RANE

AD22S
AUDIO DELAY

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AUDIO DELAY

OL

SIG

BYPASS

MEMORY
STORE
RECALL

COARSE   FINE

CHANNEL 1   1: 88.8 FRAMES 23.976 fps MEM: A*
CHANNEL 2   2: 88.8 FRAMES   24 fps MEM: A

CURSOR
LINK
CHANNEL

DISTANCE
ALIGNMENT
VIDEO

RANE

IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any ventilation openings. Install in accordance with manufacturer's instructions.
8. Do not install near any heat sources such as radiators, registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord and plug from being walked on or pinched particularly at plugs, convenience receptacles, and the point where it exits from the apparatus.
11. Only use attachments and accessories specified by Rane.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. The plug on the power cord is the AC mains disconnect device and must remain readily operable. To completely disconnect this apparatus from the AC mains, disconnect the power supply cord plug from the AC receptacle.
16. This apparatus shall be connected to a mains socket outlet with a protective earthing connection.
17. When permanently connected, an all-pole mains switch with a contact separation of at least 3 mm in each pole shall be incorporated in the electrical installation of the building.
18. If rackmounting, provide adequate ventilation. Equipment may be located above or below this apparatus, but some equipment (like large power amplifiers) may cause an unacceptable amount of hum or may generate too much heat and degrade the performance of this apparatus.
19. This apparatus may be installed in an industry standard equipment rack. Use screws through all mounting holes to provide the best support.

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Apparatus shall not be exposed to dripping or splashing and no objects filled with liquids, such as vases, shall be placed on the apparatus.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
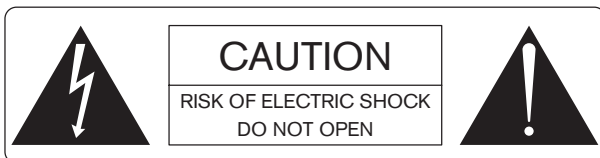
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION: Changes or modifications not expressly approved by Rane Corporation could void the user's authority to operate the equipment

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

WARNING

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

To reduce the risk of electrical shock, do not open the unit. No user serviceable parts inside. Refer servicing to qualified service personnel.

The symbols shown below are internationally accepted symbols that warn of potential hazards with electrical products.

This symbol indicates that a dangerous voltage constituting a risk of electric shock is present within this unit.

This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.

QUICK START

Your AD22S is out of its box, and now it's time to integrate it with your audio setup. But wait! What are these buttons for? What do all those numbers on the display mean? This guide intends to help you quickly learn the basics and familiarize you with the device so there's no delay before you delay.

FRONT PANEL CONTROLS

The first thing to decide is which alignment mode to use. If you're using the AD22S to synchronize audio with video, then select Video mode. Otherwise select Distance alignment. The DIS-TANCE and VIDEO buttons on the left hand side of the unit switch between the two modes. Display settings and delay values are controlled by using the CHANNEL button to toggle between channels 1 or 2, and by using the CURSOR buttons to select the value you wish to change. The COARSE and FINE buttons increment or decrement the value currently selected.

DISTANCE ALIGNMENT

One of the main applications for the AD22S is synchronizing an audio signal coming from separate sources at two different distances. Say, for example, you want the music emanating from a stack of loudspeakers on the lawn at an amphitheater to get to your audience at exactly the same time as sound coming from the speaker arrays on stage. The amount of delay needed is the time it takes sound to travel from the stage to the lawn. While in DISTANCE mode, this can be displayed in feet, meters, or mil-liseconds.

VIDEO ALIGNMENT

The AD22S is also excellent for synchronizing audio with video feeds, especially in a live environment where video processing typically adds several milliseconds to the signal that can have a noticeable effect on the final output. To assist in this application, the AD22S can show your delay value directly in terms of frames. All common frame rates for NTSC and PAL/SECAM are supported, and the audio stream can be delayed with a precision of 0.5 frames to line up perfectly with any video stream.

SETTING DELAY

Use the ◄ CURSOR ► buttons to select the unit type, then press the COARSE or FINE buttons to cycle through options. In Distance mode, choose between feet, meters, or milliseconds; in Video mode the delay is shown in frames or milliseconds. If you know the distance between the sources you are summing, set the units for feet or meters.

The ambient temperature also affects the speed of sound. To set the temperature, use the CURSOR buttons to select either °C or °F, then set the value to the approximate temperature at your speaker location. The AD22S calculates the correct delay based on your environment.

Note: Changing units from distance to time does not change the output delay. For example, if you are viewing the settings for channel 1 in meters, a change from meters to milliseconds keeps the same amount of delay but shows it in milliseconds rather than distance.

LINKING CHANNELS

The LINK button connects the controls so that all changes apply to both channels. Channels do not need to share the same setting. While linked, incrementing or decrementing a value changes the delay for both channels at once. To treat the channels as a stereo pair, first set the delay value to the same setting on both channels before pressing the LINK button.
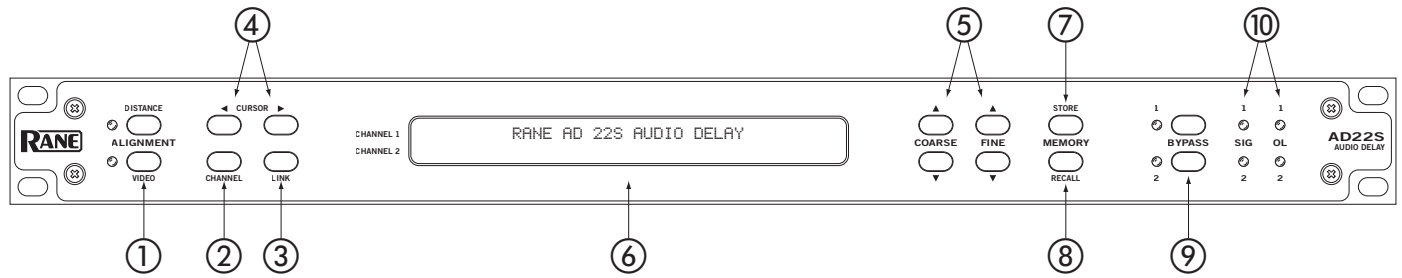
MEMORY FUNCTIONS

Each channel has two memory banks, A and B. The ✻ character at the right of the display indicates that the current setting does not match what is stored in memory.
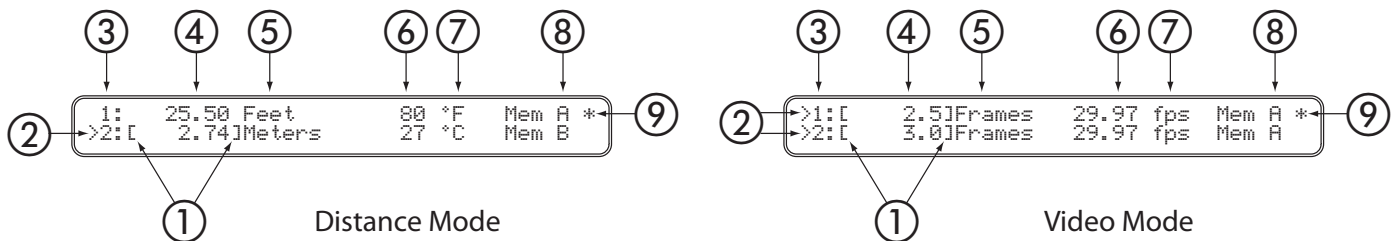
Pressing STORE copies the current settings into the selected Memory, clearing the ✻ character. The cursor must be over the Memory Bank field before pressing STORE. To activate a stored setting, press RECALL to change the active delay to the value stored in the memory location shown. If channels are linked, both will be recalled.

Additional features are described in Operation Details on page Manual-4.

WEAR PARTS: This product contains no wear parts.

FRONT PANEL DESCRIPTION

① ALIGNMENT MODE buttons: Press DISTANCE for delay in feet, meters, or milliseconds. Press VIDEO for alignment by frames or milliseconds.

② CHANNEL button: Press this to switch the cursor location between channels. This button has no effect if the channels are linked.

③ LINK button: Links channels together so changes made affect both channels at once. To treat the channels as a stereo pair, make sure settings for each channel are identical before pressing the LINK button. Press the LINK button again to unlink.

④ CURSOR buttons: Press ◀ left or right ▶ cursor to select the value for editing.

⑤ COARSE and FINE controls: These buttons affect the setting that is currently highlighted to change settings or delay values. COARSE increments or decrements delay by 1 ms/feet/meters or 1.0 frames, FINE by 0.1 ms/feet/meters or 0.5 frames.

⑥ LCD Display: Shows the current readout of settings for each channel. Fields may be selected using the CURSOR buttons and changed using the COARSE / FINE controls. See the DISPLAY sections below.

⑦ STORE button: Stores the Delay configuration into current memory for the selected channel. If the asterisk ✳ character is shown to the right of the display, the current value does not match the memory location.

⑧ RECALL button: Copies the stored delay setting into the active channel. If channels are linked, then both are recalled.

⑨ BYPASS buttons: Toggle relays for each channel. If LED is on, bypass is enabled and the device functions like a wire. If bypass LED is off, the channel is active.

⑩ SIGNAL / OVERLOAD LEDs: SIG LEDs indicate signal presence on the input. OL LEDs light red when an input signal is near the maximum level and may clip.
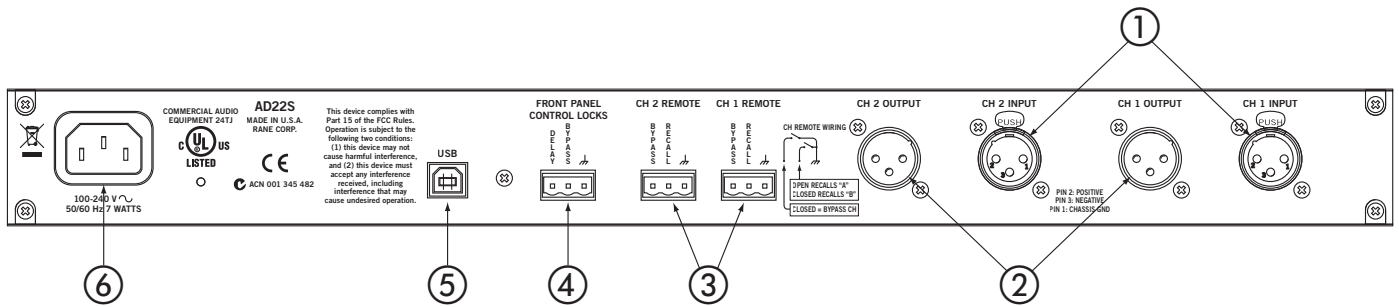

Distance Mode

Video Mode

DISPLAY: DISTANCE MODE
① Cursor
② Active Channel(s)
③ Channel #
④ Delay Setting
⑤ Units (Feet, Meters, ms)
⑥ Temperature
⑦ Temp. Units
⑧ Mem. Bank
⑨ Memory Indicator - * Shown if different than stored value

DISPLAY: VIDEO MODE
① Cursor
② Active Channel(s)
③ Channel #
④ Value
⑤ Units (Frames, ms)
⑥ Frame rate
⑦ Units (Frames per second)
⑧ Mem. Bank
⑨ Memory Indicator - * Shown if different than stored value

① CHANNEL INPUTS: Balanced XLR input jacks, 24 dBu max level.

② CHANNEL OUTPUTS: Balanced XLR outputs, 600 Ω min. load.

③ REMOTE RECALL terminals: Wire external switches to remotely recall Memory settings or toggle bypass relays. See the REMOTE RECALL section.

④ FRONT PANEL CONTROL LOCKS: A wired external switch disables the front panel controls to prevent accidental changes.

⑤ USB FIRMWARE UPDATE: This USB connection facilitates possible firmware upgrades in the future. This port provides no other functions and should not be connected during normal use. See the FIRMWARE UPDATE section.

⑥ UNIVERSAL POWER SUPPLY: Universal IEC power jack connects anywhere in the world to AC line voltage, 100-240 VAC @ 50 – 60 Hz.

OPERATING DETAILS

INITIAL SETUP

The AD22S is always on while plugged in. When first powered up, the LCD briefly displays the words "Rane AD22S Audio Delay" and the current firmware revision. Out of the box, both channels are in BYPASS mode with the inputs routed directly to the outputs. This makes it easy to set up and verify that signals are present before turning on any delay. The yellow bypass indicators mean that BYPASS is active; press each BYPASS button to disable.

ALIGNMENT MODE

Two modes of operation are available. If working with video and wish to set delay by number of frames, press VIDEO for video alignment. Otherwise press DISTANCE for distance alignment. Both modes offer milliseconds as a simple display option in addition to their distance or video functions.

SETTING THE DELAY

A '≫' by the channel number indicates the channel is selected for editing. This appears on both channels if LINK is active.

Distance Mode: Use CURSOR buttons to highlight the unit type, then select between milliseconds, feet, or meters. The AD 22S also needs to know the temperature. To set, select and set the unit type to °C or °F, then select and set the temperature.

Video Mode: Choose between frames or milliseconds as the display setting. For frames, the delay value is based on the number of frames per second, denoted by "fps" on the display. Set this first and make sure it matches your video frame rate.

Linked Channels: With channels linked, any changes made are applied to both channels at once. This does not force the delay values to be the same.

Example: For two speaker arrays at different distances from a performer, linking the two channels lets you change temperature settings for both at once.

For stereo operation, set each channel to the same value before pressing LINK.

STORING DELAYS

The ✛ character on the display means the current setting differs from the memory bank shown. Move the CURSOR to the memory field, then press COARSE or FINE to toggle between Mem A or Mem B. Press STORE to copy the current setting into this location. Note that ✛ is no longer displayed. If channels are linked, both channels will be stored.

Note: The CURSOR must be on the Memory Bank field to STORE. This is to prevent an accidental overwrite of saved settings.

RECALLING DELAYS

Press RECALL to copy from the Memory shown to the active setting for the selected channel. If LINK is active, both channels will be recalled. This will overwrite any current settings.

REMOTE RECALL

The REMOTE RECALL terminals on the rear of the unit are functionally equivalent to the RECALL button. With a switch wired between the RECALL terminal and the GND terminal, close the switch to recall Memory B. Open the switch to recall Memory A.

FIRMWARE UPDATE

Should a firmware upgrade become available, it will be posted on the AD22S page at *www.rane.com/ad22s.html*. The USB port provides the connection to a PC enabling the file transfer. Perform the following steps to update:

1. Ensure the unit is powered.
2. Connect via device cable to USB port on computer.
3. AD22S appears as an EXTERNAL DISK device containing one file (named "AD22S_XX.BIN" or similar).
4. Delete this file. NOTE: After deleting this file, the folder may disappear, then re-open after a few seconds.
5. Copy or drag the new firmware file to the AD22S.
6. After transfer, the AD22S restarts automatically and briefly displays the new revision info. It may also reappear as an EXTERNAL DISK on the PC containing the new firmware file.
7. Disconnect USB cable and resume normal operation.

Notes: If the revision number displayed does not match the new firmware, make sure you have the latest file and try again.

Tip: Press and hold both CURSOR buttons simultaneously for one second to view the currently running firmware version.

If an error occurs during transfer or a file is corrupted, the AD 22S will revert to the last working version.