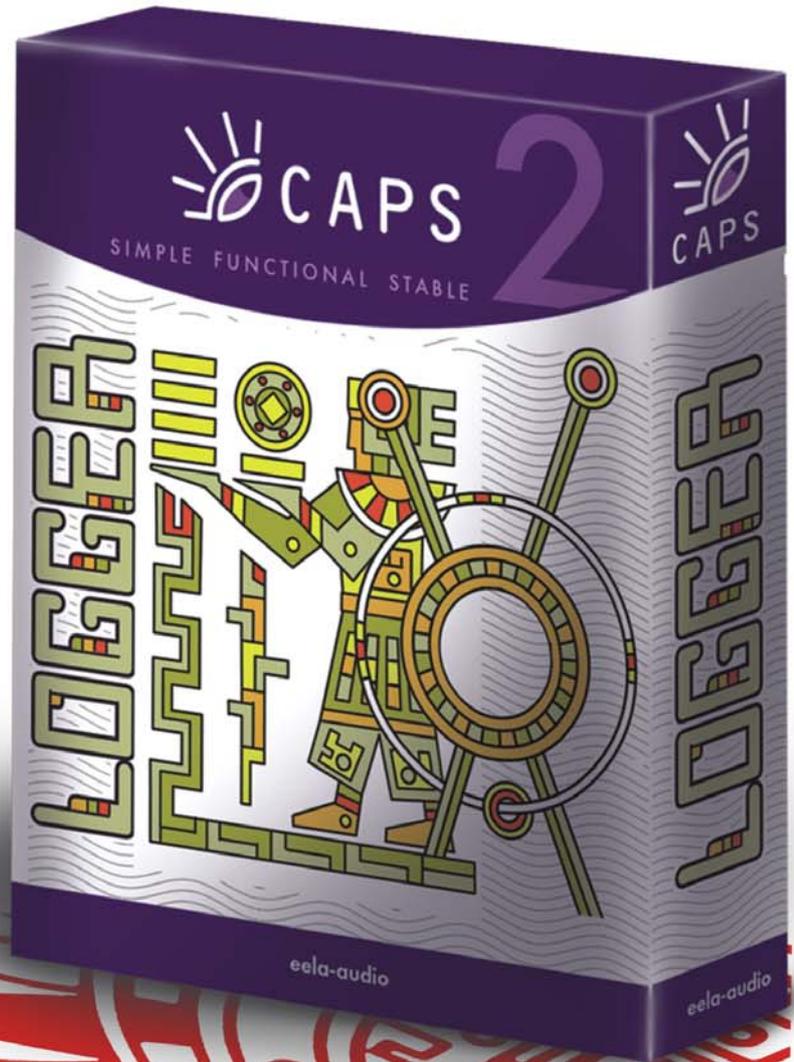


**SOFTWARE BOX-PRODUCTS
FOR RADIO BROADCASTING**



SIMPLE FUNCTIONAL STABLE

CAPS 2 Logger



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TABLE OF CONTENT

CAPS 2 LOGGER	4
1. The minimal system requirements	4
2. General Settings	6
3. Configuring the Recording Module.....	7
The Monitoring tab	10
The Automation tab	10
The Audio tab	11
4. Recording.....	11
5. PFL	11
6. The reasons of possible problems	13

CAPS 2 LOGGER

The function of the automatic radio station broadcast logger program CAPS 2 Logger is to monitor broadcasting and to provide advertisers with the control material.

The software can send messages about the input signal appearance/disappearance (individually for each channel) to a specified e-mail address.

Logger is a separate application (with a separate configuration package).

The configuration comprises a block of recording modules (each module has its own level indicator) and the window for monitoring and exporting the recorded material. There are configurations for recording one, two, or more channels.

Recording settings for each channel can be individually configured. The signal can be recorded without compression (PCM) or in the MPEG format (Layer 2 and 3). The recorded audio can be saved in the WAV or the MP2 and MP3 formats. The sampling frequency and the stream rate are set by the user. The recorded material is kept for the specified time period (e.g., a month). Recording can be carried out on schedule and based on the input level of the signal. The right and left channels can be recorded separately. The recorded material is automatically cut into slices of the specified length (e.g., 10 minutes long).

The program is started by launching the executable file LOGGER.EXE. This opens the main window of the Logger program (Fig. 1).

1. The minimal system requirements

The broadcast automation system CAPS 2 is working under Microsoft Windows XP operational system (NTFS file system). The configuration of a computer should satisfy the following requirements:

- RAM: optimal operational system requirements +128/256 MB (depending on software configuration);
- HDD: 50 MB for installation and launching of the program. Working requirements are laid out on the base of the final software configuration of CAPS 2 broadcast automation system. The approximate amount of the disk space needed to store the recorded material in the MPEG format is calculated using the following formula:

Disk space (MB) \approx (Bit rate /128) * 1300 * Days to keep

Here, **bit rate** is the parameter defining the coefficient of the signal MPEG compression expressed in Kb/sec. The formula produces results accurate to 2% (with the downward error) and does not depend on the recording format (mono or stereo) or the sampling rate. The result of the calculation is the amount of the disk space in megabytes needed to store the specified number of days of audio material. For

example, to store one month
of audio material at 128 Kb/sec this much of disk space is needed:

$$1 * 1300 * 30 = 39000 \text{ MB} \approx 40 \text{ GB.}$$

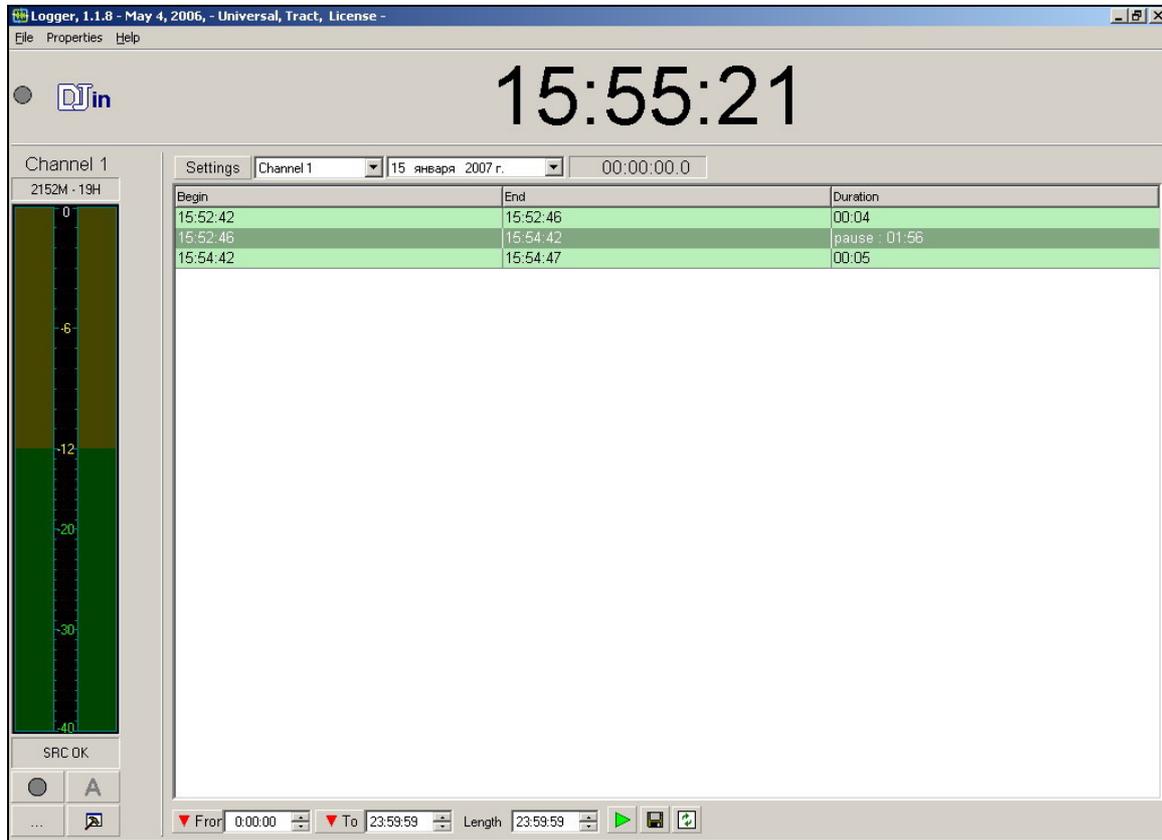


Fig. 1. The main window of the CAPS 2 Logger program

The approximate amount of the disk space for storing uncompressed audio is calculated as follows:

$$\text{Disk space (GB)} = 15 * \text{Days to keep} * (\text{Sampling rate}/44100) * (\text{No. of channels}/2).$$

Here, **Sampling rate** is the frequency, at which the signal is sampled; **No. of channels** is 2 for stereo and 1 for mono.

This formula produces results accurate to 1% (with the downward error).

Consequently, to store one day of audio at 44,100 sampling rate, 16 bit stereo format approximately 15 GB are needed; to store one month of the same format audio requires 450 GB.

- CPU: the requirements are different for different automation system components. The minimal parameters for launching of the program do not differ from minimal requirements for operational system. For editing stations and loggers it is recommended the CPU parameters to be selected whenever possible higher (capacity of the processor depends on the number of simultaneously recorded channels; for recording of one

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channel the capacity of any Pentium III processor is enough and practically any of Pentium II processor);

- Network bandwidth not less than 100 MBit/s;
- USB-ports;
- Keyboard, mouse;
- CAPS 2 software interface is designed for the screen resolution starting with 1024x768 pixels;
- Remote control connection (for example, the broadcasting console) requires the LPT-port available or the special connection device (for example, TP-308).

Also audio devices drivers need to be installed and normally functioning. Any audio cards working in MS Windows operational system and giving the standard interface for work with them are allowable. The use of several cards simultaneously (for simultaneous recording from different devices) is possible.

2. General Settings

Having installed and launched the program, some general settings need to be set up.

The process is started by executing the **Properties** command in the main menu. This opens the **Settings** window, in which the **PFL** tab needs to be opened and the device to be used for prelistening selected (see *Section 4.12.1* of CAPS 2 DJin manual).

If necessary, the interface language can be changed in the same window on the **Language** tab.

To get information concerning **Global settings** points (general parameters for all workplaces of CAPS 2 system), **Workstation settings** (parameters of all programs set on the given workplace), **Show error log** (service function of CAPS 2 system) and **GPI Status** (parameters of remote control of CAPS 2 complex) apply to Chapter 4 of CAPS 2 DJin manual.

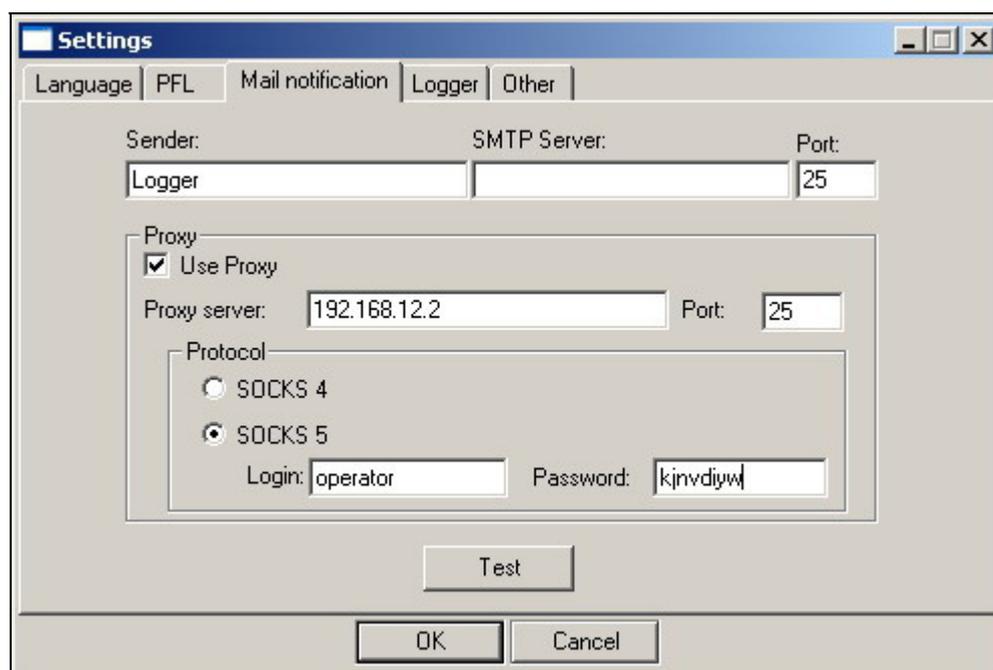


Fig. 2. The **Mail notification** tab of the **Settings** window

If you intend to send messages concerning the input signal presence/loss, the SMTP server connection parameters need to be configured. This can be done using the **Mail notification** tab of the **Settings window** (Fig. 2). It is advisable to have this task carried out by the system administrator.

3. Configuring the Recording Module

For signal recording you need to specify record parameters to the program - to tune the channel for record. Click button  on the **Logger** window to open the **Logger settings** window (Fig. 3).



Fig. 3. The **Logger settings** window

The main parameters of the recording module being configured are set in this window.

The recording device is specified in the **Recording audio device** dropdown list.

The sampling frequency is selected in the **Sampling frequency** dropdown list.

If the two mono signals from the stereo input of the specified devices need to be recorded independently, the **Record left and right channel separately** flag needs to be set. In this case, the recording parameters for the left and the right channels need to be configured separately. The only common parameter for the separate channel recording is the sampling frequency, which is specified for the recording device as a whole.

The **Record mode** group of parameters allows the recording method to be selected: **Only Audio** and **Answering machine** (for audio - logger); **Audio + Video** or **Only Video** (for video - logger).

When using logger in the **Answering machine** mode, the dropdown list **Phone line device** becomes accessible. When logging video signal, video recording device in the corresponding dropdown list needs to be selected.

Clicking the **GPI settings** button opens the window in which the parameters of the GPI signal used to start/stop recording can be configured. The window that opens is the standard GPI settings window (see *Section 4.10.7* of the CAPS 2 DJin program manual).

Clicking the **VU meter settings** buttons opens the window, in which the level indicator parameters of the recording module can be configured: the scale range, the indicator's appearance, etc. The

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VU meter settings do not affect the operation of the signal recording system, they are intended only for configuring the appearance of the level indicator to one's liking.

Configuring the parameters of the recording module is finished by clicking the **OK** button.

The module's appearance depends on the recording mode selected.

Fig. 4 shows two versions of the module's appearance. The left part of the figure is the module configured for recording one channel; the right part is the module configured for separate recording of two channels.

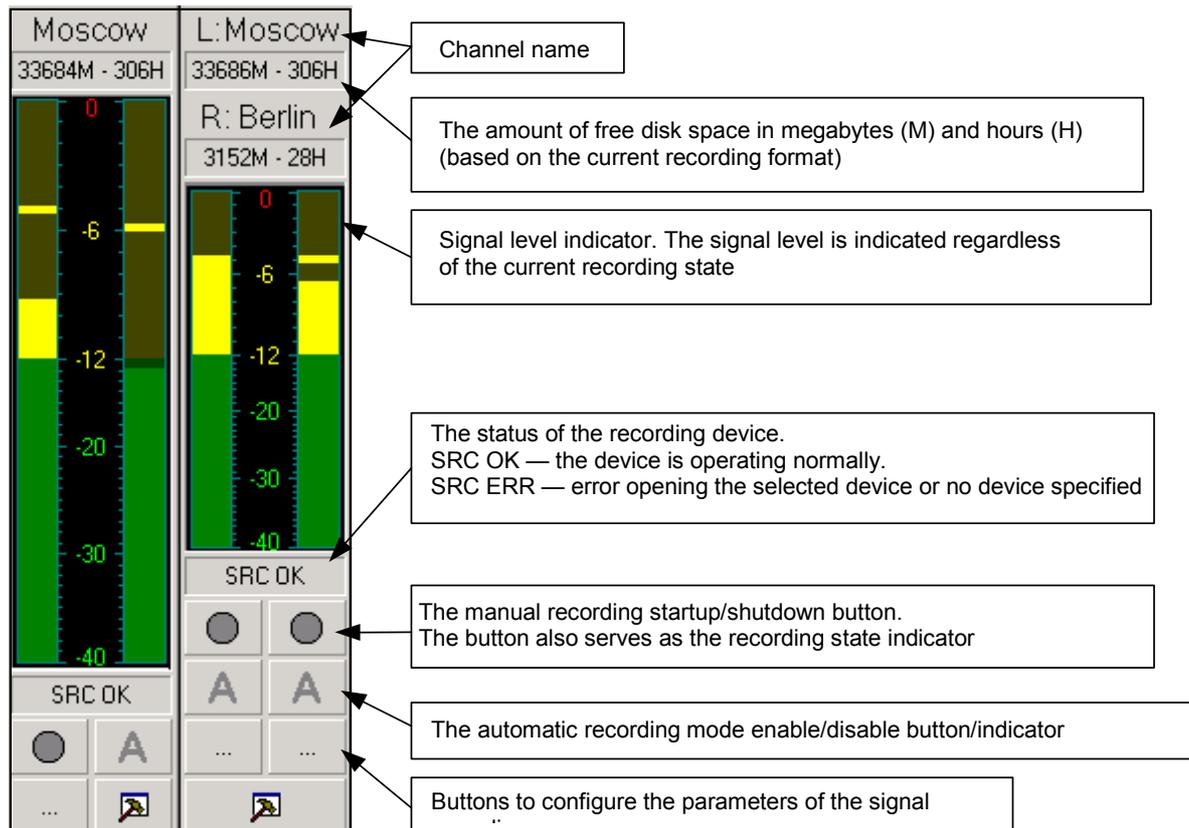


Fig. 4. The recording module appearance

The separate recording mode has all informational and control components doubled, which allows the left and right channels to be configured and the signal recording controlled completely independently.

After configuring of the main parameters of the logger, the signal recording parameters for each channel need to be set. This is done from the **Properties** window (Fig. 5), which is opened by clicking the button of the corresponding channel.

The parameters and their functions opened with the help of this window are as follows:

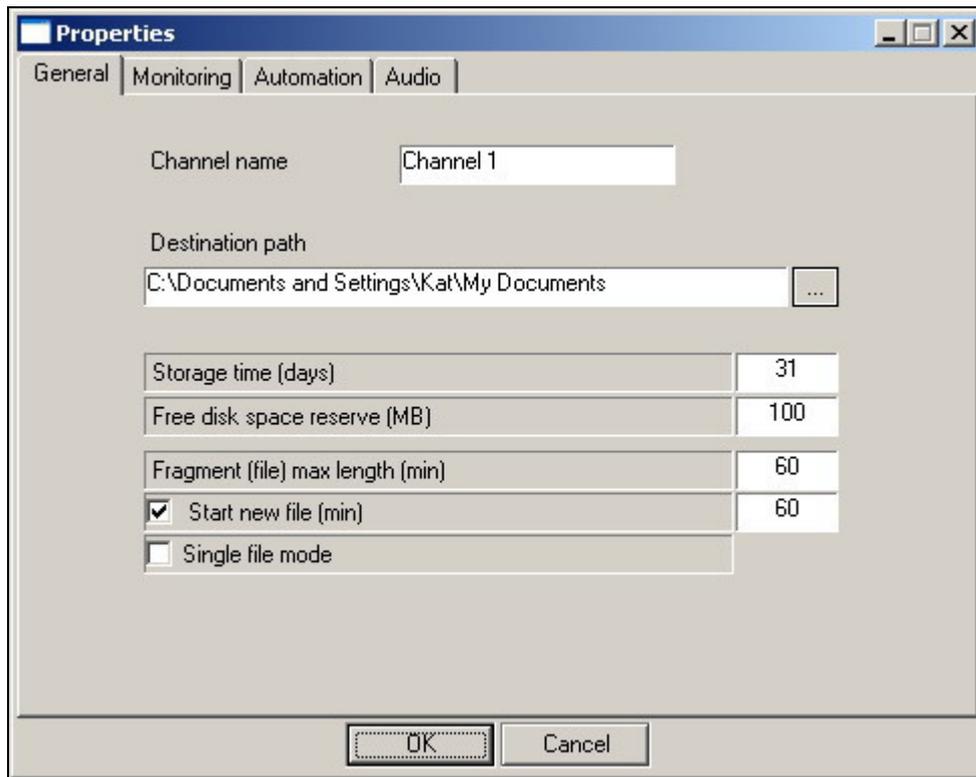


Fig. 5. The Logger channel settings window

- **Destination path.** The path to the file system directory, in which the recorded audio files are to be stored. The files are created as follows:

<Specified directory>/<date directory>/<file recording start time> .

For example, a fragment recorded at 10:30 a.m. on August 20, 2004 will be stored like follows:

<Specified directory>/2004-08-20/10-30-00.wav

- **Storage time (days).** How many days the recorded material is to be kept is specified in this field. Directories holding old recordings are automatically deleted by the program.
- **Free disk space reserve (MB).** The minimal free space in megabytes that must be left on the disk, to which the specified channel is recorded, is specified in this field. This may be necessary to leave enough disk space for other programs. If the new files created by the program are going to break this limit, the program starts freeing the necessary disk space by removing the oldest files before their deletion time specified in the **Storage time (days)** parameter.
- **Fragment (file) max length (min).** The maximum length of a single audio file in minutes.
- **Start new file (min).** This flag and its associated values are used to specify the time points (minutes within an hour) when the recording of a new file is force started. This makes creating recording slots more convenient (and as a result produces more readable file names).

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For example:

Fragment length: 15 minutes.

Start new file: Yes, every 60 minutes.

The program is started at 10:47:37 and it immediately starts recording the signal.

The first file will be named 10-47-37.wav.

Theoretically, the recording of the first file should end after 15 minutes, that is at 11:02:37 (file name 11-02-37.wav); however, on the 60th minute of the hour, that is at 11:00, a new file will be started (file name

11-00-00.wav), whose creation time is aligned on the hour boundary. The next file will be started at 11:15 (file name 11-15-00.wav), and so on.

A file list with files named using "easy" times is easier to get one's bearing in.

- **Single file mode** - this parameter defines an opposite situation when the log file is not split.

The Monitoring tab

The **Monitoring** tab of the **Properties** window contains parameters used for adjusting of automatic control of recording start / finish and also automatic notification system.

- **Signal is present if its level is higher than...** and **Signal is not present if its level is lower than...** These parameters are used to configure the signal presence detector. The information about the signal presence/absence is used for automatic recording and also for sending e-mail messages concerning the signal state.
- **If no signal present.** This group of parameters is used to specify the message recipients and the contents of the messages sent at the signal failure / appearance (The **Send E-mail** group of parameters), and also command to the external devices (**Send GPO signal**). For sending messages, the e-mail messaging system also needs to be configured (**Properties > Settings > Mail notification**). The e-mail messaging system does not require any special mail programs for its operation.

The Automation tab

The **Automation** tab of the **Properties** window is used to configure the automatic signal recording startup/shutdown.

The main item in this group is the schedule containing time slots, in which the signal must be recorded. The algorithm of the program operation is somewhat more complex than simply carrying out recording within the specified time slots. The program's behavior within and outside of the specified time slots is configured using two lists: **Record in schedule** and **Record out schedule**.

The contents of the both lists are identical: Never, Always, Level, GPI and level, GPI or level, Correlation breakdown. The program's behavior within or outside of the specified time slots is as follows:

- **Never.** The signal is never recorded.
- **Always.** The recording is always carried out regardless of any external influences and whether or not the signal is present.
- **GPI.** The signal is recorded only if there is an active control signal on the GPI input. Requires configuring the GPI. For example, the signal is recorded as long as the specified GPI input is 1.
- **Level.** The recording is carried out only if there is signal present on the input (determined by the signal presence detector). The recording starts when the signal appears and stops when the signal disappears.

- **GPI and level.** The recording is carried out only if there is signal present on the input and the GPI control signal is active.
- **GPI or level.** The recording is carried if one of the following is present: the audio signal or an active GPI signal.
- **DTMF.** The recording in the specified time slot is controlled by DTMF signals in the input audio signals. Double Tone Multi Frequency (DTMF) signal is a signal modulated in a special way that is mixed into the regular audio signal and converted by a DTMF decoder into a number (usually of 3 to 5 digits). The program allows the recording to be started or shutdown upon detecting in the recorded audio signal predefined DTMF signals.
- **Correlation breakdown.** The recording is carried out only in case of a divergence of the signals entering to different channels. This function is useful in case If LOGGER it is used as automatic "inspector" of the retransmission accuracy of regional radio station signal (in network broadcasting).

A new file is always created when time slot boundaries are crossed. The placement of the recorded audio signal into audio files is controlled by the **Fragment (file) max length (min)** and **Start new file (min)** parameters described earlier.

Button **DTMF setup** opens the window for configuring DTMF signals. Here, the parameters of the DTMF decoder can be set and the signals starting and stopping the recording specified.

The Audio tab

The **Audio** tab of the **Properties** window contains following parameters:

- **Audio file format.** This parameter specifies the format in which the recorded audio is to be stored on the hard disk. The recording format can be compressed (MPEG 1 Layer 2 and 3) and not compressed (PCM).
- The file type the audio is to be stored in is selected using switches ***.wav** and ***.mp**. Note that WAV files can store not only PCM but MPEG also.

4. Recording

There are two operating modes of record channel: manual and automatic.

The record channel operating modes are switched and its current operating mode is indicated by

button  in the recording module window. The red letter

A means the channel is currently operating in the automatic recording mode; the grey letter means the manual mode. Clicking the button switches the modes. In the manual operating mode, all settings having to do with the automation of the recording control (GPI, schedule, DTMF, etc.) are ignored. In the automatic operating mode, the recording channel starts and stops recording according to the current settings. With the automatic recording mode enabled, recording cannot be started or stopped manually. To intervene into the program's operation, the automatic operation mode needs to be disabled first. Upon startup, the program sets the recording channel operating mode in effect at the last shutdown.

Recording in the manual operation mode is controlled by the button . The same button indicates the current state of the recording in both the manual and the automatic modes. The red dot means recording is in progress, the grey dot means it is stopped. Clicking the button switches the recording state.

5. PFL

Let's get back to examining the components of the logger's main window (see Fig. 1). Audio material can be prelistened using the controls located in its right part. The contents of the specified

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directory can be displayed in this window as a list of time frames in correspondence with this directory's files. After completing configuration of the recording modules, a list of the channels available for prelistening needs

to be created. This is done by clicking the **Channel** button and adding the necessary number of channels. After that, a channel for prelistening can be selected from the dropdown list right to the button.

Clicking **Settings** button opens the **Audio log** window.

Double clicking **Channel** parameter opens **Audio log: channel settings** window (Fig. 6.). To add a channel to the list click the **Add** button of this window (the **Edit** button is used for changing of the item presented in this list, **Delete** button – for its deleting). In the opened **Log channel Properties** window enter the name of channel and also the path to the final directory in which the result of logging should be stored. Then press **OK** button.

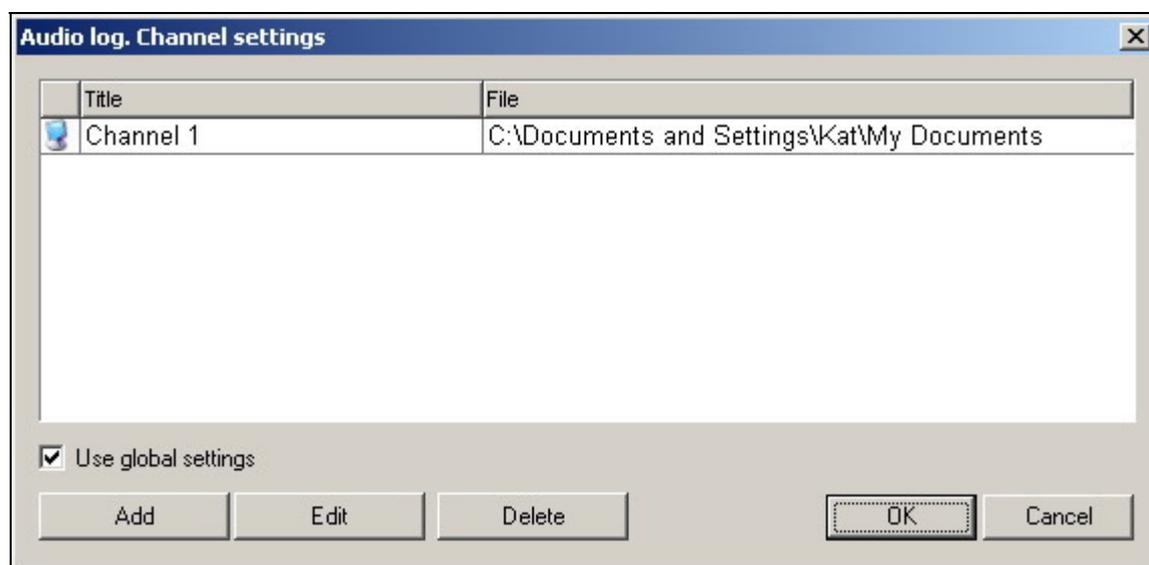


Fig. 6. The empty **Audio log: Channel setting** window

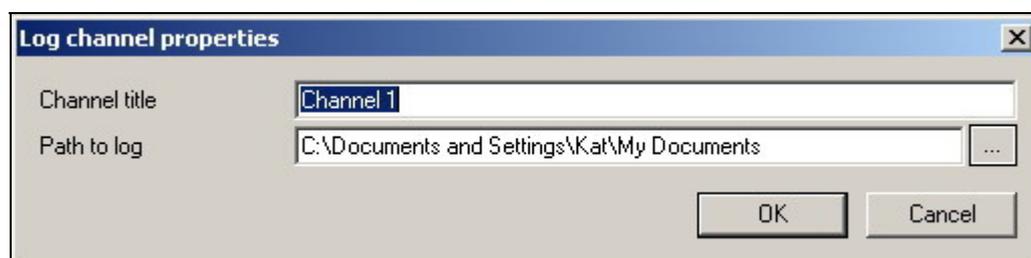


Fig. 7. The **Log channel Properties** window

The name of the selected channel will appear in the program's main window in the field right of the **Channel** button.

Dates are set using the calendar located in the upper part of the **Logger** window.

Button  is used to start/stop the playback of the time slot defined using buttons  and .

Button  is used to rescan the directory where the files are stored with the corresponding information displayed in the program window afterwards.

6. The reasons of possible problems

LOGGER does not begin record

The specified device of record does not open

It is not possible to begin record on a disk according to the specified path or the path is not specified.

It is not possible to open the codec.

It is not possible to start playback

The playback device either is not specified or does not open (for example, it is occupied).

Sampling frequency of the recorded material does not correspond to frequency from which the device is initialized (opened).