

# Speedotron

**Instruction Manual  
for Speedotron  
Black Line  
Equipment**

Speedotron Corporation  
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Chicago, Illinois 60607  
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## Speedotron's Limited Warranty

Speedotron guarantees to repair or replace, free of charge, any part or parts (except for flash tubes and modeling lamps) found by factory inspection to be defective due to faulty material or workmanship, provided the equipment is returned to our factory prepaid. The period of warranty is two years from the date of original purchase. Flash tubes, which are warranted by independent manufacturers, are covered for a period of one year only, and the length of manufacturer warranties on modeling lamps varies. The manufacturers' warranties covering flash tubes and modeling lamps are for defective merchandise only, and do not cover tubes that are cracked or broken.

The Speedotron two-year warranty does not apply to equipment which has been abused, cracked or broken in shipping, resold or rented (without written permission from Speedotron Corporation), which has the serial number removed or defaced, which has been modified or repaired by an unauthorized person, or which has been purchased from any source other than an authorized Speedotron dealer. A copy of the original sales receipt from an authorized Speedotron dealer is required at the time of warranty service.

Speedotron shall not be liable for any injury, loss or damage, direct or consequential, arising from the use or inability to use the product. Prior to use, the purchaser shall determine the suitability of the product for the intended use and assume all risks and liabilities.

The obligation of Speedotron Corporation is limited to repair or replacement only and no one is authorized to assume any obligation not in accordance with the above.

Do not attempt to make repairs to your Speedotron equipment. All electronic flash systems operate on high voltage and high power. There is a high risk of severe electrical shock when opening a power supply or light unit. Leave service to qualified and authorized electrical service personnel. Authorized service personnel are familiar with the procedure to fully discharge a live unit (flashing the unit is not enough to drain stored power even when the unit is unplugged). Repairs by unauthorized service personnel or by the user will void the warranty.

Although we do have several service stations, we encourage you to send all repairs, under warranty or otherwise, to our factory to ensure the best possible service. Not only will your unit be properly repaired, but it will be given a routine updating of all circuitry that has been revised since your unit was manufactured.

Should service be necessary under this warranty, return the item to us, prepaid (we do not accept collect shipments). We, in turn, will expedite repairs and return the item to you, prepaid, via whatever means of transportation you used to ship it to us (applies to continental U.S.A. only).

This warranty is not valid unless you fill out and return your warranty registration card. Equipment should be registered within 10 days of purchase.

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## General Instructions and Information

*For maximum equipment life and for safe, dependable operation of power supplies, we advise you to follow these general rules.*

Before doing anything with the power supply make sure that the *Model* and *Power* switches are in the off position.

Connect light head cables to the *Light Unit Outlets* on the power supply, selecting the appropriate outlets for the desired power level. (Refer to the diagrams on the side of the power supply or in this manual.)

To insert, align the light unit plug with the power supply outlet and apply even pressure while pushing. Make sure that all light unit cables are firmly seated. Make sure cables are out of pathways or are taped to the floor in order to prevent accidentally removing cables from power supply.

Never install light units while the power supply is turned on. Never insert or remove flash tubes while the light unit is connected to the power supply. Be sure flash tubes are fully seated into light unit sockets. (Read instructions in Universal Light Units section of this manual for more information on light unit assembly and operation.)

Speedotron power supplies are equipped with arc-protected outlets. However, as with any electrical equipment, arc-over (an electrical discharge between two physically disconnected electrical terminals) is a possibility. When light cables, flash tubes or power cords are improperly seated, arc-over may occur. Also, if your light unit or power supply malfunctions, or the power cord or the internal wiring in the studio is improperly terminated or defective, there is a chance of arc-over when connecting or disconnecting light units. Severe power supply damage and operator injury may result if arc-over occurs. That is why in spite of the arc-protection feature of Speedotron power supplies, you should always make sure your *Model* and *Power* switches are off when disconnecting or connecting light units.

Plug sync cord into *Sync* socket and connect other end to PC cord for camera. The sync cord supplied with the power supply accepts the standard AC twin-blade type sync connector. A standard AC to PC sync cord will be required to connect the camera to the power supply sync cord.

A slave tripper (Speedotron #23510) may be installed in the *Sync* socket (in place of the sync cord) to fire the power supply. If the power supply fails to flash when exposed to another light source with the slave installed in the sync socket, remove the slave, rotate it 180° and reinstall it in the socket.

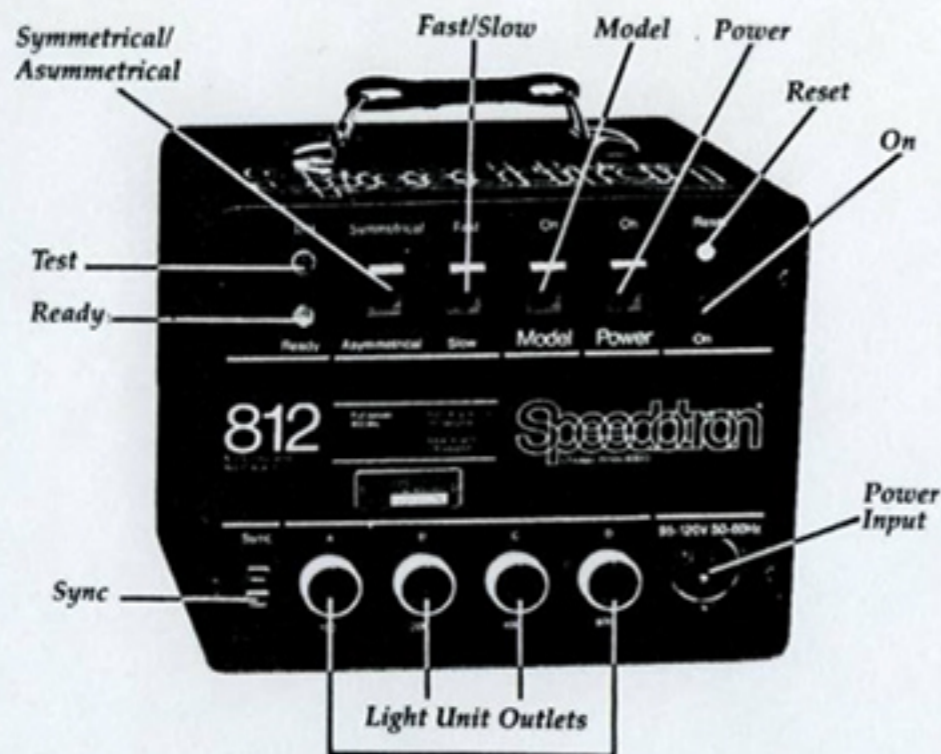
Connect AC power cord into *Power Input* on power supply. A 3-terminal ground power plug is utilized on Black Line power supplies. For maximum performance and safety, it is strongly suggested that the 3-terminal cord supplied with the power supply be properly utilized and properly terminated at the main source of incoming power.

Always use a three-wire ground power cord and a properly grounded wall outlet with all Speedotron power supplies. Failure to do so may cause the power supply to intermittently misfire. We do not recommend using an adapter and installing into a 2-blade outlet.

Once the light units are properly assembled and installed, the power cord is installed and the sync extension is connected, turn you *Power* switch on. On the first use or when the unit has been idle for periods over 3 weeks, do not fire the unit immediately. Allow several minutes for the power supply's capacitors to form. Once this procedure has been followed at these times, subsequent use of the power supply requires no waiting period.

Now refer to the Operating Instructions section of this manual for information regarding the proper use of your particular power supply.

***Never attempt to make repairs to your Speedotron equipment. All electronic flash systems operate on high voltage and high power. It is very dangerous to open a power supply.***



## Description of Controls

**Power** — turns power supply on and off (flashes light units when turning off).

**Model** — turns model lamps on and off.

**Symmetrical/Asymmetrical** — controls distribution of power to *Light Unit Outlets*.

**Fast/Slow** — controls recycle rate.

**Test** — manual triggering of flash for testing or open flash application.

**Ready** — indicator illuminates when power supply reaches 100% recycle.

**Sync** — socket to connect power supply to camera or slave.

**On** — indicator illuminates when *Power* switch is turned on

**Reset** — push to reset circuit breaker. Circuit breaker disables power supply in case of malfunction.

**Power Input** — socket for AC power cord.

**Light Unit Outlets (4)** — sockets for connecting from one to four light units to power supply.

## Operating Instructions

*Operation of the 812 power supply is quite simple and straightforward. It is suggested that this sequence of operation be utilized for maximum life and dependability.*

Make sure that the *Model* and *Power* switches are in the off position and the *Reset* button (circuit breaker) is fully depressed into its socket.

Connect light unit cable(s) to the *Light Unit Outlet(s)* on the power supply, selecting the appropriate outlet(s) for the desired power level. (See Universal Light Units section of this manual for information on assembling light units.) The outlets on the 812 power supply are wired for symmetrical or asymmetrical power distribution.

Set *Symmetrical/Asymmetrical* switch. In symmetrical operation, 800Ws is evenly divided among all light units connected to the power supply.

A table on the back of the 812 and on page 8 may be used as a guide in determining various lighting possibilities in the asymmetrical mode. The following examples may help in using the table. One light: the table shows that in the asymmetrical mode, a light unit will receive 100Ws if connected to outlet A, 200Ws if connected to outlet B, 400Ws if connected to outlet C, or it will receive the full 800Ws if connected to outlet D. Two lights: Six different two-light combinations are possible in the asymmetrical mode. Let's look at two of them. If lights are connected to outlets A and B, they will each receive 100Ws. Lights connected to outlets B and D will receive 200Ws and 600Ws respectively.

Following the table will quickly illustrate other combinations that are possible with up to four light units.

Set *Fast/Slow* switch. Normally on 20 amp electrical circuits, you will operate the unit in *Fast* recycle mode. However, if you do not have adequate power in your studio or other electrical items are sharing the same power line, this may cause circuit breakers in your studio to blow. In this case, use *Slow* recycle mode.

Connect power supply to AC outlet. Turn *Power* switch on. *On* indicator will illuminate, and shortly thereafter, *Ready* indicator will illuminate, indicating 100% power. Remember, on the first use or when the unit has been idle for periods over 3 weeks, do not fire the unit immediately. Allow several minutes for the power supply's capacitors to form. When the power supply has been used recently you may fire the unit immediately. The unit is now fully charged and ready to fire. *Test* button may be depressed to verify proper system operation. The *Ready* indicator light will periodically flicker. This is normal and indicates the operation of the voltage regulator.

When *Power* is on, be sure *Ready* indicator is illuminated before switching *Power*, *Symmetrical/Asymmetrical*, or *Fast/Slow* controls. Do not move these switches while the unit is recycling.

When changing light ratios by moving light unit power cords, we recommend that you turn the power supply off. Though arc-protection is included with all Speedotron systems, the safest method for changing ratio is to turn the power off before moving the light unit plugs.

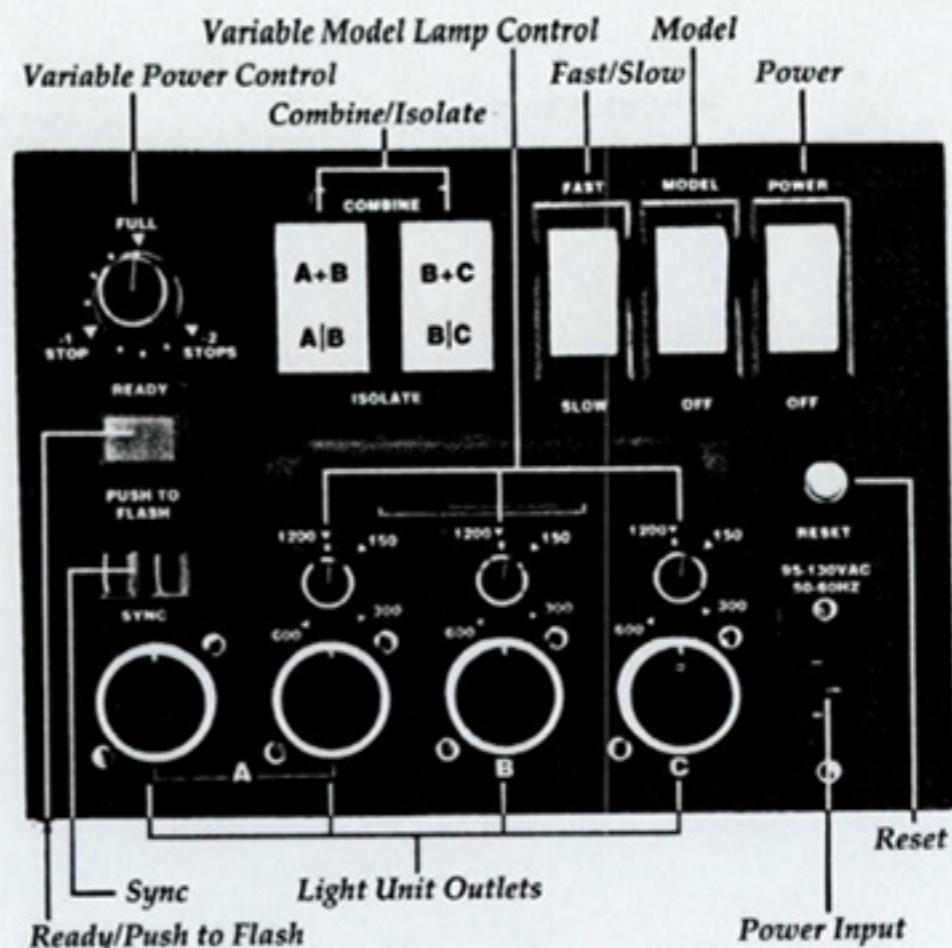
When disassembling the system, turn *Power* switch to the off position. This flashes all light units connected to the Model 812. Unplug power cord from outlet, then disconnect light units from power supply.

## Asymmetrical Power Distribution Table

	A	B	C	D
1 light	100			
	200		400	
			800	
2 lights	100	100		
	200		200	
			400	400
	100	300		
	100	700		
			200	600
3 lights	100	100	200	
	100	100	600	
	100	300		400
	200		200	400
4 lights	100	100	200	400

## Technical Specifications

Power	800Ws	
Recycle Time	Fast Recycle	Slow Recycle
	at 800Ws	.6 seconds .95 seconds
	at 400Ws	.4 seconds .55 seconds
at 100Ws	.16 seconds .21 seconds	
Flash duration (with one 102 light unit; measured 1/2 to 1/2 peak power)	800Ws	1/600 seconds
	400Ws	1/850 seconds
	Power requirements	105-125 volts AC, 50-60 Hz
Fast recycle	20 amps (nominal)	
Slow recycle	10 amps (nominal)	
Weight	17 pounds	
Size	9x11x6.5"	
System voltage	900 volts DC regulated	
Trigger voltage	80 volts DC (at sync terminal)	
Trigger current (at sync terminals)	Approximately 45 micro-amps (.000045 amps)	
Guide number (full power with 102 light unit and 11-1/2" reflector, 60° coverage)	300 @ISO 100 (feet)	



## Description of Controls

**Power** — turns power supply on and off (flashes light units when turning off).

**Model** — turns model lamps on and off.

**Fast/Slow** — controls recycle rate.

**Combine/Isolate** — controls 3-channel power distribution. Combine connects channels as indicated (A+B, B+C) with symmetrical power distribution; isolate separates channels as indicated (A|B, B|C).

**Variable Power Control** — simultaneously controls power of all 3 channels, in 1/4 stop increments, down to -2 stops (1/4 power).

**Ready/Flash** — illuminates when power supply reaches 100% recycle. Pushing the button manually triggers the flash for testing or open flash application.

**Sync** — socket to connect power supply to camera or slave.

**Reset** — push to reset circuit breaker. Circuit breaker disables power supply in case of malfunction.

**Variable Model Lamp Control** — controls output of model lamps, down to -3 stops (1/8 power), independently for each channel.

**Light Unit Outlets (4)** — sockets for connecting from one to four light units to power supply. The two left-most sockets are both on power channel A, the next two B and C, respectively.

**Power Input** — socket for AC power cord.

## Operating Instructions

Operation of the 1205 power supply is quite simple and straightforward. It is suggested that this sequence of operation be utilized for maximum life and dependability.

Make sure that the *Model* and *Power* switches are in the off position and the *Reset* button (circuit breaker) is fully depressed into its socket.

Connect light unit cable(s) to the *Light Unit Outlet(s)* on the power supply, selecting the appropriate outlet(s) for the desired power level. (See Universal Light Units section of this manual for information on assembling light units.)

Set *Combine/Isolate* switches for desired ratio of power to light unit(s). See the chart on the side of the power supply and page 11 for ratio combinations that are possible with up to four light units.

Set *Fast/Slow* switch. Normally, you will operate the unit in fast recycle mode. However, if you do not have adequate power in your studio, this may cause circuit breakers in your studio to blow. In this case, use slow recycle mode.

Connect power supply to AC outlet.

Turn *Power* switch on. *Ready* indicator will illuminate, indicating 100% recycle. The unit is now fully charged and ready to fire. Remember, on the first use or when the unit has been idle for periods over 3 weeks, do not fire the unit immediately. Allow several minutes for the power supply's capacitors to form. When the power supply has been used recently you may fire the unit immediately.

*Push to Flash* button may be depressed to verify proper system operation. The *Ready* indicator light will periodically flicker. This is normal and indicates the operation of the voltage regulator.

When *Power* is on, be sure *Ready* indicator is illuminated before switching *Power*, *Combine/Isolate*, or *Fast/Slow* controls. Do not move these switches while the unit is recycling.

The *Variable Power Control* simultaneously changes power of all 3 channels. If power is decreased (rotating knob from Full to -1 stop, for example) power to the light unit(s) will not be reduced until the 1205 has been fired. Press the *Push to Flash* button to discharge unit. If power is increased (rotating knob from -1 stop to Full, for example) it is immediately increased to the light units.

Rotating the *Variable Power Control* does not change the output of the model lamps. Their output is controlled by the *Variable Model Lamps Controls*, one control for each power channel. Rotating the knobs immediately adjusts the output of the model lamps. This way, model lamp output can be matched to the light units, and lighting ratios are easily visualized.

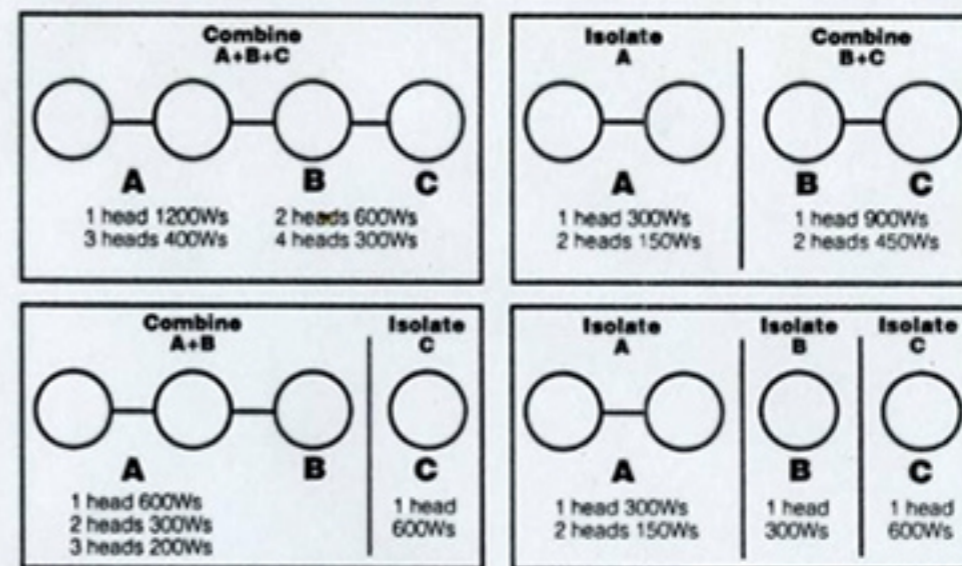
When changing light ratios by moving light unit power cords, we recommend that you turn the power supply off. Though arc-protection is included with all Speedotron systems, the safest method for changing ratio is to turn the power off before moving the light unit plugs.

When disassembling the system, turn *Power* switch to the off

position. This flashes all light units connected to the Model 1205. Do not push the *Push to Flash* switch before turning power supply off. This will damage power supply.

Unplug power cord from outlet, then disconnect light units from power supply.

## Ratio Information



Divide watt-seconds by 2 when using half power (-1 stop).  
Divide watt-seconds by 4 when using quarter power (-2 stop).

It is easiest to describe the distribution of power arrangement on the 1205 as a three-in-one, additive system. Two single and one double outlet power channels may be combined for equal power distribution between all outlets or isolated to achieve specific light ratios with up to four heads. The power supply is divided into 1) 300Ws double outlet channel, 1) 300Ws single outlet channel and 1) 600Ws single outlet channel.

(When we use the term "ratio", we are commenting on the levels of power output from the power supply to the light units only. These power output ratios do not mean that the light falling on the subject will be at that same ratio. This will only occur if the light units are the same and have the same flash tube, reflector, cable length, are at the same distance to the subject, and there is no overlap of lighting on the subject, etc. Power output ratios are offered as a guide to help you determine your lighting arrangements.)

To illustrate the ratio options, two light units may be connected to the 1205 to achieve several different ratios from 1:1 up to 1:3.

To achieve the 1:1 ratio at 150Ws, isolate the A channel and use only these two *Light Unit Outlets*. At the 1:1 ratio, 4 different power levels may be achieved from 150 to 600Ws per light unit at 150Ws intervals using the *Isolate/Combine* switches. Additional power levels may be

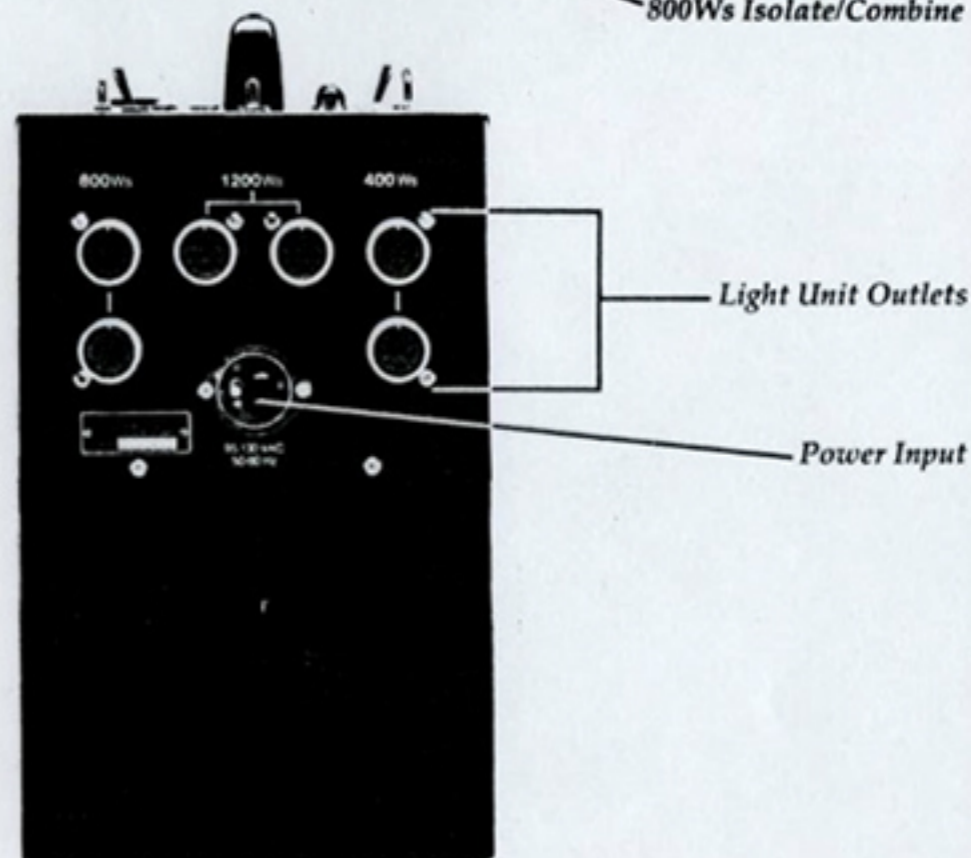
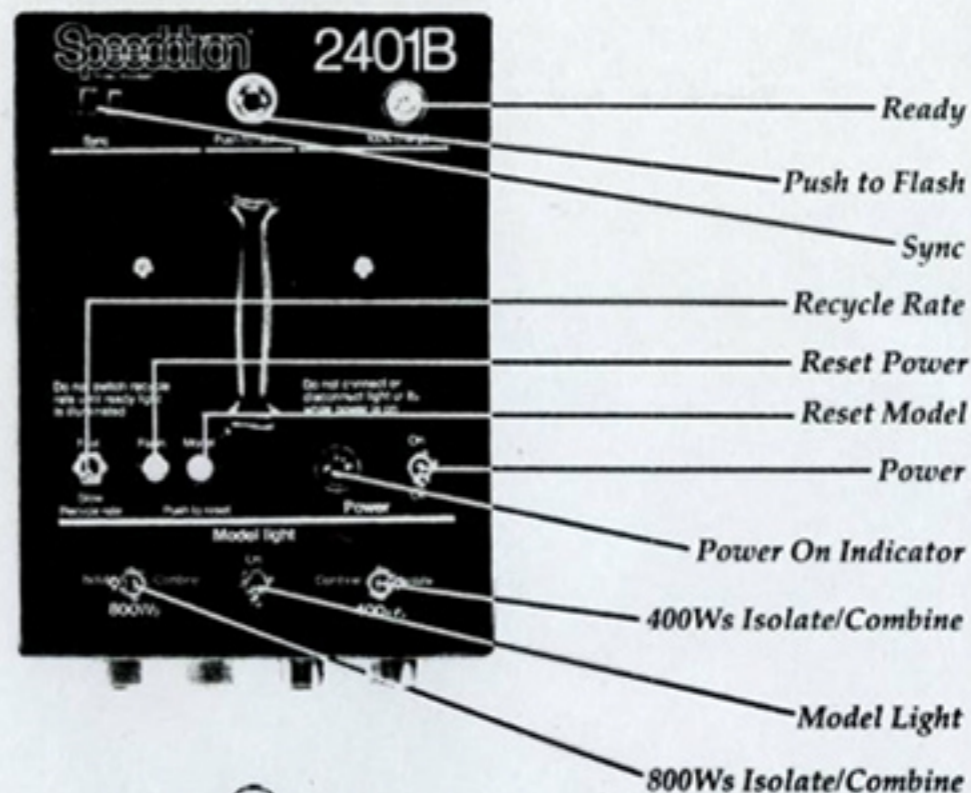
achieved at 1:1 by using the 3-stop *Variable Power Control*.

When the light units are connected to separate power channels other ratios may be achieved. For a ratio of 1:2, use a 300Ws *Light Unit Outlet* (A or B channel) and 600Ws *Light Unit Outlet* (C channel) and isolate all the channels. For a ratio of 1:3, isolate the 300Ws (A) channel and place one light unit into a connector, then combine the B (300Ws) and C (600Ws) channels for a total of 900Ws and place the second light unit into either connector. Additional power levels may be achieved at these ratios by using the 3-stop *Variable Power Control*.

Very rapid recycle rates (the 1205 recycles as quickly as .1 sec. at its lowest power levels) may produce slight variations in exposure due to the nature of its fast internal voltage regulator. If critical exposure accuracy at these low power levels is necessary, set the *Fast/Slow* recycle rate switch to slow. At high power levels, both fast and slow recycle rates will produce consistent exposures.

### Technical Specifications

Power	1200Ws	
Recycle Time	Fast Recycle	Slow Recycle
at 1200Ws	.9 seconds	2.4 seconds
at 600Ws	.6 seconds	1.4 seconds
at 300Ws	.4 seconds	.7 seconds
Flash duration (with one 102 light unit; measured 1/2 to 1/2 peak power)		
at 1200Ws	1/400 seconds	
at 600Ws	1/725 seconds	
Power requirements	100-130 volts AC, 50-60 Hz	
Fast recycle	20 amps (nominal)	
Slow recycle	13 amps (nominal)	
Weight	15 pounds	
Size	8.75x6.5x10"	
System voltage	900 volts DC regulated	
Trigger voltage	70 volts DC (at sync terminal)	
Trigger current (at sync terminals)	Approximately 45 micro-amps (.000045 amps)	
Guide number (full power with 102 light unit and 11-1/2" reflector, 60° coverage)	385 @ISO 100 (feet)	



## Description of Controls

**Power** — turns power supply on and off.

**Power On Indicator** — illuminates when main power is switched on.

**Model Light** — turns model lamps on and off.

**800Ws Isolate/Combine** — when in isolate, this switch isolates the 800Ws channel from the 1200Ws channel and provides two **Light Unit Outlets** per channel. When in combine, will provide 2000Ws among 4 **Light Unit Outlets**.

**400Ws Isolate/Combine** — when in isolate, this switch isolates the 400Ws channel from the 1200Ws channel and provides two **Light Unit Outlets** per channel. When in combine, will provide 1600Ws among 4 **Light Unit Outlets**. (With both 800Ws and the 400Ws switches in combine, 2400Ws is available through any of the 6 **Light Unit Outlets**, divided equally. See diagrams on the side panel of the power supply and page 16 for detailed examples of the ratio system.)

**Recycle Rate** — controls recycle rate.

**Push to Flash** — manual triggering of flash for testing or open flash application.

**Ready** — indicator illuminates when power supply reaches 100% recycle.

**Sync** — socket to connect power supply to camera or slave.

**Reset (1 for model lamps, 1 for main power)** — push to reset circuit breaker. Circuit breakers disable power supply and model lamp circuitry in case of malfunction.

**Power Input** — socket for AC power cord.

**Light Unit Outlets (6)** — sockets for connecting from one to six light units to power supply.

## Operating Instructions

*Operation of the 2401B power supply is quite simple and straightforward. It is suggested that this sequence of operation be utilized for maximum life and dependability.*

Make sure that the **Model** and **Power** switches are in the off position and the **Reset** button (circuit breaker) is fully depressed into its socket.

Connect light unit cable(s) to the **Light Unit Outlet(s)** on the power supply, selecting the appropriate outlet(s) for the desired power level. (See Universal Light Units section of this manual for information on assembling light units.)

Set **Combine/Isolate** switches for desired ratio of power to light unit(s). See the chart on the side of the power supply or page 16 for ratio combinations that are possible with up to six light units.

Set **Fast/Slow** switch. Normally, you will operate the unit in fast recycle mode. However, if you do not have adequate power in your studio or you are using multiple power supplies on the same circuit, this may cause circuit breakers in your studio to blow. In this case, use

slow recycle mode.

Connect power supply to AC outlet. Turn **Power** switch on. **Power On** and **Ready** indicators will illuminate. After 3 to 5 seconds, **Ready** indicator will extinguish and an audible click will be heard. This click is the interlock relays actuating and applying power to the charging circuits. After approximately 2 seconds, the **Ready** indicator will illuminate, indicating 100% power. The unit is now fully charged and ready to fire. The **Ready** indicator light will periodically flicker. This is normal and indicates the operation of the voltage regulator.

Remember, on the first use or when the unit has been idle for periods over 3 weeks, do not fire the unit immediately. Allow several minutes for the power supply's capacitors to form. When the power supply has been used recently you may fire the unit immediately. **Push to Flash** button may be depressed to verify proper system operation.

When **Power** is on, be sure **Ready** indicator is illuminated before switching **Power**, **Combine/Isolate**, or **Fast/Slow** controls. Do not move these switches while the unit is recycling.

When changing light ratios by moving light unit power cords, we recommend that you turn the power supply off. Though arc-protection is included with all Speedotron systems, the safest method for changing ratio is to turn the power off before moving the light unit plugs.

When disassembling the system, turn **Power** switch to the off position. The 2401B power supply will automatically discharge its storage capacitors. Do not push the **Push to Flash** switch before turning power supply off. This may damage power supply. Power supplies may flash their light units when turned off. This is normal.

Unplug power cord from outlet, then disconnect light units from power supply.

## Ratio Information

It is easiest to describe the distribution of power on the 2401B as a three-in-one, additive system. The three, two-outlet power channels may be combined for equal power distribution between all outlets or isolated to achieve specific light ratios with up to six heads. The power supply is divided into 1) 400Ws, 1)1200Ws and 1) 800Ws channels.

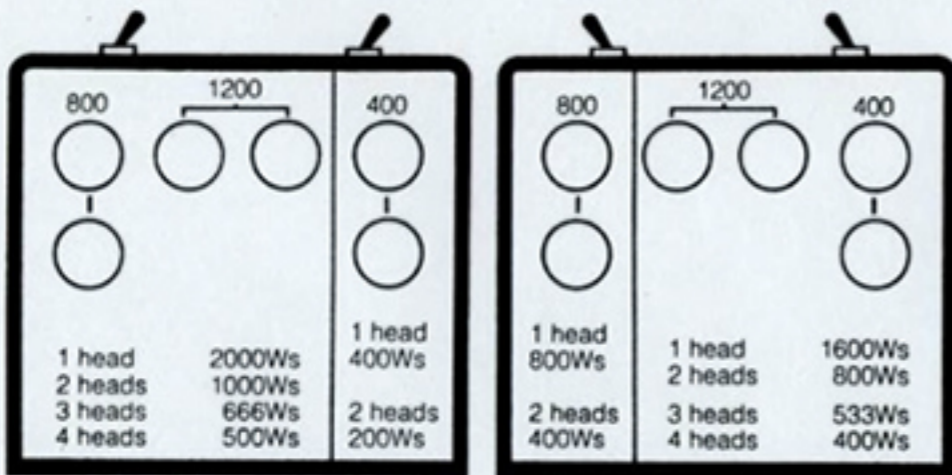
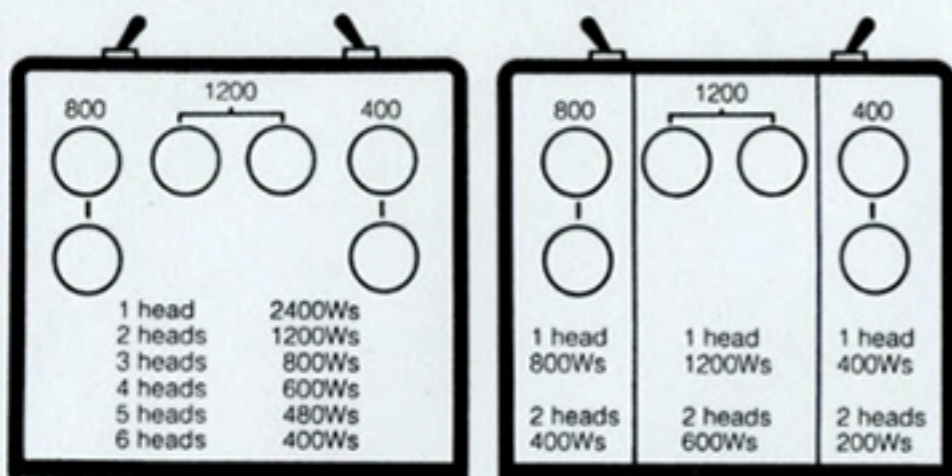
(When we use the term "ratio", we are commenting on the levels of power output from the power supply to the light units only. These power output ratios do not mean that the light falling on the subject will be at that same ratio. This will only occur if the light units are the same and have the same flash tube, reflector, cable length, are at the same distance to the subject, and there is no overlap of lighting on the subject, etc. Power output ratios are offered as a guide to help you determine your lighting arrangements.)

To illustrate the ratio options, two light units may be connected to the 2401B to achieve several different ratios from 1:1 up to 1:5. Since each power channel has two **Light Unit Outlets**, both lights may be placed into the same channel. At a 1:1 ratio, six different power levels



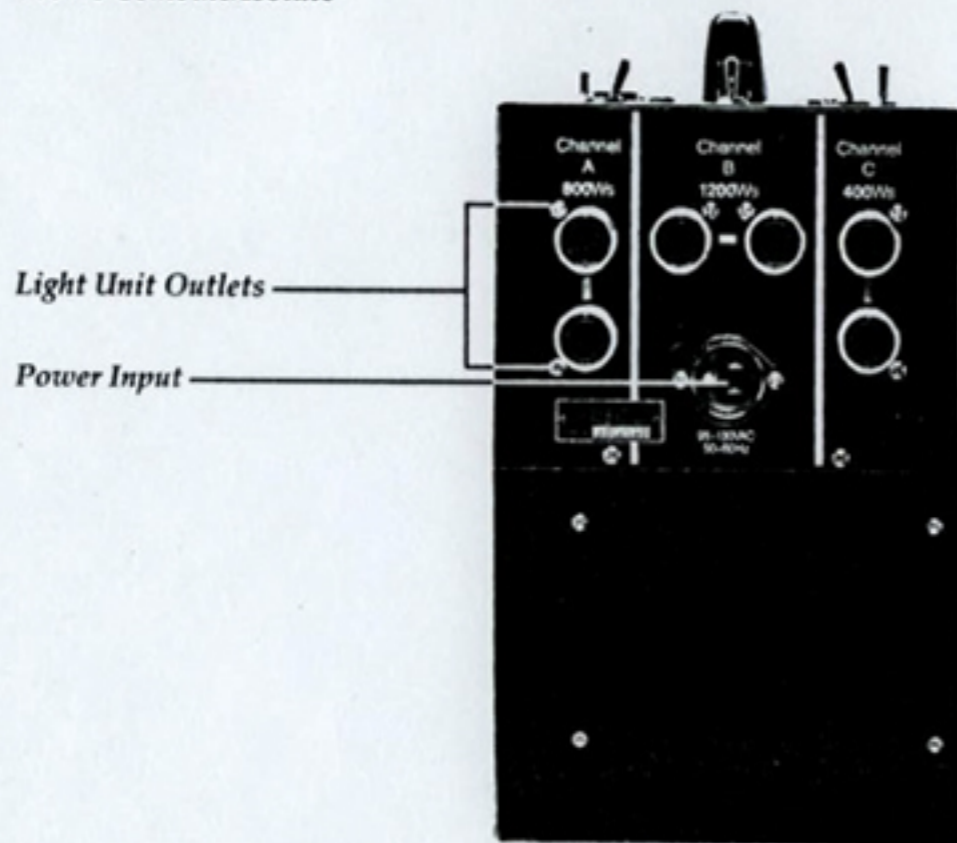
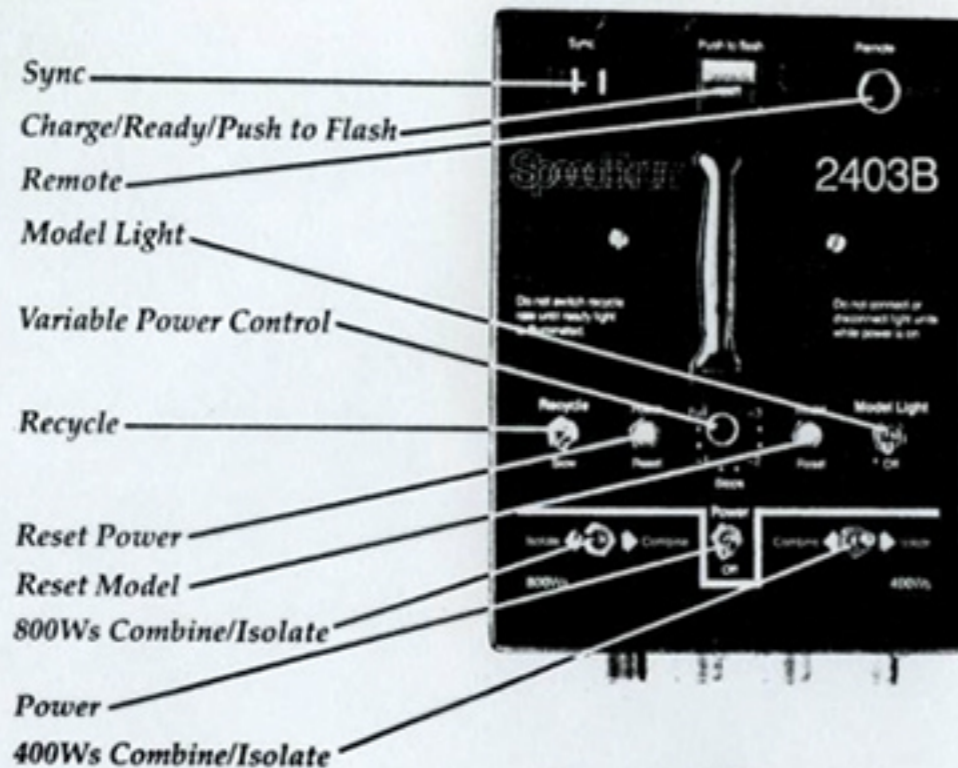
may be achieved from 200 to 1200Ws per light at 200Ws intervals using the *Isolate/Combine* switches.

When the light units are connected to separate power channels other ratios may be achieved. For a ratio of 1:2, use the 400Ws and 800Ws channels and isolate all the channels. For a ratio of 1:3, use the 400Ws and 1200Ws channels and isolate all the channels. For a ratio of 1:5, isolate the 400Ws channel and combine the 800Ws and 1200Ws channels (resulting in 2000Ws to that light unit).



## Technical Specifications

Power	2400Ws	
Recycle Time	Fast Recycle	Slow Recycle
at 2400Ws	2.0 seconds	5.0 seconds
at 1200Ws	1.0 seconds	2.6 seconds
at 400Ws	.6 seconds	1.1 seconds
Flash duration (with one 102 light unit; measured 1/2 to 1/2 peak power)		
at 2400Ws	1/210 seconds	
at 1200Ws	1/400 seconds	
Power requirements	105-125 volts AC, 50-60 Hz	
Fast recycle	20 amps (nominal)	
Slow recycle	13 amps (nominal)	
Weight	25 pounds	
Size	8.75x11.5x13.75"	
System voltage	900 volts DC regulated	
Trigger voltage	70 volts DC (at sync terminal)	
Trigger current (at sync terminals)	Approximately 45 micro-amps (.000045 amps)	
Guide number (full power with 102 light unit and 11-1/2" reflector, 60° coverage)	540 @ISO 100 (feet)	



## Description of Controls

**Power** — turns power supply on and off.

**Model Light** — turns model lamps on and off.

**800Ws Isolate/Combine** — when in isolate, this switch isolates the 800Ws channel from the 1200Ws channel and provides two **Light Unit Outlets** per channel. When in combine, will provide 2000Ws among 4 **Light Unit Outlets**.

**400Ws Isolate/Combine** — when in isolate, this switch isolates the 400Ws channel from the 1200Ws channel and provides two **Light Unit Outlets** per channel. When in combine, will provide 1600Ws among 4 **Light Unit Outlets**. (With both 800Ws and the 400Ws switches in combine, 2400Ws is available through any of the 6 **Light Unit Outlets**, divided equally. See diagrams on the side of the power supply and page 21 for detailed examples of the ratio system)

**Variable Power Control** — simultaneously controls power of all 3 channels, with ten positions down to -3 stops (1/8 power). Power ratios among the light units are unaffected since there is a proportional change in all power levels.

**Recycle Rate** — controls recycle rate.

**Charge/Ready/Push to Flash** — red **Charge** light is illuminated whenever the power supply is charging up or down to the selected level. Green **Ready** light is lit whenever the 2403B is fully charged to the selected power level. An audible beep will sound when the green **Ready** light comes on. **Push to Flash** button is for manual triggering of flash for testing or open flash application.

**Remote** — for use with optional Remote Variable Power Control (#11237) to allow exposure bracketing from the camera position. The **Variable Power Control** must be in the full position for the power levels to be correctly indicated by the remote control.

**Sync** — socket to connect power supply to camera or slave.

**Reset (1 for model lamps, 1 for main power)** — push to reset circuit breaker. Circuit breakers disable power supply and model lamp circuitry in case of malfunction.

**Power Input** — socket for AC power cord.

**Light Unit Outlets (6)** — sockets for connecting from one to six light units to power supply.

## Operating Instructions

The 2403B power supply is quite simple to operate once all of its features are understood. The following sequence of operation should be utilized for maximum life and dependability.

Make sure that the **Model** and **Power** switches are in the off position and the **Reset** button (circuit breaker) is fully depressed into its socket.

Connect light unit cable(s) to the **Light Unit Outlet(s)** on the power supply, selecting the appropriate outlet(s) for the desired power level. (See Universal Light Units section of this manual for information

on assembling light units.)

Set *Isolate/Combine* switches and *Variable Power Control* as desired. See the side of the power supply for various ratio combinations. With the *Variable Power Control* in the Full position, power is determined by the choice of outlets and position of ratio switches. The *Variable Power Control* simultaneously changes power of all 3 channels. Rotating the *Variable Power Control* immediately adjusts the power level of the 2403B. The power supply does not need to be discharged between settings.

Turn *Power Switch* to on position. The red *Charge* indicator will illuminate. After a few seconds, the green *Ready* indicator will illuminate and an audible beep will sound. (The beep will not be produced when a very small power change is made. Changing the power level by a third f-stop or so is done very rapidly with the 2403B; the *Ready* light will usually remain on and the beep will not sound.) The power supply is now charged to the selected level, and ready to fire. Remember, on the first use or when the unit has been idle for periods over 3 weeks, do not fire the unit immediately. Allow several minutes for the power supply's capacitors to form. When the power supply has been used recently you may fire the unit immediately. *Push to Flash* button may be depressed to verify proper system operation.

When *Power* is on, be sure *Ready* indicator is illuminated before switching *Power*, *Combine/Isolate*, *Fast/Slow* or *Variable Power Control*. Do not move these switches while the unit is recycling.

When changing light ratios by moving light unit power cords, turn the power supply off. Though arc-protection is included with all Speedotron systems, the safest method for changing ratio is to turn the power off before moving the light unit plugs.

When disassembling the system, turn *Power* switch to the off position. The 2403B power supply will automatically discharge its storage capacitors. Do not push the *Push to Flash* switch before turning power supply off. This may damage power supply. Power supplies may flash their light units when turned off. This is normal.

Unplug power cord from outlet, then disconnect light units from power supply.

## Ratio Information

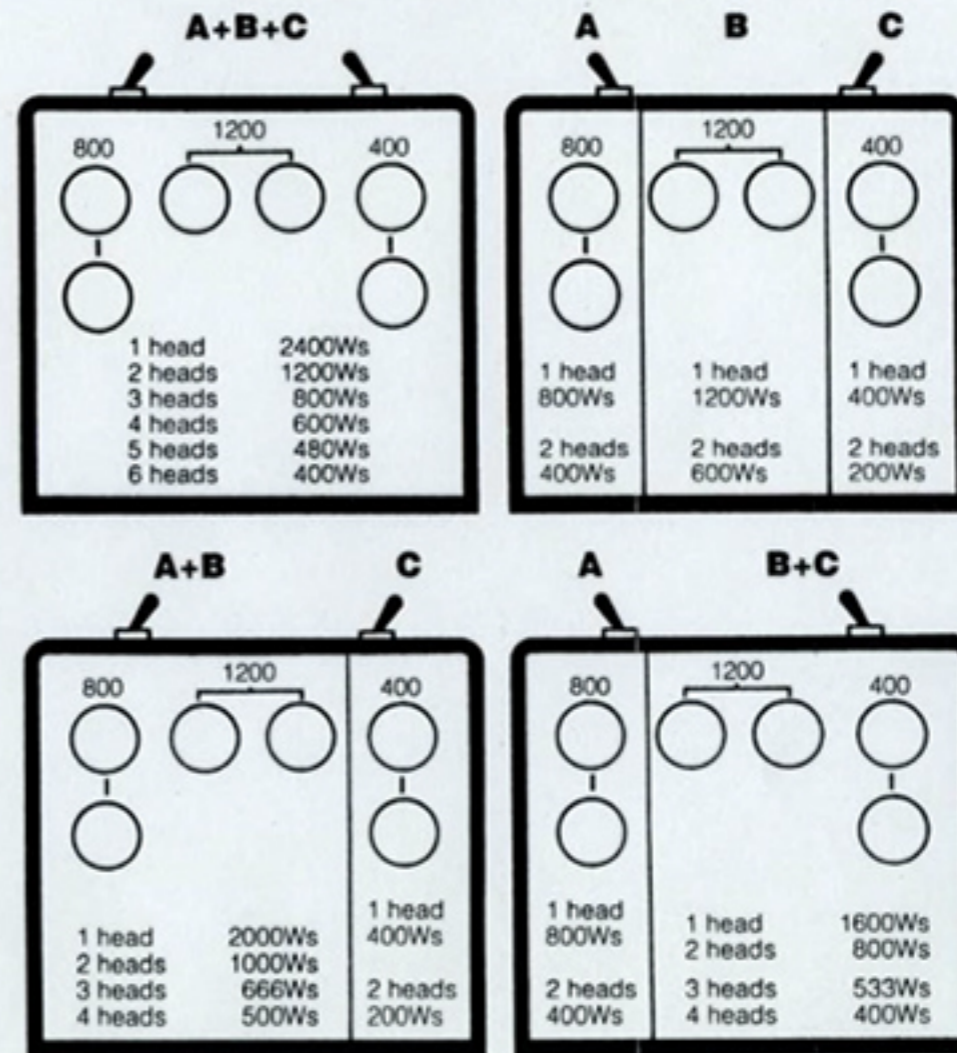
It is easiest to describe the distribution of power on the 2403B as a three-in-one, additive system. The three, two-outlet power channels may be combined for equal power distribution between all outlets or isolated to achieve specific light ratios with up to six heads. The power supply is divided into 1) 400Ws, 1)1200Ws and 1) 800Ws channels.

(When we use the term "ratio", we are commenting on the levels of power output from the power supply to the light units only. These power output ratios do not mean that the light falling on the subject will be at that same ratio. This will only occur if the light units are the same and have the same flash tube, reflector, cable length, are at the

same distance to the subject, and there is no overlap of lighting on the subject, etc. Power output ratios are offered as a guide to help you determine your lighting arrangements.)

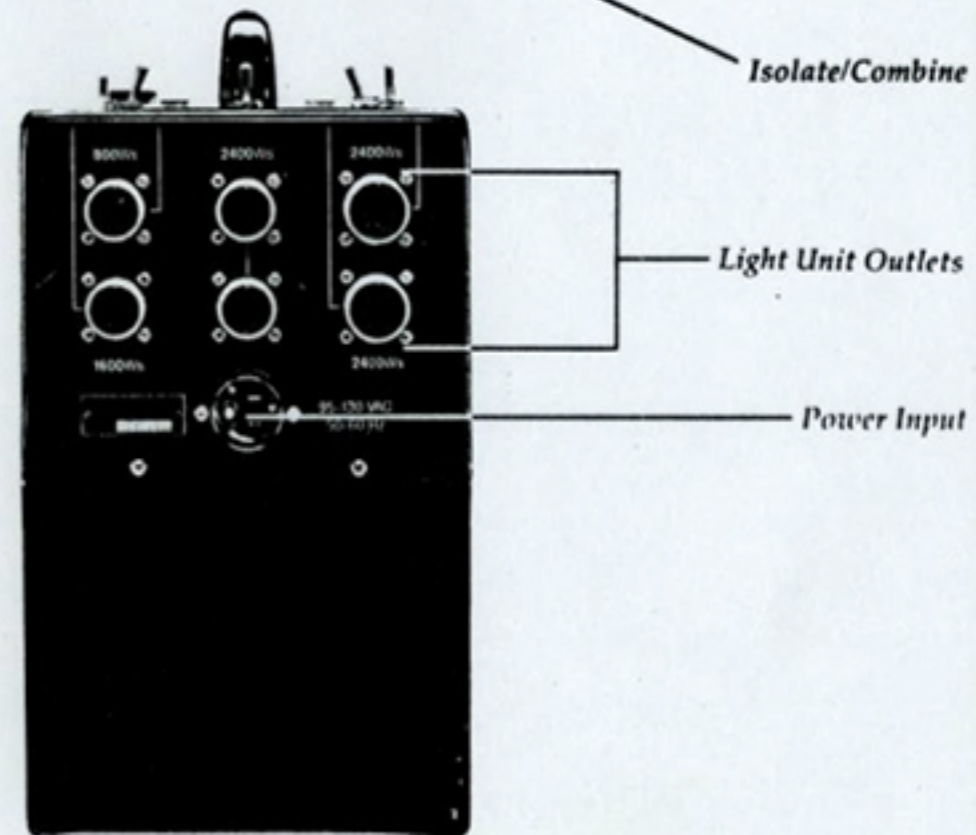
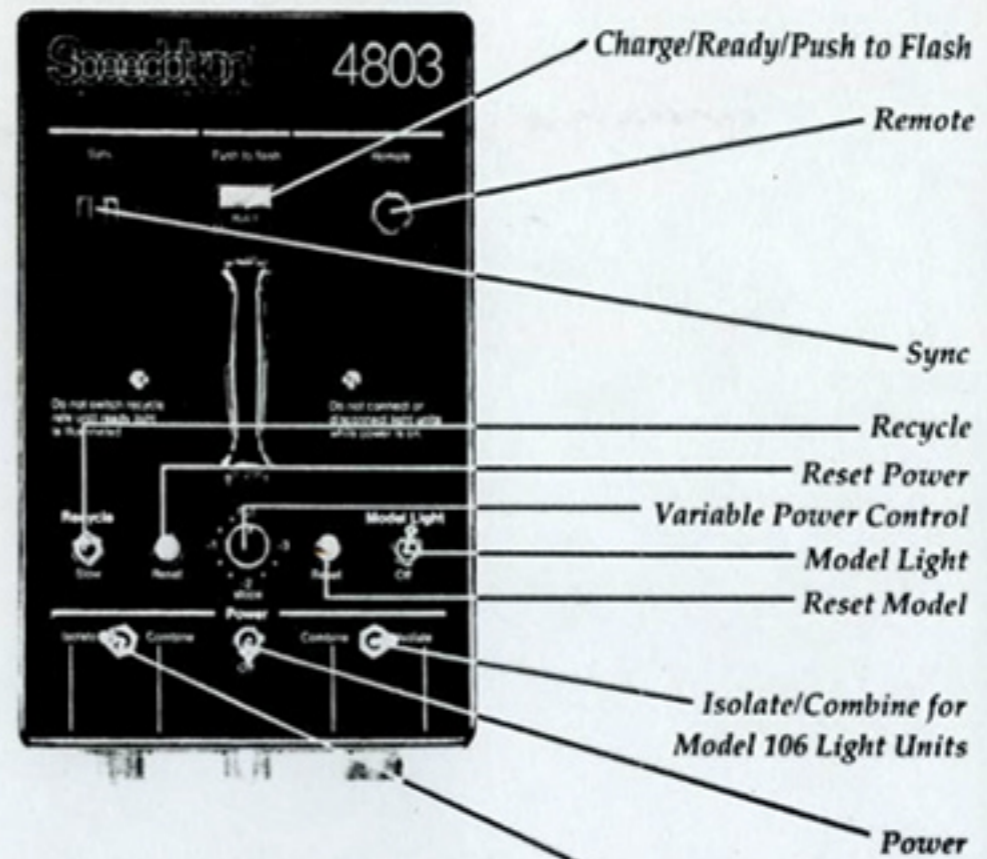
To illustrate the ratio options, two light units may be connected to the 2403B to achieve several different ratios from 1:1 up to 1:5. Since each power channel has two *Light Unit Outlets*, both lights may be placed into the same channel. At a 1:1 ratio, six different power levels may be achieved from 200 to 1200Ws per light at 200Ws intervals using the *Isolate/Combine* switches (and leaving the *Variable Power Control* at full). Additional power levels may be achieved at 1:1 by using the 4-stop *Variable Power Control*.

When the light units are connected to separate power channels other ratios may be achieved. For a ratio of 1:2, use the 400Ws and 800Ws channels and isolate all the channels. For a ratio of 1:3, use the 400Ws and 1200Ws channels and isolate all the channels. For a ratio of 1:5, isolate the 400Ws channel and combine the 800Ws and 1200Ws channels (resulting in 2000Ws to that light unit). Additional power levels may be achieved at these ratios by using the 4-stop *Variable Power Control*.



### Technical Specifications

Power	2400Ws	
Recycle Time	Fast Recycle	Slow Recycle
at 2400Ws	2.0 seconds	5.0 seconds
at 1200Ws	1.0 seconds	2.6 seconds
at 400Ws	.6 seconds	1.1 seconds
Flash duration (with one 102 light unit; measured 1/2 to 1/2 peak power)		
at 2400Ws	1/210 seconds	
at 1200Ws	1/400 seconds	
Power requirements	100-130 volts AC, 50-60 Hz	
Fast recycle	20 amps (nominal)	
Slow recycle	13 amps (nominal)	
Weight	28 pounds	
Size	8.75x11.5x13.75"	
System voltage	900 volts DC regulated	
Trigger voltage	70 volts DC (at sync terminal)	
Trigger current (at sync terminals)	Approximately 45 micro-amps (.000045 amps)	
Guide number (full power with 102 light unit and 11-1/2" reflector, 60° coverage)	540 @ISO 100 (feet)	



## Description of Controls

**Power** — turns power supply on and off.

**Model Light** — turns model lamps on and off.

**Isolate/Combine (left switch)** — when in isolate, the two left **Light Unit Outlets** provide 800 and 1600Ws, respectively. When in combine, one left **Light Unit Outlet** provides 2400Ws or with two light units installed, each provides 1200Ws. The two middle **Light Unit Outlets** provide 1200Ws each when two light units are installed, or 2400Ws when one is used.

**Isolate/Combine for Model 106 Light Units (right switch)** — when in isolate, each special 106 **Light Unit Outlet** provides 2400Ws, whether one or two 106 light units are attached. When in combine, a single **Light Unit Outlet** provides 4800Ws. With two 106 light units attached, each **Light Unit Outlet** provides 2400Ws.

(Use of both standard and special outlets can produce numerous additional lighting possibilities. See diagrams on the side panel of the power supply and on pages 26 & 27 for detailed examples.)

**Variable Power Control** — simultaneously controls power of all 3 channels, with ten positions down to -3 stops (1/8 power). Power ratios among the light units are unaffected since there is a proportional change in all power levels.

**Recycle Rate** — controls recycle rate.

**Charge/Ready/Push to Flash** — red **Charge** light is illuminated whenever the power supply is charging up or down to the selected level. Green **Ready** light is lit whenever the 4803 is fully charged to the selected power level. An audible beep will sound when the green **Ready** light comes on. **Push to Flash** button is for manual triggering of flash for testing or open flash application.

**Remote** — for use with optional Remote Variable Power Control (#11237) to allow exposure bracketing from the camera position. The **Variable Power Control** must be in the full position for the power levels to be correctly indicated by the remote control.

**Sync** — socket to connect power supply to camera or slave.

**Reset (1 for model lamps, 1 for main power)** — push to reset circuit breaker. Circuit breakers disable power supply and model lamp circuitry in case of malfunction.

**Power Input** — socket for AC power cord.

**Light Unit Outlets (6 — 4 standard, 2 for 106 light units only)** — sockets for connecting from one to six light units to power supply.

## Operating Instructions

*The following sequence of operation should be utilized for maximum life and dependability of the 4803 power supply.*

Make sure that the **Model** and **Power** switches are in the off position and the **Reset** button (circuit breaker) is fully depressed into its socket.

Connect light unit cable(s) to the **Light Unit Outlet(s)** on the power

supply, selecting the appropriate outlet(s) for the desired power level. Any Black Line Universal Light Unit may be attached to the left and center **Light Unit Outlets**. Only Model 106 light units may be attached to the right **Light Unit Outlets**. (See Universal Light Units section of this manual for information on assembling light units.)

Set **Isolate/Combine** switches and **Variable Power Control** as desired. See the side of the power supply for various ratio combinations. With the **Variable Power Control** in the full position, power is determined by the choice of outlets and position of ratio switches. The **Variable Power Control** simultaneously changes power of all 3 channels. Rotating the **Variable Power Control** immediately adjusts the power level of the 4803. The power supply does not need to be discharged between settings.

Turn **Power** switch to on position. The red **Charge** indicator will illuminate. After a few seconds, the green **Ready** indicator will illuminate and an audible beep will sound. (The beep will not be produced when a very small power change is made. Changing the power level by a third f-stop or so is done very rapidly with the 4803; the **Ready** light will usually remain on and the beep will not sound.) The power supply is now charged to the selected level, and ready to fire.

Remember, on the first use or when the unit has been idle for periods over 3 weeks, do not fire the unit immediately. Allow several minutes for the power supply's capacitors to form. When the power supply has been used recently you may fire the unit immediately. **Push to Flash** button may be depressed to verify proper system operation.

When **Power** is on, be sure **Ready** indicator is illuminated before switching **Power**, **Combine/Isolate**, **Fast/Slow** or **Variable Power Control**. Do not move these switches while the unit is recycling.

When changing light ratios by moving light unit power cords, we recommend that you turn the power supply off. Though arc-protection is included with all Speedotron systems, the safest method for changing ratio is to turn the power off before moving the light unit plugs.

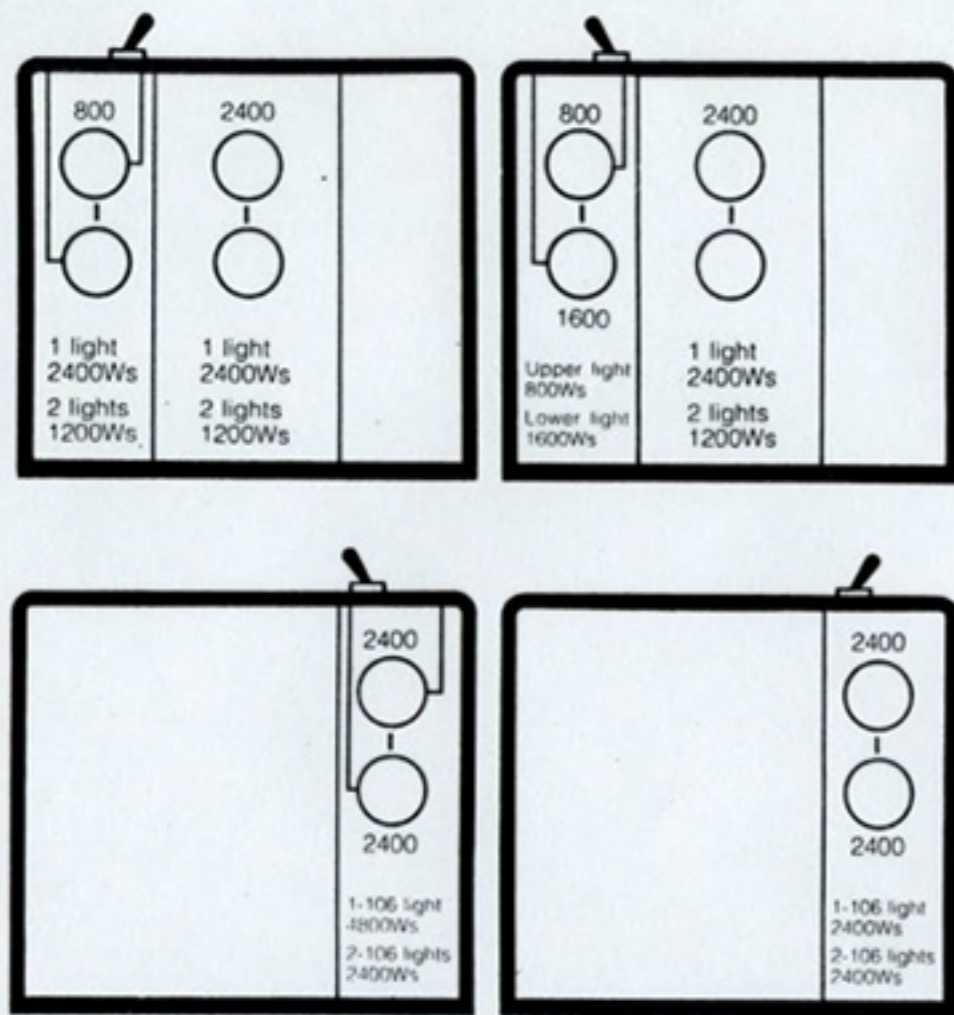
When disassembling the system, turn **Power** switch to the off position. The 4803 power supply will automatically discharge its storage capacitors. Do not push the **Push to Flash** switch before turning power supply off. This may damage power supply. Power supplies may flash their light units when turned off. This is normal.

Unplug power cord from outlet, then disconnect light units from power supply.

## Ratio Information

The 4803 has 4 standard **Light Unit Outlets** on the left and center sections that operate as 3 power channels. Two additional 106 **Light Unit Outlets** are also included. The 106 is the only light unit that may accept the full 4800Ws output of the 4803 through a single flash tube (the multi-tube 104 and 105 light units can also accept 4800Ws), so the circuitry is designed to prevent power overloads to other light units.

The ratio diagrams included here also appear on the side panel of the 4803, and show the various power combinations that are available. The 4-stop *Variable Power Control* may be used to achieve other power levels, but since it acts on all power channels, it does not change power output ratios.



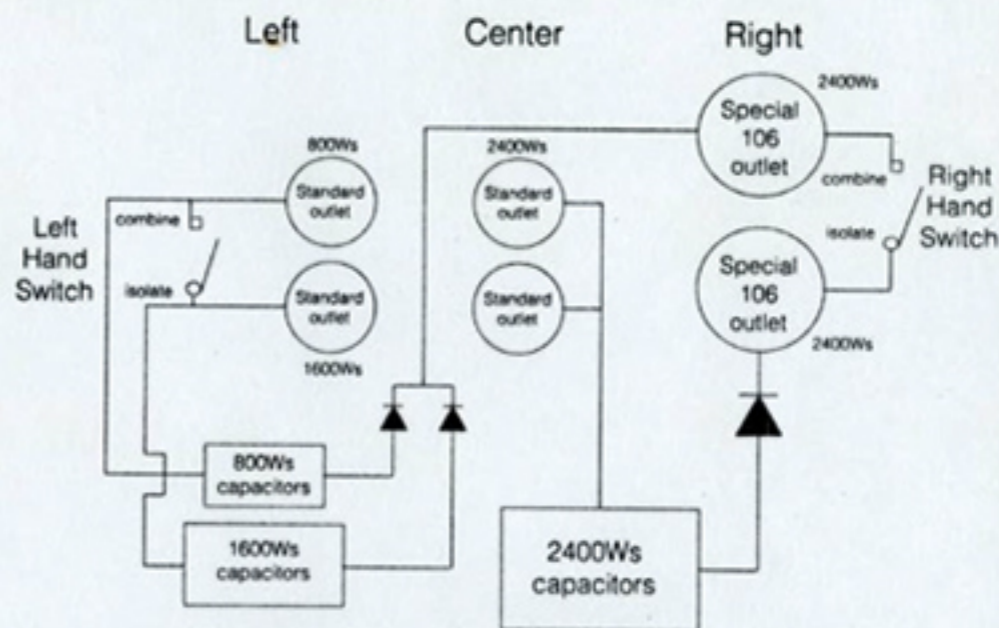
**For Model 100 through 105 Light Units with Standard Connectors**

The 100 through 105 light units are designed to accept a maximum of 2400Ws per cable, therefore the left and center sections are always isolated from each other. The center two *Light Unit Outlets* constitute an independent 2400Ws symmetrical channel. The left section can be isolated into an 800Ws, single-connector channel and a 1600Ws, single-connector channel via the left *Isolate/Combine* switch. With the switch set to combine, 2400Ws is available to the left *Light Unit Outlets*. Unlike other Black Line power supplies, this switch does not affect the center section. When four cables are connected to the 4803 and the left

switch is on combine, all four cables receive 1200Ws output. If the same number of cables are used with the switch in the isolate position, the two cables connected to the left section receive 800Ws and 1600Ws respectively, while the cables in the center section still receive 1200Ws each.

**For Model 106 Light Units**

The two right *Light Unit Outlets* fit Model 106 light units only. With the *Isolate/Combine* switch in isolate, each *Light Unit Outlet* is at 2400Ws, with either one or two light units attached. In combine, when one 106 is attached, it receives 4800Ws; with two light units, they each receive 2400Ws.



**For Model 106 and Light Units with Standard Connectors**

With a light unit with standard connector attached to either of the center *Light Unit Outlet* and a 106 light unit connected to the upper special 106 *Light Unit Outlet*, each light unit would receive 2400Ws. It does not matter what position either of the *Isolate/Combine* switches are in.

With the right *Isolate/Combine* switch in isolate and a light unit with standard connector attached to either of the center standard outlets and a 106 light unit connected to the lower outlet, the light units would split 2400Ws because the outlets are internally connected. It does not matter what position the left *Isolate/Combine* switch is in.

With the left *Isolate/Combine* switch in isolate and a light unit with standard connector attached to the 800Ws (upper left) *Light Unit Outlet*, and the right *Isolate/Combine* switch in isolate and a 106 light unit in the lower *Light Unit Outlet*, the light unit with standard connector will receive 800Ws, and the 106 will receive 2400Ws.

With the left *Isolate/Combine* switch in isolate and a light unit with standard connector attached to the 800Ws (upper left) *Light Unit Outlet*, and the right *Isolate/Combine* switch in combine and a 106 light unit in either *Light Unit Outlet*, the light unit with standard connector will receive 800Ws, and the 106 will receive 4000Ws.

## Technical Specifications

Power	4800Ws	
Recycle time	Fast recycle	slow recycle
at 4800Ws	4.0 seconds	10.0 seconds
at 2400Ws	2.0 seconds	5.0 seconds
at 1200Ws	1.0 seconds	2.6 seconds
Flash duration (with one 106 light unit measured 1/2 to 1/2 peak power)		
at 4800Ws	1/250 second	
at 2400Ws	1/425 second	
Power requirements	105-125 volts AC, 50-60 HZ	
Fast Recycle	20 amps (nominal)	
Slow Recycle	13.5 amps (nominal)	
Weight	43lbs.	
Size	8.75x13.75x14.5"	
System voltage	Approximately 900 Volts DC regulated	
Trigger voltage	Approximately 80 volts DC (at Sync terminal)	
Trigger current	Approximately 45 micro-amps (.000045 amps)	
Guide number (full power with 106 light unit and 11-1/2" reflector, 60° coverage)	720 @ISO 100	

## General Instructions and Information

Unpack and examine all equipment carefully. Should you notice any breakage or defect, notify your dealer (and the carrier if it was shipped to you) immediately. The flash tube(s) and model lamp(s) are packed in their original cartons. This affords sufficient protection and reduces the incidence of breakage during shipping. Make sure all packing materials are removed before using. This includes the pipe cleaners (used as packing material) inside flash tubes.

Install model lamp and flash tubes. Always handle lamps and flash tubes with care. Because they can break if put under stress, handle them cautiously. Don't touch glass surfaces with your bare hands. If your fingers come in contact with the glass of the model lamp, wipe off carefully with alcohol. When removing or replacing lamps and tubes, always disconnect light units from power supply. Allow lamps to cool before handling.

Flash tubes must be inserted into the sockets all the way. A slight rocking motion may be necessary when installing the larger flash tubes. New flash tubes and sockets fit very tightly. Be sure all flash tubes and model lamps are fully seated into light unit sockets.

All Speedotron Black Line flash tubes, with the exception of those in the 104 light unit, are designed to accept a minimum of 2400Ws.

Connect light cable(s) to the Light Unit Outlet(s) on the power supply. Never connect or disconnect light units while power is on. Do not insert or remove flash tubes or model lamps while power is on.

Speedotron power supplies are equipped with arc-protected outlets. However, as with any electrical equipment, arc-over (an electrical discharge between two physically disconnected electrical terminals) is a possibility. When light cables or flash tubes are improperly seated, arc-over may occur. Also, if your light unit or power supply malfunctions, or the power cord or the internal wiring in the studio is improperly terminated or defective, there is a chance of arc-over when connecting or disconnecting light units. Severe power supply damage and operator injury may result if arc-over occurs. That is why in spite of the arc-protection feature of Speedotron units, you should always make sure power is off when connecting or disconnecting light units.

Light units come with 5/8" light stand mount. The umbrella bracket is drilled to accept up to 3/8" diameter umbrella shafts (must be used with 7" reflector). The umbrella bracket may be moved to a position closer to the light unit body to accept special umbrellas and accessories. When using this alternate position the reflector will have to be custom drilled to accept the umbrella shaft.

Install the desired reflector into the light unit. Align the round notches on the reflector with the nylon buttons on the light unit, then twist firmly clockwise (viewed from front and insuring that reflector assembly is bottomed on mounting socket) approximately 1/4 of a turn. This should securely mount the reflector to the light unit housing.

Turn on power supply, wait for *Ready* light, then press *Push to Flash*

button to verify proper operation. At this time, if you have a fan cooled unit, the fan should be operating, making an audible sound. Model lamp may be turned on or off by switch located on the top of the light unit assembly (insure that Model switch at power supply is on).

For maximum performance and tube life, the model lamp should be used only when necessary and turned off after initial set-up or focusing is done. Although the forced air or convection cooling is more than ample for normal usage, turning off the model lamp will eliminate heat and enable the light unit to run cooler, extending the life of all components.

After extended use, inspect flash tubes for cracks and any unusual darkening (arc-over) around the tube plugs. This is particularly important for multi-tube flash heads. If cracks or darkening are noted the flash tube is, most likely, near the end of its duty cycle. Cracked tubes will probably misfire. The normal duty cycle is 100,000 flashes for the majority of Speedotron Black Line flash tubes.

Be sure replacement flash tubes are designed for the watt-second output requirements of Speedotron light units. Never subject a flash tube to more watt-seconds than it is designed to handle. Applying too much power severely shortens the life of flash tubes, may cause fine cracks to develop in the tube that may cause tube failure or, in the most extreme case, may cause the tube to shatter. For this reason, we suggest you always use Speedotron flash tubes and model lamps to insure safe and dependable operation.

The following accessories may be used with Black Line light units:

- 14220 7" Universal reflector for umbrella use, 110°
- 14219 7" Narrow beam reflector for 102 light unit only, 45° also for use with 14241 Honeycomb grid
- 14221 7" Universal black reflector for use with snoot
- 14225 11-1/2" Universal reflector, 60°
- 14230 16" Universal reflector, 50°
- 14231 16" Universal sports reflector, high-bright finish, 30°, best with 104, 105 or 106 light unit
- 14235 20" Universal reflector, 50°
- 24217 Barn door for use with all 7" reflectors
- 24540 Barn door for use with 11-1/2" reflector
- 24542 Barn door for use with 16" reflector
- 25525 7" Clip-on mylar diffuser
- 25527 11-1/2" Clip-on mylar diffuser
- 25528 16" Clip-on mylar diffuser
- 25529 20" Clip-on mylar diffuser
- 25212 7" Gel holder
- 25214 11-1/2" Gel holder
- 25215 16" Gel holder
- 25216 20" Gel holder
- 14241 Honeycomb grid for 7" reflectors (best with 14219 narrow beam reflector)

- 14209 Universal snoot for 7" reflector (2-1/2" opening)
- 14240 Accessory mounting collar for mounting light units to box-lights or special lighting accessories
- 14250 Flash tube protective cover for 102, 103, & 104 light units
- 14254 Flash tube protective cover for 105 & 106 light units
- 14200 25' Light head extension cable for 106 light unit only
- 14205 25' Light head extension cable

## Model 102 Universal Light Unit

This general purpose, heavy duty light unit includes a quiet, high-efficiency cooling fan. It comes standard with an 11-1/2" reflector.

For operating instructions, follow the guidelines in the General Information section of this manual.

### Technical Specifications

Maximum power	3200Ws	
Flash duration	at 2400Ws	1/210 sec.
	at 1200Ws	1/400 sec.
	at 800Ws	1/600 sec.
	at 400Ws	1/850 sec.
Flash tube, standard	MW8QV — 900V, 3200Ws	
Flash tube, 5500°K color corrected	MW8QVC — 900V, 3200Ws	
Model lamp	250W quartz halogen	
Weight	6.4 lbs., complete	
Size	5" diameter x 7.5" (less tubes or reflector)	

## Model 103 Universal Light Unit

This extremely portable medium-duty light unit uses an efficient convection cooling system. It comes standard with an 11-1/2" reflector.

For operating instructions, follow the guidelines in the General Information section of this manual.

### Technical Specifications

Maximum power	2400Ws	
Flash duration	at 2400Ws	1/450 sec.
	at 1200Ws	1/700 sec.
	at 800Ws	1/1000 sec.
	at 400Ws	1/1450 sec.
Flash tube, standard	MW9Q — 900V, 2400Ws	
Flash tube, 5500°K color corrected	MW9QC — 900V, 2400Ws	
Model lamp	150W quartz halogen	
Weight	5.5 lbs., complete	
Size	5" diameter x 5.5" (less tubes or reflector)	



## Model 104 Universal Light Unit

This special purpose, medium-duty light unit has four fan-cooled 1200Ws flash tubes supplied by two power cables. It can be powered by either one or two power supplies. Each cable delivers power to two flash tubes; when one has failed or is missing, the full power (up to 2400Ws) will be sent to the remaining operational tube. Extended full power shooting at this level will cause the second tube to fail and may damage light unit circuitry. If no more than 1200Ws is used, a single flash tube will operate through a normal duty cycle. When tubes are inserted properly and are operating normally, up to 4800Ws may be put through the 104. It comes standard with an 11-1/2" reflector.

Follow the general operating instructions in the General Information section of this manual.

### Technical Specifications

Maximum power	4800Ws
Flash duration	at 4800Ws 1/240 sec. at 2400Ws 1/500 sec. at 1200Ws 1/670 sec. at 800Ws 1/1000 sec. at 400Ws 1/1500 sec.
Flash tubes, standard	4) MW3QV — 900V, 1200Ws per tube (4800Ws total)
Flash tubes, 5500°K color corrected	4) MW3QVC — 900V, 1200Ws per tube (4800Ws total)
Model lamp	250W quartz halogen
Weight	9.6 lbs., complete
Size	5" diameter x 7.5" (less tubes or reflector)

## Model 105 Universal Light Unit

This special purpose, heavy duty light unit operates at short flash duration. It is ideal for stopping motion. It has four fan-cooled flash tubes each supplied by its own dedicated power cable. Each cable and flash tube can handle a maximum of 2400Ws, giving this light unit a maximum operating power of 9600Ws. One to four power supplies may be used to power the 105 when slaves are employed to trigger the additional packs. The cable marked with a red band operates the modeling light and fan circuits. Designed for light bank mounting, an accessory mounting collar is included with the 105.

For operating instructions, follow the guidelines in the General Information section of this manual.

## Technical Specifications

Maximum power	9600Ws
Flash duration	at 9600Ws 1/420 sec. at 4800Ws 1/725 sec. at 2400Ws 1/1000 sec. at 1200Ws 1/1800 sec. at 800Ws 1/2600 sec. at 400Ws 1/3400 sec.
Flash tubes, standard	4) MW24QV — 900V, 2400Ws per tube (9600Ws total)
Flash tubes, 5500°K color corrected	4) MW24QC — 900V, 2400Ws per tube (9600Ws total)
Model lamp	250W quartz halogen
Weight	13.6 lbs., complete
Size	5" diameter x 7.5" (less tubes or reflector)

## Model 106 Universal Light Unit

This heavy duty light unit operates with the 4803 power supply only. Its single, fan-cooled flash tube can handle up to 5000Ws maximum. It is equipped with a larger plug for use on the special 4800Ws outlets on the 4803. It comes standard with an 11-1/2" reflector.

See the General Information and 4803 power supply sections of this manual for additional operating instructions.

### Technical Specifications

Maximum power	5000Ws
Flash duration	at 4800Ws 1/250 sec. at 2400Ws 1/425 sec.
Flash tube, standard	MW18QV — 900V, 5000Ws
Flash tube, 5500°K color corrected	MW18QC — 900V, 5000Ws
Model lamp	250W quartz halogen
Weight	6.4 lbs complete
Size	5" diameter x 7.5" (less tubes or reflector)

## General Maintenance and Care

All Speedotron Black Line equipment is ruggedly built. Nevertheless, it should be treated with the same care given to other pieces of quality photographic equipment. To protect the user, all Speedotron equipment is designed to be safe when used in accordance with instructions. To assure the maximum in safe, dependable service, the following guidelines should be carefully observed.

Avoid kinking or pulling cables. Disconnect cables by pulling on the plug only. Never pull plugs out by the cable. Light cables as well as sync cords and AC power cords should be occasionally checked for wear, cracks, separation between cable and plug, and for indications of arc-over.

Do not wrap the light unit cables around the light units. Coiling cables tightly stresses the internal wires and may lead to premature cable failure. If possible, keep the coil diameter at least 10 inches.

If a cable becomes frayed, the insulation damaged, or the connectors bent or broken, have them repaired immediately.

Keep all connectors, plugs and sockets free of dust, moisture and corrosion.

Do not connect or disconnect light units or insert or remove flash tubes while the power supply is on.

When using your equipment, be sure all cable, sync, power and flash tube connections are completely and properly installed.

Do not attempt to make repairs to your Speedotron equipment yourself. It is very dangerous, and will void your warranty. Consult your dealer regarding authorized service in your area, or return the equipment to Speedotron.

When you are not using your equipment, it is recommended that you store it in a dry place. Equipment should be charged up and flashed a few times at least once a month. This will keep your equipment in top working condition for many years.

With your light unit disconnected, occasionally remove the reflector and clean the interior surface with a light solvent or soap and water. Carefully remove the flash tube, and clean the glass cover. Only in this way will you conserve a consistent color temperature and light output. Dirt and dust deposits on the tube and reflector act like a filter to alter color.

Never handle the quartz halogen model lamps with your bare hands. Use tissue or packing materials when installing and removing. The natural oils from your skin may cause the glass surface to heat unevenly and cause early failure. When removing these lamps allow sufficient cooling time before touching.

To extend their life, the model lamp circuit should be turned off after set-up and focusing.

## Trouble Shooting

### System will not work at all; no flash.

Check that sync cable, AC power cord and light unit cables are firmly and properly attached. Check that the flash tube is firmly seated. Check that *Power* switch is on.

### Occasional failure of all light units to flash.

Check sync cable and light unit cable connections. Make sure that the *Ready* indicator is illuminated before attempting to fire unit.

### Occasional failure of one light unit only.

Check light unit cable connection. Inspect the cable. Check flash tube. Make sure that the *Ready* indicator is illuminated before attempting to fire unit.

### Reduced light output.

Check to see if *Ratio* or *Variable Power Control* switch is in right position. Check flash tube; check power supply by comparing to similar pack with same light units if possible.

### Flash tube glows after a flash (afterglow) and will not flash again until glow is gone.

If confined to one light unit, check flash tube by substitution. If it continues or all heads afterglow, power supply is at fault. If this is the case, turn power supply off immediately! Power supply needs repair.

### Ratio or Variable Power Control switch has no effect on recycle time or light output.

Power supply needs repair.

### Circuit breaker on power supply pops.

Check that all cables on power supply and light units are properly connected. Also check for afterglow. If a circuit breaker blows, it is an indication that something is wrong. Normal operation will not blow circuit breakers.

### Circuit breaker or fuse in studio blows.

Use slow setting on *Recycle* rate switch.

When checking power supplies, light units and cables, be sure that *Power* is off. Look for blackened, discolored or burned pins and sockets. If a *Light Unit Outlet* on the power supply is burned, blackened or discolored, it must be replaced before it is used. It could damage light units that are connected to it. Check that cables are not loose or frayed.