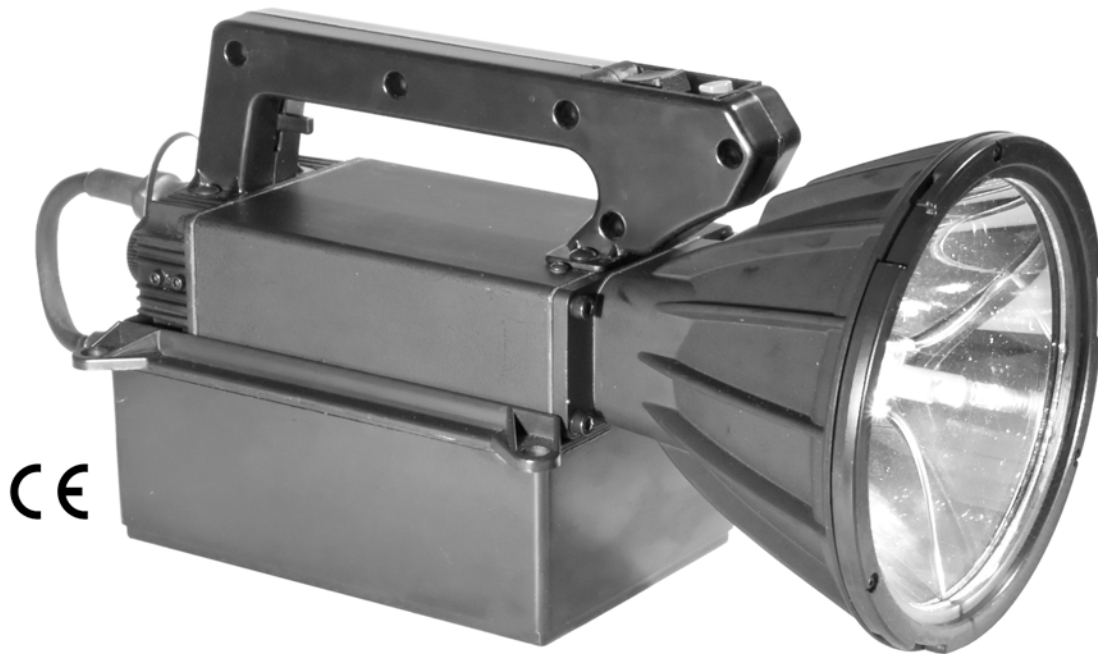




Hand Held Xenon Searchlight



Operation Manual



3938 Miller Road, Edgemont, PA 19028
Phone: (610) 353-8505 • Fax: (610) 353-8411
Web: www.peakbeam.com • E-mail: techsupport@peakbeam.com

BEAM Searchlight System Operation Manual

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Overview

Characteristics:

Maxa Beam Searchlights are lightweight, compact, high intensity illuminators which use a field replaceable 75 Watt Xenon short arc lamp and a precision electroformed reflector to provide the ultimate source for long range and wide angle portable and remote-controllable illumination.

All Maxa Beam Searchlights Feature:

- 12,000,000 Peak Beam CandlePower Output
- Color rendition similar to daylight (6000°K)
- Motorized Beam Width Adjustment from 1° Spot to 40° Flood (1° to 25° in *Weapon Lights*)
- Strobe Function with Variable Rate and Duty Cycle (*Strobe Sweep in Weapons Lights*)
- Three Beam Intensity Levels (*Two in Weapons Lights*)
- Field-Programmable Operational Characteristics (*start-up beam width, strobe rate, etc.*)
- Visible and Infrared Illumination Capability
- Flexible Mounting Options
- Remote Control of Beam Intensity, Beam Size, Strobe Function and Programming

Handheld Searchlight Systems also include rechargeable NiCad, Lithium-Ion or Lithium Iron Phosphate Battery modules that offer up to 180 minutes of continuous operation from a single battery. The searchlight and li-ion battery weigh just 5.7 lbs.

Remote-Controlled Searchlights feature an optional RS-232 interface that allows the operator to control all functions of the searchlight from a computer. Remote-controlled searchlights are frequently integrated onto camera and sensor platforms for escalation of force applications.

The Maxa Beam Searchlight Product Line consists of four basic searchlight models:

- MBS-410 Handheld Searchlight with Remote Control Capability
- MBS-430-W Crew-Served Weapons Light (CSWL)
- MBS-430-Y Mounted Remote-Controlled Searchlight
- MBPKG-E Computer-Controlled Searchlight in Environmental Housing

Applications:

For over 24 years users in locations ranging from the Sahara Desert to the AICan Pipeline have come to rely on the Maxa Beam Searchlight for:

- Force Protection
- Perimeter Security
- Search and Rescue
- Border Protection
- Tactical Operations
- Escalation of Force / Ocular Disruption
- Shipboard Protection / Maritime Security
- Night Vision Equipment Enhancement
- Crew-Served Weapon Illumination
- Infrared / Covert Surveillance

Theory of Operation:

The Maxa Beam Searchlight produces light by passing an arc of electricity between two electrodes in a quartz tube filled with a pressurized atmosphere of Xenon gas. An extremely precise plasma ball is formed and precisely positioned within an electroformed reflector by an internal microprocessor controlling a servo motor.

When the ignition button is momentarily pressed, a high voltage RF igniter produces up to 20,000 volts to ionize the Xenon gas within the lamp, allowing 12.5 to 14VDC operating voltage to bridge the arc gap and form a steady state. Once the arc is established, gas temperature and pressure start to climb, forcing the Xenon into a plasma state. The light will come on with a constant high beam for approximately 3 seconds to assure reliable ignition of a cold lamp and will then go to the programmed intensity and mode. After ignition of the lamp is complete, the internal microprocessor takes control of the operation of the electronic focus, power settings and the user programmable options.

The searchlight contains no internal, user-serviceable parts. The switch mode power supply is factory set and requires no adjustment (even after a lamp change has occurred) as the control circuitry is self-calibrating. Internal power regulation keeps both the intensity and color of the beam constant as the voltage from the battery drops.

Safety Warnings

Do not operate this light in an explosive environment.

Do not look directly into the light at close distances.

Do not immerse the light in water allowing water to enter the case. While the Maxa Beam is weather resistant, submersion will cause permanent damage to the light.

Do not operate the searchlight if the front lens is damaged or removed.

Do not allow the concentrated beam of light to be focused on flammable materials at close distances for prolonged periods of time.

Do not touch the Xenon lamp connections during operation or ignition as high voltage is present.

Do not touch the clear portion of the Xenon lamp. If the lamp is accidentally touched, clean with alcohol.

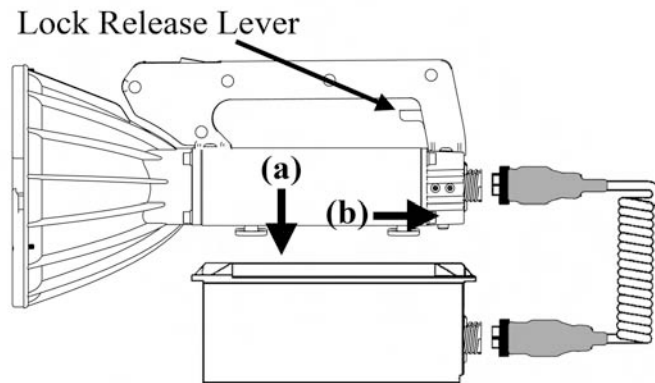
Always wear protective eyewear if removing the front lens cover. The lamp is under positive pressure and should be handled with care.

To prevent accidental activation of the light, always disconnect it from the power cord when it is not in use, placed in storage or being transported.

Searchlight Operation

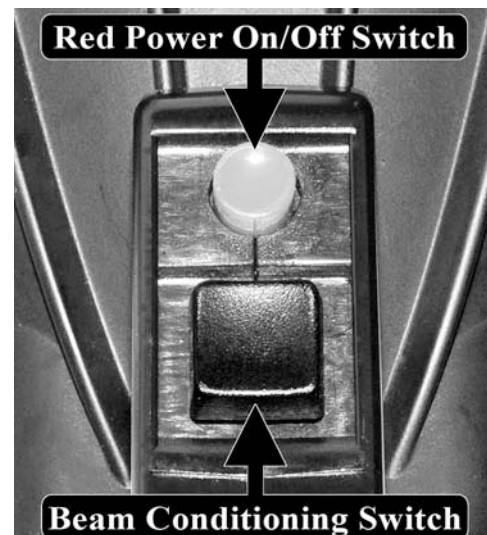
- 1) Locate searchlight, battery and power cable. Inspect items for physical damage.

- 2) **Attach Searchlight to Battery** by lining up the four feet of the searchlight over holes in top of battery (a). Lower the searchlight into the holes and then slide the searchlight towards the connector end of the battery (b). If properly locked in place the searchlight should not move.



(To release searchlight from battery, lift lock release lever under searchlight handle, then slide searchlight forward away from battery connector end.)

- 3) If desired, attach a battery shoulder strap to diagonally opposite ears on battery.
- 4) Attach male end of power cable to connector on battery. Attach female end of power cable to 4-pin connector on searchlight. To lock rotate only the locking ring clockwise. *All connections are keyed; never force connections.*
- 5) **To Turn Searchlight On**, press the red on/off switch. Searchlight starts on high power, holds setting for 3 seconds, then drops to normal power.
- 6) **To Adjust the Searchlight's Beam Width**, pull the beam conditioning switch back to increase beam width to flood. Push the beam conditioning switch forward to decrease beam width to spot. The default beam width on start up is 9 degrees. To set a different beam width on start up, please see the Programming section of this manual.
- 7) **To Set Searchlight to Strobe**, rock and hold the beam conditioning switch to the left. The default setting is *momentary strobe*, which means that the searchlight will only strobe when the beam conditioning switch is held to the left. To set *continuous strobe* or *low beam* mode, please see the Programming section of this manual.
- 8) **To Set Searchlight to High Beam**, rock and hold the beam conditioning switch to the right. The default setting is *momentary high beam*, which means that the searchlight will only stay on high beam when the beam conditioning switch is held to the right. To set a 16 second *timed high beam* mode, please see the Programming section of this manual.
- 9) **To Attach a Maxa Beam Filter**, line up the 3 tabs on the filter with the slots on the front of the searchlight. Place filter over front of searchlight and turn filter *counter-clockwise* until it is fully seated. Filter will lock in place. For filter options, see the Filters and Accessories section of this manual.



Searchlight Programming

The Maxa Beam Searchlight's operational characteristics can be modified with some simple programming sequences. This capability allows the light to be customized for specific applications. For example, if you want to use the light for an extended search operation in a wooded area, the light can be programmed to automatically start up in low beam mode with the beam width at full flood. Other scenarios include a surveillance operation where the light must start up at normal power with the beam set to the size of the area under surveillance or a tactical application where the user programs the light to start up in strobe mode at a narrow beam spread.

Factory Default Settings:

MBS-410, MBS-430-Y and MBPKG-E Series Searchlights

Automatic Beam Intensity at Start-Up	Normal Beam Level
Rock Conditioning Switch Forward	Decrease Beam Width to Spot
Rock Conditioning Switch Back	Increase Beam Width to Flood
Rock Conditioning Switch Left	Momentary Strobe Mode
Rock Conditioning Switch Right	Momentary High Beam




MBS-430-W Series Crew-Served Weapon Lights

Automatic Beam Intensity at Start-Up	High Beam Level
Rock Conditioning Switch Forward	Decrease Beam Width to Spot
Rock Conditioning Switch Back	Increase Beam Width to Flood
Rock Conditioning Switch Left	Latching Sweep Strobe Mode
Rock Conditioning Switch Right	Toggles Latching High/Low Beam

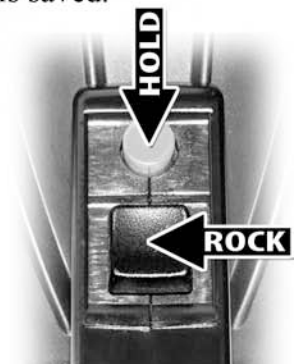
Note: The strobe function is not user-programmable on MBS-430-W series lights.

To modify these characteristics follow the instructions shown on the following pages.

Explanation of Programming Symbols:

-  = With searchlight already turned on, press and hold the red power switch down.
-  = Rock the beam conditioning switch in the indicated direction, then release.
-  = Release power switch. Light will turn off and new setting is saved.

For example, the following programming sequence indicates that you should hold down the power button while rocking the beam conditioning switch to the left, then release both buttons:



(A) Changing High Beam from Momentary to Timed Mode:

Factory default activates high beam when the beam conditioning switch is held to the right. To change function to timed high beam mode follow the below sequence. Once this programming is complete, the light will stay on high beam for 16 seconds when switch is rocked to the right. *Repeat this sequence to reactivate the default momentary high beam mode.*



(B) Changing from Momentary Strobe Mode to Continuous Strobe and Low Beam Modes:

Factory default activates momentary strobe mode when the beam conditioning switch is held to the left. To change function to continuous strobe mode, follow the below sequence.



To change to low beam mode, repeat the above sequence. Repeating the sequence a third time will return you to momentary strobe mode. *Note:* If you have programmed the light to start up on either strobe or low beam mode (see section (D) below), performing the programming changes in this section will reset the light back to starting up on normal (default) beam mode.

IMPORTANT: When continuous strobe mode is activated, all other programming sequences will not function with the exception of (G) Changing Strobe Rate or Duty Cycle. To be able to perform other programming sequences, first take searchlight out of continuous strobe mode.

(C) Setting Beam Width on Start Up:



(D) Setting Beam Intensity on Start Up (after 3 second warm up):

To set light to start up in battery saver mode (*also sets the left function to battery saver on/off*):



To set light to start up in normal mode (*this is the factory default setting*):



To set light to start up in strobe mode (*also sets the left function to continuous strobe mode*):



(E) Setting the Smallest Spot of the Searchlight:



Note: If you notice a delay between when you rock the beam conditioning switch back to move out of spot position and when the lamp actually starts to move, this means that the spot position is set beyond the point at which the lamp is physically able to move. If this occurs, the spot position should be reset to a point at or within the physical limits of the lamp’s travel. It is also possible to focus the lamp “beyond” spot to the point at which the beam begins to widen past the reflector’s focal point. Rock the conditioning switch back to move out of the unfocused position.

(F) Setting the Widest Flood of the Searchlight:



Note: If you notice a delay between when you rock the beam conditioning switch forward to move out of flood position and when the lamp actually starts to move, this means that the flood position is set behind the point at which the lamp is physically able to move. If this occurs, the flood position should be reset to a point at or within the physical limits of the lamp’s travel.

(G) Changing the Strobe Rate or Duty Cycle:

To follow this procedure the searchlight must be in continuous strobe mode (see Section B).



(H) To Lock Out Programming Functions:

This will prevent modifications from being made to a set of functions after they are preset.



To unlock use the Restore Factory Settings procedure shown below.

(I) Restore Factory Settings:

This procedure restores all of the programmable functions to their factory defaults. It is very useful to set the searchlight back to a known state for troubleshooting purposes.



Rechargeable Battery Systems

Peak Beam offers three types of rechargeable batteries. Maxa Beam batteries are for use with Maxa Beam Searchlights only and should never be used with any other device.

Part Number	MBP-1207	MBP-1307	MBP-1310
Description	NiCad Battery	Lithium-Ion Battery with Built-In Charger	Lithium Iron Phosphate (LiFePO ₄) Battery
Run Time (<i>default</i>)	90 min.	110 min.	135 min.
Run Time (<i>high</i>)	45 min.	60 min.	90 min.
Life Cycles	1,000	500	2,500
Capacity	7Ah	7Ah	10Ah
Dimensions	5 x 7.25 x 3.5 in.	5 x 7.25 x 2.75 in.	5 x 7.25 x 3.5 in.
Weight	5.5 lbs.	2.5 lbs.	3.5 lbs.
Charge Time (<i>charger</i>)	18 hours (<i>MBP-3110</i>) 150 min. (<i>MBP-5200-M</i>)	180 min. (<i>MBP-5003 & MBP-5230</i>)	120 min. (<i>MBP-3205</i>) 180 min. (<i>MBP-3200</i>)

Maxa Beam batteries incorporate an internal self-resetting thermal breaker that will disconnect the searchlight from the battery to prevent damage due to excessive charge or discharge rates or severe environmental heat. When the internal battery temperature returns to normal the breaker will automatically reset.

Maxa Beam batteries are sealed in a waterproof case. Do not attempt to use a battery that has a damaged case; please contact the factory about our re-casing service. There are no user-serviceable components in Maxa Beam batteries. Proper precautions should be taken when batteries are discarded.

MBP-1207 NiCad Batteries

The MBP-1207 NiCad Battery has been fielded for more than twenty years. This battery is rated at 1000 cycles and can be conditioned for optimum performance on the MBP-5200 or MBP-5600 Series charger. As with all Nickel-based batteries, this battery should not be stored in a discharged condition and may be permanently damaged if excessively discharged. Maxa Beam searchlights have protective circuitry incorporated in their design to prevent excessive discharging of batteries. This protective circuitry can be overridden if the situation warrants risking damage to the batteries by pressing and holding down the red power button. This emergency override procedure may yield several minutes of remaining battery power.

Recharging with the MBP-3110 Trickle Charger:

The MBP-3110 Plug-In Trickle Charger is designed to charge the MBP-1207 NiCad Battery only. Do not use this charger to charge a Lithium-based Maxa Beam battery or any other device. This charger may be used with either a 110V or 220V AC power input supply.

- 1) Set input supply voltage switch to the appropriate voltage (110V or 220V).
- 2) Plug wall adapter into an outlet and connect its output connector to the NiCad battery.
- 3) The battery will recharge in approximately 18 hours. **CAUTION: Do not leave battery plugged in for more than 48 hours as this may cause permanent battery damage!**

Recharging with MBP-5200 and MBP-5600 Series Chargers:

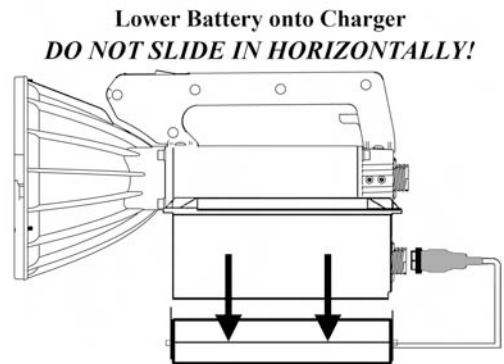
MBP-5200 and MBP-5600 Series Multi-Voltage Chargers are designed to charge MBP-1207 NiCad Batteries only. Do not use these chargers to charge a Lithium-based Maxa Beam battery or any other device. Only use these chargers with Maxa Beam power cables and adapters. For mobile and vertically mounted applications, always use the safety strap to secure the battery or battery and searchlight to the charger. These chargers can accept input voltages of 11-36VDC or 100-240VAC 50/60Hz depending on which Maxa Beam adapters are used with them.

NiCad Batteries can be charged with either a slow 18 hour trickle charge or a quick 2.5 hour charge. An optional conditioning cycle discharges the battery fully before charging it. **The NiCad Battery may be left connected to the MBP-5200 or MBP-5600 charger for prolonged periods of time without damaging battery** and the charge level will be maintained.

The **MBP-5600** Charger also acts as a power supply and can directly power the light from an 11-36VDC or 100-240VAC 50/60Hz source. The MBP-5600 will automatically stop charging the battery if an attached searchlight is turned on. When light is turned off charging will resume.

CAUTION: Do not attempt to charge two batteries at the same time with one charger. Make sure that you do not have one battery resting on top of the charger while a second battery is connected to the pigtail as this may damage the charger.

- 1) Plug the charger into external power, ensuring that proper adapter is being used to match local voltage. The red indicator light will turn on.
- 2) For a slow 18 hour trickle charge, lower the battery, with or without searchlight, onto the charger. *Do not slide battery in horizontally.* Indicator light flashes amber during trickle charge then turns solid green when charged.
- 3) For a quick 2.5 hour charge, lower battery onto charger tray and connect the charger's pigtail to the battery. Indicator light will turn solid amber during quick charge then turn solid green when battery is charged.
- 4) For a conditioning charge cycle, lower battery onto charger tray, connect pigtail and press the green recessed button on the charger. Indicator light will flash green as battery is discharged, turn solid amber during charging, then turn solid green when charged. The charger will become very warm during this cycle, which may take up to 24 hours.
- 5) If the indicator light turns red when a battery is connected to or on top of the charger, the searchlight power cord or the internal battery circuit is open. A flashing red indicator light signifies a fault. Consult the Troubleshooting section of this manual.
- 6) To directly power the light (MBP-5600 Chargers Only), connect the female end of the light's power cord to the male connector on the light. Connect the male end of the power cord to the female receptacle on the body of the MBP-5600 unit.



Note: If using an MBP-5200 or MBP-5600 series charger in an environment where salt water can splash onto the charger, wipe charger thoroughly to remove any pooled water and wipe the battery's charging contacts dry before attempting to charge the battery.

MBP-1307 Lithium-Ion Batteries

The MBP-1307 Lithium-Ion Battery features a longer run time than traditional NiCad batteries and offers the added benefit of a built-in 11-29VDC charging system and a five-level LED fuel gauge. The Li-Ion is compatible with all Maxa Beam Searchlights.

If storing the MBP-1307 Lithium-Ion Battery for long periods of time, fully charge the battery before storing and recharge the battery once every six months. The Li-Ion battery may be left connected to a power source for prolonged periods of time without damaging the battery.

- 1) Locate Li-Ion battery and charging adapter. *Compatible adapters: MBP-5003 3 Amp AC Adapter, MBP-5230 Vehicle Adapter, MBA-7406 NATO Adapter, MBP-5010 10 Amp AC Adapter, MBP-5630 Vehicle Adapter, MBP-4000S Power Supply[†], MBA-7100 Vehicle Adapter[†], and MBA-7200 Power Receptacle[†]. ([†]Requires standard power cord to connect to battery.)*
- 2) Plug the female end of the power adapter into the male connector on the battery. *All connections are keyed; never force connections.*
- 3) Connect the power adapter to the appropriate power source. The battery's bottom LED indicator will light, signifying that power is connected.
- 4) The battery will begin to charge automatically and the charge will complete in approximately 3 hours. When charge is complete the fuel gauge lights will turn off.

MBP-1310 Lithium Iron Phosphate (LiFePO₄) Batteries

The MBP-1310 Lithium Iron Phosphate (LiFePO₄) Battery features the longest run time and offers the largest number of total battery life cycles (2,500). The LiFePO₄ is compatible with all Maxa Beam Searchlights. The LiFePO₄ battery's single plastic connector is a different style than the connectors on other Maxa Beam batteries, but a compatible 8 inch straight power cord (#MBA-8208-L) is automatically included with the battery.

If storing the MBP-1310 LiFePO₄ Battery for long periods of time, fully charge the battery before storing and recharge once every three months. The LiFePO₄ may be left connected to a power source for prolonged periods of time without damaging the battery.

- 1) Locate Battery and the MBP-3200 AC/DC Charger or the MBP-3205 AC-Only Charger.
- 2) Connect the charger's cable to the battery, then connect the charger to the appropriate 100-240VAC or 11-28VDC power source. The battery will automatically begin to charge. Each charger type will indicate charging and completion as follows:
 - MBP-3200 AC/DC Charger:** Charger's LED will flash green during charging and turn solid green when charging is complete. Recharge time: 3 hours
 - MBP-3205 AC-Only Charger:** Charger's LED will turn red during charging and turn green when charging is complete. Recharge time: 2 hours

CAUTION: Due to the MBP-1310 LiFePO₄ Battery's chemistry and size, this battery falls under Class 9 Dangerous Goods restrictions for AIR SHIPMENTS ONLY.

Do not transport this battery on a passenger airplane. For cargo plane shipments, consult your shipping company or Peak Beam Systems for more information.

This battery does not fall under Class 9 restrictions for Ground shipments.

Searchlight Accessories

Optical Filters

A full line of selective band-pass and alternate beam pattern filters are available for the Maxa Beam Searchlight. Each filter is securely mounted in a high impact copolymer ring that attaches over the front lens of the searchlight. The ring is held in place by a positive locking technique that requires no tools and is easy to install or remove in seconds with only a quarter turn.

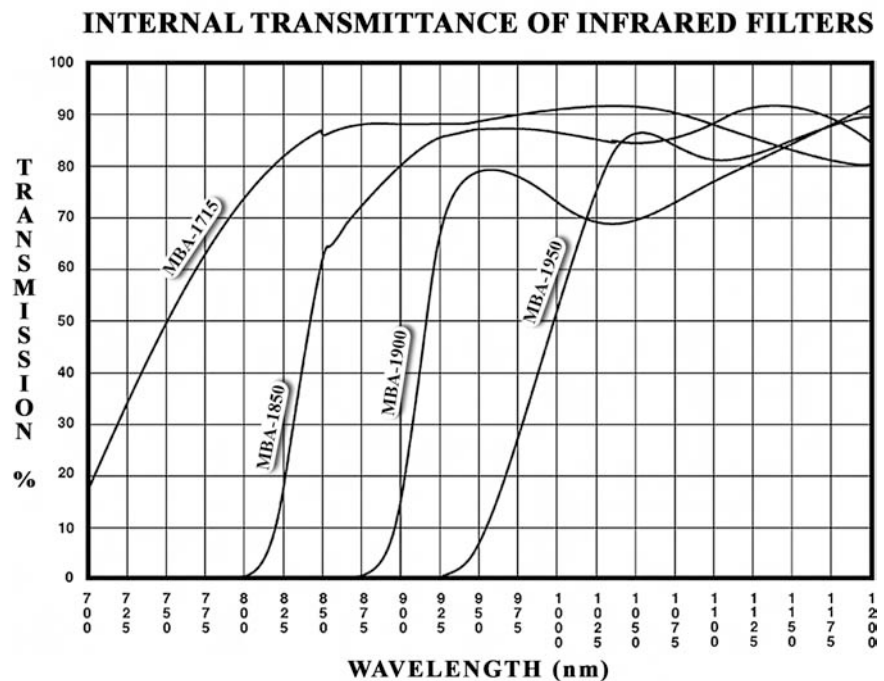
MBA-1500 Amber Smoke/Fog Filter: This filter has been optimized to produce an intense amber beam for maximum penetration in fog, haze and smoke.

MBA-1715 Semi-Covert Infrared Filter (715nm): This filter has a sharp cut-on at 715nm and passes the greatest amount of infrared energy of all of the Maxa Beam filters. When this filter is attached, a red glow is visible to the naked eye. It is useful for nature studies, extreme long range surveillance and search applications where total covertness is not required. It is compatible with Gen. 2 & 3 night vision equipment and IR sensitive cameras. With this filter attached, the Maxa Beam has an effective range of up to 2,500m.

MBA-1850 Covert Infrared Filter (850nm): This filter has a sharp cut-on at 850nm and better than 90% pass efficiency above 850nm. A red glow can only be seen if the light is boresighted and observed against a dark background at close range. It is useful for surveillance and search applications where background lights (such as those in urban areas) will mask its glow. It is compatible with Gen. 2 & 3 night vision equipment and IR sensitive cameras. With this filter attached, the Maxa Beam has an effective range of up to 1,400m.

MBA-1900 Fully Covert Infrared Filter (900nm): This filter has a sharp cut-on at 900nm. It is compatible with IR sensitive cameras and is virtually undetectable by the naked eye. With this filter attached, the Maxa Beam has an effective range of up to 500m.

MBA-1950 Ultra Covert Infrared Filter (950nm): This filter has a sharp cut-on at 950nm. It is compatible with infrared sensitive cameras and is undetectable by the naked eye and most night vision devices. With this filter attached the Maxa Beam has an effective range of up to 250m.



MBA-2100 Ultraviolet (UV) Filter: This filter blocks out all infrared and most visible light. With this filter attached, the Maxa Beam's light beam will have a faint blueish-purple color to it. The UV energy that the filter will pass through is in the 300-400nm range. This range includes UVA (black light) which makes certain pigments fluoresce.

MBA-3000 Full Diffusion Filter: This filter provides a wide, evenly lit field of light when the searchlight is in the flood mode and a narrower, brighter, evenly lit field of light when the light is in the spot position. It is useful for temporary site lighting and short range search applications. This filter can also be used with any of the Maxa Beam Infrared filters for evenly lit short range covert surveillance applications.

MBA-3015 Collimating Lens: This lens uses plano convex lens technology to collimate the Maxa Beam's beam of light and redirect the spill light back into the beam. This results in an even field of view free from any dark spots. The effects of this lens differ from those of the MBA-3000 Diffusion Filter because the lens is focusing the excess light inward rather than diffusing the light outward. This lens is useful for longer range use of the light in flood mode.

MBA-3020 Peripheral Vision Filter: This filter provides a hot center beam with a wide band of light extending to either side. It is useful for wide area search applications as it cuts down on the amount of light that is reflected back at the operator due to atmospheric conditions. This filter can also be used with any of our covert IR filters for surveillance applications.

Accessories

Power Options:

MBP-4000S	100-240VAC Direct Drive Power Supply
MBA-7100	12VDC Vehicle Adapter for Searchlight
MBA-7200	12VDC Power Receptacle for Permanent Installation
MBA-7406	24VDC Universal NATO Slave Adapter
MBA-7500	Dual BA-5590/U Military Battery Adapter

Remote Control Options:

MBA-8406	Wired Remote Handle with 6 Foot Cord <i>(25 Foot Cord also available)</i>
MBA-8406-MP	Metal Remote Control Box with 6 Foot Cord <i>(25 Foot Cord also available)</i>

Mounting Options

MBA-3600	Tripod Mount Plate
MBA-3605	Fixed Searchlight Mount
MBA-3660	Uni-Clamp Fluid Pan/Tilt Head <i>(requires MBA-3600 Tripod Mount Plate)</i>
MBA-3661	Heavy-Duty Fluid Pan/Tilt Head

Other Accessories:

MBA-2004	Searchlight Dust Cover	MBA-6250	Medium Storage Case
MBA-6005	Battery Shoulder Strap	MBA-6300	Large Storage Case
MBA-6100	Padded Filter Pouch	MBA-6400	Large Wheeled Storage Case

For a complete listing of all Maxa Beam accessories, please visit www.peakbeam.com.

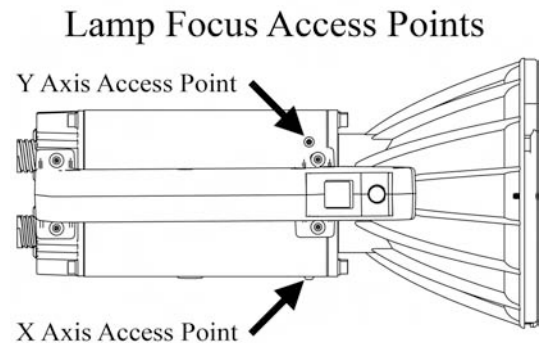
Searchlight Maintenance

The only maintenance required for the searchlight is to periodically clean the body with a damp cloth and to keep the front lens clean. Clean the lens with window cleaner.

Focusing the Lamp

If the searchlight is dropped or receives a heavy impact from transportation or shipping, it may be necessary to refocus the lamp to insure proper operation and maximum output. Refocusing of the lamp involves centering the lamp within the reflector.

- 1) Use a 1/16" hex driver to remove the two focus access screws that cover the X and Y Axis Access Points.
- 2) Turn the searchlight on and shine the beam onto a flat surface about 50 feet away.
- 3) Insert the hex driver into one of the focus access points. A slight rotation and/or side to side motion may be required until the hex driver becomes properly seated into the internal adjustment screw hole.



- 4) After the hex driver has been inserted into the adjustment screw, turn the driver to center the hotspot of the beam (you will see the hotspot move on the target as driver is rotated).
- 5) Repeat procedure for the other internal adjustment screw in the other focus access point.
- 6) Replace the focus access screws when focusing is complete. Do not over tighten screws.

Lamp Replacement

All Maxa Beam Searchlight models have a field-replaceable Xenon short arc lamp. For directions on how to replace the lamp, please see the Instruction Sheet that ships with each type of Lamp Replacement Kit. Lamp Replacement Kits include all of the tools and hardware needed to safely replace a Maxa Beam Searchlight's lamp.

MBA-2400	Lamp Replacement Kit for Standard Lens Lights	(MBS-410 Series)
MBA-2400N	Combination Lamp, Lens, & Power Connector Kit	(MBS-410 Series)
MBA-2400-E	Lamp Replacement Kit for Watertight Enclosures	(MBPKG-E Series)
MBA-2400-W	Weapons Light Lamp Replacement Kit	(MBS-430-WA-X2 Only)
MBA-2400-Y	Lamp Replacement Kit for Spyder Lens Lights	(MBS-410/430-Y Series)

Other Maintenance Kits

Peak Beam offers the following lens and connector replacement kits:

MBA-2410	Searchlight Power Connector	MBA-2420-Y	Replacement Spyder Front Lens
MBA-2415	Searchlight Remote Connector	MBA-2435	Power Cord Female Connector
MBA-2420	Replacement Standard Front Lens	MBA-2445	Remote Cord Female Connector

Technical Assistance

Remote Control Operation

Wired Remote Control:

All Maxa Beam Searchlights can be remotely controlled via an 8-, 9-, or 10-pin remote connector on the searchlight housing. This remote control capability allows the operator to control the functions of the searchlight using a wired remote handle such as the MBA-8406 or to hard wire the searchlight directly into an auxiliary control panel. Wired remote controls are available in 6 or 25 foot lengths and extension cables are available in 10, 25, or 50 foot lengths.

All contact closures (switches) used for remote operation must be momentary, normally open. During operation, the microprocessor constantly scans the status of all input lines from the remote control input connector. When the closure of one of the remote switches is detected, the microprocessor executes the appropriate command. Input lines for On/Off, High/Low, Focus Narrow/Wide and Strobe/Low are active high. These lines have internal pull down resistors.

Line 1 (“12VDC” pin) is an output line that provides power for the on/off and other remote functions. **Caution:** *Power is applied to line 1 any time there is power supplied to the light, even when the light is off.* This line is tied directly to the power input connector. When wiring the on/off switch and remote control switches, line 1 must be tied to one side of all switches in parallel. The “Ground” pin is chassis ground and should be wired to the cable shield for long cable runs. The “On/Off” pin is also scanned during operation. When the on/off switch is closed again after the light has been turned on, the microprocessor disables all normal operational modes and is then in the programming mode. If one of the other remote switches is closed while the on/off switch is closed, one of the user functions will be reprogrammed.

Computer Control via RS-232 Interface:

Several Maxa Beam Searchlights are available with a built-in RS-232 computer interface. With this capability, the searchlight can be mounted in a fixed position and remotely controlled via computer either as a stand alone illuminator or as part of an integrated computer-controlled surveillance or security system on a pan and tilt device.

A full Interface Control Document (ICD) with ASCII commands and connector pin-outs is included with all RS-232-enabled searchlights and is available upon request. RS-232 Searchlights can be controlled using a terminal emulator such as HyperTerminal or Peak Beam’s Graphical User Interface (GUI).

The following searchlight models contain the built-in RS-232 interface:

MBS-430-RSY	MBPKG-E	MBPKG-E2-24
MBS-430-RSMY	MBPKG-E2	MBPKG-E-48
MBS-430-W-RS	MBPKG-E-24	MBPKG-E2-48

Control Connector Pin-Outs

Standard 8-Pin Plastic Connector (MBS-410, MBS-410-Y, MBS-430-Y):

Pin	Color	Function
1	Red	12VDC Out
2	Blue	Ground
3	Orange	On/Off
4	Brown	High/Normal Beam
5	Black	Focus Narrow
6	Yellow	Focus Wide
7	Green	Strobe/Low Beam Mode
8	-	blank - not normally used

RS-232 9-Pin Plastic Connector (MBS-430-RSY):

Pin	Color	Function
1	Red*	12VDC Out
2	Grey†	RS-232 Signal Ground
3	Orange*	On/Off
4	Brown*	High/Normal Beam
5	Black*	Focus Narrow
6	Yellow*	Focus Wide
7	Green*	Strobe/Low Beam Mode
8	White†	RS-232 Receive Data (from searchlight to controller)
9	Purple†	RS-232 Transmit Data (from controller to searchlight)

*Used for Hand Controller Only †Used for Serial Communications Only

10-Pin Metal Connector (MBS-410-MY, MBS-430-(RS)MY, MBS-430-W, MBPKG-E2 Series):

Pin	Color	Function
A	Red*	12VDC Out
B	Black*	Focus Narrow
C	Green*	Strobe/Low Beam Mode
D	Orange*	On/Off
E	Grey†	RS-232 Signal Ground
F	Blue*	Ground (not connected on watertight enclosure)
G	Brown*	High/Normal Beam
H	Yellow*	Focus Wide
J	White†	RS-232 Receive Data (from searchlight to controller)
K	Purple†	RS-232 Transmit Data (from controller to searchlight)

*Used for Hand Controller †Used for Serial Communications; only connected on RS-232 Lights

12-Pin Metal Power and Remote Connector (MBPKG-E Series):

Pin	Color	Function
A	Green*	Strobe/Low Beam Mode
B	Black*	Focus Narrow
C	Black	Negative Supply Voltage
D	Orange*	On/Off
E	Grey†	RS-232 Signal Ground
F	Brown*	High/Normal Beam
G	Red	Positive Supply Voltage
H	Yellow*	Focus Wide
J	White†	RS-232 Receive Data (from searchlight to controller)
K	Purple†	RS-232 Transmit Data (from controller to searchlight)
L	Red	Positive Supply Voltage
M	Black	Negative Supply Voltage

*Used for Hand Controller and Not Connected on 48VDC Systems †Used for Serial Communications

Input Power Requirements

12VDC Input Systems:

(Handheld Packages, MBS-430-Y Series, MBPKG-E, MBPKG-E2)

- All specs are at 25° C
- Operating voltage range: 10.0 to 13.5 Volts
- Non-operating voltage range: ± 36.0 Volts (reverse polarity protected)

Current Draw Specs at 12.0 Volt Input <i>(at searchlight connector)</i>		
	Nominal	Max
Lamp Off	<1 Amp	1 Amp
Low Beam Mode	3.37 Amps	3.6 Amps
Normal/Default Beam Level	4.34 Amps	4.6 Amps
High Beam Mode	8.52 Amps	9.3 Amps
Peak Current at Lamp Start	18.5 Amps	20.0 Amps
Peak Current Pulse Duration*	10mS	12mS

**Pulse Duration is the time the searchlight draws more than 10 Amps.
The waveform for this current pulse resembles half a cycle of a sine wave.*

24VDC Input Systems:

(Systems utilizing the MBP-4024-S or MBP-4024-MS Converter, MBPKG-E-24, MBPKG-E2-24)

- All specs are at 25° C
- Operating voltage range: 11.0 to 36.0 Volts
- Non-operating voltage range: ± 36.0 Volts (reverse polarity protected)

Current Draw Specs at 24.0 Volt Input		
	Nominal	Max
Lamp Off	0.11 Amps	0.120 Amps
Normal/Default Beam Level	3.2 Amps	3.4 Amps
High Beam Mode	4.9 Amps	5.2 Amps
Peak Inrush Current During Input Power Connection	7.5 Amps <5uS	9.0 Amps <8uS
Peak Lamp Strike / Warm-up Current	11 Amps <12mS	15 Amps <15mS

Power Connector Pin-Out

Pin <i>(Plastic Connector)</i>	Pin <i>(Metal Connector)</i>	Color	Function
1	A	Red	Positive Supply Voltage
2	B	Red	Positive Supply Voltage
3	C	Black	Negative Supply Voltage
4	D	Black	Negative Supply Voltage

Troubleshooting

Symptom	Probable Cause	Remedy
<i>Searchlight</i>		
Light ignites but flashes or turns off after 1-2 seconds	Low Battery OR Dead Battery OR Low Input Voltage	Charge Battery OR Try another Battery OR Check power source
Light ignites but goes out when switched to high beam	Low Battery	Charge Battery
Lamp strikes but does not ignite	Bad Lamp	Change Lamp
Nothing happens when power button is pressed	No Power	Check Power Source & Cable
Light comes on but focus will not work	Limits not set correctly OR Defective Servo or Controller	Restore factory settings OR Call Factory for an RMA #
Light comes on but high/low beam and focus will not work	Defective Controller	Call Factory for an RMA #
Light beam will not focus to the full flood position	Lamp is not seated in socket completely OR Limits not set correctly	Call Factory for Instructions on Reseating Lamp OR Call Factory for Instructions
Light comes on but will not change power level	Supply voltage too high	Reduce Supply Voltage
<i>5200 & 5600 Series Chargers</i>		
Indicator does not light	No power OR Reversed polarity	Check power source OR Check fuse in vehicle power adapter
Indicator flashes red with no battery connected	Incorrect Voltage	Check power source OR Check fuse in vehicle power adapter
Indicator flashes red when a battery is connected	Battery is shorted OR Battery has bad cells OR Battery is too hot or cold	Try another Battery OR Bad Charger
Indicator alternates between red and amber when battery is connected	Insufficient Power	Check Line Voltage if using AC adapter; Try different AC adapter OR Make sure socket is clean on DC Vehicle Adapter
Indicator stays red when a battery is connected or set on top	Battery is bad OR has overheated	If battery is warm, allow to cool and try again
Indicator stays red when battery set on top & turns amber when pigtail connected	Dirty trickle charge contacts OR battery is turned in the wrong direction	Clean contacts OR Turn Battery around
Indicator turns solid amber instead of flashing amber when battery is set on top without its tail connected	Defective Charger	Call Factory for an RMA #
The fast charge cycle ends before battery is fully charged	Battery is out of balance OR Over-discharged	Allow Battery to slow charge for one cycle (place battery on top & do not connect pigtail) and wait for flashing amber indicator to turn solid green (takes about 14 hours)
<i>5600 Series Chargers Only</i>		
The indicator flashes red when powered up with something connected to the searchlight power jack	Something other than a searchlight is connected OR Red button is pressed on light OR Shorted light or coil cord	Only power Maxa Beam searchlights with MBP-5600 OR Allow MBP-5600 to power up before pressing power button OR Try another light and/or cord
Searchlight occasionally strobos or blinks once when starting if it is cold	Normal	Contact Factory if this happens consistently or if this is a problem for your application

Symptom	Probable Cause	Remedy
<i>5600 Series Chargers Only, cont'd</i>		
Searchlight jack is out-putting 20 volts	Normal	Output will instantly drop to 13V when light is turned on
Searchlight continuously strobos and the indicator light does not go out when attempting to turn on searchlight	Defective MBP-5600	Call Factory for an RMA #; Do not attempt to use with a searchlight until MBP-5600 is repaired
<i>MBP-1207 NiCad Batteries</i>		
Battery hot and will not run searchlight	Internal thermal circuit breaker in battery is tripped	Disconnect battery from searchlight; Allow to cool until breaker auto resets
Battery runs light for shorter and shorter duration	Battery has developed memory	Discharge battery until light turns off & then recharge; Repeat cycle until no improvement in run time is observed OR Run a conditioning cycle on 5200 or 5600 Series Charger OR Return battery to Factory for evaluation
<i>MBP-1307 Li-Ion Batteries</i>		
Battery hot and will not run searchlight	Internal thermal circuit breaker in battery is tripped	Allow to cool until breaker auto resets
Light turns off during high beam use when battery's charge is <40%	Internal thermal circuit breaker in battery is tripped	Wait for internal breaker to auto reset
Light will not turn on when battery is connected to charging adapter	Battery cannot power light when connected to charging adapter	Disconnect charging adapter
<i>MBP-3200 LiFePO4 Chargers</i>		
Charger's LED flashes red	Charger error	Call Factory for an RMA#
<i>MBA-7100 Vehicle Power Adapter</i>		
Will not run light	No power OR Fuse in adapter blown	Check Power Source OR Replace fuse located in plug with new 3AG 15A fuse

If you have a troubleshooting issue or technical question that is not covered in this manual, please contact Peak Beam's Technical Support Department and we will be happy to assist you.

Peak Beam Systems, Inc. Technical Support Department
1-610-353-8505 (*dial 3 for Tech Support*)
techsupport@peakbeam.com

Warranty and Repairs

Warranty

Peak Beam Systems, Inc. warrants that for a period of 12 months from the date of purchase that its products (except as listed below) shall be free of defects in materials and workmanship under normal use and that Peak Beam Systems, Inc. shall, at its option, repair or replace any defective product upon the prepaid return of the product to its factory. In the case of any lamp, light bulb or other form of light source and the battery, the warranty period shall be 90 days.

The warranty only applies to defects in materials and workmanship and not to damage incurred in shipping or handling, damage due to abuse, misuse, alteration or improper application of the equipment. Damage incurred in return shipping and handling due to improper packaging is not covered.

In order to be eligible for coverage under the warranty, the equipment must have the original Peak Beam Systems, Inc. label with a legible serial number attached.

The foregoing warranty is in lieu of any and all other warranties whether expressed or implied. This warranty contains the entire warranty. Peak Beam Systems, Inc. authorizes no other person or organization to modify this warranty or to assume for it any other warranty or liability concerning its products. The remedies of the buyer set forth hereon are exclusive and the liability of Peak Beam Systems, Inc. whether arising out of contract, negligence, strict tort, any warranty or otherwise shall not, except as expressly provided, exceed the price of the goods upon which such liability is based.

In no event shall Peak Beam Systems, Inc. be liable for direct, indirect or consequential damages, loss of anticipated profits, loss of time or any other losses incurred by the buyer in connection with the purchase, installation, operation or failure of operation of the product.

Returns to the Factory

All factory returns must have a Return Material Authorization (RMA) number. Peak Beam Systems is not responsible for items returned without an authorization number. All warranty returns without an RMA number will be returned at the customer's expense. RMA numbers can be obtained by calling 1-610-353-8505 or e-mailing techsupport@peakbeam.com. Please provide the following information:

- Serial number(s) of unit(s) to be returned
- Date and location of purchase (if known)
- For service returns, a description of the problem
- Method of payment for non-warranty service

Product returned must be sent freight prepaid along with return shipping instructions and a brief description of the problem to: Peak Beam Systems, Inc., 3938 Miller Road, Edgemont, PA 19028.

Domestic warranty returns will be returned freight prepaid by Peak Beam Systems, Inc.'s choice of freight carrier. The customer will pay any additional freight costs for special handling or expedited freight. All repairs must be prepaid unless other arrangements have been made.

Non-U.S. warranty returns will be returned by the customer's choice of freight carrier with the freight charges paid by the customer.

Returns of non-defective goods will only be accepted from the original buyer within 90 days of sale and must be in "like new" condition. These returns are subject to a minimum restocking charge of 20% plus freight out and must be returned freight prepaid. Custom equipment is not returnable.

Available online at www.peakbeam.com:



Updated Listings of all Maxa Beam Searchlights, Packages, and Accessories



Downloadable Versions of Operation Manual, Technical Specifications, and Reports

A screenshot of a web-based contact form. The form has a title bar and a close button. It contains several input fields for contact information: Name, Company, Address Line 1, Address Line 2, City, State, Zip, Telephone, Fax, and E-mail. There are also checkboxes for 'Send Copy to Mail' and 'Remember my information'. A mouse cursor is pointing at the top left of the form.

Electronic Contact Forms for Technical Support or Quote Requests

Peak Beam Systems, Inc.
3938 Miller Rd., P.O. Box 1127
Edgemont, PA 19028 U.S.A.
Phone: 1-610-353-8505
Fax: 1-610-353-8411

Technical Support:
techsupport@peakbeam.com

Sales:
sales@peakbeam.com

Peak Beam Systems, Inc.
P.O. Box 1127 • 3938 Miller Rd.
Edgemont, PA 19028 USA
www.peakbeam.com