

# Raspberry Pi Internet Radio

## Compiling and installing the Music Player Daemon



A comprehensive guide how to compile and install the Music Player Daemon

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MPD Version 0.23.13

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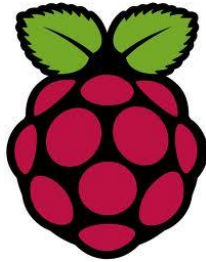
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# Chapter 1 - Introduction



This manual describes how download, compile and install the Music Player Daemon (**MPD**) for Raspberry Pi on the **Raspberry Pi OS** operating system (Formally called **Raspbian**). It is a supplement to the **Raspberry Pi Constructors Guide** for building Internet radios. However, it can be used for any package which utilises the Music Player Daemon.

The source and basic construction details for the *Raspberry Pi Internet Radio* are available from the following web site:

[https://bobrathbone.com/raspberrypi/pi\\_internet\\_radio.html](https://bobrathbone.com/raspberrypi/pi_internet_radio.html)

## Motivation for writing this procedure

The Raspberry Pi usually is installed with the **Raspberry Pi OS** operating system. At the time of writing the latest version of **Raspberry Pi OS** is called **Bullseye**. Unfortunately, **Raspberry Pi OS** is released with out-of-date versions of the Music Player daemon. To date the MPD software is never updated with the normal package upgrade releases.

The **MPD** version described in this procedure is **0.23.13** whilst the version released with **Bullseye** is **0.22.6** and is already fairly out-of-date. The version released with **Buster** is **0.21.5** which is even worse as it is years out of date. The latest version of MPD is much more stable. Due to their age, it is impossible to get support on the older versions of MPD.

## Audience

This guide is intended for anyone that wishes to update their Music Player Daemon and Client (MPC) to the latest version. However, a certain amount of knowledge of the Linux Operating System is required as well as the ability to edit and change system files. This does not rule this procedure out for use by those less experienced but in such a case caution should be applied as the procedures in this manual are classed as moderately advanced.

## Pre-requisites

1. **Raspberry Pi OS Buster** or **Bullseye** installed and updated using **apt update** and **apt full-upgrade**.
2. The version of **MPD** package released with Raspberry Pi OS **Buster (0.21.5)** or **Bullseye (0.22.6)** should be first installed.
3. A reasonably fast Raspberry Pi. The **Raspberry Pi Zero** isn't really suitable.



**Note:** During testing an attempt was made to run this procedure on a **Pi Zero** but without success. The problem was that the compile phase took hours to run and seemed to hang.

The suggestion is to put the SD card to be upgraded into a faster Raspberry Pi and then upgrade it or run the compilation procedure on the Raspberry Pi Zero overnight.

## Radio software installation

If you have reached this document whilst installing the Raspberry Pi Radio Software (**radiod**) then you should first install and configure the MPD software released with Buster and the radio software as shown in the constructor's manual.

See <https://www.bobrathbone.com/raspberrypi/documents/Raspberry%20PI%20Radio.pdf>

## Supported Operating Systems

Two versions of the Raspberry Pi OS are supported in this tutorial.

- **Bullseye** – Install version **0.23.13** (mpd\_0.23.13\_armhf.deb)
- **Buster** – Install version **0.23.5** (mpd\_0.23.5\_armhf.deb)

Version **0.23.13** will not run on Buster as it requires the **libc6** library which is not available in **Buster**. If using **Buster** substitute all commands using **0.23.13** with **0.23.5**. For example:

```
$ wget http://www.musicpd.org/download/mpd/0.23/mpd-0.23.13.tar.xz
```

For **Buster**:

```
$ wget http://www.musicpd.org/download/mpd/0.23/mpd-0.23.5.tar.xz
```

## Conventions used in this tutorial

Installation of the radio program requires you to enter lines at the command line prompt. This requires you to log into the Raspberry Pi as user '**pi**'. The default password is **raspberrypi**.



**Note:** Don't carry out any of the following commands just yet. They are just examples.

```
Raspberrypi login: pi
Password: raspberrypi
pi@raspberrypi:~$ Last login: Wed Sep  9 12:17:35 2020 from 192.168.1.200
pi@raspberrypi:~$
```

The prompt line is displayed ending with a \$ sign. The **pi@raspberrypi:~** string means user 'pi' on host machine called 'raspberrypi'. The ~ character means the user 'pi' home directory **/home/pi**. In this tutorial if you are required to do something as user **pi** then only the \$ sign will be shown followed by the command as shown in the example below:

```
$ mpc status
```

Copy and paste the **highlighted text** only to the command line. Omit the \$ sign.

Some commands produce a lot of output which does not need to be shown. In such a case a colon (':') is used to indicate that some output has been omitted.

```
$ mpd -v
Music Player Daemon 0.23.13(0.23.13)
Copyright 2003-2007 Warren Dukes <warren.dukes@gmail.com>
Copyright 2008-2018 Max Kellermann <max.kellermann@gmail.com>
:
Other features:
  avahi dbus udisks epoll icu inotify ipv6 systemd tcp un
```

Note that when a command is shown with the resulting output the command which was entered is shown in **bold**.

END OF EXAMPLE COMMANDS.

## Chapter 2 - Installing the latest MPD and MPC software

There are two methods of updating MPD.

1. Download the latest MPD source, then compile and install it.
2. Download a ready-made Debian package **mpd\_0.23.13\_armhf.deb**

To install directly from the Debian package (option 2) see *Installing MPD upgrade from a Debian package* on page 8.

### Compiling and installing the latest Music Player Daemon

This procedure is based upon the following document.

<https://www.musicpd.org/doc/html/user.html>

You are strongly advised to read both the above document and this one but with caution as either can change. However, there are a number of gaps in the document from **musicpd.org** which can lead to confusion when operating the new version of MPD. This guide has been written for the installation of Music Player Daemon version **0.23.13** dated 1st June 2023.

### Upgrade the operating system

Run the following three commands: DO NOT SKIP THIS STEP!

```
$ sudo apt update
$ sudo apt full-upgrade
$ sudo reboot
```

### Downloading the source

The source is downloaded from **MusicPd** at <https://www.musicpd.org/>

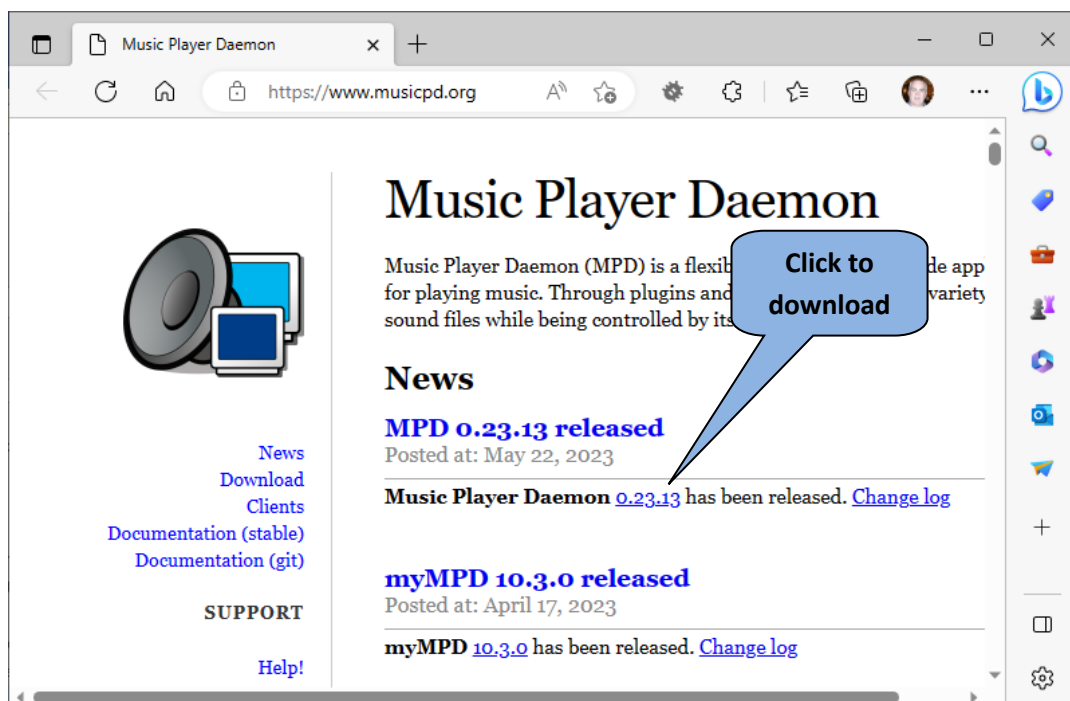


Figure 1 Music Player Daemon Website

This will list the latest version of the software; in this case it is version **0.23.13**. If downloading a later version than shown then substitute the version number shown in the following examples with the one you are downloading. Either click on the version number to download the software to your PC,

or alternatively right click the version number to copy the link then use **wget** to download it via the command line on the Raspberry Pi. Substitute **0.23.13** with **0.23.5** in the following commands if using Buster.

```
$ cd
$ wget https://www.musicpd.org/download/mpd/0.23/mpd-0.23.13.tar.xz
```

Now unzip the archive

```
tar -xvf mpd-0.23.13.tar.xz
```

This will unzip the archive to a directory called **mpd-0.23.13**.

## Install Ninja and Meson build utilities

This build uses Ninja and Meson.

```
$ sudo apt install meson ninja-build
```

## Install pre-requisite libraries

Now install the pre-requisite libraries. Note that the text below is all one line. Do not copy the \$.

```
$ sudo apt install meson g++ libpcrc3-dev libmad0-dev libmpg123-dev
libid3tag0-dev libflac-dev libvorbis-dev libopus-dev libogg-dev libadplug-
dev libaudiofile-dev libsndfile1-dev libfaad-dev libfluidsynth-dev libgme-
dev libmikmod-dev libmodplug-dev libmpcdec-dev libwavpack-dev libwildmidi-
dev libsidplay2-dev libsidutils-dev libresid-builder-dev libavcodec-dev
libavformat-dev libmp3lame-dev libtwolame-dev libshine-dev libsamplerate0-
dev libsoxr-dev libbz2-dev libcdio-paranoia-dev libiso9660-dev libmms-dev
libzip-dev libcurl4-gnutls-dev libyajl-dev libexpat-dev libasound2-dev
libao-dev libjack-jackd2-dev libopenal-dev libpulse-dev libshout3-dev
libsndio-dev libmpdclient-dev libnfs-dev libupnp-dev libavahi-client-dev
libsqlite3-dev libsystemd-dev libgtest-dev libboost-dev libicu-dev
libchromaprint-dev libgcrypt20-dev
```

Press enter to install the above libraries.

## Build the MPD package

The package uses a multi-platform software build system called **meson** from [mesonbuild.com](https://mesonbuild.com). See [https://mesonbuild.com/](https://mesonbuild.com) for further information.

Change to the recently created MPD build directory:

```
$ cd mpd-0.23.13
```

Configure the package with the following command:

```
$ meson . output/release --buildtype=debugoptimized -Db_ndebug=true
```

MPD is compiled and installed using **ninja**. For further information see <https://ninja-build.org/>. Run the following.

```
$ sudo ninja -C output/release
```

This will take quite a long time as it has at least 670 files to compile. On a Raspberry Pi 4 it will take about 7 minutes. On an older slower Raspberry Pi it will be at least twice that.

## Install the MPD package

Stop MPD and any software using it. In this example **radiod** is stopped.

```
$ sudo systemctl stop radiod mpd
```

Finally run the following command to actually install the package.

```
$ sudo ninja -C output/release install
```

This will install the **mpd** daemon in the **/usr/local/bin** directory.

```
ninja: Entering directory `output/release'
[1/2] Installing files.
Installing mpd to /usr/local/bin
Installing /home/pi/mpd-0.23.13/systemd/system/mpd.socket to
/lib/systemd/system
Installing /home/pi/mpd-0.23.13/output/release/systemd/system/mpd.service to
/lib/systemd/system
Installing /home/pi/mpd-0.23.13/systemd/user/./system/mpd.socket to
/usr/lib/systemd/user
Installing /home/pi/mpd-0.23.13/output/release/systemd/user/mpd.service to
/usr/lib/systemd/user
Installing /home/pi/mpd-0.23.13/mpd.svg to
/usr/local/share/icons/hicolor/scalable/apps
Installing /home/pi/mpd-0.23.13/AUTHORS to /usr/local/share/doc/mpd
Installing /home/pi/mpd-0.23.13/COPYING to /usr/local/share/doc/mpd
Installing /home/pi/mpd-0.23.13/NEWS to /usr/local/share/doc/mpd
Installing /home/pi/mpd-0.23.13/README.md to /usr/local/share/doc/mpd
```

## Configuring the new MPD package

If you previously installed version **0.21.5** of MPD released with **Buster** or **0.22.6** released with **Bullseye**, then the old version of **mpd** will still be present in the **/usr/bin** directory.

```
$ /usr/bin/mpd -V | head -1
Music Player Daemon 0.22.6 (0.22.6)
```

However, the new **mpd** binary is installed in **/usr/local/bin**.

```
$ which mpd
/usr/local/bin/mpd
```

This can be confirmed with the following command:

```
$ /usr/local/bin/mpd -V | head -1
Music Player Daemon 0.23.13 (0.23.13)
```



If MPD doesn't start edit the `/usr/local/lib/systemd/system/mpd.service` file (Use `sudo vi` or `nano`)

Change the **ExecStart** line from:

```
ExecStart=/usr/bin/mpd --systemd
```

To the following:

```
ExecStart=/usr/bin/mpd --systemd /etc/mpd.conf
```

Now reload system units.

```
$ sudo systemctl daemon-reload
```

## Testing MPD

Start the MPD daemon and check its status.

```
$ sudo systemctl start mpd
$ sudo systemctl status mpd
```

This should display something similar to the following:

```
• mpd.service - Music Player Daemon
   Loaded: loaded (/usr/local/lib/systemd/system/mpd.service; disabled;
   vendor preset: enabled)
   Active: active (running) since Sun 2022-07-24 09:25:13 BST; 1min 4s ago
   TriggeredBy: • mpd.socket
     Docs: man:mpd(1)
           man:mpd.conf(5)
   Main PID: 19029 (mpd)
     Tasks: 6 (limit: 2055)
        CPU: 2.534s
   CGroup: /system.slice/mpd.service
           └─19029 /usr/local/bin/mpd --systemd /etc/mpd.conf

Jul 24 09:25:13 piradio2 systemd[1]: Starting Music Player Daemon...
Jul 24 09:25:13 piradio2 mpd[19029]: Ignoring the 'pid_file' setting in
systemd mode
Jul 24 09:25:13 piradio2 systemd[1]: Started Music Player Daemon.
:
```

Note: Note ignore any warnings about wildmidi or bind errors.

Note that the version of **mpd** being used is in `/usr/local/bin` and not `/usr/bin`. This is confirmed with the following command:

```
$ which mpd
/usr/local/bin/mpd
```

This also applies to the service startup files which are now contained in the `/usr/local/lib/system/system` directory and not `/lib/system/system`.

If you already have a playlist and MPD has been configured for your sound device the first station should start playing. If you don't have a playlist then create one in **/var/lib/mpd/playlists/<playlist name>.m3u**

For example, **/var/lib/mpd/playlists/\_Radio.m3u**

```
#EXTM3U
#EXTINF:-1,BBC Radio 1
http://sc59.lon.llnw.net:80/stream/bbcmedia_radiol_mf_p#BBC Radio 1
#EXTM3U
#EXTINF:-1,BBC Radio 2
http://bbcmedia.ic.llnwd.net/stream/bbcmedia_radio2_mf_p?s#BBC Radio 2
#EXTINF:-1,Nashville FM
http://server-27.stream-server.nl:8300/stream#Nashville FM
#EXTM3U
#EXTINF:-1,UK Country Radio
http://s3.xrad.io:8064/#UK Country Radio
#EXTM3U
#EXTINF:-1,Radio Lichtenstein
http://live.radiol.li:8000/country#Radio Lichtenstein
```

Now load the new radio playlist. Omit the **m3u** extension.

```
$ mpc load _Radio
```

Confirm that it is loaded.

```
$ mpc playlist
BBC Radio 1
BBC Radio 2
UK Country Radio
```

Now play the first station.

```
$ mpc play
BBC Radio 1
[playing] #1/143 0:00/0:00 (0%)
volume: 60% repeat: off random: off single: off consume: off
```

Adjust the volume as necessary

```
$ mpc volume 70
```

This ends the procedure. If you are running the Rathbone radio software the restart it by rebooting the Raspberry Pi or run **sudo systemctl start radiod**.

## Installing MPD upgrade from a Debian package



At the time of writing this procedure only works on Buster. For Bullseye it is only possible to use the compilation and installation procedure from source.

The package is currently available in the package directory on the Bob Rathbone web site. This is an upgrade and **mpd** and **mpc** must be installed first. If you have already installed the Rathbone Internet radio software then this step isn't necessary but does no harm as mpc and mpd are already installed.

```
$ sudo apt install mpd mpc
```

Answer yes 'y' when asked to continue.

Install the required libraries. This may take some time if not already installed. Note the following instruction is all one line. Do not copy the \$ character.

```
$ sudo apt install libsidutils0 libresid-builder0c2a libcurl3-gnutls  
libaudiofile1 libyajl2 libiso9660-11 libzzip-0-13 libao4
```

### For Bullseye

```
$ sudo apt install libadplug-2.3.3-0
```

### For Buster

```
$ sudo apt install libadplug-2.2.1-0v5
```

Download the MPD update software.

```
$ wget https://bobrathbone.com/raspberrypi/packages/mpd_0.23.13_armhf.deb
```

Now install with **dpkg**.

```
$ sudo dpkg -i mpd_0.23.13_armhf.deb  
(Reading database ... 135664 files and directories currently installed.)  
Preparing to unpack mpd_0.23.13_armhf.deb ...  
Installing MPD  
systemctl stop mpd.service mpd.socket  
Warning: The unit file, source configuration file or drop-ins of mpd.service  
changed on disk. Run 'systemctl daemon-reload' to reload units.  
Unpacking mpd (0.23.13) over (0.22.6-1) ...  
Setting up mpd (0.23.13) ...  
Updating MPD configuration  
sudo chown mpd:audio /var/tmp/mpd.conf  
/etc/mpd.conf exists  
sudo chown mpd:audio /etc/mpd.conf  
Processing triggers for hicolor-icon-theme (0.17-2) ...  
Processing triggers for man-db (2.9.4-2) ...
```

Ignore the warnings for **/var/log/mpd** and **/var/lib/mpd**.

Modify `/usr/local/lib/systemd/system/mpd.service` to use `/etc/mpd.conf` as its configuration file:  
Change

```
ExecStart=/usr/bin/mpd --no-daemon
```

To

```
ExecStart=/usr/bin/mpd --no-daemon /etc/mpd.conf
```

Reboot the Raspberry Pi to enable the new version.

```
$ sudo reboot
```

Note: For some unknown reason when **mpd.socket** is run from this package it changes the ownership of the `/var/run/mpd` directory from **mpd:audio** to **root:root** which causes **mpd.service** to fail with a permissions error. To correct this problem the following line has been added to **mpd.service** just before the **ExecStart** statement.

```
ExecStartPre=--/bin/chown mpd:audio /var/run/mpd
```

## Installing the latest MPC client from source

The **mpc** client software is also out of date but will work fine with the latest version of MPD described in this manual. However, this can also be compiled and installed. Only carry out this routine after installing meson and ninja and compiling MPD as previously shown. Go to <https://www.musicpd.org/> and click on “clients” in the left-hand menu. Now copy the link to **mpc** as shown below.



Figure 2 MPC client source download

Type in **wget** and copy the link just copied from the musicpd.org site.

```
$ wget https://www.musicpd.org/download/mpc/0/mpc-0.34.tar.xz
```

Extract the **mpc** source archive.

```
$ tar -xvf mpc-0.34.tar.xz
```

Change to **mpc** the build directory.

```
$ cd mpc-0.34
```

Run meson to configure the compile process.

```
$ meson . output
```

Compile the **mpc** source code.

```
$ ninja -C output
```

Install the **mpc** client.

```
$ sudo ninja -C output install
ninja: Entering directory `output'
[0/1] Installing files.
Installing mpc to /usr/local/bin
Installing /home/pi/mpc-0.34/AUTHORS to /usr/local/share/doc/mpc
Installing /home/pi/mpc-0.34/COPYING to /usr/local/share/doc/mpc
Installing /home/pi/mpc-0.34/NEWS to /usr/local/share/doc/mpc
Installing /home/pi/mpc-0.34/README.rst to /usr/local/share/doc/mpc
Installing /home/pi/mpc-0.34/contrib/mpd-m3u-handler.sh to
/usr/local/share/doc/mpc/contrib
Installing /home/pi/mpc-0.34/contrib/mpd-pls-handler.sh to
/usr/local/share/doc/mpc/contrib
Installing /home/pi/mpc-0.34/contrib/mpc-completion.bash to
/usr/local/share/doc/mpc/contrib
```

The new **mpc** client will be found in

```
$ which mpc
/usr/local/bin/mpc
```

Move the old version of **mpc** out the way and link the newly compiled client to **/usr/bin/mpc**

```
$ cd /usr/bin/
$ sudo mv mpc mpc.old
$ sudo ln -s /usr/local/bin/mpc
```

Restart the MPD

```
$ sudo systemctl restart mpd
```

Test **mpc**. Check the version first.

```
$ mpc help | head -3 | grep version
mpc version: 0.34
```

Run **mpc**. There is no need to reboot the Raspberry Pi.

```
Radio Caroline: Sweet Little Machine - We Used To Own These Playgrounds
[playing] #18/116 262:59/0:00 (0%)
volume: 58%  repeat: off  random: off  single: off  consume: off
```



**Note:** There are new commands for the new version of **mpc**. A complete list of **mpc** commands is shown in *Appendix C – MPC commands* on page 20.

## Installing Music Player client (**mpc**) from a Debian package

The **mpc** client package is currently available in the package directory on the Bob Rathbone web site. This is an upgrade and the latest **mpd** as shown in the section called *Installing MPD upgrade from a Debian package* on page 8 must be installed first.

Download the MPD update software.

```
$ wget https://bobrathbone.com/raspberrypi/packages/mpc_0.34_armhf.deb
```

Now install with **dpkg**.

```
$ sudo dpkg -i mpc_0.34_armhf.deb
(Reading database ... 107174 files and directories currently installed.)
Preparing to unpack mpc_0.34_armhf.deb ...
Installing MPC
Unpacking mpc (0.34) over (0.34) ...
Removing MPC
sudo rm /usr/bin/mpc
sudo mv /usr/bin/mpc.old /usr/bin/mpc
Setting up mpc (0.34) ...
Updating MPC configuration
sudo rm /usr/bin/mpc
sudo ln -s /usr/local/bin/mpc /usr/bin/mpc
```

Test **mpc**.

```
$ mpc
BBC Radio: BBC Radio 2
[playing] #2/114 30:52/0:00 (0%)
volume: 85%  repeat: off  random: off  single: off  consume: off
```

## Chapter 3 - Building the MPD Debian packages

### Building the MPD Debian package

This chapter shows how to create the MPD Debian package using the script provided from the following GitHub Repository.

<https://github.com/bobbrathbone/mpdpackage>



Before this can be done you must first download and compile the MPD package from GitHub as shown in *Chapter 2 - Installing the latest MPD* on page 3. If this has already been done, download the MPD Debian package scripts from GitHub.

```
$ cd
$ git clone https://github.com/bobbrathbone/mpdpackage
```

Now change directory to **mpdpackage**.

```
$ cd mpdpackage
```

Edit the build script **build.sh**. Find the **BUILD\_DIR** definition. Amend this to point to the actual MPD build directory that was used in *Chapter 2 - Installing the latest MPD* on page 3.

```
BUILD_DIR=/home/pi/mpd-0.23.13
```

Now run the **build.sh** script.

```
$ ./build.sh
```

If you see an error similar to below, check that you have correctly specified the **BUILD\_DIR** definition.

```
Building MPD version 0.22.8
ERROR: /home/pi/mpd-0.22.8/output not found
Check that BUILD_DIR is correctly specified in this script
Aborting
```

If you have correctly specified the **BUILD\_DIR** definition the you should see the output similar to that shown in *Appendix B – MPD and MPC package build example output* on page 18. The package **mpd\_0.23.13\_armhf.deb** should also have been created. This can now be installed with **dpkg**.

```
$ sudo dpkg -i mpd_0.23.13_armhf.deb
```

If you require package symbols for debugging install **mpd-dbgsym\_0.23.13\_armhf.deb**

```
$ sudo dpkg -i mpd-dbgsym_0.23.13_armhf.deb
```

## Building the MPC Client Debian Package

This chapter shows how to create the MPC Client Debian package using the script provided from the following GitHub Repository.

<https://github.com/bobraithbone/mpcpackage>



Before this can be done you must first download and compile the MPD and MPC packages as shown in *Chapter 2 - Installing the latest MPD* on page 3 and *Installing the latest MPC client from source* on page 9.

First download the MPC Debian package scripts from GitHub.

```
$ cd
$ git clone https://github.com/bobraithbone/mpcpackage
```

Now change directory to **mpcpackage**.

```
$ cd mpcpackage
```

Edit the build script **build.sh**. Find the **BUILD\_DIR** definition. Amend this to point to the actual MPC build directory that was used in *Installing the latest MPC client from source* on page 9.

```
BUILD_DIR=/home/pi/mpc-0.34
```

Now run the **build.sh** script.

```
$ ./build.sh
```

If you see an error similar to below, check that you have correctly specified the **BUILD\_DIR** definition.

```
$ ./build.sh
Building MPC version 0.34
ERROR: /home/pi/mpc-0.34/output not found
Check that BUILD_DIR is correctly specified in this script
Aborting
```

If you have correctly specified the **BUILD\_DIR** definition the you should see the output similar to that shown in *Appendix B – MPD and MPC package build example output* on page 18. The package **mpd\_0.34\_armhf.deb** should also have been created. This can now be installed with **dpkg**.

```
$ sudo dpkg -i mpc_0.34_armhf.deb
```



## Chapter 4 - Trouble shooting

### MPD fails to start

#### Missing configuration file in the mpd.service file

```
$ sudo systemctl start mpd
Job for mpd.service failed because the control process exited with error
code.
See "systemctl status mpd.service" and "journalctl -xe" for details.
```

#### Check the status

```
$ systemctl status mpd.service
● mpd.service - Music Player Daemon
   Loaded: loaded (/usr/local/lib/systemd/system/mpd.service; disabled;
   vendor preset: enabled)
   Active: failed (Result: exit-code) since Fri 2020-05-29 19:30:19 BST;
   1min 41s ago
     Docs: man:mpd(1)
           man:mpd.conf(5)
   Process: 1060 ExecStart=/usr/local/bin/mpd --no-daemon (code=exited,
   status=1/FAILURE)
   Main PID: 1060 (code=exited, status=1/FAILURE)

May 29 19:30:19 buster03 systemd[1]: Starting Music Player Daemon...
May 29 19:30:19 buster03 mpd[1060]: exception: No configuration file found
May 29 19:30:19 buster03 systemd[1]: mpd.service: Main process exited,
   code=exited, status=1/FAILURE
May 29 19:30:19 buster03 systemd[1]: mpd.service: Failed with result 'exit-
   code'.
May 29 19:30:19 buster03 systemd[1]: Failed to start Music Player Daemon.
```

In this case `/usr/local/bin/mpd` cannot find `/etc/mpd.conf`. Check that the **ExecStart** statement in `/usr/local/lib/systemd/system/mpd.service` contains the configuration file name.

```
ExecStart=/usr/local/bin/mpd --no-daemon /etc/mpd.conf
```

#### Missing Libraries cause service start to fail

A message similar to the following shows that one or more required libraries are missing.

```
$ sudo systemctl status mpd.service
● mpd.service - Music Player Daemon
   :
Apr 12 01:54:59 buster04 mpd[3460]: /usr/local/bin/mpd: error while loading
   shared libraries: libao.
Apr 12 01:54:59 buster04 systemd[1]: mpd.service: Main process exited,
   code=exited, status=127/n/a
Apr 12 01:54:59 buster04 systemd[1]: mpd.service: Failed with result 'exit-
   code'.
Apr 12 01:54:59 buster04 systemd[1]: Failed to start Music Player Daemon.
```

Solution: Install the pre-requisite libraries. Note that the text below is all one line.  
Do not copy the \$. Press enter to install the libraries.

```
$ sudo apt install libpcres3 libao4 libmad0 libmpg123-0 libid3tag0 libflac8  
libvorbis0a libopus0 libogg0 libsndfile1 libfaad2 libfluidsynth1 libgme0  
libmikmod3 libmodplug1 libmpcdec6 libwavpack1 libwildmidi2 libsidplay2  
libsidutils0 libresid-builder0c2a libavcodec58 libavformat58 libmp3lame0  
libtwolame0 libshine3 libsamplerate0 libsoxr0 libbz2-1.0 libcdio-paranoia2  
libiso9660-11 libmms0 libzip-0-13 libyajl2 libexpat1 libasound2 libao0  
libjack-jackd2-0 libopenal1 libpulse0 libshout3 libsndio7.0 libmpdclient2  
libnfs12 libupnp13 libavahi-client3 libsqlite3-0 libsystemd0 libicu63  
libchromaprint1 libgcrypt20 libcurl3-gnutls libadplug-2.2.1-0v5  
libaudiofile1
```

Reset failed units **mpd** service units. and recheck.

```
$ sudo systemctl reset-failed mpd.socket mpd.service
```

Restart **mpd** service.

```
$ sudo systemctl start mpd.service
```

Re-check the mpd services.

```
$ sudo systemctl status mpd.*  
● mpd.service - Music Player Daemon  
   Loaded: loaded (/usr/local/lib/systemd/system/mpd.service; disabled;  
   vendor preset: enabled)  
   Active: active (running) since Sun 2022-03-20 08:39:11 GMT; 23min ago  
   TriggeredBy: ● mpd.socket  
     Docs: man:mpd(1)  
           man:mpd.conf(5)  
   Main PID: 2419 (mpd)  
     Tasks: 6 (limit: 4915)  
        CPU: 28.860s  
   CGroup: /system.slice/mpd.service  
           └─2419 /usr/local/bin/mpd --systemd /etc/mpd.conf  
  
:  
Mar 20 08:39:11 pi400 systemd[1]: Started Music Player Daemon.  
  
● mpd.socket  
   Loaded: loaded (/usr/local/lib/systemd/system/mpd.socket; disabled;  
   vendor preset: enabled)  
   Active: active (running) since Sun 2022-03-20 08:37:20 GMT; 25min ago  
   Triggers: ● mpd.service  
   Listen: /run/mpd/socket (Stream)  
           [::]:6600 (Stream)  
     Tasks: 0 (limit: 4915)  
        CPU: 2ms  
   CGroup: /system.slice/mpd.socket  
  
:
```

Finally remove any redundant libraries

```
$ sudo apt autoremove
```

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### Support

The author does not directly support the Music Player Daemon software. You are advised to contact the MPD forum at <https://forum.musicpd.org/>. However, if you have any comments or feedback about this procedure or document please contact [bob@bobrathbone.com](mailto:bob@bobrathbone.com)

### Acknowledgements and Copyrights

Warren Dukes [warren.dukes@gmail.com](mailto:warren.dukes@gmail.com) and Max Kellermann [max.kellermann@gmail.com](mailto:max.kellermann@gmail.com) and the **musicpd.org** community for their excellent work on the Music Player Daemon.

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## Appendix A – The MPD service file

Below is the service unit for MPD which is used by the **systemctl** command to stop and start **MPD**.

File **/usr/local/lib/systemd/system/mpd.service**

```
[Unit]
Description=Music Player Daemon
Documentation=man:mpd(1) man:mpd.conf(5)
After=network.target sound.target

[Service]
Type=notify
ExecStart=/usr/local/bin/mpd --no-daemon /etc/mpd.conf

# Enable this setting to ask systemd to watch over MPD, see
# systemd.service(5). This is disabled by default because it causes
# periodic wakeups which are unnecessary if MPD is not playing.
#WatchdogSec=120

# allow MPD to use real-time priority 50
LimitRTPRIO=50
LimitRTTIME=infinity

# disallow writing to /usr, /bin, /sbin, ...
ProtectSystem=yes

# more paranoid security settings
NoNewPrivileges=yes
ProtectKernelTunables=yes
ProtectControlGroups=yes
ProtectKernelModules=yes
# AF_NETLINK is required by libsmbclient, or it will exit() .. *sigh*
RestrictAddressFamilies=AF_INET AF_INET6 AF_UNIX AF_NETLINK
RestrictNamespaces=yes

[Install]
WantedBy=multi-user.target
Also=mpd.socket
```

If installing from the MPD Debian package the following line is added to **mpd.service** during installation just before the **ExecStart** statement. There is no need to add this line yourself.

```
ExecStartPre=/bin/chown mpd:audio /var/run/mpd
```

## Appendix B – MPD and MPC package build example output

### Appendix B.1 MPD package build example

```
$ ./build.sh
Building MPD version 0.23.13
Linking output directory to MPD build directory /home/pi/mpd-0.23.13/output
rm -rf output
ln -s /home/pi/mpd-0.23.13/output
/home/pi/mpdpackage

Copying MPD files from /home/pi/mpd-0.23.13
cp /home/pi/mpd-0.23.13/output/release/mpd .
cp /home/pi/mpd-0.23.13/mpd.svg .
cp /home/pi/mpd-0.23.13/AUTHORS .
cp /home/pi/mpd-0.23.13/COPYING .
cp /home/pi/mpd-0.23.13/NEWS .
cp /home/pi/mpd-0.23.13/README.md .
Corrected mpd.service ExecStart statement
ExecStart=/usr/local/bin/mpd --no-daemon /etc/mpd.conf
Set permissions for mpd.conf
sudo chown mpd:audio mpd.conf
sudo apt-get -y install equivs apt-file lintian
Reading package lists... Done
Building dependency tree
Reading state information... Done
apt-file is already the newest version (3.2.2).
equivs is already the newest version (2.2.0).
lintian is already the newest version (2.15.0).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.

Building package mpd version 0.23.13
from input file mpdpkg
dh_testdir
dh_testroot
dh_prep
dh_testdir
dh_testroot
dh_install
dh_installdocs
dh_installchangelogs
dh_compress
dh_fixperms
dh_installdeb
dh_gencontrol
dh_md5sums
dh_builddeb
dpkg-deb: building package 'mpd' in '../mpd_0.23.13_armhf.deb'.

The package has been created.
Attention, the package has been created in the current directory,
not in ".." as indicated by the message above!
Check using Lintian y/n: n
```

When asked to check using **Lintian** answer **n** (no) as any errors displayed are beyond our control and are primarily due to the locations chosen for MPD.

## Appendix B.2 MPC package build example

```
$ ./build.sh
Building MPC version 0.34
Linking output directory to MPC build directory /home/pi/mpc-0.34/output
rm -rf output
ln -s /home/pi/mpc-0.34/output
/home/pi/develop/pi/mpcpackage

Copying MPC files from /home/pi/mpc-0.34
cp /home/pi/mpc-0.34/output/mpc .
cp /home/pi/mpc-0.34/AUTHORS .
cp /home/pi/mpc-0.34/COPYING .
cp /home/pi/mpc-0.34/NEWS .
cp /home/pi/mpc-0.34/README.rst .
cp /home/pi/mpc-0.34/contrib/mpd-m3u-handler.sh .
cp /home/pi/mpc-0.34/contrib/mpd-pls-handler.sh .
cp /home/pi/mpc-0.34/contrib/mpc-completion.bash .
sudo apt-get -y install equivs apt-file lintian
Reading package lists... Done
Building dependency tree
Reading state information... Done
apt-file is already the newest version (3.2.2).
equivs is already the newest version (2.2.0).
lintian is already the newest version (2.15.0).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.

Building package mpc version 0.34
from input file mpcpkg
dh_testdir
dh_testroot
dh_prep
dh_testdir
dh_testroot
dh_install
dh_installdocs
dh_installchangelogs
dh_compress
dh_fixperms
dh_installdeb
dh_gencontrol
dh_md5sums
dh_builddeb
dpkg-deb: building package 'mpc' in '../mpc_0.34_armhf.deb'.

The package has been created.
Attention, the package has been created in the current directory,
not in "." as indicated by the message above!

Reading package lists... Done
Building dependency tree
Reading state information... Done
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
:
```

## Appendix C – MPC commands

The following are the commands for **mpc** version 0.34 or later.

```
$ mpc help
Usage: mpc [options] <command> [<arguments>]
mpc version: 0.34

Options:
  -v, --verbose           Give verbose output
  -q, --quiet             Suppress status message
  --no-status            synonym for --quiet
  -h, --host=<host>      Connect to server on <host>
  -P, --password=<password> Connect to server using password <password>
  -p, --port=<port>       Connect to server port <port>
  -f, --format=<format>   Print status with format <format>
  -w, --wait             Wait for operation to finish (e.g. database
update)
  -r, --range=[<start>]:[<end>] Operate on a range (e.g. when loading a
playlist)

Commands:
  mpc                    Display status
  mpc add <uri>          Add a song to the
queue
  mpc crop              Remove all but the
currently playing song
  mpc current           Show the currently
playing song
  mpc del <position>    Remove a song from
the queue
  mpc play [<position>] Start playing at
<position>
  mpc next              Play the next song
in the queue
  mpc prev             Play the previous
song in the queue
  mpc pause            Pauses the currently
playing song
  mpc pause-if-playing Pauses the currently
playing song; exits with failure if not playing
  mpc toggle           Toggles Play/Pause,
plays if stopped
  mpc cdprev           Compact disk player-
like previous command
  mpc stop             Stop playback
  mpc seek [+<->][HH:MM:SS]|<0-100>% Seeks to the
specified position
  mpc seekthrough [+<->][HH:MM:SS] Seeks by an amount
of time within the song and playlist
  mpc clear            Clear the queue
  mpc outputs          Show the current
outputs
  mpc enable [only] <output # or name> [...] Enable output(s)
  mpc disable [only] <output # or name> [...] Disable output(s)
  mpc toggleoutput <output # or name> [...] Toggle output(s)
  mpc outputset <output # or name> <name>=<value> Set output
attributes
  mpc queued           Show the next queued
song
  mpc shuffle          Shuffle the queue
  mpc move <from> <to> Move song in queue
  mpc playlist [<playlist>] Print <playlist>
  mpc listall [<file>] List all songs in
the music dir
  mpc ls [<directory>] List the contents of
<directory>
```

<code>mpc lsplaylists</code>	List currently
<code>available playlists</code>	
<code>mpc load &lt;file&gt;</code>	Load <file> into the
<code>queue</code>	
<code>mpc insert &lt;uri&gt;</code>	Insert a song to the
<code>queue after the current track</code>	
<code>mpc prio &lt;prio&gt; &lt;position/range&gt; ...</code>	Change song
<code>priorities in the queue</code>	
<code>mpc save &lt;file&gt;</code>	Save a queue as
<code>&lt;file&gt;</code>	
<code>mpc rm &lt;file&gt;</code>	Remove a playlist
<code>mpc volume [+&lt;num&gt;</code>	Set volume to <num>
<code>or adjusts by [+&lt;num&gt;</code>	
<code>mpc repeat &lt;on off&gt;</code>	Toggle repeat mode,
<code>or specify state</code>	
<code>mpc random &lt;on off&gt;</code>	Toggle random mode,
<code>or specify state</code>	
<code>mpc single &lt;on once off&gt;</code>	Toggle single mode,
<code>or specify state</code>	
<code>mpc consume &lt;on off&gt;</code>	Toggle consume mode,
<code>or specify state</code>	
<code>mpc search &lt;type&gt; &lt;query&gt;</code>	Search for a song
<code>mpc searchadd &lt;type&gt; &lt;query&gt;</code>	Search songs and add
<code>them to the queue</code>	
<code>mpc find &lt;type&gt; &lt;query&gt;</code>	Find a song (exact
<code>match)</code>	
<code>mpc findadd &lt;type&gt; &lt;query&gt;</code>	Find songs and add
<code>them to the queue</code>	
<code>mpc searchplay &lt;pattern&gt;</code>	Find and play a song
<code>in the queue</code>	
<code>mpc list &lt;type&gt; [&lt;type&gt; &lt;query&gt;]</code>	Show all tags of
<code>&lt;type&gt;</code>	
<code>mpc crossfade [&lt;seconds&gt;]</code>	Set and display
<code>crossfade settings</code>	
<code>mpc clearerror</code>	Clear the current
<code>error</code>	
<code>mpc mixrampdb [&lt;dB&gt;]</code>	Set and display
<code>mixrampdb settings</code>	
<code>mpc mixrampdelay [&lt;seconds&gt;]</code>	Set and display
<code>mixrampdelay settings</code>	
<code>mpc update [&lt;path&gt;]</code>	Scan music directory
<code>for updates</code>	
<code>mpc rescan [&lt;path&gt;]</code>	Rescan music
<code>directory (including unchanged files)</code>	
<code>mpc sticker &lt;uri&gt; &lt;get set list delete find&gt; [args..]</code>	Sticker management
<code>mpc stats</code>	Display statistics
<code>about MPD</code>	
<code>mpc version</code>	Report version of
<code>MPD</code>	
<code>mpc idle [events]</code>	Idle until an event
<code>occurs</code>	
<code>mpc idleloop [events]</code>	Continuously idle
<code>until an event occurs</code>	
<code>mpc replaygain [off track album]</code>	Set or display the
<code>replay gain mode</code>	
<code>mpc channels</code>	List the channels
<code>that other clients have subscribed to.</code>	
<code>mpc sendmessage &lt;channel&gt; &lt;message&gt;</code>	Send a message to
<code>the specified channel.</code>	
<code>mpc waitmessage &lt;channel&gt;</code>	Wait for at least
<code>one message on the specified channel.</code>	
<code>mpc subscribe &lt;channel&gt;</code>	Subscribe to the
<code>specified channel and continuously receive messages.</code>	
<code>mpc listneighbors</code>	List neighbors.
<code>mpc mount [&lt;mount-path&gt; &lt;storage-uri&gt;]</code>	List mounts or add a
<code>new mount.</code>	
<code>mpc unmount &lt;mount-path&gt;</code>	Remove a mount.



```
See man 1 mpc for more information about mpc commands and options
```

Run **man mpc** for further information.

```
$ man mpc
```