Toshiba Aquilion 16 CT Scanner

TECHNICAL SPECIFICATION AQUILION 16

- Digital signal transmission facilitated by innovative optical-coupling technology
- Generator is inside the gantry to conserve space
- Industry's largest aperture: 72 cm
- Five scan fields of view: 18, 24, 32, 40 and 50 cm
- Gantry controls on both sides
- Patient positioning lights
- Wide range of scan times provides greater flexibility for optimal image quality (0.32 partial; 0.5, 0.75, 1, 1.5, 2 and 3 seconds full)
- Gantry tilt range of ±30 degrees during axial and helical acquisitions
- Slice thickness selections of 16x0.5, 16x1 and 16x2 mm with the capability of stacking images to the desired slice thickness

Highlights include:

- Large-aperture, slip-ring gantry and extra-wide couch
- Ergonomic operator console
- High-frequency X-ray generator
- High-heat-capacity X-ray tube
- Volume image processor
- On-line help
- High-capacity hard disk
- Magneto optical disk storage (MOD)
- Image data transfer link
- Patient positioning accessories
- Operator manuals and quality assurance phan-

Key Features:
Routine Fast Scanning: Using slip-ring technology, Aquilion 16 is able to perform 0.32-second partial scans and 0.5-second routine scans to meet the demands of dynamic andhelical examinations.

High Image Quality: The Aquilion 16 features 896 channels in 40 rows of solid-state detectors; specialized, user-selectable, image-reconstruction algorithms; and a wide selection of slice thicknesses. The system provides outstanding low-contrast resolution of 2 mm at 0.3% and high-contrast resolution of 0.35 mm.

High-Power Generator: Robust, high-voltage circuits generate 60 kW of power and 500 mA, providing support for the 7.5 MHU X-ray tube that makes possible helical scans upto 100 seconds and scans with metal-free scan range of up to 1,800 mm.

Multiple kV Selections:
80, 100, 120 and 135 kV.

Fast Image Reconstruction Time:
Up to 10 images per second.

SURETechnology: Provides maximum productivity and best image quality at the lowest possible dose. Real-time helical display, which provides instantaneous visualization of acquired images, allowing the operator to rapidly assess if additional images are needed. SUREStart bolus tracking device, which is included in the standard configuration, provides the ability to monitor contrast media.

Dose Reduction: Real Exposure Control Superior detector technology provides better image quality with lower dose. Real EC reduces patient dose up to 40% during helical scans, automatically modifying tube current based on patient anatomy.

Easy Operation: Perform easy operations using the 18-inch LCD monitor, mouse and hybrid keyboard. Scan automatically by programming procedures with eXam Plan and vocal instructions through VoiceLink™.

Couch
- 47 cm wide, metal-free couch top
- Horizontal stroke of 2,190 mm and a scanning range of 1,800 mm for tall patients
- Couch top can be lowered to 30 cm (12 inches)
- Manual control of table incrementation from both the gantry and console or programmed by an exam protocol
- Couch top supports up to 450 lbs. while main taining accuracy of ±0.25 mm

Console
- Consists of hybrid keyboards, mouse, moni tors and Navibox
- Controls the entire system, including power
- Image display
- Scanoscope control
- Remote control of couch-top movement
- Gantry tilt control
- Window level and width adjustment
- Three preset windows can be stored in the eXam Plans
- Other mouse-operated, image-processing functions
- High line-rate, 18-inch LCD monitors
- Displays images in 512x512 or 1024x1024
- CT number display ranges from –1,536 to +8,191
- 32 programmable voice commands

X-ray Tube

The Aquilion 16 is equipped with the MegaCoolTM X-ray tube. This compact, highperformance tube was designed specifically to minimize tube-cooling delays in heavy patient-load conditions using 0.5-second scan time.

Other features include:

- Dual focal spots
- Anode capacity of 7.5 MHU
- Dissipation rate of 1,386 kHU per minute ma ximum
- Solid-state detector array
- Low-contrast resolution of 2 mm at 0.3%
- 896 detector channels and 40 rows of detec tor elements
- 1,800 views per second to produce high-reso lution images

Computer

- Two 32-bit processors
- Capable of simulta neous scanning, retrieving, reconstructing, archiving and filming without interruption, true multi-tasking system
- Ultra-fast, 217 GB hard disk
- 100,000 images on both scan and display console
- 3,600 rotations of raw data maximum
- An erasable magneto optical disk (4.8 GB) holds up to 16,000 images (512x512)

Patient Management

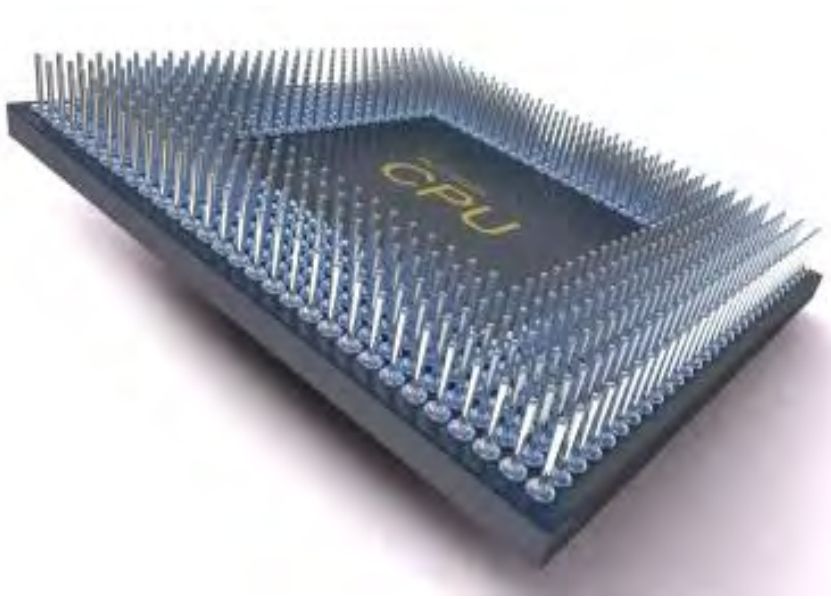
- Enter individual patient information at the time of examination
- On-line patient appointment file

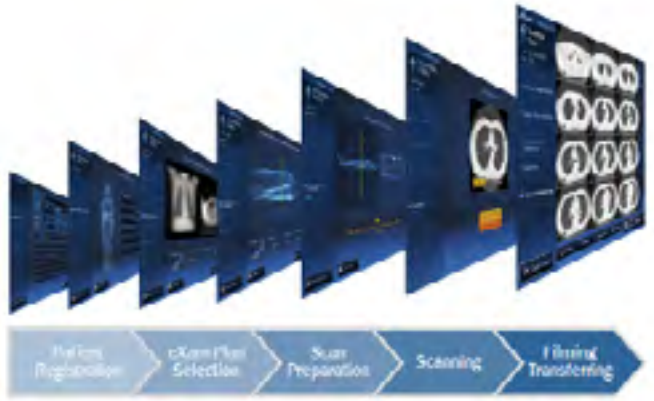
Image Management

Aquilion 16 images can be stored on hard disk, magneto–optical disk or transferred via gigabit Ethernet connection using DICOM 3.0 standards.

DICOM 3.0 (Storage SCU)

- Allows the CT scanner to export images onto a network
- Consists of software only and utilizes pre-existing Ethernet ports on the CT scanner to connect to a coax-Ethernet-based network running TCP-IP communication protocols
- The system can be set to automatically trans fer images to the network after an exam is complete





DICOM 3.0 (Print SCU)

- Allows the CT scanner to send image data that has been acquired and reconstructed to a film imager for printing via Ethernet in conformance with DICOM 3.0 standards Image Display
- Display in multiple formats ranging from 1 to 16
- Overlay an inset scanogram for quick reference marking
- Add, subtract, rotate or filter images
- Adjust window width and level non-linearly, accommodating up to six built-in curves and six user-defined curves

Image Quality Enhancement

Automatic, 2-Pass, Beam-Hardening Correction (BHC): Compensates for the nonuniform, beam-hardening effect of bone for more accurate reconstruction. Reduction of streak artifacts in the posterior fossa and elimination of cupping artifact in the mid-brain.

Raster Artifact Suppression Protocol (RASP): Reduces artifacts caused by nonuniform attenuation such as in the shoulders and pelvis, and may be applied prospectively or retrospectively.

Automatic Patient Motion Correction (APMC): Reduces streak artifacts caused by movement of high-contrast interfaces such as air, contrast or metal during scanning. APMC is especially useful for scanning trauma, sedated, or uncooperative patients.

Reconstruction Algorithms: Grouped by anatomical application, more than 20 algorithms are provided for customized image reconstruction according to the diagnostic information needed or physician preference.

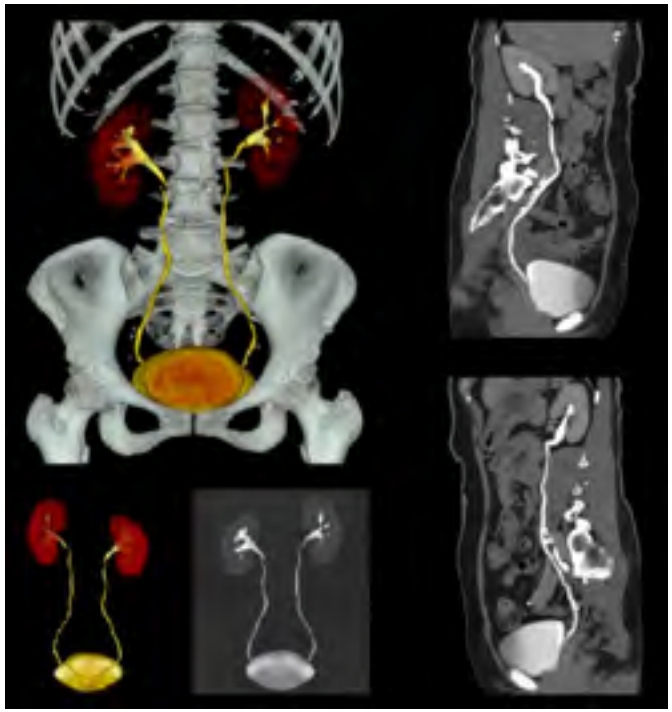
Helical Scan & Functionality

MultiView: Built into protocol for fast, multi-planar reconstruction in batch mode specifically for multislice data sets. Coronal, sagittal and axial are displayed in real-time for immediate viewing.

3-D Imaging: Provides excellent image quality with surface shaded-renderings and volume-rendered 3-D images. Provides zooming and panning over the 3-D surface and performs distance measurements.

Other features include:

- 3-D surface display
- 3-D shaded volume display
- Maximum intensity projection (MIP)
- Minimum intensity projection
- Intensity volume rendering



Quantitative Analysis

- Profile display of CT numbers along a selected line in the axial plane
- Distance measurement and display
- CT number display
- Histogram display
- Circulatory function analysis fits a curve to CT number changes over time for a selected region of interest (ROI)
- Functional images based on peak height, peak time, appearance time, area under curve, mean transit time, second moment and transit time
- ROIs can be rectangular, circular or irregular

Image Manipulation

- Vari-area allows pre-selection of ROI for accurate display field of view (DFOV) using raw data for immediate viewing
- User-defined, post-processing filters for edge enhancement and smoothing

Annotation

- Four lines of comments and arrow display
- 36 exam information fields that can be selectively masked or shown depending on site requirements

eXam Plan Protocols

- 684 eXam Plan protocols that can be adjusted while scanning
- Four preset reconstructions
- eXam Plan sets can be stored on optical disks and copied to other Toshiba scanners

Archiving

- Can be automated with each eXam Plan
- Raw data can be stored on and retrieved from MOD
- Raw data and image data can be protected to prevent deletion

Filming

- Auto filming can be set as part of the eXam Plan
- Images are displayed in 512x512 or 1024x1024

InnerVision

- Remote diagnostics proactively monitor the system to minimize downtime