

Alfanuclear

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IM512P®

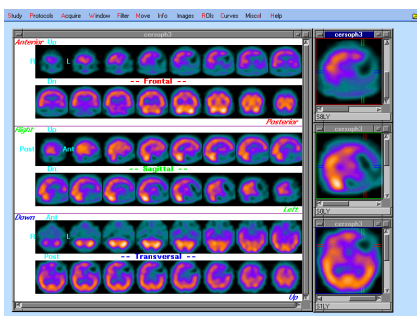
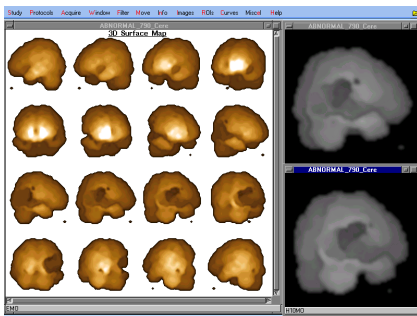
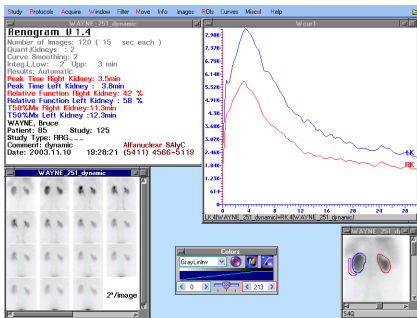
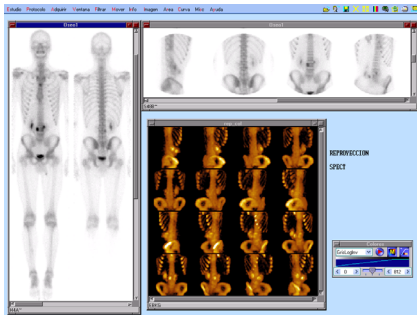
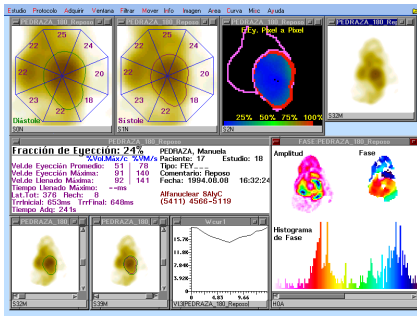


Data and Image Processor

IM512P®

Data and Image Processor

Acquisition



- Simultaneous acquisition and processing with no restrictions. It is possible to acquire a static, dynamic, gated, whole body, SPECT or gated SPECT and process any other study, planar or SPECT.
- 14 bit dual analog to digital converters (X and Y). Optional extra 14 bit ADC for energy.
- Acquisition matrices: 1024 x 1024, 512 x 512, 256 x 256, 128 x 128 and 64 x 64 up to 255 or 65,535 counts/pixel.
- Dual or triple isotope acquisition with simultaneous display of acquisitions in 2 or 3 different windows.
- Dynamic acquisition of more than 5000 frames of 64 x 64 at one frame per millisecond (1000 frames/second).
- Center of rotation correction, in X and Y, on-the-fly with a theoretical precision of 1/4000 of the field of view (0.1 mm).

- Built-in ECG for cardiac studies with a set of cables.
- Programmable acquisition protocols. All acquisition parameters can be set with one click.
- Persistence with zooms x 1, x 1.5, x 2, x 3, x 4 and x 6. Variable acquisition pan (X and Y) to center an organ in the window with a click of the mouse. Optional zooms x 1.25, x 1.75, x 2.5, x 3.5, x 5, x 7.

- Simultaneous display of ECG, cine and images during acquisition.
- Automatic saving of acquisition on disk. No data loss at a blackout.
- Energy, linearity and uniformity on-the-fly corrections (optional). Different uniformity corrections for each isotope-collimator pair may be used. 1024 channel spectrum analyzer on screen. Triple isotope / triple window with energy correction. Replaces the gamma camera console.

Display

- Configurable display (minimum: 1024 x 768) to allow the display of:
 - Several simultaneous studies in different windows.
 - One or more text editors to write reports, while observing the images and former report.
- It is possible to relocate, enlarge, reduce or move images with the mouse before documenting to the printer.
- Different color scales for each window on display and different upper and lower levels to get optimum contrast in each window.

- More than 200 color scales can be created by the user.
- From 256 to 64,000 simultaneous colors on the screen, to be selected from a palette of 262,144 colors. Sixteen programmable colors for regions of interest, curves, characters, markers, and menus.
- Independent memory for more than 1000 regions of interest per study (rectangular, circular, elliptical, irregular, by gradient)
- More than 1000 histograms or curves per study.
- More than 16 simultaneous cines on display, each with variable speed and zoom
- Single click copy of screen to Windows (*). Clipboard and paste to Word(*) or any other graphics application.

Archive

- Storage of studies with patient data, images, areas, curves, texts, etc. on hard disk. (More than 1,000,000 images of 64 x 64).
- Storage on CD, DVD, pen drive or external hard disk. Optional TCP/IP, NetBEUI and DICOM servers.
- Database can store voice reports.

Planar Clinical Protocols

- Ejection Fraction, Peak and Average Ejection Rate, Peak Filling Rate, Time to Peak Filling Rate, Fourier Phase Analysis, Wall Motion, Quantification of Myocardial Perfusion with Interpolated Background Subtraction and Circumferential Profiles. Shunt detection. First Pass.
- Protocols for Renal Perfusion, Renogram, Renal Quantitation, GFR with DTPA (with and without blood sample), ERF with MAG3 and one blood sample, Brain Flow, Esophageal Transit, Gastroesophageal Reflux, Pulmonary Quantification, Field Uniformity quality control, Gall Bladder Ejection Fraction, Gastric Emptying, Parathyroid (TI-Tc subtraction), Thyroid uptake, etc.
- A whole body can be reconstructed from a series of spots.
- Several studies can be processed simultaneously in different windows.
- Commands for general use to process images, regions of interest and curves.
- Recording and reproduction of sequenced orders to automate jobs.
- High processing speed: 0.9 seconds (CPU time) for an Ejection Fraction while another dynamic or gated study is acquired.

SPECT Clinical Protocols (optional)

- Tomographic Reconstruction with multiple filters, movement and attenuation correction at 0,01 sec/slice (CPU time).
- Tridimensional Analysis, 3D Surface Maps, X, Y, Z Axes Reorientation (0,004 sec/reoriented slice). Interpolated Zoom. Stress and Rest Gated SPECT.
- Summed, Maximum Activity and Weighted Transparency reprojections.
- Gated Polar Map, final display in 5 sec.
- Image fusion with other modalities.
- 3D volume viewer that shows 6 slices on the 6 faces of a 3D perspective cube that can be rotated, moved and resized with the mouse.

Gated SPECT (optional)

- Volume calculation protocol from gated SPECT images (SPECT sync with ECG) begins with an automatic reorientation of the cardiac axes and automatic search of the limits of the left ventricle (LV).
- The method is based on fitting a truncated ellipsoid to the actual volume of the LV. Then endo- and epicardial edges are detected along 829 radii perpendicular to the ellipsoid surface, for every interval in the cardiac cycle, constrained to the fact that ventricular mass must remain constant through the cycle. The fitted ellipsoid is used only as a starting point in order to generate the profiles. Each profile is analyzed in search of the endocardium, the epicardium and the midmyocardium (a point of maximal uptake in the LV wall), by using several methods: maximum of the filtered profile or most probable value in a fitted Gaussian curve for midmyocardium, inflexions or weighted standard deviation in a fitted Gaussian curve for endo- and epicardium. The detected points (one for each profile) generate a final contour that is not the original fitted ellipsoid but the actual LV surface. All the process takes only a few seconds with current PC processors.
- Endocardial detected positions allow the calculation of end diastole (ED) and end systole (ES) volumes. From there the ejection fraction is calculated, global or at each point of the ventricle surface (regional ejection fraction). Endocardium, epicardium and midmyocardium can be shown at ED and ES, or beating along the cardiac cycle. Both situations allow the appreciation of the wall motion.
- The reconstructed ventricular volume can be used to map perfusion, the absolute thickness, the thickening, the wall motion or the ejection fraction, in colors.

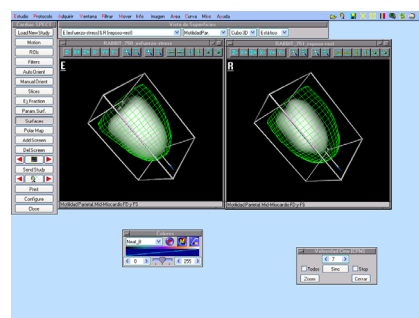
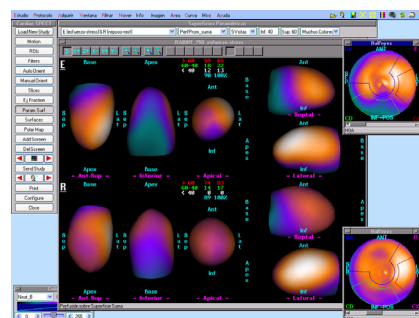
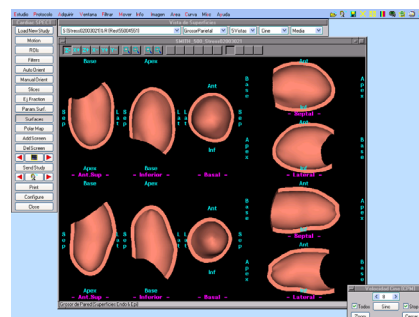
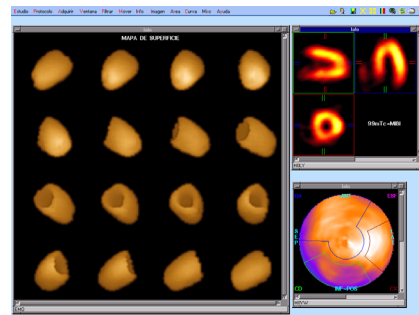
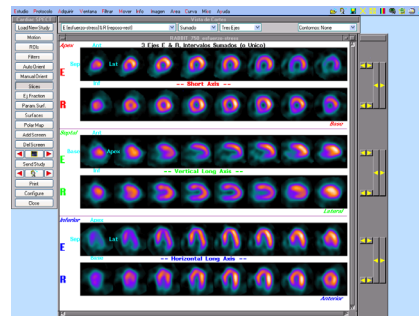
This way, in each cine 3D image the shape, the motion and the functional parameter can be evaluated in colors.

- This protocol can show simultaneously these results from 5 points of view: anterosuperior, posteroinferior, septal, lateral and apex. Or in a perspective volume that the operator moves at will, interactively with the mouse.
- Up to 4 studies of one or different patients can be shown simultaneously. This allows the operator to see in cine five stress 3D surfaces plus other five of rest and also for pre and post treatment. (Total 20 cine surfaces.)
- This protocol generates volumes, positions and thicknesses for each radii and cardiac interval in a table compatible with spreadsheets, for future analysis. For quality control, the 829 curves (profiles) of each interval of the cardiac cycle can be plotted, total or partially.
- The analysis screens display as a solid surface the epi-, mid- or endocardium and as a mesh surface (wire mesh) the epi- or midmyocardium, to appreciate 2 simultaneous surfaces in cine mode and from any angle, by rotating the images with the mouse.
- Traditional slices of short axis and horizontal and vertical long axis can be generated, automatically reoriented and realigned between stress and rest, cine or static.
- Summed polar maps can be generated. Also eight cardiac interval polar maps can be created, displaying the change of activity between ED and ES in cine mode.
- Each display with its settings may be stored for later review with a single click in Next Screen / Next Study.

Documentation (optional)

- Color printer with photographic quality in sheets of 8.5" x 11", with up to 6 photos per sheet.
- DICOM printer. Laser printer, black and white or color. Ink-jet printer. Any printer for Windows(*) can be used.
- .JPG, .PNG or .PCX files for image interchange; .AVI or .MWV for movies.
- Screen copy and paste to other Windows (*) application.
- Transmission of studies through local network or Internet without stopping the acquisition or processing.

(*) Windows and Word are registered trade marks of Microsoft Corporation.



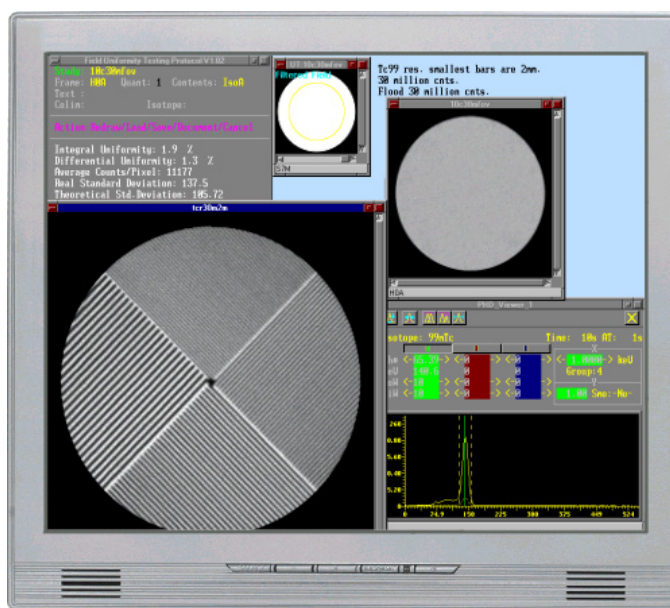
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This software has the clearance 510K of the FDA (Food and Drug Administration)

Acquisition from several Gamma Cameras (optional)

- Simultaneous acquisition from 2 or 3 gamma cameras with only 1 PC, each with its own ECG trace and simultaneous display of acquired images. All processing allowed also during this kind of acquisition.
- Simultaneous acquisition from multiple gamma cameras with 1 PC for each camera connected by Ethernet. Each PC may be an acquisition, processing or an acquisition and processing workstation.



DICOM Connectivity (optional)

- TCP/IP:
 - DICOM Print: Service Class User (SCU).
 - DICOM Query/Retrieve: SCU and SCP.
 - DICOM Storage: SCU and SCP.
- Media Interchange
 - DICOM Physical Media Storage: FSC and FSR

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