ULTRA•LŪM, INC.™
ULTRAVIOLET - IMAGING - EXCELLENCE

O P E R A T I N G M A N U A L

ULTRACAM, USING A640 CANON CAMERA

Table of Contents

1.0 General Information

1.1 Introduction

Thank you for choosing Ultra-Lum, Inc. for your instrument needs. We here at Ultra-Lum, Inc. strive to build quality into each and every product we manufacture. We all hope that the product purchased meets and exceeds your goals and expectations. Please feel free to contact us with any questions as our knowledgeable sales and customer support staff are ready and willing to work with you. We can be contacted at the following location:

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Web Site..... www.ultralum.com

Typically the Ultra-Cam system is used in conjunction with a UV Transilluminator, for the purpose of recording, documenting, and analyzing (with the appropriate software) electrophoretic gels. Suitable applications for this system are as follows: Ethidium Bromide, Coomassie Blue, Silver Stains, SYPRO Orange, SYPRO Ruby, SYPRO Red, and film imaging.

The field of view of the Ultra-Cam is 21cm x 25cm. The camera included with the Ultra-Cam features 4X optical zoom, this enables samples to be visualized from 21cm x 25cm down to 5.3cm x 6.3cm. In fact, the Ultra-Cam can be used for any application to document an item of interest when contained on a flat surface. The following describes the function of the various parts that are included with the basic Ultra-Cam package.

The Ultra-Cam comes standard with a 600nm Band Pass Filter. This filter peaks at 600nm and passes wavelengths between 580nm and 640nm. Any application emitting wavelengths in this range will work with the Ultra-Cam. Additional filters are available that can expand the capability of the system.

White EPI lighting is installed in the Ultra-Cam hood. This can be used for viewing petri dishes with bacterial colonies, opaque blots, or other visible applications that require white incidental light. Optional ultraviolet 365nm EPI lighting can be used for applications such as TLC plates and fluorescent imaging of opaque samples.

The Ultra-Cam hood incorporates a swing-out door for easy access to samples placed inside the hood. The hood also incorporates a camera that is horizontally positioned for convenient viewing of the live image on the camera LCD. These features make Ultra-Cam the easiest-to-use gel documentation system on the market.

The basic Ultra-Cam package includes 1D analysis software, specifically designed for users performing 1D analysis of electrophoretic gels. This software also includes provisions for colony counting and array analysis, provided the white EPI lighting is in use when the image is taken.

A dedicated computer is not required. Each system comes standard with a memory card reader which allows the user to save images on the 32MB removeable flashcard . Simply remove the flashcard and take it to a remote computer then insert the card into the reader to obtain the images. Larger memory flashcards are available from Ultra-Lum for greater image capacity.

Should you require image printing, several options are available. The Ultra-Cam comes standard with a video cable allowing the images from the camera to be printed directly to a video thermal printer without the need of a computer. Optional Direct Print cables are also available allowing images to be printed from the camera directly to an inkjet printer without the need of a computer. If the images are saved to the computer, virtually any printer that is connected to that computer can be used, including digital thermal printers.

Ultra-Lum recommends using either a thermal printer or a good quality inkjet printer with photographic quality paper for printing images. Thermal prints will last up to 10 years under optimum conditions but may degrade quickly if exposed to heat. These printers and paper are available from Ultra-Lum.

The Ultra-Cam system is the most economical and versatile system of its kind on the market. You can use this system with virtually any transilluminator. This product is intended for indoor use only.

1.2 Unpacking and inspection

1.2.1 Open the shipping container.

1.2.2 Using a utility knife, cut through the packing tape that secures the flaps together on each of the two boxes.

1.2.3 Carefully remove the Ultra Cam from the shipping container and place the containers aside.

1.2.3.1 We suggest saving the containers for later instrument storage, moving the unit from one lab to another, or returning the unit for service if required.

1.2.4 Inspect the unit for damage.

1.2.4.1 Dented or damaged enclosure.
1.2.4.2 Anything that might be considered unacceptable.

1.2.5 Ensure that all of the items purchased are accounted for. Listed here are the standard items that ship with each unit.

1.2.5.1	Camera mounting bracket	20.0002-81
1.2.5.2	120 VAC Line cord	58-0004-01
1.2.5.3	240 VAC Line cord	58-0006-01
1.2.5.4	Camera mounting screws, ¼-20x 1/2", (2)	60-7000-02
1.2.5.5	Camera tripod mount screw, ¼-20x 3/8", (1)	60-7000-01
1.2.5.6	This operation manual	81-0005-39
1.2.5.7	SD Memory Card Reader	92-6000-03
1.2.5.8	Canon A640 Camera	990-0714-04
1.2.5.9	600nm Ethidium Bromide filter (EtBr)	990-0804-01
1.2.5.10	Lens Tube for A640 Camera	990-0807-04
1.2.5.11	Rubber lens hood	990-0807-01
1.2.5.12	Ultra Glo Red, UV to Visible Light converter	990-0210-03
1.2.5.13	Ultra Glo Blue, UV to Visible Light Converter	990-0210-04
1.2.5.14	Spanner Screw Driver	05-0014-01

1.2.6 If any items are missing or damaged please contact customer service so that the apparent problems may be addressed. Reference section 6.3

1.3 Warranty

Ultra-Lum, Inc. Products are guaranteed to be free of defects in materials, workmanship, and manufacture for a period of two (2) years from the date purchased. Consumable and disposable products including but not limited to Ultraviolet lamps are guaranteed to be free from defects in materials and manufacture for a period of ninety (90) days from the date purchased. If a product failure should occur during the warranty periods listed above Ultra-Lum, Inc. will examine the inoperative product and have the option of repairing or replacing any parts which in the judgment of Ultra-Lum, Inc. were originally defective or became so under conditions of normal usage and service.

No warranty shall apply to any product or part thereof that has been subjected to accident, negligence, alteration, abuse, or misuse by the end-user. However, Ultra-Lum, Inc. makes no warranties, whatsoever, with respect to parts not supplied by Ultra-Lum Inc. or that have been installed, used or serviced, other than in strict compliance with the instructions appearing in the operating manual supplied by Ultra-Lum, Inc.

In no event shall Ultra-Lum, Inc. be responsible to the end user for any incidental or consequential damages, whether foreseeable or not, including but not limited to property damage, inability to use equipment, lost business, lost profits, or inconvenience arising out of or connected with the use of products supplied by Ultra-Lum, Inc., nor is Ultra-Lum, Inc. liable for or responsible for any personal injuries occurring as a result of the use, installation, or servicing of products.

Electronics:.....2 year limited warranty.
Camera & lens:.....Covered by manufacturer's warranty terms.
Software: .....Covered by manufacturer's warranty terms.

2.0 Specifications

2.1 Safety Precautions

2.1.1 CAUTION: Dangerous Ultraviolet Radiation

2.1.1.1 This Device is a powerful source of dangerous ultraviolet radiation. It is **VERY IMPORTANT** to protect your eyes and skin from exposure.
2.1.1.2 When the door is **OPEN**, all UV lights within the cabinet will remain **ON.**
2.1.1.3 Under no circumstances should the unprotected eyes or skin be exposed to the UV radiation. Ultra-Lum UV blocking glasses, UV blocking goggles, and UV blocking full face shields are available which when used in conjunction with long sleeve shirts or lab coats and gloves should provide and allow safe handling of ultraviolet products without adverse effects. Ensure that all personnel in the area who are using or observing this equipment are adequately protected.

2.1.2 CAUTION: Electrical Exposure

2.1.2.1 Do not attempt to operate the device with the protective panel removed as this will expose the user to the **HIGH VOLTAGE** AC main's circuitry.
2.1.2.2 Never operate the system in or near water or environments with high levels of moisture in the air.

2.1.3 CAUTION: Read Manual

2.1.3.1 Refer to the Gel Explorer manual before operating the instrument.

2.1.4 CAUTION: Mercury Notification

2.1.4.1 THE LAMPS IN THESE PRODUCTS CONTAIN MERCURY—DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS.

2.2 Safety Features

2.2.1 AC Mains Switch

2.2.1.1 The AC Mains power switch can be used at any time to stop all of the operations.
2.2.1.2 The sealed housing protects the user from ultraviolet radiation.

2.3 Electrical Ratings (if using an Ultra-Lum electronic transilluminator)

2.3.1 See AC Line ratings label ..... 100, 120 or 230 VAC as listed on label
2.3.2 AC Line Frequency 50/60Hz
2.3.3 Dual Fuse Rating ..... 1A 250VAC, T (Time Delay), 5x20mm

2.4 Mechanical

2.4.1 Exterior Dimensions ..... 12" D x 15" H x 14.5" W (30.5cm x 36.8cm x 38.1cm)
2.4.2 Weight ..... 26 lbs. (12 Kg)
2.4.3 Cord Inlet ..... IEC Style AC Line Power Entry Module

2.5 Environmental Conditions for Instrument Operation

2.5.1 Relative Humidity 5-95%
2.5.2 Temperature..... 10-40 degrees C
2.5.3 Installation Category II
2.5.4 Pollution Degree..... 2

2.6 Replacement Components

2.6.1 Camera Mounting Bracket 20-0002-81
2.6.2 Fuse 1A 250VAC T 5x20mm 56-2010-10
2.6.3 240 VAC Line Cord 58-0006-01
2.6.4 120 VAC Line Cord 58-0004-01
2.6.5 Camera Mounting Bracket Screws, ¼-20x ½", (2).....60-7000-02
2.6.6 Camera Mounting Screw, ¼-20x 3/8", (1).....60-7000-01
2.6.7 This Operation Manual.....81-0005-39
2.6.8 SD memory card reader.....92-6000-03
2.6.9 Camera, Digital CCD A640 990-0714-04
2.6.10 Lens Tube for A640 Camera.....990-0807-04
2.6.11 EtBr filter.....990-0804-01
2.6.12 Rubber Lens Hood 990-0807-01
2.6.13 Spanner Screw Driver 05-0014-01

2.7 Accessories

2.7.1 Red Ultra Glo UV to Visible light converter…….. 990-0210-03
2.7.2 Blue Ultra Glo UV to Visible light converter 990-0210-04
2.7.3 UV EPI lighting kit (UVA,UVB, and UVC)…… 990-0010-01
2.7.4 GFP (Green Fluorescent Protein) EPI Lighting kit…….. 990-0805-03
2.7.5 SyBr green filter, 52mm…….. 990-0804-02
2.7.6 Standard thermal paper, one roll…….. 990-1102-01
2.7.7 High gloss thermal paper, one roll…… 990-1103-01
2.7.8 Parallel thermal printer……990-1104-02
2.7.9 **Transilluminator, Mid Size Options:**

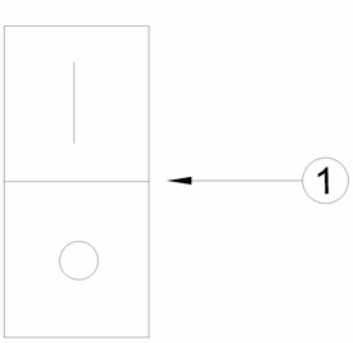
2.7.9.1 UVC, 15x15cm filter 900-1322-01
2.7.9.2 UVB, 15x15cm filter 900-1322-02
2.7.9.3 UVA, 15x15cm filter 900-1323-03
2.7.9.4 UVC/UVB, 20x20cm filter..... 900-1323-01
2.7.9.5 UVC/UVA, 20x20cm filter……..... 900-1323-02
2.7.9.6 UVB/UVA, 20x20cm filter 900-1323-03
2.7.9.7 UVC, 21x25cm filter 900-1324-01
2.7.9.8 UVB, 21x25cm filter 900-1324-02
2.7.9.9 UVA, 21x25cm filter 900-1324-03
2.7.9.10 UVC/UVB, 20x20cm filter 900-1323-12
2.7.9.11 UVC/UVA, 20x20cm filter 900-1323-13
2.7.9.12 UVB/UVA, 20x20cm filter 900-1323-23
2.7.9.13 UVB/UVC, 21x25cm filter 900-1324-12
2.7.9.14 UVA/UVC, 21x25cm filter 900-1324-13
2.7.9.15 UVA/UVB, 21x25cm filter 900-1324-23

2.8 Computer requirements using the Canon A640 and 1D Analysis software

2.8.1 CD-ROM Drive.
2.8.2 USB Port
2.8.3 128 MB ram (256MB or more recommended).
2.8.4 A Video Display card and monitor set to display 24 bit color or greater using 800x600 resolution or greater (1024x768 resolution recommended).
2.8.5 Pentium 150 Mhz minimum if using windows 2000 or 98.
2.8.6 Pentium 300 Mhz minimum if using Windows XP
2.8.7 320 MB available hard drive space. (40-60 GB recommended).
2.8.8 Windows XP, 2000, ME, 98SE, 98.

2.9 Symbols and Controls Defined

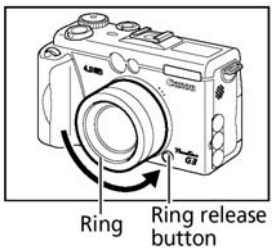
1. AC Main power switch



3.0 Set-Up Instructions

3.1 Installing the Camera (Refer to appendix A, Figure 1)

3.1.1 Install the CF memory Card into the slot on the side of the camera.
3.1.2 Press the ring release button and remove the ring from around the lens on the camera body. See image below.



3.1.3 Attach the Lens Tube and rotate in a clockwise direction to secure it to the camera.
3.1.4 Thread the EtBr Filter into the Lens Tube to secure.
3.1.5 Then thread the rubber lens hood into the EtBr filter (or to the lens tube if not using a filter).
3.1.6 Using (2) ½ " long spanner screws and driver secure the black camera bracket to the Ultra cam.

3.1.6.1 Leave the bracket loose until after the camera is mounted to the bracket. Final positioning is determined by the camera position with the entrance port of the Ultra Cam.

3.1.7 Using (1) 3/8" long spanner screw and driver place the nylon washer over the spanner screw.
3.1.8 Next place the remaining nylon washer on the camera bracket.
3.1.9 While holding the camera in place over the mounting bracket finger tighten the spanner screw.
3.1.10 With all (3) spanner screws loose adjust the alignment of the camera to the entrance port.
3.1.11 Ensure that the rubber lens hood is in contact with the Ultra Cam's enclosure.
3.1.12 Tighten the ((3) spanner screws.
3.1.13 Performing this operation correctly ensures a light tight enclosure is achieved.

3.2 Connect the AC Power Adapter to the camera

3.2.1 Open the connector cover door located on the side of the camera.
3.2.2 Insert the AC Power Adapter plug into its receptacle.
3.2.3 Then push the cable into the cable clip located on the side of the ultra cam.
3.2.4 This is used to ensure that the camera's power cable is out of the way.
3.2.5 Plug the AC Power Adapter into the appropriate AC wall receptacle.

3.3 Connecting the camera's USB cable

3.3.1 This section only needs to be done if you are using a computer to control the camera and / or upload images to the computer..
3.3.2 Locate the USB cable. This cable is provided by the camera's manufacturer.
3.3.3 Connect the cable to the cameras USB connector and the other end to the computer's USB connector.

3.4 Installing the Camera Software and Drivers

3.4.1 Follow the Software installation instructions contained within the camera user manual.

3.5 Installing the 1D analysis software

3.5.1 Follow the installation instructions contained within the software users manual.

3.6 Installing the Memory Card reader

3.6.1 Connect the USB cable supplied with the card reader into both the card reader and the USB port of your computer.

3.6.2 Refer to the instructions supplied by the card reader manufacturer for driver, software installation, and device operation.

3.7 Camera Alignment

3.7.1 Turn Ultra Cam the AC power ON. The EPI lighting should come on.

3.7.2 Refer to the Camera Instruction manual to turn on the camera power.

3.7.3 Obtain an image in the camera LCD.

3.7.4 Adjust the position of the Ultra Cam over the transilluminator filter until the filter is centered in the camera LCD.

3.7.5 If further adjustment is required loosen the (3) spanner screws that secure the camera to the bracket and the bracket to the enclosure.

3.7.6 Adjust the position of the camera to center the image of the transilluminator filter glass within the Camera LCD.

3.7.7 Tighten the (3) spanner screws using the spanner screwdriver supplied.

4.0 Operating Instructions

4.1 Hardware Operation and Verification

4.1.1 With the Transilluminator power off open the front access door to the Ultra Cam and place a piece of grid paper over the Transilluminator filter. Any appropriate black and white image target may be used for the initial set up.
4.1.2 Close the front door on the Ultra Cam.
4.1.3 Turn the White EPI lighting on using the AC power entry module power switch located on the side of the Ultra Cam.
4.1.4 Using the instructions located in the camera users manual turn the camera power on and obtain and image of the grid paper target on the camera LCD.
4.1.5 Following the instructions contained within the camera users manual adjust the focus, zoom, and F-number to obtain the best desired image. Generally the image would show the entire filter surface of the transilluminator.
4.1.6 Take a picture of the grid paper target and store the image.
4.1.7 Using the camera zoom, zoom in to get the highest magnification possible.
4.1.8 Adjust the focus and f-number to obtain a clear image of the grid paper target.
4.1.9 Take a picture of the magnified portion of the grid paper target and store the image.
4.1.10 Using the instructions contained within the camera users manual transfer the two images to the computer. This can be done (2) ways, (1) using the USB cable connection to a computer or (2) using the card reader attached to a computer.

4.1.10.1 NOTE: Because the Ultra Cam contains a single mirror all images taken will be shown upside down and backwards.

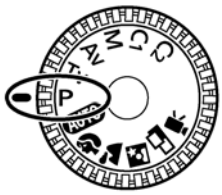
4.1.11 Using the camera software or equivalent the image can be inverted.
4.1.12 After inverting the images print a copy of each image using a high-resolution printer.
4.1.13 Visually verify that both images are clear and sharp.

4.1.13.1 If a printer is unavailable you can verify the clarity and sharpness of the images using the camera or analysis software.
4.1.13.2 In the event either image or both are not clear repeat the above instructions maintaining the highest precision possible until sharp and clear images are obtained.
4.1.13.3 It is recommended that the grid paper target be used in establishing a clear and sharp image for each of the zoom settings prior to photographing the actual working sample. This will ensure the resultant image has the best clarity possible.

4.1.14 Open the Access Door and remove the paper.
4.1.15 Turn off the white EPI lighting using the power switch located on the power entry module on the side of the Ultra Cam.
4.1.16 Close the access door.
4.1.17 Turn off the camera power.
4.1.18 This completes the hardware and operating verification.

4.2 Focusing on Non-Visible Gels through the Camera Only

4.2.1 Turn the camera power on.
4.2.2 Position the **MODE DIAL** on **P**



4.2.3 Press the **MENU** button on the back of the camera.
4.2.4 Use the **ARROW** buttons and the **SET** button to select and set the following values:

4.2.4.1 Slow Syncro : ..... **OFF**
4.2.4.2 Red Eye: ..... **OFF**
4.2.4.3 Spot AE Point: ..... **AF Point**
4.2.4.4 AF Frame: ..... **Center**
4.2.4.5 AF-Assist Beam: ... **OFF**
4.2.4.6 Digital Zoom: ..... **OFF**
4.2.4.7 Auto Power Down: **OFF**
4.2.4.8 Video System: ..... **NTSC**

4.2.5 Then press the **MENU** button to **EXIT** the menu screen
4.2.6 Press the **FUNC** button located on the back of the camera in the followingway and set the values as indicated.

4.2.6.1 Use the **UP** and **DOWN** ARROWS to select the **ISO** to change the ISO speed Setting.
4.2.6.2 Use the **UP** and **DOWN** arrows to select **AUTO**.
4.2.6.3 Use the **UP** and **DOWN** arrows to select the **photo effect.**
4.2.6.4 Use the **LEFT** and **RIGHT** arrows to select **B/W**.
4.2.6.5 Press the **FUNC** button to **EXIT** the function settings menu.

4.2.7 Press the up selection button next until the lightening bolt icon appear on the LCD screen this ICON indicates that the flash is off.
4.2.8 Press the down selection button until a flower ICON appears on the LCD screen. This turns the macro mode on.
4.2.9 Press the shutter button to take a picture.

4.2.10 If the image is out of focus, press the **SET** button.

4.2.10.1 .. Use the l**eft, right, up,** and **down** arrows to move the rectangular auto focus frame so that it is over the bright band in the gel.
4.2.10.2 .. Press the **SET** button to set the **auto focus frame** location.
4.2.10.3 .. Press the **shutter** button to take the picture.

4.2.11 If the image is still out of focus, press the **SET** button.

4.2.11.1 .. Use the main **selector dial wheel** behind the shutter button to **adjust the focus** until an acceptable focus is obtained.
4.2.11.2 .. Press the **Shutter** button to take a picture.

4.3 Transferring images into analysis software

4.3.1 You **MUST** save the images first as **Gray scale uncompressed tagged image format (.tif).**
4.3.2 Use the **SAVE AS** feature provided by the camera Software.
4.3.3 The images can then be imported into the 1D analysis software.

4.4 Focusing on Visible Gels Through the Camera Only

4.4.1 The focusing instructions are the same as for Non-Visible Gels, except the **AF-ASSIST BEAM** is set to **ON**.

4.5 Focusing for Non-Visible Gels Through the Software

4.5.1 Refer to the Camera's Software manual for further instructions.

5.0 Service

5.1 Troubleshooting

5.1.1 **Problem:** System does not operate.

5.1.1.1 Verify that the AC power cord is completely plugged into the wall receptacle.
5.1.1.2 Verify that the AC wall receptacle is functioning.
5.1.1.3 With the AC line disconnected, check the fuse and replace if necessary. Refer to Fuse Replacement section 5.2 of this manual for further instructions.

5.1.2 **Problem:** Only one of the EPI lamps operates.

5.1.2.1 Check the lamp to ensure that it is correctly seated within the lamp electrical sockets.
5.1.2.2 If the lamp is seated properly the lamp has failed and needs to be replaced. Refer to the maintenance section of this manual for additional instructions.

5.1.3 **Problem:** Both of the EPI lamps won't come on and the fuse appears good.

5.1.3.1 Ensure that the lamps are properly seated in the lamp sockets.
5.1.3.2 The lamps have failed replace both of the lamps.

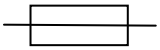
5.1.4 **Problem:** The camera fails to operate.

5.1.4.1 Refer to the camera user's manual for trouble shooting and operational malfunctions.

5.1.5 **Problem:** The camera's software fails or experienced trouble registering the software.

5.1.5.1 Refer to the user manual for trouble shooting procedures.

5.2 Fuse Replacement

5.2.1  This symbol represents the fuse and is located on rear panel of the system on a label indicating the fuse type and rating.

5.2.2 Remove the AC line cord from the side of the system.

5.2.3 Remove the fuse drawer from the input AC module.

5.2.4 Remove the fuses.

5.2.5 Visually inspect the fuses for blackening or an internally open fuse link.

5.2.6 If all visual inspection looks good then continuity check the fuse by measuring its resistance using an Ohmmeter. The resistance should be less than 1 ohm.

5.2.6.1 If any of these signs are detected replace both the fuses.

5.2.6.2 Refer to Section 2.3 to determine the correct fuse rating.

5.2.6.3 Always use fuses of the correct type and rating.

5.2.7 Place the replacement fuses into the fuse drawer.

5.2.8 Install the fuse drawer in the input AC line module.

5.2.9 Plug the AC line cord into the input AC line module.

5.2.10 Start and operate the system.

5.3 Lamp Replacement (Refer to Figure 2 in Appendix A)

5.3.1 Be careful not to touch the mirror surface. Damage to the mirror surface can result in poor image quality.

5.3.2 Unplug the AC line cord from the Ultra Cam's AC power entry module.

5.3.3 Place the Ultra Cam on a clean soft surface.

5.3.4 Tilt the Ultra Cam back until it rests on the 45-degree sloping section.

5.3.5 Using a phillips screwdriver loosen the (2) captive screws securing the filter cover to the EPI lighting enclosure.

5.3.6 Carefully lift the lid off the box.

5.3.7 Gripping the lamp with thumb and forefinger rotate the tube until the sockets unlock releasing the tube so that it may be removed from the enclosure.

5.3.8 Place the failed lamps aside for proper disposal.

5.3.9 Place the new lamp into the EPI lighting fixture. Insert both ends of the lamp completely into the lamp sockets and then rotate to lock into place.

5.3.10 Remove any finger prints from the lamps before securing the covers in place.

5.3.11 Position the cover over the EPI lighting fixture.

5.3.12 Secure the cover by tightening both (2) captive screws using a phillips screw driver.

5.4 Mirror Cleaning

5.4.1 The mirror can be damaged easily. We recommend strict adherence to the following procedure to avoid any damage to the mirror.
5.4.2 Unplug the AC line from the Ultra Cam.
5.4.3 Place the Ultra Cam on a clean Soft surface.
5.4.4 Tilt the Ultra Cam back until it rests on it's 45 degree sloping section.
5.4.5 If the mirror appears to be dirty from just particulate matter, obtain a source of clean dry compressed air.

5.4.5.1 Test the cleanliness of the air by blowing it across a clean shiny surface.
5.4.5.2 Verify that the air does not deposit oil, moisture, residues or particulate materials on the surface.

5.4.6 Using the clean dry air blow off as much loose dust as possible.
5.4.7 If dry clean air is unavailable then use a soft lens brush and gently sweep the mirror from side to side.
5.4.8 If the mirror shows signs of smudges or finger prints clean the mirror using lens tissue and cleaner.
5.4.9 Lens Tissue and cleaner can be purchased from any retail camera store.
5.4.10 Be sure to follow the instructions closely so as to not damage the mirror.

5.5 Customer Service

5.5.1 Contact Information

Ultra-Lum, Inc.
1480 N. Claremont Blvd.
Claremont, Ca 91711

Phone 909-399-3694
Toll free in USA 800-809-6559
Fax 909-482-0527

Email ..... info@ultralum.com
Web Site..... www.ultralum.com
For software technical support, contact the software manufacturer.

6.0 Application Information

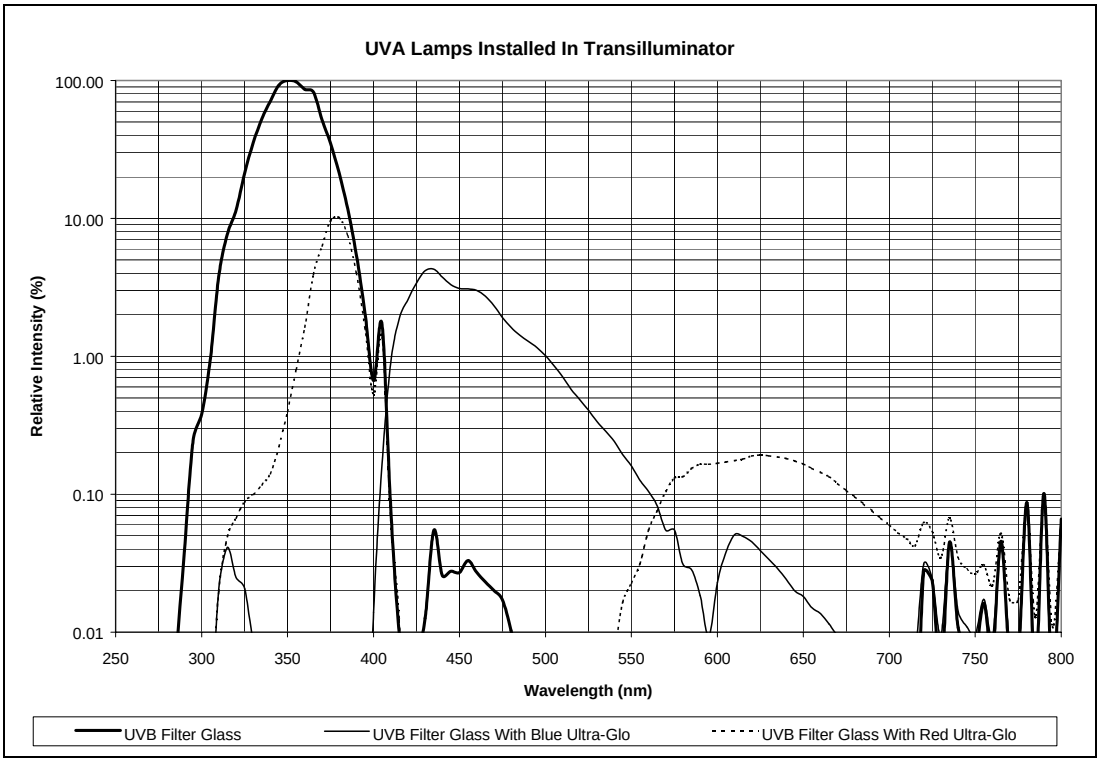
6.1 Lamp spectral characteristics

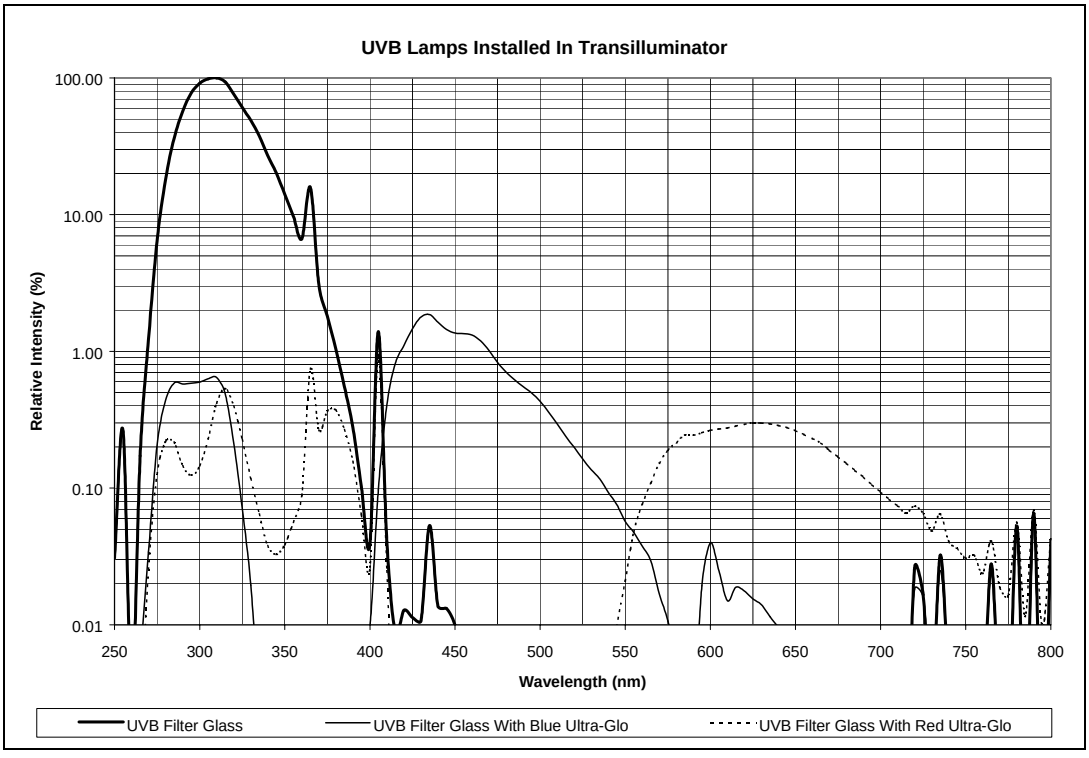
6.1.1 See pages 19 and 20.

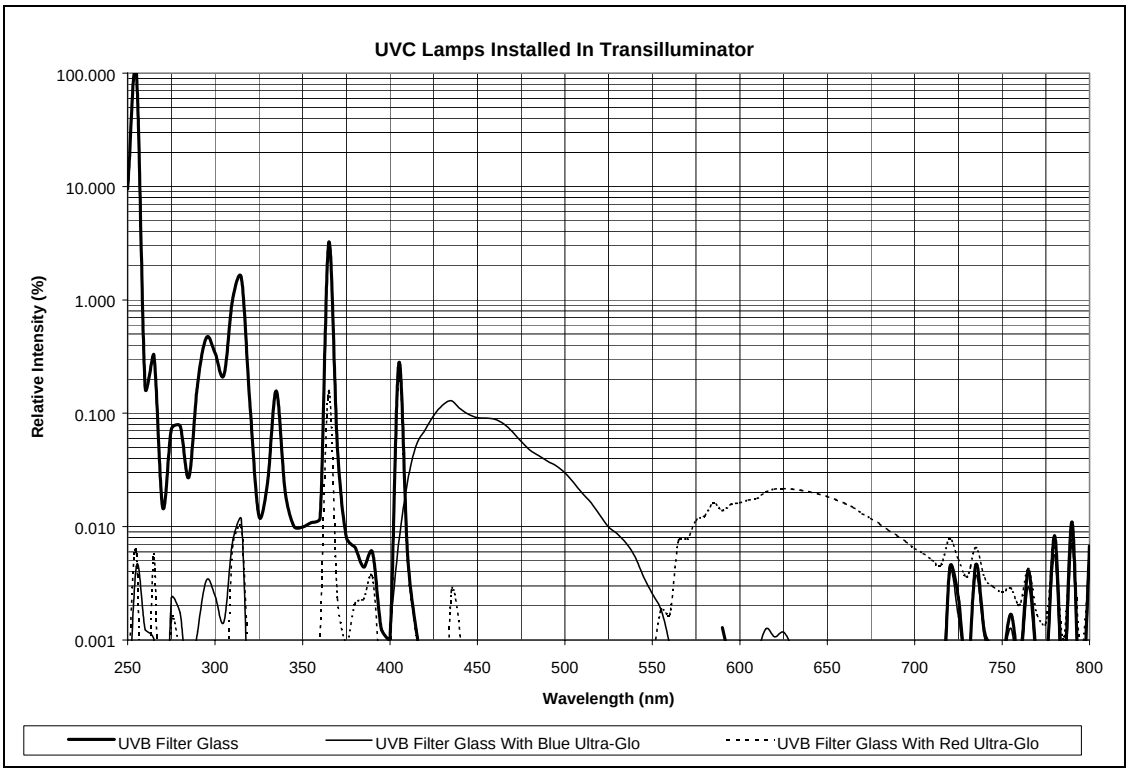
6.2 Filter Transmission curves

6.2.1 See page 20.

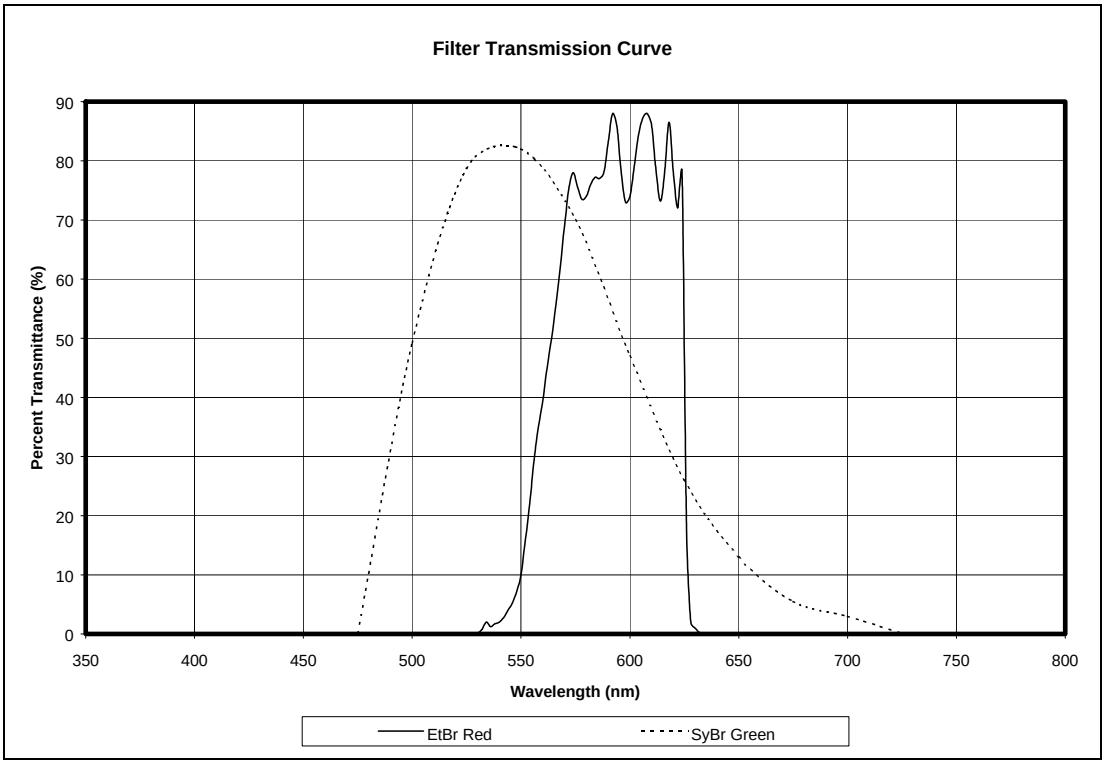
6.1 Lamp Spectral Characteristics







6.2 Filter Transmission Curves



7.0 Appendix

7.1 Figure 1

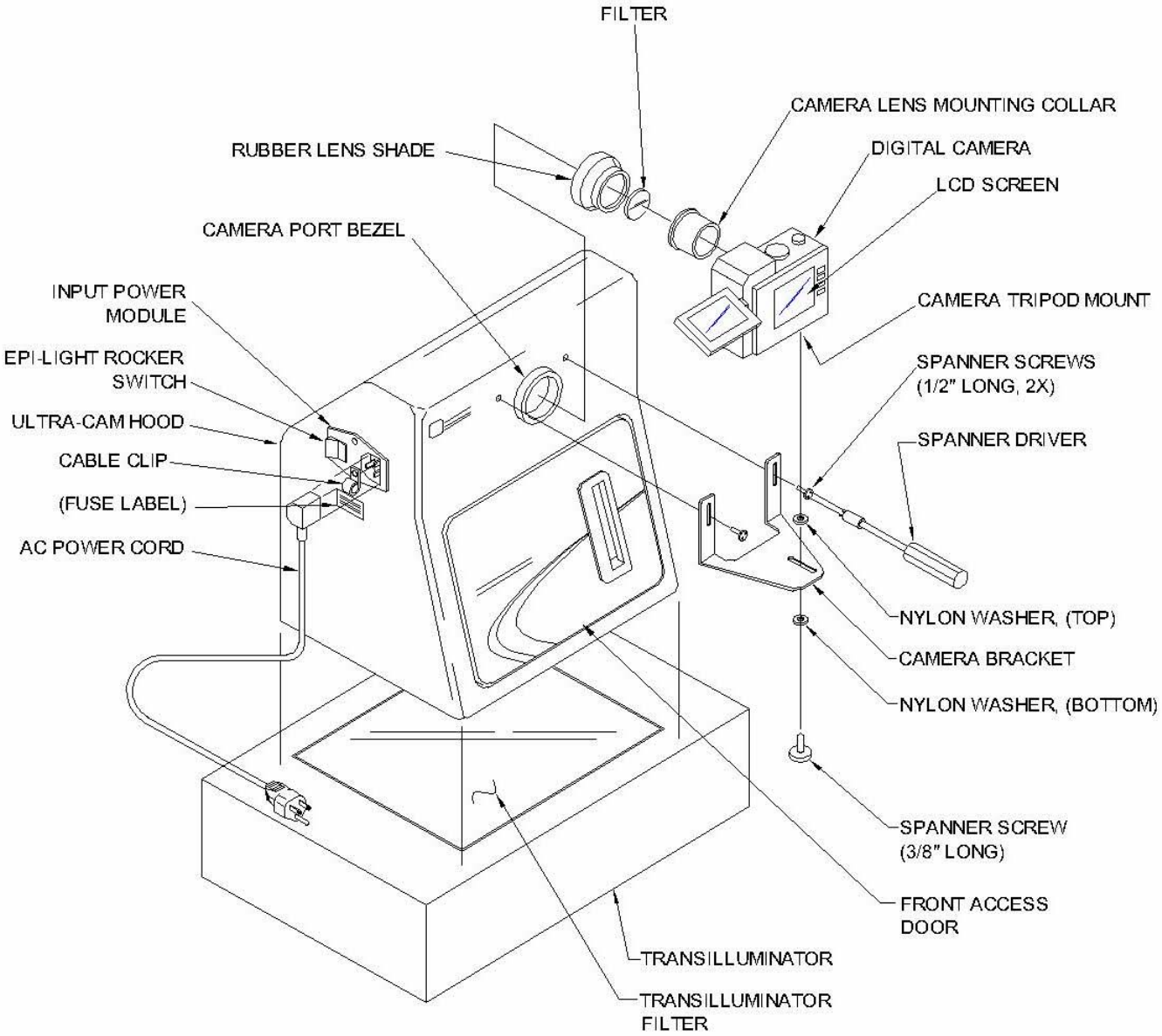
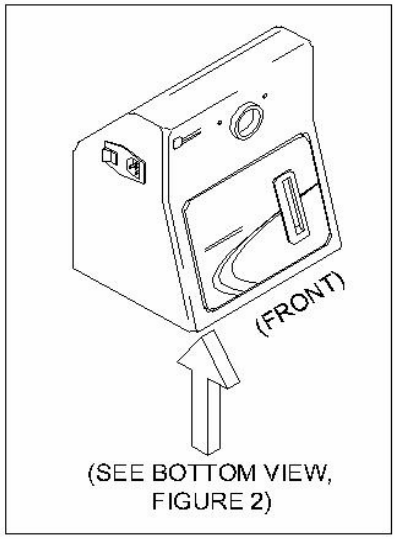


FIGURE 1
ASSEMBLY LAYOUT

7.2 Figure 2



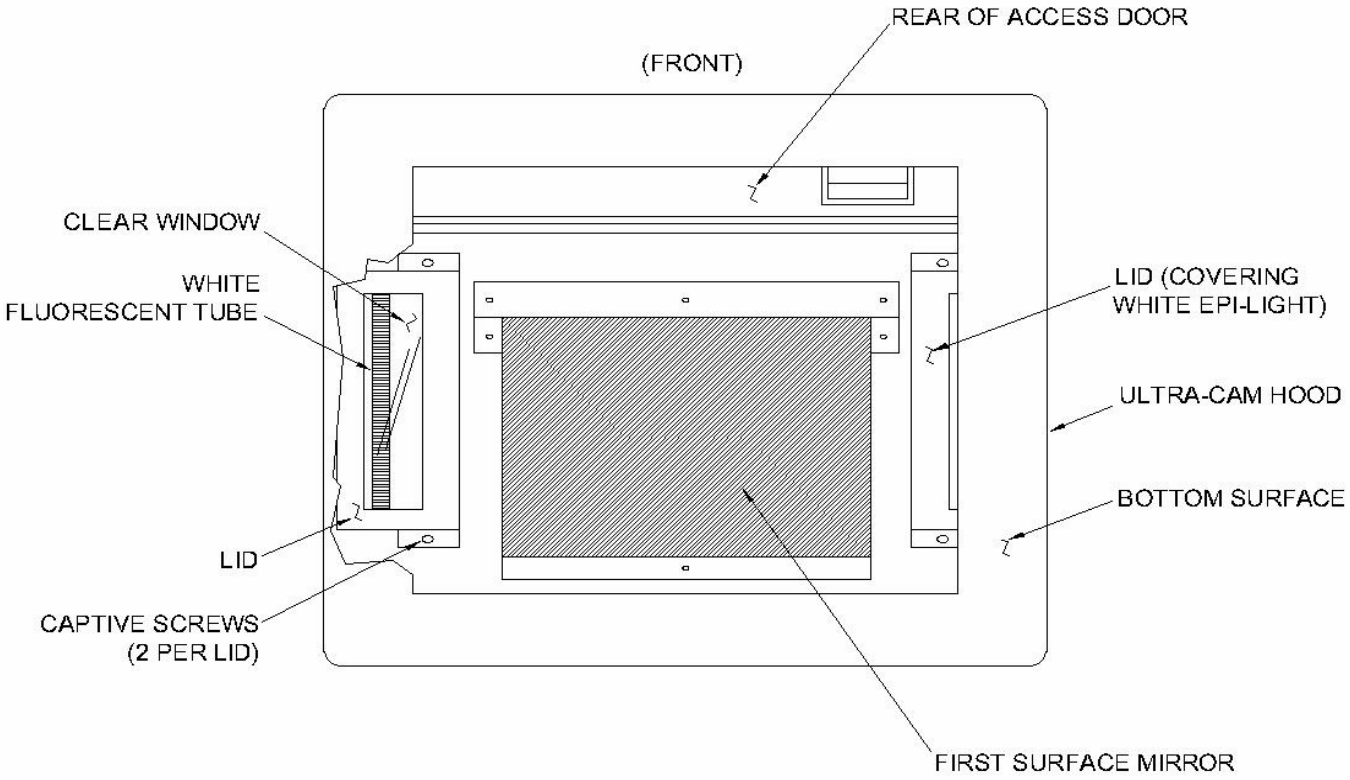


FIGURE 2

BOTTOM VIEW

7.3 Declaration of Conformity for CE (European Community)

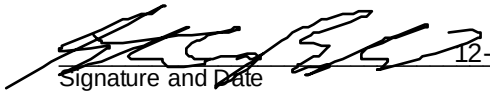
DECLARATION OF CONFORMITY

Application of Councel Directive: 89/336/EEC and 73-23-EEC

Standards to which Conformity is Declared:	EN6010-1: 2001 EN61326: 1998 EN55011 Class A Group 1 EN61000-4-2 EN61000-4-3 EN61000-4-4 EN61000-4-5 EN61000-4-6 EN61000-4-11 EN61000-3-2: 2001 EN61000-3-3: 2000
Manufacturer's Name:	Ultra-Lum, Incorporated
Manufacturer's Address:	1480 N. Claremont Blvd. Claremont, CA 91711 Tel 909-399-3694
Equipment Description:	UltraCam
Equipment Class:	Laboratory, Measurement and Process Control Equipment.
Part Numbers:	UltraCam Series 910-41XX-XX, and 910-42XX-XX

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

1480 Claremont Blvd., Claremont, California
Place



12-19-06
Signature and Date

STEVEN G. BOLAND, C.O.O.
Full Name & Title (print)

Form en219freehand/81-0005-39