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\MARTINOS DEVELOPER

HUBER

T1\_protocols

AZMA\_coil\_20251210

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## \MARTINOS DEVELOPER\HUBER\T1\_protocols\AZMA\_coil\_20251210\Scout\_alternative

TA: 13 sec Coil Selection: Manual Voxel Size: 1.6x1.6x1.6 mm<sup>3</sup> Acc:: 3 Rel. SNR: 1.00**Properties**

|   |                    |
|---|--------------------|
| Start measurement without further preparation | Off                |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | Off                |
| Load Images to Graphic Segments               | On                 |
| Graphic segment                               | 2nd Segment        |
| Inline Movie                                  | Off                |

**Resolution - Common**

|                  |          |
|------------------|----------|
| FOV Read         | 260 mm   |
| FOV Phase        | 100.0 %  |
| Slice Thickness  | 1.600 mm |
| Base Resolution  | 160      |
| Phase Resolution | 100 %    |
| Slice Resolution | 69 %     |
| Interpolation    | Off      |

**Routine**

|                     |                    |
|---------------------|--------------------|
| Slab Group          | 1                  |
| Slabs               | 1                  |
| Distance Factor     | 20 %               |
| Position            | L0.0 A16.0 H0.0 mm |
| Orientation         | Sagittal           |
| Phase Encoding Dir. | A >> P             |
| Slices per Slab     | 128                |
| Phase Oversampling  | 0 %                |
| Slice Oversampling  | 0.0 %              |
| FOV Read            | 260 mm             |
| FOV Phase           | 100.0 %            |
| Slice Thickness     | 1.600 mm           |
| TR                  | 3.5 ms             |
| TE                  | 1.51 ms            |
| Averages            | 1                  |
| Concatenations      | 1                  |
| AutoAlign           | ---                |
| Coil Elements       | AC                 |

**Resolution - Acceleration**

|                        |            |
|------------------------|------------|
| Acceleration Mode      | GRAPPA     |
| Reference Scans        | Integrated |
| Acceleration Factor PE | 3          |
| Reference Lines PE     | 24         |
| Acceleration Factor 3D | 1          |
| Phase Partial Fourier  | 6/8        |
| Slice Partial Fourier  | 6/8        |
| Asymmetric Echo        | Allowed    |
| Elliptical Scanning    | Off        |

**Resolution - Filter**

|                       |           |
|-----------------------|-----------|
| Raw Filter            | Off       |
| Elliptical Filter     | Off       |
| Distortion Correction | 3D        |
| Normalize             | B1 Filter |
| Image Filter          | Off       |

**Geometry - Common**

|                     |                    |
|---------------------|--------------------|
| Slab Group          | 1                  |
| Slabs               | 1                  |
| Distance Factor     | 20 %               |
| Position            | L0.0 A16.0 H0.0 mm |
| Orientation         | Sagittal           |
| Phase Encoding Dir. | A >> P             |
| Slices per Slab     | 128                |
| Phase Oversampling  | 0 %                |
| Slice Oversampling  | 0.0 %              |
| FOV Read            | 260 mm             |
| FOV Phase           | 100.0 %            |
| Slice Thickness     | 1.600 mm           |
| TR                  | 3.5 ms             |
| Multi-Slice Mode    | Interleaved        |
| Series              | Interleaved        |
| Concatenations      | 1                  |

**Geometry - AutoAlign**

|                     |                    |
|---------------------|--------------------|
| Slab Group          | 1                  |
| Position            | L0.0 A16.0 H0.0 mm |
| Orientation         | Sagittal           |
| Phase Encoding Dir. | A >> P             |
| AutoAlign           | ---                |

**Contrast - Common**

|                    |           |
|--------------------|-----------|
| TR                 | 3.5 ms    |
| TE                 | 1.51 ms   |
| MTC                | Off       |
| Magn. Preparation  | None      |
| Flip Angle         | 15 deg    |
| Fat-Water Contrast | Standard  |
| Dark Blood         | Off       |
| Contrasts          | 1         |
| SWI                | Off       |
| Reconstruction     | Magnitude |

**Contrast - Dynamic**

|                 |                  |
|-----------------|------------------|
| Dynamic Mode    | Standard         |
| Measurements    | 1                |
| Multiple Series | Each Measurement |

**Geometry - AutoAlign**

|                     |                 |
|---------------------|-----------------|
| Initial Position    | L0.0 A16.0 H0.0 |
| L                   | 0.0 mm          |
| A                   | 16.0 mm         |
| H                   | 0.0 mm          |
| Initial Orientation | Sagittal        |
| Initial Rotation    | 0.00 deg        |

**Physio - Signal**

|                 |        |
|-----------------|--------|
| 1st Signal/Mode | None   |
| TR              | 3.5 ms |
| Segments        | 1      |
| Concatenations  | 1      |

**Geometry - Saturation**

|                    |          |
|--------------------|----------|
| Saturation Mode    | Standard |
| Special Saturation | None     |

**Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Manual           |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 0.00 deg    |
| A >> P      | 263 mm      |
| R >> L      | 350 mm      |
| F >> H      | 350 mm      |
| Reset       | Off         |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ? Ref. Amplitude 1H | 0.000 V        |
| Reset               | Off            |
| Correction Factor   | 1.00           |
| Image Scaling       | 1.000          |

**Physio - Cardiac**

|                    |          |
|--------------------|----------|
| Tagging            | None     |
| Fat-Water Contrast | Standard |
| Magn. Preparation  | None     |
| Dark Blood         | Off      |
| FOV Read           | 260 mm   |
| FOV Phase          | 100.0 %  |
| Phase Resolution   | 100 %    |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. Control  | Off |
| Concatenations | 1   |

**Inline - Liver**

|                      |     |
|----------------------|-----|
| Liver Registration   | Off |
| Save Original Images | On  |

**Inline - Subtraction**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Save Original Images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP Sag              | Off |
| MIP Cor              | Off |
| MIP Tra              | Off |
| MIP Time             | Off |
| Radial MIP           | Off |
| Save Original Images | On  |
| MPR Sag              | Off |
| MPR Cor              | Off |
| MPR Tra              | Off |

**Inline - Soft Tissue**

|              |     |
|--------------|-----|
| Wash-in      | Off |
| Wash-out     | Off |
| TTP          | Off |
| PEI          | Off |
| MIP Time     | Off |
| Measurements | 1   |

**Inline - Composing**

|              |        |
|--------------|--------|
| Maplt        | None   |
| Flip Angle   | 15 deg |
| Measurements | 1      |
| Contrasts    | 1      |

**Inline - Maplt**

|                      |         |
|----------------------|---------|
| TE                   | 1.51 ms |
| TR                   | 3.5 ms  |
| Save Original Images | On      |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Sequence Name     | fl        |
| Dimension         | 3D        |
| Excitation        | Non-sel.  |
| RF Pulse Type     | Fast      |
| Gradient Mode     | Normal    |
| Flow Compensation | None      |
| Bandwidth         | 540 Hz/Px |
| Asymmetric Echo   | Allowed   |
| Segments          | 1         |

**Sequence - Part 2**

|                          |     |
|--------------------------|-----|
| Introduction             | Off |
| RF Spoiling              | On  |
| Acoustic noise reduction | Off |

**Sequence - Nuclei**

|                       |      |
|-----------------------|------|
| TX/RX Nucleus         | 1H   |
| TX/RX Delta Frequency | 0 Hz |
| TX Nucleus            | None |
| TX Delta Frequency    | 0 Hz |
| Coil Elements         | AC   |

**Sequence - Special**

|                        |          |
|------------------------|----------|
| Readout polarity       | Positive |
| Image processing       | Standard |
| Apply echo spacing     | Off      |
| Echo spacing           | 0 us     |
| Delta echo spacing     | 0 us     |
| Dummy scans            | 0 ms     |
| RF pulse duration      | 100 us   |
| Gradient spoiling      | Siemens  |
| Gradient moment factor | 1.00     |
| Receiver gain mode     | Siemens  |
| Number of segments     | 1        |
| Current segment        | 0        |
| Lines before/after seg | 0        |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
| Allowed Delay | 0 s |

## \MARTINOS DEVELOPER\HUBER\T1\_protocols\AZMA\_coil\_20251210\wip\_ShimToolbox\_B0map\_3mm

TA: 44 sec Coil Selection: Auto Voxel Size: 3.0x3.0x3.0 mm<sup>3</sup> Acc:: None Rel. SNR: 1.00**Properties**

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | Off                |
| Load Images to Graphic Segments               | Off                |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

**Resolution - Common**

|                  |         |
|------------------|---------|
| FOV Read         | 216 mm  |
| FOV Phase        | 100.0 % |
| Slice Thickness  | 3.00 mm |
| Base Resolution  | 72      |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |

**Resolution - Acceleration**

|                       |      |
|-----------------------|------|
| Acceleration Mode     | None |
| Phase Partial Fourier | Off  |
| Slice Partial Fourier | Off  |
| Asymmetric Echo       | Off  |
| Elliptical Scanning   | On   |

**Routine**

|                     |           |
|---------------------|-----------|
| Slab Group          | 1         |
| Slabs               | 1         |
| Distance Factor     | 20 %      |
| Position            | Isocenter |
| Orientation         | Sagittal  |
| Phase Encoding Dir. | A >> P    |
| Slices per Slab     | 52        |
| Phase Oversampling  | 0 %       |
| Slice Oversampling  | 0.0 %     |
| FOV Read            | 216 mm    |
| FOV Phase           | 100.0 %   |
| Slice Thickness     | 3.00 mm   |
| TR                  | 15.0 ms   |
| TE 1                | 2.20 ms   |
| TE 2                | 5.40 ms   |
| Concatenations      | 1         |
| AutoAlign           | ---       |

**Resolution - Filter**

|                       |     |
|-----------------------|-----|
| Raw Filter            | Off |
| Elliptical Filter     | Off |
| Distortion Correction | 2D  |
| Normalize             | Off |
| Image Filter          | Off |

**Geometry - Common**

|                     |             |
|---------------------|-------------|
| Slab Group          | 1           |
| Slabs               | 1           |
| Distance Factor     | 20 %        |
| Position            | Isocenter   |
| Orientation         | Sagittal    |
| Phase Encoding Dir. | A >> P      |
| Slices per Slab     | 52          |
| Phase Oversampling  | 0 %         |
| Slice Oversampling  | 0.0 %       |
| FOV Read            | 216 mm      |
| FOV Phase           | 100.0 %     |
| Slice Thickness     | 3.00 mm     |
| TR                  | 15.0 ms     |
| Multi-Slice Mode    | Interleaved |
| Series              | Interleaved |
| Concatenations      | 1           |

**Contrast - Common**

|                    |                  |
|--------------------|------------------|
| TR                 | 15.0 ms          |
| TE 1               | 2.20 ms          |
| TE 2               | 5.40 ms          |
| MTC                | Off              |
| Magn. Preparation  | None             |
| Flip Angle         | 8 deg            |
| Fat-Water Contrast | Water Excitation |
| Dark Blood         | Off              |
| Contrasts          | 2                |
| SWI                | Off              |
| Reconstruction     | Magn./Phase      |

**Geometry - AutoAlign**

|                     |           |
|---------------------|-----------|
| Slab Group          | 1         |
| Position            | Isocenter |
| Orientation         | Sagittal  |
| Phase Encoding Dir. | A >> P    |
| AutoAlign           | ---       |
| Initial Position    | Isocenter |
| L                   | 0.0 mm    |
| P                   | 0.0 mm    |
| H                   | 0.0 mm    |
| Initial Orientation | Sagittal  |

**Contrast - Dynamic**

|                 |                  |
|-----------------|------------------|
| Dynamic Mode    | Standard         |
| Measurements    | 1                |
| Multiple Series | Each Measurement |

**Geometry - AutoAlign**

|                  |          |
|------------------|----------|
| Initial Rotation | 0.00 deg |
|------------------|----------|

**Geometry - Saturation**

|                    |          |
|--------------------|----------|
| Saturation Mode    | Standard |
| Special Saturation | None     |

**Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Auto Coil Select |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |
| Coil Focus          | Flat             |

**System - Adjustments**

|                       |          |
|-----------------------|----------|
| Adjustment Strategy   | Standard |
| B0 Shim               | Standard |
| B1 Shim               | TrueForm |
| Adjustment Tolerance  | Auto     |
| Adjust with Body Coil | Off      |
| Confirm Frequency     | Never    |
| Assume Silicone       | Off      |

**System - Adjust Volume**

|             |           |
|-------------|-----------|
| Position    | Isocenter |
| Orientation | Sagittal  |
| Rotation    | 0.00 deg  |
| A >> P      | 216 mm    |
| F >> H      | 216 mm    |
| R >> L      | 156 mm    |
| Reset       | Off       |

**System - pTx**

|              |          |
|--------------|----------|
| B1 Shim      | TrueForm |
| Excitation   | Non-sel. |
| LR Balancing | Off      |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ? Ref. Amplitude 1H | 0.000 V        |
| Reset               | Off            |
| Image Scaling       | 1.000          |

**Physio - Signal**

|                 |         |
|-----------------|---------|
| 1st Signal/Mode | None    |
| TR              | 15.0 ms |

**Physio - Signal**

|                |   |
|----------------|---|
| Segments       | 1 |
| Concatenations | 1 |

**Physio - Cardiac**

|                    |                  |
|--------------------|------------------|
| Tagging            | None             |
| Fat-Water Contrast | Water Excitation |
| Magn. Preparation  | None             |
| Dark Blood         | Off              |
| FOV Read           | 216 mm           |
| FOV Phase          | 100.0 %          |
| Phase Resolution   | 100 %            |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. Control  | Off |
| Concatenations | 1   |

**Inline - Liver**

|                      |     |
|----------------------|-----|
| Liver Registration   | Off |
| Save Original Images | On  |

**Inline - Subtraction**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Save Original Images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP Sag              | Off |
| MIP Cor              | Off |
| MIP Tra              | Off |
| MIP Time             | Off |
| Radial MIP           | Off |
| Save Original Images | On  |
| MPR Sag              | Off |
| MPR Cor              | Off |
| MPR Tra              | Off |

**Inline - Soft Tissue**

|              |     |
|--------------|-----|
| Wash-in      | Off |
| Wash-out     | Off |
| TTP          | Off |
| PEI          | Off |
| MIP Time     | Off |
| Measurements | 1   |

**Inline - Composing****Inline - MapIt**

|              |         |
|--------------|---------|
| MapIt        | None    |
| Flip Angle   | 8 deg   |
| Measurements | 1       |
| Contrasts    | 2       |
| TE 1         | 2.20 ms |
| TE 2         | 5.40 ms |

**Inline - MapIt**

|                      |         |
|----------------------|---------|
| TR                   | 15.0 ms |
| Save Original Images | On      |

**Sequence - Part 1**

|                     |           |
|---------------------|-----------|
| Sequence Name       | WIP_GRE   |
| Dimension           | 3D        |
| Excitation          | Non-sel.  |
| RF Pulse Type       | Normal    |
| Readout Mode        | Monopolar |
| Gradient Mode       | Whisper   |
| Flow Compensation 1 | None      |
| Flow Compensation 2 | None      |
| Bandwidth 1         | 500 Hz/Px |
| Bandwidth 2         | 500 Hz/Px |
| Asymmetric Echo     | Off       |
| Segments            | 1         |

**Sequence - Part 2**

|                          |     |
|--------------------------|-----|
| Introduction             | Off |
| RF Spoiling              | On  |
| Acoustic noise reduction | Off |

**Sequence - Nuclei**

|                       |      |
|-----------------------|------|
| TX/RX Nucleus         | 1H   |
| TX/RX Delta Frequency | 0 Hz |
| TX Nucleus            | None |
| TX Delta Frequency    | 0 Hz |

**Sequence - Special**

|                  |                  |
|------------------|------------------|
| Mode             | B0 Mapping       |
| Masking          | Brain Extraction |
| Phase Unwrapping | Spatial          |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
| Allowed Delay | 0 s |

\MARTINOS DEVELOPER\HUBER\T1\_protocols\AZMA\_coil\_20251210\scout\_axial\_princes

TA: 17 sec Coil Selection: Manual Voxel Size: 1.6x1.6x1.6 mm<sup>3</sup> Acc:: 3 Rel. SNR: 1.00**Properties**

|   |                    |
|---|--------------------|
| Start measurement without further preparation | Off                |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | Off                |
| Load Images to Graphic Segments               | On                 |
| Graphic segment                               | 3rd Segment        |
| Inline Movie                                  | Off                |

**Resolution - Common**

|                  |          |
|------------------|----------|
| FOV Read         | 260 mm   |
| FOV Phase        | 100.0 %  |
| Slice Thickness  | 1.600 mm |
| Base Resolution  | 160      |
| Phase Resolution | 100 %    |
| Slice Resolution | 69 %     |
| Interpolation    | Off      |

**Routine**

|                     |                    |
|---------------------|--------------------|
| Slab Group          | 1                  |
| Slabs               | 1                  |
| Distance Factor     | 20 %               |
| Position            | L0.0 A16.0 H0.0 mm |
| Orientation         | Transversal        |
| Phase Encoding Dir. | A >> P             |
| Slices per Slab     | 160                |
| Phase Oversampling  | 0 %                |
| Slice Oversampling  | 0.0 %              |
| FOV Read            | 260 mm             |
| FOV Phase           | 100.0 %            |
| Slice Thickness     | 1.600 mm           |
| TR                  | 3.6 ms             |
| TE                  | 1.56 ms            |
| Averages            | 1                  |
| Concatenations      | 1                  |
| AutoAlign           | ---                |
| Coil Elements       | AC                 |

**Resolution - Acceleration**

|                        |            |
|------------------------|------------|
| Acceleration Mode      | GRAPPA     |
| Reference Scans        | Integrated |
| Acceleration Factor PE | 3          |
| Reference Lines PE     | 24         |
| Acceleration Factor 3D | 1          |
| Phase Partial Fourier  | 6/8        |
| Slice Partial Fourier  | 6/8        |
| Asymmetric Echo        | Off        |
| Elliptical Scanning    | Off        |

**Resolution - Filter**

|                       |     |
|-----------------------|-----|
| Raw Filter            | Off |
| Elliptical Filter     | Off |
| Distortion Correction | 3D  |
| Normalize             | Off |
| Image Filter          | Off |

**Geometry - Common**

|                     |                    |
|---------------------|--------------------|
| Slab Group          | 1                  |
| Slabs               | 1                  |
| Distance Factor     | 20 %               |
| Position            | L0.0 A16.0 H0.0 mm |
| Orientation         | Transversal        |
| Phase Encoding Dir. | A >> P             |
| Slices per Slab     | 160                |
| Phase Oversampling  | 0 %                |
| Slice Oversampling  | 0.0 %              |
| FOV Read            | 260 mm             |
| FOV Phase           | 100.0 %            |
| Slice Thickness     | 1.600 mm           |
| TR                  | 3.6 ms             |
| Multi-Slice Mode    | Interleaved        |
| Series              | Interleaved        |
| Concatenations      | 1                  |

**Geometry - AutoAlign**

|                     |                    |
|---------------------|--------------------|
| Slab Group          | 1                  |
| Position            | L0.0 A16.0 H0.0 mm |
| Orientation         | Transversal        |
| Phase Encoding Dir. | A >> P             |
| AutoAlign           | ---                |

**Contrast - Common**

|                    |           |
|--------------------|-----------|
| TR                 | 3.6 ms    |
| TE                 | 1.56 ms   |
| MTC                | Off       |
| Magn. Preparation  | None      |
| Flip Angle         | 16 deg    |
| Fat-Water Contrast | Standard  |
| Dark Blood         | Off       |
| Contrasts          | 1         |
| SWI                | Off       |
| Reconstruction     | Magnitude |

**Contrast - Dynamic**

|                 |                  |
|-----------------|------------------|
| Dynamic Mode    | Standard         |
| Measurements    | 1                |
| Multiple Series | Each Measurement |

**Geometry - AutoAlign**

|                     |                 |
|---------------------|-----------------|
| Initial Position    | L0.0 A16.0 H0.0 |
| L                   | 0.0 mm          |
| A                   | 16.0 mm         |
| H                   | 0.0 mm          |
| Initial Orientation | Transversal     |
| Initial Rotation    | 0.00 deg        |

**Physio - Signal**

|                 |        |
|-----------------|--------|
| 1st Signal/Mode | None   |
| TR              | 3.6 ms |
| Segments        | 1      |
| Concatenations  | 1      |

**Geometry - Saturation**

|                    |          |
|--------------------|----------|
| Saturation Mode    | Standard |
| Special Saturation | None     |

**Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Manual           |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|             |             |
|-------------|-------------|
| Position    | Isocenter   |
| Orientation | Transversal |
| Rotation    | 0.00 deg    |
| A >> P      | 263 mm      |
| R >> L      | 350 mm      |
| F >> H      | 350 mm      |
| Reset       | Off         |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ? Ref. Amplitude 1H | 0.000 V        |
| Reset               | Off            |
| Correction Factor   | 1.00           |
| Image Scaling       | 1.000          |

**Physio - Cardiac**

|                    |          |
|--------------------|----------|
| Tagging            | None     |
| Fat-Water Contrast | Standard |
| Magn. Preparation  | None     |
| Dark Blood         | Off      |
| FOV Read           | 260 mm   |
| FOV Phase          | 100.0 %  |
| Phase Resolution   | 100 %    |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. Control  | Off |
| Concatenations | 1   |

**Inline - Liver**

|                      |     |
|----------------------|-----|
| Liver Registration   | Off |
| Save Original Images | On  |

**Inline - Subtraction**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Save Original Images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP Sag              | Off |
| MIP Cor              | Off |
| MIP Tra              | Off |
| MIP Time             | Off |
| Radial MIP           | Off |
| Save Original Images | On  |
| MPR Sag              | Off |
| MPR Cor              | Off |
| MPR Tra              | Off |

**Inline - Soft Tissue**

|              |     |
|--------------|-----|
| Wash-in      | Off |
| Wash-out     | Off |
| TTP          | Off |
| PEI          | Off |
| MIP Time     | Off |
| Measurements | 1   |

**Inline - Composing**

|              |        |
|--------------|--------|
| Maplt        | None   |
| Flip Angle   | 16 deg |
| Measurements | 1      |
| Contrasts    | 1      |

**Inline - Maplt**

|                      |         |
|----------------------|---------|
| TE                   | 1.56 ms |
| TR                   | 3.6 ms  |
| Save Original Images | On      |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Sequence Name     | fl        |
| Dimension         | 3D        |
| Excitation        | Non-sel.  |
| RF Pulse Type     | Fast      |
| Gradient Mode     | Normal    |
| Flow Compensation | None      |
| Bandwidth         | 540 Hz/Px |
| Asymmetric Echo   | Off       |
| Segments          | 1         |

**Sequence - Part 2**

|                          |     |
|--------------------------|-----|
| Introduction             | Off |
| RF Spoiling              | On  |
| Acoustic noise reduction | Off |

**Sequence - Nuclei**

|                       |      |
|-----------------------|------|
| TX/RX Nucleus         | 1H   |
| TX/RX Delta Frequency | 0 Hz |
| TX Nucleus            | None |
| TX Delta Frequency    | 0 Hz |
| Coil Elements         | AC   |

**Sequence - Special**

|                        |          |
|------------------------|----------|
| Readout polarity       | Positive |
| Image processing       | Standard |
| Apply echo spacing     | Off      |
| Echo spacing           | 0 us     |
| Delta echo spacing     | 0 us     |
| Dummy scans            | 0 ms     |
| RF pulse duration      | 100 us   |
| Gradient spoiling      | Siemens  |
| Gradient moment factor | 1.00     |
| Receiver gain mode     | Siemens  |
| Number of segments     | 1        |
| Current segment        | 0        |
| Lines before/after seg | 0        |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
| Allowed Delay | 0 s |

\MARTINOS DEVELOPER\HUBERT1\_protocols\AZMA\_coil\_20251210\MEMPRAGE\_4e\_p2\_FOCl\_1mm\_Axial

TA: 5:39 min Coil Selection: Manual Voxel Size: 1.0x1.0x1.0 mm<sup>3</sup> Acc:: 2 Rel. SNR: 1.00

### Properties

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | Off                |
| Load Images to Graphic Segments               | Off                |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

### Routine

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A22.4 F20.5 mm |
| Orientation         | Transversal         |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 256 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 1.00 mm             |
| TR                  | 2440.0 ms           |
| TE 1                | 1.61 ms             |
| TE 2                | 3.47 ms             |
| TE 3                | 5.33 ms             |
| TE 4                | 7.19 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | ---                 |
| Coil Elements       | AC                  |

### Contrast - Common

|                    |             |
|--------------------|-------------|
| TR                 | 2440.0 ms   |
| TE 1               | 1.61 ms     |
| TE 2               | 3.47 ms     |
| TE 3               | 5.33 ms     |
| TE 4               | 7.19 ms     |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1230 ms     |
| Flip Angle         | 7 deg       |
| Fat-Water Contrast | Standard    |
| Dark Blood         | Off         |

### Contrast - Common

|                |           |
|----------------|-----------|
| Contrasts      | 4         |
| Reconstruction | Magnitude |

### Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Dynamic Mode    | Standard         |
| Measurements    | 1                |
| Multiple Series | Each Measurement |
| Reordering      | Linear           |

### Resolution - Common

|                  |         |
|------------------|---------|
| FOV Read         | 256 mm  |
| FOV Phase        | 100.0 % |
| Slice Thickness  | 1.00 mm |
| Base Resolution  | 256     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

### Resolution - Acceleration

|                        |            |
|------------------------|------------|
| Acceleration Mode      | GRAPPA     |
| Reference Scans        | Integrated |
| Acceleration Factor PE | 2          |
| Reference Lines PE     | 24         |
| Acceleration Factor 3D | 1          |
| Phase Partial Fourier  | Off        |
| Slice Partial Fourier  | Off        |
| Asymmetric Echo        | Off        |
| Elliptical Scanning    | Off        |

### Resolution - Filter

|                       |         |
|-----------------------|---------|
| Raw Filter            | Off     |
| Elliptical Filter     | Off     |
| Distortion Correction | Off     |
| Normalize             | Prescan |
| Image Filter          | Off     |

### Geometry - Common

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A22.4 F20.5 mm |
| Orientation         | Transversal         |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 256 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 1.00 mm             |

**Geometry - Common**

|                  |             |
|------------------|-------------|
| TR               | 2440.0 ms   |
| Multi-Slice Mode | Single Shot |
| Series           | Interleaved |
| Concatenations   | 1           |

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Position            | L0.0 A22.4 F20.5 mm |
| Orientation         | Transversal         |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | ---                 |
| Initial Position    | L0.0 A22.4 F20.5    |
| L                   | 0.0 mm              |
| A                   | 22.4 mm             |
| F                   | 20.5 mm             |
| Initial Orientation | Transversal         |
| Initial Rotation    | 0.00 deg            |

**Geometry - Navigator****Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Manual           |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|         |          |
|---------|----------|
| B1 Shim | TrueForm |
|---------|----------|

**System - pTx**

|            |          |
|------------|----------|
| Excitation | Non-sel. |
|------------|----------|

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ? Ref. Amplitude 1H | 0.000 V        |
| Reset               | Off            |
| Correction Factor   | 1.00           |
| Image Scaling       | 1.000          |

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 2440.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                    |             |
|--------------------|-------------|
| Fat-Water Contrast | Standard    |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1230 ms     |
| Dark Blood         | Off         |
| FOV Read           | 256 mm      |
| FOV Phase          | 100.0 %     |
| Phase Resolution   | 100 %       |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. Control  | Off |
| Concatenations | 1   |

**Inline - Subtraction**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Save Original Images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP Sag              | Off |
| MIP Cor              | Off |
| MIP Tra              | Off |
| MIP Time             | Off |
| Radial MIP           | Off |
| Save Original Images | On  |
| MPR Sag              | Off |
| MPR Cor              | Off |
| MPR Tra              | Off |

**Inline - Composing****Inline - Maplt**

|              |         |
|--------------|---------|
| Maplt        | None    |
| Flip Angle   | 7 deg   |
| Measurements | 1       |
| Contrasts    | 4       |
| TE 1         | 1.61 ms |
| TE 2         | 3.47 ms |
| TE 3         | 5.33 ms |

**Inline - MapIt**

|                      |           |
|----------------------|-----------|
| TE 4                 | 7.19 ms   |
| TR                   | 2440.0 ms |
| Save Original Images | On        |

**Sequence - Part 1**

|                     |           |
|---------------------|-----------|
| Sequence Name       | tfl_me    |
| Dimension           | 3D        |
| Excitation          | Non-sel.  |
| RF Pulse Type       | Fast      |
| Gradient Mode       | Fast      |
| Flow Compensation 1 | None      |
| Flow Compensation 2 | None      |
| Flow Compensation 3 | None      |
| Flow Compensation 4 | None      |
| Reordering          | Linear    |
| Bandwidth 1         | 650 Hz/Px |
| Bandwidth 2         | 650 Hz/Px |
| Bandwidth 3         | 650 Hz/Px |
| Bandwidth 4         | 650 Hz/Px |
| Echo Spacing        | 9.42 ms   |
| Asymmetric Echo     | Off       |
| Turbo Factor        | 256       |

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | Off |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Special**

|                        |          |
|------------------------|----------|
| Readout polarity       | Positive |
| Readout trajectory     | Bipolar  |
| FOCI pulse voltage     | 500.00 V |
| Gradient spoiling      | Siemens  |
| Gradient moment factor | 1.00     |
| Averaging              | RMS      |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|

\MARTINOS DEVELOPER\HUBERT1\_protocols\AZMA\_coil\_20251210\t1\_mprage\_sag\_stx\_sharp\_butNoisy

TA: 3:55 min Coil Selection: Manual Voxel Size: 0.6×0.6×0.7 mm<sup>3</sup> Acc:: 6.5 Rel. SNR: 1.00

## Properties

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | On                 |
| Load Images to Graphic Segments               | On                 |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

## Routine

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.65 mm             |
| TR                  | 4000.0 ms           |
| TE                  | 3.47 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | Head > Basis        |
| Coil Elements       | AC                  |

## Contrast - Common

|                    |             |
|--------------------|-------------|
| TR                 | 4000.0 ms   |
| TE                 | 3.47 ms     |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Flip Angle         | 4 deg       |
| Fat-Water Contrast | Standard    |
| Dark Blood         | Off         |
| Contrasts          | 1           |
| Reconstruction     | Magnitude   |

## Contrast - Dynamic

|              |          |
|--------------|----------|
| Dynamic Mode | Standard |
| Measurements | 1        |

## Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Multiple Series | Each Measurement |
| Reordering      | Linear           |

## Resolution - Common

|                  |         |
|------------------|---------|
| FOV Read         | 240 mm  |
| FOV Phase        | 100.0 % |
| Slice Thickness  | 0.65 mm |
| Base Resolution  | 416     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

## Resolution - Acceleration

|                       |              |
|-----------------------|--------------|
| Acceleration Mode     | CS           |
| Total Factor          | 6.5          |
| Reference Scans       | GRE/Separate |
| Reference Lines PE    | 32           |
| Phase Partial Fourier | Off          |
| Slice Partial Fourier | Off          |
| Asymmetric Echo       | Off          |
| Elliptical Scanning   | Off          |

## Resolution - Filter

|                       |           |
|-----------------------|-----------|
| Raw Filter            | On        |
| Elliptical Filter     | Off       |
| Distortion Correction | 2D        |
| Normalize             | B1 Filter |
| Image Filter          | On        |

## Geometry - Common

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.65 mm             |
| TR                  | 4000.0 ms           |
| Multi-Slice Mode    | Single Shot         |
| Series              | Interleaved         |
| Concatenations      | 1                   |

## Geometry - AutoAlign

|            |   |
|------------|---|
| Slab Group | 1 |
|------------|---|

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | Head > Basis        |
| Initial Position    | L0.0 A27.9 F42.9    |
| L                   | 0.0 mm              |
| A                   | 27.9 mm             |
| F                   | 42.9 mm             |
| Initial Orientation | Sagittal            |
| Initial Rotation    | 0.00 deg            |

**System - Tx/Rx**

|               |       |
|---------------|-------|
| Image Scaling | 1.000 |
|---------------|-------|

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 4000.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                    |             |
|--------------------|-------------|
| Fat-Water Contrast | Standard    |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Dark Blood         | Off         |
| FOV Read           | 240 mm      |
| FOV Phase          | 100.0 %     |
| Phase Resolution   | 100 %       |

**Geometry - Navigator****Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Manual           |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ! Ref. Amplitude 1H | 350.000 V      |
| Reset               | Off            |
| Correction Factor   | 1.00           |

**Inline - Composing****Inline - MapIt**

|                      |           |
|----------------------|-----------|
| MapIt                | None      |
| Flip Angle           | 4 deg     |
| Measurements         | 1         |
| Contrasts            | 1         |
| TE                   | 3.47 ms   |
| TR                   | 4000.0 ms |
| Save Original Images | On        |

**Sequence - Part 1**

|               |          |
|---------------|----------|
| Sequence Name | tfl      |
| Dimension     | 3D       |
| Excitation    | Non-sel. |
| RF Pulse Type | Fast     |
| Gradient Mode | Fast     |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Flow Compensation | None      |
| Reordering        | Linear    |
| Bandwidth         | 200 Hz/Px |
| Echo Spacing      | 8.12 ms   |
| Asymmetric Echo   | Off       |
| Turbo Factor      | 220       |

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | On  |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|

\MARTINOS DEVELOPER\HUBERT1\_protocols\AZMA\_coil\_20251210\MEMPRAGE\_4e\_p2\_FOCl\_1mm\_sa  
gittal

TA: 5:39 min Coil Selection: Manual Voxel Size: 1.0x1.0x1.0 mm<sup>3</sup> Acc:: 2 Rel. SNR: 1.00

## Properties

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | Off                |
| Load Images to Graphic Segments               | Off                |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

## Routine

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A22.4 F20.5 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 256 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 1.00 mm             |
| TR                  | 2440.0 ms           |
| TE 1                | 1.61 ms             |
| TE 2                | 3.47 ms             |
| TE 3                | 5.33 ms             |
| TE 4                | 7.19 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | ---                 |
| Coil Elements       | AC                  |

## Contrast - Common

|                    |             |
|--------------------|-------------|
| TR                 | 2440.0 ms   |
| TE 1               | 1.61 ms     |
| TE 2               | 3.47 ms     |
| TE 3               | 5.33 ms     |
| TE 4               | 7.19 ms     |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1230 ms     |
| Flip Angle         | 7 deg       |
| Fat-Water Contrast | Standard    |
| Dark Blood         | Off         |

## Contrast - Common

|                |           |
|----------------|-----------|
| Contrasts      | 4         |
| Reconstruction | Magnitude |

## Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Dynamic Mode    | Standard         |
| Measurements    | 1                |
| Multiple Series | Each Measurement |
| Reordering      | Linear           |

## Resolution - Common

|                  |         |
|------------------|---------|
| FOV Read         | 256 mm  |
| FOV Phase        | 100.0 % |
| Slice Thickness  | 1.00 mm |
| Base Resolution  | 256     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

## Resolution - Acceleration

|                        |            |
|------------------------|------------|
| Acceleration Mode      | GRAPPA     |
| Reference Scans        | Integrated |
| Acceleration Factor PE | 2          |
| Reference Lines PE     | 24         |
| Acceleration Factor 3D | 1          |
| Phase Partial Fourier  | Off        |
| Slice Partial Fourier  | Off        |
| Asymmetric Echo        | Off        |
| Elliptical Scanning    | Off        |

## Resolution - Filter

|                       |         |
|-----------------------|---------|
| Raw Filter            | Off     |
| Elliptical Filter     | Off     |
| Distortion Correction | Off     |
| Normalize             | Prescan |
| Image Filter          | Off     |

## Geometry - Common

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A22.4 F20.5 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 256 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 1.00 mm             |

**Geometry - Common**

|                  |             |
|------------------|-------------|
| TR               | 2440.0 ms   |
| Multi-Slice Mode | Single Shot |
| Series           | Interleaved |
| Concatenations   | 1           |

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Position            | L0.0 A22.4 F20.5 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | ---                 |
| Initial Position    | L0.0 A22.4 F20.5    |
| L                   | 0.0 mm              |
| A                   | 22.4 mm             |
| F                   | 20.5 mm             |
| Initial Orientation | Sagittal            |
| Initial Rotation    | 0.00 deg            |

**Geometry - Navigator****Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Manual           |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|         |          |
|---------|----------|
| B1 Shim | TrueForm |
|---------|----------|

**System - pTx**

|            |          |
|------------|----------|
| Excitation | Non-sel. |
|------------|----------|

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ? Ref. Amplitude 1H | 0.000 V        |
| Reset               | Off            |
| Correction Factor   | 1.00           |
| Image Scaling       | 1.000          |

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 2440.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                    |             |
|--------------------|-------------|
| Fat-Water Contrast | Standard    |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1230 ms     |
| Dark Blood         | Off         |
| FOV Read           | 256 mm      |
| FOV Phase          | 100.0 %     |
| Phase Resolution   | 100 %       |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. Control  | Off |
| Concatenations | 1   |

**Inline - Subtraction**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Save Original Images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP Sag              | Off |
| MIP Cor              | Off |
| MIP Tra              | Off |
| MIP Time             | Off |
| Radial MIP           | Off |
| Save Original Images | On  |
| MPR Sag              | Off |
| MPR Cor              | Off |
| MPR Tra              | Off |

**Inline - Composing****Inline - Maplt**

|              |         |
|--------------|---------|
| Maplt        | None    |
| Flip Angle   | 7 deg   |
| Measurements | 1       |
| Contrasts    | 4       |
| TE 1         | 1.61 ms |
| TE 2         | 3.47 ms |
| TE 3         | 5.33 ms |

**Inline - MapIt**

|                      |           |
|----------------------|-----------|
| TE 4                 | 7.19 ms   |
| TR                   | 2440.0 ms |
| Save Original Images | On        |

**Sequence - Part 1**

|                     |           |
|---------------------|-----------|
| Sequence Name       | tfl_me    |
| Dimension           | 3D        |
| Excitation          | Non-sel.  |
| RF Pulse Type       | Fast      |
| Gradient Mode       | Fast      |
| Flow Compensation 1 | None      |
| Flow Compensation 2 | None      |
| Flow Compensation 3 | None      |
| Flow Compensation 4 | None      |
| Reordering          | Linear    |
| Bandwidth 1         | 650 Hz/Px |
| Bandwidth 2         | 650 Hz/Px |
| Bandwidth 3         | 650 Hz/Px |
| Bandwidth 4         | 650 Hz/Px |
| Echo Spacing        | 9.42 ms   |
| Asymmetric Echo     | Off       |
| Turbo Factor        | 256       |

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | Off |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Special**

|                        |          |
|------------------------|----------|
| Readout polarity       | Positive |
| Readout trajectory     | Bipolar  |
| FOCI pulse voltage     | 500.00 V |
| Gradient spoiling      | Siemens  |
| Gradient moment factor | 1.00     |
| Averaging              | RMS      |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|

\MARTINOS DEVELOPER\HUBERT1\_protocols\AZMA\_coil\_20251210\t1\_mp2rage\_sag\_p3\_0.75mm\_blu  
rry

TA: 8:50 min Coil Selection: Manual Voxel Size: 0.8x0.8x0.8 mm<sup>3</sup> Acc:: 3 Rel. SNR: 1.00

## Properties

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | Off                |
| Load Images to Graphic Segments               | Off                |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

## Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Dynamic Mode    | Standard         |
| Measurements    | 1                |
| Multiple Series | Each Measurement |
| Reordering      | Linear           |

## Resolution - Common

|                  |         |
|------------------|---------|
| FOV Read         | 240 mm  |
| FOV Phase        | 93.8 %  |
| Slice Thickness  | 0.75 mm |
| Base Resolution  | 320     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

## Routine

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A26.9 F46.0 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 192                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 8.3 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 93.8 %              |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4300.0 ms           |
| TE                  | 2.27 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | Head > Basis        |
| Coil Elements       | AC                  |

## Resolution - Acceleration

|                        |            |
|------------------------|------------|
| Acceleration Mode      | GRAPPA     |
| Reference Scans        | Integrated |
| Acceleration Factor PE | 3          |
| Reference Lines PE     | 36         |
| Acceleration Factor 3D | 1          |
| Phase Partial Fourier  | Off        |
| Slice Partial Fourier  | 6/8        |
| Asymmetric Echo        | Allowed    |
| Elliptical Scanning    | Off        |

## Resolution - Filter

|                       |     |
|-----------------------|-----|
| Raw Filter            | Off |
| Elliptical Filter     | Off |
| Distortion Correction | 2D  |
| Normalize             | Off |
| Image Filter          | Off |

## Geometry - Common

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A26.9 F46.0 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 192                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 8.3 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 93.8 %              |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4300.0 ms           |
| Multi-Slice Mode    | Single Shot         |
| Series              | Interleaved         |
| Concatenations      | 1                   |

## Contrast - Common

|                    |                       |
|--------------------|-----------------------|
| TR                 | 4300.0 ms             |
| TE                 | 2.27 ms               |
| Magn. Preparation  | Non-sel. IR           |
| TI 1               | 1000 ms               |
| TI 2               | 3200 ms               |
| Flip Angle 1       | 4 deg                 |
| Flip Angle 2       | 4 deg                 |
| Fat-Water Contrast | Fast Water Excitation |
| Dark Blood         | Off                   |
| Contrasts          | 1                     |
| Reconstruction     | Magnitude             |

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Position            | L0.0 A26.9 F46.0 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | Head > Basis        |
| Initial Position    | L0.0 A26.9 F46.0    |
| L                   | 0.0 mm              |
| A                   | 26.9 mm             |
| F                   | 46.0 mm             |
| Initial Orientation | Sagittal            |
| Initial Rotation    | 0.01 deg            |

**Geometry - Navigator****Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                |
|---------------------|----------------|
| Coil Selection      | Manual         |
| Radial Sorting      | Off            |
| MSMA                | S - C - T      |
| Sagittal            | R >> L         |
| Coronal             | A >> P         |
| Transversal         | F >> H         |
| Coil Combination    | Sum of Squares |
| Matrix Optimization | Off            |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ? Ref. Amplitude 1H | 0.000 V        |
| Reset               | Off            |

**System - Tx/Rx**

|                   |       |
|-------------------|-------|
| Correction Factor | 1.00  |
| Image Scaling     | 1.000 |

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 4300.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                    |                       |
|--------------------|-----------------------|
| Fat-Water Contrast | Fast Water Excitation |
| Magn. Preparation  | Non-sel. IR           |
| TI 1               | 1000 ms               |
| TI 2               | 3200 ms               |
| Dark Blood         | Off                   |
| FOV Read           | 240 mm                |
| FOV Phase          | 93.8 %                |
| Phase Resolution   | 100 %                 |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. Control  | Off |
| Concatenations | 1   |

**Inline - Subtraction**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Save Original Images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP Sag              | Off |
| MIP Cor              | Off |
| MIP Tra              | Off |
| MIP Time             | Off |
| Radial MIP           | Off |
| Save Original Images | On  |
| MPR Sag              | Off |
| MPR Cor              | Off |
| MPR Tra              | Off |

**Inline - Composing****Inline - MapIt**

|                      |           |
|----------------------|-----------|
| MapIt                | None      |
| Flip Angle 1         | 4 deg     |
| Flip Angle 2         | 4 deg     |
| Measurements         | 1         |
| Contrasts            | 1         |
| TE                   | 2.27 ms   |
| TR                   | 4300.0 ms |
| Save Original Images | On        |

**Sequence - Part 1**

|               |     |
|---------------|-----|
| Sequence Name | tfl |
| Dimension     | 3D  |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Excitation        | Non-sel.  |
| RF Pulse Type     | Fast      |
| Gradient Mode     | Fast*     |
| Flow Compensation | None      |
| Reordering        | Linear    |
| Bandwidth         | 200 Hz/Px |
| Echo Spacing      | 7.22 ms   |
| Asymmetric Echo   | Allowed   |
| Turbo Factor      | 156       |

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | On  |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|

\MARTINOS DEVELOPER\HUBERT1\_protocols\AZMA\_coil\_20251210\t1\_mprage\_sag\_stx\_second\_average

TA: 3:55 min Coil Selection: Manual Voxel Size: 0.6×0.6×0.7 mm<sup>3</sup> Acc:: 6.5 Rel. SNR: 1.00

### Properties

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | On                 |
| Load Images to Graphic Segments               | On                 |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

### Routine

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.65 mm             |
| TR                  | 4000.0 ms           |
| TE                  | 3.47 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | Head > Basis        |
| Coil Elements       | AC                  |

### Contrast - Common

|                    |             |
|--------------------|-------------|
| TR                 | 4000.0 ms   |
| TE                 | 3.47 ms     |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Flip Angle         | 4 deg       |
| Fat-Water Contrast | Standard    |
| Dark Blood         | Off         |
| Contrasts          | 1           |
| Reconstruction     | Magnitude   |

### Contrast - Dynamic

|              |          |
|--------------|----------|
| Dynamic Mode | Standard |
| Measurements | 1        |

### Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Multiple Series | Each Measurement |
| Reordering      | Linear           |

### Resolution - Common

|                  |         |
|------------------|---------|
| FOV Read         | 240 mm  |
| FOV Phase        | 100.0 % |
| Slice Thickness  | 0.65 mm |
| Base Resolution  | 416     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

### Resolution - Acceleration

|                       |              |
|-----------------------|--------------|
| Acceleration Mode     | CS           |
| Total Factor          | 6.5          |
| Reference Scans       | GRE/Separate |
| Reference Lines PE    | 32           |
| Phase Partial Fourier | Off          |
| Slice Partial Fourier | Off          |
| Asymmetric Echo       | Off          |
| Elliptical Scanning   | Off          |

### Resolution - Filter

|                       |           |
|-----------------------|-----------|
| Raw Filter            | On        |
| Elliptical Filter     | Off       |
| Distortion Correction | 2D        |
| Normalize             | B1 Filter |
| Image Filter          | On        |

### Geometry - Common

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.65 mm             |
| TR                  | 4000.0 ms           |
| Multi-Slice Mode    | Single Shot         |
| Series              | Interleaved         |
| Concatenations      | 1                   |

### Geometry - AutoAlign

|            |   |
|------------|---|
| Slab Group | 1 |
|------------|---|

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | Head > Basis        |
| Initial Position    | L0.0 A27.9 F42.9    |
| L                   | 0.0 mm              |
| A                   | 27.9 mm             |
| F                   | 42.9 mm             |
| Initial Orientation | Sagittal            |
| Initial Rotation    | 0.00 deg            |

**System - Tx/Rx**

|               |       |
|---------------|-------|
| Image Scaling | 1.000 |
|---------------|-------|

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 4000.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                    |             |
|--------------------|-------------|
| Fat-Water Contrast | Standard    |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Dark Blood         | Off         |
| FOV Read           | 240 mm      |
| FOV Phase          | 100.0 %     |
| Phase Resolution   | 100 %       |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. Control  | Off |
| Concatenations | 1   |

**Inline - Subtraction**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Save Original Images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP Sag              | Off |
| MIP Cor              | Off |
| MIP Tra              | Off |
| MIP Time             | Off |
| Radial MIP           | Off |
| Save Original Images | On  |
| MPR Sag              | Off |
| MPR Cor              | Off |
| MPR Tra              | Off |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**Inline - Composing****Inline - MapIt**

|                      |           |
|----------------------|-----------|
| MapIt                | None      |
| Flip Angle           | 4 deg     |
| Measurements         | 1         |
| Contrasts            | 1         |
| TE                   | 3.47 ms   |
| TR                   | 4000.0 ms |
| Save Original Images | On        |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ! Ref. Amplitude 1H | 350.000 V      |
| Reset               | Off            |
| Correction Factor   | 1.00           |

**Sequence - Part 1**

|               |          |
|---------------|----------|
| Sequence Name | tfl      |
| Dimension     | 3D       |
| Excitation    | Non-sel. |
| RF Pulse Type | Fast     |
| Gradient Mode | Fast     |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Flow Compensation | None      |
| Reordering        | Linear    |
| Bandwidth         | 200 Hz/Px |
| Echo Spacing      | 8.12 ms   |
| Asymmetric Echo   | Off       |
| Turbo Factor      | 220       |

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | On  |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|

\MARTINOS DEVELOPER\HUBERT1\_protocols\AZMA\_coil\_20251210\t1\_mprage\_sag\_stx\_CS4\_less\_noisy

TA: 6:23 min Coil Selection: Manual Voxel Size: 0.6×0.6×0.7 mm<sup>3</sup> Acc:: 4.0 Rel. SNR: 1.00

### Properties

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | On                 |
| Load Images to Graphic Segments               | On                 |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

### Routine

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.65 mm             |
| TR                  | 4000.0 ms           |
| TE                  | 3.47 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | Head > Basis        |
| Coil Elements       | AC                  |

### Contrast - Common

|                    |             |
|--------------------|-------------|
| TR                 | 4000.0 ms   |
| TE                 | 3.47 ms     |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Flip Angle         | 4 deg       |
| Fat-Water Contrast | Standard    |
| Dark Blood         | Off         |
| Contrasts          | 1           |
| Reconstruction     | Magnitude   |

### Contrast - Dynamic

|              |          |
|--------------|----------|
| Dynamic Mode | Standard |
| Measurements | 1        |

### Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Multiple Series | Each Measurement |
| Reordering      | Linear           |

### Resolution - Common

|                  |         |
|------------------|---------|
| FOV Read         | 240 mm  |
| FOV Phase        | 100.0 % |
| Slice Thickness  | 0.65 mm |
| Base Resolution  | 416     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

### Resolution - Acceleration

|                       |              |
|-----------------------|--------------|
| Acceleration Mode     | CS           |
| Total Factor          | 4.0          |
| Reference Scans       | GRE/Separate |
| Reference Lines PE    | 32           |
| Phase Partial Fourier | Off          |
| Slice Partial Fourier | Off          |
| Asymmetric Echo       | Off          |
| Elliptical Scanning   | Off          |

### Resolution - Filter

|                       |           |
|-----------------------|-----------|
| Raw Filter            | On        |
| Elliptical Filter     | Off       |
| Distortion Correction | 2D        |
| Normalize             | B1 Filter |
| Image Filter          | On        |

### Geometry - Common

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.65 mm             |
| TR                  | 4000.0 ms           |
| Multi-Slice Mode    | Single Shot         |
| Series              | Interleaved         |
| Concatenations      | 1                   |

### Geometry - AutoAlign

|            |   |
|------------|---|
| Slab Group | 1 |
|------------|---|

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | Head > Basis        |
| Initial Position    | L0.0 A27.9 F42.9    |
| L                   | 0.0 mm              |
| A                   | 27.9 mm             |
| F                   | 42.9 mm             |
| Initial Orientation | Sagittal            |
| Initial Rotation    | 0.00 deg            |

**System - Tx/Rx**

|               |       |
|---------------|-------|
| Image Scaling | 1.000 |
|---------------|-------|

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 4000.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                    |             |
|--------------------|-------------|
| Fat-Water Contrast | Standard    |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Dark Blood         | Off         |
| FOV Read           | 240 mm      |
| FOV Phase          | 100.0 %     |
| Phase Resolution   | 100 %       |

**Geometry - Navigator****Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Manual           |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ! Ref. Amplitude 1H | 350.000 V      |
| Reset               | Off            |
| Correction Factor   | 1.00           |

**Inline - Composing****Inline - MapIt**

|                      |           |
|----------------------|-----------|
| MapIt                | None      |
| Flip Angle           | 4 deg     |
| Measurements         | 1         |
| Contrasts            | 1         |
| TE                   | 3.47 ms   |
| TR                   | 4000.0 ms |
| Save Original Images | On        |

**Sequence - Part 1**

|               |          |
|---------------|----------|
| Sequence Name | tfl      |
| Dimension     | 3D       |
| Excitation    | Non-sel. |
| RF Pulse Type | Fast     |
| Gradient Mode | Fast     |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Flow Compensation | None      |
| Reordering        | Linear    |
| Bandwidth         | 200 Hz/Px |
| Echo Spacing      | 8.12 ms   |
| Asymmetric Echo   | Off       |
| Turbo Factor      | 219       |

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | On  |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|

\MARTINOS DEVELOPER\HUBERT1\_protocols\AZMA\_coil\_20251210\t1\_mprage\_sag\_stx\_0.75\_two\_halfs

TA: 7:07 min Coil Selection: Manual Voxel Size: 0.8×0.8×0.8 mm<sup>3</sup> Acc:: 5.5 Rel. SNR: 1.00

## Properties

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | On                 |
| Load Images to Graphic Segments               | On                 |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

## Contrast - Dynamic

|                     |                  |
|---------------------|------------------|
| Pause after Meas. 1 | 0.0 s            |
| Multiple Series     | Each Measurement |
| Reordering          | Linear           |

## Resolution - Common

|                  |         |
|------------------|---------|
| FOV Read         | 240 mm  |
| FOV Phase        | 100.0 % |
| Slice Thickness  | 0.75 mm |
| Base Resolution  | 320     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

## Routine

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4000.0 ms           |
| TE                  | 3.33 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | Head > Basis        |
| Coil Elements       | AC                  |

## Resolution - Acceleration

|                       |              |
|-----------------------|--------------|
| Acceleration Mode     | CS           |
| Total Factor          | 5.5          |
| Reference Scans       | GRE/Separate |
| Reference Lines PE    | 32           |
| Phase Partial Fourier | Off          |
| Slice Partial Fourier | Off          |
| Asymmetric Echo       | Off          |
| Elliptical Scanning   | Off          |

## Resolution - Filter

|                       |           |
|-----------------------|-----------|
| Raw Filter            | On        |
| Elliptical Filter     | Off       |
| Distortion Correction | 2D        |
| Normalize             | B1 Filter |
| Image Filter          | On        |

## Geometry - Common

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4000.0 ms           |
| Multi-Slice Mode    | Single Shot         |
| Series              | Interleaved         |
| Concatenations      | 1                   |

## Contrast - Common

|                    |             |
|--------------------|-------------|
| TR                 | 4000.0 ms   |
| TE                 | 3.33 ms     |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Flip Angle         | 4 deg       |
| Fat-Water Contrast | Standard    |
| Dark Blood         | Off         |
| Contrasts          | 1           |
| Reconstruction     | Magnitude   |

## Contrast - Dynamic

|              |          |
|--------------|----------|
| Dynamic Mode | Standard |
| Measurements | 2        |

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | Head > Basis        |
| Initial Position    | L0.0 A27.9 F42.9    |
| L                   | 0.0 mm              |
| A                   | 27.9 mm             |
| F                   | 42.9 mm             |
| Initial Orientation | Sagittal            |
| Initial Rotation    | 0.00 deg            |

**Geometry - Navigator****Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Manual           |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ! Ref. Amplitude 1H | 350.000 V      |
| Reset               | Off            |

**System - Tx/Rx**

|                   |       |
|-------------------|-------|
| Correction Factor | 1.00  |
| Image Scaling     | 1.000 |

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 4000.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                    |             |
|--------------------|-------------|
| Fat-Water Contrast | Standard    |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Dark Blood         | Off         |
| FOV Read           | 240 mm      |
| FOV Phase          | 100.0 %     |
| Phase Resolution   | 100 %       |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. Control  | Off |
| Concatenations | 1   |

**Inline - Subtraction**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 2   |
| StdDev               | Off |
| Save Original Images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP Sag              | Off |
| MIP Cor              | Off |
| MIP Tra              | Off |
| MIP Time             | Off |
| Radial MIP           | Off |
| Save Original Images | On  |
| MPR Sag              | Off |
| MPR Cor              | Off |
| MPR Tra              | Off |

**Inline - Composing****Inline - Maplt**

|                      |           |
|----------------------|-----------|
| Maplt                | None      |
| Flip Angle           | 4 deg     |
| Measurements         | 2         |
| Contrasts            | 1         |
| TE                   | 3.33 ms   |
| TR                   | 4000.0 ms |
| Save Original Images | On        |

**Sequence - Part 1**

|               |          |
|---------------|----------|
| Sequence Name | tfl      |
| Dimension     | 3D       |
| Excitation    | Non-sel. |
| RF Pulse Type | Fast     |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Gradient Mode     | Fast      |
| Flow Compensation | None      |
| Reordering        | Linear    |
| Bandwidth         | 200 Hz/Px |
| Echo Spacing      | 7.66 ms   |
| Asymmetric Echo   | Off       |
| Turbo Factor      | 220       |

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | On  |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|

|  |  |
|--|--|
| \MARTINOS DEVELOPER\HUBER\T1_protocols\AZMA_coil_20251210\t1_mp2rage_sag_p3_0.75mm_no_DICO         |  |
| TA: 8:50 min Coil Selection: Manual Voxel Size: 0.8x0.8x0.8 mm <sup>3</sup> Acc:: 3 Rel. SNR: 1.00 |  |

**Properties**

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | Off                |
| Load Images to Graphic Segments               | Off                |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

**Contrast - Dynamic**

|                 |                  |
|-----------------|------------------|
| Dynamic Mode    | Standard         |
| Measurements    | 1                |
| Multiple Series | Each Measurement |
| Reordering      | Linear           |

**Resolution - Common**

|                  |         |
|------------------|---------|
| FOV Read         | 240 mm  |
| FOV Phase        | 93.8 %  |
| Slice Thickness  | 0.75 mm |
| Base Resolution  | 320     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

**Routine**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A26.9 F46.0 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 192                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 8.3 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 93.8 %              |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4300.0 ms           |
| TE                  | 2.27 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | Head > Basis        |
| Coil Elements       | AC                  |

**Resolution - Acceleration**

|                        |            |
|------------------------|------------|
| Acceleration Mode      | GRAPPA     |
| Reference Scans        | Integrated |
| Acceleration Factor PE | 3          |
| Reference Lines PE     | 36         |
| Acceleration Factor 3D | 1          |
| Phase Partial Fourier  | Off        |
| Slice Partial Fourier  | 6/8        |
| Asymmetric Echo        | Allowed    |
| Elliptical Scanning    | Off        |

**Resolution - Filter**

|                       |     |
|-----------------------|-----|
| Raw Filter            | Off |
| Elliptical Filter     | Off |
| Distortion Correction | 2D  |
| Normalize             | Off |
| Image Filter          | Off |

**Geometry - Common**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A26.9 F46.0 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 192                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 8.3 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 93.8 %              |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4300.0 ms           |
| Multi-Slice Mode    | Single Shot         |
| Series              | Interleaved         |
| Concatenations      | 1                   |

**Contrast - Common**

|                    |                       |
|--------------------|-----------------------|
| TR                 | 4300.0 ms             |
| TE                 | 2.27 ms               |
| Magn. Preparation  | Non-sel. IR           |
| TI 1               | 1000 ms               |
| TI 2               | 3200 ms               |
| Flip Angle 1       | 4 deg                 |
| Flip Angle 2       | 4 deg                 |
| Fat-Water Contrast | Fast Water Excitation |
| Dark Blood         | Off                   |
| Contrasts          | 1                     |
| Reconstruction     | Magnitude             |

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Position            | L0.0 A26.9 F46.0 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | Head > Basis        |
| Initial Position    | L0.0 A26.9 F46.0    |
| L                   | 0.0 mm              |
| A                   | 26.9 mm             |
| F                   | 46.0 mm             |
| Initial Orientation | Sagittal            |
| Initial Rotation    | 0.01 deg            |

**Geometry - Navigator****Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                |
|---------------------|----------------|
| Coil Selection      | Manual         |
| Radial Sorting      | Off            |
| MSMA                | S - C - T      |
| Sagittal            | R >> L         |
| Coronal             | A >> P         |
| Transversal         | F >> H         |
| Coil Combination    | Sum of Squares |
| Matrix Optimization | Off            |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ? Ref. Amplitude 1H | 0.000 V        |
| Reset               | Off            |

**System - Tx/Rx**

|                   |       |
|-------------------|-------|
| Correction Factor | 1.00  |
| Image Scaling     | 1.000 |

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 4300.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                    |                       |
|--------------------|-----------------------|
| Fat-Water Contrast | Fast Water Excitation |
| Magn. Preparation  | Non-sel. IR           |
| TI 1               | 1000 ms               |
| TI 2               | 3200 ms               |
| Dark Blood         | Off                   |
| FOV Read           | 240 mm                |
| FOV Phase          | 93.8 %                |
| Phase Resolution   | 100 %                 |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. Control  | Off |
| Concatenations | 1   |

**Inline - Subtraction**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Save Original Images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP Sag              | Off |
| MIP Cor              | Off |
| MIP Tra              | Off |
| MIP Time             | Off |
| Radial MIP           | Off |
| Save Original Images | On  |
| MPR Sag              | Off |
| MPR Cor              | Off |
| MPR Tra              | Off |

**Inline - Composing****Inline - MapIt**

|                      |           |
|----------------------|-----------|
| MapIt                | None      |
| Flip Angle 1         | 4 deg     |
| Flip Angle 2         | 4 deg     |
| Measurements         | 1         |
| Contrasts            | 1         |
| TE                   | 2.27 ms   |
| TR                   | 4300.0 ms |
| Save Original Images | On        |

**Sequence - Part 1**

|               |     |
|---------------|-----|
| Sequence Name | tfl |
| Dimension     | 3D  |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Excitation        | Non-sel.  |
| RF Pulse Type     | Fast      |
| Gradient Mode     | Fast*     |
| Flow Compensation | None      |
| Reordering        | Linear    |
| Bandwidth         | 200 Hz/Px |
| Echo Spacing      | 7.22 ms   |
| Asymmetric Echo   | Allowed   |
| Turbo Factor      | 156       |

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | On  |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|

\MARTINOS DEVELOPER\HUBERT1\_protocols\AZMA\_coil\_20251210\t1\_mprage\_sag\_stx\_0.75\_again\_4  
\_half\_test

TA: 7:07 min Coil Selection: Manual Voxel Size: 0.8×0.8×0.8 mm<sup>3</sup> Acc:: 5.5 Rel. SNR: 1.00

### Properties

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | On                 |
| Load Images to Graphic Segments               | On                 |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

### Contrast - Dynamic

|                     |                  |
|---------------------|------------------|
| Pause after Meas. 1 | 0.0 s            |
| Multiple Series     | Each Measurement |
| Reordering          | Linear           |

### Resolution - Common

|                  |         |
|------------------|---------|
| FOV Read         | 240 mm  |
| FOV Phase        | 100.0 % |
| Slice Thickness  | 0.75 mm |
| Base Resolution  | 320     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

### Routine

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4000.0 ms           |
| TE                  | 3.33 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | Head > Basis        |
| Coil Elements       | AC                  |

### Resolution - Acceleration

|                       |              |
|-----------------------|--------------|
| Acceleration Mode     | CS           |
| Total Factor          | 5.5          |
| Reference Scans       | GRE/Separate |
| Reference Lines PE    | 32           |
| Phase Partial Fourier | Off          |
| Slice Partial Fourier | Off          |
| Asymmetric Echo       | Off          |
| Elliptical Scanning   | Off          |

### Resolution - Filter

|                       |           |
|-----------------------|-----------|
| Raw Filter            | On        |
| Elliptical Filter     | Off       |
| Distortion Correction | 2D        |
| Normalize             | B1 Filter |
| Image Filter          | On        |

### Geometry - Common

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 256                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4000.0 ms           |
| Multi-Slice Mode    | Single Shot         |
| Series              | Interleaved         |
| Concatenations      | 1                   |

### Contrast - Common

|                    |             |
|--------------------|-------------|
| TR                 | 4000.0 ms   |
| TE                 | 3.33 ms     |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Flip Angle         | 4 deg       |
| Fat-Water Contrast | Standard    |
| Dark Blood         | Off         |
| Contrasts          | 1           |
| Reconstruction     | Magnitude   |

### Contrast - Dynamic

|              |          |
|--------------|----------|
| Dynamic Mode | Standard |
| Measurements | 2        |

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | Head > Basis        |
| Initial Position    | L0.0 A27.9 F42.9    |
| L                   | 0.0 mm              |
| A                   | 27.9 mm             |
| F                   | 42.9 mm             |
| Initial Orientation | Sagittal            |
| Initial Rotation    | 0.00 deg            |

**Geometry - Navigator****Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Manual           |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ! Ref. Amplitude 1H | 350.000 V      |
| Reset               | Off            |

**System - Tx/Rx**

|                   |       |
|-------------------|-------|
| Correction Factor | 1.00  |
| Image Scaling     | 1.000 |

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 4000.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                    |             |
|--------------------|-------------|
| Fat-Water Contrast | Standard    |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Dark Blood         | Off         |
| FOV Read           | 240 mm      |
| FOV Phase          | 100.0 %     |
| Phase Resolution   | 100 %       |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. Control  | Off |
| Concatenations | 1   |

**Inline - Subtraction**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 2   |
| StdDev               | Off |
| Save Original Images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP Sag              | Off |
| MIP Cor              | Off |
| MIP Tra              | Off |
| MIP Time             | Off |
| Radial MIP           | Off |
| Save Original Images | On  |
| MPR Sag              | Off |
| MPR Cor              | Off |
| MPR Tra              | Off |

**Inline - Composing****Inline - Maplt**

|                      |           |
|----------------------|-----------|
| Maplt                | None      |
| Flip Angle           | 4 deg     |
| Measurements         | 2         |
| Contrasts            | 1         |
| TE                   | 3.33 ms   |
| TR                   | 4000.0 ms |
| Save Original Images | On        |

**Sequence - Part 1**

|               |          |
|---------------|----------|
| Sequence Name | tfl      |
| Dimension     | 3D       |
| Excitation    | Non-sel. |
| RF Pulse Type | Fast     |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Gradient Mode     | Fast      |
| Flow Compensation | None      |
| Reordering        | Linear    |
| Bandwidth         | 200 Hz/Px |
| Echo Spacing      | 7.66 ms   |
| Asymmetric Echo   | Off       |
| Turbo Factor      | 220       |

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | On  |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|

\MARTINOS DEVELOPER\HUBER\T1\_protocols\AZMA\_coil\_20251210\t1\_mprage\_sag\_stx\_0.75\_Turbo\_factor\_andCS

TA: 3:35 min Coil Selection: Manual Voxel Size: 0.8×0.8×0.8 mm<sup>3</sup> Acc:: 5.6 Rel. SNR: 1.00

## Properties

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | On                 |
| Load Images to Graphic Segments               | On                 |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

## Routine

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 240                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4000.0 ms           |
| TE                  | 4.66 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | Head > Basis        |
| Coil Elements       | AC                  |

## Contrast - Common

|                    |             |
|--------------------|-------------|
| TR                 | 4000.0 ms   |
| TE                 | 4.66 ms     |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Flip Angle         | 4 deg       |
| Fat-Water Contrast | Standard    |
| Dark Blood         | Off         |
| Contrasts          | 1           |
| Reconstruction     | Magnitude   |

## Contrast - Dynamic

|              |          |
|--------------|----------|
| Dynamic Mode | Standard |
| Measurements | 1        |

## Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Multiple Series | Each Measurement |
| Reordering      | Linear           |

## Resolution - Common

|                  |         |
|------------------|---------|
| FOV Read         | 240 mm  |
| FOV Phase        | 100.0 % |
| Slice Thickness  | 0.75 mm |
| Base Resolution  | 320     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

## Resolution - Acceleration

|                       |              |
|-----------------------|--------------|
| Acceleration Mode     | CS           |
| Total Factor          | 5.6          |
| Reference Scans       | GRE/Separate |
| Reference Lines PE    | 32           |
| Phase Partial Fourier | Off          |
| Slice Partial Fourier | Off          |
| Asymmetric Echo       | Off          |
| Elliptical Scanning   | Off          |

## Resolution - Filter

|                       |           |
|-----------------------|-----------|
| Raw Filter            | On        |
| Elliptical Filter     | Off       |
| Distortion Correction | 2D        |
| Normalize             | B1 Filter |
| Image Filter          | On        |

## Geometry - Common

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 240                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4000.0 ms           |
| Multi-Slice Mode    | Single Shot         |
| Series              | Interleaved         |
| Concatenations      | 1                   |

## Geometry - AutoAlign

|            |   |
|------------|---|
| Slab Group | 1 |
|------------|---|

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | Head > Basis        |
| Initial Position    | L0.0 A27.9 F42.9    |
| L                   | 0.0 mm              |
| A                   | 27.9 mm             |
| F                   | 42.9 mm             |
| Initial Orientation | Sagittal            |
| Initial Rotation    | 0.00 deg            |

**System - Tx/Rx**

|               |       |
|---------------|-------|
| Image Scaling | 1.000 |
|---------------|-------|

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 4000.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                    |             |
|--------------------|-------------|
| Fat-Water Contrast | Standard    |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Dark Blood         | Off         |
| FOV Read           | 240 mm      |
| FOV Phase          | 100.0 %     |
| Phase Resolution   | 100 %       |

**Geometry - Navigator****Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Manual           |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ! Ref. Amplitude 1H | 350.000 V      |
| Reset               | Off            |
| Correction Factor   | 1.00           |

**Inline - Composing****Inline - MapIt**

|                      |           |
|----------------------|-----------|
| MapIt                | None      |
| Flip Angle           | 4 deg     |
| Measurements         | 1         |
| Contrasts            | 1         |
| TE                   | 4.66 ms   |
| TR                   | 4000.0 ms |
| Save Original Images | On        |

**Sequence - Part 1**

|               |          |
|---------------|----------|
| Sequence Name | tfl      |
| Dimension     | 3D       |
| Excitation    | Non-sel. |
| RF Pulse Type | Fast     |
| Gradient Mode | Fast     |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Flow Compensation | None      |
| Reordering        | Linear    |
| Bandwidth         | 130 Hz/Px |
| Echo Spacing      | 10.34 ms  |
| Asymmetric Echo   | Off       |
| Turbo Factor      | 200       |

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | On  |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|

\MARTINOS DEVELOPER\HUBERT1\_protocols\AZMA\_coil\_20251210\t1\_mprage\_sag\_stx\_0.75\_turnbo\_factor\_and\_

TA: 2:35 min Coil Selection: Manual Voxel Size: 0.8×0.8×0.8 mm<sup>3</sup> Acc:: 5.6 Rel. SNR: 1.00

## Properties

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | On                 |
| Load Images to Graphic Segments               | On                 |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

## Routine

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 240                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4000.0 ms           |
| TE                  | 4.66 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | Head > Basis        |
| Coil Elements       | AC                  |

## Contrast - Common

|                    |             |
|--------------------|-------------|
| TR                 | 4000.0 ms   |
| TE                 | 4.66 ms     |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Flip Angle         | 4 deg       |
| Fat-Water Contrast | Standard    |
| Dark Blood         | Off         |
| Contrasts          | 1           |
| Reconstruction     | Magnitude   |

## Contrast - Dynamic

|              |          |
|--------------|----------|
| Dynamic Mode | Standard |
| Measurements | 1        |

## Contrast - Dynamic

|                 |                  |
|-----------------|------------------|
| Multiple Series | Each Measurement |
| Reordering      | Linear           |

## Resolution - Common

|                  |         |
|------------------|---------|
| FOV Read         | 240 mm  |
| FOV Phase        | 100.0 % |
| Slice Thickness  | 0.75 mm |
| Base Resolution  | 320     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

## Resolution - Acceleration

|                       |              |
|-----------------------|--------------|
| Acceleration Mode     | CS           |
| Total Factor          | 5.6          |
| Reference Scans       | GRE/Separate |
| Reference Lines PE    | 32           |
| Phase Partial Fourier | Off          |
| Slice Partial Fourier | Off          |
| Asymmetric Echo       | Off          |
| Elliptical Scanning   | Off          |

## Resolution - Filter

|                       |           |
|-----------------------|-----------|
| Raw Filter            | On        |
| Elliptical Filter     | Off       |
| Distortion Correction | 2D        |
| Normalize             | B1 Filter |
| Image Filter          | On        |

## Geometry - Common

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 240                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4000.0 ms           |
| Multi-Slice Mode    | Single Shot         |
| Series              | Interleaved         |
| Concatenations      | 1                   |

## Geometry - AutoAlign

|            |   |
|------------|---|
| Slab Group | 1 |
|------------|---|

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | Head > Basis        |
| Initial Position    | L0.0 A27.9 F42.9    |
| L                   | 0.0 mm              |
| A                   | 27.9 mm             |
| F                   | 42.9 mm             |
| Initial Orientation | Sagittal            |
| Initial Rotation    | 0.00 deg            |

**System - Tx/Rx**

|               |       |
|---------------|-------|
| Image Scaling | 1.000 |
|---------------|-------|

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 4000.0 ms |
| Concatenations  | 1         |

**Physio - Cardiac**

|                    |             |
|--------------------|-------------|
| Fat-Water Contrast | Standard    |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Dark Blood         | Off         |
| FOV Read           | 240 mm      |
| FOV Phase          | 100.0 %     |
| Phase Resolution   | 100 %       |

**Geometry - Navigator****Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Manual           |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ! Ref. Amplitude 1H | 350.000 V      |
| Reset               | Off            |
| Correction Factor   | 1.00           |

**Inline - Composing****Inline - MapIt**

|                      |           |
|----------------------|-----------|
| MapIt                | None      |
| Flip Angle           | 4 deg     |
| Measurements         | 1         |
| Contrasts            | 1         |
| TE                   | 4.66 ms   |
| TR                   | 4000.0 ms |
| Save Original Images | On        |

**Sequence - Part 1**

|               |          |
|---------------|----------|
| Sequence Name | tfl      |
| Dimension     | 3D       |
| Excitation    | Non-sel. |
| RF Pulse Type | Fast     |
| Gradient Mode | Fast     |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Flow Compensation | None      |
| Reordering        | Linear    |
| Bandwidth         | 130 Hz/Px |
| Echo Spacing      | 10.34 ms  |
| Asymmetric Echo   | Off       |
| Turbo Factor      | 280       |

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | On  |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|

\IMARTINOS DEVELOPER\HUBER\T1\_protocols\AZMA\_coil\_20251210\t1\_mprage\_sag\_stx\_0.75\_

TA: 3:15 min Coil Selection: Manual Voxel Size: 0.8x0.8x0.8 mm<sup>3</sup> Acc:: 4.4 Rel. SNR: 1.00**Properties**

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | On                 |
| Load Images to Graphic Segments               | On                 |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

**Resolution - Common**

|                  |         |
|------------------|---------|
| FOV Read         | 240 mm  |
| FOV Phase        | 100.0 % |
| Slice Thickness  | 0.75 mm |
| Base Resolution  | 320     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

**Routine**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 240                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4000.0 ms           |
| TE                  | 4.66 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | Head > Basis        |
| Coil Elements       | AC                  |

**Resolution - Acceleration**

|                       |              |
|-----------------------|--------------|
| Acceleration Mode     | CS           |
| Total Factor          | 4.4          |
| Reference Scans       | GRE/Separate |
| Reference Lines PE    | 32           |
| Phase Partial Fourier | Off          |
| Slice Partial Fourier | Off          |
| Asymmetric Echo       | Off          |
| Elliptical Scanning   | Off          |

**Resolution - Filter**

|                       |           |
|-----------------------|-----------|
| Raw Filter            | On        |
| Elliptical Filter     | Off       |
| Distortion Correction | 2D        |
| Normalize             | B1 Filter |
| Image Filter          | On        |

**Geometry - Common**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 240                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4000.0 ms           |
| Multi-Slice Mode    | Single Shot         |
| Series              | Interleaved         |
| Concatenations      | 1                   |

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | Head > Basis        |
| Initial Position    | L0.0 A27.9 F42.9    |

**Contrast - Common**

|                    |             |
|--------------------|-------------|
| TR                 | 4000.0 ms   |
| TE                 | 4.66 ms     |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Flip Angle         | 4 deg       |
| Fat-Water Contrast | Standard    |
| Dark Blood         | Off         |
| Contrasts          | 1           |
| Reconstruction     | Magnitude   |

**Contrast - Dynamic**

|                 |                  |
|-----------------|------------------|
| Dynamic Mode    | Standard         |
| Measurements    | 1                |
| Multiple Series | Each Measurement |
| Reordering      | Linear           |

**Geometry - AutoAlign**

|                     |          |
|---------------------|----------|
| L                   | 0.0 mm   |
| A                   | 27.9 mm  |
| F                   | 42.9 mm  |
| Initial Orientation | Sagittal |
| Initial Rotation    | 0.00 deg |

**Geometry - Navigator****Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Manual           |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ! Ref. Amplitude 1H | 350.000 V      |
| Reset               | Off            |
| Correction Factor   | 1.00           |
| Image Scaling       | 1.000          |

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 4000.0 ms |

**Physio - Signal**

|                |   |
|----------------|---|
| Concatenations | 1 |
|----------------|---|

**Physio - Cardiac**

|                    |             |
|--------------------|-------------|
| Fat-Water Contrast | Standard    |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Dark Blood         | Off         |
| FOV Read           | 240 mm      |
| FOV Phase          | 100.0 %     |
| Phase Resolution   | 100 %       |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. Control  | Off |
| Concatenations | 1   |

**Inline - Subtraction**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Save Original Images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP Sag              | On  |
| MIP Cor              | On  |
| MIP Tra              | On  |
| MIP Time             | Off |
| Radial MIP           | Off |
| Save Original Images | On  |
| MPR Sag              | Off |
| MPR Cor              | Off |
| MPR Tra              | Off |

**Inline - Composing****Inline - Maplt**

|                      |           |
|----------------------|-----------|
| Maplt                | None      |
| Flip Angle           | 4 deg     |
| Measurements         | 1         |
| Contrasts            | 1         |
| TE                   | 4.66 ms   |
| TR                   | 4000.0 ms |
| Save Original Images | On        |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Sequence Name     | tfl       |
| Dimension         | 3D        |
| Excitation        | Non-sel.  |
| RF Pulse Type     | Fast      |
| Gradient Mode     | Fast      |
| Flow Compensation | None      |
| Reordering        | Linear    |
| Bandwidth         | 130 Hz/Px |
| Echo Spacing      | 10.34 ms  |
| Asymmetric Echo   | Off       |

**Sequence - Part 1**

|              |     |
|--------------|-----|
| Turbo Factor | 280 |
|--------------|-----|

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | On  |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|

\MARTINOS DEVELOPER\HUBER\T1\_protocols\AZMA\_coil\_20251210\t1\_mprage\_sag\_stx\_0.75\_again

TA: 4:31 min Coil Selection: Manual Voxel Size: 0.8x0.8x0.8 mm<sup>3</sup> Acc:: 5.0 Rel. SNR: 1.00**Properties**

|   |                    |
|---|--------------------|
| Start measurement without further preparation | On                 |
| Wait for User to Start                        | Off                |
| Start measurements                            | Single Measurement |
| Prio Recon                                    | Off                |
| Auto Open Inline Display                      | Off                |
| Auto Close Inline Display                     | Off                |
| Load Images to MR View&GO                     | On                 |
| Auto Store Images                             | On                 |
| Disable auto transfer to PACS                 | Off                |
| Load Images to Stamp Segments                 | On                 |
| Load Images to Graphic Segments               | On                 |
| Graphic segment                               | Default            |
| Inline Movie                                  | Off                |

**Resolution - Common**

|                  |         |
|------------------|---------|
| FOV Read         | 240 mm  |
| FOV Phase        | 100.0 % |
| Slice Thickness  | 0.75 mm |
| Base Resolution  | 320     |
| Phase Resolution | 100 %   |
| Slice Resolution | 100 %   |
| Interpolation    | Off     |

**Routine**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 240                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4000.0 ms           |
| TE                  | 4.66 ms             |
| Averages            | 1                   |
| Concatenations      | 1                   |
| AutoAlign           | Head > Basis        |
| Coil Elements       | AC                  |

**Resolution - Acceleration**

|                       |              |
|-----------------------|--------------|
| Acceleration Mode     | CS           |
| Total Factor          | 5.0          |
| Reference Scans       | GRE/Separate |
| Reference Lines PE    | 32           |
| Phase Partial Fourier | Off          |
| Slice Partial Fourier | Off          |
| Asymmetric Echo       | Off          |
| Elliptical Scanning   | Off          |

**Resolution - Filter**

|                       |           |
|-----------------------|-----------|
| Raw Filter            | On        |
| Elliptical Filter     | Off       |
| Distortion Correction | 2D        |
| Normalize             | B1 Filter |
| Image Filter          | On        |

**Geometry - Common**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Slabs               | 1                   |
| Distance Factor     | 50 %                |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| Slices per Slab     | 240                 |
| Phase Oversampling  | 0 %                 |
| Slice Oversampling  | 0.0 %               |
| FOV Read            | 240 mm              |
| FOV Phase           | 100.0 %             |
| Slice Thickness     | 0.75 mm             |
| TR                  | 4000.0 ms           |
| Multi-Slice Mode    | Single Shot         |
| Series              | Interleaved         |
| Concatenations      | 1                   |

**Geometry - AutoAlign**

|                     |                     |
|---------------------|---------------------|
| Slab Group          | 1                   |
| Position            | L0.0 A27.9 F42.9 mm |
| Orientation         | Sagittal            |
| Phase Encoding Dir. | A >> P              |
| AutoAlign           | Head > Basis        |
| Initial Position    | L0.0 A27.9 F42.9    |

**Contrast - Common**

|                    |             |
|--------------------|-------------|
| TR                 | 4000.0 ms   |
| TE                 | 4.66 ms     |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Flip Angle         | 4 deg       |
| Fat-Water Contrast | Standard    |
| Dark Blood         | Off         |
| Contrasts          | 1           |
| Reconstruction     | Magnitude   |

**Contrast - Dynamic**

|                 |                  |
|-----------------|------------------|
| Dynamic Mode    | Standard         |
| Measurements    | 1                |
| Multiple Series | Each Measurement |
| Reordering      | Linear           |

**Geometry - AutoAlign**

|                     |          |
|---------------------|----------|
| L                   | 0.0 mm   |
| A                   | 27.9 mm  |
| F                   | 42.9 mm  |
| Initial Orientation | Sagittal |
| Initial Rotation    | 0.00 deg |

**Geometry - Navigator****Geometry - Tim Planning Suite**

|                   |      |
|-------------------|------|
| Set-n-Go Protocol | Off  |
| Table Position    | 0 mm |
| Table Position    | H    |

**System - Miscellaneous**

|                     |                  |
|---------------------|------------------|
| Coil Selection      | Manual           |
| Radial Sorting      | Off              |
| MSMA                | S - C - T        |
| Sagittal            | R >> L           |
| Coronal             | A >> P           |
| Transversal         | F >> H           |
| Coil Combination    | Adaptive Combine |
| Matrix Optimization | Off              |

**System - Adjustments**

|                      |          |
|----------------------|----------|
| Adjustment Strategy  | Standard |
| B0 Shim              | Tune up  |
| B1 Shim              | TrueForm |
| Adjustment Tolerance | Auto     |
| Confirm Frequency    | Never    |
| Assume Silicone      | Off      |

**System - Adjust Volume**

|               |                   |
|---------------|-------------------|
| ! Position    | L0.0 A7.8 F5.5 mm |
| ! Orientation | T > C-23.0        |
| ! Rotation    | 0.00 deg          |
| ! A >> P      | 159 mm            |
| ! R >> L      | 128 mm            |
| ! F >> H      | 120 mm            |
| Reset         | Off               |

**System - pTx**

|            |          |
|------------|----------|
| B1 Shim    | TrueForm |
| Excitation | Non-sel. |

**System - Tx/Rx**

|                     |                |
|---------------------|----------------|
| Frequency 1H        | 297.117813 MHz |
| ! Ref. Amplitude 1H | 350.000 V      |
| Reset               | Off            |
| Correction Factor   | 1.00           |
| Image Scaling       | 1.000          |

**Physio - Signal**

|                 |           |
|-----------------|-----------|
| 1st Signal/Mode | None      |
| TR              | 4000.0 ms |

**Physio - Signal**

|                |   |
|----------------|---|
| Concatenations | 1 |
|----------------|---|

**Physio - Cardiac**

|                    |             |
|--------------------|-------------|
| Fat-Water Contrast | Standard    |
| Magn. Preparation  | Non-sel. IR |
| TI                 | 1500 ms     |
| Dark Blood         | Off         |
| FOV Read           | 240 mm      |
| FOV Phase          | 100.0 %     |
| Phase Resolution   | 100 %       |

**Physio - PACE**

|                |     |
|----------------|-----|
| Resp. Control  | Off |
| Concatenations | 1   |

**Inline - Subtraction**

|                      |     |
|----------------------|-----|
| Subtract             | Off |
| Measurements         | 1   |
| StdDev               | Off |
| Save Original Images | On  |

**Inline - MIP**

|                      |     |
|----------------------|-----|
| MIP Sag              | On  |
| MIP Cor              | On  |
| MIP Tra              | On  |
| MIP Time             | Off |
| Radial MIP           | Off |
| Save Original Images | On  |
| MPR Sag              | Off |
| MPR Cor              | Off |
| MPR Tra              | Off |

**Inline - Composing****Inline - Maplt**

|                      |           |
|----------------------|-----------|
| Maplt                | None      |
| Flip Angle           | 4 deg     |
| Measurements         | 1         |
| Contrasts            | 1         |
| TE                   | 4.66 ms   |
| TR                   | 4000.0 ms |
| Save Original Images | On        |

**Sequence - Part 1**

|                   |           |
|-------------------|-----------|
| Sequence Name     | tfl       |
| Dimension         | 3D        |
| Excitation        | Non-sel.  |
| RF Pulse Type     | Fast      |
| Gradient Mode     | Fast      |
| Flow Compensation | None      |
| Reordering        | Linear    |
| Bandwidth         | 130 Hz/Px |
| Echo Spacing      | 10.34 ms  |
| Asymmetric Echo   | Off       |

**Sequence - Part 1**

|              |     |
|--------------|-----|
| Turbo Factor | 180 |
|--------------|-----|

**Sequence - Part 2**

|                         |     |
|-------------------------|-----|
| Introduction            | On  |
| RF Spoiling             | On  |
| Incr. Gradient Spoiling | Off |

**Sequence - Assistant**

|               |     |
|---------------|-----|
| SAR Assistant | Off |
|---------------|-----|