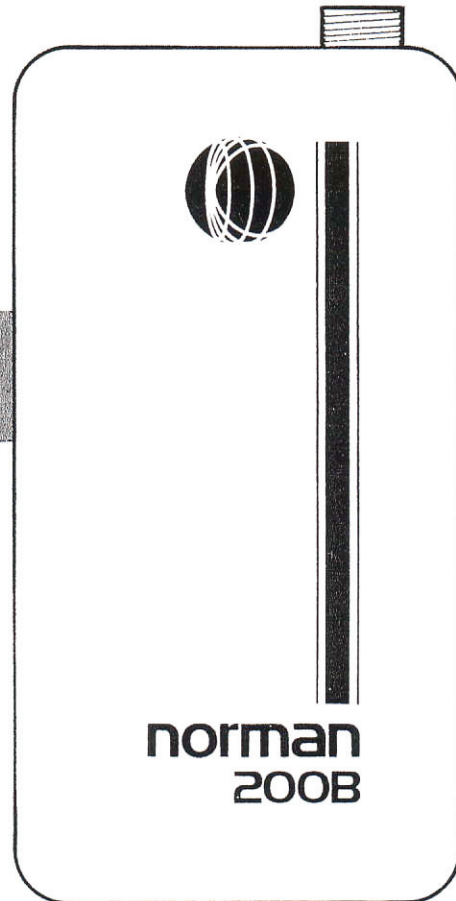




norman

**INSTRUCTION
MANUAL**



200B



200B



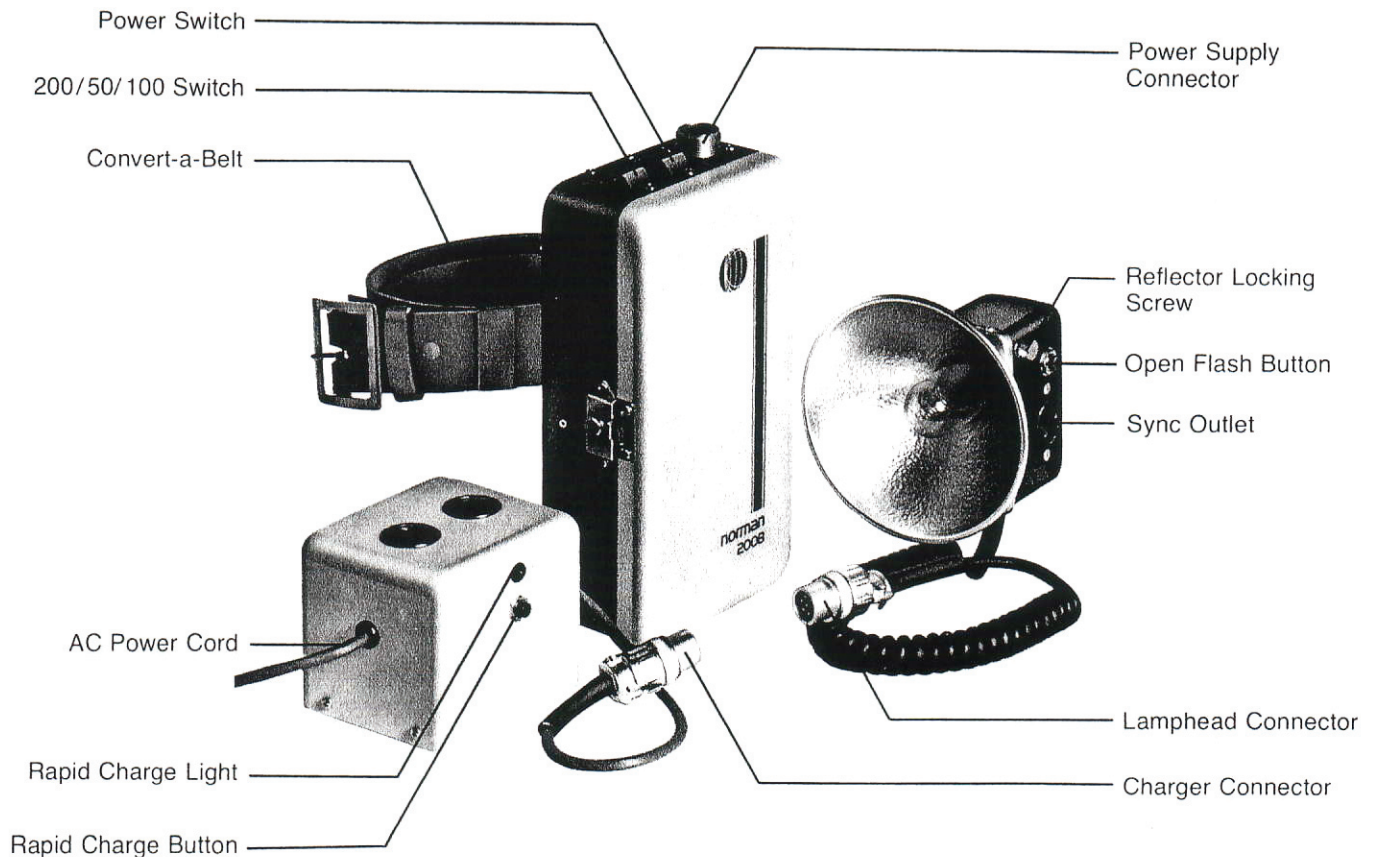
Welcome to the Norman family of interchangeable flash equipment!

You have just purchased the Norman 200B battery operated flash system that will provide years of service. It is revolutionary in concept and it offers many features not found on other commercially available electronic flash equipment.

- Fastest recycling time in the industry — $\frac{1}{3}$ second at 50 watt-seconds (w-s), $\frac{3}{4}$ second at 100 w-s, and $1\frac{1}{2}$ seconds at 200 w-s.
- Revolutionary battery charging — 90 minutes from dead to full charge.
- More flashes per battery charge — 200 on full power, 400 on half power, and 800 on quarter power.
- AC operation — battery charger can also be used as an AC adapter with the use of an R4152 "Y" cable.
- Easy serviceability — modular plug-in circuit for fast servicing.
- Interchangeable with the complete Norman series 450 equipment line which includes over 50 items — lampheads, reflectors, barn doors, diffusers, snoots, umbrellas, etc.

It is our sincere desire that you will benefit from the engineering and manufacturing expertise that has brought you this unique system.

If we can be of service or if you have any suggestions or questions, please do not hesitate to contact us.



Save these Instructions

IMPORTANT SAFEGUARDS

in accordance with UL 122 specifications for photographic equipment.

When using your photographic equipment, basic safety precautions should always be followed, including the following:

1. Read and understand all instructions.
2. Care must be taken as burns could occur from touching the modeling lamp.
3. Do not operate the appliance with a damaged cord or if the appliance has been dropped or damaged until it has been examined by a qualified serviceman.
4. If an extension cord is necessary, a cord with a suitable current rating should be used. Cords rated for less amperage than the appliance may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
5. When practical, unplug the appliance from the electrical outlet when not in use. Never yank the cord to pull from the outlet. Grasp the plug and pull to disconnect.
6. To avoid electric shock hazard, do not disassemble this appliance, but take it to a qualified serviceman when service or repair work is required. Incorrect reassembly could cause an electric shock hazard when the appliance is subsequently used.

EXPLANATION OF INDICATORS AND CONTROLS

POWER SUPPLY

Power Switch:

Switches the power supply on or off. The power supply will not function unless the lamphead is connected. This prevents accidental battery drainage during storage or transit.

NOTE — The Power Switch performs two additional functions in the off position:

1. Discharges the main storage capacitors so the circuit card can be safely removed for service.
2. Disables the trigger circuit so the camera can be operated without the flash. This is especially useful for time exposures and available light photography because the sync cord does not need to be disconnected.

200/50/100 Switch:

Provides three power selections: 200 w-s, 100 w-s, and 50 w-s. You can operate the switch as fast as you wish without damage to the circuit. The power change is instantaneous (unlike some units which require wasting one flash to complete the power change).

LAMPHEAD

Reflector Locking Screw:

Locks the reflector to the lamphead. Rotate the thumbscrew one turn counterclockwise to remove the reflector.

Sync Outlet:

Triggers the flash. Connect your camera sync cord to this polarized outlet. To test polarity, simply touch any exposed (non-painted and non-anodized) metal on the camera body to any exposed (non-painted and non-anodized) metal on the flash unit. If the unit flashes, reverse the sync cord. If the polarity is incorrect, the unit could self-flash or fail to flash during normal operation.

Open Flash Button:

Push to trigger the flash. Used for test purposes and for open flash photography.

BATTERY CHARGER

Rapid Charge Light:

Glows red when the charger is in the rapid charge mode. At full charge the light switches off, giving positive proof of a full charge. This is a solid state LED (light emitting diode) and has no filament to burn out.

NOTE — The charger is automatically in the trickle charge mode when the Rapid Charge Light is out.

Rapid Charge Button:

Push to start the rapid charge cycle. If the charger is connected to the power supply and the Rapid Charge Button is not depressed, the charger will trickle charge the battery. This takes about 12 hours for a full charge rather than 90 minutes.

AC Power Cord:

Connects to any standard 115 volt, 60Hz household outlet. The current drain is about $\frac{3}{4}$ amp on rapid charge.

THE BATTERY

HOW TO CHARGE THE BATTERY

Plug the Charger Connector into the power supply. Connect the AC Cable to any standard 115v, 60Hz household outlet:

1. **RAPID CHARGE** — Push the Rapid Charge Button. The red light (Rapid Charge Light) will glow. At full charge (about 90 minutes) the light will automatically switch off, giving you positive proof of a full battery charge.
2. **TRICKLE CHARGE** — Do not push the Rapid Charge Button. The charger will automatically be in the trickle charge mode. A full charge will take about 12 hours. At full charge, the battery will be warm to the touch.

Note — It makes no difference if the power supply switch is on or off during charging. It is normal for the charger to get warm.

BATTERY CARE

It is good to continuously trickle charge the battery when the unit is stored. This insures peak battery performance, and it will not damage the battery or the charger.

On the trickle charge mode, the charger draws about as much current as an electric clock. The battery will not overcharge or undercharge, even if the AC line voltage fluctuates from 90 to 135 volts due to the voltage/current stabilized charger circuitry.

Many users will set aside a specific place where the charger is left on continuously. Then the 200B can be conveniently left on charge when not in use.

EXTENDED BATTERY LIFE

While the battery is specifically designed for rapid charging (90 minutes), a premium may be gained if the rapid charge mode is not required. Tests have shown that you may add up to 15% more life to the battery if you charge only in the trickle mode. If you work the unit continuously a spare battery can allow you to do this.

USING THE CHARGER FOR EXTRA FLASHES TO COMPLETE AN ASSIGNMENT

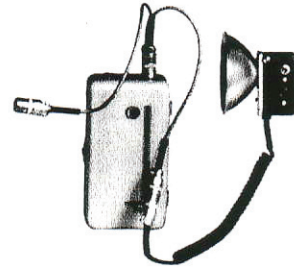
The charger produces about 2.8 full power flashes per minute of operation, after initially charging for a few minutes. This super-fast charging can provide you with those extra flashes needed to complete an assignment. It can also eliminate the expense of carrying an extra set of batteries.

Take a 10 minute break and you can obtain about 14 more full power flashes or about 28 more half power flashes.

AC OPERATION

You can convert the charger to an AC adapter with the optional R4152 "Y" cable. Simply follow the 2 steps shown below:

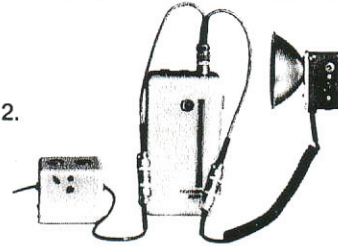
Step 1.



Connect the lamphead and "Y" cable to the power supply. Switch on the power supply.

Note — If the battery is dead, put a five minute charge on it so the power supply will start. Then, proceed with Step 1.

Step 2.



With the power supply operating, connect the charger to the "Y" cable.

Connect the charger to 115v, 60Hz outlet and push the Rapid Charge Button. The Rapid Charge Light will confirm that it is operating as an AC adapter.

Note — The charger will not operate unless it is connected *last* as instructed here.

ATTACHING THE CONVERT-A-BELT

Over the shoulder — Using the four 6x32 screws and washers, attach the belt. Refer to illustration #1.

Around the waist — This is the most popular way to carry your 200B. Using the four 6x32 screws and washers, attach the belt. Refer to illustration #2.

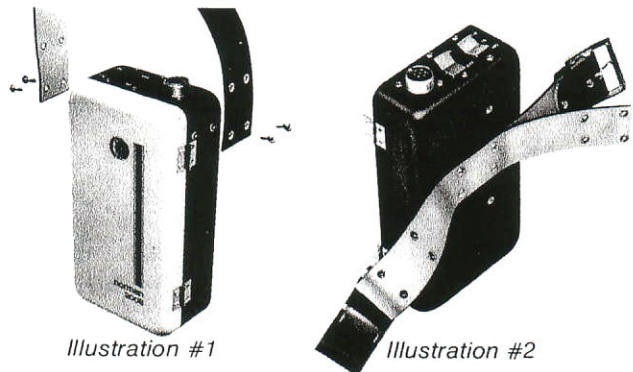


Illustration #1

Illustration #2

Notice — there are three sets of hole patterns on the longer section of the belt. Select the pattern that best fits your waist size.

CARE OF THE CAPACITORS

Miniature capacitors are used in battery portable flash units. Conditioning these capacitors is important when you initially obtain the unit, or when it has been unused for periods over 30 days.

1. CHARGE THE BATTERY.
2. CONNECT THE LAMPHEAD AND SWITCH ON THE UNIT.
3. LEAVE THE UNIT ON 5 MINUTES BEFORE FLASHING.
4. REFRAIN FROM RAPID FLASHING UNTIL THE CAPACITORS HAVE BEEN CHARGED FOR AT LEAST 30 MINUTES.

norman GUIDE NUMBER CHART

Select the ASA film speed (exposure index) and locate the number on the right hand column.

Then, locate the B.C.P.S. rating of the flash unit on the left hand column.

Lay a straight edge across these two points and the guide number will be found where the edge intersects the center line.

For example:

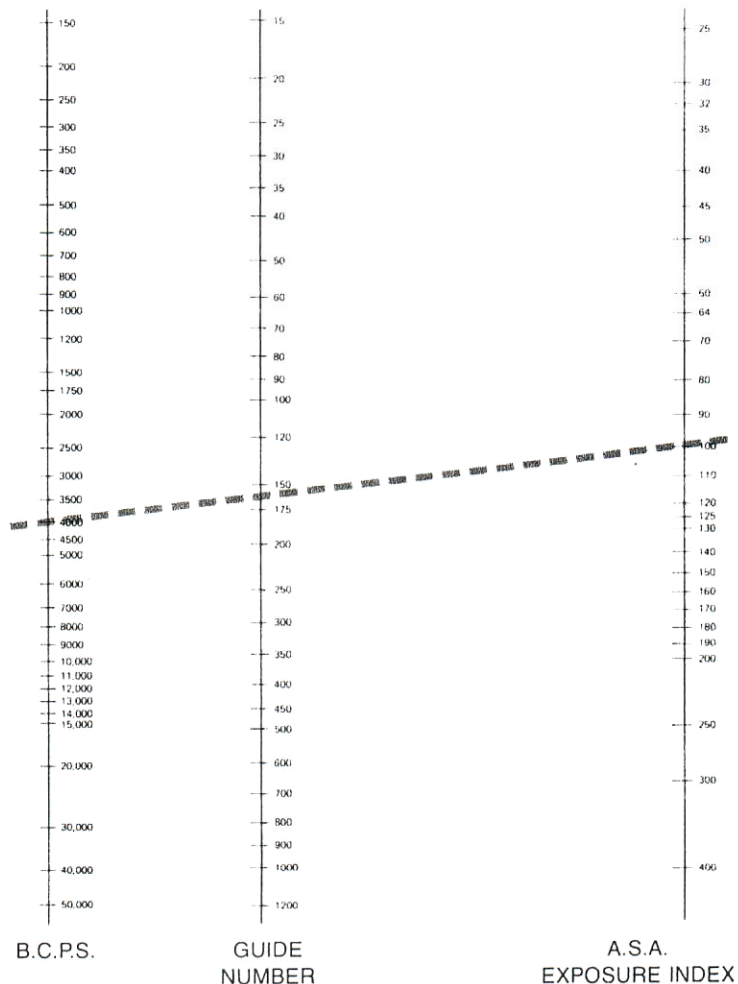
ASA 100 speed film and 4000 B.C.P.S. light output.
The guide number equals 160 (as shown).

To determine f/stop, simply divide the distance, from the light to subject, into the guide number.

For example:

Guide number of 160. Let's say that the light-to-subject distance is 10 feet: the correct f/stop would be $160 \div 10 = f/16$.

It should be remembered that due to variables in film processing and personal preference, it may be necessary to slightly alter the guide number from that indicated by the Guide Number Chart.



SERVICE

Should your 200B become inoperative, this section can help you identify the malfunctioning component. Many times you can correct the problem in the field simply by having a better understanding of your unit. Substitution is often the best form of service because it gets your unit back into operation quickly.

The actual service work should be performed by a qualified technician.

A. BATTERY

1. WILL NOT OPERATE
 - a. Requires charging.
 - b. Inoperative. Requires service.
2. WILL NOT PROVIDE ENOUGH FLASHES PER CHARGE
 - a. Weak battery. Older batteries provide fewer flashes per charge. Recycle time is hardly affected.
 - b. Malfunctioning power supply.

B. CHARGER

1. RED LIGHT WILL NOT ILLUMINATE WHEN BUTTON IS DEPRESSED
 - a. Inoperative charger.
 - b. Inoperative battery.

C. LAMPHEAD

1. WILL NOT FLASH AND THE READY LIGHT IS ON (CAMERA SYNC CORD REMOVED FROM LAMPHEAD)
 - a. Broken or defective flash tube (FT-120).
 - b. Inoperative lamphead.
2. WILL NOT FLASH FROM CAMERA, BUT WILL FLASH WITH THE CAMERA SYNC CORD REMOVED
 - a. Defective camera sync cord.
 - b. Reversed sync cord polarity.
 - c. Defective camera sync contacts (be sure the camera is set to "X" sync and that the shutter speed is set to within the operating range designed for use with electronic flash).
3. WILL NOT FLASH AND THE READY LIGHT IS OFF
 - a. Power supply may not be operating. If the power supply has an audible "buzz," when the switch is turned on, it is operating.
 - b. Inoperative lamphead.
4. SELF-FLASHES
 - a. Reversed sync cord polarity.
 - b. Defective camera sync cord.
 - c. Intermittent break in lamphead cable. Bend the cable near the connector. You may be able to complete an assignment by bending the cable in such a way as to prevent the self-flashing.
 - d. Flash tube too hot. You may slow down or use the heavy duty FT120-HD flash tube.

5. FLASH TUBE GLOWS WHEN FLASHED

- a. Orange glow — Flash tube too hot. You may have to slow down or use the heavy duty FT120HD flash tube.
- b. White glow — Malfunctioning power supply.

6. READY LIGHT DOES NOT OPERATE, BUT LAMPHEAD OPERATES

Inoperative ready light circuit in lamphead. Light output is not affected.

D. POWER SUPPLY

1. WILL NOT TURN ON
 - a. Dead or inoperative battery.
 - b. Malfunctioning power supply.
 - c. Lamphead not connected to power supply (a safety interlock which prevents accidental battery draining during storage or transit).
2. WILL NOT PRODUCE ENOUGH FLASHES PER BATTERY CHARGE
 - a. Weak battery.
 - b. Malfunctioning power supply.
3. WILL NOT PRODUCE ENOUGH LIGHT
 - a. Inaccurate flash meter. This is often the case.
 - b. Weak flash tube.
 - c. Dull reflector surface.
 - d. Malfunctioning power supply.
4. CONTINUALLY CHARGES THE CAPACITORS AND WILL NOT SHUT OFF (STABILIZE)
 - a. Weak battery. Battery may require charging.
 - b. Power supply capacitors may need forming due to storage over 30 days.
 - c. Malfunctioning power supply.

200B SPECIFICATIONS

OUTPUT LEVEL (w-s)	50	100	200
RECYCLE TIME (Sec.)	1/3	3/4	1 1/2
FLASH DURATION	1/1600	1/800	1/400
FLASHES PER CHARGE	800	400	200
LIGHT OUTPUT—B.C.P.S. (Beam Candle Power Seconds)			
Reflector Type 2D (Standard)	1000	2000	4000
Reflector Type 2D-RP	375	750	1500
Reflector Type 2E (or 2E-J)	900	1800	3600
Reflector Type 2H	7500	15000	30000
Reflector Type 2Q	1500	3000	6000
ENERGY STORAGE	200 watt-seconds (total)		
BATTERY VOLTAGE	12 volts		
DC OUTPUT VOLTAGE	480 volts		

Save these Instructions

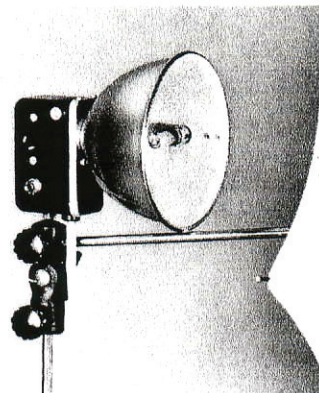
ACCESSORIES



2Q QUARTZ LAMP REFLECTOR — ideal for umbrella lighting, has super reflective surface and the powerful 250-watt quartz halogen lamp enables you to compose lighting accurately. Price includes quartz lamp, but does not include the R4153 AC cable

R4153 AC EXTENSION CABLE — connects the 2DQ modeling lamp to a standard 115 VAC electrical outlet

Q250CL/DC — Replacement 250-watt quartz halogen lamp, 1000 hour rating



2H TELEPHOTO REFLECTOR — ideal for sports, magazine, and news photography where you are required to use telephoto lenses. The 900 guide number on ASA 400 film allows you to use f/9 at a distance of 100 feet. You can now photograph at distances that were formally impractical with battery portable gear. Price includes the R4112 optical spacer



R4108 UMBRELLA STAND ADAPTER — a versatile bracket to own. Mounts the Norman LH2 lamphead (also other brands of equipment) to a light stand and mounts any of our umbrellas to the lamphead. This eliminates the "Mickey Mouse" bracketry normally associated with umbrella lighting

NORMAN UMBRELLAS

W28 28" diameter, round, white
W44 44" diameter, round, white
W56 56" diameter, round, white

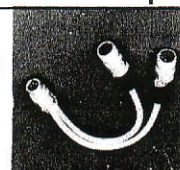


CF-5 CURTIS FLASH VALVE — a very handy item, especially for photographing flash fill. This valve will enable you balance the flash output on the 200B so this you can obtain the effective outputs of 200, 100, 50, 25, 12, 6, 3, and 1-1/2 watt-seconds. Now you can balance the 200B (or any other unit with a 5" diameter reflector) to candle light, sunlight or other main light sources

R4101 CAMERA BRACKET — positions your lamphead directly above the camera lens at a distance that prevents "red-eye". It will also tilt so you can bounce the light off the ceiling. Used with practically all hand held cameras



R4152 "Y" CABLE — enables you to use two lampheads from the 200B power supply



R450-20 LAMPHEAD EXTENSION CABLE — enables you to place the lamphead 20 feet from the power supply. Very handy for studio use when the lamphead is mounted on a light stand



REPLACEMENT PARTS/OPTIONAL ITEMS

- 200B 200 watt-second battery operated power supply, includes R4122 Convert-a-belt™ less B4121 battery assembly
- B4121 Nickel-cadmium battery for 200B power supply
- C4120 Thermomatic™ charger for the B4121 nickel-cadmium battery assembly
- R4123 External battery charging cable
- LH2 Basic lamphead with 20 foot straight cord, includes FT120-GC flash tube less reflector
- LH2K Basic lamphead with 5 foot coil cord, includes FT120-GC flash tube less reflector
- 2D-W Discontinued - now you can use the New Style 2D reflector with an R4112 optical spacer to achieve 160° coverage
- R4112 Optical spacer - used with the New Style 2D reflector for wide angle coverage - also included with the 2H reflector
- 2D 5" diameter standard reflector, 60 degree coverage
- 2E 10" diameter reflector, 60 degree coverage
- FT120-GC Replacement flash tube
- FT120-HD NEW — Heavy duty replacement flash tube for repeat flashing
- CA-4000 Replacement solid state plug-in circuit assembly for 200B power supply (trade-in against repairable circuit assembly)
- PE-4 Camrex Norman photo-eye