

Audiometer control program AM3.EXE

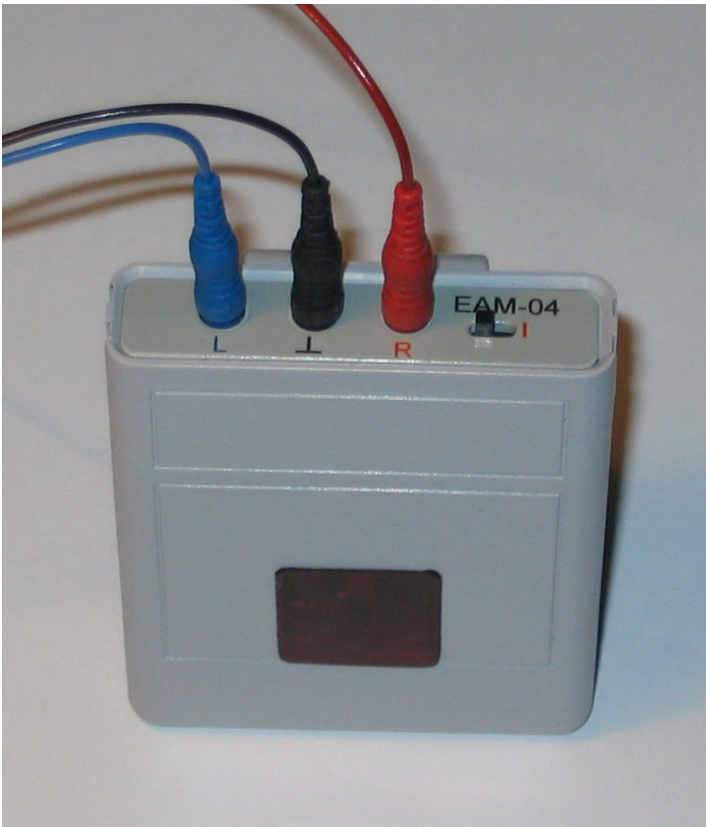


Figure 1

To control the audiometer (Figure 1), you need a computer running under the Windows operating system, not lower than P1-100, having a USB port. The AM3.EXE control program must be installed on the computer. For connecting the transmitter, the computer must have at least one free virtual COM port with a number of up to COM9.

Setting up the program

To set up the AM3.EXE program, run the AM3_DD_MMM_Y¹.EXE self-extracting archive and follow the instructions. In a general case, you do not need to change anything (Figure 2). The AM3.EXE program will be installed to the *Program Files\Audiometer* directory and an icon will be created for it on the desktop. Together with the AM3.EXE program, the *FT232driver* folder containing drivers of the virtual COM port will be installed to the same directory.

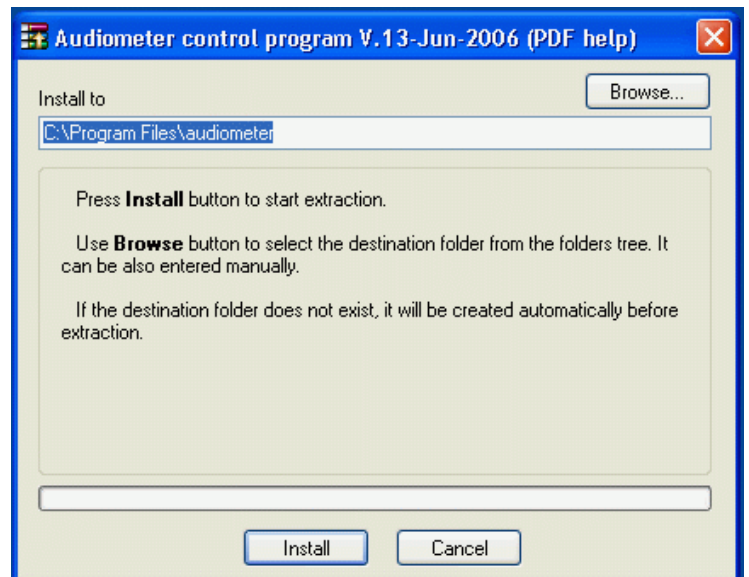


Figure 2

¹ DD_MMM_Y - is the version date, e.g. 13-Jun-6. Updates are available at <http://audiometer.ru>

Check the number of the virtual COM port. For this, select *Start – Setup – Control Panel – System – Hardware – Device Manager – Ports (COM and LPT)* and find the virtual COM port. Its number must not exceed 9 (Figure 3). A higher number is possible when *BlueTooth* devices are connected to the computer. In this case you have to deinstall the drivers for these devices (and reinstall after installing the virtual COM port).

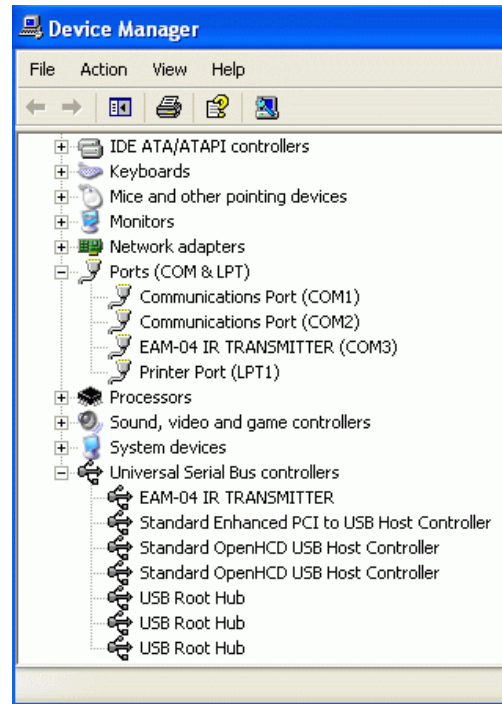


Figure 3

Connecting the transmitter

The transmitter can be connected to any free USB port of the computer. When the transmitter is connected for the first time, the system will detect the EAM-04 IR TRANSMITTER device (Figure 4) and will ask you whether you want to search a driver in Internet (Figure 5).



Figure 4



Figure 5

Reject the driver search. In the next window, opt for installation from a specific location and specify the path for the directory with drivers:

Program_Files\Audiometer\FT232driver (Figures 6,7)



Figure 6



Figure 7

Depending on the Windows version you are using, a message may be displayed during the installation, informing you that the driver was not tested for compatibility with Windows XP. Select "Continue anyway".

After this (also depending on the Windows version and the set of drivers installed in the system), the message about the device (USB Serial Port) detection may be displayed again (Figure 8):



Figure 8

In this case you have to repeat the driver installation procedure in the same way:

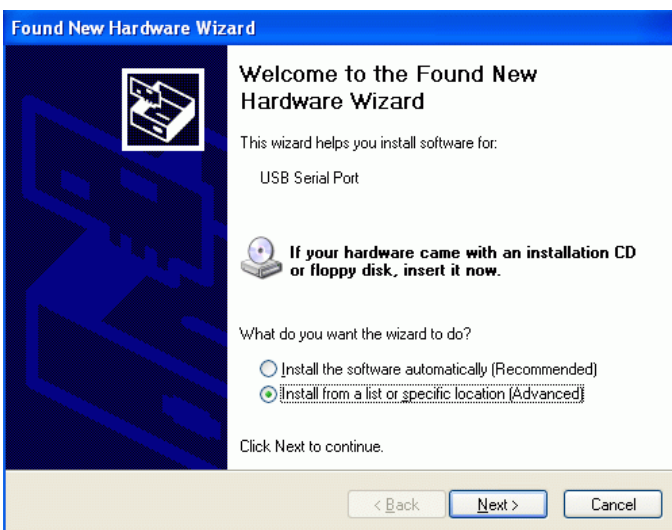


Figure 9



Figure 10

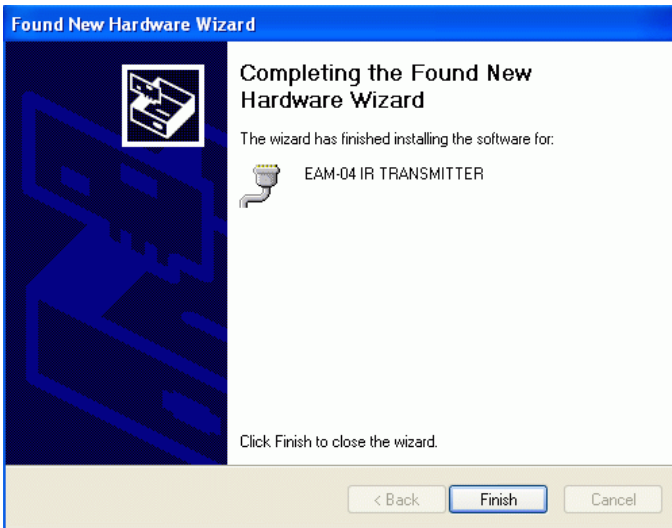


Figure 11

Now the transmitter driver is connected (Figure 11).

Starting the program

When the program is started, the main program window should appear (see Figure 12).

The size of the AM3 program window can be changed to fit it for different display units. The selected window size is saved and will be applied when you start the program next time.

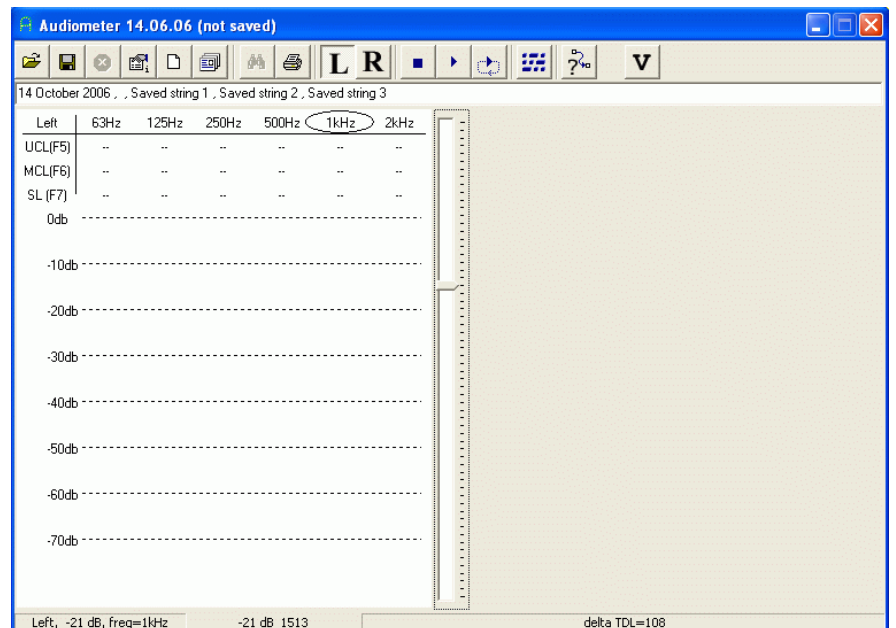


Figure 12



Figure 13

If the window shown in Figure 13 appears when you start the program, this means that the transmitter is not connected to the computer or the driver of the virtual COM port is not installed. If you want to run the control program for viewing or printing diagrams or working with the archive, choose Yes.

Controlling the stimulation signal frequency and level

Changing the stimulation signal level: move the slider in the centre of the screen by using the mouse, or the $\uparrow, \downarrow, \downarrow \uparrow$ keys, or the +, - keys. The signal level is shown in the middle of the status line of the main window (see Figure 12). This function is not available in the TDL mode!

Switching between the right and left channels: click the **L** or **R** button or press the "R" or "L" key. This function is not available in the TDL mode!

Changing the stimulation signal frequency: click the needed frequency in the program window or use the \leftarrow, \rightarrow keys. The selected frequency is shown in an oval. This function is not available in the TDL mode!

Making a mark in a chart: to mark the current stimulation signal level as **UCL**, **MCL** or **SL**, click the corresponding line (initially the lines are filled with dashes) or press the **F5**, **F6** or **F7** key, correspondingly. Entered points are marked with circles (UCL), squares (MCL) and triangles (SL), and are connected, wherever possible, with straight lines (see Figure 14). To delete a wrong number, press the **Ctrl** key together with one of the above options. A dash should appear in the corresponding line. This function is not available in the TDL mode!

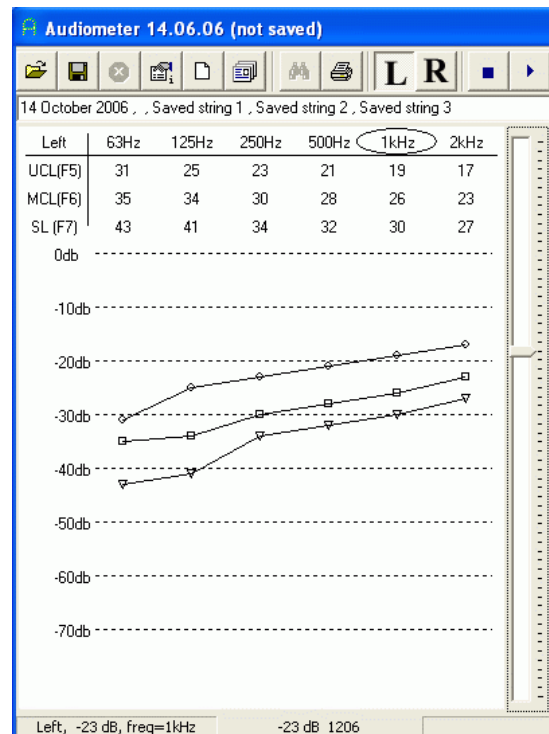


Figure 14

Menu buttons



(F3) – opens a file. If an archive name is not specified, you will be asked to select a name and a window with names of records in the archive will be opened. One mouse click shows the comment for a record, while double mouse click loads a record.



(F2) – saves the current record. As in the case of file opening, a window with names of records in the current archive will be displayed, but the first record will be --new file--. If a name is selected which already exists, the previous record in the archive will be replaced with the current one.



– selects the current archive.



– edits a comment. A comment consists of five lines. In the comment window, they are shown in one line and are separated by commas. The first line contains the date of record creation, which is filled automatically when a new record is created (but you can change this date if you want). The last three lines are remembered, and when a new record is created, they are inserted to the corresponding positions of the comment. These five lines are edited in turn. To terminate editing, press Cancel.



– deletes a record. Deletion is possible only when a window with names of records in the current archive is opened. A record occupies very little disk space, therefore deletion makes sense only for facilitating the search of needed records.



– new – erases all results and data; the first line of a comment is filled with the current date.



– search. Deletion is possible only when a window with names of records in the current archive is opened. The case is not taken into account. Lines of comments of records in the current archive are searched for matches. When a match is found, a comment is displayed and a record is highlighted. A window is displayed asking whether you want to continue the search. If you want to continue, press OK.



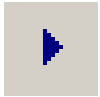
– print – prints the current record.



– left, right (L, R) – switches between the channels. This function is not available in the TDL mode.



(Esc) – cancels the stimulation. It should be used after continuous stimulation is started.






– (space) – starts single stimulation.



– (Ctrl-space) – starts continuous stimulation (signal-pause at 1-second intervals).



– (T) – switches the TDL mode on/off. When this button is in the pressed position, activation of stimulation, change of stimulation signal frequency and level and switching between the left and right channels is not possible.

A window is displayed. The slider in this window determines the delta and the three buttons open the stimulation combinations depicted on them ( ,  , ). After pressing a stimulation button, you have to enter the result by pressing Yes (correct) or No (incorrect). The result is displayed in the upper part of the window. You cannot change the delta after pressing a stimulation button for the first time.

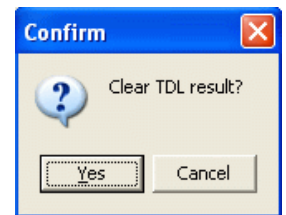


Figure 15

To clear the result and enable changing of the delta, make a mouse click on the result window (see Figure 15).



– link test (F4) – induces a long audio signal at the audiometer receiver, signifying that the link is present. The link status is also indicated by blinking of the LED on the audiometer receiver at 3-second intervals (only when the control program is running).



– battery test – induces an audiometer signal in the form of 1 to 5 short high-pitched beeps which announce the battery charge (5 signals mean that the battery is new). Also, when the battery runs down below the corresponding threshold, the audiometer gives two low-pitched audio signals (at a frequency of 0.5 kHz) every 15 seconds. You can continue operating the device for some time but you should bear in mind that the audiometer may shut down (when this happens, the audiometer gives a long low-pitched audio signal).

Storing the results

The results of measurements are stored in **records** consisting of UCL, MCL and SL data, TDL results and comments.

Records are stored in **archives**. An archive is a file with the extension .AU on a computer disk. Archives are recorded by default to the same directory where the AM3 program is located. Archives help to systemize data.

A user can create any number of archives and store any number of records in an archive, arranging archives and records in a manner which is convenient for information search.

An archive name must be selected in accordance with system convention on file names. A record name can be up to 250 characters long. One archive cannot contain records with identical names. Record names are not case-sensitive, i.e. records "**NaME**" and "**name**" are same.

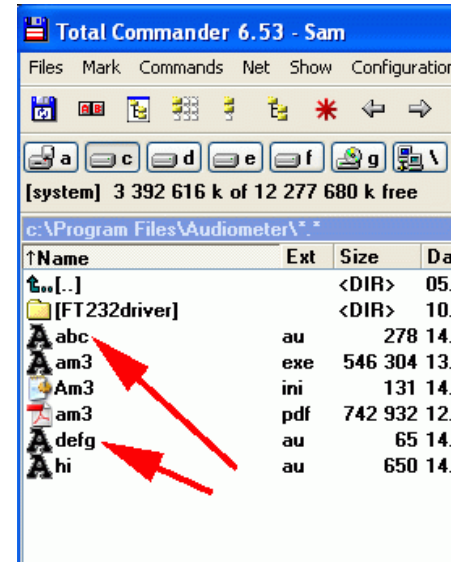


Figure 16

The program works with only one archive at a time. This means that if you want to move a record from one archive to another, you have to select the first archive, open the record you need, then select the second archive and write the record to this archive. After this, the record can be deleted from the first archive. A record occupies very little disk space, therefore deletion makes sense only for facilitating the search of needed records.

To prevent loss of data in case of system crash or computer failure, it is recommended to regularly copy all files with the extension .AU to another storage medium (a floppy or USB disk, etc). Archivers such as WinZip are not necessary, since records stored in archives are already compressed. This saves computer disk space and blocks data viewing by other programs.

Audio signals

Low-pitched sound (0.5 kHz)

Two short signals with a 15-second interval: the battery is low; you can continue operating the audiometer but it can shut down and its accuracy can get degraded (♪-♪-----♪-♪)


One long signal: the battery is low; after the signal the audiometer will shut down. Replace the battery. (♪♪♪♪♪♪♪♪♪♪♪)

Middle-pitched sound (1 kHz)

One short signal: confirmation of reception a command from the computer. (♪)


One signal of average duration: an error occurred during reception a command from the computer (for example, there is interference from other IR devices, or the receiver is closed, etc). This signal can also come following the switching signal when the audiometer is switched on. (♪♪♪)

Three short signals at 3:1 intervals and three short signals at 1:1 intervals: when switching on the audiometer. (♪---♪---♪---♪-♪-♪)

One long signal: when pressing the  "link test" button. (♪♪♪♪♪)

Six short signals: high output voltage; the connection should be checked. (♪-♪-♪-♪-♪-♪)

High-pitched sound (2 kHz)

One to five short signals: when pressing the  "battery test" button.

(♪), (♪-♪), (♪-♪-♪), (♪-♪-♪-♪), (♪-♪-♪-♪-♪)

5 signals: the battery is fully charged; 1 signal: the battery is low.

TDL mode

In this mode, the stimulation parameters such as in the last measurement are used. You can change only the stimulation signal duration delta but you have to do it prior to first stimulation.

The delta slider and the stimulation combination buttons are enabled (see Figure 17)

After one of the combination buttons is pressed, the TDL window has the view shown in Figure 18nd only the **Yes** and **No** buttons are enabled.

After a result is selected, the window has the view shown in Figure 19The stimulation combination buttons are enabled again, while the delta slider is disabled.

To clear the results, click on the result window (blue caption) and confirm your choice (see Figure 20)

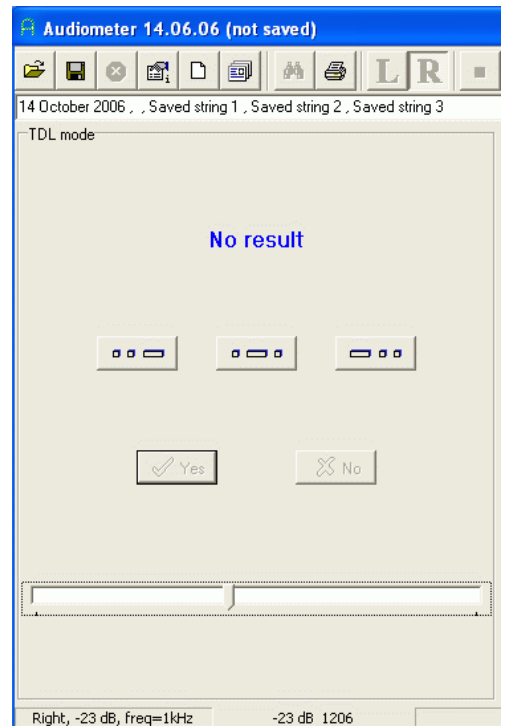


Figure 17

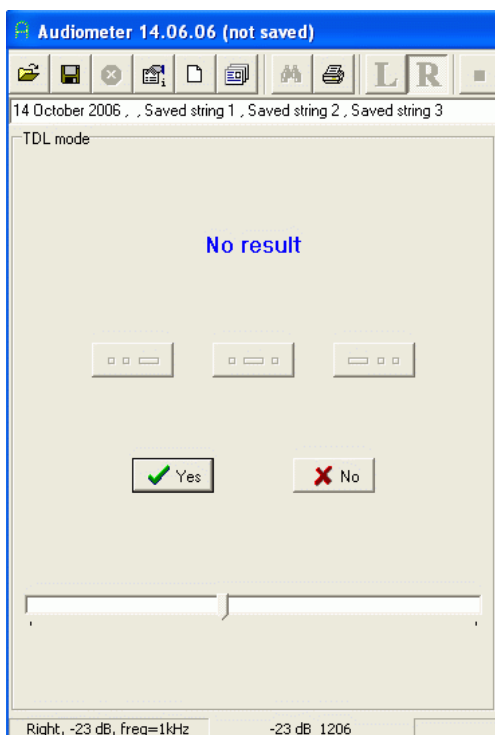


Figure 18

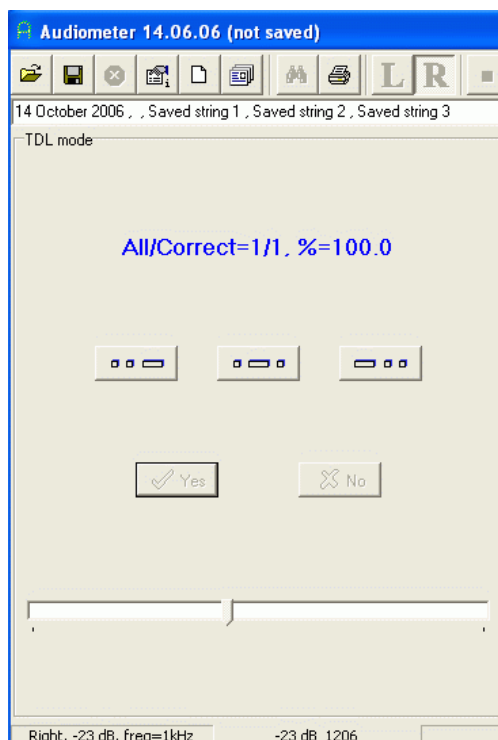


Figure 19

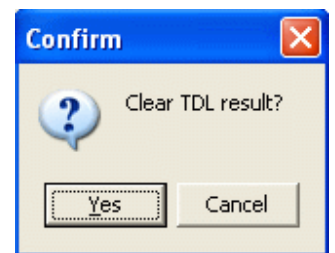


Figure 20