

```

*****
*
*
*           OPERATOR'S MANUAL FOR SPECTRUM'S
*           OX-12 AND OX-24 DIMMER MODULES
*
*
*
*
*
*
*****

```

READ THIS MANUAL BEFORE OPERATING YOUR DIMMER MODULE!
 SAVE THIS MANUAL FOR FUTURE REFERENCE!
 IT CONTAINS VALUABLE INFORMATION!

Table of Contents

Introduction.....	p 2
Description.....	p 2
Installation	
Mounting and Cooling.....	p 3
Input Power Hook-up.....	p 3
Output Power connections.....	p 4
Control Connections.....	p 4
Operation.....	p 4
Appendices	
Appendix A - Service and Maintenance	
Output circuit protection.....	p 6
Control circuit protection.....	p 6
Triacs.....	p 6
Troubleshooting.....	p 7
Factory Service.....	p 8
Appendix B - Calibration and Adjustment.....	p 9
Appendix C - Model Number Code Descriptions...	p 11
Appendix D - Specifications.....	p 12
Appendix E - Wiring diagrams.....	p 13

INTRODUCTION

Congratulations on your purchase of a SPECTRUM OX series dimmer module! Your OX dimmer is a professional quality device designed and manufactured to provide years of reliable service. This manual explains how your dimmer works, how to install it and how to operate it. An appendix section is included which explains dimmer adjustment, maintenance, and service procedures, general specifications, and electrical diagrams. To ensure maximum life and performance from your investment it would be wise for you to thoroughly read this manual before using your OX dimmer and save it for future reference.

DESCRIPTION

The function of a dimmer is to provide an interface between a low voltage, low power controller and high voltage, high power lighting instruments. The dimmer provides appropriate output voltages to the lights that are proportional to the control voltages input from the controller. As the control voltages change so do the output voltages. Your OX dimmer provides six independent channels of input/output control.

In addition to simply interfacing your controller to your lights the OX performs other utilitarian functions. It provides a convenient power distribution system that allows one power connection to supply six separate circuits, each circuit over-current protected. Circuit breaker models provide a circuit safety disconnect function ideal for relamping. You are able to configure your dimmer to operate from various available power sources. Dual control signal connectors allow easy 'stacking' of dimmers for larger systems. The internal power supply can remotely power to your controller, if required. Adjustments are provided for adapting your OX to just about any controller.

The OX series is the most versatile dimmer available. There are various options available in five different functional areas: output receptacles, output circuit protection, input power, input power connectors and control input connectors. The serial number label on the rear of your dimmer contains the model number that describes the options installed on your dimmer. Refer to Appendix C for model number code descriptions.

NOTE! References will be made, in this manual, to model number option codes. An 'x' will be used in place of option codes for those that do not matter to the specific situation. Ex: OX-12-xBxx refers to any OX-12 that contains output circuit breakers, which are specified by the 'B' in the second digit position of the model number suffix.

INSTALLATION

MOUNTING AND COOLING

The OX will mount directly into an EIA 19" rack and it is recommended that this be done. If it is used in a stand alone application, the four self-adhesive rubber feet included should be attached on the bottom of the unit.

Convection cooling is adequate for OX-12 dimmers. Make sure that the rear of the dimmer is in an open area to allow free movement of air across the heat sinks. If more than four units are mounted in the same rack, it is recommended that a fan also be installed to prevent heat build up.

OX-24 dimmers require fan cooling. One standard 4 11/16" type fan, with approximately 80 cfm capacity, per dimmer is sufficient. It should be located two or three inches behind the dimmer facing the center of the heat sink area. The air should be able to blow across the heat sinks as well as into the rear ventilation slots.

INPUT POWER HOOK UP

OX dimmer modules will operate from a variety of power sources. Refer to Appendix E for input power wiring diagrams, branch circuit breaker ratings and wire sizes.

When powering up your system make sure the control power switch on the dimmer is turned off. It should be turned on IF and ONLY IF the three neon indicator lamps marked INPUT POWER on the front panel glow equally to indicate correct hook-up. If they do not, inspect wiring and correct error.

The three neon indicator lamps on your OX were intended to show correct power hook-up for a three phase service, hence, their labels X, Y, Z. For a 120VAC single phase hook-up, with one hot line, all three lamps will function together. For a 120/240VAC single phase hook-up, with two hot lines, the lamp labeled X will indicate power on the X input leg and the two lamps labeled Y & Z will function together to indicate power on the Y input leg.

For multiple dimmer systems you may decide to use a portable power distribution system to power your OX dimmers. If so, make sure that you use a sturdy, well made system that is capable of handling the power you will use and maintain its integrity. A poorly made distribution can damage your dimmers and lights, let alone be a safety hazard. Don't cut corners here!

**** CAUTION ****

ALWAYS GROUND YOUR DIMMER WITH A SEPARATE GROUND WIRE! The ground and neutral circuits are NOT common in your OX dimmer. If you do not connect a separate ground wire to input terminal block in your dimmer neither the dimmer case nor the lighting instrument cases will be grounded! This is a very important safety consideration!

OUTPUT POWER CONNECTIONS

On all but the OX-12-Cxxx or OX-24-Cxxx simply plug your lighting instruments into the appropriate channel output receptacle. Be careful not to connect more than the rated output capacity to any one channel, ie; 1200 watts per channel for an OX-12 and 2400 watts per channels for an OX-24.

On models OX-12-Cxxx or OX-24-Cxxx it is necessary to hard wire your output connections inside the dimmer. Refer to Appendix E for the proper output wiring diagram.

CONTROL CONNECTIONS

OX dimmers are factory set to be used with SPECTRUM'S DZN series controllers. To connect your OX to one of these controllers connect one end of an OXC control cable to either of the two CONTROL I/O connectors on the OX and the other end to one of the CONTROL OUT connectors on the controller. To "stack" two or more OX's together, connect one end of an OXC-1 stacking cable, or any OXC control cable, to the unused CONTROL I/O connector on the first OX and connect the other end to the OX to be "stacked". Continue this "stacking" on a third OX or more as desired. OX's "stacked" in this fashion will operate in unison.

OPERATION

The operation of your OX dimmer module is very simple. However, to ensure maximum life and performance from your OX always follow the following procedures.

- 1) In new situations ALWAYS measure the voltage at the service supply panel BEFORE connecting your dimmers. The voltage between the hot terminals should measure either 240vac or 208vac for single or three phase services. The voltage between the neutral terminal and each of the hot terminals should measure 120vac for ALL services. The actual voltages measured may vary a few volts in either direction. DO NOT CONNECT YOUR DIMMERS IF THE VOLTAGES ARE NOT CORRECT!!

- 2) Before energizing your dimmer make sure that the CONTROL POWER switch on the front of the OX is in the OFF position. If your model has output circuit breakers make sure that these are all off, too.
- 3) Make your input power connections first, preferably before any lighting instruments are plugged in. If possible, for safety's sake, make the ground connection first, followed by the neutral and then hot connections. Next, turn on the main power and check the three INPUT POWER indicator lamps on the front of the OX. All three lamps should glow equally. If any lamp is not on, or brighter than the others, turn off the main power immediately! This means that the input power is mis-wired. Find the error and correct before re-energizing.
- 4) After the input power is correctly installed make your output power and control cable connections. If your model has output circuit breakers leave them off. Also, make sure that your controller is off or Blacked-Out to avoid any surprises when plugging in your lights.
- 5) After your lights and control cables are connected push the CONTROL POWER switch ON. The red LED indicator will glow brightly to indicate that the low voltage DC power supply is working. If your model has output circuit breakers turn them on now. Slowly turn up a few channels on your controller (it should still be off at this point) and check for proper fading. If all looks well you're ready to roll.

APPENDIX A - MAINTENANCE AND SERVICE

OUTPUT CIRCUIT PROTECTION

All OX models have output circuit protection in the form of fuses or circuit breakers. The purpose of this protection is to limit the amount of current through the internal circuitry to the rated capacity. OX-12s are rated at 1200 watts (10 amps) per channel and OX-24s at 2400 watts (20 amps) per channel. Connecting more power than this will blow a fuse or trip a circuit breaker.

If your model has output fuses, it is suggested that you have some spares on hand at all times. The proper fuse type for your dimmer is printed on the front panel and also listed in Appendix D. Use of a larger fuse or different type of fuse will void your warranty and make your OX more vulnerable to failure.

If your model has circuit breakers, you naturally need not worry about spares or replacements. In addition you have the capability to turn off the power source to any or all channels. The breakers are designed to begin tripping at a load greater than the rated capacity. Note: A breaker will not reset if the fault that caused it to trip still exists. If you blow a fuse or trip a breaker, find the cause (i.e., bad cords, excessive wattage, etc.) before replacing or resetting.

CONTROL CIRCUIT PROTECTION

There is a .5 amp, AGC type fuse located inside the OX on the circuit board near the control power switch. It is designed to protect the control circuit from control cable shorts, miswiring, etc. If the CONTROL POWER indicator LED on the front panel does not light up when the CONTROL POWER switch is pushed on, then this fuse may have blown. If this is the case, check for miswiring at the power input section or bad control cables. Correct the fault before replacing the fuse. Replace only with a fuse of the same size and type.

**** DANGER ****

Before attempting any internal service on your dimmer DISCONNECT THE INPUT POWER SOURCE! The high voltages used can cause serious injury and death!

TRIACS

The triac is the high voltage/current switching device used to control the output voltages of your OX dimmer module. It is the one component of your system under the greatest stress. During operation they generate heat which must be dissipated by the heat sinks to which they are mounted. Under normal circumstances

they will function reliably for years. However, extreme heat build-up or sudden over-currents due to output line short circuits may possibly damage them. Therefore, your OX was designed to allow easy external triac replacement.

Locate the correct heat sink to be removed; they are in the same order as the the output receptacles on the front of the dimmer. Remove the two flat head phillips screws that secure the heat sink in question and pull it out carefully. Pull off the three wires that connect to the triac noting their positions for reconnection. Reconnect the wires to the replacement part and secure. Triacs and Triac/Heat Sink assemblies are available from the factory.

If you replace the triac only, and not the heat sink, you must use a small amount of thermal grease for adequate heat conduction. The triacs supplied by the factory are electrically isolated so no insulating pad is required. Refer to Appendix D for triac part numbers.

TROUBLESHOOTING

Your OX dimmer was designed, built and tested to provide years of trouble free operation. However, in spite of all efforts, trouble sometimes arises. Most problems are of a simple nature that can be remedied by your dealer or a call to the factory. Since most lighting control systems consist of several pieces of equipment (dimmers, cables, controllers, etc.) it often happens that users suspect the wrong piece of equipment as the cause of the problem. If a problem arises perform the following troubleshooting procedures before contacting your dealer or the factory. It may save you a lot of time and trouble.

- 1) Examine the problem. Try to determine exactly what is going wrong. Its easier for your dealer or the factory to help you if you can describe your problem as accurately as possible.
- 2) If a lighting instrument doesn't turn on check the output fuses or circuit breakers. If a fuse is blown or a breaker tripped check your output lines or instruments. You could have a bad output cable or just a burned out bulb.
- 3) Determine exactly which channels on which dimmers are not functioning properly. If you have a problem that affects more than one dimmer its probably due to the controller or the input power wiring. Inspect your input power wiring. Are the three INPUT POWER indicator lamps all glowing equally on all dimmers? Could you be connected to a three phase system with a single phase OX model?
- 4) Test your dimmer with a different control cable. If the problem goes away then it was due to a bad cable.
- 5) Try connecting the suspected dimmer's control cable to a

different bank of channels on your controller. If the problem goes away suspect the original bank of channels on the controller.

One common problem that arises when using any dimmer in portable applications is that of connecting a single phase dimmer to two lines of a three phase service. It's almost inevitable that you will someday run into a situation where you tap into a single phase breaker panel that is actually supplied by two lines of a THREE phase service. This will be most likely to happen in places like schools or shopping centers. The only way to tell if this is the case is to measure the voltage between the hot terminals. If it is 240vac then it's single phase. If it's 208vac it's three phase.

If you connect an OX-12-xx1x or OX-24-xx1x, which are made for single phase applications, to two legs of a three phase service you won't damage your dimmer but channels 4, 5 and 6 won't function properly. This is because the 60hz power and timing voltages are not in phase. Your only alternative in such a case is to connect both hot lines from the dimmer together at the service and run your dimmer at not more than half its total maximum capacity.

It's for this circumstance that we offer the -xx2x, split-phase option. This option provides two timing signals so that your dimmer will operate from two lines of either single OR three phase.

FACTORY SERVICE

If, after following the troubleshooting procedures listed above, you have determined that there is a problem with your dimmer you should contact your dealer. Most SPECTRUM dealers are capable of handling OX repairs and are usually able to service your equipment faster than the factory. If you do not have a dealer in your area you may contact the factory for assistance. Service department hours are 10:00AM to 4:30PM EST. Have the model number of your OX handy when calling so we know what options are installed on your dimmer.

If you're like most SPECTRUM users you use your equipment almost every night and cannot be without it for more than a very short time. In view of this we offer three methods of factory service.

- 1) The best method, if you have the time, is to have the factory repair your system. We can usually repair and ship a unit out within forty-eight hours after receiving it. For warranty repairs we will pay normal UPS return shipping charges. Your system must be shipped to us prepaid. If you need next day or second day return shipment you must pay the difference between it and the normal UPS charge. If you decide to return your dimmer for repair it is best to call in advance to discuss your repair and arrange for any

special requirements. We will try to accommodate you in any way possible.

- 2) If we can diagnose your problem over the phone, and you have access to a qualified service technician, we can send you the necessary repair parts. This way you can save time and money by not having to return your dinner to us for repair. If we determine that your repair is under warranty we will supply the parts at no charge and pay shipping. Note that this service method will apply only if we determine that you or your technician is capable of performing the necessary repair procedure. This method is the quickest of the three.
- 3) The third service method is to send you a loaner system to use while yours is in for repair. We have a limited number of good used systems available as loaners so this method is not always available. This method only applies to systems still under warranty. A deposit may be required that would be refunded when the loaner system is returned to us. You pay shipping of the loaner both ways.

APPENDIX B - CALIBRATION AND ADJUSTMENT

The control circuit inside your OX dimmer generates one or more timing curves that are used to convert the control signals from your controller into appropriate output voltages to your lights. One timing signal is required for each electrical supply phase used by your dimmer. The number of timing signals in your OX can be determined by your model number:

<u>OX-12 or OX-24 model number</u>	<u>electrical supply</u>	<u>number of timing signals</u>
-xx1x	single phase	1
-xx3x	three phase	3
-xx2x	'split' phase (two legs of three phase)	2

The timing curve(s) in your OX are adjustable to allow compensation for various factors such as line voltage fluctuations, preheat requirements, varying control signal levels, etc. There are separate trimmers on the rear of your OX that adjust both the high and low levels of each timing curve. The LO trimmer(s) adjust the output voltage at the 'zero' output level, the HI trimmers at full output. The LO level trimmers may require occasional adjustment. The HI trim should only need adjustment when calibrating your OX for use with controllers other than SPECTRUM's.

The channels affected by each timing curve are dependent on the number of timing signals installed on your dimmer. The chart below lists the channels control by each trimmer for each option number.

<u>Trimmer Label</u>	<u>OX-12 and OX-24 models</u>		
	<u>xx1x</u>	<u>xx3x</u>	<u>xx2x</u>
X	chs 1 - 6	chs 1 - 2	chs 1 - 3
Y	-	" 3 - 4	-
Z	-	" 5 - 6	" 4 - 6

The OX timing curve is set at the factory to accept the control voltage outputs of SPECTRUM'S DZN series controllers, however, any controller can be used with your OX if its outputs are within certain voltage limits. Refer to Appendix D for OX control voltage specifications.

TIMING CURVE ADJUSTMENT

To adjust the LO curve level (also called trim or preheat adjustment) it is necessary to power up the system with a controller and some lighting instruments. Make sure the OX control power switch and output breakers, if installed, are turned on, and that the controller is blacked-out or set at minimum intensity on all channels. Using a small screwdriver or your fingertips, rotate the white trimmer knob, marked CURVE ADJ - LO, as required to obtain the trim or preheat intensity desired.

When using an OX with a controller other than a DZN it may be necessary to adjust the high control voltage input. To do this, set the system up in the same fashion as with the low adjustment except all controller settings should be on full. Using a small screwdriver inserted into the trimmer access hole marked CURVE ADJ - HI, turn the trimmer clockwise all the way, then slowly counterclockwise until the lights just begin to fade. Then clockwise again, just a little, to set the lights at maximum brightness. This will have to be done for each timing curve. When adjusting the high level of a timing curve it will be necessary to readjust the low level.

When using a controller from another manufacturer, you may have to make an adaptor cord to accommodate a different control connector. Refer to Appendix E for control connector pin-outs and wire color codes. If the controller you intend to use has its own power supply (i.e., it plugs into an AC outlet), then DO NOT connect pin #8, +15 VDC. If your controller requires power from the power pack and will accept +15 VDC power, then connect pin #8.

APPENDIX C - MODEL NUMBER CODE DESCRIPTIONS

(x) = old option code OX-12 or OX-24-xxxx

First digit: Output Connector Option -----

- A - Parallel blade U-ground, two per channel
- B - 2P&GF-FS Theatre pin connector, one per channel
- C - Terminal block connection
- D - 2P&GF-FS Theatre pin connector, two per channel

Second digit: Output Circuit Protection Option -----

- (A) R - ABC Type fuses
- (B) S - Magnetic/Hydraulic Circuit Breakers
- (C) T - SC type fuses

Third digit: Electrical Input Option -----

- 1 - 120vac 60hz 1ph, 2-pole 3-wire w/ ground
120/240vac 60hz, 1ph 3-pole 4-wire w/ ground
- 3 - 120vac 60hz 1ph, 2-pole 3-wire w/ ground
120/240vac 60hz 1ph, 3-pole 4-wire w/ ground
120/208vac 60hz 3ph, 4-pole 5-wire with ground
- 2 - same as 1 but will also accept two legs of 120/208vac 60hz, 3ph

Fourth digit: Input Power Connector Option -----

- (1) 5 - Terminal block input connection
- (2) 6 - NEMA L14-30P Twist lock connector
(available only on OX-12-xxix and OX-12-xx2x)

Fifth digit: Misc. Options (omit if not required)

- L - Dual 10 pin Cinch-Jones type control connectors in lieu of standard type

APPENDIX D - SPECIFICATIONS

MECHANICAL: OX-12 and OX-24

Size: 5 1/4" H x 19" W x 13 1/2" D
 Weight: OX-12 = 221bs. OX-24 = 241bs.

ELECTRICAL, CONTROL: OX-12 and OX-24

Control Power supply: +15VDC @ 1.0A fused at .5 amps
 (approx .25A available to controller)

Control Input Impedance: >100K ohms

Input control voltage range: Low - adj from 0.0 to approx 5.0VDC
 factory set at 2.0VDC
 High - adj from approx 7.0 to 12.0VDC
 factory set at 10.0VDC

ELECTRICAL, POWER:

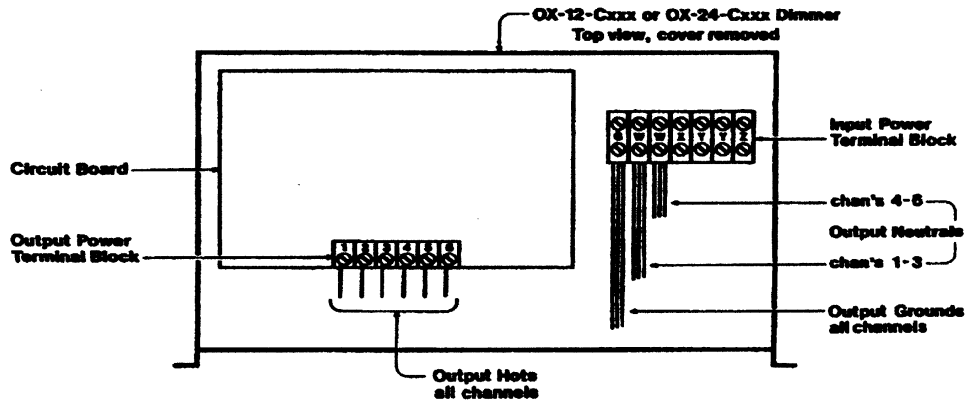
Options	OX-12	OX-24
Output Power Capacity:		
All models	6 x 1200watts @ 120vac	6 x 2400watts @ 120vac
Output Power Circuit Protection:		
xAx	ABC-10A Fuses	ABC-20A Fuses
xBx	10A Magnetic/Hydraulic Circuit Breakers	20A Magnetic/Hydraulic Circuit Breakers
xCx	SC-10 Fuses	SC-20 Fuses
Input Power Requirements:		
xx1x	120vac 60hz 60A 1ph 120/240vac 60hz 30A 1ph	120/240vac 60hz 60A 1ph
xx3x	120vac 60hz 60A 1ph 120/240vac 60hz 30A 1ph 120/208vac 60hz 20A 3ph	120/240vac 60hz 60A 1ph 120/208vac 60hz 40A 3ph
xx2x	Same as xx1x but will also operate from 2 legs of 120/208vac 30A 3ph	Same as xx1x but will also operate from 2 legs of 120/208vac 60hz 60A 3p

APPENDIX E - WIRING DIAGRAMS

OUTPUT WIRING DIAGRAM for models OX-12-Cxxx and OX-24-Cxxx

The following diagram shows how to make hard wire output connections for the above-mentioned models. For full output capacity use the following wire gauges:

OX-12	- 14 AWG
OX-24	- 12 AWG



*** DANGER ***

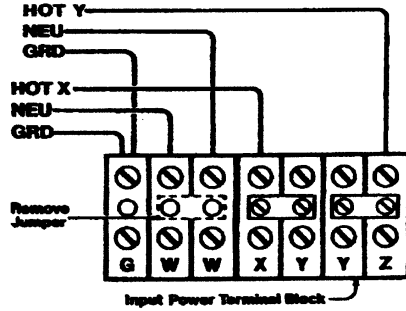
High voltages and currents are involved in wiring this dimmer! Only qualified personnel should attempt to install it! Consult local electrical codes for any procedures or restrictions involved in its installation and/or operation!

INPUT POWER WIRING DIAGRAMS

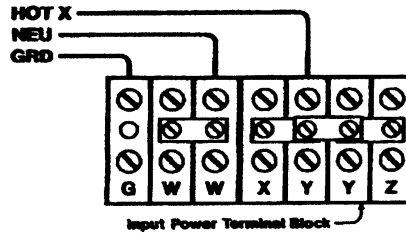
The following diagrams show how to install the input power wiring for all OX models. Each diagram lists the models that can be wired by that method. The model number of your OX is located on its rear panel. Supply circuit breaker ratings and wire sizes are based on full dimmer capacity. The top cover of your OX will need to be removed to provide access to the input terminal block shown in the diagrams. The jumpers shown are supplied loose with each OX dimmer.

OX-12 Input Power Wiring Diagrams

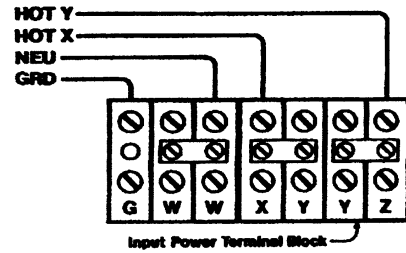
Dual 120vac 60hz inputs for OX-12-xx2x only (except for OX-12-xx1x with 1-phase only).
 Wire size: (2) 12 AWG - 3 cond
 Breaker size: (2) 20A
NOTE! This configuration limits total capacity to 67% of max.



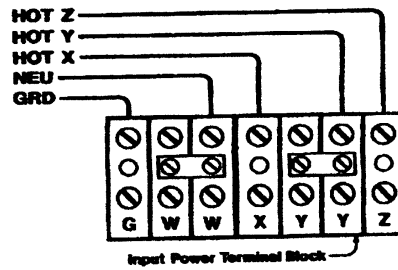
120vac 60hz 1-Phase for all OX-12 models.
 Wire size: 6 AWG - 3 cond
 Breaker size: 60A 1-pole



120/240vac 60hz 1-Phase for all OX-12 models and two lines of 120/208vac 60hz 3-Phase for OX-12-xx2x only.
 Wire size: 10 AWG - 4 cond
 Breaker size: 30A 2-pole

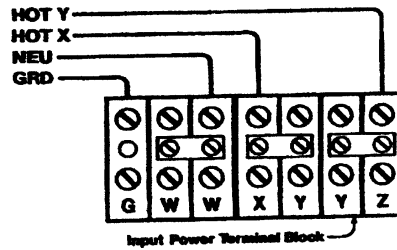


120/208vac 60hz 3-Phase
for OX-12-xx3x only.
Wire size: 12 AWG 5 cond
Breaker size: 20A 3-pole

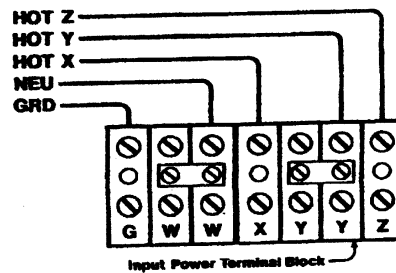


OX-24 Input Power Wiring Diagrams

120/240vac 60hz 1-Phase
for all OX-24 models and
two lines of 120/208vac 60hz
3-Phase for OX-24-xx2x only.
Wire size: 6 AWG - 4 cond
Breaker size: 60A 2-pole



120/208vac 60hz 3-phase
for OX-24 only.
Wire size: 8 AWG 5 cond
Breaker size: 40A 3-pole



CONTROL CONNECTOR PIN ASSIGNMENTS AND WIRE COLOR CODES

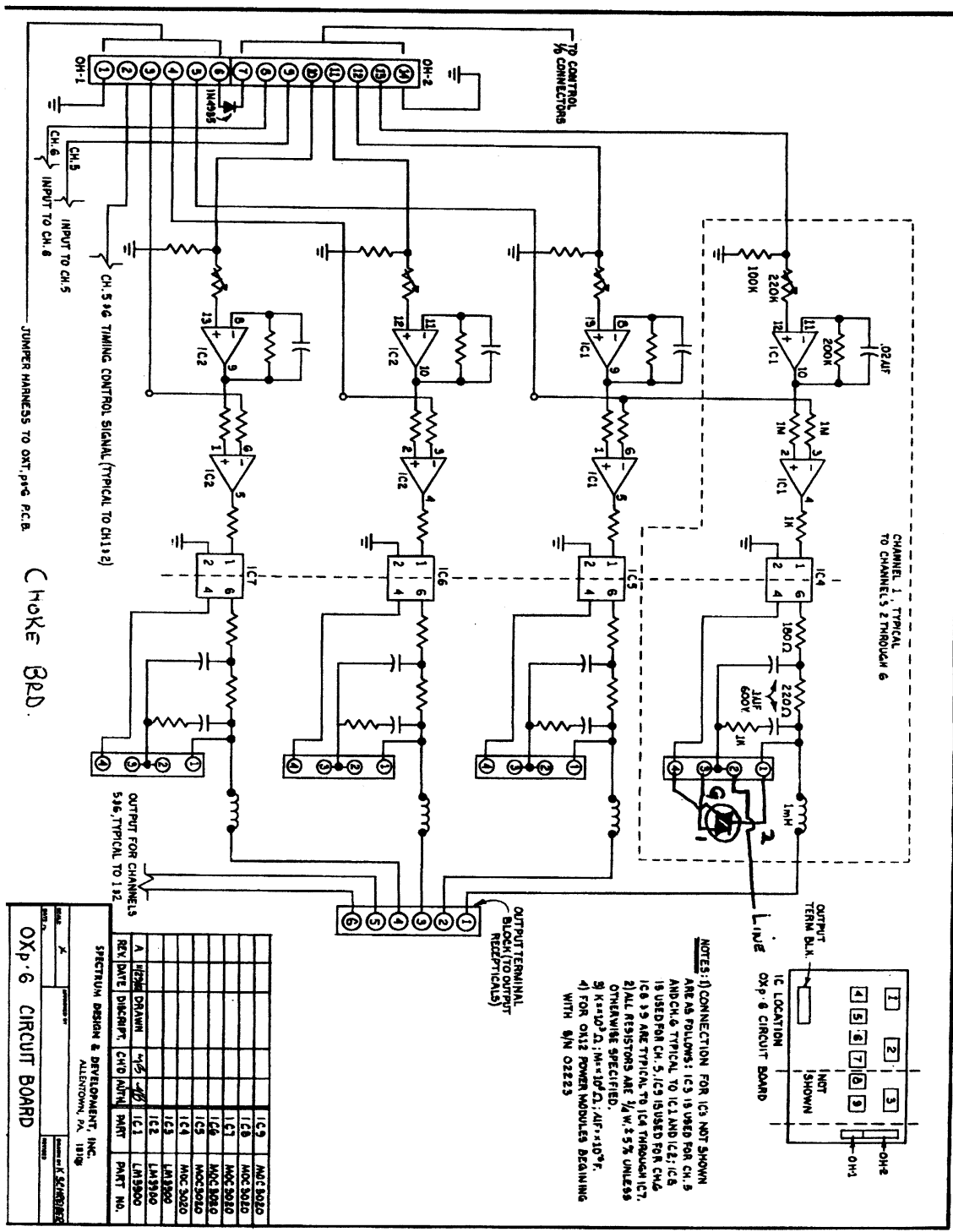
For all models with standard AMP circular plastic 8 pin connectors.

<u>Pin no.</u>	<u>Function</u>	<u>Wire Color</u>
1	Ground (common)	Green
2	Chan 1 Input	White
3	" 2 "	Yellow
4	" 3 "	Blue
5	" 4 "	Red
6	" 5 "	Orange
7	" 6 "	Brown
8	+15VDC output	Black

For models with option 'L'; 10 pin Cinch-Jones style connector.

<u>Pin no.</u>	<u>Function</u>	<u>Wire Color</u>
1	Chan 1 Input	White
2	" 2 "	Yellow
3	" 3 "	Blue
4	" 4 "	Red
5	" 5 "	Orange
6	" 6 "	Brown
7		no connection
8	Ground (common)	Green
9		no connection
10		no connection

All OX models have two CONTROL I/O connectors which are internally wired in parallel.



CH. 5 & 6 TIMING CONTROL SIGNAL (TYPICAL TO CH. 1 & 2)

CH. 5 INPUT TO CH. 5

CH. 6 INPUT TO CH. 6

JUMPER WIRE TO OXP-6 PCB

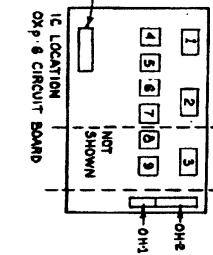
CHOKER BOARD

REV	DATE	DESCRIPTION	CHG	BY	DATE	DESCRIPTION	CHG	BY	DATE	DESCRIPTION	CHG	BY
1												

IC	DESCRIPTION	MANUFACTURER	PART NO.
IC1	741	MC	3020
IC2	741	MC	3020
IC3	741	MC	3020
IC4	741	MC	3020
IC5	741	MC	3020
IC6	741	MC	3020
IC7	741	MC	3020

SPECTRUM DESIGN & DEVELOPMENT, INC.
 ALLENDALE, CA, 91001

OXP-6 CIRCUIT BOARD

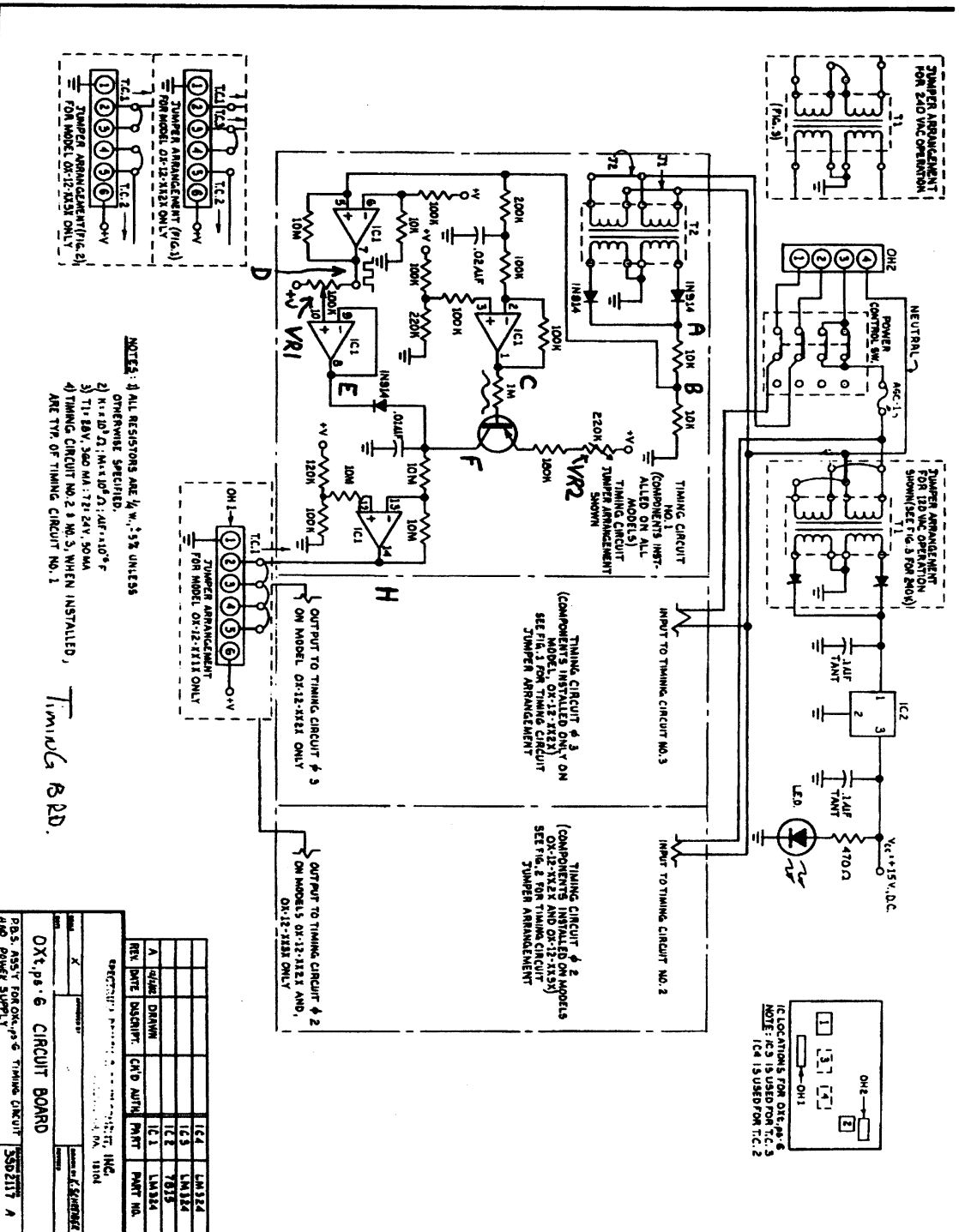


NOTES: 1) CONNECTION FOR IC3 NOT SHOWN
 ARE AS FOLLOWS: IC3 IS USED FOR CH. 5
 AND CH. 6 TYPICAL TO IC1 AND IC2; IC6
 IS USED FOR CH. 5; IC5 IS USED FOR CH. 6
 IC6 & 5 ARE TYPICAL TO IC4 THROUGH IC7
 2) ALL RESISTORS ARE 1/4 W, 5% UNLESS
 OTHERWISE SPECIFIED.
 3) K=10³; M=10⁶; u=10⁻⁶; n=10⁻⁹
 4) FOR OH12 POWER MODULES BEGINNING
 WITH S/N 02223

OUTPUT TERMINAL BLOCK (TO OUTPUT RECEPICALS)

OUTPUT FOR CHANNELS 5 & 6, TYPICAL TO 1 & 2

CHANNEL 1, TYPICAL TO CHANNELS 2 THROUGH 6



- NOTES: 1) ALL RESISTORS ARE 1/4 W., 5% UNLESS OTHERWISE SPECIFIED.
 2) T1: D: M-1250; A: AF-110
 3) T1: BAY 300 M.H.: 72-24V, 50MA
 4) TIMING CIRCUIT NO. 2 & NO. 3, WHEN INSTALLED, ARE TYP. OF TIMING CIRCUIT NO. 1

TIMING BOARD

REV.	DATE	DESCRIPTION	CH'D.	AUTH.	DATE	DESCRIPTION	CH'D.	AUTH.
1								
2								
3								
4								

DATE: 10/10/78
 BY: J. SCHROEDER
 CHECKED: J. SCHROEDER
 APPROVED: J. SCHROEDER

DESCRIPTION: TIMING BOARD

REV. 6

DATE: 10/10/78

BY: J. SCHROEDER

CHECKED: J. SCHROEDER

APPROVED: J. SCHROEDER

P.B.S. ASST. FOR ORG. 66
 AND POWER SUPPLY

