

The KRec Handbook

Arnold Krille



The KRec Handbook

Contents

1	Introduction	1
1.1	Why I wrote KRec	1
1.2	What KRec does	1
1.3	Getting more info	1
2	A first glance at KRec	2
2.1	The KRec-mainwindow in detail	2
3	Howto record	4
3.1	Recording from internal music	4
3.2	Recording from Line-In or Mic-In	5
4	KRec explained	6
4.1	The Audio Manager	6
4.1.1	The main window of the Audio Manager	6
4.1.2	The Busdialog	6
4.2	The Compressor	7
4.2.1	Tips for compressor usage	7
4.3	Configuration	8
4.4	Exporting	9
4.4.1	Exporting to Wave (*.wav)	9
4.4.2	Exporting to MP3 (*.mp3)	9
4.4.3	Exporting to OGG (*.ogg)	10
4.5	Play through	10
4.6	Quality settings	11
4.7	VU-Meter	12

The KRec Handbook

5 Credits and License	13
A Installation	14
A.1 How to obtain KRec	14
A.2 Requirements	14
A.3 Compilation and Installation	14

Abstract

KRec is a recording application for aRts. It can be used to record any sound coming into or out of the computer. Some effects for dynamics are implemented as well as the possibility to play out what is recorded.

Chapter 1

Introduction

1.1 Why I wrote KRec

After working with aRts for some time I realized that there is no recording application for it except the command line tool **artsrec**. I had to record a radio play some friends of mine wanted me to mix and master and I wanted to use Linux® for the recording. So I started writing KRec.

1.2 What KRec does

KRec's function is quite simple. It connects to the aRts server and records what is routed to it into files. These files are in a special KRec format but it is possible to export to wave, ogg and mp3 files.

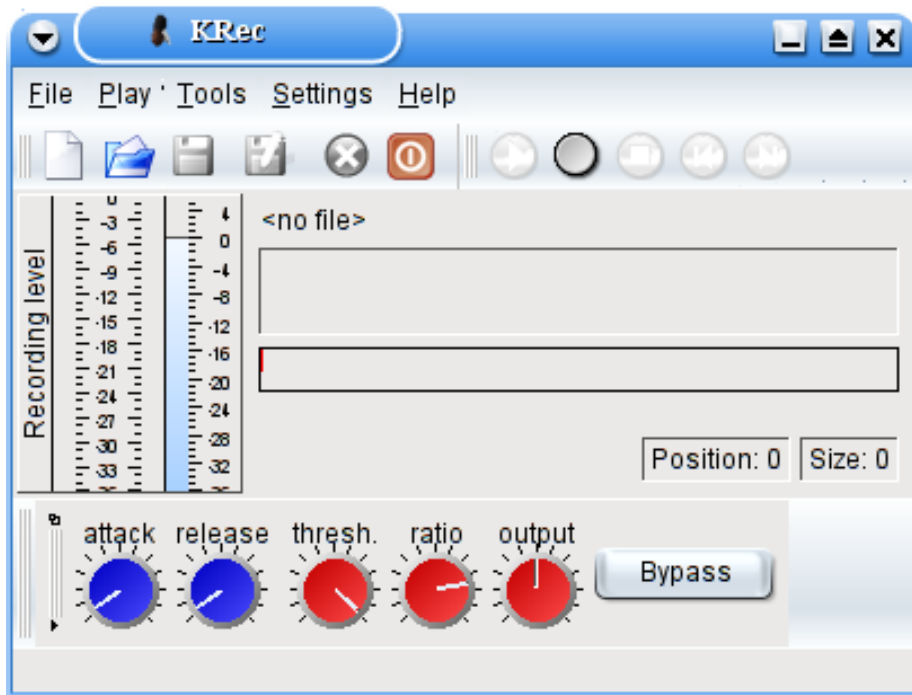
But KRec has much more functionality. You can do multiple recordings in one file even with overlaying functionality.

1.3 Getting more info

This document may have been updated since your installation. You can find the latest version at <http://docs.kde.org/development/en/kdemultimedia/>.

Chapter 2

A first glance at KRec



2.1 The KRec-mainwindow in detail

- At the top there is the *menubar* and two *toolbars*. The first toolbar contains some usefull items from the Files-menu, the second toolbar is shipped with important functions from the Play-menu.

The KRec Handbook

- The middle has the important parts: On the left is the VU-Meter displaying the volume of the audiosignal currently recorded/played combined with a volumecontrol to adjust the level.
- The main part shows the file and consists of four parts. First at the top is the name of the file, the second shows the parts recorded in their chronological order and scaled length. It also allows to disable or delete parts via contextmenu. Below is the time line where you can see the current position and (by clicking) move to the position you want. The bottom of this block are two widgets showing the current position and the length in the timeformat you want.
- At the overall bottom there is another toolbar containing a compressor to edit the dynamics of your recording and a statusbar showing all kinds of messages.

See [chapter 4](#) for more info.

Chapter 3

Howto record

This chapter contains some step-by-step tutorials which show you the way to go for some good recordings with KRec.

3.1 Recording from internal music

1. The first thing to do is a recording from our favourite KDE audioplayer. So start Noatun, JuK or Kaboodle. We could use other players but they have to use aRts for their output, otherwise recording is a bit more complex and beyond the scope of this section. So please jump over your shadow and select a song to play in one of this three players (all are shipped with kdemultimedia where you got KRec from).
2. In KRec select the Audio Manager from the Tools-menu. There you will see at least a line for KRec::In and a line for KRec::Out. The second column says what type the item is, either *play* or *record*. The last column says where the sound for this item comes from or goes to. Currently the KRec::In item is (should be?) connected to *in_soundcard* which is the input channel of your soundcard but as we currently want to record from the player and the player plays to *out_soundcard*, we click on the KRec::In item to switch it to another source. Select *out_soundcard* from the upcoming window and click Ok. To learn more about the audio manager see Section 4.1.
3. Now the VU-Meter in KRec should flicker up and down in a way corresponding to the music your hear (if you don't hear sound you shouldn't expect the VU to show something).
4. Now open a new file either by clicking on the first item in the toolbar or by selecting New from the Files-menu. Accept the quality settings for now or see Section 4.6 for more info.
5. Select Record from the Play-menu or press the **R**-key. After you are finished select Stop from the same menu or use the **S**-key.

6. Saving works the standard way, if you are interested in exporting see Section 4.4.

Thats it! Now you can hear your recording or export it (don't forget to go back to the beginning).

3.2 Recording from Line-In or Mic-In

Recording outside-sources is a bit more complicated as it involves a lot of different applications and hardware devices. I am assuming your hardware is installed correctly, the drivers are working as they should and you are able to control the hardware volumes via KMix. In KMix you can also select channels for recording which basically means that their signal is sent to the analog-digital-converter (short ADC) and can be read by the driver and applications. This works differently on almost all soundcards and drivers so you have to try a bit before you can be sure...

Second important thing is that aRts has to run in full-duplex mode. That means that aRts is reading from the soundcard and writing to it at the same time. You have to start KControl and edit the soundsystem settings (or press Alt+F2 and enter `kcmshell arts`). On the second tab-page you have to make sure the checkbox for full-duplex is selected, clicking Apply restarts aRts which means that you have to restart KRec too.

After these preparations the VU-Meter (see Section 4.7 for more info) of KRec should flicker according to the audio-signal you want to record and which you have selected for recording in KMix. Adjusting the volume to the right values is very important for usable recordings. If the amplification inside the soundcard is too high you get digital crackles because the ADC can only create values between a minimum and a maximum and if the signal is too loud it gets digitally clipped which ruins the recording. On the other hand if the volume is too silent you get the noise and hiss from the audio-hardware too loud into your recording. So you have to choose a middle-way so the signal is not too loud and gets clipped but not too silent to get lost in the noise of the hardware. Its almost always better to leave some headroom.

Now you can adjust the level a second time in KRec which then is a software amplification. Here it is best to use the compressor to equalize the differences between silent and loud parts a bit. More info on compressor usage can be found in Section 4.2.

The remaining steps are the same as in Section 3.1 from step four and following. So if you started with that section you should know it now.

Chapter 4

KRec explained

This chapter describes some parts and functions of KRec in detail and gives some tips on usage. The items are sorted alphabetically, not by importance.

4.1 The Audio Manager

The audio manager is used to connect the outputs from different applications to existing or new busses. A bus is some kind of a virtual signal distributor. Every play- or record-item can connect to exactly one bus but multiple items can connect to a bus. Example: The output of Noatun can connect to the main out *or* any other bus. But multiple Noatuns can all connect to the main out.

4.1.1 The main window of the Audio Manager

It contains three columns:

1. The name of the item playing or recording sound.
2. The type of the item either *play* or *record*.
3. The bus the item is connected to.

Click on an item and a dialog for choosing the wanted bus pops up.

4.1.2 The Busdialog

The main part shows all currently existing busses. Select one to send your audio to it or get your audio from it. Below you can create new busses to connect your item to.

TIP

To record from an aRts-aware-player and listening to what you actually record just create a new bus (*test* for example), connect your player to it (you wont hear anything now), connect KRec::In to the new bus too and then turn on the Play Through.

4.2 The Compressor

If you are recording with a microphone you might notice that the level is sometimes almost clipped and sometimes very low especially singing or speaking voices. To correct this you can use the compressor. It simply reduces all sound that is over the given *threshold* by the factor given as *ratio*. Note that the threshold is logarithmic, a mid setting is already relativ low but thats very usable that way. Another note: ratio is at its highest turned to the left, the right end of the poti means no compression at all. As this reduces the loudness there is a *output* potentiometer to expand (or reduce) the sound. *attack* and *release* let you control the time after which the compressor reacts (the time going by after input first exceeds the threshold) and the time the compressor still reacts after sound is below the threshold.

TIP

Test it while you are speaking into your microphone with Play Through enabled and you will hear the difference between the plain and a compressed version.

4.2.1 Tips for compressor usage

These are *only* tips. In the end the only thing that counts is how it sounds. So if it sounds as you want it, its probably the right setting. And don't hesitate to do some experiments.

Normal speech Most times a single voice speaking for radio or television is very heavily compressed. Because the main problem of speech is that the level is perhaps the right way at the beginning of the sentence but probably not at the end. Additionally the wordendings are less loud than the start. That makes it impossible to use spoken words without compressing it. Examplesettings: Short attack, mid-time release, low threshold, very high ratio.

Mastering 1: Limiting the level To just limit peaks but not compress whole dynamics use a high threshold, a high ration, a short attack and a short-to-mid release. This protects your recording from some internal digital distortion and, with the treshold a bit lower, removes rare (and perhaps unwanted) peakes and gives more room for the actual recorded signal.

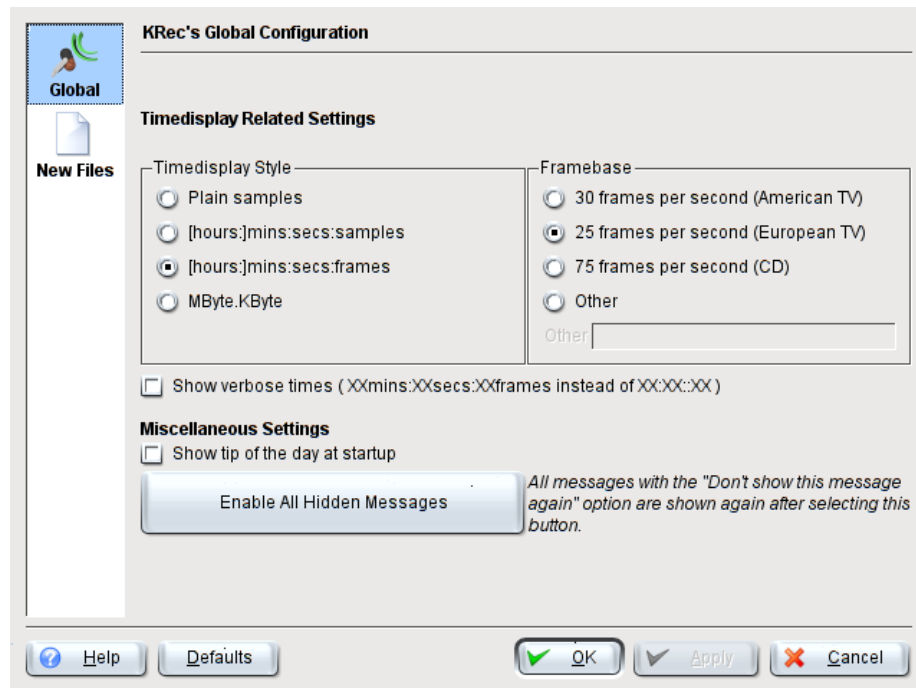
Mastering 2: Doing real mastering Doing real Mastering of music is difficult and depends totally on your hearing and the music that is to be mastered. Normally you will use fast attacks so you get the level reduced fast enough at the bass drum beat. On the other hand you don't want the music to be pumping up and down just because of the bass drum beats so you select a longer release. The compression factor shouldn't be much. Ideally you would plug a limiter after the compressor to be free of clicks and clippings.

Single Instruments These settings depend on the instrument. While recording it is wise to use a limiter setting.

Final tip Use your ears and do some practicing. Anything is allowed if it sounds right!

4.3 Configuration

Two pages are available at the configuration. The first one is for general settings and explained in this section. The second is about the default quality settings and the same as described in Section 4.6.



The first part are settings controlling the way time and positions are displayed. The style "Plain samples" just shows the number of samples, the next one has optionally hours, minutes, seconds and samples. The third style is the same as

the second except that it shows frames instead of the samples. The fourth style shows the size in megabyte and kilobyte and usefull for controlling disk space. On the right side of the styles you have the opportunity to select the number of frames forming one second.

The checkbox below makes the time displays be more verbose and showing the unit within.

If you want to restore the tip of the day at startup you can do so with the next checkbox. The button below it brings back all the messages where you did select "Don't show this message again", mostly messages from the export functions.

4.4 Exporting

Your app is very cool, I use it all my day but it really lacks exporting to wave/mp3/ogg!

—An anonymous fan of KRec

Here it is: the definitiv export functionality for KRec. The available export formats vary on the libraries found at compiletime, all currently available ones are described in the following sections.

Selecting the wanted exportplugin is done via the filename: You select Export File... from the Files, choose the filename for the exported file and its extention and the plugin is determined from your extention. The list of extentions in the dialog also shows which exportplugins are available.

For understanding the general usage of export: Technically exporting works like playing. That means that you have to go to the position where you want to start the exporting before doing it. It also means that you can see the progress of the exportation from the current position marker moving forward. And it means that in the future its possible to export every selection you like just like playing only a selection.

4.4.1 Exporting to Wave (*.wav)

The simplest exportplugin. It exports your KRec file to a wave file with the quality settings you made for the whole file.

4.4.2 Exporting to MP3 (*.mp3)

Maybe the most-wanted export possibility. This one exports your KRec-file into a mp3-file.

IMPORTANT

The qualitysettings you set up in KControl section 'Sound & Multimedia' / 'Audio CDs' are used in this version since KRec also uses the same libraries as the audiocd:/-feature.

4.4.3 Exporting to OGG (*.ogg)

This one exports your KRec-file into an ogg-file.

IMPORTANT

The qualitysettings you set up in KControl section 'Sound & Multimedia' / 'Audio CDs' are used in this version since KRec also uses the same libraries as the audiocd:/-feature.

4.5 Play through

For those who want to hear what they are recording there is the very useful Play-Through option in the menu Play. I advise using it as much as possible especially if you do things like using the compressor or other effects and want to control what actually is recorded.

CAUTION

Be sure to not build a feedback loop while recording from *out_soundcard* and activating Play-Through. Such a loop is way to much for poor aRts and it slows your system heavily down! You might kill aRts...

The reason is that aRts calculates a network for audio for every sample (acually blocks of samples) and if on sample is build via a loop from itself aRts has to calculate more than is possible.

4.6 Quality settings

Properties for the new File

Sampling Rate	Channels	Bits
<input type="radio"/> 48000 Hz	<input checked="" type="radio"/> Stereo (2 channels)	<input checked="" type="radio"/> 16 bit
<input checked="" type="radio"/> 44100 Hz	<input type="radio"/> Mono (1 channel)	<input type="radio"/> 8 bit
<input type="radio"/> 22050 Hz		
<input type="radio"/> 11025 Hz		
<input type="radio"/> Other		
Other: <input type="text"/>		

Use defaults for creating new files

OK

While creating a new KRec-file this dialog is displayed and lets you choose some settings for the quality of the recordings. All of these settings have an impact on the size.

The *sampling rate* is the rate which tells audiosystem how many samples to take during a second and is measure in Hertz (Hz) respectively Kilohertz (kHz). The higher this rate the higher is the maximum recorded frequency. Since at least two samples are needed to rebuild a 'sinus'-wave the maximum recording frequency is half of the sampling rate. The human ear is capable of hearing tones up to something between 10kHz and 20kHz depending on the age, little children are possibly nearer to 20kHz while normal adults have their maximum around 15kHz and elder people go down to 10kHz. But even without actually hearing the higher frequencies they still have an impact on what is heard and felt (corresponding keyword: psycho acoustics).

The number of channels can be freely choosen depending on the task of the recording. If you are using a mono-microphone without applying a stereo effect you can safely choose 'Mono' without the loss of data.

The last part are the number of bits used for one sample, possible values are 8 and 16 bits. The more bits the more steps are available for the range from minimum and maximum signal. 8 bits are one byte so this can also be referred to as one byte or two byte samples.

The space needed for the recording can be calculated in a very simple way: Its the sampling rate multiplied by the number of channels multiplied by the

number of bytes per sample multiplied by the number of seconds wanted to record.

Example 4.1 Calculating the size of one minute CD quality

For one minute (60 seconds) audio in CD quality (44100Hz, 16bits, stereo) the space needed is: $44100 * 2 * 2 * 60 = 1058400$ Bytes = 10335.938 Kilobytes. That is around 10 MByte of data per minute.

TIP

Always use the best needed quality! Reducing the quality later on is always possible, but enhancing the quality is not possible since then more data as available is needed.

The last item above the button is a checkbox for using the entered values as defaults for every new file without showing this dialog again.

As the same dialog is also available in the configuration to choose the standard settings, the "Use defaults..." checkbox is also accessible from there to get the dialog for every file back.

4.7 VU-Meter

As the compressor is probably not necessary for every task the vu-meter with its builtin volumecontrol is the most needed part of KRec for recordings. It shows the actual level that is recorded to the file after the used effects and after the volume set with the control. If it is deep red most of the time the recording is probably clipped and doesn't sound nice. If it flickers around the bottom 2% its probably not much you will hear in your recording.

TIP

For good recordings the level should be between -12dB and 0dB most of the time.

TIP

Use the compressor for editing the dynamics of your recordings. See [Section 4.2](#) for more info.

Chapter 5

Credits and License

KRec

Program copyright 2002-2003 Arnold Krille arnold@arnoldarts.de

Documentation copyright 2002-2004 Arnold Krille arnold@arnoldarts.de

This documentation is licensed under the terms of the [GNU Free Documentation License](#).

This program is licensed under the terms of the [GNU General Public License](#).

Appendix A

Installation

A.1 How to obtain KRec

KRec is part of the KDE project <http://www.kde.org/> .

KRec can be found in the kdemultimedia package on <ftp://ftp.kde.org/pub/kde/> , the main FTP site of the KDE project.

A.2 Requirements

In order to successfully use KRec 0.5.1, you need KDE 3.3.

KRec should be within your kdemultimedia package. As this package needs a running KDE and aRts too, everything should be fine.

A.3 Compilation and Installation

In order to compile and install KRec on your system, type the following in the base directory of the KRec distribution:

```
% ./configure
% make
% make install
```

Since KRec uses **autoconf** and **automake** you should have no trouble compiling it. Should you run into problems please report them to the KDE mailing lists.