

**NCM 708 / 716**  
**MEMORY LIGHTING CONTROLLER**  
**OPERATION MANUAL**

**Software Revision 1.01 and above**

**Document Revised: 1/9/91**

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**NSI CORPORATION**

**Wilsonville, OR**

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# 1

## Introduction

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### *Welcome*

You are entering a new era of microprocessor controlled stage lighting technology. The powerful NSI Micro-Plex designs involve the electrical marriage of microprocessor technology and digitally controlled multiplexing. The result is a control package with the flexibility for a variety of innovative applications.

The NSI NCM 700 Series Lighting Console features an advanced microprocessor based design containing many benefits found in today's personal computers. This technology provides for the option of adding programmable Memory Scene Masters and Chase effects to the simplicity of a familiar two scene console.

The NSI Micro-Plex technology found in all NSI products allows components of your lighting system to be interconnected by way of standard 3-conductor microphone cables or audio snakes. Up to 128 individual control signals may be transmitted to dimmer packs through a single microphone cable and the returned phantom power eliminates the need for AC power cords on NSI controllers. This makes the remote placement of the NCM 700 Series Lighting Console easy and convenient.

The NSI NCM 700 Series Lighting Console represents our continuing commitment of leading the industry in defining technological advances for stage lighting.

Throughout this manual specifications are listed for the NCM 716 followed by specifications for the NCM 708 in parenthesis.

Welcome to the era of microprocessor controlled stage lighting!

## 2

## Installation\Setup

### *Power Supply Requirements*

The NCM 700 Series Lighting Console requires a source of 15 volts DC (200 MA) to operate satisfactorily. When used with NSI dimming equipment, power is provided through the Micro-Plex microphone cord connection system when connected to the dimmers.

If the console is equipped with the optional DMX-512 output and used with DMX-512 controlled dimmers or if the microphone cable length exceeds 100 feet, the external power supply jack can be used to apply power to the console. Use the power supply provided with the DMX-512 option or call your dealer for assistance in obtaining a proper supply. Make sure that the plug on any power supply not supplied through NSI is configured so that the center connector is positive.

### *Dimmer Equipment Connection*

Connecting the NCM 700 Series Lighting Console to NSI dimming equipment is very simple. You need only connect a single 3 conductor audio cable (standard microphone cable equipped with a 3-pin XLR type connector) to either of the jacks marked MICRO-PLEX on the rear apron of the console. It doesn't matter which jack is used, two jacks are provided for convenience. Connect the other end of the cable to the NSI dimming equipment.

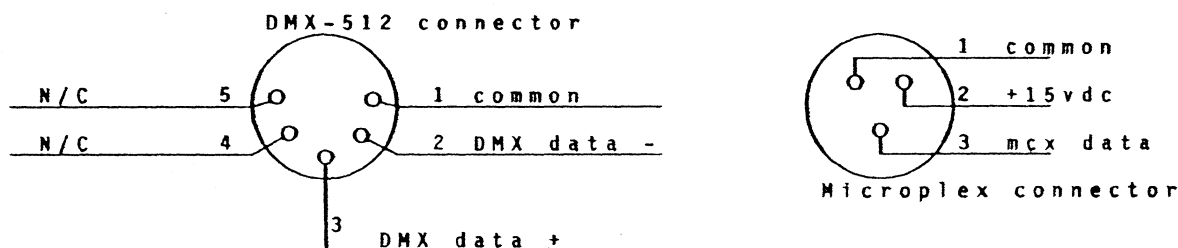


Fig. 1 Dimmer Output Connectors

If the console is equipped with the DMX-512 option, connection to the dimming equipment is provided through the 5 pin XLR type connector located on the rear apron of the console. This connector adheres to the USITT standard on DMX-512 and will support up to 32 (16) dimmer channels with one 3 wire cable. Since remote power is not provided on this connector, the power supply included with the DMX-512 option must be used.

### 3

## Overview

### Front Panel

1. *Channel Levels* These 16 (8) LED's show the current intensity of each of the console control channels. The LED's are inactive whenever the console is in the single scene mode.
2. *Scene X* These 16 (8) slide controls are used to control the intensities of channels 1 - 16 (channels 1 - 8). The overall intensity of the scene created is controlled with the X Crossfader.
3. *Scene Y* These 16 (8) slide controls are used to control the intensities of channels 1 - 16 (channels 1 - 8), channels 17 - 32 (channels 9 - 16), or scenes 1 - 16 (scenes 1 - 8) depending upon the console's current operating mode. The overall intensity of the scene created is controlled with the Y Crossfader.

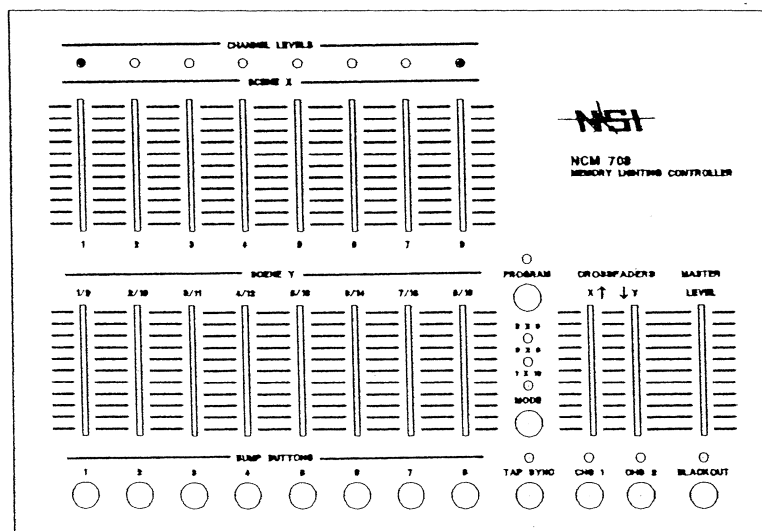


Fig. 2 Front Panel NCM 708

4. *Bump Buttons* These 16 (8) buttons are used to bring an individual or group of channels, depending upon console operating mode, to full intensity.
5. *Program Button* This button is used to program the Scene Masters, the 2 Chases, and the Flash Scenes. Programming is active when the Program LED is lit.
6. *Mode Button* This button sequences the console through the 3 operating modes. The current mode is indicated by the lit LED.
7. *Tap Sync* Repeatedly tapping this button establishes the chase rate.
8. *Chase 1* This button toggles Chase 1 on and off, indicated by the LED.
9. *Chase 2* This button toggles Chase 2 on and off, indicated by the LED.
10. *X Crossfader* This slide control is used to proportionally vary the intensity of Scene X.
11. *Y Crossfader* This slide control is used to proportionally vary the intensity of Scene Y.
12. *Master* This slide control is used to proportionally vary the overall console intensities to stage except those from the Bump buttons.
13. *Blackout* This button is used to kill all output to stage except from the Bump buttons. The console is in Blackout whenever the Blackout LED is lit.

## Rear Panel

1. **Micro-Plex Outputs** These 2 outputs provide NSI's microphone dimmer connection via a 3 pin XLR type connector.
2. **DMX-512** This optional output is used to provide dimmer control information to dimmers using this protocol. Its 5 pin XLR connector conforms to the USITT standard.
3. **AUX DC Power** This input jack allows a standard wall transformer rated at 15v DC (200 MA) to provide power to the NCM 700 Series console.

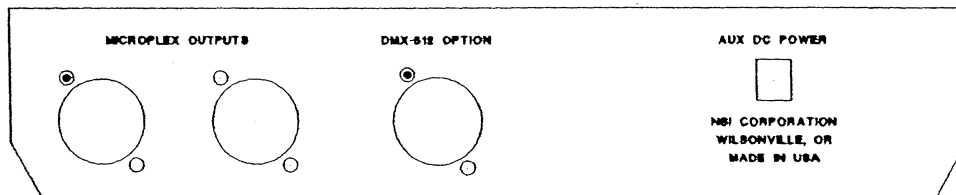


Fig. 3 Rear Panel NCM 708

## 4

## Operation Guide

### General

The NCM 700 Series Lighting Console consists of two manual scenes mastered by two split/dipless crossfaders, a set of bump buttons, two programmable chase effects, a master control and a blackout button. The console is designed to allow tailoring to your needs. Three modes of operation vary the function of the Bump buttons from individual Channel Bumps to Flash Scenes and Scene Y from channels 1 - 16 (1 - 8), to channels 17 - 32 (9 - 16), or to 16 (8) Scene Masters. In addition, two Chase Effects allow automated sequencing of lights at varying rates.

To give the user channel intensity feedback, 16 (8) channel intensity LED's are provided above the Scene X slide controls. These LED's show the relative intensities from all console functions and are not affected by the Master control or the Blackout button.

### Operation Modes

The NCM 700 Series Lighting Console has three operating modes; the 2 x 16 (2 x 8), 16 x 16 (8 x 8), and 1 x 32 (1 x 16). These modes are selected with the Mode button. The current mode is indicated by the lit LED. In standard 2 x 16 (2 x 8) mode, Scene Y controls the intensity of channels 1 - 16 (1 - 8) along with Scene X giving the console two scene capability between the scenes. In 16 x 16 (8 x 8), Scene Y becomes a bank of Scene Masters which can be programmed by the user. Each Scene Master has level control of all 16 (8) channels and operate in a pile on fashion giving greatest level precedence. In the 1 x 32 (1 x 16) mode, Scene Y becomes channels 17 - 32 (9 - 16) joining with Scene X to give the console twice the control channels on one scene. Also in this mode, the bump buttons no longer control individual channels, but control Flash Scenes which can be programmed by the user. Each scene can have any combination of channels so that they can be flashed to maximum intensity at any time. Programming either of the Chases while in this mode extends each step to 32 (16) channels.

	2 x 8	8 x 8	1 x 16
SCENE X	CHANNELS 1-8	CHANNELS 1-8	CHANNELS 1-8
SCENE Y	CHANNELS 1-8	8 SCENES X 8 CHAN	CHANNELS 9-16
BUMPS	CHANNELS 1-8	CHANNELS 1-8	8 FLASHS X 16 CHAN
CHASES	23 STEPS X 8 CHAN	23 STEPS X 8 CHAN	23 STEPS X 16 CHAN

Fig. 4 NCM 708 Mode Chart

	2 x 16	16 x 16	1 x 32
SCENE X	CHANNELS 1-16	CHANNELS 1-16	CHANNELS 1-16
SCENE Y	CHANNELS 1-16	16 SCENES X 16 CHAN	CHANNELS 17-32
BUMPS	CHANNELS 1-16	CHANNELS 1-16	16 FLASHS X 32 CHAN
CHASES	23 STEPS X 16 CHAN	23 STEPS X 16 CHAN	23 STEPS X 32 CHAN

Fig. 5 NCM 716 Mode Chart

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## *Bump Buttons*

Along the bottom edge of the console are 16 (8) momentary push buttons. These buttons are used to bump each individual channel to full intensity regardless of the Blackout button or the setting of the Master control. When in the 1 x 32 (1 x 16) mode, each button no longer controls only one channel, but can be programmed to control any combination of channels. This makes each button a Flash Scene. The console is shipped from the factory so that Bump button 1 is programmed for only channel 1, Bump button 2 for channel 2 and so on. This gives the impression that there is no functionality change from mode to mode on the bump buttons.

The Bump buttons are also used in programming Flash Scenes and Scene Masters.

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## *Crossfaders*

The two Manual Crossfaders are always tied to Scene X and Scene Y. These fade controls allow crossfading between Scene X and Scene Y with the X Crossfader controlling Scene X and the Y Crossfader controlling Scene Y. The X Crossfader is at its maximum in the fully up position, while the Y Crossfader is at its maximum in the fully down position. This configuration allows easy dipless crossfading providing both crossfaders are moved together. If the crossfaders are not kept in the same position, split crossfading effects can be accomplished.

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## *Chases*

Two Chase effects are provided on the NCM 700 Series Lighting Console. Each can be activated at any time by simply pressing its associated button. A Chase is active whenever the LED above its Chase button is lit. Each Chase has a maximum of 23 steps and each step can have any combination of channels. When programming in the 2 x 16 (2 x 8) and 16 x 16 (8 x 8) modes each step has 16 (8) channels of control, when in the 1 x 32 (1 x 16) mode each step has 32 (16) channels of control. Once a Chase is programmed, it will remain a 16 (8) or 32 (16) channel Chase regardless of mode. This can add expanded channel capabilities to the other two modes. For example, a chase could be programmed in the 1 x 32 (1 x 16) mode to control only channels 17 - 32 (9 - 16) for special effects and run in the 2 x 16 (2 x 8) or 16 x 16 (8 x 8) modes using Scenes X and Y and the Bump buttons to create area and special lighting on channels 1 - 16 (1 - 8).

The Chase Rate is set by repeatedly tapping the Tap Sync button at the rate desired. The Chases will continue to run at the rate of the last two taps until another set of taps is seen. This allows easy synchronization with music or other timed events.

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## *Master*

The Master slide control provides proportional level control over all console functions to stage with the exception of the Bump buttons. For example, whenever the Master slide control is at minimum all stage outputs will be at zero except for any resulting from a Bump button, if the Master is at 50% all stage outputs will be at only 50% of their current console settings except for any resulting from a Bump button and if the Master is at full all stage outputs will follow the console settings.

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## *Blackout*

The Blackout button is used to disable all outputs to stage with the exception of those resulting from a Bump button. This provides for quick dousing of stage levels or for creating solo effects when used in conjunction with the Bump buttons. Blackout is active whenever the Blackout LED is lit.

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## Programming Control Functions

### *General*

The functions that can be programmed on the NCM 700 Series Lighting Console are the two Chases, the Scene Masters in the 16 x 16 (8 x 8) mode and the Flash Scenes in the 1 x 32 (1 x 16) mode. To initiate programming, first tap the Program button. This will light the Program LED indicating that the program mode is active. Then tap the function button to be programmed. All programming is stored in non-volatile memory which retains information for at least 10 years, even when power is removed.

### *Scene Masters*

When in the 16 x 16 (8 x 8) mode, the Scene Masters can be programmed for later recall. First create the desired scene on Scene X. Neither the level of the Master or the X Crossfader or the state of the Blackout function have any effect on the programmed levels from Scene X. Once the scene is satisfactory, enter the program mode by tapping the Program button. Then tap the Bump button under the Scene Y slide control that is to be used as the Scene Master. The Scene Master is now programmed and the Program mode is automatically released. Once programmed, the Scene Master is ready for immediate use.

**EXAMPLE:** Program the fifth Scene Master with channels 1 and 6 at full and 7 and 8 at 50%.

- Lower all Scene X slide controls to minimum.
- Raise Scene X slide controls 1 and 6 to maximum.
- Raise Scene X slide controls 7 and 8 to 50%.
- Tap the Program button. The Program LED should now be lit.
- Tap Bump button 5.

### *Flash Scenes*

Since there are only 16 (8) Bump buttons, channels 17 - 32 (9 - 16) can not be accessed for bumping in the 1 x 32 (1 x 16) mode. For this reason the Bump buttons can be programmed as Flash Scenes to access the upper channels whenever in this mode. Flash Scenes consist of any combination of fully on or fully off channels. Flash Scenes are programmed with both Scene X and Scene Y slide controls. Simply raise those sliders that are desired on to maximum and those desired off to minimum. Next, tap the program button to turn on the Program function. Finally, tap the Bump button to be programmed. Once programmed, the Flash Scene is ready for immediate use.

**EXAMPLE:** Program Bump button 8 to flash channels 3, 15, 23 and 24 on a NCM 716.

- Lower all Scene X and Scene Y slide controls to minimum.
- Raise Scene X slide controls 3 and 15 to maximum.
- Raise Scene Y slide controls 7/23 and 8/24 to maximum.
- Tap the Program button. The Program LED should now be lit.
- Tap Bump button 8.

**EXAMPLE:** Program Bump button 8 to flash channel 3 and 15 on a NCM 708.

- Lower all Scene X and Scene Y slide controls to minimum.
- Raise Scene X slide control 3 to maximum.
- Raise Scene Y slide control 7/15 to maximum.
- Tap the Program button. The Program LED should now be lit.
- Tap Bump button 8.

## Chases

Each of the two Chase functions can be programmed to include any channel in any step up to a maximum of 23 steps per Chase. To initiate Chase programming, first tap the Program button so that the Program LED is lit. Then tap the Chase button of the Chase to be programmed and the LED under the chase button should start flashing. The console is now ready to program the first step of the chase. Use the Scene X slide controls to indicate which channels should be on or off by either raising them to full or lowering them to minimum. Once set, tap the button of the Chase being programmed to store the step. The console is now ready to program the second step of the chase. Continue programming steps, up to 23, until the chase is complete. Tapping the Blackout button exits the chase programming. Programming will be automatically exited if more than 23 steps are attempted.

If the console is in the 1 x 32 (1 x 16) mode, Scene Y can be used to include the channels controlled by these sliders in the Chase program. Follow the same procedure explained above, but include the Scene Y channels into each step programmed.

**EXAMPLE:** Program a 4 step chase consisting of channels 1 - 4 into Chase 2.

- Tap the Program button. The Program LED should now be lit.
- Tap Chase button 2. Chase 2 LED should now be lit.
- Move all Scene X slide controls to minimum.
- Raise Scene X slider 1 to maximum.
- Tap Chase 2 button.
- Lower Scene X slider 1 to minimum and 2 to maximum.
- Tap Chase 2 button.
- Lower Scene X slider 2 to minimum and 3 to maximum.
- Tap Chase 2 button.
- Lower Scene X slider 3 to minimum and 4 to maximum.
- Tap Chase 2 button.
- Tap the Blackout button.

**EXAMPLE:** Program a 4 step chase consisting of channels 9 - 12 into Chase 2 on a NCM 708.

- Tap the Mode button until the LED next to 1 x 16 is lit.
- Tap the Program button. The Program LED should now be lit.
- Tap Chase button 2. Chase 2 LED should now be lit.
- Move all Scene X and Scene Y slide controls to minimum.
- Raise Scene Y slider 1/9 to maximum.
- Tap Chase 2 button.
- Lower Scene Y slider 1/9 to minimum and 2/10 to maximum.
- Tap Chase 2 button.
- Lower Scene Y slider 2/10 to minimum and 3/11 to maximum.
- Tap Chase 2 button.
- Lower Scene Y slider 3/11 to minimum and 4/12 to maximum.
- Tap Chase 2 button.
- Tap the Blackout button.

**EXAMPLE:** Program a 4 step chase consisting of channels 17 - 20 into Chase 1 of a NCM 716.

- Tap the Mode button until the LED next to 1 x 32 is lit.
- Tap the Program button. The Program LED should now be lit.
- Tap Chase button 1. Chase 1 LED should now be lit.
- Move all Scene X and Scene Y slide controls to minimum.
- Raise Scene Y slider 1/17 to maximum.
- Tap Chase 1 button.
- Lower Scene Y slider 1/17 to minimum and 2/18 to maximum.
- Tap Chase 1 button.
- Lower Scene Y slider 2/18 to minimum and 3/19 to maximum.
- Tap Chase 1 button.
- Lower Scene Y slider 3/19 to minimum and 4/20 to maximum.
- Tap Chase 1 button.
- Tap the Blackout button.

If the Chase is active when programming is initiated, the Chase will halt during programming and resume with the new programming when completed. If the Chase was not active, it will not be running when programming is complete.

## 6

## Specifications

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### *Console Specifications*

Control Channels	16/32 (8/16)
Dimmers	32 (16)
Scene Masters	16 (8)
Chases	2, each 23 steps maximum
Memory	Non-volatile EEPROM (10 year retention)
Dimmer Outputs	NSI Micro-plex DMX-512 (optional)
Input Power	15 volts DC, 200ma
Dimensions	2 3/8" x 16 5/8" x 7 1/2" (2 3/8" x 10 5/8" x 7 1/2")
Weight	4 lbs (2 3/4 lbs)

## 7

## Trouble Shooting

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### Checklist

*Channel Level LED's do not respond.*

- Check to see if the 1 x 32 (1 x 16) mode is selected. Since all channels cannot be viewed, the LED's are disabled in this mode.

*Chase functions do not work.*

- Make sure a rate has been established with the Tap Sync button. The rate is indicated by the flashing LED located directly above the Tap Sync button.

*Lights on stage do not operate even though Channel Level LED's do.*

- Check that the Master slide control is not set at minimum and that the Blackout LED is not on.

*Scene X or Scene Y slide controls have no effect on channel levels.*

- Make sure that the X or Y Crossfader is not in its minimum position.

*Stage lights are on, but will not respond or respond erratically.*

- Make sure the dimmer packs are programmed correctly. Dimmer packs programmed for channels higher than 32 (16) will not respond to the controller.
- Check for a bad control cable by replacing it.
- The dimmer pack may be defective.
- If the microphone cable is in excess of 100 feet, heavier gauge (18 ga.) cable or an additional power supply located at the console may be necessary because of power losses over the length of the cable.

## 8

## Warranty

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### *NSI Corporation Limited Warranty*

NSI Corporation warrants new electronics products to be free from defective materials and workmanship for a period of one (1) year from the date of purchase to the original owner when purchased from an authorized NSI dealer.

The purchaser is responsible for completing and mailing to NSI, within 15 days of purchase, the warranty registration card enclosed with each product. NSI products that have been subject to accident, alteration, abuse, or defacing of the serial number are not covered by this warranty. The normal wear and tear of items such as knobs, jacks, and switches are not covered under this warranty.

If your NSI product requires service during the warranty period, NSI will repair or replace, at its option, defective materials provided you have identified yourself as the original owner of the product to NSI or any authorized NSI dealer. Transportation charges to and from an authorized dealer or the NSI factory for repair shall be the responsibility of the owner. All products returned to NSI must have factory authorization for return prior to shipping.

NSI Corporation is not liable for any incidental or consequential damages resulting from defect or failure other than repairs of the NSI product subject to the terms of this warranty. This warranty gives you specific legal rights, and you may have other rights which vary from state to state. This warranty is expressly in lieu of all other agreements and warranties expressed or implied except as may be otherwise required by law.