

Optical System Assembly Steps

For: All Retinomax 2 Kits 101-108 (4 kits) and
Retinomax 3 Kits: 109-132 (12 kits)



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Kendall Optometry Ministry, Inc.

"Serving the Lord by providing better vision to
the people of underdeveloped countries"

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Part number 10021

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1.0 Introduction

The purpose of this document is to provide picture instructions as to how to put together Kendall Optometry Ministries, Inc Optical systems to be used on Optical Mission Trips. All steps will be accompanied with an annotated picture to fully explain what is being done.

2.0 Major Components.

There are three major components of this system: 1) Autorefractor case, 2) Optical case, & 3) Laptop. The below pictures are for case types.



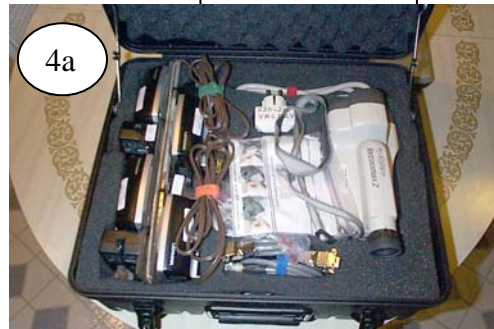
Autorefractor, Optical case, & Laptop



Laptop Case



Autorefractor Case. (Odd Numbered)



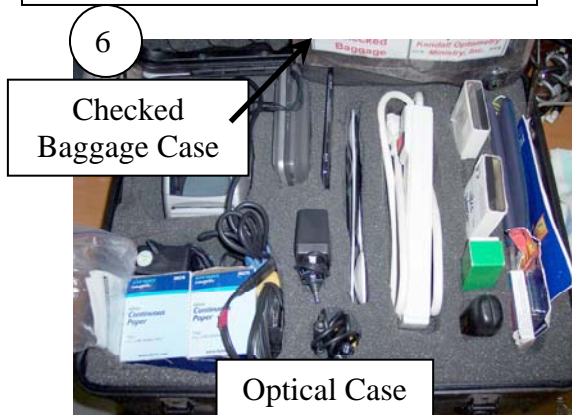
Retinomax 2 Autorefractor Case.



Retinomax 3 Autorefractor Case.



Optical Case (Even Numbered)



Optical Case

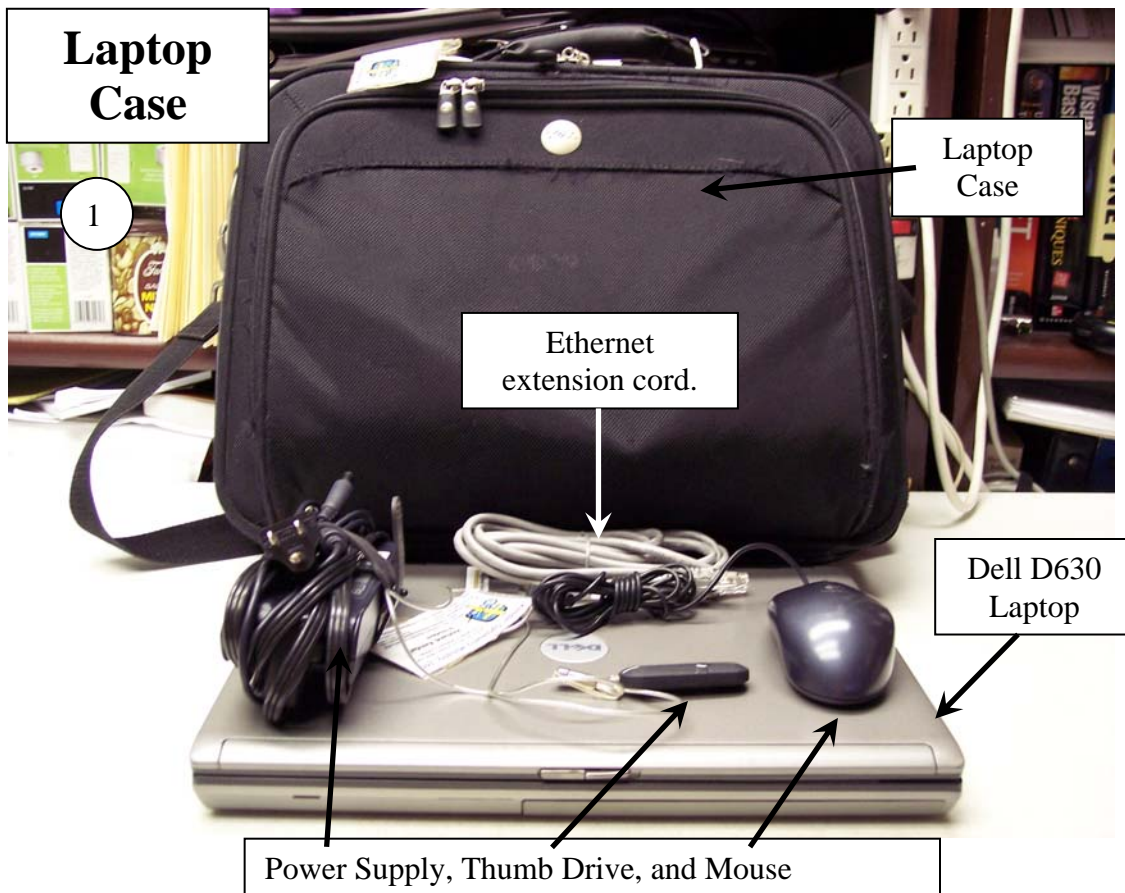
Retinomax 2 cases. (Retinomax 3 similar)



Note: All Optical cases have the video display stored at position indicated.

2.1 Laptop case

This section describes the components of the laptop case and how they are connected. Below are the major components of the laptop case. This is how the laptop case for all kits looks.



Here is the list and their description:

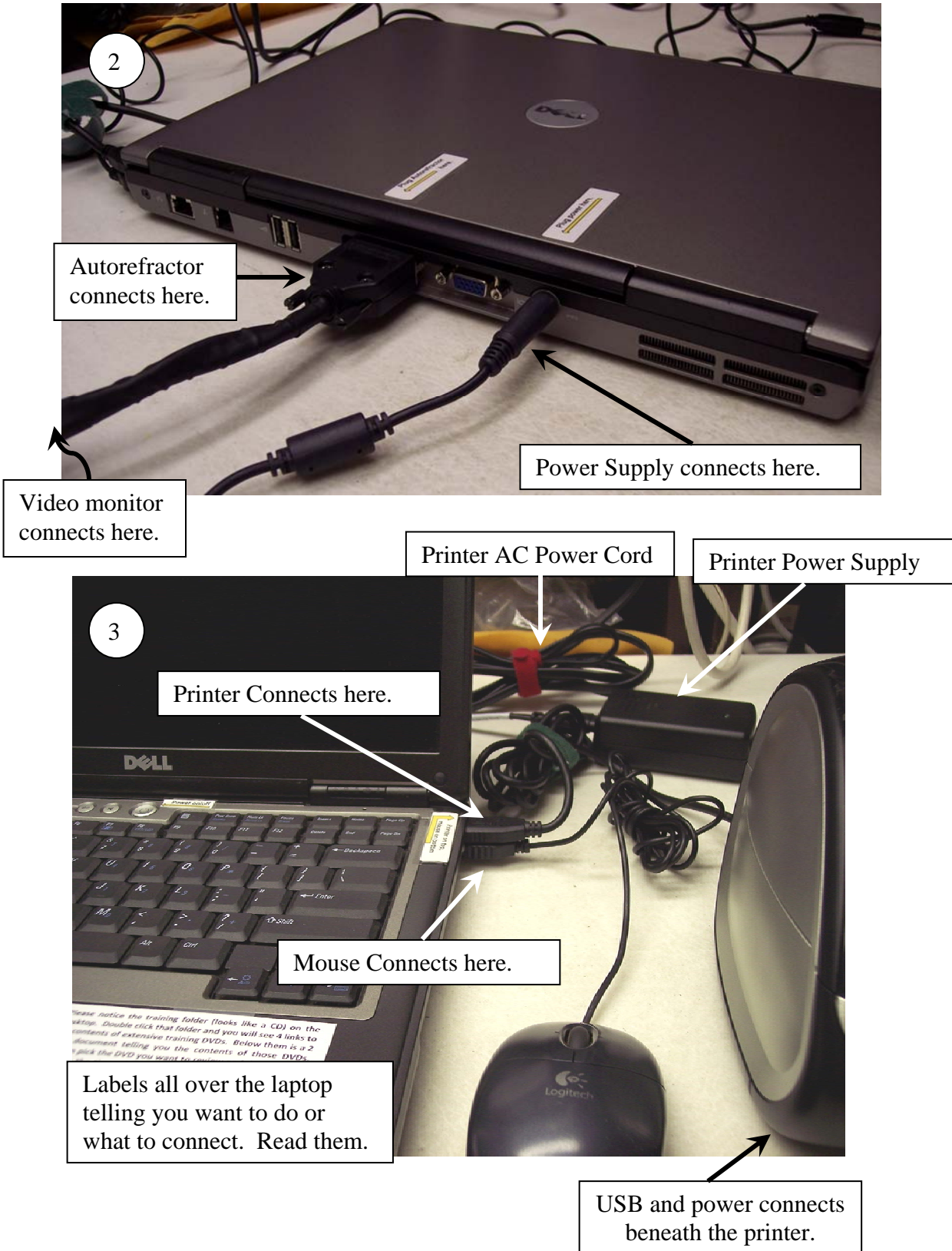
Laptop Case	Holds all the laptop associated equipment and protects it against damage
Thumb Drive	You can use this to transfer your inventory file from your computer.
Ethernet cable	Allows you to connect the computer to the network in your house. Wireless is also available on the laptop.
Power Supply	International Voltage (100-240 VAC) power supply.
Mouse	Optical mouse which connects to the USB hub.

The following pages details the individual components and how they are put together.

Please note that remote access is available on this laptop so that KOM can remote into it over the internet and provide assistance. Skype is also available so we can talk over the internet. The laptop has a microphone but no video.

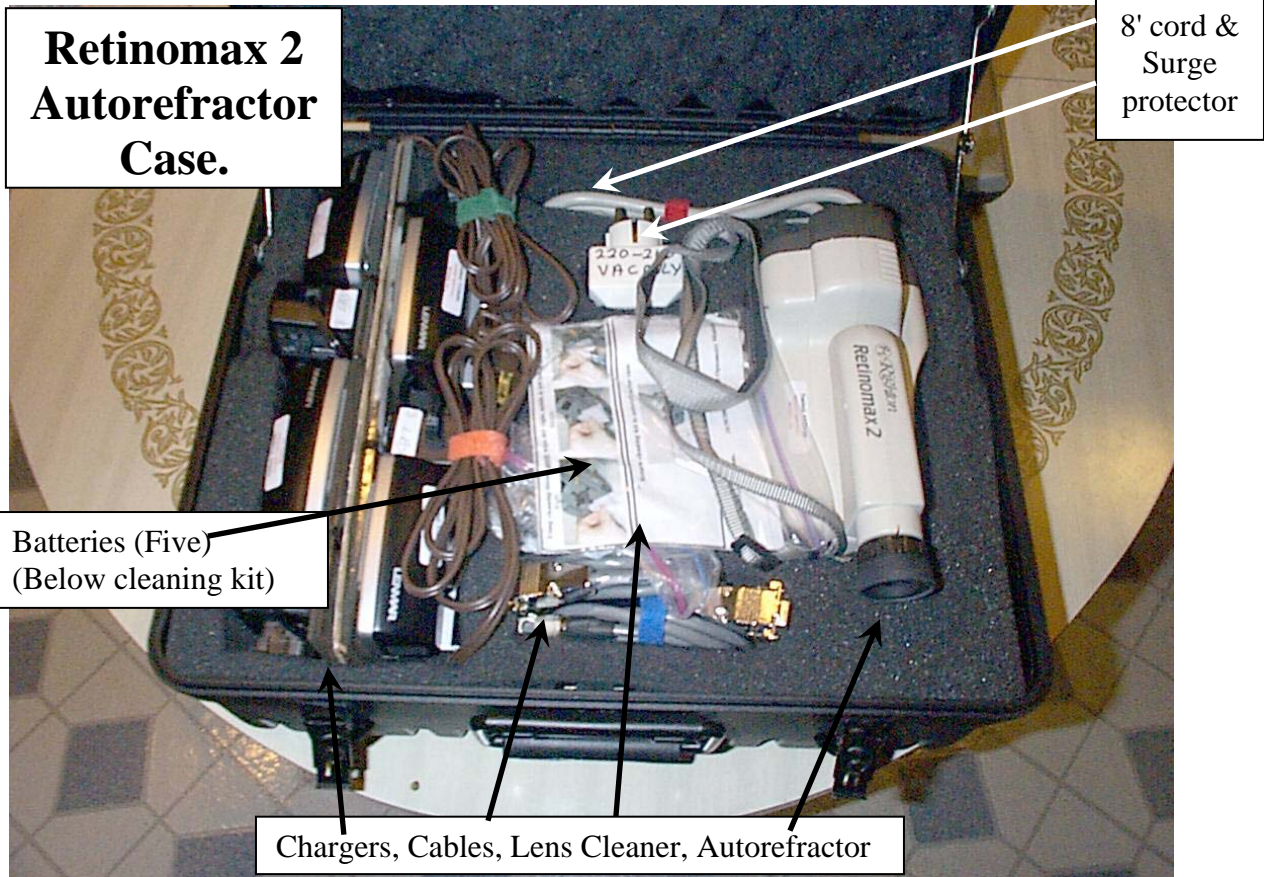
2.2 Laptop Components and how they connect.

Below shows several views of the laptop and how external items connect to it.



2.3 Retinomax 2 & 3 Autorefractor cases

Below is a picture of the Retinomax 2 autorefractor case and it's components:

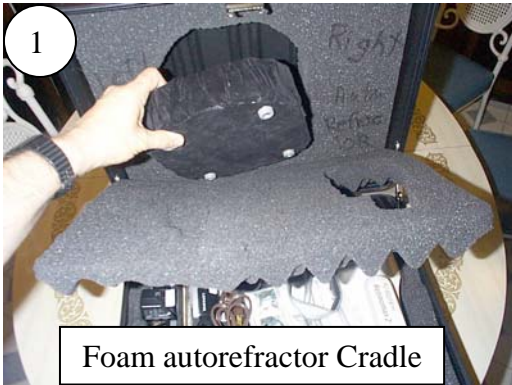


Here is the list and their description:

- Battery Chargers Holds 2 Autorefractor battery charging racks (each with two chargers) which connect to 100-240VAC. The Retinomax 3 case has 1 charging rack with 2 chargers.
- Cables Has a single cable which connects the Retinomax 2 or 3 to the PC and provides a video output for the monitor in the optical case.
- Lens Cleaner Kit which contains cleaning fluid, Q-tips, and cloths for Autorefractor lens.
- Batteries 5 batteries to be used with autorefractor. They are located beneath the Lens Cleaning kit. The Retinomax 3 case has 3 batteries as they last longer.
- Autorefractor Autorefractor packed without a battery.
- Plug Strip A 6 position plug strip tested and found capable of supporting 100-240 VAC.
- Surge Protector Depending upon the country you plan to visit, two styles of surge protectors are provided: 1) 110-125 VAC and 2) 220-240 VAC.

2.4 Autorefractor case components and how they connect

Below are the various items which are packed inside the autorefractor case.



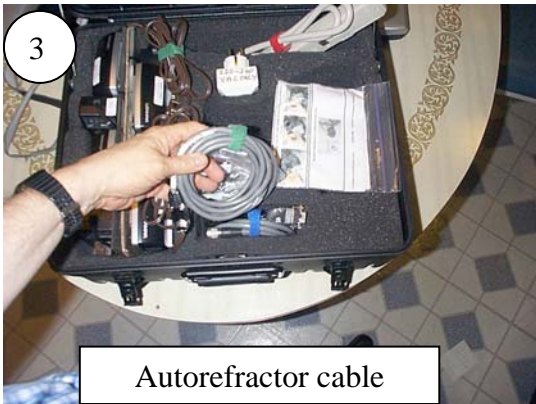
Foam autorefractor Cradle



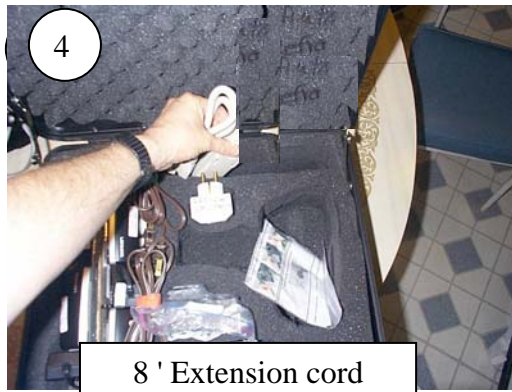
Autorefractor in the cradle.

NOTE

You should remove the autorefractor from the case by putting your hand underneath it and lift it up. You can also pull it up by the neck strap. DO NOT pull it up by the eyepiece.



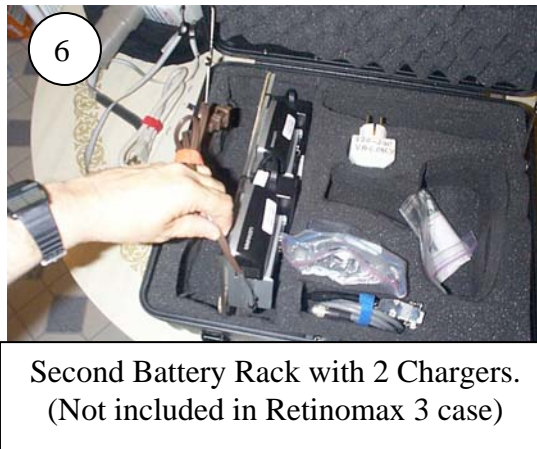
Autorefractor cable



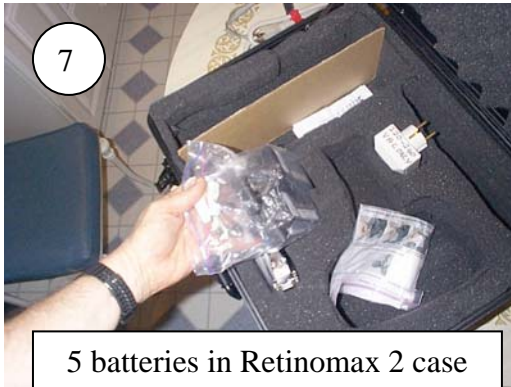
8 ' Extension cord



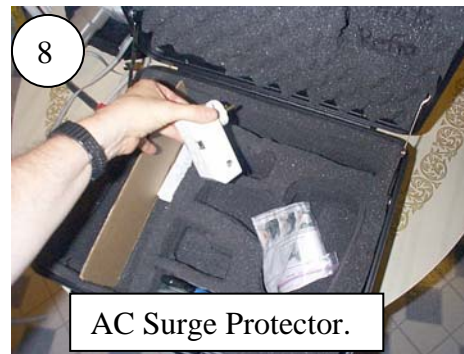
First Battery Rack with 2 chargers



Second Battery Rack with 2 Chargers.
(Not included in Retinomax 3 case)



5 batteries in Retinomax 2 case
and 3 in Retinomax 3.



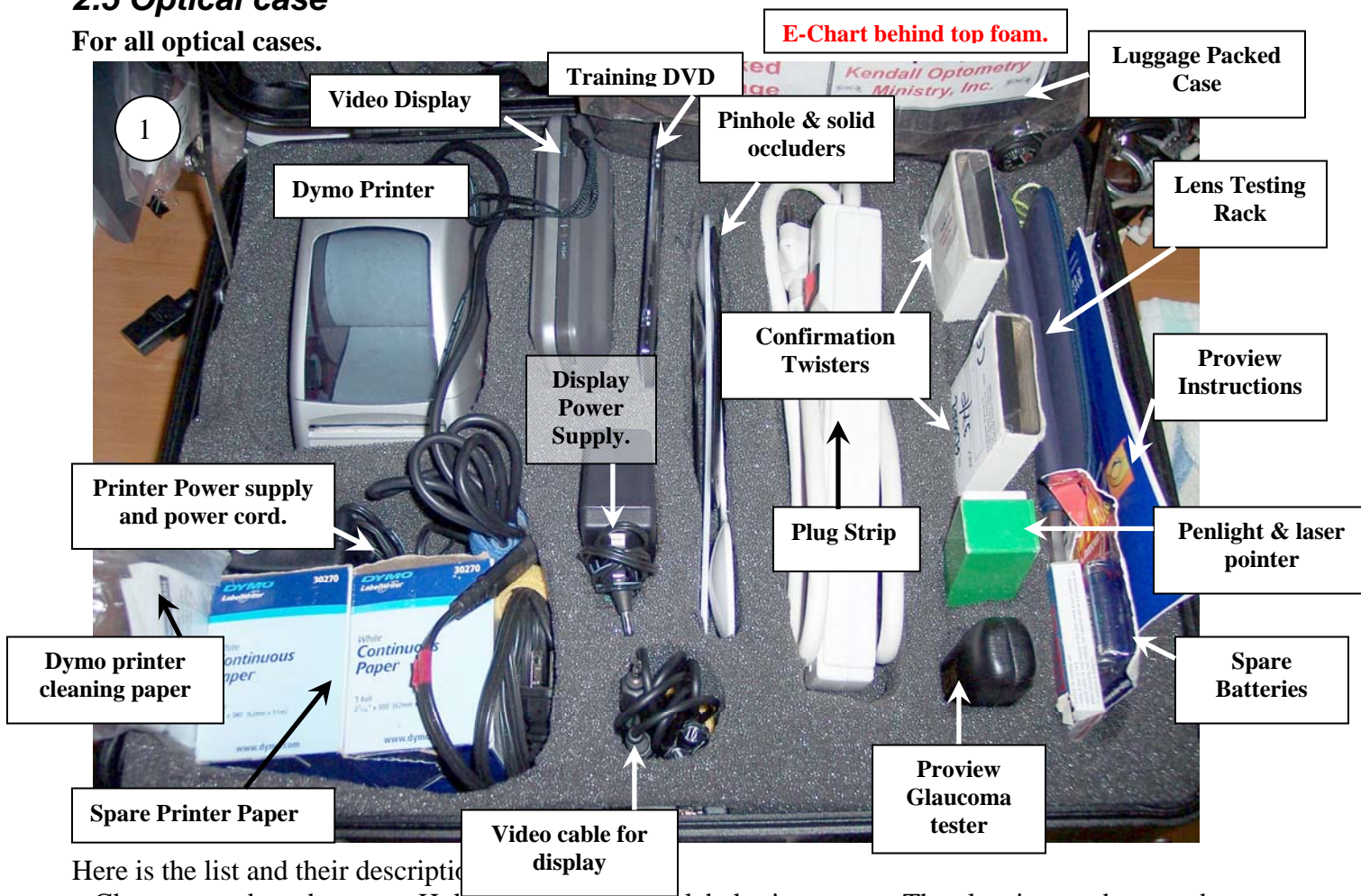
AC Surge Protector.

In the Retinomax 2 case five batteries are provided to allow 4 to be charging all the time while one is in use within the autorefractor. With the Retinomax 3 case three batteries are provided to allow 2 to be charging all the time while one is in use within the autorefractor.

There are two different types of surge protectors provided based upon the voltage of the country you will be visiting. One is 110-120VAC while the other is 220-240 VAC. Appropriate adapters are also provided for the country you will visit.

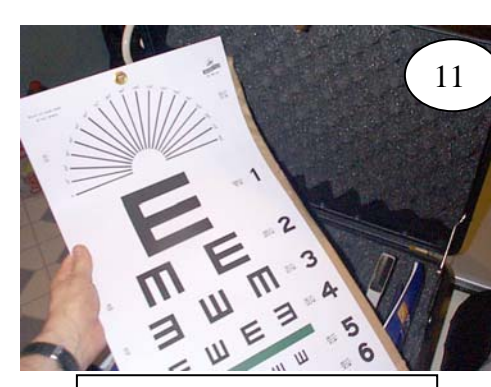
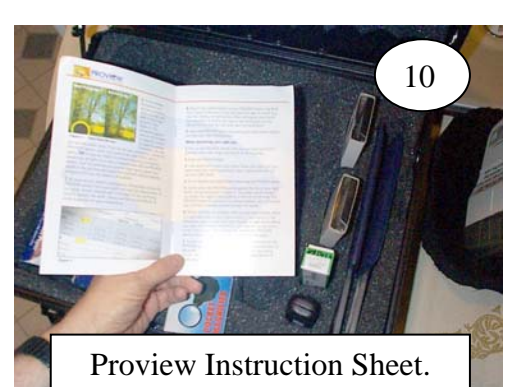
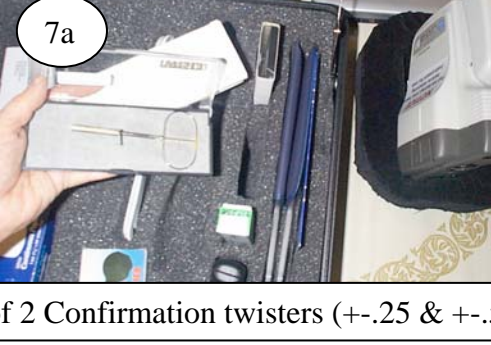
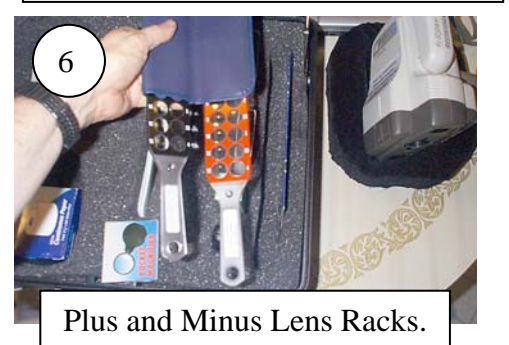
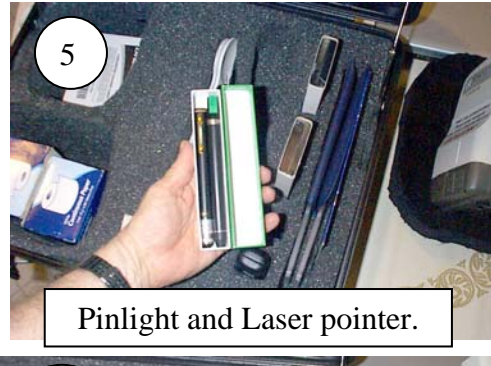
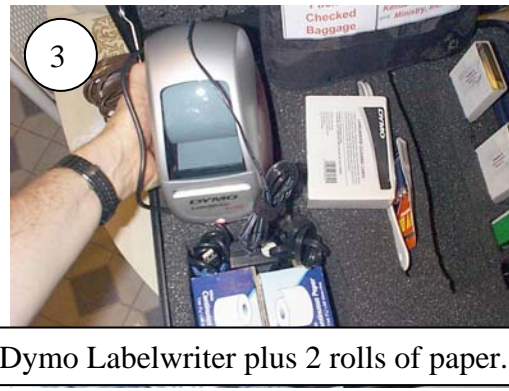
2.5 Optical case

For all optical cases.



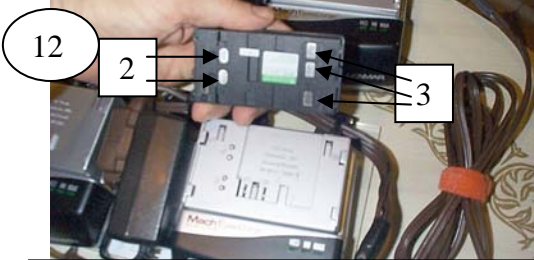
Here is the list and their descriptions:

- Cleaning cards and paper** Holds 2 rolls of Dymo labelwriter paper. The cleaning cards are to be used on the printer should the printing start smearing.
- Dymo Printer** Dymo Labelwriter printer with a roll of printer paper. Power supply and power cord are stored in front of the printer within the foam.
- Occluders (Pinhole & Regular).** The regular occluder is used to block one or the other eye while doing an eye test. If the patient can see clearly through the pinhole occluder than you can say that glasses will be helpful. If they cannot then the problem is some other problem which glasses will not fix.
- Plug Strip** This is a 6 position plug strip.
- Confirmation Twisters** There are two confirmation twisters (+-.25 and +-.50) which are used with the lens rack to refine the patient's prescription. Use these when the autorefractor fails to get a reading because of some internal eye problems (like a cataract). **Note:** With the newer optical cases the +-.25/+-.50 flippers are on a single handle.
- Lens Rack** There is a minus (for nearsighted people) and plus (for farsighted people) lens rack paddle in a blue sleeve. Use this in combination with the confirmation twisters to refine the patient's prescription.
- Penlight & Laser Pointer** The penlight is used to inspect the eye (for cataracts) and the laser pointer is used to highlight the line on the eye chart that you want the patient to read.
- Proview Eye Pressure Tester.** Use this along with the instructions to measure the pressure in the eye. 70% of the people with pressures in excess of 20 have glaucoma.
- Video Display** This display can be used to display the view the operator of the autorefractor is seeing. This can be used by the translator to assist the operator. The training DVD can also be used to further train the operator while in the field.



Retinomax 2 Battery placement.

Turn battery correct way (2 terms on left)



Placing Battery in Charger – Step 1

Slide battery forward on the plate.



Placing Battery in Charger – Step 3

Push battery down on charging plate.



Placing Battery in Charger – Step 2



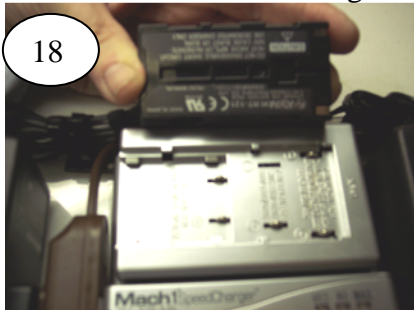
All 4 batteries on chargers and charge racks plugged into plug strip.

Retinomax 3 Battery placement.



Retinomax 3 battery rack.

Below is battery turned with the contacts to the right.



and being pushed down to the right.



Below is a picture of the charger with the battery removed:



Here the battery is being inserted:



At this point at least the left of the 3 lights on the battery charger will illuminate. If not, then the battery is not inserted properly in the charger. When all three lights are illuminated and steady, the battery is fully charged.

2.6 Checked Baggage Case

Packed within the optical case is a checked baggage case. This case contains items which should not be carry on luggage as they will likely be taken by security. Below are 2 pictures of this case which is part of case 102.



Here is the list and their description:

Miscellaneous screws	Holds a package of miscellaneous eyeglasses screws.
Jewelers Screwdrivers.	One straight edge and one Phillips reversible screwdriver.
Pliers	Tweezer pliers.
Cutters	Small cutters.
Butane torch	This is a small butane torch to heat the plastic of plastic eyeglasses frames.
Refill Cartridges	Refill cartridges for the above are in the hollow container shown below.
Cigarette lighters	A cigarette lighter to light the butane torch if necessary (if the spark does not work) The refill cartridge and the cigarette lighter are in the Butane Fuel Carrier shown below.
Hinge Oiler	This is a small oiler to oil stiff eyeglasses hinges.

Some cases have another style of checked baggage case but the contents are the same.

Butane Fuel Carrier.



This holds a fuel cell for the butane heater along with a cigarette lighter to use in case the heater spark doesn't work.

Another thing to mention is teams should go to Home Depot and purchase a couple of packages of 1/4" heat shrink tubing. This is used to cover the ear pieces of glasses in case the plastic on them is broken. This will then protect the ears of the wearer.

3.0 Final setup steps.

3.1 Main System Setup

The following pictures show the steps to perform to complete the equipment setup.



Connect the autorefractor serial cable.



See setup information for the video display at the end of this section. The display video cable connects at the arrow to the left.

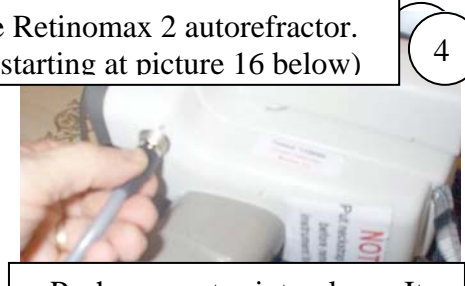
Connect video cable from the video display.

3.2 Retinomax 2 cable connection.

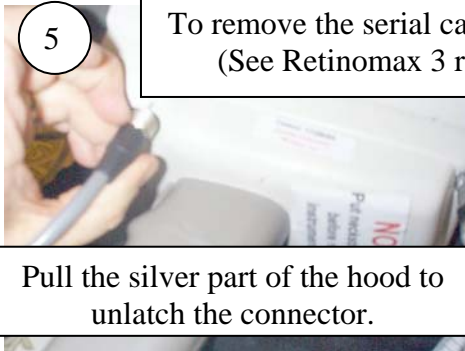


Connect the serial cable to the Retinomax 2 autorefractor. (See Retinomax 3 connection starting at picture 16 below)

Align black mark on case to black mark inside connector.

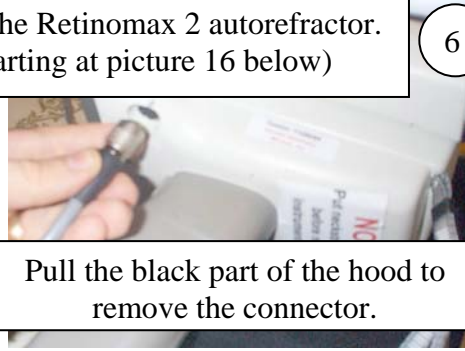


Push connector into place. It should latch securely.

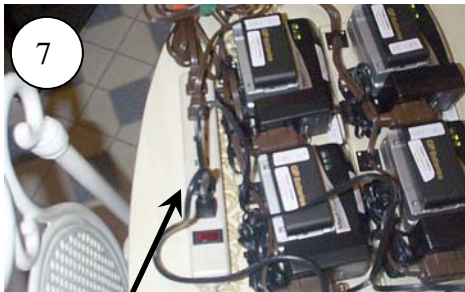


To remove the serial cable from the Retinomax 2 autorefractor. (See Retinomax 3 removal starting at picture 16 below)

Pull the silver part of the hood to unlatch the connector.



Pull the black part of the hood to remove the connector.



Plug Laptop and Dymo into plug strip



Plug power cord into Dymo Power Supply.



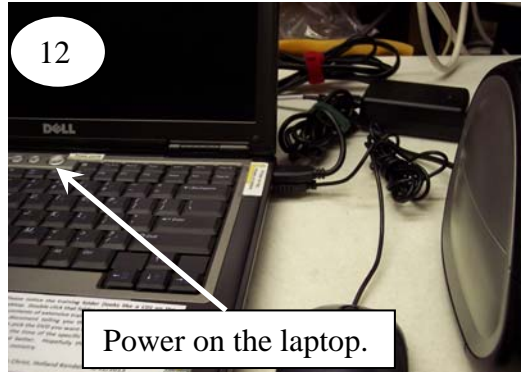
9
Plug Dymo cable into Right side of PC.



10
System is ready to power up.



11
Another view of system.



12
Power on the laptop.

Start Eyeglasses Inventory Program

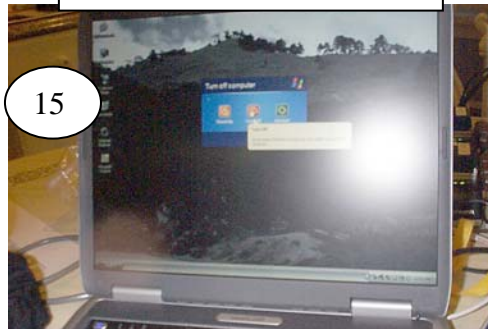


13
System is ready to Use.



14
Print on printer to verify proper operation

Shutting Down Laptop.



15
Be sure to shutdown laptop properly when completed.

3.3 Retinomax 3 Cable connection.

The Retinomax 3 has a specialized cable which connects the instrument to the video display. This cable can easily be damaged unless it is installed and removed properly. The purpose of these instructions is to describe this procedure. Please follow them carefully.

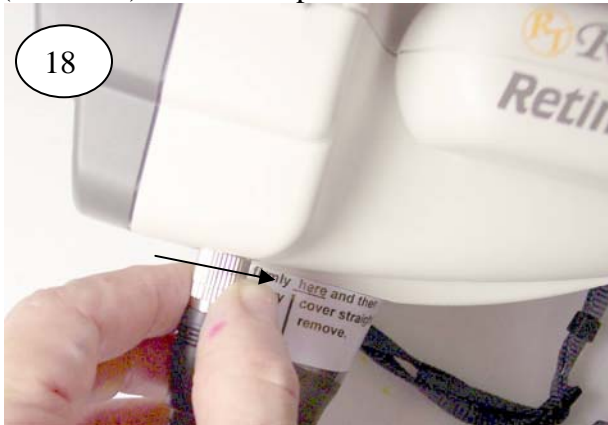
Line up the slit in the connector with the notch in the plastic case.



Gently insert Cable connector into receptacle rotating the connector if necessary for it to fit in place. Push connector in until snug.



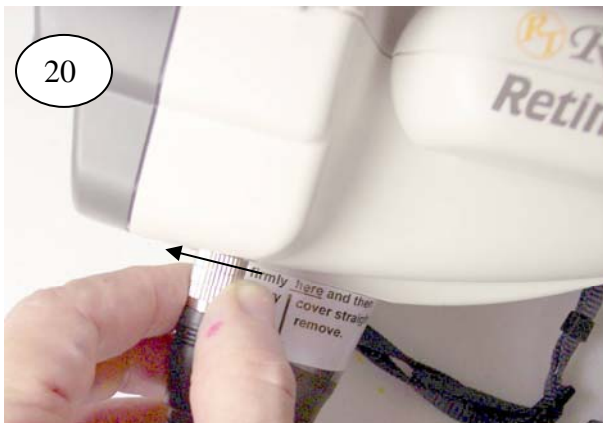
Rotate connector in a clockwise fashion (as shown) to screw in place.



Connector should now be firmly connected to the instrument.



Rotate connector in a counter clockwise direction as shown below.



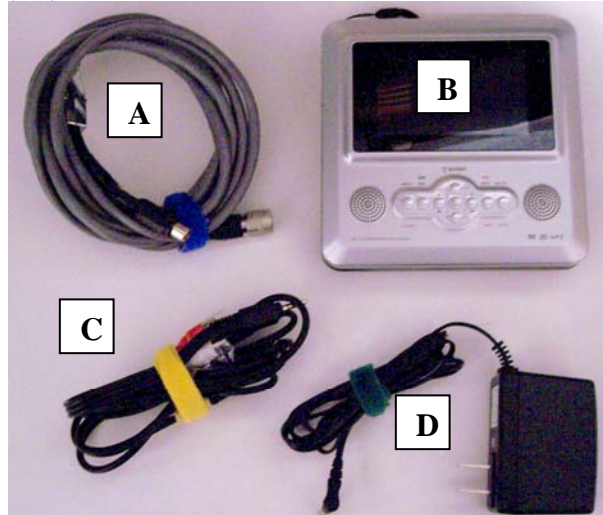
Remove cable by pulling on connector in direction shown. Do not pull on the cable to remove.



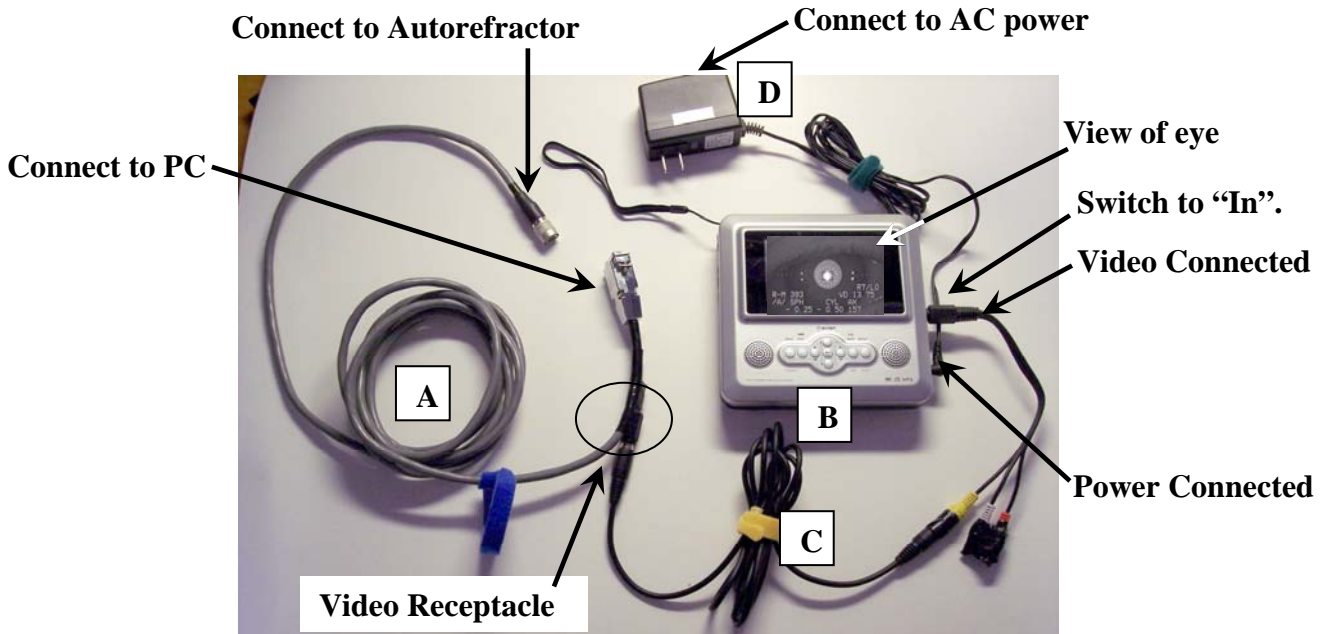
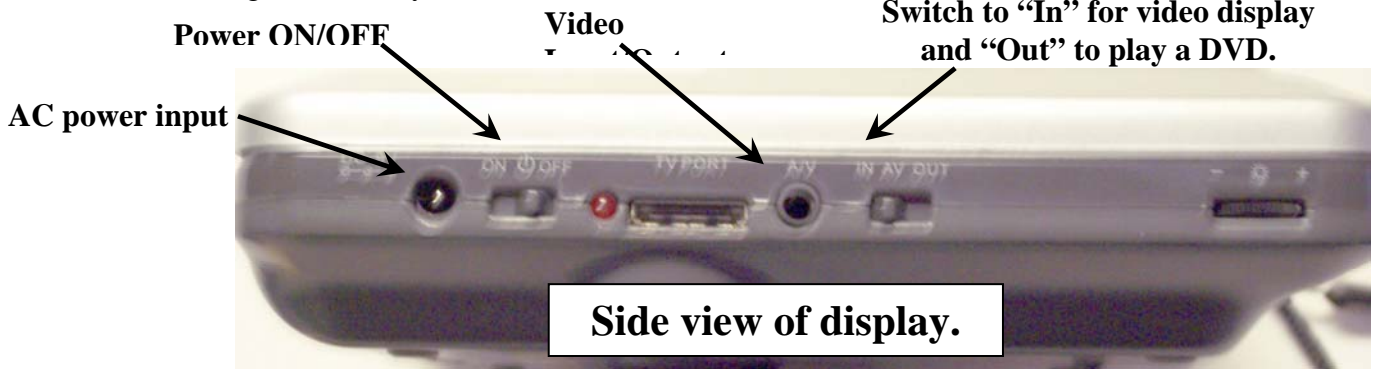
3.4 Video Display Setup

The Axion DVD player can be used for three purposes: 1) As a display to train a new person to use the autorefractor, 2) by the translator to see what the autorefractor operator sees. (He or she then knows if the patient is blinking, not looking straight, or needs to open his/her eyes wider), or 3) to play the autorefractor training DVD.

To the right you see the components used to display the autorefractor video on the Axion display.



- | <u>Item</u> | <u>Description</u> |
|-------------|---|
| A | is the autorefractor to PC connection cable. This cable also has a video receptacle near where it connects to the PC. |
| B | is the Axion Video display. |
| C | is a 6 ft video extension cable connected to the Axion adapter cable. |
| D | is the AC power supply. This may not be needed as the Axion display has a rechargeable battery. |



4.0 Replacing/Installing Autorefractor battery.

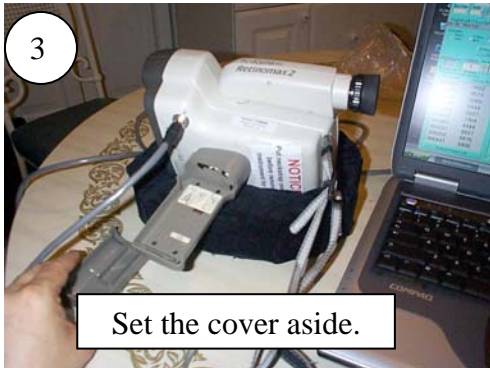
4.1 On a Retinomax 2 autorefractor.

Below are the steps showing the installation of the battery in the Retinomax 2 autorefractor.

NOTE: Velcro straps have been added to the autorefractor handle to keep it from falling open.



Slide the battery cover in the handle down.



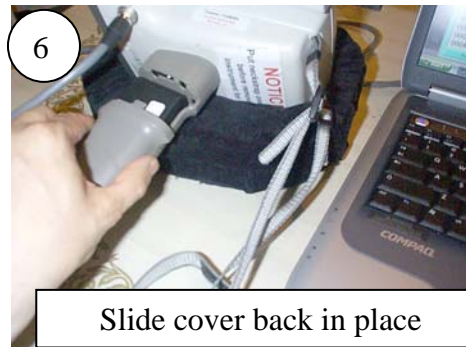
Set the cover aside.



Align battery with 3 button side down



Put battery in case bottom first.



Slide cover back in place



Slide cover back into place.

4.2 On a Retinomax 3 autorefractor.

Follow these steps to install the battery in the Retinomax 3 autorefractor

Remove the battery cover by pushing
HARD at the spot indicated below.

The battery cover will pop off.



Put cover to one side.

Align battery as shown.



Place at the top of the opening:

Push down.



and slide down.

Replace battery Cover.



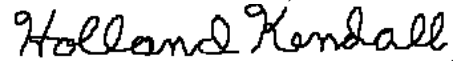
5.0 Setup Checklist.

Follow this checklist to put together an operational system. Optional steps are in yellow.

Step	Reference Section	Reference Figure(s)	Description of step.
1	2.1	1	Remove Laptop components from laptop case.
2	2.2	2	Connect power supply.
3	2.2	3	Connect the mouse.
5	2.3		Open up the autorefractor case.
6	2.4	1	Remove the autorefractor cradle.
7	2.4	2	Place autorefractor into cradle according to picture inside the cradle.
8	2.4	3	Remove autorefractor cable from case.
9	2.4	4	Remove 8 ' Extension cable from case.
10	2.4	5	Remove first charging rack from case.
11	2.4	6	Remove second charging rack from case.
12	2.4	7	Remove batteries from case.
13	2.4	8	Remove surge protector from case.
14	2.5	1	Open optical case.
15	2.5	2	Remove 6 position plug strip.
16	2.5	3	Remove Dymo Labelwriter plus power supply and cables.
17	2.5	22	Remove monitor and cables from case.
18	2.5	4	Remove occluders from case and make available in the room.
19	2.5	5	Remove penlight and laser point from case and make available in the room.
20	2.5	6	Remove lens rack from case and make available in the room.
21	2.5	7	Remove confirmation twisters from case and make available in the room.
22	2.5	8-10	Remove Proview, instructions, and magnifier from case and make available in the room.
23	2.5	11	Remove E-Chart from case and post it on the wall 20 feet from a toe line marker.
24	2.5	12-15 or 16-20	Place 4 batteries in battery charger for Retinomax 2 OR Place 2 batteries in battery charger for Retinomax 3.
25	2.6	1-2	Have checked baggage case available in the room.
26	3.1	1	Attach autorefractor serial cable to back of laptop and tighten thumb screws.
27	3.1	3-4 or 16-20	Retinomax 2: Attach serial cable to autorefractor. It can be removed with steps 5-6. Retinomax 3: Attach with 16-20 and remove with 21.
28	3.1	7	Plug laptop and Dymo into plug strip.
29	3.1	8	Plug Dymo power cable into Dymo power supply.
30	3.1	9	Plug Dymo USB cable into right side of PC.
31	3.1	10-11	System is ready to power up.
32	3.1	12-13	Power on Laptop and log into it.
33	3.4	A-D	Setup the video display to assist the translator.
34	4.1 or 4.2	1-7 or 8-16	Put battery in autorefractor handle for Retinomax 2 or Retinomax 3
35	3.0	14	Start Eyeglasses Inventory program & Test Dymo printer.
36	3.0	15	Be sure to follow proper laptop shutdown procedures.

I hope this document has been useful in your setup of the optical equipment. God bless you in your service for the Lord.

Your brother in Christ,

A handwritten signature in black ink that reads "Holland Kendall". The signature is written in a cursive, flowing style.

Holland Kendall, President
Kendall Optometry Ministries, Inc