StudioComm™

User Guide

Covering the Model 50 Central Controller,
Model 51 Control Console, and
Models 35 and 38 Talent Amplifiers

Issue 1, June 1993

5520 West Touhy Avenue
Skokie, Illinois 60077 U.S.A.
Telephone (708) 676-9177
Fax (708) 982-0747

Table of Contents

Foreword

Introduction 1
  What This User Guide Covers 1
  System Overview 1
  Model 50/Model 51 Features 2
  Model 35 and Model 38 Talent Amplifier Features 5
Installation 7
Advanced Installation Concepts 13
  Mic Module Input 13
  External Communications Switches 13
Configuration 15
Operation 19
  Model 50 Central Controller 19
  Model 51 Control Console 19
  Talent Amplifiers 22
Troubleshooting 23
Technical Notes 25
Specifications 27
  Model 50 Central Controller 27
  Model 51 Control Console 28
  Model 35 Talent Amplifier 28
  Model 38 Talent Amplifier 29
Appendix A 31

This page intentionally left blank.

Foreword

I am pleased to present the StudioComm series of products. As both president and owner of Studio Technologies, I take a very personal approach when designing products. Getting older (37 as of this writing) has increased my appreciation of the more subtle things in life—be they a part of nature or the nuances contained in a well-designed piece of electronic equipment. Do the technical and operational aspects of a product work together to "feel" right? A Studio Technologies' design is ready to go only when I am completely satisfied. My entire focus for the StudioComm series was to make a system that you'd really enjoy using, and one that would perform reliably for years. I hope you share my enthusiasm.

Many fine people worked toward making the StudioComm "happen." Mitch Budniak (ace consulting engineer) designed many of the circuits. Jim Cunningham contributed to the analog design. Carrie Gage provided engineering support. Barbara Govednik coordinated the marketing communications aspects. Ben Kamen designed the automatic testing routines. Larry Leviton wrote the excellent micro-controller software. Al Lux designed the printed circuit boards. Jim McGuire designed the graphics. Fred Roeck performed the mechanical design. Joe Urbanczyk coordinated the safety testing and agency approvals. J.C. Utter wrote and electronically illustrated the technical manual, with extensive input from me.

Many thanks to Bob Tjarks, professional audio sales manager at Gand Music & Sound, Northfield, Illinois. Bob brought to my attention the need for a product to serve digital audio workstations. His product idea evolved into the StudioComm series. Additional thanks to Timothy Powell of Metro Mobile Recording, Glenview, Illinois, who provided his excellent ears when issues of sonic quality arose. His extensive field and studio experience was extremely helpful in keeping me on the audio "straight and narrow."

Studio Technologies is receptive to your comments and questions. Please contact me via phone (708) 676-9177 or fax (708) 982-0747—I'd like to hear from you.

Sincerely,

Gordon K. Kapes
President

This page intentionally left blank.

StudioComm

Introduction

The StudioComm family of products are designed to work in conjunction with digital audio workstations to provide a full set of monitoring and communications functions. Features include control room and studio monitoring, an integrated headphone system, dubbing, and communications functions that include talk to studio, talk to phones, and slate. All StudioComm functions perform to a level that rivals even the largest recording consoles. Many of the features are user configurable, allowing unmatched flexibility.

What This User Guide Covers

This user guide is designed to assist you when installing, configuring, and using the Model 50 Central Controller, Model 51 Control Console, Model 35 Talent Amplifier, Model 38 Talent Amplifier, and related components. A limited amount of troubleshooting and background technical information is also provided. Should you require detailed technical information please refer to the StudioComm Service Guide covering the Models 50, 51, 35, and 38. The Service Guide contains detailed service information, including schematic diagrams. The Service Guide is not shipped with each StudioComm system, but is available from the factory upon request. It is free of charge to purchasers of StudioComm equipment.

Give us a call or send a fax if you need this highly exciting document!

System Overview

The StudioComm system is designed to provide control over monitor and dub sources, communication from the control room to the studio, and a headphone monitoring system. A complete StudioComm system consists of a rack-mounted central controller, a desktop control console, and one or more portable talent amplifier units.

The Model 50 Central Controller and the Model 51 Control Console work together to provide performance and features for use in advanced applications. The units interconnect using a standard 5-pin MIDI-style cable. Circuitry in the Model 50 separately routes any of seven stereo inputs to the control room, studio, headphone, and dub outputs, with commands provided by the Model 51 Control Console. If you have MIDI software that supports the StudioComm system, you can even control Model 50 with your computer.

The Model 51 Control Console's built-in microphone lets you talk to the studio or headphones, or talk to the dub output using the slate function.

Model 35

The Model 35 Talent Amplifier is a portable amplifier unit capable of driving one or two pairs of stereo headphones. A single microphone-type cable links the Model 35 with the Model 50 Central Controller. The Central Controller provides power and left and right audio over just three wires!

Model 38

The Model 38 Talent Amplifier takes the basics from the Model 35 and adds a unique stereo preamplifier section. This allows each Model 38 user to create an individual headphone mix, solving the classic problem of wanting "more me" in the phones! Like the Model 35, the Model 38 is linked to the Model 50 Central Controller by a single microphone-type cable.

Model 50/Model 51 Features

Stereo Line Inputs

The Model 50 contains seven stereo line-level inputs which are compatible with both balanced and unbalanced signals. Each input is independently software configurable for a nominal input level of –10dBV or +4dBu. This allows direct connection with virtually all audio sources. Each input can also be configured to operate as a mono input. In this manner, a signal connected to the left input is routed to both the left and right outputs. For convenience, input 7 is located on the front panel of the Model 50; inputs 1 through 6 are located on the back panel.

Control Room Monitoring

The control room section provides two stereo line-level outputs for driving two power amplifiers associated with monitor loudspeakers. Seven buttons are used to select the input source to be monitored. The control room level is adjusted using a smooth-feeling rotary potentiometer. The Dim button allows the control room level to be temporarily reduced. The Control Room A/B button allows the control room A or B outputs to be activated. The Mono button allows the sum (L+R) of the selected source to be sent as the control room output.

Studio Monitoring

The studio monitoring source is configured to follow control room source or headphone source. A push button, along with an associated LED, provides the studio on/off function. A rotary potentiometer is used to set the level.

Dub Output

A stereo line-level output is provided as a dub (copy) output. Using the Model 51 Control Console, any of the seven inputs can be assigned to the dub output. The slate function allows voice audio to be sent out the dub output. For convenience, the dub output is available from both the front and back panels of the Model 50.

Communications Functions

The Model 51 Control Console contains an internal microphone that is used in the three communications functions. The talk to studio function interrupts the studio source and sends voice audio. The talk to phones function sends voice audio to the Model 35 or Model 38 Talent Amplifiers. The slate function interrupts the dub source and connects voice audio. If configured, the slate function can also send a 50Hz sine wave along with voice audio. The audio level of each communications function is individually adjustable.

MIDI Control

All Model 50 Central Controller functions are controlled using system-exclusive MIDI commands. The Model 51 Control Console "speaks" this language, and in most applications a Model 51 will be utilized. In special applications the Model 50 Central Controller can be connected directly to a MIDI bus, allowing the creation of a fully automated recording or audio routing system. (For more information on MIDI support, refer to Appendix A.)

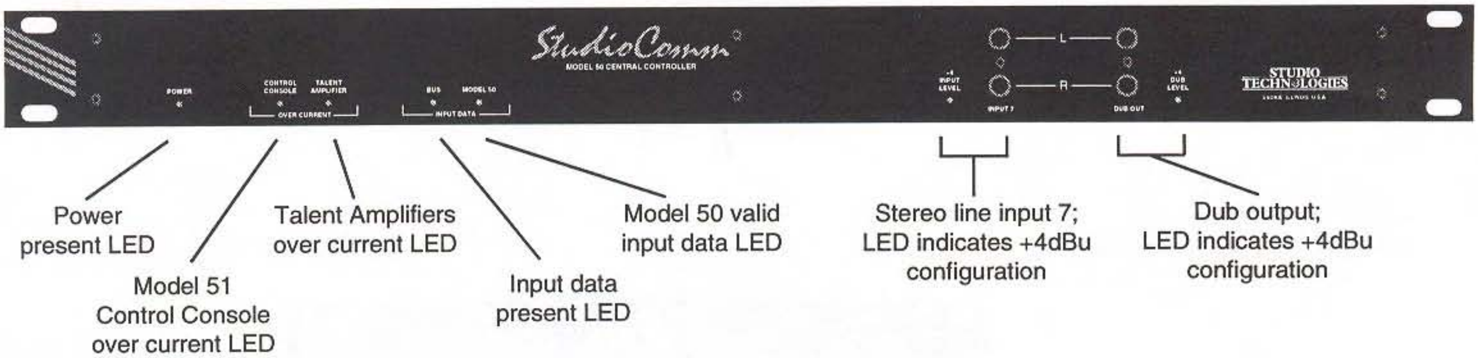
Configuration

The Model 51 Control Console can be configured to make the system meet a user's exact operating environment. As previously discussed, each of the seven stereo line inputs can be independently set for –10dBV or +4dBu operating levels. They also can be set for either mono or stereo operation. In the mono mode a signal connected to the left input is sent to the left and right outputs. The dub output level can be set for –10 or +4 nominal output level.

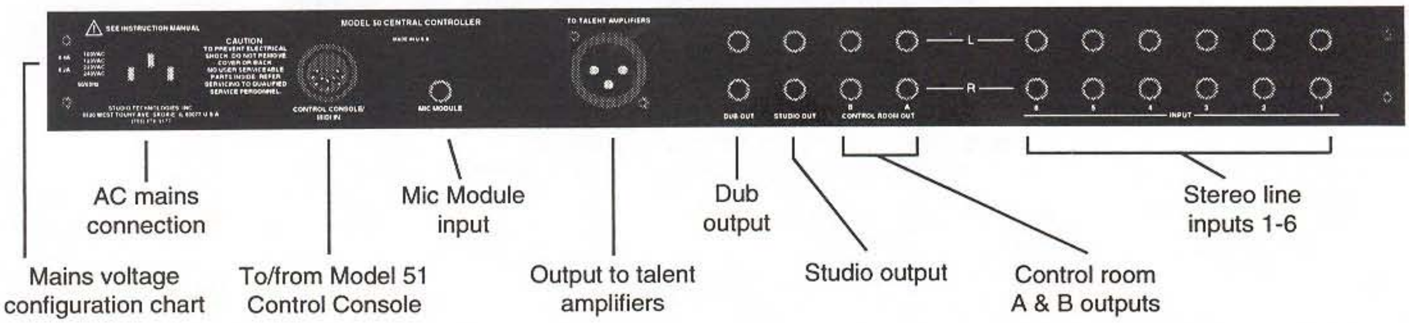
Unique to the system is the ability to configure the dim level to one of six values, ranging from full mute to a modest 10dB reduction. The slate function can be set to generate a 50Hz sine wave when activated. This provides an audible "marker" for analog tapes, and a visual indication on a wave form display screen.

Four functions can be set for push-to-latch operation if desired: talk to studio, talk to phones, slate, and control room mono. All configuration parameters, along with "power down" operation conditions, are stored in nonvolatile memory.

Model 50 Front Panel


StudioComm
MODEL 50 CENTRAL CONTROLLER
STUDIO TECHNOLOGIES
Power present LED
Model 51 Control Console over current LED
Talent Amplifiers over current LED
Input data present LED
Model 50 valid input data LED
Stereo line input 7; LED indicates +4dBu configuration
Dub output; LED indicates +4dBu configuration

Model 50 Back Panel

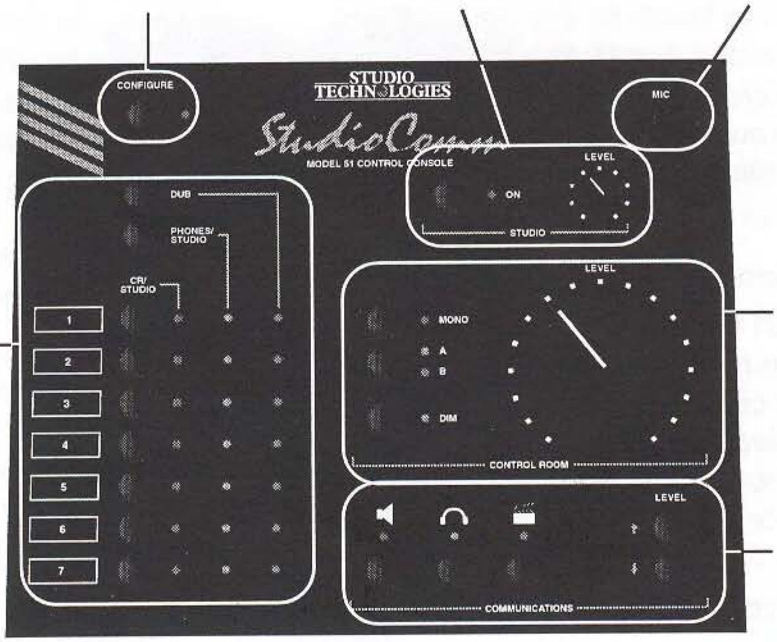

MODEL 50 CENTRAL CONTROLLER
TO TALENT AMPLIFIERS
AC mains connection
Mains voltage configuration chart
To/from Model 51 Control Console
Mic Module input
Output to talent amplifiers
Dub output
Studio output
Control room A & B outputs
Stereo line inputs 1-6

Model 51 Front Panel

Configure button switches between normal operation and configure mode

Studio area on/off button and level control knob for feed to studio

Built-in microphone for talking to studio or headphones and slating

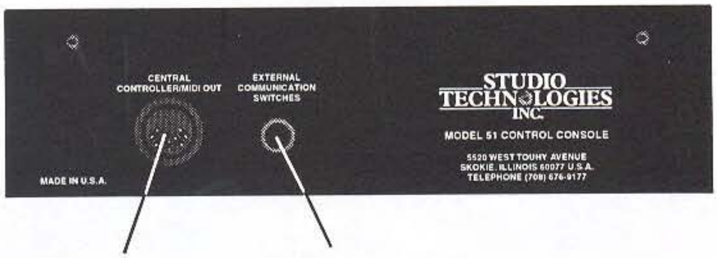

CONFIGURE
STUDIO TECHNOLOGIES
StudioComm
MODEL 51 CONTROL CONSOLE
MIC
LEVEL
ON
STUDIO
DUB
PHONES/ STUDIO
CR/ STUDIO
1
2
3
4
5
6
7
LEVEL
MONO
A
B
DIM
CONTROL ROOM
LEVEL
COMMUNICATIONS

Source selection for control room, studio, headphones and dub; three columns of LEDs show the currently selected sources

Change the control room monitor levels; listen in mono (L+R); select monitors A or B; or dim the monitors by a preset amount

Talk to the studio or headphones; slate; set communications levels

Model 51 Back Panel


CENTRAL CONTROLLER/MIDI OUT
EXTERNAL COMMUNICATION SWITCHES
STUDIO TECHNOLOGIES INC.
MODEL 51 CONTROL CONSOLE
5520 WEST TOUHY AVENUE
SKOKIE, ILLINOIS 60077 U.S.A.
TELEPHONE (708) 674-9177
MADE IN U.S.A.

Connection to the Model 50 Central Controller

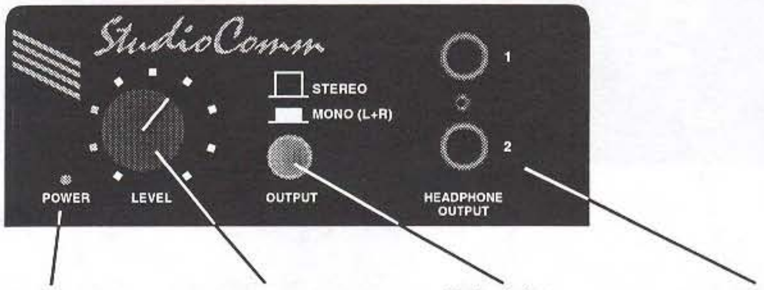
Remote control phone jack for external talk to switches

Model 35 and Model 38 Talent Amplifier Features

The StudioComm system contains an integrated, full-featured headphone system. Up to four Model 35 or Model 38 Talent Amplifiers can be connected to the Model 50's talent amplifier output. A single 3-conductor microphone cable carries power and stereo audio. The audio output is very loud, and very "clean."

Using the Model 51 Control Console, any of the seven stereo inputs can be assigned to the talent amplifier output. The talk to phones function allows voice audio to be sent to the talent amps. The talent amplifier output is short circuit protected. Error conditions are displayed via an indicator LED on the Model 50's front panel. Each Model 35 and Model 38 Talent Amplifier can drive two sets of headphones. The units feature built-in volume control and a stereo/mono switch.

Model 35 Front Panel


StudioComm
STEREO
MONO (L+R)
1
2
POWER
LEVEL
OUTPUT
HEADPHONE OUTPUT

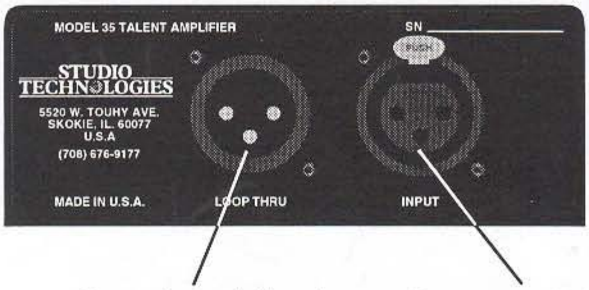
Power present LED

Headphone output level control

Switch between stereo and mono (L+R) output

Two headphone outputs

Model 35 Back Panel

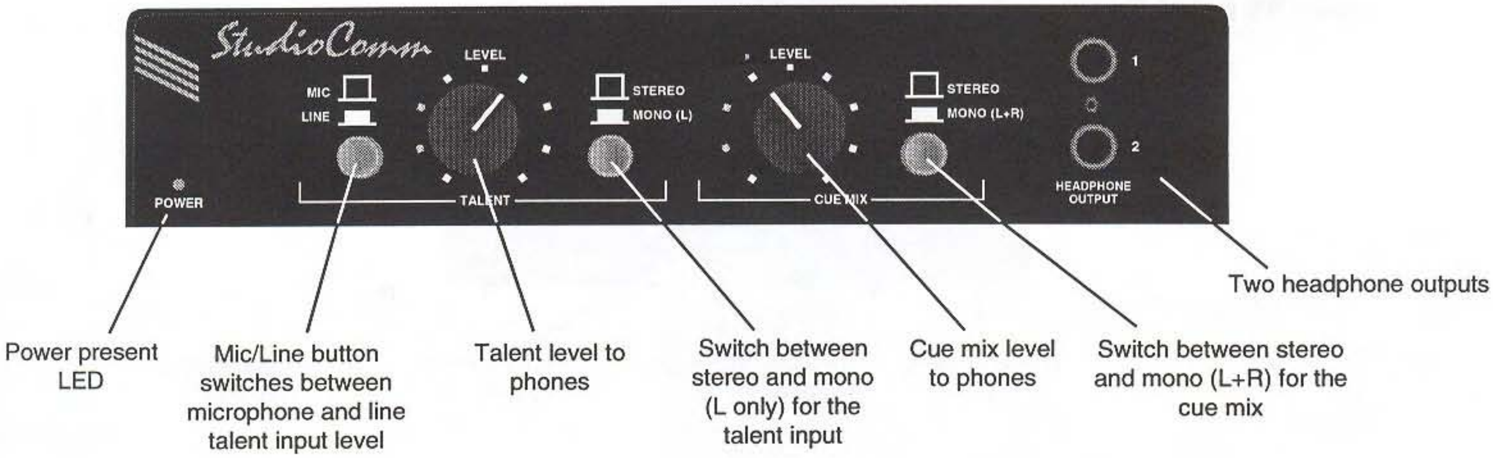

MODEL 35 TALENT AMPLIFIER
SN
PUSH
STUDIO TECHNOLOGIES
5520 W. TOUHY AVE.
SKOKIE, IL. 60077
U.S.A
(708) 676-9177
MADE IN U.S.A.
LOOP THRU
INPUT

Connects to additional talent amplifiers

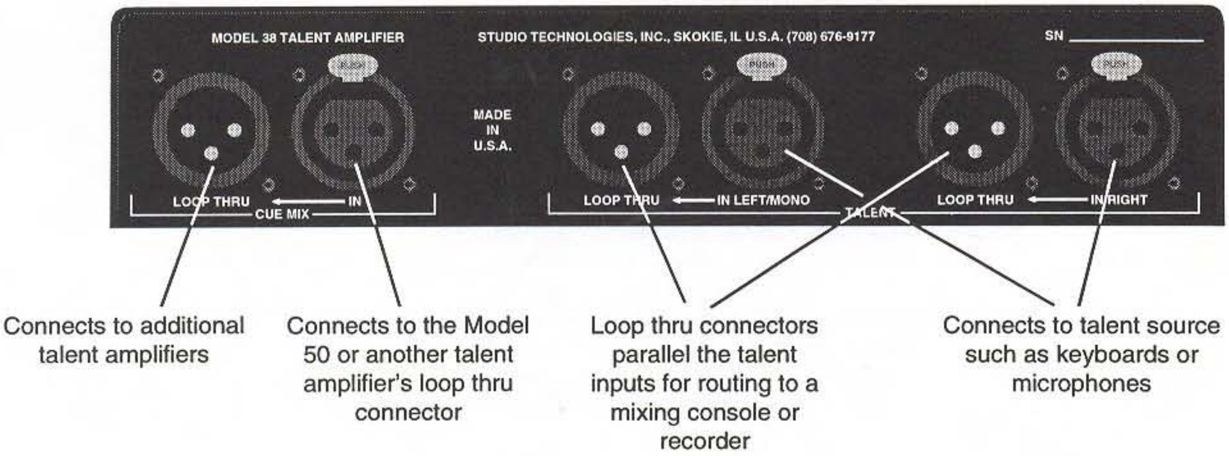
Connects to the Model 50 or another talent amplifier's loop thru connector

The Model 38 Talent Amplifier takes the basics from the Model 35 and adds a unique stereo preamplifier section. This allows a musician's microphone or line-level signal to be "looped" through the Model 38, boosted by its preamp, and then combined with the main headphone left and right signal. This provides each Model 38 with an individual headphone mix, solving the classic problem of wanting "more me" in the phones! Like the Model 35, the Model 38 is linked with a Model 50 Central Controller by a single cable.

Model 38 Front Panel


StudioComm
MIC
LINE
LEVEL
STEREO
MONO (L)
TALENT
LEVEL
STEREO
MONO (L+R)
CUE MIX
1
2
HEADPHONE OUTPUT
POWER
Two headphone outputs
Power present LED
Mic/Line button switches between microphone and line talent input level
Talent level to phones
Switch between stereo and mono (L only) for the talent input
Cue mix level to phones
Switch between stereo and mono (L+R) for the cue mix

Model 38 Back Panel


MODEL 38 TALENT AMPLIFIER
STUDIO TECHNOLOGIES, INC., SKOKIE, IL U.S.A. (708) 676-9177
SN
PUSH
MADE IN U.S.A.
LOOP THRU
IN
CUE MIX
LOOP THRU
IN LEFT/MONO
TALENT
LOOP THRU
IN RIGHT
Connects to additional talent amplifiers
Connects to the Model 50 or another talent amplifier's loop thru connector
Loop thru connectors parallel the talent inputs for routing to a mixing console or recorder
Connects to talent source such as keyboards or microphones

Installation

In this section you will be installing the Model 50 Central Controller in an equipment rack. Audio input and output connections will be made using the Model 50's multitude of jacks. A location will be selected for the Model 51 Control Console, and it will be connected to the Model 50. AC mains power will be connected to the Model 50. One or more Model 35 or Model 38 Talent Amplifiers will be connected.

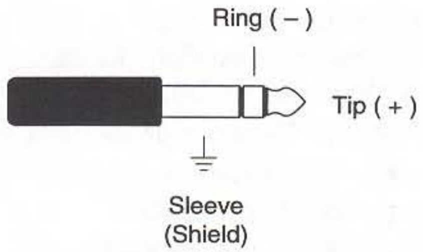
System Components

The main StudioComm shipping carton contains a Model 50 Central Controller; Model 51 Control Console; AC mains cord; 10-foot, 5-conductor MIDI-style cable; User Guide; and warranty card. Model 35 and Model 38 Talent Amplifiers, along with accessories, will be contained in separate cartons. Please check to ensure you have everything you need.

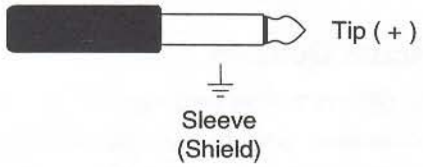
Mounting the Model 50

The Model 50 requires one space in a standard 19-inch (48.3cm) equipment rack. Select a location near the space the Model 51 Control Console will be located. A 10-foot cable is provided to connect the Model 50 to the Model 51. You can supply a longer cable, however 50 feet is the maximum length. It is also desirable to locate the Model 50 to allow easy access to both the front and the back panels. The back panel contains most of the input and output connectors, while the front panel is used to access line input 7 and a multiple (mult) of the dub output. The front panel also contains several LED indicators which can prove useful. The Model 50 is secured to the equipment rack using two mounting screws per side.

Balanced Wiring
(Input & Output)



Unbalanced Wiring
(Input & Output)



Audio Inputs and Outputs

The Model 50's line-level audio input and output connections are made using ¼-inch tip-ring-sleeve phone jacks. The choice of phone connectors was simply a matter of real estate—21 XLR connectors don't quite fit on the back of a one rack-space unit. Don't be concerned about your audio quality, the jacks we use are manufactured by Neutrik of Switzerland and feature gold-plated contacts. For all input and output phone plugs, tip is positive (+), ring is negative (–), and sleeve is shield. The Model 50 will also accept unbalanced ¼-inch tip-sleeve phone plugs for inputs and outputs. With unbalanced phone plugs, tip is positive (+) and sleeve is shield. If tip-ring-sleeve plugs are used to connect unbalanced input or output signals, connect positive (+) to tip and shield to ring and sleeve.

Stereo Line Inputs

The Model 50 provides seven stereo line-level inputs. Inputs 1 through 6 are located on the back panel; input 7 is on the front. Each input is electronically balanced, and can be configured for –10dBV or +4dBu line-level operation. You don't have to dive into your rack to set the input level. The Model 51 Control Console gives you push-button control of all settings, so you can easily change input sensitivities at any time (refer to the Configuration section under Input Sensitivity). Monaural sources should be connected to the left (L) input and configured for mono operation (refer to the Configuration section under Stereo/Mono Input).

Control Room Outputs

The Model 50 contains two stereo line-level outputs for connection to two audio power amplifiers. These audio amps serve two pairs of loudspeakers that are located in the control room. The outputs, labeled A and B, are electronically balanced and capable of driving loads of 600 ohms or greater. In most situations best performance will be obtained if the audio amplifier's input sensitivity is set to near maximum.

Warning: Applying or removing AC mains power to or from the Model 50 results in audio transients coming out of all outputs, including the control room A and B outputs. With the high input sensitivity of the connected power amplifiers, these transients can cause large excursions in the loudspeakers. Do not apply or remove Model 50 AC mains power with the power amplifiers in the powered state.

Studio Output

The Model 50 contains a stereo line-level output for connection to an audio power amplifier. This audio amplifier serves a pair of loudspeakers that are located in the studio area. The output is electronically balanced and capable of driving loads of 600 ohms or greater. In most situations best performance will be obtained if the audio amplifier's input sensitivity is set to near maximum.

Warning: Applying or removing AC mains power to or from the Model 50 results in audio transients coming out of all outputs, including the studio output. With the high input sensitivity of the connected power amplifiers, these transients can cause large excursions in the loudspeakers. Do not apply or remove Model 50 AC mains power with the power amplifier in the powered state.

Dub Output

The Model 50 contains a stereo line-level output which is intended for connection to a variety of analog audio devices. The dub output is electronically balanced and capable of driving 600 ohm loads or greater. With the input impedance of most audio devices at 10k ohms or greater, the dub output can easily drive 10 or more devices simultaneously. The dub output can be configured for nominal level of –10dBV or +4dBu, so you can connect to all line-level inputs with no hassle (refer to the Configuration section under Dub Output Level).

The dub output is available on jacks located on both the front and back panels of the Model 50. They are connected in parallel, being a multiple or mult of each other; one set of dub output circuits drive both outputs.

The design intention was that permanent connections would be made to the back panel dub output, while the front panel dub output would remain available for "on the spot" use.

Mic Module Input

A ¼-inch jack, labeled Mic Module, is located on the back panel. In most cases the Mic Module input will not be used, and no plug should be inserted. For details on using the Mic Module input, refer to the Advanced Installation Concepts section later in this guide.

Talent Amplifier Output

Up to four Model 35 or Model 38 Talent Amplifiers can be connected in any combination to the Model 50's talent amplifier output. The output connector is a 3-pin male XLR-type. For best performance, use low-capacitance shielded microphone-type cable to distribute the talent amplifier signal. If you have a choice, select cables with the heaviest gauge commonly available. This will reduce voltage drop when using long cable runs. Refer to the Technical Notes section for additional information.

The simplest installation would use a microphone cable to connect the Model 50 to the first talent amplifier; the loop through connector on that talent amp sending the signal on to the next talent amp.

For convenience, you may want to wire your facility to allow easy access to the talent amplifier signal at all locations where talent amplifiers might be used. The talent amplifiers connect to the Model 50 in parallel, so the connectors on the distribution panels or mult boxes must be wired in parallel.

Caution: Do not connect the Model 50's talent amplifier output to anything but the talent amplifiers. Some audio equipment may be damaged by the +24Vdc contained on pin 2 of the talent amplifier output connector.

Locating the Model 51 Control Console

The Model 51 was designed for desktop use, however provision has also been made for microphone-stand mounting. For details refer to the Model 38 and Model 51 Mounting Options section of this chapter.

Connecting the Model 50 to the Model 51

A standard 5-conductor MIDI-style cable is used to connect the Model 50 to the Model 51. A 10-foot cable is included. Just connect the cable between the female 5-pin DIN-type connectors on the back of the Model 50 and 51, and you're done.

Note: If you require more than a 10-foot cable, be certain to buy a MIDI cable that has all 5 pins wired. If they aren't all connected, the Model 51 will not operate. This is because the Model 50 powers the Model 51 with the pins that aren't used for MIDI data.

For best performance, the cable that connects the Model 50 with the Model 51 should be limited to 50 feet. Should you need to exceed this length, refer to the Technical Notes section of this guide for details on the cable requirements.

For more information on MIDI, and using controllers other than the Model 51, please refer to Appendix A.

Connecting External Communications Switches

The Model 51 allows the connection of external talk to studio and slate push buttons. Refer to the Advanced Installation Concepts section of this guide for details.

AC Mains Power

Warning: Applying or removing AC mains power to or from the Model 50 results in audio transients coming out of all outputs, including the control room A and B outputs and the studio output. With the high input sensitivity of the connected power amplifiers, these transients can cause large excursions in the loudspeakers. Do not apply or remove Model 50 AC mains power with the power amplifiers in the powered state.

The Model 50 is internally configured to operate from either 100, 120, or 220/240V, 50/60Hz. In most cases, units shipped to North America are factory selected for 120V operation. Units bound for Japan are selected for 100V, while our friends "down under" and in Europe receive units set for 220/240V. Before connecting the Model 50 to mains power, check that it is configured to match the local mains voltage. Look on the back panel, adjacent to the power entry connector, for the configured voltage(s). Note than an incorrect configuration could seriously damage the unit. Should it be necessary to change the unit's operating voltage it must be performed only at the factory or by a qualified service technician.

The Model 50 uses an IEC standard connector to mate with the mains cord. Normally the mains cord supplied has a North American standard plug at one end and an IEC connector at the other. In non-North American applications the appropriate plug must be attached. The wire colors in the mains cord will conform to the internationally recognized CEE color code and should be wired accordingly:

Connection	Wire Color
Neutral (N)	Light Blue
Line (L)	Brown
Protective Earth (E)	Green/Yellow

Safety Warning: The Model 50 does not contain an AC mains disconnect switch. As such the mains cord plug serves as the disconnection device. Safety consideration requires that the plug and associated outlet be easily accessible to allow rapid disconnection of mains power should it prove necessary.

As soon as mains power is applied, the Model 50's power present LED will light. The Model 51 will go through its power-up sequence lighting each LED in a rapid sequence. The power present LEDs on the talent amplifiers will also light.

The two Over Current LEDs located on the front panel of the Model 50 should not be lit. If either or both are flashing, immediately refer to the Troubleshooting section of this guide. If everything appears to be functioning properly you are now ready to configure the system.

Model 38 and Model 51 Mounting Options

Later revisions of the Model 38 Talent Amplifier and the Model 51 Control Console include provisions for mounting to microphone stands, equipment consoles, etc. To avoid "reinventing the wheel," our products are compatible with the 25 Series components from OmniMount Systems, Tempe, Arizona (602) 829-8000, a supplier of finely engineered mounting systems. This firm makes many versions of the 25 Series; one of which should fit your needs. If you desire microphone stand mounting the following components would be appropriate: 25RST-25H Straight Tube Reverse Mount with Quick Release, along with a 25MA Microphone Stand Adapter. (If quick adjustment is not required the 25RST Straight Tube Reverse Mount can be used in place of the first item.)

The bottom surface of the Model 38 Talent Amplifier contains two threaded inserts that will accept ¼-20 screw threads. Using two, ⁵⁄₈-inch long, round-head machine screws, the 25 Series clamp assembly can be directly attached. The cover of the Model 38 does not have to be removed.

The design of the Model 51 did not allow the inclusion of threaded inserts, so holes of adequate size to allow ¼-20 round head machine screws are provided. It is intended that screws of ⁵⁄₈-inch length, along with lock washers and machine nuts, will securely attach a 25 Series mounting clamp assembly. The cover of the Model 51 will have to be removed to gain access to mounting holes. Be careful when selecting the mounting screws—exceeding the recommended ⁵⁄₈-inch length will cause the mounting screws to damage the Model 51's internal components.

Model 35 Stand Mounting

A mounting bracket is available to allow the Model 35 Talent Amplifier to be attached to a standard microphone stand. The two screws located in the Model 35's cover are used with the mounting bracket. Complete instructions are provided with the bracket kit, which can be purchased from your dealer or distibutor. Contact Studio Technologies for details.

This page intentionally left blank.

Advanced Installation Concepts

Mic Module Input

The Model 51 Control Console contains a microphone which provides the audio source for the Model 50's communications functions. In special applications the Model 51 may not be used, and a separate source of communications audio will be necessary. The Mic Module input on the back panel of the Model 50 allows the Model 37 Mic Module to be directly connected. The Model 37 consists of a small enclosure, about the size of a personal-computer mouse, containing a microphone and preamplifier. Contact Studio Technologies for further details about the Model 37.

If you want to use your own microphone and preamp, you can directly connect it to the Mic Module input jack. The Mic Module input is a tip-ring-sleeve phone jack with +12Vdc on tip, audio input on ring, and ground on sleeve. The audio input requires a nominal –10dBu signal. The +12Vdc on the tip is the same source that powers the Model 51. It's normally used to power the Model 37 Mic Module. If you feel the urge to use this power source, be aware that it only provides 110 milliamps of current—and that's without a Model 51 connected! **Do not use this power source with a Model 51 connected.**

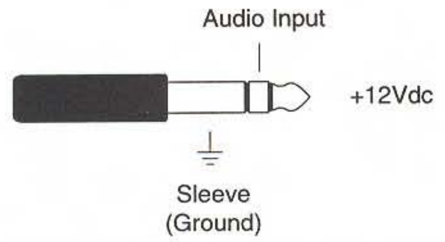
Note: The Model 51's microphone connection is broken when a phone plug is inserted in the Mic Module input. This means you can't use the Model 51's microphone and the Mic Module input at the same time.

External Communications Switches

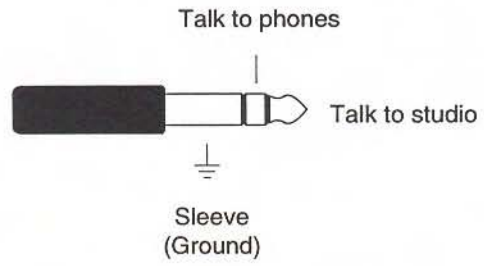
The Model 51 allows you to connect external talk to studio and talk to phones communications switches. It may be useful to install these switches at a producer/director location. The Model 51 continues to provide local control even with the external switches connected.

The required connector is a ¼-inch tip-ring-sleeve phone plug. Tip is talk to studio, ring is talk to phones, and sleeve is ground. Use a momentary, single-pole, single-throw switch for each remote function. The respective function is activated when the tip or ring get shorted to the sleeve.

Mic Module Input



Communications Switches



While the talk to studio and talk to phones buttons can be configured to latch, the external switches are always push to activate. This is provided as a safety function preventing an external user from "latching" one of the functions to the on state.

Configuration

Many StudioComm functions can be configured to meet the exact needs of your installation. Here's an overview of what you can configure:

- –10dBV or +4dBu level for each input
- Stereo or mono for each input
- –10dBV or +4dBu level for the dub output
- Dim level
- Studio source follows control room or headphone source
- Latching or momentary button operation for mono, talk to studio, talk to phones, and slate
- Slate feed to phones
- 50Hz slate tone on or off

The Configure button allows the Model 51 to go into the configure mode. While in the configure mode, all the Model 51's buttons and LEDs are associated with configure functions. Refer to the Model 51 Configuration Guide later in this section.

To enter the configure mode, press and hold the Configure button for two seconds. While in the configure mode, all audio outputs switch off and the orange LED beside the Configure button will flash. As you make changes, the Model 51 keeps track of the new settings and updates the system when you exit the configure mode.

Input Sensitivity

The CR/Studio column of seven red LEDs shows you whether an input is set to be compatible with –10dBV or +4dBu signal levels. When a red LED in the CR/Studio column is off, it means the input is set to –10dBV. When lit, the corresponding input is set to +4dBu. Just press the CR/Studio buttons to toggle inputs 1 through 7 between –10dBV and +4dBu. Factory default has all inputs set to +4dBu.

For convenience, the channel 7 input on the front panel of the Model 50 has a green LED beside it labeled +4 Input Level. When lit, it tells you that the channel 7 input is set for +4dBu. This means each time you connect a new input to channel 7, you don't have to go into the configure mode to determine the input sensitivity. You should note, however, that configure settings aren't updated until you leave the configure mode, so the +4 Input Level LED won't reflect a change until you exit.

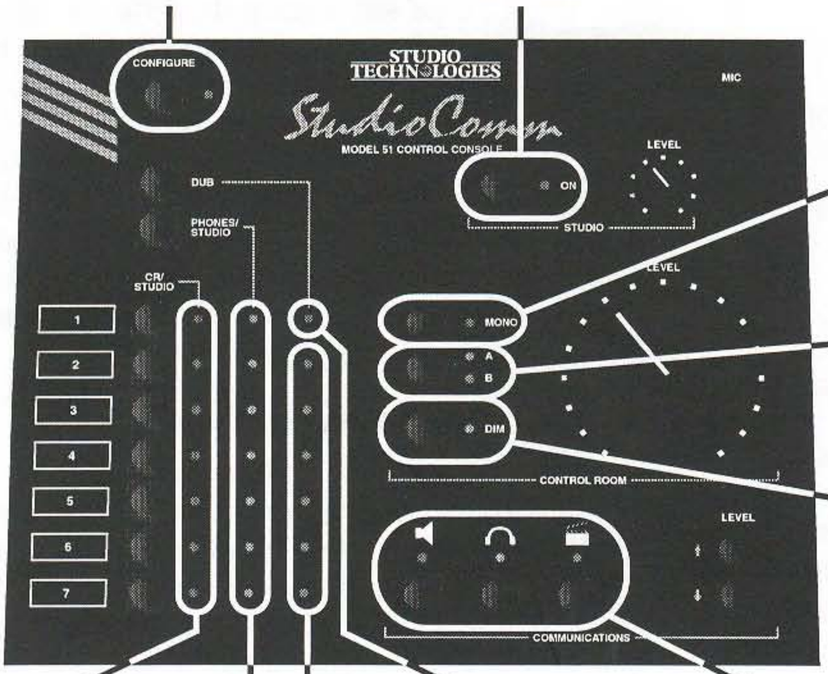
Stereo/Mono Input

The Phones/Studio column of green LEDs indicates whether an input is configured for mono or stereo operation. When a green LED in this column is off, the input is set for stereo; the LED on means the corresponding input is set for mono. In mono mode, the left input channel is sent out both the left and right outputs. To toggle a channel between stereo and mono, press and hold the Phones/Studio button and press the CR/Studio buttons that correspond to inputs 1 through 7. After you leave the configure mode, inputs configured for a mono source will flash during normal operation. Factory default has all input channels set to stereo.

Dub Output Level

The Dub column of orange LEDs will help you configure two options: dub output level and dim level. The orange LED in the first row (number 1 at the top) tells you whether

Model 51 Configuration Guide


CONFIGURE
STUDIO TECHNOLOGIES
StudioComm
MODEL 51 CONTROL CONSOLE
MIC
LEVEL
ON
STUDIO
DUB
PHONES/ STUDIO
CR/ STUDIO
1
2
3
4
5
6
7
LEVEL
MONO
A
B
DIM
CONTROL ROOM
LEVEL
COMMUNICATIONS

Press and hold Configure for two seconds to enter or exit the configure mode; while in configure, LED will flash

Press On to toggle between studio follows control room source and studio follows headphone source; LED on means studio follows headphones

Press Mono to toggle between latching or momentary operation of the Mono button; LED on means the Mono button is set to latch

Press A/B to toggle the slate feed to phones; when A LED is on, slate to phones is off

Press Dim to toggle the 50Hz tone with slate; LED on means 50Hz tone is on

Press CR/Studio 1 through 7 to toggle each channel's input sensitivity between −10dBV and +4dBu; LED on means input is set to +4dBu

Press and hold Dub, then press input 1 to toggle the dub output between −10dBV and +4dBu; LED on means dub is set to +4dBu

Press a Communications button to toggle between latching or momentary operation; LED on means the button is set to latch

Press and hold Phones/Studio, then press input 1 through 7 to toggle the inputs between stereo and mono operation; LED on means input is set to mono

Press and hold Dub, then press input 2 through 7 to select a dim level:
LED 2 is mute
LED 3 is 30dB
LED 4 is 25dB
LED 5 is 20dB
LED 6 is 15dB
LED 7 is 10dB

the dub output is set to –10dBV or +4dBu. When the LED is off, the dub output is set to –10dBV; when it's on, the dub output is configured for +4dBu. The dub output on the front panel is in parallel with the dub output on the back panel, so one configure setting controls both. For convenience, a green LED on the front panel is provided that lights when the dub output level is set to +4dBu. This means you never have to use the configure mode to determine its level. And just like the +4 Input Level LED for channel 7, the +4 Dub Level LED does not reflect any changes until you exit the configure mode. Factory default has the dub output level set to +4dBu.

Dim Level

The dim function is used to reduce the control room output level a preset amount whenever you press the Dim button. You can take a quick phone call without using the level pot to change the control room monitor level. Also, any time you press the talk to studio, talk to phones, or slate buttons the dim function is also activated.

In the configure mode, LEDs 2 through 7 in the Dub column indicate the dim level. Dim can only have a single setting, so only one of the orange LEDs is on at a time.

Row Number	Dim Value (dB)
2	Mute
3	30
4	25
5	20
6	15
7	10

When the orange LED is on in row two, dim will act as a full mute (no output). Dim is down 30dB in row three, 25dB in row four, and so forth. To change the dim level, hold down the Dub button while pressing the CR/Studio button of your choice. Factory default has the dim level set to 20dB.

Studio Source Selection

For space considerations, a separate push button and column of LEDs is not provided for studio source selection. The Model 51 is configured for either the studio source to follow the control room source, or the studio source to follow the headphone source.

In configure mode, the red Studio ON LED tells you which function the studio output will follow. When the LED is off, the studio will follow the control room source; when it's on, the studio will follow the headphone source. Press the Studio On button to toggle the setting. Factory default has the studio output following the control room.

Mono Function

The Mono function allows the control room output to be placed in the mono (L+R) mode. When you're in configure mode, the red LED labeled Mono tells you whether the Mono button works as a momentary or latching button. When the button is set to momentary, the LED will be off and mono mode will only be active while you press and hold the Mono button. When the LED is on, the button is set to latch. With this setting, you can press the Mono button once and it will remain in mono mode until you press it again. Factory default has the Mono button operating as a momentary button.

Slate to Phones

When you press the slate button, the Model 51's microphone is fed to the dub output. This is how you can record your own voice for marking takes. But there are times when it's convenient to have the slate provided in the headphone output as well.

The control room A and B indicators are used to display whether the slate will go to the phones. When the green control room A LED is on, B is off, and slate goes to the dub output only; when the orange B LED is on, A is off, and slate goes to both the dub and headphone outputs. Press the button beside the indicators to toggle the setting. Factory default has slate sent to the dub output only.

50Hz Slate Tone

A 50Hz slate tone can be generated whenever slate is active. In the configure mode, the Dim LED tells you if this feature is active. When the Dim LED is off, the 50Hz slate tone is off; when the Dim LED is lit, the slate tone is active whenever slate is active. Press the Dim button to toggle the setting. Factory default has the Dim LED off, so slate tone is not active.

Communications Functions

There are three Communications buttons at the bottom right side of the Model 51. Moving from left to right, the buttons are talk to studio, talk to headphones, and slate. During configuration, LEDs above the Communications buttons tell you whether the buttons will latch when you press them. When an LED is off, the talk to button below it won't latch. You would have to press and hold the button to activate the function. When an LED is on, it indicates that the talk to button will latch. Pressing the button will activate the function until it's pressed again. Factory default has the three buttons set for momentary operation.

Note that the Model 51's external communications switch inputs are always configured for push to activate. They cannot be set for push-to-latch operation.

Operation

Warning: Applying or removing AC mains power to or from the Model 50 results in audio transients coming out of all outputs, including the control room A and B outputs and the studio output. With the high input sensitivity of the connected power amplifiers, these transients can cause large excursions in the loudspeakers. Do not apply or remove Model 50 AC mains power with the power amplifiers in the powered state.

Now that you've installed and configured the system, you're ready to go. You should find operation very easy.

Model 50 Central Controller

The Model 50 front panel contains seven LEDs, one stereo line input, and one stereo line output.

The power present LED should be lit whenever AC mains power is connected to the Model 50. If it's not lit, you've got a problem!

During normal operation the two Over Current LEDs will not be lit. They will flash only if there is a problem interfacing with the Model 51 Control Console or the talent amplifiers that you have connected. Refer to Troubleshooting section if either LED lights.

When used with the Model 51 Control Console, both data LEDs will light whenever a command is received. Why are there two LEDs? They are provided for diagnostic use in those special cases when the Model 51 is not used, and another source is providing the commands. The Bus LED lights whenever any data is received, whether the commands are intended for the Model 50 or not. The Model 50 Input Data LED will light only when a MIDI-exclusive command that matches the Model 50's format is received. Refer to the Troubleshooting section if neither LED flashes during operation with the Model 51 Control Console.

Input 7 is located on the front panel for easy access; connecting a temporary source to your system doesn't require getting at the back of the Model 50. The LED associated with input 7 will light whenever the input is configured for +4dBu operation. If you require –10dBV operation refer to the Configuration section for details.

Again as a convenience feature, dub output is available on the front panel. The LED associated with the dub output is lit whenever the output is set for +4dBu operation. Refer to the Configuration section if you need to make a change.

Model 51 Control Console

All StudioComm functions are controlled using the Model 51 Control Console. To make things easy, we've divided the StudioComm functions into four main groups: input-output selection, control room outputs, studio output, and communications functions.

Input-Output Selection

Input-output selection is simple. To select an input for monitoring in the control room, press one of the seven CR/Studio buttons. The corresponding LED in the CR/Studio column will light to let you know which input is selected.

If the studio source is configured to follow the control room source, it will automatically switch to the input you select. You can easily tell if the studio is following the control room because whenever the studio output is on, the studio On LED will flash each time you select a new input.

To select an input for the headphones, press and hold the Phones/Studio button and press one of the seven CR/Studio buttons. In the Phones/Studio column, the LED for the input you select will light. If the studio source is configured to follow the headphone source, the studio will automatically switch to the same input, and, whenever the studio output is on, the studio On LED will flash.

A special function allows you to select no input to be sent to the headphones. This ensures a quiet feed to the phones, but still allows the talk to phones communications function to be used. To select no input, simply press and hold the Phones/Studio button, then press both Communications Level buttons at the same time. The Level buttons are located to the right of the three Communications buttons. All LEDs in the Phones/Studio column will be off when no input is selected. To again select one of the seven inputs, press and hold the Phones/Studio button, then press one of the seven CR/Studio buttons.

To select an input for dub output, press and hold the Dub button and press one of the seven CR/Studio buttons. The appropriate LED in the Dub column will light. You can select no input just as you did for the headphones. Press and hold the Dub button, then press both Level buttons at the same time.

Control Room Outputs

Associated with the control room outputs are three buttons and one level control. In addition, the Communications Level buttons are used. Use the Control Room Level control to set the control room output level. There is no on/off switch. Just select an input and turn the knob to the level you want.

The A/B button switches between the control room A and B outputs. If you only have only one set of control room monitors, be sure the proper LED is on. The Dim button lets you lower the control room levels by a fixed amount. The amount of attenuation depends on the dim level set in the configure mode (refer to the Configuration section for help). If the Dim LED is on and dim is configured to fully mute, there will be no control room output. The Dim button is always set to latch the function on or off. The Mono button lets you send L+R to both the left and right control room outputs. The Mono button can be configured for latch operation.

For diagnostic purposes, a control room left-only or right-only mode can be activated. To enter the mode you'll use the Communications Level buttons. Press and hold both Level buttons for about two seconds. The control room will switch from stereo operation to the left-channel-only mode. Press and hold the Level buttons again, and the control room switches to right channel only. Press and hold the Level buttons a third time and the control room switches back to stereo operation. The Level buttons continue to cycle through left, right, and stereo monitoring as you press them. You can even switch between the control room A and B outputs at any time during single-channel operation.

The control room A/B output LEDs indicate when you are in left-only or right-only modes. During normal operation either the A or B LED is lit steadily. During left-only operation the LED will flash once; in right-only operation the LED will flash twice.

Note that the mono function is disabled during single-channel operation. If mono is active when entering the single-channel mode, the system will terminate the mono mode.

Studio Output

Associated with the studio output is one button and one level control. As you'd expect, use the level control to set the studio output level. The button is used to turn the studio output on or off. When the LED is off, the feed to the studio is off. When the LED beside the button is lit, the feed to the studio is on. Note that the talk to studio communications function is active whether the studio output is on or off. As previously discussed, when the studio output is on the LED will flash each time a new studio source is selected.

Communications Functions

Five buttons are associated with the communications functions. The three main buttons are called talk to studio, talk to phones, and slate. They have symbols that represent (from left to right) a loudspeaker, a pair of headphones, and a slate board (or "clapper"). Pressing each button activates the Model 51's built-in microphone and sends its audio to the respective output. Press the far left button (under the loudspeaker symbol) when you want to talk to the studio; press the button under the headphone symbol to talk to the headphones; and press the button under the clapper to slate. Remember that during a slate microphone audio goes to the dub output or, depending on the configuration, to the dub and phones output. When you press a button, the LED above it will come on to tell you the function is active. Note that only one communications function can be active at a time. Pressing multiple buttons at once will not activate multiple functions.

When you press these buttons, various things happen depending on the Model 51's configuration. For example, pressing the slate button may also generate a 50Hz tone on the dub output. Any of these buttons may be configured to stay on (latch) when you press them. Also, if the headphones are configured to receive slate audio, the headphone LED will light when you press slate. The slate level to the headphones will be determined by the slate level setting (not the talk to phones level).

You can independently set the output level for the three communications functions. To set the communications levels, press and hold any one of the three buttons and press the Communications Level buttons. (If the talk to studio, talk to phones, or slate buttons are set to latch, you won't have to hold them.) The LEDs above the buttons will flash each time the level is increased or decreased until you reach the top or bottom of the range. At this point, if you continue to press the Level button, the LED won't flash to indicate you're at the top or bottom of the eight-step level range. Note that the 50Hz tone will always be 10dB below the slate level.

Headphone Level

While we haven't mentioned it explicitly, the headphone output level is only controlled at the talent amplifiers. There is no adjustment using the Model 51.

Configure Mode

Refer to Configuration section to use button.

Talent Amplifiers

Warning: protect your ears! The StudioComm talent amplifiers are capable of driving headphones to extremely high levels. Hearing experts advise against continuous extended play, especially at high levels.

Model 35 Talent Amplifier

The power present LED should be lit whenever the Model 35 is connected to an operating Model 50. The Model 35 has a Level control and a Stereo/Mono button. Plug in a pair of headphones, turn the knob to the output level you want, and select stereo or mono by pressing the button. Both headphone outputs are controlled by the one level control. The Mono button sends L+R to both the left and right output.

Model 38 Talent Amplifier

The Model 38 has the unique ability to provide a personalized headphone mix for the in-studio talent. The performer's audio can be connected to the talent inputs and passively looped through to the control room. This lets performers increase their level in the headphone mix without you getting involved. The Model 38's circuitry was carefully designed so as not to interfere with the talent audio as it passes through.

The Model 38 has all the functions of the Model 35, plus it provides personal mix controls. The power present LED should be lit whenever the Model 38 is connected to an operating Model 50. The Cue Mix Level controls the headphone output levels for the signal coming from the Model 50. The Cue Mix Stereo/Mono button switches both headphone outputs between a stereo and mono (L+R) feed of the cue mix.

The Model 38 provides controls for Stereo or Mono talent signals which are at microphone or line level. If your talent source is stereo, connect it to In Left/Mono and In Right and set the Talent Stereo/Mono button for stereo operation. With a mono source, use only In Left/Mono and set the Stereo/Mono button for mono operation. This will feed the mono talent source to both left and right headphone channels. Connect loop through cables as needed for feeds to the control room.

The Talent Mic/Line button is used to select an input sensitivity level for the talent source. When you connect a microphone or direct box, select Mic. When keyboards or other preamplified sources are connected, select Line. The expected signal level in the Mic position is –40 to –60dBu. In the Line position it's –10 to +10dBu. If you are unsure of your signal level, start with input sensitivity set for Line. If the output level is not sufficient, turn down the level control, switch to Mic, then listen as again you raise the level control.

The Talent Level control works just like you would guess: turn it up for more talent input in the headphone mix, and turn it down for less. The Talent and Cue Mix level controls work like a mixer for the headphone outputs, so you can have any level you want of either source in the headphone mix.

Troubleshooting

If you're having problems getting the StudioComm system up and running, this section can help. If you haven't read the other sections of this guide, you should do so before proceeding.

If the Model 51 Doesn't Work At All

Your StudioComm system was supplied with a 10-foot MIDI-style cable that is used to connect the Model 51 Control Console to the Model 50 Central Controller. This cable has an important characteristic; it implements all five conductors. This means that all five pins on each plug connect to each other using a length of five-conductor cable. If you choose to use your own cable it's easy to get in trouble; many MIDI cables only have three conductors! You **must** use a five-conductor MIDI-style cable or the Model 51 will not power up and function. Five conductor MIDI cables are not hard to find, but you must ask for them and ensure that you get what you asked for. **Be warned!**

Talent Amplifier Over Current LED

During normal operation the talent amplifier over current should not light. It will flash on and off if the talent amplifier output is loaded to exceed its maximum output current. The most common reason for an over current condition would be a shorted interconnecting cable. Also, connecting more than the specified maximum of four Model 35 or Model 38 Talent Amplifiers can also cause the LED to light. Possible, but not likely, would be a fault condition in a Model 35 or Model 38.

If the LED does light, troubleshooting should prove quite simple. Begin by disconnecting the cable that is plugged into the talent amplifier output connector. Perform the disconnection directly on the Model 50's back panel. The LED should stop lighting. Now check through all the wiring to determine where the short circuit condition is located. The Model 50 will not be damaged if the Over Current LED is lighting so you should use it to help you locate the fault in your system. In just a few minutes you should be able to isolate exactly what cable or talent amplifier is causing the problem.

Control Console Over Current LED

During normal operation the control console Over Current LED should not be lit. It will flash on and off if the power source that supplies the Model 51 Control Console is loaded to exceed its maximum output current. The most common reason for an over current condition would be a shorted 5-conductor MIDI-style interconnecting cable. A major fault in the Model 51 would also cause the LED to light.

If the LED does light, you should find troubleshooting very easy. Begin by disconnecting the cable that is plugged into the Control Console/MIDI In connector on the Model 50's back panel. The LED should stop lighting. Reconnect the cable to the Model 50 and disconnect the cable's other end from the Model 51. If the LED still lights you have a bad cable. If the LED does not light there is a problem with the Model 51. Replace the cable if it proves to be bad—remember you'll need a MIDI-style cable with all five conductors connected. If the Model 51 appears to be at fault it will need to be returned to the factory for repair.

Input Data LEDs

The Model 50 Central Controller's front panel contains two LEDs that represent incoming control data. The Bus LED lights any time valid MIDI-compatible data enters the unit. The Model 50 LED lights only when data is received that is valid for the Model 50. The Model 50 uses MIDI system-exclusive commands to perform all operations. When the Model 51 Control Console is connected to the Model 50, both data LEDs will light any time the Model 51 generates data. This is because the Model 51 will only generate data that is compatible with the Model 50.

If you are not using the Model 51, and instead are supplying MIDI data using another device, the LEDs should prove extremely useful for troubleshooting. Once the Model 50 is connected to a data bus that is carrying MIDI data, the Bus LED will light whenever **any** MIDI data is received. Only when the MIDI data conforms to the Model 50's MIDI system-exclusive format will both the data LED's light. If the Bus LED lights, but the Model 50 LED does not, this indicates that the data is not configured correctly for the Model 50. Refer to Appendix A, located at the end of this guide, for details on how data must be sent to the Model 50.

Intermittent Audio Connections

Should you experience audio connections that seem to be "flaky" or intermittent, refer to the Technical Notes section of this guide. The ¼-inch tip-ring-sleeve jacks used on the StudioComm products are of very high quality, conforming to the industry standard EIA RS-453. Some plugs do not meet this standard, specifically in the shape of the tip conductor. You may have to replace plugs on interconnecting cables or headphones to remedy an interconnection problem.

Technical Notes

Talent Amplifier Cable Length

There are no hard and fast rules defining the maximum cable length when connecting Model 35 or Model 38 Talent Amplifiers to the Model 50 Central Controller. The maximum cable length is directly related to the amount of resistance in the connecting cable; the lower the resistance per foot (or meter), the longer the cable can be. (Although cable capacitance affects high frequency performance, resistance is the limiting factor is this case.)

To lay out the facts in grammar-school story problem format: for correct operation, a Model 35 or Model 38 needs to see at least 20Vdc between pins 1 and 2 of their input connector. The Model 50's talent amplifier output voltage across pins 1 and 2 is 24Vdc, with a maximum current draw of 0.25A (250mA). This difference between the voltage supplied and the voltage required results in a maximum voltage drop of 4V over the interconnecting cables. Since cable is rated in ohms per 1000 feet (or ohms per 1000 meters), you need to know what the maximum cable resistance is. This can be easily calculated by dividing the maximum voltage drop by the maximum current flow: 4V divided by 0.25A = 16 ohms. For example, a standard 20 AWG microphone cable is Belden 8412, which has 10.9 ohms resistance per conductor per 1000 feet. Since we're using two conductors to carry the signal on pins 1 and 2 you'd get 21.8 ohms per 1000 feet of microphone cable. With our 16 ohm maximum resistance you'd be able to use 734 feet (222.6 meters) of this cable.

Using the numbers provided above you should be able to select a cable for your application.

Model 50 to Model 51 Cable Length

The Model 51 Control Console generates standard MIDI commands which are sent to the Model 50 Central Controller using a standard MIDI-style interconnecting cable. The standard interconnecting cable contains five conductors, although the MIDI signal is carried on only two of the conductors. The three remaining conductors are used by the Model 50/Model 51 to carry common/shield, DC power, and communications audio. The length limiting factor in the interconnecting cable is the transmission of the MIDI data, which has a rate of 31,250 bits-per-second. The inter-conductor capacitance of the cable attenuates the data, and as the cable length increases the data becomes unusable; the cable serves as a low-pass filter. The MIDI specification calls for a maximum cable length of 50 feet, which will work fine connecting the Model 51 to the Model 50. There is really no reason why this length can't be increased, as long as good low-capacitance, twisted pair cable is utilized. Runs of 100 to 250 feet are possible using the latest sophisticated cable. Simply ensure that the StudioComm system works correctly with the desired cable length. There are too many variables to give a simple formula—sorry and good luck!

¼-Inch Plugs versus EIA RS-453

An incompatibility problem lurks between the humble ¼-inch 2-conductor and 3-conductor plugs and the jacks found on professional audio equipment. While all the plugs seem to "look" the same, most do not comply with the industry standard, called EIA RS-453. This standard defines the physical dimensions, including the shape of the plug's tip. It seems that many plug manufacturers don't bother to make the tip comply with the standard. Why is this relevant to you? Because the jacks used on the Model 50 Central Controller, Model 35 Talent Amplifier, and Model 38 Talent Amplifier do comply with the standard. They expect to be mated with plugs that also meet the specification. Note that we use high-quality jacks. They are manufactured by Neutrik, the world leader in audio connectors. When interfacing your line input, line outputs, or headphones be careful with the plugs you utilize. Should a connection appear "flaky," sound noisy, or make an intermittent contact, the most likely problem is a non-standard plug. Replace the plug if this is the case. You should find that all plugs from Neutrik or Switchcraft work correctly. In our experience, headphones are the most likely place to find non-standard plugs—we even found them on some "world-class" headphones that we use in our lab!

Definition of Level—dBu and dBV

Whenever possible, Studio Technologies has opted to use the dBu designation as it seems to be quite rational. Using dBm was fine when all audio line outputs were terminated with 600 ohm loads. In this way it was easy to say that 0dBm is 1 milliwatt dissipated in the known load (i.e., 0dBm across 600 ohms will measure 0.7746V). In contemporary situations an output is rarely terminated with 600 ohms; generally 10k ohms or higher. The dBu designation is better because it refers to dB referenced to 0.7746V, with no reference to load impedance. This takes into account today's audio scene where most equipment has a low source impedance, and a high input impedance. The dBu designation is becoming the standard for the professional audio industry.

StudioComm equipment is designed to interface with audio signals that have nominal signal levels of –10dBV and +4dBu. You might wonder why dBV came into the picture. Most people don't realize that equipment that utilizes "–10" levels usually mean –10dBV—substantially different from –10dBu (–10dBV = –7.78dBu). The dBV designation is simply a different way of measuring signal level and is often used when dealing with portable or consumer audio equipment. The dBV designation refers to dB referenced to 1.0V, rather than dBu which refers to 0.7746V.

"Hot" Disconnection of the Model 51 Control Console

Should you need to relocate the Model 51 while your StudioComm system is operating, there is no reason why you can't disconnect the five-conductor cable, move the unit, and then connect it again. If the Model 51 is disconnected while it is operating, the current operating parameters are saved in non-volatile memory. If the link is broken between the Model 51 and the Model 50 Central Controller the Model 50 will simply continue to operate as it did when the link was broken. No clicks, pops, or other noises will occur when the Model 51 is again connected. The Model 51 will go through its standard power-up sequence, send a command to reset power-up defaults, then send the operating parameters as stored in its memory. You may notice a brief interval of silence while the Model 50 responds to the reset defaults command.

Specifications

Model 50 Central Controller

Mounting
One space in a standard 19-inch (48.3cm) rack

AC Mains Requirement
100, 120, or 220/240V, ±10%, factory configured, 50/60Hz, 100-120V 0.4A maximum, 220/240V 0.2A maximum

Fusing
Qty: 1

Type: 5 x 20mm time lag (Littelfuse 218-series or equivalent)

Rating: 0.400A for 100 and 120V mains power, 0.200A for 220/240V mains power

Connectors
Audio Inputs and Outputs: dual, ¼-inch, tip-ring-sleeve, gold-plated contacts. Mates with all mono or stereo plugs specified by EIA RS-453. Manufactured by Neutrik.

Talent Amplifier Output: 3-pin XLR-type, male (Neutrik)

Microphone Module: ¼-inch, tip-ring-sleeve, gold-plated contacts (Neutrik)

Control Console/MIDI In: 5-pin DIN-type, female

AC Mains: standard 3-blade IEC-type plug

Audio Inputs
Qty: 7, stereo (separate left and right input connectors)

Type: electronically balanced, direct coupled, compatible with balanced or unbalanced signals

Impedance: 24k ohms

Nominal Input Level: –10dBV or +4dBu, each input individually software configurable

Common Mode Rejection: 100dB @DC and 60Hz, 70dB @20kHz, 62dB @40kHz (typical)

Control Room Outputs
Qty: 2, stereo (separate left and right output connectors)

Type: electronically balanced, direct coupled, intended to drive loads of 600 ohms or greater, balanced or unbalanced

Output Level (input source at nominal level): –87dBu at 0% rotation (fully counter-clockwise), –48dBu at 25% rotation, –27dBu at 50% rotation, –1dBu at 75% rotation, +14dBu at 100% rotation (fully clockwise)

Maximum Output Level: +27dBu into 10k ohms, +26dBu into 600 ohms

Frequency Response: 10Hz-40kHz +0/–0.5dB

Distortion (THD+N): 0.02%

S/N Ratio: 87dB (10Hz-20kHz @ reference level of –10dBu output)

Studio Output
Qty: 1, stereo (separate left and right output connectors)

All other specifications identical to control room outputs

Talent Amplifier Output
Application: provides power and audio signals for up to 4 Model 35 or Model 38 Talent Amplifiers. The output connector (3-pin XLR-type, male) has common on pin 1, +24Vdc modulated with left channel audio at –10dBu on pin 2, and right channel audio at –10dBu on pin 3. Maximum output current 250mA (nominal)

Dub Output
Qty: 1, stereo (separate left and right output connectors located on both the front and back panels)

Type: electronically balanced, direct coupled, intended to drive loads of 600 ohms or greater, balanced or unbalanced

Nominal Output Level: –10dBV or +4dBu, software configurable

Maximum Output Level: +27dBu into 10k ohms, +26dBu into 600 ohms

Frequency Response: 10Hz-40kHz +0/–0.5dB (down 1dB @ 70kHz)

Distortion (THD+N): 0.008%

S/N Ratio: 87dB (10Hz-20kHz @ reference level of –10dBu output)

Slate Tone
Type: 50Hz sine wave

Level: 10dB below slate communications audio level (nominal)

Microphone Module Connection
Designed for use with Studio Technologies' Model 37 Microphone Module. The Model 37 provides the communications audio source when MIDI commands are sent directly into Model 50 Central Controller; i.e., the installations where the Model 51 Control Console is not used. Also can be used to connect alternate communications audio source with nominal signal level of –10dBu.

LED Indicators
Qty: 7, power present, control console over current, talent amp over current, input data present, Model 50 input data present, input 7 +4dBu, dub output +4dBu

Dimensions (Overall)
19.00 inches wide (48.3cm)
1.72 inches high (4.4cm)
8.75 inches deep (22.2cm)
(1 standard rack space)

Weight
8.9 pounds (4.1kg)

Model 51 Control Console

Mounting
Desktop. Provision for stand mounting provided.

Power Requirements
15Vdc filtered and regulated, 90mA maximum, provided by Model 50 Central Controller

Connectors
To Model 50 Central Controller: 5-pin DIN-type, female

External Communications Contacts: ¼-inch, tip-ring-sleeve, gold-plated contacts (Neutrik)

Internal Microphone
Type: electret condenser

Frequency Response: 3dB roll off at 105Hz

External Communications Contacts
Connect normally open contacts to allow operation of talk to studio and talk to headphones functions.

Dimensions (Overall)
7.4 inches wide (18.8cm)
2.6 inches high (6.6cm)
7.3 inches deep (18.5cm)

Weight
2.5 pounds (1.1kg)

Model 35 Talent Amplifier

Mounting
Desktop. Provision for stand mounting available as option.

Power Requirements
20-32Vdc (modulated with left channel audio), provided by Model 50 Central Controller

Power Present LED
Red LED indicates presence of operating power

Connectors
Input (from Model 50): 3-pin XLR-type, female (Neutrik)

Loop Thru: 3-pin XLR-type, male, connected in parallel with input connector (Neutrik)

Headphone Output: dual, ¼-inch, stereo (tip-ring-sleeve), gold-plated contacts (Neutrik)

Headphone Output
Qty: 1, feeds two headphone jacks

Load: intended for connection to one or two pairs of headphones with total impedance of 75 ohms or greater

Output Level: user adjustable

Maximum Output Voltage: 16V peak-to-peak into 150 ohms @ 1% THD+Noise, 400Hz

Distortion (THD+N): 0.03%

Frequency Response: 20Hz-20kHz ±0.5dB

Dimensions (Overall)
4.2 inches wide (10.7cm)
2.0 inches high (5.1cm)
5.3 inches deep (13.5cm)

Weight
0.8 pounds (0.4kg)

Model 38 Talent Amplifier

Mounting
Desktop. Provision for stand mounting provided.

Power Requirements
20-32Vdc (modulated with left channel audio), provided by Model 50 CentralController

Power Present LED
Red LED indicates presence of operating power

Connectors
Cue Mix Input (from Model 50): 3-pin XLR-type, female (Neutrik)

Cue Mix Input Loop Thru: 3-pin XLR-type male, connected in parallel with input connector (Neutrik)

Talent Input (Left In/Mono and Right In): 3-pin XLR-type, female (Neutrik)

Talent Input Loop Thru: 3-pin XLR-type male, connected in parallel with input connectors (Neutrik)

Headphone Output: dual, ¼-inch, stereo (tip-ring-sleeve), gold-plated contacts (Neutrik)

Cue Mix Input
Intended for connection only with Model 50 Central Controller

Talent Input
Qty: 1, stereo or mono, switch selectable

Type: electronically balanced, capacitor coupled, input impedance 20k ohms

Input level: switch selectable for microphone or line-level signals. Expected signal level: Mic position –40 to –60dBu, Line position –10 to +10dBu.

Headphone Output
Qty: 1, feeds two headphone jacks

Load: intended for connection to one or two pairs of headphones with total impedance of 75 ohms or greater

Output Level: user adjustable

Maximum Output Voltage: 16V peak-to-peak into 150 ohms @ 1% THD+Noise, 400Hz

Distortion (THD+N): 0.1%

Frequency Response: 20Hz-20kHz ±0.5dB

Dimensions (Overall)
8.0 inches wide (20.3cm)
2.0 inches high (5.1cm)
5.4 inches deep (13.7cm)

Weight
1.5 pounds (0.7kg)

Specifications and information contained in this User Guide subject to change without notice.

This page intentionally left blank.

Appendix A

Controlling the Model 50

The Model 50 Central Controller uses MIDI system-exclusive commands to control all functions. The Model 51 Control Console is programmed to generate a subset of what the Model 50 is capable of doing. By using standard MIDI commands, the Model 50 can be used for a wide range of special applications. Any device that can be programmed to send system-exclusive MIDI commands can be used to control the Model 50.

Note that the five-pin connector on the Model 50's back panel is wired somewhat differently from a standard MIDI input. While pins 4 and 5 meet the MIDI standard, the three remaining pins are implemented for use by the Model 51. Pin 1 supplies +15Vdc power, pin 2 is shield (ground), and pin 3 is communications audio input.

If you're connecting your own controller, such as a computer's MIDI interface, you might be concerned about the DC power on pin 1. Because the MIDI standard doesn't use this pin, it is highly unlikely that it will be connected inside your controller, so there's little chance of the DC causing damage. To be safe, you can use a MIDI cable with only two or three wires implemented.

The following pages provide a detailed list of all Model 50 system-exclusive MIDI commands.

Model 50 Central Controller MIDI Implementation Chart Date: June 1, 1993
Version: 1.01

Function...		Transmitted	Recognized	Remarks
Basic Channel	Default Channel	Not Applicable	Not Applicable	
Mode	Default Messages Altered	Not Applicable	Not Applicable	
Note Number	True Voice	Not Applicable	Not Applicable	
Velocity	Note ON Note OFF	Not Applicable	Not Applicable	
After Touch	Key's Ch's	Not Applicable	Not Applicable	
Pitch Bender		Not Applicable	Not Applicable	
Control Change		X	X	
Prog Change	True #	X	X	
System Exclusive		X	O	Refer to following pages
System Common	:Song Pos :Song Sel :Tune	X X X	X X X	
System Real Time	:Clock :Commands	X X	X X	
Aux Mes- sages	:Local ON/OFF :All Notes Off :Active Sense :Reset	X X X X	X X X X	
Notes				

Mode 1: OMNI ON, POLY
Mode 3: OMNI OFF, POLY

Mode 2: OMNI ON, MONO
Mode 4: OMNI OFF, MONO

O: Yes
X : No

Model 50 Central Controller

MIDI Messages to be Acted Upon

General Notes:

1. All MIDI messages to be acted upon are system-exclusive type (F0H). No channel mode, system common, or system real time messages are utilized.
2. Studio Technologies, Inc. manufacturer's ID number is 00H 00H 56H.
3. The Model 50's product device ID number is 01H.

Function: Reset to Power Up Default Configuration

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	00H	Function: Restore Power Up Default Configuration
7	F7H	EOX, End of System Exclusive

Action taken after Model 50 receives MIDI message:

1. Set control room level to off.
2. Set studio level to off.
3. Set control room source to no input.
4. Set studio source to no input.
5. Set headphone source to no input.
6. Set dub source to no input.
7. Set control room output to off.
8. Set mono to off (stereo mode).
9. Set studio output to off.
10. Set all input levels to +4.
11. Set dub output level to +4.
12. Set dim to normal, non-dim
13. Set dim level to 20dB.
14. Set talk to studio to off.
15. Set talk to headphones to off.
16. Set slate to off.

Function: Input Level

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	01H	Function: Input Level
7	0nH	Input Channel, range 1-7, 1=input 1, 2=input 2, etc.
8	0nH	Input Level, range 0-1, 0=–10, 1=+4
9	F7H	EOX, End of System Exclusive

Function: Dub Output Level

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	02H	Function: Output Level
7	0nH	Output Channel, range 1, 1=dub out
8	0nH	Output Level, range 0-1, 0=–10, 1=+4
9	F7H	EOX, End of System Exclusive

Function: Control Room Source

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	03H	Function: Control Room Source
7	mnH	Source Selected, m range 0-2: 0=stereo, 1=left only, 2=right only; n range 0-7: 0=no input, 1=input 1, 2=input 2, etc.
8	F7H	EOX, End of System Exclusive

Function: Studio Source

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	04H	Function: Studio Source
7	mnH	Source Selected, m range 0-2: 0=stereo, 1=left only, 2=right only; n range 0-7: 0=no input, 1=input 1, 2=input 2, etc.
8	F7H	EOX, End of System Exclusive

Function: Headphone Source

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	05H	Function: Headphone Source
7	mnH	Source Selected, m range 0-2: 0=stereo, 1=left only, 2=right only; n range 0-7: 0=no input, 1=input 1, 2=input 2, etc.
8	F7H	EOX, End of System Exclusive

Function: Dub Source

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	06H	Function: Dub Source
7	mnH	Source Selected, m range 0-2: 0=stereo, 1=left only, 2=right only; n range 0-7: 0=no input, 1=input 1, 2=input 2, etc.
8	F7H	EOX, End of System Exclusive

Function: Control Room Level

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	07H	Function: Control Room Level
7	0nH	Level, MSB, range 0-3, see note 1
8	nnH	Level, LSB, range 00-7F, see note 1
9	F7H	EOX, End of System Exclusive

Note 1: MSB=0 allows LSB to control lower 128 level steps, MSB=1 allows LSB field to control upper 128 level steps. (In operation MSB=0/LSB=00 gives full mute, MSB=1/LSB=7F gives maximum output level.) MSB=2 places function in reduced precision mode, where LSB=00 is full mute, LSB=7F is maximum output. MSB=3 places function in reduced precision, reverse range mode, where LSB=7F is full mute, LSB=00 is maximum output.

Function: Studio Level

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	08H	Function: Studio Level
7	0nH	Level, MSB, range 0-3, see note 1
8	nnH	Level, LSB, range 00-7F, see note 1
9	F7H	EOX, End of System Exclusive

Note 1: MSB=0 allows LSB to control lower 128 level steps, MSB=1 allows LSB field to control upper 128 level steps. (In operation MSB=0/LSB=00 gives full mute, MSB=1/LSB=7F gives maximum output level.) MSB=2 places function in reduced precision mode, where LSB=00 is full mute, LSB=7F is maximum output. MSB=3 places function in reduced precision, reverse range mode, where LSB=7F is full mute, LSB=00 is maximum output.

Function: Control Room Output Select

Byte	Value	Description		
1	F0H	System-Exclusive Message		
2	00H	1st Byte of Studio Tech ID		
3	00H	2nd Byte of Studio Tech ID		
4	56H	3rd Byte of Studio Tech ID		
5	01H	Product ID (Model 50)		
6	09H	Function: Control Room Output Select		
7	nnH	Output Selected, Range 00-33:		
		L Ch.	R Ch.	Action
		0	0	No Output
		1	0	Left Only, Output A On
		2	0	Left Only, Output B On
		3	0	Left Only, Outputs A & B On
		0	1	Right Only, Output A On
		0	2	Right Only, Output B On
		0	3	Right Only, Outputs A & B On
		1	1	Left and Right, Output A On
		2	2	Left and Right, Output B On
		3	3	Left and Right, Outputs A & B On
8	F7H	EOX, End of System Exclusive		

Function: Control Room Mono/Stereo Select

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	0AH	Function: Control Room Mono
7	0nH	Output Selected, Range 0-1, 0=stereo, 1=mono
8	F7H	EOX, End of System Exclusive

Function: Control Room Dim

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	0BH	Function: Control Room Dim
7	0nH	Status, Range 0-1, 0=No Dim, 1=Dim
8	F7H	EOX, End of System Exclusive

Function: Studio On/Off Status

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	0CH	Function: Studio Output Status
7	0nH	Status, Range 0-1, 0=Off, 1=On
8	F7H	EOX, End of System Exclusive

Function: Talkback

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	0DH	Function: Talkback
7	0nH	Status, Range 0-1, 0=no talkback, 1=talkback
8	0nH	Level, range 1-8, 8 is loudest
9	F7H	EOX, End of System Exclusive

Function: Talk to Headphones

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	0EH	Function: Talk to Headphones
7	0nH	Status, Range 0-1, 0=no talk to 'phones, 1=talk to 'phones
8	0nH	Level, range 1-8, 8 is loudest
9	F7H	EOX, End of System Exclusive

Function: Slate

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	0FH	Function: Slate
7	0nH	Status, Range 0-4, 0=no slate, 1=slate to dub output with no tone, 2=slate to dub output with tone, 3=slate to dub and phones output with no tone, 4=slate to dub and phones output with tone
8	0nH	Level, range 1-8, 8 is loudest
9	F7H	EOX, End of System Exclusive

Function: Set Dim Level

Byte	Value	Description
1	F0H	System-Exclusive Message
2	00H	1st Byte of Studio Tech ID
3	00H	2nd Byte of Studio Tech ID
4	56H	3rd Byte of Studio Tech ID
5	01H	Product ID (Model 50)
6	10H	Function: Set Dim Level
7	0nH	Status, Range 0-5: 0=full mute (approx. 70dB) 1=30dB dim 2=25dB dim 3=20dB dim 4=15dB dim 5=10dB dim
8	F7H	EOX, End of System Exclusive