



Communications Simulator System



Setup and Operation Manual

The information contained in this manual pertains to the following:

CS100 System Hardware Rev. 2
CS100-MU Main Board Firmware Version 01.05
CS100 PC Interface Software Version 1.05

March 11, 2006 – Maverick Recording Multimedia Design

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Introduction

The CS100 Communications Simulator System was designed to meet the specifications established by the U.S. Forest Service San Dimas Technology & Development Center for use with their Fire/Incident Command Simulator. The following Setup and Operation Manual describes the features and functions specific to the CS100 System but does not provide information relating to how the system should be utilized in conjunction with the Fire/Incident Command Simulator or any possible training scenarios. For recommendations in those areas, consult the documentation that was provided with that system or contact your representative from the U.S. Forest Service San Dimas Technology & Development Center.

Support

For additional CS100 support, refer to our web site at

<http://www.blitz-media.com/maverick>

There you can find some additional background sound files and future software updates for download, as well as an Adobe Acrobat PDF version of the CS100 Setup and Operation Manual.

CS100 Communications Simulator – Setup and Operation Manual



CS100 System

CS100 System Description

Although it is possible to configure a CS100 System with less than the full compliment of Remote Units and corresponding Station Module Cards, most systems are generally purchased in their “complete” configuration.

The complete CS100 System includes the following:

1- CS100-MU Main Unit with Station Module cards installed to support up to six remote units and flash memory to support storage of eight different background sounds per remote unit (48 different background sounds total). Includes line level audio output jacks to be connected to an external mixer/amplifier/speaker system (NOT included) for monitoring of channel activity.

5- CS100-RRU Remote Role-Player Units, each capable of selecting one of five transmit/receive channels and controlling eight different background sounds.

1- CS100-RSU Remote Student Unit (Handheld Radio Simulator) capable of selecting one of four transmit channels.

5- 25 ft CAT5E RJ45M patch cables for connecting CS100-RRUs to CS100-MU.

1- 75 ft CAT5E RJ45M patch cable for connecting CS100-RSU to CS100-MU.

1- DB9M to DB9F serial data cable for connecting CS100-MU to a PC.

5- Headsets (1 for each Role-Player Unit).

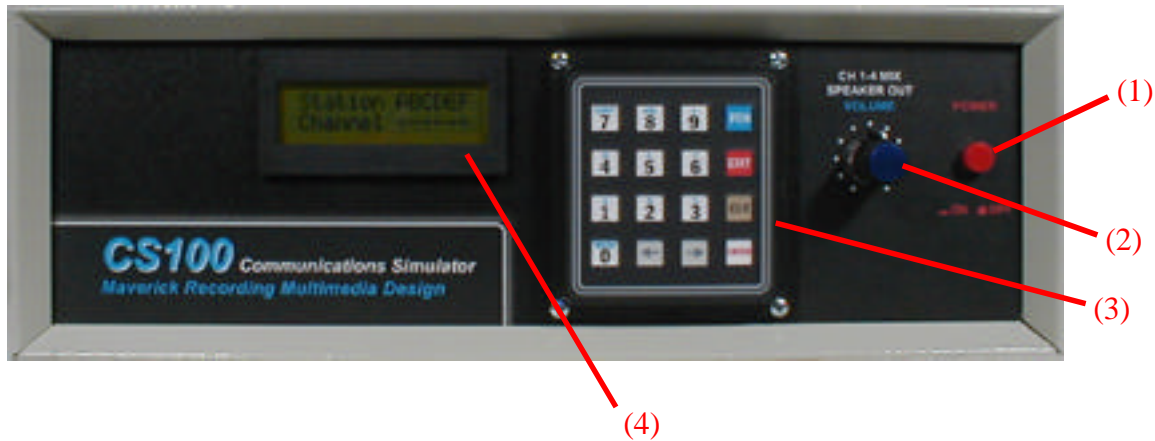
1- CS100-PS Power Supply.

1- CD-ROM with PC software for loading custom background sounds to CS100 from a PC.

1- CS100 “Setup and Operation Manual” (this document).

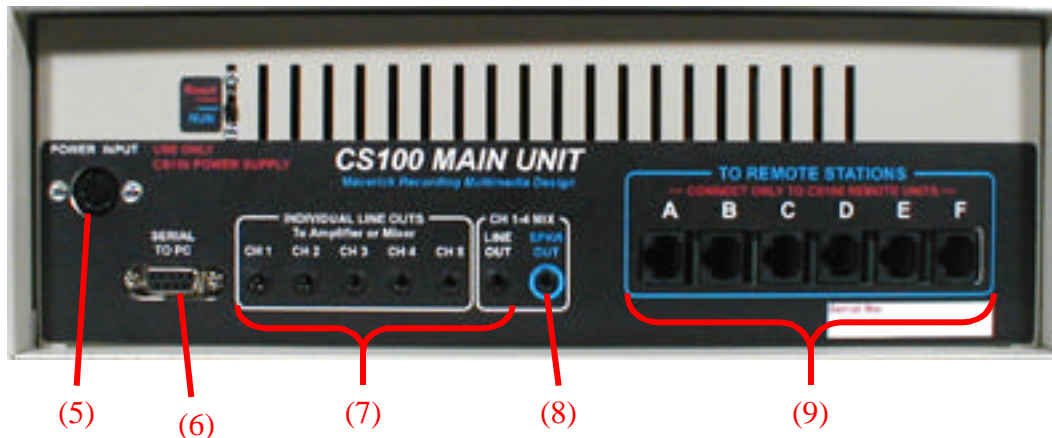
The system ships with a basic set of 8 different sounds (the same 8 sounds are loaded into each of the 6 station module cards) just to get you started. But if you have access to other wav files that you want to use, or if you know how to record and digitize your own sounds into wav files, then you can add whatever sounds you want using the sound loading software provided.

Location of Controls and Connection Jacks



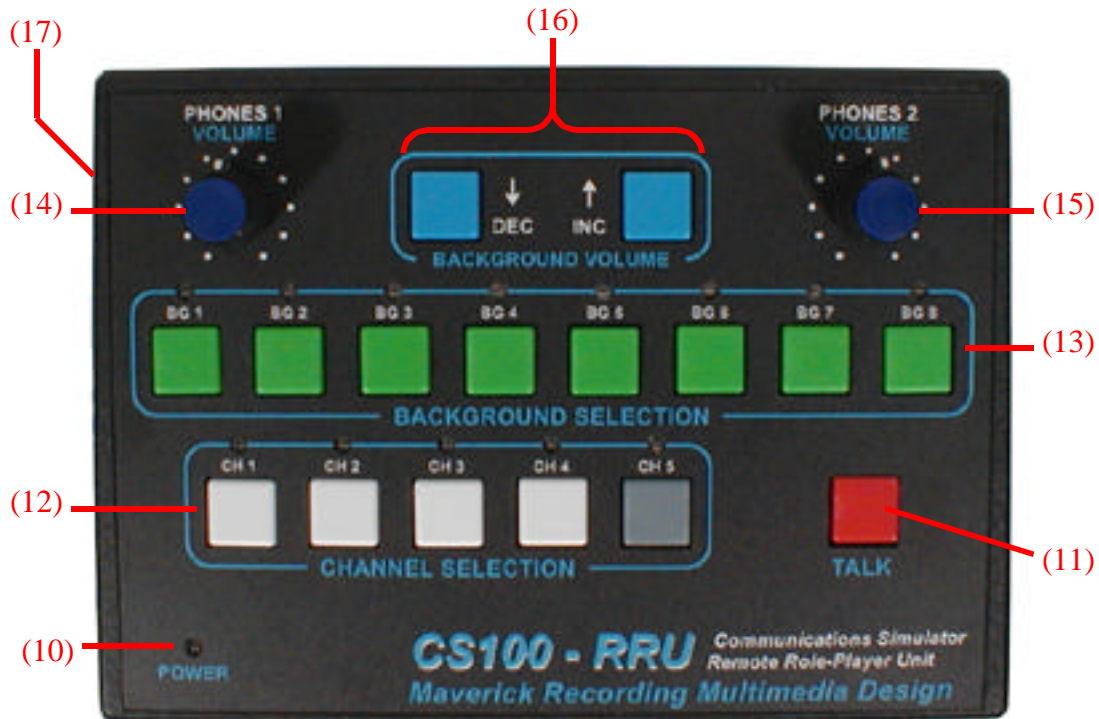
CS100 Main Unit (CS100-MU) Front Panel -

- (1) Power Switch
- (2) Ch 1-4 Mix Speaker Out Volume Control
- (3) Main Unit Keypad
- (4) Main Unit Display



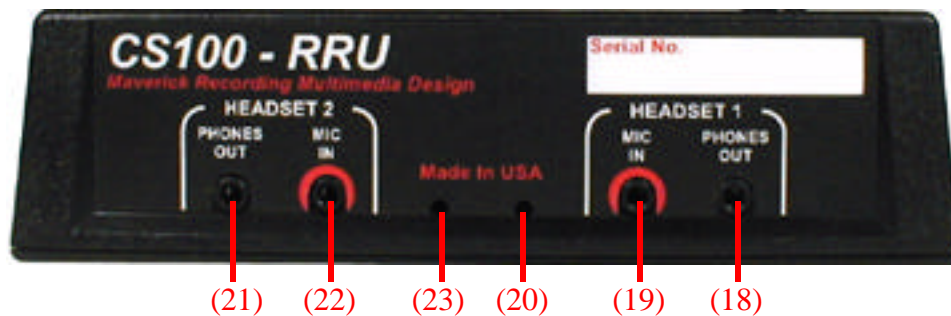
CS100-MU Rear Panel -

- (5) Power Supply Input Connector
- (6) Serial Data to PC Connector
- (7) Line Level Audio Output Jacks (including Ch 1-4 Mix Line Level Output)
- (8) Ch 1-4 Mix Speaker Output Jack
- (9) Remote Station Cat-5e Cable connectors



CS100 Remote Role-Player Unit (CS100-RRU) Top Panel -

- (10) RRU Power-On Indicator
- (11) Push-to-Talk Button
- (12) Channel Selection Buttons
- (13) Background Sound Selection Buttons
- (14) Headset 1 Earphone Volume Adjustment
- (15) Headset 2 Earphone Volume Adjustment
- (16) Background Sound Volume Adjustment
- (17) Cat-5e Cable Connector (to CS100 Main Unit)



CS100-RRU Rear Panel -

- (18) Headset 1 Earphones Output Jack
- (19) Headset 1 Microphone Input Jack
- (20) Headset 1 Microphone Input Volume Trim Adjustment
- (21) Headset 2 Earphones Output Jack
- (22) Headset 2 Microphone Input Jack
- (23) Headset 2 Microphone Input Volume Trim Adjustment



CS100 Remote Student Unit (CS100-RSU) –

- (24) Channel Selection Knob
- (25) Push-to-Talk Button
- (26) Internal Microphone
- (27) Microphone Volume Trim Adjustment
- (28) Cat-5e Cable Connector (to CS100 Main Unit)

CS100 System Setup Guide

The following describes the general system connections, followed by some Main Unit audio output to mixer/amplifier connection suggestions, as well as some initial settings and optional connections.

General System Connections

Power Supply –

- Connect the AC line cord to the CS100-PS power supply.
- Connect the round power supply plug to the Power Input socket on the rear panel of the CS100-MU.
- Plug the AC line cord into an AC outlet.

Remote Station Communication Cables –

IMPORTANT – Only connect the Cat-5e connectors on the CS100-MU to CS100 Remote Units (CS100-RRU or CS100-RSU), and only connect the Cat-5e connectors on CS100 Remote Units to the CS100-MU.

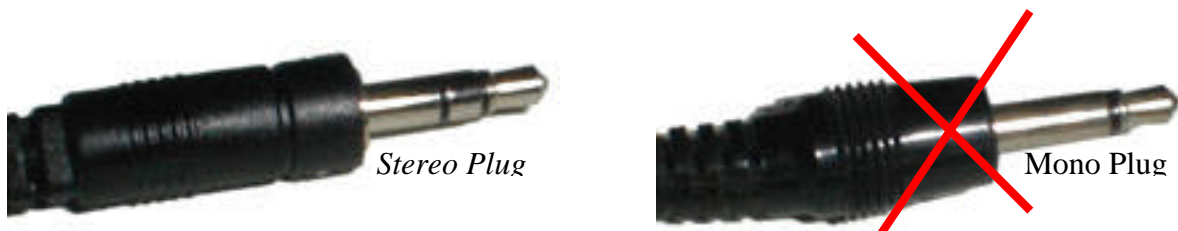
CONNECTING TO ANY OTHER DEVICES MAY DAMAGE THE CS100 SYSTEM AND/OR THE DEVICE CONNECTED TO IT!!!

NOTE: THIS IS NOT AN ETHERNET CONNECTION!!!

- Connect one end of each Cat-5e cable to the Remote Station Connectors labeled A through F on the CS100-MU rear panel. (Note that the longer 75 foot Cat-5e cable provided was intended for use with the handheld Student Unit CS100-RSU.)
- Connect the other end of each Cat-5e cable to the appropriate connector on the CS100 Remote Station. On the CS100-RRU it is located on the left side of the case. On the CS100-RSU it is located on the bottom of the case next to the serial number.
- The choice of which station letter is connected to a handheld “Student Unit” (CS100-RSU) and which are connected to “Role-Player Units” (CS100-RRU) is optional. However, the eight background sounds available to a particular Role-Player Unit are determined by which station letter that unit is connected to at the CS100-MU Main Unit. The Student Units do not have access to background sounds.

Remote Role-Player Headsets –

- Two headset connections are provided on each CS100-RRU “Remote Role-Player Unit” so that each CS100-RRU can be “shared” by two operators. Each operator has a separate control for their headset earphones volume. (Only one headset was provided for each CS100-RRU in the “Complete System” package.)
- The headsets being used with the CS100 should have 1/8” Stereo plugs for the earphones. Mono earphone plugs generally will NOT work with the CS100 system.



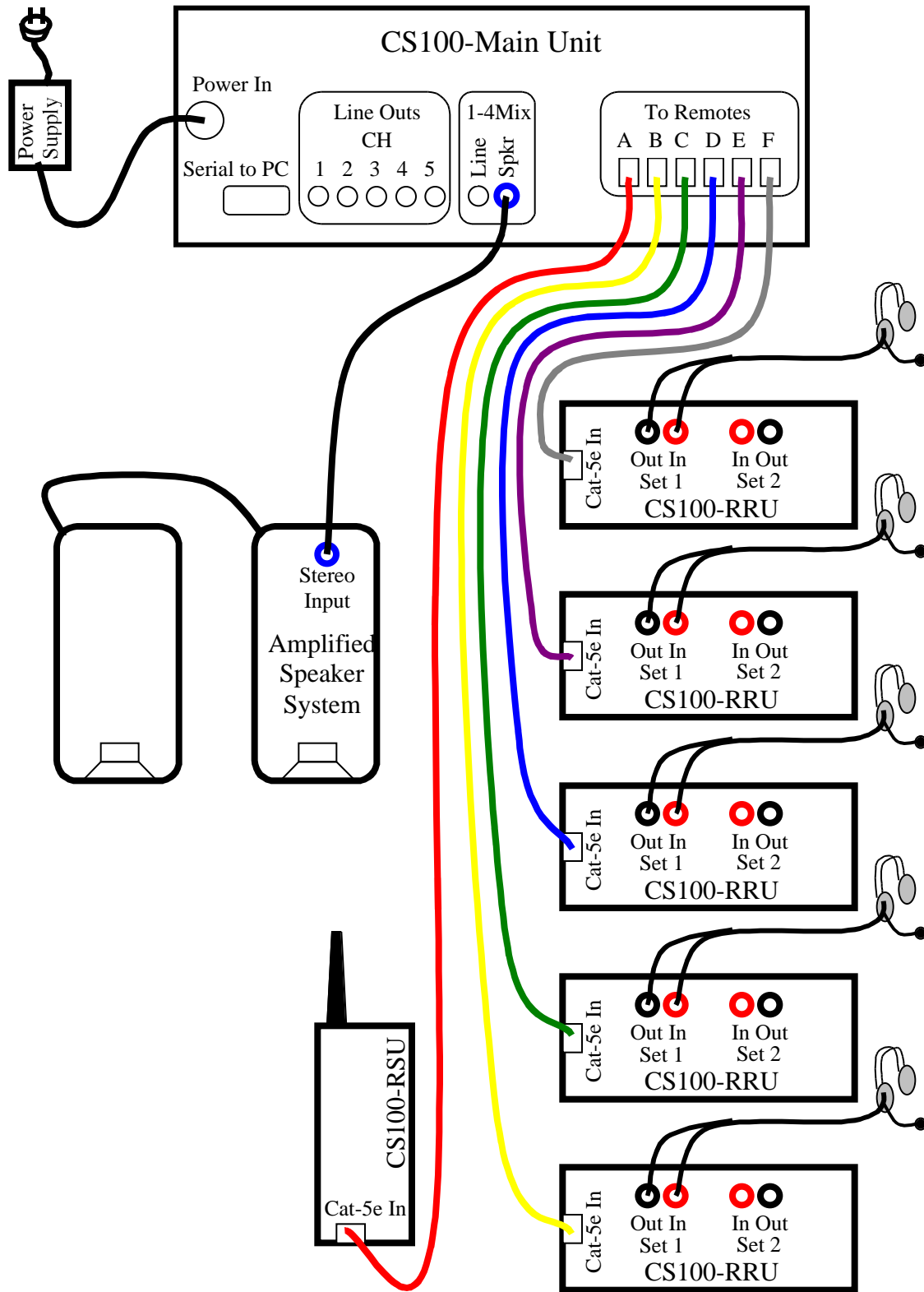
- Connect the headset's microphone plug to the "MIC IN" (Red) socket for either "HEADSET 1" or "HEADSET 2" on the rear panel of the CS100-RRU. Note that the headset's microphone plug may be red or gray (but not always). It may also have a small icon on the plug that looks like a microphone or may have some other indication that it is the microphone plug (it depends on the particular model of headset being used).
- Connect the headset's earphones plug to the "PHONES OUT" (Black) socket for either "HEADSET 1" or "HEADSET 2" on the rear panel of the CS100-RRU. Note that the headset's earphones plug may be black (but not always). It may also have a small icon on the plug that looks like earphones or may have some other indication that it is the earphones plug (again depending on the headset model).

Main Unit Audio Outputs

A number of audio output sockets may be found on the rear panel of the CS100-MU "Main Unit" which provide a variety of options for connecting external audio amplifiers or an audio mixer. The U.S. Forest Service San Dimas Technology & Development Center may have a recommended audio mixer configuration for use with their Fire/Incident Command Simulator and they should be contacted for that information. The following configuration suggestions will work, but may or may not be consistent with the San Dimas recommendations.

Minimum Audio Output Monitoring Configuration -

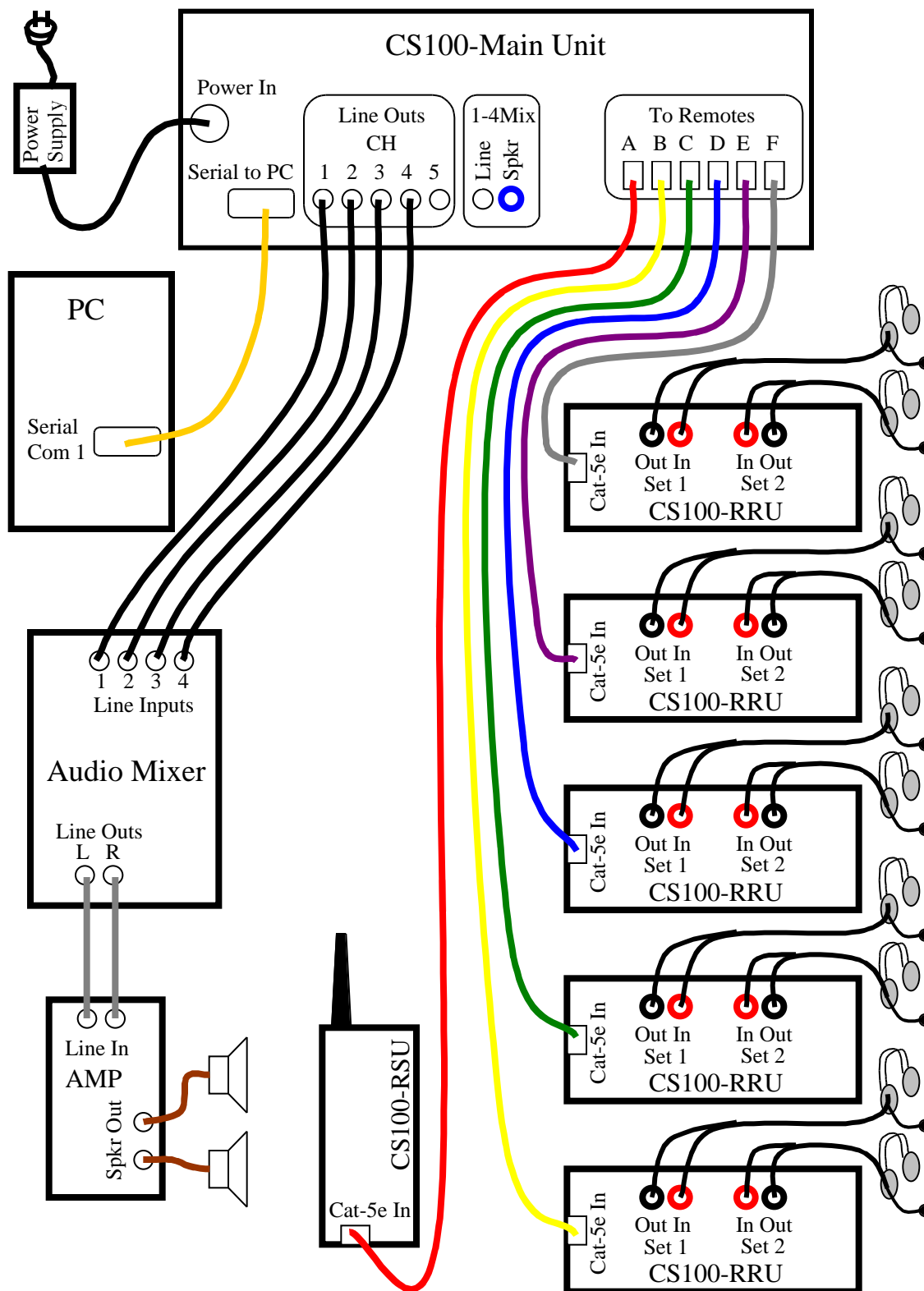
- Connect the "CH 1-4 MIX SPKR OUT" (Blue) socket on the CS100-MU rear panel to a monitor speaker system located within hearing distance of the student(s) using the CS100-RSU handheld unit.
- NOTE: The "SPKR OUT" socket is designed to drive only small speakers (such as headphones), so it is suggested that this signal is either fed through an external pre-amp, or that amplified speakers are used.
- ALSO NOTE: The "SPKR OUT" socket (as well as all the other audio output jacks on the CS100 system) is designed for use with a 1/8" Stereo plug. Mono plugs generally will not work with the CS100 system. If you are attempting to connect any of the CS100 audio outputs to a Mono system, adapter plugs may be used for this purpose (such as Radio Shack's part #274-378, or similar adapters or special cables).
- The output in this configuration is an equal mix of all the traffic on channels 1 through 4. Channel 5 is not heard on this output, and the simulation director does not have separate control over the volume levels of each channel sent to the monitor speakers. However, the overall volume level of this mixed audio output may be controlled with the "CH 1-4 MIX SPEAKER OUT VOLUME" control on the front panel of the CS100-MU.
- Adjusting the monitor speaker system volume levels too high, or placing an active microphone in close proximity to the speakers will result in audio feedback (*squealing* or *howling* sound). Adjust speaker volume levels, equalization (filter or tone controls), and/or microphone placement or orientation to compensate for this. If after attempting to eliminate feedback problems in this manner it is determined that the microphone volume level is too high, a microphone volume trim adjustment is available on the remote unit (see *Microphone Volume Level Adjustment*).



Minimum Audio Output Monitoring Configuration

Configuration for Control of Individual Channel Volume levels –

- Connect the “INDIVIDUAL LINE OUTS” sockets (CH 1, CH 2, CH 3, and CH 4 - also CH 5 if desired) on the CS100-MU rear panel to separate “Line Input” sockets on an audio mixer.
- NOTE: The “LINE OUT” sockets on the CS100-MU are designed to drive “Line Level” inputs commonly available on consumer audio mixers or amplifiers (nominal –10dB, greater than 10K ohms input impedance). These line level signals are NOT designed to drive speakers.
- ALSO NOTE: The “LINE OUT” sockets (as well as all the other audio output jacks on the CS100 system) are designed for use with a 1/8” Stereo plug. Mono plugs generally will not work with the CS100 system. If you are attempting to connect any of the CS100 audio outputs to a Mono system, adapter plugs may be used for this purpose (such as Radio Shack’s part #274-378, or similar adapters or special cables).
- Connect the speaker output signal from the external mixer (or from a separate power amplifier if needed) to the monitor speakers.
- In this configuration, the simulation director can use the external audio mixer to adjust the volume level of the traffic on each channel separately to achieve a desired mix to be heard on the monitor speakers. (The “CH 1-4 MIX SPEAKER OUT VOLUME” control on the front panel of the CS100-MU does NOT control the “LINE OUT” levels).
- Adjusting the monitor speaker system volume levels too high, or placing an active microphone in close proximity to the speakers will result in audio feedback (*squealing* or *howling* sound). Adjust speaker volume levels, equalization (filter or tone controls), and/or microphone placement or orientation to compensate for this. If after attempting to eliminate feedback problems in this manner it is determined that the microphone volume level is too high, a microphone volume trim adjustment is available on the remote unit (see *Microphone Volume Level Adjustment*).
- The “CH 1-4 MIX” LINE OUT and SPKR OUT signals available on the rear panel of the CS100-MU may be optionally used as desired. The LINE OUT socket is a *line level* signal which must be fed to a *line input* on external audio equipment as described above and is NOT controlled by the “CH 1-4 MIX SPEAKER OUT VOLUME” control on the front panel of the CS100-MU. The SPKR OUT socket may be connected to a headset, small speakers, or amplified speaker system as described in the *Minimum Audio Output Monitoring Configuration* above.



Configuration for Control of Individual Channel Output Volumes (plus Optional PC)

Reset / RUN Switch



The small “Reset / RUN” slide switch located on the rear panel of the CS100-MU Main Unit must be in the “RUN” (down) position for normal operation.

Microphone Volume Level Adjustment

For Role-Player Units -

The Remote Role-Player Units are pre-adjusted at the factory to a nominal level for the headset make and model that ships with the unit, so when using those headsets no adjustment should be required. Because various headset makes and models have varying microphone sensitivity levels, it may be necessary to adjust the microphone input level trim on the RRU when using other (non-supplied) headsets with the unit.



RRU Mic Input Volume Trim Adjuster

To adjust the RRU microphone input volume trim:

- Insert a trimpot adjusting tool or a small thin-blade screwdriver into one of the small trimpot adjusting holes located on the rear panel of the CS100-RRU under the “Made In USA” printing and next to the corresponding “MIC IN” socket (the hole under “USA” is for adjusting MIC 1, and the hole under “Made” is for adjusting MIC 2).
- When the adjusting tool touches something, gently rotate it to the left or right (you should feel the blade drop into a slot on the trimpot). The full range of rotation of the trimpot is a little less than one full turn and there are stops at each end of the rotation, so if you don’t feel these stops then you may not have the adjustment tool in the trimpot slot. Do NOT force the trimpot rotation past the stops. Note that the pot may only rotate in one direction if it is already up against one of its stops.
- With the desired headset plugged into the appropriate socket and the speaker output volume adjusted to a nominal level, hold down the “TALK” button on the RRU and speak at a normal level while adjusting the microphone trimpot. Turn the trimpot counter-clockwise to increase the microphone volume and clockwise to decrease it.

For Handheld Student Unit –

The Handheld Student Unit's microphone volume level is pre-adjusted at the factory to a nominal level for use in most common situations, so generally no adjustment should be required. If feedback from the Remote Student Unit's active microphone occurs, adjust speaker output volume levels, equalization (filter or tone controls), and/or microphone placement or orientation to compensate for this. In certain unique situations it may be necessary to adjust the microphone level trim on the RSU when an unacceptable amount of feedback occurs and other methods of eliminating the problem have been exhausted.

To adjust the RRU microphone input volume trim:

- Insert a trimpot adjusting tool or a small thin-blade screwdriver into the small trimpot adjusting hole located in the middle of the left side of the CS100-RSU (the same side as the Push-To-Talk button).
- When the adjusting tool touches something, gently rotate it to the left or right (you should feel the blade drop into a slot on the trimpot). The full range of rotation of the trimpot is a little less than one full turn and there are stops at each end of the rotation, so if you don't feel these stops then you may not have the adjustment tool in the trimpot slot. Do **NOT** force the trimpot rotation past the stops. Note that the pot may only rotate in one direction if it is already up against one of its stops.

With the speaker output volume adjusted to a nominal level, hold down the Push-To-Talk button on the RSU and speak at a normal level and standard distance from the microphone while adjusting the microphone trimpot. Turn the trimpot counter-clockwise to increase the microphone volume and clockwise to decrease it.

Serial Data Connection to PC

In normal operation, the CS100 Communications Simulator functions as a “stand-alone” system and a PC connection is not required. Background sounds that already reside in the CS100 may be copied from one location to another using the keypad and display located on the front panel of the CS100 Main Unit (see *Copying Background Sounds*). If it is desired to add a new sound to the CS100, then a serial data connection between the CS100 Main Unit and an external PC is required. Once this connection is made and the CS100PC Interface Software has been installed on your PC, new background sounds may be loaded to the CS100 from the PC. See the section on loading background sounds elsewhere in this manual.

To connect a PC to the CS100:

- To avoid serial data glitches during connection, turn off the power on both the PC and the CS100.
- Connect one end of the serial data cable (provided) to the SERIAL TO PC connection on the rear panel of the CS100 Main Unit.
- Connect the other end of the serial data cable to the COM1 serial port on the PC. Note that the current version of the CS100PC Interface Software will only work on the COM1 port and will **NOT** work on the COM2 port, or any port other than COM1.

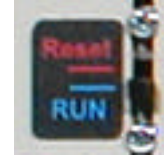
CS100 General Operation

The CS100 Main Unit

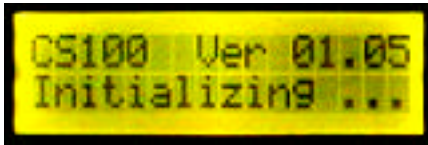


Powering-Up the System -

- Check that the “Reset / RUN” switch located on the rear panel of the CS100 Main Unit is in the “RUN” (down) position.



- Turn on the CS100 by pushing the red “POWER” button located on the front panel of the CS100 Main Unit.



- You will hear a beep and the display on the Main Unit will light up and display the initialization message for about five seconds. Also during this initialization period, the amber POWER LED will light on any connected Remote Role-Player Units, and the green and red LEDs will display a scanning sequence to indicate that the unit is being initialized.



- When initialization is complete, the Main Unit display will be in the Station/Channel “Status” mode, and the LEDs on the Role-Player Units will stop on BG 1 and CH 1. The system is now ready for use.

Station/Channel “Status” Mode -

During normal operation, the display on the CS100 Main Unit should be in the Station/Channel “Status” mode. In this mode, the display indicates which stations are functioning and the channel each station is currently switched to.



- The station letter for each functioning station is displayed across the top line.
- The channel number that each station is currently set to is displayed across the bottom line under the corresponding station letter.
- An “Inverse” channel number indicates that the corresponding station is currently transmitting (the “Talk” button is being held down) as shown for Station “E” above.
- An “X” in a channel position indicates that the corresponding station is switched to an “invalid” channel (such as a handheld Student Unit switched to a channel other than channels 1 through 4).
- A “dash” (-) in the channel position indicates that the Main Unit does not see a Remote Unit connected for the corresponding station letter. Either there is no Remote Unit connected there, or the connection is bad, or there is some other communication problem between the indicated Remote Unit and the Main Unit.

- In a “complete” six-station system, station letters A through F should be shown on the top line. Any missing station letter on the top line indicates that the station’s module card is either not installed in the Main Unit, or is not functioning properly. If your CS100 system is not a “complete” system, then only the station letters for installed module cards will be displayed.
- If the system is in a mode other than the Station/Channel “Status” mode and you wish to return to the Status mode, use the “EXIT” key on the Main Unit Keypad to get back to the Status mode. Note that this will NOT work if the display is indicating “PC is in CONTROL” (this occurs when using a PC to load new background sounds).

CH 1-4 Mix Speaker Out Volume Control –

If the “CH 1-4 MIX SPKR OUT” (Blue) socket on the CS100 Main Unit rear panel is connected to an output device, the “CH 1-4 MIX SPEAKER OUT VOLUME” knob on the front panel of the Main Unit may be used to control the volume level of the audio signal being sent to that device.



Keypad –

The keypad on the CS100 Main Unit is used for copying background sounds and for background volume level saving operations which are discussed elsewhere in this manual. Utilization of the Main Unit keypad is not required during general operation.

The CS100 Remote Role-Player Unit

The CS100 Remote Role-Player Unit (RRU) is used by “role-players” in the simulation scenario. Each RRU is designed to support two role-players with separate headsets while sharing the same controls. A role-player can operate on any of the five channels and can select from any of the eight background sounds available to their particular station.



Power LED –

Power is fed to the RRU from the Main Unit through the Cat-5e cable connection. The amber “POWER” LED near the lower left corner of the RRU top panel will light to indicate that the unit is receiving power from the Main Unit.

Talk Button –

- Press and hold the red “TALK” button to transmit on the currently selected channel.
- Release the TALK button to stop transmitting.
- Note that the system functions in a “full-duplex” mode. Operators will still be able to hear other traffic on their channel while they are transmitting, and more than one operator may transmit on the same channel simultaneously.
- Operators will hear their own voice in their headset while they transmit, which helps them to determine how well their speech and background sound levels fit with the overall mix.

Channel Selection –

- The RRU initially selects channel 1 when power is first applied.
- Press one of the Channel Selection buttons (CH 1 through CH 5) to switch to a desired channel.
- The red LED above a channel button indicates the currently selected channel.
- Any traffic occurring on the currently selected channel will be heard through the RRU headphones. In addition, any traffic on channel 5 will be heard in the headphones regardless of which channel is currently selected on the RRU (see information on channel 5 below).

Channel 5 –

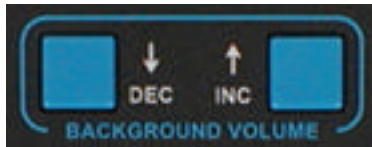
The function of channel 5 is implemented as per San Dimas Technology & Development Center specifications. The CH 5 selection button is gray instead of white to indicate its unique implementation.

- Channel 5 is reserved for use by role-players only – it is not available on the handheld Student Station.
- Any transmissions on channel 5 will be heard at all role-player stations – regardless of which channel they are currently switched to. However, other role-players must be switched to channel 5 in order to be heard by a role-player on channel 5 (only other traffic on channel 5 can be heard by a role-player switched to channel 5).
- No background sounds can be selected by a role-player with channel 5 selected.

Background Selection –

- The RRU initially selects background 1 when power is first applied.
- Press one of the Background Selection buttons (BG1 through BG 8) to switch to a desired background sound.
- The green LED above a background button indicates the currently selected background sound.
- A selected background sound is only heard when the TALK button is pressed.
- Each channel selection on a RRU is automatically “linked” to the most recently selected background sound on that channel. Therefore, if an operator goes to a different channel and selects a different background sound, the previously selected background sound will be restored upon returning to the original channel.
- When power is first applied, the RRU initially links CH 1 to BG 1, CH 2 to BG 2, CH 3 to BG 3, and CH 4 to BG 4. The operator may change these links at any time by simply selecting different background sounds.
- More than one channel may be linked to the same background sound.
- No background sound can be selected when switched to channel 5.
- If it is desired to have other channels with no background sounds on them, simply adjust the volume of the sound selected for that channel to its minimum (which is silent).

Background Volume –



Background sound volume levels may be adjusted by the role-player at the RRU in order to obtain the desired mix between their own voice and a selected background sound.

- The background sound volume levels are set to their most recently “Saved Volume” levels when power is first applied (see *Saving Background Sound Volume Levels*).
- To adjust a background volume, select the background sound to be adjusted, then use the Background Volume DEC or INC button to decrease or increase the volume. Note that in order to hear the sound while it is being adjusted, the TALK button must be pressed.
- Tapping the DEC or INC button will adjust the volume in steps. Holding down the DEC or INC button will make a continuous adjustment.
- Background sound volume levels are adjusted independent of each other.
- The current volume level setting for each background sound is maintained with that sound, so if another sound is selected, then later the original sound is returned to, it will still be set to the volume level it was left at and will not require resetting.
- If it is desired to have a channel with NO background sound on it, simply adjust the volume of the sound selected for that channel to its minimum (which is silent).
- When power is turned off, any background sound volume level settings that have not been saved will be lost (see *Saving Background Sound Volume Levels*).

Phones Volume –

The two Phones Volume adjustment knobs (PHONES 1 and PHONES 2 VOLUME) may be used to adjust the headphone volume for the audio being fed to headset plugged into the corresponding PHONES OUT socket on the back of the RRU. They may be adjusted independently to a comfortable listening level in each operator’s headphones.

The CS100 Handheld Remote Student Unit



The CS100 Handheld Remote Student Unit (RSU) is used by the “student” in the simulation scenario. As per San Dimas Technology & Development Center specifications, the RSU only transmits the student’s voice with no background sounds and does not receive any audio (there is no speaker in the RSU). Any sound that the student hears is determined by what is being sent to the monitor speakers in the room. The simulation director controls the audio mix as it is fed from the CS100 Main Unit to the room monitors.

RSU Channel Selection Knob –

- The RSU Channel Selection Knob is located on the top panel of the RSU.
- To select a channel, rotate the Channel Selection Knob until the knob pointer aligns with the desired channel number.
- Only channels 1 through 4 are available for use from the RSU. Channels 5 and above are invalid and no transmission will occur if these channels are selected (an “X” will be displayed on the “Status” display of the CS100 Main Unit).

RSU Push-to-Talk Button –

- The RSU Push-to-Talk button is located on the left side of the RSU case.
- Press and hold the Push-to-Talk button to transmit on the currently selected channel.
- Release the Push-to-Talk button to stop transmitting.
- If excessive feedback occurs while transmitting, see the *Microphone Volume Level Adjustment* section of this manual.
- More than one operator can be transmitting on the same channel simultaneously.

RSU Microphone -

- The RSU microphone is located near the top of the front panel of the RSU (the small holes to the right of the “CS100-RSU” text on the front label).
- Hold the RSU microphone a few inches from your mouth and speak clearly at a moderate volume level.
- Try to avoid blowing directly into the microphone as this produces undesirable noise and distortion. Speaking across the microphone rather than straight into the microphone may help alleviate these problems.

CS100 Main Unit Keypad Functions

The CS100 Main Unit keypad may be used to access background volume level saving options, and background sound copying capabilities. The keypad is designed with additional future capabilities in mind so some of the keypad features are not yet implemented.



General Key Descriptions

The following describes some of the general functions of the CS100 keypad keys.

FCN Key -

A number of the keys on the CS100 keypad have dual functions. The blue FCN key may be used to activate a key's second function (indicated in small blue text above a key's main function) by hitting the FCN key just prior to hitting the key with the desired second function. In most situations, hitting the FCN key prior to accessing a key's second function is NOT necessary because the CS100 software can determine the correct function based on the context in which the key is being used. For example, when the display is in the Station/Channel "Status" mode the only valid keypad options are "COPY", "VOL", and "MENU" so just pressing the "7" key without the FCN key in this case will still select "COPY" ("8" will select "VOL" and "0" will select "MENU"). As another example, when entering a station letter during "Copy" mode the only valid entries are "A" through "F" so no FCN key is required before hitting those keys in that situation. Note that using the FCN key in these cases is optional – it will work the same with or without it.

EXIT Key –

The red EXIT key is used to exit from or quit the current keypad operation. Repeatedly pressing the EXIT key will eventually return the display to the Station/Channel "Status" mode.

CLR Key –

The CLR key is generally used to clear an entered value.

ENTER Key –

The ENTER key is generally used to either select a current menu option, initiate an action, or enter previously typed data.

Arrow Keys –

The left and right pointing arrow keys are generally used to either scroll through menu options, or to move the cursor while entering data in order to edit a value.

MENU Key (FCN-0) –

The MENU key is used to access various options in the CS100 Menu. In the menu mode you can scroll through the menu options using the Arrow keys, then select an option using the ENTER key. The Menu feature is mainly intended for future expansion, so there is really no reason to use

it at this time. The only menu options currently available are “Copy BG Sound”, “Volume Settings”, and “Diagnostics”. Since the “Copy” option and the “Volume” option are directly accessible with the FCN-7 and FCN-8 keys, it is quicker to get to those options that way. The “Diagnostics” option is for use by CS100 factory service technicians only and is password protected.

COPY Key (FCN-7) –

The COPY key is used to initiate the “Copy” option, which allows you to “clone” an existing background sound or groups of sounds from one CS100 location to another. See *Copying Background Sounds* for details.

VOL Key (FCN-8) –

The VOL key is used to initiate the “Volume Settings” option, which allows you to access various features relating to the background sound volume level settings. See *Saving Background Sound Volume Levels* for details.

Asterisk (*) Key (FCN-9) –

The Asterisk key is generally used for “wild card” entries (the same as saying “all valid values”). For example, an entry of “Copy BG Sound From: A* To: B*” will copy A1 to B1, A2 to B2, A3 to B3, A4 to B4, A5 to B5, A6 to B6, A7 to B7, and A8 to B8.

Saving Background Sound Volume Levels

The “Current” volume level setting for a background sound is whatever level the sound is currently set to. The “Current” volume setting for each background sound is maintained in RAM in the CS100 system. Since any information in RAM is erased when power is turned off, any adjustments made to background sound levels by Role-Player Units will be lost if they are not saved before powering down. When volume levels are saved, the “Current” volume settings are copied from RAM to the “Saved” volume settings in non-volatile FLASH memory so they won’t be lost when power is removed. When the CS100 system is powered up, the “Current” volume settings are set to the most recently “Saved” background volume settings.

To access the “Volume Settings” options, use the VOL key (FCN-8, or you can just hit “8” from the Station/Channel “Status” mode). You will then have the following options, which you can scroll through with the Arrow keys.

Save Volumes? –



- Pressing ENTER for this option will save the “Current” volume level settings from RAM into FLASH memory so they won’t be lost when power is turned off.
- After saving volumes, the previously saved volume settings are replaced and are no longer available.
- When the operation is complete, a beep will sound and the message “Saving Volumes SUCCESSFUL” will appear on the display for a few seconds before returning to the Station/Channel “Status” mode.

Rstr Saved Vols? –



- Pressing ENTER for this option will restore the “Current” volume level settings to the most recently “Saved” settings.
- This option might be used in a case where RRU operators have adjusted their background volumes to some unwanted settings and it is desired to return to the previously saved settings. (Selecting this option has the same effect as turning power off then back on again).
- When the operation is complete, a beep will sound and the message “Restoring Saved SUCCESSFUL” will appear on the display for a few seconds before returning to the Station/Channel “Status” mode.

Rstr Deflt Vols? –



When a background sound is first loaded into the CS100 system from a PC, a “Default Volume” setting is assigned to it (see *Loading Background Sounds*). This is usually a setting that the person loading the sound had determined to be a nominal volume level for that

particular sound. The default volume setting is stored with the sound when it is loaded into FLASH memory, and it is copied with the sound when it is cloned to another background sound location in the CS100.

- Pressing ENTER for this option will restore the “Current” volume level settings to the “Default Volume” settings that were stored with each sound when it was first loaded to the CS100 from a PC.
- When the operation is complete, a beep will sound and the message “Restoring Deflt SUCCESSFUL” will appear on the display for a few seconds before returning to the Station/Channel “Status” mode.

Dfrg Saved Vols? –



Each time background volume level settings are saved into FLASH memory using the “Save Volumes” option discussed earlier, the previously saved volume settings are no longer available but they still occupy space in the FLASH memory. After numerous saves, you may notice

a slow-down in the volume saving operations due to the way in which the software has to search through the FLASH memory for the most recently saved values. In such cases, it may be necessary to “defragment” the saved volumes memory. It may also be necessary to choose this option to correct other problems that may require the re-initialization of the FLASH memory segment containing the saved volume settings.

- There is no reason to use this option unless you are noticing a problem as discussed above.
- Pressing ENTER for this option will “defragment” the “Saved Volumes” section of the FLASH memory and reinitialize that segment.
- When the operation is complete, a beep will sound and the message “Defragging Vols SUCCESSFUL” will appear on the display for a few seconds before returning to the Station/Channel “Status” mode.

Copying Background Sounds

The COPY function on the CS100 Main Unit keypad allows for copying (or “cloning”) of background sounds within the CS100 system. If a sound already resides in the CS100, no connection to an external PC is necessary for copying the sound to another location. This operation can be done “stand-alone” using the CS100 keypad COPY function. Using the COPY function is faster and more efficient than loading a sound from the PC to multiple locations. The COPY function also allows for copying “sets” of sounds from one group of locations to another by using the “wild card” feature. This can help streamline the process of cloning the entire set of sounds on one station to another station, or even to all the other stations.



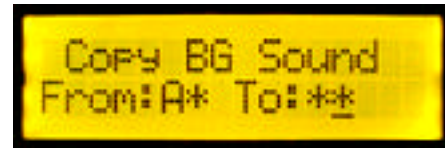
Standard Copying (single sound) -

- To access the Copy function from the Station/Channel “Status” display window, press the COPY key on the keypad. Note that you can just hit the “7” key and do not need to enter the FCN key first.
- In the “Copy BG Sound” display screen that appears, the cursor (underline) begins in the first position after “From:” awaiting a station letter entry. The “station letter” refers to the labeled Cat-5e connections on the back of the CS100 Main Unit and the corresponding Remote Unit it is connected to. Enter the station letter (A through F) for whichever station your source sound currently resides on. Note that you can just hit the key with the corresponding letter on it and do not need to use the FCN key first.
- At the second cursor position enter the background sound number (1 through 8) for your existing source sound. The background sound number refers to the location corresponding to the buttons labeled BG 1 through BG 8 on a Remote Role-Player Unit.
- The cursor now moves to the first position after “To:” in the “Copy BG Sound” display awaiting a station letter entry. Enter the station letter for the destination station that you want the sound copied to. Note again that you do not need to use the FCN key here, just hit the key with the corresponding letter.
- At the next cursor position, enter the destination background sound number that you want your sound copied to.
- Once you have entered your source and destination information, hit the ENTER key to begin copying.
- Note that you cannot copy a sound to background number 8 that is longer than 8 seconds in length (this limitation for background 8 is due to FLASH memory allocation restrictions). If you try to copy a sound longer than 8 seconds to any BG 8 storage location, you will receive an error message and the copy will not proceed.
- When a valid copy has been initiated, the display will read “Cpyng BG Sound” and a progress bar will indicate the progress. When finished, the display will show “Successful Copy”.
- Hit the EXIT key to leave the Copy function, or use the CLR key to clear out your source and destination information for a new entry.



Wild Card Copying (cloning sets of sounds) –

- To make multiple copies of a sound or to copy a set of sounds, follow the procedure outlined above for “Standard Copying” but utilize the “Wild Card” character (Asterisk) in your entries. You can just hit the “9” key to enter an Asterisk – you do not need to enter the FCN key first.
- The Wild Card character will be interpreted as meaning “all valid values”.
- An entry such as “From: A* To: B*” will copy A1 to B1, A2 to B2, A3 to B3, A4 to B4, A5 to B5, A6 to B6, A7 to B7, and A8 to B8 (the entire sound set from A is cloned to B in the same numbered order).
- An entry such as “From: A* To: **” (as in the example picture above) will clone the entire sound set from A to all the other stations.



- Note that you may have to wait quite awhile for Wild Card copying operations to complete. The display will indicate which sound it is currently copying and the progress for that sound individually. When finished, the display will show “Successful Copy”.
- Hit the EXIT key to leave the Copy function, or use the CLR key to clear out your source and destination information for a new entry.

CS100 PC Interface Software

The CS100PC software is used to load new “Background Sounds” to the *CS100 Communications Simulator System*. The CS100 comes pre-loaded with a basic set of sounds and will operate “stand-alone” without the need for a connected PC or this software. The CS100PC software and PC connection are only required when it is desired to add a new different sound to the CS100. If the desired sound already exists in the CS100 but is just in the wrong storage location, it can be copied to the desired location by simply using the COPY function on the CS100 Main Unit keypad (see *Copying Background Sounds*).

Installation Instructions

- Insert the CD into the drive.
- Click **Start** on the task bar then select **Run**.
- Type **D:\setup** (or E:\setup, or whatever letter corresponds to your CD-ROM drive) then press **OK**.
- The installation Wizard will guide you through the simple installation process.
- In addition to installing the CS100PC program, the installation wizard will create a folder in your **My Documents** folder called **CS100SndLib**, which is where the library of background sound **wav** files should be stored. A selection of sample sound files (already in the proper format for the CS100) has been included in the **CS100SndLib** folder, and it is suggested that you store any CS100 sound files that you create or obtain in the future into that same folder.
- The CD also contains an Adobe Acrobat version of the *CS100 Setup and Operation Manual*. Navigate to your CD-ROM drive in My Computer, open it up, and locate the file **cs100man.pdf**, which you can either open on the CD or copy to your hard drive for future reference.
- When the installation is complete, you may eject the CD and start using the CS100PC program by clicking the **CS100PC** shortcut that was created on your desktop.
- You may also run the program by clicking **Start** on the task bar then selecting **Programs** and finding the **CS100** directory in the Programs list. In this directory you will find the **CS100PC** shortcut, along with the **ReadMe** file and the CS100PC **Uninstaller**.

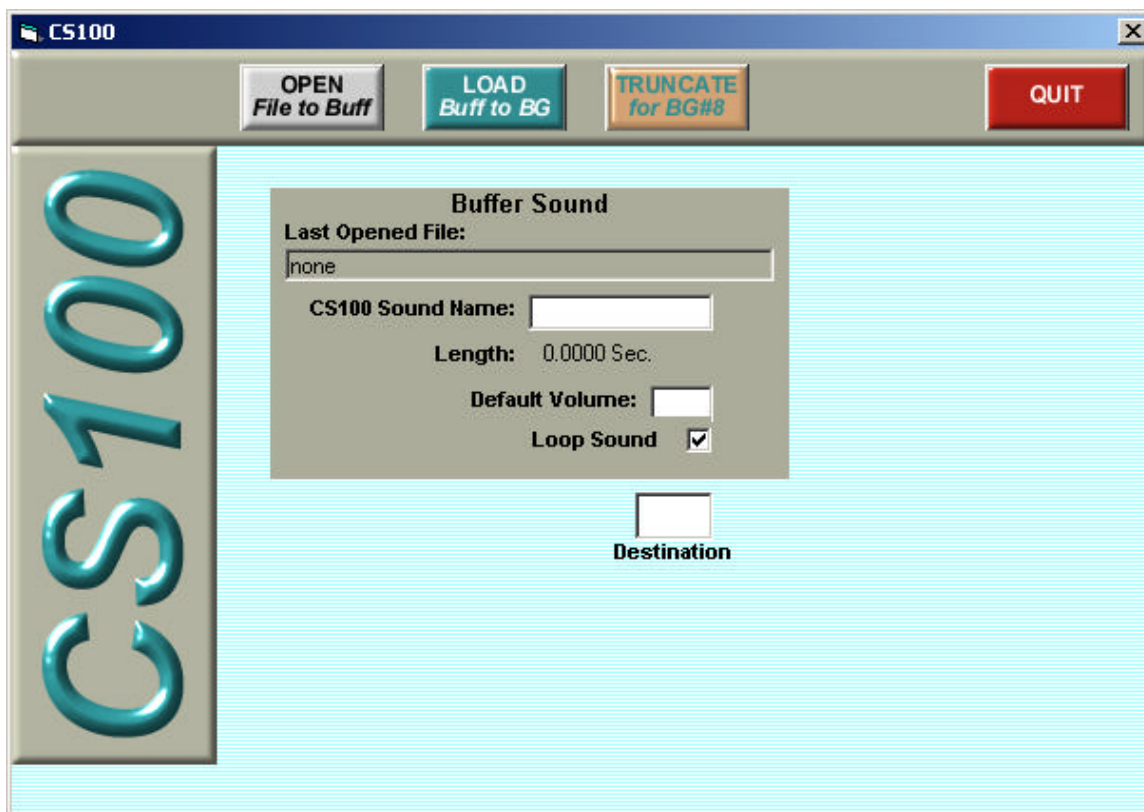
Loading Background Sounds

Before Running the CS100PC Software -

- Install the CS100PC software from the CD (see *Installation Instructions*).
- Connect the CS100 serial data connection to the PC. Note that you **must** use the COM1 serial port on the PC (see *Serial Data Connection to PC*).
- Turn on the PC.
- Turn on the CS100 (see *Powering-Up the System*).

Running the CS100PC Software –

Start using the CS100PC program by clicking the **CS100PC** shortcut that was created on your desktop. The screen will look as follows:



This program only transports properly formatted sounds into the memory of the CS100 Communications Simulator. All formatting of the sounds must be done outside of this program. If the sound to be loaded into the CS100 Communications Simulator is the wrong type or has the wrong settings, you will receive an error message and be returned to the opening screen after selecting OK from the error message (see *Creating a Sound File for the CS100* for instructions on creating a sound file).

Button Descriptions -



Open File to Buffer. This button is used to open a wav file into the CS100PC buffer for loading into the CS100 Communications Simulator.



Load Buffer to Background location. This button is used to load the wav file from the CS100PC buffer to the CS100 Communications Simulator.



Truncate sound for Background location #8. This button is used to truncate the wav file length to 8 seconds for use in one of the Background number 8 storage positions since the maximum length for a sound in BG 8 is 8 seconds (all other locations can handle up to 16 seconds).



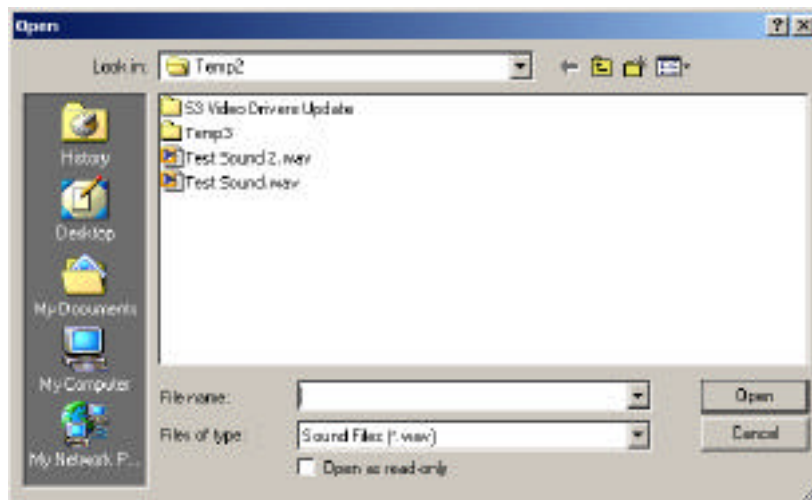
This button is used to quit the program.

Using the Software -

Once the program is opened and your sounds have been formatted to the appropriate settings as described in *Creating a Sound File for the CS100* , simply select the Open File to Buffer button.

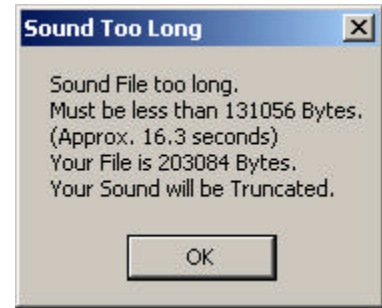


This causes the following dialog box to appear. (Note: The default location and files indicated may be different on your computer.)

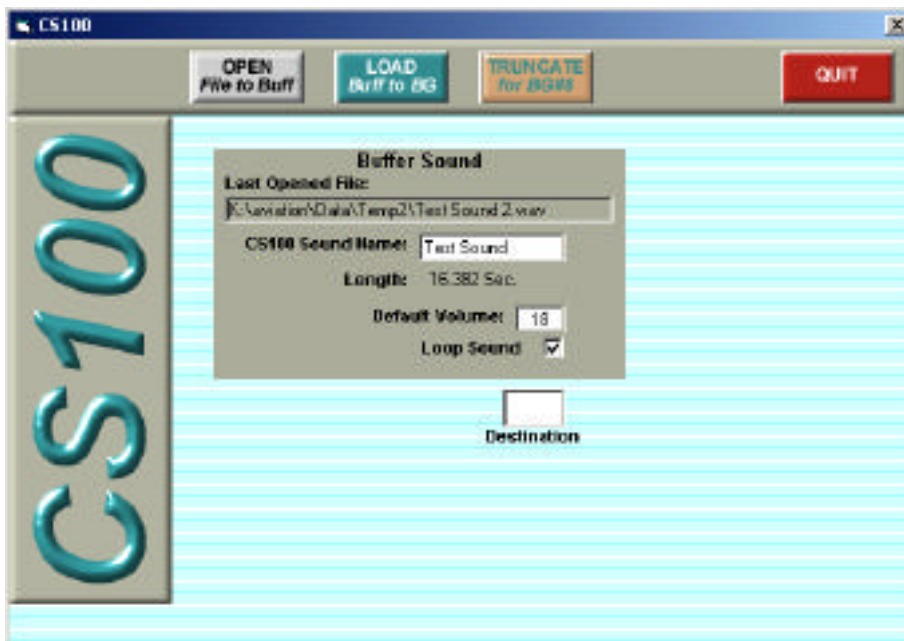


Using this dialog box, navigate to the file you want to load and select it (only one file can be loaded at a time). If you are using the folder created for you when you installed the CS100PC software, your sound files should be located in the **CS100SndLib** folder that was placed in your **My Documents** folder.

If the file you selected is longer than 16.3 seconds you will see this warning. Simply click OK and proceed to back to the main screen of the program.

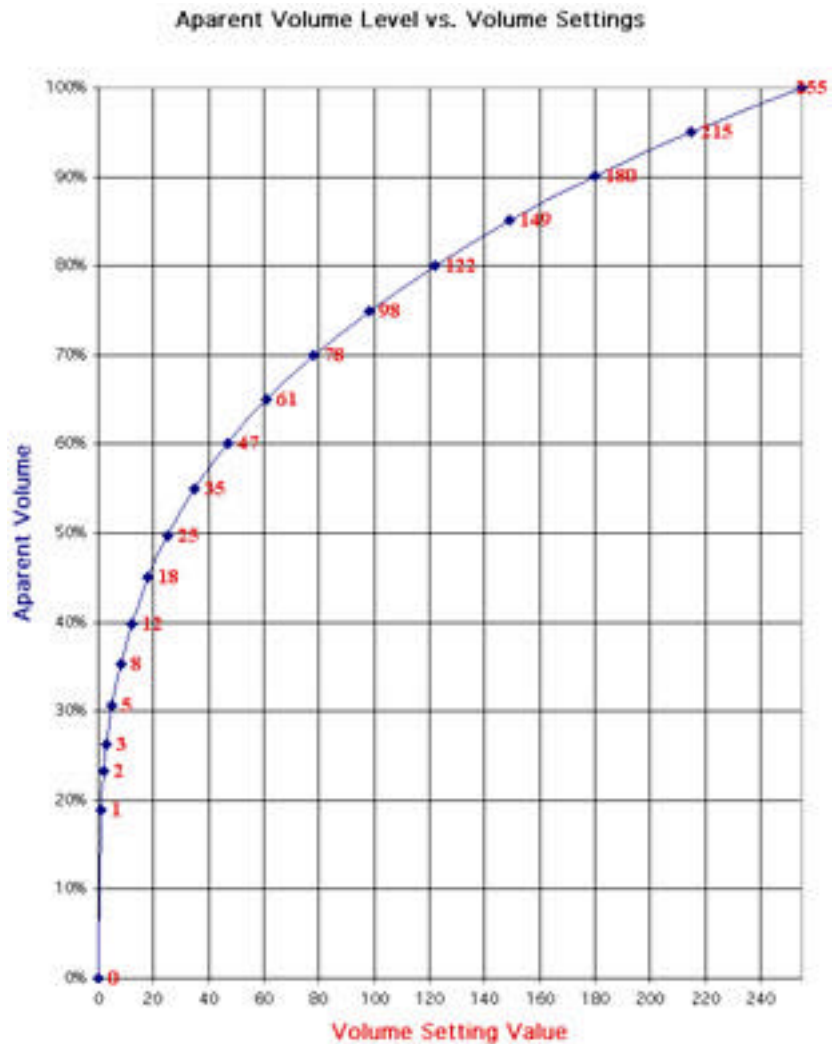


You will notice that the information in the **Buffer Sound** block of the program is filled in.

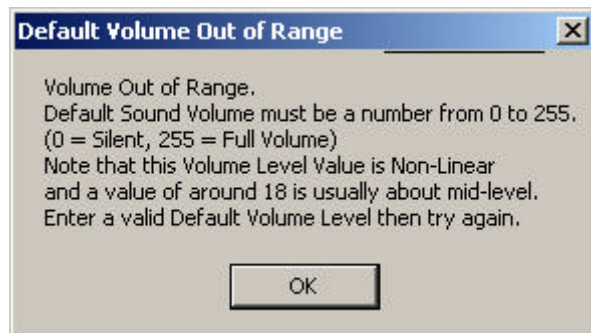


The **CS100 Sound Name** box contains a name that will be saved with your sound when it is loaded into the CS100. This name is not utilized in the current version of the CS100 software so you don't need to worry about it. The name is limited to 10 characters maximum. By default it uses the first 10 characters of your sound's filename, but you have the option to change this name if you like.

The **Default Volume** is a nominal volume level setting for the sound you are about to install into the communication simulator. The value can range from 0 to 255. Since this value actually relates to the *amplitude* of the sound wave, and the relationship between amplitude and apparent *volume* is logarithmic, the scale for values entered in the Default Volume setting is non-linear. If you are uncertain what value to put here use 18, which is about mid-range.



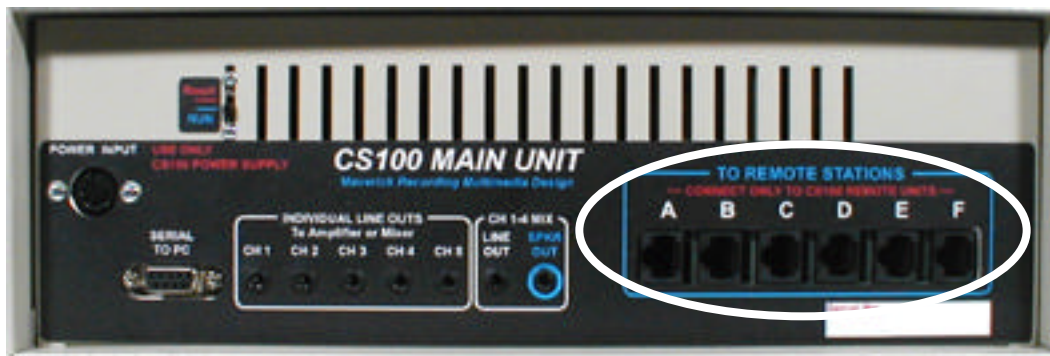
If you specify a value out of range you will receive the following message:



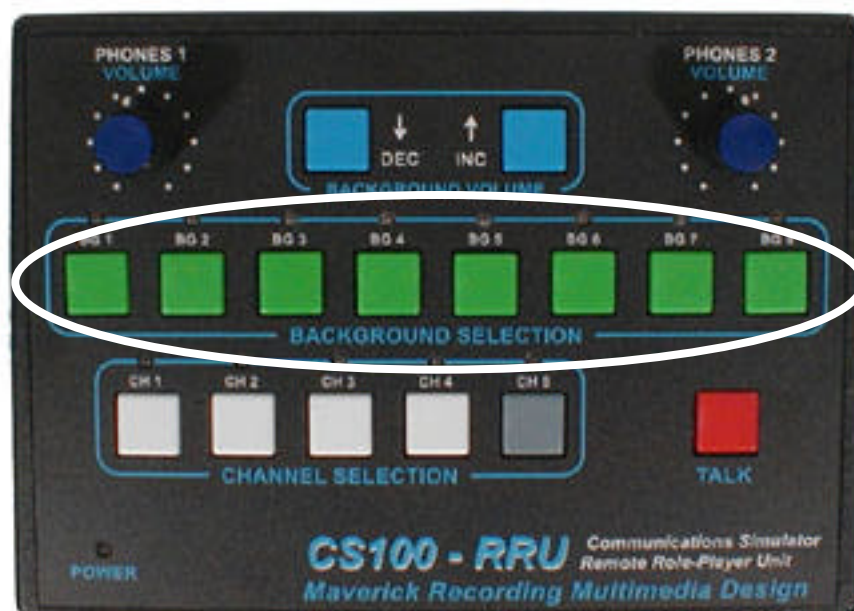
CS100 Communications Simulator – Setup and Operation Manual

The **Loop Sound** checkbox is used to select whether the background sound will be installed to *loop* or *single-play* (non-loop) in the CS100 Simulator. A check mark in the box indicates the sound will loop; no mark will cause the sound to single-play. A single-play sound will play one time through beginning at the start of the sound each time the TALK button is pressed. The single-play option may be appropriate for things like an alarm sound or a spoken command phrase. A looping sound will loop continuously within the CS100 internal memory. When the TALK button is pressed, the looping sound will be heard beginning at whatever point it is currently located in the loop and will keep playing as long as the TALK button is held down. Looping sounds would be used for most background sounds – which are commonly continuous or repetitive noises such as engines, fires, and wind.

The **Destination** box is where you identify the location you want the sound to be stored in. The location is a two character alphanumeric designator. The first character is a letter that ranges from A to F, and the second character is a number ranging from 1 to 8. The alpha character identifies which remote station will receive the sound, and the number identifies the background sound storage location at that station.



The above figure shows the back of the CS100 Main Unit where the connectors are for the remote stations. The letters correspond to the station letters discussed above.



The preceding figure shows the Remote Role-Player Unit. BG1 through BG8 correspond to the discussion of the background sound storage location numbers above.

Once all of the information has been specified for the background sound and its destination, select the **LOAD Buff to BG** button to load the sound from the CS100PC buffer into the CS100 Simulator background sound location.



If everything goes correctly, the sound file will begin its transfer from the PC to the CS100. This transfer can take a little while depending on the length of the sound. A progress bar will indicate the progress of the transfer.



You will also notice a message on the CS100 display indicating the keypad is disabled. The CS100 display will return to its normal Station/Channel “Status” mode shortly after the transfer is completed. If you receive any error messages, follow the instructions included with the message.

You can continue to load additional sounds into the CS100 Simulator by repeating the steps above and changing the storage location in the simulator. If you wish to load the same sound to another location, it is more efficient to use the COPY function on the CS100 Main Unit keypad (see *Copying Background Sounds*).

You may need to use the **TRUNCATE for BG#8** button when installing background sounds into the BG 8 position of a station. The eighth location is limited to only 8 seconds of sound. This is an unavoidable function of the FLASH memory allocation in the system. Hence, it is recommended that sounds that do not have much variation be used in location 8, for example an engine pump or interior of an aircraft.

It is better if you can choose sounds for BG 8 that are already 8 seconds or less in length because a sound that is truncated may have a noticeable glitch at the loop seam (assuming you are looping this sound). You can find or create a seamless looping sound of 8 seconds or less for use in BG 8 (see *Creating a Sound File for the CS100*), but if you don’t want to deal with that you can use the TRUNCATE for BG#8 button.



Once you have truncated the sound, follow the steps described earlier for the transport of this sound to your desired location.

When you are done loading sounds, use the **QUIT** button to close the program.



Background Sound Set Charts

In order to better document which sounds are stored where in your CS100 system, you may want to utilize sound set charts similar the one shown here.

Initial Pre-Installed Sound Set –

This chart shows the background sound set that came pre-installed in your CS100 system. Note that the same set of sounds was installed on each of the six stations. You are free to install different sets of sounds on each station for a possible total of 48 different and unique background sounds in your CS100 system.

Additional Sample Sounds –

Some additional sample background sounds are placed in the **CS100SndLib** folder that is placed in your **My Documents** folder when the CS100PC software is installed on your PC. These sounds are already converted for CS100 system compatibility and are ready for use. Our web site may also have some additional sample background sounds available for download that may be of interest to you. Go to <http://www.blitz-media.com/maverick> and click on the link to CS100 for more information.

Blank Sound Set Charts –

The following pages contain blank sound set charts that you can fill in with your custom sound sets as you load and copy background sounds in your CS100 system. Note that each chart corresponds to one of your stations (A, B, C, D, E, or F). You may want to photocopy these blank charts before filling them in so you will have some blanks to use in the future.

Station A-F	BG 1	BG 2	BG 3	BG 4	BG 5	BG 6	BG 7	BG 8
Sound Name	helicopt01	ChainSaw01	FireHvy01	HeloWind01	CrewWork01	FireMed01	FireLgt01	Pumper01
Sound Length	1.43 sec	6.35 sec	7.01 sec	7.01 sec	7.01 sec	7.01 sec	7.01 sec	7.00 sec
Default Volume	12	2	8	18	8	12	8	5
Loop Sound	X	X	X	X	X	X	X	X

Station <u>A</u>	BG 1	BG 2	BG 3	BG 4	BG 5	BG 6	BG 7	BG 8
Sound Name								
Sound Length								
Default Volume								
Loop								

Station <u>B</u>	BG 1	BG 2	BG 3	BG 4	BG 5	BG 6	BG 7	BG 8
Sound Name								
Sound Length								
Default Volume								
Loop								

Station <u>C</u>	BG 1	BG 2	BG 3	BG 4	BG 5	BG 6	BG 7	BG 8
Sound Name								
Sound Length								
Default Volume								
Loop								

Station <u>D</u>	BG 1	BG 2	BG 3	BG 4	BG 5	BG 6	BG 7	BG 8
Sound Name								
Sound Length								
Default Volume								
Loop								

Station <u>E</u>	BG 1	BG 2	BG 3	BG 4	BG 5	BG 6	BG 7	BG 8
Sound Name								
Sound Length								
Default Volume								
Loop								

Station <u>F</u>	BG 1	BG 2	BG 3	BG 4	BG 5	BG 6	BG 7	BG 8
Sound Name								
Sound Length								
Default Volume								
Loop								

Creating a Sound File for the CS100

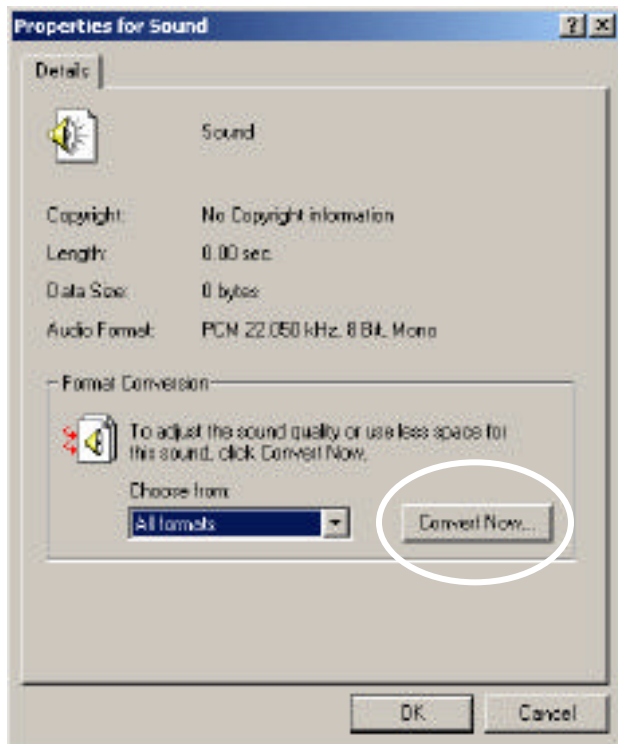
Converting Sound Files to Compatible Format

To make wav files that are compatible with the CS100 Communications Simulator, you may use the Sound Recorder accessory which is installed on most Windows® machines. Sound Recorder can usually be located by clicking **Start** on the task bar then going to **Programs>Accessories>Entertainment>Sound Recorder**. If you cannot find it that way, try looking for the file named sndrec32.exe in the Windows folder of your hard drive.

Upon opening the Sound Recorder accessory, your screen will show the following window:



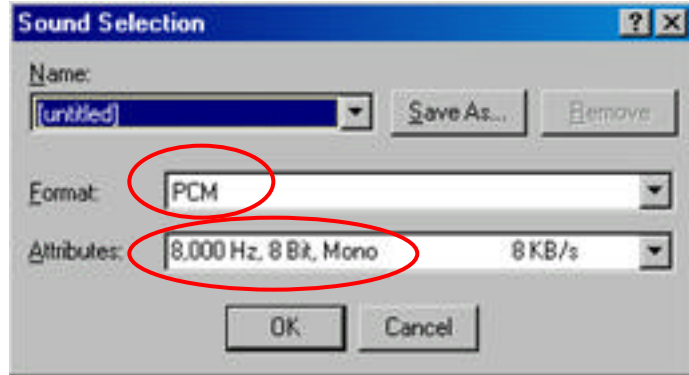
If you already have a sound in a wav file format that you want to convert, then go to the **File** menu and select **Open...** then navigate to the desired wav file and open it. Once the file is loaded into the program, you must either convert the file or assure that the wav file is already in the format that is compatible with the CS100 simulator. To do this, select **Properties** under the **File** menu. The following window will appear. (Note: Your specific information will be related to your file or default settings when the program opened.)



To convert your file, first select the **Convert Now...** button.

This will open the following dialogue box. (Again, the specific information contained in the fields initially may be different.)

In the **Format:** pull-down menu, you must select **PCM**. Then in the **Attributes:** pull-down menu select **8,000 Hz, 8 Bit, Mono**. When you have adjusted these settings select **OK**. Then select **OK** on the previous screen as well.



(Note: Any settings other than these will result in a file that is incompatible with the CS100 Communications Simulator.)

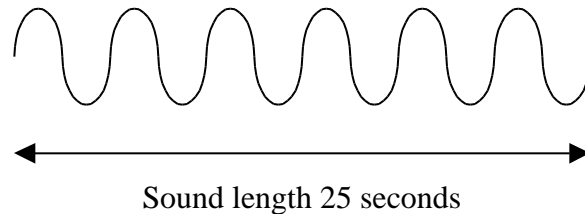
After the above settings have been made, your previously opened sound file will be in a format that is compatible with the CS100 system. You may notice some degradation in sound quality due to required sampling rate reduction. The converted sound should be saved on your computer into the folder you are using for your CS100 sound library (generally this would be the **CS100SndLib** folder that was placed in your **My Documents** folder when you installed the CS100PC software), so that it can be easily located when you want to load it to the CS100. Save the file with an appropriate name such as "Hand_Crew.wav". Note that the first ten characters of your sound filename should be unique to that sound since the CS100PC software only uses the first ten characters when generating an internal sound name for the CS100 system (see *CS100 Sound Name*). Therefore two sounds with filenames "Fire_Heavy1.wav" and "Fire_Heavy2.wav" would both end up with the same CS100 Sound Name (just "Fire_Heavy") when loaded into the CS100. So to avoid confusion make the first ten characters unique (such as "Fire_Hvy01.wav" and "Fire_Hvy02.wav").

Your sound files can be any length, but the CS100PC Sound Installation Software will automatically truncate sounds in excess of 16.3 seconds.

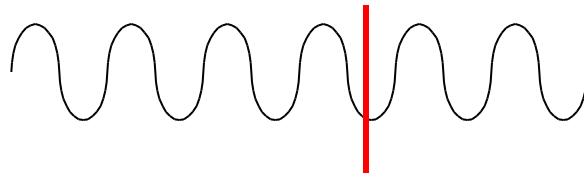
You may also use the Sound Recorder accessory to record new sounds into your computer from an external audio source. To create sounds that are compatible with the CS100 system, use the settings as specified above.

Suggestions for Creating Looping Background Sounds

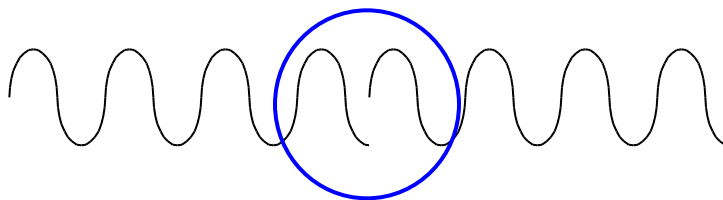
In nearly all cases you will want the background sound to loop in the CS100 Communications Simulator. Playing in a loop means that the background sound constantly plays over and over without user intervention. Care must be taken in creating the background sound so that the transition back to the beginning of the wav file is not abrupt or noticeable (often referred to as making a “seamless” transition). To illustrate the point consider a wavering siren. In the figure below imagine that the wave depicts the pitch of the siren. As you trace up the curve the pitch get higher and falls as you trace down the curve.



While we could leave the sound length alone and let the sound installation software truncate it, a little forethought shows that there will be a problem. Looking again at the curve, lets assume that the line is the location at 16 seconds into the sound.



If we truncate the sound at this point and then put a duplicate curve behind the first, we can simulate what looping sounds might visually look like.



If we examine the circled portion of the curve, we can image that the sound will be falling down and then “jump” back up. This “seam” may be noticeable. Note however that some sounds may end up being seamless just by luck or the seam may not be that noticeable, so you may want to try the sound out in the CS100 system first before taking measures to fix the seam.

If after listening to a looping sound you feel you need to fix the seam at the loop point, there are several methods that may work for you. Some of these methods may require sound editing software that is more sophisticated than the Sound Recorder accessory.

Fade Out the Sound at the Seam -

- Cut the sound to a length of 16 seconds or less.
- Fade the sound up at the beginning and down at the end, thus making the sound silent at the loop transition point.
- This method will eliminate the seam, but may not sound natural for certain types of background sounds.

Cross-Fade the Sound at the Seam –

- Cut the sound to a length of 16 seconds or less.
- Cut off the first half of the sound then paste it at the end of the remaining half but overlap the two halves by one second or more. You may need to paste the sound into a second track in your sound editing software.
- “Cross-fade” the two sound halves at the overlap (fade out the first half while fading in the second half).
- The beginning of the completed new sound should be at the point you originally cut it in half and the end should be at the point where the pasted half cuts off. Note that this will result in a final sound that is less than the original cut length by however long your overlap is (a sound originally cut to 16 seconds then with a one second overlap at the halves will end up being 15 seconds long). Since the two halves should match up at the original cut point, there will be no seam as the new sound loops from end to beginning. The seam is now at the overlap point, which should be fairly well masked by your cross-fade.
- This method will probably produce good results for many types of background sounds, but may require some specialized sound editing software.

Reverse Half of the Sound -

- Cut the sound to a length of 8 seconds or less.
- Copy the sound, then reverse the copy (flip it back to front) and paste it at the end of the initial sound.
- This method may work for some noises without much variance, but it will not work well for many sounds that would sound unnatural if reversed (such as speech).

How Looping Background Sounds are Implemented in the CS100

The CS100PC sound installation software will truncate loaded sounds to a maximum of 16 seconds. However, any sound that is less than 16 seconds and marked as “looping” when loaded will play continuously in the CS100 without a gap. For example if the sound file you load is 10 seconds in length and when loaded you mark it as looping, when the role player uses that sound it will loop at ten seconds. It will not have a 6 second gap before starting the loop again.

Looping background sounds that have a “seam” as discussed earlier may not be as critical as you might think. In practice (during a simulation), most communications are 1 to 3 seconds in length, and the student is going to be concentrating on the message not the background sound. There will probably be enough audible confusion that a seam will not be noticed. Also, background sounds are implemented in the CS100 Communications Simulator in a way that helps to reduce problems. When a background sound is selected from a CS100 role-player station, it begins looping constantly. However, the sound is not heard until the TALK button is depressed. Because the entry point into the looping background sound is random, there is little chance of catching the seam at the loop point.

The “constant looping” implementation in the CS100 system is a good simulation of real-life situations since in reality a background sound would continue to progress at a location even when the radio was not transmitting. Another benefit of this implementation is that it reduces the consistency of the background sound. For example, suppose the background sound is someone counting from 1 to 16. As implemented in the CS100, the random entry into the looping background sound on the initial press of the TALK button could be playing “six, seven, eight”. The next time, again due to random entry, it might begin with, “eleven, twelve, thirteen” etc. In contrast, if the same background sound was installed as “non-looping”, then every time the TALK button was pressed the background sound would start with “one, two, three...” This results in undesirable consistency during the simulation, which the student may find noticeable.

Technical Specifications

General

Power Supply –

- Mean Well model SPU41-13D-1
- Input: 100 – 240 VAC, 47 – 63 Hz, 1.0 A
- Outputs: +5 VDC @ 5.0 A, +12 VDC @ 1.0 A, -12 VDC @ 0.3 A

Channels and Stations -

- Number of Communication Channels: 5 (only 4 available on CS100-RSU)
- Maximum Number of Remote Stations: 6

Background Sounds -

- Number of Storage Locations: 8 per Station x 6 Stations = 48 Total
- Maximum Length of a Stored Background Sound: 16.3 Seconds
- File Format: .wav (PCM)
- Sample Rate: 8000 Hz, 8 Bits per Sample, Mono

Main Unit (CS100-MU)

Dimensions –

- 12” x 8.5” x 4.25”

Audio Line Outputs (6 = CH 1 – CH 5 & CH 1-4 MIX) –

- 1/8” Stereo Jack, line level nominal –10dB output into greater than 10K ohms load

Speaker Output (1 = CH 1-4 MIX SPKR OUT) –

- 1/8” Stereo Jack, nominal 325 milliwatt into 4-16 ohm load

Remote Station Connectors (6 = A – F) –

- RJ-45, Pin-out: Proprietary for CS100 Remote Connection Only

Serial Data Connection (1 = Serial to PC) –

- DB-9, 57.6Kbaud, no parity, 8 data, 1 stop Proprietary CS100PC Communication Protocol

Remote Role-Player Unit (CS100-RRU)

Dimensions –

- 7” x 5” x 2.5”

Headphone Outputs (2 = HEADSET 1 & 2 PHONES OUT) -

- 1/8” Stereo Jack, nominal 325 milliwatt into 4-16 ohm load

Microphone Inputs (2 = HEADSET 1 & 2 MIC IN) -

- 1/8” Stereo Jack, phantom powered for standard PC type headset microphone

Connection to Main Unit (1) –

- RJ-45, Pin-out: Proprietary for CS100 Main Unit Connection Only

Remote Student Unit (CS100-RSU)

Dimensions –

- (Including Antenna & Knobs) 10” x 3” x 1.125”, (Case Only) 6.5” x 2.75” x 1.125”

Connection to Main Unit (1) –

- RJ-45, Pin-out: Proprietary for CS100 Main Unit Connection Only

Microphone (1) –

- Built-In Noise Canceling