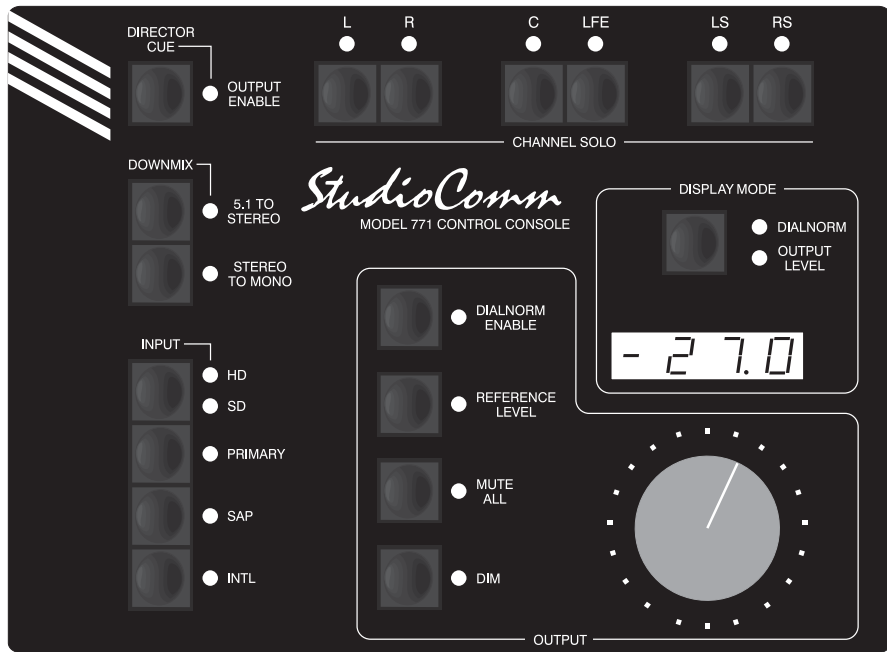# *StudioComm*

from **STUDIO TECHNOLOGIES INC.**

Model 761 & Model 771

Overview

As production of both 5.1 surround and 2-channel stereo audio material becomes a day-to-day reality, the need for monitoring these sources is imperative for broadcast and post-production facilities. Studio Technologies has addressed this need with the StudioComm for Surround Model 761 Central Controller and Model 771 Control Console. While this system was designed to support the needs of a major television network, it should find a comfortable home in many other applications as well. About the only system features that were selected to directly match this network's requirements are related to the input source/monitor output organization and naming conventions. However this implementation should match the needs of others too. With its digital audio inputs, analog outputs, and Dolby® E dialnorm support, it's a simple task to integrate the system into a variety of facilities. The carefully selected feature set provides the most-needed resources and presents them in a way that remains simple to use. In addition, by using the best of contemporary technology, as well as following rigorous design practices, the system's audio quality is simply excellent.

Features Digital Audio Inputs!

Model 771 Control Console Front Panel

Model 761 Central Controller Front Panel

This version of the StudioComm for Surround system starts with the Model 771 Control Console, the "command center" that is designed to reside at the operator's location. It allows fingertip selection of all monitoring functions. Numerous LED indicators provide complete status information. A 4-digit numeric display indicates the monitor output or dialnorm level in real time. A major strength of the Model 771 is its ability to configure, under software control, a number of operating parameters. Using a 9-pin cable, the Model 771 connects to a Model 761 Central Controller.

The Model 761 Central Controller occupies just one rack space but allows connection of two 5.1 surround inputs and three 2-channel stereo inputs. In addition, a 5.1 surround and special 2-channel stereo "director cue" monitor output are provided.

All the 5.1 and stereo inputs are digital and are compatible with AES3id sources. These unbalanced digital signals utilize BNC connectors and are ubiquitous in most broadcast and many post-production environments. Sample rates of up to 192 kHz and bit depths of up to 24 are supported. With the system's dynamic range of greater than 106 dB, there isn't a problem ensuring that the quality of all connected audio sources is maintained. The monitor outputs are analog, balanced line level, and have a maximum level of +26 dBu. They include power-up/power-down protection circuitry to help maintain the health of the connected loudspeaker systems.

A source of Dolby E metadata can be connected to the Model 761 Central Controller. This RS-485/RS-422 115.2 kbit/s compatible signal carries numerous data elements, including one that represents the average dialog level of an associated audio program. This dialog normalization or "dialnorm" value is an integral part of many broadcast distribution systems, ending up in the audio playback systems of consumers. Hardware and software within the Model 761 separates out the dialnorm element that relates to one of the connected 5.1 surround audio sources. This dialnorm level value can then be displayed on the Model 771 Control Console, as well as used to automatically adjust the monitor output level. This provides a unique solution to the broadcast and post-production world, allowing a professional environment to accurately simulate an end user's experience.

Digital audio sources are interfaced with the Model 761 using nine BNC connectors. Analog monitor output signal connections are made using one 25-pin D-subminiature connector. One 9-pin D-subminiature connector is used to link the Model 761 to the Model 771 Control Console. A second 9-pin D-sub connector is used to interface metadata and remote control signals with the Model 761. An advanced flash-based microcontroller integrated circuit provides the logic "horsepower" for the unit. AC mains power is connected directly to the Model 761, which is factory selected for 100, 120, or 220/240 V operation. The internal power supply utilizes two toroidal mains transformers for quiet audio operation.

Additional Details

The Model 771 provides four buttons and associated LEDs for selection of the input source to be monitored. A total of six sources can be monitored, one being active at a time. Two of the sources are 5.1 surround, while the other four are monaural. For flexibility, one of the 5.1 inputs can be configured to be directly compatible with a 2-channel stereo source.

The 5.1 monitor output levels can be controlled by way of a large, easy-to-use rotary control. The level control auto mute all function ensures the monitor output channels automatically mute whenever the rotary level control is in its fully counterclockwise (minimum) position. By using the reference level function, the monitor output level can be set to a pre-configured value. This is provided for audio-with-picture applications which require a specific monitor level. The reference level is easily configured by taking an electronic "snapshot" of the position of the rotary level control. For operator confirmation, a 4-digit LED display shows the level of the monitor output. The display can be configured for either an attenuation mode or a direct db SPL value.

The dim function allows the monitor output level to be reduced by a fixed dB amount. The dim level is selected from four available levels. A mute all function allows all monitor output channels to be simultaneously muted. The channel solo function allows one or more specific channels to be monitored while the others are automatically muted.
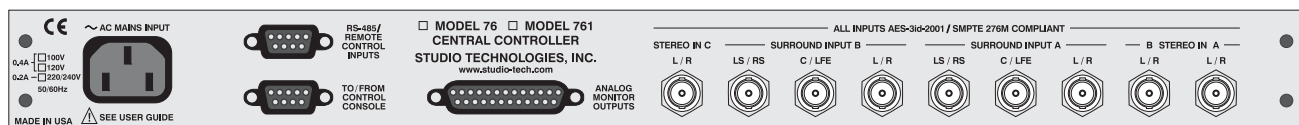
Model 761 Central Controller Back Panel

Two functions allow the format of the monitored sources to be checked for level or phase inconsistencies. The 5.1 to stereo downmix function is used to create a stereo signal from the selected 5.1 surround source. The stereo to mono downmix function allows audio on the left and right channels to be added (summed) and monitored on the monitor's system's center channel. The two downmix functions can be simultaneously enabled, allowing a 5.1 surround source to be checked for mono compatibility.

A special "director cue" output function is provided. This allows a monaural or stereo input to be connected to the Model 761 Central Controller, which also has a dedicated 2-channel stereo output associated with it. A button on the Model 771 Control Console allows on/off control of this signal. This is useful when control rooms need to monitor auxiliary audio signals, such as site-event cue signals, through an independent set of loudspeakers. For additional flexibility, two remote control input functions are provided: mute all and dim. By providing access to these functions, talkback or communications activity from an audio console or matrix intercom system can control the level of the system's 5.1 monitor outputs.

The Model 771 Control Console connects to, and is powered by, the Model 761 Central Controller. The interconnecting cable uses 9-pin D-subminiature connectors and carries RS-485 data and DC power. The Dolby E-compatible metadata connects to the Model 761 by way of a second 9-pin D-sub connector. Remote control signals, including mute all and dim, also connect to the Model 771 using the second 9-pin D-sub connector.

Model 761 Central Controller

General Audio:
Frequency Response: digital inputs to monitor outputs loaded with 10 k ohms
32 to 48 kHz Sample Rate: 20 Hz-20 kHz ±0.05 dB
88.2 to 96 kHz Sample Rate: 20 Hz-40 kHz ±0.05 dB
176.4 to 192 kHz Sample Rate: 20 Hz to 40 kHz ±0.05 dB; down 0.5 dB at 80 kHz
Distortion (THD+N): 0.004%, ref 1 kHz, +4 dBu output
S/N Ratio: 86 dB, ref +4 dBu output
Dynamic Range: greater than 106 dB
Crosstalk: 104 dB at 1 kHz; 90 dB at 20 kHz, ref –1 dBFS input

Digital Audio Inputs: 9
Configuration: organized as two 5.1 surround, one 2-channel stereo, and two dual-channel monaural
Supported Sample Rates: 32, 44.1, 48, 88.2, 96, 176.4, and 192 kHz
Word Length: 24 bit
Type: AES3id-2001 (SMPTE 276M)
Impedance: 75 ohms, unbalanced
Reference Level: –20, –18, –16, or –14 dBFS, selectable
Sync Source: all inputs independently self-clocking

Monitor Outputs: 8
Configuration: organized as one 5.1 surround and one 2-channel stereo
Type: electronically balanced, compatible with balanced or unbalanced loads
Maximum Level: +26 dBu into 600 ohms or greater
Nominal Level, Channels 1-6 (5.1 Surround): 0 or +4 dBu, selectable
Nominal Level, Channels 7 and 8 (Director Cue): –12, –6, 0, or +4 dBu, selectable

Dolby E Metadata Input:
Type: RS-485/RS-422
Data Rate/Format: 115.2 kbit/s, 8-N-1

Remote Control Inputs: 4
Function: remote mute all, remote dim, two spare
Type: +5 V logic, activates on closure to system common

AC Mains Requirement: 100, 120, or 220/240 V, ±10%, factory configured, 50/60 Hz, 30 watts maximum

Connectors:
Digital Audio Inputs: 9, 75 ohm BNC (per IEC 60169-8 Amendment 2)
Monitor Outputs: 25-pin D-subminiature female
Control Console: 9-pin D-subminiature female
Metadata and Remote Control Input: 9-pin D-subminiature female
AC Mains: 3-blade, IEC 320 C14-compatible (mates with IEC 320 C13)

Dimensions (Overall):
19.00 inches wide (48.3 cm)
1.72 inches high (4.4 cm)
8.75 inches deep (22.2 cm)

Mounting: one space in a standard 19-inch rack

Weight: 8.8 pounds (4.0 kg)

Model 771 Control Console

Application: supports Model 761 Central Controller

Power: +12 volts DC, 100 mA maximum, provided by Model 761 Central Controller

Control Data:
Type: RS-485
Data Rate/Format: 115.2 kbit/s, 8-N-1

Connector: 9-pin D-subminiature female

Dimensions (Overall):
7.20 inches wide (18.3 cm)
2.20 inches high (5.6 cm)
5.40 inches deep (13.7 cm)

Weight: 1.7 pounds (0.8 kg)

Specifications subject to change without notice.
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