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Prize-Winning Cameras and Equipment

STROBOFLASH INSTRUCTIONS

GRAFLEX, INC., Rochester, N. Y., U. S. A.

A SUBSIDIARY OF GPE

STROBOFLASH INSTRUCTIONS

INDEX

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GRAFLEX, INC.
Rochester 8, N.Y.

271/157

Printed in USA

GENERAL DESCRIPTION

The Stroboflash is a light weight completely portable electronic flash unit incorporating the latest in electron tube and printed circuit design. These design features incorporated in a unit proven in the field give the Stroboflash a very low operating cost for any of the four sizes. Each power pack is encased in heavy duty, durable and water resistant Bolotron with Koiled power cord and plug, and shoulder strap.

Stroboflash I	is dark blue
Stroboflash II	has black bottom and grey top
Stroboflash III	has black bottom and light blue top
Stroboflash IV	has black bottom and light blue top with 4-way power selector.

The Stroboflash is designed for use with all cameras having "X" or zero delay contact synchronization. It may also be used with cameras not having such contacts by utilizing open flash. All four units use the same #2025 lamphead which is housed in grey Bolotron and is completely interchangeable.

NOTE: Stroboflash III has been replaced by Stroboflash IV.

POWER PACK

The Stroboflash I Power Pack contains the two batteries, two discharge capacitors and a current limiting resistor. The batteries in this unit are made especially for use in electronic equipment and to meet GRAFLEX specifications. The Stroboflash II Power Pack contains two batteries, also specially made to GRAFLEX specifications, two discharge capacitors, a current limiting resistor and a fuse, - Bussman Fusetron MDL 2/10 amp. The prime purpose of the fuse is to open the circuit and prevent damage to the batteries in the event a capacitor were to fail. Contained in the power pack of the Stroboflash III and IV are two batteries (same as those in the II), a current limiting resistor, or resistors, eight discharge capacitors and a fuse, Bussman Fusetron MDL 1/4 amp. In all three models the power pack is connected to the lamphead by a retractable Koiled Kord. This cord enables the photographer to set the power pack down and have a 10 ft. radius in which to work with the camera and lamphead. (With the Stroboflash I this radius is 5 ft.) This feature is also advantageous when setting the unit upon a stand for slave operation.

LAMP HEAD

The completely interchangeable lamphead for the Stroboflash units houses the triggering circuit, flashtube, and reflector. The reflector has a super-satin finish which eliminates hot-spots and allows for "feathering" when off the camera. The flashtube is either a Kemlite DW2 or GE FT-118. The triggering circuit consists of a trigger tube, printed electronic circuit and trigger transformer.

LIGHT OUTPUT & ENERGY STORAGE

The color temperature of the light produced by the Stroboflash is approximately 7000° Kelvin which closely approximates that of natural daylight. Usually no filter is used with daylight type film.

In the Stroboflash I, two 250 microfarad capacitors are charged from the 480 volt battery supply to give 50 watt-seconds (joules) of stored energy per flash with a recycle time of 3 seconds with fresh batteries and up to six seconds as batteries age. Flash duration is approximately 1/1400 second. In the Stroboflash II, the two 525 microfarad capacitors are charged from the 450 volt battery supply to give 100 watt-seconds of stored energy per flash with a recycle time of three to four seconds with fresh batteries. Flash duration is 1/1000 second which is high enough to stop normal action regardless of shutter speed.

The Stroboflash III and IV use eight 250 microfarad capacitors and the same 450 volt battery supply as the Stroboflash II. Energy storage is 200 watt-seconds with a recycle time of six seconds with fresh batteries and up to ten seconds as batteries age. Flash duration is approximately 1/500 second, - a little less on the IV.

THE STROBOFLASH BATTERIES have been specially designed and built for ruggedness and durability. However, a sharp blow especially on the corners may or may not result in permanent damage. Handle batteries carefully.

An alternate source of power is the rechargeable Graflex Nickel-Cadmium AC Converter. See special insert sheet at rear. This unit is essentially a specially designed nickel-cadmium battery (NICAD) with AC converter and built-in battery charger with cord and plug to reach a 110-120 volt AC outlet.

In use you proceed as though regular dry batteries were being used. Operation requires only that its 3 way switch be set at Battery. This allows the capacitors to be charged directly from the battery and will provide sufficient flashes for all ordinary use as follows:

Stroboflash II - about 160 flashes, - then recharge
Stroboflash III - about 80 flashes, - then recharge
Stroboflash IV, full power, - about 80 flashes, - then recharge
Stroboflash IV, 1/4 power, - about 300 flashes, - then recharge

Recharging merely requires that the AC power-charger cord be plugged into any convenient 110-120 volt outlet. No need to clock the charging time as overtime will do no harm. It takes 12 hours to charge from flat to full charge so overnight charging will have the unit ready the next morning. Be sure the switch is moved from Charge to Off or Battery when ready to use. Return the Charger cord to the lower case section, out of the way.

NOTE: Periodic (4-6 months) inspection of the battery for possible refilling is of course needed, otherwise the battery needs no attention. Use distilled water.

AC converter operation (No NICAD battery) requires only a standard extension cord with good plugs with positive contact, - and of course, access to a 110-120 volt AC outlet. Connect the extension cord to the Charger cord and then plug into outlet. Set the switch at AC power and you have essentially an AC power pack.

OPERATION

To turn the unit on: Simply plug the power cord into the lamphead, observing proper polarity by matching red dots. The unit is now ready. No on/off switch is incorporated in the Stroboflash because, by eliminating the switch, there is no chance of the photographer forgetting to turn the unit off, and it is obvious the unit is on when the cable is plugged in. The unit may be left on during a shooting session as there is so little current drawn from the batteries (approximately 2 Mils*) that no harm will be done to the batteries. Tests prove when the unit is left on for one hour, approximately enough energy required for only one flash is drawn from the batteries. Arcing which will in time damage shutter contacts is eliminated in the Stroboflash by use of a trigger tube. To test, fire the unit, using a bent paper clip or short length of wire which will fit into the household type A. C. trip socket and short out the two contacts. Only a few micro-amps of current flow through the contacts so there is no sparking or danger of shock.

Connect shutter cord to camera contacts and to outlet in lamphead and you are ready to "shoot." If unit continues to flash by itself when shutter cord is connected, reverse polarity. (Note: A single flash when shutter cord is connected is normal).
To turn the unit off: Disconnect the power cord from the lamphead. The power cord may be left plugged in during a shooting session as there are only a few milliampere of current drawn from the batteries. However, when the unit is not in use for extended periods it is advisable to disconnect power cord from lamphead to conserve batteries.

MOUNTING

The lamphead is equipped with a standard thread tripod socket and may be mounted on a standard battery case or mounting tube by using a friction fitting rubber flash-gun adapter #2068 which is supplied with each unit This adapter is also available in metal #2067 utilizing a set screw. A standard "L" bracket #2065 (also supplied with the unit) may also be used for mounting. This bracket is very adaptable for bounce lighting, allowing the lamphead to be raised or lowered vertically.

SYNCHRONIZATION

With cameras having "X" or "O" type shutter contacts, simply use required connecting cord from household type A. C. outlet on lamphead to camera shutter contacts, and camera is in sync. Reverse plug on lamphead if unit fires more than once by itself when connected to camera.

Cameras not having "X" type shutter contacts may sometimes have them built in by a competent camera repairman. We do not do this work.

*milliampere

MULTIPLE OPERATION

Two or three or more lampheads may be used on one Stroboflash Power Pack. Connection is made with 20 ft. extension cables #2050. When two or three lampheads are used on one power pack, however, the total light is divided equally among the number of flashtubes fired. Be sure to connect in proper sequence, - the power pack cord to the extension cord or cords, and then connect the lampheads. The tubes may flash but without arcing in the circuit. When disconnecting, simply reverse the precedure, - remove the lampheads first and then disconnect the extension cords from the power pack cord.

SLAVE OPERATION

The Stroboflash (power pack with lamphead) will operate as a slave unit by the use of a phototube assembly. This is accomplished by inserting the phototube socket #2148 with phototube #2142 into the trip outlet on the lamphead. Light from the main light at the camera causes the slave unit to flash in synchronization with the main light source.

QUESTIONS AND ANSWERS

About the STROBOFLASH I, II, III and IV

HOW DO I TURN IT ON?

Simply insert the plug from the battery power pack into the 4-contact socket on the lamphead. This connects the batteries to the capacitors and the unit is "on," and ready to use.
WARNING: Never open the power pack nor attempt to change batteries while the power cord is connected to the lamphead!

HOW DO I TURN IT OFF?

Remove the power plug from the lamphead. No switches to turn off.
WARNING: The Capacitors are still charged and the power plug carries 450-480 volts! It is amply insulated, but no attempt should be made to touch the contacts inside the plug! Since a dry battery unit contains no vibrator nor transformer, the idling current drain on the batteries is very small. It is, therefore, unnecessary to unplug and replug to conserve the batteries, unless it is to be for an extended period of time.

HOW DO I CHECK IT?

With the battery power pack cord plugged in, short together the contacts in the standard two-terminal socket in the lamphead. The voltage at this socket is practically zero, so a bent paper clip or piece of wire may safely be used to short the contacts. No push button is provided for this purpose, because it is felt that such a button invites excessive test flashing.
WARNING: Never touch contacts in the four-terminal plug which comes from the power pack! This plug carries 450 -480 volts!

WHAT IS THE RECYCLING TIME WITH DRY BATTERIES?

Stroboflash I. Three seconds, with fresh batteries; up to five or six seconds as batteries age.
Stroboflash II. Three seconds, with fresh batteries; up to five or six seconds as batteries age.
Stroboflash III. Six seconds, with fresh batteries; up to eight to ten seconds as batteries age.
Stroboflash IV. Two to six seconds depending upon position of 4-way selector.

WHAT IS THE FLASH DURATION?

Approximately 1/1400 second with Stroboflash I.
Approximately 1/1000 second with Stroboflash II.
Approximately 1/500 second with Stroboflash III.
Approximately 1/1200 to 1/400 second with Stroboflash IV.

HOW SOON MAY 4 WAY SELECTOR BE MOVED ON STROBOFLASH IV?

Allow 2 to 3 seconds after a flash before moving the selector switch to another position.

HOW MUCH ENERGY IS STORED FOR EACH FLASH?

50 watt-seconds with fresh batteries - Stroboflash I
100 watt-seconds with fresh batteries - Stroboflash II
200 watt-seconds with fresh batteries - Stroboflash III and IV

HOW DO I MOUNT THE LAMPHEAD?

A tripod socket is provided on the bottom of the lamphead. For convenience, each Stroboflash outfit includes a rubber battery case adapter and an "L" bracket. The battery case adapter permits mounting the lamphead on the top of a standard battery case such as the Graflite, Graflite, Jr., etc. The "L" bracket permits use of the lamphead with those cameras not equipped with a standard battery case.

HOW DO I SYNCHRONIZE IT WITH MY CAMERA?

Shutters having "X" or "O" (Zero delay) type contacts may be synchronized with all STROBOFLASH. Because of the delay factor, solenoids do not synchronize properly with electronic flash. Plug the connecting cord from the camera contacts into the two-terminal trip socket in the lamphead. Polarity of this cord must be observed, so if the unit fires continually without shutter triggering, reverse the plug in the socket. The upper pin in the socket is grounded.

HOW CAN I FIRE MORE THAN ONE LAMP FROM THE POWER PACK?

Stroboflash 20' extension cords may be used to connect the power pack to several lamps. The light output will be divided equally between the lamps. When several lamps are connected to the same power pack, firing any one of them will fire them all.

HOW DO I CHANGE THE BATTERIES?

1 - Remove the power plug from the lamphead.

2 - With a coin or screwdriver remove the round head screw and washer on the ends of the power pack.

3 - Remove the top half of the power pack carefully, - lift straight up. This contains the capacitors, a series resistor, and fuse. On the Stroboflash I simply pull away the heavy rubber gasket which seals both halves together.

4 - Under normal use and life expectancy, Stroboflash batteries are good for:

1000 - 1500 flashes - Stroboflash I *
2000 flashes - Stroboflash II **
1000 flashes - Stroboflash III **
1000 flashes plus - Stroboflash IV account of 4-way selector. **

New batteries may then be inserted into the bottom half in place of the old.

* 2 to 3 times as many flashes during normal life expectancy if Battery Booster is used as directed.

** About double the number of flashes during normal life expectancy if Battery Booster is used as directed.

HOW SHOULD SPARE BATTERIES BE STORED?

Batteries should be stored in a cool, dry place, preferably not over 70°. When Stroboflash is used steadily, give your batteries a rest and use a spare set or use the Battery Booster as directed.

HOW LONG WILL THE FLASHTUBE LAST?

The tube is guaranteed by the manufacturer -

Stroboflash I	-	10,000 flashes
Stroboflash II	-	10,000 flashes
Stroboflash III	-	5,000 flashes
Stroboflash IV	-	5,000 flashes plus

HOW ARE SEVERAL UNITS FIRED IN SYNCHRONIZATION?

Because of the very low idling current, STROBOFLASH make excellent slave units, where the unit is to be set up and left unattended. Insert the phototube into the trip socket on the lamphead in place of the connecting cord from the camera. The tube should point upward to the rear. The tube may be rotated in the socket so that the concave photosensitive side faces the triggering light source, which may be any type of flash, synchronized with the camera. An extension cord may be used between the phototube and lamphead if the proper polarity is observed and to hide the Stroboflash from camera view.

If other photographers are working in the area, and phototubes are not desirable, the trip sockets of several lampheads can be wired in parallel using double or triple plugs. All units can then be fired from any trip socket.

WHAT FILTERS ARE RECOMMENDED FOR COLOR?

The light from STROBOFLASH closely approximates the color temperature of sunlight; thus daylight film may be exposed without filters. For exacting work, follow the recommendations of the film manufacturer for exposure with electronic flash.

WHAT DO I DO IF THE UNIT DOESN'T FIRE?

Check the shutter for synchronization and check the trip cord to be sure good contact is being made. Try tripping the unit by shorting the trip cord in the lamphead with a short piece of wire. If it fires, the trouble is in the shutter or trip cord.

WHAT DO I DO IF THE UNIT FIRES CONTINUALLY WITHOUT TRIGGERING FROM THE CAMERA?

First, reverse the trip cord in its socket. If this doesn't work, check for a short in the trip cord or shutter contacts.

WHAT DO I DO IF I CAN'T FIND THE TROUBLE IN EITHER CASE?

Have your dealer return the unit prepaid to your nearest Graflex Service Center for servicing.

WHAT GUARANTEE DOES THE UNIT CARRY?

We guarantee each new Stroboflash sold by us to be free from defects in material and workmanship under normal use and service. In accordance with long-established practice in the electronic industry, our obligation under this guarantee is limited to making good at the factory any part or parts thereof which shall, within 90 days after making delivery of the Stroboflash to the original registered purchaser, be returned to us with transportation charges prepaid, and which our examination shall disclose to our satisfaction to have been thus defective.

This guarantee being expressly in lieu of all other guarantees, expressed or implied, and of all other obligations or liabilities on our part, and we neither assume or authorize any other person to assume for us any other liability in connection with the sale or use of our equipment.

The guarantee shall not apply to any Stroboflash which shall have been repaired or altered in any way so as, in our judgement, to affect its performance or reliability, nor which has been subject to misuse, negligence, or accident, nor to any Stroboflash which shall have been operated with improper fuse. Graflex, Inc. will not make payments for guarantee service performed by others.

BATTERY GUARANTEE

Dry batteries used in Stroboflash are high voltage and specially made for Graflex, Inc. The manufacturer warrants them to be free of defects resulting from workmanship or quality of materials.

The 240 volt batteries for Stroboflash are warranted therefore for a period of six months from date of manufacture.

The 225 volt batteries for Stroboflash II, III and IV are equally warranted but for a 9 months period from date of manufacture.

Our stocks are constantly kept fresh and under controlled temperature until the moment of packing and shipping. A last minute voltage test is made to insure that we are shipping fully charged stock.

HOW TO SYNCHRONIZE THE STROBOFLASH

HOW TO CHECK SYNCHRONIZATION — Observe the shutter blades by the light of the flash. They should appear wide open during flash. Be sure to check several times and at all usable shutter speeds.

WHAT ABOUT SHUTTER SPEED? — The highest possible shutter speed should be used at all times in order to eliminate the possibilities of ghost images due to the room illumination.

OPEN FLASH FOR SPECIAL SHOTS — When it is desired to synchronize the flash with special action (say the breaking of an egg) the two trip lead wires can be positioned so that the falling object will bring them together momentarily. The room is darkened somewhat to prevent ghost images, the shutter opened by the photographer, the flash occurs when the object hits the contacts, and the shutter is closed.

PRECAUTIONS WITH TRIP LEADS — If the unit continues to flash by itself, or flashes every time the camera is touched, reverse the trip lead connection.

DO NOT use soldering pastes or any other than rosin core solder in soldering trip leads. Use only the best grades of insulation and wash all connectors with carbon tetrachloride whenever they become dirty, since even the smallest amount of leakage current may cause self triggering.

MULTIPLE SYNCHRONIZATION — Stroboflash units may be connected lamp to lamp, by means of a trip lead in order to synchronize any number of units. Be sure polarity of trip leads is observed.

Where other flash units will not interfere, the accessory phototube will permit perfect synchronization up to 200 feet, without connecting trip leads, provided the remote units can "see" direct or reflected light from the master unit.

SYNCHRONIZATION WITH OTHER TYPES — The accessory phototube for the Stroboflash permits synchronization with other units. Use the STROBOFLASH as a "slave unit" to be triggered by the flash from the unit at the camera. This makes an ideal way to supplement the light from a standard flash lamp on the camera.

HOW TO SYNCHRONIZE THE STROBOFLASH

TRIGGERING METHOD: The triggering method is completely electronic and since no relays are involved, the flash occurs almost the instant the circuit is closed. Very small currents flow in the trip circuit (less than 100 microamperes) permitting the use of delicate built-in shutter contacts without fear of damage. These contacts must be such that the circuit is closed at the moment the shutter blades are wide open.

BETWEEN THE LENS SHUTTERS: Most shutters and cameras are now provided with contacts for electronic flash and function perfectly with STROBOFLASH.

Graphex and Rapax Shutters: With the "X" type, simply connect the trip lead from the unit to the two prongs provided on the shutter. Tripping the shutter will trip the unit in proper synchronization. If the shutter is of the fully synchronized type providing for use of regular flash bulbs also, be sure the indicator is set to the "X" or "O" (not "OFF") position.

Kodak Supermatic Shutter: With the "X" type, simply connect the trip lead to the two prongs provided. If the shutter is of the fully synchronized type, cock the shutter in the usual fashion but DO NOT COCK THE SYNCHRONIZER PORTION. Watch polarity.

Ilex Synchronized Shutter: Set adjuster to red dot or "X" position. Watch polarity.

Custom Built Contacts: Many photographers prefer to have contacts installed in the shutter by competent repairmen. In some cases, delayed action merchanisms must be removed to accomplish this. Brush contacts can also be installed on the lens board in such manner that the cocking lever will brush a piece of spring wire or phosphor bronze at the moment the shutter blades are wide open.

Kalart Synchrostrob: An accessory cable release device that can be adjusted to operate with most between-the-lens shutters. Manufactured by the Kalart Company of Stamford, Connecticut.

STUDIO SHUTTERS: Packard and Ilexpo shutters can be readily synchronized with a "home made" brush contact made of wire or phosphor bronze, or by means of a type YZ2RW-4 Microswitch obtainable at electrical or radio supply houses.

FOCAL PLANE SHUTTERS: These shutters must be synchronized at the speed at which the entire film area is exposed, usually around 1/20 second. With Graflex cameras, it is usually convenient to set the curtain at "O", use the highest tension and have the rising of the mirror close a contact just before the curtain is released to close.

GET THE MOST FROM YOUR STROBOFLASH BATTERIES ...

The two STROBOFLASH batteries installed in your STROBOFLASH are designed to give up to the indicated number of flashes under normal use and service.

Stroboflash I - 1000 - 1500
Stroboflash II - 2000
Stroboflash III - 1000
Stroboflash IV - 1000 plus per use of 4-way selector

Follow these hints and obtain maximum results:

WHERE TO KEEP THEM

Batteries should be stored in a cool, dry place, preferably between 40° and 65° F. Batteries should be given the same care as film and may be stored in the refrigerator.

DO NOT STORE BATTERIES AT HIGH TEMPERATURES such as encountered in the trunk of an automobile parked in the hot sun.

To do so will result in cell deterioration of the batteries and will have the same effect on them as average actual use.

COLD WEATHER will not injure the batteries but will retard the chemical action resulting in a long recycling time.

This should be kept in mind if you wish to take a series of rapid pictures. When the batteries are brought back up to room temperature, the recycling time will decrease to normal.

FREEZING will not injure the batteries used in STROBOFLASH but they must be brought back up to normal temperature for operation. However, do not place batteries on a heater or radiator for quick thawing.

HOW TO USE THEM

It is normal for batteries which are consumed during the first 4 months of operation to give more flashes than batteries consumed over a period of a year.

A LARGE NUMBER OF FLASHES IN A FEW HOURS may increase the recycling time excessively. However, the batteries will regain their ability to release energy after a night's rest. If this is not convenient, there are two alternatives:

1 - Use the "Rest System." By this method an extra set of batteries must be on hand. By alternating usage the set not in use has time to build up strength.

2 - A Battery Booster is available which will "depolarize" the batteries in a few hours to bring them back to normal operation. It may also be used while the batteries are actually in service.

3 - Stroboflash I batteries are rechargeable and the Battery Booster will increase by many times the number of flashes during normal life expectancy.

THE STROBOFLASH DRY BATTERIES have been specially designed and built for ruggedness and durability. However, a sharp blow especially on the corners may or may not result in permanent damage. Handle batteries carefully.

WHEN TO REPLACE THEM

BATTERIES ARE APPROACHING THE END OF THEIR USEFUL LIFE when, after a rest, the shortest time in which two consecutive flashes may be made exceeds five seconds (Stroboflash II) or ten seconds (Stroboflash IV). When this is evident, batteries should be replaced to insure dependable service.

TO GET NEW BATTERIES IN A HURRY

SEE YOUR GRAFLEX DEALER, or . . .

Simply send check or money order in the correct amount to the nearest Service Center listed below for each 225-volt or 240-volt battery desired. Your order will be mailed to you promptly via PARCEL POST.

WHEN NEW BATTERIES ARE RECEIVED, inspect them carefully for possible physical damage from shipment such as dents, bulges, etc. If batteries appear to be damaged check them at once in a Stroboflash or with a Battery Analyzer. If they do not operate properly, enter a claim first, then notify your source immediately.

BATTERY GUARANTEE

The STROBOFLASH HIGH-VOLTAGE DRY BATTERY is guaranteed by the battery manufacturer to be free of defects resulting from workmanship or quality of materials.

GRAFLEX SERVICE CENTERS FOR HANDLING STROBOFLASH are located at:

GRAFLEX, INC.
89 Allen Street
Rochester 8, New York

GRAFLEX, INC.
800 No. Cole Ave., P.O. Box 38606
Hollywood 38, California

GRAFLEX, INC.
Suite 922, 50 Rockefeller Plaza
New York 20, New York

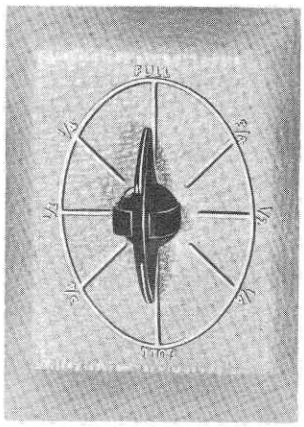
GRAFLEX of Canada Limited
137 Wellington St., West
Toronto 1, Ontario, Canada

GRAFLEX, INC.
320 West Ohio St.
Chicago 10, Illinois

9/56 Printed in U.S.A.

NEW STROBOFLASH IV WITH EXCLUSIVE "4-WAY POWER SELECTOR"

Just set the dial for nominal 50, 100, 150, 200 watt-seconds output



Here for the first time is a portable electronic flash unit that can be used for any photographic assignment. A flick of the convenient control switch gives ¼, ½, ¾ or full power output . . . the instant selection of the right light for perfect pictures. This exclusive FULL RANGE LIGHT CONTROL lets the user select the light output to professional accuracy. Take close-ups with fast film or long shots with color film . . . vary exposure without changing "f" stop . . . balance multiple light sources for delicate lighting effects . . . increase action-stopping ability by reducing the output setting . . . all are within the scope of the Stroboflash IV. There is no wasted power, either. Energy is not "thrown away" as in other units having variable light output. The capacitors not needed are automatically prevented from discharging. Besides conserving battery power, this feature also permits faster recycling time between flashes. The 50 watt-second setting has a recycling time of approximately 2 seconds. The 100 watt setting—approximately 3 seconds; 150 watt setting—approximately 5 seconds; and the 200 watt setting recycles at approximately 6 seconds. User must allow 2 to 3 seconds after discharge before changing switch position.

The new Stroboflash IV is completely interchangeable with the cords, plugs, lampheads, and other accessories of Stroboflash I, II, and III and retains all their many important features . . . extra rapid recycling . . . efficient reflector with exceptionally uniform light distribution . . . trigger tube triggering for your personal protection, protection of your shutter, and maximum slave sensitivity . . . simple, economical slave accessory . . . no wet batteries to recharge . . . no corrosive liquids . . . operates in the heat of the desert or the cold of the arctic . . . Stroboflash can be left on for hours, ready for instant action without appreciable loss of battery power.

Selector Setting	¼	½	¾	full
Nominal Watt-second	50	100	150	200
Effective Candle Power Seconds	1100	2200	3300	4400
Flash duration (Approx.)	1/1200	1/800	1/600	1/400
Recharging time (Approx.)	2 sec.	3 sec.	5 sec.	6 sec.
Guide Numbers: based on E. C. P. S. rating				
Color—ASA 32	45	66	81	94
B & W—ASA 200	115	165	200	235

Equipment: Lamphead, power pack with 10′ Koiled Kord, L-bracket and rubber battery case adapter.

NOTE

STROBOFLASH IV REPLACES STROBOFLASH III. EXCEPT AS SPECIFICALLY RELATED ON THIS PAGE, FOR USING THE 4-WAY SELECTOR, THE ATTACHED INSTRUCTIONS FOR STROBOFLASH III REMAIN UNCHANGED.

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EXPOSURE AND DEVELOPMENT WITH YOUR STROBOFLASH

WHY WATT SECONDS? This is a question very frequently asked by the photographer... Watt seconds is a method of measuring electrical energy stored in the condensers. It does not necessarily provide you with a number by which you can determine exposure. This is due to the difference in the duration of the flash in high and low voltage units. For instance, the Strob III using alternating house current (rather than batteries) is a 200 watt second unit, with a flash duration of 1/5,000 of a second, which is much faster than the 1/1,000 of a second flash duration of a battery powered Stroboflash II, (with 100 watt second energy) yet both give about the same amount of usable light.

ELECTRONIC FLASH IS DIFFERENT from any other commonly used photographic light source. Therefore, before you can use this light successfully, you must be aware of the properties which make this light different, and those which make it react diversely to photographic emulsions.

The most obvious difference is its short duration. The extremely short flash (varying from 1/10,000 to 1/1,000 of a second) produces a number of unusual effects on the film.

FILMS REACT DIFFERENTLY and will produce a somewhat thinner or denser negative than one would expect. For example: At an exposure time of 1/50 of a second Superpan Press is more than a full stop faster than Isopan. When the exposure time is greatly reduced to let us say 1/3,000 of a second, the speed of both films are practically identical. With electronic flash, Super Panchro Press Type B produces a denser negative than Tri-X Pan although the daylight ASA ratings for the two films are 125 and 200 respectively.

EXTENDED DEVELOPMENT IS USUALLY PREFERRED, due to the fact that short duration flash tends to produce soft negatives. An increase of from 25% to 100% above the normal time usually provides the desired amount of contrast for most users. Of course, an energetic developer such as Strob-X is preferred when the utmost in film speed is desired.

TO DETERMINE PROPER f/STOP SETTING for any photograph it is necessary to accurately determine the amount of light reflected by the subject. When working out of doors using daylight, or indoors using flood, for a given source of illumination the amount of reflected light can readily be determined with an exposure meter or a calculator. With flash this becomes very difficult because of the extremely short duration.

When using a STROBOFLASH the photographer knows that the unit will give the same amount of light every time it is fired. It therefore becomes reasonably simple to determine the amount of light which is reflected from the subject, if the lamp-to-subject distance is known. The method for determining correct exposure is known as the guide number system.

EXPOSURE AND DEVELOPMENT WITH YOUR STROBOFLASH

SURROUNDINGS GOVERN EXPOSURE and have an important effect on the amount of light reaching the subject. If the exposure is made in a medium sized room with light colored walls and ceiling, the photographer gains from the light which is reflected back on the subject. If a much larger room is used much of the reflected light is lost by scattering, and to obtain the same exposure it becomes necessary to increase the aperture. When the photo is made outdoors at night where there is little reflectance and much absorption, at least two more full stops are necessary for good exposure.

DEVELOPMENT TECHNIQUE IMPORTANT TO CONSISTENT RESULTS - Development varies greatly from one photographer to another. There are a great many things that will vary in the processing of a negative. There are different types of developers which produce varied effects. The time, temperature, means and frequency of agitation, - all must be standardized to produce consistent quality in any negative.

WHEN TWO LIGHTS are added to the same power supply the power or light output is divided between the two lamps. If the second light does not fall upon the same area of the subject, or if one light is used for a modeling light, the light which is closest to the subject determines the exposure. Therefore, the guide number will fall off one full f/stop. If the guide number with one light is 220, the number when two lights are used would drop to 160.

THE COLOR TEMPERATURE of commonly used electronic flash tubes is identical, as the spectral quality of the gas is the same. They produce a light which has color temperature of 7,000 degrees Kelvin. This approximates the color temperature for which daylight color films are balanced (5900 degrees Kelvin). In most cases it is not necessary to use a filter with Daylight color films although a few photographers who prefer slightly warmer tones may use a filter such as the Wratten 81C, Ansco UV-16, or Harrison C-1/4.

"PERSONAL" GUIDE NUMBERS MUST BE ESTABLISHED - Each photographer must establish his OWN GUIDE NUMBERS by making tests with his own equipment, his own processing procedure - to find the type of negative he prefers.

GUIDE NUMBER EXPLAINED - A guide number is a very important figure, which when divided by the lamp-to-subject distance (in feet) will give the correct f/stop. If the proper f/stop is known (as in synchro-sunlight) the f/stop may be divided into the guide number to find the proper lamp-to-subject distance.

WHAT GUIDE NUMBER SHOULD I USE? - It is possible to find YOUR correct guide number with your STROBOFLASH by experimenting with your equipment and your processing technique. By making a number of exposures and developing negatives to produce the type of negative you prefer, you can easily find the f/stop which produced the best exposure. By multiplying this f/stop by the distance in feet from lamp to subject you can determine your correct guide number. Let us assume that the best negative with a given film was produced at f/11 and all the pictures were made with the STROBOFLASH twenty feet from the subject. By multiplying the two numbers (11x20 = 220) we find that our guide number is 220.

We use this guide number to ascertain the correct exposure at any lamp-to-subject distance. If we wanted to make a picture at ten feet, we would divide ten into the guide number 220 and the answer would be the correct f/stop (220 divided by 10 = f/22).

APPROXIMATE GUIDE NUMBERS are given so the photographer has a basis from which to develop HIS OWN GUIDE NUMBER, FOR HIS OWN USE. On the next page are shown guide numbers based upon the ASA daylight rating of various films and the Effective Candle Power Seconds rating of each model Stroboflash. Again we emphasize, that these are suggested guide numbers as only <u>you</u> can determine the type of negative you want.

MANUFACTURER CANNOT SUPPLY COMPLETELY ACCURATE GUIDE NUMBERS for their equipment because of the greatly varied techniques of photographers. Some of the things which must be taken into consideration are:

> FILMS VARY AS MUCH AS A FULL STOP... Black and White emulsions may vary from their rated speed as much as a full f/stop, and with color, a half stop from one emulsion batch to another. The speed of the film decreases as it ages, and this may become apparent before the expiration date on the package if the film is improperly stored.

EXPOSURE

Strob lighting is different from conventional lighting in that the flash duration is shorter than most shutter speeds. This eliminates the problem of selecting the proper shutter speed for many shots. For best results the photographer should run tests to acquaint himself with this type of lighting.

DEVELOPMENT

To obtain negatives of normal contrast, about 50% longer development than usual is recommended. This is not "forced" development but is necessitated by the action of very short exposures on film emulsions. Again, the user will eventually set HIS OWN STANDARDS depending upon contrast and negative quality preferred.

MOISTURE PROBLEMS

It is a good practice to moisture-proof the highly sensitive trip circuit of your Stroboflash every 3 - 4 months (depending upon severity of use). This should be done to eliminate any erratic flashing of the Stroboflash which may occur when it is used under extremely high humidity conditions or when the unit is taken into a warm place after being out in the cold. To moisture-proof the trip circuit, first clean the following areas with carbon tetrachloride (CAUTION: DO NOT INHALE FUMES) and then apply a thin coat of Dow Corning #4 Silicone Compound to the following insulating areas:

(1) Surface of outlet on lamphead

CAUTION: Do not apply silicone to socket holes or any surface which must make electrical contact to another surface such as plug pins, prongs or posts on shutter, etc.

(2) Male and female end of shutter cord plug
(3) Plugs on power cord and extension cords
(4) Surfaces adjacent to camera shutter cord connector

When the unit will constantly be used under extreme humidity or moisture conditions, it is recommended that the lamphead housing be removed and the following places treated.

(1) Wafer base of flash tube. (both sides)
(2) Trigger tube socket. (both sides)
(3) Under portion of trip socket.
(4) Back end of 4-prong plug.

Silicone compound is available in 1 ounce tubes under catalog #2175.

SUGGESTED GUIDE NUMBERS WITH STROBOFLASH

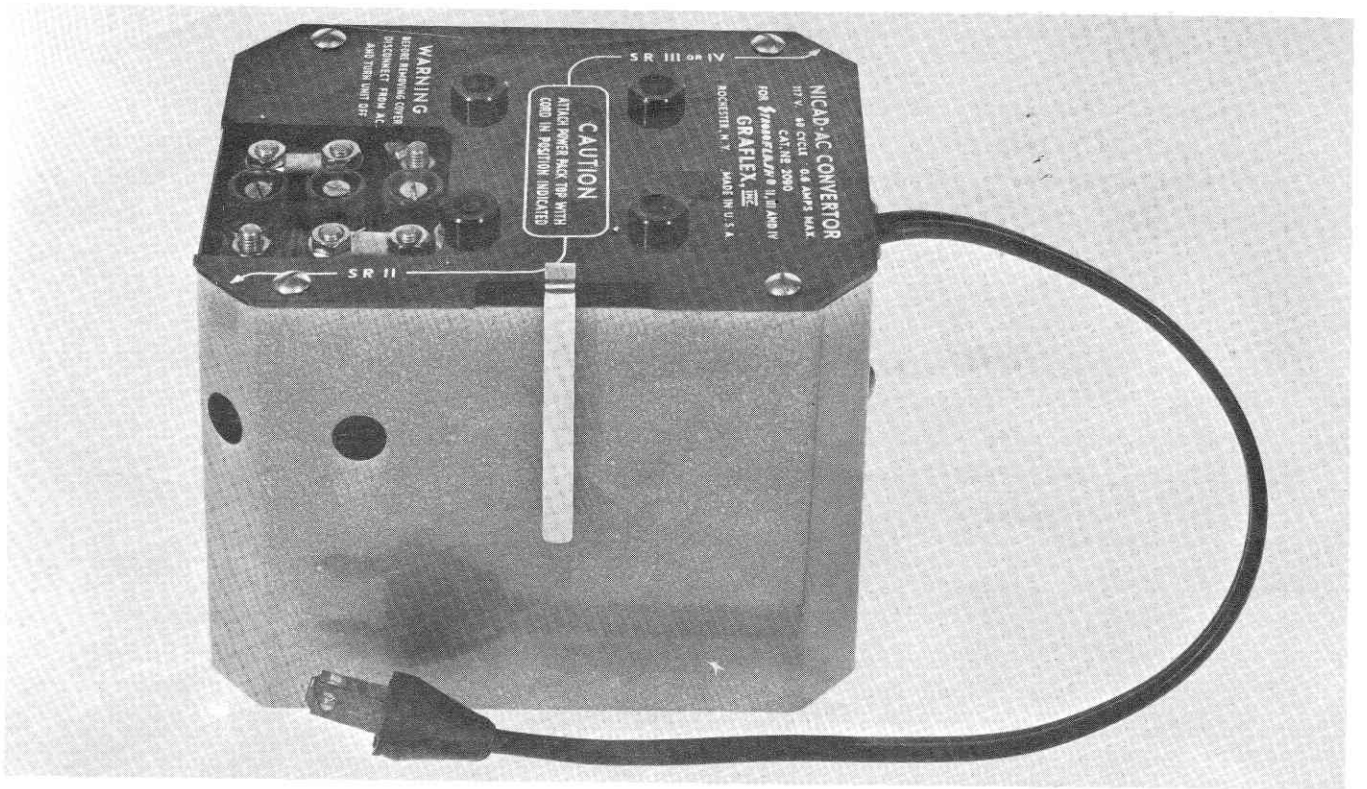
Daylight ASA Film Speed	I 50 Watt Seconds 1200 E.C.P.S.	II 100 Watt Seconds 2300 E.C.P.S.	1/4 Power Setting 50 Watt Seconds 1100 E.C.P.S.	IV 1/2 Power Setting 100 Watt Seconds 2200 E.C.P.S.	3/4 Power Setting 150 Watt Seconds 3300 E.C.P.S.	III-IV Full Power 200 Watt Seconds 4400 E.C.P.S.
10	27	38	27	37	45	53
25	43	60	41	59	72	83
32	49	68	45	66	81	94
40	55	76	53	74	91	105
50	61	85	59	83	102	118
60	67	95	65	91	110	130
80	77	105	74	105	130	150
100	87	120	83	120	140	165
150	105	145	100	140	180	200
200	120	170	115	165	200	235
300	150	210	140	200	250	290

E. C. P. S. is proposed Effective Candle Power Seconds method of rating electronic flash units. Guide numbers based on square root of .063 x E. C. P. S. x Film Speed. Watt seconds rating is nominal.

Start with these numbers to determine the guide number that will give you the type of transparency or negative you prefer.

NOTE: Exposures calculated by a proposed Average Candle Power Seconds (A.C.P.S.) method of rating electronic flash units will not differ appreciably from those above because of the unusually even distribution of light from the Stroboflash lamphead reflector.

NICAD A-C CONVERTER



INSTRUCTIONS FOR USE

DESCRIPTION

The Graflex Nicad A-C Converter serves 3 purposes:

A. It includes provision for charging the capacitors in the Power Top from an A-C 110-120 volt Power supply.

B. It has provision for charging the capacitors in the Power Top from a self-contained, optionally available, nickel cadmium 3-cell 4-volt battery.

C. It contains a built-in battery charger for charging the nickel cadmium battery as needed.

The Nicad A-C Converter occupies the same space as two 225-volt Stroboflash dry batteries otherwise used. It is self-contained in a sheet steel housing and interchanges with the dry batteries with ease.

If you purchase your Stroboflash with a Nicad A-C Converter installed, the black Boltaron battery case with shoulder strap will have been modified for the 3-way switch. If you are substituting for the 225-volt dry batteries in your own unit, the top front edge of the battery case must be notched for the switch and the plate attached to the face of the case. This plate with screws and mounting instructions, Cat. No. 2109, is furnished with the Nicad A-C Converter.

INSTALLATION

Remove the Stroboflash Power Pack Top and dry batteries from the lower black battery case. Insert the Nicad A-C Converter into it with the switch extending over the edge of the case and switch plate. If the unit is to be battery-operated, the A-C cord should be tucked into the end of the battery case. It will be found easier to slip the plug into the case before inserting the converter. The rest of the cord can then be tucked in easily. Replace the Power Pack Top.

CAUTION: BE SURE to observe proper orientation of the Power Pack Koiled Kord as indicated on the cover of the Nicad A-C Converter. If the Power Top is not properly plugged in, the Nicad A-C Converter power output will be shorted, resulting in damage to internal components.

To remove the converter, just invert the battery case, so that the converter will slip out. Note that the nickel cadmium battery is spill proof.

SWITCH

To move the switch lever from one position to another, push in slightly on the metal switch plate on the black battery case. This will disengage the lever, allowing it to be shifted easily. When the unit is not in use, the switch should be returned to the neutral (vertical) position.

BATTERY OPERATION

With the switch at "Battery," a fully charged battery will provide the approximate number of flashes shown herewith.

Flashes—Stroboflash II—about 160
Stroboflash III—about 80
Stroboflash IV—about 80 full power—more at other positions of selector.

NOTE—that the switch should not be left in the "Battery" position if the unit is not actually being used, since the vibrator will cause some drain on the battery, thereby reducing the total number of flashes obtainable.

Recycling—Stroboflash II about 8 sec.
Stroboflash IV—¼ about 4 sec.
Stroboflash IV—½ about 8 sec.
Stroboflash IV—¾ about 12 sec.
Stroboflash IV—full about 15 sec.

Recharging—Plug the A-C Charger cord into 110-120 volt outlet. A fully discharged battery can be fully recharged in approximately 12 hours. The battery will not be damaged by extended charging beyond that time. The built-in battery charger draws only 4 watts.

A-C OPERATION WITH BATTERY

Remove the A-C Power Cord from the battery case and plug it into the 110-120 volt 60 cycle outlet and turn the switch to the A-C Charge position. This will keep the capacitors in the Power Top charged and will at the same time charge the nickel cadmium battery. Recycling time is the same as that given above for battery operation.

A-C OPERATION—NO BATTERY

It is possible to use the Nicad A-C Converter as merely an A-C Power supply without the nickel cadmium battery. If the battery is to be removed, disconnect the 110 volt power cord from wall outlet and remove the 4 screws holding the top plate of the converter in place. Lift the top plate off. Disconnect and tape separately the two battery leads (1 red and 1 white). Loosen the screw holding the battery retaining strap to the end of the converter and remove the nickel cadmium battery. Replace the top cover and holding screws.

When reinstalling the nickel cadmium battery, attach the red wire to the separate positive (+) terminal in the corner of the metal Converter housing and attach the white wire to the separate negative (—) terminal (over the number W-15778) and secure in place with nut. Tighten the screw holding the battery strap and refit the top cover with the 4 holding screws.

NICKEL CADMIUM 4-VOLT BATTERY

The nickel cadmium battery is a wet cell type, but so sealed that there is no leakage. Every 4-6 months, check the liquid level of the 3 cells through the holes provided in the side and corner of the converter housing and fill with distilled water as needed. Only a few drops may be needed to bring the level up to the index line on the side of the battery. Fill only after the battery has been fully charged. When replacing the cap screws, removed for filling, be sure that these are turned down TIGHTLY, to prevent leakage and to insure proper operation of the pressure seals which are a part of the cap screws. The battery does not gas on discharge and has no noxious or corrosive odors. According to the manufacturer, the battery will not be damaged by overcharging, although it will require more frequent addition of distilled water, as a result of such extended charging. A small amount of gas may be generated at that time, but it is automatically vented by the pressure seals. Any white residue which may appear on the top of the battery is harmless (non-corrosive) sodium carbonate, which may be brushed or washed away. The battery may be stored fully, or partially charged, or completely discharged without harm. It will charge or discharge at high or low temperatures, thereby insuring good performance of the Stroboflash under extreme conditions. NOTE: A new battery should be put on charge for a few hours before putting into use.

SPECIAL INSTRUCTIONS

Do not remove the Power Pack Top from the Nicad A-C Converter when the Koiled Power Kord is plugged into the lamp head assembly.

To avoid scratching the end of the Nicad Converter, place strips of black Scotch Tape or similar material over the staples at the end of the black battery case. Apply a similar strip over the screws or rivets holding the switch plate.

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