

# *StudioComm* **for Surround**

## **Model 78 Central Controller Special Version 2**

### **User Guide**

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# Model 78 Special Version 2

The Model 78 Central Controller can be ordered from Studio Technologies to perform an 8-channel break-before-make, click-free A-B input select function. This implementation is identified as the Model 78 Special Version 2. With this version either input A or input B can be selected to be routed to the output. The input-to-output gain is configured for unity, with a +4dBu nominal operating level. The input trim potentiometers allow signals over a wide nominal level to be adjusted to achieve a +4dBu nominal output level.

The functioning of the Model 78 Special Version 2 is very simple. By default input A is selected. An optically coupled general-purpose input (GPI) allows input B to be selected. A special break-before-make, click-free switching sequence has been implemented. This ensures that a smooth transition is maintained when changing between inputs. It also allows the unit to perform a "soft-mute" function if only one input is connected.

The Model 78 Special Version 2 may be appropriate for use in post-production audio, broadcast, and other specialized multi-channel applications. For applications not effectively covered by this special version please contact the factory.

## Documentation

For a full understanding of the Model 78 Special Version 2, this document should be used in conjunction with the StudioComm for Surround Model 78/Model 79 User

Guide. One copy of the guide is shipped with each Model 78 as well as being available on the Studio Technologies web site: [www.studio-tech.com](http://www.studio-tech.com).

## Installation

### Audio Inputs and Outputs

Audio input and output connections should be made following the information provided in the user guide. The connector types, channel assignments, and other details remain the same.

### Input Source Selection

The Model 78 Special Version 2, by default, uses input A as its source. To select input B requires that a signal be applied to the Model 78. The signal can be in the form of a contact closure to ground, an isolated contact closure, or application of a +5V logic signal. Implementing any of these methods requires making connections to the 9-pin D-subminiature connector marked "To/From Control Console" on the back panel. The connector on the Model 78 is a female and requires the installer to supply a plug (male).

Note that the Model 78 User Guide shows the control console interface connector's functions as implemented in a standard Model 78 unit. This special version of the Model 78 makes two changes. The MIDI data input (pins 3 and 4) are now used as an optically coupled general-purpose input (GPI). To limit the input current, the optocoupler is in series with a 220 ohm resistor. The output voltage found on pin 2 has been changed to +5V, with current limiting maintained at 200mA. This +5V provides a local source of power for the GPI input.

To allow a contact closure to ground to select input B is simple. On the 9-pin plug connect (jumper) pins 2 and 3 together. This connects the +5V source to the + lead of the GPI input. Then connect pin 4 to the contact that will close to ground. As the +5V source is also referenced to ground, current flowing to pin 4 from ground will activate input B. The current flow will be approximately 14mA.

An isolated contact is connected in a similar fashion. First jumper pins 2 and 3 together. Then connect pin 4 to one side of the contact and pin 1 to the other side of the contact. Pin 1 on the Model 78 is connected to ground, allowing the current path into the GPI to be completed. Note that pin 1 is connected to the Model 78's chassis, as well as the mains connector ground lead and the power supply commons.

A +5V logic signal is also simple to connect. The + connection of the logic signal would connect to pin 3, the GPI's + input. The - connection of the logic signal would connect to pin 4, the GPI's - input. As the Model 78's GPI input is fully isolated, no ground loops or other issues should arise.

### **Mains Power**

Mains power should be connected according to the details provided in the user guide.

### **Operation**

Upon application of AC mains power, the Model 78 will go through a power-up sequence then begin operation. Depending on the state of the GPI input, input A or input B will be selected. As a confirmation, the data LED will display which input is active. The LED will flash once-per-second

if input A is selected and twice-per-second if input B is selected.

## **Technical Notes**

### **Operating Levels**

The Model 78 Special Version 2 is configured for unity gain, with a +4dBu nominal output level. The input trim potentiometers allow signals with nominal levels of -12dBV to +6dBu to be correctly interfaced. Calibration is very straight forward. Essentially it requires application of a steady signal at the input sources' reference level. Then, while the output channels are monitored, the input trim pots are adjusted to give +4dBu. The procedure listed in the Model 78 User Guide should be reviewed for details.

### **Switching Characteristics**

To meet the requirements of certain audio applications, a special switching characteristic was implemented in software. A soft mute, input change, soft activate sequence allows very smooth transitions between inputs. To highlight this feature consider the situation where input A is active and the GPI indicates that input B is desired. After a 10mSec debounce period, the outputs will fully mute using a soft-mute function. After a 20mSec pause input A is disconnected and input B is selected. Then the output level for all eight channels is again enabled. This "soft" switching is achieved by turning the audio signals off or on only at zero-crossings or when silence is detected.

### **Hardware and Software Modifications**

At the factory, three changes are made to a standard Model 78 Central Controller to become a "Special Version 2." As previously mentioned, the control console output

voltage is modified from +16V to +5V. This is accomplished by changing one resistor on the circuit board. To implement the GPI function one jumper strap is added to pins on the Model 78's circuit board. This routes the signal that normally connected MIDI data to the processor to a pin that can "read" the state of the optical coupler. The third change is the use of a special version of software. This software is loaded into a microcontroller integrated circuit that is installed in a socket on the printed circuit board.

### **Bass Management**

To ensure that the eight channels associated with each input pass through the Model 78 at full bandwidth, the Model 78's bass management section must be disabled. This involves setting eight jumper blocks to the required positions. While this task should have been performed at the factory, it's good to be aware of this situation. For a detailed description, the actual process is described in the main user guide. Essentially the process involves setting seven jumpers to the flat position for the seven main channels: left, right, center, surround left, surround right, back left, and back right. In addition, seven jumpers for the bass management enable positions for the seven main channels must be removed. Finally, the main bass management jumper block must be set to the disabled position.

### **Technical Support**

For questions about the Model 78 Special Version 2 please contact Studio Technologies' technical support via the E-mail link as shown on [www.studio-tech.com](http://www.studio-tech.com).