

TASCAM

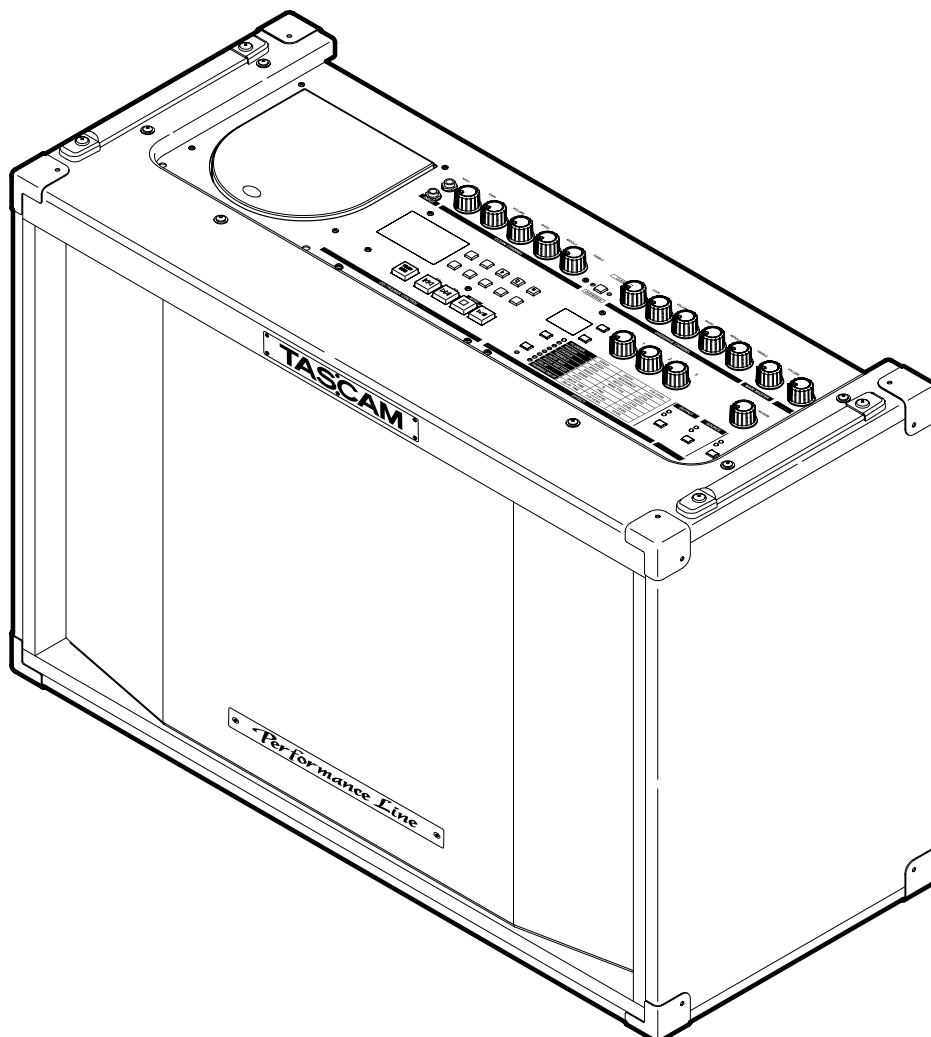
TEAC Professional Division

D00907100A

GA-100CD

Instrument Amplifier

OWNER'S MANUAL



IMPORTANT SAFETY PRECAUTIONS



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 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.

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 customers 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.

CE Marking Information

- a) Applicable electromagnetic environment: E4
- b) Peak inrush current: 21 A

In North America use only on 120V supply.

IMPORTANT SAFETY PRECAUTIONS

- 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 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. A 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.
- 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.
 - The apparatus should be located close enough to the AC outlet so that you can easily grasp the power cord plug at any time.
 - An apparatus with Class I construction shall be connected to an AC outlet with a protective grounding connection.



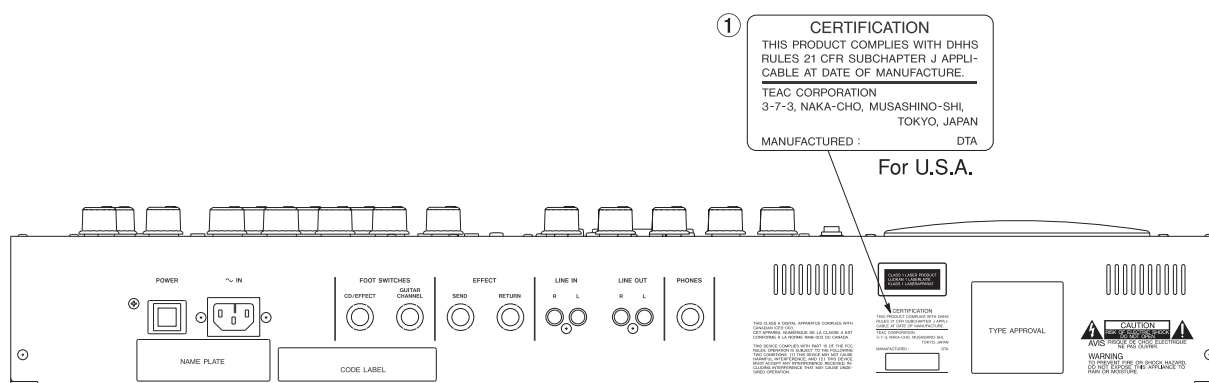
- 13 Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Safety Information

This product has been designed and manufactured according to FDA regulations "title 21, CFR, chapter 1, subchapter J, based on the Radiation Control for Health and Safety Act of 1968", and is classified as a class 1 laser product. There is no hazardous invisible laser radiation during operation because invisible laser radiation emitted inside of this product is completely confined in the protective housings. The label required in this regulation is shown at ①.

CAUTION

- DO NOT REMOVE THE PROTECTIVE HOUSING USING A SCREWDRIVER.
- USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.
- IF THIS PRODUCT DEVELOPS TROUBLE, CONTACT YOUR NEAREST QUALIFIED SERVICE PERSONNEL, AND DO NOT USE THE PRODUCT IN ITS DAMAGED STATE.
- CLASS 1M INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED AVOID EXPOSURE TO THE BEAM.



Optical pickup:

Type: KSM-900AAA
Manufacturer: SONY Corporation
Laser output: Less than 1 mW on the objective lens
Wavelength: 775 to 816 nm

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1 – Introduction

Thank you for purchasing a TASCAM GA-100CD instrument amplifier. This guitar amp has 60W output, a 12-inch speaker and sophisticated tube amp modeling circuitry that lets you realize rich, full sounds. High-quality built-in effects give you the freedom to create sounds without external effects. You can also practice along with your favorite music, play prerecorded backing tracks during performances and otherwise use the built-in CD player as you like.

Please study this manual thoroughly before using the amp so that you understand how to use it properly. We hope that with this knowledge you will enjoy using the GA-100CD and all of its features for many years. After you have finished reading this manual, please keep it in a safe place for future reference.

Main features of the GA-100CD

Guitar amp

- 60W output, 12-inch (30-cm) main speaker
- The 2 channels –clean and overdrive– can be switched remotely
- Separate knobs allow gain and volume to be adjusted independently of for optimal distortion
- Tube amp simulation using analog circuits responds faster than DSP guitar amp modeling
- Single-ended preamp and a push-pull power amp structure parallels that of a tube amp to realize a similar rich, full sound
- Stable, maintenance-free function achieved through the use of an IC power amp
- Ideal cabinet sound achieved by sending suitable negative feedback current to the power amp

DSP effects

- 2 built-in TASCAM DSP effect units provide a choice of stereo delay, panning delay, flanger, phaser, chorus, tremolo, auto-wah, or pitch shifter effects and reverb
- Effects can be output from the main speaker or from the left and right sub-speakers for spacious sounds
- Effect bank can be controlled with a footswitch

CD Trainer

- Popular TASCAM CD Trainer built in
- Playback pitch and tempo freely controllable
- Variable Speed Audition (VSA) allows playback speed to be changed without changing the pitch
- Speed adjustment from –50% to +16%
- Pitch adjustment up or down 6 semitones
- Guitar Cancel function allows specified frequency and stereo ranges to be cut during playback
- Loop playback allows repetition of a selected passage
- Independent stereo amp (20W + 20W) and two 5-inch (12-cm) sub-speakers provide clear playback
- Built-in guitar tuner for easy tuning
- Built-in metronome and oscillator

Other features

- Effect send and return jacks for connection to external effects
- Stereo line input jack for connection of external sound sources
- Headphone jack

Supplied accessories

In addition to this manual, the GA-100CD has been packed with the items listed to the right.

Contact your TASCAM supplier if any of these items are missing.

- AC power cable..... 1
- Warranty 1

Understanding this manual

We use the following conventions in this manual:

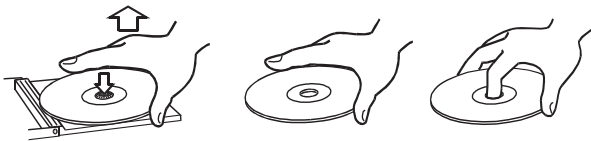
- The names of keys and controls are given in the following typeface: **REVERB**.
- Messages shown in the alphanumeric portion of the LCD are given in the following typeface: **TMOD**.
- If a preset indicator in the display (i.e. one that cannot change, but is either on or off) is shown, this is given as follows: **TEMPO**.
- Selectable values (i.e. values of dB) and ON and OFF selections are shown in the following typeface: **CHR**. (i.e. **VBR>ON**)

- The GA-100CD has keys that function differently depending on whether they are pressed briefly (less than half a second) or pressed and held (more than half a second). In this manual, instructions to “press the key” or, for example, “press **VSA**” refer to brief presses, while instructions to “press and hold the key” or, for example, “press and hold **OSC**” refer to long presses.
- The CD Trainer Control LCD usually shows the elapsed track time, remaining track time or total remaining CD time. In this manual, this status is referred to as the “time display.”

Handling of compact discs

The GA-100CD has been designed for the playback of CD-DA (standard audio) format discs. In addition to ordinary 5-inch and 3-inch CDs, it can also play properly recorded CD-R and CD-RW discs.

- Always place CDs in the tray with their labeled sides facing upward.
- To remove a disc from its case, press down on the center of the disc holder, then lift the disc out, holding it carefully by the edges.

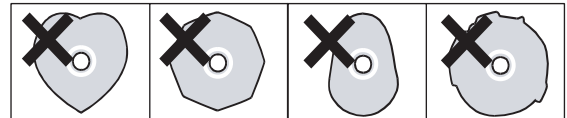


- Avoid getting fingerprints on the signal side (the non-label side). Grime and dust may cause skipping, so keep discs clean and store them in their cases when not being played. To clean the signal side of a disc, wipe gently with a soft dry cloth from the center towards the outside edge.



- Do not use any record spray, anti-static solutions, benzene, paint thinner or other chemical agents to clean CDs as they could damage the delicate playing surface. This may cause CDs to become unplayable.
- Discs should be returned to their cases after use to avoid serious scratches that could cause the laser pickup to “skip.”

- Keep discs away from direct sunlight, and places of high heat and humidity. If left in such places, warping could result.
- Do not affix any labels or stickers to the label side of the disc. Do not write on the disc with ballpoint pens.
- Do not use cracked discs.
- Only use circular compact discs. Avoid using non-circular promotional discs, etc.



- The GA-100CD cannot play CD-R/RW discs that are not finalized.
- Several record companies have released music discs that use Copy Control and other copy-protection systems in an effort to prevent piracy. Since some of these discs do not comply with the CD specifications, the GA-100CD may not be able to play them.
- After opening the CD player cover, if the CD is still spinning, wait until it has stopped before removing it.

CAUTION

Using commercially available CD stabilizers or printable recordable discs with this player will damage the mechanism and cause it to malfunction.

Never use a disc that has had a stabilizer mounted to it. The residual adhesive may cause the disc to stick to the turntable of the GA-100CD. If it sticks to the turntable, you will need a technician to get it out.

Beware of condensation

If the unit (or a compact disc) is moved from a cold to a warm place, or used after a sudden temperature change, there is a danger of condensation; vapor in the air could condense on the internal mechanism, making correct

operation impossible. To prevent this, or if this occurs, let the player sit for one or two hours at the new room temperature before using.

Precautions for placement and use

Do not place the unit in the following types of places. Placement in such locations may cause malfunction or reduce sound quality.

- Unstable places or places with frequent vibrations
- Near windows or in direct sunlight
- Near heating devices or other extremely hot places
- Extremely cold places
- Damp or poorly ventilated places

Placing this amp near another power amplifier or another device with a large transformer can cause hum.

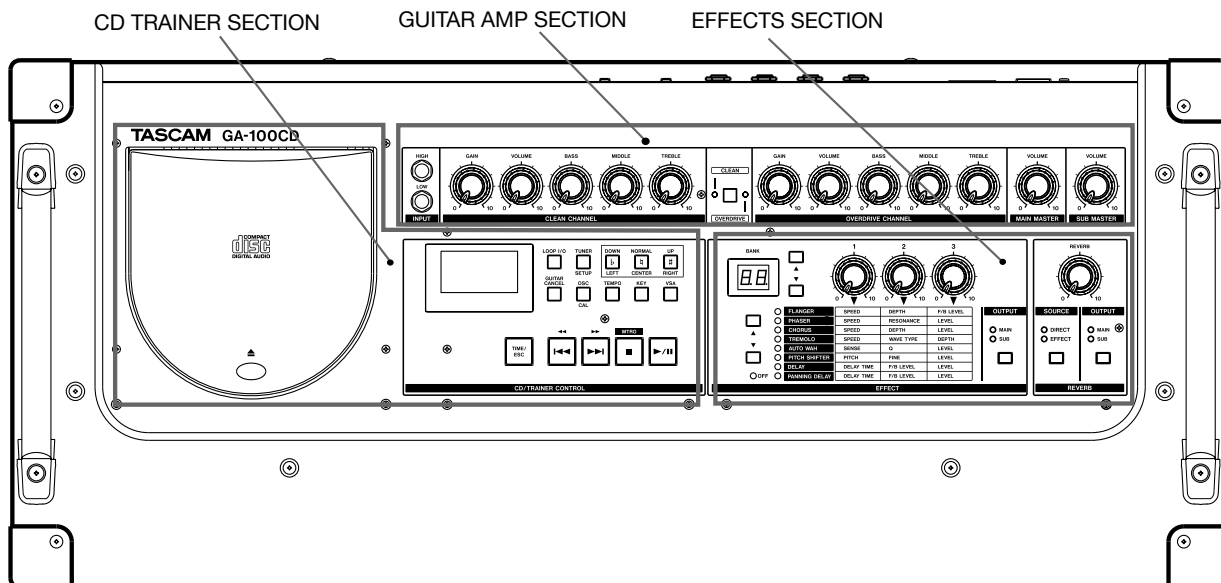
Adjust the distance and angle between the devices if this occurs.

Operation of the GA-100CD near a television or radio may cause color distortion on the television screen or noise in the radio signal. If this occurs, move the GA-100CD farther away.

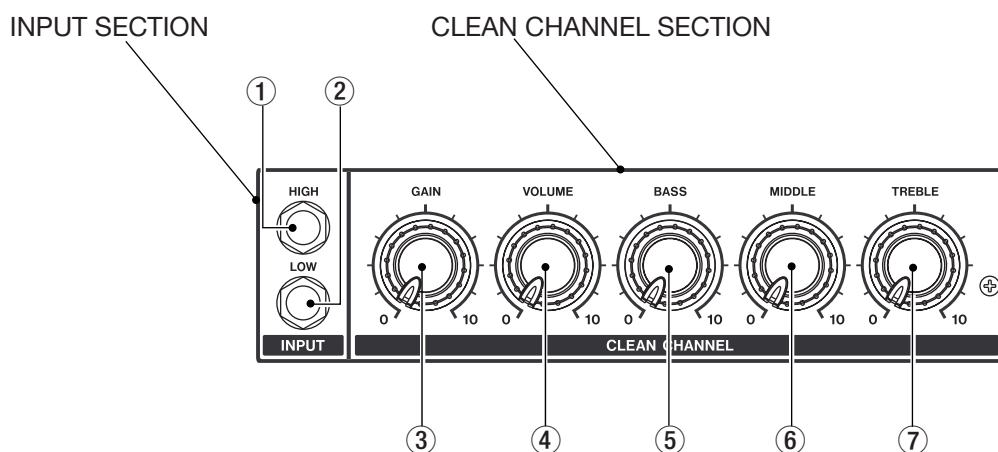
Use of mobile phones and other wireless devices near the GA-100CD may cause the amp to produce noise during use or when calls are made or received. If this occurs, turn off the device or move it away from the GA-100CD.

2 – Part names and functions

Top panel



Guitar amp



Input section

Plug your guitar in here. Most guitars are high impedance, but some guitars with built-in batteries are low impedance.

① HIGH

Connect guitars with high output impedance to this high input impedance (6.8M Ω) input jack.

② LOW

Connect guitars with low output impedance to this low input impedance (68k Ω) input jack.

Clean channel section

These preamp controls function when the green **CLEAN** light in the CLEAN/OVERDRIVE key section is on.

③ GAIN knob

Change the amount of distortion by adjusting the input gain. When connecting guitars with single coil pickups, start around 4 and gradually raise the gain to increase the distortion.

④ VOLUME knob

Use this knob to adjust the volume without changing the sound character.

⑤ BASS knob

Adjust low frequencies.

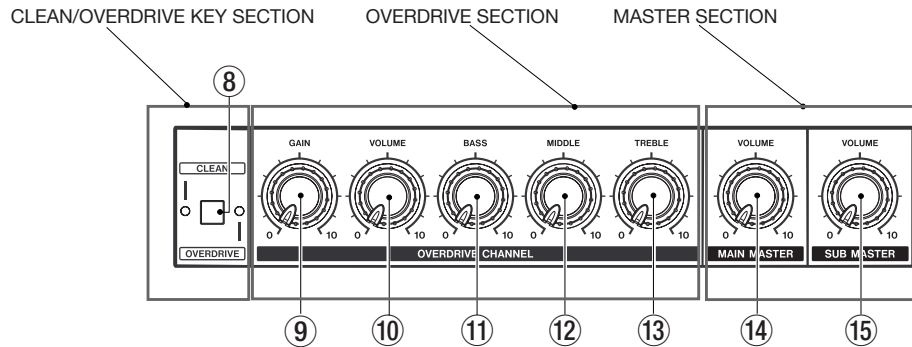
⑥ MIDDLE knob

Adjust mid-range frequencies.

⑦ TREBLE knob

Adjust high frequencies.

2 – Part names and functions



Clean/overdrive key section

⑧ CLEAN/OVERDRIVE key

Select the clean or overdrive channel.

The **CLEAN** (green) light or the **OVERDRIVE** (red) light is lit according to your selection. This key also determines the effect bank. (See “Using effects” on page 16.)

Overdrive channel section

The preamp **OVERDRIVE CHANNEL** controls function when the red **OVERDRIVE** indicator is lit in the **CLEAN/OVERDRIVE** key section.

⑨ GAIN knob

Change the amount of distortion by adjusting the input gain. This channel provides a large amount of distortion even at low **GAIN** levels.

⑩ VOLUME knob

Use this knob to adjust the volume without changing the sound character.

⑪ BASS knob

Adjust low frequencies.

⑫ MIDDLE knob

Adjust mid-range frequencies.

⑬ TREBLE knob

Adjust high frequencies.

Master section

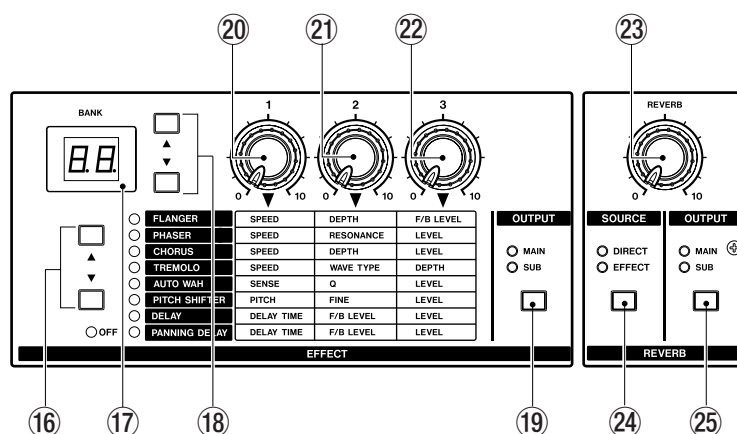
⑭ MAIN MASTER VOLUME

Adjust the volume of the total output signal sent to the main speaker (12-inch). In addition to the guitar preamp output, the effects output can also be sent to the main speaker.

⑮ SUB MASTER VOLUME

Adjust the volume of the total output signal sent to the 2 sub-speakers (5-inch). In addition to the CD Trainer, the effects output can also be sent to the sub-speakers.

Effects



Effects section

Use to set the built-in effects.

⑩ Effect selection keys (▲, ▼)

Use these to select one of the effects – delay, panning delay, flanger, phaser, chorus, tremolo, auto-wah or pitch shifter. The indicator lights next to the selected effect.

⑮ BANK display

Shows the currently selected bank number.

⑮ Bank selection keys (▲, ▼)

Select from the effects preset banks. (See “Changing banks” on page 16.)

2 – Part names and functions

19 OUTPUT key

Press this key to select the effects signal output – the main speaker, the sub-speaker pair or all three speakers. Each time you press this key, the output destination setting changes and one or both of the indicators (**MAIN**, **SUB**) lights.

20 Effect Knob 1

Adjust the first parameter of the selected effect. The panel shows each effect's adjustable parameters. (See "Using effects" on page 16.)

21 Effect Knob 2

Adjust the second parameter of the selected effect. The panel shows each effect's adjustable parameters. (See "Using effects" on page 16.)

22 Effect Knob 3

Adjust the third parameter of the selected effect. The panel shows each effect's adjustable parameters. (See "Using effects" on page 16.)

Reverb section

Use to set the built-in reverb.

23 REVERB knob

Adjust the reverb signal output level.

24 SOURCE key

Select the reverb input signal.

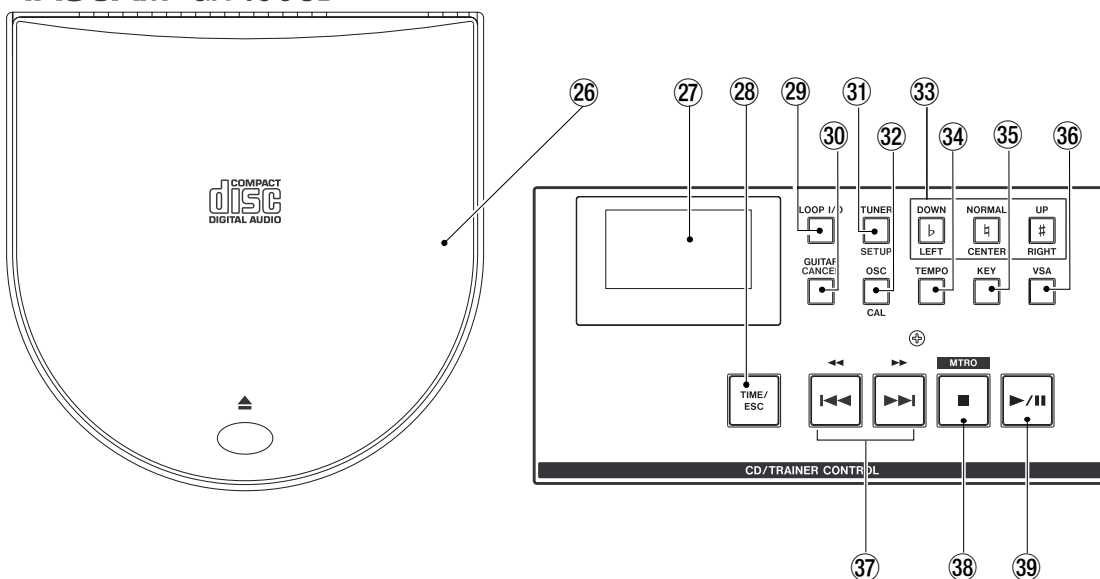
Choose **DIRECT** to apply reverb to the guitar signal as it comes in the **INPUT jack**. Select **EFFECT** to apply reverb to the effects output signal. You can also select both to apply reverb to the dry guitar signal and the effect output.

25 OUTPUT key

Press **OUTPUT** to choose the reverb signal output destination – the main speaker, the sub-speaker pair or all three speakers. One or both of the indicators (**MAIN**, **SUB**) lights to reflect the selection.

CD Trainer

TASCAM GA-100CD



In addition to standard CD player functions, the CD Trainer also has a tuner, a metronome, an oscillator and other features.

26 CD player cover

Lightly press the ▲ mark at the front of the cover to open the player.

27 CD Trainer LCD

Shows the CD Trainer status.

28 TIME/ESC key

When a time is displayed, press this key to change the time display mode.

When using a menu, press this key to return to the time display.

29 LOOP I/O key

Use for loop playback.

Press this key to set the loop IN point (starting point) for the currently playing or paused CD. Press this key again to set the OUT point (ending point) and start loop playback automatically.

When IN and OUT points are set, press and hold this key to turn loop playback between the IN and OUT points ON and OFF.

When IN and OUT points are not set, press and hold this key to turn single track or all track repeat ON and OFF. (See "Repeat playback of a selected loop" and "All track or single track repeat playback" on page 18.)

2 – Part names and functions

③⑩ GUITAR CANCEL key

Press this key to turn Guitar Cancel ON and OFF. Press and hold this key to open the Guitar Cancel setting menu. In this menu, press this key to cycle through setting items. (See “Canceling guitar sounds” on page 19.)

③① TUNER/SETUP key

Press this key to turn the tuner ON and OFF. Make detailed tuner settings using the Setup menu. (See “Using the tuner” on page 20.)

Press and hold this key to open the Setup menu to adjust the time display mode as well as other functions, including footswitch and tuner settings. Once in the Setup menu, press this key to cycle through setting items. (See “Changing settings” on page 21.)

③② OSC/CAL key

Press this key to start the oscillator and output an adjustable pitch signal from the sub-speakers. (See “Using the oscillator” on page 20.)

Press and hold this key to access the Calibration menu and set the standard tuning frequency. (See “Setting the standard tuning frequency” on page 19.)

③③ Setting adjustment keys

Use the 3 setting change keys to adjust settings.

b/DOWN/LEFT: Reduce values, flatten the pitch or shift the stereo position to the left.

h/NORMAL/CENTER: Restore the default value, cancel pitch changes or reset the stereo position to the center.

#/UP/RIGHT: Increase values, sharpen the pitch or shift the stereo position to the right.

③④ TEMPO key

Press this key to turn tempo control ON and OFF. Press and hold this key to open the Tempo setting menu. (See “Setting the tempo” on page 18.)

③⑤ KEY key

Press this key to turn key adjustment ON and OFF. Press and hold this key to enter the Key setting menu. (See “Adjusting the key” on page 19.)

③⑥ VSA key

Press this key to activate Variable Speed Audition (VSA). **VSA** appears on the LCD. When ON, VSA keeps the original pitch of the music even when the tempo is changed.

③⑦ Track skip and search keys (◀◀/|◀◀, ▶▶/▶▶)

Press ◀◀/|◀◀ and ▶▶/▶▶ during CD playback to skip to previous or later tracks.

Press these keys when playback is stopped to select a track to play. (Press **PLAY** (▶) to start playback.)

To fast forward during CD playback, press and hold ▶▶/▶▶. To rewind, press and hold ◀◀/|◀◀.

Fast-forward and rewind speed gradually increases as long as the key is held down.

③⑧ STOP (■)/MTRO key

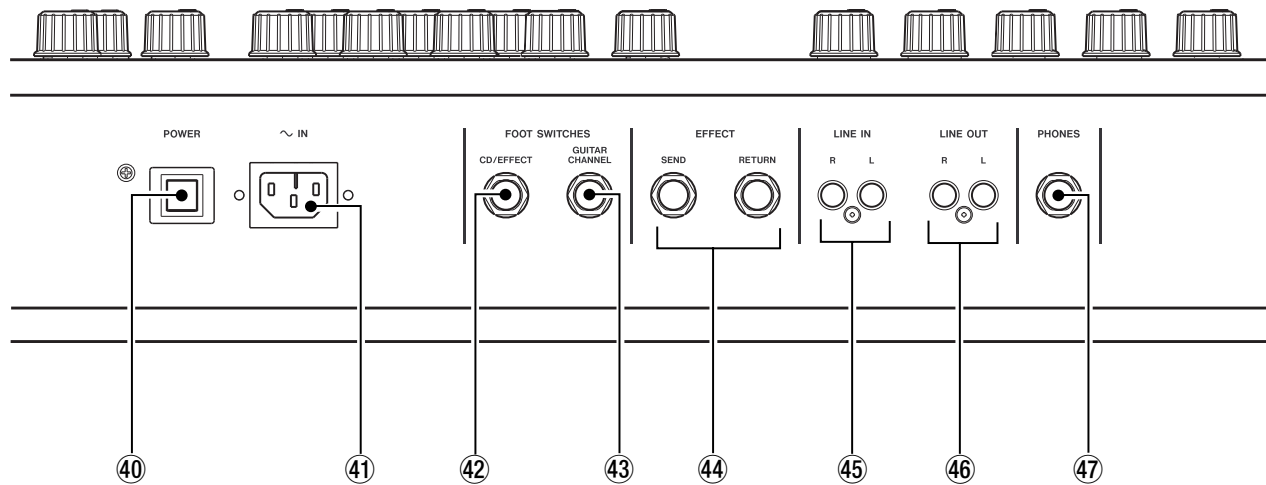
Press to stop CD playback. Press and hold this key to open the Metronome menu. (See “Using the metronome” on page 20.)

③⑨ PLAY/PAUSE key (▶/||)

Press to start playback of a stopped or paused CD or pause a playing CD.

2 – Part names and functions

Rear panel



④⑩ POWER switch

Press to turn the power ON and OFF.

④① ~ IN

Use the supplied power cord to connect the amp to an AC power outlet. Confirm that the voltage matches that marked on the rear panel of your GA-100CD amp.

④② CD/EFFECT FOOTSWITCH jack

Use a TASCAM RC-30P or similar footswitch to control playback/pause, bank number, tuner operation and other functions. Dual footswitch use is possible. (See “Changing settings” on page 21.)

④③ GUITAR CHANNEL FOOTSWITCH jack

Use a TASCAM RC-30P or similar footswitch to change between clean and overdrive channels.

④④ EFFECT SEND and RETURN jacks

Use these to send the guitar signal to an external effect loop after it has passed through the GA-100CD's preamp.

④⑤ LINE IN (L, R) jacks

Connect an external line level (-10 dBV) signal from a synthesizer, guitar preamp, MD player or other device. The signal from the external device is output through the sub-speakers.

④⑥ LINE OUT (L, R) jacks

Outputs the mix of **MAIN MASTER VOLUME** and **SUB MASTER VOLUME** signals and the signal from the **LINE IN** jacks at -10 dBV levels.

④⑦ PHONES jack

Connect standard stereo headphones to this 1/4" jack to listen to CDs or practice alone.

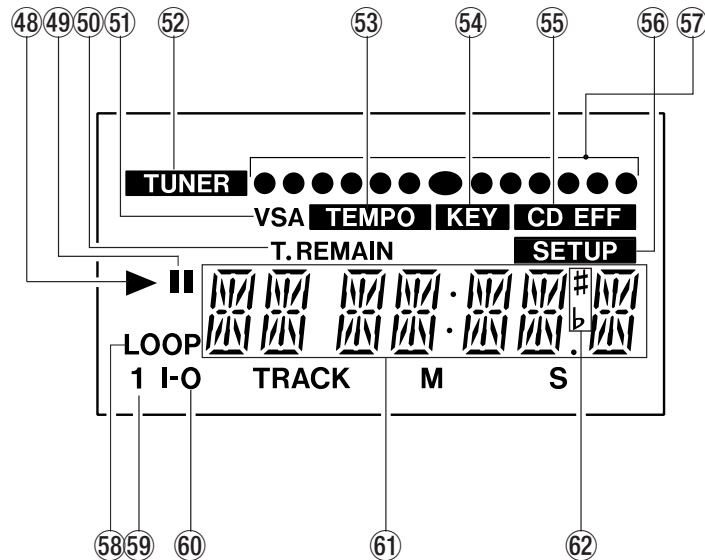
Outputs the mix of **MAIN MASTER VOLUME** and **SUB MASTER VOLUME** signals along with the input signal from the **LINE IN** jack.

NOTE

When the Phones jack is in use, the GA-100CD will not output sound from its speakers.

2 – Part names and functions

CD Trainer LCD



- ④⑧ **PLAY** indicator
Appears during playback.
- ④⑨ **PAUSE** indicator
Appears when playback is paused .
- ⑤⑦ **T.REMAIN/REMAIN** indicator
Indicates the meaning of the time displayed according to the current setting.
T.REMAIN = remaining time of entire CD
REMAIN = remaining time of currently playing track
- ⑤① **VSA** indicator
Appears when VSA is ON. (See “Changing tempo without changing key” on page 19.)
- ⑤② **TUNER** indicator
Appears when the tuner is in use. (See “Using the tuner” on page 20.)
- ⑤③ **TEMPO** indicator
Blinks when the Tempo menu is active, and lights when tempo control is ON. (See “Setting the tempo” on page 18.)
- ⑤④ **KEY** indicator
Blinks when the Key menu is active and lights when key adjustment is ON. (See “Adjusting the key” on page 19.)
- ⑤⑤ **CD EFF** indicator
Blinks when the Guitar Cancel menu is active, and lights when Guitar Cancel is ON. (See “Canceling guitar sounds” on page 19.)
- ⑤⑥ **SET UP** indicator
Blinks when the Setup menu is active. (See “Changing settings” on page 21.)
- ⑤⑦ Tuning meter
Shows pitch during tuning. The center is the correct pitch. The more the indicator lights to the left, the flatter the pitch and the more it lights to the right the sharper the pitch.
- ⑤⑧ **LOOP** indicator
Appears when set to loop playback (ALL/SGL). (See “Repeat playback of a selected loop” on page 18.)
- ⑤⑨ **1**
Appears when set to single (SGL) repeat playback.
- ⑥① **I-O**
Blinks when the loop repeat IN point is set and lights when the OUT point is set.
- ⑥① Track number/time display
Shows the currently selected track number (above **TRACK**) and time during playback in minutes (**M**) and seconds (**S**). Also provides information when making various settings.
- ⑥② **#, b**
Shows pitch when key adjustment is ON.

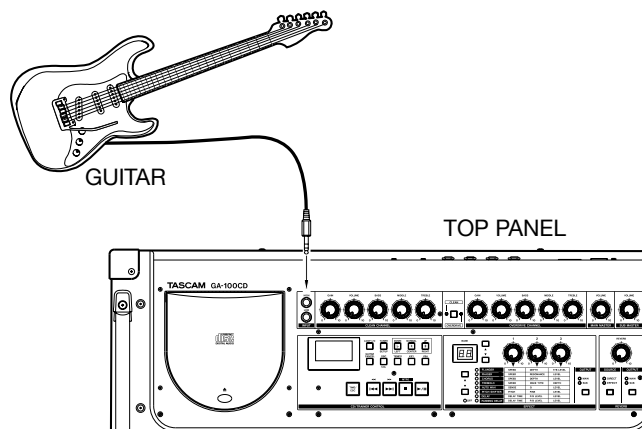
3 - Connections

Guitar connection

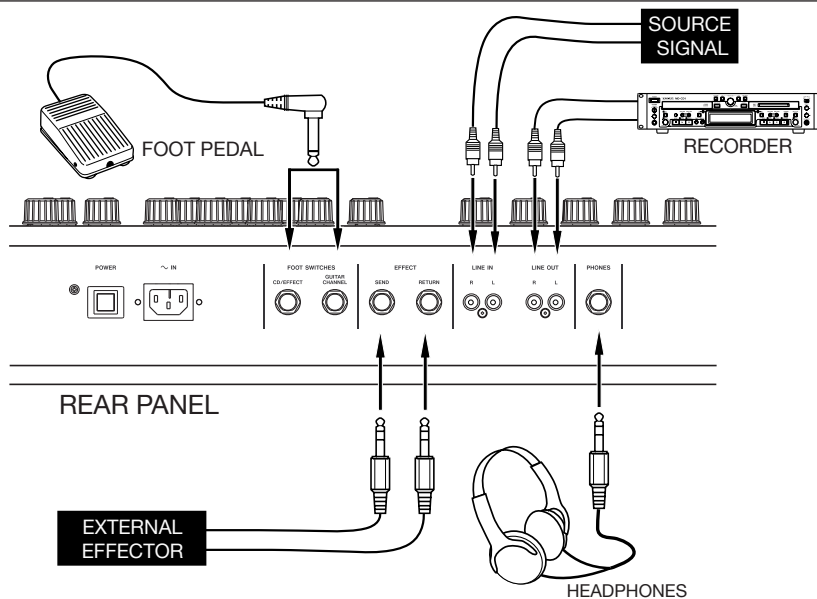
Connect a guitar using either the **HIGH** or **LOW** jack in the INPUT section.

The input impedance of the two jacks is different. The **HIGH** jack is 6.8 MΩ, and the **LOW** jack is 68 kΩ.

When directly connecting electric guitars with passive pickups, we recommend that you use the **HIGH** jack since such guitars usually have high output impedance. Two guitars can be connected simultaneously.



Connecting other equipment



Footswitch connections

Connect a TASCAM RC-30P or similar footswitch to the **GUITAR CHANNEL** jack on the rear panel to use it to change between the clean and overdrive channels.

Connect a TASCAM RC-30P or similar footswitch to the **CD/EFFECT** jack on the rear panel to use it to change effect banks or turn the tuner ON and OFF.

External effects connection

To apply an external effect to the guitar signal after it has passed through the GA-100CD preamp, connect the

external effect's input to the **EFFECT SEND** jack and its output to the **EFFECT RETURN** jack.

Headphones connection

Connect stereo headphones to the **PHONES** jack to monitor through headphones. Connection to the **PHONES** jack mutes the GA-100CD speakers.

External sound source connection

Connect an external synthesizer, audio equipment or other device to the **LINE IN** jack to input external sounds. The input signal is sent to the sub-speakers.

NOTE

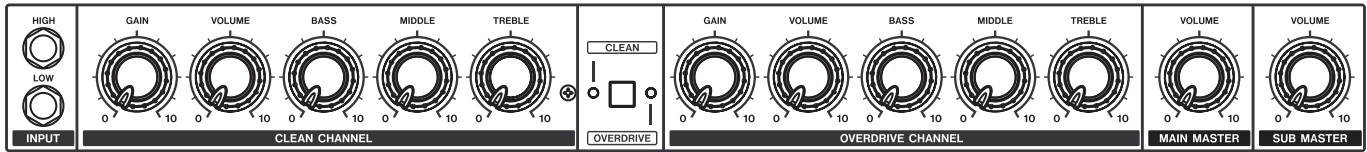
Use the volume control of the equipment connected to the **LINE IN** jack to adjust its relative volume.

CAUTION

Be careful when attaching external sound sources, as very loud signals, especially at low frequencies, may damage the GA-100CD's speakers.

4 - Using the guitar amp

Guitar amp gain, equalization and output



Choosing the channel

The GA-100CD has independent clean and overdrive channels. Use the **CLEAN/OVERDRIVE** key to choose the channel.

When the green light is ON, the **CLEAN** section is active and when the red light is ON the **OVERDRIVE** section is active .

You can also change the channel using a TASCAM RC-30P or similar footswitch connected to the **GUITAR CHANNEL** footswitch jack on the rear panel.

Adjusting the volume and tone quality

The clean and overdrive channels have the same types of control knobs.

Adjust the volume of each channel with its **GAIN** and **VOLUME** knobs. Use the **MAIN MASTER VOLUME** knob to control the final volume output of the guitar amp main speaker.

The **GAIN** knob adjusts input gain, and the **VOLUME** knob adjusts the channel output level. Raise the gain to increase distortion. Even a small amount of gain creates distortion in the overdrive channel. Distortion does not become audible in the clean channel until the gain is raised significantly. With a single coil pickup guitar, for example, distortion starts around 4.

Choose the overdrive channel to use distortion, and adjust the **GAIN** knob until you achieve the amount that you desire.

Choose the clean channel and set the **GAIN** knob low for an undistorted sound.

Adjust the overall volume with the **VOLUME** knob and the **MAIN MASTER VOLUME** knob. Adjusting these knobs will not affect the tone quality.

Adjust the **BASS**, **MIDDLE** and **TREBLE** knobs to alter the tone quality (frequency characteristics) further.

NOTE

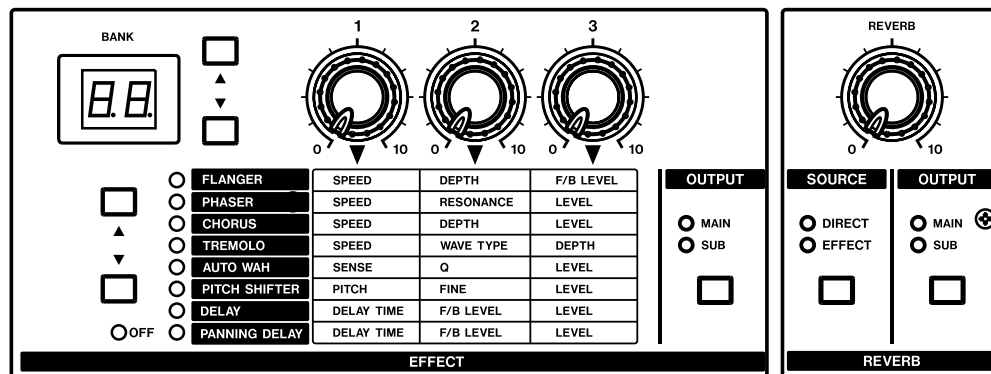
The MAIN MASTER VOLUME knob adjusts the overall volume of the output signal sent to the main speaker (12-inch). If an effect is used, it will be output along with the guitar amp output.

5 – Using effects

Effects

The GA-100CD has built-in effects and reverb. In both CLEAN and OVERDRIVE channels, the guitar signal passes through the preamp before being processed by the effect and then the reverb in that order.

External effects can also be connected to the **EFFECT SEND** and **EFFECT RETURN** jacks on the rear panel.



Selecting Effects and setting parameters

Use the effect selection (**▲**, **▼**) keys to the left of the effect parameter table to choose an effect – delay, panning delay, flanger, phaser, chorus, tremolo, auto-wah, pitch shifter – or turn the effects OFF.

The effect indicators to the right of these keys show the current setting. Use the three knobs above the effect parameter table to adjust the parameter amounts. Refer to the chart below for details.

Restoring the factory effect presets

The unit leaves the factory with the following preset settings. (See the “Tone Creation Reference” on page 24 for details.)

To restore the effects to their factory settings, use the FXRS item in the Setup menu. (See “Initializing effect presets” on page 21 for details.)

Effect controls

Effect	Knob 1	Knob 2	Knob 3
FLANGER	SPEED Set modulation frequency (0.1 – 10 Hz).	DEPTH Set modulation depth.	F/B LEVEL Set feedback level.
PHASER	SPEED Set modulation frequency (0.2 – 20 Hz).	RESONANCE Set resonance amount.	LEVEL Set effect amount.
CHORUS	SPEED Set modulation frequency (0.1 – 10 Hz).	DEPTH Set modulation depth.	LEVEL Set effect amount.
TREMOLO	SPEED Set modulation frequency (0.2 – 20 Hz).	WAVE TYPE Set modulation wave shape. 0 is triangle, 5 is sine, and 10 is sawtooth.	DEPTH Set effect amount. Set higher to increase modulation amplitude.
AUTO WAH	SENSE Set Auto Wah sensitivity.	Q Set filter characteristic. Set higher to increase the effect.	LEVEL Set effect amount.
PITCH SHIFTER	PITCH Set pitch shift amount up to ± 1 octave. The center position is 0.	FINE Set pitch shift amount up to ± 50 cents. The center position is 0.	LEVEL Set effect amount.
DELAY	DELAY TIME Set delay time (10 ms – 1.1 sec).	F/B LEVEL Set feedback level.	LEVEL Set effect amount.
PANNING DELAY	DELAY TIME Set delay time (10 ms – 1.1 sec). Sent to L and R sub-speakers alternately.	F/B LEVEL Set feedback level.	LEVEL Set effect amount.

Choosing the output

You can choose the speaker(s) that output the effect signal. Press **OUTPUT** to cycle through the settings. Either or both the **MAIN** and **SUB** indicators light according to the setting. However, the sub-speakers cannot be selected for the Auto-wah effect.

MAIN: Effect signal is output by the main speaker along with the dry guitar signal (standard setting).

SUB: Effect signal is output by the sub-speakers. Sending the dry guitar signal and the effect signal to different speakers can create a unique spacious sound.

MAIN + SUB: The effect is output by the main speaker and the sub-speakers. Set the balance using the **SUB MASTER** and **MAIN MASTER VOLUME** knobs.

NOTE

Output speaker selection greatly changes the sound. Adjust the tone quality as you switch between output settings to achieve a sound you like.

Reverb

The GA-100CD's built-in reverb simulates a classic guitar amp spring reverb.

- **REVERB** knob

Adjust the reverb signal output level.

- **SOURCE** key

Select the reverb input signal. Choose **DIRECT** to apply reverb to the guitar input signal from the

INPUT jack after the preamp. Select **EFFECT** to apply reverb to the effect output signal. You can select both at the same time.

- **OUTPUT** key

You can choose the speaker(s) that output the reverb signal. Press **OUTPUT** to cycle through the settings. Either or both the **MAIN** and **SUB** indicators light according to the setting.

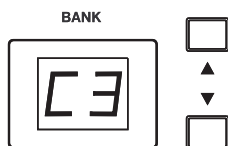
Effect banks

The GA-100CD has 10 banks to store effects and reverb settings. C1–C5 are for clean channel settings and D1–D5 are for overdrive channel settings.

Bank settings are stored in built-in memory each time a parameter is adjusted or the bank is changed. (See the Tone Creation Reference on page 24 for details about the factory presets.)

Changing banks

Switching between the GA-100CD clean and overdrive channels recalls the bank that was previously used on the selected channel.



For example, after using clean channel bank C3, you switch to overdrive channel bank D4. Later, when you switch back to the clean channel, bank C3 will be recalled automatically. The **BANK** display shows the current bank number.

Use the bank selection keys (**▲**, **▼**) or a footswitch to change banks on the same channel.

NOTE

When a bank is recalled, the indicator will show the selected bank, but the position of the effect knobs (1, 2 and 3 and REVERB level) will not change, therefore they will not match the bank settings. Move any knob to change the associated parameter value to the knob's current position.

Changing banks with a footswitch

- 1 **Connect a footswitch to the CD/EFFECT jack.**
- 2 **Set the polarity using the FOOT item in the Setup menu to BANK+ or BANK- as necessary.**
- 3 **Press the footswitch to increase or decrease the bank number setting by 1. (See “Changing settings” on page 21.)**

With a dual footswitch, one pedal will increase the bank number setting and the other will decrease it.

6 – Using the CD trainer

Playing CDs

- 1 Press **▲** at the front of the CD player cover lightly to open it.
- 2 Place a CD in the tray and close the cover.
- 3 Press **▶/II** to start playback.
Press **■** to stop playback.
Press **▶/II** to pause playback.

Use **◀◀(◀◀)** and **▶▶(▶▶)** to skip between tracks and search through them. Press briefly to skip to another track or press and hold to search a track.

NOTE

Opening the cover stops playback.

Adjusting the CD playback volume

When in a time display mode, use the **b** and **#** keys to adjust the CD playback level sent to the sub-speakers. The range is from 0 (no volume) to 10. The **h** key

restores the default setting of 5. The value appears on the LCD momentarily when it is changed.

Changing the time display mode

Press **TIME/ESC** to cycle through the three time display modes to the right.

- Elapsed time (no indicator)
- Remaining track time (**REMAIN** indicator)
- Remaining disc time (**T.REMAIN** indicator)

Repeat playback of a selected loop

Follow these procedures to repeat playback of a selected part of a disc (loop playback).

- 1 Press **LOOP I/O** when a CD is playing or paused to set the loop **IN** point (starting point). The **I-O** indicator on the LCD blinks.

- 2 Press **LOOP I/O** again to set the loop ending point and start loop playback between the **IN** and **OUT** points. The **I-O** indicator appears on the LCD during loop playback.

Stopping loop playback

Press **LOOP I/O** to stop loop playback, resume normal playback and erase the **IN** and **OUT** point settings.

To retain the loop **IN** and **OUT** points, press and hold **LOOP I/O** when turning loop playback **ON** and **OFF**.

All track or single track repeat playback

Repeat playback of the current track or all tracks on the disc is possible.

- 1 In the **Setup** menu, use the **PLAY** item to select all track loop (**ALL**) or single track loop (**SGL**). The default setting is **ALL**. (See "Changing settings" on page 21.)
- 2 Press and hold **LOOP I/O** to start all track or single track loop playback according to the above **PLAY** setting.

- Press **■** to stop playback.
- Press and hold **LOOP I/O** to stop loop playback and resume normal playback.

NOTE

Pressing **LOOP I/O** when **IN** and **OUT** points are set will erase these settings.

Setting the tempo

Follow these procedures to set the tempo.

- 1 Press and hold **TEMPO**. **TMP** appears and the tempo setting screen appears.
- 2 Use **b**, **#** and **h** keys to adjust the tempo.
- 3 Press **TIME/ESC** after completing the setting to return to the time display.

Changing the tempo value from 0 turns tempo control **ON**, and playback speed adjusts to the new tempo. **TEMPO** appears on the LCD.

The tempo setting amount depends on whether Variable Speed Audition (**VSA**) is **ON** or **OFF**. (See "Changing tempo without changing key" on page 19.)

6 – Using the CD trainer

When VSA is ON, the possible settings are: -50, -32, -16, -12, -8, -4, 0, +4, +8, +12, +16 (%).

When VSA is OFF, adjustment can be made freely between -50 % and + 16 %.

NOTE

If the tempo value was set while VSA is OFF, turning VSA ON changes the tempo value to the nearest of the above settings.

Turning tempo control ON and OFF

Press **TEMPO** to turn tempo control ON and OFF.

The set tempo value is stored even when tempo control is OFF. The next time it is turned ON, playback will occur at the last set tempo value.

Changing tempo without changing key

Turn ON the GA-100CD's Variable Speed Audition (VSA) function to change the tempo of a track without changing its key.

Press the **VSA** key to turn this function ON and OFF. When it is ON, the **VSA** indicator appears on the LCD .

Turning VSA ON and OFF also turns tempo control ON and OFF.

Adjusting the key

- 1 Press and hold **KEY** to show the key setting screen.
- 2 Change the key using the **b**, **#** and **h** keys. The key can be raised or lowered up to 6 semitones (b6-#6).

Changing the key (to any value besides 0) turns key adjustment ON and playback changes accordingly. **KEY** appears on the LCD when this function is ON.

- 3 Press **KEY** again to make fine pitch adjustments.

- 4 Use the **b**, **#** and **h** keys to adjust the pitch in cents (1/100 semitone).

- 5 Press **TIME/ESC** to finish making the setting and return to the menu.

NOTE

Even if no key change is made in step 2 above (the value is set to 0), fine adjustment in step 3 turns key adjustment ON.

Turning key adjustment ON and OFF

Press **KEY** to turn key adjustment ON and OFF. The key setting value is retained even when turned OFF.

When key adjustment is turned ON again, the set key value affects playback.

Canceling guitar sounds

Use the Guitar Cancel function to cut the sound of recorded guitars during CD playback.

Press **GUITAR CANCEL** to turn the Guitar Cancel function ON and OFF. **CD EFF** appears on the LCD when the Guitar Cancel function is ON.

Setting the Guitar Cancel function

Use these procedures to adjust the stereo region and frequency range of the cancellation effect.

- 1 Press and hold the **GUITAR CANCEL** key. **PART** appears on the LCD.
- 2 While listening to the playback, use the **b**, **#** and **h** keys, to select the stereo region (L10 – R10) that reduces the guitar sound the most.
- 3 Press the **GUITAR CANCEL** key again. **RNGE** appears on the LCD.
- 4 While listening to the playback, use the **b**, **#** and **h** keys to select the frequency range (MID or ALL)

that reduces the guitar sound most effectively.

ALL will cut out high and low sounds from other instruments in the same stereo position.

- 5 Press **TIME/ESC** to finish making the setting and return to the menu.

NOTE

The values set here are retained even when the Guitar Cancel function is turned OFF. When it is turned ON again, the previously made settings will be applied to playback again.

7 – Tuner, oscillator and metronome

Using the tuner

The GA-100CD has a built-in guitar tuner with 2 modes –chromatic mode and guitar mode. In chromatic mode (the default setting), the GA-100CD automatically detects the input signal pitch. Guitar mode helps you

tune strings to standard guitar tuning. (See “Changing settings” on page 21 for details on setting the tuner mode and sound output.)

Calibrating the tuning frequency

The standard tuning frequency (A4) can be adjusted.

- 1 Press and hold **OSC/CAL** to start calibration. **CAL** appears on the LCD.
- 2 Press the **b** and **#** keys to adjust the standard tuning frequency from 435 Hz to 445 Hz. Press the **b** key to restore the default setting of 440 Hz.

- 3 Press **OSC/CAL** or **ESC** to finish calibration and return to time display.

Tuning in chromatic mode

- 1 Connect a guitar and press **TUNER**. **TUNER** appears on the LCD along with the tuning meter shown to the right. Play the guitar string you want to tune. The LCD will show the name of the closest note.
- 2 Tune the guitar roughly until the note that you want to tune to appears on the LCD.
- 3 Tune until only the meter's large central dot lights. If the pitch is too low (flat), the dots left of the center light. If the pitch is too high (sharp), the

dots right of the center light. More dots light as the string goes further out of tune.

- 4 When finished tuning, press **TIME/ESC** to return to the time display.



Tuning in guitar mode

- 1 Connect a guitar and press **TUNER**. **TUNER** appears on the LCD along with the tuning meter. **6E** appears on the right side of the LCD, indicating that it is set to tune the 6th string.
- 2 Use the **b** and **#** keys to choose the string (1E, 2B, 3G, 4D, 5A or 6E) you want to tune.

- 3 Tune the string until only the large dot at the center of the meter lights.
- 4 When finished tuning, press **TIME/ESC** to return to the time display.

Using the oscillator

Use the built-in oscillator to output a sine wave through the speakers. This wave can be set to any pitch in a 3-octave range between C3 and B5.

- 1 Press the **OSC/CAL** key. **OSC** appears on the LCD.
- 2 Press the **b** and **#** keys to set the generated pitch. The default setting is **A4**. The selected pitch (C3–B5) appears on the screen.

- 3 Press **TIME/ESC** to finish making the setting and return to the time display.

NOTE

The oscillator's standard tuning frequency depends on the calibration setting. (See “Setting the standard tuning frequency” on page 19.)

Using the metronome

Follow these procedures to set the tempo and the number of beats per measure for the GA-100CD's built-in metronome.

- 1 Press and hold **■/MTRO** to open the Metronome menu. The metronome is still **OFF**.
- 2 Use the **b** and **#** keys to adjust the tempo in a range of 40–220 bpm (beats per minute). Adjusting the tempo turns the metronome **ON**.

- 3 Press **■/MTRO** briefly. Use the **b** and **#** keys to adjust the number of beats per measure between 2 and 6.
- 4 Press **TIME/ESC** when finished using the metronome to return to the time display.

Use the **SUB MASTER VOLUME** knob to adjust the level of the metronome.

8 – Changing settings

Use the Setup menu to change GA-100CD settings.

Press and hold **TUNER/SETUP** to open the Setup menu. Press **TUNER/SETUP** again to cycle through the setting items. Use the **↓** and **#** keys to adjust the values for each item and **↵** to restore the default setting.

Press **TIME/ESC** to finish making settings and close the Setup menu.

Settings that can be made and saved:

- Playback mode selection
- Footswitch function selection
- Footswitch polarity setting
- Tuner mode selection
- Tuner speaker output ON and OFF
- Initialize effect bank settings

Playback mode selection

Use the **PLAY** item to select whether all tracks on a disc (**ALL**) are played or only the currently selected track (**SGL**) is played when using the loop playback function. The default setting is **ALL**.

Footswitch settings

Use the **FOOT** item to set the function of the **CD/EFFECT** footswitch.

PLAY/PAUSE: Play and pause the CD

BANK+: Increase the active bank number by one

BANK-: Decrease the active bank number by one

TUNER ON/OFF: Turn the tuner ON and OFF

You can use a dual footswitch with the **CD/EFFECT** footswitch jack. When using a dual footswitch, **BANK+** and **BANK-** reverse which switch increases and which decreases the active bank number.

Footswitch polarity setting

Use the **POL** item, to set the footswitch polarity to normal (**NOR**) or inverse (**INV**). Use this to match the footswitch you use. The default setting is **NOR**.

Tuner settings

Use the **TMOD** item to set the tuner mode. (See “Using the tuner” on page 20.)

CHR: chromatic mode (default setting)

GTR: guitar mode

Tuner speaker output

Use the **TOUT** item to set whether or not the guitar signal outputs through the main speaker when the tuner is turned on. The default setting is **OFF**.

Initializing effect banks

Use the **FXRS** item to restore all effects banks to their factory settings.

NO appears on the LCD when you choose the **FXRS** item. Press the **↓** or **#** key and **YES** will appear. Press and hold the **↵** key to restore all effects banks to their factory settings.

After initialization is complete, **DONE** appears on the LCD and the time display reappears.

CAUTION

Initializing effect banks erases all the preset bank settings that have been made. Use this function only if you are sure that you want to overwrite these settings with the factory defaults.

9 – Specifications

Guitar amp

Rated output

MAIN	60W (RMS into 8 Ω)
SUB	20W (RMS into 8 Ω) x 2

Speakers

MAIN	12-inch
SUB	5-inch x 2

Inputs

GUITAR INPUT (HIGH)	Unbalanced 1/4" jack
Standard input level	-38 dBu
Input impedance	6.8 MΩ
GUITAR INPUT (LOW)	Unbalanced 1/4" jack
Standard input level	-32 dBu
Input impedance	68 kΩ
Headroom	N/A
EFFECT RETURN	Unbalanced 1/4" jack
Standard input level	-2 dBu
Input impedance	22 kΩ
LINE INPUTS	RCA pin jacks (2)
Standard input level	-10 dBV
Input impedance	22 kΩ

Outputs

EFFECT SEND	Unbalanced 1/4" jack
Standard output level	-2 dBu
Maximum output	+14 dBu
Output impedance	470 Ω
LINE OUT	Unbalanced 1/4" jack
Standard output level	-10 dBV
Maximum output	+6 dBV
Output impedance	470 Ω
HEADPHONES	1/4" stereo phone jack
Output	> 30 mW (into 39 Ω)

Built-in effects (mono/stereo)

Types	Delay, panning delay, flanger, phaser, chorus, tremolo, auto-wah, pitch shifter, reverb
Presets	10 (5 clean channel, 5 overdrive channel)

CD Trainer

Playable discs	8-cm/12-cm (audio CDs only)
DA	16-bit
Digital signal processing	32-bit

Playback characteristics

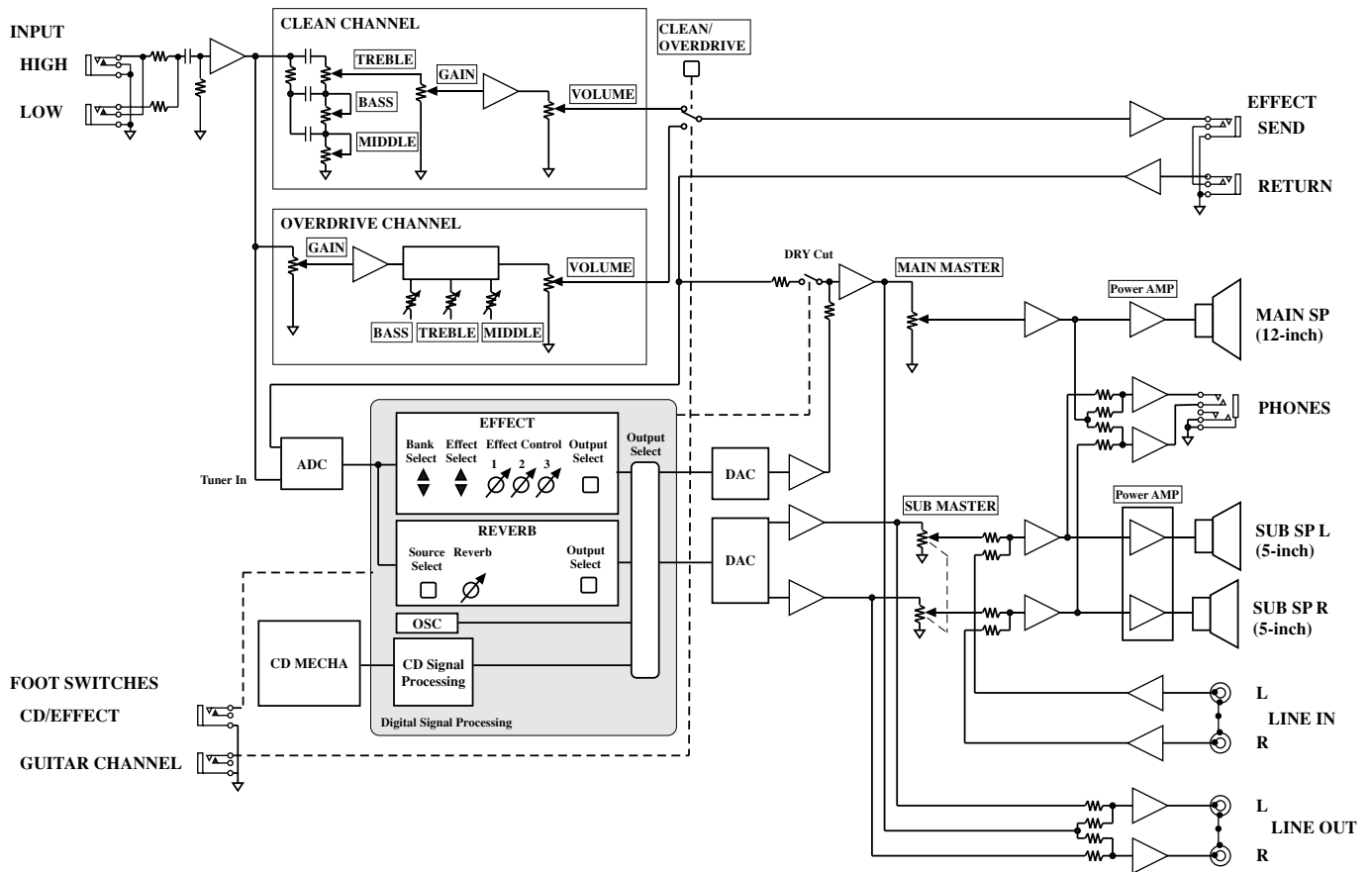
Frequency characteristics	20 – 20,000 Hz ± 1.0 dB
Dynamic range	> 88 dB
S/N ratio	> 88 dB
THD	< 0.01%

Physical

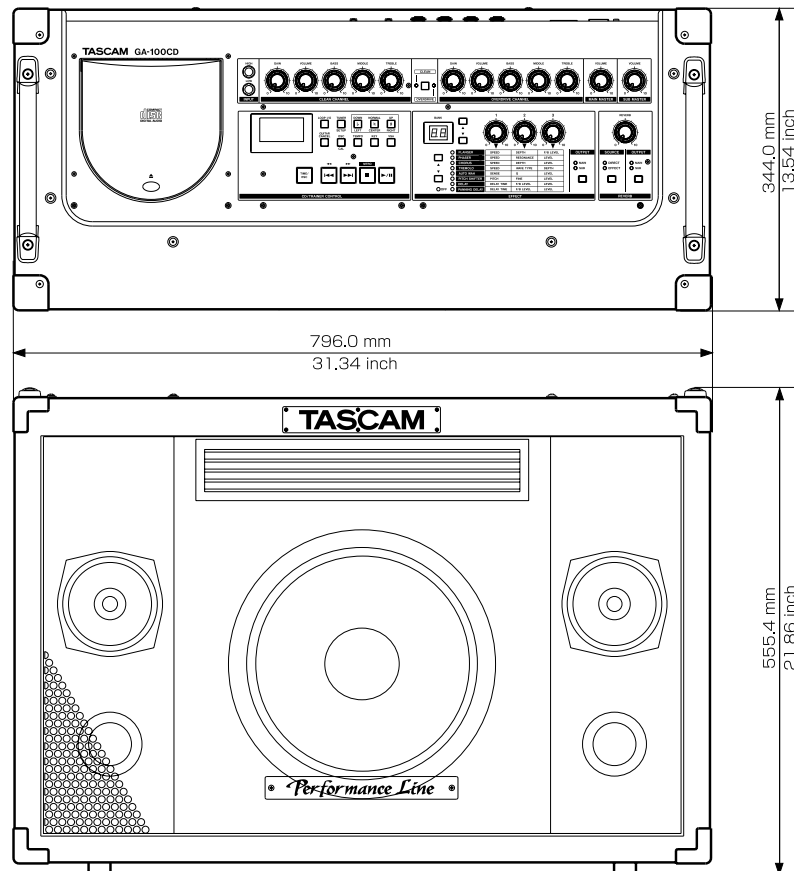
Power	USA/Canada 120 VAC, 60 Hz; UK/Europe 230 VAC, 50 Hz; Australia 240 VAC, 50 Hz
Power consumption	80 W
Dimensions (W x H x D)	818 x 548 x 344 mm (32.2 x 21.6 x 13.5 inches)
Weight	36 kg (79.4 lbs.)

9 – Specifications

Block diagram



Dimensional drawing



Appendix – Tone creation reference

This chart shows example effects settings and the factory presets. Use these examples of clean and overdrive channel settings to create your own sounds.

Your guitar will also affect the tone quality, so make adjustments as necessary to achieve the tone you desire.

Name	Description	Channel	Preamp				Knob 1	Knob 2	Knob 3	FX	Reverb		Factory preset	
			GAIN	BASS	MID	TREBLE					LEVEL	SOURCE		OUTPUT
FLANGER														
Edgy	Sharp flanger for rhythm guitar	C	3	10	6	7.5	4	5	8	MAIN	0	DIRECT	SUB	C5
Wide	Wide stereo flanger	C	3	10	6	7.5	6.5	8	8	SUB	1	DIRECT	SUB	
Slow	Heavy stereo flanger	D	7	6	7	7	1	5	10	BOTH	2	BOTH	SUB	D2
Classic	Orthodox heavy flanger	D	3	6	7	6	5	5	10	BOTH	1	EFFECT	MAIN	
PHASER														
Classic	Nice and clean for rhythm guitar	C	3	3	5.5	7	1.5	1.5	10	MAIN	0	EFFECT	MAIN	
Clean	Clean, vibrating phaser – suits arpeggios	C	4	6	10	8.5	4	7	8.5	BOTH	2	EFFECT	SUB	
Heavy	Heavy phaser	D	9	6	7.5	5	2	2	10	MAIN	1	EFFECT	MAIN	D3
Solo	Doubling 70's phaser for lead guitar	D	7	6	6	7	6	9	10	BOTH	1	EFFECT	SUB	
CHORUS														
Super Clean	Makes clean sounds cleaner and brighter	C	4	8	5	10	6.5	10	10	SUB	3	BOTH	BOTH	C1
Dirty	Dirty chorus sound for blues lead guitar	C	7	10	9	10	6.5	6.5	10	MAIN	2.5	DIRECT	MAIN	
Heavy	Heavy, thick chorus for backing guitar	D	8	9	3	10	3	3	10	BOTH	1	EFFECT	SUB	D4
Solo	Full stereo sound for lead guitar	D	6.5	7	6.5	3.5	7.5	4	9	SUB	1	DIRECT	SUB	
TREMOLO														
Clean Solo	Clean sound for lead guitar	C	5	10	7.5	7	7	3	7	MAIN	2	EFFECT	BOTH	
Panning	Pan sound only through 5-inch speakers	C	4	7	7	7	4.5	1	10	SUB	3	EFFECT	SUB	
Waver Solo	Light sound good in small amounts for lead guitar	D	6	6.5	7	3.5	8	9	4	MAIN	1	EFFECT	BOTH	
Shock-waver	Bold sound that emphasizes harmonics	D	8	9	8	8	10	10	6	MAIN	2	EFFECT	BOTH	

Appendix – Tone creation reference

- MAIN MASTER VOLUME and SUB MASTER VOLUME are both set at 5 (center)

- All values are on a 0–10 scale
- C = Clean D = Overdrive

Name	Description	Channel	Preamp			Knob 1	Knob 2	Knob 3	FX	Reverb		Factory preset	
			GAIN	BASS	MID					TREBLE	LEVEL		SOURCE
AUTO WAH	Clean auto-wah for rhythm guitar	C	4	6	5	7	4	5	10	MAIN	1	EFFECT	SUB
	Crunchy auto-wah good for humbucking pickups	C	7	10	9	7	4	8	10	MAIN	0	EFFECT	SUB
	Crunchy wah sound that uses overdrive	D	4	8	7	3	5	8	10	MAIN	0	EFFECT	SUB
	Solo Auto-wah that uses overdrive for lead guitar	D	10	10	5	5	4	8	10	MAIN	1	EFFECT	BOTH
							PITCH	FINE	LEVEL				
PITCH SHIFTER	Natural chorus sound that uses FINE for arpeggios and chord strums	C	3	7	7	7	5	6.5	10	SUB	5	DIRECT	SUB
	Octaver effect for low chord strums and arpeggios	C	3	5	2	9	10	5	4	SUB	6	EFFECT	SUB
	Doubling and chorus with a natural sound using the pitch shifter for lead guitar	D	5	2	6.5	5	5	3.5	7	SUB	1	EFFECT	BOTH
	Makes heavy sounds even heavier by doubling an octave below	D	8	6	1	10	0	5	8	SUB	1	BOTH	BOTH
							DELAY TIME	F/B LEVEL	LEVEL				
DELAY	Very short delay pans left and right to add width to arpeggios and rhythm guitar	C	4	10	10	7	2	2	7	SUB	1	BOTH	BOTH
	Delay sound with lots of feedback to thicken backing parts	C	7	10	7	7	1	9	8	BOTH	0	BOTH	BOTH
	Short delay sound adds thickness to any part	D	10	10	6	7	2	8	7	SUB	1	EFFECT	SUB
	Relatively long delay that uses long tones for both backing and lead guitar parts	D	10	10	7	4	6	3	4	SUB	2	BOTH	BOTH
							DELAY TIME	F/B LEVEL	LEVEL				
PANNING DELAY	Panning delay that sends a clean sound left and right for added presence	C	4	8	8	8	3	3	3	SUB	4	EFFECT	SUB
	Clean, rhythmical long panning delay good for live performance	C	7	8	5	6	7	9	4	BOTH	4	EFFECT	BOTH
	Panning delay for both lead and backing guitar	D	8	10	7	7	4	3	4	SUB	2	EFFECT	SUB
	Rich stereo panning delay with deep repetition for lead guitar	D	5	6	5	3	3	9	5	SUB	1	EFFECT	SUB

Appendix – Tone creation reference

Name	Description	Channel	Preamp				Knob 1	Knob 2	Knob 3	FX	Reverb			Preset
			GAIN	BASS	MID	TREBLE					LEVEL	SOURCE	OUTPUT	
AUTO WAH														
PITCH SHIFTER						SPEED	RES	F/B LEVEL						
DELAY						SPEED	DEPTH	LEVEL						
PANNING DELAY						SPEED	WAVE TYPE	DEPTH						

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