



INSTRUCTION MANUAL

for the

Model 7040 COLORAM Color Changer Head Unit

Model 7046 COLORAM Power Supply

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The COLORAM Instruction Manual

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Designed and manufactured in the U.S.A.

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INTRODUCTION

COLORAM is a direct drive color changer which makes use of a self-contained motion control system to provide smooth, quiet and rapid movement of the gel string. The gel string can be any length from 2 to 32 frames and the COLORAM color changer will automatically calibrate itself to the gel string length installed. COLORAM features include:

- quietest , fastest rolling color changer produced
- external power supply with local control capabilities
- variable gel string length of 2-32 colors
- power and signal in one cable with daisy chain capabilities
- 7 1/2-inch square aperture, fits PARs and 6-inch Lekos

The COLORAM system consists of one or more COLORAM head units and a remote COLORAM power supply which can power up to 12 head units in a daisy chain configuration. The control signal from the console, analog (0-10VDC) or DMX-512, is connected to the power supply. The power supply encodes and sends the control/channel signal, along with head unit power, down one cable which uses a common 4-pin XLR connector.

The COLORAM head units are lightweight and easy to install since the power supply is remote. Each head unit can be set to 1 of 12 channels so each of the 12 units connected to one power supply can have a unique channel. The channel switch and status lights are visible from the outside of the head units for easy setup and operation. The head unit features a direct drive motor with no gear box and a two-speed fan for quiet operation.

The COLORAM power supply can automatically accommodate all standard voltages worldwide. It also features an LCD readout with push button panel for easy setup and testing.

BEFORE YOU START

Check the shipping documents included with the product to confirm your configuration. The available accessories and options include at least the following:

<u>MODEL</u>	<u>DESCRIPTION</u>
7040	COLORAM Head Unit
7045	6-unit Power Supply
7046	12-unit Power Supply
7042	COLORAM Signal/Power 4-Pin XLR Cable Standard lengths: 3', 10', 25', 50', 100' (e.g., 7042-25 is a 25' cable)
7049	Custom Gel String
704-01-03	Leko Mounting Plate
704-01-05	PAR Mounting Plate
704-08-04	COLORAM Manual

Special Considerations:

- While the head units are available with your choice of mounting plates for various light assemblies, **USE THE SUPPLIED SCREWS** since they are treated with an anti-vibration compound to keep them from loosening.
- **ALWAYS USE A SAFETY CABLE** attached between the head unit and the pipe or truss from which your light is hung.

GETTING OPERATIONAL QUICKLY

Follow these hook-up and check-out procedures for the COLORAM head unit and power supply system to get operational quickly. Required tasks include:

- installing the gel string on the head unit(s)
- setting up the head unit(s)
- connecting the equipment and setting up the power supply
- operation of the system after setup

Installing the Gel String

To install the gel string, position the head unit so the 4-pin XLR connectors are facing down and in the lower right corner of the unit. Attach the trailer (long tag) to the left roller with masking or other strong tape - do NOT use duct tape. Roll the gel string onto the left roller. Then, while holding the left roller, turn the right (spring loaded) follower roller five turns inward to maintain tension on the gel string when installed. Attach the leader (short tag) to the follower roller with masking tape. The head unit is now ready for operation.

See the *Gel String Preparation* section of this manual if necessary for further details.

Setting Up the COLORAM Head Unit

Setup of the COLORAM Head Unit involves two basic steps:

STEP 1: EITHER.

- Locate the ROTARY channel select switch accessible through the enclosure hole on the head unit(s). Set one head unit to 1, the next to 2, and so on up to C (A=10, B=11, C=12). If needed, a more detailed description of positions is provided in the *Color Changer Head Units* information of the *How Coloram Works* section.

OR,

- Multiple head units can be set to the SAME channel and connected to the SAME power supply for similar gel string action.

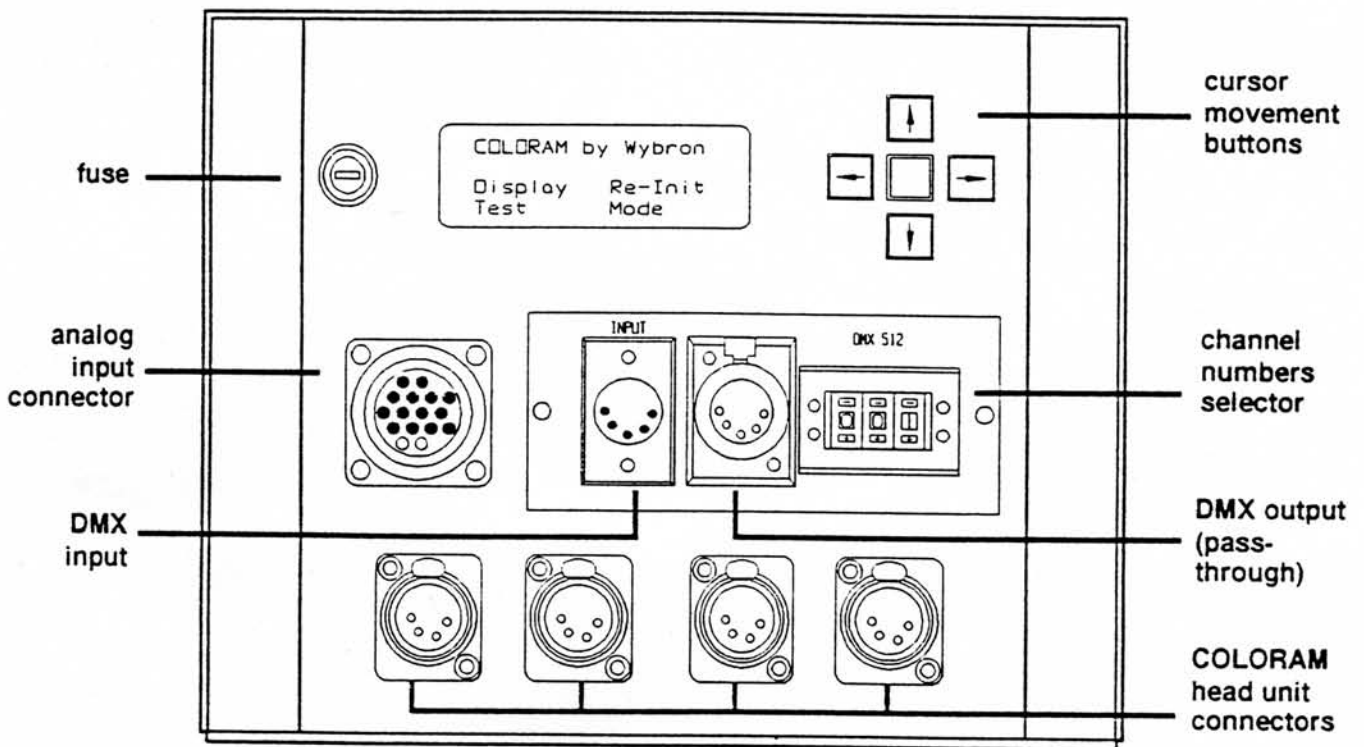
STEP 2: Locate the 4-position DIP switch accessible through the enclosure hole on the head unit(s). Set all four switches to 0 (open position). This sets the motor to normal speed and the fan to low speed.

GETTING OPERATIONAL QUICKLY (Continued)

COLORAM Power Supply Setup

Tasks required to quickly set up the COLORAM Power Supply include:

- connecting the equipment
- setting the push wheel switches
- selecting the mode, input signal and channel number values



COLORAM Power Supply

The COLORAM

GETTING OPERATIONAL QUICKLY (Continued)

COLORAM Power Supply Setup (Continued)

STEP 1: Plug the power supply into a non-switched and non-dimmed power outlet.

NOTE: DO NOT connect the power supply to the control console
OR the head unit(s) to the power supply at this time; these final steps are
detailed in the *Operation* section.

STEP 2: Select 001 on the push wheel switches. This sets the power supply to
channels 1 through 12.

STEP 3: Verify that the Liquid Crystal Display (LCD) displays the following upon
initial powerup.

COLORAM by Wybron	
Display	Re-Init
Test	Mode

STEP 4: To advance to the next screen, move the cursor to MODE with the arrow keys
and press the WHITE button. The display then will show:

MODE	
Speed	Input
Sleep	Main

STEP 5: To select the mode of operation (analog or DMX-512), move the cursor to INPUT
with the arrow keys and press the WHITE button. The display then will show:

INPUT SIGNAL	
Analog	DMX-512
Main	

GETTING OPERATIONAL QUICKLY (Continued)**COLORAM Power Supply Setup (Continued)**

STEP 6: To select the DMX-512 mode and to display channel levels from the console, move the cursor to DMX-512 with the arrow keys and press the WHITE button. You may, alternatively, select the Analog mode.

If the DMX-512 mode is selected, this display then will show:

DMX-512	
Chans	(NOTE:
001-012	Channel 1-12
e level	levels display)

OR,

If the Analog mode is selected, this display then will show:

ANALOG	
Chans	(NOTE:
001-012	Channel 1-12
e level	levels display)

You are now set up on channels 1 through 12 (all the head units should be set to channels 1 through 12 as desired) and the power supply should display input levels to each of the 12 channels.

Operation

All that is required to use the COLORAM is connection of the head unit(s) to the power supply and the power supply to the control console.

FIRST, connect the head unit(s) to the power supply using 4-pin XLR cables. You can use any of the four power supply ports and connect head units in series (daisy chain) as desired. When you initially connect a head unit to a power supply, the head unit AUTOMATICALLY "calibrates" itself to the gel string installed by:

- searching first for the long foil tag on the gel string which is on the gel string trailer (end),
- next by searching for the short foil tag which is on gel string FRAME #1 (beginning),
- and then, by parking at gel string FRAME#1.

FINALLY, to make your COLORAM system ready for operation, connect the power supply to the control console using the appropriate input cable. If you are operating in the Analog mode, refer to *Power Supply* in the *How Coloram Works* section for input cable wiring information. The head units now will respond to the input signal from the control console with the gel string positioned in proportion to the input signal.

The COLORAM

HOW COLORAM WORKSSystem Operation

The COLORAM system consists of one or more COLORAM head units and a remote COLORAM power supply which can power up to 12 head units in a series/parallel configuration. The control signal from the console, analog (0-10VDC) or DMX-512, is connected to the power supply. The power supply encodes and sends the control/channel signal, along with head unit power, down one cable which uses a common 4-pin XLR connector.

Special Considerations:

- The power conductors in this cable MUST be 14 gauge or larger to minimize voltage drop. This cable should be capable of carrying the total load of current of the number of head units which are daisy-chained together. Use 2 amps per head unit for calculations. Do not expect to use long runs with more than three or four head units at the end. For example, six head units at the end of a 100-foot feeder will cause the low voltage light to flash on the head units.
- The signal wires are a 22 gauge twisted, shielded pair.

Setting Channel Numbers

Channel numbers are set by first selecting a DMX channel number on a power supply. Each head unit connected to that power supply then also is set to a number. The channel number assigned to a head unit then will be within a group of 12 channels starting with the number selected on the power supply.

Special Considerations:

- The channel numbers always are 1 through 12 when in the Analog mode.
- Power supply push wheel switches are valid with numbers from 001 to, and including, 501.

STEP 1: Select the group of 12 sequential channel numbers for a power supply. Do this by setting the power supply push wheel switches to a number that will be the FIRST of the 12 channel numbers for that power supply. The next 11 channel numbers will follow in sequence. The first and last of these 12 numbers will be displayed on the power supply screen upon selecting DISPLAY and LEVELS (as long as a signal source is attached to the power supply). For example, if 077 is selected on the power supply, that power supply (and connected head units) will respond to channel numbers 77, 78, 79 through channel number 88.

STEP 2: Next, set the head unit channel number via its rotary channel select switch. Use the example from STEP 1, with 077 on the power supply. To set a head unit to channel 77, set its rotary channel select switch to 1, which is the first channel in the group 77 through 88. To set a head unit to channel 84, set its rotary channel select switch to 8, which is the eighth channel in the group 77 through 88. To set a head unit to channel 88, set its rotary channel select switch to C (equal to 12) which is the 12th channel in the group 77 through 88.

As a check, use the following formula:

$$\text{CHANNEL NUMBER} = \text{HEAD UNIT NUMBER} + \text{POWER SUPPLY NUMBER} - 1$$

HOW COLORAM WORKS (Continued)

Color Changer Head Units

The head units receive the control/channel signal, as well as power, from the power supply. They employ a rotary switch to select a channel from 1 through 12. The positions have been designed to include 0 through F, however the only current valid positions are: A=10, B=11, and C=12. The other position values are: 0=1, and D, E, and F are equal to C, which has a value of 12.

Special Considerations:

- More than one head unit can be set to the same channel and connected to the same power supply for identical gel string action on each head unit.

After the gel string is loaded and the head unit is connected to a power supply, it automatically "calibrates" itself to the gel string installed. The head unit then searches for the long tag on the trailer and reverses to find the short tag on the leader. This defines the length of the gel string. The signal from the control console will cause the head unit to move a length in proportion to the control signal. For example, a 50% level from the control console will cause the head unit to move to the center of the gel string.

The motor has three speeds - limited (1/2 normal speed), normal, and high. This is for maximum flexibility and performance. The setting is made via the DIP switches on the head unit.

HOW COLORAM WORKS (Continued)

Location of Controls and Indicators

The head units have rotary channel switches, four position DIP switches and four status LEDs. They are all located along the side with the COLORAM lettering. The rotary channel switch has already been explained. The four position DIP switch and the status LEDs are detailed as follows:

<u>DIP Switches</u>		
<u>DIP SWITCH</u>		<u>CONDITION</u>
Position 1	open (0)	normal motor speed
	closed (1)	limited motor speed (has priority over switch position 2)
NOTE: This switch position is effective only upon powerup.		
Position 2	open (0)	normal motor speed
	closed (1)	high motor speed
NOTE: This switch position is effective only upon powerup.		
Position 3	open (0)	not used
	closed (1)	not used
Position 4	open (0)	low fan speed
	closed (1)	normal fan speed

<u>Status LEDs Operation</u>				
where X = not relevant				
<u>GRN</u>	<u>RED</u>	<u>RED</u>	<u>YEL</u>	<u>CONDITION</u>
on	X	X	X	low fan speed
X	on	X	X	+24v marginally low (<+22V)
X	X	on	X	high motor speed
X	X	X	on	limited motor speed
X	X	off	off	normal motor speed
X	blink	blink	blink	error: no gel string tags read or +24v low (<+15V)
NOTE: If the LEDs are blinking, the head unit will not function until either power to it is turned off and then on, or it is reinitialized (Re-Init) from the power supply.				

Power Supply

The power supply converts the control console DMX-512 or analog 0-10V signal to the COLORAM format to send to the head units. It also supplies +24 VDC to the head units and allows testing and re-initialization without using a control console.

<u>Special Considerations:</u>
-- Input power is connected at the rear of the power supply.
-- The power supply uses a standard IEC power input connector.
-- All world-wide voltages and frequencies are automatically accommodated, including 100-120 VAC and 200-240 VAC at 50/60 Hz.

HOW COLORAM WORKS (Continued)

Power Supply (Continued)

Input Connector Wiring

The DMX-512 input uses standard 5-pin XLR connectors with the following pin-out connections:

- 1 = common
- 2 = signal complement
- 3 = signal true
- 4 = wired through
- 5 = wired through

The DMX-512 pass through on each power supply is buffered and includes a bypass relay in case of local power failure.

The analog input uses a 14-pin connector with the following pin-out connections:

Analog Connector Wiring
COLORAM Power Supply: 12 Channel Analog Input Cable

Figure depicts the CABLE side of the Analog Input Connector; the opposite (MATING) side attaches to the power supply.

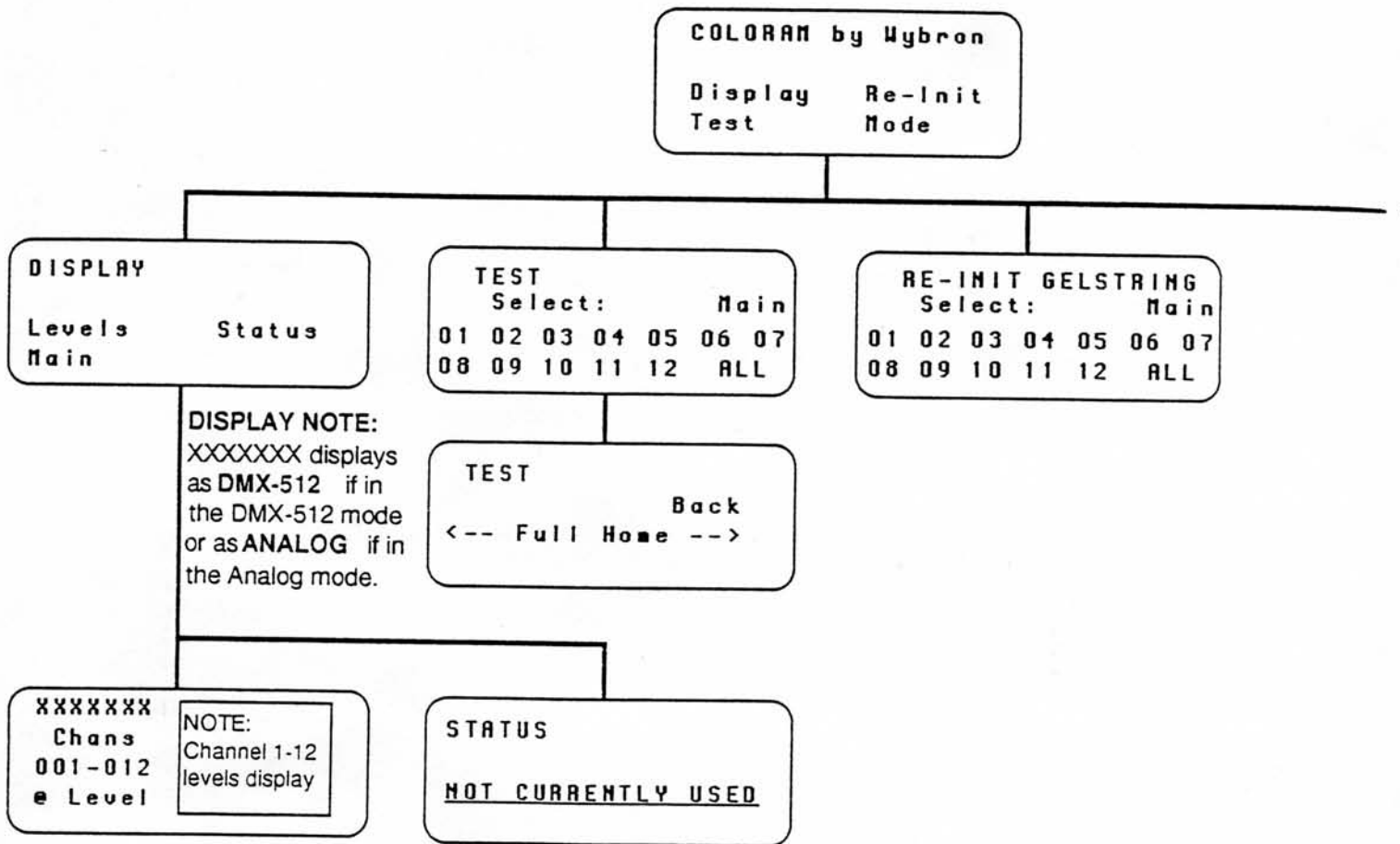
Channel Number	Color	Analog Input Connector Pin Number	Channel Number	Color	Analog Input Connector Pin Number
1	Black	1	9	Green/Black	9
2	White	2	10	Orange/Black	10
3	Red	3	11	Blue/Black	11
4	Green	4	12	Black/White	12
5	Orange	5	GND	Red/White	13
6	Blue	6	GND	Green/White	14
7	White/Blue	7	NC	Blue/White	NC
8	Red/Black	8	GND	Drain Wire	NC

Output Connector Wiring

The COLORAM connection to the head units uses standard 4-pin XLR connectors with the following pin-out connections:

- 1 = +24 VDC (14 gauge or larger)
 - 2 = signal complement
 - 3 = signal true
 - 4 = common (14 gauge or larger)
- } (pins 2 and 3 are 22 gauge twisted, shielded pair)

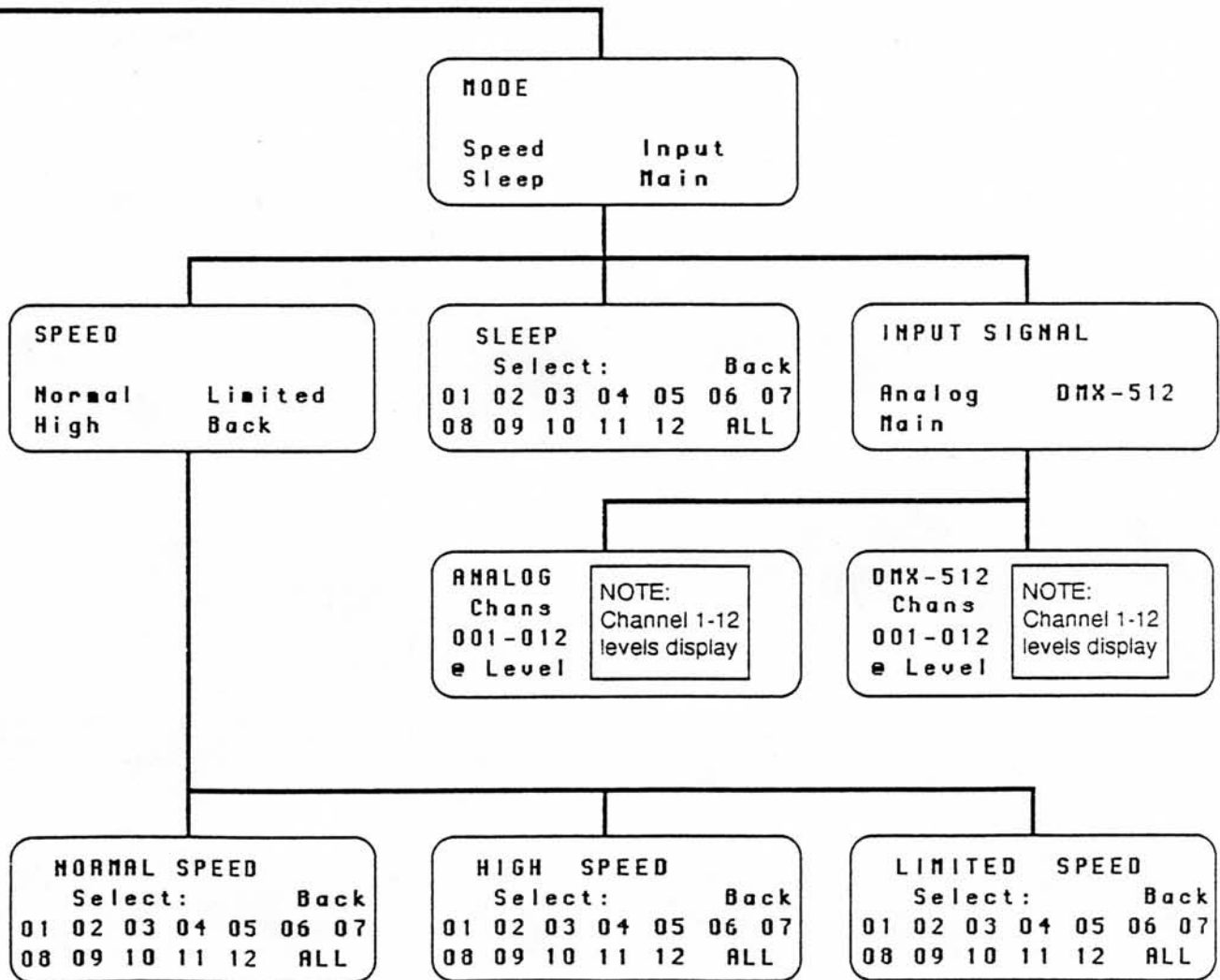
COLORAM Power Supply Menu Chart



NOTES

- Select with the WHITE button
- Selecting Main always returns to the Main Menu
- Selecting Back always returns to the previous menu
- If Back or Menu is NOT a selectable option, pressing the WHITE button returns to the Main Menu

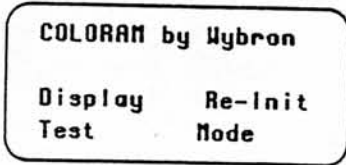
COLORAM Power Supply Menu Chart (Continued)



Detailed Operating Instructions

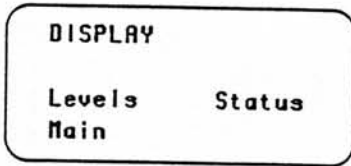
Each of the options shown in the *COLORAM Power Supply Menu Chart* tree structure is described individually in this section. Refer to the *Getting Operation Quickly* section for additional hook-up and check-out procedures.

MAIN MENU Options:



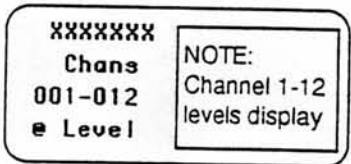
Select one of the four Main Menu options, **Display**, **Test**, **Re-Init**, or **Mode**, by moving the cursor with the arrow keys and pressing the **WHITE** button.

DISPLAY Options: (follow down the **DISPLAY** branch)



Select the **Levels** option by moving the cursor with the arrow keys and pressing the **WHITE** button. Selecting **Main** returns to the Main Menu.

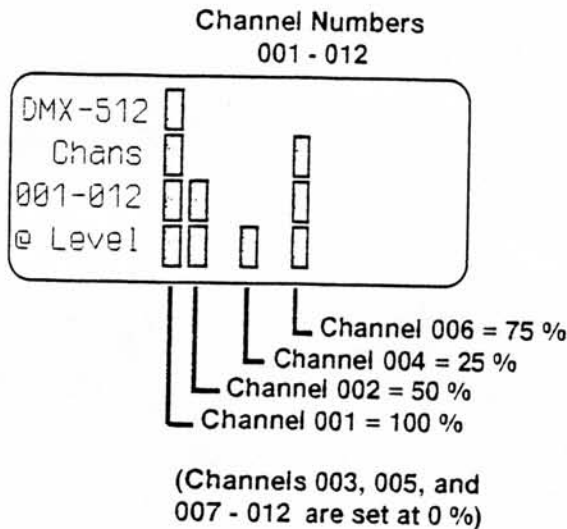
NOTE: The **STATUS** option currently is not used.



The current levels are displayed. **XXXXXXX** displays as **DMX-512** if in the **DMX-512** mode or as **ANALOG** if in the **Analog** mode.

Channel 1 through 12 input levels are displayed. Pressing the **WHITE** button returns to the Main Menu.

An example of the display with various levels follows:



Detailed Operating Instructions (continued)

TEST Options: (follow down the TEST branch)

TEST												
Select:												Main
01	02	03	04	05	06	07						
08	09	10	11	12	ALL							

Select the appropriate number or ALL by moving the cursor with the arrow keys and press the WHITE button. Selecting **Main** returns to the Main Menu. NOTE: The test feature will function in the DMX-512 mode only if the DMX cable from the control console to the power supply is disconnected. The test feature is disabled in the Analog mode.

TEST												
												Back
<-- Full Home -->												

Move the cursor with the arrow keys and press the WHITE button, selecting either <-- for full (full gel string travel) or --> for home (gel string returns). Selecting **Back** returns to the previous menu (i.e., TEST).

RE-INIT GELSTRING Options: (follow down the RE-INIT GELSTRING branch)

RE-INIT GELSTRING												
Select:												Main
01	02	03	04	05	06	07						
08	09	10	11	12	ALL							

Select the appropriate number by moving the cursor with the arrow keys and press the WHITE button. Selecting **Main** returns to the Main Menu.

The COLORAM

Detailed Operating Instructions (continued)

MODE Options: (follow down the **MODE** branch)

```

MODE
Speed      Input
Sleep      Main
    
```

Select one of the three options to set the **MODE**, **Speed**, **Sleep**, or **Input**, by moving the cursor with the arrow keys and pressing the **WHITE** button. Selecting **Main** returns to the Main Menu.

SPEED Options: (follow down the **SPEED** branch)

```

SPEED
Normal     Limited
High       Back
    
```

Select one of the three options to set the **SPEED** mode, **Normal**, **High**, or **Limited**, by moving the cursor with the arrow keys and pressing the **WHITE** button. Selecting **Back** returns to the previous menu (i.e., **MODE**).

```

NORMAL SPEED
Select:      Back
01 02 03 04 05 06 07
08 09 10 11 12 ALL
    
```

Select the appropriate number by moving the cursor with the arrow keys and press the **WHITE** button. Selecting **Back** returns to the previous menu (i.e., **SPEED**).

```

HIGH SPEED
Select:      Back
01 02 03 04 05 06 07
08 09 10 11 12 ALL
    
```

Select the appropriate number by moving the cursor with the arrow keys and press the **WHITE** button. Selecting **Back** returns to the previous menu (i.e., **NORMAL SPEED**).

```

LIMITED SPEED
Select:      Back
01 02 03 04 05 06 07
08 09 10 11 12 ALL
    
```

Select the appropriate number by moving the cursor with the arrow keys and press the **WHITE** button. Selecting **Back** returns to the previous menu (i.e., **HIGH SPEED**).

SLEEP Options: (follow down the **SLEEP** branch)

```

SLEEP
Select:      Back
01 02 03 04 05 06 07
08 09 10 11 12 ALL
    
```

Select the appropriate number by moving the cursor with the arrow keys and press the **WHITE** button. Selecting **Back** returns to the previous menu (i.e., **MODE**).

Detailed Operating Instructions (continued)

INPUT SIGNAL Options: (follow down the INPUT SIGNAL branch)

INPUT SIGNAL	
Analog	DMX-512
Main	

Select either **Analog** or **DMX-512** by moving the cursor with the arrow keys and press the WHITE button. Selecting **Main** returns to the Main Menu. NOTE: The INPUT SIGNAL (Analog or DMX-512 mode) is maintained indefinitely until changed, even if power is removed from the power supply.

ANALOG	NOTE: Channel 1-12 levels display
Chans	
001-012	
e Level	

Set up on channels 1 through 12 to display input levels to each of the 12 channels for the Analog option.

DMX-512	NOTE: Channel 1-12 levels display
Chans	
001-012	
e Level	

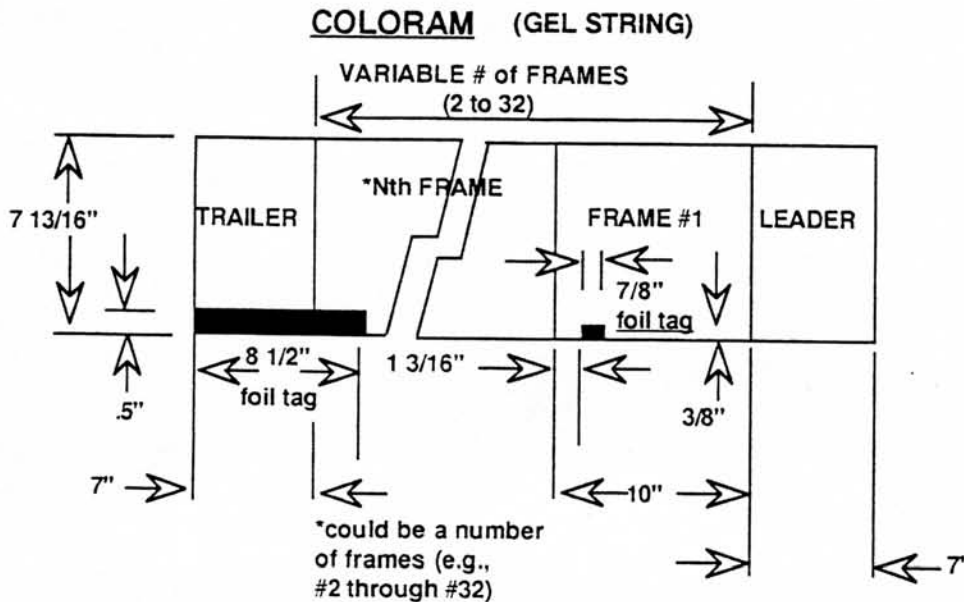
Set up on channels 1 through 12 to display input levels to each of the 12 channels for the DMX-512 option.

Pressing the WHITE button returns to the Main Menu.

GEL STRING PREPARATION

NOTE: WYBRON recommends that gel string preparation be performed only by persons experienced in the practice. Improper construction or materials can result in gel string failure and operator frustration. Custom gel strings made to your specifications may be ordered from ColorExpress by Wybron, Inc. For those persons experienced in the practice, the following information is offered.

Each gel string frame is to be 10 inches wide and $7 \frac{13}{16}$ inches high. The gel string may be any length from 2 to 32 frames with the two end gels (the leader and trailer) being 7 inches wide to allow for proper attachment to the rollers. The leader and trailer must also have a short and long foil tag, respectively, so the opto-sensor can determine the beginning and the end of the gel string.



To install the gel string, position the head unit so the 4-pin XLR connectors are facing down and in the lower right corner of the unit. Attach the trailer (long tag) to the left roller with masking or other strong tape - do NOT use duct tape. Roll the gel string onto the left roller. Then, while holding the left roller, turn the right (spring loaded) follower roller five turns inward to maintain tension on the gel string when installed. Attach the leader (short tag) to the follower roller with masking tape. The head unit is now ready for operation.

SPECIFICATIONS

COLORAM technical data includes the following features and requirements of the COLORAM Head Unit and Power Supply:

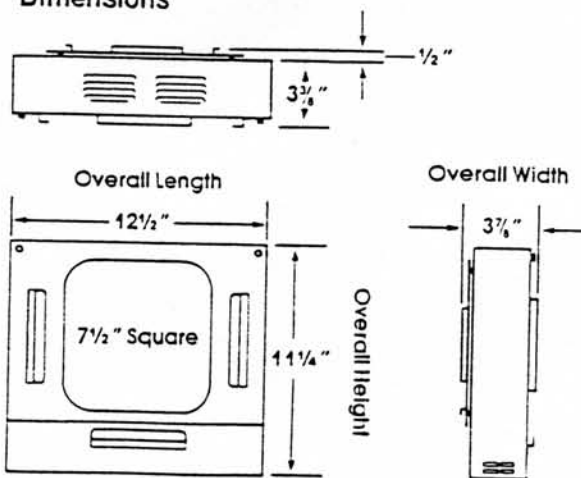
Coloram Head Unit

<p>Motor Gel String Format Two-Speed Fan LED Status Panel Top Hat Mount Mounting Plates</p>	<p>Quick, quiet direct drive, no gear box 2-32 Colors, variable length, no preset length High speed for extra gel life, low for silent operation Provides indication of operating modes from a distance Built-in for use of top hats and accessories Various - to fit a wide variety of instruments</p>
<p>Low Voltage Indicators</p>	<p>Two stage - warns of cables too long or bad connections: Stage 1 - warning light on status panel Stage 2 - shutdown to prevent running off rollers</p>
<p>Operating Modes</p>	<p>1. Normal - good top speed, smooth cross fades, quiet operation 2. Top speed limited - smooth, quiet operation at slow speed, keeps from using timed cross fades for changes 3. High speed - the maximum speed, reduced slow speed capabilities</p>
<p>Daisy Chaining</p>	<p>Individual ID's on one home run</p>

Power Supply

<p>Line Voltage Coloram Capacity Status Display/ Control</p>	<p>Automatically accepts all standard voltages worldwide 12 heads Shows input levels (up to 12) coming to power supply; Mirrors indicators in individual colorams; Local control of reset, test functions, operating mode changes, input selection</p>
<p>Signal Input</p>	<p>DMX-512, analog (0-10V)</p>

Dimensions



<p>Power Requirements Input Control Signal Fuse Value Weight</p>	<p>100-120VAC and 200-240VAC at 50/60 Hz DMX-512, analog (0-10V) 7 Amps at 110V 3 3/4 lbs. with no mounting plate or gel string</p>
--	---

TROUBLESHOOTING

<u>Problem</u>	<u>Remedy</u>
1. <i>When connecting the head unit to the power supply, the rollers turn for 10 seconds and then stop with no further movement.</i>	The unit will stop if the gel string did not have a foil tag on the trailer and leader frames or when the gel string is not positioned in the opto-sensor. Three LEDs (red, red, yellow) will be blinking. Reposition the gel string or ensure the foil tag will move appropriately.
2. <i>The gel string moves slowly and I want it to move faster.</i>	DIP switch position 1 and 2 are in the open (0) position. Move position 2 from open (0) to (1) for high motor speed.
3. <i>The head unit does not respond to changing levels from my control console.</i>	Check to see that the channel selected on the power supply/head unit and the channel at the control console match. For additional information, see the <i>Setting Channel Numbers</i> section. Also make sure all lights are not blinking. If so, the unit may may have dipped below 15 volts.
4. <i>When I am doing a timed fade (gel string should move slowly), the gel string moves erratically by stopping and then jumping ahead.</i>	The head unit DIP switches are set in the high speed motor position. Set the DIP switches to the normal motor speed position by setting positions 1 and 2 to the open (0) position.

TROUBLESHOOTING (Continued)

<u>Problem</u>	<u>Remedy</u>
5. <i>I would like to reduce the fan noise to as low as possible.</i>	Set the fan to the low speed position by setting DIP switch position 4 to open (0).
6. <i>I want to make my COLORAM color changer as quiet as it can possibly be. How do I do this?</i>	Do the following to make your COLORAM as quiet as it can possibly be: <ul style="list-style-type: none">- Set the fan to low speed by setting DIP switch position 4 to open (0).- Set the motor to limited speed by setting DIP switch position 1 to closed (1) and position 2 to open (0).- Use only precisely cut gel strings to eliminate gel string edges rubbing on the roller flanges. Eliminate this problem by using only WYBRON ColorExpress gel strings - an order form is included in this manual.
7. <i>After installing the gel string and running it back and forth a few times, FRAME#1 is not centered properly.</i>	Installing the gel string and running it back and forth causes the gel string to be rolled more tightly on the rollers than when it was first installed. This causes the position of the gel string with respect to the rollers to shift slightly. Resolve this by reinitializing the head unit using the RE-INIT command at the power supply. Alternatively, if the head units are not on hot lights you can disconnect (removing power and stopping the fan) and reconnect the head units at the power supply.