

*User's Manual*  
**The AFHCAN Cart**  
V3

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Revision C



The names of any providers and patients used in illustrations or examples in this document are fictitious.

Every effort has been made to ensure this manual is accurate, complete, and useful. Please let us know if you have any suggestions for improvement using one of the following means of contact:

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# Preface

## About this Document

This document is the first in a set of user manuals provided with the AFHCAN Cart. These user manuals, covering various topics, are normally assembled into a binder delivered with each Cart. This modular design has the following advantages:

- the set of manuals provided with your cart includes documents for the specific peripheral devices installed
- each document is a stand-alone publication, so as new devices or features are added to the Cart, new manuals can be added to the existing binder
- user information that is common to all items of equipment does not need to be repeated in each module, but can be covered in separate modules and referenced as needed

## Related Documents

The original manuals provided with the equipment were included in a set of materials delivered with the AFHCAN Cart. Those manuals can be used to supplement the information provided in this document. Be aware, however, that items installed on an AFHCAN Cart may have been modified slightly, so the features as described in the original product manuals may not apply.

## For More Information

This document describes the equipment to a level of detail that will meet most user's needs in the context of clinical use of the AFHCAN Cart. For more information, contact AFHCAN Customer Support:

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# Section 1 – Introduction

## 1.1 Introduction to the AFHCAN Cart

The AFHCAN Cart is a tool for communicating medical information obtained during a patient encounter from one healthcare provider to another. The information is generated by various medical devices attached to the Cart. Outputs from the devices feed directly into the Cart, which stores the information in its original form. It can then be transmitted over any conventional communications network including telephone lines, satellite links, or other available systems. Because the information remains in its original form, the receiving provider sees exactly what the sending provider sees with little or no loss of detail. The system is an efficient, reliable, and effective means for obtaining a telemedical consult.



Depending on the types of medical devices attached to the Cart, the medical information could be in any of the following forms:

- digital images (digital camera, video otoscope, dental camera)
- medical forms suited to various specialties (built into the AFHCAN software)
- patient identification information (a function in the AFHCAN software)
- comments or instructions (entered into the AFHCAN software by either provider)
- scanned images or documents (scanner)
- data displays and reports (ECG, digital spirometer, tympanometer, audiometer, vital signs monitor)
- video (video is a feature of the digital camera)

The list of capabilities is expected to expand to include audio information, live video, long-term monitoring, and other features.

### 1.1.1 *Store-and-Forward Telemedicine*

Perhaps the most important innovation of the AFHCAN Cart is the idea of *store-and-forward* telemedicine. The following are some of the problems that can be encountered when obtaining a medical consult using voice communications:

- the sending provider and the consulting provider must both be available at the same time
- the communications system must be up and running, and one of the available channels must be open
- it can be difficult to clearly convey the medical condition over the phone

In remote areas that depend on satellite networks, communications can be subject to a variety of technical limitations and interruptions. It can also be a problem scheduling a telephone consult with a provider working in a busy office or hospital.

The store-and-forward strategy overcomes these problems. The following steps outline the basic sequence:

- a provider sees a patient and develops a case by entering information into the Cart using various peripheral devices, forms, and other resources
- once all the information has been gathered, it is assembled into a case specific to that patient and that particular visit
- the case is sent to another provider over the communications network
- the AFHCAN system works with the communications network to ensure all the parts and pieces arrive safely at the destination
- AFHCAN software at the receiving end assembles all the information in the case, and then lets the receiving provider know a case is available for review
- the receiving provider can then open and review the case at his or her convenience

The net result is that the level of patient care goes up at the point of patient contact.

### **1.1.2 The AFHCAN System**

By itself, the AFHCAN Cart is just one part of a communications network. In the communications path from one provider to another there are a number of elements, each contributing to the process. The main elements are described in the following sections.

#### **1.1.2.1 AFHCAN Software**

The most important of these elements is the AFHCAN Software. AFHCAN designs the software that runs in the computer on the AFHCAN Cart. The software allows the user to perform the following tasks:

- identify the patient, either by selecting an existing patient from a database or by entering new patient information into the database
- describe the patient's condition and history using a variety of forms tailored to various medical specialties
- use the peripheral devices attached to the Cart to obtain images and data, and save this information into a case
- decide what to do with the case:
  - send the case to another provider
  - place the case on hold so you can come back later and add information
  - send the case to electronic archives, where it can be saved for future reference and viewed by other providers as needed
  - discard the current changes made during this session with the case

The AFHCAN software that runs on a Cart is called the *client software*. Client software is described in the *Software User's Manual*, which is included in the binder supplied with the Cart.

### 1.1.2.2 Network Servers

Each Cart in an AFHCAN system must be connected to a *network server*. In essence, a server is just a computer that supports network communications. The server stores information about all the Carts connected to that server. Servers also store the information about all the cases that the server has handled. Usually a server connects to a number of carts in a particular geographic region. All the Carts connected to a given server can communicate with each other.

Servers can also be connected to other servers. This allows Carts in one region to communicate with Carts at a distant location.

The software used in the servers is also designed by AFHCAN, and is called the *server software*. A network administrator helps to set up and maintain the information stored on the server, as described in the *Administrator's Manual* included in the binder provided with the Cart.

### 1.1.2.3 Communications Services

The communications between a Cart and a server, as well as the communications between one server and another, take place over commercially available phone lines provided by telecommunications companies. There are many ways these communications services can be set up including satellite systems, microwave systems, telephone lines, etc. These services operate behind the scenes, and a full description of these services is beyond the scope of this manual.

### 1.1.2.4 AFHCAN Workstations

An AFHCAN workstation is any computer running AFHCAN client software. As mentioned earlier, the AFHCAN client software runs on the computer in the AFHCAN Cart, and controls all aspects of the Cart's operation. The AFHCAN client software can also be loaded on ordinary personal computers or laptop PCs, allowing those computers to send and receive cases.

When a healthcare provider originates a case, the AFHCAN Cart is the primary tool for collecting the medical information. On the other hand, the receiving provider normally would not need to add new images, but would only need to view the images and data provided. The receiving provider can respond to the case by adding comments, instructions, or questions, and can then send the case back to the originating provider.

Of course there is nothing to prevent someone from receiving and reviewing a case using an AFHCAN Cart. The software is the same. The only difference between an AFHCAN Cart and other workstations is the availability of peripheral medical devices.

### 1.1.2.5 Network Security

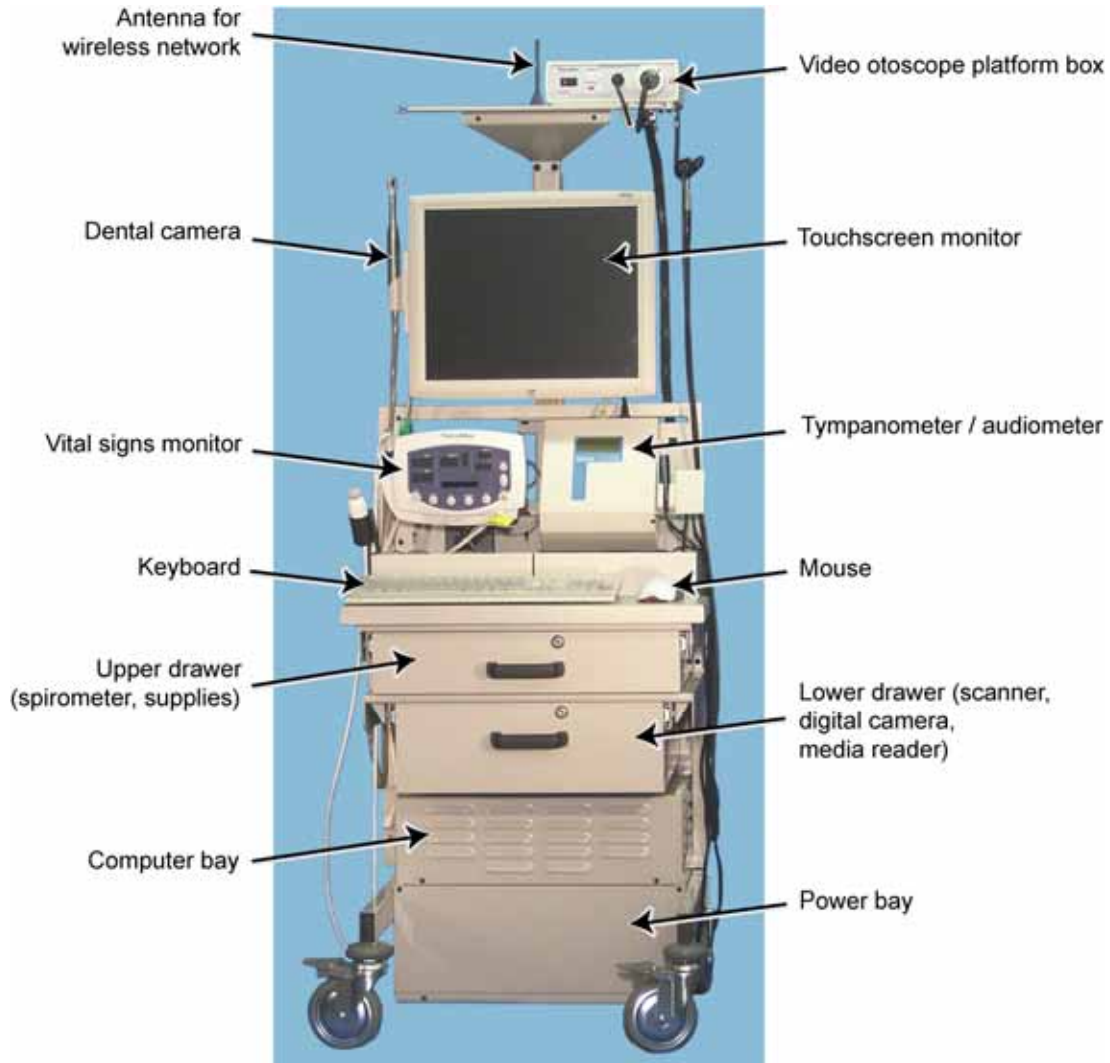
The AFHCAN software takes many steps to ensure the integrity and privacy of all data:

- all data is encrypted
- authorized users are approved by an administrator and given passwords
- connections between any points must be approved and certified at both the sending and receiving sites
- all activity within a case and on the network is tracked as a unique event

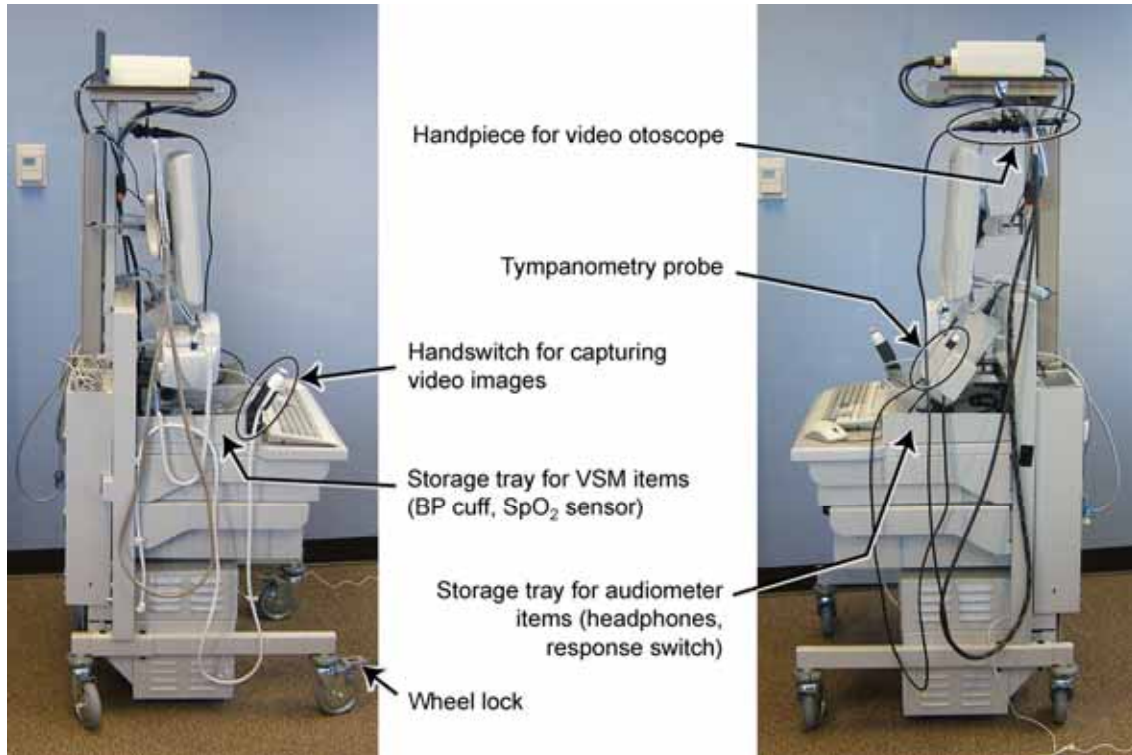
- custody of a case is systematically transferred so that only one person can open and add to a case at any given time

## 1.2 Main Components of the AFHCAN Cart

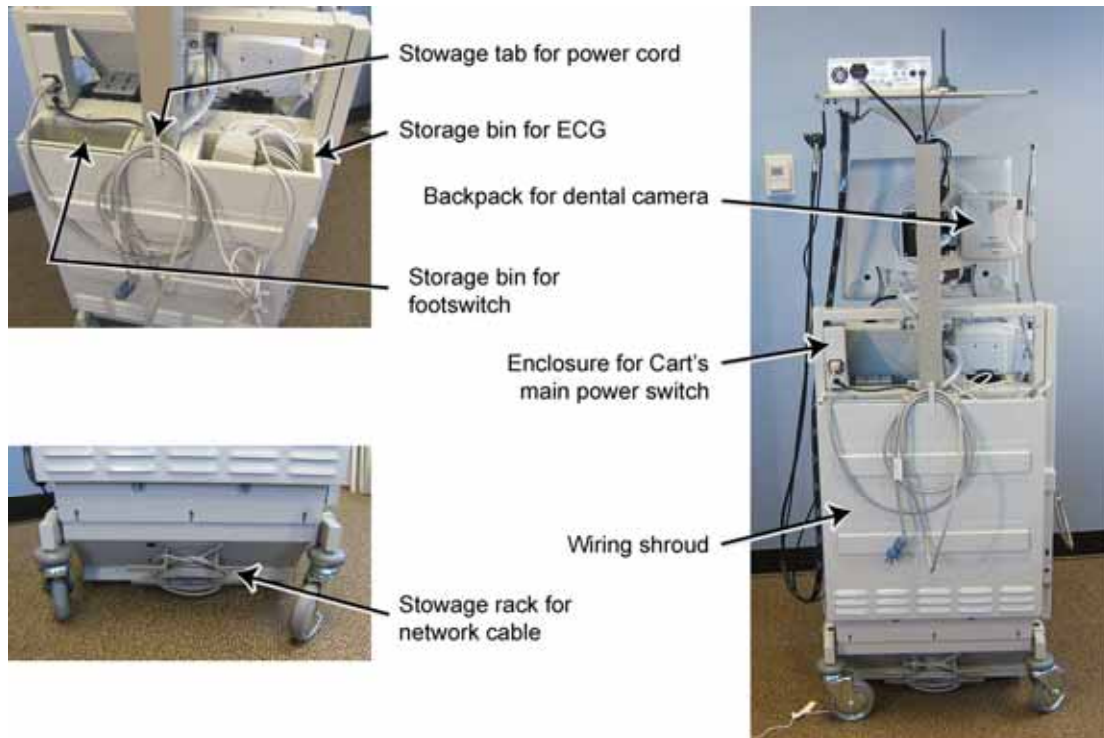
Figures 1 through 6 show the main features of an AFHCAN Cart. Please be aware that many of the peripheral devices shown here are options and may not be present on your Cart.



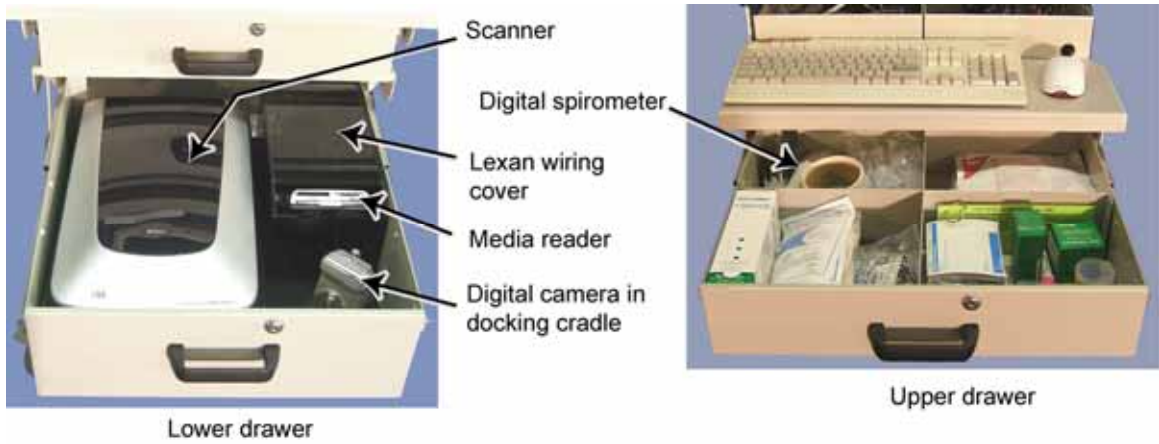
**Figure 1**  
V3 AFHCAN Cart – front view



**Figure 2**  
8/13/2009V3 AFHCAN Cart – side views



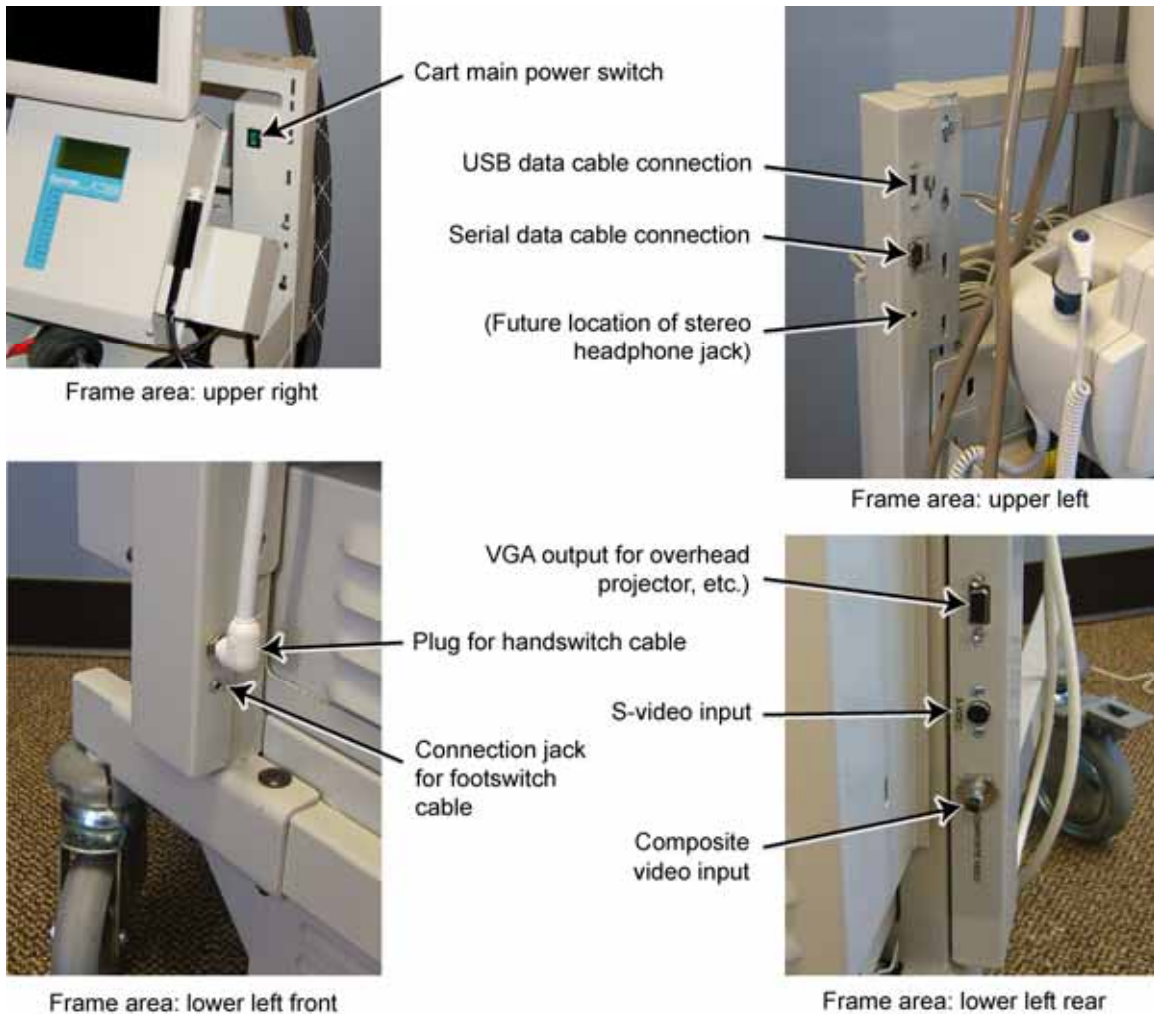
**Figure 3**  
V3 AFHCAN Cart – back



**Figure 4**  
V3 AFHCAN Cart – drawers



**Figure 5**  
V3 AFHCAN Cart – computer and power bays



**Figure 6**  
Main power switch and auxiliary connection points

### 1.3 Introduction to Peripheral Devices

The AFHCAN Cart is equipped with a number of peripheral devices. Details on the use of each device is covered in a separate manual included with the binder supplied with the Cart.

#### 1.3.1 Standard Equipment

The items described below are included as standard features of the AFHCAN Cart. All items except the media reader are described fully in separate manuals included with this binder.

##### 1.3.1.1 Media Reader

The media reader allows digital images to be read in from the various media cards or disks used by other digital cameras.

##### 1.3.1.2 Scanner

The scanner allows documents or photographs to be scanned in and added to a case.

### **1.3.1.3 Digital Camera**

The digital camera is a primary tool for dermatology, general trauma, or other visible medical situations.

### **1.3.1.4 Video Otoscope**

The video otoscope generates video images of the ear, nose, and throat that can be captured as still images in the case.

### **1.3.1.5 ECG**

The ECG generates graphs and reports brought in from an ECG monitor. Software supplied with the ECG is incorporated into the AFHCAN software to provide the necessary functionality.

## **1.3.2 Optional Equipment**

The following items can be purchased as options and installed directly on the V3 AFHCAN Cart.

### **1.3.2.1 Optional Scanner**

The Epson 4990 scanner adds the ability to handle and scan film to the basic scanning capability.

### **1.3.2.2 Dental Camera**

The dental camera generates video images that can be captured as stills in a case.

### **1.3.2.3 Tympanometer**

The tympanometer measures the flexibility of the tympanic membrane and displays the results in graphic form. (The tympanometer is incorporated into the same device as the audiometer.)

### **1.3.2.4 Audiometer**

The audiometer conducts a screening level hearing test and displays the results in graphic form. (The audiometer is incorporated into the same device as the tympanometer.)

### **1.3.2.4 Digital Spirometer**

The digital spirometer takes screening level measurements of standard respiratory tests. Software provided with the spirometer is integrated with the AFHCAN software to provide functionality.

### **1.3.2.5 Vital Signs Monitor**

The vital signs monitor measures blood pressure, heart rate, temperature, and percent oxygen saturation of the blood. Sets of data can be read into a case and displayed in data tables or graphs.

## **1.3.3 External Connections**

There are eight external connection points on the multimedia expansion rail attached to the frame on the left side of the Cart (refer to Figure 6). Four of these points allow new peripheral devices to be connected to the Cart: two for video input and two for standard I/O connections. The other four connection points include two auxiliary outputs and two basic connections standard to all Cart versions.

### 1.3.3.1 Video Input Connections

The S-video input and composite video input points are located in the lower rear of the multimedia expansion rail. Any device that generates a video image can be connected to these points. The generic **S-Video** or **Composite Video** buttons on the *Start* screen can be used to capture a still image from the video input into a case. These inputs work the same as described for the video otoscope.



These external input points are simply wired in parallel with the existing video input points. The external connection and any internally wired connections both go to the same point on the video card in the computer. Only one device can provide a video input at a time; otherwise both video feeds will be imported and the resulting image will be a mixture of the two video feeds.

**Note:** Only one video feed should be sent to the video card at a time. If an S-video device is connected to the external port, for example, then the video otoscope must be turned off because it shares the S-video connection going into the video card.

### 1.3.3.2 Generic I/O Connections

A USB 2.0 port and a serial port are located in the upper front area of the multimedia expansion rail. In general, new devices cannot be connected to these points until the AFHCAN software has been programmed to work with the devices and receive their inputs. These I/O ports allow for future expansion as new peripheral devices are incorporated into the AFHCAN product line.

At the time of this writing, there are a few devices that can be connected. It is possible to connect digital cameras or thumb drives to the USB port to import an image into a case using the *Digital Camera* screen. It is also possible to connect an IQmark ECG with serial connection to the serial port, but it may be necessary to configure the ECG feature using the Client Setup Utility (normally handled by IT or an Administrator). It is also possible to connect an IQmark digital spirometer that has a serial connection in the same manner.

**Note:** There is a limit to the amount of power available for USB-powered devices. If a device attempts to use more power than is available, the USB function will protect itself by temporarily shutting down. The same is true for the serial port.

### 1.3.3.3 Auxiliary Outputs

The two auxiliary outputs are the stereo headphone jack on the upper front of the multimedia expansion rail, and the VGA output at the lower rear of the multimedia expansion rail.

The stereo headphone jack accepts a 1/8-inch stereo plug, which is standard on personal headphones (studio-grade headphones sometimes use a 1/4-inch plug). Video clips from the digital camera will include audio, VTC, if installed, will have an audio component. Devices such as digital stethoscopes would include audio as well. Audio is normally routed to the speakers in the rear of the LCD monitor. Connecting stereo headphones cuts out the audio to the speakers so it can only be heard in the headphones. Headphones can be useful for privacy reasons or for reducing overall noise in the clinic. The use of quality headphones may yield better sound quality than that produced by the external speakers.

Normally the user interface is displayed on the LCD monitor. The external VGA output allows the user interface to be displayed on any external video display system such as an overhead projector or large-screen monitor. Any device that has provision for a VGA input can be used.

**Note:** The VGA signal is not strong enough to drive two VGA devices at the same time. When an external monitor is used, the LCD monitor on the cart must be turned off.

#### 1.3.3.4 Take Picture Connections

Images from a video input can be captured as a still image via a video capture card. There are three ways to trigger the video capture card to capture a desired image:

- by clicking on the **Take Picture** button on the screen
- by pressing the handswitch (refer to Figure 2)
- by pressing the footswitch (Figure 7)



**Figure 7**  
Footswitch installed

The handswitch and footswitch are both wired to a trigger input on the video card. This input tells the card to capture a video image. Both devices can be connected at the same time. Either device can be used to capture an image.

The handswitch is permanently mounted in position on the Cart and should never be disconnected, except as needed for maintenance purposes. The footswitch can be removed when not in use and stored in the storage bin at the rear of the Cart (refer to Figure 3).

## 1.4 Clinical Considerations

The following are some points worth considering when incorporating an AFHCAN Cart into a clinical setting:

- in general, the AFHCAN Cart is designed to support screening-level medical examinations and consults
- the Cart is designed to supplement and enhance existing channels of communication
  - it is good to have a working relationship with a provider in place before sending cases to that provider for a consult
  - never hesitate to use voice communications as a way to follow up on cases or as a way to make sure the needed information is collected in the first place
- a little practice and experience goes a long way in developing your skills as a user
  - the more experience people have in using the Cart, the easier it is to use
  - we encourage new users to take advantage of training opportunities provided by AFHCAN
- your use of the Cart must always remain within the bounds of:
  - good clinical practice
  - the procedures of your facility
  - your own clinical training, experience, and judgment

## 1.5 Warnings and Cautions

Please observe the following points:


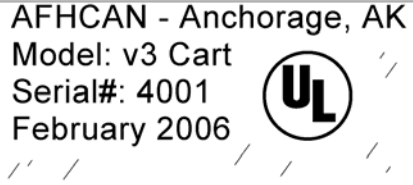



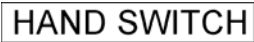
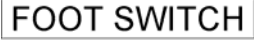



- Follow all warnings and cautions in the manufacturer's literature for peripheral devices attached to the Cart, as applicable.
- Do not expose the Cart or any of its peripherals to water (aside from a slightly dampened cloth for cleaning).
- Do not remove any of the protective covers or wiring shrouds.
- Once the Cart is positioned, push the locking levers down on the wheel locks (front wheels only) to prevent the Cart from accidentally being moved.

## 1.6 General Specifications and Operating Limits

### 1.6.1 Device Labeling

Table 1 shows the labels used on the Cart and the meaning of each label (refer to Figure 6 for locations).

**Table 1**  
Labeling used on the Cart

Label	Meaning
	<p>Identifies the Cart's main power switch.</p> <p>Placing the rocker switch into the <b>1</b> position applies power to the computer and all attached peripheral devices, and causes the rocker switch to illuminate. Each peripheral device can then be turned on using its own power switch, as described in subsequent sections.<sup>1</sup></p> <p>Placing the rocker switch into the <b>0</b> position removes power from the computer and attached peripheral devices.</p>
	<p>Indicates the Cart's manufacturer, manufacturer's address, Cart model number, Cart serial number, Cart manufacture date, and the Underwriters Laboratory (UL™) mark.</p>
	<p>Identifies a general purpose USB port that allows additional peripheral devices to be connected.</p>
	<p>Identifies a general purpose RS-232 serial port that allows additional peripheral devices to be connected.</p>
	<p>Identifies a 1/8-inch stereo headphone jack for audio output.</p>
	<p>Identifies a 1/4-inch jack for connecting the handswitch.</p>
	<p>Identifies a 1/8-inch jack for connecting the footswitch.</p>
	<p>Identifies a VGA output port which allows a second monitor or overhead projector to be connected to the Cart. Anything that is being displayed on the Cart's touchscreen monitor will be displayed simultaneously on the second device.</p>
	<p>Identifies an S-Video input port that allows a video signal from an additional device to be brought into a case.</p>
	<p>Identifies a composite video input port that allows a video signal from an additional device to be brought into a case.</p>

Note 1: The power switch for most peripheral devices is always left on when installed on the Cart. Exceptions include the Video Otoscope and the Vital Signs Monitor. Refer to the sections on the peripheral devices installed on your Cart for details.

## 1.6.2 Operating Limits

Tables 2 and 3 list the environmental limits for the AFHCAN Cart.

**Table 2**

Operating limits

Parameter	Range
Temperature	59°F to 95°F (15°C to 35°C)
Humidity (non-condensing)	30% to 75%
Pressure	608 mmHg to 776 mmHg (811 hPa to 1,035 hPa)

**Table 3**

Non-operating limits

Parameter	Range
Temperature	4°F to 120°F (-16°C to 49°C)
Humidity (non-condensing)	30% to 85%
Pressure	608 mmHg to 795 mmHg (811 hPa to 1,060 hPa)



# Section 2 – Operation

## 2.1 Basic Operating Procedures

### 2.1.1 Guidelines on Placement and Setup

Locate the Cart where there is room for both the user and the patient to be seated nearby. Make sure there is a power outlet available, as well as a network cable connection point, if wireless access is not being used.

Be sure to lock the wheels. Push the locking levers down by gently stepping on them.

### 2.1.2 Applying Power

Turn the main power switch to on (1). This makes power available to all devices on the cart. Each device, including the touchscreen monitor, has its own power switch (on right side of monitor, bottom switch).

**Note:** With just a few exceptions, most peripheral devices can be left on all the time, with power being controlled by the Cart's main power switch. However, the video otoscope and the vital signs monitor should be turned off when not in use. Refer to the manuals for each device for details on their power switches.

Once the power switch is turned on, the computer will boot up to the AFHCAN startup screen. At that point, the user can log in and begin using the software.

### 2.1.3 Logging Into the Software

Refer to the Software User's Manual included in this binder.

### 2.1.4 Shutting Down

Use the AFHCAN software to initiate Cart shutdown. When the Cart's internal shutdown sequence is complete, the screen will display the following message:

***It is now safe to turn the Cart off.***

At this point, simply turn the main power switch to off (0).



## **Section 3 – Routine Maintenance**

### **4.1 Care and Cleaning**

Each peripheral device has its own requirements and limitations in regard to cleaning and maintenance. Refer to the manual for each specific peripheral device for details.

In general, the surfaces of the Cart can be wiped down with a cloth slightly dampened with a mild detergent or dilute disinfectant solution.

The monitor surface and scanner top can be cleaned with a soft cloth moistened with a suitable glass cleaner.

### **4.2 Elementary Troubleshooting**

On the whole, the Cart is robust. The computer automatically reboots to the AFHCAN software after any power outage. It is best to initiate Cart shutdown in the AFHCAN software. This way no data is lost.

The first step in troubleshooting consists of verifying that power is available:

- ensure the Cart is plugged into a wall outlet
- ensure the main power switch is on
- ensure the power switches of the various devices are on as needed

In addition, check any cable connections which are in view or readily accessible without removing any protective shrouds or covers.



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