1. HOW TO OBTAIN YOUR FIRST MR IMAGES

Initial situation:

- ✓ The system must be up running, an RF-coil must be connected, and a sample or an animal must be placed in the centre of the scanner.
- ✓ You should be logged in as a valid user.
- ✓ The screen should display the following set of windows:

In View Display Layout ROI Processing Ametale	+ 6 * Contract Advanced	tens Candrad • 0 Help
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	on the only grant depict the same	P.P.A.
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and and descent that I are presented	nowledge to a	
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unnet serys Role Late the process directory!	amiliarity via 🛔 a System O	

Registering a patient:

- \checkmark Click on the new patient button.
- ✓ The Patient Editor window appears.

Name	KIVI			
Registration	TESTSCAN	1. 1753		
Birth	I	Sex	I	<u>_</u> 08
Remarks	I	IS ISIDAION	adiad as	
Accept	1			Cancel

- ✓ Fill out as a minimum Name and Registration.
- ✓ Click Accept.
- ✓ The Study Editor window appears.

Study	Nol			
Study ID	þ	Weight	5.00	
Referred	I			
Purpose	I			
Location	B_BIOSPEC_STD			14
Entry	Head First	Position	Supine	

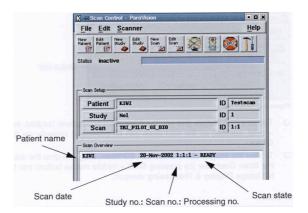
- ✓ Leave Entry and Position as it is.
- ✓ Click Accept.
- ✓ Choose a Location.

The Location window appears.

ocation	B_BIOSPEC_STD
GEFI_MTCsel	BIO
GEFI_RFspoi	1_BI0
GEFI_Trigge	
MSME_8E_BIO	and have not
MSME_BIO	Saw nus mus
MSME_BIO_BI	
	nteTagg_BI0
MSME_BIO_In	
MSME_e_coll MSME InvRec	
RARE_3Dslab RARE 8 BIO	_610
RARE 8 BIO	BTO
RARE Double	
RARE_flowC_	
RARE_Myelo_	
RARE_Turbo_	
Setup POSIT	
Setup Shin	
SNAP_3D_BIO	
SNAP_BIO	10
SNAP_IR_BIO	
SNAP_T1ser_	BIO
TRI_PILOT_G	E_BIO
TRI_PILOT_S	E_BI0
	Cancel

- ✓ Choose within the B_BIOSPEC_STD location the protocol TRI_PILOT_GE_BIO.
- ✓ Click Accept

The Scan Control window appears.



Acquiring the overview scan:

- Click the Traffic Light to start the scanning process.
- ✓ The system will perform an automatic adjustment procedure (Auto Shim, Auto Frequency Adjustment, Auto Flip Angle and

Auto Receiver Gain) and acquires the image.

- Every time prior to starting the scanning of a New Patient, New Study or after starting ParaVision an automatic adjustment procedure is started.
- You can always force ParaVision to perform all automatic adjustment procedures by clicking Shift + Traffic Light simultaneously.
- ✓ The scanning is done when the countdown in the Status bar is finished, the Status shows inactive and the Scan state in the Overview list is COMPLETED.

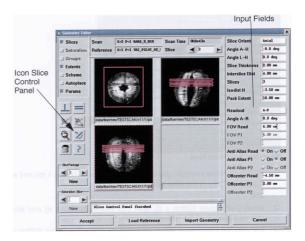


- ✓ The acquired images gives you three main orientations (sagital, transversal and coronal), so the next Scan can be positioned correctly via Geometry Editor.
- ✓ To view the images, drag and drop the dataset from the Scan Overview (by pressing Shift+middle mouse button) into the upper left Image Display & Processing viewport.

The next scan:

- ✓ Use the TRI_PILOT_GE_BIO images as reference images to position the next Scan.
- ✓ Click on New Scan, select a Location, and a Protocol (RARE 8 BIO).
- Click the geometry Editor icon to position the Scan correctly.
- ✓ The TRI_PILOT appears automatically in the viewport.
- ✓ Change viewport segmentation from 1X1 window to 4X4 window with the 2nd mouse button.

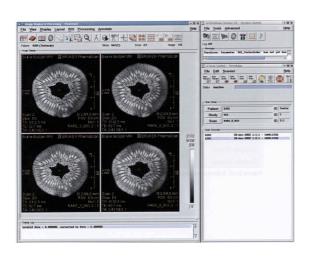
✓ The dashed borderline shows the current active viewport.



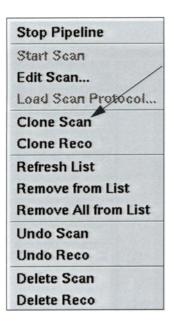
 Parameters can be modified either manually in the Input Fields or interactively by clicking on icon for Slice Control Panel.

Position		▼ 0.500 ▲
Angle	1 0.0 deg	▼ 1.000 ▲
Tilt	I -0.0 døg	¥ 4
Thickness	<u>1 2.00 mm</u>	▼ 0.050 ▲
Interslice Dist	I 4.00 mm	▼ 0.050 ▲
Field of View	[6.00 cm	¥ 0.050
FOV P1	1	¥ 4
Offcenter	I -4.50 mm	▼ 0.500
Offcenter P1	1 2.00 mm	▼ 0.500
Accept	Cancel	

- ✓ Confirm the modifications with Accept.
- ✓ Start the scan with the Traffic Light..
- ✓ After a scan is completed, the Image Display & Processing window might look like this:



- ✓ Further scans can be obtained in the same way as just described.
- ✓ Or, if you wish, clone the Scan by highlighting the COMPLETED Scan and press the 2nd mouse button to select Clone Scan.
 Parameters, positioning etc are duplicated and the Scan is ready to run.

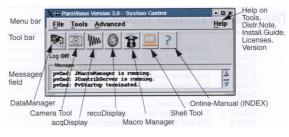


(For more details; see ParaVision 3.0.2 Application Manual, pages A-4-1 to A-4-32).

2. THE SYSTEM CONTROL TOOL

Paravision startup:

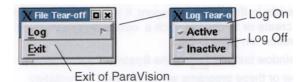
When ParaVision is started, the XWIN-NMR window appears and the ParaVision System Control Tool is opened in the right upper corner of the screen.



In addition, some other windows appear (Scan Control, Reqonstruction status, Acquisition status).

Menus and Tools:

The drop-down menu Files provides the buttons Log and Exit.



Log opens a submenu Log with two radio buttons: Active, Inactive.

 ✓ Active: The history file ParaVisionHistory will be written into the directory <PvInstDir>/prog/curdir/ <user>/ParaVisionHistory/.

Drop-down menu Tools:

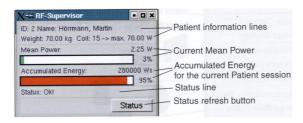
The menu Tools provides start options for several tools:

- ✓ Scan control: Starts the Scan Control Tool.
- ✓ Image Display: Starts the Image Display & Processing Tool.
- ✓ DataManager: Starts the DataManager.

- ✓ Camera Tool: Starts the Camera Tool (not working on our MR).
- ✓ Macro Manager: Starts the Macro Manager.
- ✓ Reconstruction Status: Opens the recoDisplay window.
- ✓ Acquisition Status: Opens the acqDisplay window.
- ✓ RF-Display: The RF-Supervisor window is opened.

X-¤ Tools Tear-off <2>□×	Maximizes the XWIN-NMR window
XWIN-NMR	Starts the Scan Control Tool
Scan Control	Starts the Image Display & Processing Tool
Image Display	En.
DataManager	- 90 -
Camera Tool	<u> </u>
Macro Manager	
Reconstruction Status	
Acquisition Status	Alter
RF-Display	

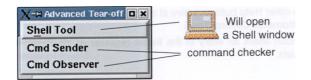
The RF Supervisor gives information about maximum allowed mean power value, the current mean power value, and the accumulated energy:



If the transmitter power exceeds the max allowed power, the user must lower the transmitter gain (i.e. by adjusting imaging parameters, e.g. pulse lengths and TR).

Drop-down menu Advanced:

The drop-down menu Advanced provides a command button to open a shell window:



- Cmd Sender: Gives you information about commands and arguments in ParaVision applications.
- Cmd Observer: May help to find and fix problems by observing the program responsible for sending and executing commands.

The icon buttons:

<u></u>	DataManager: Opens the DataManager (the Archive Tool) from within the System Control Tool.
Ō	Camera Tool: Opens the Camera Tool from within the System Control Tool.
łłw	Acquisition Status: Opens the online Acquisition-Display window (acqDisplay window). This window may be opened automatically starting a GSP or GOP pipeline.
\odot	Reconstruction Status: Opens the online Reconstruction-Display window (recoDisplay window) This window may be opened automatically starting a GSP or GOP pipe- line.
Ť	Macro Manager: Starts the Macro Manager for access to the BRUKER macro category, to the <user> macro category and for the SERVICE macro category (only for NMR Superuser).</user>
	Shell Tool: Opens a Shell window of the operating system (e.g., <i>LINUX</i> Shell win- dow) with environment variables of the current <i>ParaVision</i> configuration.
?	Index of Online Manual: Opens the INDEX of the <i>ParaVision</i> manuals.

(For more details; se ParaVision 3.0.2 Operation Manual, pages O-2-1 to O-2-8).

3. THE SCAN CONTROL TOOL

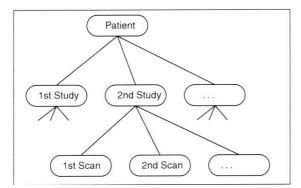
The Scan Control Tool is started automatically when ParaVision is started.

Carlos Sean Control - ParaVision File Edit Scanner Para Status inactive	<u>— H</u> e	Menu bar Tool bar Status bar
	and and a second	RF-Supervision alert messages
Patient	ID	Scan Setup
Study	ID	field
Scan	ID	.2 The loon La
- Scan Overview	ew Pedent encondes ly details	Scan Overview list

- ✓ Status bar: Indicates if the acquisition is active or inactive.
- ✓ RF-Supervision alert messages: Important messages from the RF-Supervisor are shown here.
- Scan Setup field: This field contains three lines (Patient, Study, Scan) representing the hierarchical structure of data sets.
- ✓ Scan overview list: Contains a list over the scans you have performed.

Patients, Studies, Scans:

The hierarchical structure is shown below:



The highest level is the Patient level. This could for instance be the project you are working with. Example: Frits is working with Diffusion experiments on glioblastoma xenografts in nude rats. The "Patient" in this case could for instance be "Diffusion_experiment".

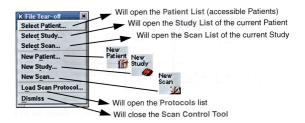
The Study in the above example would then be the individual animals. For instance: cage1_animal1, or similar.

The Scan would be the individual scans for each animal.

There are of course several ways to do this notation, but you should think through it in beforehand, and decide which notation fits your experiments.

Menus and Tools:

The drop-down menu File is shown below:



Note that you can "tear off" the File menu from the Scan control window.

Scan Control Tool icons:

New	New Patient:
Patient	Opens the Patient Editor creating a new Patient. Equivalent to Scan Control Tool > File > New Patient
New	New Study:
Study	Opens the Study Editor creating a new Study. Equivalent to Scan Control Tool > File > New Study
New	New Scan:
Scan	Opens the Scan Editor creating a new Scan.
	Equivalent to Scan Control Tool > File > New Scan
ble 3.2: Icor t, Edit Sti	Trailing of the second s
Edit Edit	buttons to create new Patient, Study and Scan entries Jdy, Edit Scan Edit Patient: Opens the Patient Editor for the currently selected Patient. Equivalent to Scan Control Tool > Edit > Edit Patient Edit Study:
ble 3.2: Icor t, Edit Stu Edit Patient	buttons to create new Patient, Study and Scan entries ddy, Edit Scan Edit Patient: Opens the Patient Editor for the currently selected Patient. Equivalent to Scan Control Tool > Edit > Edit Patient
edit Edit Patient	buttons to create new Patient, Study and Scan entries ddy, Edit Scan Edit Patient: Opens the Patient Editor for the currently selected Patient. Equivalent to Scan Control Tool > Edit > Edit Patient Edit Study: Opens the Study Editor for the currently selected Study.

E

The icons for Setup, Start/Stop:

The Icons for Setup and Start/Stop an acquisition

	Geometry Editor: Opens the Geometry Editor for the current READY Scan. Equivalent to Scan Control Tool > Scanner > Position
	Traffic Light: For a READY Scan all automatic adjustments will be made as required (shim, resonance, pulse gain, receiver gain) and acquisition will be started For a NOT RECONSTRUCTED Scan the reconstruction begins. Equivalent to Scan Control Tool > Scanner > Start.
STOP	Stop Scan: Interrupts the currently running acquisition (GSP, GOP, GS Auto). Equivalent to Scan Control Tool > Scanner > Stop
Table 3.4: Icor	buttons for start/stop an acquisition
Ti	Spectrometer Control: Opens the Spectrometer Control Tool. Equivalent to Scan Control Tool > Scanner > Spectrometer Setup

Browsing to Patients, Studies, Scans:

By clicking File>Select Patient, you will see the Patient List displayed:

	New Edit Patient Patient	*	*	4
perfusion_02_10_ perfusion_03_09_ perfusion_07_08_ perfusion_prep perfusion_test	02	perf_02_10 perf_03_09 perf-test p-prep p-test	06 Mar 200 01 May 200	
	/		/	

The Patient List contains Name, Registration and Birth.

By double clicking on a Patient (or clicking Accept), the Study List will open:

K Study List	New Edit Study	2	×
Study		14:15:14 2 oct 3 ne (h:min:s) Creat	
Accept		Lecope ine kleel	Cancel

In this example, only one study exists for this patient. Double clicking on the study (or clicking Accept) will open the Scan List:

	New Edit Scan Scan		Ø
GEFC_3Dtomo GEFC_3Dtomo RARE_8_RatHead_12 RARE_8_RatHead	scan	E=14: P=1 E=14: P=2 E=16: P=1 E=17: P=1	2
RARE_8_RatHead	/	E=23: P=1	7
Accept	EXPNO	PROCNO	Cancel

In the present example 5 scans exist. If you highlight one of the scans, and thereafter drag it into the Scan Control window by using the middle mouse button, you will be able to look at the scan in the Image Display & Processing window afterwards:

K - Scan Co	ontrol – ParaVision	• 🗆 🗙
<u>File</u> <u>E</u> dit	Scanner	<u>H</u> elp
	New Study Study	* 🐼 🚹
Status inactin	ve	
	46/04/08	TERSTARE T
Patient	perfusion_02_10_02	ID perf_(
Study	ASL	ID 1
Scan	RARE_8_RatHead	ID 23:1
Scan Overview		
	02_10_02 2-0ct-2002 1:23:1 - C	OMPLETED
	////	
/		
Patient Na	me Study ID PROC	NO
Stud	y creation date EXPNO	dataset state

(For more details; see ParaVision 3.0.2 Operation Manual, pages O-3-1 to O-3-22).

4. THE SPECTROMETER CONTROL TOOL.

The Spectrometer Control Tool allows the direct control of the spectrometer in a "low level manner". It is started by pressing the following button:



It is possible to start and stop an acquisition or an Auto Adjustment, to invoke a parameter editor or to adjust some important acquisition parameters (frequency offset, transmitter attenuators, receiver gain, etc):

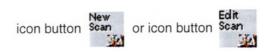
🕻 🖽 Spectrometer Control Tool – ParaVision	• 🗆 🗙
<u>File Edit Channel Acq Reco Tools Config</u>	Help drop-down menu bar
Auto RG GSP GOP STOP Edit Edit Edit Edit Edit Edit Krin Hethod ACQP GS RECO CLASS CLAS	icon row
Frequency Setting Channel 1 Basic Frequency BF1 300.092411 Set Basic Freque	Frequency Setting Channel 1
Offset Frq O1	DA
Lock Read Config Frequency Write Config Freque	incy
-Transmitter Setting Channel 1	Scale Transmitte Setting Channel 1
Tx Attenuator 0	
Tx Attenuator 1 19.0 ¥ 1.0	
	-
Receiver Setting	Receiver
Receiver Gain I 11.0 Y 0.5	Setting
Edit Single Parameter	Edit Single
Messages	
	Messages
the contract of a state of the	1
Close	

The Spectrometer Control Tool should **not** be used by routine users.

(For more details; see ParaVision 3.0.2 Operation Manual, pages O-4-1 to O-4-24).

5. THE SCAN EDITOR

The Scan Editor may be started by pressing the following buttons:



The Scan Editor is the most important editor for checking and changing measurement parameters in routine work:

 Standard Geometry 	Protocol Edit	tScanMan(modifi	ied) Scan Time	
Contrast	Field of View	2.30 cm	Repetition Time	1250.3 ms
Mode 1	Slice Thickness	2.00 mm	Echoes	8
Special	Interslice Dist	4.50 mm	TE Effective 1	18.3 mš
Research	Slices	<u>s</u> (3	TE Effective 2	36.6 ms
	Slice Orient	Sagittal	Averages	þ
	Angle H-L	[0.0 deg	Inversion Time	jn.a.
	Angle A-L	23.8 deg	Flip Angle	<u>]</u> 90 deg.
	Matrix P1	192	Contrast Agent	von 🔹 off
* *	Scan Edit: Summary	ScanMan_Doc.[5	
Sice Package		ScanMan_Doc]	5	
		ScanYan_Doc	5	

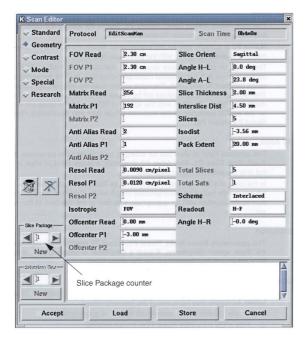
- The six parameter groups Standard, Geometry, Contrast, Mode, Special and Research are shown. Only one group can be active at any one time.
- Protocol is the name of the last loaded protocol. An added "modified" means that the originally loaded protocol has been changed.
- 3) In the centre of the window we find the currently active parameter group.
- The Slice Package counter indicates the current active slice package. In case of more than one slice package another package can be activated here. Below is the Saturation Slice counter.
- 5) Scan in the middle of the window is the currently selected scan.
- 6) Control buttons for the Scan Editor.

Standard parameter group:

This group contains a selection of parameters which are varied most often (see above figure).

Parameters of Geometry group:

Geometrical specifications can be set in this window:



The Field of View (FOV) is the size of the scanned area. The specified FOV can be small than the object diameter. To avoid folding the Anti Alias option should be used. To reduce artifacts saturation slices can be applied.

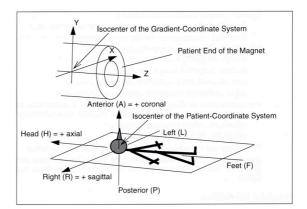
The matrix size can be specified (range between 32 and 2048).

The Resolution in Read and P1 direction is shown in cm/pixel.

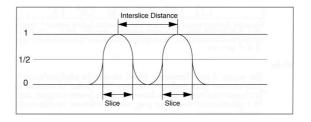
The Offcenter parameters allow the user to shift the imaged object out of the image centre.

The Patient Coordinate System:

The parameters of the coordinate system has been defined in a medical environment:



Slice Thickness and Interslice Distance:



Profile of two neighbouring slices with the definition of slice thickness and interslice distance. The slice thickness is defined as the thickness of the region where the signal intensity is half of the maximum possible value.

Parameters of Contrast group:



The parameter Echoes specifies the number of echo groups. Each echo group produces one image. TE Effective1 specifies the mean echo time for all echoes of the first group. TE Effective2 specifies

Scan Time O

the mean echo time for all echoes of the second group.

Repetition time (TR): For instance in a Spin Echo sequence, the TR is the time between two 90^{0} pulses.

The parameter Averages is used to increase the signal to noise (S/N) ratio, and thereby decrease noise and increase contrast. To increase the S/N ratio by a factor of 2 the number of acquired scans must be multiplied by 2^2 and so on. A very common value is Averages 4.

Flip Angle refers to the pulse angle for excitation $(90^{\circ} \text{ for SE sequences}, \text{ less than } 90^{\circ} \text{ for GE sequences}).$

The Inversion time is the delay between the inversion pulse and the onset of data acquisition in an inversion experiment.

Bandwidth is the effective bandwidth used for excitation.

Flipback, Fatsuppression, Motion suppression and Flow Compensation might also be chosen for the different scans.

Parameters of the Mode group:

Standard	Protocol Edi	tScanMan	1.	Scan Time	Oh4m0s
Geometry Contrast	Dimensionality	2D			
Mode					
Special	linage Mx Read	256	1		
Research	linage Mx P1	256	1		
	linage Mx P2	I			
	Movie	√ On	◆ Off		
	Slice Advance	↓ On	◆ Off		
	Time Evolution	√ On	◆ Off		
	Frames	I			
	Advances	I			
	Evolutions	I			
	Evolution Delay	I			
lice Package					
New					
aluration Size —					
[]a.a					12 10 10
New					
					1

	Rare Maximum	I		
* *				
-Since Parkango-				
a jo.a				
New				
-saturation Rive-				4
- [p.a]				1. 1. 1. 1. 1.
New				
	p			1.
Accept	L	oad	Store	Cancel

Parameters of the Special group:

18.3 ms

Protocol Edit

Echo Spacing

Echoes Group 1

Echoes Group 2 1 Rare Partitions I

Standard

Geometry

Contrast

The parameter Echo Spacing refers to the time difference between two subsequent echoes in a symmetric echo train.

Echoes Group 1 and Echoes Group 2 are editable in case Number of Echo Images are ≥ 2 .

(For more details; see ParaVision 3.0.2 Operation Manual, pages O-5-1 to O-5-22).

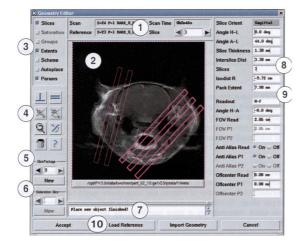
Very often only the parameter Dimensionality is editable.

6. THE GEOMETRY EDITOR

The Geometry is started by pressing the following icon in the Scan Control Tool:



The Geometry Editor is used to set up the geometric arrangement of slice packages and saturation slices for imaging experiments, to define and position voxels for volume selective experiments, and to inspect the geometry of COMPLETED scans.



- 1) Scan and Reference Info section.
- 2) Image Data Display Area.
- 3) Options Region.
- 4) Icon Buttons.
- 5) Slize [Voxel] Package Selector.
- 6) Saturation Slice Selector.
- 7) Message Area.
- 8) Slice Parameter Field.
- 9) Saturation Parameter Field.
- 10) Dialog Control.

A little more detail is shown on the Icon Buttons:



-Perpendicular: creates perpendicular slice -Parallel: creates parallel slice - Magnify: magnifies image Change Parameters: opens Slice Control Panel, - Saturation C. P., Voxel C. P. - Deletes current geometry selection - Help K Geometry Editor Slice Control Panel Position 0.00 mm ▼ 0.200 ▲ Angle -0.0 deg ▼ 1.000 ▲ Tilt] 90.0 deg -* Thickness 2.00 mm ¥ 0.050 🛦 Interslice Dist 3.00 mm ¥ 0.050 ▲ Field of View 3.70 cm ▼ 0.500 ▲ FOV P1 ¥ 4 Offcenter ▼ 0.200 ▲ 0.00 mm Offcenter P1 I 0.00 mm ▼ 0.200 ▲ Accept Cancel

The scan package is moved in X, Y and Z planes by changing the sliders Position, Offcenter and Offcenter P1. The Angle of the slices can be changed, as well as Slice Thickness, Interslice Distance and FOV.

A little more detail on the Dialog Control:

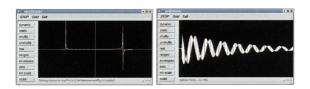
- ✓ Accept: Implements all parameter modifications entered in the Geometry Editor, and closes the window.
- ✓ Load Referance: You can use previous reference images for setting up you sequence.
- ✓ Import Geometry: All geometry parameters may be loaded from a previous Scan within the current Study.
- ✓ Cancel: Closes the Geometry Editor and discards all changes.

(For more details; see ParaVision 3.0.2 Operation Manual, pages O-6-1 to O-6-30).

You will often push the Slice Control Panel icon, and then this window appears: 25.09.2009 MR course, Practical Part.

7. ACQUISITION AND RECONSTRUCTION DISPLAY TOOLS

In a standard configuration both tools (acqDisplay and recoDisplay) will be automatically started when ParaVision is started:



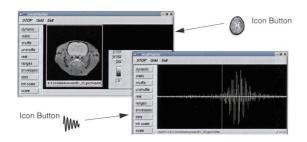
This example shows a one-pulse experiment.

As long as the scan is being performed, both windows are in a so-called dynamic state. The displays will be updated periodically depending on the corresponding parameter settings. When the scan is finished, both windows are in a static state.

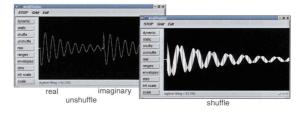
What is displayed:

acqDisplay: The horizontal scale represent the time for one acquisition time window. recoDisplay: The result of a Fourier Transform of the data shown in acqDisplay.

The results of completed scans can be displayed in both windows by a drag and drop operation:



There are several command buttons on the left side of these windows, we will not go into details here, just show two examples below:

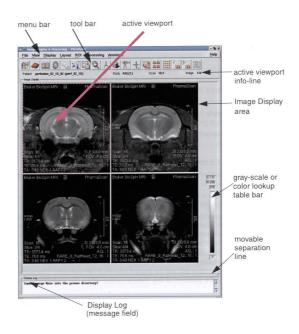


In shuffle mode the data will be displayed as a real and an imaginary part of the complex signal in an interleaved manner. In unshuffle mode the real part of the data is diaplayed on the left side, and the imaginary part is displayed on the right side.

(For more details; see ParaVision 3.0.2 Operation Manual, pages O-7-1 to O-7-8).

8. IMAGE DISPLAY AND PROCESSING

When ParaVision is started in the default layout the left part of the monitor screen is covered by the window of the ParaVision Display & Processing Tool, called XTIP:



The window is composed of the following subareas:

- ✓ A menu bar
- ✓ A tool bar just below the menu bar, with frequently used XTIP commands

- ✓ An info-line for the currently active viewport
- ✓ An Image Display area where images and related information are displayed in a user selectable layout
- ✓ A scrollable and resizeable Display Log

You display the images from a completed scan in a drag and drop fashion:

Highlight the scan you want to display. Then click and hold down then middle mouse button. Last, click with the middle mouse button on the highlighted scan, and drag it into the Image Display area. All images of the series will now be shown. If you do not click and hold down the shift key, only the middle image of the completed scan will be displayed.

Details on how to use the mouse buttons are shown in ParaVision 3.0.2 Operation Manual, pages O-8-7 to O-8-9.

Icon Tool bar commands:



Patient selection: It opens a window which display the list of all patients for whom images are available on the disk:

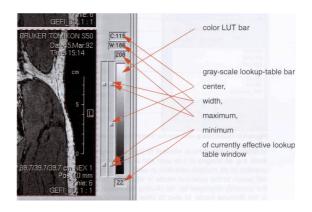
Patient: Name	ID (identifie	er)		Date o	f Birth
	Pavint Edit Patient	× 1	*		0
Legrand, Marcel Gordon, Wiliam		ma-017 ma-018		Oct 1957 Jul 1948	
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Accept				Can	cel

Patient name, ID and date of birth is shown.

Clicking the Window Lookup Table icon allows the user to adjust brightness and contrast of the images:



A maximum of 256 image intensity values of colors or gray levels can be displayed simultaneously.



After clicking the Color Window Lookup Table icon the color LUT is activated and several drag boxes are drawn. By dragging these boxes with the 1st mouse button the window level and width is changed.



Toggle between resized and original size imae presentation.



Magnifying glass. Allows for interactive zooming and scrolling of images.



Interactive distance measurements.



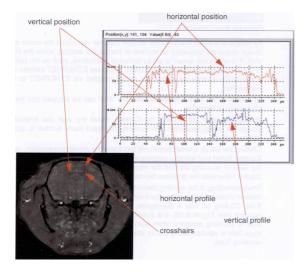
3D image visualisation: Cube view. The user can inspect the 3D image data matrix by simultaneously viewing three orthogonal planes presening the sides of a cube.



Skimming through an image sequence in the cine mode.



Clicking the Pixel Scan icon invokes the interactive display of the intensity values of single image points (pixels) and of intensity profiles of horizontal rows and vertical columns of the currently active image.



Starting this command will display a dialog window used to display the profiles and the image intensities, and will also cause crosshairs to be superimposed on the image in the currently active viewport.



Toggling between One- and Multiple-Viewport Layout.



Using the 2x2 Viewport Standard Layout.



Using the 4x4 Viewport Standard Layout.



Loading the Next Frame into the Next Viewport.

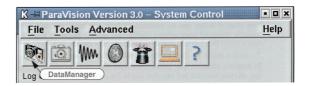


Loading the Previous Frame into the Next Viewport.

(For more details; see ParaVision 3.0.2 Operation Manual, pages O-8-1 to O-8-104).

9. THE DATA MANAGER

To Start up choose for instance the icon as shown below:



The Data Manager consists of two views: The *Manage Images* view allows the user to delete, archive or transfer data sets stored on the local disks. The *Retrieve Images* view gives an overview about archived data sets and allows the user to restore them.

Manage Image view:

Data Manager - ParaVision File Edit View Options Admi	n						• o
Manage Images Rurieve Images							
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Messages							
Starting up DataManager done Interpret results from Daemon Comm Daemony Command results interprete						alisha D.	

- 1. Status line. Display status operations.
- 2. Folder tabs. Switches between *Manage Images* and *Retrieve Images* view.
- Mark icon row. Selected Subjects and Studies are marked or unmarked for different operations by clicking on the mark icons. Four mark icons exist: Mark for Delayed Deletion, Immediate Deletion, Archiving and Transfer.
- 4. Disk usage bar. It shows the current state of the writable disk unit.
- 5. Message window (info, warning, error messages).
- 6. Information window. Displays information about the selected study, experiment and processed images on disk.
- Study table. Displays Subjects, Studies, Experiments and Processed Images.

Sorting and searching:

Subjects can be sorted in the Manage Images and Retrieve Images view. The following sort criteria is possible:

View by name, Id, date or Size.

Searching can also be performed by filtering:

	Patient Name	contains	Muster
r	Patient Id	contains	BRUK
and	Archive Date	within 2 months	20 Nov 2002

Deletion:

Subjects, Studies, Experiments/Scans and Processed Images can be deleted from the harddisk using DataManager.

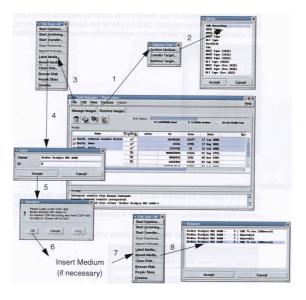
Using the delete operation has to be done carefully because it can not be undone!

It is not possible to delete raw data files which are protected with read-only permissions for the current user.

Archiving and retrieving studies:

Studies and all accompanying data can be archived to an archive medium. To archive a study the following steps are necessary:

- ✓ Configuration of archive media
- ✓ Labeling a medium
- \checkmark Mounting a volume
- ✓ Marking subjects for archiving
- \checkmark Archiving the studies



You can also archive your data using a memstick. Put it into one of the USB ports in the front of the Linux pc, and mount it by double clicking on the USB stick icon on the desk top. You can now drag and drop your data into the memstick.

Your data are found in the catalogue:

/opt/PV3.0.2/ data/<username>/nmr/<filename>

(For more details; see ParaVision 3.0.2 Operation Manual, pages O-9-1 to O-9-64).