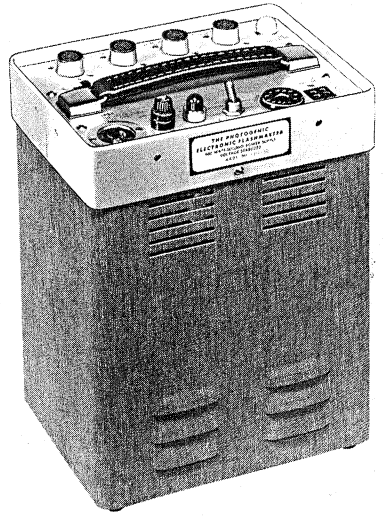
Photogenic

Electronic Flashmaster

Model AA01



SERIAL NUMBERS UP TO 700

INSTRUCTION MANUAL
AND PARTS LIST

PHOTOGENIC SPEED-LITE

Warranty

We warrant all Photogenic Electronic Flashmaster Speedlights to be free from defects in material and factory workmanship. All parts, including electronic components, are warranted for one year except for the trigger tube, fuses, and modeling lamps.. We limit our warranty for trigger tubes to the replacement of such defective tubes when returned to us through our dealer or authorized service agent, transportation prepaid, within 90 days from the date purchased. Fuses and modeling lamps are guaranteed only to be operating at the time of purchase.

All other parts carry a pro rata guarantee of one year's service. Any part found defective will be repaired or replaced for a service charge proportional to the length of time the part has been in service. For example, a defective part returned six months after purchase will be replaced at one-half price.

This warranty does not apply if the warranty card included with each outfit is not completely filled out and mailed upon receipt of equipment. It also does not apply if the outfit has been abused or connected in a manner other than in accordance with these instructions or has been repaired by an unauthorized person or without our authorization.

THE PHOTOGENIC MACHINE COMPANY
21 OLIVE STREET YOUNGSTOWN 1, OHIO

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THE PHOTOGENIC ELECTRONIC FLASHMASTER

PART I

GENERAL INFORMATION ABOUT SPEEDLIGHTS

Section 1. INTRODUCTION

Electronic Speedlights are versatile sources of illumination which will fill nearly every lighting need in the photographic studio. They are indispensable when photographing animals, children, or any moving objects. The speed of the flash, about 1/1000 second in most speedlights, will stop any rapid motion to be photographed in the studio.

Not only is the flash of light of short duration, but it also provides a high level of effective illumination without the need for heavy service lines. This is accomplished because the energy to produce the light is gradually accumulated in the capacitor bank during the charging period. The entire amount of energy is then discharged through the Xenon gas filled flashtube, producing an extremely brilliant flash of short duration.

The color of the light produced is of approximately daylight quality, so that daylight type color films may be used with little or no color correction. Even more important, the color temperature does not change appreciably when the line voltage changes, which means that good results do not depend upon the line voltage being carefully adjusted to a predetermined value.

The amount of illumination is governed by the voltage of the charge in the capacitor bank, as well as by the amount of capacitance. In general the total Watt-Second rating will determine the amount of illumination which a given speedlight will produce.

An example may serve to illustrate the meaning of the term "Watt-Seconds." Assume that a reflector equipped with a 100 Watt incandescent lamp is being used. Assume also that the lamp is turned on for one full second to make the exposure. The total energy used by the lamp during the exposure is then 100 Watt-Seconds. A Speedlight with a rating of 100 Watt-Seconds would also use the same amount of energy; however, the energy would all be used during 1/1000 second instead of one second. If the efficiency of the two lamps is the same, each would produce the same total amount of light. The Speedlight would be much brighter, but the flash would be extremely short.

Energy in Watt-Seconds may be calculated by the following formula:

$$\text{Energy in Watt-Seconds} = \frac{CV^2}{2}$$

C is capacitance in microfarads and V is voltage in kilovolts.

Section 2. USE OF SPEED-LITES

In general the Speed-Lite differs little from other types of illumination, when using a type of sensitized material suited for this purpose.

Lightings may be made in much the same manner as you are accustomed to making with other types of illumination. It may require some slight amount of experimentation to adapt yourself to this type of light. This is chiefly due to the fact that you will be using the output of the modeling lamps for your visual work. It should be considered that you are working at levels of illumination which are probably less than one-tenth of those to which you have become accustomed. This may cause you to misjudge the balance of light but after the first few negatives you will find that you will be able to compensate for these errors.

It may be desirable to use a foot candle meter or exposure meter until you are accustomed to reading this type of illumination. In using the meter it is advisable to maintain a three to one ratio between highlight and shadow. This, of course, is for standard three-quarter lightings and can be varied to suit your purpose. With a small amount of experience you will find that you will be able to interpret the light without the use of the meter.

For portraiture it may be advisable to use diffusers, or barndoors with diffusers, in order to control the illumination. In this manner it is possible to use a larger diaphragm stop resulting in improved portrait quality.

There are varied opinions concerning the type negative material to use. It is impossible to predict the action of any emulsion, with Speed-Lite, from the daylight or tungsten rating of the emulsion. In other words a normally slow emulsion may be extremely fast when used with Speed-Lite and the reverse may be true with a normally fast emulsion.

There are also varied opinions concerning developing time required with Speed-Lite negatives. Many photographers find that normal development is in order for them while others feel that up to 25% overdevelopment will give better results.

We suggest that you contact your supplier of sensitized materials for his recommendation of the correct type of emulsion and developing technique most suitable for Speed-Lite photography.

Section 3. SYNCHRONIZATION

An Electronic Speedlight flashes within a few millionths of a second after it is triggered. The camera shutter should therefore be equipped with contacts of the zero delay type for use with speedlight.

Synchronization is extremely important and the greatest care should be taken in making all connections to the synchronizer cables. If these connections are not made in a careful and workmanlike manner, either

an intermittent connection or an electrical leak between the two leads may result. Either will cause unreliable performance. An electrical leak will be especially noticeable during humid weather. When making any connection to the trip cord the following steps should be observed:

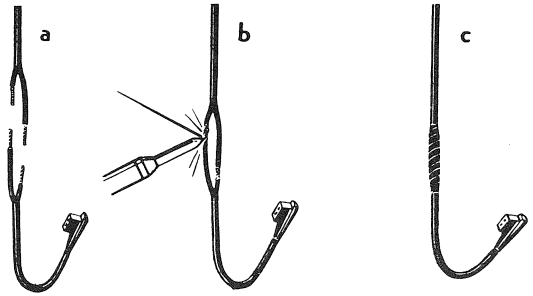


Fig. 1 - Preparation of Synchronizer Cable

1. Cut wires of the cables to be connected as shown in Fig. 1a.
2. Strip each lead 1/2" (Fig. 1a).
3. Twist leads together and solder securely. Use only rosin core solder. Use no flux either paste or liquid. (Fig. 1b).
4. Insulate with Scotch No. 33 electrical tape or equivalent. (Fig. 1c).

After the synchronizer cable is properly connected it is well to check the synchronization with the camera. Adjust the lighting unit to the same height as the camera lens and face the light into the lens. The lens aperture should be opened to its fullest extent and the camera back removed. Looking at the lens through the back of the camera, operate the shutter. The flash of the light should then appear as a circle the same size as the aperture. A few sheets of white paper in front of the lens will cut down the brilliance of the flash and aid in making the observation. It is best to perform this test with the modeling lamp turned off. If the circle is flattened on the sides, or if no light appears through the lens, the shutter is not synchronized with the light. Shutter contacts for this light should be the X or zero delay type. If the light appears not to be synchronized the shutter contacts should be checked by a reputable camera repair man.

Section 4. SAFETY PRECAUTIONS

Despite the extreme measures that have been taken to make this equipment foolproof, it must be recognized that high voltages do exist within the power supply, cables, and lighting units. Therefore, certain precautions must be observed in handling the equipment.

Dealers Repair Kit: AA52	**Net User Price**	**$51.00**
6 - Fuses 8 amp. type 3AG		1.80
6 - Fuses 1.2 amp. type 3AG		1.80
10 - 1073 Modeling Lamp		3.30
2 - 2D21 Triggering Tube		7.08
2 - 44 Charge Indicator Lamp		.48
2 - 525 MF Power Capacitor		21.00
2 - A10234 Rectifier		20.70
Purchased separately		$56.16

	Net User Price
Power Transformers and Matching Capacitors:	
1 - A10232-2 Transformer with matching capacitor for power supplies with serial No.'s below 700.	$35.70
1 - Matching Capacitor for A10232-2 Transformer for power supplies with Serial No.'s below 700. (Specify color dot)	3.75
Modeling Light Transformer:	
1 - A10231 Transformer for power supplies with Serial No.'s below 700.	7.50

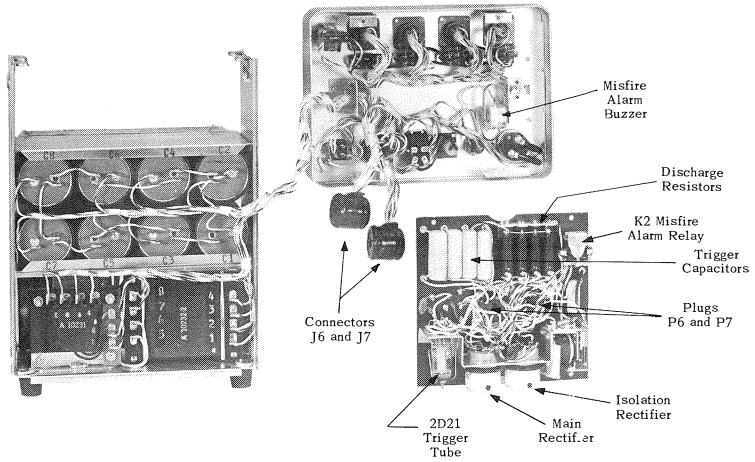


FIG. 7

AA01 POWER SUPPLY - DISASSEMBLED

REPAIR KITS FOR AA01 FLASHMASTER POWER SUPPLIES

Basic Repair Kit: AA50	Net User Price	$ 4.80
3 - Fuses 1.2 or 8 amp. type 3AG		.90
2 - 1073 Modeling Lamp		.66
1 - 2D21 Triggering Tube		3.54
1 - 44 Charge Indicator Lamp		.24
Purchased separately		$ 5.34
Intermediate Repair Kit: AA51	Net User Price	$24.00
Includes all items in the Basic Kit, plus:		
1 - 525 MF Power Capacitor		10.50
1 - A10234 Rectifier		10.35
Purchased separately		$26.19

Do not attempt to change flashtubes or modeling lamps unless the unit has been discharged and the lighting unit disconnected from the power supply.

Always make certain that the power supply is disconnected from the 115 Volt A.C. line before attempting to service it.

Do not open the power supply case or disassemble any of the equipment unless you are familiar with equipment of this type.

DO'S AND DON'TS

DO - Turn Power Supply Unit "OFF" when not in use.

DO - Avoid quick repeated flashing. Damage may result. The full charging time should be allowed between flashes.

DON'T - Permit a lighting unit cable to become frayed or loose in a connector.

DON'T - Insert or Remove a Flashtube unless the Power Supply Unit is fully discharged.

DON'T - Remove the top cover from the Power Supply Unit or place a hand near any part inside the unit until you are certain that the capacitor bank is fully discharged.

DON'T - Insert a screw driver or other metal object into the flashtube socket or any electric outlet, socket or receptacle. Contact with high voltage may result.

DON'T - Attempt to make repairs to the speedlight outfit if you are not familiar with electronic equipment. Your dealer should be consulted regarding an authorized electronic or radio service man.

DON'T - Use a higher rated fuse than is recommended.

DON'T - Plug the unit into any service except 110-120 V. 60 cycle A.C. If this unit is plugged into D.C. service it may result in serious damage to the component parts.

AA78 FLASHMASTER
WITH TWO 16" LIGHTING UNITS

A misfire alarm system is provided to alert the operator whenever a lighting unit fails to flash. When a lighting unit fails to flash, the power capacitor associated with it will not discharge. The difference in voltage between this capacitor and the discharged capacitors will cause a current to flow through one of the misfire alarm resistors, R10, R11, R12 and through relay K2. Relay K2 operates a buzzer which gives an audible alarm for several seconds. Switches S2, S3, S4, and S5 are provided to disconnect the misfire alarm from any outlet which is not being used.

All lighting units are provided with modeling lamps which are separately energized at low voltage by transformer T2. The AC line voltage is stepped down to 56 volts by transformer T2. 4 taps of 14 volts each operate the four modeling lamps independently. This circuit is fused by a 1.2 amp slow blo fuse to prevent any damage from short circuited modeling lamps or defective components. The trigger circuit, using a 2D21 trigger tube, is connected across power capacitor C1. As the power capacitors charge, the trigger capacitors C16, C17, C18 and C19 also charge through R8 and the primary of the trigger transformer. Voltage divider R8 & R9 holds the cathode of the trigger tube at about plus 13 volts, biasing the trigger tube beyond cut-off and preventing it from conducting. When the shutter contacts operate, the grid of the triggering tube is grounded, removing the bias and causing it to fire.

The trigger capacitor discharges through the primary of the trigger transformer and through the trigger tube. The high voltage spark from the secondary of the triggering transformer ionizes the flashtube, causing it to discharge the power capacitors with a brilliant flash.

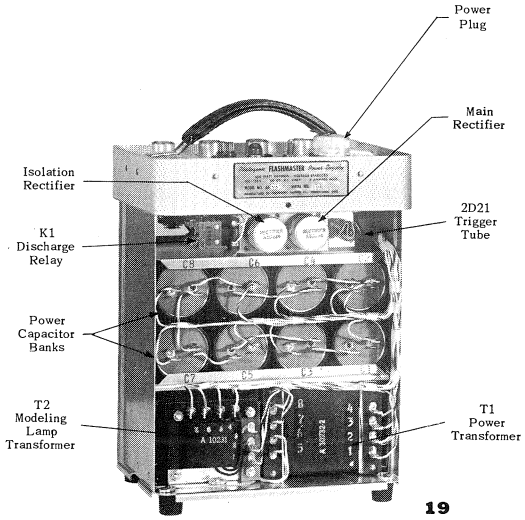


FIG. 6
AA01 POWER SUPPLY

10. - Misfire alarm buzzer does not sound even when a light is misfiring.

Causes.

(1) Wrong power plug is being used. See page 9.
(2) Misfire alarm switch turned off, or switch defective.
(3) Defective relay K2.
(4) Defective buzzer.
(5) Defective resistor R10, R11, and R12.

F. INFORMATION FOR THE ELECTRONIC SERVICEMAN

First read the general information given above in the preceeding parts of Section 6. Isolate the trouble as far as possible using the chart of symptoms and probable causes.

The section below gives a detailed description of circuit operation to aid in servicing.

AC Power is stepped up to a high voltage in transformer T1 and rectified by a bridge rectifier to provide the direct current which charges the capacitor bank. Transformer T1 is not an ordinary transformer. It has a special magnetic circuit tuned with capacitor C9 which provides a stabilized high voltage output from the secondary winding. Approximately 320 volts AC is tapped from this regulated winding and connected to the bridge rectifier circuit. The rectifier provides a DC output which charges the capacitor bank. At full charge, the DC voltage on the capacitor bank will be held within the range of 435 to 445 volts regardless of line voltage variations between 100 and 135 volts. Line current must be 60 cycles AC. This transformer will not perform properly on 50 cycle current.

The main capacitor bank consists of C1, C3, C5, and C7. These four capacitors are charged separately through the isolation rectifier. Each of these capacitors is separately connected to one of the output plugs, J1, J2, J3, and J4.

The secondary capacitor bank is composed of C2, C4, C6, and C8. By inserting a properly wired power plug in socket J9 the capacitors in the secondary bank can be connected in parallel with the capacitors in the primary bank in any combination desired. A wide choice of output power is thus available to the photographer merely by changing the power plug.

Notice that there is no fuse in the primary of transformer T1 or in the charging circuit. Neither is any charging resistor provided in series with the rectifier. The characteristics of transformer T1 are such that its output current is automatically limited to a safe value even if the power capacitor bank or the rectifier should be short circuited.

Relay K1, operated by the 115 volt power line, is provided to discharge the power capacitor banks when the unit is turned off. When K1 de-energizes, the capacitor banks discharge through four 2000 ohm resistors, by-passing the isolation rectifiers.

PART II

THE PHOTOGENIC FLASHMASTER SPEEDLIGHTS

Section 1. GENERAL

This manual covers all Flashmaster Speedlight outfits having a catalog number in the AA series.

This includes catalog AA01 power pack and 8050-L, 8050-M, AA11, and AA12 lighting units.

The Photogenic Flashmaster is a portable multiple-light speedlight outfit. It is designed for continuous heavy duty service, and incorporates many special features which make it ideally suited for school photography, Santa Claus photography and other high production work. The power pack is voltage regulated to provide the constant light output which is so necessary for quality color photography, especially where the film is processed automatically.

Two, three and four light outfits, using 6", 9", 11" or 16" lighting units are available. Each power pack will accommodate up to four lighting units.

The power pack features voltage regulation, a misfire alarm, a very rapid recharge, and components rated for continuous heavy duty service. All power packs are built around the "DO-IT-YOURSELF" repair concept which is exclusive with Photogenic in the speedlight field. The electronic components are mounted so that they can be quickly replaced by anyone without use of a soldering iron.

Section 2. UNPACKING AND SETUP

Unpack all units carefully so as to make certain that all parts are removed from the cartons. Do not discard or destroy packing material until the equipment has been assembled and all parts are accounted for.

After unpacking, all parts should be examined for any damage which may have been caused by rough handling during shipment. IF ANY DAMAGE IS DETECTED, CONTACT THE DELIVERING CARRIER AT ONCE. CLAIM FOR DAMAGE SHOULD BE MADE TO THE DELIVERING CARRIER BEFORE DESTROYING PACKING CASES.

The 6" and 9" lighting units are shipped completely assembled and ready to operate. It is only necessary to set up the stands and fasten the lighting units to them. The 11" and 16" lighting units are shipped with the lamps packed separately. After unpacking, install the flashtubes and modeling lamps. Slip the cord into the snap ring provided on one of the stand legs, so that the stands will not upset too easily if anyone accidentally kicks one of the cords.

A. INITIAL OPERATION

Plug in four lighting units and connect the line cord from the power pack to a wall outlet. Turn the power switch ON. You will note that the power switch is a three position switch. The "Flash Only" position turns on the power pack but does not turn on the modeling lamps. The "Flash & Modeling" position turns on the modeling lamps as well.

As soon as the switch is turned on, the red indicator will light. At the same time, the white charge indicator will come on, indicating that the power pack is charging. In about four or five seconds, when the power pack reaches full charge, the white charge indicator light will go out. This indicates that the power pack is fully charged and is ready to flash. Plug the trip cord into the power pack and trigger it by touching the ends of the wires together, the lights will flash. As soon as the lights flash, the charge indicator light will come on again and will go out after the power pack is fully charged.

When the switch is turned off the power capacitors will be completely discharged by the discharge relay inside the power pack. The charge indicator light will come on and then dim out as the capacitors discharge.

Section 3. USE OF THE LIGHTS

A. POWER SUPPLY

1. Power Plugs - Model AA01 Power Pack

The model AA01 power pack has a total output power of 400 watt-seconds. Many different combinations of output power are available by using different power plugs. The power output indicated on the plug is obtained when the arrow on the plug lines up with the dot on the control panel. See figure 1. This selector is not a turn type switch, but rather a plug which must be physically removed and re-inserted with the pointer toward the power chosen. Power changes should not be made without first turning off the power switch, which will discharge the power capacitors.

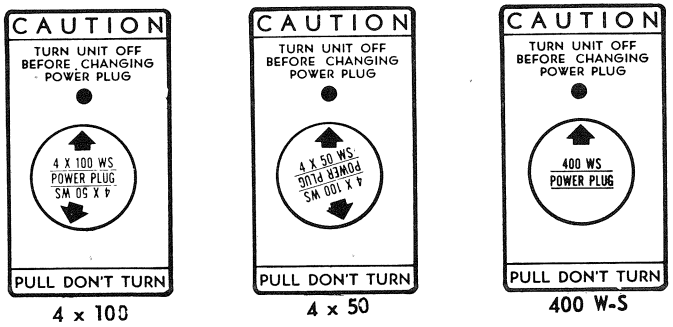


FIG. 1

4. - Charge indicator light does not go out.

Causes.

(1) Defective power capacitor.
(2) Defective lighting unit.
(3) Defective flashtube - "afterglow".

"Afterglow" is a condition in which a flashtube continues to glow dimly after the main flash is over. While this glow persists the charge indicator light will not go out. Persistent or continuous afterglow indicates a defective flashtube. A slight afterglow, lasting a second or less may occasionally occur in a normal flashtube.

5. - Modeling lamp fuse blown.

Causes.

(1) Defective modeling lamp.
(2) Defective lighting unit cord.
(3) Defective modeling lamp transformer.

6. - Charge indicator fails to light.

Causes.

(1) Defective charge indicator lamp.
(2) Defective power transformer.
(3) Defective discharge relay.
(4) Capacitor C9 short circuited.
(5) Defective rectifier.

*If the charge indicator lamp operates when it is replaced, but burns out when the power supply is turned off, a defective isolation rectifier is the cause. (Usually accompanied by a loud crack when the power switch is turned off). Discharge relay may be damaged.

7. Misfire alarm buzzer sounds continuously.

Causes.

(1) Relay RE2 defective.
(2) Defective power capacitor.

8. - Misfire alarm buzzer sounds after flash.

Cause.

(1) Defective lighting unit.

9. - Misfire alarm buzzer sounds after every flash, all lights are flashing.

Causes.

(1) Alarm switch left on when a light is unplugged. See page 9.
(2) Defective misfire alarm switch.

Whenever trouble arises, try the following simple things first;

1. Try a new fuse.
2. Try a new flashtube.
3. Try a new triggering tube.
4. Try another line cord.
5. Try another Phototube, if you are using a phototube in the unit.
6. If the unit is not triggering properly, make sure the camera shutter or trip cord is not at fault.
7. Try to determine whether the trouble is in the lighting units or the power supply. Disconnect them and try the suspected lighting unit with a good power supply and the suspected power supply with a good lighting unit, if available.

A word about intermittent defects; Often an equipment will not be completely inoperative, but will operate satisfactorily part of the time. If the equipment happens to be operating satisfactorily at the time a test is being made, the test will not find the defect. Because of this an intermittent defect is sometimes very difficult to locate. In troublesome cases be very systematic, keeping a record of each step taken and noting the results. Repeat each step in the test procedure several times to be sure that results are consistent. Care and patience will usually uncover the trouble.

E. COMMON SYMPTOMS AND THEIR CAUSES

1. - Light flashes by itself without apparent reason.

Probable cause.

(1) Defective trigger tube.
(2) Defective trip cord, or trip cord incorrectly polarized.
(3) Bright light falling on photocell (if used).
(4) Defective power capacitor.
(5) Poor connection in line cord.

2. - Trip cord will not flash lights, but charge indicator shows that pack has charged.

Causes.

(1) Defective 2D21 trigger tube.
(2) Defective trip cord.
(3) Defective lighting unit.
(4) Defective trigger capacitor.

3. - One light will not flash.

Causes.

(1) Try the non-flashing lighting unit on the other outlets, if it does not flash, suspect a defective flashtube or trigger coil. See section 3B.
(2) Try the good lighting units on the non-flashing outlet. If they do not flash, suspect a defective trigger capacitor.

Two power plugs are supplied with the equipment.

Using the first plug in the "4x100" position, each outlet will provide 100 watt-seconds. With the same plug in the "4x50" position, each outlet will provide 50 watt-seconds. All four outlets are isolated. The power supplied to each light is constant, and is not affected by any other lights which are plugged in.

Using the second plug, marked 400 watt-second, the entire 400 watt-second output of the power pack is connected to all four outlets. If a single light is used, the full 400 watt-second power is available to it. If more than one light is used, the power will divide equally among the lights connected. CAUTION: Do not apply more than 200 watt-seconds of power to the small (6" or 9") lighting units, or the flashtube may be damaged. The full 400 watt-seconds may be safetly applied to the large lighting units using either the DW7 or the FT300 flashtubes. CAUTION: Do not change the power plug with the power pack turned on. Always turn it off and allow a few seconds for the capacitors to discharge first before changing plugs.

Many other combinations of output power are possible. Write us advising the power distribution desired and we will furnish a special power plug.

2. Misfire Alarm

When using the 4x100 or 4x50 output, the Misfire Alarm will operate. All four of the Misfire Alarm switches should be set to the "ON" position. If any of the four lights should fail to flash, a buzzer will sound, warning the operator to re-take the exposure. The Misfire Buzzer can be tested merely by unplugging any lighting unit and flashing the lights.

If fewer than four lights are to be used, turn off the Misfire Alarm switch next to the unused outlets. (These switches turn off only the Misfire Alarm. They cannot be used to turn off an unwanted lighting unit without unplugging it).

When using the second plug, marked 400 W-S, the Misfire Alarm is inoperative. If several lighting units are used, the buzzer will NOT sound if one fails to flash.

3. Fuse

A 1.2 ampere fuse is provided in the modeling lamp circuit, to protect the equipment from damage by a short circuited modeling lamp. No fuse is used in the flash circuit. The special current limiting transformer used in this equipment is self protecting and no fuse is required.

4. Flashing Rate

This power pack will not be damaged regardless of how rapidly it is flashed. However, if it is flashed before the charge indicator light has gone out, the power pack has not reached full charge, and full light out-

put will not be obtained. In addition, continuous rapid flashing can overheat and damage the flashtubes.

5. Triggering

The power supply can be triggered directly, by means of the trip cord provided, or it can be triggered remotely from the flash of another speedlight by inserting an 8050P phototube and adapter in the trigger outlet.

6. Charge Indicator Light

The charge indicator light comes on whenever the power pack is charging, and goes out again when the pack reaches full charge.

Under normal conditions, the recharge time is about 4-1/2 seconds if the full output power is used; less if only part of the power is being used.

This is a voltage regulated power pack. When comparing the rated charging time with an unregulated pack, bear in mind the difference in the way the charge time rating is determined. It is customary to rate an ordinary speedlight power pack by the time required to reach only 90% of full charge. To reach 95% of full charge, 1-1/2 times the rated charging time must be allowed. To reach 98%, twice rated time must be allowed. A voltage regulated power pack, such as the model AA01, however, will reach 100% FULL CHARGE in the rated charging time. No extra allowance is needed.

B. LIGHTING UNITS

1. 6'' and 9'' Lights

The 8050-L lighting unit has a 9'' diameter reflector, and the 8050-M lighting unit has a 6'' diameter reflector. In all other respects these units are identical. The larger units are designed for use as main and fill-in sources. They are provided with rotatable barndoors and diffusers, giving control which is usually found only in more costly studio equipment. The barndoors are mounted by means of two rollers and a spring which rides the reflector head. They may be easily removed by compressing the spring and sliding the rollers over the edge of the reflector. The diffuser will slide out of its holder if the barndoors are opened as wide as they will go.

The smaller unit is designed principally for use as an auxiliary light. The smaller reflector lends itself well to use as a background light or an accent light. Snoots may be attached for greater control and for spotlight effects. Simply push the snoot onto the reflector so that the springs snap over the reflector bead and hold it in place.

The flashtube is permanently mounted in the reflector. It is recommended that the reflector be returned to the factory if it should ever be necessary to replace the flashtube, since great care must be taken to prevent cracking it during installation.

The flashtube used in these lighting units is designed to use no

3. Do not attempt to operate the equipment with the case removed, unless you are familiar with electronic equipment and the hazards involved.

B. POWER SUPPLY

The AA01 power supply has been specifically designed to make it possible for the photographer to make simple repairs himself through the use of a repair kit. Three kits are available (See pages 20-21). The Basic Kit is inexpensive and contains items which will need periodic replacement. The Intermediate Kit is more complete and will correct a majority of the failures likely to occur. The Dealers Kit includes all of the replaceable electronic components except those mounted on the control panel or on the sub-assembly panel. These panels also can be purchased separately and replaced as a unit.

The power supply components are identified in figures 3 & 4. Instructions for trouble shooting are given below in Section D. Safety precautions in Section A. above should be observed at all times.

To open the case, remove the two screws in the case rim, one on each side. Slide the case down about 1/4 inch until it rests on the table. Then, hold the case down and lift the power supply out of the case by the handle.

Wiring to the transformers and power capacitors is connected by means of quick-connect terminals. To remove, grasp the terminal firmly with a pair of pliers and pull. It will slide off. No unsoldering is required.

To remove the trigger tube or rectifiers, grasp firmly and pull straight out, while rocking the part back and forth slightly. The trigger tube has a spring retainer over the top which must first be pushed out of the way.

Power capacitors are removed from the back, by sliding the retainer plate out of the way.

C. LIGHTING UNITS

For information on replacement of modeling lamps and flashtubes see section 3 B above, pages 10 thru 13.

D. GENERAL SERVICE INSTRUCTIONS

In order that you may expect long and trouble-free service every precaution has been taken in the design and manufacture of this equipment. Frequent servicing is not likely to be necessary; however, the suggestions offered here will assist the photographer in recognizing the cause of any trouble which may arise, and will aid him in having it corrected as quickly and as inexpensively as possible.

Refer to section B. above for information on removing and replacing parts, and section A. for safety precautions.

LIGHT OUTPUT - ECPS

Lighting Unit	Output Power in Watt-seconds				
	400 w-s	200 w-s	100 w-s	50 w-s	25 w-s
8050M (6")		3400	1700	850	425
8050L (9")		4200	2100	1050	530
AA11 (11")	5800	2900	1450	725	360
AA12 (16")					
Modeling Position	9300	4650	2300	1150	580
AA12 (16")					
Flood Position	6000	3000	1500	760	380

GUIDE NUMBERS

Film	ASA Speed	Light Output - ECPS									
		400	550	800	1100	1500	2200	3000	4500	6000	9000
Royal Pan	400	100	120	150	170	200	240	280	340	390	485
Type B	250	70	75	90	105	125	150	175	210	250	310
Portrait Pan	125	38	46	57	65	76	90	104	130	152	182
Ektacolor S	80	36	44	54	63	73	86	102	125	198	175
Ektachrome (with CC20Y filter)	50	29	35	42	50	58	70	80	100	115	140

For example, if your main light is an 8050L (9") operated at 100 watt-seconds, the light output is 2100 ECPS. Using Ektacolor S film, a guide number of about 86 is indicated.

Section 6. SERVICE

A. SAFETY PRECAUTIONS

Every effort has been made in the design and manufacture of this equipment to make it completely safe in operation or during servicing. In addition, a safety discharge relay completely discharges the power capacitors whenever the equipment is turned off.

CAUTION: This equipment uses voltages which can cause uncomfortable and dangerous shock. In spite of the above safety features, ALWAYS BE CAREFUL. We recommend:

1. First turn off power switch and then disconnect line cord before changing modeling lamps or opening power supply cover.

2. Never insert a screwdriver or other metal object into any outlet, socket or receptacle.

more than 200 watt-seconds of power. 400 watt-second flashtubes can be furnished on special order if needed.

As a modeling lamp, both units use a No. 1073 automotive lamp, which is available at most service stations. When it becomes necessary to replace this lamp, loosen the three screws around the edge of the reflector back cap and pull the reflector and the cap apart. See figure 2.

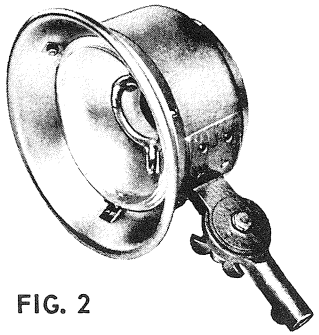
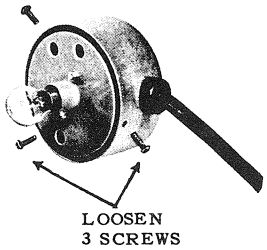


FIG. 2



FLASH TUBE - A390

2. 11" Lights

If a larger reflector is desired, the AA11 and AA12 lighting units are available. The AA11 is a wide angle light using a flat 11-1/2" diameter reflector. It provides a softer, broader, flood of illumination particularly useful for photography of groups, or for school photography where the operator does not wish to re-position his lights frequently. The AA11 lighting unit uses a 1073 modeling lamp, and a DW7 or FT300 plug-in flashtube. It will operate at 400 watt-seconds. Catalog AA41 barndoors and diffusers are available for this light if desired. See figure 3.

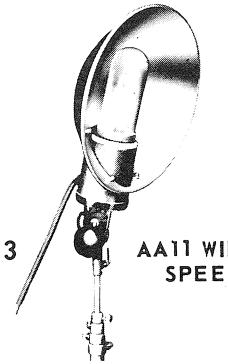


FIG. 3 AA11 WIDE-ANGLE SPEEDLIGHT

FIG. 4 AA12 LIGHTING UNIT

3. 16" Lights

The AA12 lighting unit uses a 16" diameter studio type reflector for the finest lighting control. The flashtube socket is adjustable to provide two different light patterns. To adjust, loosen the knob on the side of the socket housing, push the knob as far as it will go in the direction of the arrow, then tighten it again.

In the FLOOD position, the reflector has a coverage of 60° and has no hot spot in the center. This pattern is best for floodlighting of groups.

In the MODELING position the reflector has a coverage of 45° with a suitable hot spot in the center so that the light can be feathered to obtain correct gradation between highlight and shadow.

Best results are obtained by using these lights between 36 inches and 42 inches from the subject, for head and shoulder work. By feathering the main source light it then will be possible to shade the ear, etc. of the subject. The fill light may also be feathered in order to obtain the proper shadow illumination to balance with the main source. It is essential to feather all lights away from the background so that unwanted illumination and shadows will not fall in this area.

Either the 8088 or the AC41 Barndoor may be used to increase the effectiveness of feathering the light. It attaches to the front of the reflector and may be rotated as required. The barndoor is equipped with a removable matte finish acetate diffuser.

The socket housing of the AA12 lighting unit is fitted with a quick change mechanism which permits the reflector to be attached or detached in seconds. The reflectors nest for easy carrying, and a protectice Cover (Cat. No. AA47) is available to prevent flashtube breakage.

The AA12 uses a 1073 modeling lamp and a DW7 or FT300 flashtube. It will operate at 400 watt-seconds.

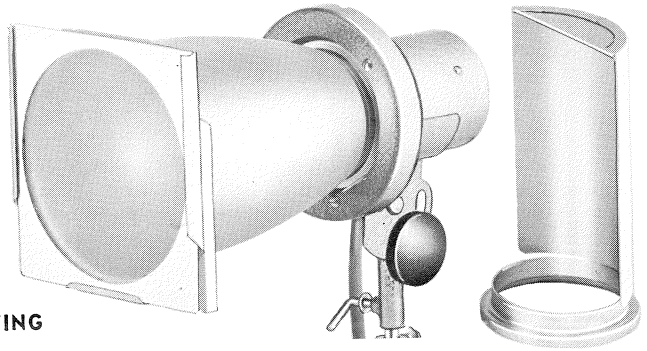


FIG. 5

AA13 LIGHTING UNIT

For background lighting or for special effects this unit will also accommodate the small reflector used with the Photogenic Studiomaster background light catalog 8083A. If ordered with these reflectors instead of the 16" reflector, the catalog number is AA13.

Note: If desired, the life of the 1073 modeling lamp can be extended at a slight sacrifice in light intensity by operating it at a lower voltage. To accomplish this, remove the wire from terminal 2 on the modeling lamp transformer and shift it to terminal 3. See figure 5.

Section 4. TECHNICAL CHARACTERISTICS

Power Source . . . 120 volts 60 cycles A.C. nominal. Will operate satisfactorily at any line voltage from 100 to 135 volts.

Power Consumption . . . 1-1/2 amperes idling, with power pack charged. 8 amperes just after flashing, as power pack begins to charge.

Recharge time . . . 4-1/2 seconds.

Duty cycle . . . continuous.

Fuse . . . 1.2 amp. type 3AG or equivalent.

Triggering . . . Instantaneous - by means of trip cord or type 929 phototube.

Flash duration . . . Approximately 1/250th to 1/1000th second. Depends on power setting and type of flashtube.

Color temperature . . . Daylight - Approx. 7000 deg. Kelvin.

D.C. voltage . . . 438 volts, regulated.

Power output . . . 400 w.s. Max.

FLASHTUBES

8050-L & 8050-M
Lighting Units . . . Type A-390; permanently mounted, maximum power 200 watt-seconds.

AA11, AA12 & AA13
Lighting Units . . . Type DW7 or FT-300; plug-in type; maximum power - 400 watt-seconds.

Modeling Lamps . . . No. 1073, all lights. (See note above)

Section 5. EXPOSURE INFORMATION

In the first table below, find the light output in ECPS (Effective Candlepower Seconds) for the main light at the power you are using. Look up the guide number in the second table in the ECPS column nearest this light output.