — Mail the message.
- `push` — Mail the message and don't wait for it to finish. The prompt comes back right away.
- `llst` — List the composed draft on the terminal.
- `edit <editor>` — Invoke the specified editor for further editing.

- **whom** — List the addresses to which the mail will go.
- **quit** — Terminate the session and keep a draft.
- **quit -delete** — Terminate the session and delete the draft.
-

Reading Mail

msgchk	Checks for messages and tells you if you have messages waiting for you.
Inc	Incorporates new mail into your <i>+inbox</i> .
show <msgs>	Shows (or prints) entire messages on the terminal screen. The default message is the current one, or the first new message after an Inc .
next	Shows the next message, after the current one.
prev	Shows the previous message.

Deleting Mail

delete <msgs>	Delete a sequence of messages from any folder by moving them to the general <i>+deleted</i> folder. (The <i>+deleted</i> folder is much like a Macintosh trash can.)
expunge	Permanently removes all deleted messages.

Scanning and Searching Mail

scan <msgs>	Shows a listing of messages in the current folder or specified folder.
search <-key pattern>	Shows a listing of each message that satisfies the constraints specified by the key pattern. Search keys include cc, date, from, subject, to, before, or after. Keys may be combined with operators and, or, or not and grouped with the brace options, lbrace and rbrace. For example, the following search will find all messages from "jd" after June 10 1987 or later. <pre>%search -from jd -and -after "10 Jun 87"</pre> Pick is an MH command which is used within search. See the pick man page to learn what other search keys are available. The message set that was found with the last search may be referenced with a sequence called the <i>csequence</i>. For example, to delete all the messages found with the above search you can type: <pre>%delete csequence</pre>

Managing Mail Folders

- folder** With no argument, **folder** lists the current folder, its number of messages, the range of messages, and the current message. When the **<+folder>** argument is given, that folder becomes the current folder.
- folders** Lists the folder information for all folders.
- refile <msgs> +folder** Moves message(s) to another folder. If no message is given it defaults to the current message. The command **refile +folder <msgs>** does the same. Multiple **+folder** arguments may be given.
- sortm <msgs>** Sorts the messages in chronological order.

Printing

- show <msgs> | lpr** This command sequence makes use of a **|**, a UNIX pipe. The output of the **show** command becomes the input of the **lpr** command, which prints the output.

Personal Mail Name Aliasing

Add these lines to your *.mh_profile* file:

```
ali: -alias aliases
send: -alias aliases
whom: -alias aliases
```

Aliases are in the following form and are kept in the *aliases* file in your *Mail* directory:

```
alias-name: list-of-users
```

Online Documentation

Each **MH** command has its own UNIX manual entry. For example, to get information about **comp**, type

```
% man comp
```

The manual entry for *mh*(1) lists all **MH** commands, while the manual entry for *mh-chart*(1) lists the syntax and switches for all **MH** commands.

In addition, here are a few other manual entries that you might find useful:

- mh-alias*(5) To find out how aliases in **MH** work.
- mh-mail*(5) To find out how **MH** stores and interprets messages (this manual entry explains all of the standard header components).
- mh-profile*(5) To find out about the **MH** user environment.

The manual pages for **MH** are in the standard UNIX format, but contain additional sections unique to **MH**. Here's a summary of the sections one might find in an **MH** manual entry:

NAME	Command name and one-line description.
SYNOPSIS	Syntax of the command. All commands accept a help switch.
DESCRIPTION	Semantics of the command.
FILES	Files used by the command. This usually includes <i>.mh_profile</i> .
PROFILE COMPONENTS	Entries in the <i>.mh_profile</i> used by the command. These do not include the profile entry for the command itself.
SEE ALSO	Other UNIX manual entries (usually MH commands) that are related to this command.
DEFAULTS	Default arguments for the command. If the command takes a folder argument, this defaults to the current folder. If the command takes a msg argument, this defaults to the current message. If the command takes a msgs argument, this defaults to the current message or all messages, depending on which one makes more sense.
CONTEXT	Changes to your MH context made by the command.
HINTS	Helpful hints discussing the easy way to do things.
HISTORY	A historical perspective on why MH works the way it does.
BUGS	Any known and yet unresolved problems.

Several **MH** manual entries lack some of these sections.

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2b. DECLASSIFICATION/DOWNGRADING SCHEDULE N/A					
4. PERFORMING ORGANIZATION REPORT NUMBER(S) CMU/SEI-88-UG-1			5. MONITORING ORGANIZATION REPORT NUMBER(S) ESD-TR-88-030		
6a. NAME OF PERFORMING ORGANIZATION SOFTWARE ENGINEERING INST.		6b. OFFICE SYMBOL (If applicable) SEI		7a. NAME OF MONITORING ORGANIZATION SEI JOINT PROGRAM OFFICE	
6c. ADDRESS (City, State and ZIP Code) CARNEGIE-MELLON UNIVERSITY PITTSBURGH, PA 15213			7b. ADDRESS (City, State and ZIP Code) ESD/XRS1 HANSCOM AIR FORCE BASE HANSCOM, MA 01731		
8a. NAME OF FUNDING/SPONSORING ORGANIZATION SEI JOINT PROGRAM OFFICE		8b. OFFICE SYMBOL (If applicable) ESD/XRS1		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER F1962885C0003	
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FIELD	GROUP	SUB. GR.	electronic mail Rand Message Handler electronic messaging		
19. ABSTRACT (Continue on reverse if necessary and identify by block number) The purpose of this document is to provide an introduction to the fundamentals of the Rand Message Handling (MH) system. The document is intended to be a tutorial on and a quick reference to the aspects of MH that are used most frequently. This document does not provide detailed discussions of the technical aspects of MH, nor does it cover all of the topics relevant to advanced use of MH. For more detailed information, see the documents referenced below, or check for Unix man pages online or in the "Unix Programmer's Manual." Parts of this document are based on "MH for Beginners" by Mary Hegardt and Tim Morgan and "The Rand MH Message Handling System: Tutorial" by Marshall T. Rose and Jerry N. Sweet. For more detailed information, we recommend "The Rand MH Message Handling System: User's Manual" by Marshall T. Rose and John L. Romine.					
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT UNCLASSIFIED/UNLIMITED ☒ SAME AS RPT. ☐ DTIC USERS ☒			21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED, UNLIMITED DISTRIBUTION		
22a. NAME OF RESPONSIBLE INDIVIDUAL KARL H. SHINGLER			22b. TELEPHONE NUMBER (Include Area Code) 412 268-7630		22c. OFFICE SYMBOL SEI JPO