IDEXX **EquiView**®
Digital Radiography System

Operator's Guide

Practice what's possible®

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Getting Started

Overview

The IDEXX EquiView® Digital Radiography System is a high-resolution digital X-ray system that generates X-ray images without films and chemistry. The digital X-ray plate is exposed by a diagnostic X-ray apparatus and the X rays are then directly converted into electrical signals. These signals are read by the X-ray generator and then converted into images by the EquiView software and displayed on the monitor.

The images created by the EquiView software allow you to view both bone and soft tissue structures in one image with one single exposure. You can easily view and enhance relevant areas and structures for diagnosis. In addition, areas of an image can be enlarged up to three times without significant pixelization. Because of the high quality of the monitor, the IDEXX EquiView Digital Radiography System is suitable for mobile application as a digital X-ray computer as well as for diagnostic purposes.

Components

The basic components for the IDEXX EquiView Digital Radiography System consist of a computer, a digital X-ray plate, two switch boxes, a trigger, and a remote control. These components form a compact system for taking, processing, and archiving digital X-ray images.

Computer

The portable, Microsoft® Windows®-compatible computer runs the EquiView software, which lets you view, manage, and archive the image files created from the digital X-ray plate.

Digital X-ray Plate

The digital X-ray plate is an ultracompact, portable plate for use in place of a regular film cassette, and can be used with any X-ray source generally available (portable sources should have a high-frequency, full-wave rectification (e.g., Gierth 80 HF ultralight).

Computer and monitor

The plate generates digital X-ray images without using X-ray film or foil. The X rays are converted directly into an image and displayed on the computer. The direct conversion of the X rays into electrical signals without the use of a scintillator absorbs less energy, thereby reducing blurring. As a result, the various structures are better differentiated so that images are sharper and provide greater detail. The plate's active imaging surface is 20 x 25 cm (8 in x 10 in).
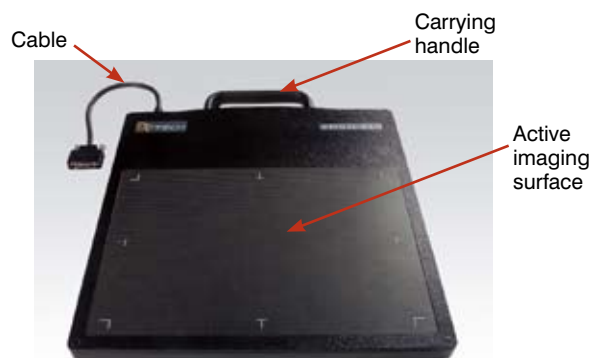
Switch Boxes

The switch box is the interface between your X-ray generator and the IDEXX EquiView Digital Radiography System computer. There are two switch boxes—one for the manual trigger setup and one for the remote control setup. Be sure you are using the correct switch box for your desired setup.

Cable
Carrying handle
Active imaging surface

Digital X-ray plate

Manual trigger switch box   **Remote control switch box**

Safety

This operator's guide is an integral part of the EquiView Digital Radiography System. Keep it close to the system for ready reference. Observance of the instructions contained herein is a precondition for the use of the system for the intended purpose and for its correct operation. The system may be operated only by personnel who have the necessary knowledge and have been instructed in its use.

Operator safety and trouble-free operation of the system are only ensured if use is made of original equipment parts. Moreover, only those accessories may be used that are specified herein or that have been expressly approved and released by IDEXX. IDEXX cannot guarantee the safety or proper functioning of this system if parts or accessories are used that are not supplied by IDEXX. All claims for damages, caused by the use of parts and accessories not supplied by IDEXX, are excluded.

The safety features of the EquiView Digital Radiography System are only ensured if the following points are adhered to:

- You may not use the system if it has any electrical or mechanical defects. This applies in particular to display, warning, and alarm equipment.
- If you want to connect the device to other devices, components, or assemblies, other than those described in the Accessories section, and if a hazard-free combination with these devices, components, or assemblies cannot be deduced from the technical data, you must consult the respective manufacturer to ensure that the safety of the patient, the operating personnel, and the environment are not affected by this intended combination.
- IDEXX is responsible for the safety features of its products only if servicing, maintenance and modifications have been carried out by IDEXX or by a person expressly authorized for this purpose by IDEXX.
- Like all technical devices, the EquiView Digital Radiography System needs proper operation, regular maintenance, and care as described in the Maintenance section.
- If you use the system incorrectly or if you neglect to carry out proper maintenance, IDEXX cannot be held responsible for resulting errors, damage, or injuries.
- Safety circuits may neither be removed nor modified.
- You are only allowed to remove or open parts of the case as instructed to do so within this operator's guide.

Electrical Safety

- You must not operate this device in potentially explosive atmospheres.
- Cleaning agents, disinfectants, flammable anesthetic material, skin cleaners, oxygen and some coupling agents, even when used on the patients, can form explosive gas mixtures. DO NOT OPERATE THE DEVICE UNDER THESE CONDITIONS!

Mechanical Safety

- Ensure that the patient is suitably restrained in accordance with accepted standards for administration of treatment.
- This is a portable, mobile device. Carry it carefully.

Setting Up the IDEXX EquiView® Digital Radiography System

Ensure that all components are present. Keep the packing materials in a dry place in case you need them later.

CAUTION: The room temperature must not drop below 5°C (40°F) and must not rise above 35°C (95°F). There is a risk that the active layer of the digital X-ray plate can be destroyed.

CAUTION: When the EquiView Digital Radiography System is taken out of a cold environment and put into a warm room, condensation may form. In this case, the equipment must not be connected to an electrical source because there is a risk of damage. Wait until the EquiView Digital Radiography System has warmed up to the ambient temperature and condensation has completely dried. This may take several hours.

The initial installation may only be carried out by suitably qualified personnel.

Initial Installation

You can configure your EquiView Digital Radiography System to use a manual trigger or a remote control to take X rays. Decide which configuration you prefer before beginning the initial installation.

Connect the trigger cable here

Connect the digital X-ray plate data cable here

Connect the power cord here

Computer connections for the manual trigger

Data cable

Digital X-ray plate

to computer video card

to computer

Trigger

Trigger cable

Switch box for manual trigger

X-ray cable

to X-ray generator

Component connections for the manual trigger

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Connect the digital X-ray plate data cable here

Connect the power cord here

Computer connections for the remote control

Data cable

Digital X-ray plate

to computer video card

Trigger

X-ray cable

Switch box for remote control

to X-ray generator

Component connections for the remote control

Connecting the Components

1. Connect the digital X-ray plate to the computer's video card with the data cable provided.

    NOTE: Use only the data cable provided with the EquiView Digital Radiography System.

2. Connect your X-ray generator to the switch box's "X-ray gen" socket with the X-ray cable.

    NOTE: There are two switch boxes—one for the manual trigger configuration and one for the remote control configuration. Be sure you are using the correct switch box for your desired configuration.

3. Connect the trigger to the switch box's "Hand s/w" socket.

4. For the manual trigger configuration, use the trigger cable to connect the switch box's "detector" socket to the computer.

5. Turn the switch box to the "on" position.

6. Connect the power cord to the computer and then to an appropriate electrical source, and turn on the computer.

    TIP: When using extension cords for your X-ray generator, make sure you use heavy duty, large-core diameter cords because this will reduce the losses that long power cords incur. These losses significantly affect the output of X-ray generators. Ideally, always use the shortest cord possible for the X-ray generator.

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Using the Software

1. Open the IDEXX EquiView Digital Radiography software by double-clicking the desktop icon.

2. In the dialog box that appears, enter your user ID and the registration key for the software (indicated on the software disc).

3. On the initial screen of the software, there are two options.
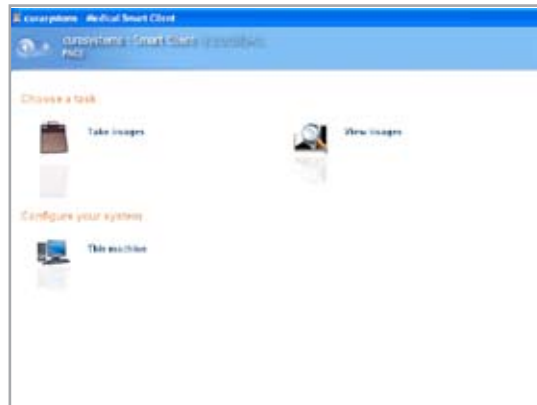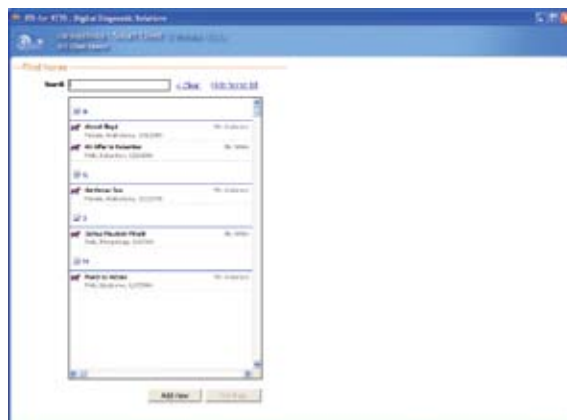

Initial screen

The **Take Images** option lets you select or add a patient and then take X rays.

The **View Images** option lets you review stored images, create a patient CD, export images, or print images.

4. To begin, click **Take Images.** The Find Horse screen appears. The information you enter here will appear on the X-ray images and on the patient CDs.

Find Horse screen

Taking Images

When taking images, you need to either select an existing patient from the EquiView Digital Radiography System database or add a new record.

Selecting an Existing Record

1. Click the **Take Images** option on the Choose a Task screen.
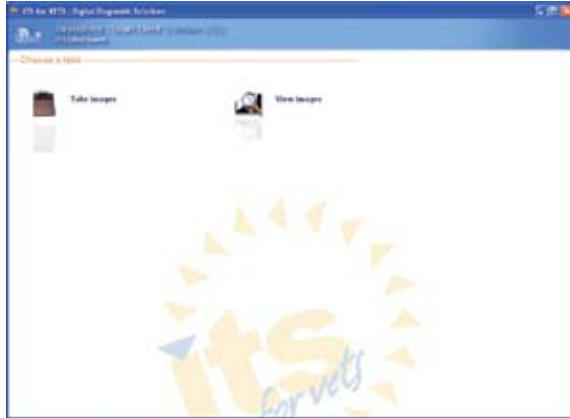
Choose a Task screen

When the Find Horse screen appears, the first 100 horses in the database are listed. To find a horse, type the first few characters of the horse's name in the Search box. The list populates with horses' names that match those characters.
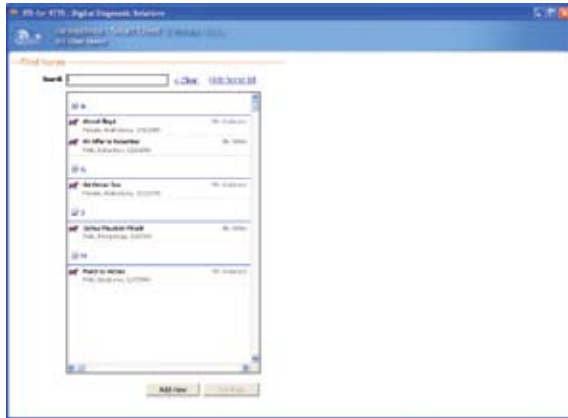
Find Horse screen

NOTE: The software can be configured so that horse names are not displayed until a specified number of characters have been typed.

2. When you locate the desired horse record, click the name and then click the **Continue** button to display the Set Up Exam screen.

Adding a New Record

The patient's record displays all the information that is entered when you add a new record. If some fields are left blank or unknown, they will also display as blank or unknown in the software and on the patient CD.

1. If the patient's record does not already exist, click the **Take Images** option on the Choose a Task screen and then click the **Add New** button at the bottom of the Find Horse screen. The Enter New Horse screen appears to the right of the Find Horse screen.
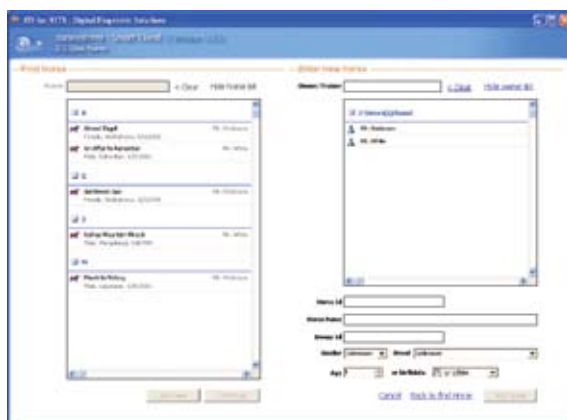
Enter New Horse screen

> **NOTE:** To avoid duplicate records, always check to see if the Owner/Trainer already exists before entering a new Owner/Trainer.

> **TIP:** To confirm an entry and move to the next field, use the Tab key.

2. Below the **Owner**/**Trainer** field, scroll through the list to find the owner/trainer. If the owner/trainer is not listed, type his or her name into this field. This is a required field.

3. Enter the horse's identification number in the **Horse ID** field. This is an optional field and your clinic may not use it.

4. Enter the name of the horse in the **Horse Name** field. Avoid using special characters such as &, \, #, and /. This is a required field.

5. In the **Owner ID** field, enter the owner's ID if your clinic uses one. This is an optional field.

> **NOTE:** This field can also be configured for other uses, such as project or stable name.

6. Select the horse's gender from the **Gender** drop-down list. This is an optional field.

7. Select the horse's breed from the **Breed** drop-down list. You can also type the first few letters of the breed to quickly access a particular breed in the list. This is an optional field; you can accept the default value, **Unknown.**

8. In the **Age** field, enter the horse's age, or use the up or down arrows to select the age. This is an optional field.

> **NOTE:** Entering the age and then pressing the Tab key will default the birthdate setting to 1/1/XXXX.

9. Enter the horse's date of birth in the **Birthdate** field. This is an optional field.

10. After entering all the patient's data, click the **Add Horse** button at the bottom of the screen to display the Set Up Exam screen.

Setting Up an Exam

After selecting an existing record or adding a new record, the Set Up Exam screen appears.

1. In the **Technician** field, enter the name of the X-ray technician. This information is stored with the exam series, and is an optional field.

> **NOTE:** Each image file stores and displays information, such as:

> - Horse name
> - Owner name
> - Hospital name
> - Date and time of exam
> - Specific exam information

2. Enter the name of the veterinarian in the **Veterinarian** field. This information is stored with the exam series, and is an optional field.

3. In the Choose Exam Types section, select the exams you want to perform. You can choose images/views from several different exam.

Click the plus (+) sign to expand the exams and display the sub-exams and specific views.

Click the individual images needed, or click the box next to the main exam heading to choose all items within that heading.
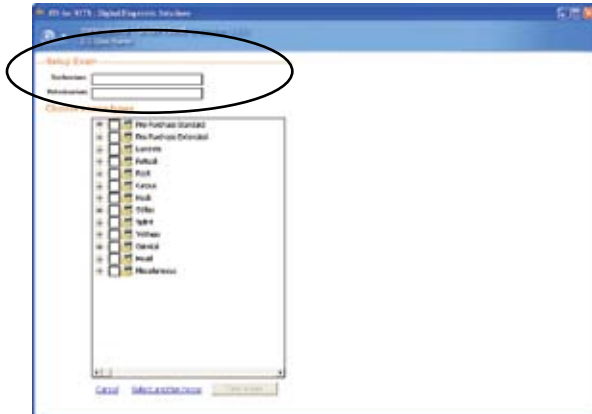
Set Up Exam screen

NOTE: In addition to taking these images, you can choose to either cancel the selection and start over again, or select another horse.

4. Click the **Take Images** button at the bottom of the screen to open the Take Images screen and begin to take X rays.

Taking X rays

The EquiView Digital Radiography System has a very large dynamic range, which means that careful technique setting is no longer a necessity, with certain exceptions. The most likely error that can occur is underexposure, in which only a part of the dynamic range of the digital X-ray plate is used. In this case, especially bony structures appear significantly less structured and there is a risk of losing important information about these areas.
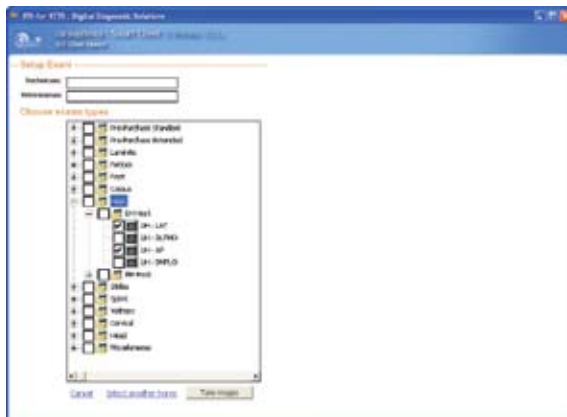
Choose Exam Types screen

Special X-ray Views

- **Thick body parts: AP Stifle, Neck, and Spinous Processes**. These thick body parts are at the limit of penetration for the small handheld generators. However, the EquiView Digital Radiography System is still able to produce good quality images provided some important points are kept in mind.

  Thick body parts produce a large amount of scatter, which tends to fog the image. Due to the high dynamic range of the EquiView Digital Radiography System, the image is very sensitive to scatter. This means in practice that there is a limit on thick body parts where increasing mAs

Image area   Borderline
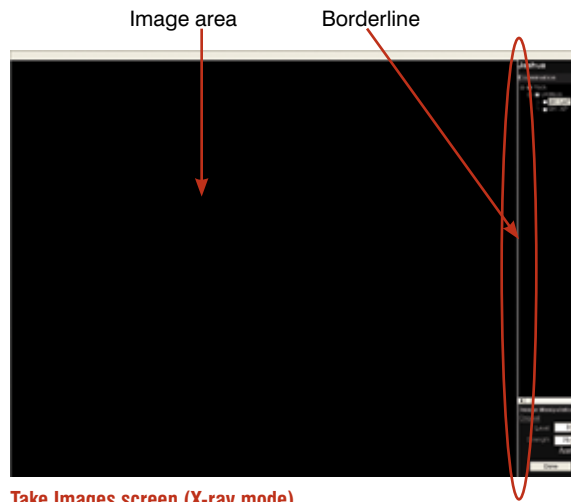
Take Images screen (X-ray mode)

becomes limiting and does not improve image quality after a certain level.

TIP: Moving the X-ray source closer to the body part, which increases the effective kVp, may have a better impact on the image than simply continuing to increase mAs.

- **Equine foot:** The equine foot is another body part that produces a great deal of scatter. To produce good images of the navicular bone, similar techniques to the above may be helpful. A grid is always helpful for images where a grid can be easily used, in respect of maintaining the geometric requirements. In addition, lead shielding of unwanted parts of the image can be helpful.

To expose the plate:

1. Place the digital X-ray plate into your X-ray equipment's holder for film cassettes or in another suitable position. The plate's active imaging surface must face the radiation source.

2. Select suitable settings on your X-ray equipment for exposure time and accelerating voltage.

   WARNING: National regulations for dealing with X-ray radiation and the operation of X-ray devices applies. Do not exceed the applicable national standards for the radiation doses. Pay particular attention to the safety of the personnel in the vicinity of the X-ray equipment.

   TIP: Use high kV and low exposure time. Dose increases proportionally with the kV, but to second order with time.

   TIP: Using old generators that do not have full-wave rectification and have exposure times over 0.2 seconds is not ideal. If you have been using a good quality X-ray generator in the past, setting kVp at 80 and mAs at 1.8 is ideal for most exams.

   TIP: Most X-ray generators have a milliamperage of 15 mA, so the time factor would be set to 0.12 seconds: 15 mA x 0.12 s = 1.8 mAs. For large structures, 80 kVp and an mAs-product of 15 mA x 0.25 s = 3.75 mAs can be used.

3. Ensure that the desired structures are located between the X-ray source and the digital X-ray plate. The plate must be aligned vertically to the direction of incidence of the X-ray beams. The film-focal distance (FFD) should be in the range of 55–60 cm (21.6"–23.6").

   TIP: The X-ray generator should be placed closely to the region of interest.

   TIP: Movement artifact is usually a combination of movement of the X-ray source, the horse and the plate itself.

4. Press and hold the exposure switch halfway down until you hear the beep indicating that the plate is ready for an exposure. This prepares the generator and plate, and can take up to 4 seconds. In addition to the beep, the light on the plate turns from green to red, and a blue progress bar appears at the bottom of the computer screen and moves halfway across.

5. After any of these signals, fully press the switch to take the image. The computer beeps, the blue progress bar continues across the computer screen, and the light on the plate changes from red to green.

6. The processed image appears on the monitor within 12–15 seconds. The next image can be taken after 5–8 seconds, when the 20-second cycle time of the plate has elapsed.

Skipping an Image

The EquiView software looks for the first unchecked check box in the Examination section and associates the image to be taken with that view. You can skip image views (if necessary or desired) by selecting the check box next to that particular image.

Better picture of a stifle due to reduced distance between the X-ray generator and the region of interest

Reshooting an Image

To reshoot an image, click the view name (it turns blue), then right-click and select Reshoot Image. This deletes the original image, and the software prompts you to confirm the deletion.

NOTE: If you have opted to reshoot an image and then decided to skip it until later, the image view name will remain highlighted in gray and the **Done** button will be disabled until that view is reshot.

Taking Additional Images

To take multiple images of the same view, deselect the check box in front of the image name after the

Take Image screen

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first image is processed and shoot again.

NOTE: If you take multiple images of a particular view, you can only review the last image taken while in the Take X-Ray mode. However, you can display all of the images for the particular view when you are in the View Images mode.

Reviewing Images

You can double-click any image view name with a selected check box to review that particular image.

NOTE: To view the next image taken, deselect the check box of the image you just viewed. The next image you took appears in that spot.

Viewing Images

After you click **Done** to save the images that you took, the Choose a Task screen displays. Click **View Images** to open the Browse Locally Stored Images screen where all owners and horses are displayed alphabetically.
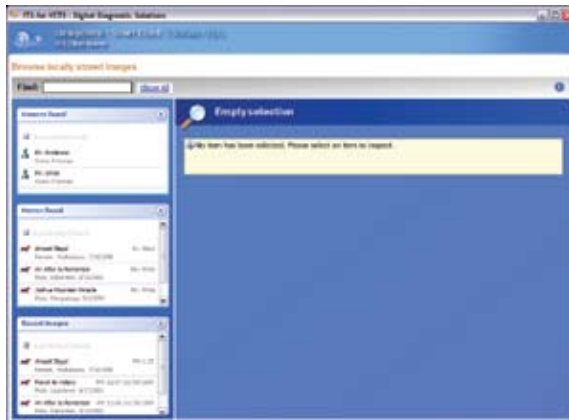
Browse Locally Stored Images screen

NOTE: You can set a filter value in the configuration file if you prefer that no information is displayed on the Browse Locally Stored Images screen.

There are four ways to search for images:

- **Find**—Type the first few letters of the horse's or owner's name into the Find text box. The matching results display in their corresponding sections.

- **Search by Owner**—Click the owner's name in the Owners Found section. This displays all horses for that owner in the Horses Found section. To view the images of a particular horse, right-click the horse's name in the Horses Found section.

- **Search by Horse**—Click the horse's name in the Horses Found section. This displays the horse's record on the right side of the screen.

  Search by Recent Images—Click the horse listed in the Recent Images section, which shows all horses that have been x-rayed recently. The most recent patients are listed first.

To view images:

1. After you have selected a horse and its information appears on the right of the screen, select an image series to view.

Select an image series to view

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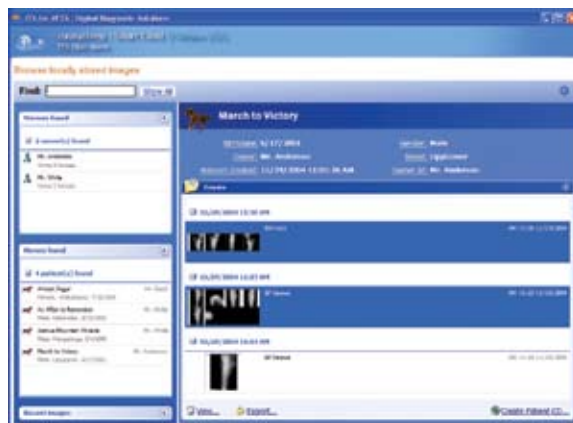
NOTE: To view more than one series, press and hold the CTRL key and select the series you want to view.

2. Double-click the series, or click the series and then click the **View** link at the bottom of the screen.

3. The Review Images screen displays the first nine images of the selected exams. Use the navigation bar at the bottom to select individual views.

Review Images screen (9 images at one time)

TIP: At the lower left corner of each image is a toolbar with the following tools:

 View single and multiple images

 Measure distances and angles
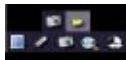
 Snapshot images and save individual images to a user-defined location

 Window and Level multiple images at one time. Rotate images

TIP: In the lower left corner of the Review Images screen, there is a small printer icon for printing.

NOTE: To exit this screen, click the blue Back button; the View Images screen appears.

Manipulating Images

The IDEXX EquiView® software allows for certain settings to be adjusted to change the appearance of the "first view." The first view is the image that appears on-screen after these automatic settings are applied. You can then manually change window and level settings and apply other functions, such as edge enhancement when looking for a stress fracture. During installation, your IDEXX representative will adjust the appearance of the first view to suit your preference and the performance of your X-ray generator.

After the image is taken, you have a full range of tools to use to manipulate the image. Images already taken are automatically stored and sequentially numbered in accordance with the presettings made by you. You can take all relevant images, and then optimize the settings for the images and make the diagnosis.

Dynamic Views

The mathematical treatment of the raw data from the plate is a very complex combination of functions known as an algorithm. IDEXX has developed an algorithm that shows some soft-tissue features while still allowing you to view dense bone detail. This is one of the features that makes the EquiView Digital Radiography System unique.

X ray of a hock showing clear soft tissue structures

The same picture using different parameters in the software to show the bone structures

Window and Level Adjustments

The Window function is a representation of the amount of image data viewed at one time (contrast). The Level function is a measure of the relative luminance of the pixels within the window (brightness). The Window and Level functions adjust the contrast and brightness as a secondary function to the primary purpose of making various structures in an image visible on the screen. Window and Level both have a numeric value that is displayed in the middle of the right border of the active viewing window.
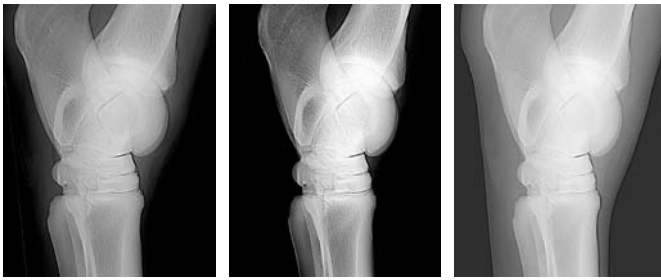
X ray of a hock

If you "window" and "level" a typical image, you can view individual hairs on a limb while still being able to "window" back to dense subchondral bone detail. With film, this is generally very difficult, and it is standard practice to take two different exposures to identify subchondral bone features of the distal condyles of MCIII and a second lower-energy setting to identify any possible osteophyte or enthesiophyte formation around the joint. The dynamic range of the digital X-ray plate and the EquiView software allow all these details to be seen in one image.

Window and Level default values

To adjust the Window, click and drag the cursor:

- Left to right to increase the Window
- Right to left to decrease the Window

To adjust the Level, click and drag the cursor:

- Bottom to top to increase the Level
- Top to bottom to decrease the Level

TIP: Drag the cursor diagonally to adjust the Window and the Level simultaneously.

Window adjustment—increased for high contrast

Level adjustment—increased for brightness

Level and Strength Adjustments

You can apply different algorithms to the image by adjusting the numbers in the Image Manipulation dialog box.

Image Manipulation dialog box

> **TIP:** Click **Original** to return the image to its original state after you have applied different Level and Strength adjustments.

Level—Adjusting the Level between and 1 and 4 flattens or deepens the image.

Strength—Adjusting the Strength between 0 and 100 softens or sharpens the image.

Level/Strength settings 1/70 (Default = 3/85)

Level/Strength settings 4/100 (Default = 3/85)

Zoom, Rotate and Move Adjustments

Zoom—To zoom in on an image, press and hold the Z key on the keyboard and then scroll with the mouse. Or, right-click and scroll up.

Rotate—To rotate an image counterclockwise, press and hold the A key on the keyboard. To rotate the image clockwise, press and hold the S key on the keyboard.

Move—To move an image, press and hold the M key on the keyboard and scroll in the direction you want to move the image.

Zoomed, rotated and moved image

Printing Images

Printer Settings

If you have already installed a printer, when you click the printer icon, the Printer Settings dialog box opens.

1. Choose the layout you want for your printed image series.

    NOTE: For optimal printing, we recommend printing the images in Landscape, as this allows the image to fill most of the paper size.

2. Select the printer and choose the paper size.

3. Click **Print.**

NOTE: The EquiView Digital Radiography System currently prints only FULL series of images, rather than individual images. To print individual images, use the **Snapshot** tool from the Review Images toolbar, paste the image into a graphics program and print from there.

Preview Mode

You can preview the images. Click **Print** when ready.

Print Preview

Exporting Images and Creating CDs

The IDEXX EquiView® Digital Radiography System lets you select an image series to export or save to a CD.

Exporting Images

To export images:

1. From the Browse locally stored images screen, select the image series you want to export. To select multiple series, press and hold the CTRL key while selecting.
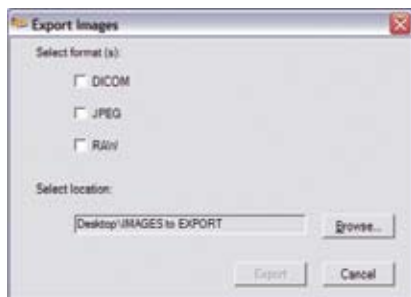
2. Click the **Export** link at the bottom of the screen to open the Export Images dialog box.

3. Choose JPEG, DICOM, RAW, or any combination of the three types of images, to indicate how you want the images to be exported.

4. Select the location where you want to save the exported images.

   NOTE: The default location for exported images is the Images to Export folder located on your desktop. The images that you exported are saved in a subdirectory of the exam name as "the horse's name_date_time of exam."

Creating a Patient CD

To create a patient CD:

1. Click the **Create Patient CD** link at the bottom right of the Browse locally stored images screen. The CD Drive (D:) screen appears.

2. In the CD writing tasks section, click the **Write these files to CD** link.
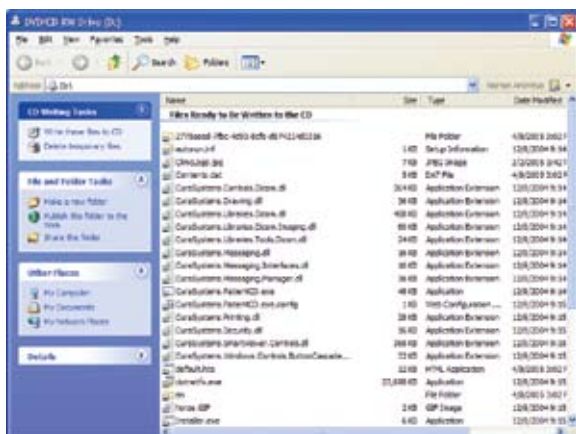
Write these files to CD link

3. Follow the on-screen instructions (accept the default values) to create your patient CD.

Viewing the Patient CD Images

Insert your patient CD into the CD drive. The patient information appears. Follow the viewing instructions on the patient CD.

NOTE: Because the viewer is running off the CD, it may take a little while to open the image.

NOTE: IDEXX recommends that the viewer for the patient CDs not be installed directly onto any computers.

NOTE: The default view format is JPEG, but you can view the images as DICOM images by selecting the check box in front of the series name and clicking the **View DICOM images** button. To view the DICOM files, you must have the Microsoft.NET Framework 1.1 software (or later) installed on your computer. If the software is not already installed, follow the instructions below.

To install the Microsoft.NET Framework software:

1. The patient CD is equipped with the .NET Framework software and will run the installer when you choose to view DICOM images. Select **Authorize this script** from the drop-down list.

2. If the .NET Framework software is not installed, you will be asked to install it. Click **Yes.** The .NET Framework setup screen appears and begins extracting the necessary files.

3. The license agreement appears. Select **I agree** and click **Install.** The .NET Framework software installation begins. A message appears when installation is complete.

Because your EquiView Digital Radiography System is protected with the industry standard in virus protection software, you may get a "Malicious script detected" warning when you choose to view DICOM images from the patient CD.

System Backup

Your IDEXX EquiView® Digital Radiography System has been preloaded and configured to back up onto an external hard drive.

To back up the EquiView Digital Radiography System:

1. Connect the external hard drive to the EquiView Digital Radiography System computer and to a power outlet if necessary.

2. Disable the Norton Antivirus software by right-clicking the **Norton Antivirus** icon and selecting **Disable Auto-Protect.** You will be asked to choose a duration; select **Until system restart.**

3. Stop the SQL Server Service by right-clicking the **SQL Server** icon and selecting **MSSQLServer - Stop.** When you are asked to confirm your decision, click **Yes.**

4. On the front of the hard drive, press the blue button. The program, Retrospect 6, starts scanning your computer.

   At the end of the backup process you may see a short "execution error" list. This is normal as not all resident applications can be shut down. The Retrospect software will close when it is finished, signifying the successful completion of the backup.

   NOTE: Do not run any programs while the backup is running.

Troubleshooting

This table identifies possible problems and procedures to fix them:

Problem	Potential cause	Troubleshooting procedure
EquiView Digital Radiography System does not turn on	• No power • Faulty power switch on the computer	• Check the power cord, plugs, and sockets • Check the fuses • Contact a service technician
Computer does not identify the digital X-ray plate	• No cable connection between the plate and the computer • Software not started	• Check the cable connection from the plate to the computer and, if necessary, make the connection • Start the EquiView software and wait until the connection has been made
Starting the EquiView software produces "Error initializing device. Could not connect to Meteor II CL hardware..."	• This message indicates that the EquiView software cannot communicate with the Matrox video card.	• Make sure the plate cable is correctly connected to the computer. Try to run the EquiView software again. • If the same message appears, try the following: Choose Start> System> Hardware and then click Device Manager. You should see a list of devices, including the Matrox Meteor II. The associated icon should be green with no other symbols. Click the icon and click Properties. The device should be enabled. If the device is disabled, click Enable. If this does not solve the problem, try restarting the computer by turning it off and waiting a few minutes before restarting. If you still get the error, contact IDEXX Technical Support.
The EquiView software opens but new X rays do not appear or an image with a broad white region appears.	• Error in synchronization or error in connection to trigger synchronization unit.	• Check synchronization. Is the trigger synchronization unit connected correctly? Check all connections, and check and/or replace batteries.
Image is underexposed or overexposed.	• Wrong exposure factors • Presets for first view images not optimal	• Check that exposure factors on your X-ray source are set correctly. For example, 80 kVp and an mAs of 1.8 (0.12 seconds on the MinXray) should give a good image of most leg joints in the horse. • It is possible to adjust the presets in the system that will globally change the appearance of the first view images (the view portrayed on-screen before any manual manipulation takes place). Your system was adjusted for your preference at installation. If your images are not diagnostic in the first view, contact IDEXX Technical Support.

NOTE: Error messages without titles generally emanate from the Microsoft Windows® XP® operating system software. Contact IDEXX Technical Support for assistance.

Cleaning and Maintenance

Cleaning

Plastic surfaces must be cleaned only with a soap solution. If you use other agents (e.g., those with a high alcohol content), the plastic will be damaged. Do not use corrosive, solvent, or abrasive cleaning or polishing agents.

To clean:
- Turn off the power switch and disconnect the power cord before cleaning the device.
- Make sure that water or other fluids do not get inside the device.
- Painted parts and aluminum surfaces should be wiped only with a damp cloth and a mild cleaning agent, and then wiped with a dry cloth.
- Wipe chrome parts with a dry cloth only.

Disinfecting

CAUTION: The EquiView Digital Radiography System must not be subject to a bath disinfection, sterilized in an autoclave, or put into another device for sterilization. The EquiView Digital Radiography System can be wiped with a disinfectant. Suitable disinfectants are listed below.

The method of disinfection applied must correspond to the applicable legal regulations and guidelines on disinfecting and explosion protection. Do not use corrosive, solvent, or gaseous disinfectants. If you use disinfectants that form an explosive gas mixture, they must evaporate first before turning on the device again.

- Turn off the power before disinfecting the device.
- All parts of the device, including accessories and connecting cables, must be given only a wiping disinfection.
- A spray disinfectant must not be used because it can enter the device.

If you use a room disinfectant atomizer, you must turn off the EquiView Digital Radiography System and remove it from the area in which the spray disinfection is to be used. You can give the EquiView Digital Radiography System a wiping disinfection in this case.

Maintenance

Maintenance consists of checks that the operator can perform and service performed by IDEXX within the scope of service contracts or by service order or by persons expressly authorized by IDEXX to perform such tasks.

Like all technical devices, the EquiView Digital Radiography System requires:
- Correct operation
- Regular inspection by the operator
- Regular maintenance and servicing

These measures help you maintain the working order and the operational reliability of your device.

As the operator of the device, you must abide by the regulations for prevention of accidents and the local medical product law, as well as other regulations.

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Inspections

Safety inspections

To avoid malfunctions and to ensure personnel, patient, and device safety, IDEXX recommends biannual inspections of the device. These inspections are part of the preventative maintenance tasks within the scope of IDEXX Laboratories, Inc. service contracts.

They include:

- Visual inspection for completeness and noticeable damage and defects as well as contamination, parts sticking together, and wear that reduces safety
- Inspection of the necessary monitoring, safety, display, and annunciation devices
- Measurement of the safety-relevant output parameters
- Further special technical inspections for the respective product corresponding to the generally recognized state of the art
- Further necessary inspections according to manufacturer's details

NOTE: The maintenance and inspections must only be carried out by trained specialists.

Operator inspections

The operator needs to check the device for obvious defects (see table). If functional defects or other deviations from the normal operating conditions occur, the operator must turn off the equipment and inform IDEXX Technical Support. The equipment can only be used again after repair. Operation with defective components can lead to an increased safety risk.

Interval	Scope	Method
Daily	Damaged parts, inscriptions, warning signs	Inspection
Daily	All cables and connections (damage, breaks)	Inspection
Daily	Water leaks, unusual noises	Inspection

Servicing

Servicing of the EquiView Digital Radiography Systems may only be carried out by personnel authorized by IDEXX. The correct setting of the electromechanical and electronic components affects the function, the image quality, the electrical safety, and the radiation exposure of patients and medical personnel.

IDEXX recommends:

- Carry out the inspections indicated in the above table on a regular basis.
- Have the device serviced at least once a year by IDEXX. Devices used very often may need to be serviced more frequently.

A service contract with IDEXX helps you preserve the value and safety of your device. All necessary servicing, including safety inspections for preventative hazard protection, is performed at regular intervals. IDEXX coordinates service intervals with you, depending on the service level you elect. Please refer to our extended maintenance agreement terms for a complete description.

Repair

Defective components that influence the device's safety must be replaced by original spare parts.
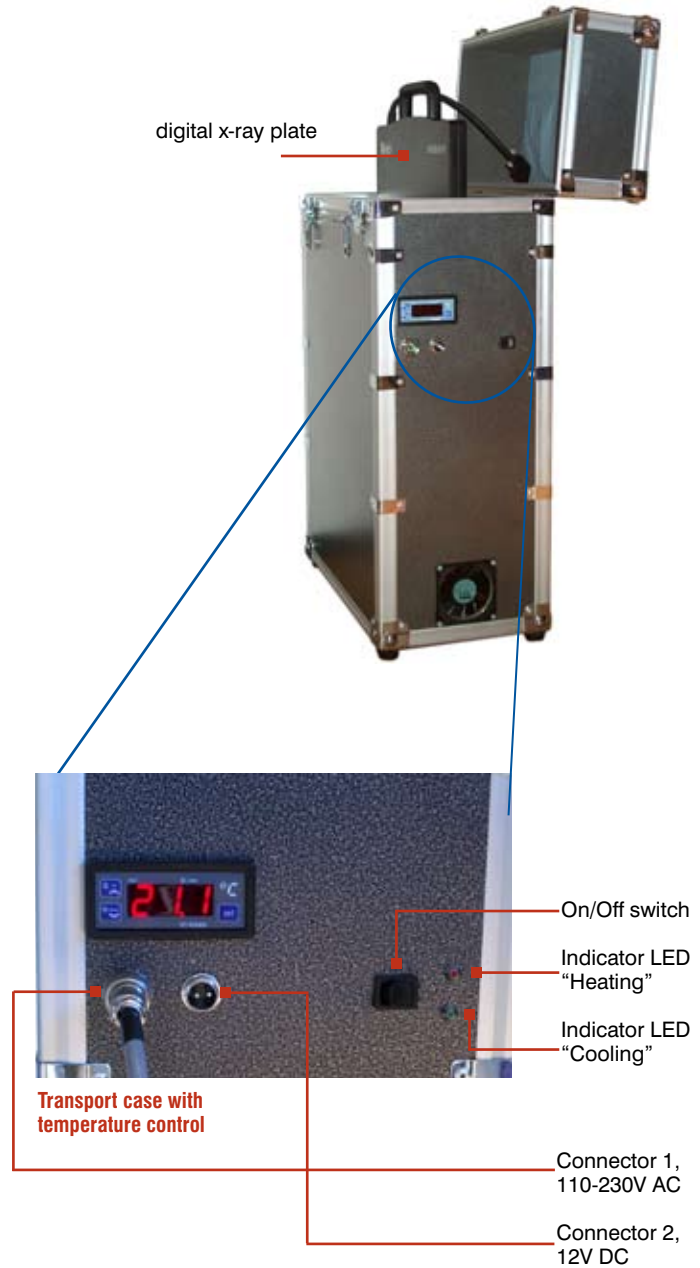
Transportation and Storage

The active imaging surface of the digital X-ray plate is sensitive to temperature. To ensure safe transportation and storage of the digital X-ray plate, always transport and store the plate in the supplied case. Connect the digital X-ray plate to a power supply (Connector 1) or to the 12-volt electrical system (Connector 2) of your vehicle as shown in the diagram, and turn on the temperature control. This ensures that the plate is always transported and stored in the optimum temperature range.

CAUTION: At temperatures below 5°C (40°F) or above 35°C (95°F), changes to the surface can occur. At temperatures above 40°C (104°F), depending on time and temperature, irreversible changes will take place.

If the ambient temperature rises above 27°C (80°F) or falls below 10°C (50°F), make sure the case is connected to a main power supply or to the 12-volt electrical system of your vehicle and is turned on. The plate can be used in the extreme temperatures as long as it is placed into the case between taking shots.

A combined heating and cooling element (Peltier element) is installed in the transport case, and insulation ensures that the temperature within the case changes very slowly. The red LED indicates temperatures below 15°C (60°F) and the temperature control module has automatically turned on the heating. The green LED indicates temperatures above 35°C (95°F) and the cooling is active. If the temperature range is above 15°C (60°F) or below 35°C (95°F), none of the LEDs light up; the temperature in the case is within the allowable temperature range and is displayed on the temperature control module. When heating or cooling is active, the temperature control module will keep heating or cooling until a temperature of 25°C (77°F) is reached in the case.

digital x-ray plate

On/Off switch

Indicator LED "Heating"

Indicator LED "Cooling"

Transport case with temperature control

Connector 1, 110-230V AC

Connector 2, 12V DC

IMPORTANT: Transport and store the digital X-ray plate only at temperatures of 5°–35°C (40°–95°F). Transportation, operation, and storage at temperatures exceeding this temperature range may permanently damage the digital X-ray plate. Damage to the plate due to inappropriate temperatures is not covered by warranty.

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Optional Accessories

Transport case and X-ray plate

Only the supplied case with built-in temperature control may be used for transporting and storing the digital X-ray plate. The Peltier element built into the case maintains the temperature inside the case reliably below 35°C, even in the event of external temperatures around 45°C. The case containing the digital X-ray plate must not be exposed to direct sunlight or kept inside a vehicle in direct sunlight. The case must be supplied with power using only the cable provided. The case can be connected to a main power supply (110V–230V on socket 1) or to a 12-volt vehicle electrical system (socket 2).

NOTE: After connecting the power supply, it is absolutely necessary that the temperature control of the case be switched on using the switch and the case closed. This ensures that the valuable plate has a long service life.

UPS (Uninterruptible Power Supply)

The UPS ensures smooth operation of the EquiView Digital Radiography System even if the power supply fails. Images not yet stored are not lost.

Travel Bag

Travel bag for transporting of the EquiView Digital Radiography System during journeys.

Optional equipment

- Toe blocks
- Tunnels
- Specialized items for holding the plates under a horse's foot and positioning the foot. Using this holder, you can place the digital X-ray plate under the hoof and position the hoof in a suitable manner.

digital x-ray plate

Transport case with temperature control for digital X-ray plate

Transport case with computer on top

Tunnel for positioning the digital X-ray plate under the hoof

Technical Specifications

Type of device: Device for digital X-ray exposure, picture manipulation, and archive system

Dimensions

Computer dimensions

Height:	36 cm (14.2")
Depth:	26 cm (10.2")
Width:	41.5 cm (16.3")
Weight:	14.9 kg (~ 32.9 lb)
Location:	mobile, portable unit

Dimensions of the computer

Digital X-ray plate dimensions

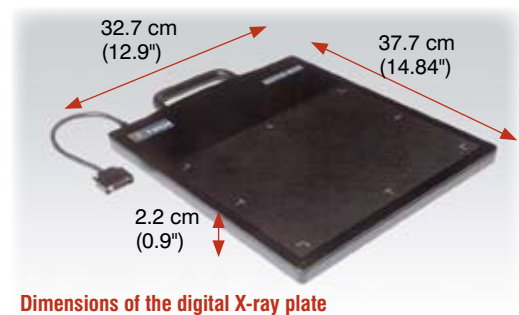|	
Length:	37.7 cm (14.84")
Width:	32.7 cm (12.9")
Height:	2.2 cm (0.9")
Weight:	~ 3.2 kg (~ 7 lb)
Location:	mobile, portable unit
Active area:	20 cm x 25 cm (8" x 10")

Dimensions of the digital X-ray plate

Electrical Data

Computer

Power supply: 100V–240V AC ±10% 50/60 Hz

Plate case

Power supply: 100V–240V AC ±10% 50/60 Hz,

75 Wh power consumption or 12V DC using the car jack

3 Amps power required

NOTE: Do not leave the plate case in the car for more than 12 hours; the car battery might go low.

Environmental Conditions

Transportation and storage

Ambient temperature:	5°C to 35°C (40°F to 95°F)
Relative air humidity:	10% to 98% (noncondensing)
Air pressure:	500 hPa to 1060 hPa

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Operation

Ambient temperature:	5°C to 35°C (40°F to 95°F)
Relative air humidity:	10% to 75% (noncondensing)
Air pressure:	700 hPa to 1060 hPa

NOTE: The EquiView Digital Radiography System must not be operated in conditions under which condensation can form in the device. Operate the device only under the above-mentioned environmental conditions.

Computer Specifications

- CPU: Intel® Pentium® 4 processor, 2.4 GHz, 512 KB cache, 400 MHz system bus
- Memory: SDRAM: 1024 MB
- Video card: Matrox Meteor II CL frame grabber card
- Hard disk: 2 x 180 GB (total 360 GB), 7200 rpm EIDE UATA
- Drive: Sony DVD-RW/CD-RW combo drive
- Monitor: 15.1" 1024 x 768 TFT monitor
- 8–24 port Ethernet switch
- Cat6 Ethernet card
- Operating system: Microsoft® Windows® XP Professional

Appendix A—List of Shortcuts

Press the indicated key and move your finger on the trackpad to:

M   Move the image across the screen

Z   Zoom the image

Press one of the following keys to:

A   Rotate the image 90° counterclockwise

S   Rotate the image 90° clockwise

Using a mouse, the following functions are available:

Window and Level—Click and hold, and then move your finger left to right and up and down on the trackpad to adjust the settings for window and level, respectively.

Zoom—Right-click and hold, and then move your finger up and down on the trackpad to zoom the picture in or out.

Move—Click and hold the mouse wheel. Move the mouse left to right and up and down to move the picture in the indicated direction.

You can use the following shortcuts to undo specific changes:

Undo Window and Level—Double-click to undo these changes.

Undo Zoom—Double-click the right mouse button to undo these changes.

Undo Move—Double-click the right mouse button to undo these changes.

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Appendix B—Technique Chart

These settings were applied using a MinXray 80/15 Ultralight on a 1,100-pound quarter horse.

View	kVp	sec	mAs	Film/Focus Distance
P3				
Lateral	66	0.1	1.5	20"
PD	66	0.12	1.8	20"
Navicular				
Lateral	66	0.12	1.8	20"
60°	70	0.3	4.5	12"–16"
Fetlock				
Lat/Obl	66	0.1	1.5	20"–24"
DP	66	0.12	1.8	20"–24"
Carpus				
All views	66	0.1	1.5	20"–24"
Skyline	68	0.14	2.1	12"–16"
Tarsus				
Lat/Obl	70	0.1	1.5	20"–24"
DP	70	0.12	1.8	20"–24"
Stifle				
Lat/Obl	70	0.2	3	20"–24"
CC	70	0.4	6	close as possible
Neck				
C1–3	70	0.2	3	20"–24"
C4ff	70	0.3	4.5	20"–24"
Whithers	70	0.3	4.5	18"–24"

NOTE: Higher kVp settings do not always produce a better image. If you are not satisfied with the penetration or the contrast, try increasing the time (sec), and thereby the dose (mAs).

NOTE: Generally, the image is improved when the film/focus distance is smaller.

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