

# Emotion Recognition and Behavior Detection System

## VibraLite

### Manual

Version 8.1

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# 1. Introduction

Welcome to the **VibraImage** World! Thank you for your purchase of **VibraLite** system. This Manual is written to help you enjoy **vibraimaging** and open new features in well-known objects!

**VibraImage** technology measures micromovement (micro motion, vibration) of person by standard digital, web or television cameras and image processing. Human head microvibration is linked with the vestibular-emotional reflex (VER) of a person and reflects emotion status and personality traits. **VibraLite** system detects human emotions by the control of three dimensional (3D) head-neck movements and fluctuations, accumulated as frame difference in several video frames.

## 1.1. Basic applications

**VibraLite** software solves the following aims:

- Emotions recognition and quantitative measurement of emotions;
- Vibraimage real time surveillance, research and control;
- Aura (external vibraimage) real time surveillance, research, analysis and interpretation;
- Behavior detection and psychophysiological control of person;
- Personal compatibility;
- Psychophysiological detection of deception, lie detection;
- Medical psychophysiological personal diagnostics based on corresponding statistic norms;
- Monsters detection.

**VibraLite** program has several modification. The choice of modifications is carried out at a stage of software installation.

**Note**, each of 12 modification requests a separate key for authorization. Every **VibraLite** modification program is independent from the other modifications.

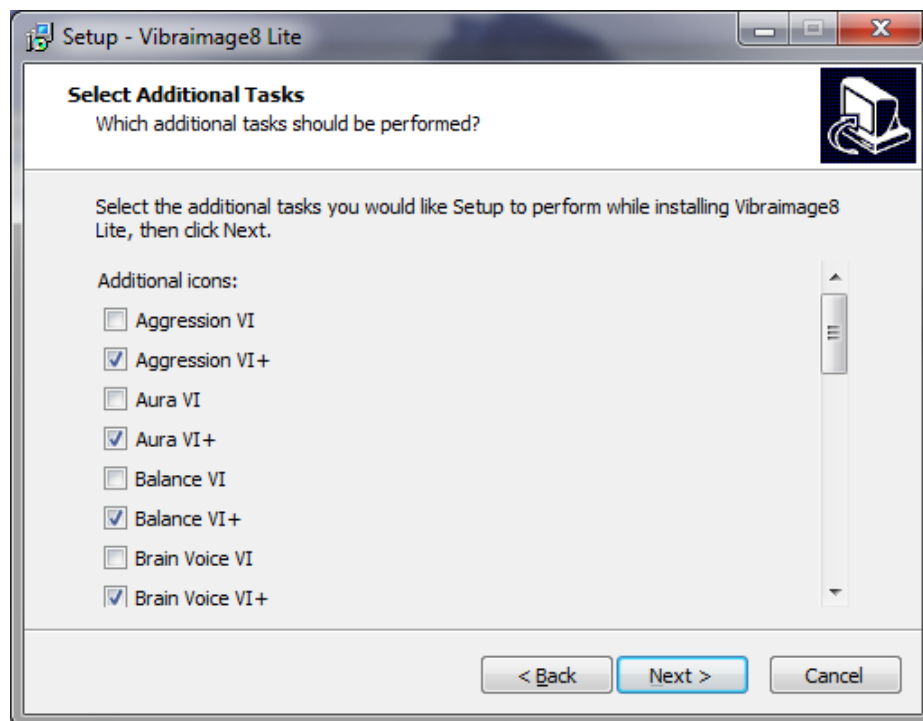


Fig. 1.1. *VibraLite* modifications.

1. **Aggression VI** – detection and quantitative measurement of aggression (activity) personal level as one of the base human emotions. Every person has some aggression or activity level and low aggression level is the same pathology as high aggression level. User could control his own aggression level, or aggression of friends, partners and any controlled person.
2. **Aura VI** – indication of the personal vibra-aura (external vibraimage), visualized by vibraimage technology.
3. **Balance VI** – detection and quantitative measurement of personal mental balance, balance scale in % from 0-100. the best mental balance state corresponds to 100% .
4. **Brain Voice VI** – audio indication of person vibra-aura, visualized by vibraimage technology.
5. **Biotester VI** - quantitative measurement of psychological-energy changes in personal state, calculation of person energy in kkal/min, psychological state in % from 0-100. the best psychological state corresponds to 100%
6. **Charming VI** – quantitative measurement of personal charming level, charming scale in % from (0-100)%, the best charming state corresponds to 100%
7. **Compatibility VI** - quantitative measurement and testing of couple compatibility for lovers, friends, familiar, partners etc. Compatibility scale in % from (0-100)%, the best compatibility corresponds to 100%
8. **Energy VI** - quantitative measurement of personal energy level, energy scale in % from (0-100)%, the maximum energy corresponds to 100%

9. **Stress VI** - Some of scientists don't correspond stress with emotions, however, nowadays stress is the most popular term characterizing human mental state. **VibraImage** allows fairly analyze own or others stress level, that is important for regular mental health control, also as precautions, rehabilitation and cure for depression states. Stress scale in % from 0-100. the maximum stress corresponds to 100%
10. **Suspect VI** – quantitative measurement of personal suspect level (potential danger of person) by calculation of aggression, stress and anxiety levels. Suspect scale in % from 0-100. the maximum suspect corresponds to 100%
11. **Tension VI** - Anxiety (fear, tension) presents physical emotion realization, produced by any alarm, independently from conscious or unconscious of this state by person. **VibraImage** program intends for anxiety level analyzing, allows to indicate unconscious alarm and fear, so assists in it medical treatment. Anxiety scale in % from 0-100. the maximum anxiety corresponds to 100%
12. **VibraLie** – psychophysiological detection of deception based on vibraimage technology. Contactless high sensitive detection of psychophysiological response during examination and auto lie calculation based on suggested MCQT method.
13. **E-Monster** - Program shows facial image of person changed by emotions. You could detect monsters by this program even if person is hidden emotions under the mask of normal face.

All parameters are calculated in a range from 0 up to 100 %, the greater value of parameter corresponds to the greater calculated value.

If in the name of the program there is a sign «+», for example **Energy VI +**, its means that this updating of the program has advanced features.

## 1.2. Specifications

### 1.2.1. Basic parameters

- |   |          |
|---|----------|
| • Resolution, TVL, more than                | 400      |
| • Noise level of VibraImage, bit, less than | 0.1      |
| • Frame speed, frame/sec, more than         | 15       |
| • Frequency range, Hz, more than            | 0.1 ÷ 10 |

### 1.2.2. Digital (web) camera requirements

- |                                 |                           |
|---------------------------------|---------------------------|
| • Sensor                        | CCD or CMOS Sensor        |
| • Resolution, pixel., more than | 640 x 480                 |
| • USB compatible                | USB 3.0, USB 2.0, USB 1.0 |
| • Frame speed, f/s, more than   | 15                        |
| • Microphone                    | external                  |

- Exposition control auto and manual
- Color mode color and B/W switch
- Flicker mode Flicker 50Hz and 60Hz

### 1.2.3. System requirements for local module computer

- Operation System Windows XP Prof/Vista/7/8 with DirectX 9.0 or later
- Processor Pentium Core Duo 2 2400 MHz or later
- RAM more than 1024 Mb
- HDD more than 10 Гбайт
- USB порт 1 free USB ports version USB 2.0
- DVD-ROM DVDRW
- Installed software 1 DirectX 9.0 or later
- Installed software 2 Windows Microsoft.NET Framework 1.1 or later
- Video capture WDM-compatible video device

### 1.3. Package contents

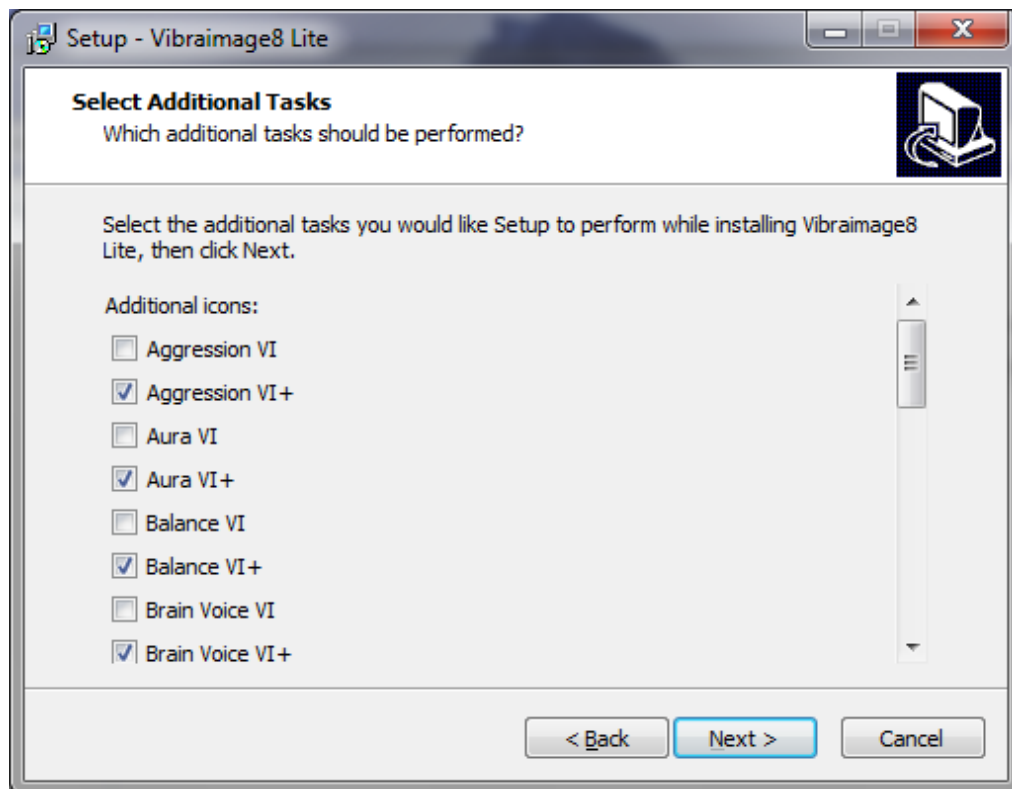
- |    |                             |   |   |
|----|-----------------------------|---|---|
| 1. | <b>Vibra</b> Lite software  | - | 1 |
| 2. | Activation code             | - | 1 |
| 3. | User's manual               | - | 1 |
| 4. | Digital USB camera (option) | - | 1 |
| 5. | Microphone (option)         | - | 1 |
| 6. | Personal computer (option)  | - | 1 |

## 2. VibraLite software installation

It is necessary to execute the following actions for installation of VibraLite program on your computer:

1. Go to Web page <http://www.psymaker.com/ru/support/downloads/>
2. Load file [www.psymaker.com/downloads/Vibraimage8Lite.exe](http://www.psymaker.com/downloads/Vibraimage8Lite.exe)
3. Run file Vibraimage8Lite.exe from archive file.
4. Select language for installation procedure.
5. Press button «Next» in the appeared window of the beginning installation.
6. Accept the license agreement and to press button «Next» in the appeared window.
7. In the appeared window specify a way to the catalogue where files of the program will be written down, then to press button «Next».
8. Press button «Next» in the appeared window, allows installation of software files on your computer.
9. In the appeared window select versions of the program which you want to install on the computer (fig. 2.1).

**Note,** each of 11 program modifications requires a separate authorization key.



*Fig. 2.1. Choice of VibraLite modifications.*

10. Press button «Install» at the start of installation.
11. If you want to have the **VibraLite** program in the other modification, in the appeared window it is necessary to choose item of installation of virtual camera drivers, and press «Next».
12. Press button «Finish» at the end of installation.
13. **VibraLite** program pictograms appears after the end of installation in system menu on desktop of your computer.
14. To reboot a computer.

**Note**, if it is necessary to install some updating of **VibraLite** program, after start of a installation file in the opened window of a modifications choice (fig. 2.1) it is necessary not only to specify the new chosen the program updating, but also, corresponding ticks to confirm work with all old already installed the program modifications.

## 2.1. **VibraLite** software activation

### **Attention!**

1. Procedure of activation is made once at the first start of the program.
2. The received activation code can be used only for corresponding program.
3. Activation procedure requests access to the Internet for receiving answer code from server.

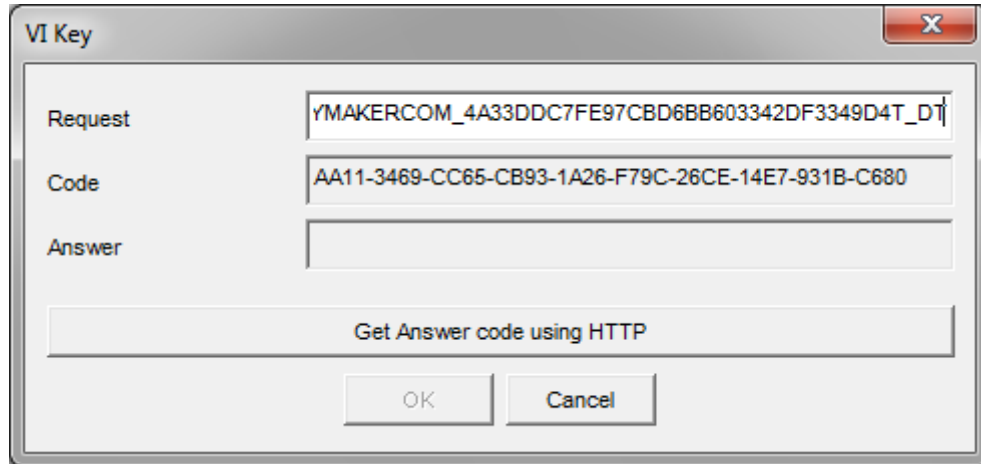
Key type	Software modification
VI7_XXXXXXXX_C	<b>Compatibility VI</b> software is intended for check of compatibility of two people
VI7_XXXXXXXX_DC	<b>Compatibility VI+</b> software is intended for check of compatibility of two people
VI7_XXXXXXXX_A	<b>Aggression VI</b> software is intended for check anger level of person
VI7_XXXXXXXX_DA	<b>Aggression VI+</b> software is intended for check anger level of person
VI7_XXXXXXXX_Z	<b>Aura VI</b> software is intended for check vibra-aura and vibraimage of person
VI7_XXXXXXXX_DZ	<b>Aura VI+</b> software is intended for check vibra-aura and vibraimage of person
VI7_XXXXXXXX_K	<b>Biotester VI</b> software is intended for check vibra-aura and vibraimage of person, its frequency histograms
VI7_XXXXXXXX_DK	<b>Biotester VI+</b> software is intended for check vibra-aura and vibraimage of person, its frequency histograms and
VI7_XXXXXXXX_V	<b>Brain Voice VI</b> software is intended for check «sound vibra-aura» of person



VI7_XXXXXXXX_DV	<b>Brain Voice VI+</b> software is intended for check «sound vibra-aura» of person
VI7_XXXXXXXX_D	<b>Suspect VI</b> software is intended for check suspect level of person
VI7_XXXXXXXX_DD	<b>Suspect VI+</b> software is intended for check suspect level of person
VI7_XXXXXXXX_S	<b>Stress VI</b> software is intended for check stress level of person
VI7_XXXXXXXX_DS	<b>Stress VI+</b> software is intended for check stress level of person
VI7_XXXXXXXX_T	<b>Tension VI</b> software is intended for check tension level of person
VI7_XXXXXXXX_DT	<b>Tension VI+</b> software is intended for check tension level of person
VI7_XXXXXXXX_B	<b>Balance VI</b> software is intended for check balance level of person
VI7_XXXXXXXX_DB	<b>Balance VI+</b> software is intended for check balance level of person
VI7_XXXXXXXX_H	<b>Charming VI</b> software is intended for check charm level of person
VI7_XXXXXXXX_DH	<b>Charming VI+</b> software is intended for check charm level of person
VI7_XXXXXXXX_E	<b>Energy VI</b> software is intended for check energy level of person
VI7_XXXXXXXX_DE	<b>Energy VI+</b> software is intended for check energy level of person
VI7_XXXXXXXX_L	<b>VibraLie</b> program for psychophysiological detection of deception (Lie detector)
VI7_XXXXXXXX_LD	<b>VibraLie2</b> program for contactless psychophysiological detection of deception. Lie detector .
VI7_XXXXXXXX_M	<b>E-Monster</b> program shows facial image of person changed by emotions. You could detect monsters by this program even if person is hidden emotions under the mask of normal face.
VI7_XXXXXXXX_MD	<b>E-Monster+</b> program shows facial image of person changed by emotions. You could detect monsters by this program even if person is hidden emotions under the mask of normal face.

### 2.1.1. Standard activation

1. For the activation start it is necessary to select **VibraLite** modification.
2. At the first start of the program the activation window will be displayed (fig. 2.2).



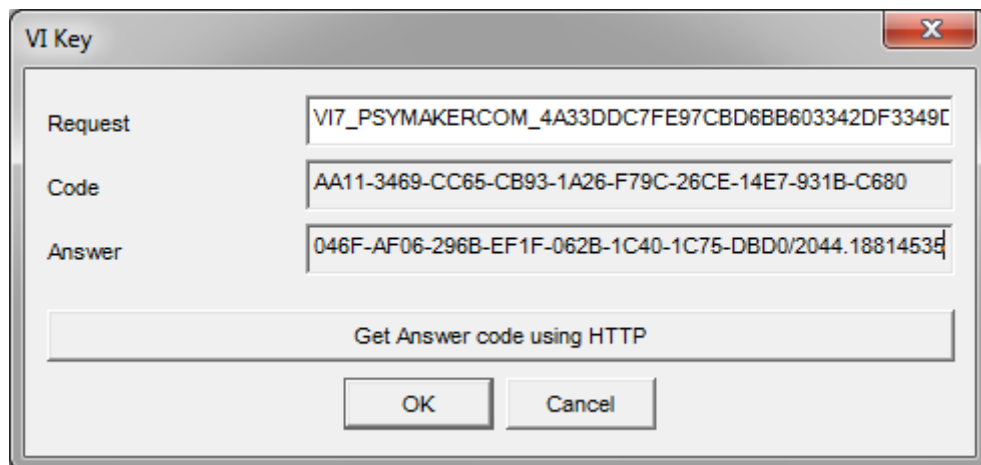
*Fig. 2.2. Activation window.*

3. In the field «Request» it is necessary to enter the activation code received by e-mail or specified by the seller. After input of activation code to press the button «Get Answer code using HTTP».

#### **Attention!**

**Please, be careful and paste code without additional gaps!**

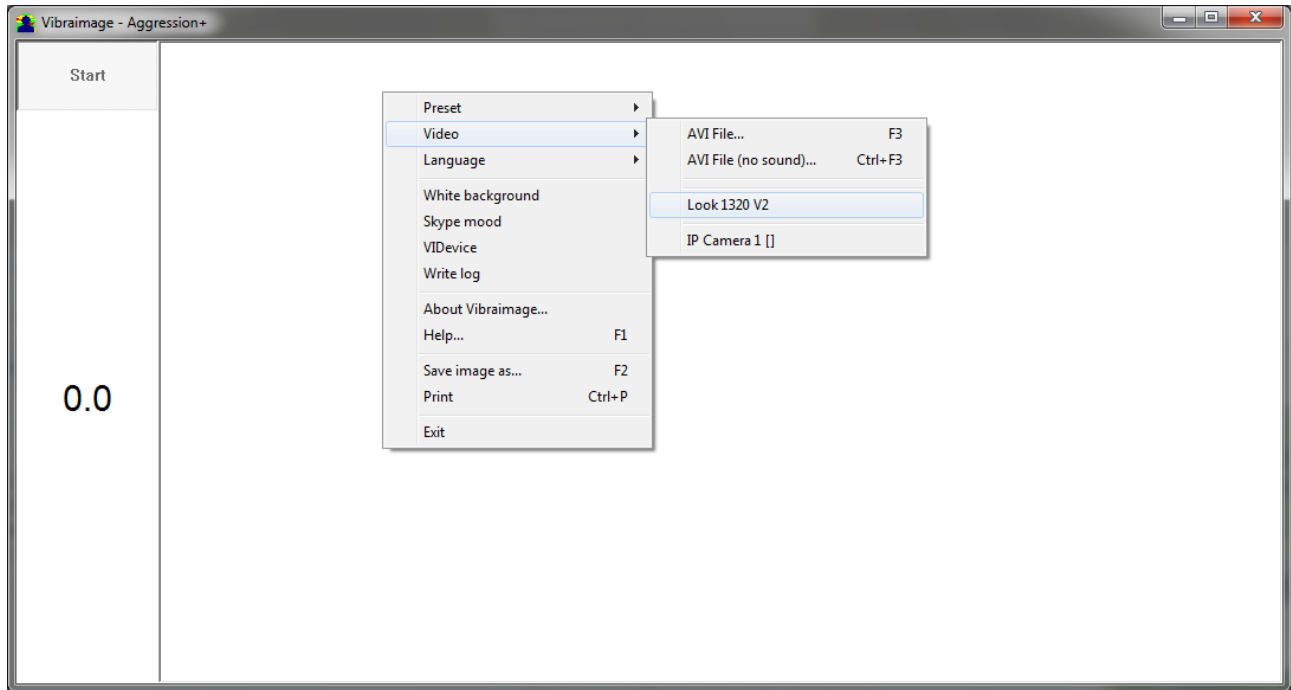
4. The activation code will be checked up through the Internet and, in case of successful end of activation procedure, the answer code will be sent (fig. 2.3).



*Fig. 2.3. Successful activation.*

5. Press button «**OK**». **VibraLite** will be automatically started in selected version.

After starting program you will see white screen (fig. 2.4). For camera selection in program it is necessary to click the right mouse button and to select the camera from the appeared submenu «Video» for operation (fig. 2.4).



*Fig. 2.4. The first start of the program. The camera isn't connected.*

6. Start operation with system.

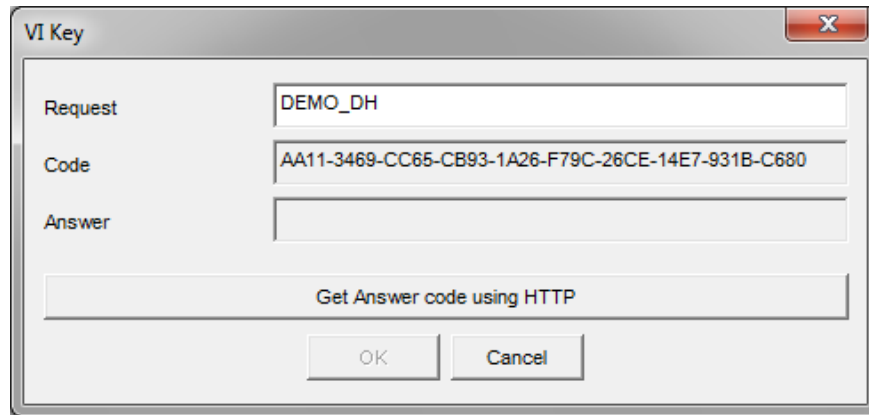
### 2.1.2. DEMO activation

**Note, for each modification you have a possibility of the program start in the DEMO mode only 5 times. Then the Internet code is required to be bought.**

1. For the activation beginning it is necessary to start the chosen **VibraLite** modification.

**Note, the DEMO mode is only available for modifications with the «+».**

2. At the first start of the program the activation window will be displayed (fig. 2.5).



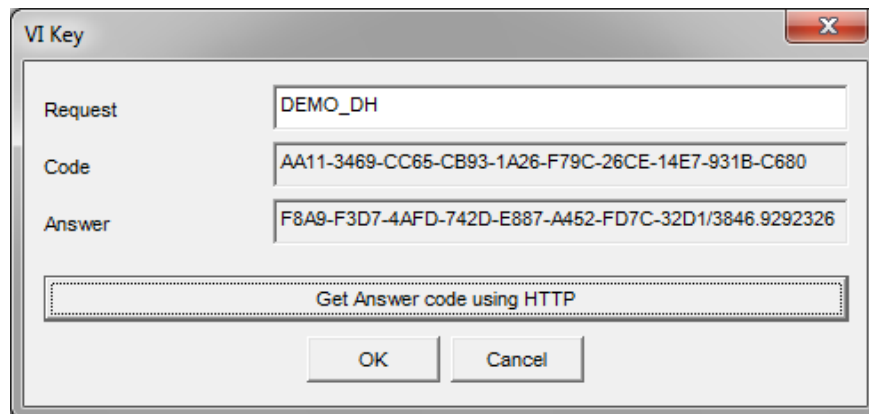
*Fig. 2.5. Activation window.*

3. In the field «Request» it is necessary to enter uppercase letters of «DEMO\_x», where x - letters corresponding modifications (shown in the table above). For example, on the fig. 2.5 x – DH, that corresponds to the program " **Charming VI** +». After input of a key to press the button «Get Answer code using HTTP».

**Attention!**

**Please, be careful and paste code without additional gaps!**

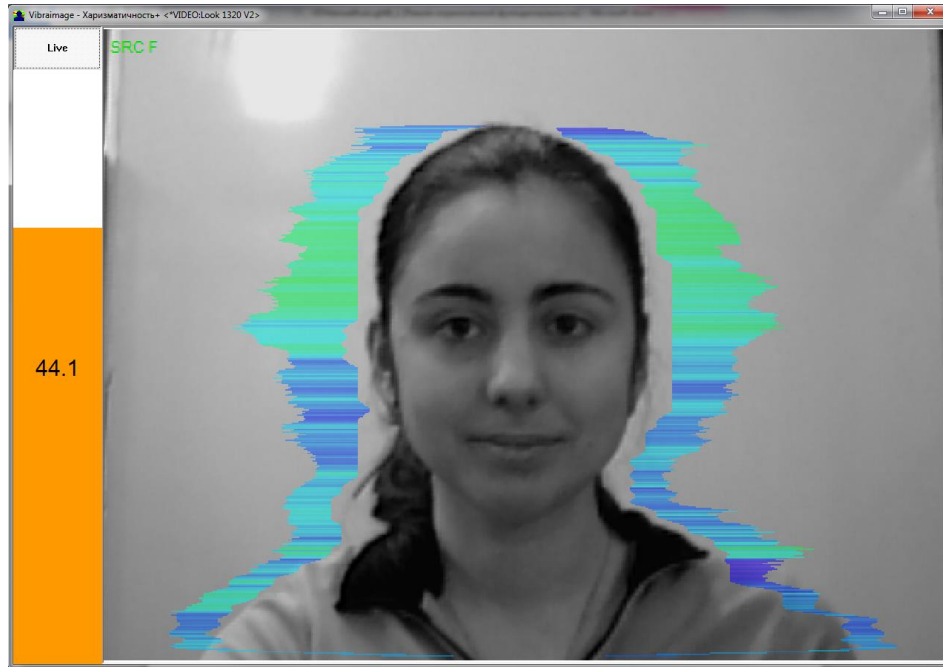
4. The activation code will be checked up through the Internet and, in case of successful end of activation procedure, the answer code will be sent and will be appeared in the field «Answer» (fig. 2.6).



*Fig. 2.6. Successful activation.*

5. To press button «OK». **VibraLite** will be automatically started in selected version **VibraLite** will be automatically started in selected version.

After program start you will see white screen (fig. 2.4). For camera selection in program, it is necessary to click the right mouse button and to select the camera from the appeared submenu «Video» for operation (fig. 2.4).



*Fig. 2.7. The web camera is connected. It is possible to begin operation.*

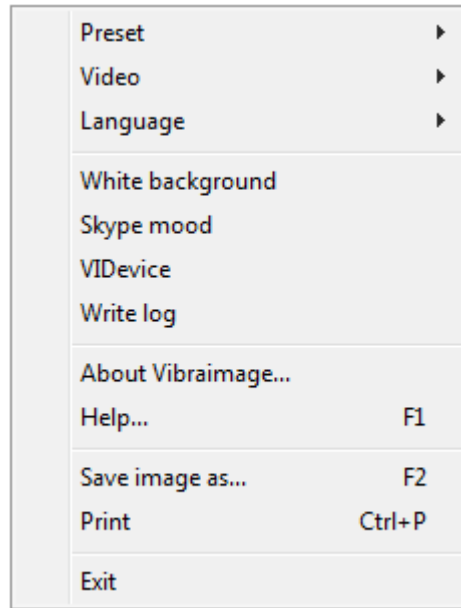
6. To begin operation with system according to the description of the **VibraLite** modification.

## 2.2. Reinstallation of **VibraLite**

**Note**, the ability to reinstall chosen **VibraLite** modification on a new computer is given to user only for **VibraLite** modifications with «+» This operation is also recommended before any upgrade SW or HW on PC.

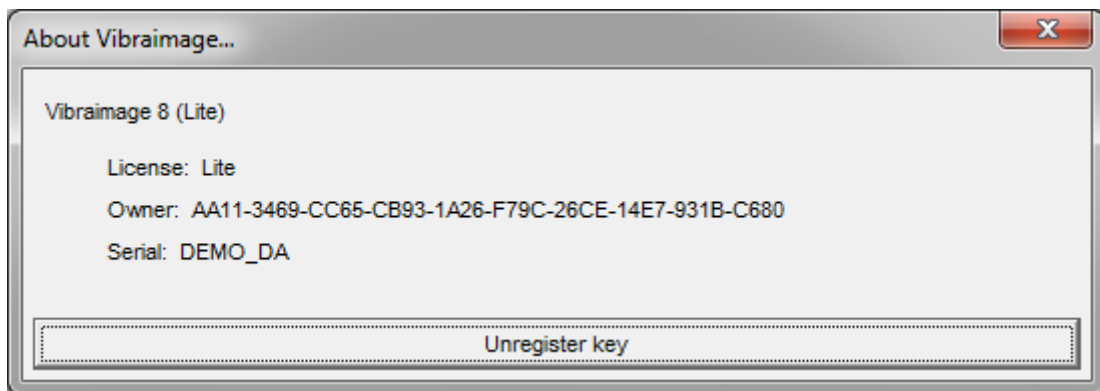
For this purpose it is necessary to execute the following actions:

1. To connect computer to the Internet.
2. To start **VibraLite** program for reinstallation on a new computer.
3. In a program window, having pressed the mouse right button, to cause the menu and to choose item «About Vibraimage...» (fig. 2.8).



*Fig. 2.8. Program menu.*

4. In the opened window to press the button «**Unregister key**» (fig. 2.9).



*Fig. 2.9. Information about the program.*

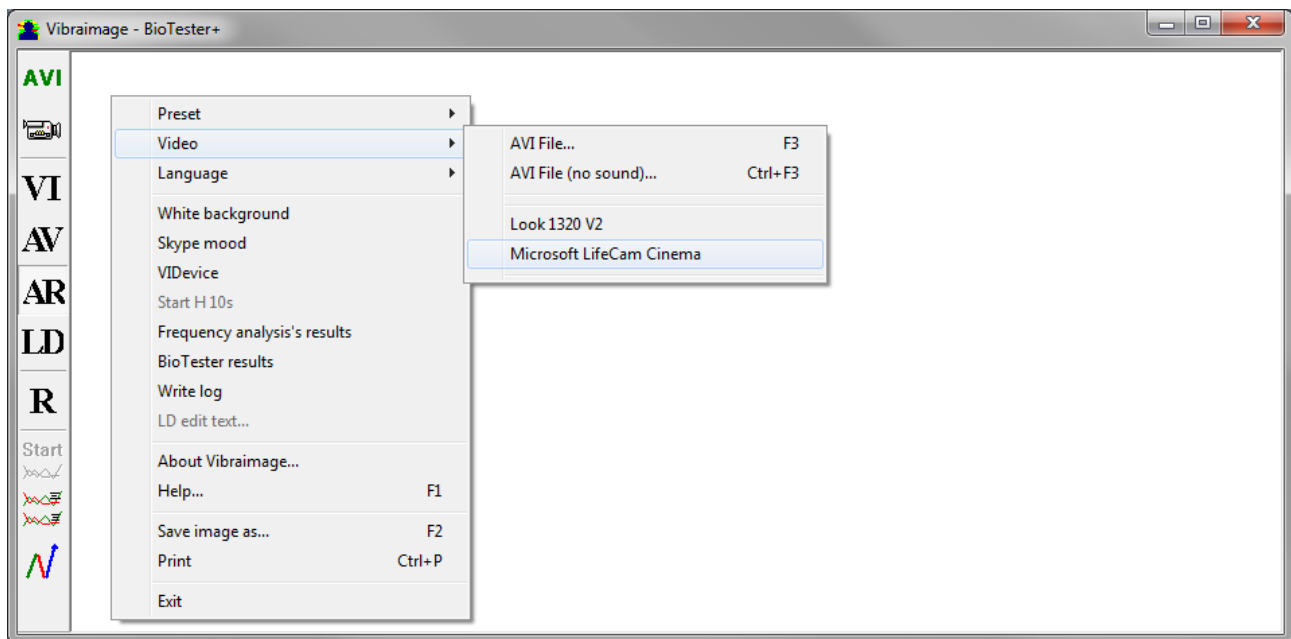
5. Close the program.
6. Connect a new computer to Internet.
7. On the new computer to install the chosen program modification and to make registration of an "old" modification activation code through the Internet, according to recommendations of section 2.1.
8. After successful program registration the given activation code will be fixed to the given computer.

## 2.3 Camera's setting

Standing correct camera settings is very important operation for the next vibraimage processing, because mistakes in image quality have great influence to the vibraimage processing results.

### 2.3.1 Video camera choice

It is necessary to click in a working window the mouse right button for video camera choice and to choose «**Video**» => «.../**name used camera**/...». In figure 2.9 the process of selecting camera «Look 1320 V2» is shown. If the camera is connected, selected and works, then on the left of the name there will be an icon «✓» (fig. 2.10), and the menu will be extended with the «**Video capture filter...**» and «**Video capture format...**».



*Fig. 2.9. Example of camera choice in BioTester.*

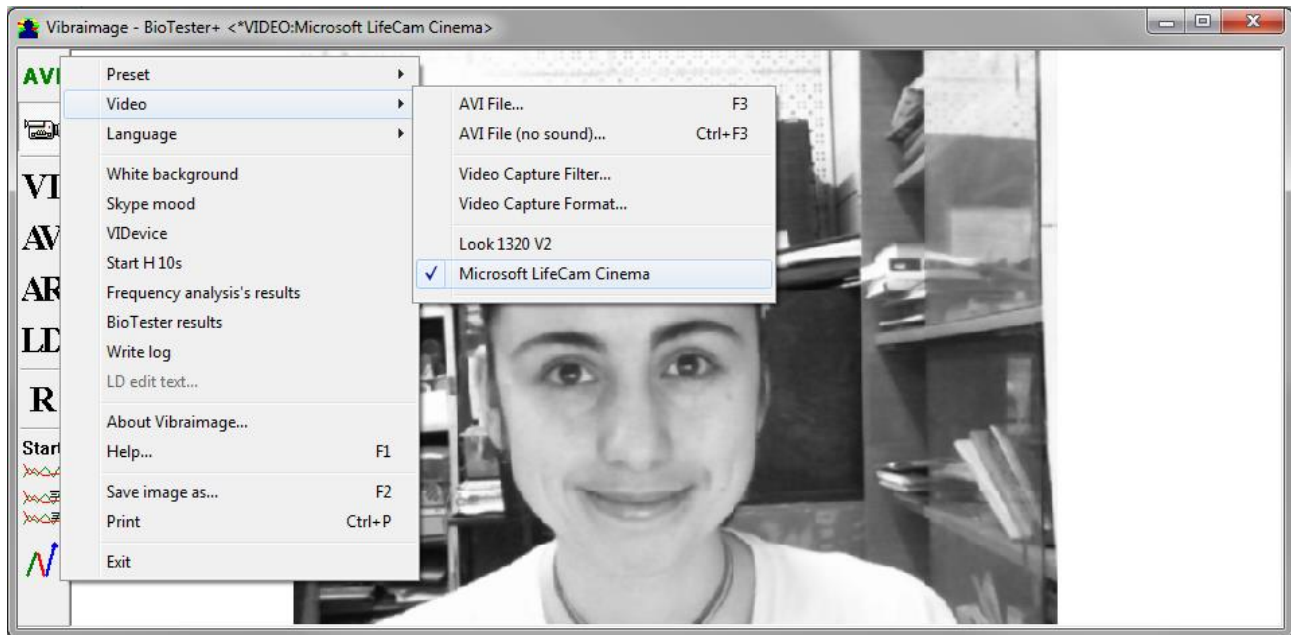


Fig. 2.10. The camera «Microsoft LifeCam Cinema» is selected.

### 2.3.2 Video capture filter

Select «**Video capture filter.....**» in the submenu «**Video**» (fig. 2.11) for open menu of the camera settings. Item «**Video capture filter....**» appears in the menu only in case of the correct installation of camera drivers and correct choice of operating camera.

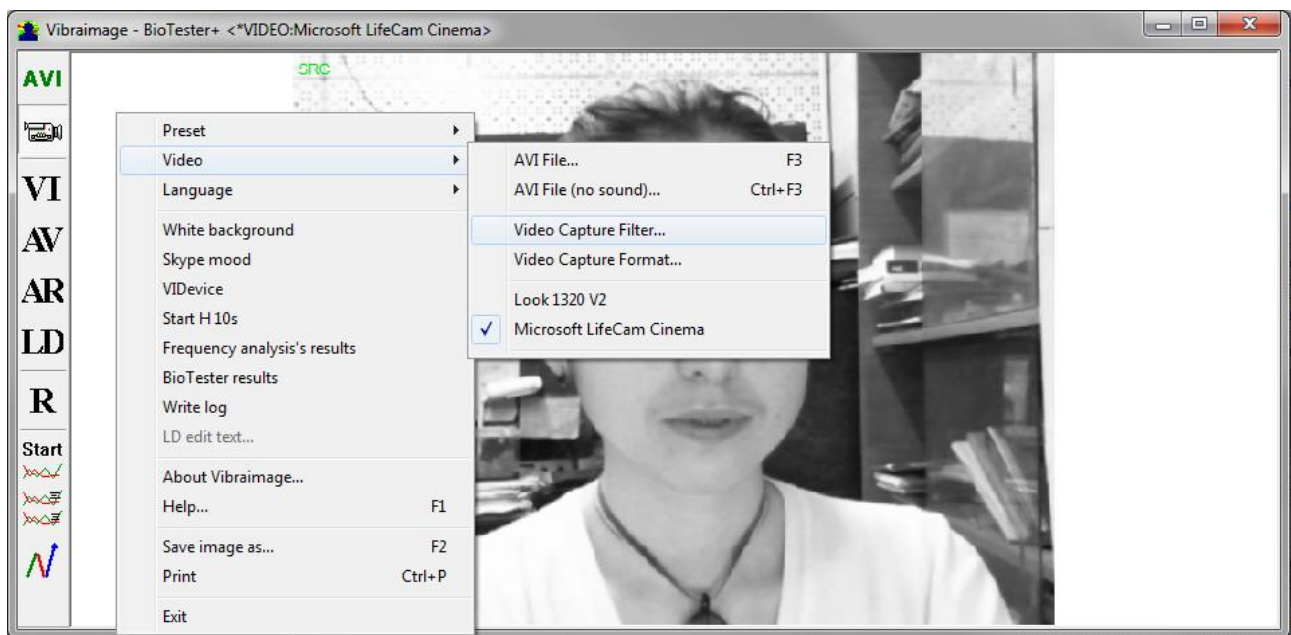


Fig. 2.11. Opening of the camera's settings menu («Video capture filter...»).

After a choice of the «**Video capture filter....**» the window «**Settings**» will open. Settings window differs depends on camera type. The first tab of this window is usually devoted to the image



setup (Brightness, Contrast, etc.). In a figure 2.12 the window «**Settings**» for the camera «**Microsoft LifeCam Cinema**», and in a figure 2.12 for the camera «Look 1320 V2» is shown. Camera Microsoft LifeCam Cinema has low noise level and is preferable for vibraimage applications among webcams.

«Brightness», «Contrast» and other parameters should be set up so that image of object has more contrast. Switching on/off flicker-effect from artificial lighting could be necessary for some illumination types.

Depending on the experimental conditions and light is necessary to select auto or manual settings «**Focus**», «**Exposure**». If the illumination is constant, then it is recommended to use manual configuration, if you change (for example, the illumination of an object depends on street lighting), it is better to use automatic configuration. The «**Scale**» (Zoom) is recommended to select based on two factors. Firstly you need to have maximum image size of control object and it is preferably to stand maximum zoom level. From the other side high level of electronic zoom in some cameras could go down the frame rate and it is necessary to control this parameter and fixed frame rate more than 25 f/s. So for webcam Microsoft LifeCam Cinema the optimal meaning of zoom for personal control is 4, see Fig. 2,14. For other cameras is possible to adjust other optimal zoom settings.

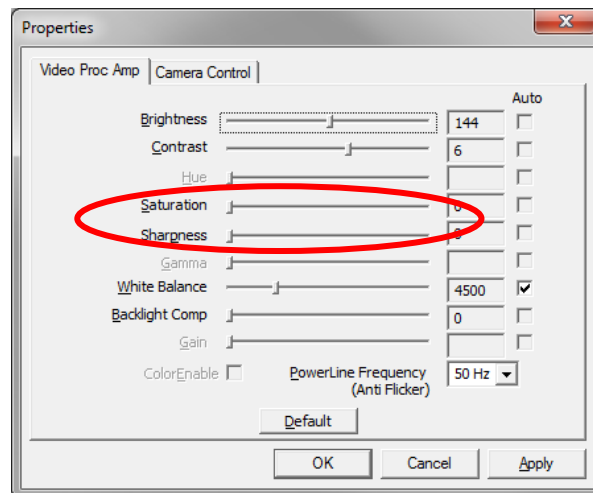


Fig. 2.12. Video setting, camera « Microsoft LifeCam Cinema»

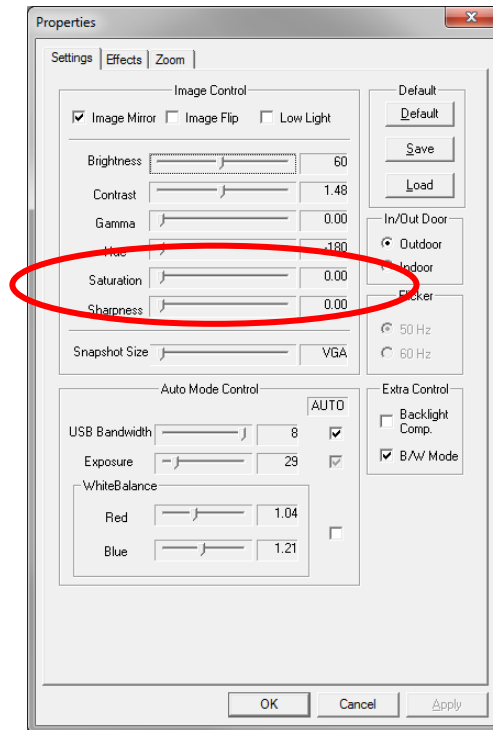


Fig. 2.13 Window «Settings», video setting, camera «Look 1320 V2»

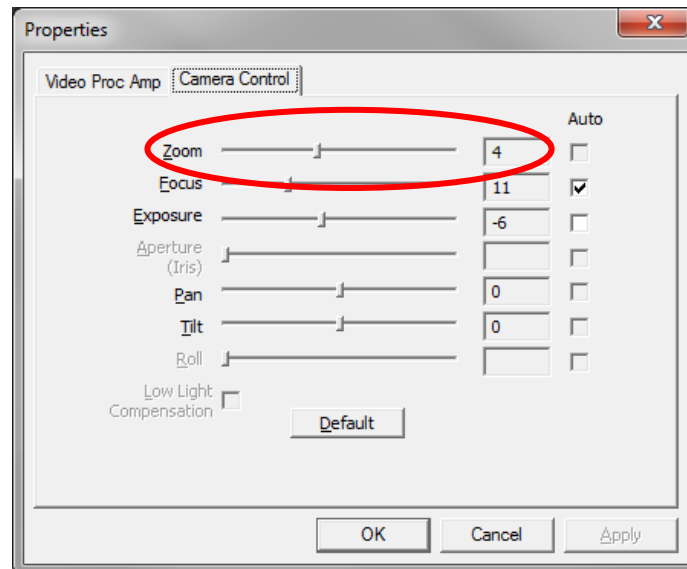


Fig. 2.14. Zoom setting, camera « Microsoft LifeCam Cinema»

### 2.3.3 Video capture format

Select «**Video capture filter...**» in the submenu «**Video**» (fig. 2.14) for open menu of the camera settings. Item «**Video capture format...**» appears in the menu only in case of the correct installation of drivers of the camera and a choice of the working camera. Frame rate is necessary to set 30 and the frame size to set ("Output Size") not less than 640 x 480 elements (fig. 2.15).

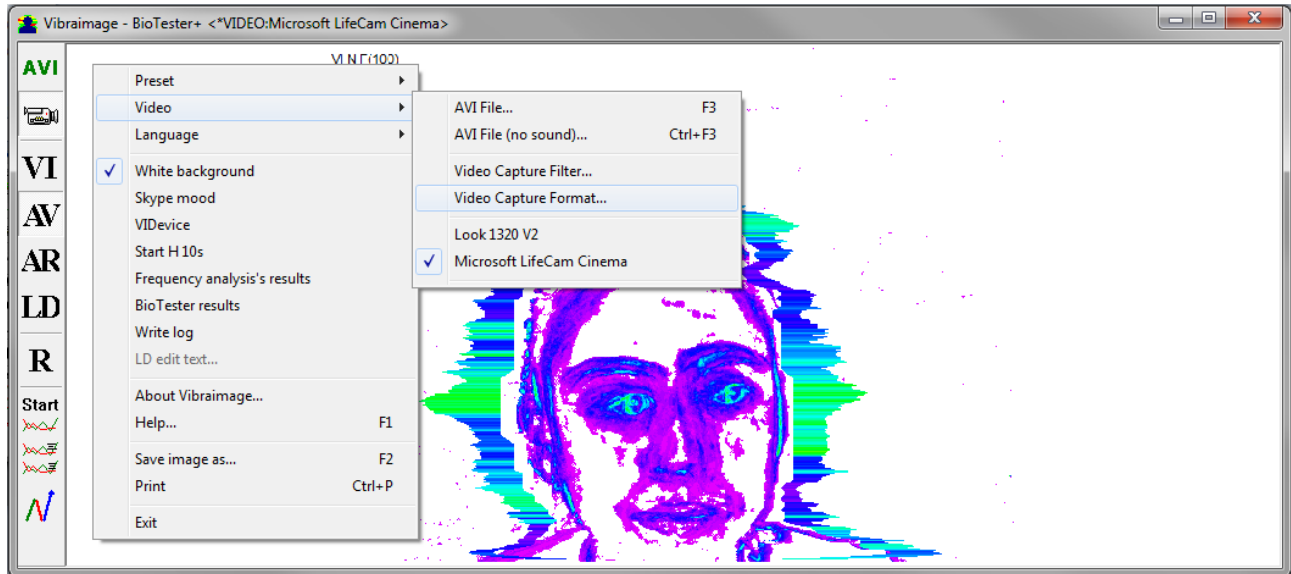


Fig. 2.14. Opening the settings window «Video capture format»

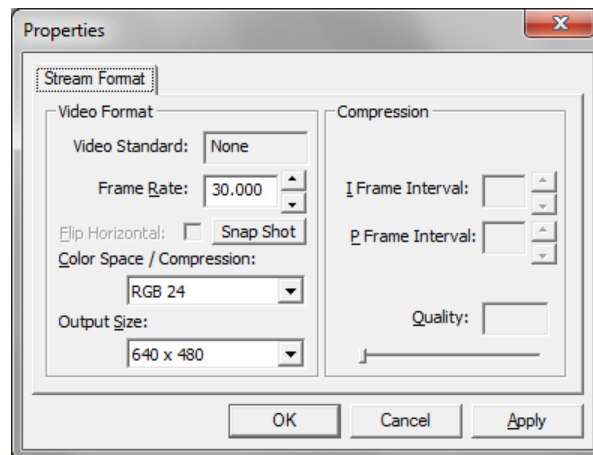


Fig. 2.15. Window «Video capture format»

**Note**, after changing camera settings in the program **VibraImage PRO** frame rate «In» must be in the range of 25 – 30 frames/s. The parameter IntegratedN (Am) indicating in main menu must be minimum and not exceeding 0.1. In other case the vibraimage processing could be wrong.

### 2.3.4 Checking the settings on the test table

During the first start of Vibraimage system and periodically it is recommended to test image quality by the test table. It is required to place a test pattern opposite to the camera so that the image of the table occupies the entire space of the frame. To achieve the optimal contrast range of object is need to stand in camera settings auto regulation of illumination in case of unstable illumination (fig. 2.16) and manual regulation of illumination in case of a constant illumination (fig. 2.17).

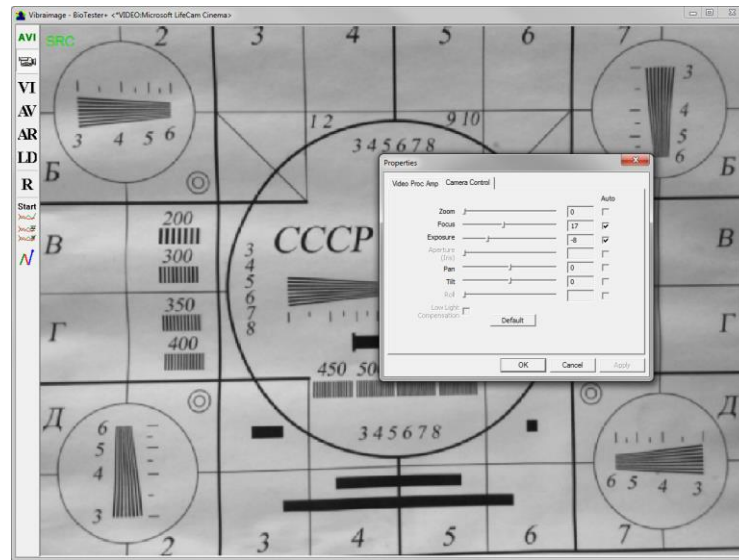


Fig. 2.16. Checking the camera settings on the test table, automatic regulation of the exposure (mode is recommended for unstable object illumination).

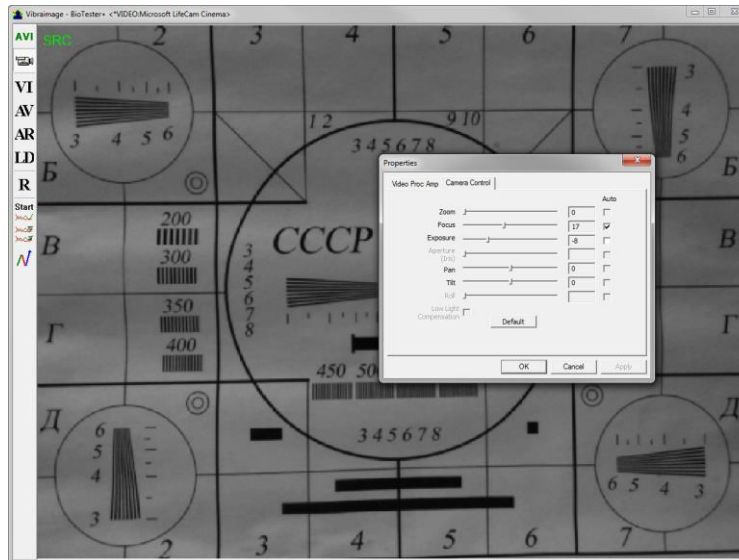


Fig. 2.17. Checking the camera settings on the test table, manual regulation of the exposure (mode is recommended for stable object illumination).

### 3. **VibraLite**. User's manual

Welcome to the **VibraImage** World! Thank you for your purchase of **VibraLite** system. This manual is written to help you enjoy **vibraimaging** and open new features in well-known objects!

**VibraLite** is intended for receiving, processing and the analysis of electronic images of the live biological objects making periodic oscillatory relocation of different frequency and amplitude, and also can be applied to the lifeless objects making periodic vibrational motions.

After start of **VibraLite** in the main window there is an image from connected video device.

#### 3.1. Main window

Main window (fig. 3.1) consists of the following parts:

- image area (on right side);
- information window (on left side).

In an information column (at the left side on the screen) it is displayed, calculated by the program, values of person emotion level parameters.

**Note** The type of the displayed parameter depends on the running program.

Running program	Parameter indicating in information column
<b>Compatibility VI</b>	Compatibility level of two persons in frame.
<b>Aggression VI</b>	Person aggression (activity) level
<b>Aura VI</b>	-
<b>BioTester VI</b>	Buttons for switch on/off basic work mode
<b>Brain Voice VI</b>	-
<b>Suspect VI</b>	Person suspect level
<b>Stress VI</b>	Person stress level
<b>Tension VI</b>	Person tension level
<b>Balance VI</b>	Person balance level
<b>Charming VI</b>	Person charm level
<b>Energy VI</b>	Person energy level
<b>VibraLie</b>	Person level of psychophysiological response and lie detection result (DI, NDI, INC).
<b>E-Monster</b>	-

In heading of the basic window the following information is indicated (fig. 3.1):

- type of video source: Video camera or AVI file;
- model of video source: Video camera model or AVI file name;
- Name of running VibraImage module



*Fig. 3.1. Main window **VibraLite.exe***

**Note**, double click by the left button of a mouse in the image field of makes **RESET** of all saved up information and statistics about frames and start new cycle collection of information.

## 3.2. Main menu

For a call of the program menu it is necessary to click in a working window the mouse right button. The appeared main menu will consist of the following items (fig. 3.3):

- «**Preset**» – choice of the basic modes of display of the information: VI – vibraimage, AV – aura on vibraimage, AR – vibra-aura on real image, LD – lie detect mode.
- «**Video**» – adjustment of a video camera parameters or loading of an external videofile.
- «**Language**» – Choice of language of the interface and help system (fig. 3.2).

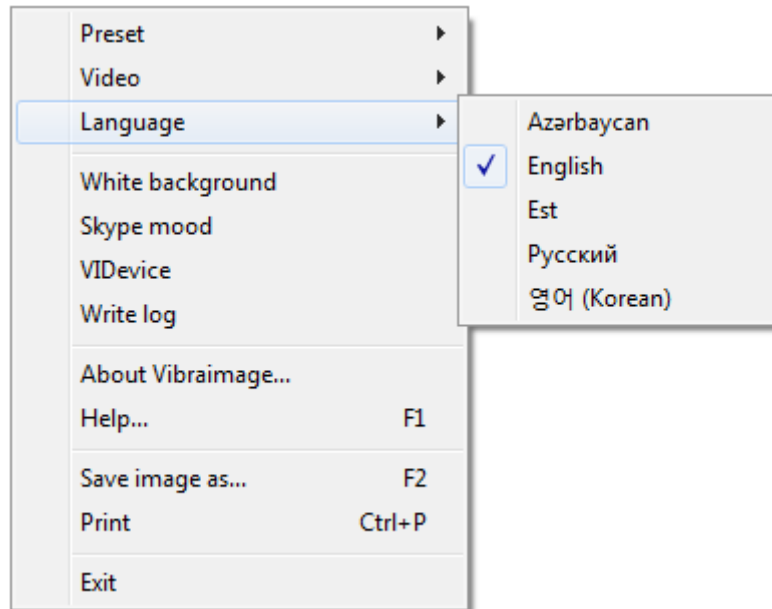
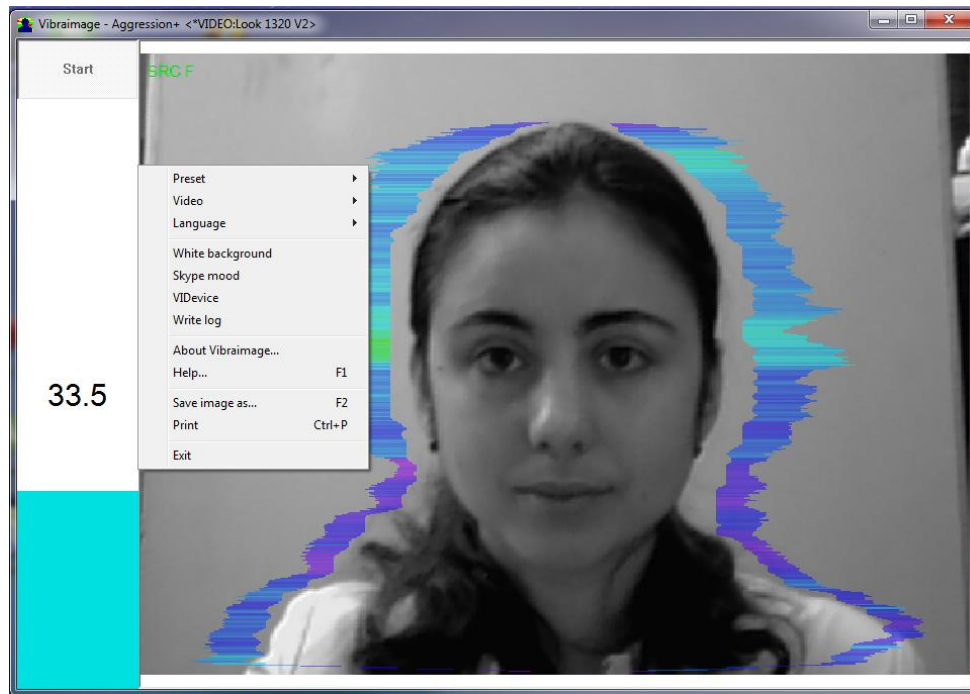


Fig. 3.2. Submenu «Language».

- «**White background**» – white background using.
- «**VIDevice**» – support virtual camera drivers.
- «**Write log**» – saving of current data as files with format «\*. xml» for every 60 seconds.
- «**About Vibraimage...**» - view the information about software version, license type and registered user name.
- «**Help...**» – call the help system about full version VibraImage software.
- «**Save image as...**» – save current picture to external graphics file.
- «**Print**» – print current picture.
- «**Exit**» – allows to quit the program.

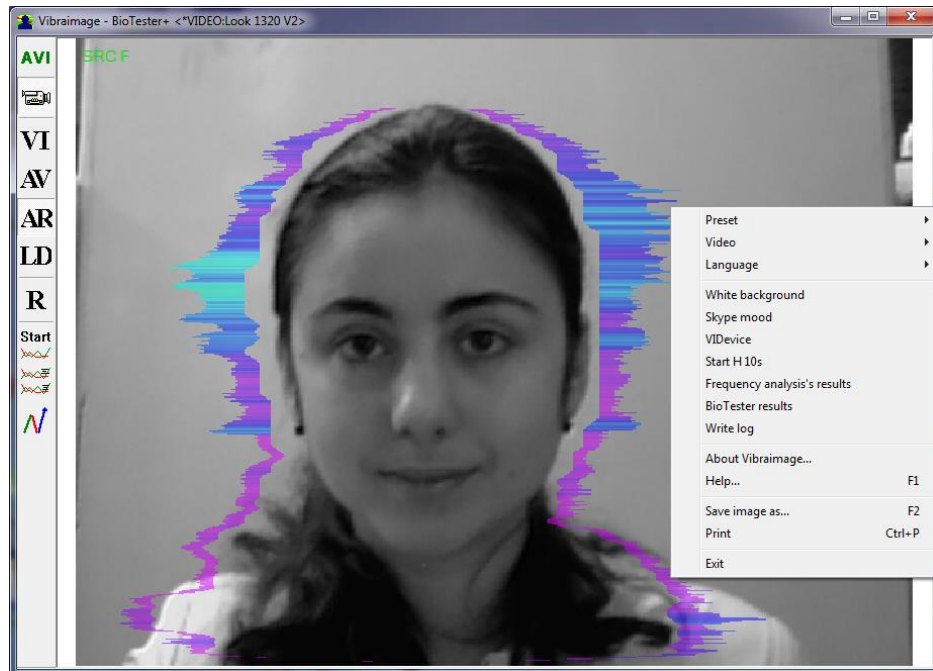


*Fig. 3.3. Main menu.*

In **BioTester** mode the appeared main menu will consist of the following additionally items (fig. 3.4):

- **Start H 10s** – gathering of information is made for 10 seconds, and the window of frequency information viewing is showed automatically after 10 seconds
- **Frequency analysis results** - switching in a mode of frequency analysis graph display
- **BioTester Results** - to open a window with results of psycho-energy condition of the person testing



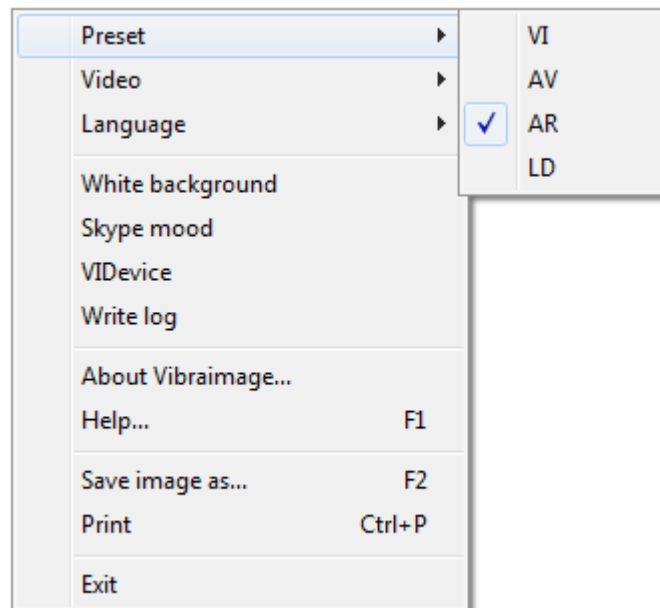


*Fig. 3.4. Main menu in BioTester mode.*

### 3.2.1. Image area control

Vibraimages, images and external vibraimages (vibra-auras) are displayed in the image area.

The main window of the basic **VibraLite.exe** module can be configured for observations in several operation modes.

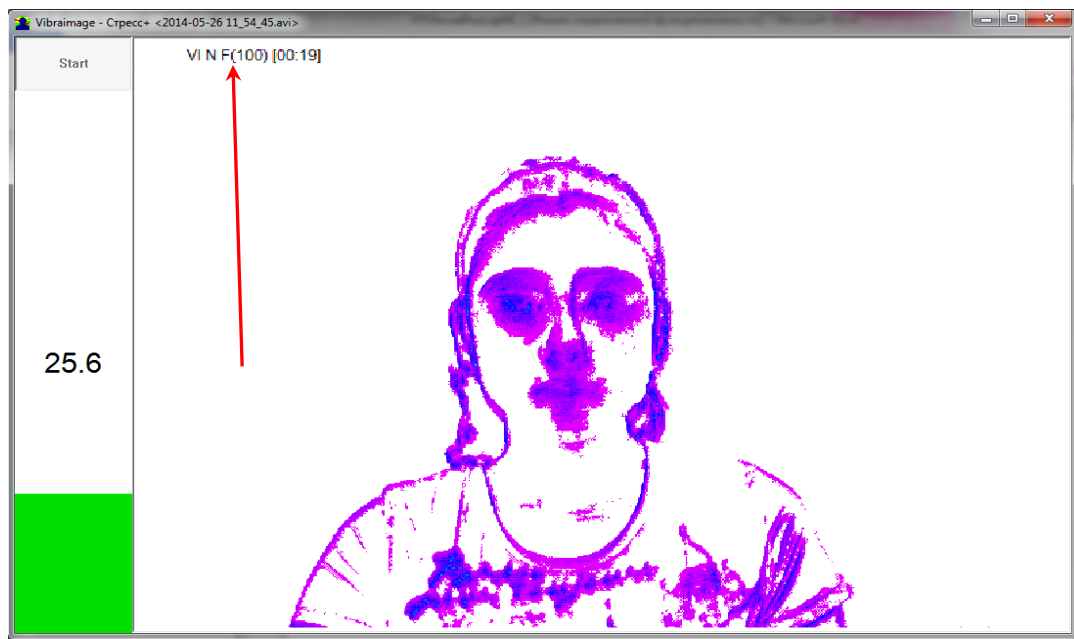


*Fig. 3.5. Operation mode select.*

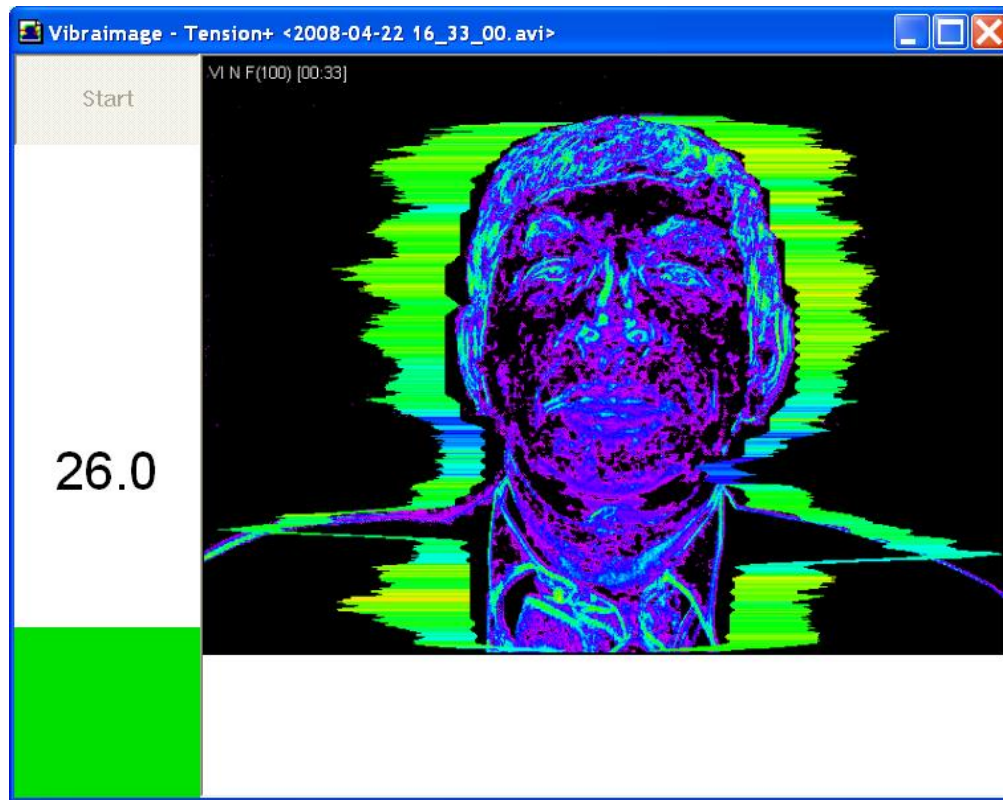
Item «**Presets**» menu (fig. 3.5) designed to choice one basic mode in image area.

- In «**VI**» mode [«VibraImage mode»] displays vibraimage of person. Color for every image pixel depends on its amplitude or frequency of vibrations (fig. 3.6). In VibraLite version color for every image pixel depends on its vibrations frequency.
- In «**AV**» mode [«Aura Vibraimage mode»] external vibraimage (aura) allocated around the internal vibraimage or simple vibraimage. Aura line size depends on medium line vibration amplitude. Aura line color depends on maximum line vibration frequency inside vibraimage contour (fig. 3.7).
- In «**AR**» mode [«Aura on the Real image»] the aura of the person is shown around his real image (fig. 3.8).
- In «**LD**» mode [«Lie Detector mode»] image area shows real object image.

**Note**, at a displayed of the image in VI and AV modes it is possible to change color of a background of the image, having chosen main menu item «**White background**».



*Fig. 3.6. VI mode on white background with point frequency analysis( $F$ ) and average on  $N=100$  frames..*



*Fig. 3.7. AV mode on black background.*

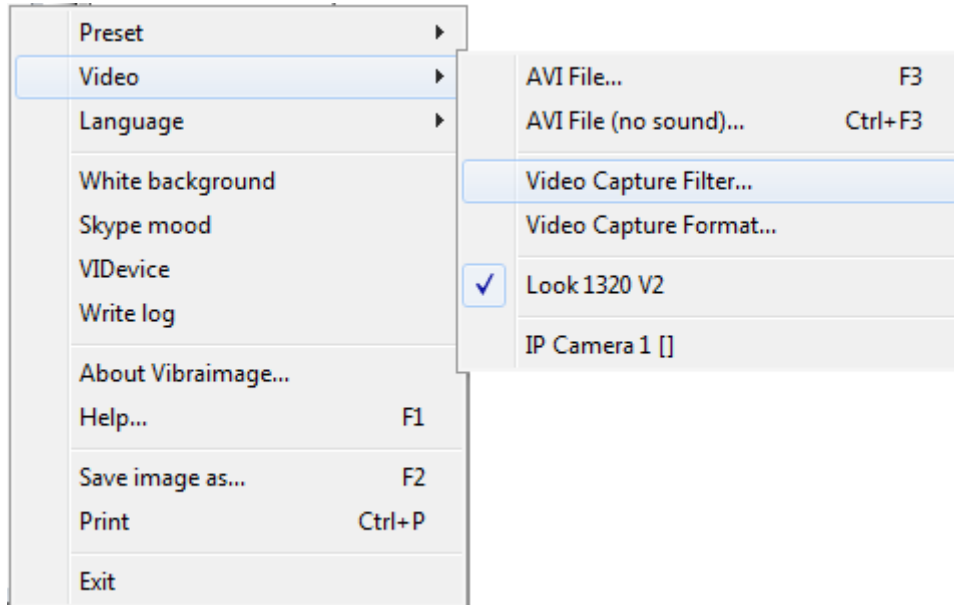


*Fig. 3.8. AR mode.*

**Note**, in the left top corner of a image window the image processing mode (Fig. 16) and time from the beginning of viewing AVI file are showed.

### 3.2.2. Video source choice

Video source choice is carried out through the settings window, caused by the submenu «**Video**» (fig. 3.9). Submenu «**Video**» contains options of video modes. Its can differ depending on connected devices. For example this menu contains the following items. You can choose as video source one from many installing in PC video-devices or load external video file.



*Fig. 3.9. Submenu «Video».*

Subitem «**Video Capture Filter...**» allows to set up parameters of video input signal such as: brightness, contrast range, shade, exposure and others. With its help windows with the settings which look differs for different devices of video capture are caused. It is recommended to include a mode of the black-and-white image for cameras, to turn on the filter from flicker of fluorescent lamps (flicker), the parameter of sharpness (sharpness) to set no more than 1.

Subitem «**Video Capture Format...**» is intended for change video capture format.

**VibraLite** system allows to processing as the «alive» video signal acting from a videocamera, and the videodata, before written down and saved as a AVI-file. On default the system works with a signal from a videocamera. Subitems « **AVI File ... F3** » and « **AVI File (no sound) ... Ctrl+F3** » are intended for a choice for the analysis of an external videofile.

Mode «**File (no sound)...**» - use for load AVI files without audio support. This mode designed for work with **VibraSound** mode.

### 3.2.3. Data saving

In version 8.1 there was a new function – continuous data record of measurements.

To include this option, it is necessary to select in the main menu the item «Write log» (fig. 3.2). Thus saving results of measurements in the form of text files in the «\*.xml» format will begin. Each text file will contain information about 1 minute of measurements. By default files will be saved to the folder «VI Result» in the folder «My Documents» (C:\Users\user\Documents\VI Result).

Figure 3.10 illustrates the view of data array, which was recorded by results of measurements in the «Tension+» for 60 seconds.

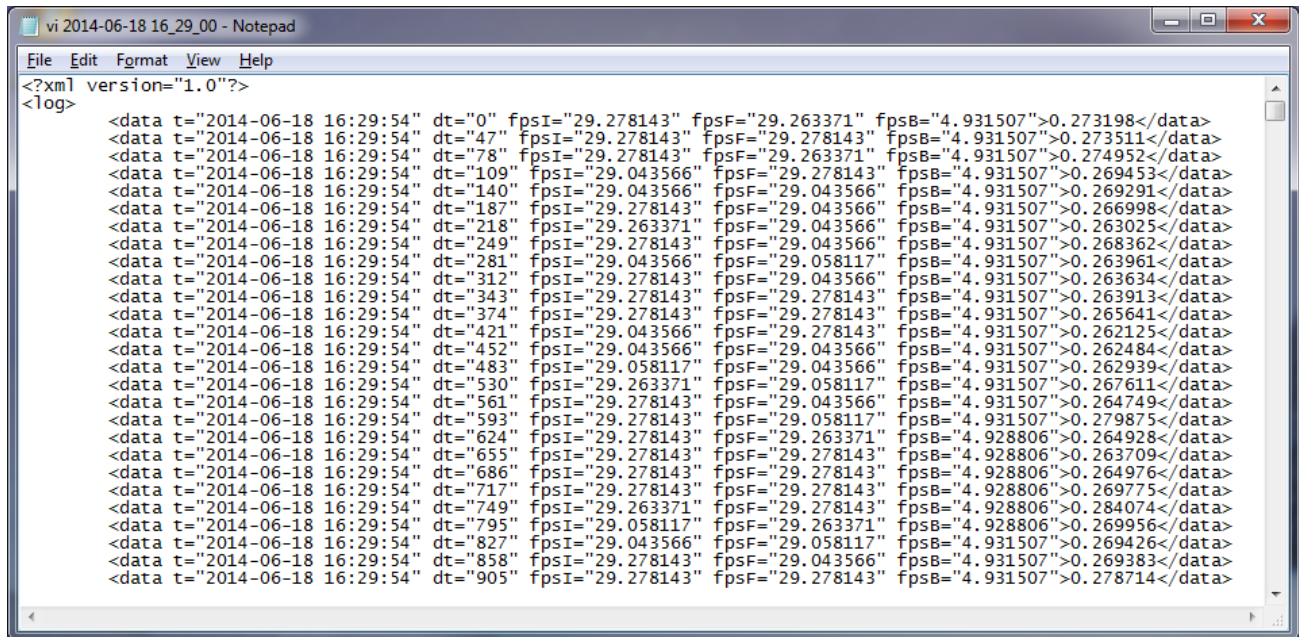
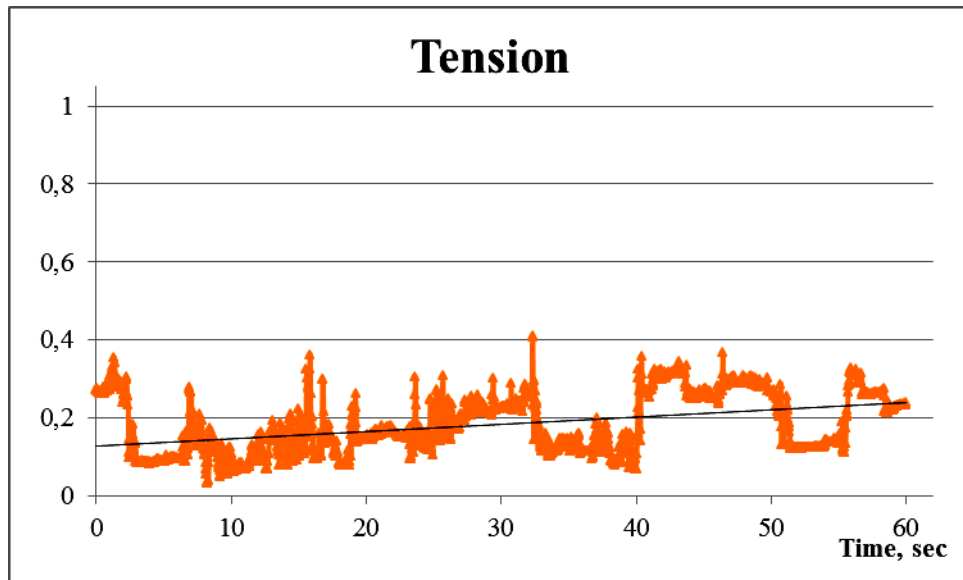


Fig. 3.10. Example of the data saving.

Data in an array in all programs include values of the following parameters:

- «**Data**» in the format yyyy-mm-dd;
- «**Time**» - t – in the format hh:mm:ss;
- «**Time from the record beginning**» - dt – in ms;
- «**Input**» - fpsI – framerate received from a video device;
- «**Fast processing**» - fpsF – number of the processed frames per second for calculation of "fast" parameters;
- «**Basic processing**» - fpsB – number of the processed frames per second;
- «**Values**».

Based on these data it is possible to carry out the further analysis, for example, change of the researched parameter in time, as shown in a figure 3.11.



*Fig. 3.11. Example of the parameter «Tension» analysis in time.*

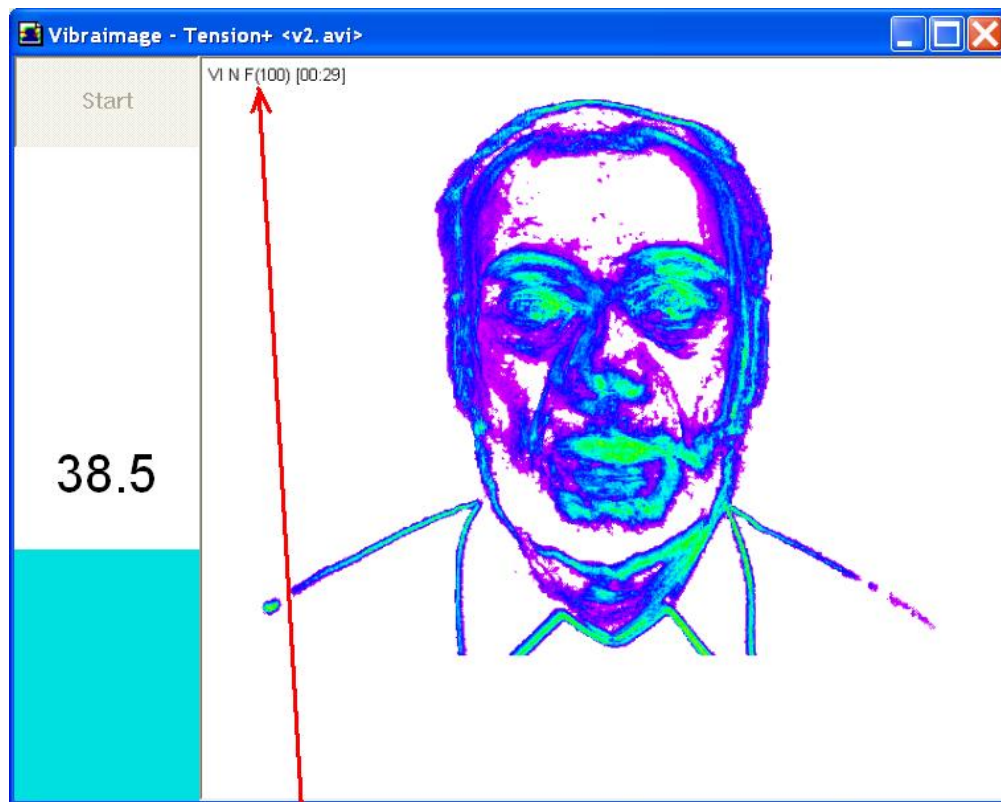


### 3.3. Information column

By default, at the left in an information column (fig. 3.12) the current value of the chosen emotional parameter is displayed.

**Note,** in the mode «BioTester» information column is replaced by a toolbar with buttons (§ 3.4).

By pressing «Start» button accumulating information on the chosen parameter will start for 1 minute.



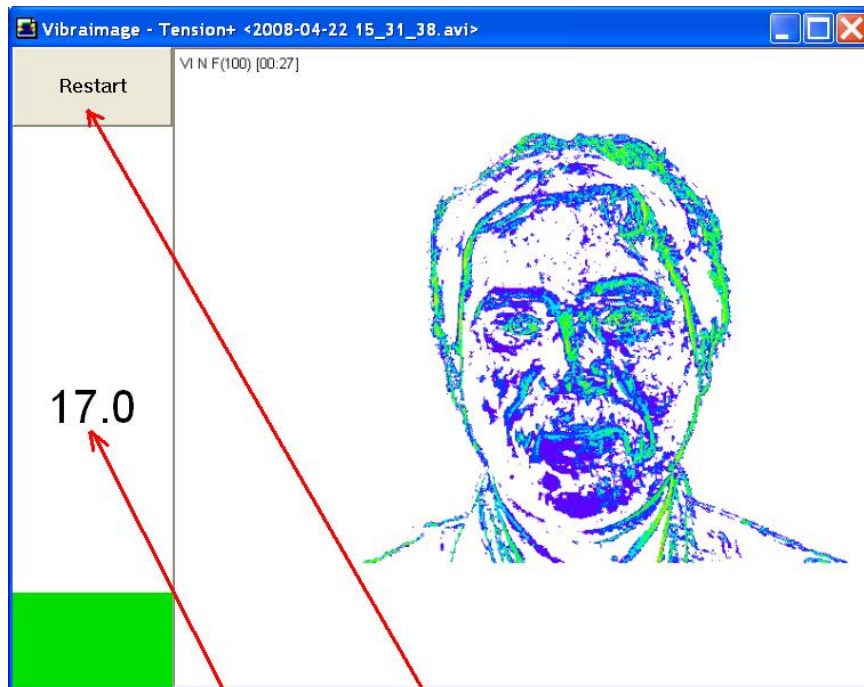
*Fig. 3.12. In information columns displayed current parameters value.*

After pressing «**Start**» button in an information column «sand-glass» with down counter will appear (fig. 3.13). If thus to press «**Live**» button the system will return to a base operating mode with display of the current parameter value.



*Fig. 3.13. In information columns displayed timer value.*

On the end of the information accumulating an information column the average value of parameter will be displayed (fig. 3.14). By pressing «**Restart**» button the new 1 minute interval of the information accumulation about parameter will start.



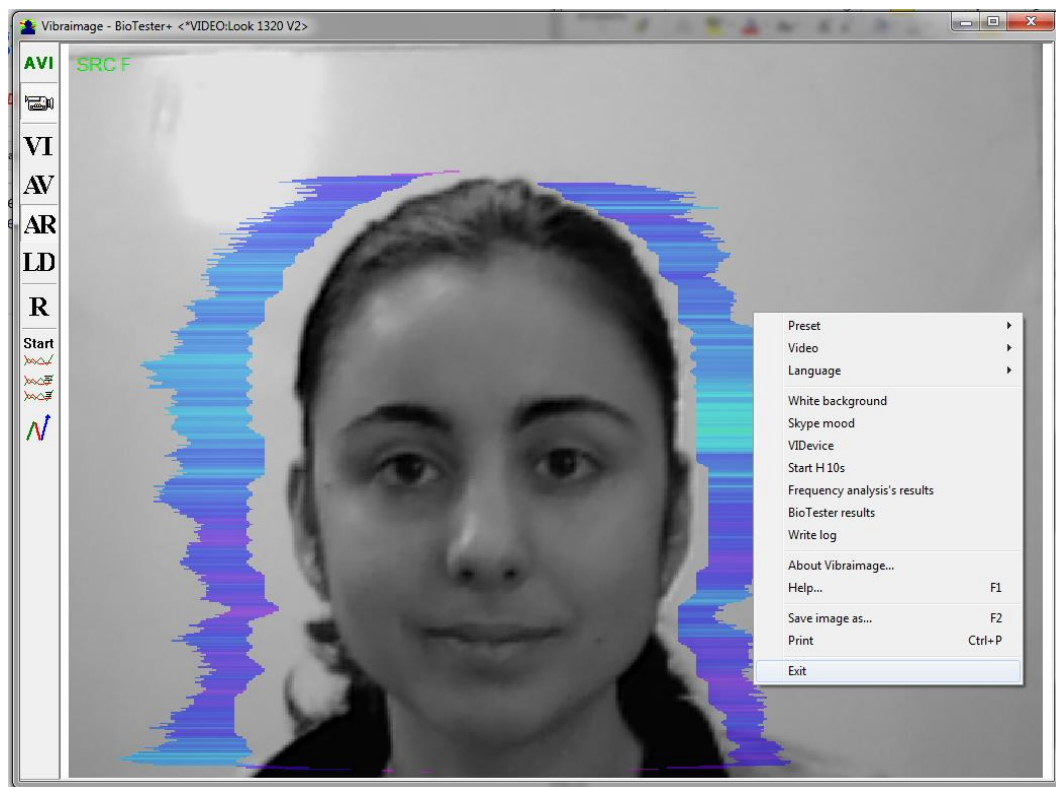
*Fig. 3.14. In information columns average parameter value is displayed.*




### 3.4. BioTester software


The given program is intended for providing testing of the person and animals psychophysiological status before, after and during any external influences. The BioTester characterized by high sensitivity and displays change of mental concentration and physical energy of live objects. The BioTester shows change of a psycho-energy condition of the patient at the weakest influences, for example, from radiation of mobile phone, influence of jewelry, amulets, bio correctors, physical and mental loading on the person. The BioTester information field indicates value of bioenergy allocated by the person on a horizontal scale in dimension kcal/minute, and on a vertical scale in %, a status of person psychological concentration. The given values of physical parameters are calculated of the vibration frequency histograms which help to characterize person psychophysiological status.





**Note**, the frequency analysis modes are accessible only to BioTester VI modification of **VibraLite** software (fig. 3.15).






*Fig. 3.15. BioTester mode*

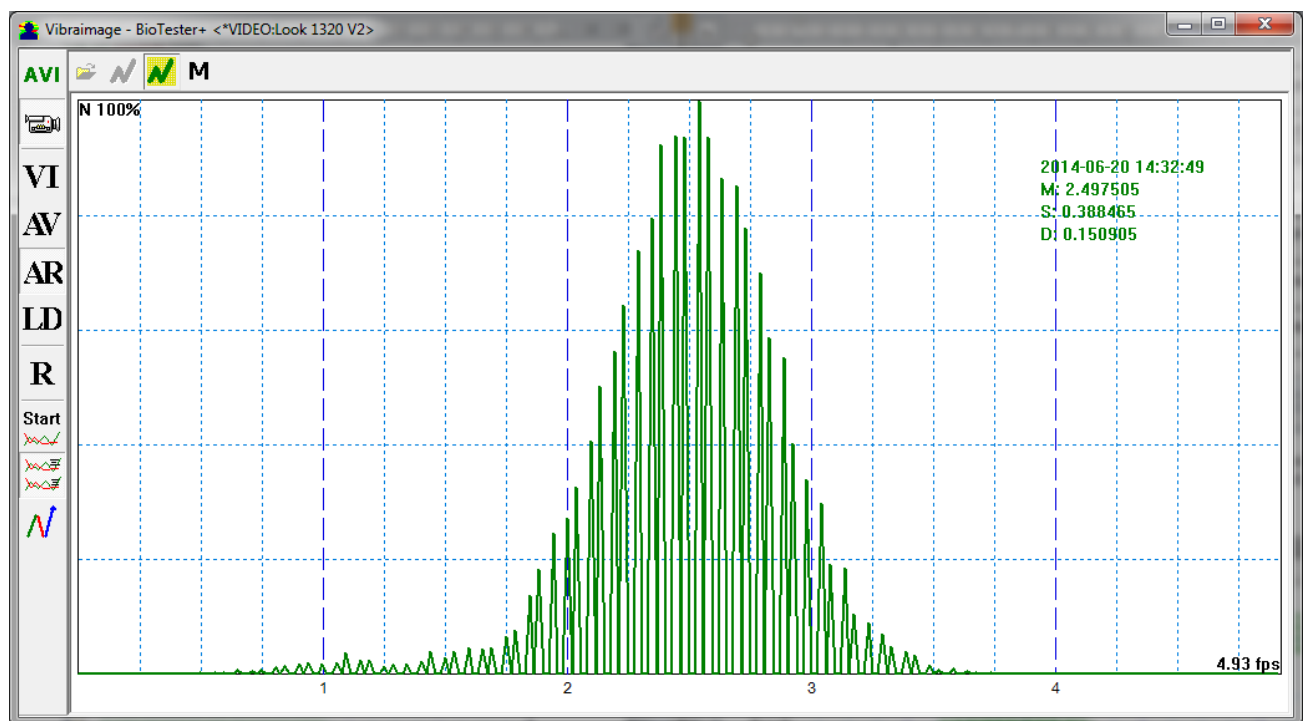
The button  «**AVI file**» from the toolbar at the left side of the screen allows to choice a video file in AVI format, for display on the screen (the submenu «Video»).

The button  «**Camera**» allows to operation with video camera (the submenu «Video»).

Buttons     allow to choice corresponding mode of the image (§ 3.2.1).

At a choice of item « **Start H 10s** » or pressing of the button  will be made information accumulation for 10 seconds, and the window with results of testing is showed automatically after 10 seconds (fig. 3.16).

The user can be switched between windows with results of testing emotional conditions and windows with results of the frequency analysis. The mode of viewing of frequency analysis graph is switched on/off by the button  or a choice of menu item « Frequency analysis results ». And a mode of viewing of testing of the person condition results (fig. 3.17) is switched on/off by the button  or a choice of menu item « BioTester results ».

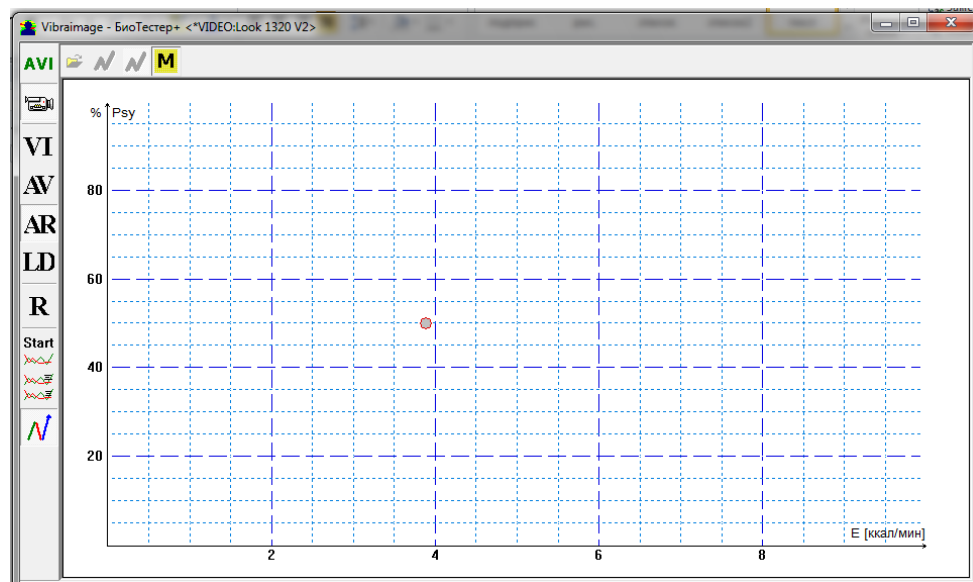


*Fig. 3.16. Frequency analysis results.*

The switch «**N**» defines: a graph of the frequency histogram will be displayed or not (graph displayed in green).


Each histogram is characterized by the following parameters:

- M - the center of weights of frequency distribution (average value of microvibrations frequency);
- S - root-mean-square deviation of frequency distribution;
- D - a dispersion of frequency distribution



*Fig. 3.17. BioTester results view mode.*

The point on the graph displays the current psycho-energy condition of the person. On axis Y the mental condition of the person is displayed in %, if it is more, than the condition is better. On axis X in a Kcal/minute energy of the person is displayed.

At repeated pressing of the button  or a choice of corresponding menu item, it will be made new accumulation of the information and in graph area the following result of frequency distribution will be displayed (fig. 3.18).

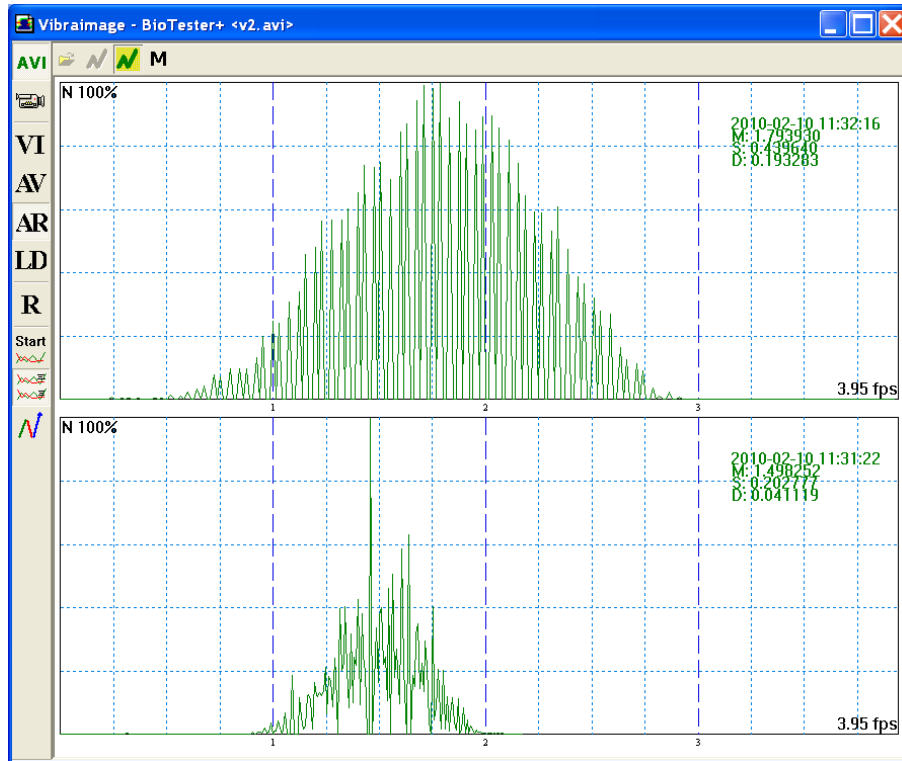


Fig. 3.18. Old and new frequency histograms.

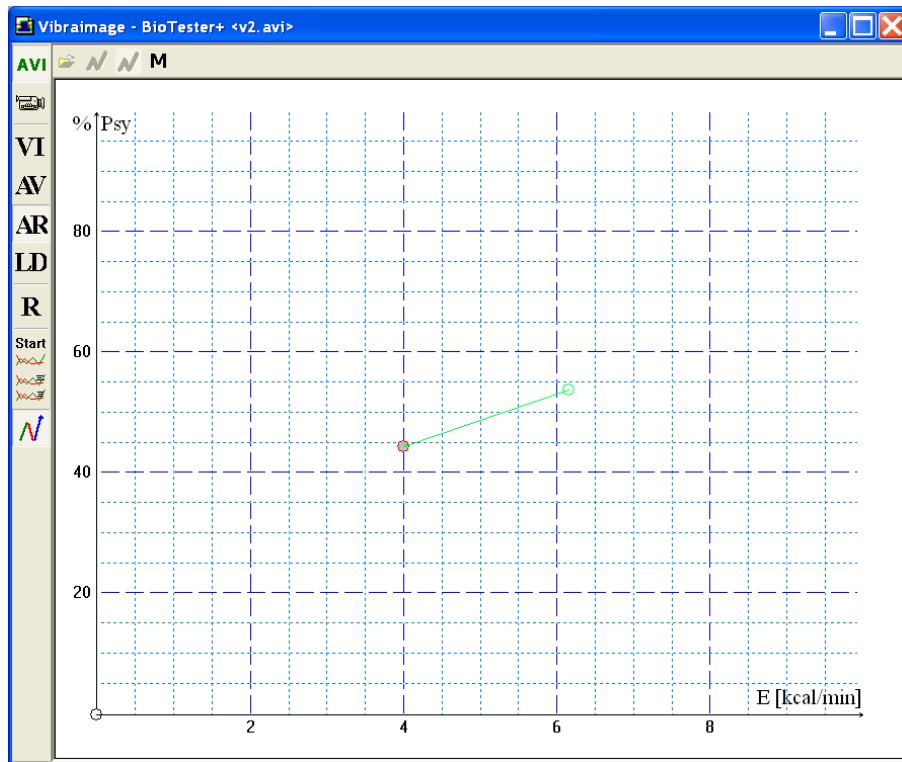

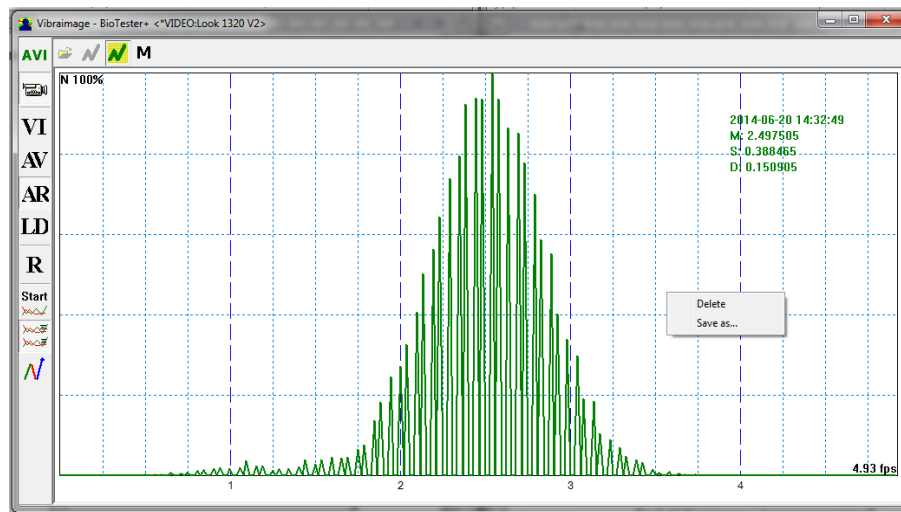


Fig. 3.19. Old and new human state.

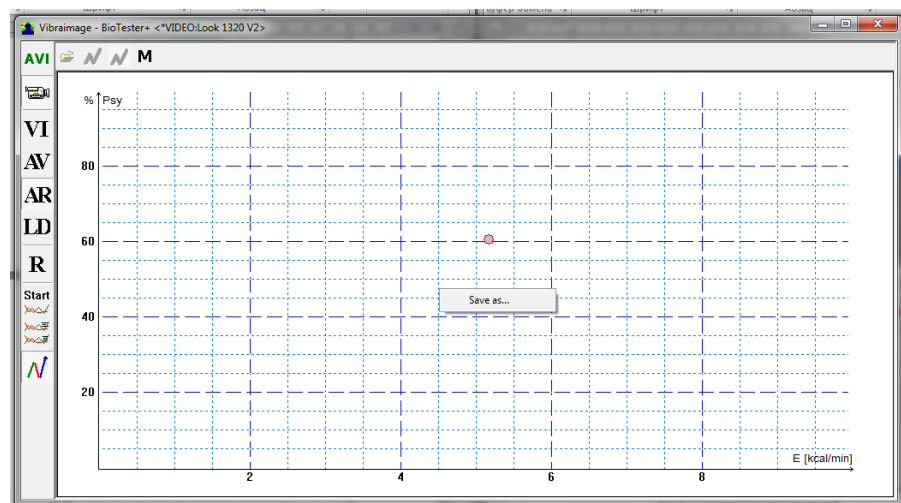
The user also has an opportunity of viewing previously saved results of the frequency analysis. For this purpose it is necessary, to pass in a mode of viewing of the frequency histogram in the area of image, and then having pressed button «**Load**»  to load earlier saved data and to compare them with just received.

To remove the received graph of the frequency analysis it is necessary to bring the mouse pointer to the chosen diagram, to press the right mouse button and to choose item «**Delete**» (fig. 3.20).

To save the received graph it is necessary to bring the mouse pointer to the chosen diagram, to press the right mouse button and to choose item «**Save as...**» (fig. 3.20. 3.21).



*Fig. 3.20. Save and delete results.*



*Fig. 3.21. Saving results.*

### 3.6. Brain Voice software

The program is intended for audio display of the person microvibrations, thus the color scale of vibra-aura vibrations frequency is replaced on sound signal frequency accessible to person hearing, i.e. standard micromovements with frequency of 0.1-10 Hz will proportionally be transformed to a standard sound signal with frequency from 100 up to 20000 Hz, and the amplitude of vibrations reflects capacity of a sound for each frequency.

The given mode allows watching for behavior of object, for example, when the visual control over the monitor is impossible or unprofitable over any reason. Also this program allows people with loss of sight to receive the full information about emotional condition of the interlocutor, at all not seeing him.

In many cases additional audio signal about a condition, ideas and emotions of the person can be more informative and is accessible, than visual supervision which too can take place.

Visually working window of the Brain Voice program little than differs from other programs of « lite version » vibraimage, but the constant going broadband sound signal, characterizes the smallest changes of movement and even idea of supervision object.

**Note**, for operation with this modification of the program the computer shall have the sound output device. There aren't special requirements to the output device of a sound aren't present.

### 3.7. VibraLie program for psychophysiological detection of deception

VibraLie program intents for psychophysiological detection of deception of verbal and non-verbal lie in auto, auto-manual and manual modes. Program fixes and compares psychophysiological characteristics of person captured in different time period for standard examination methods. Every nowadays existing technical means of lie detection registers changes in different psychophysiological parameters of humans. Current opinion that significant changes in psychophysiological parameters happens when person is nervous, worry and lie. When person is still and calm his psychophysiological parameters are more stable in time, so if we compare known still time period with examinees question period, we determine is it lie or true. Different examination methods (Comparative Questions test (CQT), Guilty Knowledge Test (GKT), Concealed Information Test (CIT)) are constantly developed and improving, it is possible to read a lot of literature about it, for example (<http://en.wikipedia.org/wiki/Polygraph>). The modern technical lie detection is mostly based on Integrated Zone Comparison Technique (IZCT) was firstly suggested by Cleve Backster ([http://en.wikipedia.org/wiki/Cleve\\_Backster](http://en.wikipedia.org/wiki/Cleve_Backster)). The comparison test principals are easy for everybody understanding and requests only comparing of responses to control and relevant questions, controlled by psychophysiological detector like VibraLie system.

The main window of VibraLie program indicated on fig.3.22.

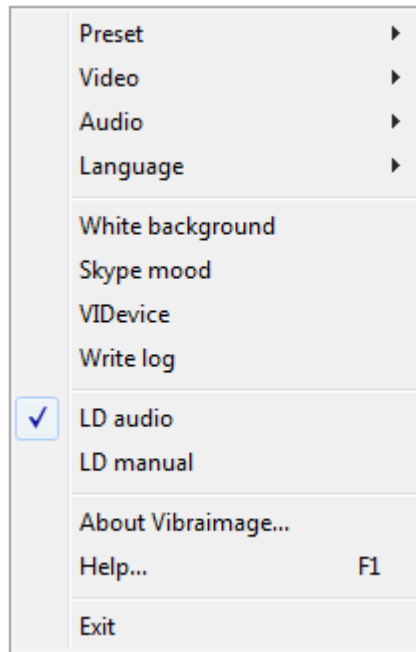


Fig. 3.22. The main window of VibraLie program with time dependence of psychophysiological parameters during the examination and indication of questions type and examination result.

### 3.7.1 Main menu

VibraLie program main menu includes the following functions and options (fig. 3.23):

- «**Preset**» – choice of visualization mode from.  
**LD** - real video image,  
**AR** - external vibraimage (vibra-aura) around real video image,  
**AV** - vibra-aura around internal vibraimage,  
**VI** - internal vibraimage.
- «**Video**»– choice of video source, as recorded video files (AVI), or live camera video.
- «**Audio**»– choice of audio threshold of the start LD detection and finish LD detection in LD audio mode.
- «**Language**»– choice of the interface and help system language (fig. 3.2).



*Fig. 3.23. Main menu of VibraLie.*

- «**White background**» – choice of background color in VI mode.
- **VIDevice** – the support of the drivers of virtual camera.
- «**Write log**» – saving of current data as files with format «\*. xml» for every 60 seconds.
- «**LD audio**» – choice of audio mode for lie detection, where audio signal more than stand threshold used for start lie detection analyzing time period.
- «**LD manual**» – choice of manual mode for lie detection, where time period for lie detection selected by pressing LD button on the Tools panel.
- «**About VibraImage...**» - is intended for viewing software version, user name, which is registered on the copy of the program, the key protection number and expiry date of the license.
- «**Help...**» – help information about **VibraImage** program.
- «**Exit**» – program exit.


















### 3.7.2 Tools panel of VibraLie program

Tools panel of VibraLie program shown on fig. 3.24.



*Fig. 3.24. Tools panel of VibraLie program.*

Tools panel of VibraLie program includes functions corresponding to buttons on the Tools panel from left to right:

-  – main menu;
-  – AVI files download for PDD analysis;
-  – live video camera connection;
-  – pause on image and program operations;
-  – choice of internal vibraimage mode (VI);
-  – choice of external vibraimage (vibra-aura) around internal video image mode (AV);
-  – choice of external vibraimage (vibra-aura) around real video image mode (AR);
-  – choice real video imagemode (LD);
-  – R – reset parameters and graphs to 0;
-  – T= 0. setting to zero graphs on the timeline and installation of video being played in the beginning of the file;
-  – RQ – mark of relevant questions on graphs and LD calculation results;
-  – CQ – mark of control questions on graphs and LD calculation results;
-  – GQ – mark of general questions on graphs;
-  – indication of PDD results as DI, NDI, INC;
-  – LD – start/stop of psychophysiological response analyzing time period in manual mode.

### 3.7.3 Psychophysiological detection of deception in LD audio mode

In LD audio mode user needs firstly to adjust Audio Threshold so that background audio level must be lower than Audio Threshold and audio level of questions and answers must be higher than Audio Threshold. In this case every question-answer response divided by time period not less than 10 seconds from the next question-answer response is characterized by level of changes for every measured psychophysiological parameter. The total changes in psychophysiological parameters are characterized by two general indicators – P5 integral parameter indicated on the down graph, and P20 differential parameter indicated on the vertical column. More quantity of P20 parameter after response indicates more high level of psychophysiological response and gives more lie probability for two response comparison.

Sample of program window for PDD is shown on fig. 3.25.



Fig. 3.25. Program VibraLie window of PDD sample in Audio mode.

**It is necessary to note**, that calculations of integral response P5 and differential response P20 are doing based on the more quantity of psychophysiological parameters than is indicated on the fig. 3.25. In the base of LD calculation algorithm are using the same equations as in **VibraImage** PRO version including calculation of time dependence changes about 30 psychophysiological vibraimage parameters. The results of comparative testing between traditional contact polygraph and vibraimage PDD shows 95% matching.

For psychophysiological changes visualization in VibraLie are using the indication of the following vibraimage parameters:

- A1 – value of base processing frame difference amplitude, indicated fast head movement of person,
- F3 – average value of pixel quantity, change for time period of 100 frames processing, shows general level of head movements and emotional energy for current 20 seconds period,
- F8 – peak value of F6 parameter (in seconds) shows current period of F1 parameter changes, indicated minimal time of person response,
- S2 – average difference between left and right accumulated movement response of object for 2 second, show movement and minds asymmetry,
- P2 – dispersion of vibraimage frequency distribution for 100 processing frames, indicated dispersion of head movement in time and space,
- P5 – – integral indicator of psychophysiological response, calculated with equal rates for every fixed vibraimage parameters,
- P20 – quantitative indicator of psychophysiological response, calculated with different rates for the fixed vibraimage parameters, because for vibration process some part of psychophysiological parameters are accelerated and other part are inhibited during the one psychophysiological response.

In auto mode examiner need to control left vertical column, because maximal level in this column (P20), shows maximum psychophysiological response and could be interpretive as lie.

### 3.7.4 Psychophysiological detection of deception in auto mode

Principals of comparative testing and averaging for responses of question-answer zones, coined in the 60<sup>th</sup> years of XX century by Cleve Backster (<http://www.backster.net/images/accuracy.pdf>), gave requested high accuracy for psychophysiological detection of deception and have done lie detector the reliable instrument in expert hands. The comparative zones are based on the fixed structure of question-answer testing, including general, comparative and relevant questions in one test. So fixed test structure allows combine analyzing of response to several similar questions, so it is possible to calculate average response to several control questions and separately calculates average response to several relevant questions. This testing structure gives more accuracy for any measurement, so it is acceptable also for lie detection, too. Standard lie detection test structure includes 9-14 questions, one of these questions relevant (most important) is presented by several times (during one test), because was proved that during one test is correct to present the only one relevant question. Several relevant questions in one test give more errors, because examinee could concentrate only on one question during the test.

Let's consider the test structure on the simple actual test sample: You are interesting where your partner was at night, when he tells that was working in office. In this case the question «Really, were you in the office last night» is relevant question and the main important question of this test. All test must include several questions for replying one meaning answers as Yes or No, like the suggested sample:


1. Did you have breakfast yesterday, as usual?
2. Was the cold weather on the morning street?
3. Did you tell lie to your friends?
4. Did you work in office this night?
5. Let's go to cinema this weekend?
6. Did you ever tell lie to me or my family?
7. Really you were in office this night?
8. Did you take your purse from home at this morning?
9. Did you steal something before?
10. Is it true, that you were working this night?

General (blue) questions (GQ) have diverted meaning and have not influence to calculation result, but they are necessary for reducing concentration attention of examinee on the relevant questions. Response to the control (green) question (CQ) is very important to the test calculation, control question usually asked about past criminals, which are happened in everybody life. The verbal answer on control question is not so important (Yes or No), more important is psychophysiological response corresponding to this reply. If quantitative average response to control questions is more than analogical quantitative average response to the relevant (red) questions (RQ) that means person tells true. If quantitative average response to relevant questions (RQ) is more than analogical quantitative average response to the control questions (CQ), that means person tells lie. These results are based on experience of several dozen years of psychophysiological detection of deception.

Sample of psychophysiological responses for comparative zones test to control and relevant questions captured by VibraLie system is shown on fig. 3.26.



Fig. 3.26. VibraLie window for comparative zones test of PDD.

Examiner or operator marks control questions (CQ) and relevant questions (RQ) pressing on corresponding buttons on the Tools panel of VibraLie window. After test finishing operator or examiner (person asking questions) press button  on the same Tools panel. VibraLie program immediately shows test result on the vertical column. The true test shows green column with NDI (Non Deception Indication), the lie test shows red column with DI (Deception Indication), if it is impossible to do precise calculation of lie detection, program shows yellow column with INC (INConclusive result).

### 3.7.5. Psychophysiological detection of deception in LD manual mode

Lie detection in manual mode used when question-answer audio quality (live or recorded) is poor for correct mark of questions start and it is impossible to divide questions-answers from background audio. In this case is necessary to switch program into LD manual mode as it is shown on the fig. 3.27.

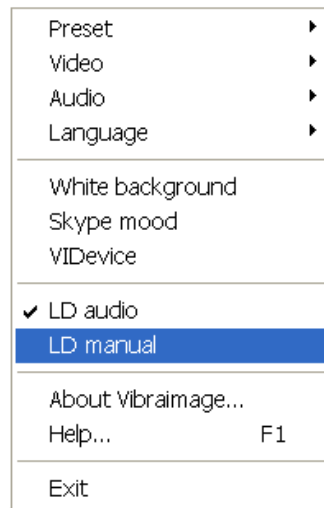


Fig. 3.27. Choice of LD manual mode.

In LD manual mode also is possible lie detection based on comparison test zone, and in this case operator or examiner mark the start of control question zone and finish of control question zone, so as for relevant question zones pressing button LD on the Tools panel of VibraLie window.

### 3.7.6. Contactless lie detection application

In spite of complicated processing algorithms VibraLie system is very simple and friendly for users and could do lie detection so mass technology like personal computer application. Though psychophysiological lie detector appears before personal computer, lie detectors did not receive so mass application, firstly because using of contact sensors which are not friendly for privacy. First computers also were not using for personal application, it were great boxes used only in big companies, and term personal computer was joke and nonsense for a long time. Traditional polygraph with contact sensors comparative to vibraimage looks like old computer vs modern computers. Technical progress is constant and it is difficult to accept the conclusion of several polygraph specialists that the only method for psychophysiological detection of deception is contact, and you need to measure only skin-galvanic response, pulse, respiration and blood pressure. Really for screening psychophysiological state of person needs to capture uncorrelated psychophysiological data, however high quality digital television signal gives greatly more independent psychophysiological information about person based on vestibulo-emotional reflex (VER) [http://en.wikipedia.org/wiki/Vestibulo\\_emotional\\_reflex](http://en.wikipedia.org/wiki/Vestibulo_emotional_reflex) than limited number of contact sensors from traditional polygraphs.

## Note!

1. It is necessary to take in account that correct PDD results are based on right vibraimage conditions described in this manual. Less illumination, noisy camera and slowly computer could give a lot of errors to the result.
2. VibraLie system used only for private using. VibraLie and VibraLie2 programs result are not accepted by the court and could not be used as juridical evidence. The results captured by VibraImage PRO system could be accepted to the court.
3. Remember that lie is natural function of evolution process, everybody are lying in some conditions. VibraLie system gives you more possibilities for lie detection, please, use these possibilities according to common sense and based on the laws of your country.
4. Please, note, that suggested PDD examination method shows VibraLie system possibilities, but not limited it. Users could apply VibraLie system according to their aims and methods.

**Note,** for operation with this program modification it is necessary to have the standard device of input/output of a sound (a microphone + the sound card, supporting the frequency of a flow of 44100 Hz and 16-bit data).

## 3.8 E- Monster

Program shows facial image of person changed by emotions. You could detect monsters by this program even if person is hidden emotions under the mask of normal face. This program allows to see monsters around you!

Webcam looks on the person and transforms the facial images depends on emotional state like it is shown on the fig. 3.28.



*Fig. 3.28. Facial dimensions transformed by E-Monster program images based on emotional analysis.*



Any changes from normal status of aggression, stress, anxiety, threat, balance, charming, energy and self-regulation could transform human to monster. More changes of emotions give more changes from human to monster. When person emotions are normal the program image is identical to standard video image. It is very funny to look how person image is changed by emotions in such magic mirror.

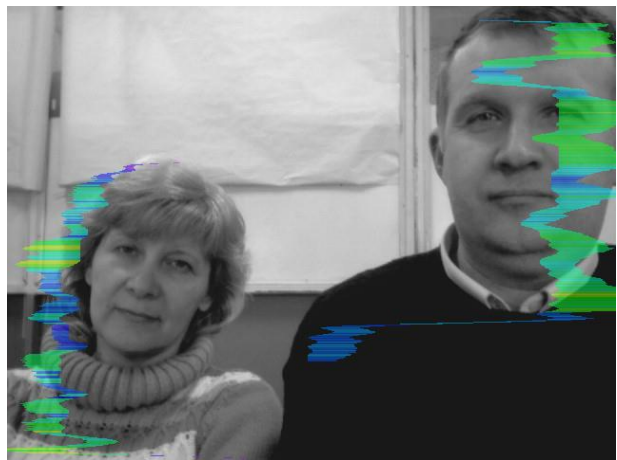
### 3.9 People compatibility

**VibraLite** system application allows registering people compatibility on the basis of their vibraimage analysis (figs. 3.29-3.30). For reception of a correct estimation of compatibility it is necessary to carry out the rules necessary for reception qualitative vibraimage:

- Two persons sit down beside as it is possible closely more to each other.
- Web camera is stand opposite and adjusted so that on the computer screen the image of two persons completely entered in the screen of a computer was visible.
- The distance from each person up to lateral screen side should be identical and make approximately 10 % from width of the monitor screen.
- Light exposure of pair should be sufficient and uniform.
- Persons should be inverted to the camera and not concern each other.
- Any other physical contact of pair, (embraces, pressings and other) only is welcomed and are raised measurement accuracy.
- The background should be uniform and it is desirable contrast concerning pair.



*Fig. 3.29. Correct position of people pair*



*Fig. 3.30. Wrong position of people at check of their compatibility. People are on different distance from the camera and far apart.*



## **Compatibility Estimation**

Ideal compatibility of pair is characterized completely by symmetric aura. Any asymmetry of aura, characterizes the certain problems in compatibility, the more asymmetry, the it is more than problems in compatibility.

To the maximal compatibility there correspond the following aura parameters:

1. The symmetric form of aura from both sides of the researched pair
2. Symmetric painting aura from both sides of the researched pair

## 4. Definition of emotions

Head movements in space classically associated with vestibular system are studied and discussed in relation to the status of vestibular reflexes (i.e., the vestibulo-ocular, vestibulo-collic, and cervico-ocular reflexes). But it is possible to look on head movements according to the vibraimage system and technology. We supposed that head balance for person without consciously movements could be considered as isolated thermodynamic system and any emission of internal energy would change the balance of this isolated system and realized by movements or vibrations. Every emotional state characterized by specific energy conversation and work done by the system transfers to micro vibrations, if the person forced to stand or set still. The head vibration parameters (frequency in range 0.1-10 Hz and amplitude) are stable in time for stable emotional state of person. Parameters of vibrations changed only after emotional state alteration. VibraImage technology allows to contactless register of person vibration parameters and calculates emotions according to accumulated statistics of comparative testing with EEG, skin galvanic reaction and psychological testing. VibraImage technics, parameters and research results are below.

### 4.1. VibraImage parameters

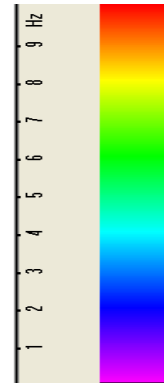
Values of amplitude and frequency of vibrations of a person head differ in each point of space and are displayed as pseudo color image. Integrated processing of parameters values of vibration in each point can give the general information on parameters of the person movement. Vibraimage the person heads displaying amplitude (fig. 4.1) and frequency (fig. 4.2) the distributions of vibrations modulated by a color scale (fig. 4.3), are showed below:



*Fig. 4.1. Amplitude vibraimage*



*Fig. 4.2. Frequency vibraimage*



*Fig. 4.3. Pseudo color scale of frequency distributions*

Each point (pixel) amplitude vibraimage (fig. 4.1) reflects the relative moving of an element of the image saved up for determined time as it is known, that at insignificant moving the frames difference is proportional to the movement of object. For transformation of this relative moving in absolute, it is necessary to have the exact information on distance up to object and a working corner of an objective of the chamber, and then a color scale (fig. 4.3) can be scaled in millimeters or microns. However, at about the same location of faces on the screen, automatically the condition the single relative amplitude vibraimage scale satisfies. This allows to compare the obtained information about moving images to different people.

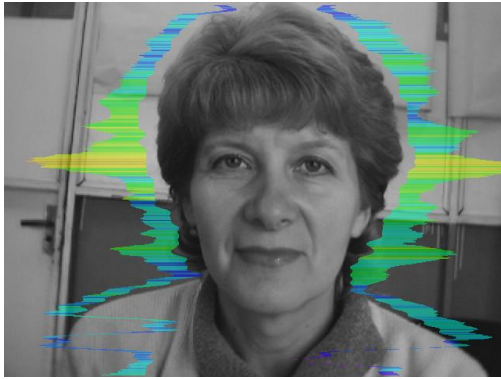
As against amplitude analyses, each point frequency vibraimage has physical dimension frequencies (Hz) as really displays frequency of signal change in each element of the image. Therefore the resulted color scale (fig. 4.3) scaling in Hz, i.e. violet color frequency vibraimage displays a range of vibrations (0-1) Hz, dark blue displays a range of vibrations (1-4) Hz, green the range of vibrations displays (4-8) Hz, red displays a range of vibrations (8-10) Hz.

On the basis of the given two primary images the technique assumes definition more than 40 integrated vibraimage parameters, reflecting various types of movement and vibration, and the parameters divided into 4 basic groups:

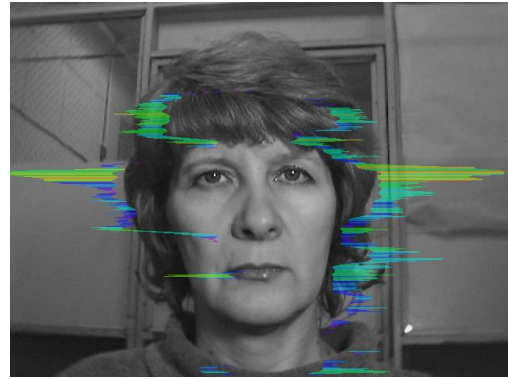
- A – amplitude parameters;
- F – frequency parameters;
- S – symmetry parameters;
- P – spatial and timing parameters of mathematic calculation.

## 4.2. Aura-VibraImage

External (around of a head) interline display of the maximal frequency and average amplitude vibraimage looks as aura and more informatively displays a condition of the person, than internal vibraimage. Color of vibra-aura is coded by the same color scale, as vibraimage (fig. 4.4), and displays the maximal frequency in each line. The size of aura is defined by average amplitude for the given line. Any non-uniformity in color and the size of aura characterizes movements of object and its emotion condition. The normal condition of the person is characterized more uniform external vibraimage (vibra-aura), and for an intense condition of the person are characteristic the big space and color non-uniformity of vibra-aura.

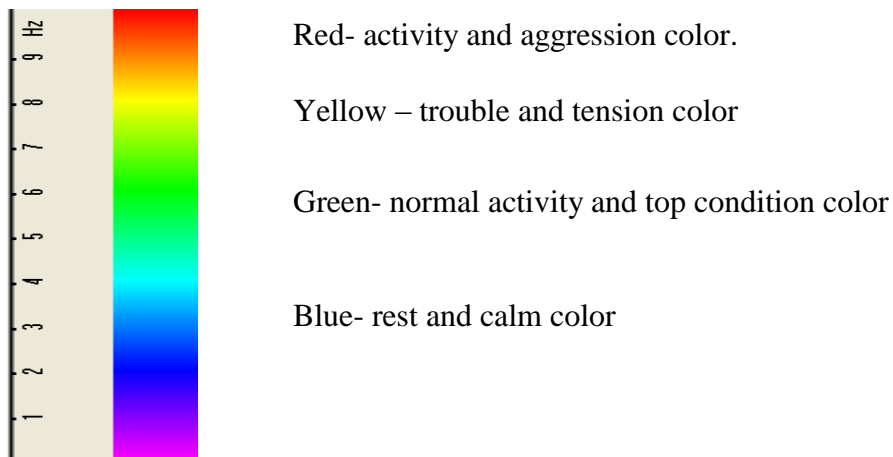


*Fig. 4.4. External vibraimage (vibra-aura) of person in normal condition*



*Fig. 4.5. External vibraimage (vibra-aura) of person in tension condition*

Obvious distinctions between images on fig. 4.4 and fig. 4.5 illustrate advantages of the visual analysis of the person condition on external aura in comparison with the visual analysis initial vibraimage. The vibraimage method gives significant freedom of a choice of registration of a condition, and visual supervision of aura allows to estimate quickly and evidently practically all emotion parameters of the person. Brief interpretation of the form and color of aura is resulted on the fig 4.6. This brief information does not limit, and sets to the user of system the basic directions of the analysis of person condition. Getting experience and taking into account the specificity of application, each user of system can diversify and deepen essentially results of the analysis of vibra-aura, open secret secrets of soul and a body of the person.



*Fig. 4.6. Brief vibra-aura color interpretation.*

### **Brief aura form analysis**

1. Any aura asymmetry (form, color) characterized deviation from mental or physiological norms.
2. Color irregularity of vibra-aura characterizes psycho-physiological imbalance of a person status.

3. Any breaks in aura uniformity characterized deviation from mental or physiological norms.
4. Ideal aura has mono color, symmetrical and uniform. Any real aura differs from ideal and the question of interpretation is to characterized real aura deviations.

### **Note!**

This brief aura interpretation correspond default vibraimage system settings and based on main rules for right vibraimage scanning:

- uniform and stable object illumination;
- high quality and low noise camera application;
- frontal plane object before camera;
- maximum facial image size on monitor;
- mechanical stabilization of camera.

## **4.3. Examples of various states of a person**

### **Normal and top emotional state**

Normal condition characterized by aura color and form uniformity around the head, relevant monochrome color in the middle of suggested color scale (fig. 4.7). Activity level is about 0.3– 0.6. Stress level is about 0.2– 0.5.

Tension level is not more than 0.4.

Every emotion level measured in the range from 0 till 1,0 and minimal value coordinates with minimal emotion intensity.

Frequency distribution histogram is near normal (Gauss) distribution and spectrum of high speed vibraimage signals is near exponential distribution.

Vibra-aura photos samples for normal condition of person are on fig. 4.7 below:



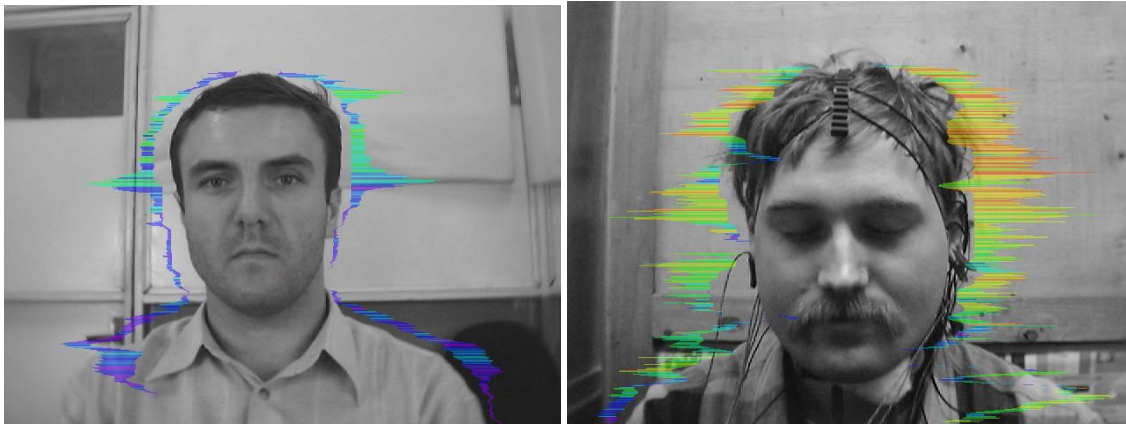
*Fig. 4.7. Vibra-aura photos samples for normal condition of persons.*

### Stress state

Stress state characterized by amount gaps in aura form and greatly aura colors non uniformity. Vibra-aura includes every scale colors and sharp color transfer, like red color could transfer to blue (fig. 4.8). Stress level more than 0.7.

Aggression or activity level is low, not more than 0.5 and tension level is high and usually more than 0.4.

Frequency distribution histogram has several modes and high speed vibraimage signals spectrum presents superposition of exponential and uniform distributions.



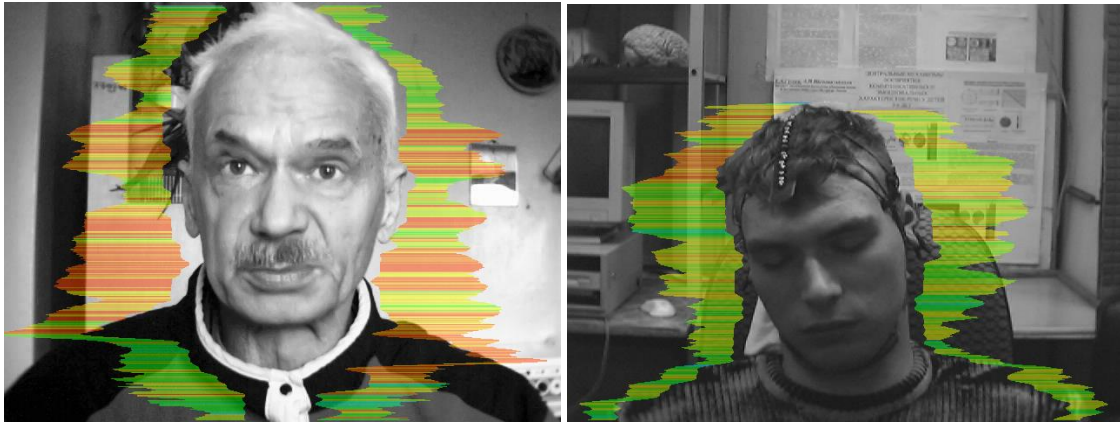
*Fig. 4.8. Vibra-aura photos samples for stress condition of person.*

### Aggressive and/or tension state

Aggressive state is not every time coordinates with tension, and tension state is not always coordinates with aggression. But often these two emotions accompany each other. Aggressive state obligatory characterized by high frequency vibrations and red colors in vibra-aura (fig. 4.9). Vibra-aura size is more than normal and gaps could absent, but color and form non uniformity must present. Stress level could be low, less than 0.3.

Anger level is more than 0.7 and tension level is more than 0.4.

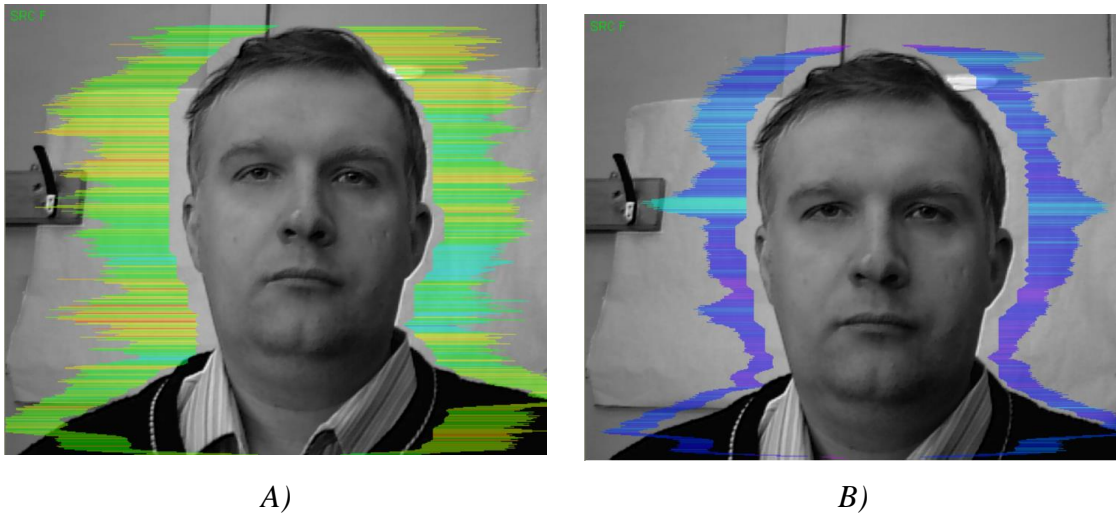
Frequency histogram distribution has maximum in right part of the range and distribution has amount dispersion. High speed signals spectrum envelope looks like uniform distribution.



*Fig. 4.9. Vibra-aura photos samples for aggression condition of persons.*

### **Meditation**

**VibraImage** system application allows to register distinction not only between the aggressive (abnormally excited) and normal condition of the client, but also and to register a degree of condition change of the person when the person calms down (fig. 4.10) or meditates (fig. 4.11-4.13).



*Fig. 4.10. Samples of self-correction person emotional states. A - 10 seconds after the beginning of supervision. B - 100 seconds after (the person have asked to calm down and count up to 100).*



## 5. Warranty

Maintenance service and service regulations of **VibraLite** system is carried out according to this Manual and instructions of used hardware maintenance (a computer, the camera, etc.).

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