

GE Healthcare

Enter the volume

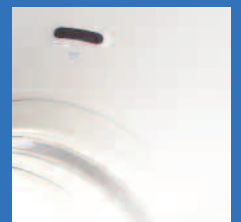
LightSpeed VCT: the first Volume CT



“Imagination at work” is the inspiration that drives us – an open license to think outside the box and dream of a better world for tomorrow. A world that is as pain and stress free as possible for patients, while enabling physicians to get to an answer accurately, quickly and reliably.

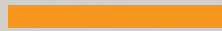
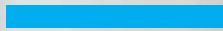
Now, the innovative technology of LightSpeed® VCT makes this world possible, opening the door to new and advanced procedure possibilities in non-invasive diagnostic imaging.

Dare to dream





LightSpeed
VCT

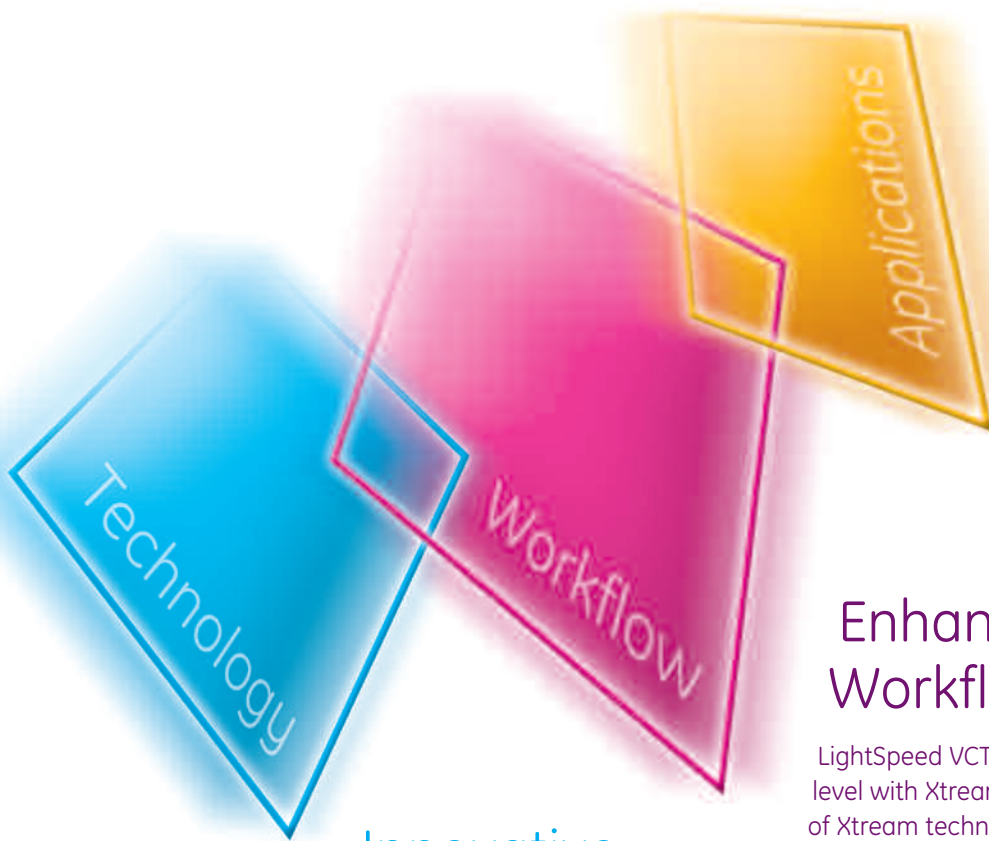


Volume CT achieves this technological leap forward through a radical platform design that enables the clinician, for the first time, to utilize volume coverage and thin slice imaging concurrently rather than alternately.

LightSpeed VCT delivers 40mm of coverage per rotation while providing 0.35mm microVoxel™ resolution.

This unprecedented marriage of high volume and high resolution has three major clinical rewards: dramatically reduced acquisition times, improved image quality and new clinical applications.

Volume CT generation



Innovative Technology

A balanced system design to deliver
technology without compromise

New Clinical Applications

LightSpeed VCT takes
a leap forward in expanding
the role of CT imaging

Enhanced Workflow Platform

LightSpeed VCT takes workflow to the next
level with Xstream™ FX, the second generation
of Xstream technology platform

Why LightSpeed

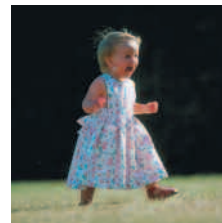
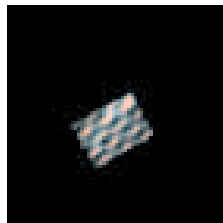
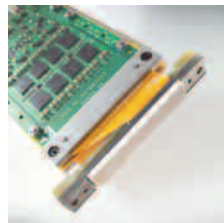
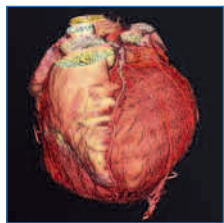
Image quality

5-Beat Cardiac™, Triple RuleOut™, Stroke WorkUp - breakthrough clinical applications

V-Res™ true 64 channel detector with 40mm coverage

Isotropic 0.35mm resolution with isotropic detector size and conjugate ray recon

Performix™ Pro tube, 100kW, 800mA, for cardiac and large patients



Patient friendly

Fast rotation, down to 0.35sec, for short breath hold, reduced sedation, improved compliance

VT Patient Table, 227kg capacity, 2m scannable range, 43cm minimum height

ed VCT?

Reduced dose

Optidose™, 3D and ECG dose modulation, 3 dose reduction bowtie filters, to ensure lowest dose to patient, always

Volara™ DAS - 30% lower electronic noise to give better IQ and lower dose

Throughput

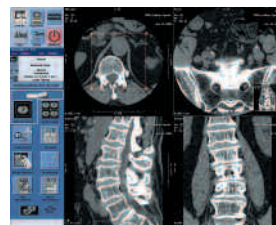
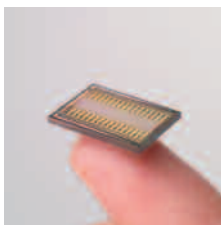
Xtream™ FX reconstruction and transfer at **16 images per sec**

DirectMPR and Direct Connect, protocol driven and automated 3D workflow

Uptime Future

Fault tolerant design and high reliability – redundant recon processors, disk arrays

Open platform for evolution, in acquisition and clinical applications



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GE imagination at work

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Fastest route to diagnosis

LightSpeed VCT Clinical Applications



True volume review

Volume CT is opening doors to new clinical applications, and making routine studies even better. In cardiac, trauma, pediatric, neuro, angiography, or pulmonary exams, the ability to hit the parameter trifecta of high speed, sub-millimeter resolution and wide coverage is critical to imaging success. Demonstrated benefits include freezing of cardiovascular motion, pure arterial phase imaging, and superior MultiPlanar Reformats through routine high resolution acquisition. LightSpeed VCT is expanding the role of CT imaging.

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5-Beat Cardiac™

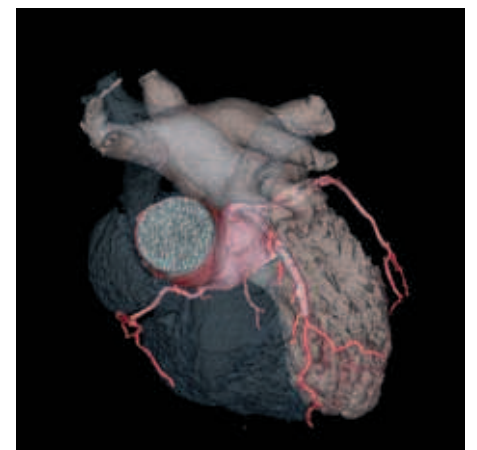
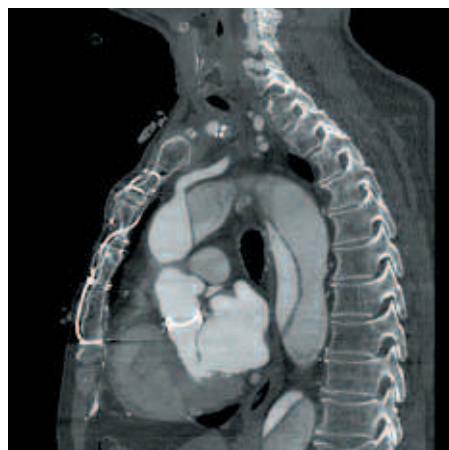
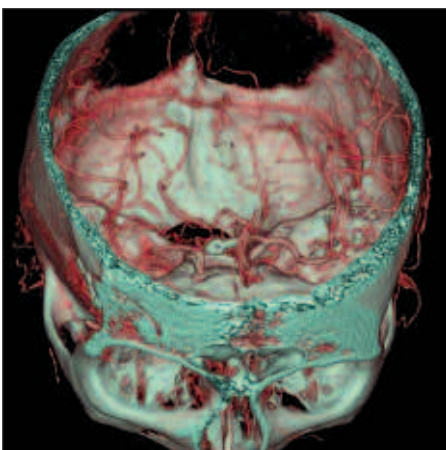
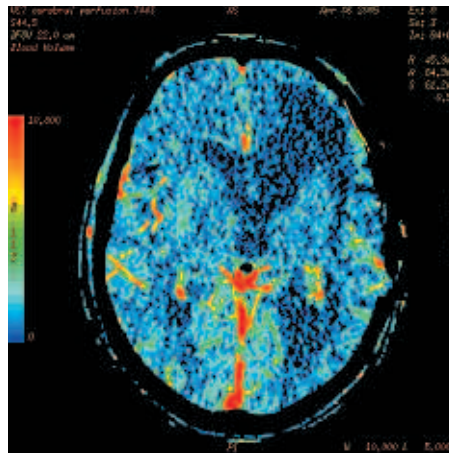
Fully robust and repeatable procedure

The LightSpeed VCT offers the unique possibility to scan in just 5 beats, delivering coronary arteries, cavities and myocardium assessment in pure arterial phase. 5-Beat Cardiac minimizes heart rate variability, delivering a diagnostic study for virtually every patient. Delivering a true coverage of 40 mm per rotation, a rotation speed of 0.35 sec, for an acquisition in a short breath-hold, LightSpeed VCT makes cardiac CT a routine examination.

Triple RuleOut™

Chest pain management... all in one

The Triple RuleOut acquisition based on ECG gated protocol allows extended anatomical coverage for a patient exhibiting acute chest pain in an emergency environment, for evidence of coronary disease, pulmonary embolism or aortic dissection - the three most life-threatening causes of chest pain.



Stroke WorkUp

24x7 operation mode to rule out cerebral bleeding

In many institutions, CT is the only modality staffed 24 hours a day and 7 days a week that can be commonly used to rule out cerebral bleeding. Volume CT delivers, with 40 mm of high resolution per rotation. Combined with the GE CT Brain Perfusion application, the user can process dynamic image data and generate functional perfusion parameters based on changes in image absorption over time. Low-dose protocols also permit procedure repeats in the follow-up phase.

Whole Body Trauma

The fastest way to a clinical decision for polytrauma patient

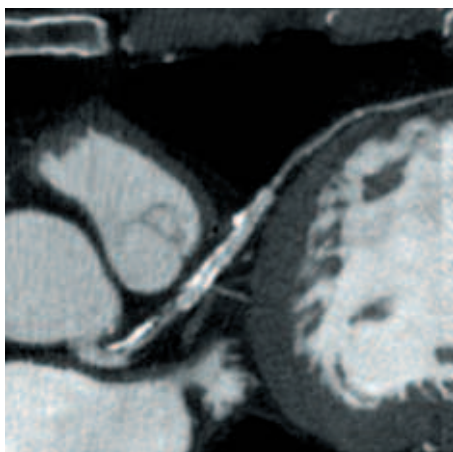
Polytrauma patient management requires speed, flexibility and detailed visualization. With high resolution scanning from head to toe in 10 seconds, the LightSpeed VCT delivers. Automated protocols for scanning, reconstruction, multiplanar reformat and data transfer give you the images you need. When time cannot be wasted.

Pediatric Imaging

Better patient comfort and diagnosis when time is critical

With the combination of fast acquisition speed, large coverage and high spatial resolution in all acquisition modes, the LightSpeed VCT is especially appropriate for pediatric examinations. Quick and precise together with reduced radiation dose, such non-invasive techniques can be addressed for restless patients, improving the likelihood to complete the exam, with the potential to reduce sedation and pre-medication, specially for the exploration of congenital malformations such as transposition of great vessels.

Expand the role of



Oncology

Tumor and organ perfusion

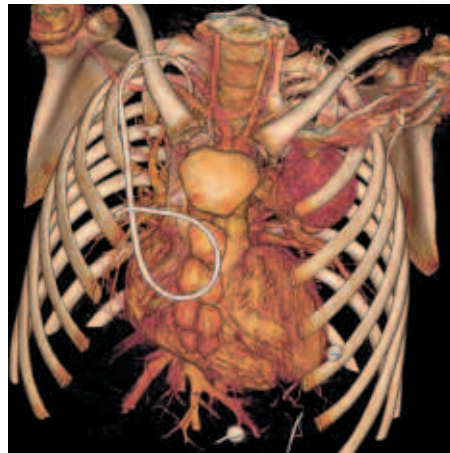
Volume CT Perfusion provides results in the evaluation of primary cancer targets, metastasis, therapy follow-up and the future developments of new therapy courses, such as new anti-angiogenesis drugs. The extended coverage of the LightSpeed VCT together with new acquisition protocols makes CT a potential new investigation technique for myocardium perfusion. CT is also a choice of investigation for lung nodules assessment including growth over time and efficiency of therapy. In addition, CT shows growing impact on colon cancer and polyps characterization as non-invasive technique well tolerated by the patient.

CT Angiography

Pure arterial phase from Circle of Willis to toes

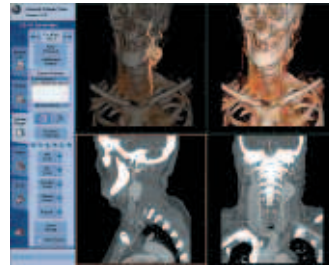
With no trade-off between speed and high resolution, LightSpeed VCT allows a complete assessment of all vascular segments including lumen views and vessel wall. Optimized injection protocols combined with flexibility in acquisition parameters leads to a large anatomical coverage within arterial phase and consequently to new limits in vessel visualization. The combination of unequalled image quality delivered by the LightSpeed VCT and color-coded plaque capability, makes CT Angiography a new standard in vascular investigation.

CT imaging

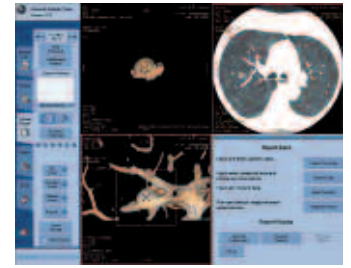


The most comprehensible set of clinical tools for your application

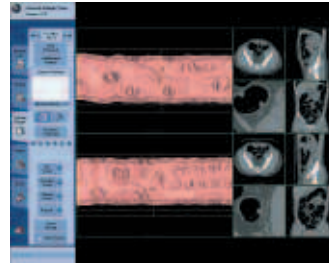
GE offers an unmatched breadth and depth of anatomical and disease-focused advanced clinical applications, directly on the operator console or on the Advantage Workstation.



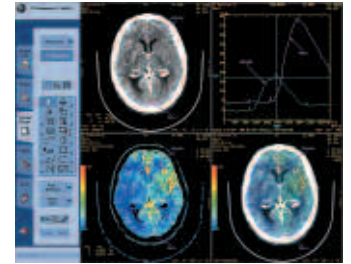
Volume Viewer provides simultaneous access to MPVR, MIP, Volume Rendering and 3D enabling comparison studies (either same study with different rendering, or comparing two or more studies).



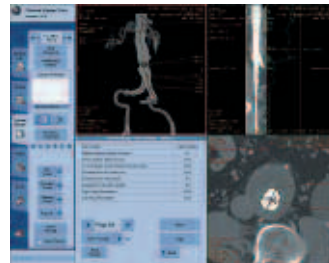
Lung Analysis for one-click auto segmentation and sizing of lung nodules from vessels and pleural surfaces with the ability to calculate doubling times and percent growth for follow-up studies.



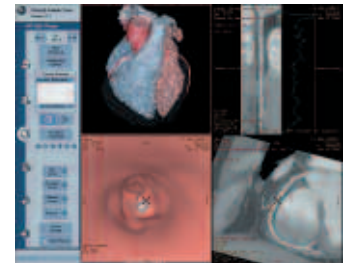
Advantage CTC, which provides new reading tools that reduce overall reading times. Exclusive features such as "virtual dissection" mode speeds identification of polyps and other anatomy of interest, and delivers a complete colon and abdominal assessment in a single study.



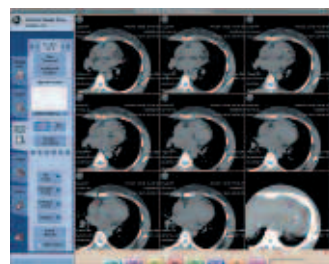
Perfusion to provide qualitative and quantitative information for the assessment of brain stroke, brain tumor and body tumor conditions including the liver. It combines the lowest injection rates in the industry with a wide array of intuitive decision-making tools.



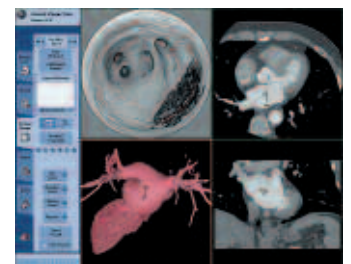
Vessel Analysis for the visualization and quantification of vascular anatomy and structures. The fast, accurate measurements are valuable for stent placement planning and follow-up, as well as visualization and characterization of highly tortuous vessels.



CardIQ Analysis, a comprehensive cardiac package used to streamline postprocessing capabilities in the heart and coronary vessels. With GE's exclusive vessel analysis, phase registration and automated volume rendering application, coronary arteries and anatomy can be displayed accurately within minutes.



SmartScore to compute coronary artery calcification scores for assessing the extent of heart disease with multiple scoring algorithms and a comprehensive patient report.



CardEP enables planning for electro-physiology procedures by providing visualizations of the coronary chambers and veins, including the left atrium, pulmonary veins and coronary sinus, while reducing processing time.

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The next big breakthrough

LightSpeed VCT Technology



Revolution

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For decades, GE has been the undisputed leader in Computed Tomography. CT has evolved from step-and-rotate to helical to multi-slice scanners. And now, for the first time, the generation of Volume CT has arrived.

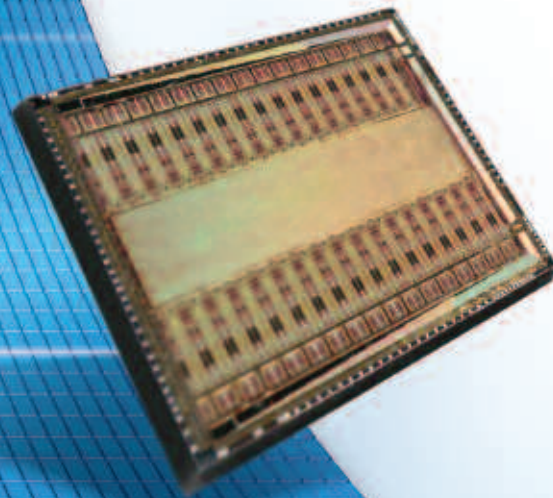
The consummation of five years of development, 75 patents, and more than \$100M investment, the GE LightSpeed VCT is a breakthrough in CT technology. LightSpeed VCT is the largest R&D effort in GE CT history.

Ultimately, the performance of every CT scanner begins with its detector and X-ray tube design. At the heart of this technological breakthrough: GE's revolutionary V-Res™ detector with true 64 channel microVoxel™ acquisition, and the industry's most powerful X-ray tube: the Performix® Pro. Both concepts were developed by GE's Global Research Center, gathering over a thousand scientists and engineers representing more than twenty different nations.

Today, the LightSpeed VCT will allow you to discover the Volume CT generation, a true symbol of the innovative spirit that drives GE's research teams throughout the world.

Volum

Volara™, GE's new digital DAS, delivers increased processing power for high quality images and low dose performance.



V-Res™ detector The Volume CT enabler

Never before has a CT scanner delivered volume, resolution and speed - simultaneously. Welcome to the generation of Volume CT, where data is acquired sub-millimeter, all the time.

With the ability to acquire 64 channels at 0.35mm microVoxel™ resolution across 40mm of anatomy in a 0.35sec rotation, GE's V-Res detector is the first to enable routine clinical Volume CT.

The V-Res detector was made possible by GE exclusive technology innovations: fast and efficient HiLight™ scintillator, scalable Backlit Diode, high density interconnects, and the highly miniaturized Volara™ digital Data Acquisition System (DAS).

The first CT detector with 64 true acquisition channels, the 40 mm-wide V-Res detector uses 100% of its active area to cover anatomy at the fastest speed - with sub-millimeter resolution.

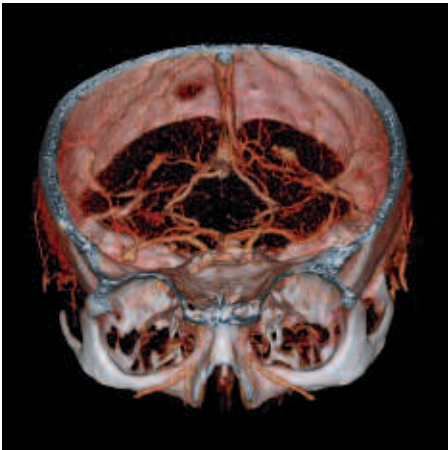
e CT, the next gene

Volara™

A true 64-channel DAS

Complementing GE's efficient Backlit Diode technology, the V-Res detector is powered by the Volara digital DAS capable of acquiring 58,368 channels simultaneously, for over 143 million detector channel readouts per second. Its highly miniaturized integrated circuitry makes the V-Res detector scalable to increase coverage and rows, while achieving the space, weight, thermal, and mechanical requirements to rotate at 0.35 sec. LightSpeed VCT's Volara digital DAS addresses the main limiting factor of CT image quality - noise - by reducing electronic noise 30-40% compared to previous generations of DAS.

Volara delivers Volume CT with ALARA dose (As Low As Reasonably Achievable).



Performix® Pro tube

The power to perform

Volumetric CT places unprecedented demands on tube technology. The ability to scan routinely at sub-second speeds with 40mm coverage and 0.35mm microVoxel™ resolution requires exceptional power, throughput and X-ray beam quality.

Backed by a powerful 100kW generator, the Performix® Pro delivers the highest peak mA capability of any X-ray tube on the market - up to 800 mA. Well above the typical industry performance of 440-500 mA, this capability provides the user with ample power to:

- Image smaller structures and see greater detail
- Examine larger patients successfully without making tradeoffs
- Achieve higher gantry rotation speeds for routine 0.35 second scanning.



The GE Performix® Pro X-ray tube meets the unprecedented demands on X-ray sources with industry leading image quality, peak power and total throughput. All at the lowest dose that today's CT users demand.

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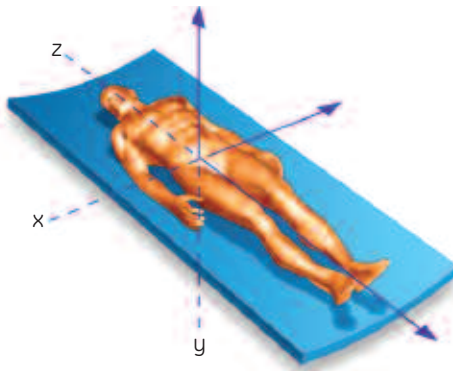
Optidose™

Volumetric scans with less dose

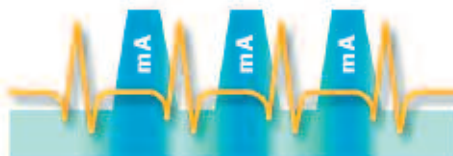
Patient dose reduction and image quality are inseparable topics. Improved image quality and dose efficiency allow lower doses to be used for scanning. At GE, our goal is to enable clinicians to obtain the maximum image information for the minimum dose. GE's OptiDose™ dose reduction program has long enabled LightSpeed to demonstrate proven dose efficiency leadership in independent studies, thanks to features such as SmartTrack dynamic collimation, Color Coding for Kids protocols, 3D automatic dose modulation, ECG dose modulation, and the electron collector on the Performix Pro X-ray tube. LightSpeed VCT further improves dose efficiency with a new, exclusive X-ray filtration system tailored for small, medium or large patients.

Fully 3D volume reconstruction

LightSpeed VCT utilizes a fully three-dimensional volumetric reconstruction algorithm with GE's unique 3D conjugate ray reconstruction. Conjugate ray reconstruction provides z-oversampling for isotropic 0.35mm resolution, without the dose penalty of other z-oversampling techniques. And volumetric reconstruction delivers superior off-isocenter and pitch-independent resolution.



3D dose modulation accounts for the body in all three dimensions - personalizing each scan.



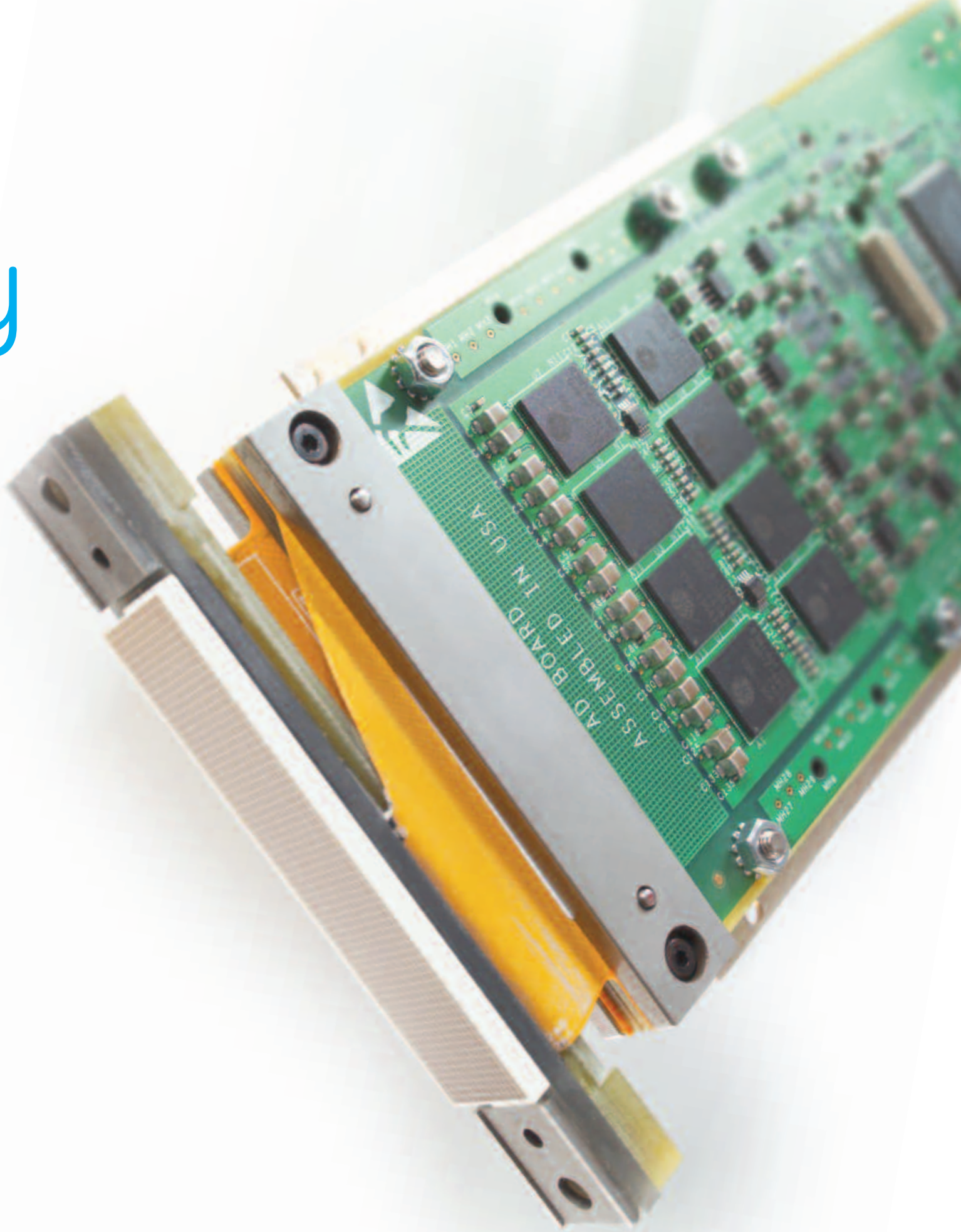
ECG dose modulation helps to achieve up to 50% dose reduction on most cardiac studies.

New service paradigm

LightSpeed VCT introduces a breakthrough in the way service is delivered to CT. A dedicated service design and service infrastructure is the answer to deliver optimal availability and performance.

Thanks to the unique combination of the component redundancy and fault tolerant model used in the aircraft industry, along with the GE proactive services remote infrastructure, LightSpeed VCT delivers the quality and productivity you expect, even in the most demanding utilization environment. In many cases, a single component failure no longer impacts the overall equipment availability.

In parallel, people are key to deliver first class service. Field engineers selected to provide LightSpeed VCT service are required to complete more than 100 hours dedicated training. In order to ensure that all engineers have access to the most up-to-date service information, all the global engineering and service expertise is stored in one knowledge database available online through a remote interface. This interface allows a field engineer to not only diagnose failures and get support from GE remote services, but also order spare parts and track their delivery.



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