

NAME

ar, **ranlib** - manage archives

SYNOPSIS

ar -d [-T] [-f] [-j] [-v] [-z] *archive file ...*

ar -m [-T] [-a *position-after*] [-b *position-before*] [-f] [-i *position-before*] [-j] [-s | -S] [-z] *archive file ...*

ar -p [-T] [-f] [-v] *archive [file ...]*

ar -q [-T] [-c] [-D] [-f] [-s | -S] [-U] [-v] [-z] *archive file ...*

ar -r [-T] [-a *position-after*] [-b *position-before*] [-c] [-D] [-f] [-i *position-before*] [-j] [-s | -S] [-u] [-U] [-v] [-z] *archive file ...*

ar -s [-j] [-z] *archive*

ar -t [-f] [-T] [-v] *archive [file ...]*

ar -x [-C] [-T] [-f] [-o] [-u] [-v] *archive [file ...]*

ar -M

ranlib [-D] [-U] *archive ...*

DESCRIPTION

The **ar** utility creates and maintains groups of files combined into an archive. Once an archive has been created, new files can be added to it, and existing files can be extracted, deleted or replaced.

Files are named in the archive by their last file name component, so if a file referenced by a path containing a "/" is archived, it will be named by the last component of the path. Similarly when matching paths listed on the command line against file names stored in the archive, only the last component of the path will be compared.

The normal use of **ar** is for the creation and maintenance of libraries suitable for use with the link editor `ld(1)`, although it is not restricted to this purpose. The **ar** utility can create and manage an archive symbol table (see `ar(5)`) used to speed up link editing operations. If a symbol table is present in an archive, it will be kept up-to-date by subsequent operations on the archive.

The **ranlib** utility is used to add an archive symbol table to an existing archive.

OPTIONS

The **ar** utility supports the following options:

-a *member-after*

When used with option **-m** this option specifies that the archive members specified by arguments *file ...* are moved to after the archive member named by argument *member-after*. When used with option **-r** this option specifies that the files specified by arguments *file ...* are added after the archive member named by argument *member-after*.

-b *member-before*

When used with option **-m** this option specifies that the archive members specified by arguments *file ...* are moved to before the archive member named by argument *member-before*. When used with option **-r** this option specifies that the files specified by arguments *file ...* are added before the archive member named by argument *member-before*.

-c Suppress the informational message printed when a new archive is created using the **-r** and **-q** options.

-C Prevent extracted files from replacing like-named files in the file system.

-d Delete the members named by arguments *file ...* from the archive specified by argument *archive*. The archive's symbol table, if present, is updated to reflect the new contents of the archive.

-D When used in combination with the **-r** or **-q** option, with the **-s** option without other options, or when invoked as **ranlib**, insert 0's instead of the real mtime, uid and gid values and 0644 instead of file mode from the members named by arguments *file ...*. This ensures that checksums on the resulting archives are reproducible when member contents are identical. This option is enabled by default. If multiple **-D** and **-U** options are specified on the command line, the final one takes precedence.

-f Use only the first fifteen characters of the archive member name or command line file name argument when naming archive members.

-i *member-before*

Synonymous with option **-b**.

-j This option is accepted but ignored.

-l This option is accepted for compatibility with GNU ar(1), but is ignored.

-m Move archive members specified by arguments *file ...* within the archive. If a position has been specified by one of the **-a**, **-b** or **-i** options, the members are moved to before or after the specified position. If no position has been specified, the specified members are moved to the end of the archive. If the archive has a symbol table, it is updated to reflect the new contents of the archive.

-M Read and execute MRI librarian commands from standard input. The commands understood by the **ar** utility are described in the section *MRI Librarian Commands*.

-o Preserve the original modification times of members when extracting them.

- p** Write the contents of the specified archive members named by arguments *file ...* to standard output. If no members were specified, the contents of all the files in the archive are written in the order they appear in the archive.
- q** Append the files specified by arguments *file ...* to the archive specified by argument *archive* without checking if the files already exist in the archive. The archive symbol table will be updated as needed. If the file specified by the argument *archive* does not already exist, a new archive will be created.
- r** Replace (add) the files specified by arguments *file ...* in the archive specified by argument *archive*, creating the archive if necessary. Replacing existing members will not change the order of members within the archive. If a file named in arguments *file ...* does not exist, existing members in the archive that match that name are not changed. New files are added to the end of the archive unless one of the positioning options **-a**, **-b** or **-i** is specified. The archive symbol table, if it exists, is updated to reflect the new state of the archive.
- s** Add an archive symbol table (see ar(5)) to the archive specified by argument *archive*. Invoking **ar** with the **-s** option alone is equivalent to invoking **ranlib**.
- S** Do not generate an archive symbol table.
- t** List the files specified by arguments *file ...* in the order in which they appear in the archive, one per line. If no files are specified, all files in the archive are listed.
- T** This option is accepted but ignored. In other implementations of **ar**, **-T** creates a "thin" archive.
- u** Conditionally update the archive or extract members. When used with the **-r** option, files named by arguments *file ...* will be replaced in the archive if they are newer than their archived versions. When used with the **-x** option, the members specified by arguments *file ...* will be extracted only if they are newer than the corresponding files in the file system.
- U** When used in combination with the **-r** or **-q** option, insert the real mtime, uid and gid, and file mode values from the members named by arguments *file ...*. If multiple **-D** and **-U** options are specified on the command line, the final one takes precedence.
- v** Provide verbose output. When used with the **-d**, **-m**, **-q** or **-x** options, **ar** gives a file-by-file description of the archive modification being performed, which consists of three white-space separated fields: the option letter, a dash "-", and the file name. When used with the **-r** option, **ar** displays the description as above, but the initial letter is an "a" if the file is added to the archive, or an "r" if the file replaces a file already in the archive. When used with the **-p** option, the name

of the file enclosed in "<" and ">" characters is written to standard output preceded by a single newline character and followed by two newline characters. The contents of the named file follow the file name. When used with the **-t** option, **ar** displays eight whitespace separated fields: the file permissions as displayed by `strmode(3)`, decimal user and group IDs separated by a slash ("/"), the file size in bytes, the file modification time in `strftime(3)` format "%b %e %H:%M %Y", and the name of the file.

- V** Print a version string and exit.
- x** Extract archive members specified by arguments *file ...* into the current directory. If no members have been specified, extract all members of the archive. If the file corresponding to an extracted member does not exist it will be created. If the file corresponding to an extracted member does exist, its owner and group will not be changed while its contents will be overwritten and its permissions will set to that entered in the archive. The file's access and modification time would be that of the time of extraction unless the **-o** option was specified.
- z** This option is accepted but ignored.

MRI Librarian Commands

If the **-M** option is specified, the **ar** utility will read and execute commands from its standard input. If standard input is a terminal, the **ar** utility will display the prompt "AR >" before reading a line, and will continue operation even if errors are encountered. If standard input is not a terminal, the **ar** utility will not display a prompt and will terminate execution on encountering an error.

Each input line contains a single command. Words in an input line are separated by whitespace characters. The first word of the line is the command, the remaining words are the arguments to the command. The command word may be specified in either case. Arguments may be separated by commas or blanks.

Empty lines are allowed and are ignored. Long lines are continued by ending them with the "+" character.

The "*" and ";" characters start a comment. Comments extend till the end of the line.

When executing an MRI librarian script the **ar** utility works on a temporary copy of an archive. Changes to the copy are made permanent using the **save** command.

Commands understood by the **ar** utility are:

addlib *archive* | **addlib** *archive* (*member* [, *member*]...)

Add the contents of the archive named by argument *archive* to the current archive. If specific members are named using the arguments *member*, then those members are added to the current archive. If no members are specified, the entire contents of the archive are added to the current archive.

addmod *member* [, *member*]...

Add the files named by arguments *member* to the current archive.

clear Discard all the contents of the current archive.

create *archive*

Create a new archive named by the argument *archive*, and makes it the current archive. If the named archive already exists, it will be overwritten when the **save** command is issued.

delete *module* [, *member*]...

Delete the modules named by the arguments *member* from the current archive.

directory *archive* (*member* [, *member*]...) [*outputfile*]

List each named module in the archive. The format of the output depends on the verbosity setting set using the **verbose** command. Output is sent to standard output, or to the file specified by argument *outputfile*.

end Exit successfully from the **ar** utility. Any unsaved changes to the current archive will be discarded.

extract *member* [, *member*]...

Extract the members named by the arguments *member* from the current archive.

list Display the contents of the current archive in verbose style.

open *archive*

Open the archive named by argument *archive* and make it the current archive.

replace *member* [, *member*]...

Replace named members in the current archive with the files specified by arguments *member*. The files must be present in the current directory and the named modules must already exist in the current archive.

save Commit all changes to the current archive.

verbose

Toggle the verbosity of the **directory** command.

EXAMPLES

To create a new archive *ex.a* containing three files *ex1.o*, *ex2.o* and *ex3.o*, use:

```
ar -rc ex.a ex1.o ex2.o ex3.o
```

To add an archive symbol table to an existing archive *ex.a*, use:

```
ar -s ex.a
```

To delete file *ex1.o* from archive *ex.a*, use:

```
ar -d ex.a ex1.o
```

To verbosely list the contents of archive *ex.a*, use:

```
ar -tv ex.a
```

To create a new archive *ex.a* containing the files *ex1.o*, and *ex2.o*, using MRI librarian commands, use the following script:

```
create ex.a          * specify the output archive
addmod ex1.o ex2.o  * add modules
save                * save pending changes
end                 * exit the utility
```

DIAGNOSTICS

The **ar** utility exits 0 on success, and >0 if an error occurs.

SEE ALSO

ld(1), archive(3), elf(3), strftime(3), strmode(3), ar(5)

STANDARDS COMPLIANCE

The **ar** utility's support for the **-a**, **-b**, **-c**, **-i**, **-m**, **-p**, **-q**, **-r**, **-s**, **-t**, **-u**, **-v**, **-C** and **-T** options is believed to be compliant with IEEE Std 1003.2 ("POSIX.2").

HISTORY

An **ar** command first appeared in AT&T UNIX Version 1. In FreeBSD 8.0, Kai Wang <kaiw@FreeBSD.org> reimplemented **ar** and **ranlib** using the Streaming Archive Library (libarchive, -larchive) and the ELF Access Library (libelf, -lelf).