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2D Processing and Visualization of DICOM Medical Images

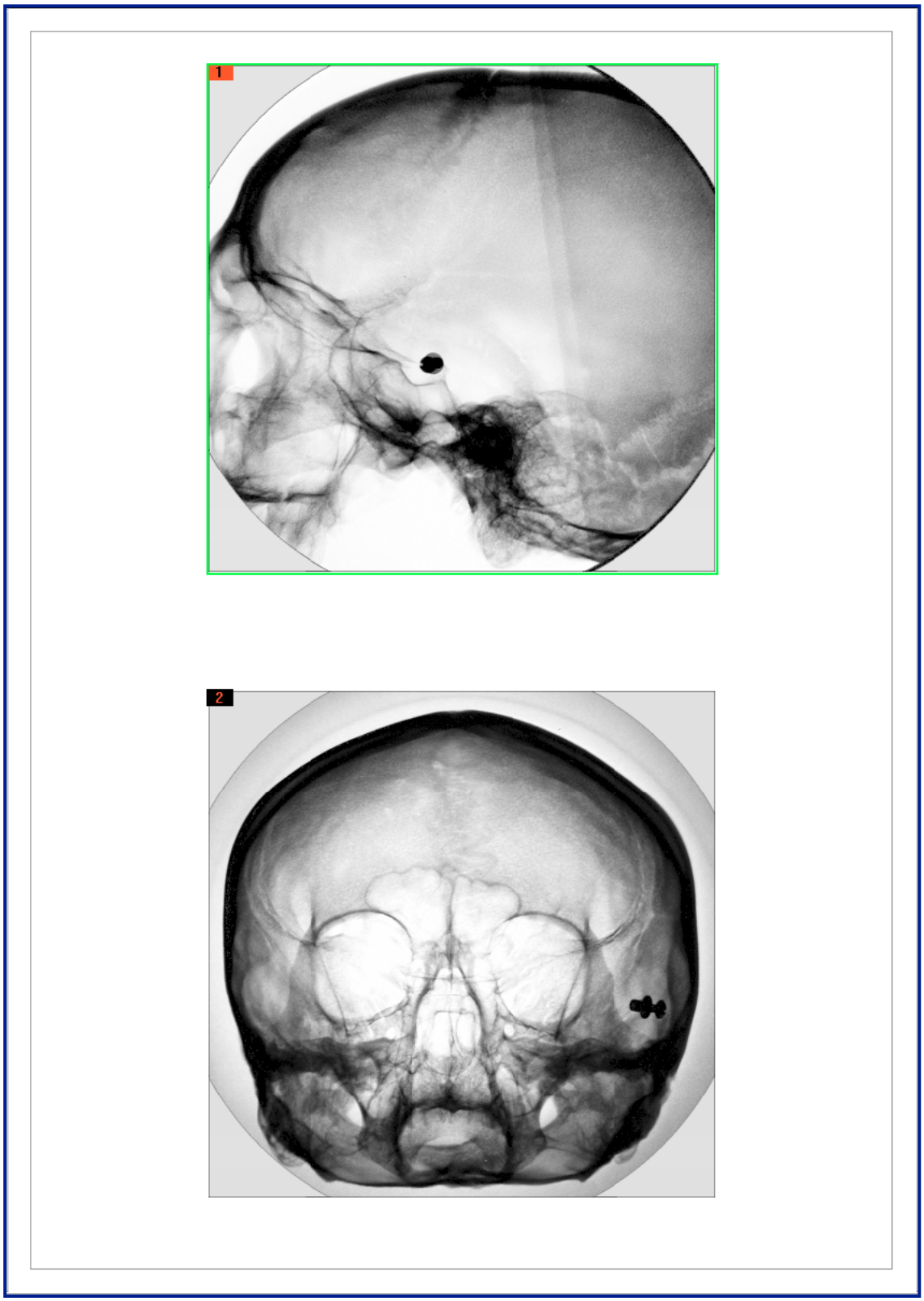
Preprinted Processing, Viewing & Multiple-Frames Print M F P R – V W

- 2005 -

Preprinted Processing, Viewing and Multiple-Frames Print **MFPR-VW**

Preprinted Processing and Multiple-Frame Print is created for a qualitative printing results of processed **DICOM** files, realized on Modules of ***System 2D Processing and Visualization DICOM Medical Images***, on high resolution professional printers for general purpose.

Fig. 1. Multiple-Frames for Print



• Preprinted Processing and Multiple-Frame Printing.

It is possible to choose two main options of the **Multiple-Frame Printing**:
- Positioning the frames or their chosen parts on a sheet, with elements of zooming.
- Special print preprocessing of each frame separately for a qualitative printing.

Printing process directly depends on high resolution of printer's drivers, established in operational system of station, as jet (from 4800dpi and higher), and laser (2400dpi and higher).

The interface of the **Multiple-Frame Printing** is called from image processing Modules of System 2D Processing and Visualization for medical high resolution images.
The interface is divided into the control panel and the area displaying a printing page A4 format (other formats of printing can be accessible by concordance).

The preprinted processing control panel of processing frames consists of several elements:

1. **Orientation.**
   Choosing of a sheet orientation.
   The choice is made between vertical **Portrait** and horizontal **Landscape** orientation.

2. **Zooming.**
   Scaling is made with scaling factor to inversely proportional integers, and carried out by activation of positions **Zoom Factor** and by an element of a number scaling factor choice, or made on the size of a sheet - by activation of option **On all sheet**.

3. **Frame Options.**
   a. The control area of frame sheet position - has an element of fast and fine positioning. Fast positioning is made by pressing one of nine buttons of fast positioning matrix, which defines the region of allocation. Fine positioning is performed by multi step navigation on four directions with a step in pixels, installed in the step window of navigation by a user.
   b. Choosing a frame number (**№ Frame**) of preprinted processing will be made. Each frame placed on a sheet, is marked by number in the left top corner of the frame. At accommodation on a printing sheet more than one frames the given option transfers all group of preprinted processing on the chosen frame.
   c. For adding a new frame on a printing sheet use **Add Frame** button, by pressing on it the option of Viewing and Selecting frames is called. The frame, which is not actual for printing, can be removed at its active window and pressing **Delete** button on the keyboard. Absence of preprocessing is established by activation of **Without** option.

4. **Processing Options.**
   Control of preprinted processing starts the options of preprinted processing conveyor:
   a. Option of image normalization. It is activated by a selection of **Normalization** position, with a slider of a normalization level **Normalize / Filter**.
   b. Option of sharpness improvement for printing. It is activated by a choice of **Sharpness Filter** position, with a slider of the weighed filtration and automatic frame normalization after the weighed filtration.
   c. Option of frame brightness adjustment for concrete printers fine tuning.

5. **Print Options.** Includes adjustment of a printer (**Printer Options)** and **Print**.
   Comment: In the presence at the station of **Acrobat Distiller** program the printing can be carried out by **PDF** file.

Fig. 2.
Control Panel

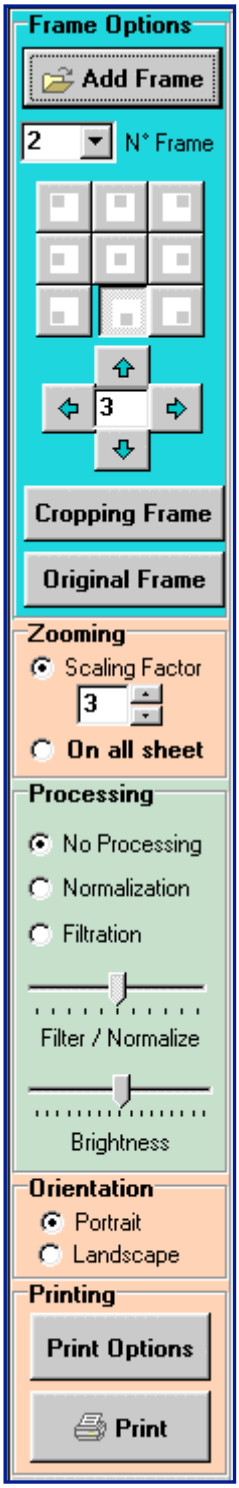
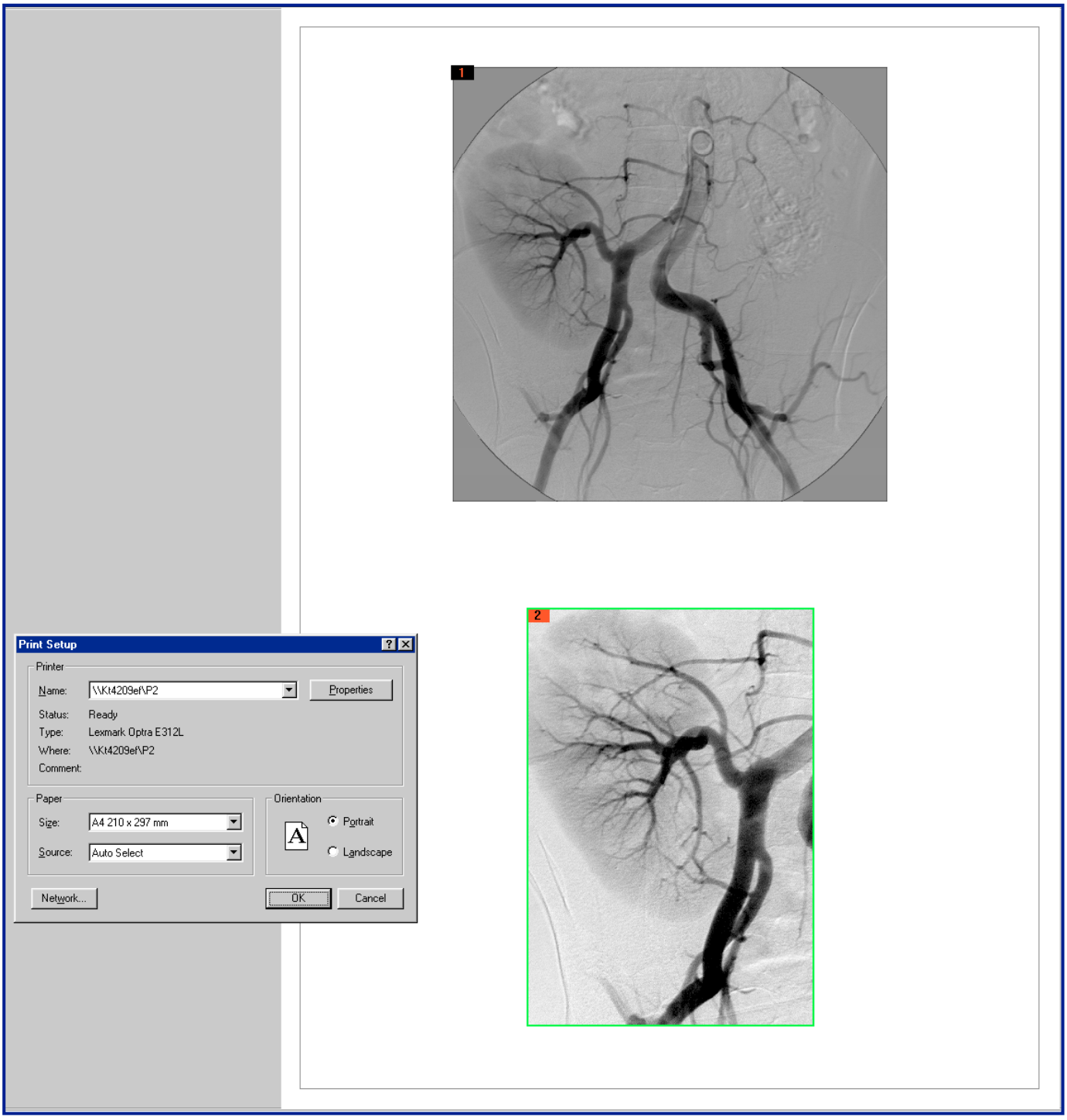


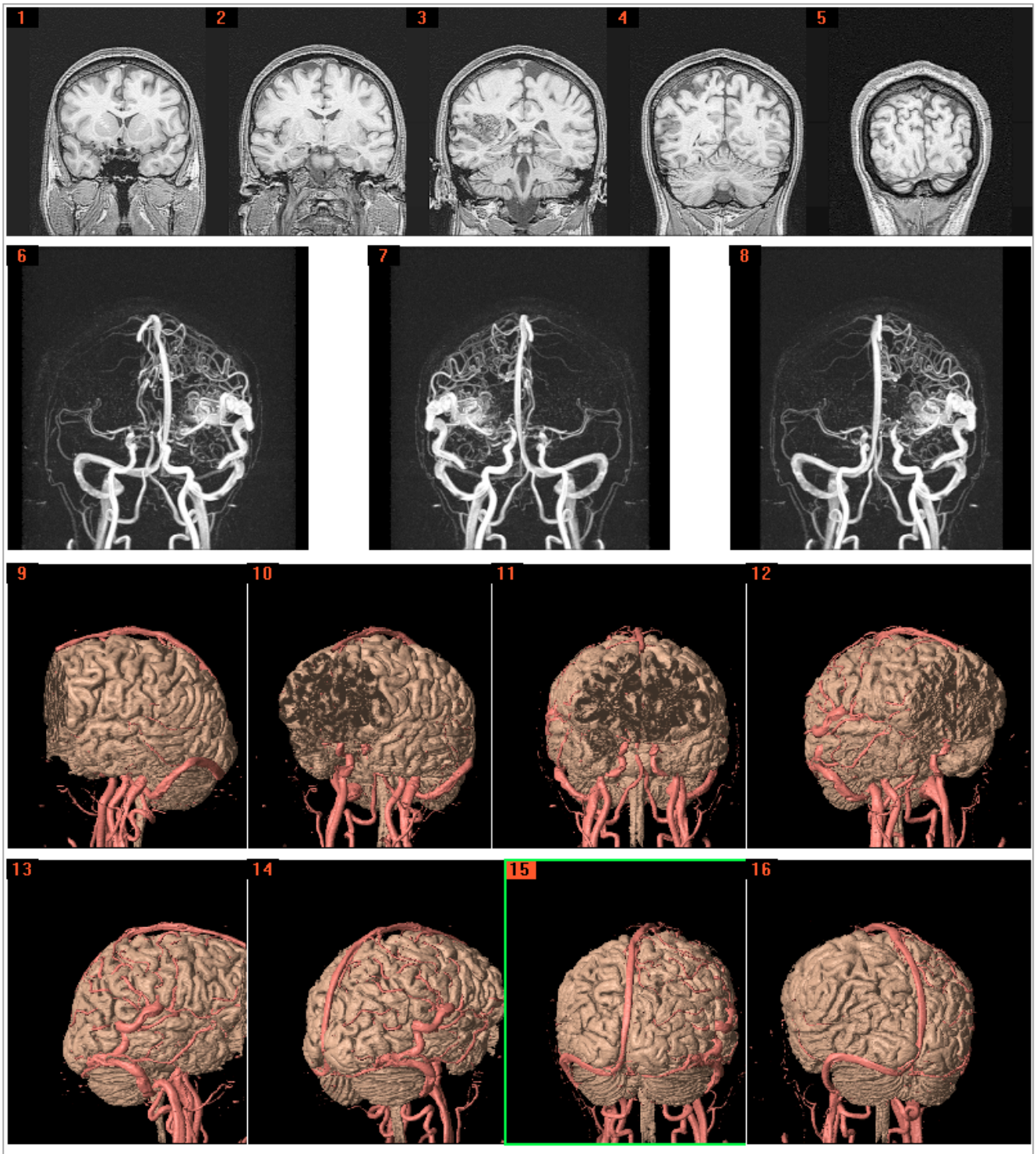
Fig. 3. Cropping Frame for Print



By default each new frame is placed on the centre of a sheet, and its further placement is carried out by the user. If necessary, the frame can be cropped off on the rectangular contour marked with a mouse on the frame by pressing **Cropping** button.

Cropped frame can be positioned and zoomed by the user as a whole frame as well. **Original** button serves for return to the initial frame.

Fig. 4. Example for **Multi-Frames Print** (16 frames)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- **A choice and Viewing of the processed frames (**Picture Viewer**).**

The selection and viewing of the processed frames incorporates:

1. Interface **File Open** of dialogue for selection on directories and graphic files.

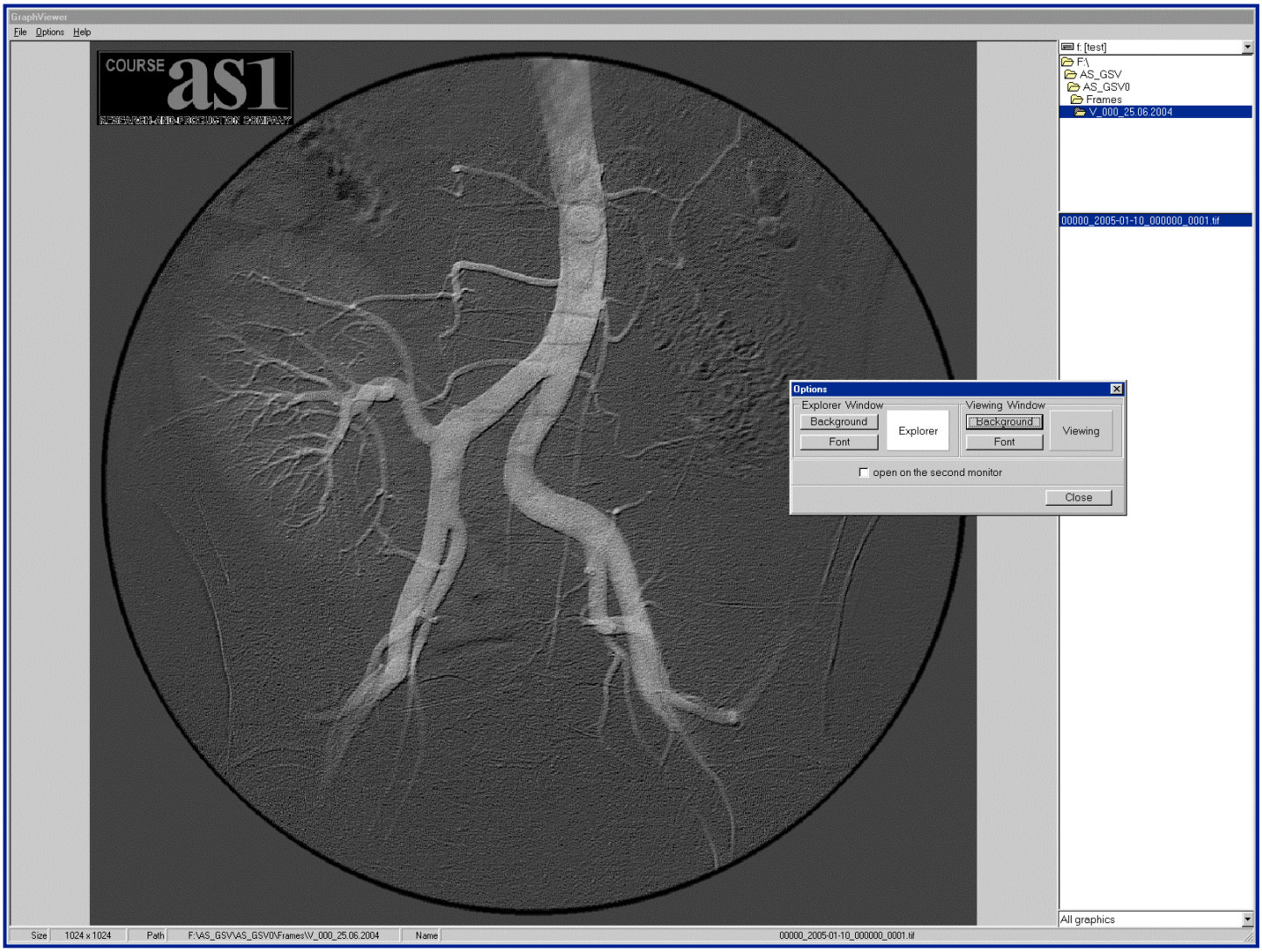
2. Accompanying file information for display of the size, a way and a name, chosen by the user.

3. Area of a sheet display with frames.

4. User menu, consisting of sections:
   a. Work with files **(File)**, having positions:
      - **Print**,
      - **Converting** into another graphic format and
      - an exit from the Module **Picture Viewer (Exit)**.
   b. Opportunities **(Options)** with a adjustment position of a representation kind **(Properties)**, calling a interface window **(Properties)**.

5. Auxiliary information, including **About**.....

Fig. 5. Viewing Processed DICOM Images



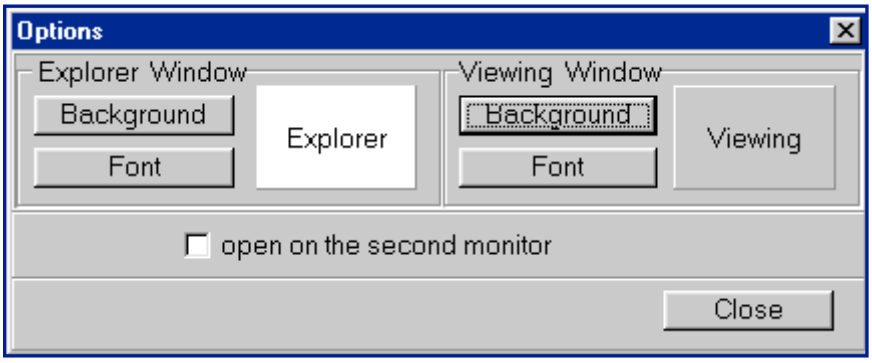
The adjustment Picture Viewer interface.

Have two areas in which the color gamma of windows and used font is separately established. In each of these areas the following adjustments are applied:

- Adjustment of displayed search guide and a choice of the printing frame – **Explorer Window**. Color gamma for interface choice opens by **Background** button, and a choice of font guide color display performed by the **Font** button. Color of a window background is displayed on **Explorer** field.

- Adjustment of a graphic window background – **Viewing Window**. Color gamma choice interface of a guide window background opens by **Background** button, and makes a choice of font guide color display performed by **Font** button. The window background color is displayed on **Viewing** field.

Fig. 5. Viewing Processed DICOM Images



Visualization adjustment on the second monitor from **Picture Viewer** component is made by activation of **Open on the second monitor** option.

• Finish