The Miracle Piano Teaching System™

Owner's Manual
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Welcome to The Miracle Piano Teaching System!

You are about to take a complete beginner’s piano course. In the months to come, this system will provide hundreds of Lessons to teach you about playing the piano.

These Lessons are tailored to your individual needs. The Miracle listens to your playing, identifies problem areas, and provides special exercises to overcome them.

In the process, you’ll play many different types of music, including Classical, Jazz, and Rock & Roll.

Length of the Course

The minute you touch The Miracle, you’ll be making music. But, if you want to become a good piano player, you’ll need time and practice.

People learn at different rates. An average student with no prior musical training should complete the course in 6-12 months. After this time, you should be able to:

- Read music notation.
- Play with two hands using chords and common rhythms.
- Learn new pieces of music on your own.
- Perform with other musicians

Where to Set Up The Miracle

Ideally, put the keyboard where you can sit comfortably with your feet flat on the floor, and with the monitor screen directly in front of you. The screen should not be high, low, or off to the side.

A desk is a good place. Other good places are a card table and keyboard stands. The kitchen table works too, although you may need to sit on a phone book or pillow so your arms are at the right height. Avoid the living room coffee table, because it is bad for your back, and your feet can’t rest flat on the floor.

No matter what table you use, put The Miracle keyboard at the edge nearest you. That way, you don’t have to stretch to reach the keys.
Where to Go from Here

For information about running The Miracle on your system, see The Miracle Piano Teaching System User's Guide.

If you want to connect The Miracle to your stereo or to another MIDI (Musical Instrument Digital Interface), or use The Miracle as a stand-alone keyboard, see About The Keyboard.
GETTING THE MOST FROM THE MIRACLE

With a little patience and regular practice, you'll soon be playing the piano. The Miracle helps you every step of the way, with Lessons that make learning and practicing every Chapter fun.

Completing a Chapter
At first, you'll want to do as many Chapters as you can. That's okay, but it's best to complete one Chapter's Lessons before going to the next Chapter. Try using The Miracle like this:

1. Complete a Chapter.
2. Go to the Practice Room and play all of that Chapter's pieces until you can do them well.
3. Redo the Chapter, to be sure you got it. If you practiced enough, the second time won't take long.
4. Go on to the next Chapter.

Later in the course, expect Chapters that take a week or more to complete. These Chapters are more challenging to sharpen your skills. They take time to master, so don’t get discouraged. With practice, you’ll get it!

Practice Makes Perfect
To get the most out of The Miracle Lessons, practice a little every day — 45-60 minutes is ideal. Even 15 minutes is better than no practice at all! You’ll learn to play sooner by practicing regularly.

When you can’t get through a Lesson, you may think “I’ll never get this!” This happens to everybody, and just means that it’s time for a rest. Play some music you already know, or stop for awhile. Remember, if you don’t get it now, you will get it eventually.

The Practice Room
Use the Practice Room. There you can work on more challenging pieces, rather than just repeating Lessons. With all of The Miracle’s Activities available, you can practice many ways. For example, if you’re having trouble with the right hand notes in a song, select Right Hand practice and work in either the Shooting Gallery or Practice Notes. If you’re having trouble coordinating both hands, select Both Hands practice and work in Practice Rhythms.
The Practice Room has many pieces that are not in the Lessons. To learn any piece using only the Practice Room:

1. Learn the left-hand rhythms.
2. Learn the left-hand notes.
3. Play the entire left-hand part.
4. Repeat this 3-step procedure with your right hand.
5. Repeat it again with both hands.

When learning rhythms, use Practice Rhythms. If you make too many mistakes, just start again. You might also try listening to the rhythm of the piece by selecting Demonstrate the Piece.

When learning pitches, use the Shooting Gallery at first. When you can hit most of the ducks with the first shot, switch over to Practice Pitches. Take all the time you need, and try to remember the rhythms you already learned.

If you have trouble playing the entire part, go back to Practice Pitches or Practice Rhythms.

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**Special Note to Parents**

The Miracle Piano Teaching System works with children age 8 and up, but pre-seen may need help reading Lessons, or learning to position their fingers on the keys.

This is a great way for you to get involved with your child’s piano playing. If you don’t know how to play piano, you might enjoy taking the course along with your child. You’ll both find it rewarding to learn a creative skill together.

Children make the best progress when practicing is fun. To convince your child that practice is fun, show an interest in his or her progress during and after practice. Your excitement about the child’s progress can really inspire him or her to continue. This is especially fun for everyone in activities where The Miracle accompanies your child’s performance.
Special Note to Teachers

The Miracle can enhance your teaching with practice exercises that are possible only on a computer:

- **Pointers** - Give visual cues that builds music reading confidence.
- **Pitch Practice Activities** - Advance pointers to new notes only when you play the correct pitch.
- **Properly Adjusted Metronome** - Continuously reinforces good rhythm.
- **Rhythm Practice Activities** - These play the proper pitches no matter what key you press. This lets the student actively participate in partially demonstrating the piece.
- **Shooting Gallery** - Makes practicing fun while developing note reading and rhythm skills.
- **Special Exercises** - Help students overcome specific problems. These are given as needed, when The Miracle detects error trends in a practice session.
- **Different Display Formats** - Provide variety and help students focus on specific aspects of a piece.
- **Practice is constantly varied and fun** - Students tend to practice more — and regularly!

As the teacher, these tools can effectively speed your students’ progress. This gives you time to focus on:

- Maintaining good hand position.
- Phrasing and tapering of phrases.
- Rubato or sub tied notes in the tempo.
- The art of pedaling.

**Note:** The pedal that connects to The Miracle is a sustain pedal. Its use is introduced in the later Lessons.
Note to Experienced Players

Experienced piano players often find the Miracle course a wonderful way to refresh their memories and improve their playing skills. Also, since The Miracle is designed to teach music to beginners, experienced players can zip through the initial Lessons. Complete the first two Chapters, to see how the system works. Then skip ahead as far as you want.

The interactive nature of The Miracle lets you teach piano using unique, new techniques that only a computer can provide. You'll find learning with it quite different from a course presented by traditional instructors, although all of the standard elements are there. These elements are sometimes presented in a different order than they are in standard courses. As a result, you might find an occasional Lesson that covers things you already know.

About The Miracle Keyboard

You do not need to connect the Miracle keyboard to the computer to use it. In fact, it is an excellent stand-alone keyboard with a variety of features:

- **128 different instrument sounds** (patches). Each patch is fully accessible from the buttons on the top panel.
- **16 voices**. The Miracle can play 16 different notes simultaneously or 8 in stereo patches.
- **Velocity sensitive keys**. This means that the quicker you strike a key, the louder it sounds, and the slower you strike a key, the softer it sounds.
- **MIDI support**. You can connect The Miracle to a sequencer, computer, or other MIDI compatible device.
- **Split keyboard function**. The left half of the keyboard can sound like one instrument while the right half sounds like another.
- **Performance and Library modes**. You can play with combinations of many instruments and sound effects.

To find out how to use these and other features of The Miracle keyboard, see ABOUT THE KEYBOARD.
WHERE TO GO FROM HERE

Congratulations! You've finished The Miracle Piano Teaching System and mastered the basics of an exciting skill. You have every reason to be proud!

You now know how to:

- Recognize commonly found symbols in piano sheet music.
- Read and play notes, rhythm, and fingerings for a piece.
- Separate pieces into smaller sections and parts, such as pitch and rhythm.
- Coordinate changing keyboard positions and chords.
- Blend notes using the pedal.

Now, continue your training by learning pieces on your own. Select pieces that interest you and try to practice daily. Your skills in both playing and sight reading will continue to improve.

Practice the way you did with The Miracle for 45 minutes to an hour each day. Don't forget that playing for even a few minutes is better than not playing at all.
Selecting New Pieces

Visit your local music store, browse through the sheet music section, and choose some music that you like. Here are some guidelines.

Consider trying some of the following:

General
- Scott Joplin piano rags
- Spiritual and Gospel arrangements

Contemporary
- Folk music collections
- Movie soundtracks
- Popular songs
- Rock collections, such as The Beatles, Elton John, and Billy Joel
- Beginning Jazz collections

Classical
- Bach’s 2-Part Inventions
- Bartok’s Mikrokosmos
- Schumann’s Kinderszenen
- Sonatas and sonatinas by Clementi, Kuhlau, Haydn, and Mozart
- Easy pieces by Grieg
In addition to practice, you can further your studies by taking piano and/or music theory lessons through group classes or private instruction.

Group Piano Lessons

Group lessons are an excellent way to continue from The Miracle course. Try your local Parks & Recreation departments, community programs, adult education programs, and community, state, and private colleges.

Private Piano Lessons

There is no substitute for a good piano teacher to improve your playing technique, phrasing, dynamics, touch, musical style, and interpretation. With a good teacher, you'll learn different styles and more difficult pieces. Many piano teachers include theory lessons in their training programs. Playing in public is fun and exciting, and with a good piano teacher you'll get a chance to do recitals, competitions, and other performances.

To find a good teacher, contact the music department in a nearby college and ask for a list of qualified music teachers in your area.

Theory Classes

Music theory teaches you the underlying concepts behind music and how it is put together. Among other things, you'll learn about the formation of chords and chord progressions.

Rock and Jazz musicians need music theory because they must improvise as they play. Classical pianists use it to recognize patterns in complex pieces. If you want to compose music, theory is invaluable.

Theory classes are also offered through community programs, adult education programs, and community, state, and private colleges. Prices vary.

If You're Interested In Playing Jazz

A private instructor is your best bet for learning Jazz and improvisation. Again, your local college is a good source on where to find a qualified instructor. If you want to learn Jazz, music theory is invaluable.

If You're Interested In Playing Rock

Keyboardists are in demand by Rock bands. If you're interested in Rock, learn about improvisation, Blues, and Jazz. Make up stuff you like and play it. Listen to other Rock keyboardists to get ideas and discover different styles of playing. Copy styles you like while you develop your own.
**Playing With Friends**

Playing music with your friends is a fabulous, fun way to learn any style of music you choose. There is a wide range of classical material for piano and one or two other instruments, and a rich repertoire for Jazz and Rock bands.

Playing in a group increases your confidence, improves your sight reading, develops your rhythm skills, and introduces you to new challenges and material. Most importantly, you'll get excited about practicing with your friends.

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<td>Talking Heads</td>
<td>Andre Previn</td>
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Here are some rock and jazz artists you may want to consider:

### Rock

- The Doors
- Joe Jackson
- Billy Joel
- Elton John
- Jerry Lee Lewis
- Talking Heads

### Jazz

- Bill Evans
- Oscar Peterson
- Art Tatum
- Teddy Wilson
- Claude Bolling
- Andre Previn

### Classical

Listen to music written by:

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Friends and record store employees can also offer suggestions.
HISTORY OF THE PIANO

In the Pidgin trading language of New Guinea, the piano is called "a box of music with teeth like a crocodile; suppose you fight it hard, it cries out." Amazingly, this accurately describes the piano's earliest ancestor.

Pipe Organ

The piano's earliest ancestor is the organ, which was invented in the 3rd century B.C. by the Greek engineer Ktesibios. His Hydraulics was the first keyboard instrument. The wooden "keys" looked like tongues and worked like hydraulic pumps. Key presses used water pressure to force air through pipes, which made sounds. This was not easy. Hydraulics players had to pound keys with their fists to fight the water pressure!

Pipe organs with easier actions appeared around the 6th century, and quickly became the favorite instrument of The Church. They are still popular today.

Clavichord

The clavichord was the first keyboard instrument that used strings instead of pipes. Invented during the Middle Ages, the clavichord became popular in the 1400s. Key presses moved flattened brass pins against brass strings that vibrated when struck. The pressure on the keys controlled the volume; however, at its loudest, the clavichord was as quiet as a mouse.

This made the clavichord ideal for home practice and the instrument of choice in libraries. Nuns loved it, because they could play without disturbing those around them.

Harpsichords

An Italian, Giovanni Spinetti, was less impressed. He wanted a more powerful instrument than made louder sounds. To increase the volume, Spinetti made the soundboard and strings longer. On his harpsichord, key presses firmly plucked strings with quills. This made the loud toast that Spinetti wanted, but there was no way to quiet it down!

Orchestrations

During the 16th century, orchestrations appeared with harpsichords as standard instruments. Performances by early orchestrations were either private affairs for royalty, or associated with a new musical form called opera.
Although keyboard music became popular, few people owned keyboards. Because harpsichords and clavichords were complicated, hand-made instruments, they were quite expensive. Royalty and wealthy people displayed them proudly, but they were rarely seen elsewhere. Music was an art for the rich.

Public Performances

Public performances by individual musicians were unheard of until 1672. That year an English violinist, John Bannister, realized there was money to be made from them. At 4 o'clock every afternoon, Bannister charged "a shilling a head" for anyone who wanted to come to his house and listen to musicians.

Keyboardists introduced themselves to the public in 1678 when another Englishman, Thomas Britton, rose to fame holding concerts in the loft above his real store. Handel (best known today for his Messiah) was one of many who performed on the harpsichord in Britton's well-heated loft. Here is an early ad for these performances:

"anybody that is willing to take a hearty Sweat may have the Pleasure of hearing many notable performers in the cheering Science of Music."

By the early 1700s, public performances were common, and the harpsichord's volume made it the logical keyboard instrument to play. This frustrated many composers, who wanted subtle volume variations to express their music. In fact, Johann Sebastian Bach publicly called the harpsichord a "useless instrument."

What the world needed was an instrument that combined the harpsichord's volume with the clavichord's expressiveness.

Kirk Nurock's 'Sonata for Piano and Dog,' a work in four movements, Carnegie Hall, 1983
HISTORY OF THE PIANO

The Piano is Born

In Italy

In 1709, the piano was born. The inventor, Italian harpsichord designer Bartolommeo Cristofori, called it the Clavicembalo Col Piano & Forte (harpsichord with Loud and Soft).

The Pianoforte, as it was known, used hammers and dampers to control the strings. A key press threw a small wooden hammer up against a string, making it vibrate. A hard key strike struck the hammer hard, making a loud note. A soft key strike struck the hammer softly, making a quieter sound. When the key was released, a damper fell on the string, silencing it. This is essentially how pianos work today.

Cristofori was excited about his invention. Unfortunately, no one else seemed to be. Despite the piano’s advantages, the harpsichord continued to dominate the musical world.

German Piano Manufacturing

A German organ maker, however, was excited by Cristofori’s hammer action design. In 1725, Gottfried Silbermann began copying Cristofori’s piano and promoting it throughout Germany. But he too fought an uphill battle to get it recognized.

In 1736, Silbermann tried to promote the design by introducing his piano to one of the harpsichord’s harshest critics, the great Johann Sebastian Bach. Silbermann had high expectations as Bach played the instrument and considered it.

The famous composer agreed that the piano had a pleasant tone, but declared that the treble was too weak and the action too stiff. This infuriated Silbermann, who refused to speak to Bach for many years.

Eventually, Silbermann improved the features of the piano that Bach criticized. By 1747, 11 years after his introduction of it. Bach said the piano was “coming along.”

First Public Concert

The first public concert featuring a piano was held in 1767, 58 years after the instrument’s invention. An ad promoted the concert as a benefit by a “Miss Brickley,” who sang while accompanied “on a new instrument called a Piano Forte.”

Although the piano was well received at the Brickley concert, it was a performance in the following year by Johann Christian Bach (the youngest son of Johann Sebastian Bach) that finally brought the instrument public acceptance. Suddenly, pianos of numerous designs appeared all over Europe and the New World. Future American President, Thomas Jefferson, an extraordinary violinist and passionate music lover, bought a piano in 1771.
At this time, the largest manufacturers of pianos were the French, led by Sébastien Erard, and the English, led by John Broadwood. French pianos were known for their crisp, delicate touch, while the English pianos were known for their fullness of sound. The virtues of each were a topic of many arguments among composers in the late 1700s.

The first American piano factory opened in Philadelphia in 1774, manufacturing instruments in the English design.

Around that same time, the fame of an amazing keyboard performer was spreading across Europe. Wolfgang Amadeus Mozart was a child prodigy of exceptional talent. When the child began composing music at age 4, his father realized there was money to be made. By age 6, Wolfgang was paraded past the royalty of Europe, stunning them with his performances.

At age 14, Mozart was so skilled that at a single exhibition, he was challenged to play the following:

"a Symphony of his own composition; a harpsichord concerto which will be handed to him, and which he will immediately play prima vista (on first look); a Sonata handed to him in like manner, which he will provide with variations, and afterwards, repeat in another key; an Aria, the words for which will be handed to him, and which he will immediately set to music and sing himself, accompanying himself on the harpsichord; a Sonata for harpsichord on a subject given to him by the leader of the violins; a strict Fugue on a theme to be selected, which he will improvise on the harpsichord; a Trio, in which he will execute a violin part all’improvviso (improvised); and finally, the latest Symphony composed by himself."

Mozart met the challenge and the concert was a success.

Mozart was another composer who disliked the limits of the harpsichord. Unlike Bach, he embraced the piano, making it a serious professional instrument.

With the piano’s endorsement by Mozart and his contemporaries, piano teachers soon found themselves in demand. By 1779 in Vienna, over 300 piano teachers were making a comfortable living.
HISTORY OF THE PIANO

Beethoven

In 1787, a 31-year-old Mozart heard a performance by a young prodigy, the somber but brilliant Ludwig van Beethoven.

Mozart was never easily impressed. He correctly believed that few, if any, composers were even close to being his equal. Of the 17-year-old Beethoven, however, he claimed "This young man will leave his mark on the world."

Not everyone agreed with Mozart. Seven years later, when Beethoven studied counterpoint with Johann Georg Albrechtsberger, the famous Viennese instructor insisted that Beethoven "has learned nothing, and will never do anything properly."

Albrechtsberger was frustrated because Beethoven’s active imagination distracted him from the dry, traditional course of study. This imagination, however, was Beethoven’s strength, and it made him one of the greatest composers in the world. To him, music was just a puzzle to be solved. His imaginative solutions yielded works of great power and expression, often built from seemingly dull themes. In fact, Beethoven’s performances were so powerful that he hired musicians to run around the piano and remove the strings and hammers that he broke.

Piano Frames

Then again, Beethoven’s performances had to be powerful. Concert halls were getting bigger and outgrowing the carrying power of 18th-century pianos. Although manufacturers knew that thicker strings would increase the piano’s volume, the 16-ton tension required to tune such strings would snap a wooden piano frame like a twig.

A Bostonian, Alpheus Babcock, solved the problem in 1810 by making a cast iron piano frame. Within a few decades, his design revolutionized the industry. A variation of Babcock’s cast iron design is still standard in today’s pianos, in which the thicker strings require tensions of over 30 tons!
Russian School

Babcock's design helped the rise of pianists such as Anton Rubinstein, a Russian known for thunderous performances. In Europe, most critics wondered at all the fuss, since Rubinstein often played sloppily, botching notes during his energetic recitals. Audiences, however, loved the energy of Rubinstein's performances, and left his concerts feeling well entertained. Today Rubinstein is remembered as the founder of the Russian School of piano playing, which emphasizes fiery performances and virtuosity.

Liszt

Another exciting performer was Franz Liszt, whose handsome features, unrivaled skill, and dramatic playing style got the same response from the women of his day that the Beatles got from their fans in the 1960s. Women charged the stage, throwing jewels and shrieking in ecstasy. A fight always broke out over the green gloves that Liszt left on stage after the performance. One woman supposedly fished through trash for a cigar stub that Liszt smoked, then carried it in her bosom until she died.

Chopin

Although Liszt was the most popular pianist in Europe, another composer, Frederic Chopin, had a greater impact. Chopin was a small, foppish man to whom social circles and proper fashion meant everything. Although lacking Liszt's personal magnetism, he amazed audiences by playing with a grace and agility that seemed impossible to achieve with his tiny, delicate hands. Today, Chopin is remembered as the pioneer of a style of music, called Romanticism. This form, which is still popular today, concentrated on the emotional aspect of music instead of the technical, and often abandoned the rigid forms imposed by the earlier composers.

The Steinway Piano

As music changed, so did the piano. In 1836, German cabinet maker Heinrich Steinweg of Steinway & Sons built a piano in his kitchen, which combined Babcock's cast iron frame with the recent English notion of pedals and the hammer action improvements made by the French. It was the first modern piano, and the beginning of the most prestigious piano manufacturer, Steinway & Sons.
In 1853, Steinweg moved his business and family to New York, where it remains today. By this time, piano playing had spread like wildfire, and the instruments were everywhere. They were even common in the rugged American west, where piano players appeared in dance halls, bar rooms, and bordellos.

**American Piano Manufacturing**

By 1870, there were over 7000 piano manufacturers in the USA alone, with production increasing almost twice as fast as the population. Over the next 20 years, one out of every six Americans was involved in the piano industry.

During this time, manufacturers began experimenting with stranger and stranger variations on their designs. Inventors did anything to appeal to the public's piano obsession. Some of these pianos were round. Others were square or wing shaped. Still others stood upright. Some had keyboards on each side so that several pianists could play at once. The New York piano keyboard looked like a typewriter. And Emil J. Coert's made the smallest working piano in the world--measuring 1/2" x 3 3/8" x 6 1/2" — about the size of a short paperback book!

**Player Piano**

The most unique of these inventive pianos required no pianist. The player piano could duplicate a performance by rolling a hole-punched sheet of cardboard past a line of air jets. Each hole was one note of the performance. As a hole passed a jet, it shot a rubber hammer at the piano's strings.

These player pianos accurately recorded many aspects of a performance, including dynamics and pedal activity. As a result, surviving player piano rolls provide us with accurate recordings of performances that were played long before the advent of modern recording equipment.

**Ragtime**

A wide variety of music was available for player pianos, but the most popular of the day was a new style of playing called Ragtime, which stood for ragged time. Ragtime tunes, called Piano Rag, were highly syncopated pieces that favored fast tempos and a more staccato flow.

![Typical player piano ad](attachment:image.png)
As a result of Ragtime, the piano’s popularity increased more than ever. By the turn of the century, almost 365,000 pianos a year rolled out of factories. The stranger designs mostly disappeared, leaving pianos primarily in the form of either wing-shaped Grands or Uprights. The Grand piano produced louder and superior sounds, so was used for concert performances. The Upright’s smaller footprint, however, made it the piano of choice for the home.

Jazz

The Upright was also the favorite of artists in another new style of music—Jazz. This uniquely American form had its roots in both Blues and Ragtime. Unlike these single instrument styles, however, Jazz was played by small bands, usually with a piano, a coronet, a trombone and a bass.

The thing that made early Jazz most unique, however, was that it was rarely written down. Few Jazz musicians could read music. Instead, these musicians depended on their skill, intuition, and experience. The Jazz age heralded a return to the art of improvisation which, though applauded in Morant’s day, was frowned upon by the classical performers of the late 19th century, and is still uncommon in classical performances today.

Electric Piano

The early 1950s saw the most unique addition to the piano since the cast iron frame—electricity. This addition was first made by the Wurlitzer Company. With it, the era of portable pianos has arrived.

In an electric piano, the hammers strike metal reeds or rods whose vibrations create electrical signals. These signals are then sent to an amplifier and a speaker which reproduces them as sound. The sound, however, is somewhat different from that of a traditional piano. As a result, the electric piano found a home in new, rather than classical forms of music.

Moog Synthesizer

While the electric piano was sparking interest, German inventors and composers were learning to produce sounds by entirely electronic means. They used a device called an oscillator, which, when coupled with a keyboard by Robert Moog in 1965, formed the first synthesizer.

The 1922 Operano Marathon winners, after 51 hours of continuous song.

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Using this Moog synthesizer, composer Walter Carlos created the 1969 album "Switched on Bach." Bach's music lent itself magnificently to the unusual sounds of this new keyboard instrument. The result legitimized the synthesizer while introducing the works of the baroque period's greatest composer to a new generation.

**Sound Sampling**

Synthesizers have made enormous advances since the early Moogs. Although today's synthesizer can still make unique electronic sounds, it can also accurately reproduce the sound of many traditional instruments.

This is done by a process called sampling. The process starts by making a digital recording of notes played by a real instrument. Using computer technology, the sound is converted into a series of numbers, which are later converted back to sound. Compact Discs also work by the same process.

In synthesizers, these numbers are stored in a computer chip rather than on a disc. When the keyboardist plays a note, the synthesizer converts the numbers for that note back into sound. The result is the exact sound of the instrument that was originally recorded.

By the early 1980s, computer technology was also being used to attach sequencers to electronic keyboards. Performances were digitally recorded, edited or overlayed with additional musical sequences, then played back through the synthesizer. Unfortunately, each manufacturer's sequencer only worked with their own synthesizer.

**MIDI**

In 1982, representatives of the top synthesizer manufacturers met to discuss this compatibility problem. The result was MIDI (Musical Instrument Digital Interface), which became the standard format for sending data between instruments and sequencers (or other instruments). MIDI is so versatile that it is also used to control stage lighting, special effects, and video equipment. All manufacturers, including The Miracle's, support the MIDI standard today.
The combination of sampling and MIDI changed the way many composers work. Making a recording no longer requires dozens of musicians, a studio, and a room full of recording equipment. A single composer with a sequencer and a keyboard can create the sound of everything from a rock band to a symphony orchestra. To do this, the composer uses the synthesizer to create one instrument sound at a time, then sequences all sounds together. In fact, most of today’s movie soundtracks are created in exactly this manner.

MIDI keyboards are also a boon to Rock musicians. A keyboardist can replace an entire wind, brass, or string section, providing an instrumentation range once impossible to create in live Rock performances. In addition, some bands use sequencers to help them perform songs that normally require many more musicians.

The Miracle
All these things are done on synthesizers similar to The Miracle keyboard, which can reproduce 128 different sampled stereo sounds. In The Miracle Piano Teaching System, you’ll use a synthesizer to learn an instrument with a rich 300-year tradition... the piano.

Life before The Miracle
THE THEORY BEHIND THE MIRACLE

The Miracle Piano Teaching System is the first computer program that teaches you how to read and play music on the piano. It does this by providing interesting activities and games that build your knowledge and playing skills step by step. If you've been through The Miracle course, you're familiar with how this works.

But what happens inside The Miracle Piano Teaching System? This chapter describes the inner workings of the software and how The Miracle seems to "know so much" about piano playing.

Lessons and Chapters

The Miracle teaches piano in hundreds of small steps called Lessons, which are grouped into Chapters. One Chapter, for example, introduces rhythm. Another Chapter introduces staff notation (how music is written).

These Chapters are arranged to give you basic skills first, then to improve on these skills while introducing more advanced concepts. When you successfully complete a Lesson, you go on to the next Lessons in that Chapter. When you complete the last Lesson in a Chapter, you go on to the next Chapter.

But what happens when you don't get through a Lesson the first time?

Human piano teachers watch you practice. If you don't get through a Lesson properly, the teacher gives you special exercises to help you get over the problem.

The Miracle does the same thing. It "listens" to how you play, then analyzes your performance. If you had problems, it too creates a special exercise to help you overcome those problems.

The Analysis Phase

The Miracle analyzes your playing both during the performance and afterward.

During your performance, The Miracle listens to make sure you are playing the right notes at the right times.

The Miracle also records your performance for later analysis. It records which keys you press, when you press them, how hard you press them, and when you release them. The Miracle calls this data the AMS, or Actual MIDI Stream.

When you finish playing, The Miracle compares your AMS with its IMS, or Ideal Music Stream. This is its recording of how the performance is supposed to sound.
Choosing the Most Significant Error

When you play the piece incorrectly, it is not enough for the program to say, "Well, you played some notes wrong." The goal of an expert teaching system is to determine why you played the notes wrong, then offer corrective measures.

The Miracle classifies each of your errors as one of 200 error types. These types are sorted into 41 main categories. Some examples of the main error categories are:

- Ignoring an accidental mark
- Holding a note too long
- Playing the notes too fast
- Misunderstanding the previous accidental rule
- Ignoring a rest
- Not holding a dotted note long enough
- Firing the wrong finger
- Striking the crack between two keys

Because different Lessons develop different skills, The Miracle pays particular attention to the error categories associated with those skills. For example, when evaluating a Lesson that focuses on rhythm, The Miracle is less picky about a few wrong notes than it is about bad rhythm.

The Miracle determines which categories are important by assigning an importance value or weight to each of the 41 error categories for that Lesson. The more important the error, the higher the number.

Each category's weight is then multiplied by the percent of mistakes made in that category. This creates a score in each of the 41 error categories.

Low scores mean you made few mistakes. If your scores are low enough, The Miracle gives you a passing grade and takes you to the next Lesson. Otherwise, The Miracle identifies your most significant error (the one with the highest score), and designs an exercise to help you overcome this problem.

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Creating Exercises

Each of the 41 error categories has a half-dozen or more exercises that can help you overcome a problem in that category. These exercises use The Miracle’s various Activities, such as Shooting Gallery, Rhythm Practice, and so on.

When The Miracle chooses an exercise, it first eliminates any exercise for the category that is not appropriate to the Lesson. For example, if you haven’t learned how to play with both hands yet, it won’t ask you to play with both hands.

From the remaining exercises, The Miracle then selects the one that uses the least recent Activity. For example, if you have a pitch error, you’ll get a Shooting Gallery exercise. In this way, you constantly work in a variety of Activities.

Repair Chalkboards

Once the exercise is selected, The Miracle creates a Chalkboard screen that tells you what your error was, and what exercise you’ll do to work on it. It does this by combining two pieces of text:

• The first comes from a phrase list associated with each error category; it tells you what you did wrong.

• The second comes from a phrase list associated with the Activity; it tells you what to do to correct the problem.

The two phrases are combined using common rules of English.

This explains why the repair Chalkboards have no Chapter and Lesson numbers on them. They are custom-made to match your error, so they don’t come from any particular Lesson.

After the Exercise

Your performance in the exercise is analyzed in much the same way as your performance in the Lesson. If you receive a passing grade, The Miracle returns you to the Lesson where you had the problem. If you make many mistakes in the exercise, The Miracle creates another practice exercise.

As you work with these exercises, your skills gradually improve. Eventually, you will be able to get through the initial Lesson and move on to the next.
ABOUT THE KEYBOARD

This chapter provides the following details about The Miracle keyboard:

- How to connect the foot pedal
- How to connect the earphones
- How to connect The Miracle to a stereo system
- How to select different patches (instrument sounds)
- How to split the keyboard between two patches
- How to use The Miracle with MIDI

Connecting the Foot Pedal

The pedal that comes with The Miracle functions as a Damper pedal. To connect the pedal:

1. Plug it into the two-pin Foot Pedal jack on the back of The Miracle keyboard. It doesn't matter which side of the plug is up.
2. Put the pedal on the floor with the foam (squishy) side up.

Connecting the Earphones

The stereo earphones included with the hardware bypass The Miracle's speakers when connected, so you can practice without disturbing others.

To connect the earphones, plug them into the Head Phone jack on the back of The Miracle.
Connecting The Miracle to a Stereo

You can play the sound from The Miracle through your stereo for enhanced sound. This also lets you record performances, if you attach a tape deck to your stereo.

To connect The Miracle to a stereo:

1. Purchase two Male-to-Male RCA-type connection cables, one for each stereo channel, at any store that sells stereo or electronic equipment.

Note: This is the same type of cable that connects your stereo receiver to your tape deck, CD player, or turntable. Some stores also sell a single stereo cable that combines two regular cables. 5-pin cables have two RCA-type plugs on each end. These work fine too, and you'll only have to buy one.

2. Connect one cable between the LT Audio Out jack (back of The Miracle) and the Left AUX In jack (on receiver).

3. Connect the other cable between the RT Audio Out jack (back of The Miracle) and the Right AUX In jack (on receiver).

Plugging in these cables does not disable the speakers on The Miracle. Instead, The Miracle volume control affects both the internal speakers and your stereo speakers. If you want to use your stereo and not The Miracle speakers, connect The Miracle to your stereo and connect the earphones.

Selecting Different Patches

Musicians use the term patches for the different instrument sounds in a synthesizer. The Miracle contains 128 different patches. Of these, 8 are the default sounds assigned to the left 6 buttons on the keyboard top. They are:

- (Grand) Piano
- (Mnkl) Vibraphone
- (Mnkl) Vibraphone
- Harpsichord
- (Pipe) Organ
- (Pipe) Organ
- (Pipe) Organ
- (Pipe) Organ
- (Pipe) Organ

To use these instruments, press the button for the instrument you want. The light (called a LED) above the selected button lights up.

You can also select from 9 predefined groups of sounds, called Patches. Or, you can enter a special Library Select Mode that lets you select any of The Miracle's 128 patches.
Selecting Presets

To select a group of Presets:

1. Place the keyboard overlay over the buttons and lights on the top of The Miracle.
2. Hold down the Select button and press the Scroll Down button.
   The light next to the first Preset, Classical, starts to blink.
3. Take one of these alternatives:
   To select from the five patches in this Preset, press the buttons (Melody 1, Melody 2, Accompany, Bass, Percussion).
   To select a different Preset, hold down Select and Scroll Down or Scroll Up until the light flashes next to the group you want.
   To return to the default Preset, hold down Select and Scroll Down or Scroll Up until none of the LEDs flash.

The following preset groups are available:

<table>
<thead>
<tr>
<th>PRESET</th>
<th>MELODY 1</th>
<th>MELODY 2</th>
<th>ACCOMPANY</th>
<th>BASS</th>
<th>PERCUSSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classical</td>
<td>Clarinet</td>
<td>Oboe</td>
<td>Strings</td>
<td>Sil Bass 1</td>
<td>Xylophone</td>
</tr>
<tr>
<td>Rock</td>
<td>Bass Guitar</td>
<td>Soprano</td>
<td>Puck Synth</td>
<td>Stack Bass</td>
<td>Percussion 1</td>
</tr>
<tr>
<td>Jazz</td>
<td>Saxophone</td>
<td>Trumpet</td>
<td>Sax Guitar</td>
<td>French Bass</td>
<td>Percussion 3</td>
</tr>
<tr>
<td>Blues</td>
<td>Harmonica</td>
<td>Orgon</td>
<td>Steel Guitar</td>
<td>Electric Bass</td>
<td>Percussion 1</td>
</tr>
<tr>
<td>Rap</td>
<td>Keytar</td>
<td>Maze</td>
<td>Foot Guitar</td>
<td>Moog</td>
<td>Effects 2</td>
</tr>
<tr>
<td>Late</td>
<td>Dixie</td>
<td>Marimba</td>
<td>Guitar</td>
<td>Upright Bass</td>
<td>Percussion 2</td>
</tr>
<tr>
<td>Country</td>
<td>Banjo</td>
<td>Violin</td>
<td>12-string Guitar</td>
<td>Demod Piano</td>
<td>Percussion 1</td>
</tr>
<tr>
<td>Cathedral</td>
<td>Harp</td>
<td>Horns</td>
<td>Vox 3</td>
<td>Pops Organ</td>
<td>Church Bells</td>
</tr>
<tr>
<td>New Age</td>
<td>Harmonica</td>
<td>Tubas</td>
<td>Digital Waves</td>
<td>Electric Bass</td>
<td>Log Drum</td>
</tr>
</tbody>
</table>
Library Select Mode  

To enter **Library Select Mode**:  

1. Place the keyboard overlay over the buttons and lights on the top of The Miracle.  

2. Hold down the **Select** button and press the **Scroll Up** button. 
   
   The light next to the words **Library Select** starts to blink, and **Melody 1** lights up. This selects Patch 0, **Grand Piano**.  

3. Use the buttons on the keyboard to scroll through the list of patches as shown below:  
   
   **MELODY 1** - Scrolls forward through the patches, one at a time.  
   
   **BASS** - Scrolls backwards through the patches, one at a time.  
   
   **MELODY 2** - Scrolls forward through the patches, jumping ten at a time.  
   
   **PERCUSSION** - Scrolls backward through the patches, jumping ten at a time.  
   
   **ACCOMPANY** - Jump to patch 64 (Synth Bells).  
   
   **SELECT** - Jump to patch 0 (Grand Piano).  
   
   If you scroll past the ends of the list, you will wrap around to the other end of the list.  

4. To exit **Library Select Mode**, hold down the **Select** button and press **Scroll Down**.
<table>
<thead>
<tr>
<th>Available Patches</th>
<th>The following patches are available through both the Library Select Mode and MIDI control:</th>
</tr>
</thead>
<tbody>
<tr>
<td>000 Grand Piano</td>
<td>043 Trampersists</td>
</tr>
<tr>
<td>001 Detuned Piano</td>
<td>046 Horn 1</td>
</tr>
<tr>
<td>002 FM Piano</td>
<td>049 Horns</td>
</tr>
<tr>
<td>003 Dyno</td>
<td>046 Trombone 1</td>
</tr>
<tr>
<td>004 Harpsichord</td>
<td>047 Trombones</td>
</tr>
<tr>
<td>005 Clarinet</td>
<td>048 Cappello 1</td>
</tr>
<tr>
<td>006 Organ</td>
<td>049 StBass 1</td>
</tr>
<tr>
<td>007 Pipe Organ</td>
<td>050 StBass 2</td>
</tr>
<tr>
<td>008 Sonet Guitar</td>
<td>051 Synth Pads 1</td>
</tr>
<tr>
<td>009 12 String Guitar</td>
<td>052 Tuba 1</td>
</tr>
<tr>
<td>010 Guitar</td>
<td>053 Harmonica</td>
</tr>
<tr>
<td>011 Banjo</td>
<td>054 Fiddle</td>
</tr>
<tr>
<td>012 Mandolin</td>
<td>055 Fiddle 1</td>
</tr>
<tr>
<td>013 Koto 1</td>
<td>056 Calliope</td>
</tr>
<tr>
<td>014 Jazz Guitar 1</td>
<td>057 Shokuhachi</td>
</tr>
<tr>
<td>015 Clean Guitar 1</td>
<td>058 Clarinet 1</td>
</tr>
<tr>
<td>016 Chorus Guitar</td>
<td>059 Choral</td>
</tr>
<tr>
<td>017 Parrot Guitar</td>
<td>060 Bananarama</td>
</tr>
<tr>
<td>018 Stop Guitar</td>
<td>061 Sax 1</td>
</tr>
<tr>
<td>019 Harp 1</td>
<td>062 Church Organ</td>
</tr>
<tr>
<td>020 Detuned Harp</td>
<td>063 Big Bell</td>
</tr>
<tr>
<td>021 Upright Bass 1</td>
<td>064 Synth 1</td>
</tr>
<tr>
<td>022 Upright Bass 1</td>
<td>065 Synth 1</td>
</tr>
<tr>
<td>023 Electric Bass 1</td>
<td>066 Synth 1</td>
</tr>
<tr>
<td>024 Mochi</td>
<td>067 Synth 1</td>
</tr>
<tr>
<td>025 Techno Bass 1</td>
<td>068 ModSynth</td>
</tr>
<tr>
<td>026 Digital Waves</td>
<td>069 Phynk Synth</td>
</tr>
<tr>
<td>027 Veneer Bass 1</td>
<td>070 Hard Synth</td>
</tr>
<tr>
<td>028 Stick Bass 1</td>
<td>071 Synth</td>
</tr>
<tr>
<td>029 Vibeaphone</td>
<td>072 Effects 2</td>
</tr>
<tr>
<td>030 Motor Vibeaphone</td>
<td>073 Effects 2</td>
</tr>
<tr>
<td>031 Xylophone</td>
<td>074 Percussion 1</td>
</tr>
<tr>
<td>032 Marimba</td>
<td>075 Percussion 2</td>
</tr>
<tr>
<td>033 Glockempernell</td>
<td>076 Percussion 3</td>
</tr>
<tr>
<td>034 Kalimba 1</td>
<td>077 Syn Organ</td>
</tr>
<tr>
<td>035 Tube Bells</td>
<td>078 Pipe Organ</td>
</tr>
<tr>
<td>036 Steel Drums</td>
<td>079 Pipe Organ</td>
</tr>
<tr>
<td>037 Log Drums 1</td>
<td>080 Harpsichord</td>
</tr>
<tr>
<td>038 Strings 1</td>
<td>081 Synth Pad 1</td>
</tr>
<tr>
<td>039 Piccolo</td>
<td>082 Synth Pad 2</td>
</tr>
<tr>
<td>040 Strings 2</td>
<td>083 Synth Pad 3</td>
</tr>
<tr>
<td>041 Violin 1</td>
<td>084 Synth Pad 4</td>
</tr>
<tr>
<td>042 Trumpet 1</td>
<td>085 Synth Pad 5</td>
</tr>
</tbody>
</table>

1. These programs are single voice, which lets the Miracle play up to 16 notes simultaneously. All other programs are dual voice, which lets it play up to 8 notes simultaneously.
2. See the table on the next page for a list of these sounds.
3. To be true to the nature of the sampled instruments, these patches do not respond to velocity.
The following table describes how the special effects and percussion sounds are mapped onto the keyboard. Each effect or percussion patch contains up to 9 different sounds, which can be played on 6 keys each. Each key of a particular sound will play at a different frequency (higher or lower), just like a normal instrument.

To play these sounds on the keyboard, select the patch that has the sound you want, then play the keys that correspond to that sound. For instance, to hear the keyboard play applause, select patch 73, then play keys starting at the second set of six (the first F-sharp through the first B on the keyboard).

Note that the first key on the keyboard corresponds to MIDI note 36, so sounds that fall below that number are available only through MIDI.

### Splitting the Keyboard

Splitting the keyboard means to assign one patch to the left half of the keyboard and a different patch to the right half. This can be done in all modes except Library Select Mode. To split the keyboard:

1. Press and hold the button you want to assign to the keyboard’s left side (everything to the left of Middle C).

2. Now press the button you want to assign to the keyboard’s right side (Middle C and everything to the right of it).

When you release the buttons, both instruments’ indicator lights stay lit, and the keyboard is split.

Note: If the left patch is not velocity sensitive, neither patch will respond to velocity.

3. Cancel the split by selecting any other patch.
Connecting The Miracle to a MIDI

The Miracle can be connected via MIDI (Musical Instrument Digital Interface) to a standalone or computer-driven sequencer. Through MIDI, The Miracle can also be used as a keyboard input device for another synthesizer.

To connect The Miracle to a MIDI device:
1. Disconnect The Miracle cable (or neither The Miracle nor the MIDI will work.)
2. Purchase two MIDI cables, which you can find in any store that specializes in electronic or computer retail stores.
3. Connect one cable between the "MIDI In" jack on the back of The Miracle and the "MIDI Out" jack on another MIDI device.
4. Connect the other cable between the "MIDI Out" jack (on the back of The Miracle) and the "MIDI In" jack (on the other MIDI device).

MIDI Technical Data

- The Miracle keyboard always:
  - Sends MIDI information on MIDI Channel 1.
  - Receives on MIDI channels 1-8.

This allows you to play 8 different patches at once.

The MIDI data understood by The Miracle keyboard is defined below.

<table>
<thead>
<tr>
<th>HEX</th>
<th>Status</th>
<th>BINARY</th>
<th>Number of data bytes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x</td>
<td>101010m</td>
<td>2</td>
<td>2</td>
<td>No op/off</td>
</tr>
<tr>
<td>Bn</td>
<td>101101m</td>
<td>2</td>
<td>2</td>
<td>Control change</td>
</tr>
<tr>
<td>Cn</td>
<td>11000m</td>
<td>1</td>
<td>1</td>
<td>Program change</td>
</tr>
<tr>
<td>Fn</td>
<td>11110m</td>
<td>varies</td>
<td></td>
<td>System commands</td>
</tr>
</tbody>
</table>

The "MIDI Channel"

i.e., 000 is Channel 1, 001 is Channel 2, and 111 is Channel 8.
NOTE ON COMMAND:
1) Note on command (90h)
2) Key number (24h through 5Ah)
3) Velocity (01h through 7Fh)

NOTE-OFF COMMAND:
1) Note off/on command (90h)
2) Key number (24h through 5Ah)
3) NOTE OFF (00h)

PATCH CHANGE COMMAND:
1) Patch change (C0h)
2) Patch number (00h through 7Fh)
* Patch change is sent only in Library mode.

SUSTAIN OFF COMMAND:
1) Control change (60h)
2) Sustain Pedal (40h)
3) SUSTAIN OFF (00h – Pedal released (OFF))

SUSTAIN ON COMMAND:
1) Control change (80h)
2) Sustain Pedal (40h)
3) SUSTAIN ON (7Fh – Pedal pressed (ON))

MIRACLE BUTTON ACTION:
1) SysEx command F0h, 00h, 00h, 42h, 01h, 03h, 08h, bb, F7h
bb = button on/off
  00 - Button 1 off
  01 - Button 2 off
  02 - Button 3 off
  03 - Button 4 off
  04 - Button 5 off
  05 - Button 6 off
  06 - Volume + button off
  07 - Volume - button off
  08 - Button 1 on
  09 - Button 2 on
  0A - Button 3 on
  0B - Button 4 on
  0C - Button 5 on
  0D - Button 6 on
  0E - Volume + button on
  0F - Volume - button on.

KEYBOARD BUFFER OVERFLOW ERROR:
1) SysEx command F0h, 00h, 00h, 42h, 01h, 03h, 01h, F7h

MIDI BUFFER OVERFLOW ERROR:
1) SysEx command F0h, 00h, 00h, 42h, 01h, 03h, 02h, F7h

MIRACLE Firmware Version:
1) SysEx command F0h, 00h, 00h, 42h, 01h, 05h, x, y, F7h
version = r.y (from version 1.0 to 99.99)
MIDI Information
Received By
The Miracle

NOTE ON COMMAND:
1) Note on command (90h through 97h)
2) Key number (18h through 54h)
3) Velocity (01h through 7Fh)

NOTE OFF/COMMAND:
1) Note off command (90h through 97h)
2) Key number (18h through 54h)
3) NOTE OFF (00h)

VOLUME LEVEL COMMAND:
1) Compressed change (B0h)
2) Main volume (07h)
3) Volume level (00h [LOWEST] through 7Fh [FULL])

SUSTAIN PEDAL ON/OFF COMMANDS:
1) Command change (B0h through B7h)
2) Sustain Pedal (40h)
3) On or Off (00h [OFF] or 7Fh [ON])

LOCAL CONTROL ON/OFF COMMANDS:
1) Command change (B0h)
2) Local control (7Ah)
3) On or Off (00h [OFF] or 7Fh [ON])

ALL NOTES OFF COMMAND:
1) Command change (B0h through B7h)
2) All notes off (7Bh)
3) data (00h)

MIRACLE SOFTWARE VERSION REQUEST:
1) SysEx command F0h, 00h, 00h, 42h, 01h, 04h, F7h

PATCH SPLIT COMMAND:
1) SysEx command F0h, 00h, 00h, 42h, 01h, 06h, mc, lp, up, F7h
   - mc = MIDI channel (0-7)
   - lp = lower patch number
   - up = upper patch number

You can split each MIDI channel the same way as the keyboard split. This
lets you combine two different patches on one MIDI channel. The lower patch
is selected for notes 36-59. The upper patch is selected for notes 60-83.

ALL LEDs ON COMMAND:
1) SysEx command 5Fh, 00h, 00h, 42h, 01h, 08h, F7h

LEDs TO NORMAL COMMAND:
1) SysEx command F0h, 00h, 00h, 42h, 61h, 09h, F7h
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<th>Transmitted</th>
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<th>Remarks</th>
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<td><strong>Basic Channel</strong></td>
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<td>Remarks</td>
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<tr>
<td>Basic Channel</td>
<td>1</td>
<td>1</td>
<td>Up to 8 simultaneous channels may be received.</td>
</tr>
<tr>
<td><strong>Mode</strong></td>
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<tr>
<td>Default Messages</td>
<td>1</td>
<td>1</td>
<td>Up to 8 simultaneous channels may be received.</td>
</tr>
<tr>
<td>Altered</td>
<td>3</td>
<td></td>
<td>Some sounds respond to notes 24-35 thru MIDI/Miracle port.</td>
</tr>
<tr>
<td><strong>Note Number</strong></td>
<td>Transmitted</td>
<td>Recognized</td>
<td>Remarks</td>
</tr>
<tr>
<td>True Voice</td>
<td>36-84</td>
<td>(24) 36-85</td>
<td>Some sounds respond to notes 24-35 thru MIDI/Miracle port.</td>
</tr>
<tr>
<td><strong>Velocity</strong></td>
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<tr>
<td>Note On</td>
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<td>X</td>
<td></td>
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<tr>
<td>Note Off</td>
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<td>X</td>
<td></td>
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<tr>
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<tr>
<td>Keys Channel</td>
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<tr>
<td><strong>Pitch Bender</strong></td>
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<td>Pitch X</td>
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<tr>
<td><strong>Control</strong></td>
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<td>X</td>
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<tr>
<td>Sustain</td>
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<tr>
<td>Local on/off</td>
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<td></td>
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<tr>
<td>Notes off</td>
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<td>X</td>
<td></td>
</tr>
<tr>
<td><strong>Program Change</strong></td>
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<tr>
<td>True Number</td>
<td>0-127</td>
<td>0-127</td>
<td>Program changes are only sent while in Library mode.</td>
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<tr>
<td><strong>System Exclusive</strong></td>
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<td>Remarks</td>
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<tr>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>System Common</strong></td>
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<tr>
<td>Song Position</td>
<td>X</td>
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<td>Song Select</td>
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<td>X</td>
<td></td>
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<tr>
<td>Tune Request</td>
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<td></td>
</tr>
<tr>
<td><strong>System Real Time</strong></td>
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<tr>
<td><strong>Aux Messages</strong></td>
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<td>X</td>
<td></td>
</tr>
<tr>
<td>All Notes Off</td>
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<tr>
<td><strong>Notes</strong></td>
<td>Transmitted</td>
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<tr>
<td>1Sustain pedal is sent through MIDI on output channel only.</td>
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<tr>
<td>2Volume control is received on any/all MIDI input channels and changes overall instrument volume.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3Transmission: front panel button pushes; Received: configurations, local button control off, keyboard split modes.</td>
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Mode 1: Omni ON, Poly Mode 2: Omni OFF, Mono O-Yes
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<tr>
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</table>
Finger Independence
The ability to move each finger independently of the others.

Finger Number
The numbers that appear above or below the notes in staff notation to indicate which fingers to use.

Fingering
The coordination of hand positions to play the notes of a piece smoothly.

Flat
The sign for a note one half-step lower than the indicated note.

Forte
A musical term meaning loud.

Fortepiano
The early name given to the piano (literally, loud-soft).

Grand
A type of piano in which the strings lie horizontally. It has a graceful curve on one side.

Half Note
A note that is played for half of the duration of a whole note. In staff notation, it looks like a hollowed-out circle with a stem.

Half Note Rest
A rest that lasts for the same duration as a half note. It is also called a Half Rest.

Half Step
The distance between two adjacent keys on the keyboard, counting both white and black keys.

Hand Position
The proper way to hold the fingers while playing.

Imitative Piece
A type of music in which one musician (or hand) plays a sequence of notes with a particular rhythmic pattern, then the other musician (or hand) plays a sequence of equal length, using the same rhythmic pattern. In many cases, the sequences have identical melodies.

Improvisation
The art of creating music without following a specific written or practiced routine.

Interval
The distance between two keys on the keyboard.

Jazz
A form of music that developed in the United States in the early 1900s from elements of Blues and Ragtime. Its style is often characterized by long improvisational solos and extensive use of syncopation.

Key Signature
An indicator at the beginning of a staff that identifies which lines and spaces of the staff should be played sharp or flat.
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<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
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<td>Keyboard Position</td>
<td>The placement of the hand on certain notes of the keyboard. It is often necessary to move the hand to different keyboard positions during play.</td>
</tr>
<tr>
<td>Lead Beefs</td>
<td>One measure's worth of beats, counted off before a piece starts for the purpose of setting tempo.</td>
</tr>
<tr>
<td>Ledger Lines</td>
<td>Short horizontal lines above or below the staff, attached to the stem of a note. Used to indicate the pitch of notes that fall outside the range of the staff.</td>
</tr>
<tr>
<td>Legato</td>
<td>A technique of playing in which notes appear to flow together smoothly.</td>
</tr>
<tr>
<td>Length</td>
<td>The duration of a note.</td>
</tr>
<tr>
<td>Loud Pedal</td>
<td>See Damper Pedal.</td>
</tr>
<tr>
<td>Measure</td>
<td>A group of notes, framed on the staff between vertical bars called bar lines. Each measure in a piece has the same number of beats. Normally, the first beat in a measure is stressed. Also called a Bar.</td>
</tr>
<tr>
<td>Melody</td>
<td>The tune or theme of a piece. In piano scores, it usually appears on the treble staff.</td>
</tr>
<tr>
<td>Metronome</td>
<td>A device which makes evenly spaced tick sounds to help musicians maintain tempo.</td>
</tr>
<tr>
<td>Middle C</td>
<td>The musical note C that is closest to the center of the keyboard.</td>
</tr>
<tr>
<td>Natural</td>
<td>The sign for a note that is neither sharp nor flat.</td>
</tr>
<tr>
<td>Octave</td>
<td>The closest distance between 2 notes with the same letter name. Including both white and black keys, this is a range of 12 notes.</td>
</tr>
<tr>
<td>Oscillator</td>
<td>An electronic wave form generator used in synthesizers to create sounds.</td>
</tr>
<tr>
<td>Ostinato Rhythm</td>
<td>A rhythmic pattern that repeats continuously.</td>
</tr>
<tr>
<td>Parallel Motion</td>
<td>A musical pattern in which notes on both staves rise and fall in pitch at the same time.</td>
</tr>
<tr>
<td>Piano</td>
<td>A musical term meaning soft. Also, short for pianoforte.</td>
</tr>
<tr>
<td>Pianoforte</td>
<td>A keyboard instrument that uses a system of hammers and dampers to control the vibration of strings.</td>
</tr>
</tbody>
</table>
Glossary

Player Piano
A type of piano invented in the late 19th century that required no performer.

Playing By Interval
A technique for reading music in which distances between notes on the staff are associated with distances between keys on the keyboard.

Previous Accidental Rule
A special case to the normal rules of staff notation. When an accidental appears in a measure, the accidental remains in effect for future occurrences of notes on that line or space for the rest of the measure. See Accidental.

Quarter Note
A note that is played for one quarter the duration of a whole note. In staff notation it appears as a solid black circle with a stem.

Quarter Rest
A rest that lasts for the same duration as a quarter note.

Ragtime
A style of piano music that first appeared in the late 1880s. Pieces are highly syncopated, favor fast tempos, and use a staccato flow.

Rest
A moment of silence in music of specific duration.

Rhythm
The proportions between notes of different durations.

Romanticism
School of composing and playing with emphasis on subjective interpretation, emotional qualities, and freedom of form.

Russian School
A style of piano begun by Russian composer Anton Rubinstein that emphasizes fiery performances and virtuosity.

Sequence
A pattern of notes and rhythm that repeat three or more times with each repetition beginning higher or lower than the previous one.

Sharp
The sign for a note one half step higher than the indicated note.

Sight Reading
Playing a new piece without first studying or practicing it.

Sixteenth Note
A note played for one 16th the duration of a whole note. In staff notation it appears as a solid black circle with a stem possessing two flags.

Sixteenth Note Rest
A rest that has the same duration as a sixteenth note. Also called a Sixteenth Rest.
Soft Pedal  The left pedal on the piano. When pressed, the piano produces a more muffled sound.

Sostenuto  See Sustaining Pedal.

Soundboard  The wooden surface over which the strings of a piano are stretched. The sound of the vibrating strings resonate off the soundboard.

Staccato  A style of playing in which notes are crisp and separated by silences of varying lengths.

Staff  A set of 5, evenly-spaced horizontal lines. Each line represents a different note. Each space between the lines also represent a note. The space above and below the staff can also represent notes; see Ledger Lines.

Staff Notation  The written form of music.

Stretches  Fingerings that require skipping notes with adjacent fingers.

Sustaining Pedal  The middle pedal on a piano. This pedal sustains the sound of a note being played (and only that note) beyond the time when the finger is lifted from the key.

Syncopation  A style of rhythm in which accented notes appear between beats, rather than on them.

Synthesizer  A musical instrument, usually having a keyboard, that can electronically create a wide variety of sounds.

Tapping  A method of learning rhythm in which the pianist plays a single note on the keyboard in time with the rhythm of a piece of music.

Tempo  The overall speed at which a piece is played.

Theme  The main melody of a piece, for which the piece is known and recognized.

Third  An interval of two notes separated by one note. It is written on two consecutive lines or two consecutive spaces.

Tie  A curved line that connects two or more notes of equal pitch. Such notes are played as a single note, lasting for the duration of all the tied notes combined.
**Glossary**

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<tr>
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<th>Description</th>
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<tr>
<td><strong>Time Signature</strong></td>
<td>The numbers that appear at the left of the first measure of a piece, indicating the number of beats per measure (upper number) and the note duration to which a beat is equal (lower number).</td>
</tr>
<tr>
<td><strong>Treble Clef</strong></td>
<td>The symbol at the left edge of a staff that identifies it as a treble staff. Sometimes called a G-clef, because it indicates that the note on the second line of the staff is a G.</td>
</tr>
<tr>
<td><strong>Treble Staff</strong></td>
<td>A staff that begins with a treble clef, whose note pitches are normally associated with the female voice and high-pitched instruments. On the piano, it is associated with the right half of the keyboard.</td>
</tr>
<tr>
<td><strong>Triplet</strong></td>
<td>Three notes played in the same time it would normally take to play two. They appear in notation as a set of beamed notes with a small 3 above the beam.</td>
</tr>
<tr>
<td><strong>Una Corda</strong></td>
<td>A term meaning Soft Pedal.</td>
</tr>
<tr>
<td><strong>Upright</strong></td>
<td>A type of piano whose strings are mounted vertically, thus requiring less floor space than a grand piano.</td>
</tr>
<tr>
<td><strong>Variation</strong></td>
<td>A modified repetition of a basic theme.</td>
</tr>
<tr>
<td><strong>Whole Note</strong></td>
<td>A note whose duration is 4 times that of a quarter note. In staff notation, they appear as a hollow circle with no stem.</td>
</tr>
<tr>
<td><strong>Whole Note Rest</strong></td>
<td>A rest that has the same duration as a whole note. Also called a Whole Rest.</td>
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