

Work Flow Diagram
Fisher Biomedical Inc

Pre-Capture



“Focus”

Post-Capture



“Scroll”
+ “Dis”
+ “Text”

Quick Note on Ultrasound Modes:

While you are operating your ultrasound, you can always get a quick indication of what mode you are in by looking to the lower right corner of the screen. Generally, you will find one of the following listed there:

Focus	<i>... means:</i> you have a live image on the screen, and by rolling your trackball up and down, you are able to move your focus pointers up and down along the right side of the image to indicate where you want the ultrasound to focus most of its calculation power.
Scroll	<i>... means:</i> you have a frozen image, and by rolling the trackball to the left, you are able to back up through the captured cineloop (sequence of frames captured up to the point where you hit the Freeze button); scrolling left and right moves you backward and forward through the captured frames, and pressing “Cine” starts and stops the playback.
Dis	<i>... means:</i> you have pressed the “DIS” (distance) measurement key, and you are in measurement mode. Use the “Enter” and “Dis” buttons to make your measurements, and when you are finished, press the “Esc” (escape) button to exit this mode.
Text	<i>... means:</i> you have pressed the “TEXT” key, and you are now able to move the cursor around the screen and type in your annotations. When you are finished, press the “Text” key again to exit this mode.
Wcont	<i>... means:</i> you have pressed the “T-Ball” key (just above the trackball), taking you into the menu of settings on the left side of the screen. Scrolling down moves you through this menu, selecting any option and pressing “Enter” makes it active, and you are able to change its value by turning the Value Knob (furthest knob to the right). Pressing “Enter” again locks in the new value, and pressing “T-Ball” again takes you out of this menu.
Pat Data	<i>... means:</i> you have pressed the “Pat Data” button (just to the right of the spacebar), taking you into the Patient Data menu, where you begin by selecting “New” at top right, then enter in the patient’s name and ID number, then select the “Set” button at lower left, and press “Enter.”

Note: Only when it says “Focus” in the lower-right corner are you actively scanning for an ultrasound image. When you press the “Freeze” button, the word in the lower-right corner will become “Scroll,” reminding you to scroll back through your cineloop using the track ball. From here you may go into the distance-measurement mode, the text annotation mode, etc. Remember that in order to hit “Disk” to save an image, you must back out of any of those measuring or annotating modes, back to where it says “Scroll” at the lower-right again, indicating you are back to your frozen image.

Workflow Chart (Detailed):

Preliminaries:	Mode:
1. Make sure your practice name is at the top (you set this in the general settings using the “Menu” button to get in, and the “Menu” button to get back out); and make sure that the exam type at lower left has something like “Podiatry” or “Foot/Ankle” or even “Orthopedics” (you set this using the “Exam” button to get in and set your user-defined exam type as the default, and the “Exam” button to get back out).	
2. Make sure you have a live image. Look to the lower-right corner and make sure it says “Focus.” If it doesn’t, press “Freeze” to unfreeze the image.	Focus
3. Dim the room and adjust brightness and contrast as necessary.	Focus
4. Press “Pat Data” to enter in the patient’s name. <ul style="list-style-type: none"> • Select “New” at the top and press Enter. • Type in the patient’s name and press Enter. • If you like, enter in an ID as well. (The rest you can skip.) • Keep pressing Enter (or use the trackball) until you are highlighting “Set” at the bottom, and press Enter to exit this box. It should now display patient name & ID at lower left. 	Pat Data
5. Get your orientation (how you are holding your probe). <ul style="list-style-type: none"> • Make sure the white orientation dot is at the top left (if it is not, press the “L/R” key), and make sure you are holding the probe with the notch or bump facing either the patient’s left, or pointing toward the patient’s head, or pointing up. • Note the centimeter markings along the top and along the side of the image and, thinking anatomically, consider in advance how deep you will probably be looking. 	Focus
6. Check your default settings. <ul style="list-style-type: none"> • Make sure your frequency (“Freq”) is at 7.5 MHz. • Make sure your display depth (using the “Depth” knob) is set at either 4.7cm or 6.3cm. 	Focus

Workflow Chart (Detailed):

Dialing in the Image:	Mode:
1. As you begin to scan, scroll the trackball up or down to move your focus pointer(s) to indicate the section of the image you are going to be concentrating on. Press the “Focus” button to change the number of pointers displayed if you want to broaden or narrow down the area of the image you want to focus on.	Focus
2. Adjust your frequency (“Freq”) and display depth (using the “Depth” knob) as necessary. <ul style="list-style-type: none"> • A frequency of 7.5 MHz is standard for most foot and ankle ultrasound work, but if you are looking more shallow, raise the frequency (near to 10 MHz), and if you are looking more deep, lower the frequency (nearer to 5 MHz). • Keep your display depth either 4.7cm or 6.3cm pretty much all the time. It is rare you will want it lower or higher. 	Focus
3. Adjust your “B-Gain” knob to increase or reduce the gain of the probe (remember that you are usually safe between 50 to 70).	Focus
4. Adjust your Gain Sliders , moving the ones in the area of the image you are focusing on, a little to the left, a little to the right, with the center being “normal.”	Focus
5. Consider adjusting some of the “T-Ball” settings to see if you can improve the image quality. Use the trackball to select an item you want to adjust, press “Enter” to select it, use the “Value” knob to change the setting, press “Enter” again to lock it in place. (If you adjust something and see no improvement, move it back to its original setting.) When you are finished making changes, press the “T-Ball” button again to exit. <ul style="list-style-type: none"> • Try turning your Enhancement (ENH) up from 0 to 3. • Try playing with the Smoothing (SMO) settings. • And for some subtle or dramatic shifts, try changing the Grayscale curve setting (B_GSC), always remembering that a setting of 7 is a safe bet. 	T-Ball
6. Work the image ... Keep the probe moving. Make sure you use plenty of gel. Always think about the angle at which you are holding the probe (remember: 90 degrees!). Consider using the stand-off if you are looking at tendons or at something near the surface of the skin. Apply more and less pressure to the probe. Flex the foot or ankle and watch for known anatomical features to move in the image. Continue to adjust the Display Depth, Frequency, Gain, and Gain Sliders as necessary. And when you find the image you like ...	Focus
7. Press “Freeze” to freeze the image.	Scroll

8. Roll the trackball to the left, to back up through your cineloop, so you can go back to the clearest frame. If you like, press “ Cine ” to play the loop like a small video file, turn the “Value” knob to speed it up or slow it down, and press “Cine” again to stop at any point. Then use the trackball, to the left and the right, to move forward or backward through the loop (represented at the top of the screen in a little rectangle with frame numbers beside it). When you have the frame you like best on screen, move on to the next phase ...	Scroll
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Processing the Image:	Mode:
1. Make your measurements by pressing “ Dis ” and using the trackball to choose your first point, and press “Enter” to select it. Move the trackball to choose your second point and press “Dis” to calculate that distance (which is displayed to the side of the image). Make additional measurements by pressing “Enter” and “Dis” again. And when you are ready to leave this mode, press escape “ Esc ” to get out.	Dis
2. Make your text annotations by pressing “ Text ” (to the far left of the spacebar). Use the trackball to position the cursor and simply type onto the image. When you are ready to leave this mode, press the “ Text ” button again to get out.	Text
3. Press “ Print ” to print your image.	Scroll
4. Press “ Disk ” to save your image to the USB thumb drive. <ul style="list-style-type: none"> • Press “Disk” • Scroll to “USB Device” and press Enter. • Leave the next column on “Write Image” and press Enter. • Scroll to “JPG” for file type and press Enter. • Leave the two dots (“ . . ”) highlighted to save to the top directory on the thumb drive and press Enter. • Give the image a name and press Enter to save and exit. 	Disk
5. Go back to a live image by pressing “ Freeze ” again.	Focus

Workflow Chart (Abridged):

Preliminaries:	Mode:
1. Make sure practice name and exam type are listed on screen.	
2. Make sure you have a live image (press "Freeze" to unfreeze if necessary).	Focus
3. Dim the room and adjust brightness and contrast as necessary.	Focus
4. Press "Pat Data" to enter in the patient's name.	Pat Data
5. Get your orientation (how you are holding your probe).	Focus
6. Check your default settings. <ul style="list-style-type: none"> • "Freq" = 7.5 MHz. • "Depth" knob = 4.7cm or 6.3cm. 	Focus

Dialing in the Image:	Mode:
1. Use the "Focus" button and scroll ball to adjust focus pointers.	Focus
2. Adjust "Freq" and "Depth" knob as necessary.	Focus
3. Adjust "B-Gain" knob to increase or reduce the gain of the probe (remember that you are usually safe between 50 to 70).	Focus
4. Adjust Gain Sliders .	Focus
5. Consider adjusting some of the "T-Ball" settings: <ul style="list-style-type: none"> • Try turning your Enhancement (ENH) up from 0 to 3. • Try playing with the Smoothing (SMO) settings. • And for some subtle or dramatic shifts, try changing the Grayscale curve setting (B_GSC) with 7 as your default. 	T-Ball
6. Work the image ... Keep the probe moving ...	Focus
7. Press "Freeze" to freeze the image.	Scroll
8. Roll the trackball to the left, to back up through your cineloop.	Scroll

Processing the Image:	Mode:
1. Measurements: "Dis" to get in ... then "Enter" and "Dis" to select points ... then "Esc" to get out of the measurement mode.	Dis
2. Text annotations: "Text" to get in, and "Text" to get out.	Text
3. Press "Print" to print your image.	Scroll
4. Press "Disk" to save your image to the USB thumb drive.	Disk
5. Go back to a live image by pressing "Freeze" again.	Focus

Saving Images on Your CTS-5500 or CTS-7700 Ultrasound

After you capture an image and freeze it (press “Freeze”), you will scroll your trackball to the left to back up through the cineloop to find the clearest frame. With that onscreen, you will make your measurements and your annotations. At this point, you will want to press “Print” (either on the system or on the printer itself) to print a hard copy. But you should also save the annotated image to the USB thumb drive plugged into one of the USB slots in the back of the ultrasound.

Your ultrasound has two ways of saving images. One way is purely internal, using the “Save” and “Recall” buttons on the right side of the console. *I strongly recommend against using these*, because these only save images temporarily and once in there, they cannot be saved permanently. Instead, use the second way, which is to press the “**Disk**” button on the left side of the console, and save the images externally to a USB thumb drive.

Note Concerning Modes:

You may only save images that are frozen, and you want to be in the normal frozen mode, not in one of the measurement or annotation modes (look to the bottom right and make sure it says “Scroll”). You can always be aware of what mode you are in by looking to the lower-right corner of your screen:

Focus	<i>... means:</i> you have a live image on the screen, and by rolling your trackball up and down, you are able to move your focus pointers along the right side of the image to indicate where you want the ultrasound to focus most of its power.
Scroll	<i>... means:</i> you have a frozen image, and by rolling the trackball to the left, you are able to back up through the captured cineloop (sequence of frames captured up to the point where you hit the Freeze button); scrolling left and right moves you backward and forward through the captured frames.
Dis	<i>... means:</i> you have pressed the “DIS” (distance) measurement key, and you are in measurement mode. Use the “Enter” and “Dis” buttons to make your measurements, and when you are finished, press the “Esc” (escape) button to exit this mode.
Text	<i>... means:</i> you have pressed the “TEXT” key, and you are now able to move the cursor around the screen and type in your annotations. When you are finished, press the “Text” key again to exit this mode.

Saving Images to the USB Device (Memory Stick / Thumb Drive)

Follow this procedure for saving images as .jpg files to your USB drive for transferring them to a computer:

- 1.) After you have found an image, you will have pressed “Freeze” to freeze it. (You should see “Focus” change to “Scroll” at the lower-right.) You will then scroll your trackball to the left to back up to the clearest frame, make your measurements and annotations, and (if you have a printer) probably press “Print” to get a hard copy.
- 2.) Now you are ready to save the image to the USB device. Press the **DISK** button (on the left side of the console).
- 3.) The menu that comes up has several fields. (On some systems an initial mini-menu will come up, where you need to scroll to the bottom and select “Disk” from the menu and press “Enter.” This will take you to the main menu for saving images.) The first field it starts you in is where you tell it where you want to save the image. Using your trackball, scroll down to highlight the words “**USB Device.**” This is the only option you should ever choose for where to save. (Never save on the hard drive.) Press “Enter.”
- 4.) It should jump you now to the next step, where the first item (already highlighted) is what you want: “**Write Image.**” (The only other option in this list you may want to select at some point would be to recall or read an image you have already saved to the USB thumb drive.) With “Write Image” selected, press “Enter.”
- 5.) You can now select what file type you wish to save the image as. The only image type you should use is JPG. Scroll down until **JPG** is selected, and press “Enter” again.
- 6.) It should now jump you to the big middle box area, showing the contents of what is on the USB thumb drive. By default, it should start out with two dots “.” selected (or possibly an arrow). These two dots (or arrow) refer to the topmost directory on the USB drive, which is a perfect place to save your images. Just press “Enter” again.
- 7.) It should now allow you to enter in the name you want to give the image using the keyboard on your console. Type in anything you like (see the next page for suggestions, and do not use spaces or commas) and press “Enter” one last time. There will be a pause as the image is saved to the thumb drive, then the menu will disappear, and you will be back to the frozen image (it will say “Scroll” at the bottom right). If your system took you to the mini-menu up in step 3 above, it will take you back to that mini-menu. Just hit “Esc” to escape from that.) If you are completely done with this image, and ready to go back to a live screen, press “Freeze” again to un-freeze the image (and it will go back to saying “Focus” at the bottom right) and return to a live image for a new scan.

Suggestions for Naming Images

You may use any system you like, of course, but there is one particular format we recommend as perhaps the most effective.

First, decide whether you are going to type in the full name on the ultrasound itself, or if you are simply going to put in the patient's name and leave creating the full file name to whatever nurse you assign to move the images from the USB thumb drive to a computer in your office at the end of the day, or twice a day. If you do not mind typing it all out, that is fine; but if you want to save a little time, you might simply put in the patient's last name, and let your nurse expand upon the file name after she moves them to computer.

The idea should be to get the images saved to the USB thumb drive throughout the day, and once or twice a day, as part of your system, have a nurse take the thumb drive out and move the images off of the thumb drive and into a folder saved on a computer in your office. After the files are moved off the thumb drive, it should be clear, and she can then plug it back into your ultrasound.

TIP: If you do not already have a system for backing up files from your computers periodically, I also recommend that you look into that. Definitely set up a system where at least once a month (ideally once a week) your nurse in charge of the ultrasound image files saves all of the images onto a CD for storage in case the computer were to ever crash or go down.

Whether you give the full name to the image on the ultrasound itself when you are saving it, or you simply put in the patient's name (and maybe a number, if there are multiple images for that patient) and let the nurse expand the name after the fact, here is the format we recommend:

YYMMDD-lastnamefirstinitial-#

Meaning, you would start with the two-digit year, then the two-digit month, then the two-digit day ... then put in the patient's last name, followed by first initial, and then (if there are multiple images for that patient that day) numbers (1, 2, 3, etc.).

Using this format, all of your ultrasound image files saved on the computer will stack up in chronological order, making it easy to search for images according to when they were taken. An alternative, if you think it would be better to have the list sort automatically according to the patients' last names, you could do it this way:

lastnamefirstinitialYYMMDD-#

Either of these formats would be just fine. The idea is to simply decide upon a system for naming the image files and stick to it.

If you follow a system like this, you will be able to have your nurse pull up specific images very rapidly at a later date, and as long as you also annotated the images well and kept reports, your image archive and patient records will be bullet-proof.