



North Carolina Department of Health and Human Services
Division of Health Service Regulation

Pat McCrory
Governor

Aldona Z. Wos, M.D.
Ambassador (Ret.)
Secretary DHHS

Drexdal Pratt
Division Director

January 29, 2015

William James
Northern Hospital of Surry County
830 Rockford Street
Mount Airy, NC 27030-5322

Exempt from Review - Replacement Equipment

Facility: Northern Hospital of Surry County (Northern Hospital)
Project Description: Replace CT Scanner
County: Surry
FID #: 953376

Dear Mr. James:

The Healthcare Planning and Certificate of Need Section, Division of Health Service Regulation (Agency) determined that based on your letter dated January 9, 2015, received by the Agency on January 22, 2015, the above referenced proposal is exempt from certificate of need review in accordance with G.S 131E-184(a)(7). Therefore, you may proceed to acquire, without a certificate of need, the new GE Optima CT 660 64-slice to replace the existing GE LS QXi 1-slice, Model # 2138400, S/N 210351CN3 located on the hospital campus. This determination is based on your representations that the existing unit will be removed from North Carolina and will not be used again in the State without first obtaining a certificate of need.

Your letter also indicated you are relinquishing one of the three CT scanners located at Northern Hospital, the GE LS Ultra 8-slice, Model # 2377708-41, S/N 385389CN2, which will not be replaced. At the end of this project, Northern Hospital will have a total of two CT scanners. Please remember that once CT scanner, Model # 2377708-41 is removed and is not replaced, a new certificate of need may be required before a third CT scanner can be acquired if the capital cost exceeds \$750,000.

Moreover, you need to contact the Agency's Construction and Acute and Home Care Licensure and Certification Sections to determine if they have any requirements for development of the proposed project.

Healthcare Planning and Certificate of Need Section

www.ncdhhs.gov

Telephone: 919-855-3873 • Fax: 919-733-8139

Location: Edgerton Building • 809 Ruggles Drive • Raleigh, NC 27603

Mailing Address: 2704 Mail Service Center • Raleigh, NC 27699-2704

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William James
January 29, 2015
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It should be noted that the Agency's position is based solely on the facts represented by you and that any change in facts as represented would require further consideration by this office and a separate determination. If you have any questions concerning this matter, please feel free to contact this office.

Sincerely,

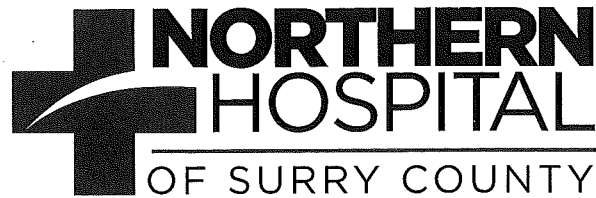


Kim Randolph
Project Analyst



Martha J. Frisone
Assistant Chief, Certificate of Need

cc: Construction Section, DHR
Acute and Home Care Licensure and Certification Section, DHR
Assistant Chief, Healthcare Planning



January 9, 2015

Ms. Martha Frisone
 Interim Chief
 Certificate of Need Section
 2704 Mail Service Center
 Raleigh, NC 27699-2704

RE: Written Notice for Exemption from Review for Replacement CT Scanner Equipment at Northern Hospital District of Surry County

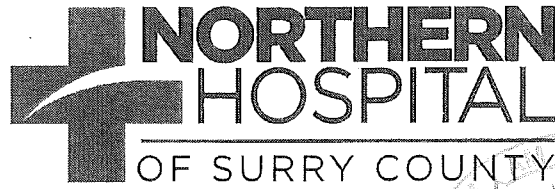
Dear Ms. Frisone:

Northern Hospital District of Surry County d/b/a Northern Hospital of Surry County currently owns and operates three CT scanners at the hospital campus in Mount Airy, NC as seen in the 2014 License Renewal application included in attachment 4. Northern Hospital of Surry County intends to replace one of its existing CT scanners with a new CT scanner, trade in one existing scanner with no replacement and continue to utilize one existing CT scanner. At the completion of the CT scanner replacement and trade in, Northern Hospital of Surry County will own and operate a total of two CT scanners. The following table summarizes the transaction:

CT Scanners at NHSC	Proposed Action	CT Scanners Following Transaction
GE LS Ultra 8-slice Model: 2377708-41 S/N: 385389CN2	Trade in / no replacement	No replacement
GE LS QXi 1-slice Model: 2138400 S/N: 210351CN3	To be replaced	Replacement New GE Optima - CT 660 64 slice
GE LS VCT 64-slice Model: 5115335 S/N: 401894CN1	Continue to operate	No change in current GE LS VCT 64-slice

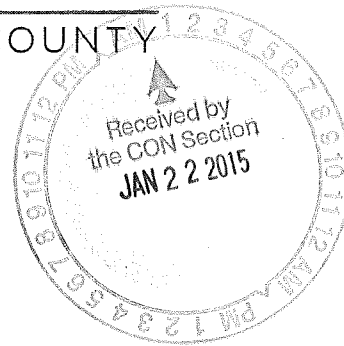
In accordance with NCGS 131 E-184, this letter provides justification and written notice regarding the replacement equipment. Northern Hospital of Surry County ("NHSC") also provides documentation that the replacement equipment conforms to the Certificate of Need laws and Administrative rules:

- G.S. 131E-176 (22a) Replacement equipment definition
- G.S. 131E-184 (a) (7) Exemptions from review to provide replacement equipment
- 10A NCAC 14C.0303 Replacement Equipment Administrative Rules



January 9, 2015

Ms. Martha Frisone
Interim Chief
Certificate of Need Section
2704 Mail Service Center
Raleigh, NC 27699-2704



RE: Written Notice for Exemption from Review for Replacement CT Scanner Equipment at Northern Hospital District of Surry County

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Overview

The existing CT scanner was acquired and installed at NHSC in 1996 and will need to be replaced very soon for several reasons:

- 1) The CT scanner is a single slice unit with older software applications that are difficult to maintain.
- 2) Costly maintenance and repairs are required due to the age and condition of the scanner.
- 3) Newer CT scanners provide reduced radiation exposure.

The existing GE LSQXi CT will be replaced with the GE model number Optima CT660 described in the equipment quote and brochure in attachment 1. The serial number for the replacement CT scanner is not available prior to ordering the unit.

Compliance Documentation

Compliance with G.S. 131E-176 (22a) Replacement Equipment Definition is demonstrated in Attachment 1 which shows that the replacement CT scanner will cost less than \$2,000,000. The capital cost worksheet is included in attachment 1 with the equipment comparison form. As seen in Attachment 1 the replacement CT scanner equipment will be used for the same diagnostic purposes as the existing CT scanner. The equipment quote for the new GE scanner is included in attachment 2. Attachment 3 includes the quotes from RCS for renovations and equipment installation and a quote from Bayer Healthcare for the relocation of the MedRad injector.

In addition, NHSC is providing prior written notice to the Department in accordance with G.S. 131E-184 (a) (7) Exemption from Review to provide replacement equipment.

Applicability and Conformance with Administrative Rule 10A NCAC 14C.0303 Replacement Equipment

10A NCAC 14C.0303 Replacement Equipment

(a) The purpose of this Rule is to define the terms used in the definition of "replacement equipment" set forth in G.S. 131E-176(22a).

NHSC has reviewed this rule definition.

(b) "Activities essential to acquiring and making operational the replacement equipment" means those activities which are indispensable and requisite, absent which the replacement equipment could not be acquired or made operational.

NHSC has reviewed this rule definition.

(c) "Comparable medical equipment" means equipment which is functionally similar and which is used for the same diagnostic or treatment purposes.

NHSC has reviewed this rule definition. The replacement CT scanner will be used to perform the same types of procedures as the existing CT scanner.

(d) Replacement equipment is comparable to the equipment being replaced if:

(1) it has the same technology as the equipment currently in use, although it may possess expanded capabilities due to technological improvements; and

The replacement CT scanner is comparable to the equipment being replaced because the new equipment will also obtain CT images. The proposed replacement CT scanner does possess expanded capabilities due to technological improvements including minimize radiation doses and maximized image quality.

(2) it is functionally similar and is used for the same diagnostic or treatment purposes as the equipment in use and is not used to provide a new health service; and

NHSC certifies that the replacement CT equipment will be used for the same diagnostic purposes as the existing CT scanner that will be removed from the hospital. Please see attachment 1.

(3) The acquisition of the equipment does not result in more than a 10% increase in patient charges or per procedure operating expenses within the first twelve months after the replacement equipment is acquired.

NHSC certifies that the acquisition of the equipment does not result in more than 10% increase in patient charges and per procedure operating expenses within the first twelve months after the replacement equipment is acquired. Please see attachment 1.

(e) Replacement equipment is not comparable to the equipment being replaced if:

(1) the replacement equipment is new or reconditioned, the existing equipment was purchased second hand and the replacement equipment is purchased less than three years after the acquisition of the existing equipment.

Not applicable. The replacement CT scanner will be purchased more than three years after the acquisition of the existing equipment. As seen in the table on page 5, the equipment being replaced was purchased and installed in 1996.

(2) The replacement equipment is new, the existing equipment was reconditioned when purchased, and the replacement equipment is purchased less than three years after the acquisition of the existing equipment; or

Not applicable. The replacement equipment is a new CT scanner and the existing equipment was purchased in 1996.

(3) The replacement equipment is capable of performing procedures that could result in the provision of a new health service or type of procedure that has not been provided with the existing equipment; or

Not applicable. The replacement equipment will be used for the same diagnostic procedures as the existing equipment. The replacement equipment is a more advanced CT scanner with lower radiation dosage and higher imaging quality. These features do not change the basic technology or result in the provision of a new health service or type of procedure.

(4) The replacement equipment is purchased and the existing equipment is leased, unless the lease is a capital lease;

Not applicable. The existing equipment is not leased.

(5) The replacement equipment is a dedicated PET scanner and the existing equipment is:

(A) a gamma camera with coincidence capability; or

(B) nuclear medicine equipment that was designed, built, modified to detect only the single photon emitted from nuclear events other than positron annihilation.

Not applicable. The existing equipment is not a dedicated PET scanner, gamma camera or nuclear medicine equipment.

Attachment 1 – Signed Capital Cost and Equipment Comparison Forms

PROJECTED CAPITAL COST

Project Name: CT Scanner Replacement

Proponent: Northern Hospital of Surry County

A. <u>Site Costs</u>			
1	Full purchase price of land	NA	
	Acres _____ Price per Acre	NA	
2	Closing costs		\$0
3	Site Inspection and Survey		\$0
4	Legal fees and subsoil investigation.		\$0
5	Site Preparation Costs		
	Soil Borings	NA	
	Clearing-Earthwork	NA	
	Fine Grade For Slab	NA	
	Roads-Paving	NA	
	Concrete Sidewalks	NA	
	Water and Sewer	NA	
	Footing Excavation	NA	
	Footing Backfill	NA	
	Termite Treatment	NA	
	Other (Specify)	NA	
	Sub-Total Site Preparation Costs	NA	
6	Other (Specify)		\$0
7	Sub-Total Site Costs		\$0
B. <u>Construction Contract</u>			
8	Cost of Materials		
	General Requirements	Included in amount below	
	Concrete/Masonry	Included in amount below	
	Doors & Windows/Finishes	Included in amount below	
	Thermal & Moisture Protection	Included in amount below	
	Equipment/Specialty Items	Included in amount below	
	Mechanical/Electrical	Included in amount below	
	Other (Specify)	Included in amount below	
	Sub-Total Cost of Materials	Included in amount below	
9	Cost of Labor	Included in amount below	
10	Other (RCS Quote)	\$59,051	
11	Sub-Total Construction Contract		\$59,051
C. <u>Miscellaneous Project Costs</u>			
12	Building Purchase		\$0
13	Fixed CT Scanner (GE Quote, excluding trade in values)	\$704,725	
14	Relocated Existing MedRad Injector (Bayer Quote)	\$6,825	
15	Furniture	\$0	
16	Landscaping	\$0	
17	Consultant Fees		
	Architect and Engineering Fees	\$0	
	Legal Fees	\$0	
	Computer Connectivity (estimate)	\$9,000	
	Physicist Inspections	\$2,000	
	Sub-Total Consultant Fees		\$11,000
18	Financing Costs (e.g. Bond, Loan, etc.)		\$0
19	Interest During Construction		\$0
20	Other (Contingency)		\$3,000
21	Sub-Total Miscellaneous		\$725,550
D.	Total Capital Cost of Project		\$784,601

I certify that, to the best of my knowledge, the costs of the proposed project named above are complete and correct.

Beulah R. Gunn Maintenance Manager Date Certified: 1/9/15
 (Signature of Licensed Architect or Engineer)

I assure that, to the best of my knowledge, the above costs for the proposed project are complete and correct and that it is my intent to carry out the proposed project as described.

Neil J. Hill President & CEO Date Signed: 1/13/15
 (Proponent - Signature of Officer) (Title of Officer)

EQUIPMENT COMPARISON

	EXISTING EQUIPMENT	REPLACEMENT EQUIPMENT
Type of Equipment (List Each Component)	CT Scanner	CT Scanner
Manufacturer of Equipment	GE LS QXi 1-slice	GE Optima 64-slice
Tesla Rating for MRIs	NA	NA
Model Number	Model: 2138400	CT 660
Serial Number	S/N: 210351CN3	Not yet known
Provider's Method of Identifying Equipment	GE LS QXi 1-slice	GE Optima 64-slice
Specify if Mobile or Fixed	Fixed	Fixed
Mobile Trailer Serial Number/VIN #	NA	NA
Mobile Tractor Serial Number/VIN #	NA	NA
Date of Acquisition of Each Component	12/1996	2015
Does Provider Hold Title to Equipment or Have a Capital Lease?	Holds Title	Will Hold Title
Specify if Equipment Was/Is New or Used When Acquired	New	New
Total Capital Cost of Project	NA	\$784,601
Total Cost of Equipment	NA	\$704,725
Fair Market Value of Equipment	NA	\$704,725
Net Purchase Price of Equipment	NA	\$704,725
Locations Where Operated	NHSC Mount Airy	NHSC Mount Airy
Number Days In Use/To be Used in N.C. Per Year	365	365
Percent of Change in Patient Charges (by Procedure)	NA	Less than 10%
Percent of Change in Per Procedure Operating Expenses (by Procedure)	NA	Less than 10%
Type of Procedures Currently Performed on Existing Equipment	CT Diagnostic	NA
Type of Procedures New Equipment is Capable of Performing	NA	CT Diagnostic

I certify that the percentage change in patient charges for the first 12 months following the replacement of the CT equipment shall not exceed 10 percent and the percentage change for per procedure operating expense for the 12 months following replacement shall not exceed 10 percent.



President - CEO

1/13/15

SIGNATURE

TITLE

DATE SIGNED

Attachment 2 - CT Scanner Equipment Quote and Brochure



GE Healthcare

Date: 12-22-2014
Quote #: PR1-C36974
Version #: 26

Northern Hospital Of Surry County
830 Rockford St
Mount Airy NC 27030-5322

Attn: Michael Leonard
830 Rockford St Mount Airy
NC 27030-5322

Customer Number :
Quotation Expiration Date: 12-28-2014

The terms of the Master Purchasing Agreement, Strategic Alliance Agreement or GPO Agreement referenced below as the Governing Agreement shall govern this Quotation. No additional or different terms shall apply unless agreed to in writing by authorized representatives of both parties.

Governing Agreement: HPG
Terms of Delivery: FOB Destination
Billing Terms: 80% delivery / 20% Installation
Payment Terms: NET 30
Total Quote Net Selling Price: \$624,725.15

INDICATE FORM OF PAYMENT:

If "GE HFS Loan" or "GE HFS Lease" is NOT selected at the time of signature, then you may NOT elect to seek financing with GE Healthcare Financial Services (GE HFS) to fund this arrangement after shipment.

Cash/Third Party Loan

GE HFS Lease

GE HFS Loan

Third Party Lease (please identify financing company) _____

By signing below, each party certifies that it has not made any handwritten modifications. Manual changes or mark-ups on this Agreement (except signatures in the signature blocks and an indication in the form of payment section below) will be void.

Each party has caused this agreement to be executed by its duty authorized representative as of the date set forth below.

CUSTOMER

Authorized Customer Signature Date

Print Name Print Title

Purchase Order Number (if applicable)

GE HEALTHCARE
Mark Henry 12-22-2014

Signature Date
Product Sales Specialist
Email: Mark.Henry@med.ge.com
Phone: +1 828 322 1331
Fax: 888-453-3941



GE Healthcare

Date:	12-22-2014
Quote #:	PR1-C36974
Version #:	26

Total Quote Selling Price	\$704,725.15
Trade-In and Other Credits	\$80,000.00

Total Quote Net Selling Price	\$624,725.15

To Accept this Quotation

Please sign and return this Quotation together with your Purchase Order To:

Mark Henry

Mobile: +1 828 322 1331

Email: Mark.Henry@med.ge.com

Fax: 888-453-3941

Payment Instructions

Please **Remit** Payment for invoices associated with this quotation to:

GE Healthcare

P.O. Box 96483

Chicago, IL 60693

To Accept This Quotation

- Please sign the quote and any included attachments (where requested).
- If requested, please indicate, your form of payment.
- If you include the purchase order, please make sure it references the following information
 - The correct Quote number and version number above
 - The correct Remit To information as indicated in "**Payment Instructions**" above
 - The correct SHIP TO site name and address
 - The correct BILL TO site name and address
 - The correct Total Quote Net Selling Price as indicated above



GE Healthcare

Date: 12-22-2014
Quote #: PR1-C36974
Version #: 26

12-22-2014

NOTICE REGARDING COMPUTED TOMOGRAPHY ("CT") PRODUCTS. This notice applies only to the following GE Healthcare products: CT: Revolution CT and EVO, Optima 680 CT and Optima 520 CT. GE Healthcare has reclassified several advanced software tools and associated documentation to a GE Healthcare Technical Service Technology package that GE Healthcare feels will bring greater value and interest to our customers. GE Healthcare will continue to provide trained Customer employees with access to the GE Healthcare Technical Service Technology package under a separate agreement. GE Healthcare will continue to provide customers and their third party service providers with access to software tools and associated documentation in order to perform basic service on the CT, MR and NM products listed above upon a request for registration for such access. This will allow GE Healthcare to react faster to the future service needs of GE Healthcare customers. If you have any questions, you can contact your sales Service Specialist.



GE Healthcare

Date: 12-22-2014
Quote #: PR1-C36974
Version #: 26

Item No.	Qty	Catalog No.	Description	Contract Price	Discount	Ext Sell Price
	1		Optima - CT660 Systems			
1	1	S7660CP	<p>Optima CT660 128 sl system with ASiR</p> <p>The Optima CT660 is GE's latest generation intelligent CT system. It is a scalable 128 slice platform including advanced innovations from our Discovery Series (TM), This means that Optima CT660 is capable of addressing your advanced clinical needs. Optima CT660 with Xstream gantry display is ready to help you deliver personalized care for your demanding patient schedule and quickly manage your unscheduled ED exams. With the Optima CT660 you get fast, high-quality acquisition at optimized dose for patients young and old, large and small, across a wide spectrum of procedures: angiography, brain, chest, abdomen, orthopedic, and more.</p> <p>Key Features:</p> <ul style="list-style-type: none"> • Exclusive V-Res (TM) Detector technology providing 40mm of 0.625mm acquisitions • Volara* XT DAS (Data Acquisition System): The Volara* XT digital DAS for faster sampling and improved image performance and reduced artifacts • Fast coverage speed of 110mm/sec with sub-mm resolution • Full 360 degree rotation in 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0 and 2.0(axial) seconds, ensuring short breath holds, comfortable exams and flexibility to customize protocols for unique patient 	\$1,460,000.00	59.22%	\$595,334.60



GE Healthcare

Date: 12-22-2014
Quote #: PR1-C36974
Version #: 26

Item No.	Qty	Catalog No.	Description	Contract Price	Discount	Ext Sell Price
			<p>needs with minimal coverage impact</p> <ul style="list-style-type: none">• Routine thin slice scanning, as thin as 0.625mm optimizing the use of thinner images for sagittal, coronal, oblique, and volume image presentation and review• The overlapped reconstruction feature enables 384 slices reconstruction in helical acquisitions and 128 slices per rotation in axial mode delivering improved Z-axis visualization performance relative to non-overlapped reconstruction• Highly efficient compact geometry design delivering optimum performance of the x-ray tube and generator• Image decomposition to:<ul style="list-style-type: none">- Retrospective thin images from data sets where thicker images were initially reconstructed- Facilitates more detailed image analysis- Improves 3D and reformat visualization• ASiR reconstruction technology may enable reduction in pixel noise standard deviation (a measurement of image noise). The ASiR reconstruction algorithm may allow for reduced mA in the acquisition of images, thereby reducing the dose required(**).• A reconstruction technology that			



GE Healthcare

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			<p>may enable improvement in low contrast detectability(**)</p> <p>(**) In clinical practice, the use of ASiR may reduce CT patient dose depending on the clinical task, patient size, anatomical location and clinical practice. A consultation with a radiologist and physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task.</p> <p>Fast, User-Friendly, Simultaneous Workflow:</p> <ul style="list-style-type: none"> • Advanced Workflow Platform, the next evolution of GE's workflow platform built to help you maximize productivity. <ul style="list-style-type: none"> - Delivers up to 35 images per second (ips) reconstruction - Image Check delivers up to 55 images per second (ips) reconstruction (340x340 matrix) - Up to 10 fps network transfer rates - Direct Multiplanar Reformats (DMPR) that enables the move from 2D review to prospective 3D review of sagittal, coronal and oblique planes automatically - Data Export and Interchange that allow you to easily share images with referring physicians and patients 			



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Item No.	Qty	Catalog No.	Description	Contract Price	Discount	Ext Sell Price
			<ul style="list-style-type: none"> • One Stop ED mode: Optima CT660's exclusive 12" Xstream touch display on the gantry enables unique one stop ED scanning to streamlined ED exam workflow allowing patient selection, protocol selection and confirming exam parameters directly at the gantry, without having to leave the patients side. • Includes reference protocols and the ability to customize your own for a total of 6,840 programmable protocols • SmartPrep with Dynamic Transition allows low dose intermittent monitoring of intravenous contrast enhancement in a user-selected section of anatomy. With Dynamic Transition when the prescribed contrast enhancement is reached the system will automatically transition from the monitoring phase to the scan phase • 10 Prospective Multiple Reconstructions: Up to 10 reconstructions can be pre-programmed as part of the scan protocol prior to acquisition. The operator can select different start/end location, slice thickness, interval, interval reconstruction algorithms and display fields of view for each reconstruction. Assisting to prospectively prescribing the image reconstructions needed, 			



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Item No.	Qty	Catalog No.	Description	Contract Price	Discount	Ext Sell Price
			<p>even for complex trauma exams and freeing the user up to focus on the patient</p> <ul style="list-style-type: none">• Remote tilt from the operator console to increase exam speed• Built-in breathing lights with a countdown timer, so the patient does not have to guess how much longer to hold their breath• New built-in 12-inch touch screen gantry display allows technologists to deliver personalized care by displaying the patient's name on it. When not scanning, the video of relaxing scenes or cartoons may have a calming effect on children or patients of all ages.• By using One Step patient positioning on built-in 12-inch touch screen gantry display the bed provides automatic positioning according to the type of exam, reducing manual positioning and streamlining workflow• In room start button mounted on gantry with countdown display, facilitates single technologist operation and improved departmental productivity• GE software allows you to automate or build every task into the protocols to increase throughput• Has up to 250,000 uncompressed 512 x 2 image files storage capacity, and 3,520 scan rotations or up to 1,500			



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Item No.	Qty	Catalog No.	Description	Contract Price	Discount	Ext Sell Price
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scan data files, or up to 300 exams.

Dose Management Leadership:

- OptiDose management features: new bowtie filters optimized for adult and pediatric body exams, full 3D dose modulation, color coding for kids, tracking collimator hardware and software for x-ray beam tracking to name a few of GE's dose optimization features, all based on the ALARA principle
- Dynamic Z-axis tracking provides automatic and continuous correction of the x-ray beam shape to block unused x-ray at the beginning and end of a helical scan to reduce unnecessary patient radiation
- 3D Dose modulation - Before the scan, clinicians must select the desired Noise Index as well as the minimum and maximum mA setting. The system automatically accounts for the changing dimensions of the patient's anatomy, enabling patient to patient reproducibility in this aspect of image quality and real-time x-y-z during each scan.
- Tracking collimator hardware and software for x-ray beam tracking to minimize patient dose
- Filtration of the x-ray beam is optimized independently for



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Item No.	Qty	Catalog No.	Description	Contract Price	Discount	Ext Sell Price
			<p>body and head applications</p> <ul style="list-style-type: none">• DLP (dose length product), and dose efficiency display during scan prescription provides the patient's dose information to the operator• Dose Reporting provides access to the CTDIvol and DLP with the patient record prior and post exam. DICOM Structured Dose Report is also supported.• Dose Check provides the user with tools to help them manage CT dose in clinical practice and is based on the standard XR-25-2010 published by The Association of Electrical and Medical Imaging Equipment Manufacturers (NEMA). Dose Check provides the following:<ul style="list-style-type: none">- Checking against a Notification Value if the estimated dose for the scan is above your site established value- Checking against an Alert Value where the user needs specific authority to continue the scan at the current estimated dose without changing the scan parameters if the estimated dose exceeds the alert value- The ability to define Alert Values for Adult and Pediatric with age threshold- Audit logging and review			



GE Healthcare

Date: 12-22-2014
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Item No.	Qty	Catalog No.	Description	Contract Price	Discount	Ext Sell Price
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capabilities
 - Protocol Change Control
 capabilities

The Advanced Reconstruction breaks through existing limits on speed, image quality and flexibility to provide an optimized volumetric workflow solution from acquisition to final report and has the capability to deliver up to 16 full fidelity images per second (fps) reconstruction and 10 fps network transfer rates.

Clinical Benefits:

- CTA runoffs
- Thin slices fast; routine use of thin slices
- Organ coverage in arterial phase
- Long helical scans
- Multi-phase organ studies
- Improved multi-planar reformats with isotropic microvoxel imaging
- Fast scanning with outstanding image performance and GE's proprietary cross beam and hyperplane helical reconstruction algorithms
- System designed for optimization of z-axis resolution and dose with 0.625mm slice thickness

System Components:

Gantry:

- Advanced slip ring design continuously rotates the generator, Performix 40 X-ray



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Item No.	Qty	Catalog No.	Description	Contract Price	Discount	Ext Sell Price
			<p>tube, detector and Volara XT digital data acquisition system around the patient.</p> <ul style="list-style-type: none"> - Aperture: 70 cm - Maximum SFOV: 50 cm - Rotational Speeds: 360 degrees in 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0 and 2.0(axial) seconds - Tilt: +/- 30 degrees, speed 1 degree/sec - Remote tilt from operator's console - Integrated breathing lights and countdown timer - Integrated 12-inch touch screen on gantry with workflow features - Integrated start scan button with countdown timer to indicate when x-ray will turn on <ul style="list-style-type: none"> • Visual readout is easy to read from the tableside or from the operator console. Gantry tilt controls are located on the side of the gantry. <p>Laser Alignment Lights:</p> <ul style="list-style-type: none"> • Defined internal and external scan planes to +/- 1mm accuracy • Operate over full range of gantry tilt • Coronal light remains perpendicular to axial light as gantry tilts <p>Table:</p>			



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Item No.	Qty	Catalog No.	Description	Contract Price	Discount	Ext Sell Price
			<ul style="list-style-type: none"> • Cantilever design for easy access • Vertical range: 43.0 cm to 99.1 cm • Vertical scannable range: 79.1 cm to 99.1 • Horizontal range: 1,745 mm (VT1700 table) or 2,045 mm (VT2000 table) • Horizontal Speed: up to 137.5 mm/sec • Table load capacity: 227 kg (500 lb) +/- 0.25mm positional accuracy <p>X-ray Tube: Performix 40 metal-ceramic tube unit</p> <ul style="list-style-type: none"> • Performix 40 tube with 6.3 MHU of storage and capable of 72kW operation provides increased helical performance with greater patient throughput • Wide range of technique (10 mA to 560 mA, in 5 mA increments) gives technologist and physician flexibility to tailor protocols to specific patient needs, while optimizing patient dose, and providing the power needed to perform a broad spectrum of examinations. • Maximum anode heat storage capacity: 6.3 MHU • Dual Focal Spots: <ul style="list-style-type: none"> - Small Focal Spot: 0.9 x 0.7 IEC60336:2005 - Large Focal Spot: 1.2 x 1.1 IEC60336:2005 • Maximum power: 72 kW 			



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			<ul style="list-style-type: none"> Beam collimated to 56 degree fan angle <p>High Voltage Generator: High Frequency on-board generator allows for continuous operation during scan.</p> <ul style="list-style-type: none"> 72 kW Output Power kV: 80, 100, 120, 140 kV mA: 10 to 560 mA, 5 mA increments <p>Maximum mA for each kV Selection (large focal spot):</p> <ul style="list-style-type: none"> 400mA @ 80kV 480mA @ 100kV 560mA @ 120kV 515mA @ 140kV <p>V-Res Detector: The V-Res detector was designed for high performance imaging. The V-res detector benefits are:</p> <ul style="list-style-type: none"> Solid 40mm coverage per rotation GE's patented ceramic detector material <p>Volara XT Digital DAS (Data Acquisition System): The Volara XT digital DAS dramatically reduces electrical noise for improved imaging performance.</p> <ul style="list-style-type: none"> 2,460Hz maximum sample rate Effective analog to digital conversion <p>Optima CT660 Operator Console:</p> <ul style="list-style-type: none"> 1,792GB of total system storage Up to 250,000 512 x 2 images 			



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and 3,520 scan or up to 1,500 scan data files or up to 300 exams

- 4.7 GB DVD-R/CD-R for DICOM interchange (not recommended as a long term archive)

Image Networking: Exams can be selected and moved between the Optima CT660 CT System and any imaging system supporting DICOM protocol for network send, receive and pull/inquiry.

- Standard Auto-configuring Ethernet
- Direct Network Connection
- Supports 1GB or 1000/100/10 BaseT

DICOM Conformance Standards

- DICOM Storage Service Class
- Service Class User (SCU) for image send
- Service Class Provider(SCP)for image receive
- DICOM Query/Retrieve Service Class
- DICOM Storage Commitment Class Push
- DICOM Modality Worklist (incl. Performed Procedure Step) (through ConnectPro option)
- DICOM Print

The Optima CT660 workflow platform is designed to deliver high performance in each of these tasks:

- SmartTools Simplifies Scan Setup and Includes All Reconstructions,



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			<p>Filming, Archiving, Transferring Propsectively</p> <ul style="list-style-type: none"> • Workflow platform built on the LINUX operating system delivers up to 35 fps reconstruction and 55 fps with Image Check, and the fastest network transfer rates of up to 10fps • Data Export and Interchange allow you to easily share images with referring physicians and patients • Direct MPR that enables the move from 2D review to 3D image review of axial, sagittal, coronal and oblique planes automatically • Exam Split delivers the capability to split a series of patient images into seperate groups for networking • Exam Rx desktop environment provides the clinical tools desired for fast, efficient control of patient studies. Exam Rx tools include patient scheduling and data entry, exam protocol selection, protocol viewing and editing, scan data acquisition, image display and routine analysis, AutoTransfer, AutoStore, and AutoFilm • ImageWorks is a desktop environment designed to take advantage of the Optima CT660 CT System advanced computer systems. Standard features include archive, network and manual film control, as well as 			



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some advanced image processing such as Direct multi-planar reformatting (DMPR), multi-projection volume rendering (MPVR) and display. The ImageWorks desktop also provides a gateway for DICOM 3.0 image transactions, either through a local area network, or via DICOM-formatted media

- Volume Viewer includes Volume Analysis, Volume Rendering and Navigator software. This combination allows the user to render volumetric data in three dimensions for use in analysis of patient condition, i.e. CT Angiography (CTA), gives more information on the spatial relationships of structures than standard 3D,

allows the translucent visualization of structures for improved problem solving, can perform "virtual endoscopies" of air and contrast filled structures. Enables 3D reformats in any plane, ALL on the Xstream ready console

Scan Modes: The Optima CT660 system can perform virtually any clinical application due to its wide variety of scan modes. Helical scan mode offers continuous 360 degree scanning with table incrementation and no interscan delay. Axial scan mode allows for up to 64 contiguous axial slices acquired simultaneously with each 360 degree rotation.



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- Helical scanning pitches: 0.516:1, 0.984:1, 1.375:1
- Retrospective reconstruction image thicknesses: 32 x 0.625, 64 x 0.625, 128 x 0.625*

* Available only with Overlapped Reconstruction option (axial mode & 40 mm coverage)

Scan Enhancements:

- Anatomical programmer: a ten region anatomical selector allows quick and easy access to user programmable protocols and a separate selector for adult and pediatric exams with greater than 6,840 protocol storage available.
- Protocols include preset scan time, kV, mA, scan mode, image thickness and spacing, table speed, scan FOV, display FOV and center, recon algorithm, and special image acquisition and processing options like DMPPR
- Any scan parameters may be edited for each scan or all scans - either before or during an exam. The number of scans may also be easily changed
- AutoScan: Automates longitudinal table movement and start of each scan
- Auto-Voice: 3 preset (9 languages) and 17 user defined messages automatically deliver patient breathing instructions, especially useful for multiple helical scanning



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			<ul style="list-style-type: none"> Trauma Patient: Allows patient scans and image display/analysis without entering patient data before scanning Reconstruction Algorithms: Soft Tissue, Standard, Detail, Chest, Bone, Bone Plus, Lung, and Edge <p>Warranty: The published Company warranty in effect on the date of shipment shall apply. The Company reserves the right to make changes. All specifications are subject to change.</p> <p>Regulatory compliance: This product is designed to comply with applicable standards under the radiation control for Health and Safety Act of 1968.</p> <p>Laser alignment devices contained within this product are appropriately labeled according to the requirements of the Center for Devices and Radiological Health.</p> <p>Siting Considerations: See the Pre-Installation manual for details of the siting requirements for the Optima CT660.</p> <p>This product is a CE-compliant device that satisfies IEC60601-1:1998 and applicable collateral and particular standards, including regulations regarding Electro-Magnetic Compatibility (EMC) and Electro-Magnetic Interference (EMI), pursuant to IEC-60601-1-2:2004.</p> <p>This product complies with NEMA Standard 29-2013.</p>			
2	1	B7590EN	English Keyboard Kit English Keyboard Kit	Incl.	Incl.	Incl.



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3	1	B7660MR	STD CABLE COLLECTOR STD CABLE COLLECTOR	Incl.	Incl.	Incl.
4	1	B7877TC	VT2000 Table The CT system 2000 table enables volume scanning. Key features of the VT 2000 table include: 500 lb weight capacity, 2000 mm scannable range, 175 mm/sec travel time, real-time position control to support advanced application such as SnapShot Pulse, VolumeShuttle, and Volume Helical Shuttle.	\$10,000.00	59.22%	\$4,077.63
5	1	B75002CD	CT Operator Console Desk The Freedom workspace is an ergonomic working environment specifically designed for use with the GE Healthcare imaging systems. The sleek table design enables the efficient use of space while enhancing clinical workflow and technologist comfort. The Freedom workspace provides a minimalist footprint to improve patient visibility and giving the user easier access to patients in the imaging suite. It offers sit/stand and horizontal/vertical monitor flexibility. It can also help reduce noise and heat with remote location options of the console. The non-adjustable Freedom workspace version is 1300mm long x 895mm wide x 850mm height and weighs 55.8kg.	\$1,000.00	59.22%	\$407.76
6	1	B7500SG	Additional license Required for Non-GE X-ray tubes Tube license software required for use	Incl.	Incl.	Incl.



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			with a third party x-ray tube. The use of a 3rd party x-ray tube will require an additional license for the activation and continued use of the following options: ASiR, Volume Helical Shuttle, Gemstone Spectral Imaging, High Definition Scan Mode, Cardiac, Enhanced Rotor Management (may vary by product). Does not include installation.			
7	1	B75342CA	Coronal Head Holder Coronal Head Holder.	\$500.00	50.00%	\$250.00
8	1	E4502F	14 KVA 3-Phase Partial UPS for VCT 3 Phase 14 KVA Partial UPS for Lightspeed VCT, Discovery ST - HP and Lightspeed Pro32. The 14KVA Partial UPS has been specifically designed to coordinate with GE Healthcare CT & PET/CT scanners. In the event of a power outage a partial system UPS provides continuous backup power to the scanner host and control computers, thus assuring no loss of usable scan data. In addition, critical circuits in the gantry and table remain powered which facilitate the safe removal of the patient from the scanner. If power is restored within the battery hold-up time, the operator can continue scanner operations without the need to reboot the system. When longer power outages are anticipated, the UPS provides time for the operators to safely remove the patient and complete an orderly shutdown of the system software.	\$27,000.00	21.00%	\$21,330.00



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FEATURES/BENEFITS

- True double-conversion, online technology provides reliable operation & uninterrupted glitch free power
- Automatic voltage and frequency selection eases startup, i.e., 50 or 60 Hz compatible
- Integral Manual Bypass switch facilitates continued scanner operation while UPS is being serviced
- Single input connection utilized for both UPS input and static switch
- Maintains system electronics and allows critical scanner operations to continue for > 10 minutes (typical) after loss of power
- Protects electronics from under voltage, brownouts, line sags, over voltage and transients
- Advanced Battery Management (ABM) software monitors / indicates battery health and improves battery service life

SPECIFICATIONS

- Dimensions (H x W x D): 49" x 12" x 32"
- Weight: 620 lbs.
- Rating: 14.4 kVA
- Input Voltage Range: Three-Phase; 102-132V / ph
- Input Frequency Range: 45-65 Hz



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			<ul style="list-style-type: none"> Output Frequency: 50 or 60 Hz, auto-sensing <p>COMPATIBILITY</p> <ul style="list-style-type: none"> CT LightSpeed Pro 32, Lightspeed VCT, CT 750HD, PET Discovery ST & ST-HP, PET Discovery VCT, PET Discovery 600/690 <p>NOTES:</p> <ul style="list-style-type: none"> Customer is responsible for rigging and arranging for installation with a certified electrician ITEM IS NON-RETURNABLE AND NON-REFUNDABLE 			
9	1	E4502AC	<p>110 Amp Main Disconnect Panel for CT (INTL)</p> <p>110 Amp Main Disconnect Panel for CT (INTL)</p> <p>This 110 amp main disconnect panel for GEHC CT systems provides emergency shut down, undervoltage protection, overcurrent protection, OSHA lockout tag provisions, and serves as a local disconnect for the imaging system. It also reduces installation time and cost by providing a single-point power connection eliminating the need to mount and wire a number of individual components. The standardized design and testing assures high product quality and system reliability, and it is UL and cUL listed for compliance with National Electric Code. Panel can be surface or semi-flush mounted and includes one remote emergency off</p>	\$7,199.00	21.00%	\$5,687.21



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			push button. Customer is responsible for rigging and for arranging for installation by a licensed electrician. ITEM IS NON-RETURNABLE AND NON REFUNDABLE. Warranty Code: Y			
10	1	E8016AN	CT Table Slicker with Cushion - 2000 Systems (2-pc Set) Slicker - CT HD750 and VCT w/GT 2000 Table (2 Piece Set) FEATURES/BENEFITS <ul style="list-style-type: none"> • Two-piece, sealed slicker cushion set has comfort pads enclosed inside the slicker cover and extender cover • Durable, clear PVC plastic cover facilitates faster, more thorough cleanup of blood and fluids • Increase system uptime by protecting table from spills and particulate contaminants • Thermo-sealed seams and flaps prevent contaminate buildup in hard to clean areas COMPATIBILITY <ul style="list-style-type: none"> • VCT with GT 2000 Table, CT HD750 	\$440.00	21.00%	\$347.60
11	1	E8016BA	CT Footswitch Slicker - 2000 & 1700 Systems Footswitch Slicker for CT HD750 and VCT Systems The footswitch slicker for CT VCT 2000 and 1700 systems is made of durable, clear PVC plastic that protects the footswitch and facilitates faster, more thorough cleanup of contamination	\$50.00	21.00%	\$39.50



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			caused by blood and other body fluids. Cover is held securely in place with Velcro...H			
12	1	E8004GD	CT Straps, Narrow (2) 540mm, 1060mm VCT Straps - Narrow (Width 60mm/2.36 in.) 1 side measures 21.25 in (540mm), other side measures 41.73 in (1060mm). Both straps with Velcro. Warranty Code: H	\$50.00	21.00%	\$39.50
13	1	W0100CT	6 Day CT TIP Onsite System Training 6 Day CT TIP Onsite System Training CT Onsite Training for a new CT system <ul style="list-style-type: none"> • One 4 day onsite visit to coincide with system start-up. • One 2 day onsite follow-up visit 6-8 weeks post system start up. <p>During the first visit, the applications specialist will work with the medical and technical staff on system operation and patient procedures. The training produces the best results when a dedicated core group of 2-4 CT technologists complete the session with a modified patient schedule. It is suggested that key physicians are available to participate in the protocol implementation and image quality review sessions. By the end of this visit, the core group should be able to perform the routine patient procedures.</p> <p>The 2 day revisit is suggested after the staff has run the system for 6-8 weeks, however this is flexible based on the site needs. The training will focus on</p>	\$12,700.00	0.00%	\$12,700.00



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			<p>the intermediate and advanced functions of the system or special needs of the customer. The training produces the best results when the same dedicated core group of 2-4 CT technologists from the initial visit complete the session with a modified patient schedule.</p> <p>This training program must be scheduled and completed within 12 months after the date of product delivery.</p>			
14	1	W0004CT	<p>4 Days Ct Onsite</p> <p>4 Days CT TIP Onsite Training</p> <p>Four Days CT Onsite Training provided from 8AM to 5PM, Monday through Friday. Includes T&L expenses. Days provided consecutively.</p> <p>This training program must be scheduled and completed within 12 months after the date of product delivery.</p>	\$8,600.00	0.00%	\$8,600.00
	1		AW VOLUMESHARE5 AND APPLICATIONS			
15	1	M81571GM	<p>Upgrade from XW8200 or Below Hardware to Z800 with VolumeShare 5</p> <p>Upgrade from XW8200 or Below Hardware to Z800 with VolumeShare 5. Also includes Two Flat Panel Monitors and 6GB of RAM.</p> <p>AW VolumeShare 5 is a multi-modality image review, comparison and post processing workstation built with simplicity and power at its core. Powerful software is optimized to take advantage of state of the art 64 bit technology and multiple cores to</p>	\$69,200.00	41.00%	\$40,828.00



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ensure leading edge performance.

AW VolumeShare 5 features include:

Hardware:

- HP Z800 Workstation with Intel x5650 Six Core Xeon 2.66 GHz CPU with 8MB Shared L2 Cache / 1333 MHz Dual FSB
- 6GB DDR-3 1333 ECC DIMM
- 300GB SAS 15,000rpm Hard Disk for OS and Apps.
- 600GB SAS 15,000rpm Hard Disks for Image Data
- 2 x 19" EIZO MX191 monitors

Software:

- Fast access to information you need through optional RIS integration & priors post-fetch
- Efficient workflow through dynamic load, end review and Key Image Notes features
- Optional productivity package to pre-process exams and allow up to 8 simultaneous sessions
- Applications usage monitor to track usage of your system
- Smart layouts with Volume Viewer General review protocol that optimizes comparison and single exam layouts
- Enhanced multi-modality contouring tool with support for PET SUV's
- Support for external DICOM USB media and preference management tool to exchange preferences across users
- Support for optional, broad suite



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			of multi-modality advanced applications			
			NOTE: The AW Workstation that is to be Upgraded with this purchase becomes the Property of GE Healthcare. Upon Installation of the New AW Workstation, the current AW Unit must be De-Installed and Returned to GE Healthcare.			
			Note: A Signed Trade-in Addendum Required at Order Entry.			
16	1	M81521PH	Productivity Package with 24GB of RAM	\$25,565.00	41.00%	\$15,083.35
			AW VolumeShare5 Productivity Package with 24GB of Additional RAM.			
			Requires HP Z800 Hardware			
			AW VolumeShare5 with Productivity Package Represents:			
			<ul style="list-style-type: none"> • More Capacity to Load Multiple Large Dataset with at least 24GB of RAM. • Instantaneous Display of Exams with AutoLaunch. • Instantaneous Access to the Segmented Vessel Volume with Preprocessing. 			
			Productivity Package makes full use of the 64 bit Technology as well as the Dual Screen z800 Hardware of the AW workstation. It Runs 12 to 24 GB of RAM giving the Ability to Load simultaneously up to 15,300 Images.			
			AutoLaunch Loads Automatically Multiple Cases as soon as they are Transferred to the AW. A Single Click in			



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			<p>the AutoLaunch Window Raises Instantly in the Case in Volume Viewer. Interaction with the Data is Immediately Possible as they are Preloaded and Ready to Use. AutoLaunch is compatible with CT, MR and PET Single Volume Protocols of Volume Viewer.</p> <p>One-Touch Links provide the Ability to Automatically Launch the best Protocol for each Exam based upon DICOM Image Acquisition Elements. An Intuitive User Interface in the Protocol Launcher provided an Easy Configuration of One Touch Links by Clicking the Hand Icon.</p> <p>When combined with Optional AutoBone Xpress, the Productivity Package will also Provide the Automatic Preprocessing of the Bone Removal. Raising CTA Exams Located in the AutoLaunch Window will give Instantaneous Access to the Vessel Volume Resulting from the 0-Click Bone Removal. There is No More Waiting Time between the Exam Selection and the Ability to interact in 3D with the Segmented Vascular Volume.</p>			
17	1	B78141ME	<p>LUNG VCAR LICENSE TRANSF.</p> <p>Lung VCAR Software License Transfer for VolumeShare5</p>	Incl.	Incl.	Incl.

Quote Summary:

Total Contract List Price:	\$1,622,304.00
Total Discount: (56.56%)	(\$917,578.85)
Total Extended Selling Price:	\$704,725.15



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			Trade in of Lightspeed Ultra			(\$45,000.00)
			Trade in of LS Qxi CT			(\$35,000.00)
			Total Quote Net Selling Price			\$624,725.15

(Quoted prices do not reflect state and local taxes if applicable. Total Net Selling Price Includes Trade In allowance, if applicable.)

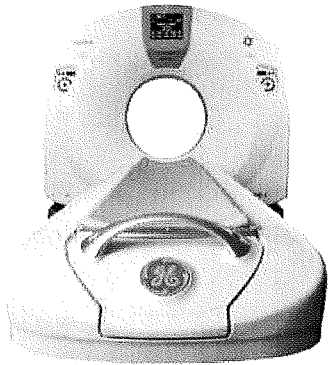


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GE Healthcare
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Paris, France - Fax: 33 1 30 70 94 35



PRIMARY BENEFITS

Innovation in Image Quality and Dose Optimization

ASiR™* (Adaptive Statistical Iterative Reconstruction)

ASiR™* dose reduction technology: A reconstruction technology that may enable reduction in pixel noise standard deviation. The ASiR reconstruction algorithm may allow for reduced mA in the acquisition of diagnostic images, thereby reducing the dose required. ⁽¹⁾

ASiR™* dose reduction technology: A reconstruction technology that may enable improvement in low contrast detectability. ⁽¹⁾

When imaging the same object, the Optima CT660 system with ASiR* may deliver pixel noise standard deviation equivalent to a higher mA acquisition such as that delivered by a higher power generator. ⁽¹⁾

The use of ASiR* may allow for scanning at lower mA and less anode heat input, thereby reducing the likelihood of encountering tube cooling delays. ⁽¹⁾

(1) In clinical practice, the use of ASiR may reduce CT patient dose depending on the clinical task, patient size, anatomical location and clinical practice. A consultation with a radiologist and a physicist should be made to determine the appropriate dose to obtain diagnostic image quality for the particular clinical task.

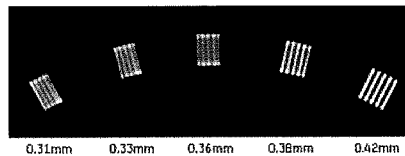
(2) mA modulation is designed to optimize the dose for the user prescribed noise index. It's effect on dose depends on the patient body habitus, and prescribed noise setting.

Asterisk*: Option
This data sheet is available for US only.

40mm-sub-Millimeter Imaging

Routine use of sub-millimeter slices without coverage compromise can be achieved.

Isotropic 0.35mm microvoxel enables multiplaner equivalent IQ in all plans compared to non-isotropic microvoxels.



Example of 0.35mm resolution with CATPHAN™ Phantom

0.625mm FWHM at Helical

GE's exclusive helical reconstruction technologies, crossbeam correction, conjugate ray interpolation and hyper plane helical reconstruction with alpha smoothing method, allow scanning at thin slice 0.625mm and reconstructing at thin slice 0.625mm.

IQ Enhance

IQ Enhance is a special algorithm that can be prescribed to minimize artifacts commonly seen in thin slice helical acquisition.

Neuro 3D Filter

Neuro 3D Filter provide user the capability to filter head acquisition data using specially designed and optimized 3D filters.

Note: Neuro 3D Filter is not available when ASiR is implemented.

Volara™ XT Digital Data Acquisition System (DAS)

Volara XT enables true 64-Channel acquisition with an 8-to-1 miniaturization of conventional multi-slice technology, and a dramatic reduction in electronic noise for improved imaging performance at low signal and is capable of faster sampling rates.

Conjugate Cone-Beam Back Projection

Utilizes 2 sets of counter-opposed projections to provide 128 distinct projection measurements per rotation for axial and a helical acquisition mode.

Overlapped reconstruction*

The overlapped reconstruction feature enables 128 slices per rotation in Axial scanning modes and delivers improved Z-axis visualization performance relative to non-overlapped reconstruction.

3D Dose Modulation utilizing SmartmA™ and Auto mA

Having this kind of volumetric knowledge before you scan allows you to personalize protocols and optimize dose for every patient – large and small. During the scan, real-time, 3D dose modulation helps deliver consistent image quality because it automatically accounts for the



Optima™ CT660

Optima™ CT660

changing dimensions of your patient's anatomy. 3D mA modulation acquisitions may reduce dose compared with fixed mA acquisitions.

Short geometry design

The short geometry design of the Optima CT660 system may enable equivalent Imaging flux compared to a system with a longer geometry and higher generator power.

Outstanding Optima™ CT660 Workflow

Xtream Display

Xtream Display is a multi purpose LCD display.

Xtream Display can show basic patient information on Gantry monitor. The user can confirm patient information in the scan room improving workflow and reducing the opportunity for error.

Xtream Display provides workflow improvement with preset positioning (Default patient positioning) on new gantry display.

Xtream Display has a Movie function to assist the user in explaining the CT examination to patients.



Emergency patient mode

Optima™ CT660 series has a dedicated User Interface (UIF) for emergency cases to start examination quickly.

Xtream Injector*

Provides one handed synchronized start of the scan and injection from the CT Operators console or from the scan room providing consistent simultaneous start of contrast injection and scan acquisition protocols.

Optima™ CT660 ecomagination claims

Optima™ CT660 was designed as a green product and was recognized officially as ecomagination product in GE.

Energy saving

With its Energy Saving Mode activated, GE's Optima™ CT660 Series scanner is designed to reduce electricity consumption for operation and ambient cooling by more than 33,000kWh per machine annually, an energy savings of more than 60% compared to LightSpeed VCT.

CO2 reduction

With its Energy Saving Mode activated, GE's Optima™ CT660 Series scanner is designed to reduce electricity consumption for operation and

ambient cooling by more than 33,000kWh per machine annually, a CO2 savings of more than 60% compared to LightSpeed VCT.

-Avoid 20 metric tons of CO2 emissions per year on the U.S.
 -Avoid 14 metric tons of CO2 emissions per year on the Japan.
 -Avoid 15 metric tons of CO2 emissions per year on the UK.

Short foot print design

Because of its smaller footprint, GE's Optima™ CT660 Series scanner may reduce siting requirements by up to 15 %, compared to LightSpeed VCT.

Optima™ CT660 Increased Coverage

Volume Shuttle™*

Volume Shuttle allows for a 80mm (2x wider coverage, 128 slice-width) acquisition scan with contrast injection.

Volume Shuttle is a repetitive axial scan mode where the table shuttles back and forth between two consecutive imaging locations (X-ray is off during table movement). Each location covers 40 mm in the Z-direction for a total of 80 mm of axial coverage in Z. The shuttle action repeats over a defined duration to enable evaluation of tissue changes over time.

Volume Helical Shuttle*

Volume helical shuttle covers up to 312.5mm or 500 slices for 4D CTA studies.

Volume Helical Shuttle acquires data up to 120mm of coverage at a sample interval of 3.2 seconds or less. Volume helical shuttle acquisition provides data to support perfusion analysis

Dynamic Pitch Reconstruction extends z-coverage and improves temporal sampling by utilizing acquired scan data during table acceleration and de-acceleration.

Optima™ CT660 Cardiac capability

5-Beat Cardiac™*

Optima CT660™ has the ability to cover the heart in 5 beats

The following calculation is based on a patient heart rate of 60bpm, and a total coverage of 120mm (nominal scan length to cover the heart). Using a helical pitch of 0.22:1 and a rotation speed of 0.35s/rotation, the table speed in mm/s is given by:

$$Table_Speed = \frac{0.22 * 40mm / rotation}{0.35s / rotation} = 25.14mm / s$$

$$Total_Scan_Time = \frac{120mm}{25.14mm / s} = 4.8s$$

$$Number_of_Beats = \frac{60beats / min}{60s / min} * 4.8s = 4.8beats$$

Asterisk*: Option
 This data sheet is available for US only.



Optima™ CT660

Optima™ CT660

SnapShot™ Pulse*

Prospectively Gated SnapShot™ Pulse is an electrocardiogram (ECG) gated acquisition that activates the X-ray to the ON state during a specified window of the projected cardiac cycle. The x-ray then remains in the OFF state while the table advances to the next cine location and awaits the desired timing of the cardiac cycle to return to the ON state and repeats until the desired range in Z-locations is covered.

Prospective Gating based SnapShot Pulse achieves significant dose reduction compared to ECG gated helical acquisition mode while maintaining image quality needed for cardiovascular imaging.

Using SnapShot Pulse helps reduce pulsatile motion artifacts when imaging vascular structures attached to the heart such as pulmonary arteries, thoracic aorta, abdominal aorta, and carotid arteries when compared to un-gated imaging and reduces dose significantly compared to cardiac gated helical imaging.

SnapShot Pulse's real-time adaptive scanning has the ability to avoid unanticipated premature beat arrhythmias, improving overall scan reliability.

44 msec cardiac temporal resolutions with 0.35* second rotation and SnapShot scan algorithm. Optima™ CT660 not only offers fast acquisition speed, it builds on GE's exclusive variable speed technology that has now been expanded for cardiovascular imaging to include 0.35*, 0.375*, 0.40, 0.425, 0.45, 0.475 and 0.50 second scans – so you have the power to customize rotation speed to your patients' heart rates.

Editable ECG

The ECG Editor improves acquisition rate by enabling users to modify the R-R intervals and the location of the triggers.

The ECG Editor improves cardiovascular acquisition rate by enabling users to modify the R-R intervals and the location of the triggers in the case where there are suboptimal triggers or irregular heartbeats such as PVCs, PACs and other arrhythmias.

OPTIMA™ CT660 FAMILY MAIN FEATURES

Optima™ CT660 introduces Volume CT capabilities while extending the following features of today's Optima™ CT660 series scanners.

- Routine use of **sub-millimeter slices** without image noise or coverage compromise.
- GE's **OptiDose** philosophy provides the following built-in dose reduction capabilities:
 - **ECG Dose Modulation:** For cardiac applications, prospective ECG dose modulation automatically adjusts the mA to minimize the patient's exposure to X-rays – reducing dose during systolic phases of the cardiac cycle. This provides clear images and allows you to reduce dose primarily in the systolic phases of the cardiac cycle – yet gives you enough power to obtain quality images for functional analysis.
 - **CT 4Kids** Dose-optimized procedure based protocols for pediatric imaging provide more options for ensuring balanced radiation dose and image quality for specific pediatric applications.

Protocols are based on patient size (up to 200 pounds) and scan type and available at gehealthcare.com.

- **Color Coding for Kids**, winner of a National Heroes Award from the Emergency Medical Services for Children, provides pediatric scan protocols based on the Broselow-Luten™ Pediatric System. This Color Coding system is incorporated into the protocol selection on the operator's console and is designed to facilitate pediatric emergency care and reduce medical errors.
- **SmartTrack™** advanced hardware and software for X-ray beam tracking minimizes patient dose.
- **SmartBeam™** hardware and software optimizes X-ray beam filtration independently for body, head, and cardiac applications.
- **CTDI_{vol}**, **DLP** (Dose Length Product), and Dose Efficiency display during scan prescription provides dose information to the operator.
- **Dose Reporting** provides access to the CTDI_{vol} and DLP with the patient record prior and post exam. DICOM Structured Dose Report is also supported.
- **Dose Check** provides the user with tools to help them manage CT dose in clinical practice and is based on the standard XR-25-2010 published by The Association of Electrical and Medical Imaging Equipment Manufacturers (NEMA).
 Dose Check provides the following
 - Checking against a Notification Value if the estimated dose for the scan is above your site established dose value
 - Checking against an Alert Value where the user needs specific authority to continue the scan at the current estimated dose without changing the scan parameters if the estimated dose exceeds the alert value.
 - The ability to define Alert Values for Adult and Pediatric with age threshold
 - Audit logging and review capabilities
 - Protocol Change Control capabilities
- **Productivity features** designed for the CT Technologist: In-Room Start, Remote Gantry Tilt, Breathing Lights with countdown timer, and an Integrated IV Pole* at the foot of the table plus table tray*.
- **Standard set of clinical reference protocols** derived from leading luminary sites around the world. Up to 6840 protocols can be edited, modified and stored on the system.
- **Remote Gantry Tilt** from the Operator's Console to increase exam speed, including built-in safety features to prevent accidental contact of the gantry with the patient.
- Built-in **patient breathing lights** and digital counter provides a goal-oriented approach to coach the patients in holding their breath during an exam.
- **SmartStart™** gantry-mounted start scan button and countdown display, facilitates single-technologist operation by allowing start of scan at the gantry, with a visual reminder of time until X-ray initiation.
- **Direct MPR:** Direct MPR with Auto-Batch feature, affording automatic real-time direct reconstruction and transfer of fully corrected multi-planar images, in any plane.
- **DVD interchange:** DVD interchange capability, for archiving of up to 7168 uncompressed 512*512 images.
- **Data Export:** Data Export capability, ensuring the relevant images and reports can be visualized by the referrals in PC friendly format (JPEG, PNG, AVI, MPEG and MOV)

Asterisk*: Option
 This data sheet is available for US only.



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- **Auto Transfer by Series:** Auto Transfer by Series to distribute images where you need them when you need them.
- **Exam Split*:** Exam Splits allow multi-anatomic exams to be read in separate anatomic sections. This allows specialists to review only those images needed for a given requisition.
- **Grayscale Presentation State:** It saves display presentation of WW, WL, flip, rotate, and zoom, user annotation and measurements for transfer to a remote viewing station using DICOM GSPS object.
- **Direct Connect:** Direct connect allows remote Advantage Workstation (AW) access to True in One console's thin-slice data, eliminating unnecessary network traffic and storage duplication. (AW4.3* or later)
- **Graphic Retro:** Graphic Retro allows users to prescribe retro recon graphically on appropriate prospective image by mouse. Visual adjustment parameters such as DFOV, AP/RL, center improves retro recon productivity.
- **SmartPrep™:** SmartPrep can automatically play the prerecorded messages after the operator triggered the scan phase. With Auto Minimum Delay function enables, the diagnostic delay time is set automatically to the minimum time.
- **Copy PMR & Series:** Automatically copy the parameters of existing series when "Copy series" is selected. The series parameters include: start location, end location, interval, DFOV, A-P center, and R-L center.
- **DICOM Structured Dose Report:** DICOM Structured Dose Report creates a machine-readable record to be saved with each CT exam. This allows a hospital's radiation tracking system/RIS/HIS to retrieve the Dose information for a given CT study.
- **Series number for Retro Recon:** The system will automatically specify the series number for Retro Recon series. A new series number can be automatically assigned when a new series is created.
- Large breadth of **Advanced Software Applications*** (AW or Xstream): Autobone Removal, Advanced Lung Analysis, CT Colonography, Advanced Vessel Analysis, Neuro and Multi-Organ Perfusion, Cardiac Analysis, Cardiac Function, Cardiac Electrophysiology, Coronary Calcium Scoring, DentaScan, Advantage 4D CT, and Advantage Sim.

The following options are available for Cardiac CT scanning:

- **SmartScore Pro*** provides ECG-gated hardware for both prospective and retrospective gating.
- **SnapShot Imaging** provides software and hardware to perform retrospective helical ECG-gated reconstructions of the heart with three SnapShot-imaging modes.
 - **SnapShot Segment** is a single sector protocol using information from one heart cycle to generate an image with temporal resolution of 175 to 200msec.
 - **SnapShot Burst** is a multi-sector protocol using up to two sectors from two different heart cycles to produce an image with temporal resolution of 88 to 100msec.
 - **SnapShot Burst Plus** is a multi-sector protocol using up to four sectors of data from four different heart cycles to produce images with temporal resolution of 44 to 50msec.
- **Cardiac Image Filters** provides users the capability to reconstruct filtered images using three steps of noise reduction for helical and axial cardiac imaging, allowing reduced dose while maintaining an acceptable level of image noise.

Asterisk*: Option
This data sheet is available for US only.

- **ECG Waveform on the Console** will allow users to visualize the ECG waveform directly on the CT scanner console during the scan. The waveform data can be viewed to determine where prospectively created images are located with respect to the heart cycle to better understand and avoid motion artifacts like blurring or mis-registration.
- **ECG Viewer / Editor** provides users the capability to view and retrospectively modify intervals and adjust location of triggers for cardiac cycles based on ECG waveform displayed on the console.

OPTIMA™ CT660 INTERACTIVE CT TECHNOLOGY

The Optima™ CT660 supplies exceptional computer and image processing power that enhances clinical productivity, building upon the strength of the Optima™ CT660 family - true interactive CT technology.

Interactive CT embodies a variety of design choices all striving to enhance operator and department productivity. A truly interactive CT system will:

- Provide a user interface beyond "intuitive" to become purely "natural" - from the screens to the console hardware itself;
- Allow users to review cases side-by-side, with minimal interference;
- Supply a truly multi-tasking environment where even advanced image processing can take place quickly and simultaneously with other processes underway;
- Operate with a very high degree of automation, yet allow patient-specific changes to be easily made, with virtually no restrictions;

One key element of this design is to combine some of the best features from several product families into one state-of-the art CT system. For example, the Optima™ CT660 combines:

- SmartTools productivity software to automate every step of the examination, ensuring the high productivity and throughput with the Optima™ CT660
- Large screen interface for scan acquisition, with virtually everything at a single glance;
- Excellent simultaneity and multi-tasking performance;
- Completely protocol-driven scan control with a dramatic reduction in number of screens;
- Highly flexible editing tools that allow easy tailoring of the exam to the patient;
- Large, 1024 color display;
- Leading edge, real-time image processing (MPR, MPVR, Volume Viewer 3.1*).

In summary, primary benefits of Interactive CT include:

- A natural scan control user interface
 - Reduction in the number of screens; only 2 screens to set up first scan and 1 screen for real-time monitoring while scanning;
 - Easier and more flexible protocols
 - Flexible and intuitive graphic prescription process with a 1024 Localizer;
 - **View/Edit Wizard™** intuitively adjusts dependent parameters automatically in response to operator-initiated changes and highlights them for quick review; also alerts the operator to incompatible dependencies requiring operator intervention;



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- **DynaPlan Plus™** full screen display illustrates scan status pictorially, with real-time feedback.
- Large color screen
 - Extensive use of picture icons and color cues enhance ease of use;
 - Large on-screen controls and attractive color palette provide comfortable viewing over extended periods.
- Enhanced multi-tasking allows operators to review more than one exam simultaneously, independently - even with AutoView and AutoFilm on
 - **BrightBox™** dedicated controls for image next, prior, manual paging and trackball W/L helps make two person image review practical;
 - Up to four 512x512 images from four different exams can be viewed on a large 1024 color display.
- **SmartmA™** User Interface - optimizes mA to maintain constant image noise (pixel noise standard deviation) when collimation/detector configuration, scan mode, scan rotation speed, table speed, or image thickness changes. The user must select initial Noise Index as well as minimum and maximum mA setting. The setting of the Noise index enables reproducibility in this aspect of image quality from one patient to another and from one user to another.
- **Protocol Pro™** protocol manager - provides operator control of automated features (like AutoFilm, and AutoTransfer) on per exam, series or image basis.
- Patient demographics and exam protocols can be preprogrammed in advance of patient arrival through the Schedule Patient feature. Common inputs for new patient include: physician, radiologist, technologist and contrast type (oral and IV).
- A preprogrammed selection of AutoView and Image Review Layouts allow simple customization of the image presentation to match the anatomical area of interest - without the complexity of free-form "windows".
- **ImageWorks™** provides instant access to advanced image processing features such as MIP, MPR, MPVR, Volume Viewer3.1, AVA Xpress*, CT Perfusion 4* - Neuro or Multi-Organ, DentaScan*, CardIQ Xpress 2.0 Plus*, Advantage CTC Pro*, CardEP*, Add/Subtract and AutoBone Xpress*.
- Background filming allows use of the full screen for AutoView and image review/processing without interruption when auto or batch filming. Special "one-touch" controls provide on-screen viewing of camera progress during AutoFilm without disrupting other image processes in progress.
- **ProView™** visualization algorithms available to enhance anatomical structures without additional image reconstruction time.
- Direct network connection means a multi-suite Ethernet card is not required for a gateway out of the suite - saving costs and simplifying installation.
- **Learning Solutions** provides an on-line Operator manual detailing system operation via a multi-media CD-ROM player integrated into the media tower. Learning Solutions can also be accessed on a stand-alone PC providing flexibility and productivity for on demand learning of system operation.

SCAN MODES

The Optima™ CT660 system can perform virtually any clinical application due to its wide variety of scan modes.

Helical

- Continuous 360° scanning with table incrementation and no interscan delay.
- Scans can be acquired in a wide variety of speeds.

Axial

- Up to 64 contiguous axial slices acquired simultaneously with each 360° rotation, with the time between scans set by the user-selected interscan delay (ISD) or intergroup delay (IGD).
- Scans may be easily clustered in groups to allow multiple scans in a single breath hold.
- Minimum scan-to-scan cycle time of only 1.0 second with table moves of ≤ 10 mm (any scan time).

Cine

- Up to 64 contiguous axial slices acquired simultaneously with each 360° rotation.
- Minimum scan-to-scan cycle time of only 1.0 second with table moves of ≤ 10 mm.
- Half-scan imaging and segmented reconstruction is supported with acquisition times of 0.65 times that of the scan speed.

Scout™

- Single radiographic plane for scan localization and graphical prescription of prospective reconstruction;
- Extended range matches helical scannable range.

Typical scan protocols

	<u>Chest/Abd/ Pelvis</u>	<u>Peripheral Run-Off</u>	<u>High-Res Chest</u>	<u>ECG-Gated Cardiac</u>
Coverage (mm)	600	1000	200	120
Rotation (s)	0.5	0.6	0.5	0.35
Mode (mm)	64 x 0.625	64 x 0.625	64 x 0.625	64 x 0.625
Pitch	1.375	0.984	1.375	0.22
MA	400	350	380	450
MA's	216	210	190	158
Speed (mm/s)	110	65.6	110	25
Scan Time (s)	6.04	15.94	2.41	5.37

Note: Scan time that is displayed on Optima™ CT660 system.



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HELICAL SCANS

Slip ring technology has advanced axial scanning by enabling scans with zero interscan delay and simultaneous table movement.

Helical Multi-Slice Modes

Multi-slice acquisitions and short intergroup delays significantly reduce potential mis-registration between scans by increasing the number of scans possible in a patient breath hold.

Helical protocols are almost identical to "classical" axial scan protocols. At the beginning of a study, the operator selects the type of exam with the anatomical programmer, and indicates the desired scan range - either manually, or from a Scout.

After completing the prescribed exam, the system remains ready to continue with additional helical scans or a set of axial scans.

The operator may reconstruct helical scans prospectively with up to 90% overlap, and retrospectively, at any arbitrary table location in 0.1 mm increments.

Generating images at fine intervals, as small as 0.1mm, enables reconstructed images that exceed 128slices (images) per gantry rotation. The number of slices able to be generated per gantry rotation is a function of rotations and coverage.

Rotations	Z Coverage (mm)	Generated Sliced (Images)/Rotation*
1.71	30	176
2.00	46	230
3.00	101	337
4.00	156	390
5.00	211	422
6.00	266	443

* 64*0.625mm&1.375:1 helical pitch

Prospective Multiple-Thickness Reconstruction

For all helical scan modes, the operator can choose to reconstruct images prospectively in any of the defined nominal slice thicknesses.

In addition to the initial reconstructed slice thickness, the operator has the option to prospectively specify additional images to be reconstructed from a single raw data set. These images can be reconstructed at any of the defined nominal slice thicknesses available for a given table speed and scan mode.

This effectively facilitates later, more detailed image analysis without additional patient scans and subsequent dose and image registration concerns.

Asterisk*: Option
 This data sheet is available for US only.

64-SLICE HELICAL MODES			
Table Speed (mm/rotation)			
Slice Thickness (mm)	0.516:1	0.984:1	1.375:1
0.625	20 mm/rot	40 mm/rot	55 mm/rot
1.25			
2.5			
3.75			
5			
7.5			
10			

Helical Scan Parameters

Scan Speeds: Full 360° rotational scans in 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0 seconds (0.4 is for Pediatric only); Cardiac application: 0.35*, 0.375*, 0.40, 0.425, 0.45, 0.475, and 0.50.

Helical Pitch (nominal): 0.516:1, 0.984:1, 1.375:1

Cardiac Pitch: 0.16:1 to 0.325: 1 for 0.35*second gantry speed. Up to 0.325:1 for slower gantry speeds.

Scan Technique:

- kV: 80, 100, 120, 140
- mA: 10 to 560mA, 5mA increments
- Power: 0.8 to 72kW
- Focal Spot Selection
 - Small spot for up to 24kW
 - Large spot for greater than 24kW

Single Acquisition: 60-second scan maximum.

Multiple Acquisition Maximum Scan Time: Multiple scans may be acquired in one series to produce up to 3,000 contiguous helical images. Up to 3,000 rotations helical coverage is possible in multiple series.

Minimum Inter-Group Delay (IGD): 1 second between adjacent helical scans

Maximum Scan Fields of View:

- 32cm for pediatric head	- 50cm for body, large
- 32cm for pediatric body	- 32cm for cardiac - small
- 32cm for head	- 50cm for cardiac - large
- 32cm for body, small	

Helical Scan Enhancements

Full simultaneity allows complete image display, processing and analysis, as well as image archival and filming, concurrent with scanning and reconstruction -- even when acquiring helical images in a multi-slice mode.

Confirm Rx to X-Rays on: < 18 seconds, for any state of tube and gantry; < 10 seconds, with the gantry rotating.

Anatomical Programmer: a ten-region anatomical selector allows quick and easy access to 90 user-programmable protocols per region. Separate selector for adult and pediatric exams. There are four



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GE Healthcare
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selection tabs to select: GE, User, Service and Most Recent Patient. Copy/Paste is supported for easy modification and copying of protocols.

Ten user-defined regions, each with one reference protocol displayed with the anatomical selector for very fast access to most commonly used protocols.

Protocols include preset scan time, kV, mA, scan mode, slice thickness and spacing, table speed, scan FOV, display FOV and center, recon algorithm and special image acquisition and processing options.

Any scan parameters may be edited for each scan or all scans - either before or during an exam. The number of scans may also be easily changed.

AutoScan™: Fully automates longitudinal table movement and start of each scan.

AutoVoice™: 3 preset and 17 user-defined messages automatically deliver patient breathing instructions with a programmable delay; especially useful for multiple helical scanning.

Preset messages are supported in 9 different languages: Chinese, English (Male/Female), French, German, Italian, Japanese, Korean, Spanish, and Mexican Spanish.

Advanced Artifact Reduction (AAR) Filter significantly reduces streaking artifacts when highly absorbent objects are in the field of view - ie: large shoulders.

Helical Image Reconstruction

Reconstruction Algorithms: Soft Tissue, Standard, Detail, Chest, Bone, Bone Plus, Lung, and Edge

Reconstruction Matrix: 512 x 512

Display Matrix: 1024 x 1024

Display FOV: Freely variable center/off-center, prospective/retrospective target selection.

Preferred Viewing Orientation: Images may be reconstructed flipped right/left, top/bottom, or right/left/top/bottom for anatomical viewing.

CT Number Scale: ±31,743 HU

Helical Reconstruction Times:

- Reconstruction time as fast as 16 images per second
- Iterative bone processing, which is always enabled for head scanning, reduces image artifacts in head scans stemming from X-ray beam hardening effects.

Minimum DFOV: 9.6 cm

Minimum Pixel Size: 0.1875 mm

Queued Recon: Requests will be processed continuously and simultaneously with other processes on the system including scanning. Prospective recon will be prioritized over retrospective recon.

Images annotated to indicate continuous scan acquisition with table increments: HE (helical) + Pitch, Table speed

Prospective Multiple Reconstruction (PMR): Up to 3 sets of reconstructions can be pre-programmed as part of the scan protocol prior to acquisition. The operator can select different start/end location, slice thickness, interval, reconstruction algorithms and display fields of view for each reconstruction. These parameters may be automatically copied from the first prospective reconstruction. This frees the operator

from sitting at the console, directly contributes to increased productivity, and reduces the opportunity for error.

Prospective Recon: Operator may initiate full recons at any table location in increments of 1/10 the image thickness; image thickness remains constant.

Retrospective Recon: Operator may initiate full recons at any table location in 0.1 mm increments; image thickness remains constant.

Retrospective Image Decomposition: The operator has the option to retrospectively decompose the original raw data set and reconstruct additional images at any of the defined nominal image thickness available for a given table speed and scan mode.

Helical Scan Protocols

All protocols assume 120kV scans under typical clinical conditions (maximum mA subject to system configuration).

Single Helical Scans:

Scan Time [s]	Maximum mA
3	560
5	560
10	560
20	445
30	385
40	350
50	325
60	310

Multiple Helical Scans (IGD = 5 seconds):

No. Scans	Max mA				
	3S Scan Time	5s Scan Time	10s Scan Time	20s Scan Time	30s Scan Time
2	560	560	460	360	315
3	560	550	425	335	285
4	560	530	405	315	240
5	560	505	390	--	--
6	545	490	365	--	--

Helical Scan Image Quality

The Optima™ CT660 is a sub-millimeter isotropic CT scanner making it possible to specify coronal and sagittal image quality.

The optimized x-ray source (focal spot shape & dynamics as well as reduced off focal radiation) allows for improved measurement methods to fully characterize the limiting resolution of the Optima™ CT660 system design. In conjunction with the additional power of Optima™ CT660, this helps enable exceptional vascular and anatomical detail.

For details of scan techniques and tolerances, please refer to the Technical Reference Manual.

Visual Measurement:

Reformatted resolution is demonstrated on the Catphan High Contrast High Contrast Resolution Insert Module CTP528.

0.35 ± 0.05mm voxel size is seen in the reformatted plane.

Asterisk*: Option
 This data sheet is available for US only.



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1. 3D MTF:

Typical MTF is demonstrated on a 0.05mm tungsten wire and a 1.0mm x 0.025mm gold foil phantom for in-plane and z-plane, respectively.

	High-Resolution Algorithm	
	X/Y lp/cm	Z lp/cm
50%	10.1	7.3
10%	13.5	12.2
4%	14.2	14.2
0%	17.1	19.7

2. Low-Contrast Detectability:

On 8 inch (20cm) CATPHAN phantom:

Reconstruction Mode	Object Size	% Contrast	Dose Level (mGy CTDIvol)
			5mm Slice
Standard Algorithm	5mm	0.32%	15.5
	3mm	0.32%	44.3
Standard Algorithm with ASIR*	5mm	0.32%	11.8
	3mm	0.32%	33.2
	2mm	0.32%	63.45

Body Low Contrast Detectability – Statistical

On 8 inch (20cm) CATPHAN phantom surrounded by a 36cm tissue equivalent ring.

5mm @ 1.3% at 17.0 mGy CTDIvol

3. Noise:

On either an AAPM water phantom or GE Quality Assurance phantom with 5mm slice thickness equivalent:

0.43% ± 0.05% at 19.9 mGy CTDIvol with Standard Reconstruction Algorithm

0.43% ± 0.05% at 11.1 mGy CTDIvol with Standard and ASIR* Reconstruction Algorithm

4. CTDI:

On CTDI Head and Body Dose Reference Phantoms:

CTDI_{vol} expressed in mGy/100 mAs (0.984:1 Pitch):

Head 17.0mGy/100 mAs
 Body 8.8 mGy/100 mAs

AXIAL SCANS

Multi-slice acquisitions and short interscan delays significantly reduce potential missed registration between scans by increasing the number of scans possible in a patient breath hold.

Axial Multi-Slice Prescription

Simplified scan prescriptions and easy-to-use reference protocols make the Optima™ CT660 fast and efficient in patient set-up. Axial protocols are nearly identical to helical scan protocols.

Axial Multi-Slice Modes

The Optima™ CT660 acquires axial scans in sets of 2 through 64 contiguous images in one 360° rotation.

Asterisk*: Option

This data sheet is available for US only.

For each rotation of the gantry, the Optima™ CT660 collects up to 64 rows of scan data. There are seven reconstruction modes available for creating images from the multi-slice scan data (1i, 2i, 4i, 8i, 16i, 32i, 64i). By using 1i, 2i, 4i, 8i, 16i, 32i reconstruction modes, scan data can be combined prior to image reconstruction to create slices with reduced partial-volume artifacts. This is particularly useful for posterior-fossa imaging.

Biopsy Mode: Simplified prescription for single or multiple scans around an arbitrary table position aids biopsy studies.

SmartStep*: Interventional mode providing step-and-shoot imaging with in-room viewing and manual x-ray control.

Axial Scan Parameters

Scan Speeds:

- 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, and 2.0 second full scans (360° acquisition); 0.4* is for Pediatric only, Cardiac application: 0.35*

Scan Technique:

- kV: 80, 100, 120, 140
- mA: 10 to 600mA, 5mA increments
600mA is available only for SnapShot Pulse* study.
- Power: 0.8 to 72kW
- Focal Spot Selection
 - Small spot for up to 24kW
 - Large spot for greater than 24kW

Scan Plane Geometry:

- ± 30° gantry tilt, 0.5° increments

Interscan Delay (ISD):

Table Movements	Minimum ISD
- 0 to 10 mm	1.0s
- 10 mm to 20 mm	1.3s
- 20 mm to 30 mm	1.6s
- 30 mm to 40 mm	1.7s

- User-selectable.

Inter Group Delay (IGD):

- Minimum IGD is the same as minimum ISD; also user-selectable.

Scan-to-Scan Cycle:

- Minimum scan-to-scan cycle of 1.5 seconds possible for 0.5 seconds scan speed with minimum ISDs.

Maximum Scan Fields of View:

- 32cm for pediatric head	- 50cm for body, large
- 32cm for pediatric body	- 32cm for cardiac – small
- 32cm for head	- 50cm for cardiac – large
- 32cm for body, small	



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Scan with no table incrementation, contiguous image location, or skipped image locations are possible. Overlapped axial scans are not possible.

Axial Image Reconstruction

Reconstruction Algorithms: Standard, Soft Tissue, Detail, Chest, Bone, Bone Plus, Lung, and Edge

Reconstruction Matrix: 512 x 512

Display Matrix: 1024 x 1024

Display FOV: Freely variable center/off-center, prospective/retrospective target selection.

Preferred Viewing Orientation: Images may be reconstructed flipped right/left, top/bottom, or right/left/top/bottom for anatomical viewing.

CT Number Scale: ±31,743 HU

Axial Reconstruction Times:

- Iterative bone processing, which is always enabled for head scanning, reduces image artifacts in head scans stemming from X-ray beam hardening effects.

Prospective Multiple Reconstruction (PMR): Up to 3 sets of reconstructions can be pre-programmed as part of the scan protocol prior to acquisition. The operator can select different reconstruction algorithms and display fields of view for each reconstruction. This frees the operator from sitting at the console and directly contributes to increased productivity.

Similarly, additional reconstruction supports partial-volume artifact reduction by reconstructing images with 2, 4, or 8 times the acquisition image thickness.

These reconstruction features effectively facilitate later, more detailed image analysis without additional patient scans and subsequent dose and image registration concerns.

The following table illustrates the retrospective reconstruction image thicknesses available for each acquisition thickness and mode:

Scan Mode	Slice Thickness	Recon Slice Thicknesses
64 slices / 40mm	0.625	128i – 0.625mm* ^o 64i – 0.625mm* 32i – 1.25mm* 16i – 2.5mm 8i – 5mm 4i – 10mm
32 slices / 20mm	0.625	32i – 0.625mm 16i – 1.25mm 8i – 2.5mm 4i – 5mm 2i – 10mm
16 slices / 10mm	0.625	16i – 0.625mm 8i – 1.25mm 4i – 2.5mm 2i – 5mm 1i – 10mm
8 slices / 5mm	0.625	4i – 1.25mm 2i – 2.5mm 1i – 5mm
4 slices / 2.5mm	0.625	2i – 1.25mm 1i – 2.5mm
2 slices / 1.25mm	0.625	1i – 1.25mm

* Retro Recon Only, ^o Overlapped Reconstruction

Axial Scan Protocols

All protocols assume 120kV scans under typical clinical conditions (maximum mA subject to system configuration).

Standard Scans:

Scan Time (s)	ISD (s)	mA	Number of scans (xxx)	Number of scans (yyy)
1	1	560	4	16
1	1	520	8	26
1	1	480	14	37
1	1	440	18	45
1	1	400	24	55
1	1	360	32	68
1	1	320	43	86
1	1	280	58	110
1	1	240	74	135
1	1	200	94	168

xxx: 120KV scans under thermal equilibrium condition (infinitely repeatable scans with about 10 minutes ISD)

yyy: 120KV scans under cool condition (two hours past from last scan)

Axial Scan Image Quality

For details of scan techniques and tolerances, please refer to the Technical Reference Manual.

1. High Contrast Spatial Resolution:

Typical in-plane MTF is demonstrated on a 0.05mm tungsten wire.

	High-Resolution Algorithm X/Y lp/cm
50%	10.1
10%	13.5
4%	14.2
0%	17.1

2. Low-Contrast Detectability

On 8 inch (20cm) CATPHAN phantom:

Reconstruction Mode	Object Size	% Contrast	Dose Level (mGy CTDIvol) 5mm Slice
Standard Algorithm	5mm	0.32%	15.2
	3mm	0.32%	42.6
Standard Algorithm with ASiR*	5mm	0.32%	12.2
	3mm	0.32%	32.0
	2mm	0.32%	63.16

Body Low Contrast Detectability – Statistical

On 8 inch (20cm) CATPHAN phantom surrounded by a 36cm tissue equivalent ring..

5mm. @ 1.3% at 16.7 mGy CTDIvol

3. Noise

On either an AAPM water phantom or GE Quality Assurance phantom with 5mm slice thickness equivalent:

Asterisk*: Option
 This data sheet is available for US only.



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0.43% ± 0.05% at 19.8 mGy CTDIvol with Standard Reconstruction Algorithm

0.43% ± 0.05% at 11.0 mGy CTDIvol with Standard and ASiR*Reconstruction Algorithm

4. CTDI

On CTDI Head and Body Dose Reference Phantoms:

CTDIw expressed in mGy/100 mAs:

Head 16.7 mGy/100 mAs
Body 8.7 mGy/100 mAs

SCOUT SCANS

ScoutView™ scans provide excellent detail for anatomical localization in conjunction with scan prescription.

Scan locations may be prescribed at the operator console either graphically (via mouse), or explicitly (keyboard entry) from a Scout scan.

Prescription of scans with multiple gantry angles is also available on a single Scout.

Scout Scan Parameters

Aperture: 8 x 0.625 mm effective aperture

Table speed: 100 mm/s

Scout range:
1600mm with 500 pounds table

Maximum Display FOV: 50 cm

Scouts longer than 1,000 mm are auto minified to fit the display.

Scan Technique:

- kV: 80, 100, 120, 140
- mA: 10 to 560mA, 5mA increments
- Power: 0.8 to 72kW

Orientation: AP, RLAT, PA, LLAT (preset); or any angle from 0° - 359° (manually selected).

Axial scan prescription lines indicate scan location to nearest 1 mm table position.

Preset Scout width/window level (WW/WL) values available in protocol management tool or during scan prescription.

USER INTERFACE

Optima CT660 Operator Console, utilizes a computer workstation with the following user interface features:

- Two 19-inch LCD monitors
 - Scan/recon monitor for scan and recon control with no image display
 - Image monitor for image display, analysis, processing, and management
 - Each monitor provides a 1280 x 1024 high resolution, flicker-free display
- Scan control keyboard assembly with intercom speaker, microphone and volume controls

Asterisk*: Option
This data sheet is available for US only.

- Three button mouse with mouse pad
- BrightBox* (trackball assembly)
- Two wide work surfaces

All these devices are freestanding and can be easily moved to accommodate a large variety of working conditions and individual operator preferences.

Desktop Overview

The user interface utilizes the paradigm of managed work environments for a more intuitive clinical workflow.

Virtually, all clinical operations are managed through three "virtual desktops" or applications managers: Exam Rx, ImageWorks and Learning Solutions. Operators can effortlessly move back and forth between these environments simply by clicking on an icon. Xstream technology enhances multi-tasking architecture and maintains simultaneously all processes so no work is lost or disrupted as desktops are switched.

Exam Rx:

The Exam Rx desktop environment provides the clinical tools necessary for comfortable, efficient control of patient studies.

These tools include patient scheduling and data entry, exam protocol selection, protocol viewing and editing, scan data acquisition, image reconstruction, image display and routine analysis, AutoFilm or manual filming, and AutoTransfer.

ImageWorks:

ImageWorks is a desktop environment designed to take advantage of the Optima™CT660 System computer and image processor.

Standard features include archive, network and manual film control, as well as some advanced image processing such as multi-planar reformatting (MPR), multi-projection volume rendering (MPVR), and MR image display. It also has optional add-on packages for Volume Viewer 3.1*, CT Perfusion 4* and DentaScan*.

The ImageWorks desktop also provides a gateway for DICOM image transactions, either through a local area network

Learning Solutions:

The Optima™ CT660 provides an on-screen, on-line operator assistance via a multi-media CD-ROM/DVD player integrated into the front of the operator's console. Learning Solutions is also viewable on a stand-alone PC providing flexibility and productivity for on-demand learning of system operation.

EXAM RX

Patient Scheduling

Patient demographics and exam protocols can be pre-programmed in advance of patient arrival by selecting Schedule Patient from the scan/recon monitor. This productivity enhancement allows entry of all or some of a patient's demographic data, as well as pre-selection of the exam protocol.

This feature is available any time a patient exam is not currently underway.



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This feature uses the same interface as New Patient selection for simplified, consistent programming.

Patient information can be easily recalled to set up an immediate exam via List/Select Scheduled Patient on the scan/recon monitor. Pre-programmed patient exams can also be recalled from the New Patient screen automatically by entering the patient ID number.

Patient Data Entry

Patient data can be entered as part of New Patient set-up, or can be recalled from the list of pre-scheduled patients. Common inputs for new patient include: physician, radiologist, technologist and contrast type (oral and IV).

Trauma Patient ID allows patient scans and image display/analysis without entering patient data before scanning.

Exam Protocol Selection

One of the main contributions of the Optima™ CT660 to department productivity is its simplified exam set-up.

- Exam parameter set-up has been simplified through the exclusive use of protocols
- Protocols can be easily selected in one of three convenient ways:
 - A large, graphical Anatomical Programmer located on the New Patient screen
 - A reference list of the "top 10" most commonly used protocols located near the anatomical programmer
 - A numerical entry
- Two Anatomical Programmers - one for adults and one for pediatrics - provide quick and easy access to 6840 user-programmable protocols (total). Each programmer has ten anatomical regions with 90 protocols for each region
- Reference protocols have been expanded through Protocol Pro - a "behind the scenes" protocol manager - that allows preselection of automated features like AutoVoice, AutoFilm, AutoStore and AutoTransfer on a per exam, series or image basis.
- Protocol Pro also provides preselection of two different window/level settings per image for AutoFilm and can automatically display the 1024 Localizer each time a new series is requested.
- Reference protocols also include preset scan time, kV, mA, slice thickness, scan mode, table speed, image interval, gantry tilt, scan field-of-view, display field-of-view and center, recon types, and breath timing parameters.
- Any scan parameter can be edited for each scan or all scans either before or during an exam. Scans can be easily added or removed from the prescription.
- Scan/recon control uses only 2 screens to set up first scan - New Patient and Protocol View/Edit.

Protocol View/Edit

- A single, full screen View/Edit table allows fast and easy examination and modification of exam parameters before scanning begins.
- Exam parameters can be changed for one scan or all scans in a series
- When used in conjunction with the 1024 Localizer, changes made in the View/Edit table that affect the number of scans, image interval, starting/ending locations, tilt, or display FOV are automatically shown on the 1024 Localizer.

- Any changes made directly on the 1024 Localizer display using the mouse and the on-screen cursor controls are also reflected automatically in the View/Edit table
- View/Edit Wizard intuitively adjusts dependent parameters automatically in response to operator-initiated changes and highlights them for quick review. It also alerts the operator to incompatible dependencies requiring operator intervention.
- Tab card groupings for Timing, Recon and Filming help organize the large number of parameters available within each protocol.
- Parameters such as Patient Position, Patient Orientation and reconstruction parameters automatically update between series to reduce the change of user error.
- As many as 6,840 protocols can be stored on the Operator Console.

Scan Data Acquisition

- Full-screen DynaPlan Plus illustrates scan status graphically, with real-time feedback while the exam is underway. Scans, programmed delays (prep, breathing, inter-group), and even AutoVoice announcements are clearly shown before and during scanning.
- AutoScan: Fully automates longitudinal table movement and the start of each scan
- AutoVoice: Preset and user-recorded messages automatically deliver patient breathing instructions, especially useful for multiple or multi-pass helical scans
- Full Simultaneity allows scan and recon to work concurrently with image display, processing and analysis (including computationally intensive features such as MPR, MPVR and 3D*/MIP) while still running image archival, filming and networking processes.

Dose Computation, Display & Reporting

CTDI_{vol} (CTDI volume), DLP (Dose Length Product), and Dose Efficiency computation and display during scan prescription provides patient dose information to the operator.

CTDI_{vol} is a dose index defined by IEC 60601-2-44. This index is computed automatically by the Optima™ CT660 and reported on the Exam Rx screen. CTDI_{vol} is a single number consisting of 2/3 of the CTDI₁₀₀ peripheral dose plus 1/3 of the CTDI₁₀₀ central dose that is divided by the helical or axial pitch factor.

CTDI₁₀₀ is a dose index based upon CTDI dose measurements over a 100 mm volume, as defined in IEC 60601-2-44.

Dose Length Product (DLP) is given in mGy*cm and is computed and displayed for each group prior to the scan. Additionally, an accumulated DLP is displayed for the entire exam, as the exam prescription progresses. The final exam accumulated DLP provides a convenient measure for maintaining patient or procedure dose management statistics.

Dose Efficiency is automatically computed and displayed on the Exam Rx screen. The dose efficiency is a measure of how much of the Z-axis X-ray beam is used by the system, as defined in IEC 60601-2-44.

Dose Reporting saves the CTDI_{vol} and DLP in the patient record. Series and cumulative exam values are saved. Saved values can be networked, filmed and archived. DICOM Structured Dose Report is also supported.



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AutoView Layouts

- Eight powerful AutoView layouts provide exceptional flexibility in tailoring the 1024 image display to the user or the application at hand - without the complexity of free-form "windows."
- AutoView Layouts include:
 - 1024 AutoView image
 - 768 AutoView image (matches the image size shown on the HiSpeed Advantage 2.X Series OC monitor)
 - 512 AutoView image + 512 Localizer Scout with cut lines automatically showing the location of the AutoView image on the Scout
 - Two 512 AutoView images (same image but at different window/level settings) + 512 Localizer Scout with cut lines automatically showing the location of the AutoView images on the Scout
 - 512 AutoView image + 512 AutoFilm image
 - Last two & four 512 AutoView images
 - AutoLink which links the current series to a view port
- Basic image review features such as window/level, magnification and flip/rotate are available for AutoView images.
- Any window not used for AutoView is available to independent, simultaneous review of other exams.
- Special BrightBox, a three-button trackball device, provides independent control of image next, prior, manual paging and trackball window/level for any review images in focus. This helps make two-person operation practical.
- Regardless of the AutoView Layout used, AutoFilm viewing is available anytime via an on-image selection - without disrupting other image processes in progress. Background filming allows full use of the image display monitor for AutoView and image review/processing without interruption during AutoFilm.

Image Review Layouts

- Five flexible Image Review Layouts are provided for those applications where greater than 512-image display may be desired and AutoView is not required.
- Image Review Layouts include (Note - uses short notation for screen options)
 - 1024 single image display
 - 768 single image display
 - Two 512 image display, horizontal format
 - Two 512 image display, vertical format
 - Four 512 image display
- Each image display window can be further subdivided into four more images, increasing the total number of images that can be displayed at once to 16.
- BrightBox* image control is also available for Image Review Layouts.

Image Access

- Point and click interface along with a pictorial directory (browser) allows for easy selection by exam, series or image

Routine Image Display

- Image display features provided within Exam Rx:

- Zoom/Room	- Grid On/Off
- Explicit Magnify	- Cross Reference
- Flip/Rotate	- User Annotation
- ProView	- Exam/Series Page
- Display Normal	- Hide Graphics
- List/Select	- Erase
- Ellipse ROI	- Screen Save
- Measure Distance	- Gray Scale Enhancement

- ProView visualization algorithms are available to enhance anatomical structures without additional reconstruction time:
 - Four Selections for enhancement of high contrast objects where fine detail is required without aliasing (such as lungs)
 - Three Selections for modifying perceived levels of noise and low contrast discrimination
- Three ways are provided to adjust window/ level of images in focus in order to meet a variety of clinical work environments and user preferences:
 - Six user-programmable keys on the scan control keyboard (F6 - F11), plus one key for returning to prior setting (F5)
 - On-image through middle mouse button
 - BrightBox trackball

Routine Measurements

- Image measurement features provided within Exam Rx:

- ROI: Box, Ellipse, Trace	- Hide Graphics
- Measure Distance	- Erase
- Measure Angle	- Screen Save
- MiROI (Multiple Image ROI)	- Grid On/Off
- Report Pixels	

Display Preferences

Display settings available to tailor the overall display (settings apply to all images in all exams):

- Annotation Levels
- Inverse Video
- Next/Prior Each View Port
- Next/Prior Series Binding
- Continuous Report Cursor
- Large font for patient name, patient ID, and accession number

Auto Image Management

The Exam Rx work environment conveniently provides for selection of AutoFilm, , and AutoTransfer (across a network).

An AutoFilm Composer provides a simple programming interface for automated filming set-up.

Batch Filming is accomplished through a single keystroke that automatically prints an entire series at a time.

Manual Image Filming

- On-screen filming is available for a digital camera using a DICOM protocol.
- Images may be individually filmed manually via "drag and drop" to the on-screen Film Composer.



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- Print Series permits automatic printing of an entire series with one keystroke.
- Page filming permits creation of an entire film with one keystroke.
- Multiple image formatting allows filming of multiple images in a single film frame.
- Film formats supported are 1:1, 2:1, 4:1, 6:1, 8:1, 9:1, 12:1, 15:1, 16:1, 20:1, 24:1, 25:1, 30:1, 35:1, 42:1, and 35-mm slide

Important note: The Optima™ CT660 comes standard with a DICOM Print Interface configurable for multiple DICOM Print destinations. Connections with cameras that do not support DICOM Print may require a filming interface (purchased separately).

To save further filming cost, the Operator Console can directly print to a postscript printer such as the GE Color Printer available as an option.

IMAGEWORKS

ImageWorks software is designed to take advantage of the Optima™ CT660 computer and image processor. This desktop environment includes image management and networking.

Because some of the image analysis and display features of ImageWorks replicate those in Exam Rx, the next section describes only features that are incremental or significantly different.

Image Analysis

- Multi-Projection Volume Reconstruction (MPVR): Quick and easy way to generate volumetric images for CT angiography without thresholding data or removing unwanted anatomy. An entire volume is used to generate images in any plane, creating real-time frames of reference at the same time;
- Clinical utility is extended via two additional modes:
 - MIP - enhances contrast and improves visualization of calcifications
 - Average - generates 2D radiographic images
 - Volume Rendered 3D
- Multi-planar Reformation (MPR): Provides real-time assessment of anatomy in offaxis planes. Sagittal, coronal, oblique and curved planar reformations available;
- Batch reformatting can also be defined and executed for later viewing if desired;
- Image Addition and Subtraction: Includes image addition of more than two images at a time;
- Direct MPR allows customer to move from routine 2D review to prospective 3D image review of axial, sagittal, coronal, and oblique planes while enabling automated protocol-driven batch reformats to be created and networked to their desired reading location, reducing total exam time and increasing technologist and radiologist productivity.
- Exam Split* provides customers with the capability to "split" a series of patient images into separate groups. These new smaller image groups can then be networked to desired reading stations for multiple "reads" and multiple billings on select patient exams. Virtual mode provides ability to send window level values, flip & rotate images, and compatibility with MPPS.
- Data Export provides CT scanner customers with a stand-alone tool to convert clinical images into PC-friendly formats like .jpeg, .mpeg, and .avi, creating more flexible report creation for both referring

physicians and patients. Images can then be saved using Data Export tool to CD or transferred (FTP) to an IP destination.

Image Display

- Magnifying Glass allows quick 2X magnification window that can be moved over an image.
- Image Scroll moves an image within its' own window.
- Groupings allow application of window level values; magnification/minification; image scroll or flip and rotate to a user-defined image set.
- Save State stores user-selected image orientation and window/level with each data set.
- Window/Level values may be:
 - Preset to provide six on-screen instant window/level settings
 - Set independently for up to 16 images on the screen
 - User-modified in discrete or variable steps
 - Adjusted real-time on-image by holding down the middle mouse button and moving the mouse
- Cine mode provides paging in up to 4 view ports of up to 128 previously stored CT or MR images at full selected display frame rate. For more than 128 images, display frame rate may be reduced.
- Cine mode also provides temporal, spatial or manual playback loops.
- Text Page displays patient scan information

Image Annotation

- Image annotation and cursor are shadowed to permit ease in reading.

Image Management

- Images save to a CD-R or DVD-R with DICOM Interchange.

Direct MPR

- Direct MPR enables automated protocol-driven axial, sagittal, and coronal reformats. Reformatted images may be routed to multiple network destinations, eliminating the need to transfer and store all thin-slice data.
- Direct MPR provides an interactive axial review mode that can change the slice thickness reconstruction instantaneously.
- The user selects the volume to be specifically analyzed and chooses the slice thickness to be displayed as axial, sagittal, coronal and oblique images. The user can then save a number of recon images sets, viewing a large number of slices for pure axial or multi-planar review and filming.
- Batch film can typically enable you to reduce filming images by 50%, thickening the slab from 0.625 to 1.25mm or 1.25 to 2.5mm with no information loss.

Image Networking

Exams can be selected and moved between the Optima™ CT660 and any imaging system supporting the DICOM protocol for network send, receive and pull/query. NOTE: Because the Optima™ CT660 creates images in pure DICOM format, exams *cannot* be moved from the Optima™ CT660 to MR Signa Advantage, CT HiSpeed Advantage or the Advantage Independent Console systems.

Image transfer time using DICOM protocols is 10fps on a 1000baseT network.



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DICOM Interchange allows the saving of any image from the database, along with PC viewer to a CD-R or DVD-R without marking the exam/series or image as archived for exam transfer between stations that are not networked or pass along to referring physicians or patients.

DICOM Conformance Standards

For detailed information, please reference DICOM conformance statement DOC063565r3-4_CS.

- DICOM Storage Service Class
- Service Class User (SCU) for image send
- Service Class Provider (SCP) for image receive
- Service Class User (SCU) for storage commitment
- DICOM Query/Retrieve Service Class
- DICOM Storage Commitment Class Push
- DICOM Modality Worklist
- DICOM Modality Performed Procedure Step
- DICOM Print
- DICOM Structured Dose Report

Filming Protocol

- DICOM protocol

On-line User Documentation

This innovative feature provides on-screen, on-line support of system features via a multi-media CD-ROM player and is integrated into a tower on operator console for easy access. A well-indexed table of contents helps speed access to information. The CD can be viewed on the system or on a PC.

SYSTEM COMPONENT SPECIFICATIONS

Gantry

Advanced slip ring design continuously rotates generator, tube, detector and data acquisition system around the patient.

- Aperture: 70 cm
- Tilt: $\pm 30^\circ$
- Tilt Speed: 1°/s
- Focus to Detector: 95 cm
- Focus to Isocenter: 54 cm
- Maximum SFOV: 50 cm
- Rotational Speeds (s): 360° in 0.35*, 0.375*, 0.40*, 0.425*, 0.45*, 0.475*, 0.50, 0.60, 0.70, 0.80, 0.90, 1.0, and 2.0
- Remote Tilt from Operator's Console
- Breathing lights and countdown timer
- Cardiac gating indicator light
- Start scan button with countdown to X-ray on
- Scan plane toward front of gantry for improved positioning access

Biopsy and interventional studies have been facilitated through a more streamlined gantry shroud, and bilateral table/gantry controls and gantry display that maximize maneuverability while working next to the gantry.

Laser Alignment Lights:

- Define both internal and external scan planes to ± 1 mm accuracy
- Operate over full range of gantry tilt; activated any time during exam (with tube stationary)
- Coronal light remains perpendicular to axial light as gantry tilts.

Visual readout is easy to read from the tableside or from the operator console. Gantry tilt controls are located on the side of the gantry.

Table

Table configurations and specifications

	500 pounds Table	500 pounds long Table
Vertical Range*	430mm to 991mm	430mm to 991mm
Vertical Scanable Range*	791mm to 991mm	791mm to 991mm
Elevation Speed Full range motion	Less than 22sec (Fast) Less than 45sec (Slow)	Less than 22sec (Fast) Less than 45sec (Slow)
Elevation Accuracy Position repeatability	± 1.5 mm	± 1.5 mm
Horizontal Range	1745mm	2045mm
Horizontal Scanable Range (Axial)**	1730mm	2000mm
Horizontal Scanable Range (Helical)**	1580mm	1890mm
Horizontal Scanable Range (Scout)**	1600mm	1900mm
Cradle Speed Max Horizontal Speeds	137.5(150***) mm/sec	137.5(150***) mm/sec
Cradle Speed Operator-controlled slow speed operation	5mm/sec $\pm 3\%$	5mm/sec $\pm 3\%$
Cradle Speed Operator-controlled fast speed operation	125mm/sec $\pm 2\%$	125mm/sec $\pm 2\%$
Position repeatability	± 0.25 mm	± 0.25 mm
Longitudinal accumulated position error	± 0.25 mm $\pm 0.06\%$	± 0.25 mm $\pm 0.06\%$
Table Load Capability	227kg*** (500lbs)	227kg*** (500lbs)

* The distance from the Table bottom to the cradle upper side surface



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** Table Height, Gantry Tilt and scanning software determine the scannable range.

*** During Move to scan operation

X-Ray Tube

Performix™ 40 X-ray Tube Unit, Design optimized for exams requiring a large number of scans without tube cooling.

- Maximum Power: 72kW
- Dual Focal Spots:
 - Small Focal Spot:
 - 0.9 x 0.7 IEC 60336: 2005
 - 0.7 x 0.6 IEC 60336: 1993
 - Large Focal Spot:
 - 1.2 x 1.1 IEC 60336: 2005
 - 0.9 x 0.9 IEC 60336: 1993

Maximum mA for each kV selection:

kV	Small Spot Max mA	Large Spot Max mA
80	300	400
100	240	480
120	200	600
140	170	515

- Thermal Ratings:
 - Maximum Anode Heat Content (Reference: IEC 60613):
The maximum anode heat capacity: 4.7 MJ (6.3MHU)

- X-ray tube assembly fan angle is a minimum of 56.37°
- Average time to replace tube: ≤ 9 hours

High Voltage Generation

- High-frequency on-board generator. Continuous operation during scans.
- kV: 80, 100, 120, 140
- Max Power: 72kW
- mA: 10 to 600mA, 5mA increments
600mA is available only for SnapShot Pulse* study.

V-Res Detector

- 58,368 individual elements composed by 64 rows of 0.625mm thickness at isocenter. All data is acquired as thin slice at 0.625mm with the option of thicker slice from image reconstruction or processing.
- 98% absorption efficiency.

Data Acquisition System

- 64 Slice configuration
- 2 - 0.35 second scan
- 2,460 Hz maximum sample rate
- 861 - 1968 views per rotation Scan/Control Unit

Asterisk*: Option
 This data sheet is available for US only.

SCAN/CONTROL UNIT

Optima™ CT660's console is designed as a silent operator console, up to 80% noise reduction compared to LightSpeed VCT.

Host Computer	
CPU	Intel E5540 DUAL 2.53GHz Quad Core Xeon Processors QPI
O/S	64-bit
Cache	x 6MB shared L2 Cache
RAM	24GB DDR3-1333MHz
Graphics Card	Nvidia Quadro FX1800 PCI Express 16x
Reconstruction Unit	Commercial-Off-The-Shelf Graphics Processor add-in card
Storage	
Applications & Images	146GB 10,000 rpm miniSAS HDD
Image Disk	146GB 10,000 rpm miniSAS HDD
Scan Data Storage	5 x 300GB SAS 15,000rpm HDD

1,792GB Disk(system, image, scan disks) stores up to 250,000 512*2images and 3520 scan rotations at 64 slice mode or up to 1,500 scan data files, or up to 300 exams.

Software Architecture

- Software architecture based on industry standards and client-server design

Peripherals

- Scan control keyboard assembly with intercom speaker, microphone and volume controls.
- Color LCD monitors (2 standard):
 - 19 inch diagonal width
 - 1280 x 1024 dot resolution
 - Horizontal & Vertical viewing angle: 176 degrees
 - Horizontal synchronization range: 31.5 - 81.1 kHz
 - Vertical synchronization range: 50 - 85 Hz
- DVD-RAM (Scan Data & System State):
 - 9.4 GB total. 4.7 GB per side
 - Assigned for Scan Data and System State (Protocol files)
- DVD-R/CD-R (DICOM Interchange):
 - 4.7 GB capacity (DVD)
 - Up to 7,168 image storage (DVD)
 - Supports CD-R, DVD-R
- 3-Button Mouse
- 3-Button Trackball*

Image Networking

- Standard auto-configuring Ethernet (UTP connection) - 1000/100/10 BaseT
- Direct network connection; multi-suite ethernet card not required for gateway out of suite



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- Protocols supported:
 - DICOM network send (one IP address at a time) and receive, pull/query, and storage commitment push
 - InSite point-to-point

STANDARD, SELECTABLE ITEMS

- Keyboard: English, French, German, Scandinavian or International (with overlays for English, French, German, Italian, Japanese, Mandarin, Portuguese, and Spanish)
- Freedom Work Space or Optima desk
- Cable Set, STD Cable or Long Cable.

COMPATIBLE OPTIONS

The following options are available on the Optima™ CT660 and Xstream console. See Advantage Workstation (AW) product data sheet for list of available AW options.

Scanner Options:	
• 0.4sec rotation	• Volume helical shuttle
• Overlapped 128 slice recon	• SmartStep package
• ConnectPro	• Xstream Injector
• Exam Split	• Enhanced Xstream Injector
• Volume shuttle	
Cardiac Options:	
• SmartScore pro acquisition	• 0.35sec rotation
• ECG Trace on Console	• Card IQ Snapshot
• SnapShot Pulse option	• Cardiac Enhancement Filter
Operator Console Options:	
• ASiR option	• Advantage CTC Pro
• Volume Viewer 3.1	• Perfusion 4 Multi-Organ
• AVA Xpress	• Perfusion4 Neuro
• AutoBone Xpress	• DentaScan
• CardIQ Xpress 2.0 Plus	• CardEP
Hardware Options:	
• Uninterruptible Power Supply (UPS)	• Shallow Head Holder
• Advantage 4D	• Straps Auto Traction
• BrightBox	• Catheter bag holder
• Bar code reader	• Arm Support
• Table Convenience kit	• Long Body strap
• Coronal head holder	

LICENSE

ASiR™, Volume Helical Shuttle™ and Cardiac scan are licensed for use with a GE x-ray tube. Use of a third party x-ray tube will require the purchase of an additional license for these features.

SITING REQUIREMENTS

For siting requirements details, see Pre-Installation Manual Direction 5368510-1.

WARRANTY

The published Company warranty in effect on the date of shipment shall apply. The Company reserves the right to make changes.

General Electric Company reserves the right to make changes in specifications and features shown herein, or discontinue the product described at any time without notice or obligation.

REGULATORY COMPLIANCE

Laser alignment devices contained within this product are appropriately labeled according to the requirements of the Center for Devices and Radiological Health.



This product is a CE-compliant device that satisfies IEC 60601-1 and applicable collateral and particular standards, including regarding Electro-Magnetic Compatibility (EMC) and Electro-Magnetic Interference (EMI).

The product complies with radiation performance standards 21 CFR subchapter J.

Optima™ CT660 may not be available in all markets.

General Electric Company doing business as GE Healthcare

DOC0904978

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Attachment 3 - Quotes from RCS and Bayer Healthcare



Quotation

Quote To:
 Northern Hospital of Surry Cty
 830 Rockford St
 MOUNT AIRY NC 27030-5322
 USA

Bayer HealthCare LLC

Quotation number: 0020012728
 Customer number: 0003155720
 Date: 12/03/2014
 Page: 1

Valid from: 12/03/2014 to 12/18/2014

Bill McDonnell
 Professional Sales Consultant
 630-877-2949
 william.mcdonnell@bayer.com

We deliver according to the following terms and conditions:

Currency: USD

Terms of payment: 30 d. w/o discount of inv. net
Terms of delivery: Carriage paid FOB SHIPPING POINT

Item	Part No	Qty	Unit Price	UoM	Amount
1	84433765	1 PCE	5,700.00	1 PCE	5,700.00
	OCS, 580mm CEILING MOUNT, PORTEGRA2				
	Discount (%)		35.00-		1,995.00-
	Net value		3,705.00		3,705.00
2	84433838	1 PCE		PCE	
	PLATE, MOUNT, CEILING, PORTEGRA2				
3	59943247	1 PCE	1,669.00	1 PCE	1,669.00
	INS OCS INSTALLATION - OCS				
	Discount (Value)				49.00-
	Contract Price R&I		1,620.00		1,620.00
	Net value		1,620.00		1,620.00

*****PLEASE NOTE: Due to a system conversion, orders placed between December 24, 2014 and January 1, 2015 will not be processed until January 2, 2015. If pricing and terms of this order are based upon your current Group Purchasing Organization (GPO) affiliation, any change to your current affiliation may require a new quote or updated terms and pricing.**

When applicable, State and Local taxes will be calculated on the order. If you are exempt from taxes, contact customer support at 1(800)633-7231. Thank you for your order!



Quotation

<i>Item</i>	<i>Part No</i>	<i>Qty</i>	<i>Unit Price</i>	<i>UoM</i>	<i>Amount</i>
4	59942828 DE-INSTALL CHARGE SERVICE ITEM	1 PCE	1,500.00	1 PCE	1,500.00
	Net value		1,500.00		1,500.00
	* De-Install fee of existing injector *				
Sub Total					6,825.00
Total					6,825.00

NOTE: If using signed quote as a purchase order please complete the following information:

Print Name: _____

Signature: _____

Title: _____

PO #: _____

Phone #: _____

*****PLEASE NOTE: Due to a system conversion, orders placed between December 24, 2014 and January 1, 2015 will not be processed until January 2, 2015. If pricing and terms of this order are based upon your current Group Purchasing Organization (GPO) affiliation, any change to your current affiliation may require a new quote or updated terms and pricing.**

When applicable, State and Local taxes will be calculated on the order. If you are exempt from taxes, contact customer support at 1(800)633-7231. Thank you for your order!

Bayer HealthCare



BAYER PRODUCT TERMS AND CONDITIONS

If Customer is a member of a group purchasing organization ("GPO") who has a contract with Bayer, the terms of that GPO Agreement will supercede the terms herein.

The following terms and conditions will not apply to the license of Bayer's Radimetrics or Certegra products. Such products are subject to a separate license agreement.

1. **Modifications.** The prices and terms on this Quote are not subject to verbal changes or other agreements unless approved in writing by Bayer.
2. **Acceptance.** Bayer's products and services are sold only under the terms and conditions stated on this quotation. Acceptance of any Purchase Order is expressly and exclusively made conditional on your assent to these terms and conditions. Any different or additional terms and conditions that may appear in your Purchase Order or any other document sent by you, shall have no effect. Bayer expressly objects to and rejects all inconsistent or additional terms, conditions and limitations contained on any of your forms or other writings. If you do not communicate your objection to these terms and conditions in writing and within a reasonable time, or if you accept the goods covered by this Quote, you will be deemed to have accepted these terms and conditions and they will control in all instances. If the Products include embedded software or if you are purchasing software, **BY HAVING THE SOFTWARE INSTALLED AND USING THE SOFTWARE PURCHASED HEREUNDER, YOU AGREE TO BE BOUND BY THE TERMS OF THIS AGREEMENT. IF YOU DO NOT AGREE TO THE TERMS OF THIS QUOTE, DO NOT INSTALL OR USE THE SOFTWARE AND NOTIFY BAYER IMMEDIATELY.**
3. **Pricing.** Prices are based on costs and conditions existing on the date of this Quote and may be changed by Bayer before final acceptance. The pricing for products provided pursuant to this Quote may reflect or be subject to discounts, rebates, or other price reduction programs. Please be advised that you are obligated to: a) fully and accurately disclose the amount of any such discounts, rebates, or other price reductions in your cost reports or claims for reimbursement to Medicare, Medicaid, or health care programs requiring such disclosure and b) provide such documentation to representatives of the Secretary of the Department of Health and Human Services and state agencies upon request. Unless noted otherwise, the value of any product listed as \$0.00 on this Quote may constitute a discount that you should evaluate when filing such reports. You may request additional information from Bayer in order to meet your reporting or disclosure obligations, by writing to the address set forth in this Quote. All payments are due net thirty (30) days on the total invoiced amount. For all new customers Bayer requires a thirty percent (30%) pre-payment for all capital equipment orders, unless otherwise agreed to by Bayer. Bayer must approve any payment terms other than net thirty (30) days.
4. **Shipping.** All shipping dates are tentative. Bayer will make every reasonable effort to meet shipping dates referenced in this Quote. However, Bayer will not be liable for its failure to meet any such date.
5. **Installation.** The cost of installation is not included in the product price and is your responsibility unless otherwise stated. For details on equipment installation, you should consult with your Bayer Sales Representative or refer to your Products Manual, which is included with your equipment.

If this Quote includes installation of an overhead counterpoise system (OCS) it is your responsibility to ensure a suitable mounting location for the system. The counterpoise ceiling plate is required to be installed prior to Bayer installation of the counterpoise system and installed in accordance with the specifications listed in the installation manual. The OCS ceiling plate should always be installed by a qualified Structural Engineer and/or Architect. In addition, if applicable building codes require the use of a conduit, you are responsible for ensuring that a conduit is available prior to Bayer's installation.

If this Quote includes a Certo wireless network it is your responsibility to ensure the approval of the Information Technology Department to allow the operation of the wireless network at your site.

If this Quote includes a Spectris Solaris with an Integrated Continuous Battery Charging System (iCBC), installation will require a standard power outlet in the scan room, or authorization to install a filter through the penetration panel.
6. **License.** If the Products include embedded software, or if you are purchasing software, Bayer grants to you a non-exclusive license to use such software provided by Bayer, solely in connection with, or to operate, the Products. Use of the software for any other purpose is strictly prohibited. This license is effective on the date you begin using the Products and software and will continue in effect unless you return the Products or software or if the license is terminated because

Please reference the quote number on your PO and fax to 412-406-0952

Bayer HealthCare



you breach any provision of these Terms. Upon termination you shall immediately cease use of all software and shall return the Products and software to Bayer. The software copyright is owned by Bayer and is protected by United States copyright laws and international treaty provisions. Bayer does not transfer title to the software to you, but retains the rights to make and license the use of all copies. You shall not copy, translate, disassemble, or decompile nor create or attempt to create, by reverse engineering or otherwise, the source code from the object code of the software. You are not permitted to modify or make derivative works of the software and ownership of any unauthorized modification or derivative work shall vest in Bayer.

7. Warranty. Bayer warrants that all new Bayer products are free from defects in workmanship or material under proper, normal use and service for a period of one year (12 months) from shipment, unless a longer period is provided on the warranty with the products, or as otherwise provided herein.

Bayer warrants that all refurbished Bayer products shall perform in accordance with the documentation provided, under proper, normal use and service for a period of the shorter of a) 90 days from installation or b) six months from shipment, unless a longer period is provided on the warranty with the products, or as otherwise provided herein.

If this Quote includes a Monitor, peripheral accessories on the Monitor such as pulse oximeter sensors, extension cables, power cables, fiber optic cables, ECG leads, capnography accessories (excluding patient connections), blood pressure cuffs, batteries, and extension tubing are warranted for a period of 90 days from the date of installation, but not to exceed six months from the date of shipment.

If this Quote includes disposable products or angiographic catheters, Bayer's warranty shall be limited to repair or replacement of any defective disposable product or angiographic catheter upon receipt of the defective product and a Bayer Return Goods Authorization. You acknowledge that the disposables and the equipment are a system and your actions regarding your equipment may invalidate your warranty on the disposables.

During the warranty period, there shall be no charge for any action deemed necessary by Bayer, including parts, travel, or labor to fulfill the terms of the warranty, during local business hours of 8:30 a.m. to 5:00 p.m., Monday through Friday, except holidays.

Your actions may invalidate this warranty. If Bayer determines that an equipment or disposable problem is due to any of the following, you agree to pay Bayer for all labor, travel, material handling and shipping at Bayer's, or Bayer's agents, standard rates:

- a) Malfunction or damage due to spillage of any type of fluid in or on the unit.
- b) Malfunction due to operator error, including failing to follow specified provisions of the Operations Manual.
- c) Malfunction or damage due to unauthorized modification or repair. Unauthorized actions may jeopardize functionality, reliability, or operator and patient safety. Therefore any unauthorized modification or repair shall render this warranty void and relieve Bayer from any further obligation. Bayer must review and authorize all modifications and repairs. This service may be obtained by contacting the Bayer Service Department.
- d) Malfunction or damage due to the use of non-Bayer or non-approved accessories. The use of accessories in connection with the equipment may jeopardize functionality, reliability or operator and patient safety. Therefore any use of non-Bayer or non-approved accessories (such as non-Bayer disposables or in the case of any PET/CT product, the use of vials or vial shields that are not approved by Bayer) shall render this warranty void and relieve Bayer from any further obligation.
- e) Damage by fire, floods, or other disaster commonly known as "Acts of God".
- f) If the Products include any Counterpoise system, any system malfunction, damage or failures due to improper installation or not meeting Bayer's specific requirements for level and plumb and/or loading as specified in the Bayer manuals.
- g) If the Products include any Counterpoise system, any ceiling or wall support structure used to mount or support an Injector Head Counterpoise System is excluded from Bayer's warranty. Bayer does not in any way warrant such structure.

8. Warranty Exclusions. EXCEPT AS PROVIDED IN THE ABOVE WARRANTY SECTION, BAYER EXPRESSLY DISCLAIMS ALL WARRANTIES OR CONDITIONS OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY,

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Bayer HealthCare



NONINFRINGEMENT AND FITNESS FOR A PARTICULAR PURPOSE (WHETHER OR NOT BAYER IS AWARE OF YOUR INTENDED USE OF THE PRODUCT), AND ALL SUCH WARRANTIES ARE EXPRESSLY EXCLUDED. IN NO EVENT SHALL BAYER BE LIABLE FOR ANY LOST PROFITS OR INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF OR IN CONNECTION WITH THE USE OR OPERATION OF BAYER'S PRODUCT OR SERVICE. Some states do not allow the exclusions on limitation of incidental or consequential damages, so the above limitations may not apply. This Limited Warranty gives you specific legal rights and you may also have other rights.

9. Software Warranty. If the Products include embedded software or if you are purchasing software, Bayer warrants that the software will substantially conform to the functional specifications contained in the Operations Manual for one year following delivery. This warranty shall not apply if you use the software in a manner that is not authorized or not in accordance with the user instructions or if you modify the Products or the software or if a party other than Bayer provides service to the Products or software. Bayer does not warrant that the software will operate uninterrupted or that it will be free from minor defects or errors that do not materially affect its performance. Your sole and exclusive remedy for any damages or loss in any way connected with the software whether due to Bayer's negligence or breach of any other duty shall be, at Bayer's option: i) to bring the performance of the software into substantial compliance with the functional specifications or ii) return of an appropriate portion of any payment by you with respect to the portion of the software that is not functioning.

10. Indemnification. Bayer agrees to indemnify, defend and hold you harmless from any liability, loss, expense, cost, claim or judgment (including attorneys fees), arising out of any claim for property damage, or personal injury or death where the product is alleged to have caused or contributed to the damage, injury or death, provided that this indemnification does not extend to injuries, damages or death to the extent caused by the negligence, reckless disregard or intentional acts of you or any third party.

11. Force Majeure. Bayer will not be responsible for delays or non-performance directly or indirectly caused by any acts of God, fire, explosion, flood, war, accident, action by governmental authority, inability to procure supplies and raw materials, delays in transportation, work stoppage, court order, and other causes beyond Bayer's reasonable control.

12. Compliance With Laws/Export. In addition to any rights and remedies specifically identified here in this Quote, Bayer shall have all rights and remedies conferred by law. Bayer shall not be required to perform its obligations under this Quote if you have defaulted (e.g. failed to pay) under this Quote or any other contract involving Bayer. This Agreement shall be construed in accordance with the laws of the Commonwealth of Pennsylvania, United States of America. You warrant that you are and will remain in compliance with all export and reexport requirements, laws and regulations of the United States of America and any other applicable export and reexport laws and regulations.

13. HIPAA. Bayer represents that it is not a Business Associate as defined in the Health Insurance Portability and Accountability Act ("HIPAA"). The functions Bayer is required to perform hereunder do not require the use or disclosure of Protected Health Information ("PHI"). To the extent any disclosure of PHI does occur, it is incidental and covered under the incidental disclosure rule found in 45 CFR 164.502(a)(1). In addition, to the extent any such incidental disclosure does occur, Bayer agrees to keep all such information confidential.

Please reference the quote number on your PO and fax to 412-406-0952



Revels Contracting Services, Inc

Mike Leonard
Northern Hospital of Surry County
Mount Airy, NC

8 December 2014
(revised)

RE: GE Optima 660 - CT Scan Room 2:

Mike,

Revels Contracting Services, Inc. appreciates the opportunity to bid this project. This price was based on a GE preliminary drawing, scheme no.14CRF607, dated 11/30/14, a GE typical drawing for an Optima 660 CT and a site visit. This price is **strictly budgetary**, pending final drawings and/or agreement on the final scope of work.

This price does not include any medical use equipment, nor the transportation, and/or the installation of such equipment.

Material and Labor:

All For The Sum Of = **\$59,051.00**

Fifty nine thousand, fifty one dollars.

If you have any questions or we can be of further assistance, please do not hesitate to contact us at your earliest convenience.

Sincerely,

Jim Brown
Vice-President
Revels Contracting Services, Inc.

Accepted By: _____

Title: _____

Date: _____

P.O. # _____



8 December 2014
(revised)

Attachment B

Scope of Work
Northern Hospital of Surry County
Mount Airy, NC
GE Optima 660 - CT Scan Room 2

The summary of work for this construction project includes general trade's work, some concrete, some structural, finishes and electrical work to modify the existing space for the proposed GE equipment to be installed.

Division 1 – General Requirements

- Provide a site superintendent and project management.
- Provide A&E Drawings. (including DHSR submittals)
- Provide local permits as required.
- Provide Payment and Performance bond.
- Construction dumpster for removal of debris.
- Provide daily and final clean up of the construction area.
- Provide final inspection and closeout documentation prior to patient use.

Division 2 – Site Work

- Furnish labor and material for selective demolition including acoustical ceiling tile in exam and control, floor covering in exam and control, door locks in exam and control, countertop on existing cabinets, remove and replace sink, etc.
- Furnish labor and material for dust protection as necessary. (including hepa filters and air scrubbers)

Division 3 – Concrete

- Furnish labor and material to cut and/or core bore concrete for electrical conduits as required.

Division 4- Masonry

- No work in this contract.

Division 5 – Metals

- Furnish labor and material to install med-rad plate in ceiling of exam at current location.

Division 6 – Wood & Plastics

- Furnish labor and material to install new countertop with back splash onto existing cabinets in exam.

Division 7 – Thermal & Moisture Protection

- Furnish labor and material to maintain fireproof drywall above ceiling in construction area.

Division 8 – Doors, Windows, & Glass

- Furnish labor and material to install new (lever style) door locks on exam and control room doors. (lead lined Sargent cylinder locks keyed lever style to match hospital master)
- Furnish labor and material to install new (lever style) door locks on control room doors.(regular Sargent cylinder locks keyed lever style to match hospital master)

Division 9 – Finishes

- Furnish labor and material to install new acoustical ceiling (tile only) in exam and control room.
- Furnish labor and material to install new 1' sq. VCT floor covering with 6" base cove in exam and control room.
- Furnish labor and material to patch and repair walls and prep for paint in exam and control room.
- Furnish labor and material to paint exam and control room. (re-poly doors, paint door and window frames)(paint wall and floor duct covers)
- Furnish labor and material to prep and paint existing laminate base and overhead cabinet in exam.

Division – 10 Specialties

- Furnish labor and material to install 8' section of Acrovyn wall covering at southwest wall corner of exam behind exam door.

Division – 11 Equipment

- All medical use equipment by others, installed by others.

Division – 12 Furnishings

- No work in this contract

Division – 13 Special Construction

- No work in this contract.

Division – 14 Conveying Systems

- No work in this contract

Division – 15 Mechanical

- Furnish labor and material to remove and replace existing sink in exam room.

Division – 16 Electrical

- Furnish labor and material to install new x-ray in use warning light, new door switch at exam and control room doors and rework 3-existing emergency stops and tie into the new system per the drawings as applicable.(GE warning light control panel is included)
- Furnish labor and material for selective electrical demolition.(including existing GE MDC, flex duct and LB with wall duct and any other electrical not to be reused).
- Furnish labor and material to reuse and rework existing electrical duct, conduits and boxes in exam per GE requirements. (rework duct to gantry, wall duct to control)(replace some floor duct covers as necessary)
- Note! Existing line side feeder to be reused.
- Furnish labor and material to rework line side feeder only at new GE MDC.
- Furnish labor and material to rework and reuse existing load side feeder to GE equipment in exam.
- Furnish labor and material to install and wire GE supplied 90 amp MDC (at current location) in exam room. (100 amp breaker at MDP is adequate)
- Furnish labor and material to wire GE supplied PDU and UPS.
- Furnish labor and material to clean and re-lamp existing overhead lights.
- Furnish electrical testing and certification.
- Provide final closeout documentation prior to room usage.

Exclusions:

The following items are specifically excluded from this RCS proposal:

- Asbestos testing and/or removal.
- Any construction due to State or Local code upgrades.

Exclusions: (continued)

- Any work involving millwork including countertop other than specified, doors and windows other than specified, sprinklers and fire protection, plumbing other than specified, hvac and medical gas.
- Any work involving rigging of GE equipment.
- Any work involving halon or halon canisters.
- GE MDC.(supplied by GE)
- Any work involving lead on walls, ceiling and/or floor.
- Any upgrades to existing power conditions.
- Any work involving major utilities underneath concrete slab such as electrical, plumbing, etc;
- Any work involving moving any major utilities such as water, steam, chilled water, medical gas, HVAC duct, etc: **(can be done on a cost plus basis if required)**
- Any work involving telephones, computer data, intercom, music, code blue, alarms, or security systems, etc. other than specified.
- Emergency power, generator, Automatic transfer switch, and/or UPS system other than specified.
- Any electrical testing and/or certification other than by Revels Contracting.
- Physicist analysis and/or report of existing lead shielding.
- State plan review fees and/or room licensing fees.
- Any medical imaging equipment and/or the transportation, installation, or de-installation of such equipment.
- Any other work or service other than those specified in the Scope of Work.

Qualifications:

- This price is for Northern Hospital of Surry County.
- Medical use equipment will be by GE Medical Systems.
- The length of the construction portion of this project will be approximately **3-weeks**.
- The work is to be performed during normal working hours.
- Any changes to the Scope of Work will be by written order, only.
- This price does not include any other work or service.
- A physicist analysis will be required to determine the need for additional lead.
- This proposal assumes that the existing floor is of adequate structural design to support the proposed new equipment.
- A clear, unrestricted access route to the construction area will be provided.
- Any delay time beyond the control of RCS will be considered a change order and will be billed to the responsible party on a cost plus basis.
- This price is good for **30** days from the date of this proposal.

If you have any questions or we can be of further assistance, please do not hesitate to contact us at your earliest convenience.

Terms of Contract:

Upon signed acceptance, this Proposal and Scope of Work will become inclusive as a contract. The total sum for the project will be invoiced in 3 equal draws with 1/3 due prior to the start of the project, 1/3 at midway and the balance due upon completion. 10% retainage will be withheld and will be invoiced at the end of the project upon acceptance of the work by the Owner. All invoices will be due upon receipt.

If there are no changes to the Scope of Work each invoice will equal \$17,715.33

The retainage amount will be \$5,905.00 and will be invoiced upon acceptance.

Any options taken will be invoiced in full upon completion of that option.

Work can be scheduled for this project upon signed acceptance of this proposal and/or the issuance of a purchase order number.

This proposal and scope of work are confidential information and are the sole property of Revels Contracting Services, Inc., exclusively.

**Attachment 4 - Excerpt of Northern Hospital of Surry County 2014 License Renewal Form
Documenting Three Existing CT Scanners**

North Carolina Department of Health and Human Services
Division of Health Service Regulation
Acute and Home Care Licensure and Certification Section
1205 Umstead Drive, 2712 Mail Service Center
Raleigh, North Carolina 27699-2712
Telephone: (919) 855-4620 Fax: (919) 715-3073

For Official Use Only
License # H0184 Medicare # 340003
Computer: 953376
PC _____ Date _____
License Fee: \$2,777.50

**2014
HOSPITAL LICENSE
RENEWAL APPLICATION**

Legal Identity of Applicant: Northern Hospital District of Surry County
(Full legal name of corporation, partnership, individual, or other legal entity owning the enterprise or service.)

Doing Business As
(d/b/a) name(s) under which the facility or services are advertised or presented to the public:

PRIMARY: Northern Hospital of Surry County
Other: _____
Other: _____

Facility Mailing Address: P O Box 1101
Mount Airy, NC 27030

Facility Site Address: 830 Rockford St
Mount Airy, NC 27030

County: Surry
Telephone: (336)719-7000
Fax: (336)789-3470

Administrator/Director: William B James
Title: CEO President and Chief Executive Officer
(Designated agent (individual) responsible to the governing body (owner) for the management of the licensed facility)

Chief Executive Officer: William B. James **Title:** President and CEO
(Designated agent (individual) responsible to the governing body (owner) for the management of the licensed facility)

Name of the person to contact for any questions regarding this form:

Name: Andrea J. Hickling **Telephone:** 336-719-7102

E-Mail: ahickling@nhsc.org

Primary National Provider Identifier (NPI) registered at NPES 1366449282

If facility has more than one "Primary" NPI, please provide _____

For questions regarding NPI contact Azzie Conley at (919) 855-4646.

All responses should pertain to October 1, 2012 through September 30, 2013.

10b. MRI Procedures by CPT Codes *continued*

CPT Code	CPT Description	Number of Procedures
74183	MRI Abdomen w/o & with	43
74185	MRA Abdomen w/o OR with contrast	2
75557	MRI Cardiac Morphology w/o	0
75561	MRI Cardiac Morphology with contrast	0
75554	MRI Cardiac Function Complete	0
75555	MRI Cardiac Function Limited	0
75556	MRI Cardiac Velocity Flow Mapping	0
77055	MRI Breast, unilateral w/o and/or with contrast	0
77056	MRI Breast, bilateral w/o and/or with contrast	5
76125	Cineradiography to complement exam	0
76390	MRI Spectroscopy	0
76393	MRI Guidance for needle placement	0
76394	MRI Guidance for tissue ablation	0
76400	MRI Bone Marrow blood supply	0
7649A	MR functional imaging	0
7649D	MRI infant spine comp w/ & w/o contrast	0
7649E	Spine (infants) w/o infusion	0
7649H	MR functional imaging	0
N/A	Clinical Research Scans	0
Subtotal for this page		50
Total Number of Procedures for all pages		2645

10c. Computed Tomography (CT)

How many fixed CT scanners does the hospital have? 3
 Does the hospital contract for mobile CT scanner services? ___ Yes X No
 If yes, identify the mobile CT vendor _____

Complete the following tables (one for fixed CT scanners; one for mobile CT scanners).

Scans Performed on Fixed CT Scanners (*Multiply # scans by Conversion Factor to get HECT Units*)

	Type of CT Scan	# of Scans		Conversion Factor		HECT Units
	1 Head without contrast	5862	X	1.00	=	5862.00
	2 Head with contrast	35	X	1.25	=	43.75
	3 Head without and with contrast	51	X	1.75	=	89.25
*	4 Body without contrast	4987	X	1.50	=	7480.50
*	5 Body with contrast	4262	X	1.75	=	7458.50
*	6 Body without contrast and with contrast	1767	X	2.75	=	4859.25
	7 Biopsy in addition to body scan with or without contrast		X	2.75	=	
	8 Abscess drainage in addition to body scan with or without contrast		X	4.00	=	

Revised 08/2013 *Body CT volumes reflective of ABD/Pelvis Combo Codes