An Introduction to

Recording Your Own CD

Learn the basics
of CD production

Fourth Edition

Music makes our lives so much richer. We love to listen to music on CDs, on portable MP3 players, on TV, radio, and in movie theaters. We listen to it at work and when we play, when we exercise, and in our cars.

When we discover something we want to hear again and again, we add it to our collections by purchasing it as a download or on a CD. We can also "rip" music from a CD for listening to on a portable MP3 player.

Many of us do more than just listen to music. We make our own music as we sing and play and write our own songs. Thanks to recent advances in digital technology, we can even record audio CDs of our own music all by ourselves. Computers and all-in-one studio workstations make it possible.

In the past, great-sounding recordings could only be made in expensive, professional recording studios. Not anymore. *Anyone* can record a CD at home—it's easy, inexpensive and lots of fun.

You might want to record a CD for any number of reasons:
- You can listen to your own music through your favorite sound system—or anywhere, for that matter. It's an amazing experience.
- You can give your music to friends and family.
- You can give personalized mix CDs as gifts.
- You can sell CDs of your music at performances or over the internet.
- You can create CDs for singing or playing along with for fun.
- You can make reference CDs of music you want to practice or rehearse with other musicians.

The CD Recording Process

The process of bringing your music from performance to a final, completed CD takes place in four stages. These operations are always performed in the same order—this only makes sense, as you'll see.

You start by recording your music.

You sing, play...

...and record your performance.
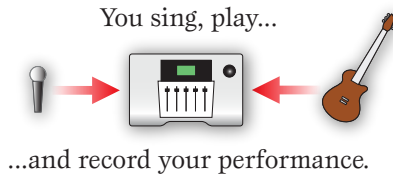
Second, you "mix" your music.

You combine all of your recorded elements—and any desired enhancements—into a single stereo concoction called a "mix."
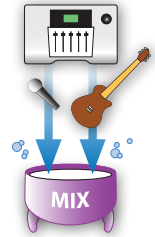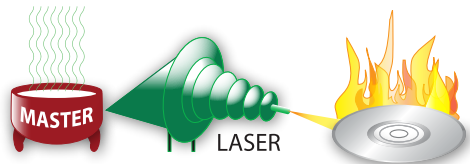
Third, you "master" your music.

Mastering adds the finishing touches to the mix's overall sound, smoothing out any rough edges so that it sounds great.

Finally, you transfer, or "burn," your music onto a CD.

When you transfer your music to a CD, a tiny laser beam uses heat to write your music onto the CD—don't worry, you won't actually see any flames!

Every complete CD-recording studio has to have the same four basic pieces of equipment. Whether it's a big commercial studio, a computer-based system or a one-piece studio workstation, it should have a:
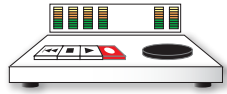
- recorder
- set of mastering tools
- mixer
- CD burner

Each of these elements allows you to perform one of the operations described on the previous page.

Every studio should also have effect processing—we'll explain this later.

Multitrack Recorder

When you sing or play an instrument, a digital recorder captures the sound you produce. It can then play it back at your command. A recorder may store your performance on a hard disk drive—like the kind you'd find in a computer—on a memory card, on digital tape, or on a CD, depending on the recorder the studio has.

A multitrack recorder can make multiple recordings and play them back together. Each of these recordings is stored on a "track"—hence the word "multitrack." What this means is that you could, for example...
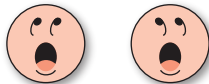
...record a vocal on Track 1...

...and then record another on Track 2.

When the multitrack recorder plays them back, they
sound like a duet performed at the same time.

You could also record a group of musicians at the same time on different tracks. This would let you individually control each player's recorded performance during playback, changing its volume or sound if you wish.

Studio Gear: *Mixer and Mastering Tools*

Mixer

A mixer gives you control over the volume and sound of each microphone, instrument, track, or any other type of audio you want on your CD.
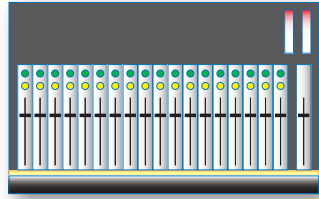
- *When you're recording*—you use the mixer to set your microphone or instrument volume levels to get the best sound.
- *When you're mixing*—you use the mixer to set the volume of each track so it's as loud as you want it to be in relation to your other tracks. You also use it to change a track's sound using tools we'll discuss later on.

A mixer is a device that contains a group of identical "channels." A channel is just a collection of knobs, buttons or settings that you can use to shape the sound of a mic, instrument, or track, and so on.

Did You Know...

...that since a mixer is mostly made up of channels, if you learn how to use only one channel, you'll already know how to use most of the mixer?

Mastering Tools

A good recording studio has tools with which you can prepare your finished mix for transfer to a CD. During mastering, a great mix gets that last bit of polish to help ensure that it becomes an amazing CD. In a studio workstation or on a computer, mastering tools may be special software programs. Roland and BOSS studios, for example, contain a professional-quality Mastering Tool Kit ("MTK") for this purpose. In some studios, each mastering tool may be a hardware device that performs a specific mastering task.

Did You Know...

...that there's a "CD track marker" at the start of each song on a CD? This special bookmark tells a CD player where the song starts when you press the Next or Previous Song button on the player or when you select a song by number. You can place CD track markers where you want them during mastering.

CD Burner

A CD burner is a device that can write your mix onto a CD. Once the CD holds your music, it can be played on most audio CD players. A CD burner may be built right into a studio workstation for maximum portability, and most computers also have a CD burner. For burning audio CDs on a computer, you may need to purchase CD-burning software if it doesn't come pre-installed.

Most CD burners are actually called "CD-R/RW burners" because they can create CDs using two types of discs:

- *CD-R discs*—are discs that can't be erased once you've burned your music onto them. Any CD player can play them.
- *CD-RW disks*—can be erased, and you can burn new material onto them over and over again. As a result, they're also more expensive. Since some audio CD players can't play them, they're best for archiving your music or for creating temporary reference CDs that let you listen to your work on other systems as you refine your final mix.

Effects Processor

In every studio, you'll find one or more devices that generate "effects." Effects are often what make a recording sound like a professional CD.

What *Is* an Effect?

An effect is a type of processing that takes an original sound and changes it in some way. If this definition sounds pretty general, it is, and that's because there are so many ways you can change a sound using effects.

Some effects replace the original sound altogether—these effects are called "insert" effects. "Loop" effects are added to the original sound so that the effect and the sound are both heard at the same time.

On the next page, we'll discuss some of the most frequently used effects.

Frequently Used Effects

Here are a few of the most important effects.

Reverb

Reverb—short for "reverberation"—is the most commonly used effect. Reverb simulates the sound of a real-world physical space such as a concert hall, a small room, a bathroom, or most any other type of space. When reverb is added to a sound, it creates the illusion that the sound is taking place in that space.

Reverb can make a sound seem more natural. When it's added to a singer's voice, it can also reinforce the meaning of the lyrics: longer reverbs sound great on vocals in ballads while shorter reverbs can toughen-up a voice.

Delay

A delay is a copy of a sound, delayed slightly and then added to the original sound. This simple effect has a surprising number of uses. For example, some people use a delay to create a second copy of a lead vocal so it sounds like the vocal was performed twice.

Chorus

A chorus creates multiple delays and gently detunes and delays them for a sort of shimmering effect. It can also turn a single sound into a wide, animated stereo sound. Chorus is often used on guitars and electric pianos.

Modeling

Modeling—such as Roland/BOSS COSM® modeling—applies the sonic characteristics of one sound to another.

- *Mic modeling*—makes an inexpensive microphone sound like an expensive, world-class studio mic. Mic modeling is found, for example, in some Roland and BOSS studio workstations.

- *Amp modeling*—makes a plain, un-amplified guitar sound like it's being played through the guitar amp of your choice. Roland and BOSS studio workstations contain spectacular amp modeling effects.

- *Speaker modeling*—allows your speakers to simulate the sound of various professional and consumer speaker systems. By auditioning your mix through different speaker models, you can be sure that your CD will sound great wherever it's played. Speaker modeling is a great innovation, available in Roland and BOSS studio workstations when you use compatible Roland speakers.

The Benefit of Internal Effects

In some studios, effects are produced by external effect processing equipment. This can be quite a complex job, and unwanted buzzes and hums are often introduced through the wires that connect everything.

Studio workstations such as those made by Roland and BOSS—and many computer recording/mixing programs—have effects built in. Therefore:

- The effects are much easier to use since there's no wiring to set up.
- The lack of external wires means that there are no unexpected hums, buzzes, or other noises, so the effects sound better.

Plug-In Effects

Among the most exciting innovations to hit the professional recording world in recent years are effect "plug-ins." A plug-in is a software program that produces a specific effect or suite of effects, adding new capabilities to a studio, keeping it right on the cutting edge of technology. Plug-ins can be quite powerful, too. You'd be surprised, for example, at the number of successful singers who owe their careers to auto-tuning plug-ins.

Most Roland V-Studios can use a range of third-party plug-ins with the installation of the optional VS8F-3 Plug-In Effect Expansion Board.

Now that we understand the elements of a digital recording studio, let's see how the pieces fit together to make recording a CD so much fun.

Creative Freedom

Recording music in some digital studios—such as those from Roland and BOSS—is fun and easy thanks to "non-destructive" recording and editing. You can record anything or try out any creative idea without worrying that you're going to do something that'll ruin your work so far, or that you'll throw away something you wish you'd kept. Try things over and over or explore any possibility. You can always go back and try again.
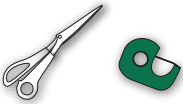
Undo

If you do something you wish you hadn't done, relax—you can often undo it by simply pressing an Undo button. Some digital studios offer you the chance to undo your most recent actions, one-by-one. And if you undo something and change your mind, you can often redo it by pressing REDO.

UNDO

REDO

Editing

Everything you record can be bent, twisted and shaped in lots of ways. You can easily fix mistakes, use a great background vocal or guitar riff in a few places by copying it, move things around, and more.

If you're a songwriter, you'll also love the fact that you can move entire sections of a song around, trying out different structures for the song even after you've recorded everything that goes in it!

Virtual Tracks

On some digital recorders, every track contains a set of "Virtual Tracks." For each track, you can pick one Virtual Track for recording and playback at a time.

Virtual Tracks give you *way* more recording room than you might think. The ultra-compact 4-track MICRO BR, for example, provides 32 Virtual Tracks in each song. Each 24-track VS-2480CD song has *384* of them!

You can record multiple versions of any performance, recording each on its own Virtual Track. For example, on a single track, you can record a guitar solo on Virtual Track 1, then another guitar solo on Virtual Track 2, and then another, and keep them all—simply select the one you want to hear. Try out a different vocal approach or a different guitar solo. You can combine the best parts of several Virtual Tracks into one perfect Virtual Track. You've got plenty of room in each song to try out all of your ideas.

Nothing kills the creative process like having to wait. In most digital studios, you get an idea and go.

Run, Don't Walk

Digital recorders can jump to any spot in a song in a heartbeat. As soon as you tell the recorder where you want to go, you're there. You don't have to fast-forward or rewind as you would on a VCR or cassette deck.

You may also be able to bookmark important places in a song by using "locators." You can place a locator in position by pressing a single button, and get back there just as quickly. You don't have to go hunting around, trying to remember where some song section is when inspiration strikes. Locators remember them for you.

Making a Scene

A significant amount of time in a studio can be spent setting things up or tweaking things so that they sound just right. Some digital mixers and studio workstations can remember all of these settings for you as a "scene." It's hard to overstate the wonder of scenes: Press a button and your entire studio setup snaps into place instantly. Using scenes, you can experiment with different mix ideas, comparing them with the push of a button.

Safe and Sound

When you save your song after each session, a studio workstation can keep track of all of the song's recordings and remember all of your settings. At the next session, you can simply load your song and pick up right where you left off. Everything will be just where you left it, including Virtual Tracks, mixer settings, and your Undos.

This means that when you want to resume work on a song you can do so, quickly, without having to manually recreate your setup. It also means that you can easily work on any song at any time, even if you're in the middle of work on another song. Just save your current work and load the song you want to work on.

Recording Your Music

Here's a brief description of the things you'll do to record your CD.

Recording with Mics

When you want to record a voice, an acoustic instrument or an electric instrument playing through your amplifier, you'll capture that sound using a microphone. Connect the mic's cable to an input jack on your mixer or studio workstation. An input jack is how the sound gets into your recording equipment.
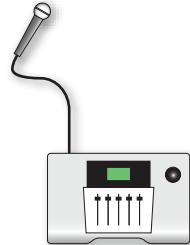
Did You Know...

...that there's a very simple way to figure out where to place a microphone to get the best sound? Use your ears. Listen to the instrument from different angles to find where it sounds best—that's where you should place your mic, aiming it at the instrument. If you're recording a singer, aim the mic at the singer's mouth, and experiment with different angles to see which sounds best for the singer's voice and performance style.

Some mics require electrical power to operate—it's called "phantom power." Your mixer or studio workstation may provide built-in phantom power.

If your studio has mic modeling and a compatible mic, you can use it to make your recordings sound as if they were made using some of the best mics in the world even if you use an inexpensive mic.

Recording Electric Instruments

You'll use essentially the same process for recording electric instruments such as an electric guitar, electric bass, drum machine or synthesizer. The only difference is that you can plug the instrument directly into your mixer or studio workstation instead of using a mic cable.
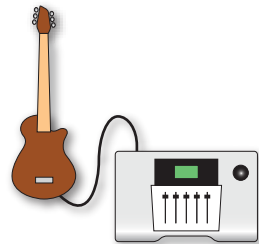
You can make an electric instrument sound even better by adding amp modeling—for example, Roland/BOSS COSM Amp Modeling—as you record. Your guitar can sound like it's playing through some of the world's most sought-after guitar amps. And even if you're using headphones, you can enjoy the experience of playing the selected amp at full volume.

Recording from a CD or a Cassette

You can also record from CD or tape players just as if they're instruments. (If you're planning on publishing or selling your CD, make sure that you have the legal right to use anything you get from a CD or tape.)
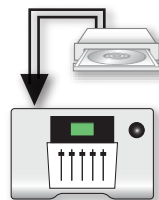
Recording with Rhythms

You may find that playing or singing along with some sort of rhythmic reference as you record makes the process more fun. A reference rhythm also helps ensure that all of the song's recorded performances stay accurately in time with each other.

Use a Metronome

The simplest type of reference rhythm is a metronome. Computer recording software and studio workstations often have a metronome built in.

Did You Know...

...that playing along with a metronome is a lot more fun if the metronome plays a rhythm that complements what you're playing instead of just a simple quarter-note click?

Use a Rhythm Track
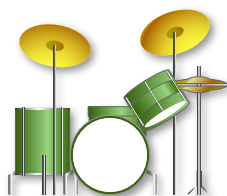
Some studio workstations offer a special rhythm track or rhythm guide that can play realistic drum or percussion patterns in a range of styles. You can even incorporate these patterns into your arrangements, including them on your CD with no charge to you for their use.

Import a Loop

Another way to add a great-sounding drum part or rhythm to your song is to import a rhythm loop—a pre-recorded drum or percussion phrase. There are lots of these loops available as .WAV files on commercial loop CDs. (If you want to use a loop in a CD you plan to sell, do make sure you have the legal right to do so.)

Recording Your Music, *continued*

There are lots of different loops available, including loops in all sorts of music styles. Within a style, there may be a loop for each section of your song—the introduction, verse, chorus, and so on. You can string the loops together to construct your song. On Roland's VS-2480CD and the BOSS BR-600, BR-900, BR-1200CD, and BR-1600CD, you can play the loops in the desired order on pads, making the whole process fast and fun.
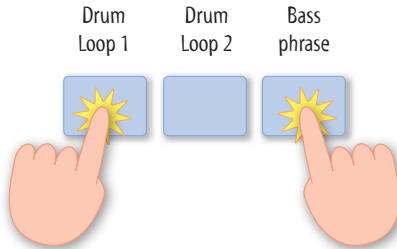

In the BOSS BR-600, BR-900, BR-1200CD, and BR-1600CD, you can import a .WAV loop—or a Standard MIDI File—directly into the Rhythm Track so it doesn't use up any of your recording tracks.

Recording Tracks

The process of recording tracks is sometimes called "tracking." Here's how it goes:

- Record your first track.
- You can re-record any portions of the track you'd like to improve without losing the parts you like. This process is called "punching." When you begin to re-record a section of a track, you "punch in." When you stop, you "punch out."
- Record additional tracks to complete your arrangement.
- You can combine already-recorded tracks to make them easier to manage, lock in effects you really like, or free up space for new tracks. The process of combining tracks is called "bouncing" or "ping-ponging." Since Virtual Tracks provide so much elbow room, you can hold onto the original, un-bounced tracks in case you need to change any of them or re-do the bounce later on.

You can also perfect any track using the non-destructive editing techniques we mentioned earlier. You can move pieces around, clean up unwanted noises, and much more.

Once all of your tracks are recorded, you'll mix them together into a final stereo mix. Mixing can be a lot of fun, since it's often a very creative process during which you hear your song assume its final form.

Balancing Track Levels

Set the volume level of your tracks. Make each track just as loud or soft as you want it to be in relation to the other tracks. Do this with care since it will determine what your listeners hear.

When all of your tracks are playing, make sure the overall level isn't too quiet or loud. Your studio's documentation will provide you with guidelines for setting the best level.

Panning

When you listen to a stereo mix, the sound covers the space between your two speakers—if you're listening on headphones, it goes from ear to ear. Each track seems like it's coming from a particular place between the left and right edges of the sound. This is called "panning." You can pan a track to any position you like.

In this mix, the lead vocal and acoustic guitar are panned to the center, with background harmonies to either side. There's an electric guitar panned far left and another one panned far right.

Panning is something of an art form in which there are really no hard and fast rules—feel free to experiment. Typically, the most important sounds—lead vocal, bass, snare, bass drum, solo instruments—are placed in the center for emphasis, though they don't have to be.

EQ

Equalization, or "EQ" for short, lets you shape the tone, or "timbre," of each track. Without getting too technical here, EQ works much like the treble and bass controls on any home or car stereo, but it's much more precise. You can select any of the elements that make up a sound and make them louder or softer, altering the tonal characteristics of the sound. EQ a bass to make it punchier, or use EQ to warm up a vocal.
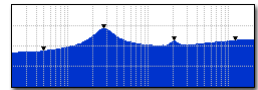
Mixing Your CD

Dynamics Processing

Dynamics processors can control the volume changes—or "dynamics"—in your tracks.
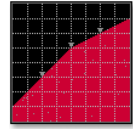
- *Compressors and limiters*—subtly control the loudest parts of a track to smooth out volume changes, making the track sound more polished and professional. They're often used on vocals, basses, and bass drums. Compressors and limiters are also helpful for taming tracks that have a lot of wild volume fluctuations.

- *Expanders and gates*—can silence a track when its volume falls below a specified level. You may, for example, use an expander or gate on a noisy electric guitar so you don't hear it humming in places where it's not playing. Expanders can also increase the excitement in a lackluster performance by making its volume changes more dynamic.

Adding Effects

As we mentioned earlier, effects play an important part in the overall sound of most CDs. During mixing, you'll add any effects you need to complete the sound of your tracks and enhance the way they work together. Reverb, for example, is usually added during mixing.

Automating Your Mix

Some recording studios and studio workstations offer mix automation that memorizes all of your mix settings at a particular moment in a "snapshot." Automation may also be able to record any changes you make as the song plays during mixdown, and then play them back for you. Roland's Automix feature, for example, can perform both of these jobs for you.
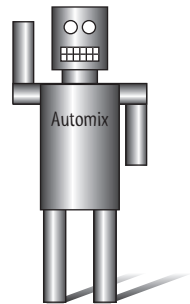
Automation makes mixing much easier, since you can slowly perfect your mix, automating your work a track at a time. When you're finished, all you have to do is press PLAY, and your entire mix is automatically performed by your studio. In Roland's VS-2480CD and VS-2400CD, you'll even see the motorized faders move up and down all by themselves.

Get Your Mastering Tools Together

Now that your mix is complete, it's time to prepare it for burning on a CD. Gather the tools you need, such as mastering software and/or hardware. Roland and BOSS studio workstations already contain a Mastering Tool Kit that includes everything you might need.

The onscreen icon for the Roland/BOSS Mastering Tool Kit

Time to Identify and Fix Problems

During mastering you'll listen carefully to your final mix and make sure it sounds exactly the way you want. If you discover anything you need to fix, you'll use the appropriate mastering tool to correct the problem. (If you find too many problems, you can always go back and do another mix.)

- *Check the overall level*—Make sure that your mix is at a good, strong level without being too loud. If parts of your mix are too loud or soft, use a mastering-quality compressor—such as the one found in the Roland/BOSS Mastering Tool Kit—to smooth out the volume level of the mix.

- *Check the overall EQ*—Take a moment to verify that your mix isn't too bright or too dull. If you need to, add some mastering EQ to fix the problem. If certain sounds in your mix are too soft or loud, it's sometimes possible to make corrections using mastering EQ.

Record Mastering Tracks

A CD can only play back a single stereo pair of tracks at a time. This means that you'll have to bounce your mix—containing all of your individual tracks—down to a single stereo pair of "mastering tracks." Once your mix sounds exactly the way you want it to sound, record your mastering tracks.

Place CD Track Markers

If your CD contains more than one song, you'll create CD track markers so any CD player will be able to locate the start of each selection. This is especially easy to do on a studio workstation made by Roland and BOSS.

Burning a CD

Once you've mastered your mix, you'll burn it onto a CD. If you've got a CD burner built into your workstation, as easy as turning on your CD burner and selecting the mastering tracks you want to burn. If your workstation has a USB connector, you can also move your music over to a computer that has CD-burning software installed.

Did You Know...

...that some studio workstations—like the BOSS MICRO BR—can play and export MP3 files you can send to your computer via USB and copy straight onto your personal MP3 player without even burning a CD?

Burning a Standard CD

A CD burner lets you make a CD that can be played on any audio CD player. This CD will also contain everything a mass duplicator would need to produce as many copies of the CD as you want.
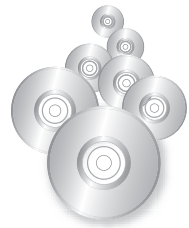
Burning a CD a Song at a Time

Many CD-burning workstations and disc-burning computer programs also allow you to burn one song at a time. This is handy for a couple of reasons.

If you're working on an album of songs, you can build up the album song-by-song: mix a song, burn a CD. When you mix the next song, you can add it to the same CD, and so on.

You can also create a CD with different versions of the same song, allowing you to compare them and pick the best version.

A CD you compile a song at a time may be playable only on your CD burner until you finish adding songs and "finalize" the CD. Finalizing makes the CD playable anywhere.

Packaging Your CD

With your final CD in hand, you can design a cover package for the CD or hire someone to do it for you. You can print the cover elements on your printer. If you prefer, you can have it printed professionally. Insert the cover elements into each CD case and you're ready to go.

Some CD manufacturers can handle the packaging and assembly for you when they duplicate your CD. On the other hand, many independent musicians have gotten great results, and have gone on to successful careers, doing everything themselves.

Your CD is Done

Congratulations! You now hold in your hand a CD of your own music. Share it with the world if you like, send it to friends and family, sell it at live performances, or fire it off to music industry professionals. Or maybe just enjoy hearing your own music on a professional-sounding CD. It's a great time to be making music.

Getting Ready for Your Next CD

It's time to prepare for recording your next song:

- *If you're using a hard disk recorder or memory card*—make a copy of your song data, called a "backup," on a CD, or back up the song to your computer's hard drive via USB. Once you've made your backup, check to see if you have enough disk or card space for the new song. If not, you can now erase your hard disk or card to make room. You can "restore" the backup to your hard drive or card at any time and everything will be right where you left it. A data backup retains all of the song's materials—even the stuff you need if you want to undo something—and all of its settings.
- *If you're recording on digital tape*—insert and format a new tape if you're out of recording space.

What Kind of Studio Do I Want?

There are three kinds of recording systems—here are their pros and cons.

Component-Based Hardware System

This type of studio contains separate pieces of recording, mixing, effect processing, and CD-burning hardware. It might, for example, incorporate a tape-based digital recorder, an analog or digital mixer, some effect processing boxes, and a CD burner.

Advantages

- You can select each element individually
- Traditional-style operation reminiscent of gear found in older analog studios that incorporated separate components
- Can combine new and vintage equipment

Disadvantages

- Can be expensive
- Steep learning curve
- Wiring can be complicated and result in unwanted hums, etc.
- No system-wide memory for scenes and so on
- Tape-based recorders lack non-destructive editing
- Requires advanced configuration skills
- Not portable

Computer-Based Recording System

A computer can host recording and CD-burning software programs that may include mixing capabilities and effects. You may also be able to purchase additional effect "plug-in" software programs.

Advantages

- Powerful recording and mixing tools
- May offer automation
- May offer non-destructive editing
- Large display
- Effect plug-in software
- Can typically burn CDs

Disadvantages

- Can be expensive
- Requires powerful computer
- Requires advanced configuration skills
- Steep learning curve
- Stability difficult to maintain
- Mixing with mouse not as enjoyable as using faders
- Not portable

What Kind of Studio Do I Want?

Studio Workstation

A studio workstation can provide everything you need to make music in a single, portable box.

Advantages

- Powerful integrated recording, mixing, effects, mastering
- May contain CD burner
- May provide USB connector for song/file transfer to computer
- System-wide scene memory
- Non-destructive editing
- Minimal configuration
- Fast and easy to use
- May offer automation
- Real physical faders and knobs are great for mixing
- No wiring worries or noises
- Portable, may be battery-powered
- Optional display with mouse-based editing in some products
- May have effect plug-in capabilities
- May be able to play and record MP3 files

Disadvantages

- May require computer for burning CDs
- May not offer large display
- May not offer plug-in capability

> A studio workstation's power and ease of use makes it far and away the best option for beginners and a great choice for professionals!

BOSS Studio Workstations

Roland and BOSS offer digital studio workstations designed to meet the needs of everyone from the beginner to the most demanding professional.

MICRO BR Digital Recording Studio

Palmtop Powerhouse!

COSM
USB

Meet the world's smallest pro studio. The MICRO BR is the ultimate palmtop guitar companion and recording studio. Only slightly larger than a portable MP3 player, the tiny-yet-powerful MICRO BR is a dream for musicians on the go. No guitar case or gig bag should be without one!

• Ultra portable, only slightly larger than an MP3 player
• 4-track playback, 32 V-Tracks
• Loads and plays MP3 files
• Multi-effects onboard; dedicated guitar input
• Time-Stretch and Center Cancel features (including MP3 files)
• 293 rhythm patterns
• Built-in tuner and microphone
• USB port for data transfer
• SD Card slot for recording media, 128MB card included

BR-600 Digital Recording Studio

Streamlined,
Feature-Packed!

COSM

USB

The BR-600 is the ultimate notebook studio. Built to go, the BR-600 is the most physically streamlined, feature-rich, eight-track studio on the market. It's packed with high-end BOSS effects. It's onboard drum machine contains nearly 300 percussion/drum patterns, and you can make your own. It even has a high-quality stereo mic built-in. What more could you need?

• Portable and ultra slim!
• 8 simultaneous playback tracks, 64 V-Tracks
• CompactFlash memory card slot for recording media; 128MB card included
• Powerful guitar and effects processor, including vocal FX and pitch corrector
• Built-in drum machine with velocity-sensitive pads
• Built-in stereo microphone and battery power to record anywhere
• USB port for data transfer/computer connectivity
• Carrying case and XLR-to-1/4" mic cable included

BOSS Studio Workstations

BR-900CD Digital Recording Studio

Small but mighty!

COSM
USB

The BOSS BR-900 is the musician's portable dream studio. No matter where you are, all you need is this all-in-one digital recording studio.

- Built-in CD-burner and Mastering Tool Kit
- 8 simultaneous playback tracks, 2 simultaneous recording tracks with 8 V-tracks (64 V-Tracks total)
- 2 XLR inputs with phantom power, plus 1/4" and RCA inputs, and digital out
- Pitch correction, chorus, delay, reverb, EQ, and other great BOSS-quality effects
- Programmable drum generator with 294 patterns, plus Tone Load function for custom beats
- Record direct to Compact Flash (128MB card included; record up to 624 minutes with optional 1GB card)
- Record direct to CD-R/RW
- USB port for data backup to computer, plus importing/exporting WAV files
- Runs on batteries or AC power

BR-1200CD Digital Recording Studio

Versatile, and Feature-packed!

COSM
USB

COSM® effects and amp models from BOSS's GT-6/6B, plus a great-sounding bass and drum programmer for instant backing tracks, the BR-1200CD is the friendliest and most complete hard disk recorder on the market.

- Built-in CD-burner and mastering effects for CD-quality mixes
- 12 simultaneous playback tracks (192 V-Tracks) with individual Comp/EQ
- 2 individual XLR inputs with phantom power, digital output
- GT inside! Famous BOSS GT-6 Guitar and Bass effects engine built-in for unsurpassed signal processing
- Vocal Toolbox provides pitch correction and harmony generator for true pro vocal processing
- COSM Mic and Amp models offer incredible hardware simulation
- Backing band built-in — programmable drum/bass pattern generator with 600 patterns and EZ Compose feature for super fast drum and bass pattern creation
- Easy importing of stereo drum loops with Automatic Tempo Matching
- Internal hard drive can store up to 120 hours of uncompressed music
- USB port for data backup to computer, plus importing/exporting WAV files

Roland Studio Workstations

BR-1600CD Digital Recording Studio

Power, Simplicity, 16-Tracks!

COSM
V-LINK
USB

The BR-1600CD Digital Recording Studio combines BOSS' famous, easy-to-use interface with eight XLR inputs for recording eight tracks simultaneously.

- 16-track (256 V-Track) digital studio with 40GB hard drive, and CD-R/RW drive
- Record all 8 XLR inputs simultaneously—ideal for tracking live performances
- Powerful onboard effects including COSM modeling for guitar, bass, and vocals
- New Vocal Tool Box with auto pitch correction and Harmony Sequence function
- 16 individual track EQs, plus 8 dedicated compressors
- Mastering Tool Kit with multi-band compression for loud and punchy CDs
- Create backing tracks quickly via independent Drum/Bass and Loop Phrase tracks
- USB port for easy data exchange, plus V-LINK video control*

V-LINK requires Edirol DV7-PR with software version 1.50 or higher..

VS-2400CD 24-bit Digital Studio Workstation

VS Plug-In Roland Approved

Professional and compact!

V·Studio

COSM

V-LINK

R-BUS

VGA monitor not included.

The VS-2400CD Digital Studio Workstation brings professional 24-track recording and CD burning to a new low price, with plug-in support.

- Self-contained 24-track/24-bit/96kHz recording workstation with onboard effects, CD-RW drive, and 40GB hard disk
- 24-track playback; 16-track recording* with 384 V-Tracks
- 48-channel, fully automated digital mixer with 13 motorized faders
- VGA Monitor output for fast, software-style editing with mouse
- Edit using included mouse and optional ASCII keyboard
- New RSS 3-D panning creates a 3-Dimensional sound field for mixing
- V-LINK function for synchronizing or controlling video equipment*
- 8 XLR/balanced TRS inputs and Hi-Z input
- Import .WAV/AIFF files direct from CD-ROM; export in .WAV format
- 2 stereo effects (expandable to 4 stereo, 8 mono) including COSM Mic, Speaker and Guitar Amp Modeling, plus Mastering Tool Kit
- Use 3rd party plug-ins with optional VS8F-3 Effect Expansion Boards

*V-LINK requires Edirol DV-7PR Digital Video Workstation (sold separately) with software version 1.5 or later.

*16 track simultaneous recording requires optional 8 channel R-BUS device such as the ADA-7000 or Edirol DA-2496 A/D to D/A converter or the RPC-1 computer interface.

Roland Studio Workstations

VS-2480CD 24-bit Digital Studio Workstation

VGA monitor not included.

The Roland VS-2480CD is the ultimate studio workstation. Its jaw-dropping features make it simply the best all-in-one studio in the world.

- Self-contained, 24-track/24-bit/96kHz digital recording workstation with built-in CD-RW multi-drive
- 80GB hard drive for unprecedented recording time
- 24-track playback; 16-track simultaneous recording, 384 V-Tracks
- "Drag-and-drop" control using included mouse; also accepts ASCII keyboard (optional)
- 64-channel, fully automated digital mixer with 17 motorized faders
- Pro-quality connections including 8 XLR/16 balanced TRS inputs
- 2 stereo effects processors—expandable to 8 stereo, 16 mono—with COSM Mic, Speaker and Guitar Amp Modeling, Mastering Tool Kit
- Use 3rd party plug-ins with optional VS8F-3 Effect Expansion Boards
- 24-voice Phrase Pads for triggering and arranging samples, plus onboard phrase sequencer
- .WAV file import/export, CD Capture function for importing from CD
- Dual R-BUS ports for expandable I/O in a variety of analog and digital formats; SMPTE and Word Clock input
- VGA video output for intuitive, software-style editing with mouse

An Introduction to Recording Your Own CD

VS8F-3 Plug-In Effect Expansion Board

The VS8F-3 Plug-In Effect Expansion Board is an easy and affordable way to add third-party plug-in effect processing to your V-Studio. Plug-ins are available from the following companies.

Auto-Tune VS corrects intonation problems in vocals or instruments in realtime.

T-RackS offers professional mastering, including EQs and dynamics-based vintage hardware mastering equipment.

Hi-Resolution parametric EQ is a high-precision 4-band EQ with the smoothness of analog.

Chrome Tone Amp brings custom guitar amps and boutique pedal effects too your V-Studio.

SoundBlender provides pitch-shifting, dual resonant filters, echo and reverse echo, arpeggiation, and more.

TCR 3000 provides 16 award-winning reverbs including Classic Hall, Vocal Studio, Room, Drum Box, and more.

The VS-LA2A and VS-1176LN are exacting emulations of the original legendary compressor and limiting amp.

Included with each VS8F-3 are 5 new high-quality effects from Roland:

- Roland Stereo Reverb
- Roland Pre-Amp Modeling
- Roland Vocal Channel strip
- Roland Tempo Mapping Effect
- Roland Mastering Toolkit

Comparison Chart

Roland/BOSS

Digital Studio Comparison Chart	MICRO BR	BR-600	BR-900CD	BR-1200CD	BR-1600CD	VS-2400CD	VS-2480CD
Playback Tracks/Virtual Tracks	4/32	8/64	8/64	12/192	16/256	24/384	24/384
Simultaneous recording tracks	2	2	2	2	8	16	16
Medium (HD=hard drive, CF=Compact Flash)	1GB CF max	1GB CF max	1GB CF max	40GB HD	40GB HD	40GB HD	80GB HD
Onboard digital mixer channels	5	10	10	14	24	48	64
Phantom power (V=Volts)	2.5V	n/a	48V	48V	48V	48V	48V
Effects (S=stereo, M=mono, L=loop, I=insert)	I-1, reverb	L-1, I-1, EQ	L-2, I-2	L-2, I-2	L-2, I-2	S-2, M-4	S-2, M-4
Max FX (S=stereo, M=mono, L=loop, I=insert)	I-1, reverb	L-1, I-1, EQ	L-2, I-2	L-2, I-2	L-2, I-2	S-4, M-8	S-8, M-16
Mastering Tool Kit	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Support for third-party plug-in effects	No	No	No	No	No	Yes	Yes
Burner	No	No	Yes	Yes	Yes	Yes	Yes
Non-destructive editing and recording	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Undos	1	1	1	10,000	10,000	999	999
Scenes	No	No	No	Yes	Yes	Yes	Yes
Automated mixing (R=realtime, S=snapshot)	No	No	No	S	S	R,S	R,S
Import/export .WAV files	Yes	Yes	Yes	Yes	Yes	Yes	Yes
MP3 file playback and export	Yes	No	No	No	No	No	No
Mic modeling	No	No	No	Yes	Yes	Yes	Yes
Amp modeling	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Speaker modeling	No	No	No	Yes	Yes	Yes	Yes
Time compression/tempo matching	No	No	No	Yes	Yes	Yes/Yes	Yes/Yes
Rhythm Part/Bass Part (Rhythm=R, Bass=B)	R	R	R	R,B	R,B	No	No
Vocal harmony generator	No	No	No	Yes	Yes	No	No
Mouse operation and VGA monitor output	No	No	No	No	No	Yes	Yes
Waveform editing	Yes	Yes	Yes	Yes	Yes	Advanced	Advanced
Motorized faders	No	No	No	No	No	Yes	Yes
USB connectivity for data transfer	Yes	Yes	Yes	Yes	Yes	No	No
Digital input and output (I=input, O=output)	n/a	n/a	O-2	O-2	I-2, O-2	I-10, O-10	I-18, O-18

An Introduction to Recording Your Own CD

Glossary

24-bit

The data format for professional-quality digital recording and playback. 24-bit recordings faithfully capture and reproduce even the most subtle nuances in audio.

Audio

Another word for "sound."

Automix

Automix, or "Auto-Mix," is the name of Roland's automated mixing system. It records and plays back changes in your mix, such as fader movements. Automix makes it easy to create the perfect mix since it remembers everything for you.

Back up

To "back up" is to make an external copy of your data, called a "backup." A backup contains all of a song's recordings, its settings and materials you need if you want to Undo something later on.

Bouncing

Bouncing is the recording of tracks onto another track or pair of tracks. Most often, this is done to combine a greater number of tracks into fewer tracks.

Burn

"Burn" is music industry slang for writing data onto a CD.

CD-R, CD-RW discs

CD-Recordable ("CD-R") and CD-ReWritable ("CD-RW") discs. You can write unerasable data one time onto a CD-R. A CD-RW can be reused—you can erase it and write new data onto it. Both types can be played as many times as you wish.

CD-R/RW drive

A CD-R/RW drive is a device that can burn audio onto CD-R or CD-RW discs.

CD Track Marker

A bookmark that pinpoints the beginning of each selection—for example, each song—on an audio CD.

Channel

A channel is a set of tools for controlling and shaping an audio signal.

Compressor

A device that reduces the loudness of audio exceeding a specified volume. A compressor can smooth out a recording by controlling excessive volume changes.

Glossary

Dry

Audio to which no effect processing has been applied is called "dry." A vocal without reverb, for example, is "dry." When you add reverb, it becomes "wet."

Digital audio

Computer-based data representing sound as strings of binary numbers—that is, digits. Audio captured by a digital recorder is converted into numbers. Digital audio sounds great and can be manipulated without any degradation in its quality.

EQ, Equalization

The process of adjusting the volumes of individual sonic elements within a sound. EQ lets you change a sound's overall personality by making it crisper or warmer, and also lets you bring out or hide other aspects of the sound.

Fader

A bar that you slide forward or back to raise or lower volume on a mixer.

Hard drive

A device that stores data—such as digital audio—magnetically on a rigid platter mounted inside a case.

Insert

An effect setup in which dry audio is completely replaced by a processed (wet) version.

Line level

The high-level signal produced by the outputs of synths, samplers, beat boxes, turntable preamps, CD players, multitrack recorders, cassette decks, and so on.

Locator

A bookmark that lets you quickly jump to any location within a song or project with the press of a button or the click of a mouse.

Loop

The act of playing the same audio phrase over and over. A loop may also be a pre-recorded audio phrase used in a composition. In the context of effects, a loop effect is an effect in which both dry and wet versions of a sound are combined.

Mastering

The final step in the process of preparing a mix for burning onto an audio CD.

Glossary

Mastering tracks

A pair of tracks onto which a final mix is recorded so it can be burned to an audio CD.

Mic level

The audio level produced by mics and instruments such as electric guitar or bass.

MIDI

For "Musical Instrument Digital Interface," the wiring and message protocol that allows devices to communicate by exchanging instructions called "MIDI messages."

Pad

A button you can strike with your fingers to play or trigger a recorded phrase. Pads make the recording and song-construction process even more fun and musical.

Panning

Positioning a sound between the left and right speakers of a stereo system.

Plug-in

A third-party effect program, sold separately, that adds new effect processing capabilities to a digital recording studio.

Realtime

A process that occurs while you're recording or playing back without requiring you to stop since it takes place in "real time."

Redo

When you've undone a recording or editing action—and then change your mind— you can often Redo it by simply pressing a button.

Recover

To reload data you've backed up, you "recover" it. When you recover a song or project, all of its recorded material and its settings are restored, including anything you need if you want to Undo something.

Scene

A scene stores a mixer's current settings—recall the scene to instantly restore the settings. Scenes make it easy to try out different ideas since they let you quickly switch between different mix setups at the press of a button or the click of a mouse.

Sequencer

A MIDI recorder that captures and plays back MIDI messages.

Glossary

SmartMedia

A compact memory card that can hold recorded audio, settings, and other data.

Snapshot

A snapshot stores mixer settings at a particular moment in time within a song or project. During playback, the settings are restored when that moment is reached.

Track

In a traditional recorder, a track is where audio is recorded. In a digital recorder, a track may be a collection of Virtual Tracks, any one of which can be active at a time. In a sequencer, a track is a stream of MIDI data. An automation track contains mix settings that are recorded and reproduced as a song or project plays.

TRS

For "Tip/Ring/Sleeve," a 1/4" plug on balanced electric instrument cables.

Undo

Undo is a feature that allows you to reverse recording and editing actions so you can freely experiment with recording and editing ideas, safe in the knowledge that you can always Undo what you've just done.

USB

"USB" stands for "Universal Serial Bus," and is a type of connector that allows the for the transfer of audio and other data between connected devices.

V-Track, Virtual Track

A Virtual Track—or "V-Track"—is where audio data is recorded in some digital recorders. Virtual Tracks provide elbow room for multiple versions of a performance, different approaches for a musical idea or solo, or alternate edits of something you've recorded.

.WAV

A common file format used for digital audio. There are many high-quality, professionally recorded drum and instrumental loops available as .wav files for use in song construction.

Wet

An audio signal to which an effect has been applied is called "wet." A vocal without reverb, for example, is "dry." When you add reverb, it becomes "wet."

XLR

A professional-quality, three-pin analog or digital audio connector.

Notes

Notes

An Introduction to Recording Your Own CD

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