

PO# 593-B81013

SHIP TO:
SUPPLY WAREHOUSE B81013
V.A. Medical Center
5406 E. EL CAMPO GRANDE
AVE. SUITE 150
LAS VEGAS, NV 89115

This system will mobile and will be in a trailer.

Qty

Item Description

1

MAGNETOM Aera - System

MAGNETOM Aera is designed to provide you the versatility you need to meet the increasing demands in healthcare. Maximize 1.5T with its core technologies Tim(r) 4G and Dot(r), along with its comprehensive application portfolio and experience unique functionalities to increase patient comfort.

Every case. Every day.

System Design

- Short and open appearance (145 cm system length and 70 cm Open Bore Design) to reduce patient anxiety and claustrophobia
- Whole-body superconductive Zero Helium Boil-Off 1.5T magnet
- Actively Shielded water-cooled Siemens gradient system for maximum performance
- TrueForm Magnet and Gradient Design

Tim 4G (Total imaging matrix in the 4th generation) for excellent image quality and speed

- Siemens unique DirectRF(tm) technology enabling the all digital-in/ digital-out design
- Dual-Density Signal Transfer Technology
- Tim Coil Interface

Dot (Day optimizing throughput) for higher consistency, flexibility and efficiency

- Dot Display
- Dot Control Centers
- Brain Dot Engine

Tim Application Suite allowing excellent head-to-toe imaging

- Neuro Suite
- Angio Suite
- Cardiac Suite
- Body Suite
- Onco Suite
- Breast Suite
- Ortho Suite
- Pediatric Suite
- Scientific Suite

Qty**Item Description**

Further included

- High performance host computer
- Patient communication: standard headphones and MagnaCoil(tm) In-Ear headset
- Siemens uniqueTimCT FastView localizer and CAIPIRINHA
- syngo MR software including
- 1D/2D PACE
- BLADE
- iPAT²
- Phoenix
- Inline Diffusion
- WARP
- MDDW (Multiple Direction Diffusion Weighting)
- CISS
- DESS
- TGSE

The system (magnet, electronics and control room) can be installed in 30sqm space. For system cooling either the Eco Chiller options or the Separator is required.

1

Tim [204x48] XQ Gradients #Ae

Tim [204x48] XQ-gradients performance level

Tim 4G with it's newly designed RF system and innovative coil architecture enables high resolution imaging and increased throughput.

The system provides a maximum number of 204 channels (coil elements) that can be connected simultaneously. Flexible parallel imaging is achieved by the 48 independent RF channels that can be used simultaneously in one single scan and in one single FOV, each generating an independent partial image. Maximum SNR is furthermore ensured through the new Tim 4G matrix coil technology. This option includes also Advanced High Order Shim.

XQ - gradients

The XQ- gradients are designed combining high performance and linearity to support clinical whole body imaging at 1.5T. The force compensated gradient system minimizes vibration levels and accoustic noise. The XQ gradients combine 45 mT/m peak amplitude with a slew rate of 200 T/m/s.

High-performance measurement and reconstruction system

1

Standard Coil Package 48+ ch #Ae

This package includes:

- Head/Neck 20 DirectConnect
- Spine 32 DirectConnect
- Body 18
- Flex Large 4
- Flex Small 4
- Flex Coil interface

1

Mobile Configurator #Ae1

The Mobile Configurator option contains dedicated components for installation of a MAGNETOM Aera in the mobile environment.

It includes:

- Pure White Cover, Mobile
- Mobile Kit

For a mobile MAGNETOM Aera system the following options are mandatory: Separator (SEP)
[additional mandatory items may be required, please check with the Mobile Product Manager]

Qty	Item Description
1	<p>for your country].</p> <p>Pure White Design, Mobile #Ae</p> <p>The color of the main face plate cover of the Pure White Design of the mobile MAGNETOM Aera with the integrated Dot Control Centers and the unique Dot Display is brilliant white surrounded by a silver trim. The asymmetrical deco area on the left side is colored white matte with honey-comb and also surrounded with a silver trim.</p> <p>The table cover is presented in the same color and material selection.</p>
1	<p>Tim Table #Ae</p> <p>The new Tim Table is designed for maximized patient comfort and smooth patient preparation. The unique design of the Tim Table can support up to 250 kg (550 lbs) patients without restricting the vertical or horizontal movement.</p>
1	<p>PC Keyboard US english #Tim</p> <p>Standard PC keyboard with 101 keys.</p>
1	<p>SW syngo MR E11C</p> <p>syngo MR E11C software with new features and applications.</p> <p>GOBrain protocols (for Aera and Skyra with 48 or more rf-channels).</p>
1	<p>DotGO Routine Package #T+D</p> <p>The DotGO Routine Package includes both:</p> <ul style="list-style-type: none"> - Spine Dot Engine and - Large Joint Dot Engine. <p>As a package they offer a comprehensive set of workflows with guidance and automation, for standardized image quality in Spine and MSK MR imaging.</p> <p>The Spine Dot Engine provides the functionality of Inline Composing and Tim Planning Suite for streamlining workflows in all spine imaging. Tools, such as auto-positioning and vertebral recognition with AutoAlign Spine, AutoCoverage and Spine Labelling support and optimize reproducibility for your cervical, thoracic and lumbar spine imaging for all clinical indications.</p> <p>The Large Joint Dot Engine enhances standardization of the knee, hip and shoulder workflows and optimizes reproducible image quality by incorporating automation tools, such as anatomically based auto-positioning (AutoAlign). Dedicated imaging techniques, such as Advanced WARP, are included and can help to expand the access of diagnostic MRI to a broader range of patient types.</p>
1	<p>Advanced Dot Imaging Package #T+D</p> <p>The following components are already included in the DotGO Advanced Package:</p> <ul style="list-style-type: none"> - Angio Dot Engine - Abdomen Dot Engine <p>As a package they offer a comprehensive set of workflow with guidance and automation, for standardized image quality in Vascular and Abdominal MR imaging.</p> <p>The Angio Dot Engine provides semi-automatic detection of arterial and venous timing windows using a test bolus technique.</p> <p>This information is feedback for next planning steps automatically adapting scan parameters to the individual patient and patient's condition. Where needed, AutoVoice Commands support the communication with the patient and ensure optimal timing of breathing, scanning and contrast media. All steps of contrast injection are presented in a simple, automated graphic on the monitor. syngo Inline Composing and the Tim Planning Suite are included.</p>
	<p>The Abdominal Dot Engine offers intuitive guidance and a high level of automation. It allows automatic sequence scaling according to physiological characteristic.</p> <p>Auto Navigator detects breathing pattern detection. With Automatic FoV, the optimal FoV is automatically estimated based on the localizer images.</p> <p>Within the contrast-enhanced abdomen exam, multiple phases are acquired: native, arterial</p>

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1	<p data-bbox="399 369 813 396">phase, portal-venous phase and late-phase.</p> <p data-bbox="399 411 721 438">Advanced Diffusion #T+D</p> <p data-bbox="399 447 1146 474">QuietX DWI and RESOLVE together make up the Advanced Diffusion package.</p> <p data-bbox="399 506 1289 558">QuietX DWI enables quieter diffusion-weighted imaging of the brain with up to 70% reduction in sound pressure relative to conventional diffusion-weighted imaging.</p> <p data-bbox="399 562 1289 709">RESOLVE (Readout Segmentation Of Long Variable Echo-trains) is a multi-shot, readout segmented EPI sequence for high-resolution, low-distortion diffusion-weighted imaging (DWI). This technique is largely insensitive to susceptibility effects, providing anatomically accurate diffusion imaging for the brain, spine, breast and prostate. In combination with the DTI Tractography package, RESOLVE enables excellent white-matter tract imaging even in regions of high susceptibility, such as the spine.</p>
1	<p data-bbox="399 722 521 749">SWI #Tim</p> <p data-bbox="399 758 1289 884">Susceptibility Weighted Imaging is a high-resolution 3D imaging technique for the brain with ultra-high sensitivity for microscopic magnetic field inhomogeneities caused by deoxygenated blood, products of blood decomposition and microscopic iron deposits. Among other things, the method allows for the highly sensitive proof of cerebral hemorrhages and the high-resolution display of venous cerebral blood vessels.</p>
1	<p data-bbox="399 896 581 924">SMS EPI #T+D</p> <p data-bbox="399 932 1289 1058">Simultaneous Multi-Slice (SMS) EPI enables accelerated imaging for diffusion-weighted (DWI/DTI) and BOLD functional MR imaging. With SMS EPI, scan times for DWI can be reduced by up to 68% and/or images with higher spatial/diffusion resolution can be acquired. For BOLD imaging, SMS EPI can enable increased temporal sampling of BOLD data acquisitions and/or improved slice coverage/resolution.</p>
1	<p data-bbox="399 1071 630 1098">DTI Package #T+D</p> <p data-bbox="399 1106 704 1134">The DTI Package is a bundle of:</p> <ul data-bbox="399 1136 651 1220" style="list-style-type: none"> - Diffusion Tensor Imaging - DTI Evaluation and - DTI Tractography syngo <p data-bbox="399 1255 1289 1308">The bundle comprehends all acquisition and postprocessing tools for comprehensive DTI exams.</p>
1	<p data-bbox="399 1320 794 1348">Neuro Perfusion Package #T+D</p> <p data-bbox="399 1356 1289 1430">The Neuro Perfusion Package helps to streamline the clinical workflow by inline post-processing in dynamic susceptibility contrast (DSC) based perfusion imaging. This makes it possible to see perfusion maps immediately.</p> <p data-bbox="399 1465 1289 1518">Perfusion parameter maps are based on a Local Arterial Input function. A corrected relCBV map calculation and motion correction is provided.</p>
1	<p data-bbox="399 1530 740 1558">Neuro Perfusion Eval #T+D</p> <p data-bbox="399 1566 1289 1734">Neuro Perfusion Evaluation syngo provides a task card for detailed post-processing of brain perfusion data sets. Color display of the relative Mean Transit Time (relMTT), relative Cerebral Blood Volume (relCBV), corrected rel CBV, and relative Cerebral Blood Flow (relCBF) is supported. Flexible selection of the Arterial Input Function (AIF) for more reliable analysis taking into account the dynamics over time of the contrast agent enhancement. Furthermore a calculation of maps using automatically selected local Arterial Input Functions (AIF) is provided to reduce the amount of user interactions.</p> <p data-bbox="399 1738 1289 1843">The detailed evaluation of brain perfusion data sets generates parameter maps for TTP and PBP and for the hemodynamic parameters relMTT, relCBV, rel CBVcor and relCBF. These may show perfusion deficits and assist in the diagnosis and grading of e.g. vascular deficiencies and brain tumors.</p>
1	<p data-bbox="399 1856 623 1883">Mapit syngo #Tim</p> <p data-bbox="399 1892 1289 1944">Based on the T1, T2 or T2* properties of the cartilage syngo ParametricMap allows the early detection of osteoarthritic break down of cartilage structures even before morphological</p>

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	<p>changes occur. The method supports therapeutic decisions in individual patients and can be used to control treatments non-invasively, replacing surgeries or biopsies.</p> <p>The assessment of T1, T2 and T2* properties of tissues in other body regions is also possible. syngo ParametricMap provides very fast 2D and 3D high resolution imaging sequences and the Inline calculation of parametric maps for the T1, T2 and T2* properties of the imaged tissue.</p>
1	<p>LiverLab #T+D</p> <p>LiverLab is a system guided workflow to examine the hepatic fat and iron status, as part of the Abdomen Dot Engine.</p>
1	<p>FREEZEit Body MRI Package #T+D</p> <p>FREEZEit Body Package contains two robust sequences for advanced body imaging: TWIST-VIBE and StarVIBE.</p> <ul style="list-style-type: none"> - TWIST-VIBE is a new fast, high-resolution 4D imaging sequence for multi-arterial liver imaging. - StarVIBE is a motion insensitive VIBE sequence using a stack-of-stars trajectory. <p>FREEZEit StarVIBE allows for free-breathing during the scan, which reduces stress and improves the patient experience.</p>
1	<p>Native syngo #Tim</p> <p>Integrated software package with sequences and protocols for non-contrast enhanced 3D MRA with high spatial resolution. syngo NATIVE particularly enables imaging of abdominal and peripheral vessels and is an alternative to MR angiography techniques with contrast medium, especially for patients with severe renal insufficiency.</p>
1	<p>QISS #T+D</p> <p>Software package with QISS sequence, protocols and Dot AddIn for non-contrast enhanced peripheral MRA. QISS particularly enables higher reproducibility than existing methods and is an alternative to MR angiography techniques with contrast medium, especially for patients with severe renal insufficiency.</p>
1	<p>Composing syngo #Tim</p> <p>This application provides dedicated evaluation software for creation of full-format images from overlapping MR volume data sets and MIPs acquired at multiple stages.</p>
1	<p>TWIST syngo #Tim</p> <p>This package contains a Siemens unique sequence and protocols for time-resolved (4D) MR angiographic and dynamic imaging in general with high spatial and temporal resolution. syngo TWIST supports comprehensive dynamic MR angio exams in all body regions. It offers temporal information of vessel filling in addition to conventional static MR angiography, which can be beneficial in detecting or evaluating malformations such as shunts. In case of general dynamic imaging, for example an increase in spatial resolution by a factor of up to 2 at 60 seconds temporal resolution (compared to conventional dynamic imaging) is possible due to intelligent k-space sampling strategies. Alternatively, increased temporal resolution at constant spatial resolution is possible.</p>
1	<p>Flow Quantification #Tim</p> <p>Special sequences for quantitative assessment of flow.</p>
1	<p>Quiet Suite #T+D</p> <p>Quiet Suite enables complete, quiet examinations for neurology and orthopedics with at least 70% reduction in sound pressure levels.</p>
1	<p>Tim Whole Body Suite #T+D</p> <p>Tim Whole Body Suite puts it all together. This suite enables table movement for imaging of up to 205 cm (6' 9") FoV without compromise. In combination with Tim's newly designed ultra-high density array higher spatial and temporal resolution can be achieved along with unmatched flexibility of any coverage up to Whole Body.</p> <p>For faster exams and greater diagnostic confidence.</p>

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1	<p>syngo Expert-i #T+D</p> <p>This software application enables remote access to the system (connected via local area network) for planning and processing.</p>
1	<p>Body 18 long #Ae</p> <p>The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility:</p> <ul style="list-style-type: none"> - 18 channels (inherent) or more, if the coil is combined with other coils - Dual Density Signal Transfer - Ultra light-weight - SlideConnect Technology <p>The 18-channel coil with its 18 integrated pre-amplifiers ensures excellent signal-to-noise ratio. The 18 coil elements provide extensive coverage in all directions. The single SlideConnect plug allows for fast and easy patient preparation. The coil's extended cable allows for more flexibility in connector selection which is especially helpful if multiple flexible coils need to be combined and challenging imaging set-ups need to be supported like in therapy imaging (e.g. for combined head-neck exams). The light-weight coil ensures highest patient comfort.</p> <p>The Body 18 1.5T long features:</p> <ul style="list-style-type: none"> - 18-element design with 18 integrated preamplifiers (3 clusters of 6 elements each) - Operates in an integrated fashion with the Spine 32 as an 30 channel body coil (not in combination with the Combi Dockable Table) - Can be combined with further coils for larger coverage - Can be positioned in different orientations (0°, 90°, 180°, 270°) for patient specific adaptations - No coil tuning - iPAT compatible in all directions <p>The highly flexible design supports a wide variety of applications including:</p> <ul style="list-style-type: none"> - Thorax (incl. heart) - Abdomen - Pelvis - Hip
1	<p>Shoulder 16 Coil Kit #Ae</p> <p>The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility. The Shoulder 16 Coil Kit for examinations of the left or right shoulder consists of a base plate and two different sized iPAT compatible 16 channel coils (Shoulder Large 16 and Shoulder Small 16). These will be attached and can be relocated on the base plate. The 16-element coils with 16 integrated pre-amplifiers ensure maximum signal-to-noise ratio. Shoulder Large 16 and Shoulder Small 16 will be connected via a SlideConnect plug for fast and easy coil set-up and patient preparation.</p>
1	<p>Hand/Wrist 16 #Ae</p> <p>The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility.</p> <p>Hand/Wrist 16 for examinations of the left or right hand and wrist region consists of a base plate and an iPAT compatible 16-channel coil and allows high resolution imaging of the wrist and the hand within one examination. Hand/Wrist 16 will be connected via a SlideConnect plug for fast and easy patient preparation.</p>
1	<p>Tx/Rx Knee 15 Flair 1.5T #Ae</p> <p>New 15-channel transmitter/receiver coil for joint examinations in the area of the lower</p>

Qty**Item Description**

extremities.

Main features :

- 15-element design (3x5 coil elements) with 15 integrated preamplifiers,
- iPAT-compatible
- SlideConnect Technology

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Foot/Ankle 16 #Ae

The new Tim 4G coil technology with Dual Density Signal Transfer and DirectConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility.

Foot/Ankle 16 for examinations of the left or right foot and ankle region consists of a base plate and an iPAT compatible 16-channel coil and allows high resolution imaging of the foot and ankle within one examination. Foot/Ankle 16 is a cable-less coil and will be connected via DirectConnect for fast and easy patient preparation.

1

Peripheral Angio 36 #Ae

The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technology combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility:

- 36 channels
- Dual Density Signal Transfer
- Ultra light-weight
- SlideConnect Technology

The 36-channel coil includes 36 integrated pre-amplifiers for excellent signal-to-noise ratio. The single SlideConnect Plug allows for fast and easy patient preparation.

The Peripheral Angio 36 features:

- 36-element design with 36 integrated preamplifiers, distributed over 6 planes with 6 elements each
- Operates in an integrated fashion with Body 18 coils and with the Spine 32 . For Whole-Body examinations also with the Head/ Neck 20
- Automatic table feed and active coil switch
- Can be utilized head and feet first
- Both legs are independently covered with coil elements, maximizing the coil filling factor and the signal-to-noise ratio
- No coil tuning
- iPAT-compatible
- Dual-Density Signal Transfer enables ultra-high density coil designs by integrating key RF components into the local coil
- SlideConnect technology for easy coil set up
- One cable only for easy handling
- Includes special non-ferromagnetic coil cart for safe, user-friendly storage

Applications:

- High-resolution angiography of both legs incl. Pelvis (by additional use of the Body 18) with highest signal-to-noise ratio
- Visualization of the iliac arteries and aorta in combination with Body 18
- Bilateral examinations of long bones of the legs

Typically combined with:

Head/ Neck 20, Body 18, Spine 32, and all flexible coils such as Flex Large 4 or Flex Small 4

1

Tx/Rx CP Head Coil #Ae

Circularly polarized no-tune transmit/receive coil with an open patient-friendly design. The integrated transmit mode allows volume selective excitation. Integrated, extremely low-noise pre-amplifiers permit very high signal-to-noise ratio. Furthermore, the coil is outfit with

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	SlideConnect Technology, allowing for easier patient preparation and less table time for the patient.
1	<p>syngo MR Workplace #T+D</p> <p>syngo MR Workplace based on the newest generation syngo host computer consisting of:</p> <ul style="list-style-type: none"> - Color LCD monitor, 19" flat screen. - syngo MR Workplace computer system with Quad Core Xeon(tm), 2.66 GHz, >= 6 GB RAM, Quad Core host computer incl. one 300 GB system hard disk, one 300 GB hard disk for image data, one CD/DVD-R drive for image storage, one DVD-ROM drive and electronic mouse. - syngo MR Maestro class user interface for optimized clinical workflow. <p>Viewing, Filming, and Post-processing is intended for DICOM data sets acquired with Numaris/4 based systems (e.g. Skyra, Avanto). Proper handling of data from Numaris/X-based systems (e.g. Vida) has not been tested and is not supported.</p>
1	PC Keyboard US English
1	<p>DTI Evaluation MRWP #Tim</p> <p>DTI Evaluation provides advanced post-processing and visualization of Diffusion Tensor Imaging (DTI) data. DTI Evaluation includes the possibility to calculate tensor data from a DTI dataset retrospectively and enables calculation of different diffusion parameter maps. Furthermore it facilitates joint ROI-based evaluation of parameter images and anatomical images, as well as color-coded display and fused 3D visualization in the anatomical context.</p>
1	<p>DTI Tractography syngo MRWP #Tim</p> <p>syngo DTI Tractography allows the visualization of multiple white matter tracts of the human brain based on diffusion tensor imaging data. DTI Tractography is optimized to support the presurgical planning and to allow for neuro physiological research with respect to connectivity and white matter pathology.</p>
1	Image Fusion syngo MRWP
1	Argus Flow MRWP
1	<p>Argus 4D Ventr.Funct.MRWP syngo#Tim</p> <p>syngo Argus 4D Ventricular Function software processes MR cine images of the heart and generates quantitative results for physicians in the diagnostic process.</p>
1	<p>Separator 60kW</p> <p>The SEP (Separation cabinet) has to be used if a central hospital chilled water supply is available or if a chiller of any brand/type is already available.</p> <p>The SEP is the interface between the on-site water chiller (of any brand or type) or the interface to the central hospital cooling water supply.</p> <p>For the above-mentioned cases the SEP is mandatory!</p> <p>In these cases, the primary water specifications must fulfill the requirements (i.e. 63 kW heat dissipation; 100+-10l/min flow; 6 to 12°C water temperature; pH value 6 to 8, max. working pressure 6 bar).</p> <p>Dimensions: 1950mm x 650mm x 650mm (height x width x depth)</p> <p>Weight: approx. 340kg</p>
1	<p>UPS system (Libert)</p> <p>UPS system Liebert GXT4 3000RT230E for MAGNETOM Aera, Skyra, Prisma, Essenza, Amira, Spectra, C! for safeguarding computers. Including Power Cable of 9 m for connecting the UPS.</p> <p>Power output: 3.0 kVA / 2.7 kW</p> <p>Bridge time: 3 min full load / 12 min half load</p> <p>Input voltage: 230 VAC</p>

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1	<p>UPS Battery module (Libert GXT4 BATT)</p> <p>UPS battery module Liebert GXT4 72VBATTE for MAGNETOM Aera, Skyra, Prisma, ESSENZA, Amira, Spectra, C! for safeguarding computers.</p> <p>Extension for: Liebert GXT4 3000RT230E (14456315)</p> <p>Battery type: Closed, maintenance-free</p> <p>Extension of the bridge time to: 21 minutes full load / 48 min half load with one module</p> <p>Dimensions (H x D x W): Battery module: 430 x 602 x 85 mm</p> <p>Weight: approx. 46 kg</p>
1	<p>Additional Set of Manuals</p> <p>Additional set of manuals for the above selected MR system.</p>
1	<p>MR Mobile Rigging and Installation</p>
1	<p>T+D Preinstall kit for fixed table</p>
1	<p>Standard Cryogens</p>
1	<p>MR Project Management</p> <p>A Siemens Project Manager (PM) will be the single point of contact for the implementation of your Siemens equipment. The assigned PM will work with the customer's facilities management, architect or building contractor to assist you in ensuring that your site is ready for installation. Your PM will provide initial and final drawings and will coordinate the scheduling of the equipment, installation, and rigging, as well as the initiation of on-site clinical education.</p>
1	<p>Armrest #MR</p>
1	<p>Initial onsite training 32 hrs</p> <p>Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p>Follow-up training 32 hrs</p> <p>Up to (32) hours of follow-up on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p>MR Dot Govt. Training Class (No T&L)</p> <p>Tuition for (1) government attendee to attend a Classroom Course of choice at one of the Siemens training centers. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p>Additional onsite training 32 hours</p> <p>Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist if applicable. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.</p>
1	<p>Spectris Solaris EP Injector-mobile</p>

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1	<p>GOBrain</p> <p>GOBrain delivers reliable quality at exceptional speed. It enables clinically validated, push-button brain exams, with multiple orientations and all relevant contrasts. This fast exam is more tolerable for patients, and helps reduce motion-related artifacts and the need for rescans and sedation. As a result, GOBrain potentially doubles throughput and reduces costs per scan. Supported by our Tim 4G technology and DotGO, it delivers consistently high quality and maximizes the productivity of your MRI scanner - while improving patient care.</p>
1	<p>MR400 Basic + AA,O2,IBP(x2),Temp</p> <p>Feature set includes non-invasive blood pressure, wireless ECG, wireless SpO2, low-flow CO2, respiration monitoring, dual anesthetic agent detection, O2 monitoring, invasive blood pressure (2 channel), and body/surface temperature. Includes all standard accessories.</p> <p>Expression Patient Monitor (MR400): 15 inch Widescreen Touchscreen interface, MRI Rating 5,000 gauss 4W/kg SAR 3.0T, 8-Hour Smart Battery Technology, 3rd-Gen Wireless ECG with Advanced Filters, 3rd-Gen Wireless Pulse Oximetry (SpO2) with Perfusion Index, Single-Lumen Non-Invasive Blood Pressure (NIBP), CO2 monitoring with Respiration Rate, Wired and wireless gating with MRI systems, and Multi-priority alarm system with CDS. All parameters support Adult, Pediatric, Infant and Neonatal applications.</p> <p>Includes all hardware accessories, and reusable and disposable accessories for 20 Adult and Pediatric patients.</p> <p>One (1) day on-site system training, One (1) year limited warranty and factory service for hardware provided by Invivo.</p>
1	<p>MR400-X47 Patient Accessories</p> <p>Bundled accessories to be used with the Expression MR400 MRI patient monitor.</p> <p>Includes all hardware accessories and reusable and disposable accessories for 20 adult and pediatric patients.</p>
1	<p>Expression IP5 19" Touchscreen Display</p> <p>Control room display for the Invivo Expression patient monitor. Not to be used inside the MR room. Includes one year warranty through Invivo.</p>
1	<p>Optional IP5 Flex Antenna</p> <p>Optional flex antenna for the Invivo Expression IP5 display.</p>
1	<p>teamplay Welcome & Registration Package</p> <p>teamplay is a cloud-based network that brings together your imaging modality users, the systems' dose and utilization data, and the users' expertise to help you improve the delivery of care to your patients. Basic features are provided free of charge. Premium features (benchmarking, non-Siemens devices) are provided on a trial basis for three months at no charge, and may be used thereafter on a subscription fee basis.</p> <p>To register: http://teamplay.siemens.com/#!/institutionRegistration/1</p>
1	<p>GOKnee3D</p> <p>GOKnee3D is a 10-minute, push-button examination for diagnostic imaging of the knee developed and clinically validated by the US board certified MSK radiologists at John Hopkins University Hospital. GOKnee3D exam consists of AutoAlign localizer in the knee, PD weighted contrast and T2 weighted contrast with fat suppression. The AutoAlign technology provides a push-button functionality and ensures consistency in imaging. The 3D protocols are high resolution and isotropic, enabled by SPACE sequence with CAIPIRINHA technique. SW syngo MR E11C AP04 is required for GOKnee3D. Examination time for 3T system is 10 minutes, for a 1.5T system is up to 11 minutes. All given examination times are examination only, adjustments have been excluded. Applies to measurements only with 15channel knee coil.</p>

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MAGNETOM Aera/Skyra/Avanto FIT Complimentary Biomed Training

This educational offering includes system training tuition for 1 clinical engineering professional on the MAGNETOM Aera, Skyra, Avanto FIT, and the syngo multimodality workstation as applicable. The training curriculum depends on and is limited to the system purchased and may include multiple courses including classroom training in USA or an international site, and/or virtual and web-based training. Additional modality basics training may be required as a prerequisite to these courses and must be purchased separately. This system training includes a 15% discount. Travel and lodging are not included. This educational offering must be completed by the later of (12) months from purchase or install end date; if training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund. This forfeiture does not apply to Federal government agencies.

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This educational offering includes system training tuition for 1 clinical engineering professional on the MAGNETOM Aera, Skyra, Avanto FIT, and the syngo multimodality workstation as applicable. The training curriculum depends on and is limited to the system purchased and may include multiple courses including classroom training in USA or an international site, and/or virtual and web-based training. Additional modality basics training may be required as a prerequisite to these courses and must be purchased separately. This system training includes a 15% discount. Travel and lodging are not included. This educational offering must be completed by the later of (12) months from purchase or install end date; if training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund. This forfeiture does not apply to Federal government agencies.

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Service Essentials for MR

This educational offering covers modality service essential training tuition for 1 clinical engineering professional on the MR imaging systems. The training curriculum depends on and is limited to the system purchased and may include multiple courses including classroom training and/or virtual and web-based training. This offering includes a 15% discount. Travel and lodging are not included. This educational offering must be completed by the later of (12) months from purchase or install end date; if training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund. This forfeiture does not apply to Federal government agencies.

Offset Part 14407354 Additional Set of Manuals (

Offset for Initial onsite train 32 hrs

Offset Part MR_FOLLOWUP_32 Follow-up training 32 hrs

Certified Medical Coaches Aera trailer Proposal #18-175LWM

Medical Coaches (MEDC) mobile MR trailer for use with the Siemens (mobile ready) MAGNETOM Aera - 1.5T MRI System. The standard Siemens certified MR trailer meets Medical Coaches' specification #120517/Aera, Drawing #D24298. Vehicle sizing and power requirements prepared to USA Standards.

Offset MAGNETOM Aera/Skyra/Avanto FIT Complimentary Biomed Training

Detailed Technical Specifications

Description

MAGNETOM Aera - the first 1.5T Tim+Dot system - integrates the next generation Tim (Total imaging matrix) - Tim 4G and the Siemens unique Dot (Day optimizing throughput) engines enabling workflow efficiency combined with higher diagnostic confidence due to consistent results.

The system includes:

Tim 4G+Dot

Tim 4G provides increased patient comfort and optimized workflow efficiency. Only one patient setup, no repositioning, no changing of coils. Ultra-light-weighted coils with high density of coil elements for maximized patient comfort and increased SNR. Feet-first positioning for almost all examinations possible reduces claustrophobia. Tim 4G with its 4G flexibility, 4G accuracy and 4G speed brings image quality and acquisition speed to a new level.

Dot offers a customizable framework for patient personalization, user guidance and exam automation. Optimized scan strategies are provided and can be selected based on patient condition, which allow for high quality exams even when conditions change. Integrated decision points allow the user to easily add or remove one or a group of protocols with one click. Step by step image and text guidance guides novice users even through the most complicated exams. Exam automation allows optimal timing for breathing, scanning, planning or contrast arrival. Dot can be easily customized to follow the individual standards of care. Dot is personalized, guided and automated and designed to improve workflow efficiency and image consistency.

MAGNETOM Aera with its 70 cm Open Bore design and a system length of only 145 cm gives a patient friendly appearance that can significantly help patients with anxiety or claustrophobia.

Magnet:

- Ultra-short 137 cm long (145 cm with covers), whole-body superconductive 1.5T magnet with active shielding (AS) technology with counter coils
- External Interference Shielding (E.I.S.)
- Excellent homogeneity enabled by TrueForm magnet design which allows for a cylindrically optimized homogeneity volume resulting in higher image quality (50 × 50 × 45 cm³ DEV, typ. 3.1 ppm based on the 24-plane plot method)
- The magnet has a helium capacity of approximately 1,280 liters and a typical Helium boil-off rate of 0 l/yr during typical, undisturbed clinical operation depending on the sequences used and examination time, and provided the system is serviced in regular intervals.
- It has an integrated magnet cooling system.

Gradient system :

- Actively shielded water-cooled world-class gradient system
- True Form Gradient Design
- All axes force compensated

DirectRF - RF Transmit/Receive System:

- Fully integrated Transmit and Receive path in the magnet housing including extremely compact water-cooled solid state amplifier with 26.1 kW peak power
- High dynamic range
- Immediate feedback loop for real-time sequence adaptation
- Integrated no tune transmit/receive Body Coil
- The revolutionary Tim 4G technology allows connecting 204 channels (coil elements) simultaneously enabling higher SNR and iPAT in all directions. No repositioning of patients is needed even for large Field of View

Description

examinations.

- Dual-Density Signal Transfer enables ultra-high density coil design by integrating key RF components into the local coil.

Tim Table

- The maximum scan range of the Tim Table is 140 cm. A scan range of 205 cm can be achieved with the Tim Whole Body Suite (optional)
- The maximum patient weight of 250 kg (550 lbs) is valid for horizontal and vertical movements, which ensures maximized patient comfort for obese patients.
- The patient table can be lowered to a minimum height of 52 cm from the floor, for easier patient positioning and better accessibility for geriatric, pediatric or immobile patients. An infusion stand is integrated to ensure fast patient set up also for critical patients.
- Multiple Tim4G coils can be connected at once for efficient and patient friendly examinations.
- The Tim Table can be moved with two clicks into the isocenter - one click to the upmost position and one click into the isocenter.

Dot (Day Optimizing Throughput) engine

Dot multiplies the power of Tim resulting in greater image consistency and diagnostic confidence

Dot Control Centers and Dot Display

- The ergonomically designed Dot Control Centers are integrated left and right into the front covers for controlling table movement and interaction with the Dot Display. The Dot Control Centers are well illuminated for easy visual recognition.
- Automated table move up to upmost position, to center position or Home position facilitate smooth patient preparation and will reduce table time
- Variable (6 levels) ventilation and lighting inside the magnet bore or volume adjustments are possible for increased patient comfort
- The Dot Display provides on board guidance for patient set up where it's needed - directly at the scanner. Information such as patient name or exam type or required patient position, guidance for ECG set up and immediate visualization of physiological curves will be provided for convenient operation.
- Almost all table control functions, including ventilation and illumination of the magnet bore, can be also controlled from the operator console for convenient operation.

Dot Technology

Dot gives uniquely tailored, optimized scans configurable to patient condition or clinical question.

Dot provides patient personalization, user guidance and exam automation and is of course configurable by the user to adapt to the different clinical needs and standards of care.

Brain Dot Engine

The Brain Dot Engine provides guided and automated workflows customizable to the site specific standards of care for general brain examinations. The Brain Dot Engine supports the user in achieving reproducible image quality with increased ease of use and time efficient exams.

The brain workflow can be personalized to the individual patient condition and clinical need. Several predefined strategies are included, which can be easily selected with one click. They can be changed at any time during the brain workflow.

Protocols tailored for use of contrast media are integrated.

- Standard: Standard examination with 2D protocols
- Resolution focus: Examination with 3D protocols (with e.g. SPACE) for detailed views
- Speed focus: Examination with fast 2D protocols (with e.g. HASTE) for further speeding up the exam
- Motion insensitive: Examination with *syngo* BLADE protocols
- to minimize and correct for the effects of motion automatically

Step-by-step user guidance is seamlessly integrated. Example images and guidance text are displayed for each individual step of the scanning workflow. Both - images and text - are easily configurable by the user.

Easy positioning of the patient with AutoPosition. The patient is automatically placed at the isocenter without any laser marking required.

Description

AutoAlign Head provides automated, positioning and alignment of slice groups to the anatomy, relying on multiple anatomical landmarks. Besides basic brain positioning, AutoAlign Head computes reference position for several other brain structures such as the inner ear, the orbits and the optic nerve.

Automatic real-time calculation of trace-weighted images and ADC maps with Inline Diffusion Technology.

Easy rerun or repeat with functionality allows for reduced table time. Alternatively an exam can be repeated with a changed strategy.

The Brain Dot Engine as all Dot engines can be modified by the user to their individual standard of care.

Tim Application Suite

The Tim Application Suite offers a complete range of clinically optimized sequences, protocols and workflow functionalities for all body regions. Excellent head-to-toe imaging can be accomplished with the sequences and features included in this application suite. To enable this comprehensive application range, ten dedicated application packages have been included.

- syngo TimCT FastView
- Neuro Suite
- Angio Suite
- Cardiac Suite
- Body Suite
- Onco Suite
- Breast Suite
- Ortho Suite
- Pediatric Suite
- Scientific Suite

syngo TimCT FastView

syngo TimCT FastView is a “one go” localizer for the whole body or large body regions such as the whole spine or the whole abdomen. It acquires the complete extended Field of View in one volume with isotropic resolution. Transversal, coronal and sagittal reformats of the volume are calculated inline and displayed for planning subsequent exams. Moreover, while planning is underway, adjustments are acquired automatically for further time savings in subsequent measurements.

syngo TimCT FastView runs without laser light positioning to further streamline the workflow for several indications.

Neuro Suite

Comprehensive head and spine examinations can be performed with dedicated programs. High resolution protocols and fast protocols for uncooperative patients are provided. The Neuro Suite also includes protocols for diffusion imaging, perfusion imaging, and fMRI. It includes for example:

- EPI sequences and protocols for diffusion, perfusion and fMRI for advanced neurological applications. Diffusion weighted imaging is possible with up to 16 b-values in the orthogonal directions. Dynamic Analysis software (included in standard configuration) enables calculation of:
 - ADC maps
 - t-test maps from the EPI images for fMRI
 - Time-to-Peak maps for perfusion analysis.
- Whole spine protocols acquire in multiple steps via software controlled table movement in a single click.
- 3D isotropic resolution volume imaging using T1 3D MPRAGE / 3D FLASH, SPACE DarkFluid, T2 SPACE and 3D TSE
- T2-weighted high resolution 3D Restore protocols optimized for inner ear examinations
- Whole-spine protocols in multiple steps with software controlled table movement
- 2D and 3D MEDIC protocols for T2-weighted imaging, particularly for C-spine examinations in axial orientation where reproducibility is difficult due to CSF pulsations and blood flow artifacts
- 3D Myelograms with 3D HASTE and 3D True-FISP for anatomical details
- Dynamic sacro-iliac joint imaging after contrast administration using a fast T1-weighted FLASH 2D sequence

Description

- Spine diffusion protocols to differentiate osteoporosis versus tumor infiltration and post-radiotherapy changes versus residual tumor with PSIF sequence
- Precision filter for high spatial accuracy e.g. for neuro intra-operative imaging and stereotactic planning
- 3D CISS (Constructive Interference in Steady State) for excellent visualization of fine structures such as cranial nerves. High resolution imaging of inner ear and spine
- AutoAlign Head LS providing a fast, easy, standardized, and reproducible patient scanning supporting reading by delivering a higher and more standardized image quality

Angio Suite

Excellent MR Angiography can be performed to visualize arteries and veins with or without contrast agent.

Contrast-enhanced MRA

- 3D contrast-enhanced MRA protocols for e.g. single step, dynamic, peripheral, whole body MRA with the shortest TR and TE. The strong gradients make it possible to separate the arterial phase from the venous phase.
- TestBolus workflow for optimized bolus timing and superb image quality.
- CareBolus functionality for accurate determination of the bolus arrival time and the "Stop and Continue" of the 3D ce-MRA protocol after the 2D bolus control scan.
- Dynamic ce-MRA for 3D imaging over time.

Non-contrast-MRA and venography

- 2D and 3D Time-of-Flight (ToF) protocols for MRA for the Circle of Willis, carotids, neck vessels, and breath-hold protocols for abdominal vessels
- Triggered 2D ToF sequences for non-contrast MRA, particularly of the abdomen and the extremities
- 2D/3D Phase-Contrast
- MR venography with 2D/3D Time-of-Flight (ToF) and Phase-Contrast
- TONE (Tilted Optimized Non-saturation Excitation) and MTC (Magnetization Transfer Contrast) techniques for improved Contrast-to-Noise Ratio (CNR)

Image processing tools

- MPR, MIP, MinIP, and 3D SSD (Multiplanar Reconstruction, Maximum Intensity Projection, Minimum Intensity Projection, Shaded Surface Display)
- Inline MIP for immediate results
- Inline subtraction of pre- and post-contrast measurements
- Inline standard deviation maps of Phase-Contrast measurements for delineation of arteries and veins

Cardiac Suite

The cardiac suite covers comprehensive 2D routine cardiac applications, ranging from morphology and ventricular function to tissue characterization. Featuring *syngo* BEAT 2D in conjunction with iPAT and T-PAT techniques.

Cardiac views

- Fast acquisition of the basic cardiac orientations for further examination planning
- Cardiac scouting provides users with a step-by-step procedure for the visualization and planning of typical cardiac views, e.g. based on TrueFISP or Dark Blood TurboFLASH: short axis, 4-chamber and 2-chamber views.

syngo BEAT

- Unique tool for fast and easy cardiovascular MR imaging
- E.g. 1 click change from FLASH to TrueFISP for easy contrast optimization
- 1-click to switch arrhythmia rejection on / off
- 1-click change from Cartesian to radial sampling to increase effective image resolution (e.g. in pediatric patients) and avoid folding artifacts in large patients

Visualization of structural cardiovascular pathologies with CMR – syngo BEAT

- Breath-hold and free breathing techniques for strong contrast between the blood and vascular structures. Dark Blood TSE and HASTE imaging are available for the structural evaluation of the cardiothoracic anatomy, including vessels or heart valves. Cine techniques (FLASH & TrueFISP) for high-resolution valve evaluation
- Multiple contrasts such as T1- and T2-weighted imaging for use in diseases such as myocarditis (inflammation / hyperaemia), ARVD (fibrous-fatty degeneration) or acute myocardial infarction (edema)
- Dark-blood TSE with motion compensation for high-quality vessel wall imaging in small or large vessels

Description

Tools for rapid evaluation of left or right ventricular function

- Acquisition of a stack of short-axis slices (standard segmented FLASH, or advanced segmented TrueFISP)
- Automatic adjustment of the acquisition window to the current heart rate
- Use of the Inline ECG for graphical ECG triggering setup
- Retrospective gating with cine sequences (TrueFISP, FLASH)
- Protocols for whole-heart coverage
- iPAT integration for highest temporal and spatial resolution
- Real-time imaging in case the patient is not able to hold his breath

Dynamic imaging and tissue characterization with syngo BEAT

- Protocols for high-contrast and high-resolution tissue characterization
- Protocols for stress and rest imaging with TrueFISP or TurboFLASH contrast support the acquisition of multiple slices with high resolution and arbitrarily adjustable slice orientation for each slice
- T-PAT with mSENSE and GRAPPA for advanced parallel imaging provides fast high-resolution dynamic imaging
- Segmented IR TrueFISP / FLASH with T1 scout for optimization of tissue contrast
- Advanced tissue characterization with 2D phase-sensitive IR (PSIR) sequences TrueFISP and FLASH contrast. Magnitude and phase-sensitive images with one acquisition
- Simple: no adjustment of inversion time (TI) necessary with PSIR technique
- Ungated single-shot PSIR imaging for tissue characterization under difficult conditions: free-breathing technique that can be applied even in case of arrhythmia

Physiological Measurement Unit (PMU) - Wireless Physio Control

- Synchronizes the measurement with the physiological cycles (triggering to minimize motion artifacts caused by cardiac and respiratory movements)
- Wireless Sensors
- Wireless Vector ECG / respiration and pulse sensors for physiologically synchronized imaging, rechargeable battery-powered - for optimized patient handling
- Physiological Signals Display
- ECG (3 channels)
- Pulse
- Respiration
- External Trigger Input Display

ECG Triggering:

- Acquisition of multiple slices, e.g. of the heart, at different phases of the cardiac cycle
- Excellent image quality by synchronizing data acquisition with cardiac motion
- Peripheral Pulse Triggering: Reduces flow artifacts caused by pulsatile blood flow
- Excellent image quality by synchronizing data acquisition to the pulsatile blood flow
- Respiratory Triggering: Excellent image quality by synchronizing data acquisition with the respiratory motion
- External Triggering: Interface for trigger input from external sources (e.g. Patient Monitoring System) inside the examination room
- Interface for trigger input from external sources (e.g. pulse generator, trigger sources for fMRI) outside the examination room
- Optical trigger output for fMRI
- Retrospective gating for ECG, peripheral pulse, and external trigger input

Breast Suite

MR imaging has proven a very high sensitivity for breast lesions and is the gold standard for the examination of silicone implants. Extremely high spatial and temporal resolution can be achieved in very short measuring times by using iPAT with GRAPPA.

Excellent soft tissue differentiation, customized protocols (e.g. with fat saturation or water excitation or silicone excitation), as well as flexible multiplanar visualization allow for fast, simple and reproducible evaluation of MR breast examinations.

This package includes:

Description

- Quantitative evaluation and fast analysis of the data with colorized Wash-in, Wash-out, Time-To-Peak, Positive-Enhancement-Integral, MIPtime and combination maps with Inline technology or for offline calculation
- High-resolution 2D protocols for morphology evaluation
- High-resolution 3D protocols covering both breasts simultaneously
- Protocols to support interventions (fine needle and vacuum biopsies, wire localization)
- Protocols for evaluating breasts with silicone implants
- Automatic and manual frequency adjustment, taking into account the silicone signal
- Detection of the silicone signal either to suppress the silicone signal, if the surrounding tissue is to be evaluated, or to suppress the tissue signal in order to detect an implant leakage
- SPAIR - robust fat sat (robust fat suppression using an adiabatic frequency selective inversion pulse)
- DIXON - 2-point Dixon with 3D VIBE, the following contrasts can be obtained: in-phase, opposed phase, fat and water image.
- iPAT with GRAPPA for maximum resolution in short time
- Inline subtraction and MIP display
- Offline subtraction, MPR and MIP display
- *syngo* REVEAL: diffusion imaging for breast exams
- iPAT Extension allows bilateral 3D sagittal breast imaging with Fat Sat or Water excitation

The Breast Suite also includes:

***syngo* VIEWS (Volume Imaging with Enhanced Water Signal)**

- bilateral - both breasts are examined simultaneously
- axial - the milk ducts are directly displayed
- fat-saturated or water-excited - fat complicates clinical evaluation and is suppressed
- near-isotropic 3D measurement - the same voxel size in all three directions for reconstruction in any slice direction
- submillimeter voxel - highest resolution for precise evaluation

Body Suite

Body Suite covers your needs for clinical body applications. Ultrafast high resolution 2D and 3D protocols are provided for abdomen, pelvis, MR Colonography, MRCP, dynamic kidney, and MR Urography applications. Siemens unique 2D PACE technique makes body imaging easy allowing for multi-breath hold examinations as well as free breathing during the scans. Motion artifacts are greatly reduced with 2D PACE Inline technology.

This package includes:

- Free breathing 2D PACE applications with 2D/3D HASTE (RESTORE) and 2D/3D TSE (RESTORE)
- Optimized fast single shot HASTE protocols and high-resolution 3D RESTORE protocols based on SPACE and TSE for MRCP and MR Urography examinations

ABDOMEN:

2D:

- T1w (FLASH) breath-hold scans +/- Fat Sat (SPAIR, Q-FatSat, in-/opp-phase)
- T2w (HASTE, TSE/BLADE, EPI) breath-hold scans +/- Fat Sat (SPAIR, FatSat, STIR)
- T1w (TFL) triggered scans (2D PACE free breathing) in-/opp-phase
- T2w (HASTE, TSE/BLADE, EPI) triggered scans (2D PACE free breathing) +/- Fat Sat (SPAIR, FatSat, STIR) as well as HASTE- and TSE-multi-echo
- Optimized fast single shot HASTE protocols and high-resolution 3D RESTORE protocols based on SPACE and TSE for MRCP and MR urography examinations

3D:

- Dixon (VIBE 2pt-Dixon) breath-hold scans, following contrasts can be obtained: in-phase, opposed phase, fat and water image.
- Dynamic (VIBE + Q-FatSat) protocols for best visualization of focal lesions with high spatial and temporal resolution
- Colonography bright lumen with T2-weighted TrueFISP and dark lumen with T1-weighted VIBE
- CAIPIRINHA enables VIBE sequence with improved iPAT² algorithm to improved abdominal dynamic scans

Description

as well as SNR. Reduced patient stress can be achieved through reduced acquisition (and breathhold) times.

PELVIS:

- High-resolution T1w, T2w pelvic imaging (prostate, cervix)
- Isotropic T2w SPACE 3D protocols for tumor search in the pelvis
- Dynamic volume examinations with 3D VIBE
- *syngo* REVEAL: diffusion imaging for liver and whole body exams

Onco Suite

MR imaging has an excellent advantage of soft tissue contrast, multi-planar capabilities and the possibility of selectively suppressing specific tissue e.g. fat or water. This helps visualize pathologies, particularly metastases. The Onco Suite features a collection of sequences as well as protocols and evaluation tools that guide through a detailed screening of clinical indications, such as in hepatic neoplasms.

This package includes:

- STIR TSE and HASTE, FLASH in-phase and opposed-phase protocols with a high sensitivity to metastases visualization
- Dynamic imaging protocols for assessment of the kinetic behavior for lesion visualization and characterization
- Quantitative evaluation and fast analysis of the data with colorized Wash-in, Wash-out, Time-To-Peak, Positive-Enhancement-Integral, MIPtime and combination maps with Inline technology or for offline calculation
- Display and analysis of the temporal behavior in selected regions of interest with the included MeanCurve postprocessing application. This includes the capability of using additional datasets as a guide for defining regions of interest even faster and easier than before.
- *syngo* REVEAL: diffusion imaging for liver and whole body exams

Dedicated prostate protocols for detection, localization, and staging of tumors and recurrences

- *syngo* REVEAL (diffusion-weighted imaging)
- Protocols with high temporal resolution allow time course evaluation based on pharmacokinetic modeling

OrthoSuite

Ortho Suite is a comprehensive collection of protocols for joint and spine imaging. MR imaging is especially suitable for avascular necrosis and internal derangements. The protocols included in this Suite can also be applied for imaging of tumors and infections.

This package includes:

- 2D TSE protocols for PD, T1 and T2-weighted contrast with high in-plane resolution and thin slices
- 3D MEDIC, 3D TrueFISP protocols with water excitation for T2-weighted imaging with high in-plane resolution and thin slices
- High resolution 3D VIBE protocol for MR arthrography (knee, shoulder and hip)
- 3D MEDIC, 3D TrueFISP, 3D VIBE protocols with water excitation having high isotropic resolution, optimized for 3D post-processing
- PD SPACE with fat saturation and T2 SPACE with high isotropic resolution optimized for 3D post-processing
- Whole spine single-step or multi-step protocols
- Excellent fat suppression in off-center positions, e.g. in the shoulder due to high magnet homogeneity
- Dynamic TMJ and ilio-sacral joint protocol
- Susceptibility-insensitive protocols for imaging in the presence of a prosthesis
- Multi-Echo SE sequence with up to 32 echoes for the calculation of T2 time maps (calculation included in the Scientific Suite)
- High resolution 3D DESS (Double Echo Steady State): T2 / T1-weighted imaging for excellent fluid-cartilage differentiation

syngo WARP Susceptibility Artifact Reduction

- 2D TSE sequences with high bandwidth protocols tailored to reduce susceptibility artifacts. Available protocols include T1-weighted, T2-weighted, proton density and STIR contrast.

Pediatric Suite

The parameters for pediatric imaging vary significantly in comparison to the parameters for adults. The reasons are developing tissues, body size, faster heart rates and restricted compliance with breath-hold commands. Protocols can be adapted for imaging infants.

Description

Scientific Suite

Scientific Suite supports the scientifically oriented user with an easy access to application-specific data for further processing and advanced image computation methods.

- Support of USB memory sticks
- Access to the file system by means of a secure and convenient browser
- Anonymization of patient data
- Easy generation of AVIs and screenshots for integration into presentations and training videos
- Export function for tables, statistics and signal-time-courses in a communal format (MeanCurve, Spectroscopy, DTI evaluation)
- Advanced image computation methods such as T2 and T1 time calculation, addition, subtraction, multiplication, division, and integration of images

The sequences, features and techniques for acquisition and reconstruction included in the Tim Application Suite are described in detail below.

Sequences

Spin Echo family of sequences:

- Spin Echo (SE) - Single, Double, and Multi Echo (up to 32 echoes); Inversion Recovery (IR)
- 2D / 3D Turbo Spin Echo (TSE) - Restore technique for shorter TR times while maintaining excellent T2 contrast; TurboIR: Inversion Recovery for STIR, DarkFluid T1 and T2, TrueIR; Echo Sharing for dual-contrast TSE
- 2D / 3D HASTE (Half-Fourier Acquisition with Single Shot Turbo Spin Echo) - Inversion Recovery for STIR and DarkFluid contrast
- SPACE for 3D imaging with high isotropic resolution with T1, T2, PD, and DarkFluid Contrast

Gradient Echo family of sequences:

- 2D / 3D FLASH (spoiled GRE) - dual echo for in- / opposed phase imaging 3D VIBE (Volume Interpolated Breathhold Examination) - quick fat saturation; double echo for in-phase / opposed phase 3D imaging; DynaVIBE: Inline 3D elastic motion correction for multi phase data sets of the abdomen; Inline Breast Evaluation
- 2D / 3D MEDIC (Multi Echo Data Image Combination) for high resolution T2 weighted orthopedic imaging and excellent contrast
- 2D / 3D TurboFLASH - 3D MPRAGE; single shot T1 weighted imaging e.g. for abdominal imaging during free breathing
- 3D GRE for field mapping
- 2D / 3D FISP (Fast Imaging with Steady State Precession)
- 2D / 3D PSIF - PSIF Diffusion
- Echo Planar Imaging (EPI) - diffusion-weighted; single shot SE and FID e.g. for BOLD imaging and Perfusion-weighted imaging; 2D / 3D Segmented EPI (SE and FID)
- ce-MRA sequence with Inline subtraction and Inline MIP
- 2D / 3D Time-of-Flight (ToF) Angiography - single slab and multi slab; triggered and segmented
- 2D / 3D Phase Contrast Angiography
- syngo BEAT Tool - TrueFISP segmented; 2D FLASH segmented;
- Magnetization-prepared TrueFISP (IR, SR, FS); IR TI scout; Retrogating

Standard Fat/Water Imaging

- Fat and Water Saturation. Additional frequency selective RF pulses used to suppress bright signal from fatty tissue. Two selectable modes: weak, strong
- Quick FatSat
- SPAIR: robust fat suppression for body imaging using a frequency selective inversion pulse
- Fat / Water Excitation. Spectral selective RF pulses for exclusive fat / water excitation
- Dixon technique for fat and water separation - available both based on VIBE (2 point Dixon)

Description

Standard Techniques

- True Inversion Recovery to obtain strong T1-weighted contrast
- Dark Blood inversion recovery technique that nulls fluid blood signal
- Saturation Recovery for 2D TurboFLASH, gradient echo, and T1-weighted 3D TurboFLASH with short scan time (e.g. MPRAGE)
- Freely adjustable receiver bandwidth, permitting studies with increased signal-to-noise ratio
- Freely adjustable flip angle. Optimized RF pulses for image contrast enhancement and increased signal-to-noise ratio
- MTC (Magnetization Transfer Contrast). Off-resonance RF pulses to suppress signal from certain tissues, thus enhancing the contrast. Used e.g. in MRA
- Argus viewer for reviewing cine studies•
- Report Viewer for DICOM structured reports including report editing
- Dynamic Analysis for addition, subtraction, division, standard deviation, calculations of ADC maps, T1 and T2 values, TTP, t-Test, etc.
- Image Filter
- 3D post-processing MPR, MIP, MinIP, SSD
- Flexible film formats and paper print
- Data storage of images and cine AVI files on CD / DVD with DICOM viewer as the viewing tool for hand out to the patients or referrals
- Selectable centric elliptical phase reordering via the user interface
- Inversion Recovery to nullify the signal of fat, fluid or any other tissue
- Multiple Direction Diffusion Weighting (MDDW) - perform diffusion tensor imaging with multiple diffusion weightings and up to 12 directions for generating data sets.

Standard techniques for Flow Artifact reductions

- LOTA (LongTerm Data Averaging) technique to reduce motion and flow artifacts
- Pre-saturation techniques using RF saturation pulses to suppress flow and motion artifacts
- Tracking SAT bands maintain constant saturation of venous and/or arterial blood flow eg. for 2D/3D sequential MRA
- TONE (Tilted Optimized Non-saturating Excitation - variable excitation flip angle to compensate inflow saturation effects in 3D MRA - selectable on desired flow direction and speed
- Gradient Motion rephasing permitting effective reduction of flow artifacts

Standard Motion Correction

- *syngo* Blade - improves image quality by minimizing and correcting for the effects of motion during an MR sequence acquisition. e.g. head, spine, orthopedic imaging and the abdomen
- 1D PACE (Prospective Acquisition CorrEction) allows examination of patients with free breathing
- 2D PACE (Precise Motion Correction) detects and corrects respiratory motion eg of the heart or liver

MAGNETOM Aera runs *syngo* MR software. *syngo*® is the unique software platform for medical applications. Parallel working and one-click exams are efficiently supported and increase productivity. Parallel scanning and reconstruction are standard.

The unique Phoenix technique is the easiest way to exchange protocol data. It supports intelligent extraction of sequence parameters from images acquired on a MAGNETOM Aera system.

Inline technologies, scan@center or AutoVoiceCommands speed up the workflow further.

The context-sensitive "Online Help" function and *syngo* Scan Assistant offer support and propose solutions to MR-specific questions and parameter conflicts.

Studies can be easily networked and managed using the standard DICOM 3.0 protocol for efficient support of workflow. The following standard functions are supported: Send/Receive, Query/Retrieve, Basic Print for DICOM-compatible laser cameras (Camera is not included in the basic unit. Verify if existing camera is compatible or order separately.), DICOM Worklist, DICOM Storage Commitment (SC) DICOM Modality Perform Procedure Step (MPPS), DICOM Structured Report (SR), DICOM Study Split.

Patient Communication

Description

- The intercom system includes an ergonomically designed patient communication unit for desktop positioning on the *syngo* Acquisition Workplace and pneumatic headphones for the patient.
- It controls emergency table stop, volume control of speaker and headphones in the examination room, volume control of speaker in the control room, response to the patient's activation of the assistance-call button and provides a connection to an external audio system (external audio system is not included in the basic unit) for music playback.

Computer system

The high performance measurement and reconstruction system and the high performance host computer are ideally suited for even the most demanding applications. The PC-based computer system uses the intuitive *syngo* MR user interface. The computer system includes the following components:

High-performance host computer

- Intel Xeon processor \geq E5-1620 QuadCore
- Clock rate 3.6 GHz, or comparable
- Main Memory (RAM) \geq 16 GB
- Three hard disks
 - system SW \geq 300 GB SAS
 - data base \geq 300 GB SAS
 - images \geq 300 GB SAS
- DVD-R writer for CD-R (approx. 4000 images 256² DICOM Standard, ISO 9660) and DVD-R (approx. 25 000 images 256² DICOM Standard, ISO 9660) storage of DICOM data or other data like AVI files
 - DVD-ROM drive
 - Electronic mouse.
- The combination of host computer and the measurement and reconstruction system offers a truly powerful imaging system designed for large image matrix sizes of up to 1024 x 1024. The unrestricted multitasking capability allows time-saving parallel scanning and reconstruction.
- High-resolution 19" color LCD flatscreen monitor with 1280 x 1024 pixel display, integrated gamma correction for optimum display of radiographic grayscale images and automatic backlight control for longterm brightness stability.

Installation:

- The relatively lightweight design of the MAGNETOM Aera in most cases eliminates the need for structural building reinforcements and thus facilitates installation in upper floors.
- The compact integrated design allows for short installation times and reduces the required space to less than 30 sqm (323 sq. ft.) for the entire installation. The minimum room height clearance is only 2.40 m (7' 10").
- MAGNETOM Aera allows siting of the system without a dedicated computer room - no additional cooling or floor requirements.
- MAGNETOM Aera combines state-of-the-art performance with peace of mind. High system availability is ensured by the expert, highly trained Siemens MR service engineers;
- Your Siemens service contract (not included in the basic unit) offers a comprehensive range of benefits such as Uptime Remote Diagnostics for improved productivity and maximum uptime.

Tim [204x48] performance level

Tim 4G offers DirectRF a completely redesigned RF architecture. This all digital-in/ digital-out design integrates all RF transmit and receive components at the magnet, eliminating analog cables for true signal purity. This compact and efficient design enables feedback loop for unmatched RF stabilization.

The innovative coil architecture packs more coil elements in a smaller space and the system provides a maximum number of 204 channels (coil elements) that can be connected simultaneously. The newly designed ultra-high density array is an essential part supplementing Tim 4G. Advanced iPAT capabilities and SNR are enabled by the 48 independent RF channels that can be used simultaneously in one single scan and in one single FOV, each generating an independent partial image.

An additional benefit of multiple coil elements and receiver channels is improved performance in multi-directional, i.e. three dimensional, high-speed, high-resolution iPAT in the head-feet, anterior-posterior or left-right directions. This option includes also Advanced High Order Shim.

Description

XQ gradients

Siemens XQ gradients provide actively shielded, water cooled world-class gradients. All axes are force-compensated.

The XQ gradients have:

- Maximum gradient amplitude of 45 mT/m, per axis, i.e. 78 mT/m vector summation gradient performance,
- max. slew rate 200 T/m/s per axis, i.e. 346 T/m/s vector summation,
- minimal rise time 225 μ s, from 0 to 45 mT/m amplitude
- Max. output voltage for each of the gradient axes 2250 V
- Max. output current for each of the gradient axes 900 A
- Separate cooling channels that simultaneously cool primary and secondary coils allow the application of extremely gradient intensive techniques in a new class of performance.
- 100% duty cycle for fast and demanding techniques such as ultra-short TE MRA in continuous operation, thin slice single breath-hold liver studies and EPI imaging techniques (all optional in appropriate clinical packages).
- Variable Field-of-View selection from 0.5 cm to 50 cm (up to 45 cm in z direction) for optimal coverage and highest spatial resolution in diagnostic. The minimum slice thickness in 2D and 3D is 0.1 mm and 0.05 mm, respectively.
- Acquisition of sagittal, transverse, coronal, single oblique and double oblique slices with highest resolution.
- The extremely compact water-cooled gradient amplifier features a modular expandable design with excellent linearity and pulse reproducibility. It is digitally controlled and has very low switching losses due to ultrafast solid state technology.

High-performance measurement and reconstruction system

- Two Intel Sixcore Processor \geq E5-2620
- Clock rate of $\geq 2 \times 2.0$ GHz, or comparable
- Main memory (RAM) of 48 GB
- Hard disk for raw data ≥ 300 GB
- Hard disk for system software ≥ 300 GB
- Parallel Scanning and Reconstruction of up to 12 data sets
- Reconstruction speed
 - 22,556 recons per second (256 x 256 FFT, full FoV)

Tim 4G Coils:

The new Tim 4G coil technology with Dual-Density Signal Transfer, DirectConnect and SlideConnect technology combines key imaging benefits:

Excellent image quality, high patient comfort, and unmatched flexibility.

The Tim 4G coils are designed for highest image quality combined with easy handling. The high coil element density increases SNR and reduces examination times. DirectConnect and SlideConnect™ technology reduce patient set up time significantly. The coils are designed with the patient in mind. Light weighted coils and open design ensure highest patient comfort which results in better patient cooperation and image quality. No coil changing with multi-exam studies saves patient setup- and table time.

AutoCoilSelect enables dynamic, automatic, or interactive selection of the coil elements within the Field of View and speeding the exam preparation at the host.

All coils are time-saving "no-tune" coils.

A comprehensive set of pads for comfortable and stable patient positioning together with safety straps are included.

- Head/Neck 20
The 20-channel coil with its 20 integrated pre-amplifiers ensures excellent signal-to-noise ratio. The unique DirectConnect technology allows users connecting the 20 coil elements of the Head/Neck 20 without cables. The patient friendly open design allows for maximum patient comfort which is supported in addition by a look-out mirror for claustrophobic patients. The high channel coil is iPAT compatible in all directions.

Description

The open and light design of the upper coil part increases patient comfort and is removable for easy patient handling. The lower coil part may remain on the table for most of the examinations can be used without the upper part. The Head/Neck 20 and Spine 32 are smoothly integrated into the patient table, thus enabling high flexibility in imaging and fewer coil changes and easy handling when switching patients. The Head /Neck 20 coil is equipped with two removable cushioned head stabilizers for stable and comfortable patient positioning.

The Head/ Neck 20 can be used for applications like head examinations, neck examinations, MR Angiography, combined head/neck examinations or for imaging of the TMJ (temporomandibular joints).

Typically combined with the Spine 32 and Body 18 or Peripheral Angio 36 but also other combinations eg with flexible coils like the Flex Large 4 are possible.

- **Body 18**

The 18-channel coil with its 18 integrated pre-amplifiers ensures maximum signal-to-noise ratio. The 18 coil elements of the Body 18 with only one SlideConnect Plug allows for fast and easy patient preparation resulting in less table time. Fast acquisition times enabled by iPAT in all directions. The light-weighted coil ensures highest patient comfort.

Body 18 operates in an integrated fashion with the Spine 32 as an 30 channel body coil

Body 18 can be combined with further Body 18 coils for larger coverage and positioned in different orientations (0°, 90°, 180°, 270°) for patient specific adaptations

The Body 18 is typically used in combination with the Spine 32 for examinations of the thorax, abdomen, pelvis or hip and operates as a 30 channel body coil (3 rings 10 elements). The Body 18 can also be used for cardiac or vascular applications. Through its perfect combinability with the Spine 32, further Body 18 (optional), the Peripheral Angio 36 (optional), but also the Head/Neck 20 and all flexible coils (e.g. Flex Large 4, Flex Small 4) it contributes for a broad range of indications up to whole-body imaging.

- **Spine 32**

The 32-channel coil with its 32 integrated pre-amplifiers ensures maximum signal-to-noise ratio. The unique DirectConnect technology allows connecting the 32 coil elements of the Spine 32 without the need to plug in any cable. The patient friendly ergonomic design allows for maximum patient comfort. The high element coil is iPAT compatible in all directions.

Smoothly integrated into the patient table the Spine 32 may remain on the patient table for nearly all exams.

The Spine 32 is typically combined with Body 18, Head/Neck 20, Peripheral Angio 36 (optional) or Flex Large 4, Flex Small 4.

- **Flex Large 4/ Flex Small 4**

Light-weighted, very flexible, iPAT compatible, 4-element no-tune receiver coils which are made of soft and smooth material. The coils can be wrapped around or used flat.

Both coils can be connected via Flex Coil interface. One Flex Coil interface is already delivered as standard.

The coils can be used for different examinations ranging from examinations of the extremities to abdominal examinations.

Mobile Kit

The Mobile Kit includes all components that are specially designed for an MAGNETOM Aera in a mobile environment. It contains e.g. Electronics Board Assembly with cover, special cabling, additional quench line components, shock logger kit, mounting kit for magnet to trailer, high altitude venting kit.

The unique color and material selection enhances the visual appeal of the system design, thereby creating an enticing, patient-friendly impression.

The Dot Control Centers and the unique Dot Display are neatly integrated into this main face plate. The aesthetically pleasing and ergonomically designed control elements of the Dot Control Centers are well illuminated for easy visual recognition.

In particular, the table cover and the asymmetric left deco area cover have also been designed to promote a

Description

modern visual appearance. This combination of ingenuity and practical design as presented with "Pure White" design with its brilliant white and the silver trim simply makes the mobile MAGNETOM Aera an overall visually appealing system and creates a patient-friendly environment.

The new MAGNETOM Aera table with its light appealing design allows for a fast patient preparation and maximized patient comfort. It provides unobstructed foot space for attending staff and direct access to the patient. The patient table can be lowered to a minimum height of 52 cm from the floor, for easier patient positioning and better accessibility for geriatric, pediatric or immobile patients. The Tim Table can be moved with two clicks into the isocenter - one click to the upmost position and one click into the isocenter. The tabletop travels beyond the rear end of the system, enabling additional patient access. An infusion stand is integrated to allow for fast patient set up of critical patients. Multiple Tim 4G coils can be connected at once for efficient and patient friendly examinations. The seamless integration of multiple Tim 4G coils is possible via 4 SlideConnect and 4 DirectConnect connector slots, which are embedded in the table. This allows for comprehensive examinations without the need of repositioning.

The keys of the numerical key panel are assigned to syngo-specific functions and labeled with the corresponding syngo icons. The keyboard supports the country specific special characters.

syngo MR E11C provides several workflow and performance enhancements, and an extended IT security configuration.

There are new options (with separate licenses) available with the *syngo* MR E11C software:

- Simultaneous Multi-Slice EPI (for brain diffusion and BOLD imaging)
- Advanced Diffusion (RESOLVE and QuietX Diffusion for brain)
- *syngo* System Security Enhanced

GOBrain comes standard for MAGNETOM Aera and Skyra with Tim [204x48] or higher configurations with E11C.

GOBrain is a set of optimized protocols for diagnostic neuroimaging developed by the board-certified neuroradiologists at Massachusetts General Hospital, USA. These protocols aim to achieve a diagnostic brain examination and are optimized for short acquisition times.

The following contrast and orientations are provided with this protocol:

- sagittal T1-weighted GRE
- axial T2-weighted TSE
- axial T2 TSE FLAIR
- axial Diffusion-weighted single-shot EPI
- axial T2*-weighted EPI-GRE

syngo System Security Basic comes standard for all system configurations with *syngo* MR E11C. *syngo* System Security Basic features provide security settings to protect the scanner against known security threats. It uses an embedded Windows® version that adjusts user rights to the required minimum and restricts network communication to the clinically relevant. It also protects the protocol trees against unauthorized modifications.

Spine Dot Engine:

The Spine Dot Engine provides optimized cervical, thoracic and lumbar spine imaging for patients of all conditions. Spine Dot Engine provides the functionality to simplify your spine workflow by providing tools to reduce examination times, achieve optimal image quality, and assist you during reading.

- User guidance step-by-step
- AutoPosition
- AutoAlign Spine with intervertebral disc detection
- AutoCoverage
- AutoSatPosition
- Initial and interactive snapping
- AutoLabeling of vertebrae

Description

- Automatic curved multiplanar reconstructions of 3D datasets

The Spine Dot Engine includes:

- Tim Planning Suite
- Inline Composing
- *syngo* WARP Susceptibility Artifact Reduction
syngo WARP integrates different techniques tailored to reduce susceptibility artifacts caused by orthopedic MR-Conditional metal* implants. 2D TSE sequence combining optimized high-bandwidth protocols and View Angle Tilting (VAT) technique, tailored to reduce susceptibility artifacts caused by orthopedic MR-Conditional metal* implants. This helps in evaluation of soft tissue in proximity of the implant. Available protocols include T1- weighted, T2-weighted, proton density and STIR contrast.

LargeJoint Dot Engine:

LargeJoint Dot Engine optimizes image quality of knee, hip and shoulder scans by proposing the most appropriate protocols according to the examination strategy chosen for the specific patient. It ensures reproducible image quality and streamlines large joint examinations to the greatest extent.

Dot Exam Strategies

The workflow can be personalized to the individual patient condition and clinical need. The LargeJoint Dot Engine comes with the following predefined strategies, which the user can select according to patient conditions or change at any time during the workflow, when conditions change:

- Image quality: Achieve highest image quality in a reasonable scan time with 2D and 3D protocols.
- Speed focus: Examine patients in the shortest possible time with protocols being accelerated to the maximal extent.
- Motion artifact reduction: Compensate for the effects of motion, e.g. with motion insensitive *syngo* BLADE protocols.
- Artifacts reduction: Reduce susceptibility artifacts, using *syngo* WARP.

AutoAlign

- Automated, localizer based positioning and alignment of slice groups to the anatomy, relying on anatomical landmarks. Providing fast, easy, and reproducible patient scanning and supporting the reading by consistently delivering high image quality with a standardized slice orientation.

Inline MPRs - Automatic multiplanar reconstruction for 3D datasets

- The Multi Planar Reconstruction (MPR) tool uses the position information from the AutoAlign algorithm and can be easily configured to automatically generate any required 2D images from high resolution 3D acquisitions.

Guidance View

- Step-by-step user guidance is seamlessly integrated.
- Example images and guidance text are displayed for each individual step of the scanning workflow.
- Both images and text are easily configurable by the user

syngo WARP - Susceptibility Artifact Reduction

- *syngo* WARP integrates different techniques tailored to reduce susceptibility artifacts caused by orthopedic MR-Conditional metal* implants. 2D TSE sequence combining optimized high-bandwidth protocols and View Angle Tilting (VAT) technique, tailored to reduce susceptibility artifacts caused by orthopedic MR-Conditional metal* implants. This helps in evaluation of soft tissue in proximity of the implant. Available protocols include T1- weighted, T2-weighted, proton density and STIR contrast.

Advanced WARP:

- Advanced WARP application consists of SEMAC, a technique to reduce gross metal* artifacts (i.e. through-plane artifacts) caused by big orthopedic implants. The main clinical applications are in hip and knee joint replacements. Available protocols include T1-weighted, T2-weighted, proton density and STIR contrast.

Customization

The LargeJoint Dot Engine can be modified by the user to their individual standard of care.

- Add/remove protocol steps
- Change guidance content (images and text)

Description

- Change or add Dot exam strategies
- Add clinical decision points
- Add/remove parameters in the parameter viewing card
- *MR imaging of patients with metallic implants brings specific risks. However, certain implants are approved by the governing regulatory bodies to be MR conditionally safe. For such implants, the previously mentioned warning may not be applicable. Please contact the implant manufacturer for the specific conditional information. The conditions for MR safety are the responsibility of the implant manufacturer, not of Siemens.

Angio Dot Engine

Guidance View

- Step-by-step user guidance is seamlessly integrated.
- Example images and guidance text are displayed for each individual step of the scanning workflow.
- Both images and text are easily configurable by the user

Test bolus

- Automatic detection of arterial / venous timing window

Feedback of bolus timing information

- Timing information is fed back into planning steps and parameters are adapted automatically

Auto Voice Commands

- Integrated into the scanning workflow.
- The system plays them automatically at the right point in time.
- This ensures optimal timing of scanning, breathing and contrast media.
- The user can monitor which breath hold or pauses are actually played, and could add pauses between the automatic breath hold commands if necessary

Customization

Existing Dot engines can be modified by the user to their individual standard of care.

- Add/remove protocol steps
- Change guidance content (images and text)
- Change or add Dot Exam Strategies and Decision Points
- Modify the Parameter View

Application Packages:

syngo Inline Composing

- Automatic anatomical or angiographic composing of multiple adjacent coronal or sagittal images
- Composed images can be automatically loaded into Graphical Slice Positioning for scan planning purposes

Tim Planning Suite

With the Tim Planning Suite, multiple regions in the entire body can be examined in a minimum of time through measurement planning on a single FoV of any desired size.

Abdomen Dot Engine

Patient View

- Within the Patient View the user can easily tailor the exam to each individual patient.
- Several pre-defined Dot Exam Strategies are integrated. The user just selects the appropriate strategy with one click and the queue and the complete scan set-up are automatically updated. Furthermore protocols tailored for use of contrast media are integrated.

Dot Exam Strategies allows personalizing the workflow to the individual patient condition and clinical need. The

Description

following predefined strategies are included:

- Standard with breath-hold
- Standard with PACE triggering
- Limited patient capabilities using syngo BLADE and PACE triggering.

Guidance view

- Step-by-step user guidance is seamlessly integrated.
- Example images and guidance text are displayed for each individual step of the scanning workflow.
- Both images and text are easily configurable by the user

Parameter View

- This new view displays the parameters that are really needed for this scan set-up.
- This reduced set of protocol parameters allows the user to concentrate on the essentials.
- The Parameter View can be opened at any time during an examination

Additional functionalities:

Automatic sequence scaling according to physiological characteristic. (Auto FoV, AutoNavigator, breath-hold adaptations).

Auto Navigator based automatic breathing pattern detection and scaling of triggered scans.

Automatic FoV: the optimal FoV is automatically estimated based on the localizer images.

Dot Decisions

Decisions are seamlessly integrated into the scanning workflow. The user just selects the queue and the appropriate pulse sequences are added automatically. For the abdomen MRCP and Diffusion decision points are offered.

Timeline setup and monitoring for best overview of multi-phase breath-hold examinations and CM enhancement curve visualization.

Auto Voice Commands

The system plays them automatically at the right time point. This ensures optimal timing of scanning, breathing and contrast media. The user can monitor which breath hold or pauses are actually played, and could add pauses between the automatic breath hold commands if necessary.

Auto Bolus Detection initiates automatically the dynamic upper abdomen examination based on bolus detection. The user can override this function.

Inline radial range calculation for MRCP

MRCP is measured and Inline Radial Ranges are automatically generated.

Inline Subtraction

Within the contrast-enhanced abdomen exam, multiple phases are acquired: native, arterial phase, portal-venous phase and late-phase. The scanner automatically subtracts the native measurement from the arterial, portal-venous and late phase.

Inline Registration

For best visualization of lesions, the system automatically performs a registration / alignment of the anatomy for the different dynamic phases. The importance of registration / correction can be seen when examining nodular enhancing pathologies.

Customization

Existing Dot engines can be modified by the user to their individual standard of care.

- Add / remove protocol steps
- Change guidance content (images and text)
- Change or add Dot Exam Strategies and Decision Points
- Modify the Parameter View

Description

RESOLVE is a diffusion-weighted, readout-segmented EPI sequence optimized towards high resolution imaging with reduced distortions.

The sequence uses a very short echo-spacing compared to single-shot EPI, substantially reducing susceptibility effects. A 2D-navigator correction is applied to avoid artefacts due to motion-induced phase errors. This combination allows diffusion weighted imaging of the breast, prostate (SEEit sequence for prostate DWI), brain and spine with a high level of detail and spatial precision.

Additionally, an automatic reacquisition of data with large phase errors can be used to ensure that diffusion-weighted images of the brain are not affected by CSF pulsation.

QuietX DWI protocols for the brain utilize QuietX, an intelligent algorithm which effectively reduces noise through summation of gradients and reduction of slew rates while keeping timing parameters within the same range. All features and contrasts of DWI remain available, delivering image quality comparable to a conventional single shot diffusion sequence, while providing at least 70% sound pressure reduction for increased patient comfort.

Despite a strong sensitivity for local magnetic field inhomogeneities Susceptibility Weighted Imaging (SWI) as a 3D technology keeps up the signal near large susceptibility leaps due to very thin slices and high resolution in the slice (high image quality e.g. in the area of the forebrain near the frontal sinus).

Moreover, the phase information of the MR signal is integrated in the image display. In order to further increase sensitivity for localized microscopic magnetic field inhomogeneities, large-area magnetic field inhomogeneities (e.g. caused by susceptibility leaps near the sinus) are specifically suppressed in the phase images.

This allows even small amounts of deoxygenated hemoglobin (e.g. in cerebral veins) or from products of hemoglobin decomposition (e.g. from hemorrhages) to be displayed.

Interesting measuring times for the ultra-high-resolution 3D protocols are achieved through parallel imaging with iPAT (GRAPPA).

The Susceptibility Weighted Imaging package includes:

- SWI measuring sequence, iPAT compatible
- optimized measuring protocols for the head
- inline-postprocessing for automatic calculation of relevant images within the scope of image reconstruction:
 - calculation of susceptibility-weighted images
 - venous angiography: MIP of a thin slice block

SWI has been optimized for clinical use to support diagnostics with cerebrovascular diseases (e.g. cerebral insult), venous malformation, brain trauma and tumors.

Prerequisite: Software syngo MR B13

Simultaneous Multi-Slice (SMS) EPI provides slice accelerated BOLD and Diffusion protocols for the brain.

The slice acceleration factor can be selected on the protocol parameter card and can be utilized by the user in various ways:

- For diffusion weighted imaging, the user can choose to invest the benefits into scan time reductions or into more spatial or diffusion resolution.
- For BOLD, the user can utilize the slice acceleration to increase temporal sampling of BOLD data, for higher sensitivity to BOLD signal changes, and/or to increase the slice coverage and resolution (Inline BOLD Imaging required).

Diffusion Tensor Imaging

Diffusion Tensor Imaging allows for a complete description of the diffusion properties of the brain within the scope of the tensor diffusion model, both for anisotropic and isotropic diffusion. Efficient diffusion direction schemes are pre-defined to allow for optimal diffusion directional resolution. Schemes with up to 256 directions can be selected. Inline technology enables automatic and immediate calculation of the diffusion tensor, including grey-scale and colored "fractional anisotropy" (FA) map derived from it.

With the addition of Diffusion Spectrum Imaging (DSI), it is possible to acquire diffusion data in up to 514 different directions each with independent b-values.

Details:

- Measurements with up to 256 different directions and with up to 16 different b-values

Description

- Inline calculation of tensor, grey-scale and colored FA map, ADC map and trace-weighted image
- Support of parallel imaging (iPAT)
- Clinical protocols with full head coverage, incl. inline calculation of tensor, FA, ADC and trace-weighted images in 4 minutes.

DTI Tractography *syngo*

syngo DTI Tractography is optimized for the clinical use by providing advanced 3D visualization of white matter tracts in the context of 2D or 3D anatomical datasets and DTI datasets. DTI data sets can be explored fast and intuitively using the interactive QuickTracking. QuickTracking instantaneously displays the tract originating from the mouse pointer position while moving over the DTI data set. This also allows identifying qualified regions to place seeding ROIs. Seed points can be set to assess connectivity by tracking with single ROI and with multiple ROIs. Furthermore they can be placed in fused views displaying the anatomical reference and e.g. the colored FA map simultaneously.

Texture Diffusion, a highly versatile in-plane visualization of white matter tracts, allows to display and read DTI Tractography results on PACS reading stations and in the OR.

At the same time the package provides the scientific user with the flexibility to configure the tracking algorithm and to change display settings for the tracts. Tract and seeding ROI statistics are included to support publications (e.g. mean/max FA value, min/mean/max ADC value).

All views can be exported as DICOM images or bitmaps. Tract and seeding ROI statistics can be exported as html files.

DTI Evaluation

Clinical applications are supported by a dedicated DTI evaluation mode to support diagnostics of white matter diseases (e.g. multiple sclerosis and brain maturation disorders). Based on the tensor, in addition to the already inline-calculated parameter maps, further maps characterizing the anisotropy of diffusion properties can be calculated and stored. Multiple diffusion parameter maps (e.g. Fractional Anisotropy, ADC, $b=0$) and an anatomical image are displayed next to each other in the same slice position for comparison. The images can be evaluated together based on ROIs and the results can be documented in a table. The display options include 2D and 3D tensor graphics, colour-coded images and overlay images on the anatomical images.

In addition, the package offers the scientific user full flexibility of 2- and 3-dimensional visualization of the diffusion tensor with measures of isotropic and anisotropic (fractional and relative) diffusion, Eigen vectors (E1, E2, E3) of the diffusion tensor and shape-descriptive measures of the diffusion tensor (linear, planar, spherical).

Neuro Perfusion Package provides a modified sequence and image reconstruction for motion correction and post-processing in dynamic susceptibility contrast (DSC) based perfusion imaging.

Depending on whether motion correction is switched on, the following uncorrected or motion corrected perfusion maps can be calculated: time-to-peak (TTP), relative cerebral blood volume (relCBV), relative cerebral blood flow (relCBF), relative mean transit time (MTT), relative corrected cerebral blood volume (relCCBV) and bolus plots.

Perfusion parameter maps are calculated based on a Local Arterial Input Function. The algorithm selects many AIFs per slice and volume based on a number of built-in criteria. This removes the need for manual selection of AIF voxels to calculate the cerebral perfusion parameters and allows the calculation to be performed in-line at the end of the measurement. It also minimizes deconvolution errors due to the effects of delay and dispersion of the contrast agent bolus. Additionally, in cases of contrast extravasations due to a disrupted blood-brain barrier, the postprocessing allows a correction to be applied during calculation of the relCBV maps.

Post-processing features:

- Flexible selection of the Arterial Input Function (AIF) by the user.
- Pixelwise calculation of the hemodynamic parameters relative Mean Transit Time (relMTT), relative Cerebral Blood Volume (relCBV), relative Cerebral Blood Flow (relCBF), corrected relative Cerebral and Blood Flow (relCBF) for compensation of blood brain barrier leakage.
- Pixelwise calculation of maximum signal loss due to contrast agent enhancement (Percentage of Baseline at Peak, PBP) and of the time to the maximum signal loss (Time-To-Peak, TTP).
- Display of the global signal time course (averaged over all slices) to assess the quality of the exam.
- Predefined post-processing protocols available, user definable post-processing protocol are possible.

Visualization features:

Description
<ul style="list-style-type: none"> - Colored display of relMTT-, relCBV-, relCBF-, relCBFcor, PBP- and TTP-maps. - Zoom, pan, annotate. - Colored images can be saved as DICOM images.
<p>Features:</p> <ul style="list-style-type: none"> - 3D VIBE sequence for Inline T1 mapping - Multiecho spin echo sequence for Inline T2 mapping - 3D Multiecho gradient echo sequence for Inline T2* mapping - iPAT compatibility - Protocols for Inline parametric mapping <p>Using iPAT the 3D sequences provide isotropic imaging extremely high resolution while maintaining clinical measurement times. These data sets allow for the multi planar reconstruction of all planes. 3D is necessary to properly visualize the whole articular cartilage since it typically has a complex shape. In addition the accuracy of isotropic high resolution 3D data sets is superior because partial volume effects between e.g. synovial fluid and cartilage are minimized.</p> <p>For the visualization of the parametric maps in the anatomical context the maps can be displayed as a colored overlay onto anatomical images using the optional package "syngo Image Fusion"</p>
<p>Main Features:</p> <ul style="list-style-type: none"> - The inline screening Dixon sequence gives the user a first overview of possible fat and/or iron overload in the whole liver. - Based on the result images, liver segmentation runs without user interaction. - If further evaluation is needed, the user can choose from two methods: <ol style="list-style-type: none"> 1. HISTO is a pushbutton single breath-hold single voxel spectroscopy method to calculate fat fraction as well as water R2. 2. Multi-echo Dixon is an image based method to calculate maps such as water, fat, fat signal percentage, and R2*.
<p>Main Features:</p> <ul style="list-style-type: none"> - TWIST-VIBE is a VIBE sequence with CAIPIRINHA capability providing high spatial resolution. The view-sharing mode provides temporal information to ensure the right contrast timing for different lesions. Dixon is used for fat-water separation. - StarVIBE allows body imaging in free breathing mode, providing a solution for patients without breath hold capabilities.
<p>syngo NATIVE offers:</p> <ul style="list-style-type: none"> - Non-contrast enhanced MRA - Separate imaging of arteries and veins - Visualization of - e.g. - renal arteries or peripheral vessels <p>The syngo NATIVE package comprises:</p> <ul style="list-style-type: none"> - syngo NATIVE TrueFISP - syngo NATIVE SPACE
<p>QISS offers:</p> <ul style="list-style-type: none"> - Non-contrast enhanced peripheral MRA - Higher robustness when compared to other non-contrast enhanced peripheral MRA methods - Improved usability provided by the Dot AddIn which enables easier multi-stage planning

Description

The QISS package comprises:

- QISS sequence
- QISS Dot AddIn
- Non contrast-enhanced peripheral vessels protocols

The option features:

- Display and storage of full-format images, e.g. of the spine, the central nervous system or the vessel tree (starting from *syngo* MR B13), combined from multiple overlapping stages.
- Dedicated composing algorithms, optimized for the generation of anatomical or angiographic (starting from *syngo* MR B13) full-format images.
- Data sets with different FoV, resolution, matrix and slice thickness can be combined (starting from *syngo* MR B13).
- Generation of full-format images from inline MIPs (starting from *syngo* MR B13).
- Original, detail and reconstructed images can be displayed in different layouts.
- Comparison of two reconstructed images for evaluation and diagnosis is thus made possible.
- Filming in different layouts is supported.
- Measurements of basic functions via reconstructed images is then possible.
- Measurements of extended orthopedic functions:
scoliotic angle, kyphotic angle, vertical distance measurement and differences in width of the intervertebral spaces.

Prerequisite: SW syngo MR B13.

syngo TWIST provides:

- Visualization of contrast agent dynamics in the vessel system of interest with maximum flexibility.
- Needs only a low amount of contrast agent.
- Imaging in all body regions, e.g. carotids, pulmonary and peripheral vessels with brilliant spatial and temporal resolution.
- Clear separation of the arterial and venous phase.
- High speed acquisition by intelligent k-space strategies and use of iPAT, powered by Tim.
- *syngo* TWIST provides fat suppression using water selective excitation.
- Inline technologies, such as subtraction and MIP are provided for optimal workflow.
- In case of very high spatial resolution *syngo* TWIST may even replace conventional static MR angio. Moreover, *syngo* TWIST does not require any bolus timing - just inject and go.

Flow Quantification enables the acquisition of flow encoded images and the evaluation of blood as well as of cerebro-spinal fluid (CSF).

Sequences include:

- ECG triggered 2D phase contrast with iPAT support
- Retrospective reconstruction algorithms for full R-R interval coverage
- Maxwell Term Compensation

Effective noise reduction is achieved through Quiet Suite by targeting the main source of MRI noise - rapid switching in the gradient coils. Quiet Suite consists of QuietX, an intelligent algorithm which effectively reduces noise through summation of gradients and reduction of slew rates while keeping timing parameters within the same range. QuietX has been enabled for TSE, SE and GRE sequences for T1, T2 and DarkFluid contrasts. Within the TSE-sequence, the parameter "Echo-spacing" allows the user to further lower the gradient slew-rates. QuietX has also been enabled for susceptibility and diffusion-weighted imaging and these sequences are available with the SWI and Advanced Diffusion licenses (not available for MAGNETOM ESSENZA), respectively. The automated algorithm runs in parallel to normal protocol handling. All features and contrasts of the TSE, SE, and GRE sequences remain available.

In addition, Quiet Suite contains PETRA, a 3D T1 UTE sequence. The PETRA sequence allows for even lower gradient switching. With its unique gradient trajectories, no acoustic noise associated with gradient switching is generated during a PETRA scan. Residual noise may arise due to radio frequency switching.

Description

With Quiet Suite, optimized quiet protocols for imaging the brain and large joints are also provided.

Tim and the Tim Whole Body Suite enable for true whole body MR scanning for head-to-toe imaging. Whole body imaging with highest image quality without patient repositioning and without the need to change a single coil, not even once, this means whole body imaging without compromise.

The Tim Whole Body Suite features:

- The all-new Tim Table or Tim Dockable Table enable a full Field-of-View with coverage up to 205 cm (6' 9"). The table top has the same length as the standard system without whole body capabilities. Additional free space is required at the rear part of the magnet to ensure, that the table movement is not limited by the rear wall.
- Table movement to its full extent can be remotely controlled from the operator console either by the operator or by sequence protocols.
- Protocols and programs for whole body MR angiography and morphology e.g. for metastasis visualization and preventive care examinations.
- Whole body MR Angiography is possible with high speed, high resolution and high image contrast on the entire volume combining high speed gradients and iPAT.
- The large FoV of 205 cm supports the assessment of metastases distribution in the body with sequences such as TIRM (Turbo Inversion Recovery).

The option is integrated in the *syngo* user interface thus enables easy access to the user interface of the *syngo* Acquisition Workplace for planning and processing support purposes.

The access is protected by appropriate security mechanisms (active enabling prior to every connection through the user present on site, password protection), in order to prevent unwanted connections.

The client software can be operated on any commercial PC with the following specification:

- Operating system: Windows XP/ 7
- 32 bit graphics board
- 850 MHz CPU

The Body 18 1.5T long has a 18-element design with 18 integrated preamplifiers that are arranged in 3 clusters of 6 coil elements each. This ensures excellent signal-to-noise ratio. It can be positioned in different orientations and addresses the requirement range for the examinations of obese patient to pediatric patients. The light weight coil improves patient comfort and can be easily connected via SlideConnect technology. The coil's extended cable allows for more flexibility in connector selection which is especially helpful if multiple flexible coils need to be combined and challenging imaging set-ups need to be supported like in therapy imaging (e.g. for combined head-neck exams). No tuning of the fully iPAT-compatible Body 18 1.5T long is necessary allowing for efficient and patient friendly set-up.

In case of Radiation Therapy imaging, the Body 18 1.5T long will be typically combined with :

- Flex 4 coil(s)
- Body 18 coil(s)
- Spine 32 coil

In case of imaging in the context of neuro- and cardiovascular interventions, the Body 18 1.5T long will be typically combined with:

- Body 18 coil(s)
- Combi Coil Base (only in combination with the Combi Dockable Table; allows to combine the Body 18 long with a Body 18 (standard cable length) and to use the combination as spine coil in situations where the patient is positioned on a transfer board so that the regular Spine 32 cannot be used)

The dimensions of the Body 18 1.5T long are 385 mm x 590 mm x 65 mm (L x W x H). Its weight is about 1.6 kg (3.5 lbs), whereas the patient feels as little weight as 1.1 kg (2.5 lbs). The cable length is 168 cm, which compared to the Body 18 1.5T (with standard cable length) is 70 cm more.

Description

The iPAT compatible Shoulder 16 Large and Shoulder 16 Small are ergonomically designed and adapted to the shape of the shoulder.

The different sizes obtain maximum image quality for different body sizes:

- 165 mm (6.5 in) diameter for small and medium sized shoulders
- 200 mm (7.9 in) diameter for large shoulders

The coils can be used either for left or right shoulders. It features sliding attachments to the base plate and can easily be adjusted for comfortable positioning. The coils excel in highest resolution imaging with exceptional signal/noise ratio.

The 16-element coil with 16 integrated pre-amplifiers excels in highest resolution imaging with exceptional signal/noise ratio, while taking full advantage of iPAT in all directions.

Hand/Wrist 16 is ergonomically designed and adapted to the shape of the hand/wrist region. The coil features a hinged design of the upper part and slidable attachment to the base plate. Together with the included stabilization pads the coil allows easy, fast and comfortable patient positioning.

Thanks to its 15-channel design this coil is perfectly suited for high-resolution images with excellent SNR. With the arrangement of the antennas in three rings of 5 elements each, the coil is specially designed for parallel imaging with high acceleration factors.

The coil is positioned on a laterally movable support and therefore allows for comfortable patient positioning of both legs for off-center examinations. SlideConnect Technology allows for fast and easy patient preparation, resulting in less table time. Furthermore, the upper part can be removed for easier patient positioning. Additional cushions allow for optimum patient immobilization.

The integrated transmission function makes volume-sensitive excitation with greatly reduced RF power possible on the one hand and, on the other, prevents aliasing artifacts (e.g. due to the other knee).

The new housing of this coil allows a flared opening on the patient thigh part, as well as an easy coil opening mechanism.

The 16-element coil with 16 integrated pre-amplifiers excels in highest resolution imaging with exceptional signal/noise ratio, while taking full advantage of iPAT in all directions.

Foot/Ankle 16 is ergonomically designed and features a boot-like coil design. Together with the included stabilization pads the coil allows easy, fast and comfortable patient positioning.

The Peripheral Angio 36 has a 36-element design with 36 integrated preamplifiers distributed over 6 planes with 6 elements each.

A uniquely designed non-ferromagnetic coil cart for safe coil storage is included. The PA Matrix Coil is also shipped with a set of positioning cushions for proper handling.

No tuning of the fully iPAT-compatible Peripheral Angio 36 is required.

With a length of about 1m both legs are covered from the iliac artery level down to the foot arch vessels using multiple, flexible wings. For the visualization of the abdominal aorta and the iliac bifurcation it can be combined with the Body 18 and Spine 32. For larger body coverage eg whole body with up to 205 cm possible coverage, it can be combined with Head/Neck20 or a further Body18 to allow for large Field of View examinations with high patient comfort. Patient set up is done once and no repositioning is necessary

For peripheral Angiography the PA Matrix coil will be typically used in feet-first position, but also head-first positioning for whole-body examinations is possible (optional Tim Whole Body Suite required).

The dimensions of the Peripheral Angio 36 are:
860 mm x 300 - 640 mm x 280 mm

This enables studies with very high spatial resolution and very short scan time. The upper part of the coil is detachable and can be fitted with a mirror allowing the patient a rear view out of the magnet. Displaceable cushions are provided with the coil for positioning. The coil is suited for head proton imaging and brain spectroscopy.

Description

The *syngo* MR Workplace computer system includes:

- High-performance host computer of the latest Intel Xeon CPU generation Quad Core processor with 2.66 GHz clock rate, \geq 6 GB RAM, one 300 GB system hard disk, one 300 GB hard disk, one CD/DVD-R drive for uncompressed image storage on CD/DVD-R in DICOM format (ISO 9660 Level 1), one DVD-ROM drive and electronic mouse.
- High resolution color LCD flat screen monitor with 1280 x 1024 pixel display, integrated gamma correction for optimum display of radiographic grayscale and automatic backlight control for longterm brightness stability.

The new *syngo* MR software includes among others the following features relevant for the *syngo* MR Workplace:

- The "Task Card" concept permits structured processes with several patients by means of simplified image exchange between the task-specific interfaces.
- The image view card permits image data from up to three patients to be administered viewed, and processed simultaneously.
- The "Dynamic Analysis" evaluation software permits functions such as addition/subtraction, division/multiplication, T1 and T2 calculations, and standard deviation to be performed.
- The "Mean Curve" can be used to analyze dynamic examinations, e.g. employing contrast media.
- The "Breast Evaluation" software can be used to calculate colored representations of different dynamic parameter maps, like Wash-in, Wash-out, Time-to-Peak.
- Post-processing software for filtration of MR images. The software includes an adaptive image filter which automatically adapts the filtration to the local image contents. Three filters can be selected: soft, medium or sharp. These three filter types can be changed individually by means of the parameters "smoothing" and "edge enhancement" from 1 - 5. Three different filter strengths can be stored in addition to the three basic settings.
For filtration also individual or multiple images as well as complete series can be selected simultaneously. The current calculation status and a preview of the already filtered images is displayed via an additionally selectable window.
- Precision filter for high spatial accuracy. The precision filter increases the spatial accuracy of MR data sets for surgical planning, stereotactical procedures, therapy planning and multi modality fused visualization. The filter can correct image distortions in the image plane as well as across the slices.
Functions:
 - Offline correction of 3D data sets.
 - Offline correction of 2D data sets, whose inter-slice gap is not larger than the slice thickness.
 - Corrected data set is saved as a new series.
 - Correction of images from all SIEMENS gradient systems that were available at the release of the software.
- The Argus Viewer allows users to load a large list of dynamic data sets and view it comfortably. For example cardiac images are automatically sorted into user definable reading configurations after loading. Re-sorting and re-display can be changed instantaneously, either automatically or manually. Integrated 8-on-1 movie provides efficient review of data. AVI creation of movie loops (up to 4-on-1) is possible. Creating and editing reports which can be stored together with the images or printed is possible.
- The 3D post-processing card includes basic functionalities for manual MPR, MIP, MinIP, and SSD image reconstruction (Multiplanar Reconstruction, Maximum Intensity Projections, Minimum Intensity Projections and Shaded Surface Display).
- Efficient filming is possible directly from the different user interfaces and can be controlled by minimum user interaction. There is a wide range of different film layouts with regular and irregular formats. Selectable Mother and Child function which allows you to display the position of the measured slice in a scout showing a small image in the upper right-hand or the lower left-hand corner of the larger image (image within an image). The drag-and-drop functions allows the images to be positioned anywhere on the film from the Patient Browser. The images can be moved, enlarged, and tiled directly on the film sheet. As an additional aid to orientation, a reference image can be included in the upper right-hand corner of the image segment. (Camera not part of the basic equipment. Verify if existing camera is compatible or order separately.)
- The standard implementation of the DICOM 3.0 protocol permits examinations to be easily transferred to and from a network for managing them, thus effectively supporting more efficient workflow.
The following functions are supported as part of this standard implementation:
Send/Receive, Query/Retrieve, Basic Print for DICOM-compatible laser cameras (Camera not part of the basic equipment. Verify if existing camera is compatible or order separately.), DICOM Worklist, DICOM

Description

Storage Commitment (SC).

The keys of the numerical key panel are assigned to *syngo*-specific functions and labeled with the corresponding *syngo* icons. The keyboard supports the country specific special characters.

Based on the tensor, in addition to the already inline-calculated parameter maps, further maps characterizing the anisotropy of diffusion properties can be calculated and stored. The display options include 2D and 3D tensor graphics, color-coded images and overlay images on the anatomical images. In fusion mode the color-coded diffusion images can be overlaid on an anatomical 3D image data set acquired in the same examination. The overlaid image volume can be evaluated, displayed and stored in cut planes with any double oblique angulation. If the option "*syngo* 3D Offline fMRI" or "Advanced Functional Neuro" is available, the results of an fMRI experiment from the same examination can also be displayed fused with DTI and anatomy. Clinical application is supported by a dedicated DTI evaluation mode. Multiple diffusion parameter maps (e.g. Fractional Anisotropy, ADC, $b=0$) and an anatomical image are displayed next to each other in the same slice position for comparison. The images can be evaluated together based on ROI and the results can be documented in a table.

The following parameter maps can be calculated and displayed:

- Measures of isotropic diffusion:
ADC, trace-weighted, exponential ADC
- Eigen vectors of the diffusion tensor:
E1, E2, E3
- Measures of anisotropic diffusion:
Fractional Anisotropy (FA), Relative Anisotropy (RA),
Volume Ratio (VR), E1-E3, E1-E2, E2-E3
- Shape-descriptive measures of the diffusion tensor:
Linear, planar, spherical

Visualization options include:

- 2D/3D grayscale and color display
- 2D/3D display with color coding of one preferred diffusion direction, e.g. Fractional Anisotropy image with color coding of the direction of the first Eigen vector of the diffusion tensor.
- Display of tensor as an overlaid graphic on parameter maps or anatomical images as an ellipsoid or cuboid (colored).
- Overlay of parameter maps on anatomical images (if the "*syngo* 3D Offline fMRI" option or the "Advanced Functional Neuro" option is available: also simultaneous overlay of fMRI results)

Documentation

- Storage of parameter maps
- Storage of all views
- Storage of the result table of the common ROI-based evaluation of parameter maps
- Storage of multi-planar, double oblique reconstructed series from overlaid 3D visualizations (anatomy + diffusion parameters)

The DTI Evaluation package with comparative side by side mode is optimized for clinical application to support diagnostics of white matter diseases (e.g. multiple sclerosis, brain maturation disorders...). In addition, the package offers the scientific user full flexibility of 2- and 3-dimensional visualization of the diffusion tensor with measures of isotropic and anisotropic diffusion, Eigen vectors of the diffusion tensor and shape-descriptive measures of the diffusion tensor.

Prerequisite: Software syngo MR B13

syngo DTI Tractography is optimized for the clinical use by providing advanced 3D visualization of white matter tracts in the context of 2D or 3D anatomical datasets and DTI datasets. DTI data sets can be explored fast and intuitively using the interactive QuickTracking. QuickTracking instantaneously displays the tract originating from the mouse pointer position while moving over the DTI data set. This also allows identifying qualified regions to place seeding ROIs. Seed points can be set to assess connectivity by tracking with single ROI and with multiple ROIs. Furthermore they can be placed in fused views displaying the anatomical reference and e.g. the colored FA

Description

map simultaneously.

Texture Diffusion, a highly versatile in-plane visualization of white matter tracts, allows to display and read DTI Tractography results on PACS reading stations and in the OR.

At the same time the package provides the scientific user with the flexibility to configure the tracking algorithm and to change display settings for the tracts. Tract and seeding ROI statistics are included to support publications (e.g. mean/max FA value, min/mean/max ADC value).

All views can be exported as DICOM images or bitmaps. Tract and seeding ROI statistics can be exported as html files.

This fully *syngo* integrated application with common data base access eliminates the need for time consuming data transfer to a separate workstation.

CT, MR, NM, or PET images are accepted as input for image fusion. Studies can be done with the same modality or with different modalities.

Registration Algorithms:

- Easy-to-use visual alignment with 6 degrees of freedom (3x translation, 3x rotation)
- Landmark based registration with convenient landmark editor for point-based registration using anatomical landmarks
- Automatic registration
- Storage of transformation matrix after registration for later retrieval with datasets

Visualization Techniques:

- Side by side visualization of both datasets with correlated pointer and correlated scrolling with dog ears
- 2D alpha-blending in monochrome or pseudo-color with adjustable balance between the two superimposed data sets.

Storage of fused results as secondary capture images.

Integrated, *syngo* based image analysis tool with common data base access, allowing direct image analysis right after image acquisition without the need for time consuming data transfer to a separate workstation.

The combination of automated contouring and easy-to-use editing tools, provides users with a rapid way to quantify parameters of interest.

Argus flow includes:

- Calculation of flow and velocity parameters (e.g. mean and max velocity, mean, cumulative, prograde, retrograde flow) for large and small vessels.
- Semi-automatic detection of regions of interest over time
- Color-coded display of velocity values.
- Calculation of flow and velocity parameters (e.g. peak velocity, average velocity, flow, integral flow)
- Graphical and tabular display of the results (e.g. flow-time curves).
- Integration of the results in Argus structured report and storage in DICOM format for documentation.

This package includes Argus Function as well as Argus 4D Ventricular Function.

Argus Function:

- Automatic, semi-automatic, or manual segmentation of the left and right ventricle.
- Volumetric analysis and wall thickness analysis.
- Output of parametric results, volume-time curves and bull's-eye plots.
- DICOM Structured Reporting.

Argus 4D Ventricular Function:

- Calculation of volumetric cardiac data of a given patient very quickly and easily.
- Parametric results and volume-time curves are calculated upon automatic creation and adaptation of a 4D

Description

model of the left ventricle.

- The resulting 4D model of the patient's heart can be visualized superimposed to anatomical images as a reference.

Function:

- Interface between the on-site water chiller (of any brand/type) or
- Interface to the central hospital chilled water supply.

Delivery volume:

- Separator
- Two 3.0 m hoses (forward and return) for connecting the SEP to the local cooling water supply system
- Separation cabinet
- With the SEP configuration, the helium compressor is built into the SEP cabinet and connected internal
- Regional specific adapter for connection to the hospital installation

Voltage range: 115 - 280 V

Input frequency: 40 / 70 Hz

Output voltage: 230 VAC

Dimensions (H x D x W): UPS 430 x 602 x 85 mm

incl. 9 m Power Cable

Weight: approx. 36 kg

An MR-compatible arm rest that supports the patient's arm on the magnet patient table when starting intravenous lines. The board is removed after the IV is inserted.

This product has been tested and verified for compatibility with the following Siemens' products: MAGNETOM Trio, Verio, Espree, Essenza, Avanto, Symphony, Area Skyra and Biograph mMR. Compatibility with other products cannot be assured and may void service contracts and/or system warranties.

Spectris Solaris EP injector for mobile use.

- Optimized color touch screen with few keystrokes.
- Six user-programmable phases for added flexibility.
- Independent Keep Vein Open (KVO) allows more time to focus on patient.
- Large 115 mL saline syringe allows for longer KVO and multiple flushes.
- Design of low pressure tubing eliminates dead space in the "T" connection that can waste contrast.
- The clear barrel design with molded FluidDots help detect the presence of air in a syringe.
- Pressure Limit Setting control software enables user to select from one to six preset maximum pressure limits, ranging from 100-300 psi, and to view current pressure during injection next to the pre-selected maximum value on the Solaris display.

Installation, applications and one year warranty provided by Medrad.

For mobile use only. For fixed site injector refer to Siemens part # M3SSMREPICBC.

This product has been tested and verified for compatibility with the following Siemens' products: MAGNETOM Trio, Espree, Essenza, Verio, Avanto and Symphony. Compatibility with other products cannot be guaranteed and use with any other products may void service contracts and/or system warranties.

<u>Approximate Interior Dimensions</u>	
Length	47' 6" (14.25M)
Width	8' 0" (2.44M)
Height	7' 6" (2.29M)

1. TRAILER AND BODY CONSTRUCTION:

- A. Trailer shall be a closed van, semi-trailer type, having a tandem axle and equipped with air suspension. Trailer to consist of three (3) major sections: Equipment Room, Control Room, and Scan Room.
- B. Wheels shall be equipped with 11R22.5 (14 ply) steel belted radial tires. Wheels will have bright, stainless steel covers.
- C. A two-leg, Power Gear stabilizer system shall be installed having a capacity of 25,000 pounds per stabilizer, 12-inch swivel foot, hydraulic raising and lowering, locking stiff legs, and individual control for leveling trailer. Power system to be electric-over-hydraulic. Leveling jacks shall be attached to the main structural members at trailer front. Shall be designed to reduce natural vibration and maintain settings without "sinking" with the addition of stiff legs. Each jack shall have individual control located at master control box. In addition, locations will be provided at trailer rear for jack stands as a means of "quick leveling". Two (2) portable jack stands shall be provided. Rear leveled through use of air bag control.
- D. There shall be sufficient "I" beam crossmembers and other reinforcement pieces to insure that the trailer has adequate strength and rigidity to withstand all road shocks and loading conditions.

1. TRAILER AND BODY CONSTRUCTION: Continued

- E. Trailer brakes shall be 16-1/2 by 7-inch, air-operated in conjunction with the tractor brakes, and connected thereto by standard flexible hose connections. The trailer brakes shall set automatically when it is disconnected from the tractor. The braking system, including anti-lock, shall comply with all applicable Federal laws in effect at the time of delivery.
- F. The fifth wheel of the trailer shall be a single-bag, low-profile, upper fifth wheel air-ride coupler, with a capacity of 32,000 pounds. Size to be adequate to completely cover the fifth wheel of the towing tractor when coupled and turned at any angle.
- G. General body wall construction shall consist of roll-formed "C" channels, 8.625 inch high by 1.75 inch deep, 3003-H14 aluminum alloy, .080 inch thick. The channels shall run vertically the entire length and width of the unit and shall be secured to aluminum corner posts, roof rail and lower rail using 3/16-inch brazier head aluminum rivets.

The channels shall be fastened together along their full length with Plexus, or equal, high-performance adhesive specially designed for metal bonding in transportation, marine, and aviation industries. The bond formed has a tensile strength of approximately 2,500 PSI; temperature resistance range of -67° F to +250° F; chemical resistance; high-fatigue endurance; and impact resistance.

- H. The roof carlines shall be aluminum extrusions, 6063-T6 alloy, which shall be welded to the roof rail on 12-inch centers. The roof assembly shall consist of a one-piece, .040-inch aluminum sheet. Roof panel to be secured around perimeter with adhesive and 3/16-inch brazier head aluminum rivets to aluminum extruded roof rail.
- I. All door openings shall be framed with welded aluminum structures and gusseted to prevent torsional twisting. Heavy-gauge metal tapping plates shall be installed to secure heavy wall-mounted equipment as per custom body floor plan. An integral part of the roof rail is provided around the perimeter of the interior body to secure ceiling, side panels and overhead cabinets. Tapping plates shall be installed in the ceiling to permit positive securing of light fixtures and other equipment supported from roof framing.
- J. Floor crossmembers shall be 4.25-inch deep, aluminum trailer "I" beams spaced on 12-inch centers (steel crossmembers shall be used in the front fifth wheel area).

2. INSULATION ("R" VALUE IN EXCESS OF 14):

- A. Body shall be insulated on sides, ends, floor and roof with foamed-in-place urethane. This type of insulation offers optimum environmental protection; adds support; prevents entrance of moisture; and acts as a sound retardant.
- B. A thermal break will be provided by installing foil-covered foam sheet on walls and ceiling. The floor in the Computer and Control Rooms will also be insulated with foil-covered foam sheets.

3. WALLS AND CEILING:

- A. The interior walls shall be lined for full width and length with 1/4" thick laminated Formica panels. Panels shall be secured with joiners, edgings and moldings specifically designed for this purpose.
- B. Ceiling in Scan and Control Rooms is an aluminum assembly with lights, air supply and air return all integral. Ceiling panels are easily removable for service access, if required, and include sound-deadening liners.

4. FLOOR:

- A. Between cross sills, secure .040-inch aluminum sheet to fully enclose floor area.
- B. Sub-floor in Scan Room shall be .090-inch aluminum sheet with fully welded seams and 3/4-inch seamless FRP panels.
- C. Sub-floor in Control and Office Rooms shall be 3/4" seamless FRP panels.
- D. Floor shall be surfaced with decorative seamless linoleum.
- E. Underside of trailer exposed to road shall be sprayed with Quaker Koat, or equal, sound-deadening undercoating.

5. MAGNETIC SHIELDING:

- A. The two (2) side walls and rear wall within the Scan Room shall be lined with special high-permeable steel which contains the 5-gauss line of the magnetic field within the trailer walls.
- B. The shielding allows the trailer to be moved "at field".

6. PAINTING PROCEDURES:

- A. Body exterior shall be thoroughly cleaned, sanded and primed with PPG epoxy chromate primer. Body shall be painted with two (2) coats of PPG polyurethane acrylic enamel. Basic trailer to be PPG 90531 pure white. (Special artwork and painting designs will be quoted separately.)
- B. Aluminum structural trailer chassis undercarriage, landing gear assembly, front splash plate and steel crossmembers shall be painted black.
- C. Heat-Protecting Roof Coating: The entire roof shall be coated with a patented ceramic coating that reflects 99% of radiant energy, preventing temperature loss through the ceiling/roof, reducing HVAC needs, and providing more consistent interior temperatures.

7. DOOR(S):

A. Personnel Entrance/Exit Door:

Shall be fiberglass architectural door having an insulation R-value of 12. Door will close on dust-proof extruded "Sea-Lok™" seal. Door shall include a 30-inch by 18-inch tinted thermopane safety-glass window. Door to be equipped with mortised, heavy-duty latch with stainless steel handle inside and out. Includes keyed dead-bolt lock and latch. Hinges shall be stainless steel, strap type, with 7/16-inch (minimum) hinge pin.

B. Sliding Patient Entrance Door:

Shall be manually operated sliding door with keyed-lock hardware. Door shall be constructed of lightweight honeycomb material surfaced with .040-inch aluminum on both sides. The door shall slide into a pocket and "disappear" when fully open. Electrical interlocks provide a visual and audible alarm when operating the door without the patient lift in proper position. Includes flip-up protective canopy constructed of aluminum-faced honeycomb panel raised and lowered by gas springs.

C. Underbody Storage Compartment Doors:

A series of underbody storage compartments shall be provided that are accessible through hinged doors with gas spring holding devices and close on dust-proof extruded "Sea-Lok™" seal. Doors will be equipped with 12-volt electric automatic locking-unlocking latches activated with push buttons (similar to passenger car auto-latching system). The 12-volt system will be controlled by a master on/off switch in the landing gear control panel compartment. Includes emergency back-up unlocking system controls.

8. ENTRANCE STEP ASSEMBLY:

There shall be provided at curbside entrance/exit door, an aluminum pull-out step assembly. Entire step assembly shall store in a compartment below door and slide on guide rails. Steps shall be non-skid aluminum. Includes tubular, stainless safety rail plus manual "lock-out" safety features.

9. PATIENT/GURNEY LIFT: (Side Mounted)

Lift will conform to Federal Motor Vehicle Safety Standard (FMVSS) Nos. 403 and 404. Lift platform shall measure approximately 78 inches wide by 42 inches deep. Lift shall be self-storing, 12-volt hydraulically operated from "walk-around" push-button control, with a capacity of 1,000 pounds. Includes power failure "lift down" release switch and hand-operated emergency pump for raising and lowering lift. Lift will have a removable safety railing built of custom-formed stainless steel, OSHA compliant, 1-1/2-inch round tubing with a hinged gate. Lift shall be installed in an enclosed compartment to prevent the accumulation of dirt, dust, ice, and snow during transit.

10. ELECTRICAL SYSTEM:

The trailer shall be wired to receive 4-wire, 480-volt, 60-Hertz, AC, three-phase, 200-amp delta or wye power. The power shall be supplied from a local source via lead-in cable hardwired to coach. A power lead-in cable of 50 feet in length consisting of three-phase wires and one (1) ground wire within oil-resistant thermoset jacketing shall mate with hospital-site-supplied Russell Stoll connector (Medical Coaches supplies cable connection; customer supplies hospital connection).

11. WIRING:

- A. All trailer wiring shall be to NEC standards. All cables shall be and run in non-metallic Polytuff electrical tubing or in metal conduit and raceways, as required, and supported by Caddy fasteners. Conductors shall be adequate to carry 125% of the current required by the connected load. Wiring and related devices shall be installed in a workmanlike manner, mechanically and electrically secure. Items requiring periodic service shall be readily accessible and serviceable. Wiring shall be protected by grommets when passing through structural members.
- B. Circuit breakers, switchboard, and panel boards: A switchboard shall be installed within the Control Room and contain a main-disconnect circuit breaker with a minimum rating of 200-amperes at 480-volts, three-phase Delta. Power distribution circuit breakers for all power circuits required during stationary operation shall be supplied. A second section of the power distribution panel shall have circuit breakers installed for equipment that is required to operate when the unit is mobile. The second section receives power through a power transfer switch. A third load section shall be installed to serve the lighting and receptacle power requirements.
- C. A power transfer switch shall be provided to transfer power to the main panel box from either the shore power line or the generator.
- D. Install three (3) 110-volt, waterproof, duplex receptacles on body exterior. Receptacles to be G.F.I. protected.
- E. Incorrect phasing protection is provided by installed phase sequence monitor. The main breaker trips when an out-of-phase condition is sensed.
- F. Install an external electrical grounding lug on the trailer.

12. LIGHTING:

- A. Lights shall be flush-mounted at finished ceiling. Lights provide a minimum light density of 50 foot-candles at working surfaces. A dimmer switch shall be provided in the Control Room.
- B. Provide 12-volt dome lights within exterior body compartments where applicable.
- C. Provide an exterior floodlight at entrance/exit location.
- D. Provide 12-volt, flush-mounted lighting in Scan and Control Room ceiling. These direct-current lights provide longest-lasting lighting in a strong magnetic field, and have multi-level lighting selectable through wall switches.
- E. Emergency lighting, in case of power failure, shall be provided through built-in systems within the lighting fixtures of the Computer Room. The Scan Room and Control Room lighting has an automatic switchover to on-board battery.
- F. Install "EXIT" sign on interior wall by entrance/exit door.
- G. Install a "WARNING – STRONG MAGNETIC FIELD" sign on curbside entrance door.
- H. Install dimmable, low-density lights under cabinets in Control Room.

13. GENERATOR/GENERATOR COMPARTMENT:

- A. Generator compartment shall be located in skirt with access through hinged doors with flush-mounted lock and holders in the open position. Compartment shall be properly framed with aluminum members.
- B. Provide a 48 KW Kubota, or equal, 480-volt, 60 Hertz, three-phase, liquid-cooled diesel generator. Generator shall be shock-mounted and equipped with remote controls, a heavy-duty deep-cell starting battery, blanketed critical area silencer, and AC instrument package. Generator shall be installed for easy servicing, proper heat and exhaust dissipation. Generator includes a digital control panel that annunciates current conditions and displays problems as they occur. The 12-volt battery for generator starting shall be connected to a separate battery charger.
- C. A remote start/stop button shall be installed. Two (2) 12-volt dome lights shall be installed in ceiling of the compartment.
- D. Install engine monitor with fault light and three (3) generator shutdown safeties.
- E. A manually controlled 200-amp transfer switching system shall be supplied to transfer power for the unit from the local power source to the generator power. The control station shall be located at the main power input area in skirt compartment.
- F. Generator provides power for in-transit heat/cool as well as interior lighting, cryogenerator and chiller. NOTE: Generator WILL NOT power SIEMENS equipment.
- G. A 51-gallon fuel tank, with gauge, shall be installed within trailer skirt. The tank will provide fuel for 24 hours of generator operation.
- H. Generator shall be mounted on sound and vibration reducing pads.

14. HEATING/VENTILATOR/AIR CONDITIONING/HUMIDIFICATION: (HVAC)

- A. Air conditioning and chilled water requirements will be supplied by a front-mounted Northern Air unit. Total cooling capacity of 315,000 BTUs and total heat capacity of 13.5KW will be supplied throughout the ambient range of -20 F to 105 F. Unit is controlled by a Programmable Logic Controller (PLC) with a remote display unit in the Control Room.
- B. Unit has a built-in humidifier connected to a 38-gallon water supply tank located in a skirt compartment. Install two (2) 500-watt heaters in skirt compartment for freeze protection.
- C. Air conditioning and heating shall be controlled by a single thermostat.
- D. Exterior condensation drain lines shall have full-length heat strips.

15. SMOKE ALARM:

Ceiling-mounted ionization and photoelectric smoke alarm is provided.

16. INTERIOR FURNISHINGS:

Note: All surfaces are Class A fire rated. All cabinets shall be constructed using high-pressure laminate on all surfaces.

A. Equipment Room:

1. Properly install SIEMENS-supplied cabinets.
2. Separated from Control Room by custom-built wall and doors.

B. Control Room:

1. Provide dual, Formica-surfaced operator's console for installation of customer-supplied computer monitors, hide-away keyboard, and mouse trays.
2. Above control desk install overhead storage cabinetry with access through hinged doors with positive door latches and adjustable hinges.
3. Install AM/FM Bluetooth stereo radio with CD player connected to ceiling-mounted speakers.
4. Provide and secure two (2) castered, upholstered operator's chairs with backrest.

C. Scan Room:

1. Scan Room shall be separated from Control Room by floor-to-ceiling, RFI-shielded partition. Shielding level shall be in accordance with SIEMENS requirements. Access shall be through hinged, shielded door which opens into Control Room (in case emergency exit from Scan Room is required). A shielded view window shall be installed within partition. All signal and power cables shall be run through a RFI filter panel.
2. Custom-built cabinet with positive door latches located on streetside wall.
3. Scan Room will accommodate optional Siemens Tim Dockable Table.

17. EQUIPMENT:

In order to centralize total responsibility for the trailer including: weight distribution, plumbing and electrical connections, and securing of all equipment for safe travel; equipment shall be delivered to Medical Coaches' plant for installation.

Equipment to be supplied shall include, but not be limited to:

- A. Magnet with patient table
- B. Computer racks
- C. Control stations
- D. Interconnecting cables
- E. Power conditioner (optional)
- F. UPS for computers (optional)

18. MISCELLANEOUS:

- A. Provide two (2) 5 lbs., non-magnetic A-B-C fire extinguishers bracketed and installed in the following areas: one (1) within body interior and one (1) within exterior compartment.
- B. Provide one (1) 50-foot, 4-wire, lead-in cable with waterproof receptacle on end for connection to 480-volt power source. Cable shall be rated for 200-amps.
- C. Provision shall be made for securing all equipment during operational transit.
- D. Provide one (1) detailed operating and service manual to include supporting manuals covering supplied items.
- E. Provide battery switch in streetside front compartment that switches between generator battery and 12-volt system battery. This allows a "back-up" for 12-volt system battery.
- F. Install an access port within the compartment door of the electrical cable compartment allowing the lead-in cable to be connected with the compartment doors closed.
- G. Provide a 50-foot water hose to fill humidifier tank.
- H. Two (2) manually controlled, clear back-up lights shall be installed on rear of trailer. Switch control is located on front of trailer.

19. BODY EQUIPMENT:

All vehicle lights, reflectors, markings and wiring systems shall be in conformance with D.O.T. Safety Regulations and State laws. The system shall be 12-volt. Lights shall not be mounted on rub rails or vehicle bumper. An illuminated rear license plate holder shall be furnished. All exterior lights shall be LED.

20. SPECIAL REQUIREMENTS:

- A. Due to variances in State and Local regulations, there may be some additional options required for individual compliance. If compliance necessitates extra-cost options, they will be quoted separately as necessary.
- B. Proper maintenance of trailer suspension and tractor suspension is required to meet SIEMENS' technical requirements for mobile MRI trailer suspensions.

21. LIMITED WARRANTY:

Medical Coaches Incorporated offers a limited warranty on the mobile unit for twelve (12) months or 12,000 miles. The warranty includes all equipment supplied by Medical Coaches except those items that are covered by a separate warranty.

A detailed warranty statement shall be provided upon purchase or upon request.