

TOSHIBA
Leading Innovation >>>

DIAGNOSTIC X-RAY SYSTEM

KALARE™



TOSHIBA MEDICAL SYSTEMS CORPORATION

<http://www.toshibamedicalsystems.com>

©Toshiba Medical Systems Corporation 2006 all rights reserved.
Design and specifications subject to change without notice.
Model number: MCAXR0155EA 2006-7(201002) TME/NS

Toshiba Medical Systems Corporation meets internationally recognized standards for Quality Management System ISO 9001, ISO 13485.

Toshiba Medical Systems Corporation Nasu Operations meets the Environmental Management System standard, ISO 14001.

Made for Life and Kalare are trademarks of Toshiba Medical Systems Corporation.

Printed in Japan

KALARE

Designed For High Impact Performance

More Versatility. More Functionality. Better Patient Comfort.

The Kalare system incorporates the latest in innovative R&F technology through a feature-rich 'one system' approach for clinical and productivity enhancements. Kalare creates new standards for improving image quality, staff productivity, and patient care. Designed from extensive customer input Kalare will deliver long-term system performance and reliability.

Following Toshiba's *Made for Life*[™] philosophy, Kalare is fully designed to handle the most demanding clinical environments by emphasizing maximum clinical performance and premium patient care, ensuring that more exams are performed with ease, comfort and speed.

The versatile Kalare accommodates a variety of exams for maximum asset utilization by offering:

► Consistent Image Quality

- High-resolution images with real-time processing.
- Optimized generator and X-ray tube, for imaging large patients.

► Intuitive System Operability

- Exclusive tabletop control layout, for more patient focused exams.
- Easy adjustment of patient position, even with large patients.
 - 90°/45° tilt table for optimal clinical tilting range.
 - Improved table weight capacity, for handling sizeable patients.
 - Increased aperture of tabletop to image intensifier, for accommodating large patients.
- Sophisticated Ceiling-Suspended tube support system enhances overall productivity and system utilization.
 - 360° user handle and intuitive controls permits rapid positioning and setup.
 - Expanded range of motion ensures ample coverage for R & F examinations.
 - Detents every 15° provides optimal horizontal positioning of X-ray tube.
- Examination and post processing can be performed simultaneously.
- Advanced DICOM interface for streamlined procedure and efficient network image management.

► Dose Management Features

- Flexible pulsed fluoroscopy, for optimized dose control.
- Virtual Collimation.



Intuitive User Control Panel

Designed for quicker navigation

In today's healthcare environment with its growing requirements, clinical challenges should be handled quickly and efficiently, without neglecting the human element. Utilizing their technical skills and customer expertise, Toshiba developed a system that is intuitive and efficient in design and system architecture. The system offers strong performance on the most demanding examinations as well as increasing the patient's comfort.

The feature-rich Kalare consists of many areas of operation that benefit the patient, the operator and the healthcare facility, such as:

- Universal table configuration enables easy adjustment of patient position, combined with an improved weight capacity and aperture between tabletop and image intensifier supports the imaging of larger patients.
- Perform more exams with greater ease and speed using the user-friendly ergonomic operator controls with true power assisted one-hand operation, offering quick access to critical system controls.
- The filmless imaging tower reduces examination time by providing instant and efficient access to patient images. Digital imaging eliminates conventional film handling and storage.
- Unique Color LCD touch panel with backlit buttons permits full table side operation, including review and adjustment of generator and dose parameters.



Color Liquid-Crystal Touch Panel Display

The image displays four screenshots of the control panel interface, each showing different operational modes:

- Main:** Shows parameters such as 68kV, 150mA, 0.025s, 0.9mm, 3.5mm, and 30.0fs. It includes buttons for MAIN, APC, and various imaging functions.
- Fluoroscopy:** Shows parameters like 80kV, 10mA, and 3.5ms. It features a large central display and buttons for fluoroscopy settings.
- APC:** Shows a grid of buttons for various imaging techniques, including AP, LAT, and others.
- Radiography:** Shows parameters like 68kV, 150mA, 0.025s, 0.9mm, 3.5mm, and 30.0fs. It includes a large display for actual exposure values (000.0 mAs, 0000.0 s) and a MAX EXPOSURES indicator.

Superb Image Quality

Technology delivering optimum performance

Kalare offers advanced technologies that ensure superb image quality and effectively reduces radiation exposure of both patients and clinical staff.

J-type Image Intensifier for clearer fluoroscopic images

As an essential part of the standard configuration, the new image intensifier provides sharper fluoroscopic images due to the improvements made to the X-ray entrance plane/output surface and electronic lens. Other improvements to peripheral image distortion have also led to better image uniformity.



High-Frequency Generator

Good image quality starts with proper X-ray exposure. Kalare's powerful high-frequency 80kW generator provides automatic exposure controls and anatomical programs for optimized X-ray techniques, ensuring delicate to ample X-ray penetration power for small to large patients.



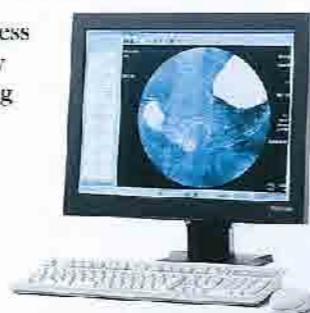
GRID Controlled X-ray Tube



An advanced high-heat capacity GRID controlled X-ray tube allows for long term performance and reduces unnecessary radiation dose, ensuring maximum patient care and user safety throughout the examination.

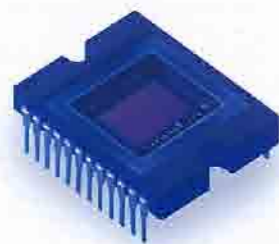
All Digital Multi-tasking System

The Kalare comes standard with a digital DICOM compliant output that makes true multitasking possible, facilitating efficient and flexible archiving options of patient information. The PC workstations provides seamless network integration and easy data interchange. Multitasking dramatically enhances workflow by allowing simultaneous acquisition, processing, storage and transfer of images.



Advanced CCD Digital Camera

A high-performance megapixel CCD digital camera is used for the imaging element. This provides superior high contrast, high resolution images for superior diagnostic power.



Advanced Dose Management

Kalare incorporates Toshiba's Made for Life philosophy by providing comprehensive dose management.

Digital Pulsed Fluoroscopy

Kalare is equipped with grid-pulsed fluoroscopy with a broad selection of pulse fluoro frame rates providing optimum dose control from the color LCD control panels.

Reduction dose saving

6 different pulse rates can be selected during pulsed fluoroscopy. Lower pulse rate is available for dose saving.

Pulse rate: 30, 15, 7.5, 3.75, 2, 1 exp/s

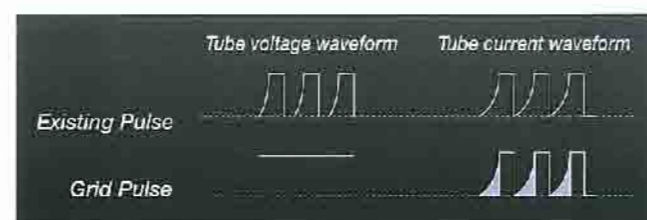
Virtual Collimation

A virtual collimation function is provided, permitting the square blades of the beam limiting device to be displayed and positioned on the LIH (last image hold). This reduces dose and avoids further use of fluoroscopy.



Grid Control Pulsed Fluoroscopy

In order to select the most suitable mode of pulsed fluoroscopy and to minimize exposure dose, Kalare takes advantage of the latest GRID control fluoroscopy, whereby any unnecessary X-ray dose at the leading and trailing edges of the pulse waveform is removed, reducing low-energy X-rays.



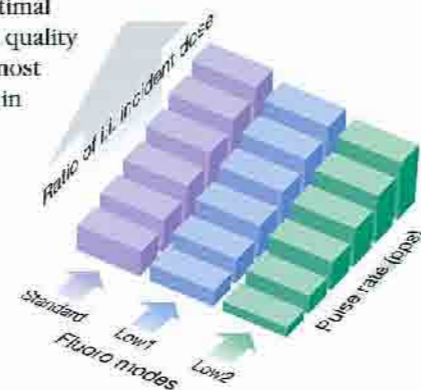
Low Dose Pulsed Fluoroscopy

The three-dose mode controls featured on the Kalare allow the operator to easily and effectively reduce the radiation dose to a minimum practical level. The dose can be changed with one touch of a button, allowing the operator to switch between Low 1, which reduces dose up to 40%, or Low 2, which reduces dose up to 60%.

6 pulse fluoro settings and 3 dose mode provides dose control in the most delicate situations



The operator can select among 3 customized dose modes and 6 fluoroscopic pulse rates (up to 30 fps) in order to realize the most optimal fluoroscopic image quality available with the most effective reduction in radiation.



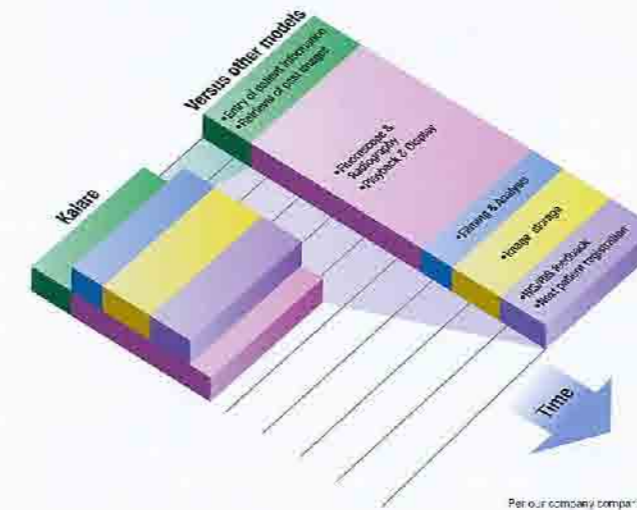
Digital Advancements Maximize Workflow

Optimal data interchange through concurrent processing and network connectivity

Toshiba is at the forefront of utilizing today's digital technology and network connectivity in maximizing the daily workflow related to selecting, transferring and storing images for easy retrieval. Toshiba workstations feature one of the fastest processors with high RAM capacity in the industry, which in combination with its built-in DICOM connectivity provides true multitasking capabilities for the efficient management of fluoroscopy, fluorography, post-processing, filming, and network filing.

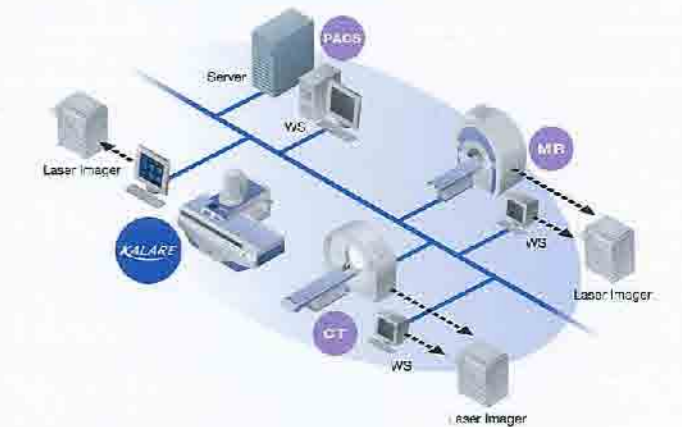
Parallel Processing Improves Overall Throughput

Kalare provides simultaneous functionality or parallel processing, which makes it possible to work with different tasks during fluoroscopy and fluorography. For instance, during digital image acquisition it is possible to simultaneously film, archive or post process the same patient's images or the previous patient's images. The following illustrates how Kalare's parallel processing technology differs from conventional systems:



Expansion to DICOM Network

The digital processor provides access to a large on-line archive that saves operators valuable time and eliminates the daily task of manual backup. The following is a schematic illustration of the Kalare in a typical network configuration:



Superior Resolution for All Anatomical Regions

Technology improving image quality

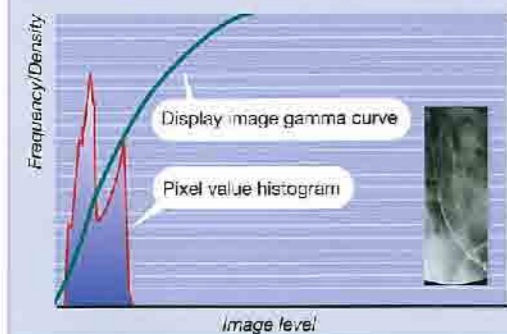
Kalare takes advantage of the latest technological advances in diagnostic image enhancements. Better visualization of fine details during diagnostic and interventional procedures are ensured thanks to compact reliable digital processing like auto-window processing and Digital Compensation Filter (DCF) image processing.

Auto-Window Processing

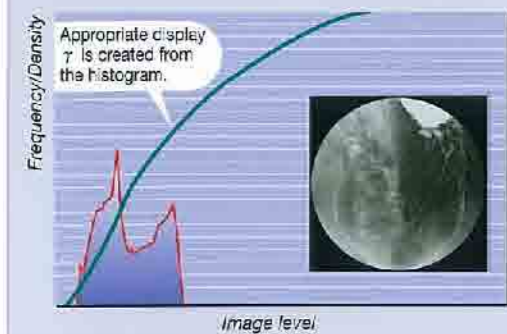
In actual radiography, the image level and the dose may vary for each radiographic technique due to patient thickness, region, direct X-rays, and the X-ray beam limiting device. Therefore, according to changes in the window or image histogram, it is necessary to apply the appropriate gamma curve.

The auto-window processing method used by Kalare, however, changes the window according to the distribution of the image histogram and automatically creates an appropriate gamma curve. In addition, greater stability of the image output is made possible by setting the radiographic ROI size, location, and shape for each region examined

Example: Esophageal double-contrast radiography



Example: Upper GI double-contrast radiography

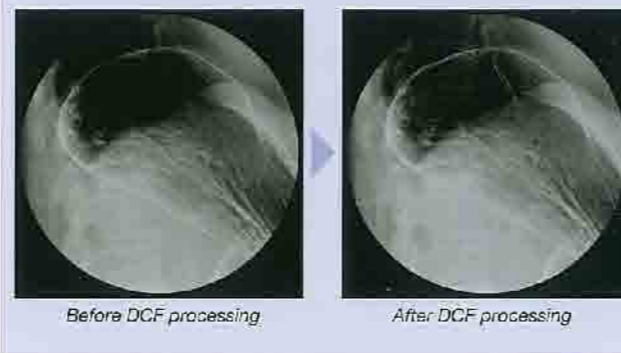


DCF (Digital Compensation Filter) Image Processing

With film/screen systems or conventional imaging processing, partial black areas generated by gas in the overlapping intestinal tract or by differences in patient thickness are difficult to correct. The DCF can correct these differences in density on a single image and can create an easily-viewable image. The filter can be applied automatically and appropriate images can always be obtained in any region in gastrointestinal contrast radiography or orthopedic studies.

Regions where the DCF is effective

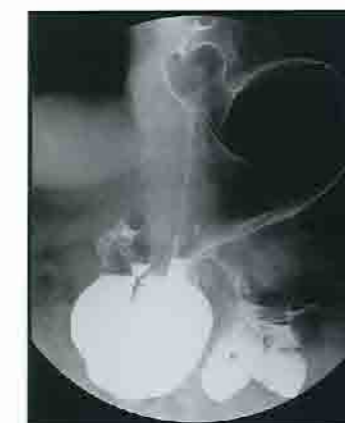
- Barium enema** Sections with overlapping intestinal tract/ Sections where gas has accumulated
- Barium swallow** Sections where there is a large difference in barium density/ Gastric fundus during double-contrast radiography
- General skeletal radiography** Thin sections and black sections/Skin folds



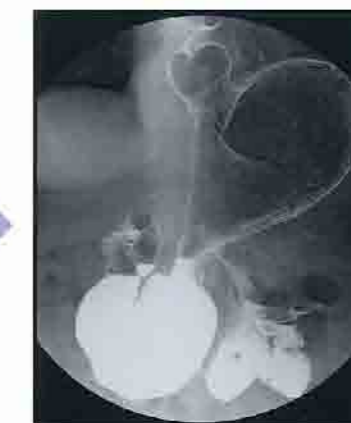
High Resolution Imaging through Progressive Technology

DCF Image Processing provides tremendous benefit for more accurate diagnostics and reliable performance, and is therefore an essential part of the system's configuration. Kalare applies DCF Image processing as standard for all fluorographic examinations, but is also available as an option for realtime fluoroscopy. The pictures below illustrate the enhanced image quality using this technology.

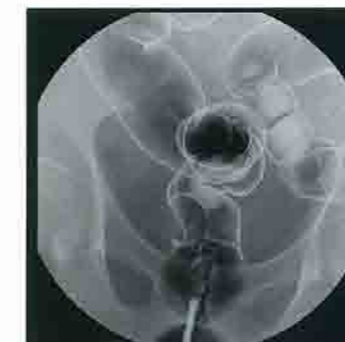
DCF-OFF



DCF-ON



View of upper GI, note the lack in over saturation of diagnostic interest area, as well as, the balance in radiographic densities.



Superimposed bowel and gas-filled areas is improved in barium enema studies.



View of Shoulder Arthrogram, note how in the DCF image brightness is equalized in the over penetrated areas enhancing the overall image quality.