SuperBright II 3000 Series
Instruction Manual

Terms Used in This Warranty and the Instructions

Light – This always refers to the complete light assembly, which is the housing, handle, and everything inside the housing. Sometimes referred to just as the ***SuperBright II***.

Lamp – This always refers to the bulb, tube, or light tube. The **LS-16X** is the lamp (bulb) that is used in the ***SuperBright II*** Short Wave model 3254. The **LM-16-312** is the lamp used in the Medium Wave model 3312. The **LL-16-351** is the lamp used in the LW350 model 3351, and the **LL-16-368** is the lamp used in the LW370 model 3368. The last three digits of the model number refer to the peak wavelength of the output.

Power supply (AC adaptor) – This refers to the 100VAC to 220VAC to 12VDC electronic power supply that provides the 12VDC necessary to operate the light from a wall outlet [the power supply is labeled an AC Adaptor]. This **HIPRO HP-O2040D43** (or equivalent) power supply is a separate unit that has an 115VAC cord that plugs into wall power with another cord that has a round plastic female connector that plugs into the ***SuperBright II***.

MODELS AVAILABLE

There are four models of the ***SuperBright II,*** model 3254 is Short Wave (SW) at 253.7 nm, model 3312 is Medium Wave (MW) with a peak at 312 nm, model 3351 is Long Wave with a peak at 351 nm (LW350), and model 3368 is Long Wave with a peak at 368 nm (LW370).

WARRANTY

The UV SYSTEMS, Inc. ***SuperBright II*** model 3254, complete with the **HP-O2040D43** power supply, is guaranteed to be free of defects in materials, workmanship, and manufacture for one (1) year from date of purchase. Consumable and disposable products, including –but not limited to –lamps (light tubes), filters, and rechargeable batteries are guaranteed to be free from defects in workmanship and materials for thirty (30) days from date of purchase. If equipment failure or malfunction occurs during the warranty period, UV SYSTEMS, Inc. will examine the inoperative equipment and have the option of repairing or replacing any part(s) which, in the judgment of UV SYSTEMS, Inc., was (were) originally defective or became so under conditions of normal usage and service.

No warranty shall apply to any instrument or light, or part thereof that has been subject to accident, negligence, alteration abuse, or misuse by any user. Moreover, UV SYSTEMS, Inc. makes no warranties whatsoever with respect to parts not supplied by UV SYSTEMS, Inc. or that have been installed, used, and/or serviced other than in strict compliance with the instructions appearing in the operation manual supplied to the end-user.

In no event shall UV SYSTEMS, 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 the equipment, lost business, lost profits, or inconvenience arising out of or connected with the use of instruments or lights produced by UV SYSTEMS, Inc. Nor is UV SYSTEMS, Inc. liable or responsible for any personal injuries occurring as a result of the use, installation and/or servicing of the equipment or light.

WARNING for Models 3254 and 3312

When the 3254 or 3312 model lights are operating, considerable ultraviolet (253.7 nm, UV-C from the model 3254, or 312 nm, UV-B from the model 3312) energy is emitted which may produce sunburn on the skin and/or conjunctivitis to the eyes upon exposure to direct or reflected radiation. Never look into a lighted ***SuperBright II*** model 3254 or model 3312 light because it can quickly sunburn your eyes and skin. Always hold the ***SuperBright II*** models 3254 or 3312 so that the ultraviolet light shines away from you and others. The ***SuperBright II*** models 3254 or 3312 may emit more ultraviolet than you are used to. It is suggested that protective goggles (such as UV SYSTEMS GBa, or equivalent) be used to block ultraviolet radiation from reaching your eyes, and that your skin be protected from direct exposure to the light's ultraviolet rays.

A1. OPERATION INSTRUCTIONS FOR Short Wave *SuperBright II* model 3254

You are now the owner of the newest ultraviolet light specifically designed for mineral fluorescence. The light is more powerful than the original SuperBright 2000SW. The model 3254 uses a quartz U-shaped lamp that is very resistant to bulb solarization. This hot cathode quartz lamp is the only one used in hand-held ultraviolet lights for mineral fluorescence. It has an electronic instant start inverter-ballast that will allow the light to be operated in the field from a 12VDC battery. The inverter-ballast in the ***SuperBright II*** has been redesigned to be more powerful than the original one used in the SuperBright. The instant start operation means that no starters or extra switches are needed to turn the lamp "on." Instant start operation also means that the **HP-O2040D43** AC power supply can be plugged directly into an external electrical or electronic timer for timing applications. Note that it takes about one second after the power supply is plugged in or turned on before it produces the 12VDC necessary to operate the ***SuperBright II***. The internal inverter-ballast inside the ***SuperBright II*** operates the lamp at a higher frequency than the usual 60 Hz. The result is a highly efficient lamp.

Note that the **LS-16X** lamp has the minimum amount of mercury in the bulb to protect the environment. This means that when you **first** use the ***SuperBright II*** (or if the light has sat unused for several months) you might have to initialize the **LS-16X** lamp by turning it “on” and warming it up for about five minutes to distribute the mercury in the lamp. If the lamp is only bright in a small area (usually near the ends) of the bulb then it needs this one-time warm-up (do not look at the lamp without a protective faceplate of protective goggles). Once the mercury has been distributed and the whole lamp is bright you should not have to do it again unless you don’t use the ***SuperBright II*** for months at a time (and the mercury settles to one end of the lamp).

Inspect each of the three parts to make sure there is no shipping damage. The three parts are the light assembly housing, the handle assembly (including the plastic handle with a bolt and matching nut, two nylon wing nuts, slip ring and neck lanyard), and the power supply (**HP-O2040D43** 100-240V 50-60 Hz to 12V DC or equivalent). The only assembly required is to attach the handle to the light's housing. The handle can be installed using the nylon wing nuts. The desiccant in the plastic bag is to protect the filter by keeping it dry; you can throw the desiccant away since it will not work well once the plastic bag is opened.

A2. OPERATION INSTRUCTIONS FOR Medium Wave *SuperBright II* model 3312

These instructions are very similar to those of A1 above, since the only difference is the lamp. The model 3312 uses a **LM-16-312** UV phosphor coated lamp with a peak output at about 312 nm. The lamp bulb is made with a special glass that transmits the UV-B wavelengths; sometimes this special glass is referred to as UV-C glass. Note that MW (UV-B) radiation will not solarize the **FS-20** filter. Therefore if the filter is kept dry it should last for many years.

The **LM-16-312** lamp might need to be warmed up occasionally as is mentioned above about the LS-16X lamp in A1.

A3. OPERATION INSTRUCTIONS FOR Long Wave (LW350) *SuperBright II* model 3351

These instructions are similar to those of A1 above; however, both the filter and lamp are different. The model 3351 uses a **FL-20** long wave filter that does not solarize or deteriorate. The model 3351 uses a **LL-16-351** UV phosphor coated lamp with a peak output at about 351 nm. The lamp bulb is made from standard soda-line glass that transmits the UV-A wavelengths.

A4. OPERATION INSTRUCTIONS FOR Long Wave (LW370) *SuperBright II* model 3368

These instructions are similar to those of A1 above; however, both the filter and lamp are different. The model 3368 uses a **FL-20** long wave filter that does not solarize or deteriorate. The model 3368 uses a **LL-16-368** UV phosphor coated lamp with a peak output at about 368 nm. The lamp bulb is made from standard soda-line glass that transmits the UV-A wavelengths.

B. TO ATTACH THE ERGONOMIC HANDLE AND NECK LANYARD TO THE LIGHT'S HOUSING

Remove the two nylon wing nuts from the top of the light assembly. The handle-bracket can be installed in one of four positions on the top of the light. The most common position is with the handle-bracket parallel with the long sides of the ***SuperBright II*** with the open handle towards the jack. Another handle position is 90° to the length of the light. That will make the handle-bracket to face toward one side of the light. You can choose. Tighten the nuts with your hand, but do not over-tighten. The handle-bracket can be easily removed to pack for a field trip or travel if you wish. And the white nylon wing nuts are more easily seen on the ground if you happen to drop one.

The handle has a split ring attached that allows the custom made neck lanyard to clip on to the ring. The neck lanyard will hold the ***SuperBright II*** around your neck so your hands can be free. This comes in handy in the field, at mineral shows, or other locations where you cannot find a convenient location to set your ***SuperBright II*** down.

C. CONNECTING THE HIPRO HP-O2040D43 POWER SUPPLY AND TURNING THE LIGHT ON

The **HP-O2040D43 (**100-240V 47-63 Hz to 12V DC) power supply is separate from the light so that the light itself will be lightweight for easy handling. Just attach the female connector from the power supply to the ***SuperBright II*** and plug the AC cord into wall power. It is not necessary to lock the female connector to the ***SuperBright II*** unless you want too. Just inserted the connector into the mating male connector of the ***SuperBright II*** and it will make electrically contact, if you want to lock it just twist the outer shell about one turn clock-wise.

The HIPRO **HP-O2040D43 power** supply can be left plugged into the 100V to 240V AC wall outlet continuously.

The switch on the light then can be used to turn the light "on" or "off" rather than unplugging the power supply from the outlet. The switch is a rocker switch.

The ***SuperBright II*** new connector system is designed to be robust and very reliable. The Military Specification type connectors have four pins for redundancy, only two pins are actually needed, but all four are used to increase reliability. The pins in the ***SuperBright II*** male connector are wired in parallel, pins 1 and 2 are positive and 3, and Gnd are negative. Usually only pins 1 (+) and 3 (–) are needed. The male and female connectors will make electrical contact just by inserting them together, or they can be locked in place by turning the sleeve about one turn clock-wise.

D. REPLACING THE SHORT WAVE FS-20 FILTER

Reasons you might want to replace the glass filter in your ***SuperBright II*** are included below at the end of this section D. If you are already familiar with this subject, you can go right on to the following directions for removing it.

To remove the glass **FS-20** filter, first unplug the 115V AC plug and disconnect the connector to the ***SuperBright II***. Then: (1) Remove the two screws (marked with arrows) that hold the rubber feet and also hold the cover on. (2) Remove the cover (note that you might have to gently pry the cover off of the housing). (3) Loosen (but do not remove) all six Phillips head sheet metal screws on the cover that hold the two aluminum filter holders. (4) Remove the three screws on one side. (5) Remove that metal filter holder and slide the filter out. To install a filter just reverse this procedure. Use care when installing a new filter so that the aluminum cover or metal filter holders do not put undue stress on the filter. For example, the recommended method is to tighten each screw a little bit, going around to all six screws several times, rather than tightening first one completely and then another screw. Tighten only enough to hold the filter gently in place.

Reasons you Might Want to Replace the Filter

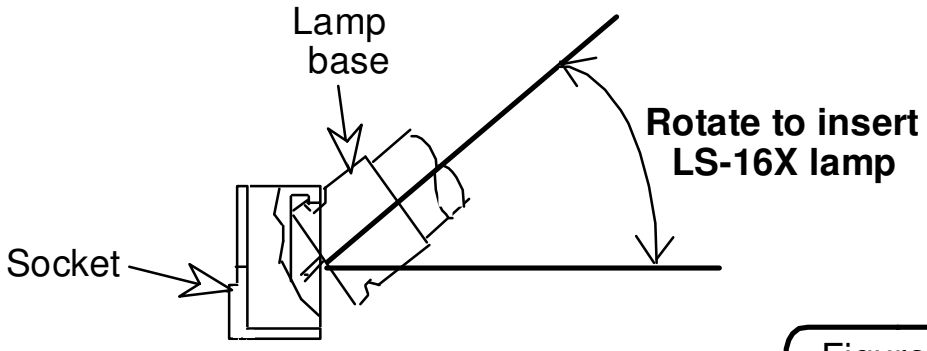
Because the ***SuperBright II*** model 3254 is so powerful, more short wave ultraviolet passes through the **FS-20** filter than with many other lights on the market. Short wave ultraviolet radiation causes a chemical reaction in the filter glass that reduces the transmission of the 253.7 nm [UV] wavelength with time. This is called solarization. The visible light that you can see transmitted through the filter does not change as the filter solarizes, and so in no way indicates the degree of solarization. This solarization effect is a function of the amount and duration of short wave ultraviolet light exposure. In addition, if the light is stored in a damp or humid environment, a white coating can form on the glass that also causes a reduction in 253.7 nm UV transmission. The coating is caused by a chemical action with the moisture in the air. The coating can be cleaned off, but the glass under the coating has already been affected, resulting in reduced transmission. The filter can be checked periodically for solarization by obtaining an ultraviolet radiometer and measuring the actual 253.7 nm transmission. When the light is not being used, turn it off to reduce the filter's exposure to

excessive ultraviolet. Turning the light "on" and "off" frequently has a negative effect on the life of the lamp, but it has a positive effect on the life of the filter (with less ultraviolet exposure). A life test of several SW filters in a ***SuperBright II*** test showed that the filters will last about 3,100 “on” hours. For many owners this will be 2 to 4 years or normal use. A humid environment can shorten the life of a SW filter. When not in use, the light should be stored in a dry environment to protect the filter. Note that MW (UV-B) will not solarize a SW **FS-20** filter.

E. REPLACING THE LAMP (Figures 5 and XY)

To either remove or install a **LS-16X, LM-16-312, LL-16-351** or **LL-16-368** lamp, first unplug the cord going to the ***SuperBright II***. There are two arrows that point to the rubber feet and bolts that hold the cover on; release the cover by removing those two bolts (note that the rubber feet and bolts should be captive). Then remove the cover (note that you might have to gently pry the cover off of the housing because of the thickness of the paint on the housing). Remove the bare copper wire that holds the lamp in the lamp clip. Hold the light facing up with the lamp horizontal. Note that the lamp WILL NOT come straight out of the socket, but will pivot. Grasp the lamp near the bent "U" end and gently pull it up out of the metal lamp clip. Now pivot with the pins still in the socket. As you continue to pivot the "U" end up, (still within the first approximately 15° of the pivot) you may feel some slight resistance (or hear a pop) as the back of the lamp base snaps past a plastic tab in the lamp socket. As you pull up more (greater than about 20°) the lamp will clear the back plastic tab and the pins will clear the socket so the lamp can be removed.

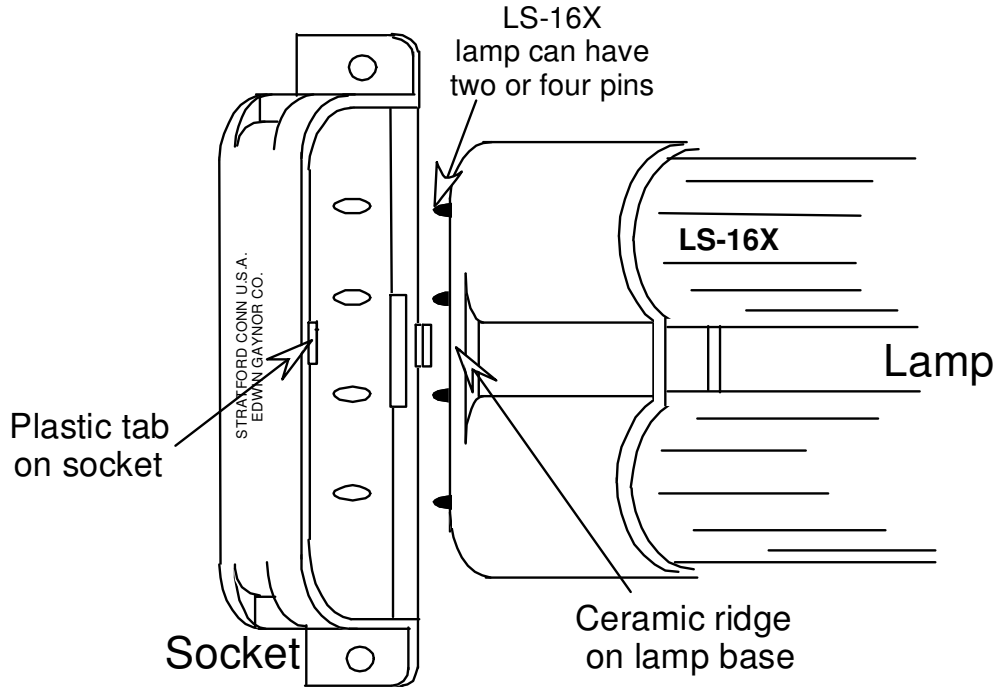
INSERTING THE LS-16X LAMP INTO THE SuperBright 2000SW



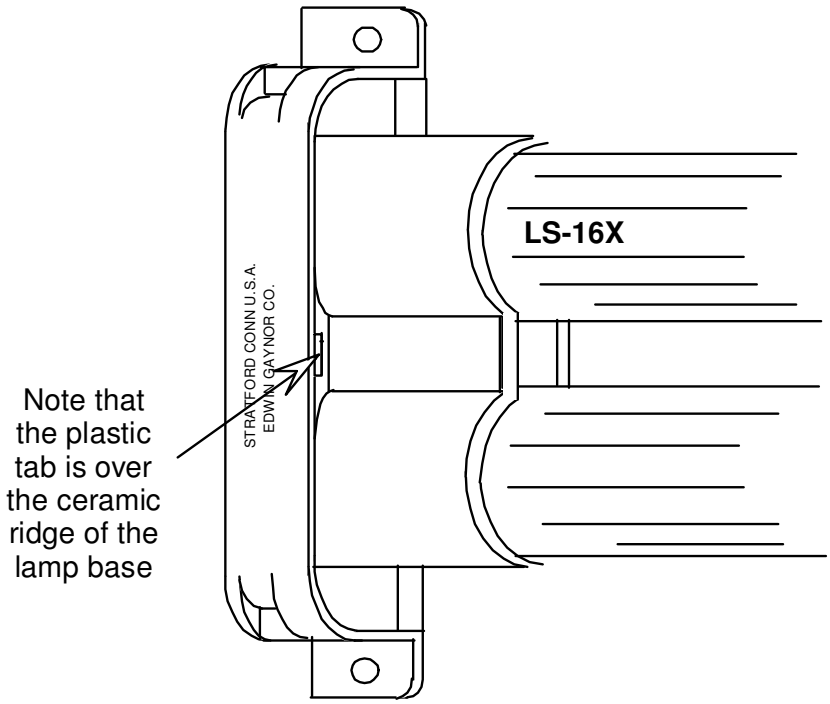
SIDE VIEW

Figure XY
1-14-96

PLUGGING THE LAMP INTO THE SOCKET



Lamp just before its insertion into the socket



Lamp after insertion into the socket

Figure 5
5-23-01

To install the new lamp, hold the light facing up with the socket on your left. Notice that there is a plastic tab* (pointed out in Figure 5) in the middle of the top of the plastic socket. Also notice on the lamp base that there is a 0.1" wide straight ceramic ridge near the pins, between, and connecting, the two partly circular bases. See Figures 5 and XY. Hold the lamp in your right hand near the ceramic base (not the bent "U" end), with your thumb on one side and your other fingers on the other side. Insert the lamp base at an angle so that the straight ceramic ridge of the lamp base is **under** the plastic tab of the socket. The plastic tab must be hooked over the ceramic ridge. Apply slight pressure into the socket (the direction of the force should be from the bent "U" end along the lamp and toward the lamp ceramic base) as you pivot the lamp downward. If done correctly, the lamp pins will make contact, and the lamp can be clipped into the metal lamp clip. Note: if the plastic socket tab is not over the ceramic ridge of the lamp base the pins will not make contact, and you must try again. It may take more than one try to get the lamp pins into the socket. Note that there might be some play in the lamp when the pins are correctly in the socket; however, the pins are making electrical contact, and the lamp clip will keep the lamp from moving. The copper wire between the lamp clip prongs is not required, but it does give added stability, and it is suggested that you use it.

Incidentally the lamp clip is also designed to function as a heat sink. That is, it helps to cool the lamp. This helps to maintain the correct mercury vapor pressure in the lamp. As is typical of most ultraviolet lights, if the mercury vapor pressure gets too high because the lamp or bulb wall gets too hot, the ultraviolet output will temporarily drop. The ***SuperBright II*** is designed for optimum performance with intermittent use. If the light is left on continuously, no harm will be done to the light, lamp, inverter-ballast, or power supply; however, after a period of time the light may exceed the optimum operating temperature that the lamp was designed for and the ultraviolet output will be temporarily reduced by a small amount. In order to regain peak ultraviolet output, the light may need to be turned off for a short time to be allowed to cool. After the lamp cools, and is then turned back on, the ultraviolet output will be at maximum again. Typical service design for this is ten minutes on and twenty to forty seconds off repeated continuously. If the light is operated longer than about ten minutes no harm will be done; the ultraviolet output will just be temperately reduced by a small amount. It is extremely unlikely that the slight temporary reduction in ultraviolet output will be noticeable. If the owner gets in the habit of turning off the light every time he sets it down, this will not only preserve the life of the short wave filter, but also help cool the lamp for optimum bulb wall temperature and optimum ultraviolet output. If the light is going to be used for a permanent display and left on for hours as a time, it can be modified to maintain peak ultraviolet output. The end user can contact UV SYSTEMS to find out how the owner can quickly and permanently modify the light for optimum continuous use.

As with most hot cathode fluorescent lamp, each time the lamp is started the life of the lamp is reduced by a small amount. However, whenever the lamp is "on", it is causing the SW filter to solarize. Keep in mind however, that turning the light "off" saves the filter. The life

* That is 0.2 inch wide and only 0.05 inch deep.

of a typical lamp depends on how many times it is turned "on" and "off". Three life tests were conducted over 21 months on several ***SuperBright II*** lamps, with each lamp being cycled "on" and "off". One cycle is 10 minutes "on" and about 36 seconds "off". The tests indicate that the SW **LS-16X** lamp, on average, should last over 19,900 "on-off" cycles. The MW **LM-16-312** lamp, on average, should last over 16,000 "on-off" cycles, and the LW350 **LL-16-351** lamp, on average, should last over 6,900 "on-off" cycles. Because there are so many factors involved it is impossible to recommend an ideal use of the ***SuperBright II*** that exactly balances SW lamp life and SW UV filter life.

F. INPROVEMENTS IN THE *SuperBright II* OVER THE ORIGINAL SuperBright

There are at least five improvements in the ***SuperBright II*** over the original SuperBright.

1. A new inverter-ballast (IB-26) that drives the lamp harder so that there is more lamp current going through the lamp which results in more UV output. The UV output is increased by 11% to 13%.
2. The new Military Specification (Mil. Spec.) connector system is much more reliability and robust. It also allows the cord to be locked to the ***SuperBright II.***
3. The new switcher power supply is smaller and lighter in weight. It will operate from 100 to 240VAC and from 50 Hz to 60 Hz so it can operate from house current anywhere in the world.
4. A new system to holding the cover to the housing. Only two bolts are used instead of four and those two bolts are now captive so you will not lose them.
5. A neck lanyard can be attached to the slip ring on the handle so that your ***SuperBright II*** can hang on your neck for hands free operation.

G. 12VDC BATTERY OPERATION

The ***SuperBright II*** is designed to operate from 12VDC (± 1.2VDC) power. The external **HP-O2040D43 power** supply supplied by UV SYSTEMS is designed to supply the 12VDC needed to operate the light. Any 12VDC power supply that can deliver at least 2.5 Ampere can be used to operate the ***SuperBright II***, providing that the polarity is correct. Pins 1 and 2 are positive (+) while pins 3 and Gnd are negative (–). If reverse polarity power is plugged into the light, permanent damage can be done causing the inverter-ballast to fail. If the user applies incorrect power to the ***SuperBright II*** and damage or a failure occurs as a result, that would of course void the warranty.

A **B215** accessory cord is available that will allow you to plug into your car cigarette lighter connector and operate the ***SuperBright II*** from your car battery. That cord is 15 feet long and available now.

H. New B2 BATTERY PACK

The **new** B2 battery pack has been designed; it will include a sealed rechargeable lead-acid battery that comes complete with a heavy duty coiled cord, 115VAC battery charger, heavy duty nylon carrying case, and shoulder strap. The battery will operate the ***SuperBright II*** for over 7 hours per charge. The heavy duty coiled cord is permanently attached to the carrying case. The battery carrying case is nylon "Cordura" and can be either attached to your belt or put over your shoulder with the built-in shoulder strap. The shoulder strap is removable and

can be snapped together to use as a belt. The charger will plug into the end of the coiled cord to recharge the battery.

I. MAJOR PARTS LIST FOR ***SuperBright II***

SW and MW Filter	**FS-20**
LW350 and LW370 Filter	**FL-20**
SW Lamp (U-shaped tube)	**LS-16X**
MW Lamp	**LM-16-312**
LW350 Lamp	**LL-16-351**
LW370 Lamp	**LL-16-368**
Power Supply (100 - 240VAC to 12VDC)	**HP-O2040D43, HIPRO**
Inverter-ballast	**IB-26**
Fuse in **B2** battery pack	**10A auto fuse**.

J. Other UV SYSTEMS, Inc. products and accessories to the ***SuperBright II***

Automobile cigarette lighter power fifteen-foot cord **B215**

Allows you to operate your ***SuperBright II*** from you car battery. This is a fifteen-foot cord.

B2 Portable battery pack **B2**

This battery pack is a carrying case complete with shoulder strap, sealed lead-acid 12V 8.5 AH rechargeable battery, heavy duty coiled-cord, and 115VAC charger.

Contrast and Safety Goggles **GBa**

These goggles will block all ultraviolet from getting in your eyes. A necessity for every collector.

Replacement filters **FILTERS**

15 sizes of replacement SW or LW filters for your other ultraviolet light assemblies.

Replacement lamps (tubes) **LAMPS**

26 sizes of replacement SW, MW, LW350, or LW370 lamps for your other ultraviolet light assemblies.

Medium Wave lamp for the ***SuperBright II*** **LM-16-312**

By replacing the present **LS-16X** lamp with a MW **LM-16-312** lamp you can convert your ***SuperBright II*** model 3254 to a MW model 3312 UV light.

K. MY "MOST IMPORTANT LIGHT"

I want to give recognition to the most important light in my life, Jesus Christ, who said, "I am the world's light. No one who follows me stumbles around in the darkness. I provide plenty of light to live in." -John 8:12 "The Message" translation.

Don Newsome

FLUORESCENT MINERAL SOCIETY

The Fluorescent Mineral Society (FMS), it is an international organization for those interested in the fluorescence and luminescence of minerals. It is not connected in any way with UV SYSTEMS, Inc. The FMS members keep in touch through the *UV Waves*, a bimonthly newsletter with articles about fluorescent minerals and their localities, ultraviolet lamps, and related matters. The yearly or biennial *Journal of the Fluorescent Mineral Society* publishes technical articles of lasting interest. FMS members have regular regional meetings, and get together at major mineral shows like those at Denver, Tucson, and Franklin, NJ. The FMS was founded in 1971.

To receive a free application to the FMS contact UV SYSTEMS or contact Jan Wittenberg at PO Box 572694, Tarzana, CA 91357 USA or on the web at: http://www.uvminerals.org Or communicate by Internet mail with Jan Wittenberg (FMS President) at president@uvminerals.org

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