

## Instructions and User Guide

# Focused Assessment with Sonography for Trauma (FAST) Ultrasound Training Model

BP-FAST1800, BP-FAST1801, BP-TTE1701,  
BP-TTE1701B, BP-TEE1702



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# Overview

# 1

## Giving you the confidence only experience can offer™

Congratulations on the purchase of your Blue Phantom™ ultrasound model(s) for hands-on training. Every product we manufacture at Blue Phantom™ is specifically designed to be the most realistic and ultra-durable ultrasound simulation phantoms available anywhere. Our high standards for quality manufacturing and design guarantee that you receive only the absolute best.

## About Blue Phantom™

Blue Phantom™ brings you the most realistic and durable hands-on ultrasound training models available anywhere. At Blue Phantom™ we know that learning to use ultrasound requires practice. You gain confidence and skill through experience. That is why we offer you the best ultrasound simulation training available.

## Blue Phantom™ Warranty

Blue Phantom™ takes pride in its quality design and manufacturing standards. Our products are warranted to you by Blue Phantom™ for one year from the date of purchase against defects in workmanship and materials. During the warranty period, a defective part or product will be replaced either with a new or reconditioned part or product, depending on the availability at the time.

This warranty covers normal consumer usage and does not cover damage incurred through use not consistent with the product design. Failure that results from alteration, accident, misuse, vandalism, or neglect is not covered under this warranty. This warranty does not extend to any products that have been used in violation of written instructions.

# Product Cautions

# 2

Please read this user guide carefully. Do not begin using your training model until you fully understand these safeguards and have read the user guide in its entirety.

## Important Safeguards



1. Read Instructions – All safety and operating instructions should be read before the unit is operated.
2. While all parts of this user guide are important, the red flag that you see to the left denotes especially important content. Please familiarize yourself with all of the content prior to using your training model or damage to the model can occur.
3. This user guide includes instructions applicable to a variety of model configurations. Not all models contain electrical components. If your model does not contain electrical components, please disregard the Risk of Electric Shock section of the user guide.
4. Retain Instructions – The safety and operating instructions should be retained for future reference.
5. Heed Warnings – All warnings in the operating instructions should be adhered to.
6. Follow Instructions – All operating and maintenance instructions should be followed.
7. Weight Warning— Use caution as the model is heavy. Use proper lifting techniques to prevent bodily injury. Notify others of the heavy weight warning to prevent others from being injured while operating or moving the model.
8. Care must be taken to place the model in a position in which it will not fall off of the bed or surface, as this may cause injury to yourself or others.
9. Accessories – Do not place this unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall causing serious injury to a child or adult, and serious injury to the unit.
10. **CAUTION:** Please use extreme care when using needles and sharp objects as to not accidentally injure yourself during training.



## Risk of Electrical Shock



**WARNING:** To reduce the risk of electric shock, do not remove cover (or access port) of models containing automated pumping systems or electronic components. Refer servicing to Blue Phantom™ personnel or Blue Phantom™ trained technician. Do not expose any electronic components to rain or moisture. Do not submerge to clean. Unplug unit from wall outlet before cleaning.

1. Upon receiving the unit, inspect to make sure all electronic access ports are sealed shut. If any are open or accessible, please report this to Blue Phantom™ immediately.  
Telephone: (425)881-8830  
Email: customersupport@bluephantom.com  
Web: www.bluephantom.com
2. Unplug the unit when not in use.
3. Do not open or remove the control panel located on the back of the model. Opening or removing the access panel by other than Blue Phantom™ personnel or Blue Phantom™ trained technician, will void your warranty.
4. Never push objects of any kind into the unit as they may touch dangerous voltage points or short out parts that could result in fire or electric shock. Never spill liquid into the unit.
5. Cleaning – Unplug unit from the wall outlet before cleaning.
6. Water and Moisture – Do not use this unit near water – for example near a bathtub, wash bowl, sink, in a wet environment, or the like.
7. Servicing - Do not attempt to service this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to Blue Phantom™ personnel or Blue Phantom™ trained technician.
8. Power Sources – Units with electronic components should only be operated from the type of power source indicated on the marking label. If you are not sure of the type of power supply you are using, consult your local power company.
9. Grounding or Polarization – This unit may be equipped with either a polarized 2 wire AC (Alternating Current) line plug (a plug having one blade wider than the other) or 3-wire grounding type plug, a plug having a third (grounding) pin.
10. The 2-wire polarized plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug still fails to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety features of the polarized plug.
11. The 3-wire grounding type plug will fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety features of the polarized plug.
12. Power Cord Protection – Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon them or against them, paying particular attention to cords of plugs, convenience receptacles, and the point where they exit from the unit.

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## Risk of Electrical Shock (*continued*)

14. If your model utilizes an electronic controller **NEVER** unplug the electronic controller without properly shutting the controller down using the shutdown procedure found on the user interface touch panel. Improper shutdown can result in damaging your model beyond repair. This will void your warranty.
15. Never leave the fluid states in the model in the large effusion state for extended periods of time (greater than 1 hour) as damage to your model can occur.
16. To reduce the risk of burns, fire, electric shock, or injury to persons, the electronic controller and pumping system should never be left unattended when plugged in.
17. The electronic controller and pumping system contain sensitive components. Do not drop, disassemble, open, crush, bend, deform, puncture, shred, microwave, incinerate, paint, or insert foreign objects into housings.
18. Do not use electronic controller or pumping mechanism in rain, or near washbasins or other wet locations. Take care not to spill any food or liquid on electronic controller or pumping mechanism. In case electronic controller or pumping mechanism gets wet, unplug all cables, turn off electronic controller and pumping mechanism using on/off switch before cleaning, and allow it to dry thoroughly before turning it on again. Do not attempt to dry electronic controller or pumping mechanism with an external heat source, such as a microwave oven or hair dryer. An electronic controller or pumping mechanism that has been damaged as a result of exposure to liquids is not serviceable.
19. Potentially Explosive Atmospheres—Turn off electronic controller and electrical pumping system when in any area with a potentially explosive atmosphere. Sparks in such areas could cause an explosion or fire, resulting in serious injury or even death.
20. It is important to keep model and corresponding electronic controller and electronic pumping system within acceptable temperatures. Operate all components where the temperature is between 0° and 35° C (32° to 95° F). Avoid dramatic changes in temperature or humidity as condensation may form on or in the electronic controller and electronic pumping system.
21. It is important to keep the touch panel on the electronic controller clean. Handle the electronic controller with care to maintain its appearance. If you are concerned about scratching or abrasion, always use soft objects when making contact with the touch panel display. An example of this is your finger or an eraser of a pencil. To clean the surface, unplug all cables and turn off the electronic controller and pumping system. Then use a soft, slightly damp, lint-free cloth. Avoid getting moisture in openings. Do not use window cleaners, household cleaners, aerosol sprays, solvents, alcohol, ammonia, or abrasives to clean any components.

## Product Information

# 3

### Blue Phantom™ FAST Series

BP-FAST1800, BP-FAST1801, BP-TTE1701, BP-TTE1701B, BP-TEE1702

#### Included in this Package

- Blue Phantom™ FAST ultrasound training model (*#BP-FAST1800*)
- Transthoracic echocardiography (*TTE, #BP-TTE1701*)
- Transthoracic echocardiography guided pericardiocentesis (*#BP-TTE1701B, optional*)
- Transesophageal echocardiography (*TEE, #BP-TEE1702, optional*)
- Electronic controller and auto pump system (*#BP-FAST1801, optional*)
- Body form plastic shell for shipping and storage
- Cleaning cloth
- Syringe with tubing attachment (*TEE models only*)
- Baby powder
- Blue Phantom™ effusion fluid refill solution (*#BRS180-Clear*)
- Blue Phantom™ simulated blood refill solution (*#BRS180-Blue, #BRS180-Red*)
- Low voltage transformer (*AC pumping models only*)
- User Guide and Utilities CD

#### Additional Items Required for Training

- For optimal performance, please use 18-21 gauge needles (sharp and unbent) and associated catheter kits (for use during fluid aspirations and pericardiocentesis training)
- Intravenous fluid bag to fill with Blue Phantom™ simulated blood refill solution
- Ultrasound system with abdominal and/or cardiac transducer, TEE probe (*optional*)
- Ultrasound gel

#### Optional Accessories for Your Training Model

- Blue Phantom™ simulated blood refill solution (*#BRS180-Blue, #BRS180-Red*)
- Blue Phantom™ effusion fluid refill solution (*#BRS180-Clear*)
- Hard Storage Case with Thermoform interior and caster wheels (*#BP-FASTCASE-1704*)

#### Introduction to Your Training Model

This model is intended as a platform for Focused Assessment for Trauma with Sonography (FAST) and cardiac ultrasound (echocardiography) hands-on technique training and optional transesophageal echocardiography (TEE). The model is designed to be extremely realistic and its self healing design provides you with superb durability. In order to get the most out of your training platform, it is important that you properly care for your model.

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## Introduction to Your Training Model (*continued*)



The ultrasound training platform has an access panel at the back of the model. This access panel should never be opened or removed by anyone except Blue Phantom™ personnel or Blue Phantom™ trained technicians.



The tubes that exit through the access panel or the leg of the model are for refilling the effusion spaces contained within the model (see *Chapter 4: Utilizing Your Model—Manually Adjusting Fluid Volumes Using a Syringe—Non Electronic Controller Models only* on page 12 of this user guide). The tubes terminate with a female snap lock fitting that is designed to connect with syringes fitting with a male snap lock connector.

## Quick Facts about Your Training Model

- Use your ultrasound system to train users to perform FAST ultrasound exams
- Fully imageable upper and lower torso using real-time sonography
- Model contains the liver, gallbladder, kidneys, spleen, heart, lungs, bowel, bladder, stomach, and skeleton allowing users a complete imaging experience
- Uncompromising image quality: all structures match the sonographic acoustic characteristics of human tissue
- Dynamically adjust internal bleeding states around the liver, spleen, heart, and bladder
- Model extends from head to mid thigh
- Ultra durable, self healing tissue
- Made in USA



# Utilizing Your Training Model

# 4

## Blue Phantom™ FAST Series

BP-FAST1800, BP-FAST1801, BP-TTE1701, BP-TTE1701B, BP-TEE1702

### Anatomy of Your Training Model

1. Remove your training model from its shipping container and make sure that you have received all of the items listed in *Chapter 3: Product Information—Included in this Package* section on page 8 of this user guide. If you did not receive one of the listed items, or if you received the wrong items please contact Blue Phantom™ Customer Support immediately:

Telephone: (425)881-8830

Email: [customersupport@bluephantom.com](mailto:customersupport@bluephantom.com)

Web: [www.bluephantom.com](http://www.bluephantom.com)



Save the plastic shipping body for storing your model.

2. Familiarize yourself with the anatomy of your training model.



Blue Phantom™ ultrasound training models are constructed using our patented simulated ultrasound tissue and contains similar imaging characteristics to that of human tissue. Care must be taken to not place the model on rough surfaces as the model can take on the surface characteristics of that surface. Do not place objects under the model as the tissue is soft and will conform to the shape of the object.

This ultrasound training platform contains a skeleton which allows the user to encounter the same imaging characteristics as those seen while imaging a human patient. While the skeleton also provides internal structural support for the model, the ribs and sternum offer similar intercostals access as encountered while imaging a human patient.

The model has an access panel located at the back of the model. This access panel should never be opened or removed by anyone except by Blue Phantom™ personnel or Blue Phantom™ trained technicians.

The tubes that exit through the access panel or through the leg of the model are for refilling the individual effusion spaces contained within the model. These spaces include the heart, pericardial effusion, liver, spleen, and bladder. The tubes terminate with a female snap lock fitting that is designed to connect with syringes fitted with a male snap lock connector. The model is delivered with minimal fluid present in the organ spaces. Users can infuse prescribed amounts of fluid into the identified tube, thus adjusting the level of effusion surrounding the specific organ. (See *Chapter 4: Utilizing Your Model—Manually Adjusting Fluid Volumes Using a Syringe—Non Electronic Controller Models only* on page 12 of this user guide.)

## Using Your Training Model



1. **PRODUCT WEIGHT WARNING:** Be careful as the model is heavy. Use proper lifting techniques to prevent bodily injury.
2. Notify others as to the weight of the model to prevent others from being injured while moving or using the model.
3. Remove the model from the shipping container while carefully cradling the head of the model. Excessive stress due to improperly supporting the model's head can result in damage or tearing of the head/body cuff.
4. Retain the plastic body container for storing the model.
5. Place the model in the proper orientation by positioning the training model on a very stable patient bed. It is important that you place the model on a patient bed rated to handle an excess of 200 lbs (91 Kg).
6. Care must be taken to place the model in a position in which it will not fall off of the bed, causing injury to yourself, others, or the model.
7. Do not place this unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall causing serious injury to a child or adult, and serious injury to the unit.
8. Place the model on a smooth surface as rough surfaces can leave indelible impressions where they contact the rough surfaces.
9. Do not use pens or other marking instruments on the model without testing them first on non obvious areas to make sure permanent staining does not occur.
10. Place ultrasound gel on the model or on the ultrasound transducer in adequate quantities so that the probe slides effortlessly across the surface of the model. Add more gel as necessary.
11. Adjust the ultrasound system controls per the manufacturer's instructions, increasing and decreasing the depth and gain controls until the desired image is obtained.

## Performing a FAST Ultrasound Procedure

All of the soft tissue of the FAST Ultrasound training model is constructed using Blue Phantom™ simulated ultrasound tissue. The model contains a skeleton which provides the user with similar sonographic imaging windows that you would expect in imaging a patient as well as offering structural support for the model. The internal organs contained in the model are:

- Liver
- Gallbladder
- Left and right kidneys
- Heart
- Spleen
- Bowel
- Stomach
- Bladder

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## Performing a FAST Ultrasound Procedure *(continued)*

Additional structures in the model offer imaging conditions encountered when imaging a human patient. These structures include the ribs, lung, esophagus *(optional)* and articulating jaw *(optional)*.

If you are utilizing the model for FAST ultrasound procedural training, you will experience the best performance from your training platform if you utilize the appropriate sized needles and catheters on your model.

## Using Needles and Catheters



1. For best performance, we recommend that you utilize a new, sharp, unbent 18-21 gauge needle and similarly sized catheter kits when accessing the structures in the model.
2. Do not use any needle larger than 18 gauge or permanent damage to your model may occur.
3. Smaller bore needles (>22 gauge) can bend during use and damage your model's simulated tissue.
4. Aggressive repositioning of needles rather than removing and repositioning can cause stubborn or permanent needle tracks due to the needle tip dragging through the simulated tissue.
5. Dull needles may also cause permanent damage to the tissue. It is important to replace needles about every ten cannulations.

## Manually Adjusting Fluid Volumes

### *(Non Electronic Controller Models only)*

The FAST trauma ultrasound training model contains fluid spaces around the heart, liver, spleen, and bladder. The fluid present in each of the fluid spaces can be adjusted to vary the simulation training scenario desired.

The model is delivered with little to no fluid in each of the fluid spaces thus simulating a normal ultrasound exam. The amount of fluid in each of the spaces can be easily adjusted using the fill tubes that exit the leg of the model. The amount of fluid can be adjusted to simulate small, medium and large effusions dependent on the amount of fluid infused by the user using the chart on the next page.



Take care to not overfill the cavities as this may cause damage to your model. If additional fluid is infused, take care to return the fluid volumes to little or no fluid after each training session. Failure to do so may result in damage to your model.

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## Manually Adjusting Fluid Volumes

### *(Non Electronic Controller Models only—continued)*

Each tube with click lock connector exiting the leg is labeled with the corresponding fluid space location (i.e. heart, liver, spleen, or bladder). Use these locations to adjust the fluid volumes in the corresponding organs.

To increase the amount of fluid present in each space, infuse the desired amount of fluid using the enclosed syringe. If large amounts of fluid are required, multiple syringe infusions may be necessary. To decrease the amount of fluid in each space, use the syringe with click lock connector to remove the desired amount of fluid.

	Heart	Liver	Spleen	Bladder
Small	50	100	50	25
Medium	100	150	100	50
Large	150	225	150	75

Recommended Fluid Volumes (ml)



When infusing fluid into the trainer, take care as to not infuse air into the fluid line as this will obstruct the imaging window when ultrasound imaging is applied. The click lock fitting should make this an easy process.

If it is necessary to infuse large amounts of fluid in a space, it may be necessary to infuse fluid multiple times to reach the desired fluid volume. To accomplish this follow the steps below:

1. Infuse all of the fluid in one syringe.
2. Disconnect the syringe with click lock fitting by pressing the metal quick disconnect latch on the fitting.
3. Connect the refill tube with accompanying spare male click lock fitting and carefully fill syringe with refill solution fluid taking care not to aspirate air into the syringe. If air is aspirated into the syringe, purge the air from the syringe.
4. Slowly draw fluid up into the syringe as this will prevent air from being introduced into the fluid during filling.
5. Disconnect the filling tube with male click lock fitting and reconnect the syringe to the desired fitting and fill the system with the recommended amount of fluid.



Never exceed the recommended fluid volumes found in the filling chart or damage to your model may occur.

## Introduction to Pericardiocentesis Training

If you are utilizing the model for ultrasound guided pericardiocentesis training, you will experience the best performance from your training platform if you utilize the appropriate sized needles and catheters on your model. Please see *Chapter 4: Utilizing Your Training Model—Using Needles and Catheters* on page 12 of this user guide.

## Performing an Ultrasound Guided Pericardiocentesis

Connect an I.V. bag filled with Blue Phantom simulated pericardial refill solution to the tube at the back of the model using the luer lock at the end of the tube.



### **WARNING:**

1. Never inject air into the pericardium or heart.
2. Never inject fluid removed from the heart into the pericardium.
3. Never inject fluid removed from the pericardium into the heart.

## Pericardiocentesis System Setup

1. To allow for a continuous inflow of fluid into the pericardium, fill an I.V. bag with the enclosed simulated blood refill solution. Using I.V. tubing, connect the I.V. bag to the tube that exits the back of the model, using the luer lock attached to the tubing.
2. Removal of the blue luer lock cap is necessary prior to connecting to the luer lock.
3. Hang the I.V. bag 1 foot (30cm) above the model. Hanging the I.V. bag greater than a distance of 1 foot (30cm) can result in excessive pressure in the pericardial space resulting in fluid appearing at the surface of the model at previously accessed cannulation sites. This will not damage your model but can be irritating to the user. Lowering the I.V. bag to the recommended height will alleviate the excess pressure.
4. As you are performing an ultrasound guided pericardiocentesis, it is important that you never inject air into the heart or pericardium during procedural simulation training. Air injected into the anatomy can obstruct your imaging window and require purging from the system.

As you are performing pericardiocentesis procedural simulation, you are able to differentiate between pericardial fluid (pink fluid) and intracardiac fluid (the right heart is filled with blue simulated blood refill solution while the left heart is filled with red simulated blood refill solution).

If you encounter any fluid that is different from the color of fluid observed in the tube that exits the back of the model, you have entered the heart. The user should re-inject the fluid removed from the heart without injecting air into the system. The user should then withdraw the needle until they are in the pericardium. Never inject fluid removed from the heart into the pericardium, as this will cause a mixing of fluid colors.



Use extreme care when using needles and sharp objects as to not accidentally injure yourself during training

## Purging Air from the Pericardium

It is possible to encounter air in the pericardium and heart if users infuse air during procedural simulation. Air in the heart requires purging the air by accessing the air and removing it with a needle. However, air can be purged from the pericardium using the tube that exits the model's back. Use the following technique to remove air from the system:

1. Taking care to support the models head, place the model in the prone position with the model face down towards the bed. It is important that you place the model on a patient bed rated to handle an excess of 200 lbs (91 Kg).
2. Care must be taken to place the model in a position in which it will not fall off of the bed. If the model were to fall off the bed, it can cause injury to the model and its users.
3. Do not place this unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall causing serious injury to a child or adult, and serious injury to the unit.
4. Place the model on a smooth surface as rough surfaces can leave indelible impressions where they contact the rough surfaces.
5. Have a second user hold the pericardial fluid tubing (exits the model's back) upward, toward the ceiling so that air will travel upward to the top of the tube where the luer lock fitting is located. An air trap is located at the base of the pericardium and air will be captured in this area when placed in the prone position. Some air may be trapped in other areas of the pericardium. Gently rock the model side to side and lift the lower torso of the model to be assured that all air has traveled to the air trap where it can be easily evacuated. Infusing 30 milliliters of fluid into the tube can allow air to travel more easily out of the system.
6. Replace depleted fluid into the pericardial system. Using a syringe, introduce Blue Phantom™ effusion fluid refill solution in 30 milliliter increments. After each 30 milliliter infusion, remove the syringe to verify that you are not overfilling the system which is identified by fluid overflowing out of the end of the tube when the tube is lowered to 6" (15 cm) above the back of the model.
7. Repeat this process until the pericardium is full of fluid.
8. Lower the end of the tube with the luer lock until it is 5" (15cm) above the back of the model and replace luer lock blue cap.
9. Taking care to support the models head, position the model on its back (supine position).

## Introducing Transesophageal (TEE) Transducers

Prior to use you must perform the following procedure to assure that you do not damage your ultrasound training model:



**NEVER** force the transducer if you encounter resistance moving the transducer through the esophagus. Excessive force applied to the transducer can result in tearing of the esophagus which will require in factory repair.

*(continued on next page)*

## Introducing Transesophageal (TEE) Transducers (*continued*)



**IMPORTANT:** You must properly lubricate the TEE transducer and the model's mouth and throat with ultrasound gel prior to placing the ultrasound transducer into the model's mouth or esophagus.

1. It is important that you treat your training model as you would a live patient. If you are performing a transesophageal echo, never force the transducer if you encounter resistance to moving the transducer through the esophagus. Excessive force applied to the transducer can result in tearing of the esophagus which will require factory repair.
2. Lubricate the transducer and training model's throat with ultrasound gel prior to introducing the transducer. Adequate amount of lubricant is necessary to introduce and thread the transducer. As you begin introducing the TEE probe, you will experience the same anatomical structures as in a live patient; you may encounter resistance to inserting the transducer at the epiglottis/esophageal interface. Careful introduction is necessary. Placing your fingers at the base of the tongue to direct the probe will aid in proper introduction. Cover the length of the transducer with copious amounts of ultrasound gel and fill the base of the model's throat with gel to allow for smooth introduction. Buildup of dried ultrasound gel should not impair echocardiographic imaging and can easily be cleaned from the model (see *Chapter 6: Caring For Your Training Model—Cleaning Your Training Model* on page 23 of this user guide).



Hyperextension of the mouth on the model is possible and should be avoided. Excessive extension of the jaw and mouth structures can result in overstressing the mouth tissue resulting in tearing. Proper use will allow for a long model life.

3. Using the TEE probe per the manufacturer's user guide, place a slight forward flex in the probe tip using the transducer's rotary controls to aid in introduction. Never lock the rotary control position as this can result in perforating the esophagus. The transducer should move smoothly throughout the esophagus. If you encounter resistance, abort the procedure by verifying that all transducer rotary controls are unlocked and slowly remove the transducer and begin reintroduction of the probe.
4. Place a bite guard in the mouth of the model to aid in simulation training.
5. The cardiac structures should come into view as you first pass the great vessels followed by the cardiac chambers. Full introduction into the stomach is possible. All standard TEE views are obtainable.
6. Prior to removal of the transducer, verify that all rotary controls are in a neutral position and unlocked position. Slowly withdraw the transducer until the probe tip is out of the training model's mouth.

# Electronic Controller Models

# 5

## Introduction to the Electronic Controller and Pumping System

The FAST trauma ultrasound training model contains fluid spaces around the heart, liver, spleen, and bladder. The fluid present in each of the fluid space can be adjusted using the electronic controller and associated pumping system to vary the simulation training scenario desired.



Never unplug the electronic controller without properly shutting the system down using the shutdown procedure found on the user interface touch panel. If an accidental power disconnect or power outage occurs, it is important that you immediately reconnect power to the controller and recalibrate the system. An improper shutdown can damage your model beyond repair. This will void your warranty.

The electronic controller is a way to automate your training regimen by having the computer controller infuse and remove fluid in the internal fluid spaces based on user input. The system consists of a touch screen electronic controller and a separate pumping system. Input provided by the user varies the fluid located around the liver, heart, spleen and bladder. The fluid variability is based on selecting specific bleeding states, or a random protocol determined by selecting the desired protocol.

## Setting Up the Electronic Controller and Pumping System



The electronic controller and pumping system contain electrical components. Please read the warnings in the Product Cautions: Risk of Electrical Shock section of this user guide and abide by all warnings to prevent bodily injury. To reduce the risk of burns, fire, electric shock, or injury to persons, the electronic controller and pumping system should never be left unattended when plugged in.

1. Place the FAST Trauma ultrasound training model on a sturdy surface. (See warning in *Chapter 4: Utilizing Your Training Model—Using Your Training Model* section on page 11 of this user guide.)
2. Position the pumping system on the floor or on a sturdy surface where it will not come in contact with any fluids or liquids of any kind.
3. Plug the electronic controller into the pumping system utilizing the data cable connected to the electronic controller.
4. Connect the pumping system to the FAST Trauma ultrasound training model using the quick connect fitting.

## Powering Up the Electronic Controller

After you have set up your FAST Trauma ultrasound training model per the instructions detailed in the previous section, you are ready to turn on the electronic controller.

1. Locate the power switch located on the side of the pumping system.
2. Move the power switch from the OFF position (0) to the ON position by rocking the power switch to the ON (-) position
3. The electronic controller will take a moment to display the on screen menu
4. Once the menu is displayed on the touch panel, please proceed to the section below titled, *Using the Electronic Controller*.

## Using the Electronic Controller

The electronic controller consists of a touch screen and computer which controls the infusion and removal of fluids into and out of the model. Use of the computer controller is made by making using the touch screen. The controls of the multi-touch screen change dynamically, depending on the task you are performing.

## Navigating the On Menu: Main Menu

When you first turn on the electronic controller and pumping system, the system will initialize and the following menu will be displayed:



## Navigating the On Menu: Initialize at Power Up

The initialization process will remove all of the fluid in the model and calibrate the bleeding states within the model. This provides a starting point for the electronic controller to validate the fill state of each fluid space. This process may take a few minutes to complete. Allow the system to initialize. Additional menu items will not be available until full initialization has been completed and the additional selections will be grayed out making them inaccessible. Once the initialization process has been completed, the full menu will be displayed allowing the user to make a selection. The menu will appear as the image on the following page:

*(continued on next page)*

## Navigating the On Menu: Initialize at Power Up (*continued*)



## Navigating the On Menu: Instructions

At any point, the user can access the *Instructions* panel which provides more information about the menu tasks.



## Navigating the On Menu: User Select Training

The *User Select Training* menu allows the user to designate the specific fluid volumes in each of the effusion spaces. Select *User Select Training* from the displayed menu. Continue by selecting the desired fluid level for each of the displayed spaces.

The selection of NONE leaves the fluid levels around the organ at a minimal state. Selecting MEDIUM fills the fluid spaces to a moderate fluid level, and selecting LARGE fills each space with a large effusion.

*(continued on next page)*

## Navigating the On Menu: User Select Training (*continued*)



Effusion	None	Medium	Large
Heart	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Liver	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spleen	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bladder	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

*Press Continue to Accept Selections*

**Back**      **Continue**      **?**

The process of filling the effusion spaces can take a few minutes to complete, depending on the selected effusion level.

## Navigating the On Menu: Random Training

Selecting *Random Training* on the menu allows the computer controller to change the effusion states based on computer generated random fluid settings. The electronic controller will randomly select none, medium or large effusion states for each of the four organ spaces. This provides fluid filling that is not disclosed to the user until completion of the exam when the user inputs the effusion states and their input are compared with the computer generated levels.

## Navigating the On Menu: Fluid Filling

Reaching the desired effusion state may take a few minutes to complete, depending on the amount of fluid being moved into the effusion locations. While the effusion states are being filled using the pumping system, the following menu will be displayed:



**Blue Phantom™ FAST Trainer**

**Preparing Selection**

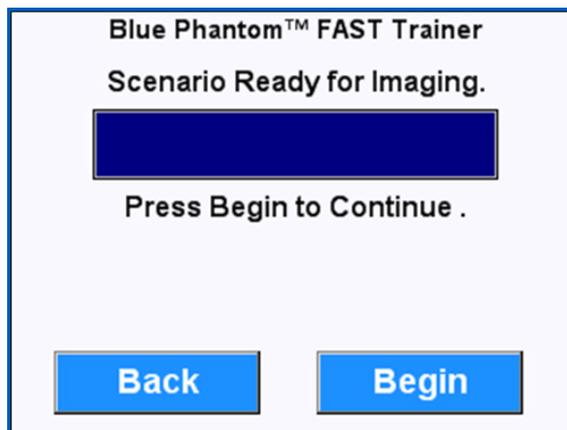
**Please Wait ...**

**Back**      **Begin**

(*continued on next page*)

## Navigating the On Menu: Fluid Filling (*continued*)

When the pumping system has reached the desired fill state, the following menu will be displayed:



Select BEGIN from on the touch panel. Once the user has selected BEGIN from the touch panel, a timer keeps track of the time from selection until the user enters the detected effusion state.

Begin imaging the model.

## Navigating the On Menu: Entering the Detected Effusion State

Upon completion of imaging, the user then enters the suspected effusion state they detected during imaging and selects DONE on the electronic controller touch panel which stops the timer. During *Random Training*, the user then inputs the suspected effusion state they detected using the radio buttons. The user entered results are then compared with the computer known effusion state. If the user entered choice is the same as the computer generate fluid state, the selection is outlined in GREEN. If the fluid state entered differs from the known fluid state generated by the computer, the correct state is outlined in RED.



## Navigating the On Menu: Shutting Down the Electronic Controller and Pumping System

Properly shutting down the system is an important part of maintaining your FAST Trauma model with Electronic Controller and Pumping System. It is critical that the system be shutdown using the appropriate shutdown process.



The model must be stored with proper internal fluid levels to avoid permanent damage. If the appropriate system shutdown process is not followed, it could result in damage to your model. The shutdown process should be completed before power to the system is disabled.

From the *Main Menu*, select the *Shutdown* button from the electronic controller touch screen panel. This will return the fluid volumes to a safe storage level. While this process is being completed, the following status indicator will be displayed on the electronic controller touch panel:



Once the shutdown process is completed, the user will be notified on the electronic controller touch panel.



It is now safe to shut off the system.

# Caring for Your Training Model

# 6

## Proper Use and Care

Proper care of your training model will result in years of utility. Please be sure to heed the following instructions when using your model:



1. Always lubricate the transesophageal (TEE) transducer, as well as the model's mouth and throat, with ultrasound gel prior to attempting to pass the transducer.
2. Never force the transducer when resistance to forward progress is encountered. As with live patients, damage to the tissue can result from excessive force.
3. Never excessively flex the transducer while the probe is in the model's esophagus. Damage can occur with excessive flexion of the transducer.
4. Never over extend the model's jaw or mouth. Roughly opening the mouth can result in tearing of the mouth and cheek tissue.

## Cleaning Your Training Model

The model is designed to offer you years of use. The model can be cleaned using mild soapy water. For best results, mix one part liquid soap with one part tap water. Gently rinse the model with this mixture to remove any accumulated dirt.

Use a clean, soft, lint-free cloth to dry after cleaning. Dry the model using a dabbing motion, rather than wiping or rubbing the model.



Wiping or rubbing the surface aggressively can result in scuffing the simulated tissue.

If you encounter reduced quality of the echocardiographic image after significant use, it may be necessary to clean the esophagus with the soapy water mixture, which is easily accomplished using the following method:

1. Place the model in a moderate Trendelenburg position to aid in draining the fluid from the model after cleaning.
2. Apply the soap mixture to a clean soft cloth and begin by cleaning the model's mouth removing any visible excessive dried gel which should be visible as a fine powder. Using a syringe with tubing attached, fill with soapy mixture. Introduce the tubing into the model's throat and infuse soap water mixture into the tubing.
3. Flush the esophagus with the soapy mixture, introducing the mixture and allowing the fluid to flow into the mouth where it can be easily aspirated with the syringe/tubing apparatus. Perform this procedure 2 times. Leave the model in the Trendelenburg position and allow drying – approximately 3 hours at room temperature.

*(continued on next page)*

## Cleaning Your Training Model (*continued*)

4. After complete drying has been obtained, lightly coat the external surface of the model with baby powder. Heed all warnings on the baby powder container per manufacturer's recommendations.
5. Lightly dust off excessive baby powder. This procedure should result in returning the model's skin surface to a smooth silky finish.

If you encounter any problems or have any questions regarding your model, please immediately contact Blue Phantom™ using the contact information provided below.

## Storing Your Training Model

The model can be stored at room temperature either in the plastic body form storage container or in the open.



Do not store the model in contact with other objects. This can cause the simulated tissue to become deformed.

## Blue Phantom™ Customer Support

Blue Phantom™ is committed to providing you with superb products and uncompromising customer support. Should you require assistance feel free to contact us directly at:

Telephone: (425)881-8830

Email: [customersupport@bluephantom.com](mailto:customersupport@bluephantom.com)

Web: [www.bluephantom.com](http://www.bluephantom.com)