

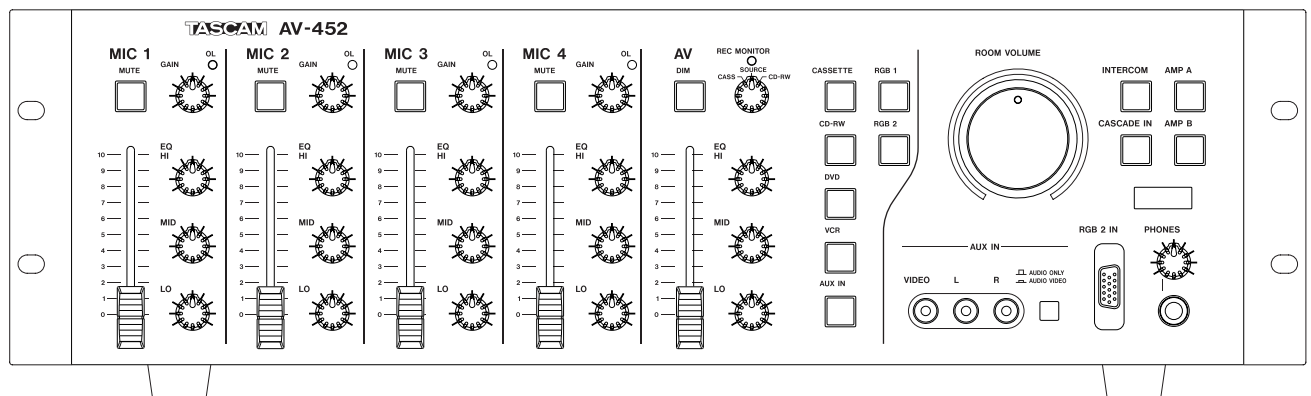
TASCAM

TEAC Professional Division

D00788500B

AV-452

Powered Mixer



INSTALLATION & SUPPORT GUIDE



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.




The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

This appliance has a serial number located on the rear panel. Please record the model number and serial number and retain them for your records.

Model number _____
Serial number _____

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

IMPORTANT SAFETY INSTRUCTIONS

- 1 Read these instructions.
- 2 Keep these instructions.
- 3 Head all warnings.
- 4 Follow all instructions.
- 5 Do not use this apparatus near water.
- 6 Clean only with dry cloth.
- 7 Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8 Do not install near any heat sources such as radiators, heat 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. Grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are 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 from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11 Only use attachments/accessories specified by the manufacturer.
- 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.
 - Do not expose this apparatus to drips or splashes.
 - Do not place any objects filled with liquids, such as vases, on the apparatus.
 - Do not install this apparatus in a confined space such as a book case or similar unit.
 - The apparatus draws nominal non-operating power from the AC outlet with its POWER switch in the off position.

IMPORTANT (for U.K. Customers)

DO NOT cut off the mains plug from this equipment.

If the plug fitted is not suitable for the power points in your home or the cable is too short to reach a power point, then obtain an appropriate safety approved extension lead or consult your dealer.

If nonetheless the mains plug is cut off, remove the fuse and dispose of the plug immediately, to avoid a possible shock hazard by inadvertent connection to the mains supply.

If this product is not provided with a mains plug, or one has to be fitted, then follow the instructions given below:

IMPORTANT: The wires in this mains lead are coloured in accordance with the following code:

GREEN-AND-YELLOW	: EARTH
BLUE	: NEUTRAL
BROWN	: LIVE

WARNING: This apparatus must be earthed.

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured GREEN-and-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol \perp or coloured GREEN or GREEN-and-YELLOW.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

When replacing the fuse only a correctly rated approved type should be used and be sure to re-fit the fuse cover.

IF IN DOUBT — CONSULT A COMPETENT ELECTRICIAN.

For U.S.A.

TO THE USER

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION

Changes or modifications to this equipment not expressly approved by TEAC CORPORATION for compliance could void the user's authority to operate this equipment.

For the consumers in Europe

WARNING

This is a Class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.

Pour les utilisateurs en Europe

AVERTISSEMENT

Il s'agit d'un produit de Classe A. Dans un environnement domestique, cet appareil peut provoquer des interférences radio, dans ce cas l'utilisateur peut être amené à prendre des mesures appropriées.

Für Kunden in Europa

Warnung

Dies ist eine Einrichtung, welche die Funk-Entstörung nach Klasse A besitzt. Diese Einrichtung kann im Wohnbereich Funkstörungen verursachen ; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen durchzuführen und dafür aufzukommen.

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The TASCAM AV-452 coordinates the audio/visual needs for presenters of all levels. Functionally, the AV-452 serves as a microphone mixer, A/V receiver, and power amplifier into one compact unit. The control surface is elegant and intuitive.

Audio: Four microphone inputs (with phantom power) offer plenty of inputs for multiple presenters, or multiple speaking positions. Up to two audio and three audio/visual components can be connected to the A/V channel, with simple switching control. A 3-band EQ is available on each channel to enhance the individual sounds as needed.

Video: The AV-452 will perform video switching between three A/V components, offering a single video feed for projectors or monitors with limited in-

puts. Switching is done in parallel, and video switching is handled for composite and S-Video inputs.

Control: The RC-452 universal learning remote is included with the AV-452, allowing the presenter to operate all the key equipment with a single remote. The RC-452 will control the AV-452, and can learn commands for projector power, and transport commands for up to four components.

The AV-452 itself also can learn IR commands, to integrate projector/monitor switching with the AV-452 internal switching. This IR command set can be transmitted with an IR “blaster” (not included) to the 37-pin ‘D’-sub **RELAY CONTROL** port (see "Relay control port" on page 18 for details).

“AV installation” features

Special additional features of the AV-452 relevant to fixed installation:

- Microphones can be connected using either XLR-type connectors or using a barrier strip and can be phantom powered, allowing the use of miniature condenser or PZM (boundary field) microphones.
- Switchable 80 Hz bass roll-off to eliminate low-frequency rumble.
- Microphone insert loop for parametric EQ, compressor/limiter/gate, etc.
- AV signal dimmer to allow manual voiceovers, etc.
- Automatic AV ducker with adjustable ratio and threshold settings.
- A CV (constant voltage) paging system can be connected (12V, 24V or 70V) to the rear panel. A level control and defeatable noise gate are provided for optimal settings.
- A building alarm system can be connected to the EMG input. When the alarm sounds, the AV-452 will mute local audio, and switch the CV paging input on.
- The speaker and line output have independent mono switches for use in single-zone or multi-zone systems.
- Cascade input can be configured to combine the input as a submixer, or operate as "room cascade", allowing the AV-452 to become a drone amp.
- Dedicated unbalanced **MEETING OUT** jacks, together with balanced **LINE OUT** jacks allow for connection with other equipment.
- Serial (RS-232) and relay (37-pin D-sub) connectors allow for control of the unit by other devices.

About this manual

This manual is intended for use by those designing, installing and supporting the AV system including the AV-452. It is not necessary for the everyday user of the equipment to read this manual.

The user should refer to the single-sheet *Operation Guide* for a quick reference on how to operate the unit. However, a brief guide to the front panel, and remote control unit is given here, and this also provides some information which can be used when introducing the operation of the unit to its users.

We suggest that the *Operation Guide* is kept close to the AV-452, and the spaces on this sheet are filled in,

for a written record of the permanent connections made between the AV-452 and other equipment.

Note that controls and connectors on the unit and the remote control unit are written in this typeface: **LINE OUTPUT**. Sometimes a control or connector is referred to by a number, corresponding to the numbers in the diagrams "Front panel features" on page 8, "Remote control unit features" on page 10 and "Rear panel connections" on page 12. In these cases, a feature of the main unit is numbered like this: ①, and a feature of the remote control unit like this: ②.

Controls and connectors on other units are written in this way: **REC IN**.

How the manual is organized

The different sections of the manual are as follows:

1, “Introduction” (page 5) This introduction to the AV-452.

2, “General installation notes” (page 7) As the title suggests, this includes general notes on the physical and electrical installation requirements for the AV-452.

3, “Front panel features” (page 8) As well as a list of the front panel controls and features, this section provides details on the operation of the AV-452. Read this section to obtain an overview of the way in which the AV-452 works.

4, “Remote control unit features” (page 10) This provides a list of the features and functions available using the RC-452 remote control unit, as well as details on how to program the RC-452 to learn and replay the command codes of other units.

5, “Rear panel connections” (page 12)

This lists the connections to and from the AV-452.

6, “Customization and settings” (page 16) The AV-452 can be customized for the individual installations in a number of ways, using the rear panel switches, etc. This section describes the way in which this customization can be carried out, including the way in which the AV-452 can learn the IR codes necessary to control external devices.

7, “External control” (page 18) The AV-452 can be controlled by an external serial controller, and this section lists the control codes available for control, status, and query. Additionally, relay control and tally indicator connectors are provided. Details of these are given in this section.

8, “Specifications and block diagram” (page 20) Performance figures, dimensional drawings and a block diagram of the AV-452.

These notes provide you with information about the installation of the AV-452.

The packing should contain (in addition to this manual):

- The *User's Guide*—a single sheet containing operating instructions
- A power cord with a 3-pin plug suitable for your region

- A rack mounting kit consisting of four screws and four washers
- The RC-452 remote control unit
- Two AAA batteries for use in the RC-452 remote control unit
- Warranty card

Contact your TASCAM dealer or distributor if any of these items is missing.

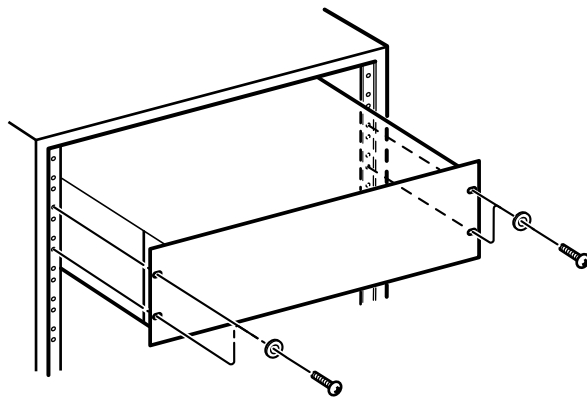
Physical installation

The unit can be fitted in any standard 19" rack, using the mounting kit (screws and washers) provided. No rear support is needed.

3U of rack space is required for the unit itself. Since the AV-452 incorporates power amplifiers, it is strongly recommended that at least 1U of space is left above the unit to avoid overheating.

NOTE

Do not install this apparatus in a confined space such as a book case or similar unit.



For the same reason, adequate space for ventilation should be left at the front and rear of the unit. In any case, the space at the rear of the unit should be sufficient to accommodate the audio and video connectors plugged into the AV-452.

Since many of the functions of the unit are set using small preset controls (trimmer pots, DIP switches, etc.) on the rear panel, we suggest that you ensure you have clear visual access to the rear panel, or that you make these settings before final installation in the rack.

Power supply

The AV-452 can use an AC power supply as marked on the rear panel. Do not use any other voltage of power supply, as this may result in damage.

The unit should be properly grounded (earthed).

The power switch is located on the rear panel to prevent the user from accidentally turning power off during a presentation. If you want to turn the system on and off routinely, you may consider using a power switch for the outlets, or using a centrally-switched power distribution system.

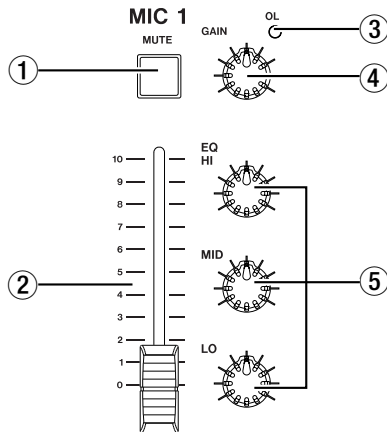
3 – Front panel features

A brief guide to the front panel features of the AV-452, with a little more technical detail than in the *Operation Guide*.

It can be used as a quick reference guide for everyday operation, or to form the basis for an introductory explanation to the users of the equipment.

Microphone channels

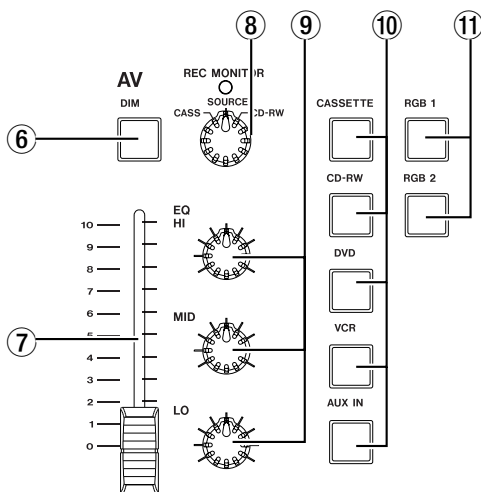
Each of the four microphone channels is identically equipped.



- ① **MUTE key** This latching key lights when the mic input channel is muted.
- ② **Fader** The unity gain for this fader is at the 7 mark.
- ③ **OL indicator** Lights at 10dB above the nominal clipping level.
- ④ **GAIN control** Provides 33dB of control to adjust the mic level appropriately.
- ⑤ **EQ section** 3 bands, each providing ± 10 dB at the following frequencies (optimized for voice):
 - HI:** 8kHz (shelving)
 - MID:** 2.5kHz (peaking)
 - LO:** 250Hz (shelving)

AV control and selection section

This section is used to select the appropriate AV source, and control the sound.



- ⑥ **DIM key** This latching key is used to attenuate the AV source signal by 20dB. It lights when dimming is active.
- ⑦ **Fader** The unity gain for this fader, which is used to control the level of the selected AV signal, is at the maximum level.
- ⑧ **REC MONITOR control/indicator** Despite the name, this control and indicator acts a record source selector.
 - In the **SOURCE** position, the output of the signal selected using the AV selector keys is fed to the

inputs of all connected equipment (except the source unit, to avoid signal loops). For example, if the cassette is selected, the cassette output is fed to the CD-RW and VCR inputs. The indicator lights.

- In the **CASS** position, the cassette output is fed to the CD-RW and VCR inputs, regardless of the AV selector keys.
 - In the **CD-RW** position, the CD-RW output is fed to the cassette and VCR inputs, regardless of the AV selector keys.
- ⑨ **EQ section** 3 bands, each providing ± 10 dB at the following frequencies:
 - HI:** 12kHz (shelving)
 - MID:** 2.5kHz (peaking)
 - LO:** 100Hz (shelving)
 - ⑩ **AV source selector keys** Only one of these latching keys can be active (lit) at a time. Used to select the AV source.

NOTE

If the **REC MONITOR** selection and the selection here are the same, the source output is muted, to avoid a feedback loop.

Also note that if an audio-only source has been selected (**CASSETTE**, **CD-RW** or **AUX IN** on the **AUDIO ONLY** setting), the last-selected video source will be output through the video connectors.

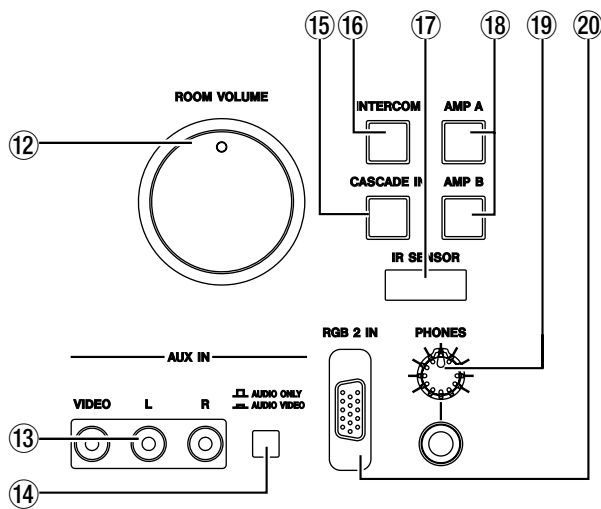
⑪ **Video input selector keys** Only one of these latching keys (**RGB 1** and **RGB 2**) can be active (lit) at a time. They are used to select the input source for an external projector.

NOTE

These **RGB 1** and **RGB 2** keys do not affect the switching of the composite video or S-Video outputs connected to the AV-452. They allow centralized control of a projector or display forming part of the AV system containing the AV-452. See "LEARN IR (switch 1)" on page 16 for details.

Main control section

This section contains controls related to the overall system.



⑫ **ROOM VOLUME control** This is used to adjust the levels from the speaker outputs as well as from the line level outputs. The indicator on this control lights when power is supplied to the AV-452.

It is motorized, meaning that it will reflect changes made from the RC-452 remote control unit (⑭).

⑬ **AUX inputs** This set of three RCA jacks is used to connect a composite video signal and/or the left and right components of a stereo audio signal.

⑭ **AUX selector switch** This determines whether audio and video are enabled together at the **AUX** jacks (switch pushed in), or audio only (switch in the out position).

⑮ **CASCADE key** When this key is active (lit), the input to the **CASCADE** inputs (rear panel) is fed to the stereo bus (pre-**ROOM VOLUME**). A rear panel switch determines whether this input replaces the input signals or is summed with them (see "CASCADE (switch 2)" on page 17).

⑯ **INTERCOM key** When this key is lit, the signal received at the **INTERCOM** connection on the

rear panel is fed to the stereo bus. This signal is not affected by the **ROOM VOLUME** control.

⑰ **IR SENSOR** This window is used to receive the commands from the supplied wireless remote control unit.

⑱ **AMP A and AMP B keys** The AV-452 can operate in mono mode, with each amplifier driving a separate speaker, in which case, these will act as room control keys.

Alternatively, it can be operated in stereo mode, in which case, these keys turn the stereo channels on and off individually.

NOTE

These keys do not turn the amplifiers on and off—they simply mute the signal to the speakers.

The mono/stereo setting for the line outputs is made using the dedicated switch on the rear panel (④) and for the speaker outputs using the DIP switches (④).

⑲ **PHONES level and jack** Connect a standard pair of stereo headphones to this 1/4" jack. Adjust the volume with the **PHONES** level control (pre-**ROOM CONTROL**).

NOTE

Remove the headphones from the jack when turning the AV-452 on or off, to avoid possible damage from "thumps".

⑳ **RGB 2 input** Connect one end of a VGA standard 15-pin D-sub (analog) cable to this connector and the other end to a personal computer. The signal is passed through to the **RGB 2 THRU** connector on the rear panel.

NOTE

The AV-452 is not provided with an "RGB 1" input or output. This numbering system refers to any projector or video display unit connected to the AV-452.

4 – Remote control unit features

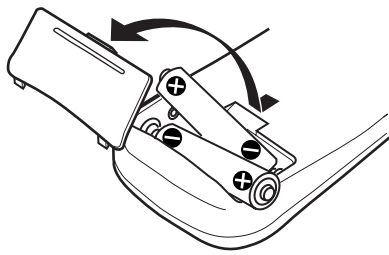
The RC-452 remote control unit is designed for control of not only the AV-452, but up to four additional connected units (marked as **CASSETTE**, **VCR**, **CD-RW** and **DVD**).

A total of 36 keys in total can be programmed (as described later in this section).

When using the RC-452 with the AV-452 or any other unit, make sure:

- There is a clear unobstructed path between the remote control unit and the remote sensor on the unit being controlled.
- The remote control unit is located within 5 m (15 ft.) of the unit being controlled, and is pointing at approximately right angles ($\pm 30^\circ$) to the front panel.

The RC-452 should be maintained in the same way as a consumer control unit. When changing the batteries:



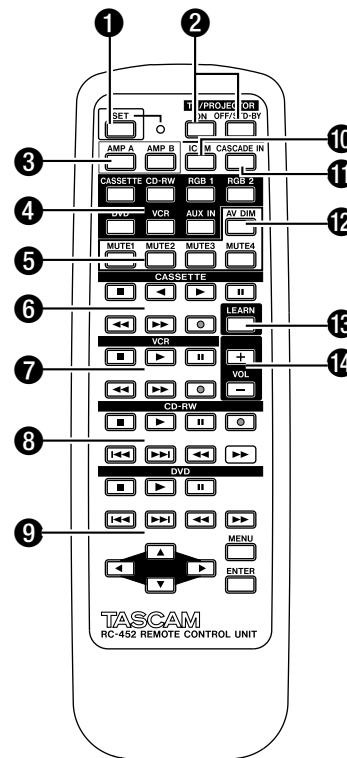
- Always make sure that both batteries are replaced together. Do not mix old and new batteries.
- Do not mix batteries of different types.
- Always make sure that the batteries are located with the correct polarity (the positive terminals of the batteries should match the + markings inside the battery compartment, and the negative terminals should match the - markings).
- If you are not going to use the remote control unit for an extended period of time, remove the batteries. Old batteries can leak, causing damage to the remote control unit.
- Always dispose of used batteries in the way recommended by your local garbage disposal authorities.

NOTE

The **CASSETTE** and **CD-RW** keys of the RC-452 are programmed at the factory to control the TASCAM CC-222 unit. However, they may be programmed to control other units. The names of these keys and other keys which may be programmed are enclosed [in brackets] in the list below. See "Learning command codes" on page 11 for details of how to do learn other units' commands

When the batteries are changed in the RC-452, the programmed codes are typically retained. However, you

should note that if the batteries are removed for an extended period of time, data loss will occur, and the codes must then be re-learned.



- 1 **SET key and indicator** Used when learning commands for other units (as described below)
- 2 **[TV/PROJECTOR power keys]** One programmable key (**ON**) is used to put the TV or projector on, and the other (**OFF/STD-BY**) is used to put it into standby or off mode.
- 3 **AMP A and AMP B keys** These keys duplicate the function of the **AMP** keys on the AV-452 (18).
- 4 **AV selector keys** These keys duplicate the function of the audio and video keys on the AV-452 (10 and 11).
- 5 **MUTE keys** These keys duplicate the function of the microphone **MUTE** keys on the AV-452 (1).
- 6 **[CASSETTE keys]** Use these programmable keys to control a cassette deck (pre-programmed for the TASCAM CC-222 when the unit is shipped).
- 7 **[VCR keys]** Use these programmable keys to control a videocassette recorder.
- 8 **[CD-RW keys]** Use these programmable keys to control a CD recorder (pre-programmed to control the TASCAM CC-222 when the unit is shipped)

- ⑨ **[DVD keys]** Use these programmable keys to control a DVD player.
- ⑩ **ICOM key** This key duplicates the function of the **INTERCOM** key on the AV-452 (⑩).
- ⑪ **CASCADE IN key** This key duplicates the functions of the **CASCADE** key on the AV-452 (⑮).

- ⑫ **AV DIM key** This key duplicates the functions of the **AV DIM** key on the AV-452 (⑥).
- ⑬ **LEARN key** Use this key when learning the commands for other units (see below).
- ⑭ **VOL + and – keys** These keys operate the **ROOM VOLUME** control (⑫).

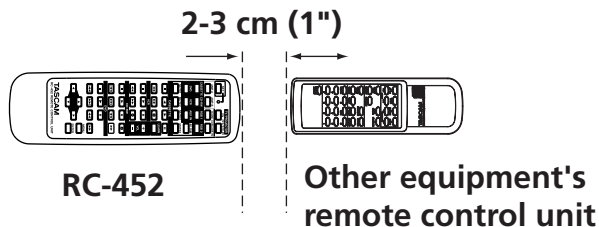
Learning command codes

The RC-452's design allows it to be used for the control of up to five devices in addition to the AV-452: projector or display (**TV/PROJECTOR**), audio cassette recorder (**CASSETTE**), videocassette recorder (**VCR**), CD recorder (**CD-RW**), and DVD player (**DVD**).

Of course, the devices and functions that you program for them do not have to match absolutely with those marked on the AV-452 and RC-452, but it makes sense to map the target units to the RC-452's labels.

To teach remote control commands from another remote control unit to the RC-452:

- 1 **Make sure that both the RC-452 and the other equipment's remote control unit have batteries installed, and place them on a flat surface, about 2–3 cm (about an inch) apart, facing each other.**



- 2 **On the RC-452, press and hold the SET key ① and then press the LEARN key ⑬. Release these keys. The SET indicator lights steadily.**
- 3 **Within 10 seconds of the previous step, press the ►► key of the RC-452's VCR section ⑦ three times.**

The **SET** indicator ① of the RC-452 flashes as you press it and remains lit to show the unit is now in learning mode.

- 4 **On the RC-452, press the key which will be mapped to the other equipment's function.**

The **SET** indicator ① of the RC-452 starts flashing rapidly to show that learning is started.

- 5 **On the other equipment's remote control unit, press the key to be learned. The RC-452's SET indicator ① stops flashing rapidly and lights steadily for a short time, goes out briefly *once* and then lights steadily to show that the command has been learned.**

- If the RC-452's **SET** indicator goes out briefly *three* times and then lights steadily, it means that the learning command has not been properly learned.
- If the RC-452's **SET** indicator goes out briefly *six* times and then lights steadily, it means that the RC-452's memory is full, and no more commands can be learned.

- 6 **Repeat steps 4 and 5 until all appropriate commands have been learned.**
- 7 **To exit the learning mode, press the RC-452's LEARN key ⑬. The SET indicator goes out (it also goes out if no keys are pressed on the RC-452 for about 10 seconds).**

NOTE

The RC-452 can learn and store up to 36 different commands.

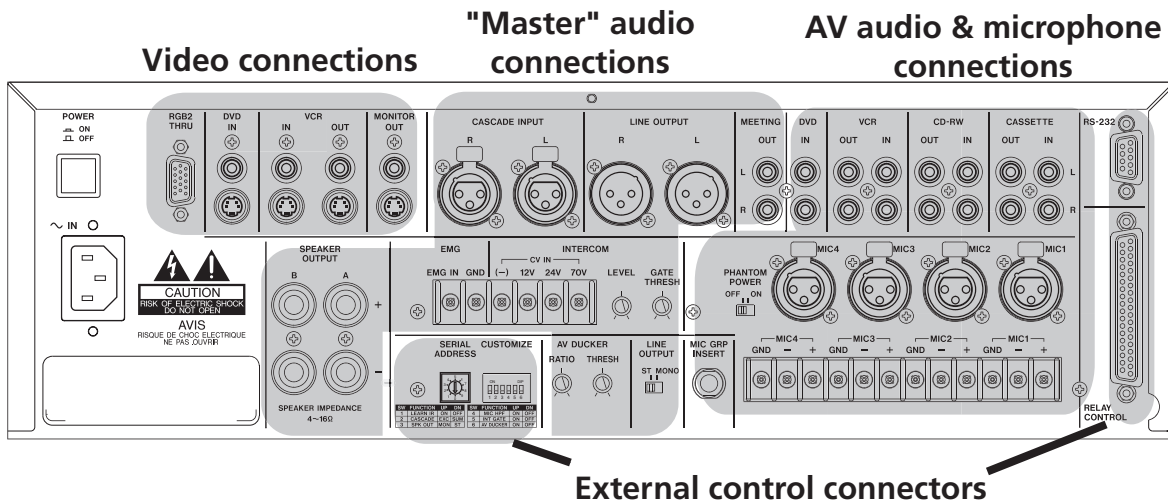
The angle and distance between the two remote control units affects the difficulty of the learning process.

The RC-452 may not be able to learn some units' commands which use long IR codes for transmission.

5 – Rear panel connections

This section provides detailed information on the rear panel connectors, as well as some notes on installation and connection of other units.

Basic specifications and performance figures are provided later in the manual.

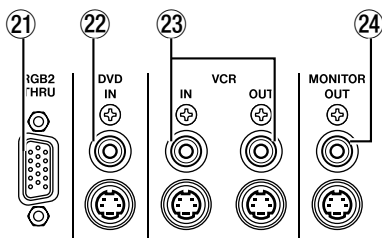


Video connections

All video connections on the AV-452 switch in parallel. There is no conversion between composite and S-Video signals. In some designs, you may need to connect both video formats to the source decks.

This also means that the AV-452 is standard-independent and can accept NTSC, PAL or SECAM format video with no configuration needed.

In addition to these connectors, remember that there is an additional **AUX** video connector on the front panel ⑬.



NOTE

All connectors on the rear panel are labeled relative to the AV-452. In other words, a connector labeled **IN** on the AV-452 should be connected to one marked **OUT** on another piece of equipment.

⑳ **RGB2 THRU connector** This 15-pin D-sub connector echoes the signal input at the front panel input ⑳.

㉑ **DVD IN connectors** This pair of connectors is used to connect the video output of a DVD player to the AV-452.

㉒ **VCR IN and OUT connectors** Connect the video output of a videocassette recorder to the **VCR IN**, and the video input of the VCR to the **VCR OUT**.

㉓ **MONITOR OUT connectors** Link these connectors to the appropriate input of a TV, monitor or projector.

AV audio and microphone connections

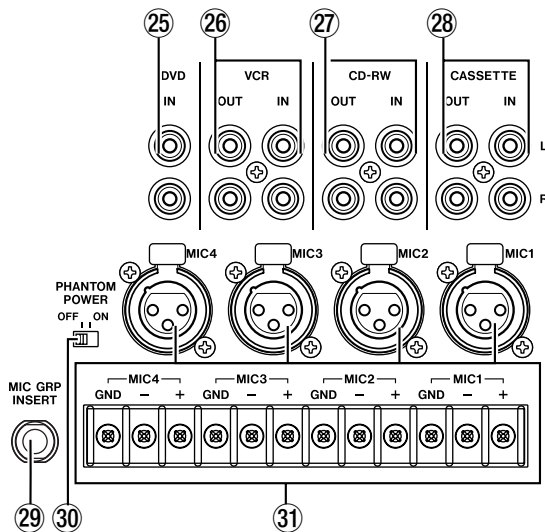
NOTE

The AV-452 is supplied with several sets of shorting plugs for the unused RCA input connectors. Remove these when making connections to these terminals, and leave them in place when these terminals are unused. This will help to improve the audio performance of the system.

In addition to the connections listed here, there is also a pair of **AUX** audio inputs (13) on the front panel.

NOTE

All XLR-type connectors are wired with pin 1 to ground, pin 2 hot, and pin 3 cold.



25 **DVD IN connectors** This pair of connectors accepts the audio outputs of a DVD player.

26 **VCR OUT and IN connectors** These pairs of connectors feed the audio inputs of a video-cassette recorder (**OUT**) and accept the output signals from the VCR (**IN**).

27 **CD-RW OUT and IN connectors** These pairs of connectors feed the inputs of a CD recorder (**OUT**) and accept the output signals from the CD recorder (**IN**).

28 **CASSETTE OUT and IN connectors**

These pairs of connectors feed the inputs of a cassette recorder (**OUT**) and accept the output signals from the cassette recorder (**IN**).

29 **MIC GRP INSERT connector** This TRS 1/4" connector is used to pass the summed microphone signals through a dynamics processor (limiter, gate, etc.) or a graphic or parametric EQ unit, etc. The connector is wired with tip = send, ring = return, sleeve = ground).

30 **PHANTOM POWER switch** Use this switch to provide +48V phantom power to condenser microphones. All four microphone inputs are activated with the same switch.

Do not use dynamic microphones connected with an unbalanced connection or high-impedance microphones, with phantom power turned on.

NOTE

To avoid possible damage to microphones, always connect microphones, turn down the **ROOM VOLUME** control, and turn the speakers off using the **AMP A** and **AMP B** keys, before switching the phantom power on or off.

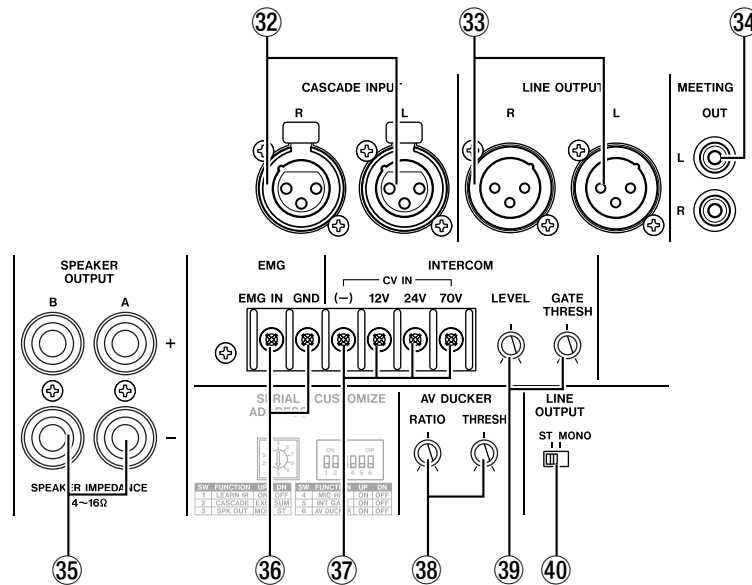
31 **MIC 1 through 4 connections** Microphones can be connected using the XLR connectors. In permanent installations where wires are being run through walls, the bare wires can be connected to the barrier strip instead.

Do not connect microphones via the XLR and barrier strip connections of the same microphone channel (though it is possible to connect some microphones via the XLR connectors and some via the barrier strip).

Always make sure that polarity is observed consistently throughout the installation, in order to avoid phase reversal problems.

5 – Rear panel connections

“Master” audio connections



These connections relate to the audio functions of the AV-452 which play a “master” role in the setup and operation of the unit.

32 CASCADE INPUT connectors These balanced XLR connectors accept balanced signals from another AV-452 (or similar unit). These input signals are selected using the front panel **CASCADE** key **15** and are pre-**ROOM VOLUME**.

Depending on the position of the rear panel DIP switch (“CASCADE (switch 2)” on page 17), the cascade input signal can sum with the AV-452 audio, or can replace it.

33 LINE OUTPUT connectors These balanced XLR connectors output the post-**ROOM VOLUME** mix (to another AV-452 unit or power amplifier).

34 MEETING OUT connectors These unbalanced RCA jacks outputs the pre-**ROOM VOLUME** mix.

One use for this facility is to connect a recorder to log the proceedings of meetings, etc.

35 SPEAKER OUTPUT A and B connectors Connect speakers to these binding post terminals. Take care to observe polarity to avoid out-of-phase problems.

The speakers attached to these terminals can be switched individually using the selector keys on the front panel **18**.

The impedance of the speaker system connected to each channel should be between 4Ω and 16Ω.

WARNING

Use of speakers with impedances outside these limits may result in damage to the speakers and/or the AV-452.

Also note that the AV-452 should not be operated in bridged mono mode.

Depending on the DIP switch setting (“SPEAKER OUT (switch 3)” on page 17), and the **LINE OUTPUT** mode switch **40**, the AV-452 may be configured as a dual mono amplifier, or as a stereo amplifier.

In the latter case, channel A corresponds to the left channel, and channel B to the right channel.

36 EMG IN and GND connectors Use these barrier strip connectors to attach a 5Vrms emergency signal cable.

When this signal is activated, the AV-452 will cut the signals from the **LINE OUTPUT 33** and **SPEAKER 35** terminals and all front panel indicators flash.

37 INTERCOM connectors (CV IN) Use these connectors to attach the cables from a constant voltage (CV) intercom system.

Before connecting the AV-452 to such an intercom system, confirm the voltage used by the intercom system. The AV-452 can work with intercoms using 12, 24 or 70 volts. When the speaker signal arrives at the AV-452, it is converted by the AV-452 into a line level signal, where it is added to the line and speaker outputs (but not to the **MEETING OUT** or **PHONES**).

Note the following levels and input impedances, corresponding to the different connectors on the barrier strip:

Connector	Level, input impedance
70V	70V, 40kΩ
24V	24V, 12kΩ
12V	12V, 4.7kΩ

The level of the intercom signal is set as explained below, and a squelch circuit is also available (39). The intercom signal is enabled and disabled using the front panel INTERCOM key (16).

38 AV DUCKER RATIO and THRESH controls These trimmer pots are used if the AV ducking facility is enabled using the DIP switches (see "Customization and settings" on page 16). If this facility is not enabled, these controls have no effect.

If this is enabled, the amount by which the currently-selected AV signal is ducked is set between -6 and -20 dB, depending on the position of the **RATIO** trimmer pot. Turn this pot clockwise to increase the amount that the AV signal is dimmed.

The **THRESH** trimmer pot adjusts the threshold level of the microphone signal at which the ducking facility operates. Turn this pot clockwise to increase this trigger level.

39 LEVEL and GATE THRESH controls

These two trimmer pots are used with the **INTERCOM** signals input at (37).

The **LEVEL** control adjusts the level of the intercom signal fed to the mix (post-**ROOM LEVEL**). Turn this clockwise to increase the level of the signal.

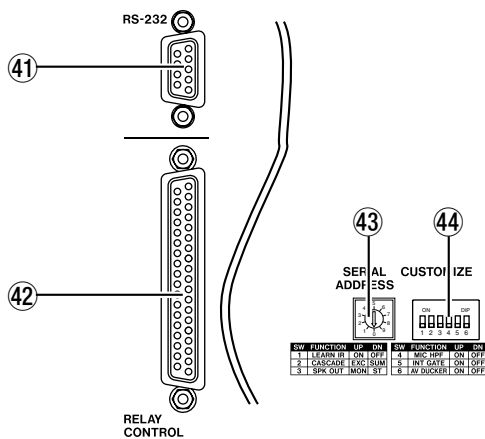
The **GATE THRESH** squelch control is used to control the threshold of a noise gate, which opens when the level of the intercom signal exceeds this level. This allows an otherwise slightly noisy intercom to be connected without interfering with the other signals.

40 LINE OUTPUT mode switch This switch allows the line output (33) of the AV-452 to act as two mono line sources, driving auxiliary amplifiers, etc. in two locations, or it allows it to act as a stereo amplifier, driving another stereo unit.

External control connectors

There are two D-sub connectors, used for external control of the AV-452.

The details relating to these connectors are described in "External control" on page 18.



41 RS-232 serial port This female 9-pin D-sub port accepts and receives serial signals, allowing the AV-452 to be controlled by a serial device. See

the document *Serial Protocol Reference* (available on request from your TASCAM dealer or distributor) for full details of the format and content of the serial commands and messages.

NOTE

Although the connector is marked **RS-232**, it can be used for **RS-422** and **RS-485** serial data interchange as well as for **RS-232** format data.

42 RELAY CONTROL connector This female 37-pin D-sub connector accepts commands and transmits tally signals. It also can be used to connect a wired IR "blaster" transmitter for the control of other devices, such as a video projector or monitor.

43 SERIAL ADDRESS selector Use this to select the serial address (0 through 9) of the AV-452 when controlling it using RS-485 commands.

44 CUSTOMIZE DIP switches See the following section for the meanings of these configuration switches.

6 – Customization and settings

The customization and settings of the AV-452 are made using a set of six DIP switches.

These switches are as follows:

Switch	Function	Up position	Down position
1	Learn IR codes(LEARN IR)	ON	OFF
2	Cascade mode (CASCADE)	Exclusive (EXC)	Summed (SUM)
3	Speaker outputs (SPK OUT)	Mono (MON)	Stereo (ST)
4	Microphone high-pass filter (MIC HPF)	ON	OFF
5	Intercom gate function (INT GATE)	ON	OFF
6	AV ducking facility (AV DUCKER)	ON	OFF

These are explained here:

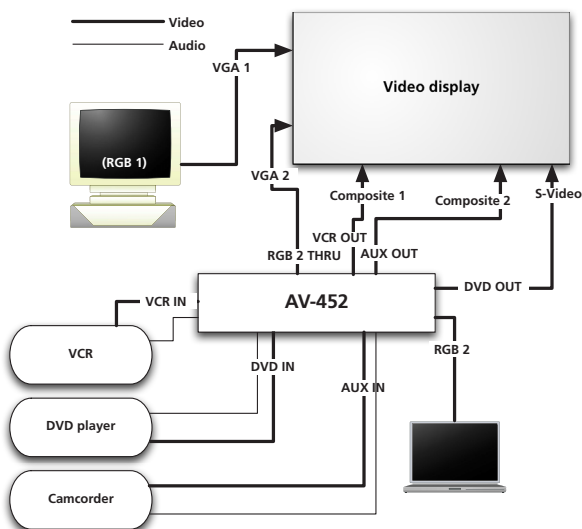
LEARN IR (switch 1)

This function allows the AV-452 to learn the IR codes for direct control of a monitor, video projector, etc. allowing the external video source for the video display unit to be selected using the AV selection keys as well as the **RGB 1** and **RGB 2** keys.

This allows the video signal of different devices to be hooked up directly to the monitor and switched together with the audio from one control surface (the AV-452 or the RC-452).

An external IR “blaster” (not supplied) must be connected to the AV-452 for control of the video display unit.

Learning the external IR commands In the following explanation, we assume that the AV equipment is hooked up to a multi-input video display device in the following way:



Not shown here is the IR blaster device, connected to the relay control (42) connector of the AV-452 and pointing at the video monitor's IR receiver.

Here we are programming the **DVD** key on the AV-452 to switch the video monitor to the **S-Video** input.

- 1 Make sure the power to the AV-452 is OFF.
- 2 Set the **LEARN IR** switch (switch 1) to ON.
- 3 Turn ON the AV-452. The **AMP A**, **AMP B**, **INTERCOM** and **CASCADE** keys on the front panel flash to show the unit is in IR learn mode.
- 4 Press the **DVD** key on the AV-452 front panel. It starts to flash.
- 5 Point the video display device's remote control unit at the AV-452's **IR SENSOR** (17) and press the key which enables the S-Video input on the remote control unit of the video display device.

- If a valid IR code is received and stored, the **DVD** key stops flashing.
- If the IR code is not received and stored correctly, the **DVD** key continues to flash.

NOTE

The AV-452 only supports the NEC type IR command specification. If the key continues to flash, and you are sure that the source change command has been transmitted, the video display device may not conform to the NEC ITR command specification.

- 6 Press another AV selection key (for example, the **RGB 1** key) and the corresponding input key on the video remote control unit of the video display device to learn this command.
- 7 When you have finished programming these commands, set the **LEARN IR** switch (switch 1) to OFF.

The AV-452 resets itself and starts normal operation.

CASCADE (switch 2)

This switch determines the use of the audio signals received at the **CASCADE IN** connectors ③② when the **CASCADE** key ①⑤ is activated.

In the **EXC** (exclusive) setting, the input cascade signal replaces the direct input signals at both the **LINE OUTPUT** ③③ and **SPEAKER OUT** ③⑤ terminals.

In the **SUM** setting, the cascaded signal is summed (pre **ROOM LEVEL**) with the direct input signals from the **LINE OUTPUT** ③③ and **SPEAKER OUT** ③⑤ terminals (as well as the **MEETING OUT** ③④ and **PHONES** ①⑨).

NOTE

Remember that this only applies to audio signals. You cannot cascade video signals using the AV-452.

The cascade and intercom Note also that when the switch is set to the **EXC** (exclusive) setting, the CV intercom input is disabled. The front panel **INTERCOM** key ①⑥ will not light if the switch is set to **EXC**. Also, when the switch is in this position, pressing the **INTERCOM** key will cause the key to flash briefly, indicating that the intercom input is disabled.

SPEAKER OUT (switch 3)

This switch determines whether the signal sent to the **SPEAKER OUT** ③⑤ terminals is the same from both speakers (left and right summed) (**MON**) or whether it is a stereo signal (**ST**).

If the mono option is chosen, it is possible to use the AV-452 to control the sound fed to either or both of

two rooms, switchable using the **AMP** keys on the front panel ①⑧.

NOTE

*This switch setting only affects the speaker outputs. It does not affect the **LINE** outputs ③③, which are switched between mono and stereo with a dedicated switch ④①.*

MIC HPF (switch 4)

This switch enables or disables an 80Hz high-pass filter added to the summed microphone signals.

Use this filter to cut out wind noise, floor rumble, etc. from microphones which are located in less than acoustically perfect environments.

INTERCOM GATE (switch 5)

This switch enables or disables the intercom squelch circuit (noise gate).

When this switch is in the **OFF** position, the **GATE THRESH** trimmer pot ③⑨ has no effect.

AV DUCKER (switch 6)

This switch enables or disables the AV ducking circuit.

When this switch is in the **OFF** position, neither of the **AV DUCKER** trimmer pots: the **RATIO** or **THRESH** ③⑧ controls, has any effect.

7 – External control

The AV-452 can be controlled from other units in two ways.

The first is a serial protocol, as used by many AV controller vendors. This allows a number of AV-452

units to be controlled from a personal computer, as well as by these dedicated controllers.

The second is by using the relay connector, allowing a number of external relay controls and tally indicators to be connected to the AV-452.

AV-452 serial protocol

NOTE

A separate document “AV-452 Serial Control Protocol”, providing details on the implementation of the serial control, is available on request from your TASCAM dealer or distributor. If you are implementing the serial protocol, you may choose to provide your “back-room” systems integration team with the separate document, and to keep a copy to hand for troubleshooting on site.

The serial port can operate as a RS-232, RS-422 or RS-485 port (as determined by the controller or

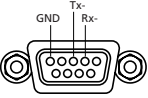
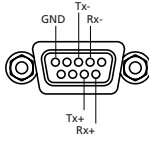
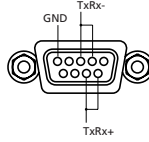
PC). The AV-452 is fitted with a standard 9-pin D-sub serial port, as well as a rotary address selector switch ④③, allowing it to take an ID from 0 through 9.

This allows a number of AV-452 units to be chained together and controlled from a single source.

NOTE

Only set the serial address with the power to the AV-452 turned off as the AV-452 will only recognize the setting at power-on.

Serial port pinouts

RS-232	RS-422	RS-485
		
Pin 2: Rx- Data Pin 3: TX- Data Pin 5: Ground	Pin 2: Rx- Data Pin 3: Tx- Data Pin 5: Ground Pin 6: Rx+ Data Pin 7: Tx+ Data	Pin 2: TxRx- Data Pin 3: TxRx- Data Pin 5: Ground Pin 6: TxRx+ Data Pin 7: TxRx + Data

The diagrams above show the AV-452 rear panel connector. Any cable connectors will accordingly be mirror images of the above.

The transmission speed is always 9,600bps, with a character length of 8 bits, and no parity. The command spacing is >25ms.

The RS-422 and RS-485 implementations follow standard specifications.

The RS-232 operation is a modification of the RS-422 port, operating at 0 to 4.5 V, rather than ± 9 V. It should work with most older control systems and PCs, but if you have problems with using this protocol, try using the controller with RS-422, if possible, to remedy the situation.

Relay control port

There is also a 37-pin D-sub connector ④② which may be used for relay control of the AV-452 and connecting tally indicators.

The following should be taken into account when connecting external equipment to the AV-452 using this port:

The relay outputs are low when active, and must be low for at least 50ms.

The maximum current is 20mA, and the maximum voltage is 30V.

The tally indicator outputs are open collector.

IR “blaster”

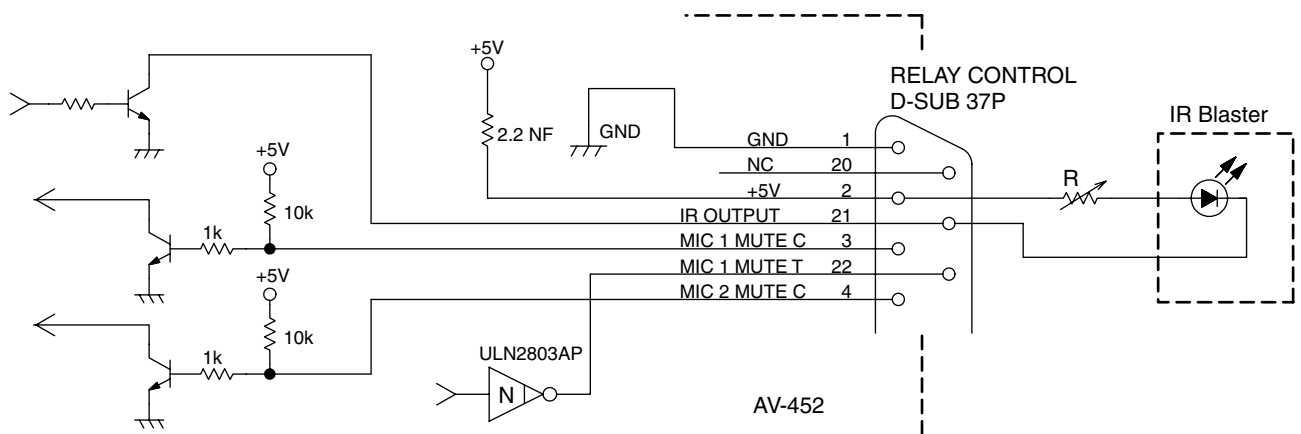
Note that pin 21 (and pin 2, +5V) may be connected to an IR “blaster” device, which can be used to relay command codes from the AV-452 to an external monitor or projector, etc.

The procedure for learning these command signals is described in "LEARN IR (switch 1)" on page 16.

An IR blaster that has been found to work well with the AV-452 is the Xantech 283M IR emitter. Please consult your TASCAM distributor for up-to-date details of other suitable units that can be used with your AV-452.

RELAY CONTROL pinouts

Pin #	Signal	Meaning	Pin #	Signal	Meaning
1	GND	GND	20	NC	
2	+5V	+5V (50mA maximum)	21	IR OUTPUT	Connect the wired IR remote device
3	MIC 1 MUTE	Turns the MIC 1 MUTE on and off	22	MIC 1 MUTE Tally	
4	MIC 2 MUTE	Turns the MIC 2 MUTE on and off	23	MIC 2 MUTE Tally	
5	MIC 3 MUTE	Turns the MIC 3 MUTE on and off	24	MIC 3 MUTE Tally	
6	MIC 4 MUTE	Turns the MIC 4 MUTE on and off	25	MIC 4 MUTE Tally	
7	A/V DIM	Turns the AV DIM on and off	26	A/V DIM Tally	
8	CASSETTE	Selects Cassette as the AV source	27	CASSETTE Tally	
9	RGB 1	Selects RGB 1 as the Projector or RGB monitor source	28	CD-RW Tally	
10	RGB 2	Selects RGB 2 as the Projector or RGB monitor source	29	DVD Tally	
11	CD-RW	Selects CD-RW as the AV source	30	VCR Tally	
12	DVD	Selects DVD as the AV source	31	AUX IN Tally	
13	VCR	Selects VCR as the AV source	32	RGB 1 Tally	
14	AUX IN	Selects AUX IN as the AV source	33	RGB 2 Tally	
15	AMP A	Turns the AMP A output on and off	34	AMP A Tally	
16	AMP B	Turns the AMP B output on and off	35	AMP B Tally	
17	INTERCOM	Activates the INTERCOM input	36	INTERCOM Tally	
18	CASCADE	Activates the CASCADE input	37	VOLUME DOWN	Volume down
19	VOLUME UP	Volume up			



8 – Specifications and block diagram

Video specifications

Composite inputs All composite inputs are through RCA jacks.

AUX IN	75Ω, 1 Vp-p
VCR IN	75Ω, 1 Vp-p
DVD IN	75Ω, 1 Vp-p

S-Video inputs All S-Video inputs are through 4-pin mini-DIN connectors.

VCR IN	75Ω, 1 Vp-p
DVD IN	75Ω, 1 Vp-p

Composite outputs All composite outputs are through RCA jacks.

VCR OUT	75Ω, 1 Vp-p
MONITOR OUT	75Ω, 1 Vp-p

S-Video outputs All S-Video outputs are through 4-pin mini-DIN connectors.

VCR OUT	75Ω, 1 Vp-p
MONITOR OUT	75Ω, 1 Vp-p

RGB 2 connections

RGB 2 IN	15-pin D-sub female
RGB 2 THRU	15-pin D-sub female

AV audio and microphone specifications

AV audio inputs All inputs are made through RCA pin jacks (unbalanced).

CASSETTE	Input impedance, 47kΩ, Nominal input level -10dBV (-7.8dBu)
CD-RW	Input impedance, 47kΩ, Nominal input level -10dBV (-7.8dBu)
VCR	Input impedance, 47kΩ, Nominal input level -10dBV (-7.8dBu)
DVD	Input impedance, 47kΩ, Nominal input level -10dBV (-7.8dBu)
AUX IN	Input impedance, 47kΩ, Nominal input level -10dBV (-7.8dBu)

AV audio outputs All outputs are made through RCA pin jacks (unbalanced).

CASSETTE	Output impedance, 100Ω, Output level -10dBV (-7.8dBu) (nominal), +10.8dBV (+13dBu) (maximum)
CD-RW	Output impedance, 100Ω, Output level -10dBV (-7.8dBu) (nominal), +10.8dBV (+13dBu) (maximum)
VCR	Output impedance, 100Ω, Output level -10dBV (-7.8dBu) (nominal), +10.8dBV (+13dBu) (maximum)

Microphone group insert Made through TRS 1/4" jack:

Send (tip)	Output impedance 100Ω, nominal level -10dBV (-7.8dBu), maximum level +15dBV (+17.2dBu)
Return (sleeve)	Input impedance 10kΩ, nominal level -10dBV (-7.8dBu), 21 dB headroom

Microphone inputs The following figures apply to connections made via the XLR connectors and the barrier strips.

Input impedance	2.2kΩ
Input level	-60dBu (GAIN ④ at maximum) to -27dBu (GAIN at minimum)
Phantom power	+48V (global for 4 channels)
OL indicator ③	Lights at 10dB above nominal level
HPF	Global for 4 channels, switchable @ 80Hz

Master section specifications

CASCADE INPUTS	Balanced (XLR -type connectors Input impedance 10k Ω , input level +4dBu
LINE OUTPUT	Balanced XLR-type connectors Output impedance 100 Ω , nominal output level +4dBu, maximum output level +23 dBu
MEETING OUT	Unbalanced RCA connectors Output impedance 100 Ω , nominal output level -10 dBV (-7.8dBu), maximum output level +15 dBV (+17.2 dBu)
INTERCOM	Barrier strip 70V, 40k Ω , 24V, 12k Ω or 12V, 4.7k Ω
EMG IN	5V r.m.s.

Phones

Connector	1/4" stereo jack
Maximum output power	100mW + 100mW (68 Ω) control at maximum power

Speaker outputs

Connector	Binding posts
Load impedance	8 Ω
Rated output power	80W + 80W (1 kHz, 1%, 8 Ω)
Maximum output power	100W +100W (EIA, JAITA)

Audio performance

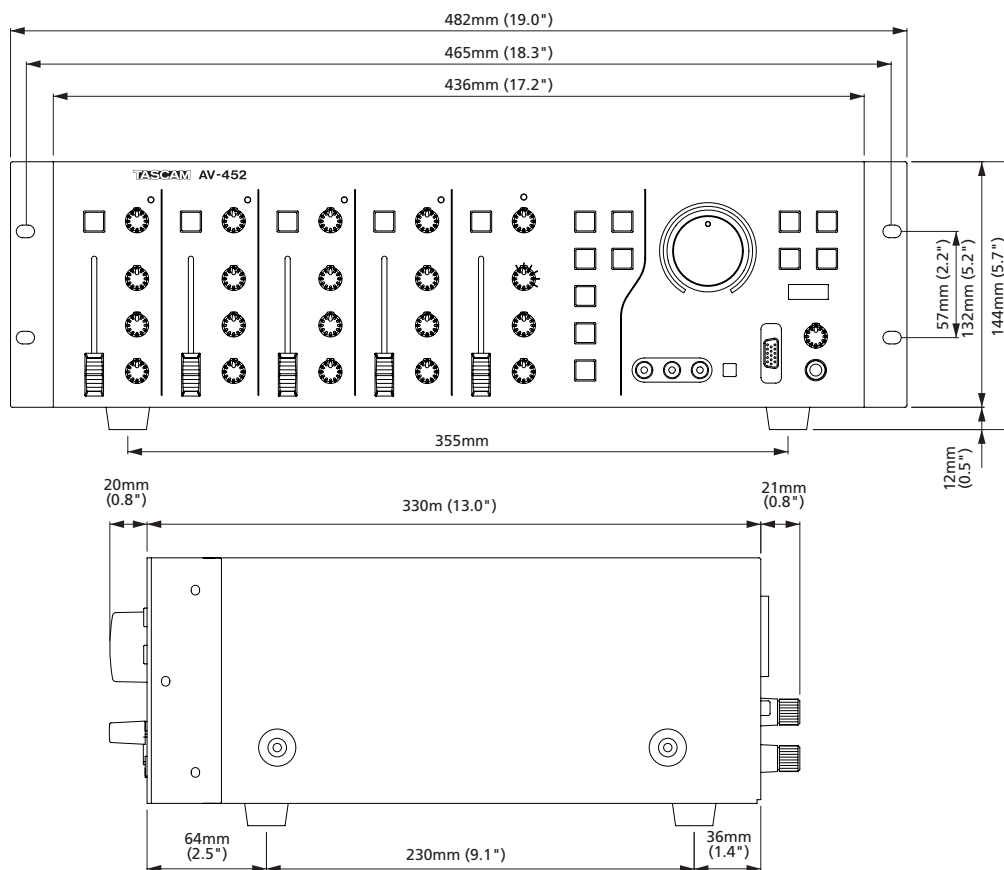
Frequency response	20Hz to 20kHz +1.0/-2.0dB, MIC IN to INSERT SEND
	20Hz to 20kHz +1.0/-2.0dB, LINE IN to LINE OUTPUT
	20Hz to 20kHz +1.0/-2.0dB, LINE IN to MEETING OUTPUT
	20Hz to 20kHz +1.0/-2.0dB, LINE IN to OUTPUT (to LINE sources)
	50Hz to 20kHz +1.0/-2.0dB, LINE IN to PHONES OUTPUT
THD (nominal level, 1 kHz)	0.07%, MIC IN to LINE OUTPUT (GAIN: MIN, DIN AUDIO)
	0.03%, LINE IN to LINE OUTPUT (DIN AUDIO)
	0.03%, LINE IN to OUTPUT (to LINE sources) (DIN AUDIO)
	0.03%, LINE IN to MEETING OUTPUT (DIN AUDIO)
Noise level (DIN Audio+A)	MIC IN (GAIN: MAX, EIN, 150ohm terminated) -110dBu, MIC IN to INSERT SEND
	LINE IN -72 dBV (-70dBu), LINE IN to LINE OUTPUT
	(DIN Audio) -72 dBV (-70dBu), LINE IN to OUTPUT (to LINE sources)
	-72 dBV (-70dBu), LINE IN to MEETING OUTPUT
	-70 dBV (-68dBu), LINE IN to PHONES OUTPUT
Crosstalk	60dB, L/R at 1kHz
	65dB, Input channels at 1kHz
Speaker outputs	Noise level (DIN Audio +A): 4mV (ROOM VOLUME at max, MIC faders at min, inputs shorted); 1.2mV (ROOM VOLUME minimum)
	Signal-to-noise ratio (DIN Audio+A):70dB (output of 50W)

8 – Specifications and block diagram

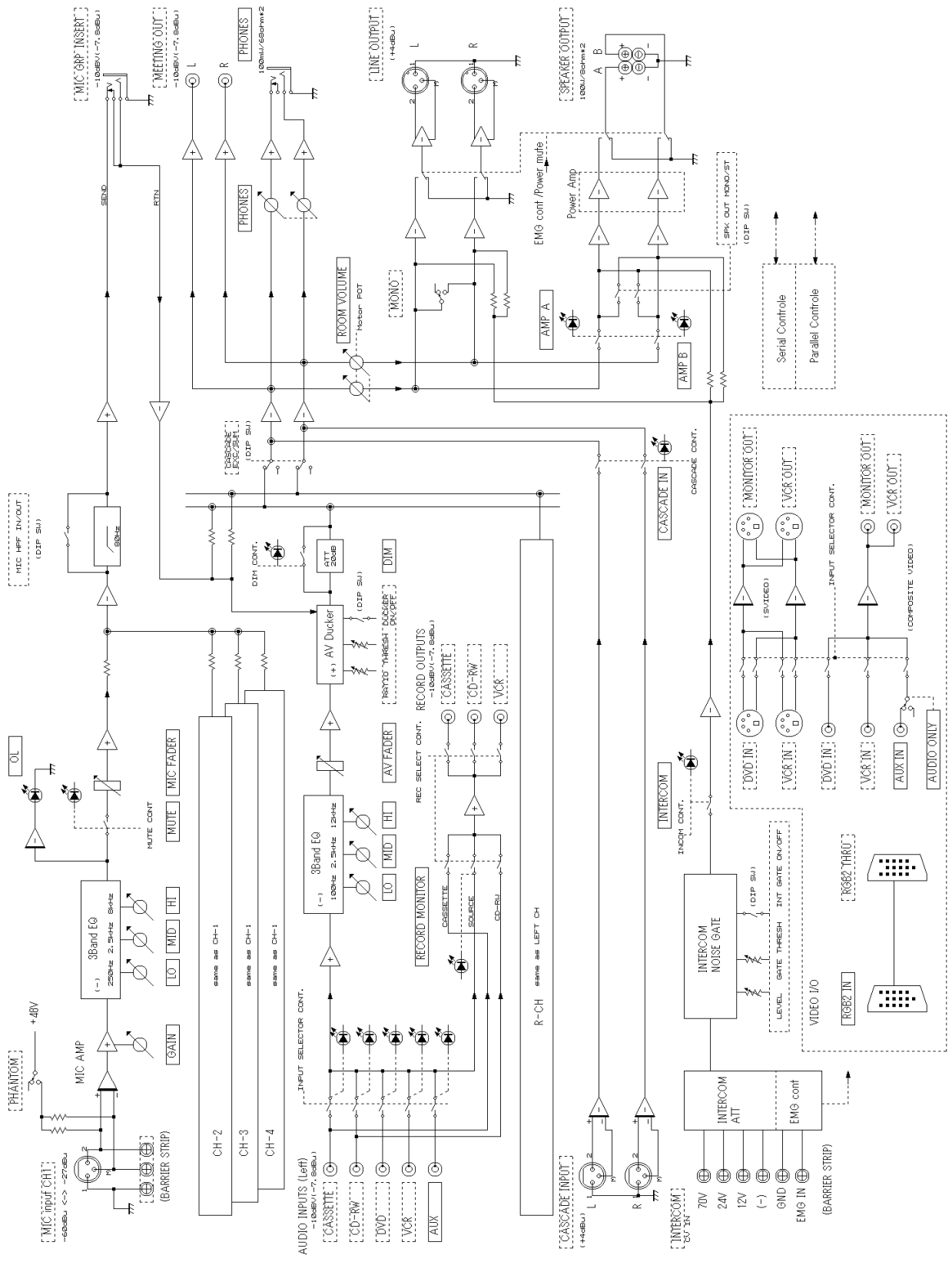
Power and physical specifications

Power requirement	100V AC, 50-60Hz
	120V AC, 60Hz
	230V AC, 50Hz
	240V AC, 50Hz
Power consumption	125W
Peak inrush current	16 A
Applicable electromagnetic environment	E4
Dimensions (W xHxD)	482 x 144 x 371 (mm) 19.0 x 5.7 x 14.6 (in)
Weight	11.3kg (24.9 lbs)
Supplied accessories	RC-452 remote control unit 2 x AAA dry cell batteries Power cord Rack mounting kit

Dimensional drawing



Block diagram



TASCAM

TEAC Professional Division

AV-452

TEAC CORPORATION

Phone: +81-422-52-5082
3-7-3, Nakacho, Musashino-shi, Tokyo 180-8550, Japan

www.tascam.com

TEAC AMERICA, INC.

Phone: +1-323-726-0303
7733 Telegraph Road, Montebello, California 90640

www.tascam.com

TEAC CANADA LTD.

Phone: +1905-890-8008 Facsimile: +1905-890-9888
5939 Wallace Street, Mississauga, Ontario L4Z 1Z8, Canada

www.tascam.com

TEAC MEXICO, S.A. De C.V

Phone: +52-555-581-5500
Campesinos No. 184, Colonia Granjes Esmeralda, Delegacion Iztapalapa CP 09810, Mexico DF

www.tascam.com

TEAC UK LIMITED

Phone: +44-1923-438880
5 Marlin House, Croxley Business Park, Watford, Hertfordshire. WD1 8TE, U.K.

www.tascam.co.uk

TEAC EUROPE GmbH

Phone: +49-611-71580
Bahnstrasse 12, 65205 Wiesbaden-Erbenheim, Germany

www.tascam.de

TEAC FRANCE S. A.

Phone: +33-1-42-37-01-02
17 Rue Alexis-de-Tocqueville, CE 005 92182 Antony Cedex, France

www.tascam.fr

TEAC AUSTRALIA PTY.,LTD. A.B.N. 80 005 408 462

Phone: +61-3-9672-2400 Facsimile: +61-3-9672-2249
280 William Street, Port Melbourne, Victoria 3000, Australia

www.tascam.com.au

TEAC ITALIANA S.p.A.

Phone: +39-02-66010500
Via C. Cantù 11, 20092 Cinisello Balsamo, Milano, Italy

www.teac.it