

To: MTB Distribution
From: T. Casey
Date: December 30, 1974
Subject: New list command - Revision 1

The design of the new list command proposed in MTB-125 has been modified as a result of the design review. The changes made to the original proposal are summarized below. A draft MPM writeup of the revised design is attached.

Changes to Proposed Features

1. The ability to control the order in which entry types are listed, by typing their corresponding control arguments in the desired order, has been removed. It was felt that the undesirability of order-dependent control arguments outweighs any advantage of being able to vary the order of the listing.

The change to the default order remains, however, and entry types will now be listed in the order: segments, multisection-files, directories, and links.

2. The method of specifying which columns are to be printed has been changed slightly. In the original proposal, giving the control argument corresponding to a column caused that column, plus all those to its right, to be printed, unless -brief was also given. The default was -mode, causing mode, records, and names to be listed by default.

In the revised proposal, by default, the names, records, and mode columns will be printed, but if -brief, or any of the control arguments corresponding to the default columns, is given, the default will be overridden, and only the names column (which is always printed), plus any columns named explicitly by control arguments, will be printed.

Either or both dates will be printed, if their corresponding control arguments are given. Use of the date control arguments will have no effect on whether or not any of the default columns are printed.

3. The method of specifying which column to sort on was changed. Instead of typing one of the column-name control arguments after -sort to request sorting on the corresponding column, it will now be necessary to type a

Multics Project internal working documentation. Not to be reproduced or distributed outside the Multics Project.

keyword that does not begin with a minus sign. The keywords will be spelled the same as the column-name control arguments (except for the leading minus signs), and both the long and short forms will be accepted. It was felt that a value following a control argument should not have the same form as a control argument.

4. The default of sorting on the leftmost column, when `-sort` is given without being followed by a column specification, has been changed. If one of the sort keywords follows `-sort`, the listing will be sorted by the specified column. However, if none of the keywords follows `-sort`, a default column will be determined as follows: if neither date is being printed, sort by name; if one of the dates is being printed, sort by that date; if both dates are being printed, sort by dtm.

New Restriction

The ability to give more than one `-pathname` argument (to specify that more than one directory be listed), will be removed from the command. A single `-pathname` argument, anywhere on the line, will cause only that directory to be listed, and, naturally, all starnames given on the command line will be searched for in that directory. The default will still be to list the working directory. The purpose of this is to eliminate all order-dependent control arguments.

New Features

1. The ability to sort by mode has been added.
2. A new argument, `-match`, has been added, to request that, for multiply-named entries, only those names that match a starname be printed. (This is what the current list command does by default, but the default is being changed to print all names on the entries selected for listing.)
3. New control arguments: `-from` (`-fm`) `date_time` and `-to` `date_time` have been added, to request that only entries having dtm or dtu between the specified dates be printed. dtm will be used for this purpose in all cases except when dtu is being printed or sorted on, and dtm is being neither printed nor sorted on.

If `-from` is omitted, entries from the earliest `date_time` thru the `-to` `date_time` will be printed. If `-to` is omitted, entries from the `-from` `date_time` thru the current `date_time` will be printed. The given `date_times` must be strings acceptable to `convert_date_to_binary`, and the `-to` `date_time` must be later than the `-from` `date_time`.

4. A new control argument, `-exclude` (`-ex`) has been added, to specify that entries matching a given starname be excluded

from the listing, rather than being included. This new argument will precede each starname whose matching entries are to be excluded. It will be possible to give both include and exclude starnames on the same command line, and only entries that meet both criteria will be listed. That is, entries matching any of the exclude starnames will be excluded from the listing, and from the ones that remain, those that match any of the include starnames will be listed.

Documentation

The attached MPM writeup says that the default order, when no sorting is specified, is the order in which entries are found in the directory, and that `-reverse` without `-sort` will reverse this order.

Some readers of this MTB might interpret this as a change in the present operation of the `list` command, knowing that new entries are added to the end of a directory, with the oldest entries remaining at the beginning, and the `list` command deliberately reverses this order, printing the newest entries first. In fact, the operation of the command is not changing, but the MPM writeup is being simplified by the removal of the above detail.

NAME: list, ls

The list command prints information about entries in a single directory. Arguments allow the user to specify the directory to be listed, the entry types, names, and dates for which information is to be printed, the amount of information to be printed for each entry, and the order in which entries are to be listed.

The default, when no arguments are given, is to list files (segments and multi-segment files) of all names, in the working directory. For each entry, the mode, records used, primary name, and any additional names, will be printed. The two entry types will be listed in the order: segments, multi-segment files; within each entry type, entries will be printed in the order in which they are found in the directory. Preceding the listing of each entry type will be a line giving the total number of entries of that type and the total records used.

USAGE: list -entry_names- -control_arguments-

1) entry_names are the (optional) names of entries to be listed. If entry names are given, only entries having at least one name matching one of the entry names will be listed. The star convention may be used in the entry names. Except when the -exclude control argument is used, the positions of the entry names (before, after, or among the control arguments) have no significance.

2) control_arguments may be chosen from the following:

-pathname dir_path
-pn dir_path causes the directory dir_path to be listed, instead of the working directory.

The following control arguments are used to specify the entry types to be listed:

-segment, -sm print information about segments.
-multisegment_file,
-msf print information about multi-segment files.
-file, -f print information about files (i.e., segments and multi-segment files, in that order). This is the default.
-directory, -dr print information about directories.
-branch, -br print information about branches (i.e., segments, multi-segment files, and

directories, in that order).

- link, -lk print information about links.
- all, -a print information about all entry types (segments, multi-segment files, directories, and links, in that order).

The following control arguments are used to specify whether totals information, or detailed information for each entry, or both, should be printed:

- total, -tt print only the heading lines giving total entries and total records used, for each entry type specified.
- no_header, -nhe omit the heading lines (which are printed by default when detailed information about each entry is being printed).

The default is to print totals information, plus detailed information for each entry. When detailed information is being printed, it is arranged in columns, in the order (from left to right): date-time modified, date-time used, mode, records used, names, name count. By default, only the mode, records, and names columns are printed. If the -brief control argument (see below) or any of the control arguments corresponding to these default columns is given, then this default is overridden, and only the names column, plus any columns selected explicitly by control arguments, will be printed.

The following control arguments are used to specify which columns should be printed:

- name, -nm print the names column.
- record, -rec print the records column.
- mode, -md print the mode column.
- date_time_used, print the date-time used column.
- dtu
- date_time_modified, print the date-time modified column.
- dtm

The following control arguments are used to specify the printing of information about multiply-named entries:

- primary, -pri print the primary name, but not the additional names, of multiply-named entries.

`-match` print only those names that match one of the given starnames.

The default is to print all of the names of multiply-named entries.

`-count, -ct` for multiply-named entries, print the total number of names.

The following control arguments are used to decrease the amount of information printed, or cause it to be printed in a more compact format:

`-brief, -bf` This argument has two meanings, depending on whether or not detailed information is being printed. If just totals information is being printed, this argument will cause the totals information for all selected entry types to be abbreviated and printed on a single line. Otherwise, it will suppress the printing of the default columns when they are not explicitly named in control arguments. For example, `list -dtu -brief` will cause names and `date_time_used`, but not mode and records, to be printed.

`-short, -sh` print link pathnames starting two spaces after their entry names, instead of aligning them in column 35.

The items: mode, records, and `date_time_used` have no meaning for links, and there is an additional item, `link_path`, associated with each link. There is no control argument to specify that `link_path` should be printed. It will be printed in all cases except the following:

- 1) when only totals information is being printed;
- 2) when the only column being printed is the names column;
- 3) when the `-brief` control argument is given.

The following control arguments specify the order in which entries will be printed, within each entry type:

`-sort sort_key` sort entries according to either name, records, mode, `date_time_used`, or `date_time_modified`, as specified by the `sort_key`, or by the default described below.

The `sort_key` can be one of the following keywords:

name, nm	sort entries by primary name.
record, rec	sort entries by records used (largest first).
mode, md	sort entries by mode.
date_time_used, dtu	sort entries by date_time_used (most recent first).
date_time_modified, dtm	sort entries by date_time_modified (most recent first).

If `sort_key` is omitted, the default column on which to sort is determined as follows: if neither date is being printed, sort by primary name; if one of the dates is being printed, sort by that date; if both dates are being printed, sort by date-time modified.

Links can only be sorted by name or date-time modified. When sorting by any other column is specified, links will remain in the order in which they are found in the directory.

If `-sort` is not given, entries will be printed in the order in which they are found in the directory.

`-reverse, -rv` This argument is used to reverse the order in which entries are printed. If `-sort` is also given, the sort will be reversed. Otherwise entries will be printed in the reverse of the order in which they are found in the directory.

The following control arguments are used to specify that only a subset of all entries in the directory be listed:

`-exclude entry_name`
`-ex entry_name` do not list any entries that have a name that matches `entry_name`. The star convention can be used in `entry_name`.

Multiple exclude entry names can be given (each immediately preceded by the `-exclude` control argument). They will operate together with include entry names (those not preceded by `-exclude`), to limit the entries listed. All entries having a name that matches any of the exclude entry names will be excluded from the listing, and from the entries that remain, all those that have a name matching any of the include entry names will be listed.

The following control arguments are used to limit the entries listed to those having date-times (either date-time modified or date-time used) before or after specified date-times. The date-time that is used in this comparison will be date-time modified, in all cases except when date-time used is being printed or sorted on, and date-time modified is neither being printed nor sorted on, in which case, date-time used will be used in this comparison.

- from date-time
- fm date-time do not list entries whose date-time (selected as described above) is before the specified date-time.
- to date-time do not list entries whose date-time (selected as described above) is after the specified date-time.

If both are given, the from date-time must be earlier than the to date-time. The value after -from or -to must be a string acceptable to the `convert_date_to_binary_subroutine`, described in MPM Volume III (Subroutines). If the date-time string contains blanks, it must be enclosed in quotation marks. Note that the from and to values are date-times, and that the default time supplied by `convert_date_to_binary`, when only a date is given, is Midnight. Therefore, to list entries modified on a certain date, use -from that_date -to next_date.

EXAMPLES:

```
list -pri -ct
```

lists all files in the working directory; for multiply-named files, the primary name is printed, but not any of the secondary names, and the total number of names that the file has is printed after the primary name, on the same line. In addition to the names column, the mode and records used columns are printed. (This is the default, and it will not be mentioned in the examples below, when only the default columns are printed.)

```
list -sm *.* -ex *.pl1
```

lists all the segments in the working directory having two-component names whose second component is not "pl1".

```
list -ex *.*
```

lists all the files in the working directory having other than two-component names.

```
list -dtm -sort
```


lists all files in the working directory, sorted by date-time modified. The date-time modified column is printed, in addition to the mode, records, and names columns.

`list -name -sort dtm`

lists all files in the working directory, sorted by date-time modified. Only the file names are printed.

`list -sm -name -pri -nhe`

lists the primary name of each segment in the working directory, without printing a heading line or other extraneous lines.

`list -mode -pri`

lists the mode and primary name of each file in the working directory.