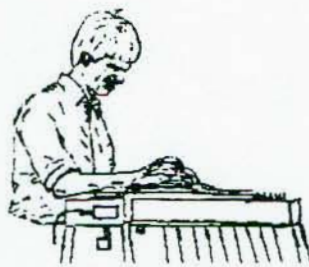


MY  
APPROACH  
TO  
PEDAL STEEL  
GUITAR



MY APPROACH  
BY  
JOE WRIGHT  
BOOK I

MY APPROACH  
TO  
PEDAL STEEL GUITAR

by  
Joe Wright

In memory of Francis D. Bowerman  
He bought me my first guitar.  
He became my Dad.

To the future of  
**PEDAL STEEL GUITAR**  
(C)opyrite 1988  
JOE WRIGHT

# MY APPROACH TO PEDAL STEEL

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## MY APPROACH

One day as I was playing, someone came up and asked me if I had an instruction book or tape, with my approach to playing. At the time the answer was no. I was too busy learning to play myself and I didn't feel qualified to teach someone else. I felt I needed to learn alot more myself. I could have written out some licks and sold them, but that is only one way to learn. When you copy someone else's licks to see how they approach things, you can use their licks to see different ways of doing things. If you then apply the things you learn to your own style, you will be further ahead in the long run. But to copy licks, to learn, will leave a definite void in your playing. You play using a set of licks that came from someone else. We all learn by mimicing, but there should come a time when you start to express your own ideas. This usually is accomplished after years of playing. There are a lot of things going on when you're playing Pedal Steel and the only way for me to approach teaching, is to dig into that all the ways I can.

I tried to learn in everyway I could. The biggest advantage, I feel I had, was playing in a trio. We had bass, drums, and steel. We played all kinds of gigs. Everything from weddings, clubs, and even high school dances. I played in bands for eight years before I knew any music theory at all. I played what I had to, to get the sound we needed. *Hunt and peck*, is not the best method of accumulating knowledge, but it does work. It was the fact it was a trio that meant I had to be the lead section. The guitar parts, piano, strings, whatever were my responsibility. The different types of music that we had to play also gave me a lesson. This was an invaluable experience. I learned to see the versatility of the steel at an early age. The situation of the trio was a great way to learn and to experiment.

A steel player usually has to start playing in a country band. What if one was to start out playing bebop? Or, he started playing from day one, in a heavy metal band? The experience would tend to make him a better jazz or rock player. This type of thinking, started me investigating the steel. Analyzing everything I could. Nothing too small. What may seem silly to some, may be meaningful to others. The more approaches a young player can utilize in his informative years, can only help to promote better players for the future. I'm trying to reach the players who want to know more than how to get by. Those who don't believe in close

enough. Those who have the desire to learn as much as they can about their instrument.

It is my hope to offer another approach to becoming an accomplished steel player. This book is for the *thinking person*. The person who is looking for answers to the question, *why?* To me the steel is still in its infancy. There are many things to be explored and exploited in the future. If the steel continues to be stereo-typed as it has for the past thirty years, it could disappear from the earth, unfortunately, as a useful instrument. People always ask what has happened to the pretty old solos? Nothing has happened to them, there still around for everyone to listen to. To me, the question is, *what about the future of Pedal Steel?* The majority of people do not know what a steel guitar is. Our instrument is known mostly in a world of twang. Great players have gotten it this far and now its up to the younger players, who are daring enough to be innovative, to help perpetuate the use of pedal steel.

After thinking about how I would teach steel to someone else, I started investigating different approaches. I needed to know as much as I could if I were going to teach. As I started to dig into the steel, I kept coming up with more and more ideas. Each of them would trigger another and it seemed to go on forever. A lot of notebooks got filled with ideas and now its time to share them.

These are the methods I use to improve my playing. Throughout this book I'll try to talk about techniques that can help you learn to improve. What can I do to play faster single string solos, cleaner chords, more jazzier solos? I hope to provide some insight on these things, plus a lot more that will help you be your own player and not some clone. This is not a book of shortcuts. I approach the steel by trying to learn, or at least think about, every aspect. Leave no stone unturned. Use what you need from the book. It works great as a refresher course or just something to read to start your own imagination wandering. Free your playing spirit and approach this with a very open mind.

The Pedal Steel is my hobby. It is also the way I've made my living. I've been lucky enough to travel around the world getting to play the most fascinating instrument I know. Quite an experience. Time to share.

PEDAL STEEL FOREVER.

## MY APPROACH

To eliminate some of the confusion I'd sometimes find myself faced with, I started working on the little things that go along with playing. Hearing things I liked and wanting to play, I had to ask a lot of questions. What is a lick? What are the things that happen when you play licks? The first thing I noticed was the fact that the best players had better hand control. They seemed to be playing their instrument rather than it playing them. They made it look so easy..... The questions that started to go through my mind????? What were they thinking about when they played? What did they practice? How did they get that technique? How could I increase mine? As interest and curiosity grew, I soon found myself knee deep in notebooks filled with things I tried out or thought about, to help my playing. The person inside of me kept looking at everything.

The fact that I appreciate someone who does whatever they do, to the best of their ability, led me to want to improve. Athletics, is a great example of someone training for something specific. The stronger the legs, the faster the runner? I say the smarter the legs, the faster the runner. I wanted to be a steel player, so that is what I worked on. I specialized. The most important discovery was that of the physical aspect of playing. I got into things that moved to make music happen on the Pedal Steel. The need for a job had a lot to do with my intense desire for improvement. Worry does wonders for energy. Its human nature to try to be the best, even if your best is only the best that you can be.

I see myself as a musician who just happens to play steel guitar. Stereotyping of the steel has made me think more open minded. I didn't want that to be a factor in what kind of music I played. There are only two kinds of musicians, good and bad.



The Pedal Steel is only a machine that is used to produce music. If we were to step back and look at it all by itself we can see what we have to learn. The biggest thing to remember is that it takes a driver to operate the thing. We are pedal steel operators. The name steel guitar, sounds like heavy equipment, but the only thing it has in common with the crane and backhoe is, they don't work by themselves. There are a lot of things going on with the steel. There are the strings to be picked, done by the right hand. The movements of the bar, left hand. The movement of the pedals, left foot and, the right foot on the volume pedal. And then you sit down to find the knees must work in conjunction with everything else. So, if any two people were to use the same machine, the only difference would come from the individuals.

One may know a lot of music theory, but not have the technique to play what he's thinking, while the other may have great technique but a limited knowledge of where to use it. I divided these into two categories, the physical and the musical. The techniques are the actual movements it takes to play. The picking, pedals, volume pedal, and knee levers are the movements. The musical is the theory, or the *why* of the music. A piano player learns the theory and sees how it lays on a keyboard. He then learns physical techniques that apply the theory to the piano, to create licks. The beginner is started out with the simplest of theories applied to the easiest techniques. We steel players must learn the same music theory, but we see it on a fretboard. To set the strings in motion we pick the strings, a piano player pushes a key, that hammers a string. The object of this book is to show you ways of increasing your inventory of techniques. That's the physical part. It also shows how to apply them to the musical to create your own *licks*. To better understand, we will look at each aspect in sections. We will analyze the steel guitar. To analyze, we look at each individual part and then theorize how it can be applied in the overall picture. We sort everything out and then think about how to apply them.

The way I feel, the player who works on all the aspects individually and then works on playing them together smoothly, is going to be better off in the long run. There are all kinds of licks and they all take movement to make them happen. You can learn right hand finger rolls, and use them against pedal moves to create licks. You can let the pedals bring you licks. The slide of the bar can bring you another type of lick. The only thing stopping you from playing the ones you do see is the condition of your hands and feet. If you're not seeing them on the steel then you need to work on the theoretical, or the music theory. It sounds like a dirty word, but it is really fascinating. You have to learn to see it on the steel and then apply the physical to it and come up with licks. Its not easy. Hours of practice are required. In the long run, the amount of time spent on learning your guitar will show up in your playing.

One way of making something, like music theory, a little more appealing, is to try and learn all you can about it. If you start to dig into what's going on, you start to understand more and then you want to know more. Did you ever meet someone and instantly you didn't like them? Something about them bothered you. Six months later, and a few hours spent together, and you find you have many things in common. As your friendship grows, so does your curiosity about this person. Try to take music theory and apply these same principals. As you start to learn about it, you will want to know more. You'll know when you're there. You won't be able to find another book to read about it and you start reading the ones you have over and over again. As you read the books the third and fourth times, in retrospect, see if you don't find things in there that you never saw the first times. Dig in and find out all you can, and you'll start to enjoy learning a little bit more.

I'll dissect each technique and try to exploit every aspect of it. Everything has a job to do when your playing steel guitar. The most important ingredient to me is the right hand. The stronger and faster your hand is, the faster and stronger you will play. Keep this in mind as you start working on these techniques. Please

note that this is not easy and requires a lot of time and concentration and diligence. At times it may seem frustrating, but stick with your program. Set yourself a time limit to reach a certain plateau. You can achieve your goal, be it large or small. Work hard. We all have highs and lows in our playing, so stick with it. Improvement comes only with hard work. Learning to play a steel guitar is a process; that takes time. Nothing of value comes easy, to anyone.

You will notice throughout the book that I keep coming back to these very important points:

### 1. Total approach

- a. mental            thinking it all out.
- b. physical        body plays the guitar.
- c. musical        the language we speak.

To actually play you need to combine all of these factors. To study we need to look at the basics of each and learn to apply them to the steel guitar.

## THE MENTAL

Looking at everything that could affect your playing, I divided things into three basic categories. The three most important are the mental, the physical and the theoretical (music). To better see my way of thinking, imagine a college graduate with a degree in music theory. The scales, chords, and theories he learns are universal. He most likely learned to play the examples on a piano. His hands are

accustomed to those techniques. He knows all the theory there is, yet he hasn't the slightest idea what makes a steel work. Not because of the musical part but because of the physical. The actual physical workings of the steel are totally beyond him. His hands don't know the licks, but these things (techniques) can be learned.

Seeing the total picture is the only way to approach something as complicated as the pedal steel. Stand back and look at the things that you may have missed. Each could lead to a new lick.

How do we learn? All skilled learning is accomplished by trial and error. We attempt something, make a mistake, take note of the degree of error and then correct it. Just learning this little bit of info, cleared up a lot of things for me. When I would be playing, I would make a mistake and see it and turn around and do it again. Why? The reason being, my mind remembered the false information that it received from the wrong lick and I recalled it from the memory banks. After I had placed the correct action in my mind, your mind imitates that one. The mind works on what information it receives. Place a mistake in, and that mistake will come out. Place facts in real slow and the mind has a better chance of understanding the theory. When the mind understands, it can start to show the hands and feet. I didn't understand the move and trying to play it fast, my mind made a move and repeated the wrong one. My hand wasn't loose. The nerves that came around when I wasn't sure tightened up my control. Nerves are another aspect that you have to consider when your playing.

The basis of all this, is that the mind uses whatever information it receives. This is called knowledge, but before it is remembered it must be understood. This is why I started working on building up the physical movements. To learn them I had to figure out all the things that were possible. Once the mind learns the correct responses, it remembers them. They now may be done without conscious thought, they have become a habit. To take this one step further, we can think of the accomplished musician. When you hear or see a solo played by these types, they make the whole thing look so easy. They have done two things. One is they placed an abundance of musical knowledge into their memory banks from which to draw upon. And secondly, they made the movements (the physical part) a habit.

Think of a lick that you use all the time. Your *pet lick* is one that you have all the movements down better than the others. Its not always what you wanted to play, but its there when you need it. The muscles that work to achieve music upon an instrument can be raised to a great degree of proficiency. A great player's muscles have done the movements so many times they are memorized. Thus, we have the term **muscle memory**. Over and over the same things are ingested into the mind. This repetition is how we learn. Don't try to grasp everything on the first try. Slow and easy at your own pace. The mind controls the muscles.

There are two things that can make my mind short out when I am playing. I can best describe this, in this analogy. You start playing a solo and what seems to be going great becomes a nightmare. All of a sudden your hand tightens up and you feel everyone is standing on your forearms. Afterwards, when I would think about what happened to cause the short circuit, I could relate it to either; not knowing the physical move that the lick required, stamina, or being confused musically. One way to fall apart physically is when your fingers, hands, and arms run out of stamina. Another way is when your fingers, knees, or feet become confused over how to play a lick. All of these things create a state of tension or nervousness, which is the opposite of relaxed. The only way to overcome this is practice. Musical confusion can be not knowing the song (chords, breaks, etc.), which causes a hesitancy, or losing your place in the song. There are a lot of things that can cause a distraction, but hopefully your concentrating upon your steel.

To help learn, I looked at everything in a controlled atmosphere, at a controlled pace. When I did this, it was done real slow and at home. I painstakingly went over everything. Paying particular attention to detail and precision. Everything in this book I have actually tried on my steel. I might not use them but I can see the theory behind the process of learning. Picture in your mind the worlds fastest runner. Imagine the preparation he went through to achieve proficiency. He not only worked on running in the physical sense, but he thought about everything that would affect his performance. A sprinter works on the placing of his starting blocks, coming out of the blocks, the starters gun, and crossing the finish line. He works a great number of years to run ten second races. The thought to emphasize here is preparation. Being ready to play what is called for, which sometimes is nothing at all. There is the head games that

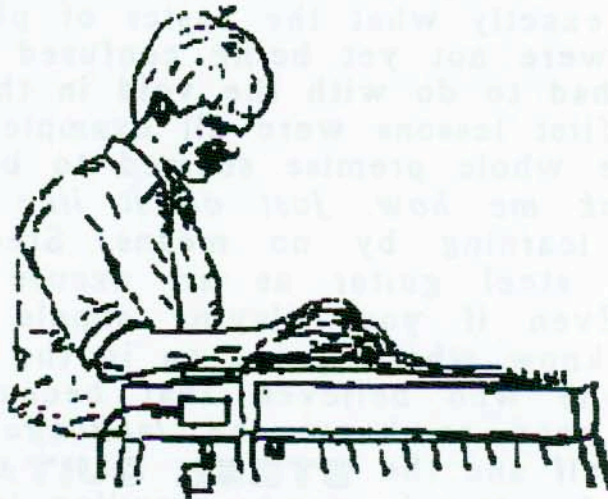
are played by the runners before the race. It all effects you. The best always seem to know what they're doing. Or, they've learned to make it look that way.

The fact that you have read this far must mean you have a curiosity about the steel. It was curiosity that led me to start looking at all the things about the steel I could. An intense curiosity. I was fascinated by all the things I discovered. Each discovery led to another. The whole key was my desire to improve, to be a better player. I didn't want to play like anyone else. I wanted my own style. This desire became an obsession. I started setting goals with a metronome to build up the picking fingers. It even got so bad that I no longer do any type of work with my hands that could lead to a munched finger. No oil changes or power tools. If you have the desire to improve your overall playing ability, that is half the battle. Finding the information to help you achieve these goals was the hard part. For the most part, I had to find my own methods. The methods in my early years of playing were all the Oahu method. All were done on guitars with no pedals. This was good and bad in my learning. The good aspect was the fact that I saw exactly what the basics of playing a steel were. The hands were not yet being confused by the pedals. The bad aspect had to do with the void in the teaching of pedal steel. The first lessons were all examples of someone else's playing. The whole premise seemed to be, *this is how I do it. Don't ask me how. Just do it like this.* Not the best method of learning by no means. Steel players use the stereo-typed steel guitar as an excuse for not becoming musicians. Even if your playing simple country steel, you should still know what's going on in the total picture of the *music*. Anyone who believes, that because they play steel, they don't need to know the *language* of music, is only hurting himself and the **STEEL GUITAR**.

The steel guitar is slowly crawling into the main stream of music. The reason for the this slow movement is not the instrument. The instrument itself can be many things. Beautiful, haunting, tearful, exciting, raunchy. The reason for the misunderstanding and lack of recognition of the steel lies in the hands of steel players. The future lies in the hands of those who are willing to explore, exploit and explain the guitar to the masses. Not everyone will like steel guitar but I wonder how many would if they knew what it was?

Practice is very important, but what to practice depends on where you want to go. This book can make a great study guide. To complement the other courses on the market. Reading about the steel has always been a fascination and inspiration to me. Another way to use this is to let the book bring you back to the basics. Sometimes, as I play, I start to feel stale. I always go back to the basics and build myself back up to peak. The slowing down of everything gives your mind all that it needs to play fresh ideas. Plus, there is so much, that all of it can not be remembered. A refresher course is good for even the greatest players.

Use the examples I give not as licks per se, but as examples of techniques that will give you ideas for your own licks. Be your own player.



# THE PHYSICAL SENSE

When you first learned to tie your shoes as a youngster, you were starting to apply the muscle memory theory. It was difficult at first, but gradually became easier. The repetition made the movements automatic and doing it everyday, gave you lots of practice. Remember when you were first being instructed in the art of tying up your shoes? Whoever taught you, did it for you real slow to let you see the movements. Soon, the awkwardness gave way to precision. Your mind had all the movements memorized and told your fingers to carry out the task.

As you learned to play steel, can you remember licks that you thought you'd never be able to play? Then one day you could play them with ease. You placed the theory of muscle memory in use. Your repetitions, on that difficult lick, gave your hands ample practice at that lick. The movements required to play steel, with proficiency, must become as easy as tying your shoe.

The muscle memory theory, is the basis for my methods of improving my technique. The thing I thought of was why not speed up the process. Take a movement that played a certain lick and work it over and over. As I thought about this, I kept thinking of the key word, movement. Why work on one lick, why not work on the movements that *operated* a steel guitar?

Having given some thought to the theory of muscle memory, we now need to apply it to the steel. We know that we have both hands, both feet, and both legs working together to play steel. Each of these, has a definite function in the total picture, as well as, a physical movement we can study. The fact that you study it and look at it, will give each of your limbs an advantage. What I did to learn, was look at each lick strictly in the physical, before I heard the sound of it. That way the musical had no affect upon the physical.



To better explain this, let's discuss my earlier methods of learning to play. The first songs I played I picked out one note at a time. All this was done with no thought other than matching the tones I wanted, to a place on the guitar. Once I could play the simple melody, my hands could coordinate with my mind to improve on speed. This was how I learned. I would hear something and then attempt to search for it on the fretboard. All the while, I was putting the mistakes into my mind, along with all the corrections. Both of my hands were totally confused most of the time. Eventually, I came up with the correct melody, but only after much frustration. The whole problem was my ear. I could hear the tones I wanted, but as I learned the errors were affecting my hands and my feet. After many trials and errors, I thought about how to eliminate some of the hand and feet confusion. The method I learned was to play a lick without hearing it. To *feel* the lick is what I thought of. The ear could not affect the hands and feet. They were working out the physical move. Starting to think of the physical moves, made me break down the guitar in every conceivable way. If it moves, I thought about it. When I thought about it in great detail, the confusion subsided, and my confidence as a player increased. Confidence works hand in hand with fear. Fear is only in your mind, and is from the unknown. When I started learning *every possible way*, I was facing the things that created the fear. I beat the fear by increasing my knowledge.

Another aspect of the physical, is endurance. Like the runner who trains for hours for the 10 second race, a steel player has to work beyond what he may actually need to play. How many times have you been in the middle of a solo, and felt your right arm begin to tighten? You started to feel like you had been lifting weights. Think of a drummer who has to play fifties eighth notes all night long. His arms must be conditioned. We are athletes in this sense. We need more power for those short, hot bursts. To exercise control and precision over a simple lick, we need a degree of technique a level above. The amount of technique, stamina, and control you can have, will come from the amount of time and effort you put in to achieve what you desire. Nothing comes easy.

Improvisation is taking all of the musical, physical, and mental things you learned and adlibbing. You are creating on the spot, but not before a lot of practice went into freeing the muscles from confusion. You work on the moves that are possible and this makes the movements second nature. As you improvise with conditioned hands you are able to venture off on more elaborate ideas.

We as steel players need to know all these things as they apply to the steel. We can borrow ideas and techniques from other instruments, but then we need to apply them to the steel. We need to *Think Steel*. I use every instrument as a way to learn things for the steel. Watch a concert pianist or violinist. They are in total control of their every movement. Was this all natural? **No**. They worked at it and thought about it in great detail. Where should my bow be on this lick? To play this lick I need to have my hands here, but why? The last word of the previous sentence led me to write this book.

The amount of variables that lie before you when you sit down to play are many, but they all can be thought out on a logical basis. Everything, can be defined and explained. I use to talk about the steel in terms of infinite possibilities. The only way to have this is to change the tuning on your guitar everyday. Your mind will think it endless, but approaching all the variables before they start to drive you crazy, will help you to play more, and enjoy more.

The endlessness goes, as far as, each factor that is applied to the steel. The fact remains that we have a known number of strings, tuned to a certain pitch, a known set of pedal functions, and so many fingers with picks on them. Even though this all seems endless we can see the end by looking at the facts.

Lets take a standard E-9th copedent. Lets use three floors and five knees, one of which is vertical. How many pedal combinations are there? Without even thinking about playing them, lets talk statistically. All of the single pedal moves gives us 3, the single lever moves number 5. We can also activate each pedal, with each of the knee levers. That would bring us 15 combinations. We can also hit two knee levers together. I figured 8 that were physically possible amongst the five knees. (You can't play two knees on the same leg that go in opposite directions, unless you reach your hand down and activate one of them.) We also have 2

ways to play the pedals in combination. With the double pedal and single levers we can put them together 10 ways. Thinking back to the single pedal moves and matching them with the double lever moves. We have three pedals that can be matched to eight lever combinations. That gives us 24 more. And we have the double pedal and double levers. That is 16 more. There are also triple lever combinations possible (LL,Up,RR) I found 4 of these that could be used. These are a little difficult but the physical move can be learned. Putting the three lever and single pedal moves together gives us 12 combinations. Also, the double pedal combinations with the triple lever would be 8 more. Totalling the numbers we come up with 107 possible ways to physically play our pedals and knees together on a standard E-9th copedent. Trivia, in the physical sense.

If you play the more traditional E9th or C6th, you'll start to see how close they really are. We first have to compare the pedal functions of the three basic tunings. The three basic as I see them are E9th, C6th, and E9th/B6th. The pedals will be given function numbers, and cross referenced on a chart. If you learn to think steel you can play other guitars by thinking of the move and the function of the pedals. Different set-ups take different moves to bring about the music.

The theories I am trying to teach can be applied to any tuning. A string is a string and a pedal is a pedal. It has to do with thinking steel or how you approach playing. Be prepared to do a little bit of thinking. A little preparation can be beneficial to your playing and your attitude about the guitar.

## SOUND PROPERTIES

To begin the discussion of **Pedal Steel**, we must first look at some basic properties of sound and acoustics. Sound is produced when vibrations hit your ear drum. Regular vibrations produce tones that are of a certain pitch. The number of vibrations per second is called the frequency. The strength of the vibration controls the intensity or the volume of the sound.

The tones that are produced, each have certain characteristics and we have terminology to talk about them with.

*Pitch* is the degree of high or low.

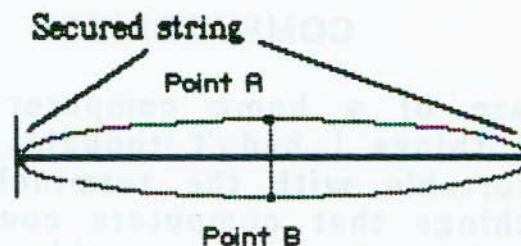
*Duration* is the length of the sound or rhythm.

*Intensity* is the degree of volume or loudness.

*Timbre* is the distinctive quality of the sound.

A musical instrument is a device which produces, resonates, and controls vibrations. There are different types of instruments in several categories. The three basic categories are vibrating strings, vibrating air columns and vibrating bars or plates. An example of each category would be guitar, trumpet, and marimba. The steel falls into the vibrating string family. That means we are related to the guitar, banjo, piano, and violin. To break this down further, we can list them by the method that the vibrating string is put into motion. We have the bowed instruments, the plucked, and the struck instruments. The violin is bowed, the steel is plucked, and the piano is struck. The strings, no matter what method used to place them in motion, all react the same acoustically.

Given a string secured at both ends:



As you pick a string, its elasticity allows it to go to point A, then to point B. One full vibration is A to B and back to A. The string keeps vibrating until you mute it or it stops due to the resistance of the air around it. The distance of point A depends on how hard you pick the string. This vibrating creates the sound of our steel. The

material used to make the steel can make the strings all sound differently. A wood guitar sounds different than a formica. The string is attached to the steel, and the way they are supported effect their sound. It all depends on what you get used to, or in most cases, what you can afford.

The tension and size of the string brings us our pitch. To change the pitch we can change the tension, or shorten the string. Placing the bar on the string at a certain fret will change the pitch, and the tension can be changed by engaging a pedal. The steel bar is the same as the fingers of the guitar, banjo or violin player. The pedals can change a string by tightening it or loosening it. The tighter stretched the string, the less freedom it has for movement.

This simple theory of the strings vibrating is the very basis of how I think. Seeing how the strings work in the most basic sense, helps to eliminate the fear I had of the guitar itself. We will use the most basic theories to help increase our understanding and open our minds.

We can see that we have a lot of things taking place at one time. Each of our limbs are taking part in playing music. Over the years that I have been playing, I would at times, be afraid of a lick. To eliminate fear, one must use knowledge. Why was I afraid to use this or that pedal? It was because I didn't know its function, and its relationship to the rest of the picture. It was the *unknown*.

## COMPUTERIZED

The purchase of a home computer got me to thinking about a lot of things I hadn't thought of since high school. As I got comfortable with the terminology, I started seeing some of the things that computers could be programmed to do. I thought about having a machine, that was run by a computer that could play a steel guitar. For this to happen all of the movements of the hands, feet and knees, would have to be taken over by a machine. The fingers, bar, and pedals could all be adapted to be played with a computerized machine. The computer could learn to move things to exact locations. It could place the bar anywhere in milliseconds.

The pedals, picks, knee levers, bar, slides, everything, could all be fine tuned. For a machine to do this, we would have to place all the movements into a language that the computer understands. (The robots in auto assembly lines are examples of machines being made to make controlled movements by a computer). To write a program to do that, you would first have to know all the information the computer should know. And, after the process of programming, or placing everything into the language of the computer, only then could you program it to play.

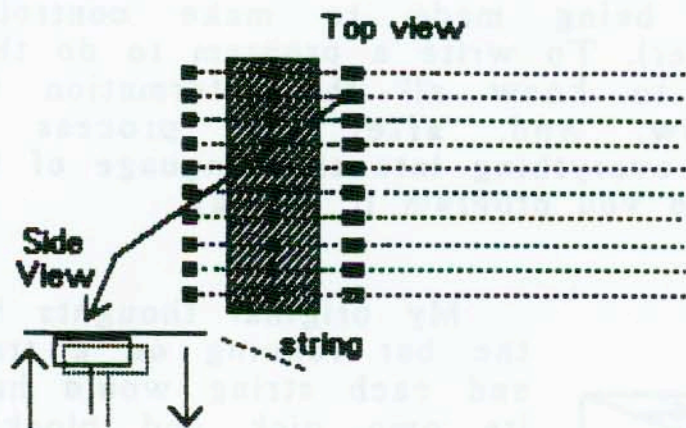


Bar tracks along the top of the strings.  
Picking and blocking device replaces  
your right hand.

My original thoughts had the bar running on a track and each string would have its own pick and blocking device. I first saw it with computer fingers that had little picks near each string. The last way I saw it was, with each string having its own pick and blocking device that worked independent of the others.

You could have a plastic and metal pick on each string. They could pick in both directions so each string could be flat picked simultaneously. The blocking device could be a felt pad that moves up against the string to mute it. The computer could be showed to play this crazy sounding instrument in ways a hand could never do. When I thought of how to place the information in a computer, I began to analyze the guitar mathematically. The computer works in another language, so to teach it, you would have to know all the moves. Imagine playing all ten strings, with picks working with an alternating pick motion and the blocking could follow milliseconds after each time a string was picked. This is where I started thinking everything out with the logic the computer would need to understand.

### Blocking device



The pedals could be placed right where the rods hook at the top. The machine could move the pedal a controlled distance, at incredible speeds. On a universal guitar the pedals could be played all at once. The combinations possible would not be effected by the physical limitations of the body. The only drawback is the lack of the human

factor. We are spontaneous.

After thinking about how efficiently the computer could be taught to pick and block the strings, I began thinking this as it applied to my hands and feet. The computer would have a stationary picking device while my hand couldn't remain still. It could have two picks on each string if it wanted. I began to look at the hand as something that was moving over the strings. It was like a claw that came down and moved the strings. My hand has four picks that it uses, so it would have to open and close to reach the wider pickgrrips it wanted.

The two ways I look at each string are either moving or still. To place it in motion the computer would use the pick. To stop it from moving we have the pad coming up to stop it. The hands are all you have to use when your blocking. Thinking of the independence of a computer, I started seeing my picks, going up and down at the end of my fingers. Seeing the concepts of the machine, I tried to get my hands to duplicate them. The spontaneous player must have control over his hands.

Seeing what the choices are has always been my nature. When I get into something, I get in all the way. The way my mind works is very rational. If it moves I wanted to know why. That word has led me down some roads I don't even talk about anymore. The one I do talk about is the steel guitar. I hope that by sharing this I can help the

future of steel guitar. The most amazing instrument I've ever come across. The exploration of its possibilities are just beginning. To see the recognition it deserves, come to it, is one of my lifelong dreams. Treat this book as another method to approach the playing of the pedal steel, not the only one. Learn from everything you can. I learned by looking at everything from a piano to a computer. The computer can remember everything and flash it back to me as fast as I want. The more I can show it the more I can learn. The best way to see things are with charts. Graphics can be used to show you scales, grips and everything in a picture. To use charts, you have to associate the charts to the steel. Then your hands must understand them. The bottom line is to know your guitar. The better you know it, the better you can play it.

The process of getting your hands in shape is well worth the effort that it takes. If you want it bad enough, you'll work for it.

## THE STRINGS

It goes without saying that the strings are the life line of a steel guitar. This section talks about the strings and some things you may not have realized about them. This is not an exercise but a place to do a little thinking. The facts below usually get overlooked but they all should be given a little bit of thought. Most of the facts you already use but you may find something here that will lead to improving your technique. The basics are a good place to start.

When we speak of the steel guitar in terms of the number of strings, we have a variety of choices. They range from the six string lap steel to a fourteen string pedal. The fact that they all have strings and are played with a bar (slide), make them alike. The thing to remember about the pedal steel, is that, it is a decedent of the non-pedal steel. Another term for this is straight steel. The theory (chords, scales) should be learned from the basics up. The open tuning is your basis of study. Everything else is applied to the basic form. You learn your straight steel and



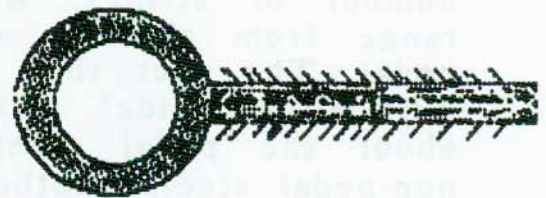
then, add pedals to your basics. An advanced method is to study each pedal and combination, as a separate tuning. This means you can have a variety of *straight* tunings on one guitar. Its all in how you look at it.

## TONE and PITCH

Each string has a unique tone due to the gauge or thickness. The thicker strings are more mellow than the higher strings. Listen to the difference between wound and unwound. The ear will notice all these differences. You must teach your ear to hear each string and its individuality. As your fingers get used to playing and feeling the strings, you'll begin to know what string each pick is on just by the feel. Play your third string open on your E-9th, the note is a G#. On the fourth string you can find that same note at the fourth fret. The only difference is the characteristic of each string. Find the G# on the fifth string, sixth string, seventh, etc. Each will have its own distinct sound. This determines where you decide to play a certain note. What kind of tone do you want? The actual gauge you use on your guitar depends again on what you get used to. What's right for you, works every time. A little experimentation and you may find something new that you like.

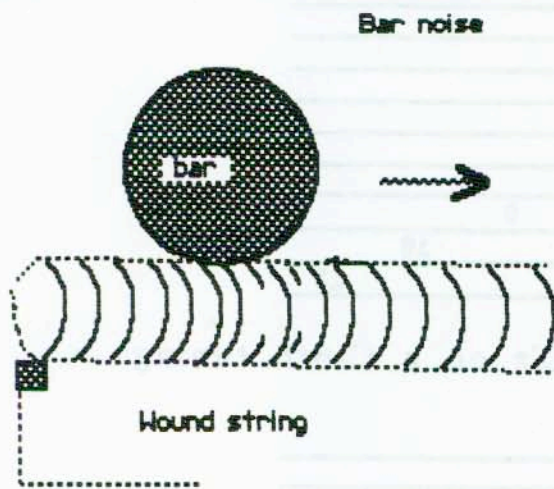
Don't be afraid of the larger wound strings. Practice playing on all the strings on your guitar. The lower ones have a different feel under your picks. You also have to think of controlling them with the strength that you pick them with. The harder you pick the strings, the more that it will vibrate. The lower

### Wound string



Bar noise must be blocked carefully on a heavily wound string.

the string, the less you have to tighten it with the tuning peg. The larger strings are so loose that you can see them vibrating without getting in close.



The larger strings have a unique sound when fretted up at the higher frets. Sometimes you may like your tone better if you played the same thing at a lower fret on a smaller string. These are things that come only with experimentation. You have to please yourself on most of these ideas.

Heavily wound strings have to be thought of in terms of the noise created with the sliding of the bar.

The heavy wind scratches the bar as you slide. This *bar noise* can be a nuisance. The section on blocking gives some tips on how to use your hands to help silence some of these sometimes, unwanted noises.

We can see how each string differs by playing the lick on the following page. We are playing a middle C on all of the strings. The only difference is the gauge and type of strings, wound or unwound. The lick is below on the E-9th neck. S - string. F - fret. Play S5 at F1, then S6 at F4, then S7 at F6, then S8 at F8, then S9 at F10, then S10 at F13. All are the same note. The note is middle C. Below, I've tabbed it out in traditional tablature. First you see it on the E-9th, then on the C-6th.

The gauge that you use on your steel is entirely up to you. Most steel guitar manufacturers have a recommended set that they use, but you can experiment. The only thing to keep in mind is, that on some guitars, you have to readjust the pedal if you change the gauge too much. A good example is the fifth string on the E-9th neck. I use a .017 on this string. Some use a .018. You have to check it out for yourself.

The following shows middle C's on an E-9th tuning:

F#	
D#	
B#	
E	
B	1
B#	4
F#	6
E	8
D	10
B	13

The following are middle C's on a C-6th tuning:

D	
F#	
C#	
A	3
G	5
E	8
C	12
A	15
F	19
C	24

My good friend Johnny Read of Dallas, Texas showed me a great tip for making your strings last longer. He called it taking the winds out of the string. What he means is when you take a new string out of its package it has been twisted and the string itself can be wound up. To take out these winds you simply do this:

With a towel in your right hand, take the ball end of your string and hold it up in the air with your left hand. Starting at the top of the string, take the string between your thumb and first finger of your right hand, through the towel, and run your fingers down the string. Just like your wiping it off. Do this until you see the string starting to curl up. This will make your strings last longer and sound cleaner.

When you change a string, always be sure to clean off the changer. If your guitar is getting grooves from the string, a fine sandpaper can smooth those out. Be careful not to use too harsh of an abrasive.

## MUSICAL INTERVALS

The strings are tuned to a certain pitch and can be studied as to what the relationship between each of them are. The relationship between two tones is called an interval. It is important to see the pedals as variables to change the intervals. More study will be given to this in the interval section. Here are the musical intervals.

Open strings intervals.



minor third

B to D  
G# to B  
Eb to F#

major second

D to E  
E to F#  
F# to G#

major 3rd

B to E  
D to F#  
E to G#

major fourth

G# to Eb  
B to E

## MY APPROACH

## STRING BUOYANCY

The strings, being suspended across two points, create a movable bridge of wire. If you place your bar across the strings you can push them down below their normal level. On some guitars this is tighter, on some looser. The tension of each guitar is different because of many factors. The length, gauge, and tunings of the strings, determine how hard it is to push them down. The guitar itself has tighter points itself. The closer it is to a suspension point, the harder it is to push down. The center at the twelfth fret is the easiest point. This pressure is exerted by the left hand and plays a very important part in your tone. The strings can only be pushed down until they rest on the pick-up.

The importance, of this movement of the strings, is how it applies to your hand that must apply pressure to the bar. This floating bed of strings is what you have resisting you. The hand must be able to control this pressure. Most of the tone that is achieved through the contact of the bar and string, is controlled by the bar hand.

The right hand deals with this but the picks are striking more towards the sides than to the top of the strings. The hands move the strings from side to side. The amount of resistance you have is related directly to how strong your hands are. You must be in shape. The hands must play the guitar. Be in control. Experiment with the strings by sliding the bar up and down the strings. First, push down hard on



Pressing the bar into the string shows the buoyancy or give of the string.

The bar on the left shows a normal position. On the right we see an exaggerated example of pressing the bar into the strings.

the strings and then use less and less pressure. You can see the buoyancy and learn to be in control of it. You may want to play a lick that needs a hard downward pressure at the first fret. The left hand has its work cut out for it at the first fret.

## TYPE OF STRINGS?

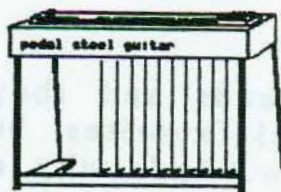
I've tried all brands and they all seem to get the job done. I have personal favorites, but the biggest thing for me is that they are new. And, why endorse something you have to buy anyway! Fresh, would be a better word to describe the way I like my strings. I've found that strings kept around can get moisture on them and corrode. This means in your pac-a-seat, too. The same thing takes place when your strings react with the acid in your hands. Whether they go bad in the box or on the guitar, you will hear the weeeeee, that comes along with the note your playing. Get ready to change that string when you hear that sound. The strings that are being pulled most of the time should be changed more often than ones that aren't. The metal can only be stretched so far and for so long.

Another thing that tells you if a string is starting to go bad, is the string will be out of tune with itself. That is, when you play it open and then play the octave note at the twelfth fret, they are slightly out of tune with each other. This will cause you to be in tune at the lower frets and out of tune as you go up the neck. Always check your strings at their octaves to see that they are in tune with each other. It can be a nightmare trying to stay in tune with bad strings. Newer strings ring better anyway. They have more sustain and that is the key to a viable string.

## HARDWARE or WHAT??

When you play steel you are using a finely engineered piece of machinery. You must always keep it in good working order. I can only recommend that you take your guitar to a steel mechanic. He can help you keep the wear

and tear on your moving parts to a minimum. Being the kind that never liked to work on such things, I have a friend named Bruce Moody who keeps the moving parts from binding and wearing out faster. He also keeps it lubricated for me and adjusts the pedals just the way I like them. Thank you Bruce!! If it doesn't work right, you can't play it properly.



I try to deal with only the top of the guitar. Working on a steel has always turned me off, as I'd rather be playing one. The things that we need to deal with are the strings, pick-up, tuning keys, and the fretboard.

## CHANGING

You can help you're cause a great deal if you pay attention to changing your strings. The questions of, when and how, come to mind most when thinking in terms of a string change. How often you change strings depends upon how often you play them. The weekend player does not wear out his strings as much as the professional. The moisture and acid from your hands can make a string go dead. This all depends upon the amount of hours they have on them. The strings on the E-9th neck that are constantly being pulled should be changed every 10-15 hours of play. The amount of time may vary with the mechanics of your guitar. Your guitar may wear a certain string out faster than others. In general, you should keep them cleaned and free from corrosion, as much as possible.

The how of changing strings varies from player to player. The most important thing is to be organized. Try to do it the same way every time. If you have consistent habits changing your strings, you won't run into tangled messes and slipping strings. Some players cut their strings

off to a desired length before they wind it on the peg. The thing to do is remember to do it the same way every time. You will get a lot of practice over the years, but if you are already thinking of making the change as quickly and efficiently as possible, you will find yourself formulating a pattern of habit.

This efficiency will come in handy when you are in the middle of a show and break one. I use the universal and don't have an alternate neck to go to. Speed is of the essence. But, never compromise efficiency for speed. You may hurry yourself into more problems than what you started with.

If you have really sweaty hands you may try these tips to help you hold on to the bar (the one with a low stool) and keep the strings from corroding as fast. The purchase of a bottle of talcum powder can help keep the sweat from your hands. I also use rubbing alcohol to wipe my strings with. You should do this a lot on those hot nights when the humidity is really high.

## TUNING

The methods that are used for tuning are as numerous as players. I tune my steel first with a strobe to get it close. I then take it from there with my ear. To make it pleasing with my ear usually does the job. I start with the fourth string and check the open tuning from there. I make sure that the vibrations, or beats, are comfortable to me. From there, I start playing various combinations of strings and check them. Then, I add the pedals to see how they sound with combinations of strings and pedals. You have to play a game of give and take with some pedal combinations.

The strobe is used to get me close so my ear can bring it in tune. I find that having strobe settings and tuning strictly to them every time, doesn't always work the best. The reason is that I always wait, for the rest of the band to start, so I can make any adjustments to the rest of the instruments on the stage. A guitar that hits the same tone as you, may be slightly different than you. To play together you have to learn to tune together. Use the strobe as a



quick means to get you started. Then trust your ear from there. An out of tune piano is the hardest thing to work with. The best method I've found is to tune your guitar to your ear and try not to tune anything to the piano. It may not be you that's out of tune. The overtones of the piano may be messing with your ear. Be careful. Be grateful for digital.

The strings are directly attached to the pedals and you should know which strings can be moved, the distance they can be moved and which pedals move which strings. The section on *function Numbers*, deals directly with the pedals and what they do to your strings. Everything works together in one way or another. You should also be able to look at a string on your guitar and know what you can do to that string. Which pedals can move this string and how much. You should see the string as something that you can move. Your pedals can only do what you've set them to do, so you need to learn them.

I'm talking about the pedals in the string section because of their interrelationship with each other. You can study the function of a pedal but eventually all you'll have to look at is the strings. As you see any string, you should be able to relate all the physical moves of your feet and knees that can change the tone of that string. You should know to what degree you can move any string. Some are raised or lowered a half and some can be raised or lowered a whole. If your improvising a fast lick and see something you'd like to try, instantly, you'll have to know what pedals will do what you want.

As your hands start to get in shape you will be able to feel the difference of a string and your feet and knee movements will be right in sync with your hands. That is what playing steel is about, coordination.

With the advent of new technology, you will start to run into a great thing. The use of digital pianos. The notes they play are already memorized in some type of memory. The computer I'm typing this text with is doing the same thing with letters. The word processor. For more information about this technology I'll be writing a book about steel and midi. It will be coming after this one.

If your interested in alternate methods of tuning, such as setting your strobes or beat free with a strobe, I recommend Al Petty's cassette *The History And Science of Tuning*, or

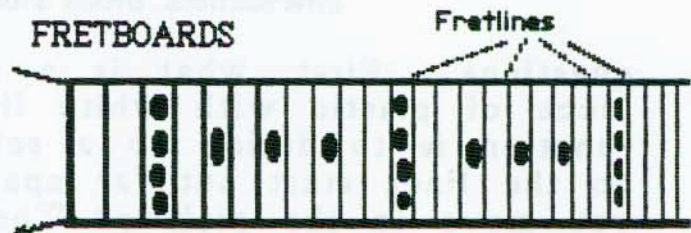
for interesting articles write to Charlie Hord, 980 Hartford Drive, Boulder, Co., 80303. Charlie deals with different ways of tuning and how they compare. Both are great reading.

## FRETBOARD

If you were to become a professional truck driver, there are certain things that you would have to learn. Of course, you'd need to know how to drive, but after you're on the road, you need to find your way around. This means learning to read a road map. The guitar has a road map that you have to know how to read. The guitar's road map is the fretboard. The same principles can be related to any instrument that has a fretboard. To know where you're going on the highway of steel, you need to know your fretboard. The best way to learn the fretboard is to sit and study it. The way I study it, is to look at it mathematically. The points that you have to concern yourself with, when reading a fretboard, are the string/fretline intersections. On a steel these are where you place your bar. On a guitar they guide you as to where your fingers should go.

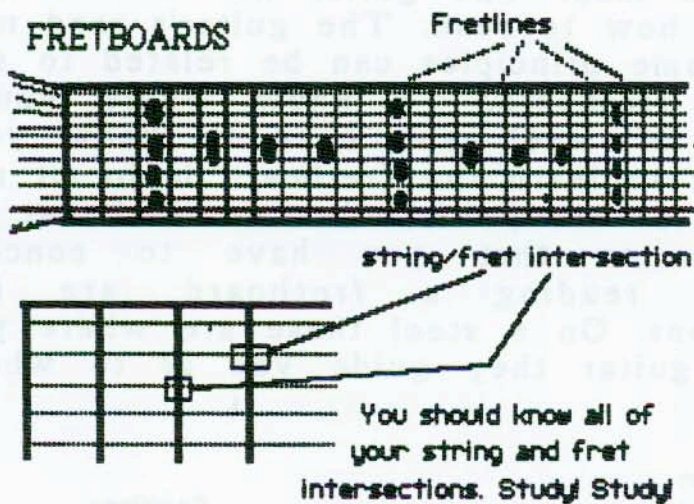
This is a miniature fretboard. You should know one of these like the back of your hands. Special care should be given to playing at the higher frets. The space between the lines make a half-step movement very cramped. Learn to feel free at any fret.

You have to know a fretboard if your going to play a guitar. It is the basis for knowing where to move your bar. The fact is, you should *know it like the back of your hand*. You should be able to look at a fret and instantly know the number. You should also be able to think of a fret number and put your bar right at it without giving it a second thought. On



This is a miniature fretboard. You should know one of these like the back of your hand. Special care should be given to the higher frets. The space between the lines make a half-step move very tight. You should learn to feel free at any at any fret.

a standard E-9th, you can get more than one chord at any fret. If you already know what your frets are, as you learn the names of the chords and the pedals that are required to play each chord, your mind will remember where they are at. That makes it easier to put everything that's going on, together. The basics of the fretboard are never really given much thought. Taking the time to look at what you have to work with, can only help your playing in the long run. The hands can be given a head start by spending a little time focusing on the fretboard

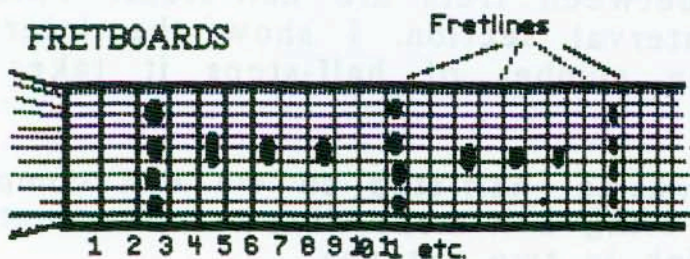


Here's the fretboard with the strings drawn in over the fretboard inlay. You can see the string/fret intersections that you should learn.

For starters, let's forget completely about the strings. Let's learn to read the fretboard all by itself. The strings have their own section. Thinking only of the fretboard, let's ask ourselves a few

questions. First, what is a fretboard? A fretboard is a piece of plastic with white lines. What is its purpose? Its function is to divide up a set distance into sections. Why do the lines start out far apart and get closer together as you move to the pick-up? The string is stretched out over two points, the roller and the changer. The twelfth fret is the center of this suspension. When you place the bar on the first fret, the bar replaces the roller as the left point. The center point between the bar and the roller is F13. Going up, the centers adjust accordingly with the distance between the bar and the end of the guitar. If you are at the twelfth fret the center between that and the roller is at F24. It all has to do with the properties of sound. How do they apply to the steel? They represent places to line up your bar over.

## FRETBOARDS



To study fret/string intersections, we will use numbers. F5 stands for fret #5. S6 stands for string #6. The lefthand section goes into more detail about the subject.

Lets unfold the large graphic of the fretboard. Its in the back of the book. Each of the frets are numbered up, just as you should call them on your guitar. When speaking of a fretline in this book we will use the abbreviation of F1, F2, etc. That way we can communicate in steel-ese. On a guitar

you press the string down over the fret with your left hand. The string actually contacts the fret to shorten its length and produce a tone. The bar is used for this on a steel guitar. The string is totally suspended on a steel so all we have is lines, thus, fretlines. The reading of the fretboards, is the same. The frets are marked with various manufacturers designs, at certain frets, that are used to find your way around. They are marked before the third, fifth, seventh, ninth and twelfth fretlines. And that repeats at their respective octaves. They are fifteen, seventeen, nineteen, twenty-one and twenty-four. These symbols are the same on a guitar, only the frets are actually different. You should be able to find any fret instantly. The faster you can read the map, the more efficiently you can get around.

## NUMBERS

When you're playing you have no numbers to go by. The best way to avoid problems, is to know your fretlines and their markings like the back of your hand. To really study them we divide them mathematically. Looking under the fretlines on the graph, we see rows dividing them into equal parts. The first line divides them all by one, so we see all of our fretlines marked with a symbol. The second row divides them by two, so we use two different symbols. For three we use three symbols, and so on. This way we can divide the fretlines by 1, 2, 3, 4,.....24.

The frets are equal to a half-step interval. ON ANY STRING, the distance between frets are half-steps. This is studied more in the interval section. I show the interval, explain it and give the number of half-steps it takes to move that distance.

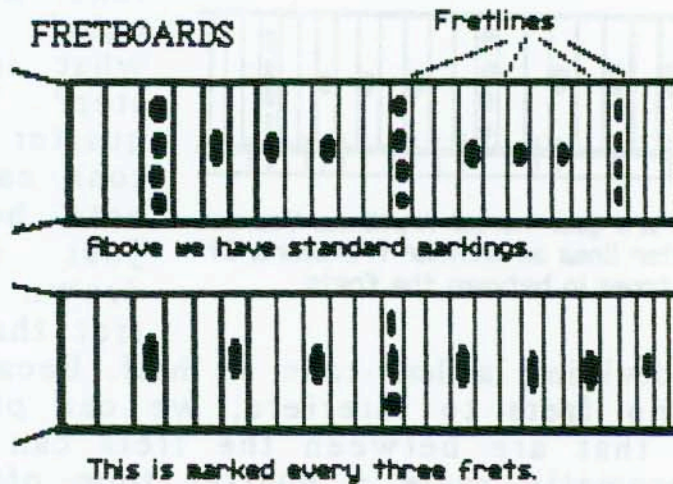
Each fretline is a musical half-step so we can compute the interval movements using half-steps. If you can count to twenty-four, you can think in two octaves.

To get the full advantage of your fretboard, you have to see each symbol in a row (horizontal), as one of the possibilities in that group. Take the *three* group for instance, its row uses the, X, Y, and the Z. Follow the X's up the fretlines; then follow the Y's; then same with the Z's. Those are all the groups within the "three" group. We are playing every third fret. The same applies to each of the groups. Study all the different groups, soon you'll see how they work to bring you music on the guitar. These are the moves of the left hand. You will learn to do them in both directions and in combinations. Learning to think in half-steps can help you see more music on your fretboard. It makes the mathematics easier to figure.

In the **Lefthand** section we will study all of the possible movements. We will do this by taking a closer look at the numbers.

In my study of the fretboard, I wondered if it wouldn't be easier to read a fretboard that was divided every third fret. Instead of at 3, 5, 7, 9, and 12, I thought it would be easier at 3, 6, 9, 12. That would make the fretboard more uniform. The only change would be in playing harmonics. If your counting frets as you play to see where your going, then dividing them into three would make things easier to read.

The fretboard below is marked in the traditional manner. The frets are F3, F5, F7, F9, and F12.

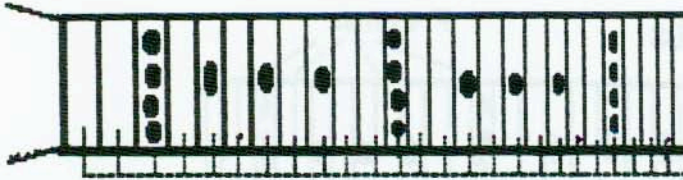


This fretboard is marked in an alternate method. This is every three frets. When your counting frets it would seem easier to have a fretboard that is marked uniformly. It makes it easier to compute your movements. Half-steps are the simplest movement. Each fretline is a half-step.

Another idea was to play a fretless steel. You can do this by removing your fretboard. This would place incredible pressure on your bar work. It would also make you think a lot more. The player who can play without frets will have to know his guitar and be able to execute the moves without fretlines. He will truly have to feel what he is playing. The more you study your guitar in different ways the more you will have to draw upon when you are soloing.

The solid lines are your normal fretlines on your guitar. The lighter lines are the imaginary frets in between. Half of a half-tone is a quarter-tone. To see the scale is easier than finding places to use them. You can use it to color a note. We use this to play with a cassette that plays things on the quarter tone.

## 24 Tone Scale



The solid lines are your normal fretlines. You can imagine the lighter lines as another fretboard. It is the quarter tones in between the frets.

would be dividing a half-tone in half. Because we use a bar and have no frets to interfere, we can play in the *cracks*. The notes that are between the frets can be thought of as another chromatic scale a quarter tone off. Seeing this we can see another scale that is on our fretboard. The twenty-four tone scale. It is made up of the notes on the frets and the notes between the frets. The 24 tone scale is used in Indian music and not very often in modern music. The only time I use it is when I'm playing the blues. I sometimes don't quite make it to the fret. Try this on a blues tone. A violin player showed me this technique. It gives your playing a certain *flavor*.

The only way to truly figure these things out is to get on your guitar and experiment. Let yourself go. Stretch your imagination to the limit. There's more than one way to skin a cat.

We know that two half-steps equal a whole tone and one half-step equals a semitone. But what is half of a half step? We call that a quarter tone. A quarter tone can be seen as the note between the frets. Just imagine a line drawn between each fret that you have. This





## WHERE IT BEGINS

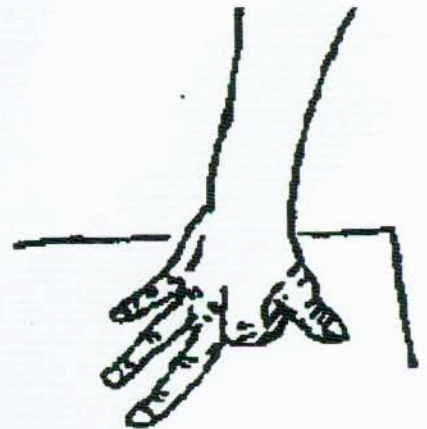
The *RIGHT HAND* tends to be the most confusing part of playing the steel. Its no wonder when you consider all the things that you can get your right hand to do. I have found that once you know how something works, and understand why it works, the better you can use it to your advantage. To pick the strings with accuracy and with a good tone, is at times very difficult. If your hands are not in as good of shape as the licks require, the steel becomes a very frustrating instrument. The right hand is truly, where it all begins.



Which technique should I use? Which is right for me? These were some of my questions when I started playing. Not being able to make up my mind, I had to see what my choices were. The more I explored and the more logical I got about the whole thing, the more I started to see on the guitar. The way a steel works, is the way the steel works. No getting around that fact. I began to work on the right hand techniques with an entirely different attitude. I saw every movement as a potential lick. If it moved, it was worth studying.

The graphics show various exercises and hints that may help to increase your efficiency. Stretching your fingers keeps them limber and ready to play that new lick you've been thinking about. Squeezing a ball is just one of the many things you can do to improve. Make up your own.

I worked on everything little by little. I was learning the movements and then, exercising the muscles that made that movement happen. The only limits you have, are what your hands and feet can do, so I figured the better my hands, the better I could play. The same goes for pedal combinations and quick moves of the feet. The stronger my hand(s) got,



the easier the playing became for me. If I didn't play for a week, I would notice the difference. The muscles lose a little of their flexibility when they are not put to use. The art of typing is relative to the way you learn independence in your fingers. These all require movements that can be singled out and improved. Your fingers learn the pattern a certain word makes and a pattern to play a lick. The best way to show your hands is with repetition. Repeating, the same thing over and over and gradually increasing the pace, will give you that special feel. For instance, the more I typed, the easier it became, because I started out slow and learned the movement of each word. Not worrying about speed I did everything the way it should be done and my hands were learning those moves. Doing this right from the start gives your hands the advantage. Sounds so simple.....



How fast you learn to do something is related directly to how much time you apply to it. It all lies in your attitude. What do you want to learn? How good do you want to be? Practicing the right hand is hard. You should work it until it hurts. Rest it and then work it again. Build things up gradually. If its not right slow, it will only be played not right fast. The more control you have of the physical, which starts at the mental, the more control you will have over the musical. Everyone learns at a different pace. Pick yours and stick with it. Even if its the speed of a snail, don't give up. There's a lot to learn.



The stringed instrument family works upon the vibrating string principle. To acquire any sound, we need to start the string vibrating. A piano uses a hammer, that is triggered by a key, hit the string. Our string family, is based upon picking the string. Like the guitar, banjo, and mandolin we need to pick the string in some way. The right hand techniques are the same in a lot a ways for all these instruments.

Playing the stringed instruments, as I do, lets me take things from one and apply to the other. For instance, I use banjo rolls on steel and guitar. And, I even practice the steel using a flat pick. This gives you an entirely different approach to placing the steel

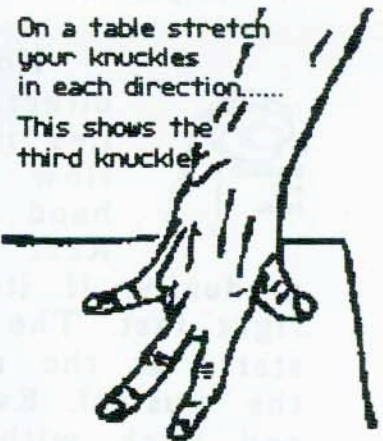


strings in motion. A string is a string, the method that you use to set it in motion, is usually the one you were first taught, or in some cases, the first one you saw. I will try to talk about all the ones I can think of. Remember, the right way to play steel is the one that works for you. I believe it is better to have a wider selection of choices to create your own style with. You can decide on your own technique after you investigate the choices. The ultimate would be to know and be able to use them all at will, right at your fingertips. Each finger is on call at all times. To play any string you want, whenever you want.

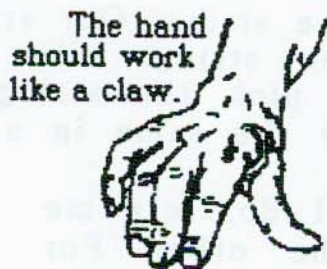


### THE MOVING PARTS

To help understand the right hand, we must first look at the moving parts. We have the thumb, first finger, second finger, and in some cases the third finger. (I use a pick on my third finger, its all what you get used to). We also have the palm and the little finger. All of these can be put to use in a technique. The wrist and arm are moving parts that have to be in sync to achieve the total picture. And, after you've practiced for about two hours, you'll see how the arms, shoulders, and neck are all part of the action.



On a table stretch your knuckles in each direction..... This shows the third knuckle



The hand should work like a claw.

The shoulders play an important part if you play like I do. I hold my entire hand off the steel guitar. This includes my forearm. My hand comes down over the strings. The left hand works this way to. Its sort of like a claw. Special consideration had to be given to learning this technique. I tell how I did it in the blocking section. If you don't think your neck and shoulders are part of the process, wake up with a stiff neck and your whole arm is affected.

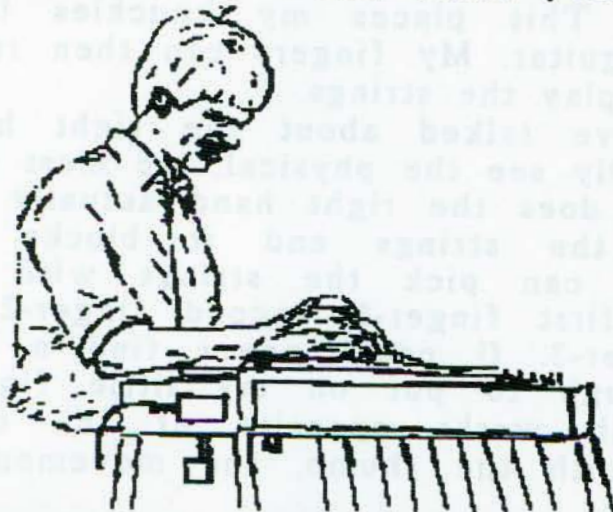


To play at your best, all of these things have to be under control. To be at your best, you need to be able to play, with your muscles totally relaxed. The most relaxed people are athletes. They are more in touch with their bodies and their muscles are in use and have good tone.

Look at a concert pianist's hands. They have a musically, athletic look. They've attained this over years of playing. Repetition is practice. You can increase the physical aspects of your playing, by thinking of your hands with a musically, athletic approach. By applying basic science to our moving parts, as they apply to the playing of the steel guitar, we can learn all of our movements before we have to hear a note to throw them off. The amount of progress you make is directly related to the amount of work you put out.

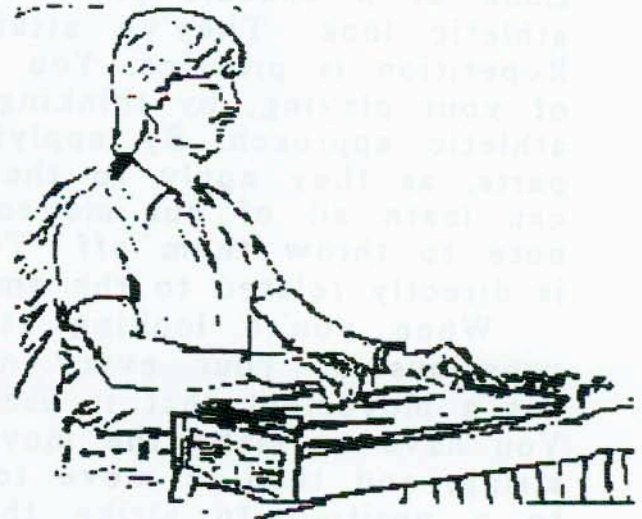
When you're looking at the right hand, you should be conscious of your every movement. Each joint has a movement that is used to move the picks.

You have to make the movement that picks the string, and then, a move to take the pick back to a position to strike the string again. This uses two sets of muscles. One coming and one going. If you are lifting your hand up high after picking the strings, it has to make the trip back down to the strings, to be in position to strike the string again. The faster you want to play, the smaller you make the movement. The small movement should have the same power as an exaggerated one. Every hand move can be slowed down and you can teach your hand to do it right. I found myself working on the feel of all the distances that your wrist can make. I would do them exaggerated, at a slow pace, and then find the one that works best for me. I worked on not overplaying by purposely raising my hand between licks. If they are not by the strings they can't pick them. The thing to think about, is that, I controlled the raising



of my hand, along with the individual picks coming on and off the strings. It's all relevant to playing steel. The more I worked on all of them, (fingers) the stronger my hand was becoming. The more you work, the looser your hand will feel. When it starts to feel loose and in control, you're on your way to being yourself and having your own style.

The position of your forearm is also crucial to how you play. Some lay theirs down on the bottom neck. You can play like this, but don't let the lower neck be a crutch. Notice how different it feels playing the lower neck. Your arm has to hold your hand and forearm in the air because there is no where to rest your forearm. The graphic shows both arms reaching out for the strings. Before you can utilize this technique, you must first exercise the arms and shoulders.



Also, take notice of the area at your wrist joint. Most people instruct you to play with your wrist twisted to the right. This lets the right edge of your palm lay on the strings for blocking. When I'm pick blocking, I hold my forearm level, or with a slight angle coming down from my elbow. My shoulders and upper arms are hanging relaxed. This way the wrist is held free. The top of my hand is held flat. This places my knuckles level with the guitar. My fingers can then reach down and play the strings.



We have talked about the right hand, but to really see the physical, we must first ask; what does the right hand actually do? It picks the strings and it blocks the strings. It can pick the strings with the thumb-T, first finger-1, second finger-2, or third finger-3. (I could never find a pick small enough to put on my little finger.) The thumb works opposite of the other fingers. When you pick with the thumb, the movement is

towards the audience. The best finger movement is towards the palm of your hand. The exact movement depends on how you hold your hand. Study your hand and see how it works. To play a lick, your hand has to know it. How you hold your hand depends on the size of your hand, how you wear your picks and even how you sit at your guitar. Look at the little things with a microscopic attitude. Lower your body and everything will change. The more sensitive you are about the little things, the more you will notice. To gain control, you first have to know what your wanting to control.



Individual

First in this group is the thumb. The number of places that it can go depends on the number of strings you have. It can be on any of the twelve strings. If you are playing a fourteen string guitar, the possibilities would increase. The thumb is the fastest and the strongest of the first group. The thumb is dependent upon the particular size of thumb pick you use. I use Ernie Ball's and shave the pick down closer to my thumb. The thumb then becomes part of the pick, rather than the pick being just an object extending from the thumb. This gives me added control over the pick. With less pick to get caught in the string, the movement can be faster. The pick is thicker at the top, so more pick gets on the string. It also puts the edge of my thumb close to the strings and I use it for blocking. The short pick doesn't twist on your finger when you pick, this gives you more power.

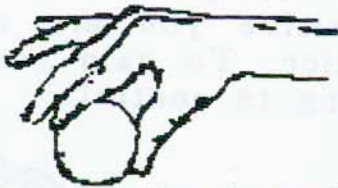
Wrist exercise



The thumb is used a lot in a repetitive fashion. There are thousands of licks than can be obtained by increasing the speed at which the thumb works. Give the thumb attention

and it will be good to you. How much does your thumb travel? Where is the best part of the pick to go on the

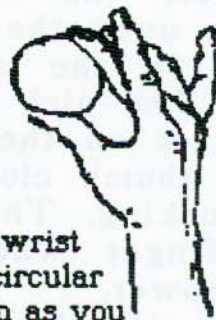
string? Can I control what part of the pick touches the string? Asking yourself these questions, will help you to attain different degrees of control over the strings. However you wear your thumb pick is up to you. Experiment with different sizes.



Squeeze ball with thumb and first finger.

The fingers all move the same direction. To play a finger in a repetitive fashion, is a harder technique, but good for a strengthener. The fingers can learn a lot about touches, by picking the same thing over and over. The important thing to remember about the picking movement is that to

pick a string over and over the hand has to make two movements. The actual picking movement that I try to obtain with the finger picks is like a small scratching. You need the pick to slide across the string. My picks are bent around the contour of my fingers. The ends of the picks extend out past the nail about a quarter of an inch. I find that the best part of the pick to use on the strings is the part with finger behind it. Again, imagine the pick scratching the strings. The movement should be studied in great detail and the distances should be experimented with. Different touches bring different tones.



Bend wrist in a circular motion as you squeeze the ball. Repeat for each finger.

## ALTERNATING

The thumb and fingers work in opposite directions of each other. This allows us to play licks alternating each of the fingers with the thumb. The section called, Total Hand Control, uses graphics to show the possible moves that you can make. The alternating of the thumb and fingers is where you get your speed picking. The movement should be slowed down and built up with proficiency in mind.

The finger rolls are sometimes overlooked in a lot of players' arsenal. They bring you a lot of licks that you would not normally play if you limit yourself to alternating licks. The graphs will show all the different rolls better than a written explanation.

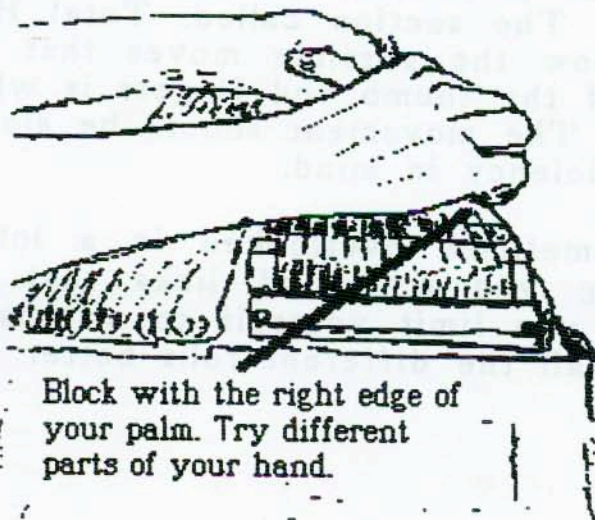


## MY APPROACH



## ARTICULATION

The hardest aspect of the right hand is the touch. Another word to describe this is articulation. Trying to put this into words is by far the hardest thing I've ever done. Its easier to play than to describe. Some of the factors involved are; the gauge of the pick, strength of the finger, and the placement of your pick on your finger. Every player



Block with the right edge of your palm. Try different parts of your hand.

I've ever come across, puts their picks on different. The process that you go through as you learn to play, lets your placement evolve. This evolutionary process is where your tone comes from. I never considered these things as I was learning to play. I went by the feel. I have a callus on my thumb from adjusting my picks as I am playing. Some nights, they never felt right. Wherever they were on my finger was

uncomfortable. They were sliding all over the place. When your picks are out of control, so is your playing.

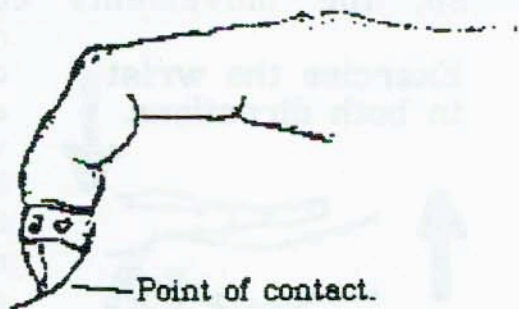
When I started to think about these little things, I started noticing that the times they felt the best, they were extensions of my fingers. They had become part of my hand. As part of the hand, they were my fingers. Some players bend their picks around their fingers and some like them sticking straight out. The way you wear yours is up to you. The only way to find out what feels best to you is to try out the different ways. You may come across your own method of wearing your picks. Remember to think of your picks as part of your fingers.

The tone of your guitar depends on the pick-up, how it was built, materials used to construct it, the amp, and how the strings are set in motion. Notice the difference between plastic and metal when they touch the string. The amount of force or strength used to pick the string also matters. The part of the pick that extends past the finger, gives a thinner

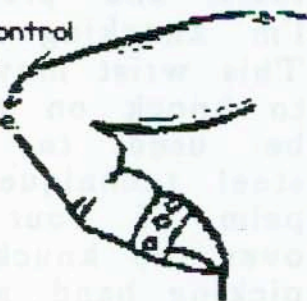
metal sound. When you go to a part of the pick with finger behind it, you have a deeper tone. The gauge of picks I use are real thin. This allows my fingers to actually feel the strings through the picks. My fingers can tell which strings they are playing just by the feel of each string. This is a process that takes time. Hours must be spent behind your guitar. Practice.

When it feels best to me, the picks are actually popping the strings. The fingers are actually moving the strings. You should practice pulling the strings with a scratching movement. Place all four of the picks on strings and without picking the strings feel the tension of the strings. Squeeze your hand and control the movement of the strings. Each string can be learned by each finger.

The best move is when you can place as much power and snap in a little move, as you do in a larger one. The touch can be thought of in degrees of hard or soft. The movements can be large or small. The steel player needs to train his hand to play large moves with varying degrees of touch. He must also play small moves with all the varying degrees of touch. You must be in control. The hands need to learn these thoughts as techniques. The techniques are the movements.



You should control each knuckle. The move is like a backhoe.



### GRAVITY / WRIST BOUNCE

The two ways we move, to strike a string, are with a movement of the wrist, and with the wrist stationary and just the fingers moving (pick blocking). The rhythms that you can add to the movements can also be learned mathematically. (Another section.) I started practicing the movement of the wrist in both directions. The one thing to notice again, is that they are moving up to pick and back

down to be ready to repeat the motion. The wrist bending, causes the picks to slide across the strings. Going up is the unnatural move. Gravity moves the hand back to the guitar. So, the movements coming and going takes two sets of muscles.

**Exercise the wrist in both directions.**

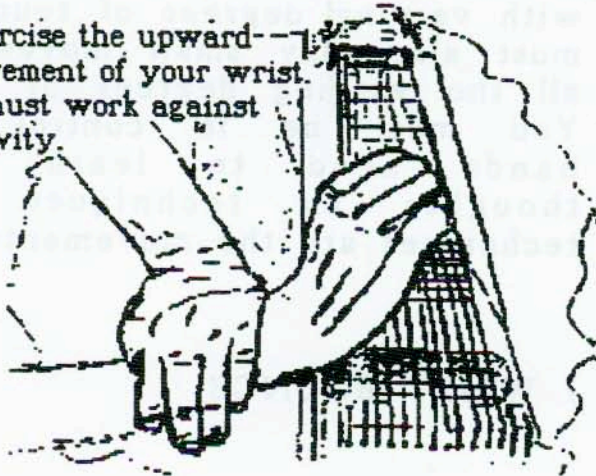


Practicing and exercising both directions can only lead to more efficient hands. A good example of wrist motion producing a lick is Jerry Lee Lewis' piano technique. He plays the same notes over and over. The motion of his wrist gives him the articulation he needs.

The gravity theory must be brought into consideration throughout the book because it affects all the parts. The feet must lift off the pedals, while gravity can be an aid in pushing them down. The bar must be lifted on and off the strings. Remember to work on the lifting motion Gravity will assist in movements going down. Your muscles have to raise things up.

A good exercise I used, was to hold my hand over a table and pretended like I'm knocking on a door.

**Exercise the upward-movement of your wrist. It must work against gravity.**



This wrist movement, used to knock on a table, can be used to exercise a steel technique. Place the palm of your left hand, over the knuckles of your picking hand, and work on the upward movement. Just relaxing should let the fingers come back down to pick again. The wrist can bring you a lot of licks.

## RIGHT HAND Across the STRINGS

Another thing to think of is, the right hand movements up and down the strings. What I mean by right hand across can be defined thinking of the thumb. I look at the position of the thumb to be my guide. If the thumb is on the tenth string, I consider that the starting point. If the thumb moves to the fourth string the hand must follow. For the thumb to move up or down the string bank, we must move our whole hand accordingly. If you are playing with your forearm

Both hands must work together.



resting on the strings then this move is seldom made. To make this move properly you have to move your forearm towards the front of the guitar.

I then see the hand in a pick grip over the strings. Applying the math to the strings we can look at all the ways to place the picks on the strings. I have named these Pickgrips. The abbreviation will be PG. In the section on Pickgrips, you can see how

they all come about. Learning to play the physical, will place the limitation upon the sound and not the movement. Your hand will already know the feel of the chord. We'll look at this more in the section about pick grips.

The section, *TOTAL HAND CONTROL*, shows this with a graphic. What you should be concerned with mostly, is keeping your hand free to travel along the strings in all directions. Not only free, but capable. Stamina comes from lots of repetitions.

## WIDE/CLOSED

We also have to consider wide grips and closed grips. The widest would place the thumb on the bottom string and third finger on the first, while the tightest would be all the picks on one string. This closed technique brings you different kinds of licks altogether. The distance the hand is open can bring you different kinds of licks. The rolls can be applied to each of the fingers no matter what kind of grip you use. This even applies to having the T, 1, 2, all on the same string.

Some people use the thumb and second finger in an alternating fashion for speed picking. I use that as one of the techniques to learn. The thumb and first finger, thumb and second finger, and thumb and third finger are given equal time. The movements lead to interesting licks. Your imagination can help in these instances. Trying to make my hand free as possible to play more movements, means more ways to play.

I have to consider the right hand the most important part of playing steel. Simply due to the fact that we can play a lot of notes without moving our left hand. The feet can be a little slow, and an over active right hand can make a difference. Thinking like an athlete, we want to develop more stamina than we need. The way to do this is by exercise.



I work my hand by placing it down on the table and doing isometrics on each joint, in each direction. Here's how I work them:

I start with my hand flat on a table. I then take each finger and press down trying to work the first joint. You can do this by using the thumb and resisting each finger. Place the thumb on the outside and inside (palm) of each finger. Place the thumb on either side and do the exercise. Then I worked on the next joint, on up to the knuckle joint. Then to the wrist, etc.

Do exercises that work each joint in both directions. You could call it coming and going. Anyway you look at it the hand should be stretched out everyday like a runner or dancer. Sometimes it will be tight, this will cause the touch to be different. Sometimes your so tight that you have to play everything in a different way. On those nights it always helped when you could rely on hand blocking if your pick blocking isn't as good as you'd like. The good nights outweigh the bad though when you have the stamina.

If your not loose for one reason or another the playing gets tougher. The nights at the steel can cause the neck and shoulders to tighten also. The best way is to keep them as limber as possible. Besides exercising them, you can also use heat rubs on the muscles. Just like a baseball player would. Tight muscles are not good for playing steel!!



You'll practice all the ways to play with the right hand and take a look at the graphics. Once again, we'll be figuring all the options mathematically. Each way to play, can be looked on as a lick, somewhere. It may be for a country tune, a bebop, a rocker or a jazz tune. A movement is a movement. Write notes down and keep track of your own new ideas.

What you can do with what you know, depends on how well you can apply the move to what you feel. The ear still has a lot to do with what you play, and I never could show someone how to play with heart. That comes from inside each person. As you start feeling more at home on the steel, this uniqueness will only then, start to come out.



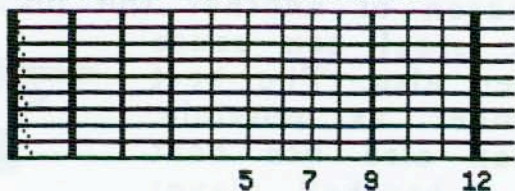
The best way to see the finger moves is to study them mathematically. You understand that they all can be played individually, which are groups of one. Or, in groups of two, groups of three, or groups of four. In each group there are two ways to use each of the combinations.

The actual theories are the same. This goes for any guitar with strings. The right hand deals with the strings. Learn your strings and how each feels to your right hand. The thickness can be felt if you are thinking about it. I never play with my hand in an anchored position. I see my hand as an object that hovers over the strings free to go where ever its needed.

## THE RIGHT HAND AND HARMONICS

The playing of harmonics on the steel can sometimes be very frustrating. The point of attack has got to be right on the mark for most guitars to ring. With a good amp though, I find it possible to place the point of contact a little to the left, or right, of the actual mark.

### HARMONICS ON OPEN STRINGS



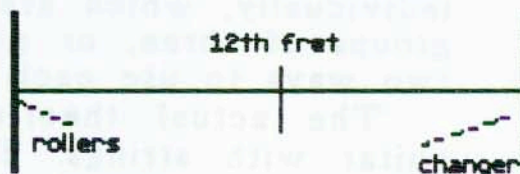
5, 7, & 9 are natural.

The most general places are up 5 frets from your bar, 7 frets, and twelve frets. If you were to see the string vibrating real closely you could see the actual sections of the string vibrating.

If you measure the length of a string from its suspension points, you'd find that the 12th fret is the center of these two points. If you place the bar at the twelfth fret, the midway point between that and the bridge is the 24th fret. The parts of the hand that work best for playing harmonics are the;

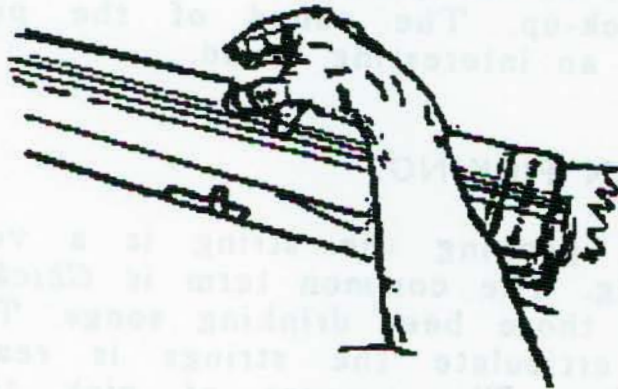
- 1- right edge of palm
- 2- bottom of ring finger
- 3- top of ring finger bent to the palm.

The right edge of the palm is the part of the hand that does the blocking. You can also use this area of your hand to play a harmonic. The thumb holds the key to how strong the harmonic sounds. The harder you vibrate a string, the deeper it sounds. Don't rip them off the guitar but beware of the touch you want. As you start to use this technique you may run into some problems. The fact that the hand is in the way of the fret you're are trying to play, means that you will have to sight the fret through the hand, as you move in to execute



12th fret is the center of the suspended string. Harmonics divide the string into sections.

the lick. I sight the point of contact that I want on the string, and then I look at where my thumb is going. The thumb becomes the new method of sighting that crucial point of contact. This method is not easy to use on the harmonic



that are five frets up. As you move up the neck, the distance of five frets does not give a large hand enough room to operate. The size of your hand is the key there. The larger your hand the more fretboard is blocked.

A good exercise is to play a palm harmonic at every fret. You should practice moving the left hand and the right hand in conjunction with each other. The more you work at it the easier it will become. Here are some exercises that work on right/left hand harmonic coordination.

1. The first number is the left hand, the second number is the point of contact. The type of harmonic will be shown by p = palm, fb = finger bent under, and tb = thumb behind. Play with each of the right hand positions and types.

Left hand	Right hand	Type
0	5/7/12	p/fb/tb
1	6/8/13	p/fb/tb
2	7/9/14	p/fb/tp
3	8/10/15	try to play all
4	9/11/16	the possible
5	10/12/17	combinations.
6	11/13/18	Remember that your
7	12/14/19	hand must learn
8	13/15/20	what it can do,
9	14/16/21	before it can
10	15/17/22	do it.
11	16/18/23	
12	17/19/24	
13	18/20	

Another thing to think about is that the pick is on the



left side of the point of contact, between the bar and point of contact. The method of picking with the right edge of the ring finger places the pick to the right of the point of contact. These two methods each give you a different sound. Putting the pick to the right of the point of contact, places the pick closer to the pick-up. The sound of the pick popping the string makes for an interesting sound.

### CHICKEN PICKING.

The sound of the pick popping the string is a very interesting method of playing. The common term is *Chicken picking*. It sounds great on those beer drinking songs. The way that you attack or articulate the strings is really important to chicken picking. The amount of pick that touches the string should be increased. The fingers should place the picks deeper into the string bank. That way they can get more pick to attack with.

### INDEPENDENCE

Independence of the fingers to work in as many combinations as possible is what you should work on. What I am trying to attain is total independence in my fingers. Total hand control. Independence is the key ingredient in making your right hand work for you.

Right hand motto:

**CLEANLINESS IS NEXT TO GODLINESS.**

The section, *TOTAL HAND CONTROL*, starts to show you the possibilities of your right hand. Below we look at the main sections and how I remember them. Take time to study each graphic. It at first you don't understand them, come back at a later time, and try them again. I've divided the way the fingers work, into four main categories.

## TABLATURE

The basic method of telling a steel player what pedals to play, where to place your bar, and which strings to pick, is called tablature. I define tablature as: a coded method of communicating how to *operate* a pedal steel guitar. They are no more than coded function charts. They show you the movements that must be made.

There are many different brands of tablature on the market today. The basic function of each is the same. That is, to show you what each part is doing. Some tab places the notation above, which gives you the **time** in which its played. Others, have only the physical moves and how the author plays it for you on a tape. You have to copy the sound using your ear.

All tablature that I've seen, places all the different functions all within the string lines. Old tab has the numbers representing the frets, the right hand is shown in the spaces, and the picks are T, 1, 2, etc. Pedals are shown by many different ways. Some have a letter for each pedal, some use sharps and flats on the appropriate string. To really study the workings of the tablature, I started placing each of the functions on their own lines. That makes it easier to see what is going on.

To see this theory lets compare the two different kinds of tablature. The first is traditional. The second is what I call right hand tab. It is based around the right hand. Remember, it's just another way of writing the same thing. When I read my tablature, I see the separate functions of the picks, the bar, and the pedals a lot better because I don't have to hunt for them on the lines. Its a matter of learning to put these moves together, to play steel. Everything must work together, but first, we separate it and look at the moves.

The rhythm of the lick can be written out above the right hand moves. Every vertical row represented by a note. The note represents the time value of that column. The right hand is shown in the block graphs. The left hand is shown by the numbers underneath each of the columns. You can follow each move throughout the song. To show all the little things that can be done, we have notation for each.

The graphics show ways of communicating blocking, slides, which pick to use and many other subtle things that take place when you're playing.

To get better at reading all types of tablature, you have to practice it. Its just like learning to sight read music. The more you do it the easier it becomes. Go back and find tablature that you've already worked on, and read it without playing. If you've already worked it out, you should be able to follow it right along with the music. If you don't have a recording of it, play it yourself, on tape, and then read the tablature along with that. The mind has to learn to hear a sound and turn that into a movement. Tablature tells you what you have to do, physically, to make a sound.

Another good practice exercise is to write out the licks that you play. This not only helps you to write better, but you can also see what all has to take place to play any given lick. The ear, hands, feet, knees and eyes have got to work together. Learning to hear a sound and transpose that into a movement, that is musical, is the basis for improvisation on any instrument. The steel guitar has more things going on, than other instruments, so the process of developing all the parts, takes longer.

Start looking at all your tab and seeing the parts that go together. It will help your playing in more ways than you can imagine. The biggest thing is the fact that you have to think about your guitar. Everything you do starts in the mind. If you can think the tab, you can play the lick.

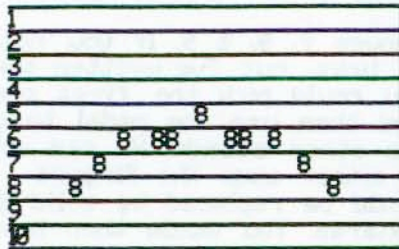
The following pages start you into what I've named right hand tab. Remember that RH tab is still growing. I had the idea about three years ago and it is still evolving. I don't believe that it will ever be perfect, but you can definitely find the advantages. Stand back and look at RH tab from a distance. Notice the building block patterns that the right hand makes. You can learn thing faster by seeing the overall picture. As you progress through the book, Right Hand Tab will evolve. More and more nuances will be communicated to you, the reader.

## MY APPROACH

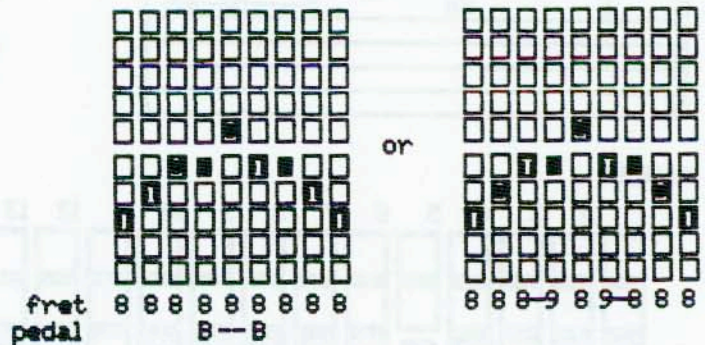
# RIGHT HAND TABLATURE

Below we see a lick in a traditional tab.

E-9th



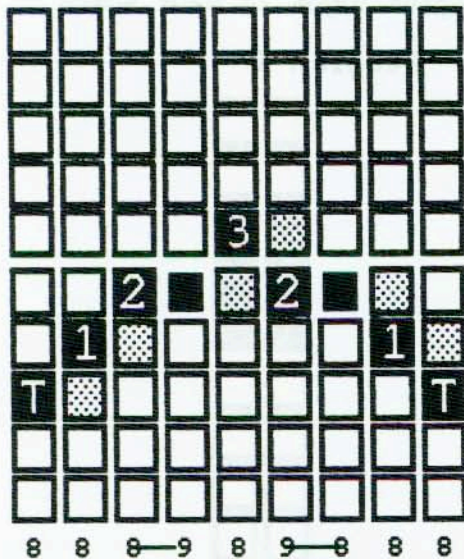
We can rewrite it in right hand tab like this.








All three examples will give you the same thing. The first two are exactly the same. The third example changes the fingering and uses a slide instead of the pedal. The fingering on example two is tricky, but can be done. Then solid square tells you that something is happening. In this case it's a pedal. The pedal gives your fingers a rest. That rest is enough time for you to move your fingers up a string. Notice how you use your second finger going up and your first coming back. They have to pick twice in a row. A slide or a pedal gives you that fraction of a second you need to move.

The lick that is shown is from Orange Blossom Special. I use various fingerings when I play it. As you start to get more familiar with RH tab, I'll start showing more things that can be shown. For example, we may want to show a pick block. Lets see how we can write this.

This tab lets you see more nuances of someone's playing. This sharing of the finer aspects of playing, can only lead to better playing in the future.

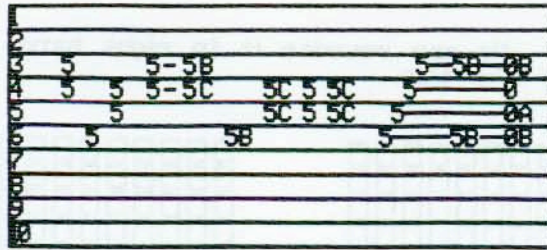


This is how I play this scale lick. The dots in the squares are telling me to place my pick back on the string to stop it from ringing. This is pick blocking. Below I've listed some other ways to block. I use different patterns to signify how.

-  This shows that something is taking place. You should look for a pedal or a slide.
-  A string that has nothing happening to it.
-  This is used to show a pick block.
-  This is to tell you to use a palm block.
-  This tells you to keep the string ringing.

RH TAB cont.

Here are some traditional tabbed licks, changed to RH tab.



The lick is in the key of A. What I've done is separate each movement. For discussion, I've numbered each move. With things divided up, you can see what each of your limbs have to do. With the pick blocking notation, you know just how to articulate any move.

Look below to moves 7, 8, & 9. If you notice these are pedal licks, but I've written them to be picked. You could pick the first one, and then use the pedal to get the other sounds. We can write it either way. The fingers would be replaced by solid squares. You would then have to look at either the fret, or pedal, whichever is articulating the move in question.

A palm block can generally be substituted for a pick block. It is personal preference that rules. We'll use the blocking notation to study and practice different methods of blocking. Understanding this notation makes it easier to show how you can develop this technique.

MOVE#

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
	2	□	□	2	□	□	2	2	2	□	□	□	3	□	3
	1	□	2	1	□	□	1	1	1	□	□	2	□	□	2
	□	□	1	□	□	□	□	□	□	□	1	□	□	□	1
	□	T	□	□	□	T	□	□	□	T	□	□	□	□	T
	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□
F	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
P						C	C	C	C						A
P					B	B	B	B	B					B	B

Here's the chorus to steel guitar rag. We can use repeat signs to save space.

Section A

Section B

Section C

□	□	□	□	□	□	□	□
□	□	2	□	□	2	□	□
□	□	1	□	□	1	□	□
T	□	□	T	□	□	T	□
□	□	□	□	□	□	□	□
□	□	□	□	□	□	□	□
□	□	□	□	□	□	□	□
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□	□	□	□	□	□	□	□
□	□	□	□	□	□	□	□

□	□	□	□	□	□
□	□	2	□	□	2
□	□	1	□	□	□
T	□	□	T	□	□
□	□	□	□	□	□
□	□	□	□	□	□
□	□	□	□	□	□
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□	□	□	□	□	□
□	□	□	□	□	□

□	□
□	□
2	□
1	□
T	□
□	□
□	□
□	□
□	□
□	□

11-12 12 12 12 12 12 12  
 11-12 12 12 12 12 12 12  
 11-12 12 12 12 12 12 12

11-12 12 12 12 12 next line  
 6-7 7 7 7 7 next line  
 4-5 5 5 5 5 to section C

11-12 THEN section C 6-7  
 THEN section C 11-12

The next section, **Total Hand Control**, starts to show you the possibilities of your right hand. Below we have an overview of the main sections. Take time to study each graphic. If at first you don't understand, come back at a later time and try them again. Here are the basic categories.

### Basic Fifteen

The first category I call the basic fifteen. Using four picks, on four strings, we have a graph representing fifteen ways to place your individual fingers on the strings. I sub-divide the basic fifteen into sub-groups of one, two, three and four. 1 to 4 are using one pick, these are individual. 5 to 10 are all the combinations of two, 11 to 14 are the threes, and 15 is all four together.

### Alternating

The next category is alternating. We take each of the first three groups and show all of the ways each can be played in an alternating fashion. You can then look at the combinations that can be attained by placing the possibilities of sub-groups one, two, and three can be alternated together. The possibilities are endless.

There is also an advanced alternating for those with a lot of time to kill.

### Finger Rolls

The third main category contains the finger rolls. This is done using sub-groups three and four. The finger rolls are divided into forward, backward, and forward/backward.

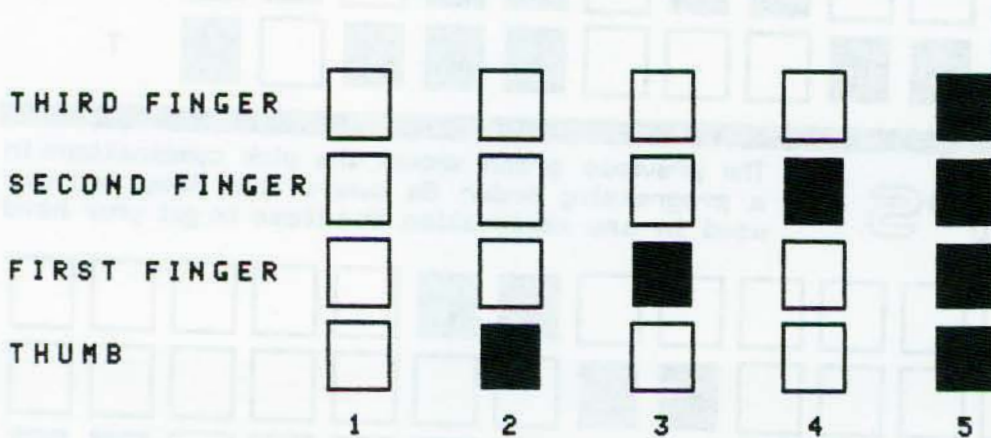
### Pick Grips

The fourth and final category are the pickgrips. I show all the ways four fingers can go over twelve strings. I also show three fingers, going over ten strings. Pickgrips help in learning chords.

These four categories are the main ones. I look at all the others as extensions of these four. I start at the smallest and move out to the largest. At the first of the section there's an introduction to how I portray the right hand with the graphics. At first they can be rather confusing, but once you're used to them you'll see more on your guitar than ever before.

# TOTAL HAND CONTROL

Here's where we really dig into the true potential of your right hand. We will deal with four picks. To visualize, what is taking place, we first need to learn to read a graph. This way we can communicate in pedal steel-ese. In this language, we will have four horizontal rows. Look at the first five examples below. Each finger and the thumb, has its own row. This way we can look at the physical moves. The only way to gain independence, in your fingers, is to go back to the basics and build your hands up. Try to learn the little moves, that go together, to make the larger ones. Be in **TOTAL CONTROL**.



Underneath each vertical column I've placed a number. Look at number one. We see four squares like building blocks. They are all empty which means to have your hand ready over the strings. In the second row we see the thumb is blacked out. That tells you to start the string in motion with that finger. Number three tells you to play a string with the first finger. Number five, is all 4 fingers in unison.

To learn your right hand moves, we will place our picking fingers on any three or four adjacent strings. If you use three picks place a ruler over the top row if it throws you off. Try to memorize the feel of the roll without worrying about what the sound will be. After we get used to the rolls, we'll study how they go over the strings. If you're not used to the pick on your third finger, try it a little at a time. I thought I could never get used to it, and now I can't play without it. Now that I can use it, I can take it off if I need to for a lick. Lets review the squares one more time. We can use dot patterns to represent different functions. We can communicate about what the right hand can do.

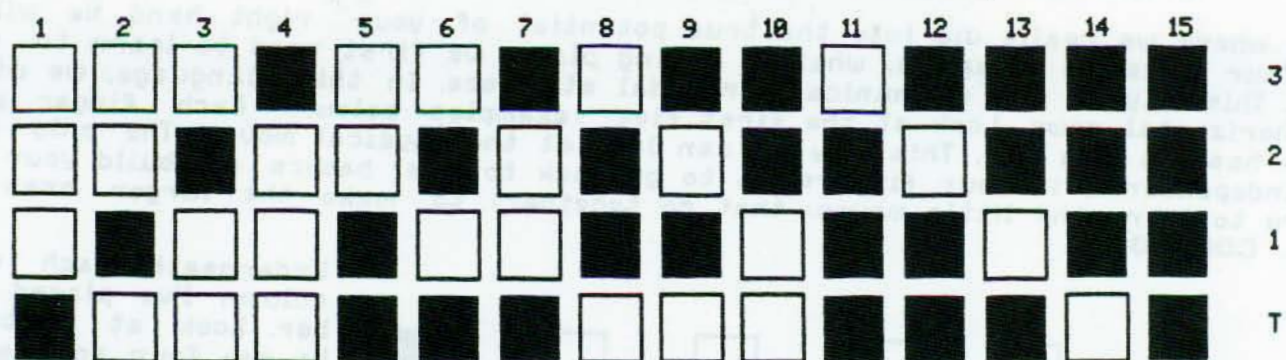
- 3** A 3 with a solid background represents the third finger. The solid background is to signify that a string is vibrating. You've turned the sound on.
- 2** The 2 represents the second finger.
- 1** A 1 represents your first finger.
- T** The T represents the thumb.

This is the basis for the way I study my right hand technique. As you get a little more familiar with the squares, I'll start adding different backgrounds, that will tell you ways to articulate the string. It can be used to show you whether to palm block or pick block. When you study pick blocking, I'll use this method to do exercises that will build better technique. On the next page, I've taken all four picks and shown them in combinations with each other. The thing to notice, is how we start with the simple moves and proceed to the more complex. They become the BASIC FIFTEEN.



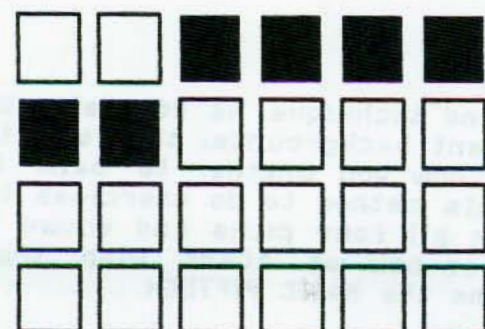
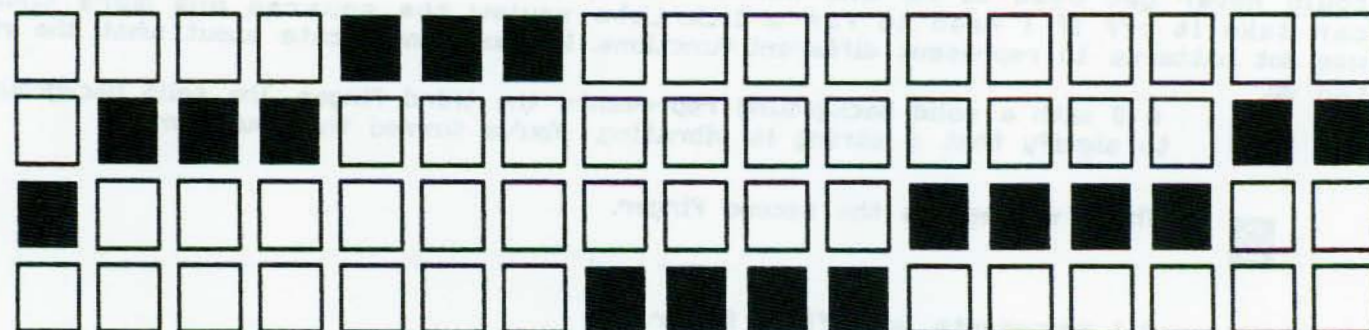
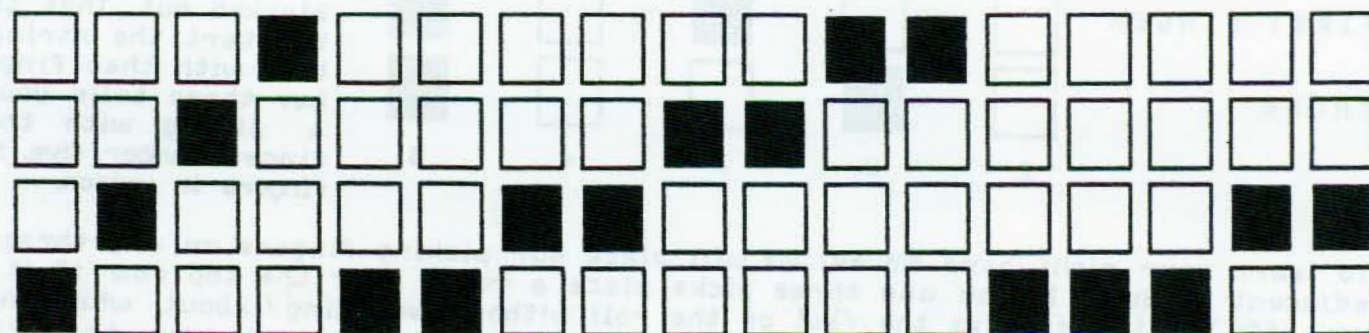
# BASIC 15

Below we have what I call the Basic Fifteen. Thumb, first, second and third fingers, showed singularly, and then in combinations of one, two, three, and four fingers.



## WARM-UPS

The previous graph shows the pick combinations in a progressing order. Be aware that they can be used in any combination. Use these to get your hand



and eyes used to using the charts. These have you working each finger once, twice, etc. On the pages that follow, we'll start putting these basic 15 together. First we'll do the alternating, and then we will work on some rolls.

Going back to the top row, look at the last one. The hand is in a closed position. If you were to start opening the distance between fingers, you can figure out, all the ways, four fingers can go across the strings. This is covered in the Pick Grip section. Lets move on to the alternating of the two fingers.

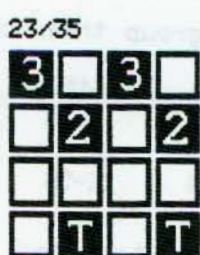
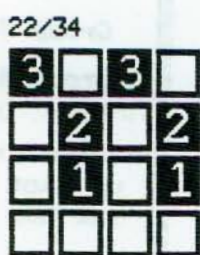
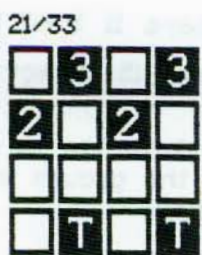
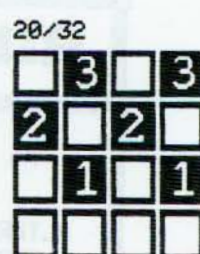
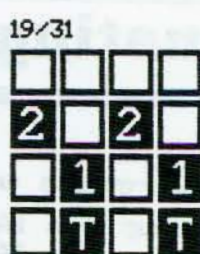
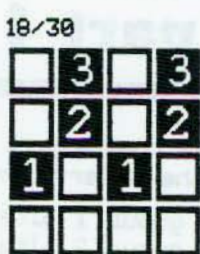
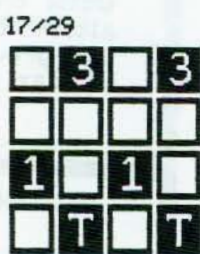
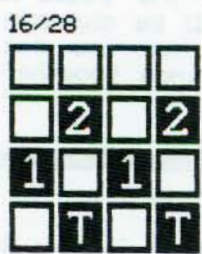
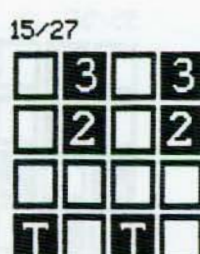
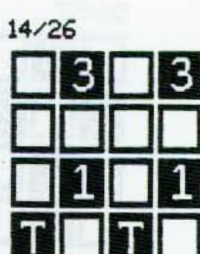
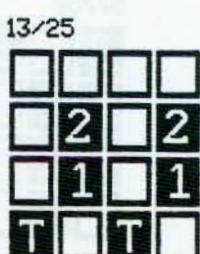
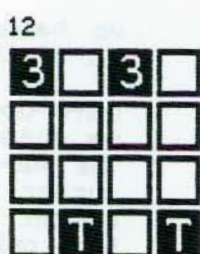
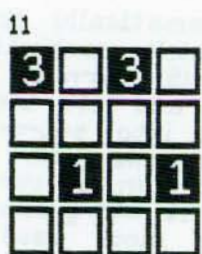
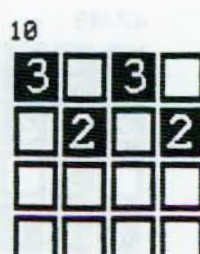
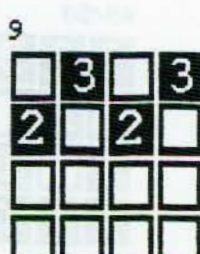
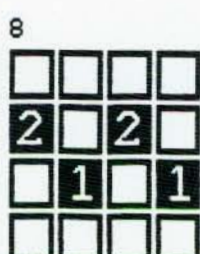
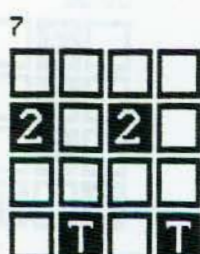
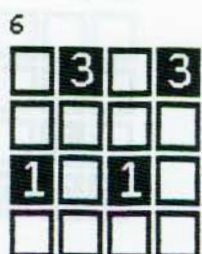
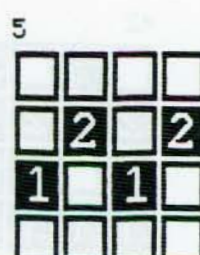
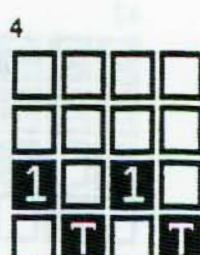
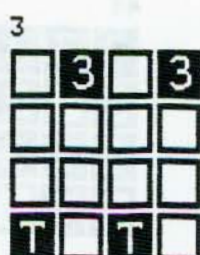
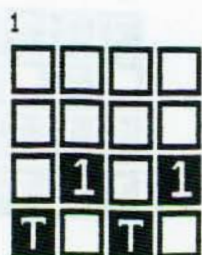






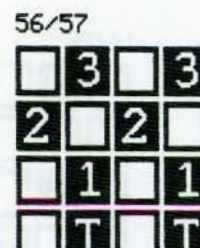
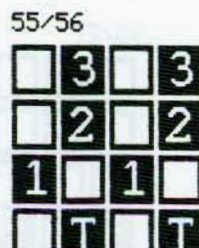
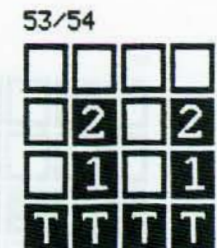
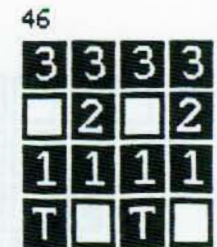
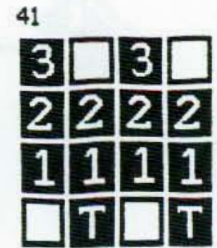
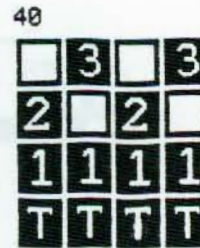
# ALTERNATING

## Part 1



1-12 are Group 1  
13-36 are Group 2

You can play each of group 2 in two directions. Read them left to right, and right to left.



We have systematically applied all of the possible combinations of the Basic 15. Turn to the warm-ups page and let's see how we divide those into sub-groups. The sub-groups come from the number of blocks in a vertical column. The first sub-group all have only one block used. The second has two, etc. Here they are listed for you. Be sure to think only of the Basic 15. The alternating will be divided into sub-groups to help you see how we can put things together.

## Alternating part 1 cont.

As we alternate the 15 basic, we start to see sub-groups within the alternating.

- ALTERNATE group 1 is BASIC 15 group 1 alternate.
- ALTERNATE group 2 is BASIC 15 group 2 alternate.
- ALTERNATE group 3 is BASIC 15 group 3 alternate.

We can use the numbers to group them with. Alternate groups are:

- group 1 1-12
- group 2 13-36
- group 3 37-50
- group 4 51-58

Group 4 is basic 1 & basic 3 alternated.

### THE BASIC 15

- Group 1: Numbers 1 thru 4
- Group 2: Numbers 5 thru 10
- Group 3: Numbers 11 thru 14
- Group 4: Number 15 (pickgrips)

These are found on the warm-up page. Study the groups and see how they grow.



# ALTERNATING

## Part 2

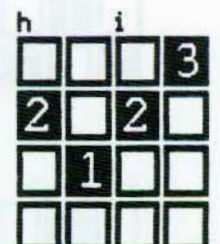
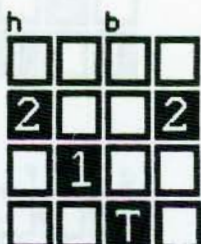
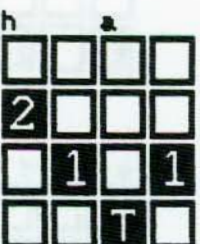
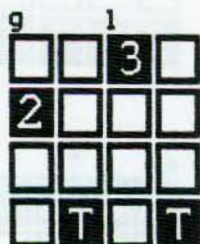
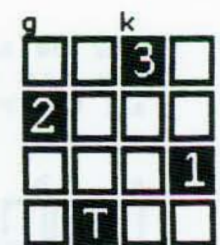
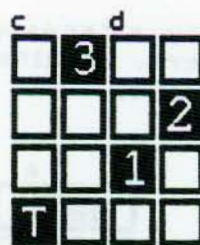
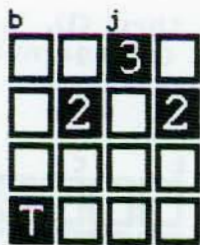
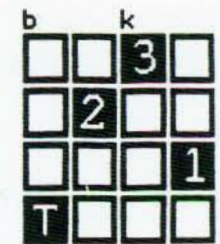
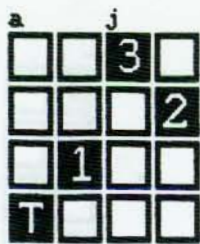
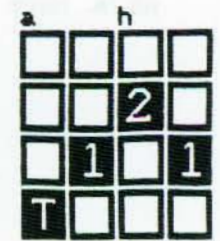
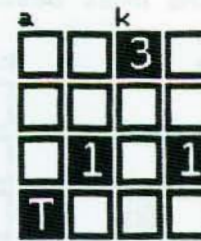
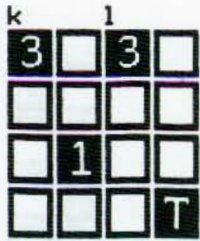
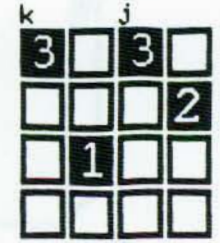
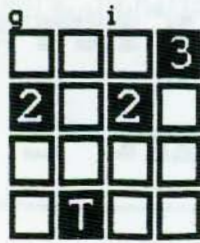
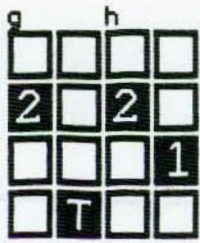
To continue, let's look back to alternate group 1. This time we'll letter them using ABC's. Here are the most basic alternates.

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Now we are going to get serious. We are going to alternate (a) thru (l). You can see how its done, by following the letters. We alternate (a) against all the rest first. Looks so simple. **STUDY!! STUDY!!**

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# alternate part 2



# alternate part 2

h		j	
		3	
2			2
	1		

h		k	
		3	
2			
	1		1

h		l	
		3	
2			
	1		
			T

i		a	
	3		
2			
			1
		T	

i		b	
	3		
2			2
		T	

i		c	
	3		3
2			
		T	

i		d	
	3		
2			2
		1	

i		e	
	3		
2			
		1	
			T

i		f	
	3		3
2			
		1	

i		g	
	3		
2			
		T	

i		h	
	3		
2		2	
			1

j		a	
3			
	2		
			1
		T	

j		b	
3			
	2		2
		T	

j		c	
3			3
	2		
		T	

j		d	
3			
	2		2
		1	

j		e	
3			
	2		
		1	
			T

j		f	
3			3
	2		
		1	

j		k	
3		3	
	2		
			1

j		l	
3		3	
	2		
		T	

k		a	
3			
	1		1
		T	

k		b	
3			
			2
	1		
		T	

k		l	
3			3
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k		q	
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k		h	
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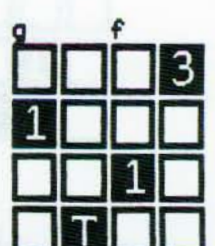
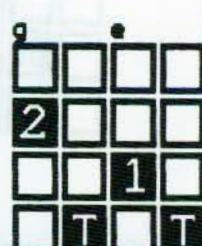
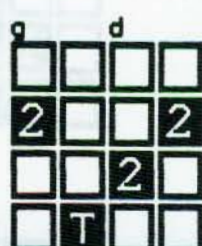
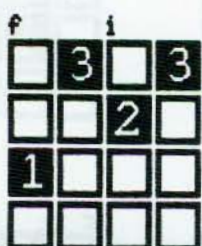
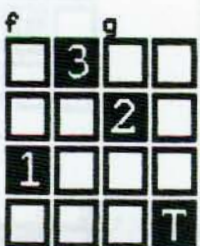
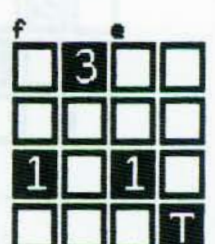
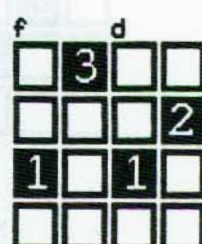
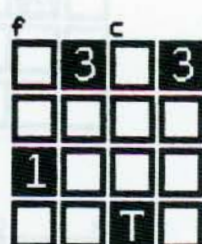
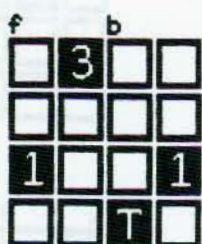
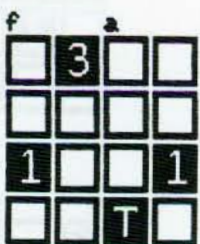
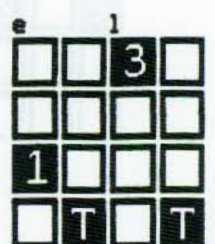
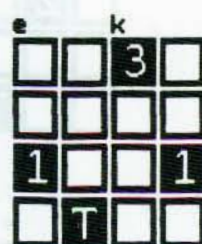
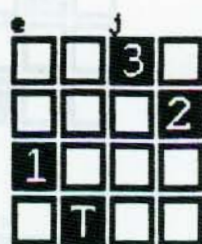
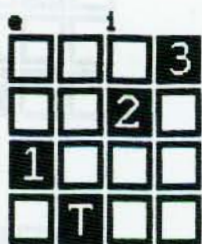
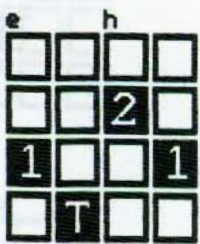
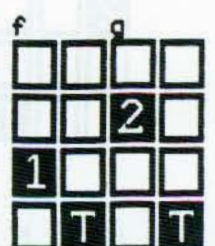
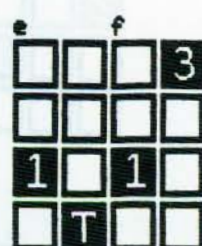
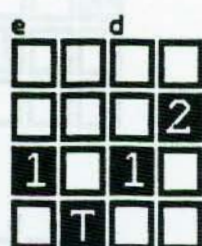
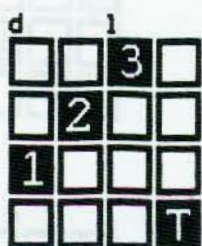
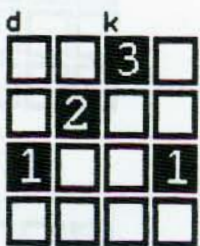
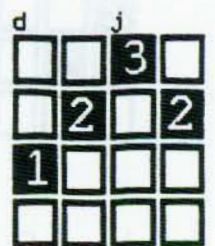
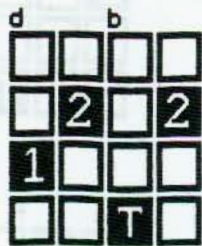
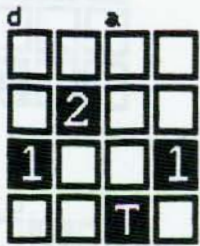
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l		d	
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			2
		1	
	T		

c		h	
	3		
		2	
			1
T			

c		i	
	3		3
		2	
T			

## alternate part 2





# FINGER ROLLS



The finger rolls can be used to bring you many new licks. Below we have right hand tab. The first six are your main movements. These should be committed to memory. I've given them names to help remember. To examine them, we will use **T**, **1**, & **2**. Any group of three fingers will work. You should be able to play them in all combinations. The thumb, first, and second finger are the strongest.

Practice this: 

2
1
T

 or 

3
2
1

 or 

3
1
T

 or 

3
2
T

Forward thumb start

□	□	2	□	□	2	□	□
□	1	□	□	1	□	□	1
T	□	□	T	□	□	□	T

Forward second start

2	□	□	2	□	□	2	□
□	□	1	□	□	1	□	□
□	T	□	□	T	□	□	T

Forward first start

□	2	□	□	2	□	□	2
1	□	□	1	□	□	1	□
□	□	T	□	□	T	□	□

Backward second start

2	□	□	2	□	□	2	□
□	1	□	□	1	□	□	1
□	□	T	□	□	T	□	□

Backward thumb start

□	2	□	□	2	□	□	2
□	□	1	□	□	1	□	□
T	□	□	T	□	□	T	□

Backward first start

□	□	2	□	□	2	□	□
1	□	□	1	□	□	1	□
□	T	□	□	T	□	□	T

Forward/Backward 1

□	□	2	□	□	□	2	□
□	1	□	1	□	□	1	□
T	□	□	□	T	□	□	□

Forward/Backward 2

□	2	□	□	□	2	□	□
1	□	1	□	1	□	1	□
□	□	□	T	□	□	□	T

Forward/Backward 3

2	□	□	2	□	□	□	2
□	□	1	□	1	□	□	1
□	T	□	□	□	T	□	□

*continued*



# Finger Rolls cont.

Backward/Forward 1



Backward/Forward 2



Backward/Forward 3



To see how we can get more out of the rolls, we have to learn to approach things in a different light. The first of the rolls is the forward.

## Forward Roll:

I've separated the forward roll into three categories. If you play them all one after another you will be playing just a simple forward roll. When you start the roll of one of the divisions, you get a different sound. It is important to teach each finger to start a roll. There are different muscles that are involved. To recognize how the same roll brings us different music, place your picks on three adjacent strings. We can have three separate notes and the rolls play them in different orders. Just by changing the physical, we can rearrange the musical.

## Backward Roll:

Turn the forward roll around and it becomes the backward roll. The same theories apply to its use. The fingers have to learn to start, stop, and take off in different directions. This ability to control your fingers is independence. Independence is freedom and freedom is better than being limited by your hand.

## Forward/backward--Backward/forward:

Each of these place the two directions, together. Notice how busy the first finger is. Use three notes and play them starting on the fingers. The directions all bring the notes to you in a new order. A new order to play your notes is found in your fingers. The B/F & F/B rolls are to be studied in groups of 8 across. Lets look at F/B 1.

We can see that there are eight movements grouped together. Reading left to right look at the first four moves. That's the basic lick. The key number here is 2. We have to remember that music is divided into groups of two, four, eight, and sixteen. The movements of the F/B rolls, are good for playing eighth and sixteenth notes. We'll put this together later in the book.

You'll be amazed to find out just how fast you can get your fingers to do the rolls. The best way to learn them is to learn the first four moves real slow then do the same move over and over. Speeding up and slowing down, always under control. As you get more proficient, play the separate rolls in groups of 2, 4, and 8. The fingers need lots of practice to build up the muscles. Play these over and over as exercises.

You'll find more and more licks by applying the basic rolls to different strings and to different pedal combinations. The section entitled Putting it All Together, goes into these ideas a little more in depth.

# ALTERNATING

## part 3 advanced

1

	2		2
1	1	1	1
T		T	

2

	3		3
	2		2
1		1	
T		T	

3

	2		2
1		1	
T	T	T	T

4

	3		3
1		1	
T	T	T	T

5

	3		3
1		1	
T	T	T	T

6

	3		3
1	1	1	1
T		T	

7

2		2	
	1		1
T	T	T	T

8

2	2	2	2
	1		1
T		T	

9

	3		3
2	2	2	2
T		T	

10

	3		3
2		2	
T	T	T	T

11

	3		3
2		2	
	1		1
T		T	

12

3		3	
	1		1
T	T	T	T

13

3		3	
	2		2
	1		1
T		T	

14

3	3	3	3
	1		1
T		T	

15

3		3	
	2		2
T	T	T	T

16

3	3	3	3
	1		1
T		T	

17

2		2	
1	1	1	1
	T		T

18

	3		3
2	2	2	2
1		1	

19

2	2	2	2
1		1	
	T		T

20

	3		3
2		2	
1	1	1	1

21

	3		3
2		2	
1		1	
	T		T

22

3		3	
2		2	
	1		1
	T		T

23

3		3	
2	2	2	2
	T		T

24

3	3	3	3
2		2	
	1		1

25

3	3	3	3
2		2	
	T		T

# Advanced Alternate cont.

□	3	□	3
2	2	2	2
1	1	1	1
T	□	T	□

□	3	□	3
2	□	2	□
1	1	1	1
T	T	T	T

□	3	□	3
2	2	2	2
1	□	1	□
T	T	T	T

3	□	3	□
□	2	□	2
1	1	1	1
T	T	T	T

3	3	3	3
□	2	□	2
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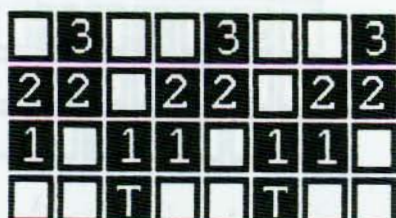
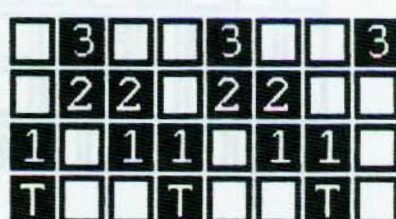
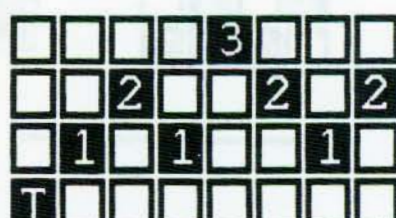
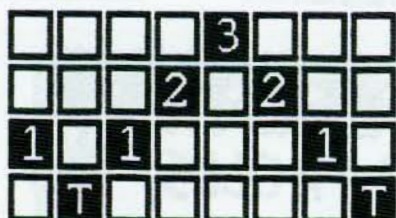
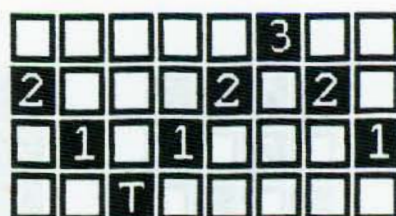
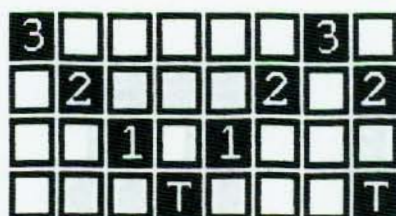
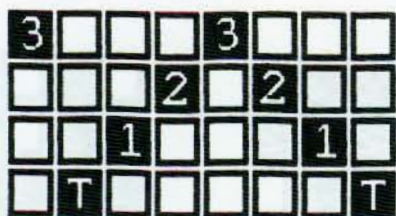
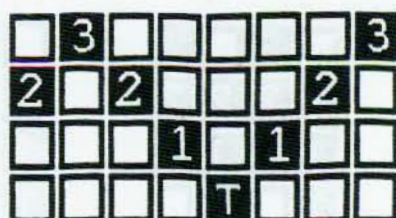
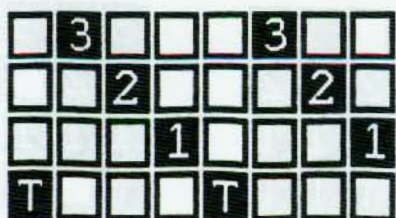
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advanced finger rolls cont.



# PICKGRIPS

When we started with the Right Hand graphics, I showed you what I call the Basic 15. We then divided those into sub-groups depending on the number of fingers used. We then alternated Basic 1, Basic 2, and Basic 3. The group that we didn't get to is group 4. These are what I call the PICKGRIPS.

The Pickgrips are used to study the right hand moves for chord work. Learning to play fast, clean chords, can be very confusing, to say the least. To help eliminate the confusion of the right hand, I wrote out all the possible pickgrips. Studying the PG's, as a concept, I found myself gaining more control of chords. The wider grips started to become automatic. The grips I used to avoid, became spontaneous. And spontaneity is a valuable asset for improvisation!!!

There are quite a few that are not practical because of the size of your hand. As you begin studying, play a few PG's considering the only the physical move. Learn to feel each of the grips, as you visualize the move. "Feel" each of the grips as you play.

Think of the grips and the symmetrical pattern, as it is, on paper. The touch can be thought of, while you are practicing. Then, when you play live, the conscious thought given in practice, will make the movement of your right hand a sub-conscious habit.

With one less thing less to throw you off, you'll have more time for playing the music. A chord run can be thought of as Pickgrip movements. It may escape you at first, but don't give up. The benefits, will soon outweigh the hardships of learning.

PICKGRIPS CONT. 

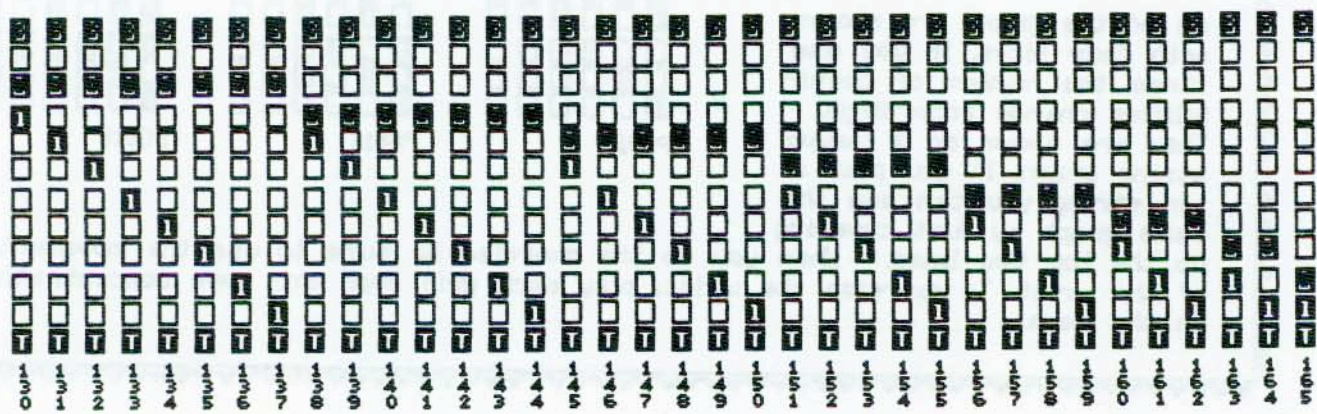
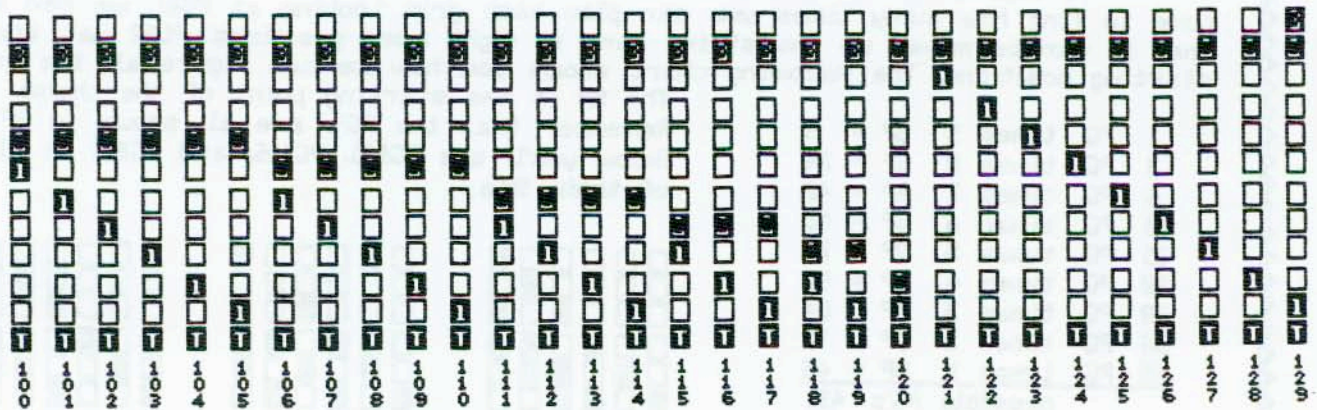








The following graph shows PG's 100-165. They are the widest possible grips.



REMEMBER PG = pick grip. Sp = starting point, which is the position of the thumb. Don't worry about anything except training the right hand. Pay close attention to feel and touch. Building up stamina in your right hand makes playing easier. Try this as a workout to get the hand in shape. The fret choice is up to you.

- |             |               |                |              |              |             |               |               |                |              |
|-------------|---------------|----------------|--------------|--------------|-------------|---------------|---------------|----------------|--------------|
| Exercise 1. | PG1<br>SP8    | PG 3<br>SP 8   | PG 9<br>SP 9 | PG5<br>SP8   | Exercise 4. | PG 24<br>SP11 | PG 27<br>SP12 | PG 65<br>SP 10 | PG 2<br>SP 5 |
| Exercise 2. | PG13<br>SP 9  | PG 15<br>SP 10 | PG 1<br>SP 8 | PG 8<br>SP 8 | Exercise 5. | PG 30<br>SP12 | PG 28<br>SP11 | PG 22<br>SP 9  | PG 1<br>SP10 |
| Exercise 3. | PG17<br>SP 12 | PG 5<br>SP 9   | PG 2<br>SP 5 | PG 3<br>SP12 | Exercise 6. | PG 1<br>SP 12 | PG 2<br>SP11  | PG 3<br>SP 10  | PG 4<br>SP 9 |

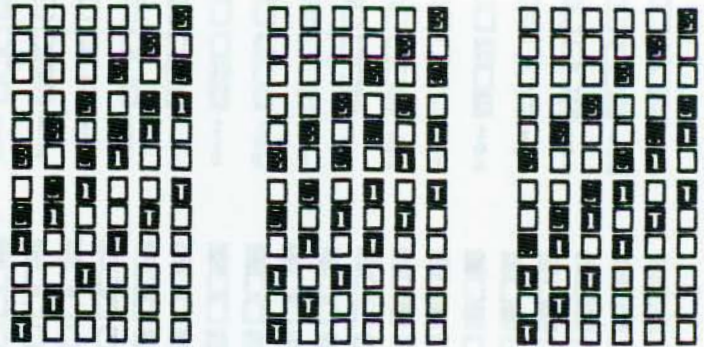
Another good exercise is to take a song you already know and figure the PG's. Try and go through the PG's in your mind, before you play the song. The results of the exercising should be increased improvement in your control. Better control leads to more confidence. More confidence leads to less fear of certain chordal situations. Drill them over and over to get them to sink in. Practice. Practice. Practice!!!!!!



To figure all the possible ways to place your fingers on the strings, we have to find how many times you can play each grip. Looking at PG#1, we can see that it can be moved up the string bank in eight more positions. PG#2 has six starting positions. The following chart shows you how we can figure all the grips.

1	PG	times	9	SP =	9	
3	PG	times	8	SP =	24	
6	PG	times	7	SP =	42	
10	PG	times	6	SP =	60	
15	PG	times	5	SP =	75	
20	PG	times	4	SP =	80	
28	PG	times	3	SP =	84	
36	PG	times	2	SP =	72	
45	PG	times	1	SP =	45	
					possible PG's	491

The SP is the starting point of the thumb. Remember that the PG's are all shown in SP12. Below you'll see PG#15, PG#16, and PG#18 in all of their SP's.



PG#15

PG#16

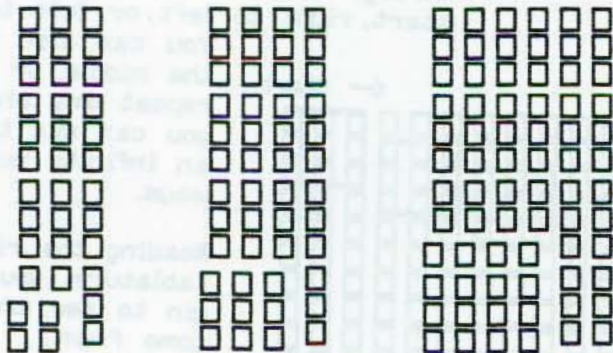
PG#18

All of the grips are shown with four picks. If you use three, the number of possibilities change accordingly. They are shown on a twelve string graph. If you play a ten string you can use the same graph by just covering up the top two lines. When you do the exercise be sure to use the movement of the wrist. To exercise the wrist, play each grip over and over concentrating on the move.

The pickgrips give your hand power. To really develop them go back to the double hits and apply that theory to the PG's. You'll find out what condition your hand is in real fast doing these. Expect your arm, fingers, hand, and wrist to fatigue fast. The number of repetitions you use should coincide with your abilities. You can build stamina with the use of drills. Do the same thing over and over until you can do it no more. Then, move to another and work it. Then go back and do the first one again. You can work on the right hand and then the left, while the other is resting. Make up your own exercises depending on what you need to improve on. Some days, I'll work on one aspect of playing, and see, just how proficient I can do it. **THINK and Practice!!**

# Right Hand Across

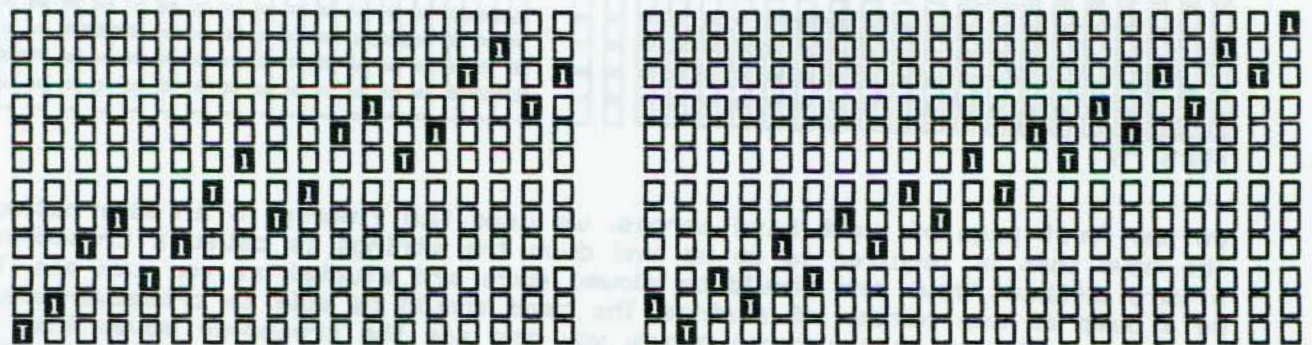
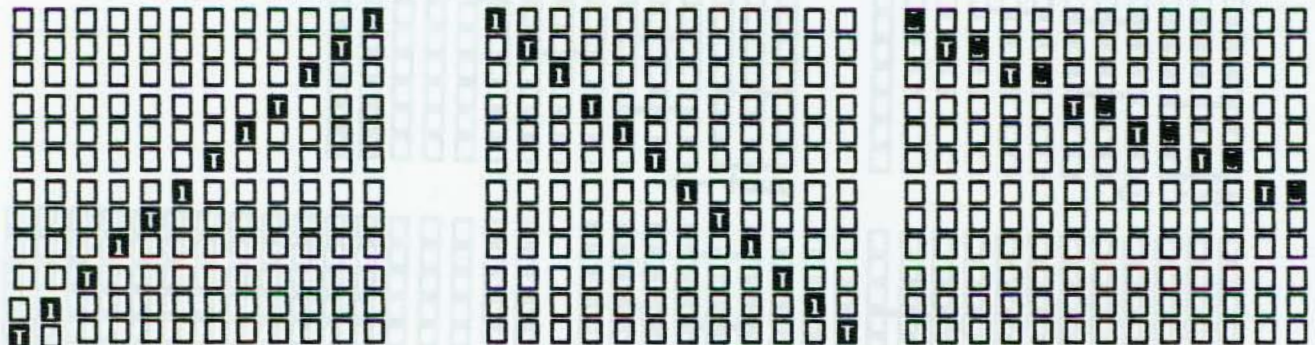
To understand what is meant by the right hand across, we must look at two, three, or four fingers. We can see this by taking a section of the RH tablature. The following takes out a group of two from the lower left hand corner. We also see three, and four.



Looking at the two group, we must be aware that you can use **1 1** or **1 2**. You can use either one depending on which you prefer. I learn both of them as separate techniques. Of all the two's, you can have these possibilities.



To see how these can go across the strings, we will look at the the four squares. The movements can be seen on the graph.



Another thing to remember, is that you can play these starting left to right, or right to left. The movement is what you are learning. And every move can be seen as starting at the top, or at the bottom.

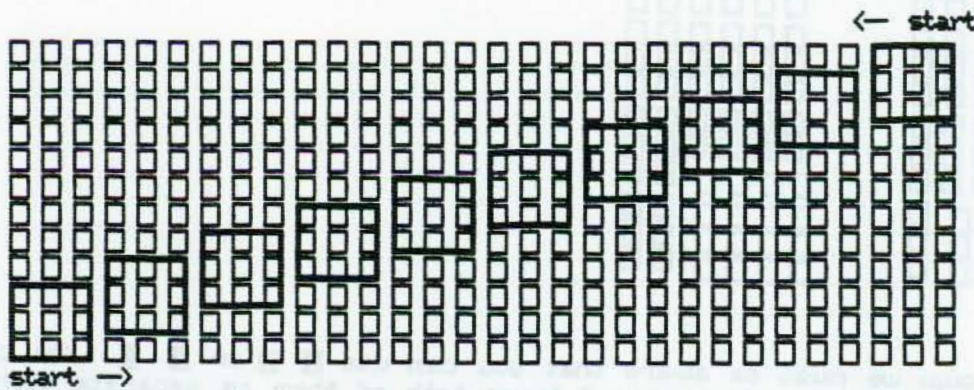
The previous page shows two fingers alternating and going across the strings. The examples start at the bottom and go up or vice versa. You can also start in the middle and go in either direction. For these examples I'll show the rest in the same manner. I use these as exercises for building muscles in your right hand. As you look at the three groups, keep in mind the finger rolls.



In the squares below, we can see how we can move the rolls across the strings. Be sure to remember you can start, right to left, or left to right.

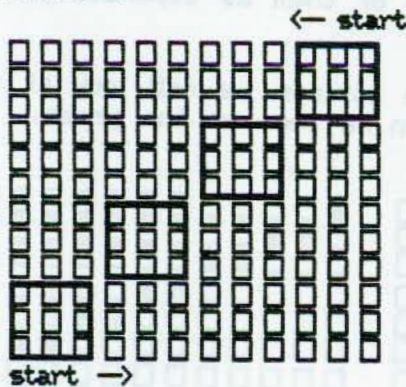
You can also start in the middle. Or you can repeat any one, and you can mix them in an infinite number of ways.

Reading the right hand tablature, you can begin to see where licks come from.



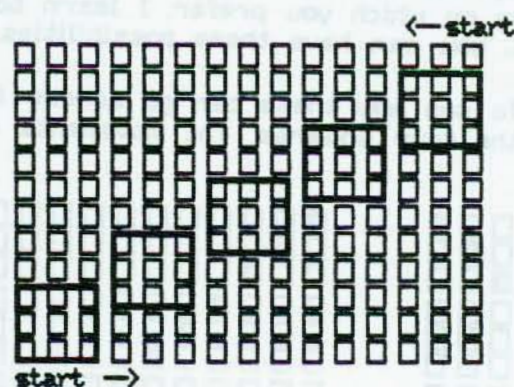
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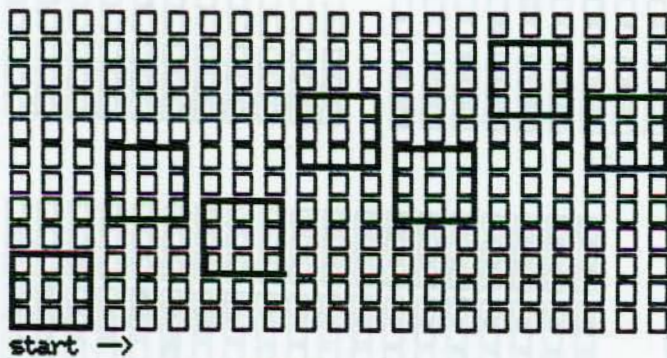
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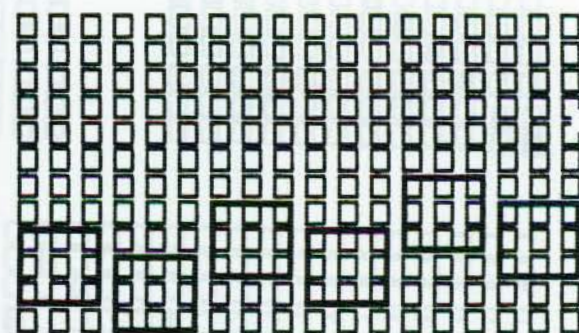


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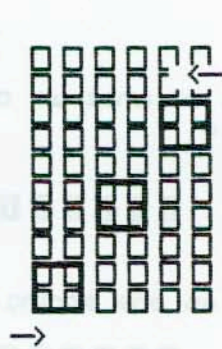
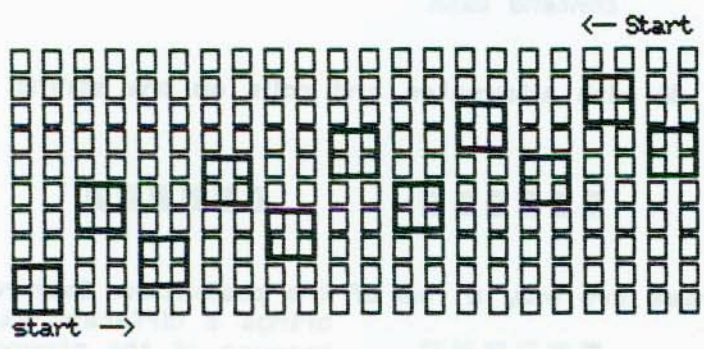
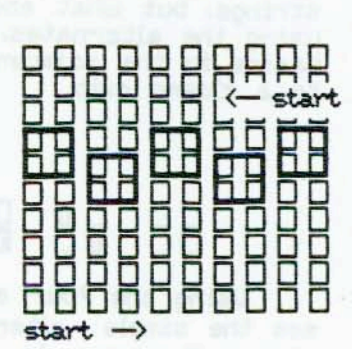
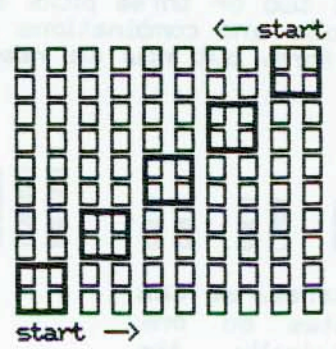
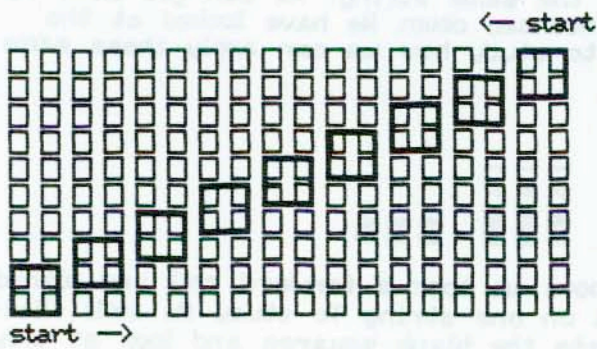
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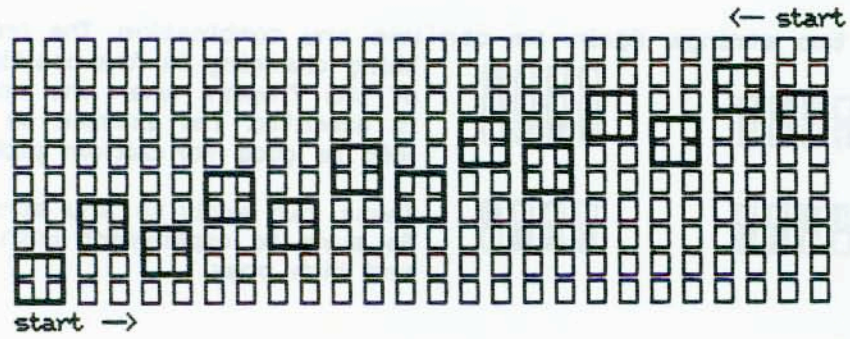
On the first page of right hand across, we used two fingers in an alternating fashion. The move that is required to go up and down the strings is called a crossover. This is a very difficult move and should be slowed down and studied, as you can see. There can be a jump of any number of strings. The hand should be able to crossover any number of strings. Looking at the three groups, you can see the crossover moves that you can do. These movements are what brings you your licks. The more moves your hands can execute, the more situations you'll be ready for. As we continue, lets go back and see the two group placed over the strings.

To continue, we will take another look at the two finger alternates. These are to show you movement. How you use them depends on what you need, musically. Substitute a square from the left, for those on the graphs below. Use one at a time and then mix up different combinations of a, b, c, or d. Work on your independence.



Did you notice we are using a ten string graph? The moves are the same, only thing is that we have more to work with on a 12.

Practice playing these up and down. And then down and up. Your fingers should be able to start and stop in any direction. Be sure to think of these things as you practice.



The important thing to remember is not to let your hand get locked in one position. You should see your hand as a movable, pliant object. Anchoring your hand places a limitation upon yourself. This thinking places restrictions on what you can do. Free your thinking and technique will follow. Only after hours and hours of practice, can you hope to make gains. Keep at it, don't give up. Rome was not built in a day.

For those of you who use four picks, I haven't included them in the RH across section. You should be able to see from the two and three pick examples what the hand and fingers need to know.

# CLOSED GRIPS

We've worked with our hands stretched wide and with the fingers on adjacent strings, but what about two or three picks on the same string? We can get licks by using the alternates, rolls and combinations condensed down. We have looked at the basics in the adjacent form, but now we need to study how we can apply those same to a closed grip.



Using the four squares, we can see the simple alternates on one string. The move is basically the same, but your fingers have to learn to share a string.

Above we took a forward roll and placed it on one string. To study it, we'll eliminate the blank squares and look at only one row. This gives us one string to contend with.

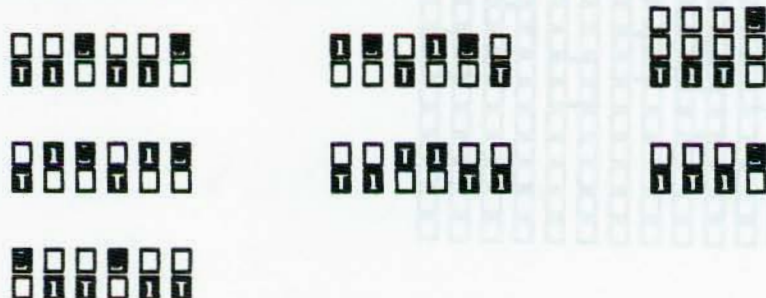
Here are some examples of what we can do with alternates and rolls on one string. On any string, do these:



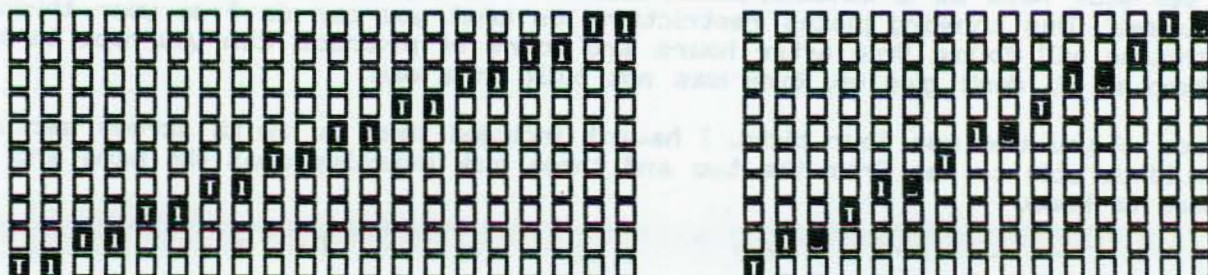
These are finger rolls on one string. These are only a few of the possibilities. Each roll brings a different sound because of the strength of the fingers. The thing to see is the potential for licks.



These concern your hand with two strings. Again, we can use any combination. The only thing changing is the position of the fingers when the roll is executed. The example to the left is good for chicken picking. These can apply to any strings. Be sure to experiment with low and high ones.



The next two are examples of a closed grip going across the strings. The same theory applies to all of the closed grips.



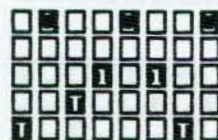
# BANJO ROLLS

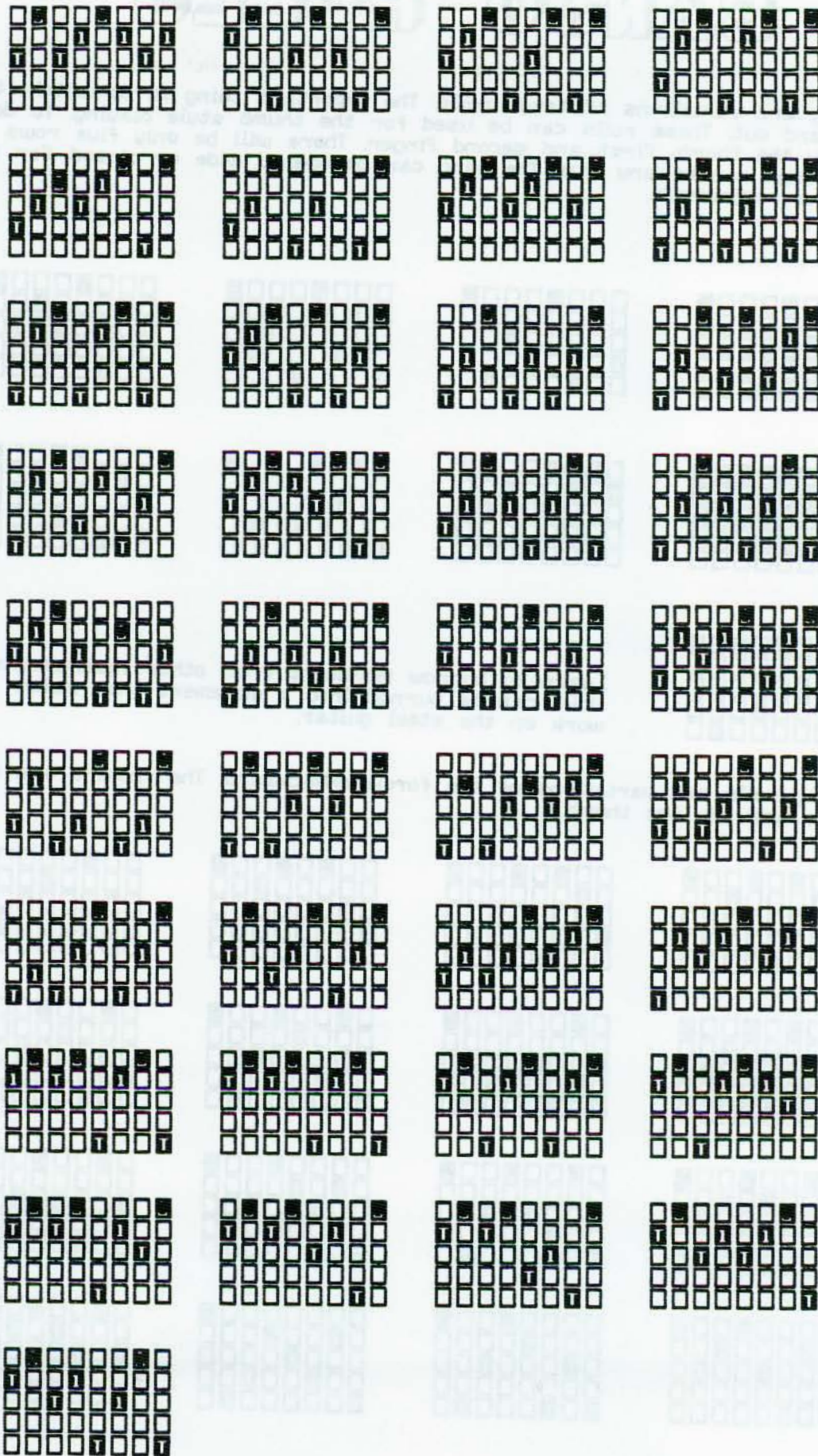
The following are variations of banjo rolls. The important thing is to watch the thumb working in and out. These rolls can be used for the thumb style playing. To do these, we will use only the thumb, first, and second finger. There will be only five rows of strings. The five strings can be any five. The hand can be opened wide or closed. For study we will place them adjacently.



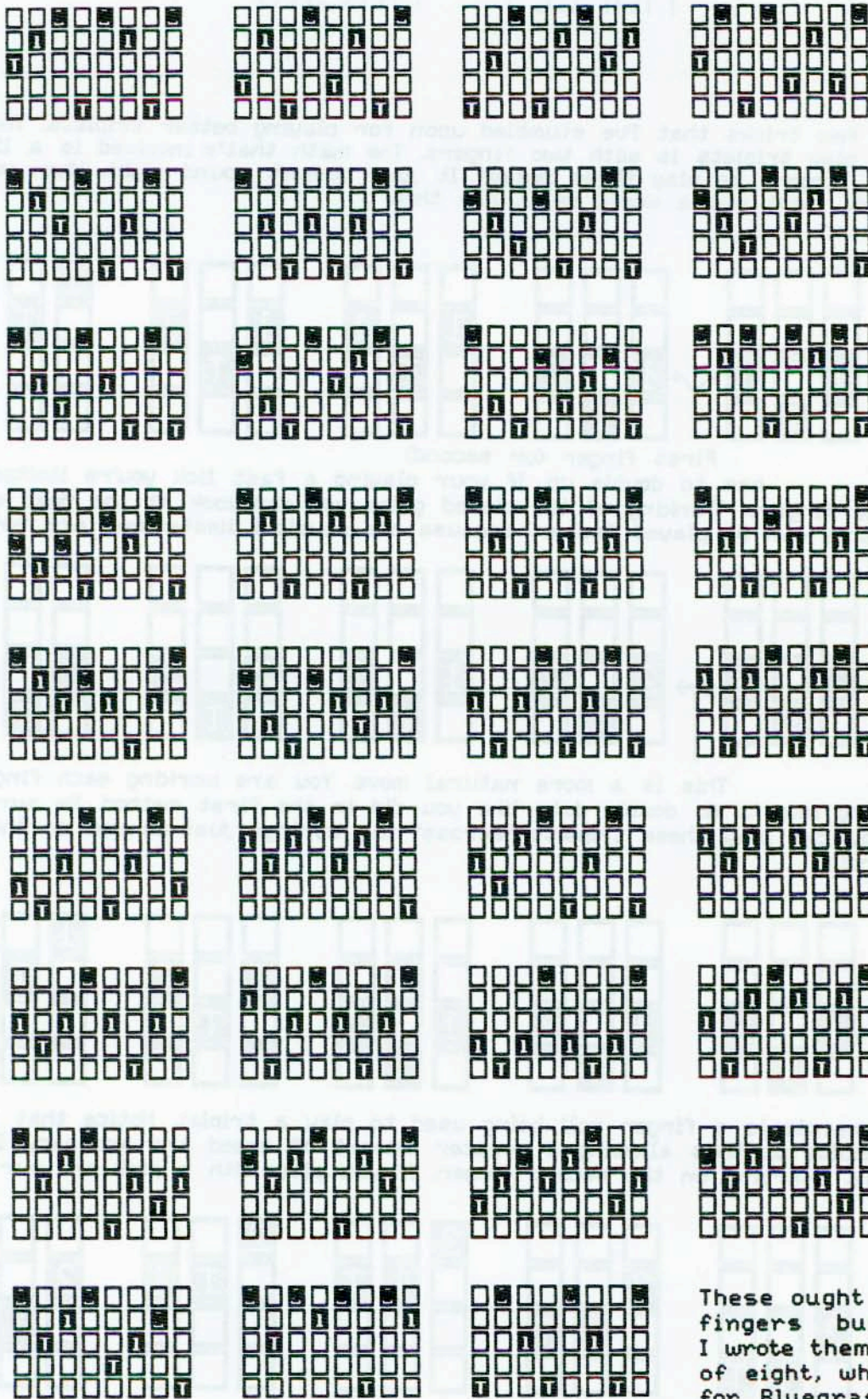
Learn to borrow movement from other instruments. The licks can be turned into a movement that makes them work on the steel guitar.

The following rolls are variations of the forward/backward. The fingers are moving in and out, as well as, the thumb.







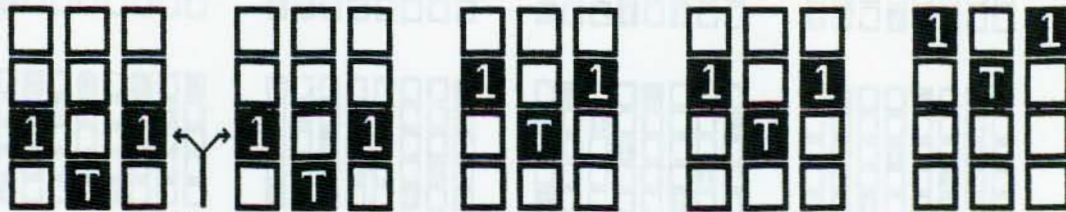


These ought to keep your fingers busy for awhile I wrote them all in groups of eight, which are good for Bluegrass tunes. Eighth notes are the root of banjo

playing. For now, use these as exercises. As you learn more music theory, you'll start to see places to use the rolls in a song. Before you can use them your hand has to know the moves. The rolls progress in an orderly fashion, with each finger used as a starting point.

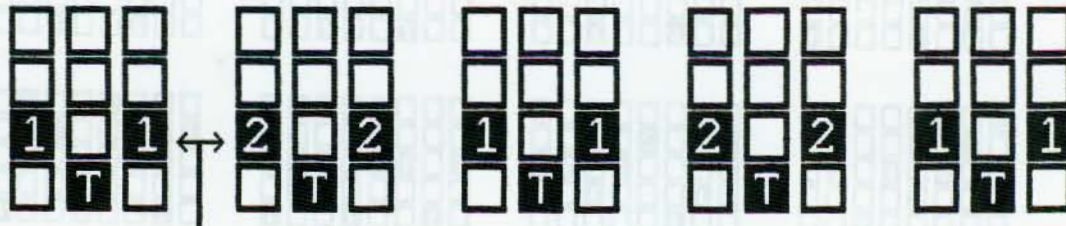
# TRIPLET TRICKS

Here are a few tricks that I've stumbled upon for playing better triplets. The first way most people play triplets is with two fingers. The math that's involved is a little out of balance. Two fingers to play three notes? It just doesn't sound right. When you're playing a triplet lick, most people would do it like this:

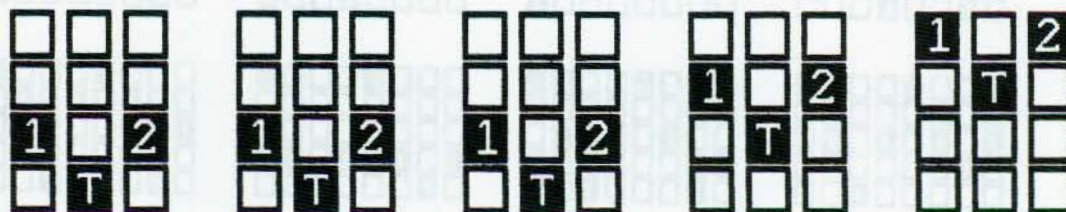


First finger (or second)

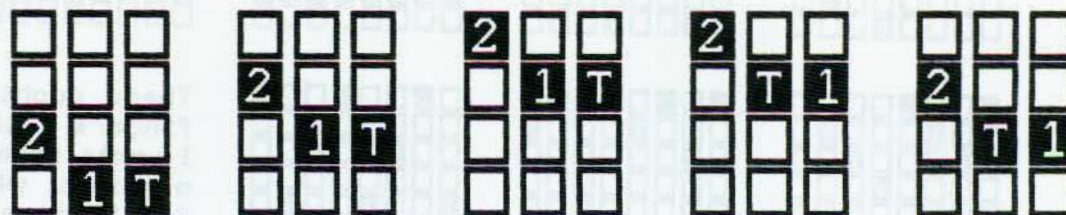
has to double up. If your playing a fast lick you're limited to the speed of you fingers. Thinking of the closed grips, we can look at the next example and see where this can be played faster, because the physical limitations are not a factor.



This is a more natural move. You are working each finger off the thumb. Nothing has to do double duty like you did in the first method. Be sure to remember that you can play these triplets "across" the strings just as you do the alternates, or finger rolls.



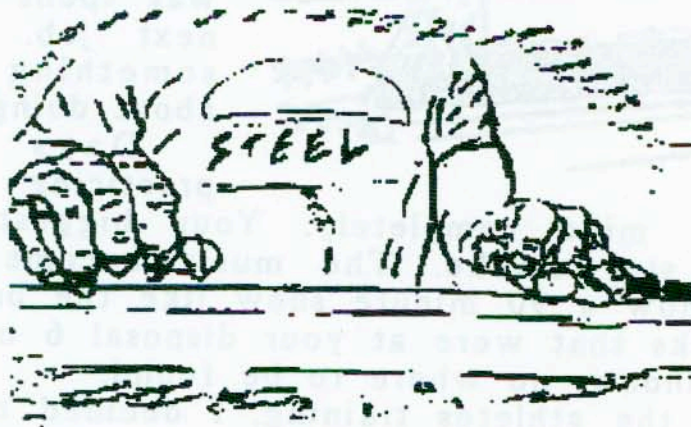
The above example is a finger roll being used to play a triplet. Notice that nothing is having to double up, thus allowing a greater amount of speed and accuracy. Below we see a roll that's starting on the second finger.



you can substitute it in place of 2. The same theories apply. You'll find this technique extremely useful on those 4/4 country swing tunes that most bands play about twice as fast as the record. Slow the moves down and learn the basics. Then, apply them going up and down the string bank. Every move is a lick somewhere.

# MY APPROACH

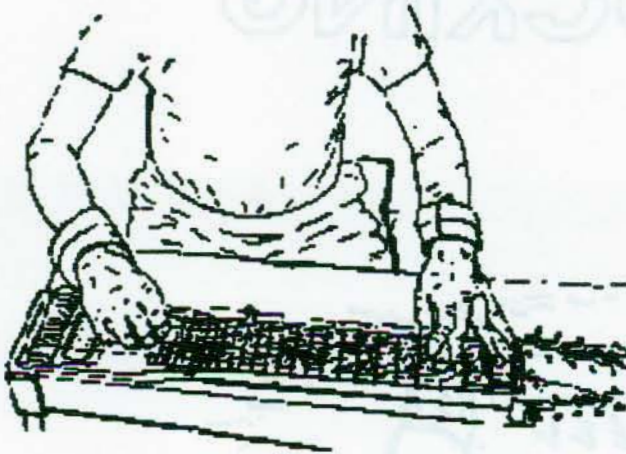
## BLOCKING



## BLOCKING

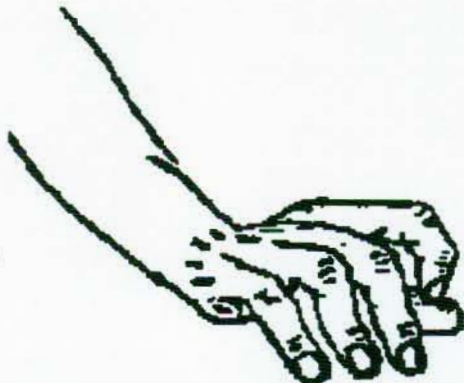
My method of playing, came about from many different influences and needs. The whole concept came to me as I was watching the '84 Olympics. Those athletes were in such superb condition and in Total control of what they were doing. The training was what made the difference. The best, work for the honor.

Working in a club, as I did, 6 nights a week, I learned to play steel guitar. Doing it every night, makes you get a lot of experience behind your guitar. This experience, is from repetition. Over and over, my hands had to play something, to keep the job. As I started to play concerts and theatrical shows, I wasn't getting as many hours behind the guitar. Most of my time was spent travelling to the next job. Practice became something you thought about doing.



Days go by and practicing starts to fade from your mind completely. Your biggest worry becomes trying to stay awake. The music becomes automatic. You start to know a 90 minute show like the back of your hand. All the licks that were at your disposal 6 months earlier, are out the window, no where to be found.

Seeing the athletes training, I decided to try training on my steel. Working on all the things I could think of to improve. To train, I started using weights. That's right, weights. Whenever I practiced, I placed 5 pounds on my ankles and 1.5 pounds on my wrists.



Everyday, I went through about three hours of nonstop work outs behind the guitar. The weights were awkward and almost impossible. But, after much pain and

lots of anguish, I got used to wearing them. I started to feel strange without the weights.

10 Proficiency falls during the year as you go without practice.



The graph moves higher with practice.

New licks were coming to me, spontaneously. I started to develop more control over my hands, fingers, knees, and feet. The licks that I had lost started to come back. It got easier.

Soon, I was back on the road. No practice. My level of efficiency started to fall. After about six months, all of my hard work had vanished. Back

to square one. Out come the weights. It was amazing that it only took about a week to surpass my previous technique level. The first time I worked about a month. The reason it took less time was I didn't have to learn the techniques. I had already went through the learning process. It was a matter of, rebuilding the muscles that had lost their power and coordination.

The use of the wrist weights brought me an entire new way of playing. I was already using pick blocking in my playing, but now, I had these awkward weights on my wrists. This kept me from laying my forearm on the pad. (Bottom neck is padded) I had to hold my forearm suspended over the strings and pad. The result was I started to notice the contribution of the forearm.

To hold your hand; over the strings, with a weight on your wrist, while picking the strings, your arm feels like its going to fall off. Two good things came from these weights. I learned to pick block while holding the palm of my hand over the strings and increased my strength in both hands.

I no longer feel bad about the condition of my **chops**. I had figured out the movements that

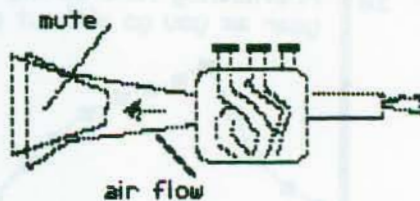


second finger raised

make a steel work, discovered ones that had never been

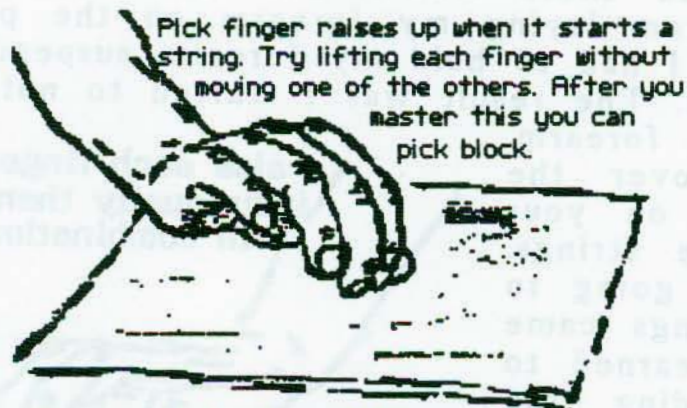
approached, and used weights to increase my physical proficiency as a player. I realize that in one week I can increase my proficiency level, as far as playing is concerned.

The art of blocking is a study in itself. The way I came about my way of thinking, was when I thought about the computer, controlled robot, playing steel. This thinking, started to manifest itself in my mind. The opening of the mind to new thinking became extremely helpful in making me a better player.



When a trumpet player places a mute over the bell of his horn, he is restricting the vibrations. He is altering the way they come out by blocking the air flow. When you pick a string and then mute it you are changing the vibrations. We start a string in motion and then stop it. In talking about this as steel players we refer to it as blocking. You can also pick the strings when you have them muted. This restricts their movement. In theory we can use anything to change or stop the vibrations. Place a towel over your guitar and the strings will sound through the pick-up, but the tone is muted. The length that the string vibrates is referred to

as sustain. All we have to think about for now, is whether the string is ringing or not. Thinking along these lines, let's investigate how many ways we can find to block the strings.



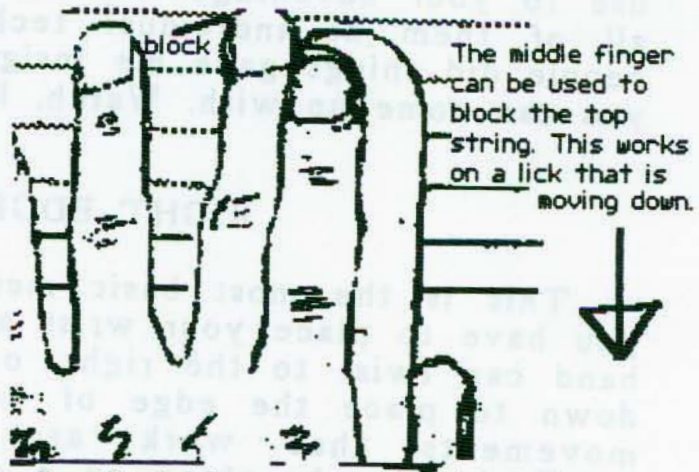
**Start with the picks on the strings. Lift to start the string moving.**

There are many ways to block. Think of each, as a separate technique to be learned and mastered. This will give you a wider selection of licks at your disposal. You put the licks into

your hands. If you don't play certain licks because your blocking is not right, this means the motion is off and that, makes the sound sloppy. Blocking takes a considerable

amount of effort. The time spent on the little things, shows up in your steel playing.

Your hand uses the picks to vibrate the string and it can use the placing of a pick, back on the string, to stop the vibrating. The most exciting is the use of the picks. You just place the pick back on the string. That's called pick blocking. Anything that stops the strings from moving will work. You can also use various parts of the right and left hands. Vibe players use a mute that comes up and stops the bars from ringing. I thought about a device that would press a mute on the strings. That way you could play wider grips and use the lever to block, freeing both hands to play.

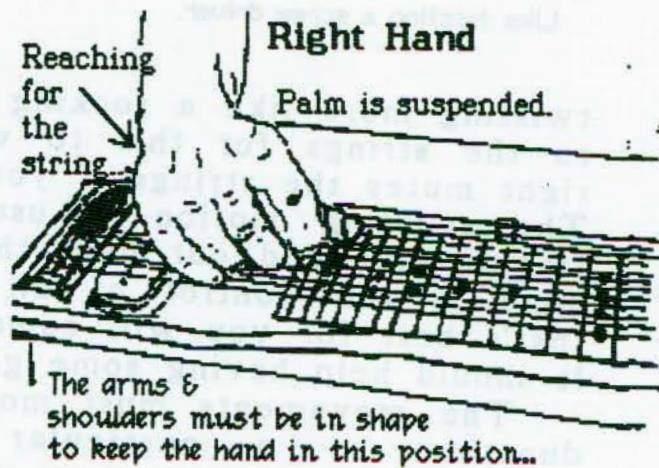


Practice holding your bar in this position.

Various parts of the right hand, used for blocking, are usually; the edge of the palm of your hand or a finger bent behind the picking fingers.

The right thumb can also be trained to move down and stop the strings behind it from vibrating. Other methods use parts of the left hand.

We'll work on the main ones and discuss the ones that might be used to fit an occasion. The more prepared you are the better you can handle all the situations that may arise. I sometimes use the little finger of the right hand to block a string that's left ringing. Blocking is really an individual art. The size of your hand has a great

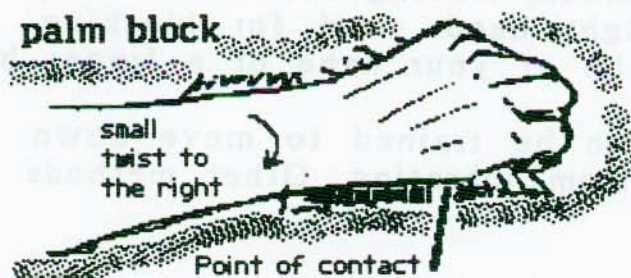


deal to do with how and where you position your hand. Whatever works best for you, is it. To find that out, its best to know all your choices and see which one you can use to your advantage. I tried to think them out and learn all of them as individual techniques. Watching how other people did things gave me insight to seeing what other ideas you can come up with. Watch, listen and learn.

### RIGHT EDGE of PALM

This is the most basic method of blocking. To do this you have to place your wrist at an angle to the guitar. The hand can twist to the right, or the wrist can move up and down to place the edge of your palm on the strings. The movements that work are; pretend your twisting a screwdriver or knocking on a door. The actual move can be made real small with practice. Again, remember to think of both movements that are needed to do the lick, the coming and the going. You should be thinking of the blocking motion as a technique separate from the picking. The

#### palm block



Like twisting a screw driver.

blocking comes after you place the strings in motion. The speed is determined by the lick that your playing. You can let the strings ring as long as you need.

The palm method works well if you get your right palm edge close to the strings. This makes the

twisting more like a rocking effect. The hand must be close to the strings for this to work. The slightest rock to the right mutes the strings if your palm edge is near the strings. The twisting motion is used if you have your last two fingers extended out over the strings. The thing to keep in mind is the control of all movement. The exact position that's best for you will come with time and experimentation. It should help having some guidelines to go by.

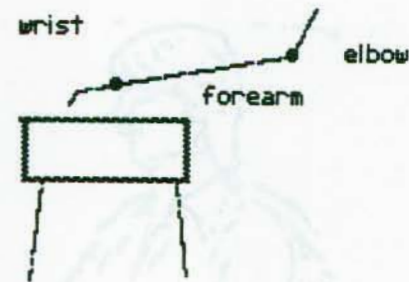
The movements must move in accordance with the time duration of a particular lick. Ballads can use large movements, where as single string playing needs small



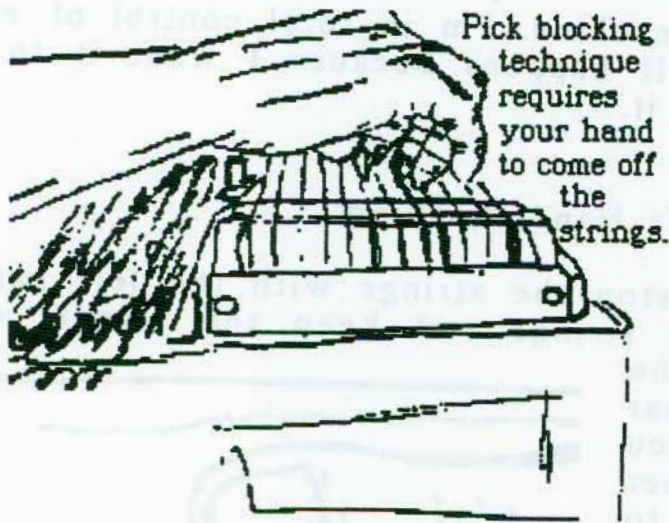
movements. Don't raise your hand high up off the strings. You will only waste time with the large movement. Work on making the blocking motion as **small as possible**.

### PICK BLOCKING

The secret behind my pick blocking method is to start with your picks on the strings. When the finger is down, the string can't vibrate. When they leave the string they place it in motion. This movement can be a large or small one. You should control it as you want. The angle of the forearm is very important. When I am pick blocking, my palm is up off the strings. This places my forearm almost parallel to the strings.



From the elbow, to the wrist there is a slight downward angle. From the top of my forearm to my knuckles, its level. From the knuckle to the second joint, its slightly bent. At the second joint, it bends to the strings. Its can be described as a piano position. The classical pianist, holds his hand over



Pick blocking technique requires your hand to come off the strings.

the keys and pushes them down. Watch how his fingers and wrists work to strike the keys. A great method of visual study is watching the action without the sound. If you have a VCR, you can slow it down. And, with the sound turned down, you can study the movement, without the sound being the main influence to your mind. To use this theory on the steel, our fingers are

reaching down, and come up to set the strings in motion. This puts the arm and shoulders into the picture because the forearm doesn't rest on the guitar. If they are to be used they will also have to be in condition to hold the hand

extended.

The thing to remember about pick blocking, is the sound of the metal picks hitting the vibrating string has to make a noise. When the pick touches the string, a slight click is heard. This is because the string is moving. Pick a string and watch the very small movement that takes place. You can actually see the string vibrating if you look. The faster you are playing, the less you have to worry about that click.



The notes cover any other sound that may come out. On the slower licks, the pick blocking may stand out. This is where you have to decide for yourself which to use. If you have more than one technique at your disposal, your choices are increased.

Ideally you should have such independence in your fingers, that you can lift them up and down in any order or pattern. The thing I strive for is getting my fingers to work like a machine. I'm in total control of every movement taking place. It happens because I want it to and not because I can't help it.

### Left Hand Blocking

The easiest way to stop the strings with the left hand is to lift the bar off the strings and keep the fingers down behind the bar. The distance you lift the bar should be as small as you can make it. The farther you move your hand to get the bar off the strings, the farther you have to travel to replace the bar. Again, all movement must be



thought out slow and exaggerated to learn. And, it must always be totally controlled. I find that lifting the bar and using the trailing fingers as mutes works well when you don't want the sound of the bar sliding to be heard. You could use the volume pedal to cut the sound out, but sometimes your hand is more efficient than your right foot. This technique will make your playing a lot smoother and quieter. I use this a lot with chord work. For instance, if I'm sustaining a chord and want to get my fingers in position to pick another one, I block by lifting the bar off and keeping



Lift the bar leaving the hands on the strings.



Thumb and middle finger squeeze the bar.

### Front view

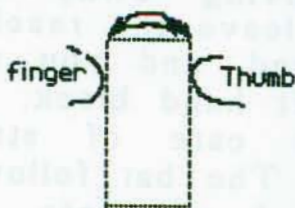


As you squeeze inward with the thumb and fingers, your bar should raise up to your palm.

on the thicker wound strings, then the amount of noise can sometimes be heard without the volume being on. By just lifting the bar a little bit you create a damper on the strings.

This blocking movement can then be seen as a subtle lifting of the bar. Try to build the muscles up to be able to control a small, quick movement. It gets a little tricky when you try to slide your bar to another position at the same time your lifting it, but the muscles are usually not able. To remedy this you need to do motions that exercise the muscles that you need. I always made up exercises using the move I was

Hold the bar out vertically. Hold it between the thumb and each finger.

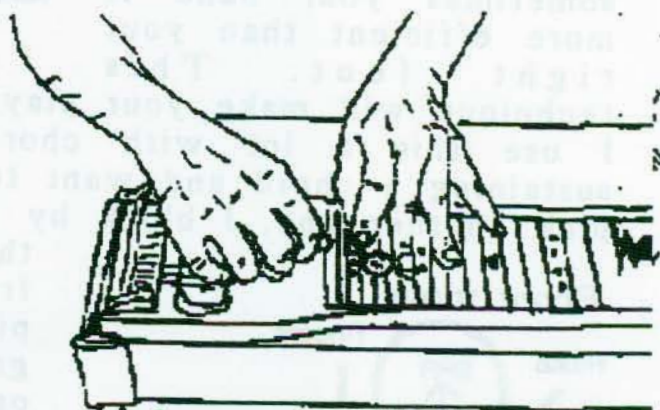


This will give you better control of your bar.

lifting of the bar. Try to build the muscles up to be able to control a small, quick movement. It gets a little tricky when you try to slide your bar to another position at the same time your lifting it, but the muscles are usually not able. To remedy this you need to do motions that exercise the muscles that you need. I always made up exercises using the move I was

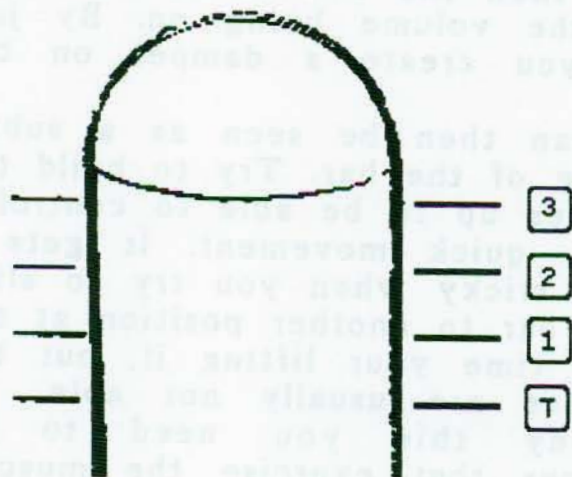
trying to improve. This gives you two advantages. First, you have the chance to slow things down to study movement and second, you are getting time at your guitar, where you can develop your own style. There's more about lifting the bar in the left hand section.

The next method of blocking is using the left thumb to stop strings from vibrating. I use this method a lot when I'm pick blocking. The thumb must drop down to the strings and also be ready to squeeze the bar if you need to lift it. This works best when you use the thumb of the left hand muting the strings below the position of the thumb pick. I let it mute all strings as I go up the strings. If the thumb plays the 9th string, then goes to the 8th, I use the thumb of the left hand to mute that string. This means my bar must follow my right hand as it goes up the string bank.



Can you play without the strings there to hold you up. Control the up & down movements of the bar...

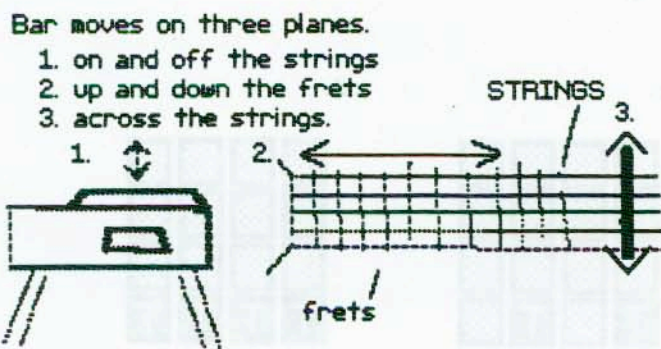
**BAR AREA:** The bar area is any part of the bar, where the right hand is picking the strings. The bar area is where the strings are being played.



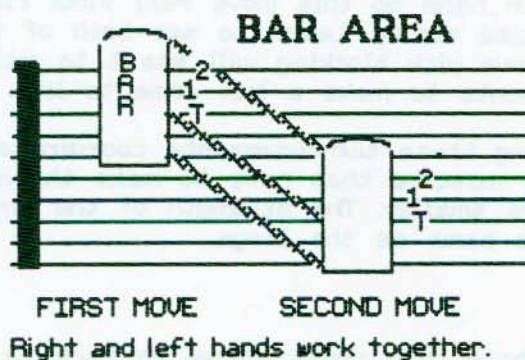
As you move, the bar should move along with your right hand. You may have strings that are ringing, but if the hand is moving away from them. They leave the reach of the right hand, and you need to use a left hand block. The thumb takes care of strings left ringing. The bar following the right hand lets this happen.

Have you ever played a lick on the first strings and then move down to the middle strings, and find the first string still ringing? I have many times. I even quit using that lick for awhile because of this. The most efficient way I've found of stopping this, was to use the middle finger extended out past the top of the bar. Having long fingers helps me because I can hold my bar so I can use the finger to clean up anything that isn't in the bar area.

The bar moves on three planes. Off and on the strings, sliding up and down the strings, and across the strings staying with the right hand.



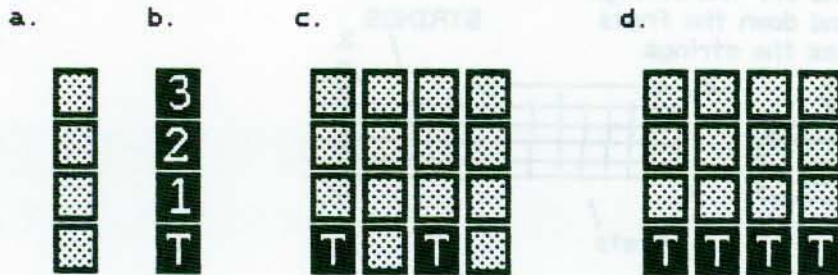
This came from playing a universal which has large gauge strings on the lower strings. The heavy wind makes a louder noise. As I play on my Universal, I had to compensate for the sound of the large wound strings. The thumb and fingers of the left hand can be trained to clean up all the extra noises.



### MY APPROACH

# PICK BLOCKING

Having gotten more familiar with right hand tablature, I can now use it to show you how you can work on pick blocking techniques. When you pick one string over and over, you are using a pick block. If you are going fast enough, the string is not ringing long enough to be blocked. The fingers have to learn two moves. One going to the strings and one going back to strike it again. The movement back could also be thought of as a blocking motion. Lets look at the basic fifteen. We will practice real simple moves. I do these with my hand resting on a table. The motion of the fingers is what you have to consider. Remember the trick to pick blocking is starting with your picks on the strings. If your pick leaves it starts it vibrating. If you no longer need the string to sound, you stop it by placing the pick back on the string. The palm of your hand should be parallel to the strings.



a. This shows us that the picks are setting on the strings ready to pick. Any finger, or combinations of; should be ready to pick. This is only one half of what goes on.

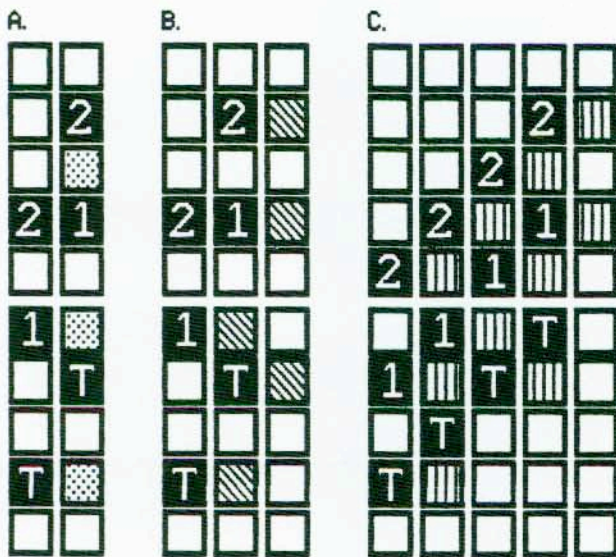
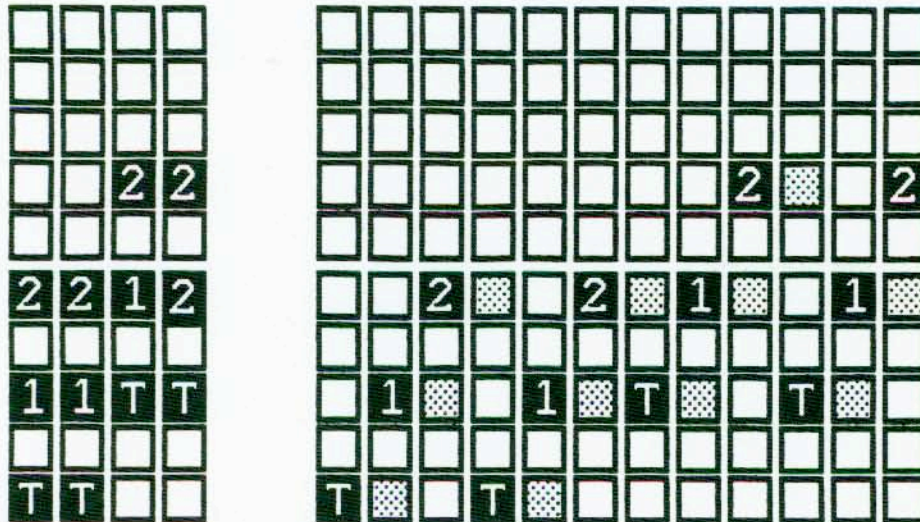
b. This is the second half of what has to happen. This shows all four picks leaving the strings. Placing them in motion. The next move is the move that puts you back to position (a). We make these motions every time we pick. The fingers have to go to and from the strings.

c. This has the thumb doing both moves. This simple move is the secret behind pick blocking. You should make your hand do this move real slow. Play the exact move you want. A You should do this exercise slowly. Learn to see both of these movements. As you get better at making this move pick blocking will start to make more sense. Your hand will know the required movements to make a lick come to life.

d. This represents getting these two movements coordinated as one. The only way to improve is to build up the muscles that have to make the movements. The hands should be able to make these moves smaller. The strength of the finger should be controlled. A small move should be the same as the large.

Now to really get your hand into great shape, go back to the alternating, rolls, even the pick grips, and substitute a pick block in all the blank squares. As you get better at pick blocking, you don't even think about which one you use. You do it automatically. The first exercise should be is taking each finger and striking the string at least a hundred times. Repetition with a little thought behind it, sounds like an itellectual definition of practice. The slowing of the lick lets your mind see what your fingers have to do. Understanding this concept of movement takes away the confusion. If your confused, your not relaxed. Being relaxed is how you can "make it look easy".

Below we see an exercise for pick blocking on wider chords. I find that the widest grips, sometimes work better with a palm block. The reason for this is when the fingers change strings, they have to move away, if they're moving away then you can't go back to block. If your palm is off the strings, you can't get back to the string it placed in motion.



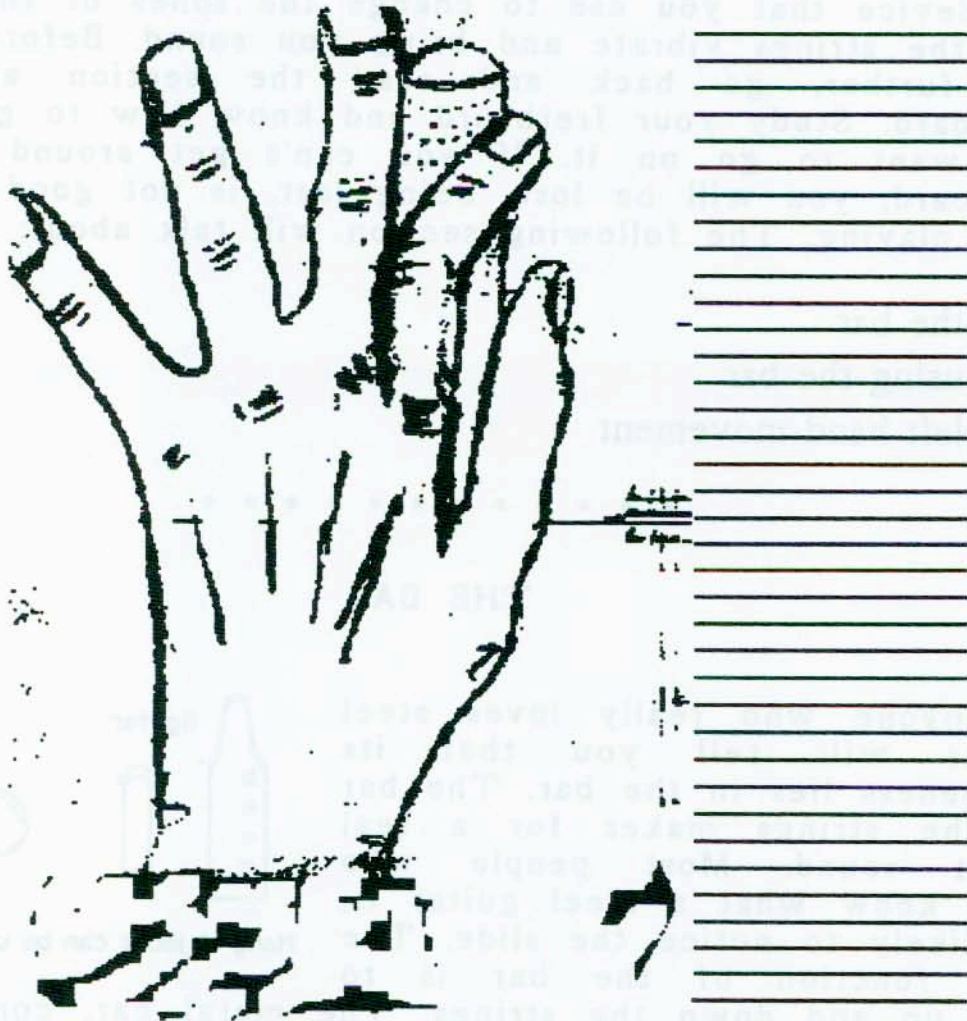
A. Turning to this one we should notice that you can't pick block this one the way its written. The fingers that are supposed to me pick blocking, are on the way to pick a different string. To block this properly you would use B.

B. This is the same lick but the notation is telling you to block it with the palm of your hand. Notice that one string is being blocked by another pick that is picking it.

C. Here we are introducing a new block. The left thumb is used to block strings that are left ringing under the thumb. If you see this at the top of the tablature, it means that the middle finger of the left hand should extend out to catch any of the strings left ringing. When your playing faster licks, you may not be able to get your palm down if your having to move your hand.

Another pick block that I find myself using, is the trickiest of all. I started using it at first by accident. When I would me playing a roll on an adjacent string, the finger-nail of the pick below a vibrating string would stop the string above vibrating. This is really a factor on a twelve string guitar because of the distance between the strings. The farther you put your finger into the string, you can stop the string.

# LEFT HAND



## MY APPROACH



## LEFT HAND

As you study the left hand, you must first define what it is supposed to do. We then have to find out what it can and can't do, or what its physical limitations are. The left hand uses the bar, strings, and fretboard. The fretboard is used to direct the movements of your left hand. The bar is the device that you use to change the tones of the strings. And the strings vibrate and bring you sound. Before you go any further, go back and read the section about the fretboard. Study your fretboard and know how to get where you want to go on it. If you can't get around on your fretboard, you will be lost. Being lost, is not good for your steel playing. The following section will talk about:

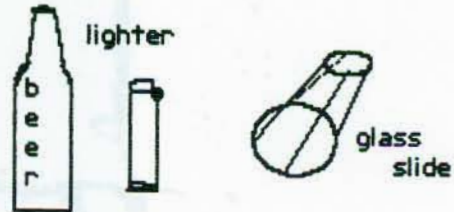
the bar  
using the bar  
left hand movement

\* \* \* \* \*

### THE BAR

Anyone who really loves steel guitar will tell you that its uniqueness lies in the bar. The bar on the strings makes for a real sweet sound. Most people who don't know what a steel guitar is, are likely to notice the slide. The main function of the bar is to slide up and down the strings. The metal bar, contacts the metal strings and gives the steel its character. The left hand, is in charge of controlling the bar.

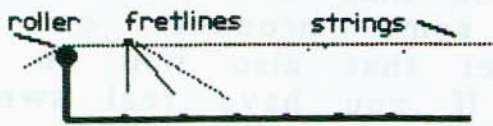
The slide has been around for a long time and is used on a regular guitar. This puts us in a category with the bottle neck guitar, the dobro, or a glass slide. Our guitars, have the strings suspended in the air, and they contact only the slide (bar), where as, a guitar contacts the frets and the slide. The frets or lack of them, make a difference in the sound of the instrument. Our bar slides over the strings smoothly.



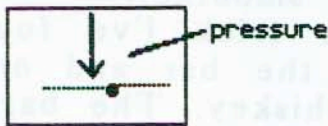
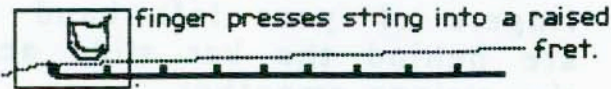
Many objects can be used as slides.

Using a slide on a guitar, you get the fret sound and the slide sound. This difference, is what makes a steel so unique.

5 The slide and pedals combine to play some great licks.



Steel guitar uses a fretboard with lines to navigate with.



We can play licks that no other instrument can play. The first one that comes to mind is a slide that goes through the chord inversions. A guitar has to relocate fingers, a piano has to move his hand. We can play a triad and without stopping the sound of any note, play all of its inversions.

The bar, is only an object, that we use to contact the strings with. The hands still have to control what takes place with the bar.

Bars are round and usually made of stainless steel. The stainless steel seems to hold up better over the years and they are reasonably priced. They are machined to be real smooth. The roundness makes it easier to slide them over the strings. All kinds of objects can be used as a slide. Each creates its own sound and it depends entirely on the material that its made of. Experiment with different things to see what sound they have.

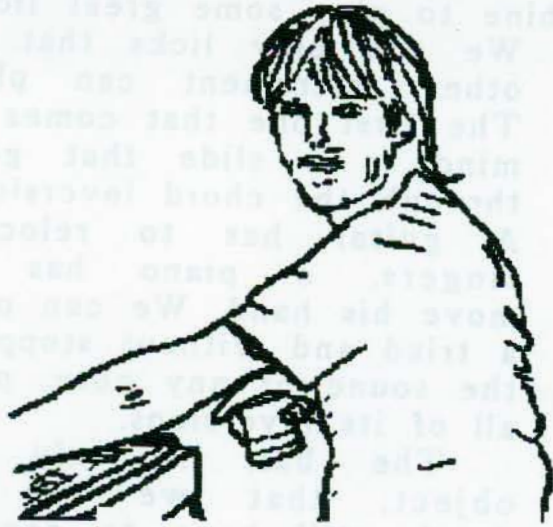
I've used a variety of bars. I have them in all sizes. Some are solid and some have the centers hollowed out. The heavier ones have the thicker tone. They are easier to press down into the strings and harder to pick up off the strings. The heavy ones are good for practicing. Its like weight training when you use a heavier bar to play for awhile, and then use a lighter one. The hand can whip the lighter bar around easier after working with the heavier one. The choice is yours. You may want to try a few different varieties and see which is best for you. Or, you may end up collecting them and experiment with the sound that each can bring you.

I've started using a chromium bar that works well on those sticky nights. The stainless steel



bar can *stick* to the strings and make all of your slides jerky. The only way to overcome this is, to keep the

strings and bar as clean as possible. If you have rubbing alcohol that will work. There are some products on the market that also will do the job. If you have real sweaty hands you may like to try some baby powder. It will make the fingers of your left hand that are behind the bar slide across the strings smoother.



Another trick I've found is to go to the bar and order a shot of whiskey. The bartender will give you a funny look when you tell him its for your

guitar, but the alcohol content will take some of the gunk off your strings. I also polish my bars with furniture polish to keep them smooth and looking shiny. These are some of the things I've come across, if you have a few more, I'm always interested in improving my playing and the conditions I have to play under.

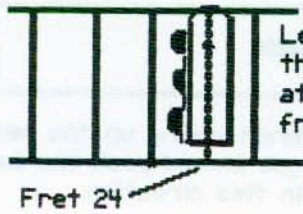
I try to keep, what I call, the *sweet part* of the bar around the strings I pick. Its easier to see on the picture. The main note here is that you don't want to be playing at the bottom of the bar. This is more appropriate in terms of single string playing. The sweet part of the bar should stay with the strings that the picks are playing. On wide grips you use the entire length of the bar. Again, we need to be aware of all that's going on.

Stretch your fingers in all directions. The flexibility gives you more licks at your disposal.



When working the bar from the 24th down to any fret between that and the 12th, you will have to contend with the fingers of the left hand blocking the frets behind the bar. Not that the distance between the frets isn't small enough, but you also have to contend with not being able to see the fret you want to go to. The best way to avoid this sometimes is to cheat. You can open up a space and peak at where you want to go. If I'm not playing on the top two or three strings, I bring my bar down and follow the top edge

of the fretlines. This is where following your picks with the sweet part of the bar comes in handy. If your playing on the first strings, then you'll have to sight *through* your hand.



Learn to sight thru your hand at the higher frets.

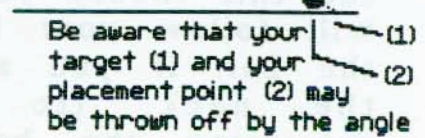
Sometimes you can see under the edge of the hand. The best thing to do is practice sliding the bar up at the top frets.

The size of the frets and the size of your hand covers up what you need to see. A lot of players don't use the top frets because

they can't control the bar in the little space that the frets allow. Think about playing the top frets just like the bottom ones where the moves are nice and easy. Then, when you get smooth at the top, try to incorporate the speed of the little slide into its lower octave equivalent. The size of the move is different in both places, but your hand should be able to play the same lick, the same way, in both places. The slow slides at the lower fret should be duplicated at the top and vice-versa. Practice playing different licks at different octaves. The physical move is something to be studied.



### Fret Sighting

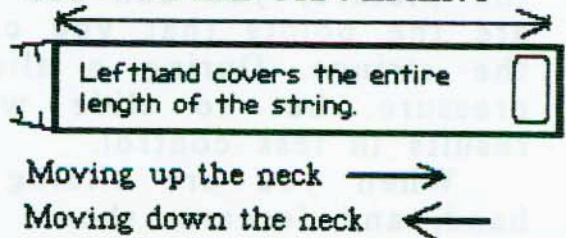


### Left Hand Movement

I look at the movement of the left hand, in terms of, the directions that the hand can be moved. We need to think about the muscles, that are put to work, to make each of the motions. The first and most logical movement is up and down the neck.

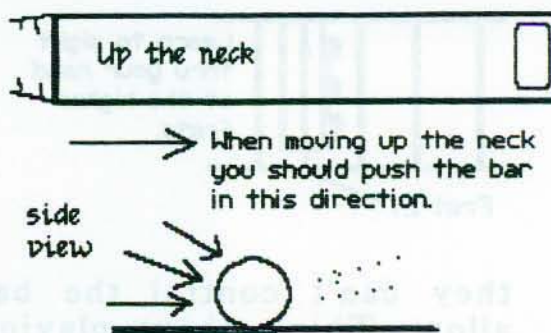
The slide, is the key movement in playing the steel guitar. The bar, is only the hardware that is used. The fingers, hand, wrist, forearm, shoulders and neck all play a part in the sliding motion. We need to see what has to take place to execute a good slide. Concentrate your thinking, on the fact that there are two

### LEFT HAND MOVEMENT

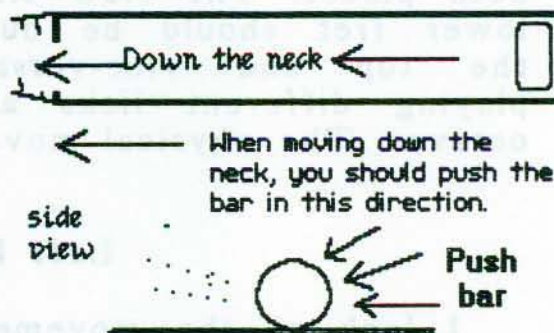


separate moves to be made. One coming and one going. The hand should be able to start in either direction, go any distance, at any speed, and do this whenever you desire.

Your grip on the bar is very important. This is done with two fingers and the thumb. The middle finger and thumb are on either side of the bar and the first finger is on the top. The grip is crucial. You must be in control of the bar. You have to pick it up and set it down on the strings, slide back and forth, apply vibrato, all the time keeping with the right hand.



The forearm is responsible for moving the bar up and down the fretboard. The motion of the forearm, moving the hand back and forth on the strings, can work in two directions. It can push, or pull, the bar up the strings. To see this theory you need to be at your steel. The forearm will follow your hands when it comes putting pressure on the bar. If you are going up the neck, (to the right) pressuring the bar with the thumb, makes the forearm, have to pull the bar up the strings. If you notice, the thumb is in front of the bar. Using the same pressure on the thumb going back down the strings, causes the thumb to be behind the move, so the forearm, wrist and fingers are pushing the bar.

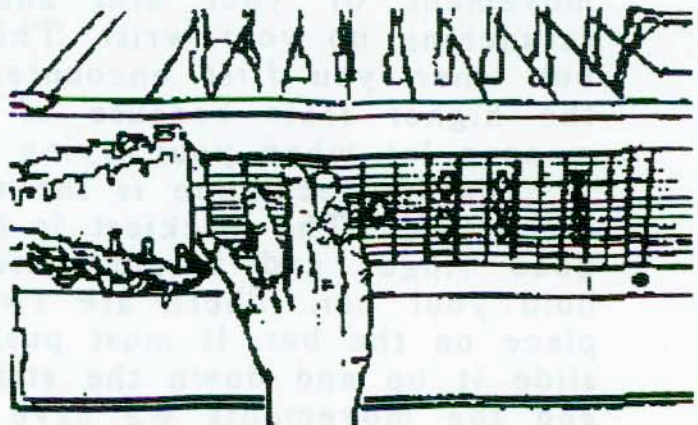


The fingers play an important role in executing the slide. They control what I call, the sliding pressure. Your thumb and middle finger are holding the bar, so any pressure you want to place on the bar, has to be done through them. In the picture, you can see where they contact the bar. These are the points that you can put pressure through the bar, to the strings. During a slide, all of the points are applying pressure, but to slide with a straight downward pressure, results in less control.

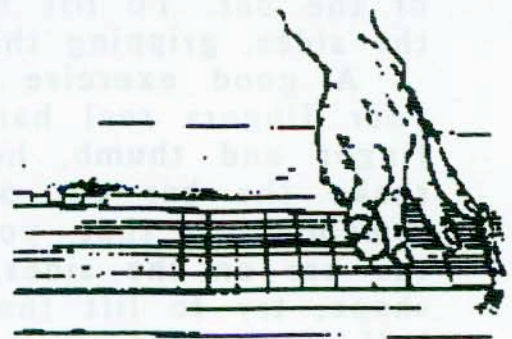
When you are sliding up the neck; your middle finger, hand, and forearm should all be thinking push. Your pressure should be behind the bar. The middle finger is where your

main sliding pressure should be concentrated on a slide going up the strings.

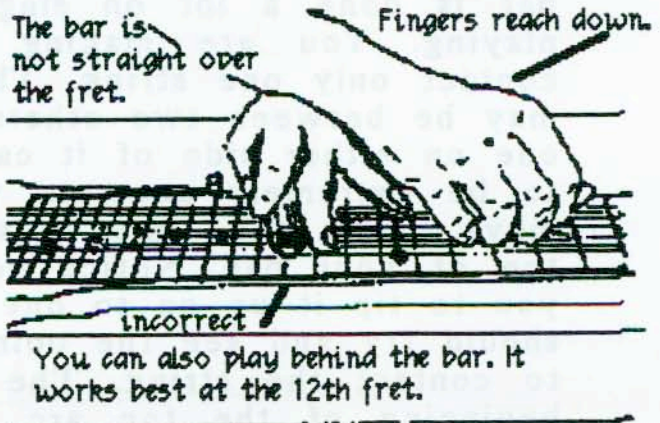
Each direction has a set of muscles that it uses to move the bar back and forth. All of them must work together. You should try to use the set of muscles that are behind the move. Pushing the bar is the most efficient means of sliding the bar. A pulling motion can be used but it is not as smooth. Once again, we need to be behind our movement. If we are pulling, it means we're out in front, and out of control.



The left hand moves the entire length of the neck, but once you get too close to the pick-up, the frets aren't there, thus, you rely on touch. The higher you go on the fretboard, the closer together the fretlines become. To get used to this, I began doing exercise at every fret. I also did them beginning on every fret and going to all the others. The result, of all this exercising, was to give my left hand more coordination and stamina. The bar hand must get used to very small movements and large ones that physically are different but musically they are only an octave apart.



The arm, is moving the hand, which is gripping the bar. What this section is trying to convey, is that, all the parts of your body play a roll in the movement. As you get to the higher frets, your arm will cross in front of your body. If you set to the left of your guitar, you will find



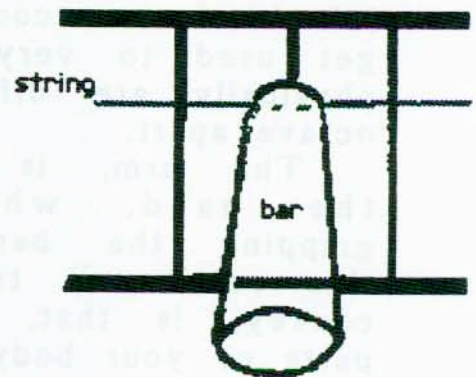
that playing up the neck will cause you to bend your wrist to get the bar up the neck. The body is blocking the free movement of your arm and you have to compensate by scrunching up your wrist. This may sound like a small detail, but when you first encounter this, you may shy away from the higher frets because of this awkwardness. Little things mean a lot when your trying to improve.

Another technique is the art of lifting the bar on and off the strings. The trickiest is the lifting. This movement takes good finger and thumb muscles. The trick is in how you hold your bar. There are two pressures that the hand must place on the bar. It must push it into the strings and it must slide it up and down the strings. Thinking of the two axis's and the movements we have to make, we must think about how we're holding our bar. What grip on the bar do we need to accomplish each move? Pushing the bar down into the strings, requires you to be at the top half of the bar. The sliding movement has to have the fingers at the sides of the bar. To lift the bar you need to squeeze the bar on the sides, gripping the bar with the thumb and middle finger.

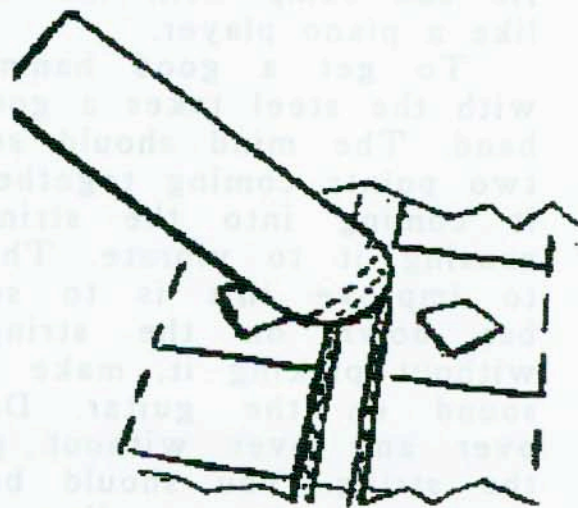
A good exercise to build up this movement is snapping your fingers real hard. Holding the bar between the middle finger and thumb, hold the bar out in the air and try to shake the bar out of your fingers. The important thing to remember, is that, your working on the muscles that squeeze the bar on the sides. When you think your hand is in good shape, try to lift the bar off the strings using only the top half of the bar.

### TIPPING THE BAR

Another technique, that is derived from lifting up the bar, is playing with the tip. Tipping the bar is done a lot on single string playing. You are making the bar contact only one string. This string may be between two others. Having one on either side of it causes you to be extremely accurate with this move. Take the time to study the top of your bar. Notice how its arc. The roundness allows you to tip it up on to one string. As you study the bar you should try and see the point on the bar that should be used to contact the string. The point where the side meets the beginning of the top arc of the bar is the best place to



contact the string. You should see the point on the string, and the point on the bar coming together. The bar should go into the string pushing it down slightly or really digging in. Because the strings are suspended you have the ability to press them down. The larger strings are not as stretched out as far as the higher ones. The lower the tone the more play in the string. If you aren't careful though you can *press* the string(s) sharp. This control comes only with thought and practice. You can't work on something, if your not aware of it. For more on this, read the section on string buoyancy.



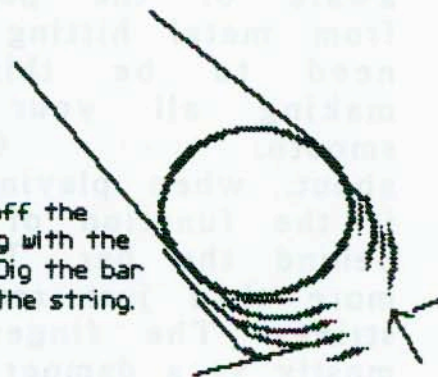
As you get better at tipping the bar, you should learn the technique that goes along with it. This, is the art of, pulling off the strings. The guitar player does these licks with his fingers. They

are the hammer-ons and pull-offs. The same theory can be applied to the bar. A pull-off, causes the finger of the left hand to pick the strings on a guitar. The steel player can do the same thing but only to an open string. We could call it a bar-off. The guitar player can have another finger

behind the one doing the pull-off. The pull-off on the guitar, is done when the finger leaves the string, and pulls it down as it leaves. This sets the string in motion. The steel player has to do this by digging the bar into the string and leaving the string with a downward angle. The tip of the bar coming off the string should set the string in motion. An exercise for this is to place your bar on the strings and pull it off over and over but you can only pick it once. The bar itself has to generate the picking.

**PULL-OFFS**

Pull off the string with the bar. Dig the bar into the string.





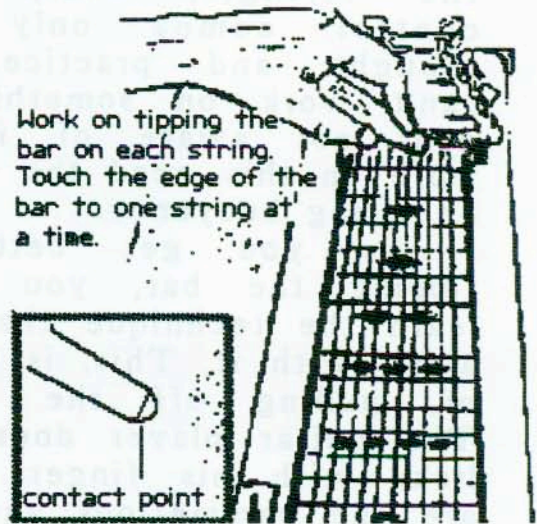
The opposite of the pull-off is called a hammer-on. You are actually hitting the string with enough power to make it sound. These pull offs and hammer ons are used by rock guitarists. If you want a better example, listen to Stanley Jordan play a guitar. He uses these techniques in both hands. He can comp with the left and play leads with the right, like a piano player.

To get a good hammer on with the steel takes a good left hand. The mind should see the two points coming together. See it coming into the string and causing it to vibrate. The way to improve this is to set the bar down on the string and without picking it, make a note sound on the guitar. Do this over and over without picking the string. You should be able to control the sounding of the notes at different speeds.

The next direction the hand must concern itself with is, across the strings. This is when the left hand must make the bar follow the right hand, to keep the sweet part of the bar, with the picks.

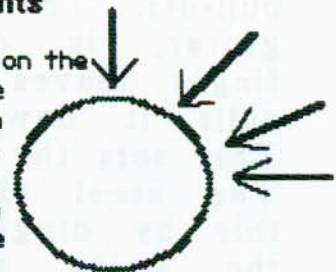
When you place the bar on the strings, you should be aware of the possible clank from metal hitting metal. You need to be thinking about making all your bar work smooth.

Often forgot about, when playing the steel, is the function of the fingers behind the bar. They can do more than just resting on the strings. The fingers are used mostly as a damper for the bar, and help, to minimize the noise that the bar makes during a slide. One note I like to make, is the part they play in placing pressure downward upon the strings. These fingers, can assist the rest of the hand in pushing the bar into the strings. The best way to see this,



### Pressure Points

Keep pressure on the bar in all these directions when you are sliding.



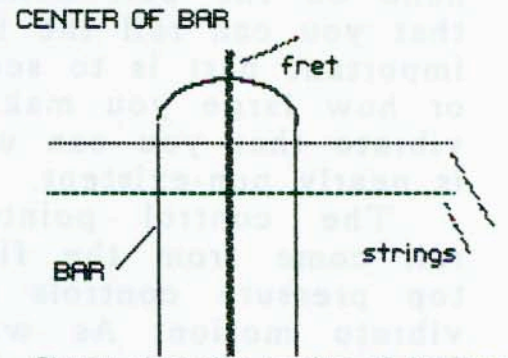
This would be a slide "down" the neck.

It is better to push than to pull the bar. When you pull, you are working against yourself. The steel is playing you.

The opposite muscles work on each of the two separate moves. Think!!!

is to push the bar down into the strings, with only the fingers on the bar. Then, apply the pressure, but push the back strings harder than you do the bar fingers. You can see how they should learn to work together in controlling the pressure on the bar.

To be accurate at your bar work, you must be able to hit the frets dead center. You must place the center of the bar over the fretline. The picture shows the bar centered over a fret. This is looking straight down at the fret. The emphasis should be placed on hitting the center. This should take place even if your looking at the bar at an angle. See the picture. The hand must learn to compensate for the angle of the eyes. Did you ever find yourself a passenger in a car and look at the speedometer from that angle? You have no idea how fast your going. You have to learn to adjust the angles with your eyes and your ears on the steel. When a steel player misses the center of the fret, he is said to be playing the cracks. The easiest way to get out of any band in a hurry is to play between the frets. Practice can eliminate this tendency.



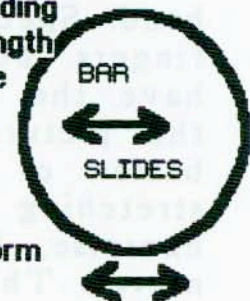
Always place the center of the bar over the fret.

### Vibrato

The stringed instruments all have one more thing in common. That is vibrato. The hands place a waver in the note. We have to think in degrees of vibrato. This waver can vary from real slow to very fast. The slowest is to barely roll your bar back and forth. The fastest is called a shiver. You can learn that one up in Michigan with all the snow.

The vibrato comes from the subtle sliding of the bar. The length of the slide can be

variable to the degree that your muscles can perform the task.

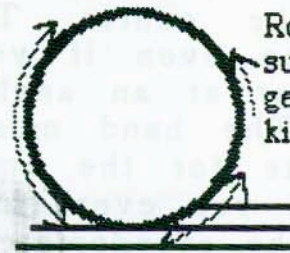


To see the roll, place your bar on the strings and place only your first finger, on the center at the top. The only movement that your finger can produce is a rocking motion. The bar should not slide with this movement. Look at the move carefully and see that you are only rolling the bar

slightly back and forth. This rolling motion lets you place an exact number of beats to your vibrato. You can match the beat of the song if you desire. Be sure to practice this roll with only the first finger on the bar. You prevents you from making a sliding motion without placing the rest of your hand on the bar. Using one finger also limits the distance that you can roll the bar back and forth and control it. The important part is to see the movement and control how small or how large you make your move. The roll is the smallest vibrato that you can use. The roll can be done to where it is nearly non-existent.

The control points for the roll come from the fingers. The top pressure controls the rolling vibrato motion. As we add the fingers we can apply another method of vibrato. This method is actually a subtle sliding motion. Once again, we need to learn the move and then control it, as we need it. This sliding

### Bar Vibrato



Roll the bar in a subtle manner to get a different kind of vibrato.

motion can be large or small. To reproduce the sound of a whammy bar on the guitar, you have to make this move in a quick motion.

This type of vibrato involves three different approaches. They coincide with the parts of the body that can be used to execute the move. The parts are the fingers, wrist and arm. The first way is to control the vibrato with just the fingers. To do this we need to take a close look at the left hand. Special attention should be given to the fingers behind the bar. The fingers should have the coordination to open and close like the pictures show. These movements are the basics of vibrato. They are also good for stretching your fingers. The moves are exaggerated in the exercise, but they make your hand open up and learn the moves. That makes the movements easier to control.

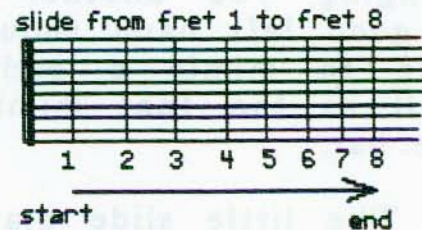


A good exercise that you can do to build this motion is as follows. The fingers start, by just rolling the bar the slightest bit. Slowly and in total control, make it faster and larger. As you start to get larger, you will have to start adding the movement of the wrist, and then the arm. The important thing, is to get the whole arm into it as you need it and, as you control it. After you are moving as fast as

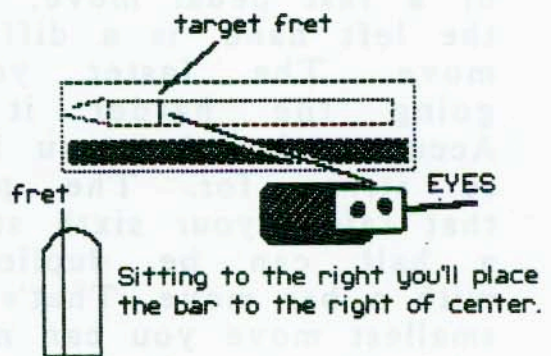
you can, while still in control, start to slow down. Be in total control of the slowing down process. Speeding up and slowing down are two separate moves to your limbs. Each should be thought of. Make this exercise last about 45 seconds from start to finish. As you do the exercise learn to feel which muscles are controlling your motion. This is how you learn to feel your guitar.

Now that you've got your hand ready to fall off, we have another exercise that leads to an important lick. I found myself working on this after I tried to copy the great John Huey. The hardest thing I found about these licks, is having a good vibrato going in a stationary position, and maintaining this at a constant speed, slide it up to another fret. I would have a good vibrato going and then as I tensed up the muscles needed to slide, the vibrato would stop. All this means is that the two sets of muscles used to make these two moves, aren't in good enough shape to work together. You can best remedy this by doing the exact move you want real slow. If your in control, it should really start to hurt. Exercise first a one fret move, then a two fret, three, etc. Do them going in both directions and then at different speeds. As you build the muscles up you'll start to see the difference in your smoothness on those pretty country slides. The extra control lets you do other things like the wammy sound on a guitar.

A lot of thought should given to the large slides that are so pretty in the country songs. They give the steel its trademark and are one of the prettiest sounds I know of. The often overlooked and usually neglected are the small slides. A small slide? Those slides of 1, 2, and 3 frets. These are the bread and butter moves of single note playing. To me a large, beautiful slide of ten frets on a



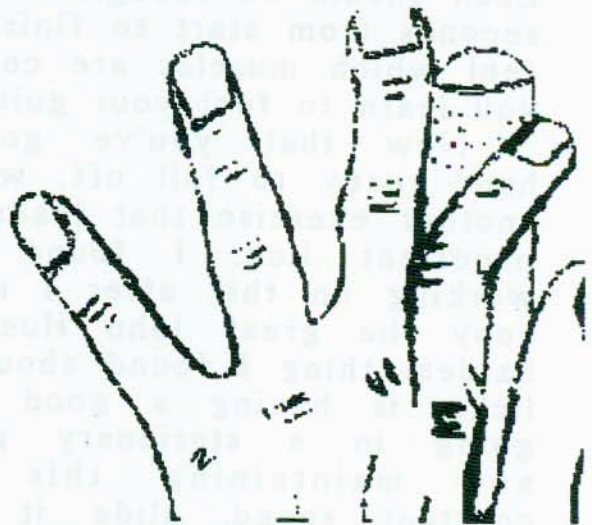
**Maintain the same amount of bar shiver. Don't stop as you slide.**



ballad and a small one, are the same thing, only the size of the move is different. The same attention should be applied to both. Musically they are bringing you another note. A good left hand should be able to mimic a pedal as well as the foot mimicking the bar.

The little slide plays an important part in the execution of those fast solos. The idea is to be able to articulate with your bar. For instance, on the E-9th neck you can raise the fifth string an full step with a floor pedal. You can also do the same move with the bar. The secret is to make the bar duplicate the sounds that you can get with a pedal and vice versa.

To duplicate the sound, of a fast pedal move, with the left hand, is a difficult move. The faster you're going the harder it is. Accuracy is what you have to strive for. The pedal that raises your sixth string a half can be duplicated with a bar move. That's the smallest move you can make with the bar. If your still curious, the section on putting it all together will talk about this in great detail.



#### SUMMING UP

When your playing the steel, the movement of the bar is very critical. It always matters how you get there. The smoother you are with all the moves, the more control you'll have. The wrist should be able to snap the bar any distance. This is real nice when you want to have a grace note. I start a little behind the fret and snap the bar to the desired note. This movement should be done real slow and then speeded up.

The fretboard deals with where we are going on the steel. The left hand has to follow the frets but it also has to consider how it gets there. The bar has to go somewhere at a certain

speed. There are many ways to move the bar. Each move can be used in a lick. What are all the factors? We have speed of the motion and distance of travel.

The bar can only move the length of the strings. And, the speed is dependent upon your own physical limitations. To build up your speed, study the next section. And do the exercises.

Just knowing what a move is only part of the process of playing steel. The next aspect is the music theory. This will start to tell you what your choices are. You will learn to apply the music to the movements. The mind must learn to hear a musical passage and then turn it into a movement that brings them those tones on a steel. You need to think steel.

\*\*\*\* ---- TIP ---- \*\*\*\*

I used raise my back legs on my guitar and play my strings on an angle. Now I like it as level as possible. You can use the bar to level your steel. Place it at the 12th fret and adjust your legs until the bar doesn't move.

MY APPROACH

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## LEFT HAND MATH

This section deals with the mathematical possibilities of left hand movement. We may not use them all, but it will not be because we didn't know them all. First, do nothing but slide the bar up and down the strings. A good warm up is to slide from the left to right as far as you can go. You should practice everything in its *mirrored* state. The mirror of a slide beginning at the left going right, is one starting at the right going left. Every exercise and thought in this book should be *mirrored*. That way you can get the best of both worlds. Every movement has its opposite.

For example, starting with the bar off the strings and, sliding left to right, (you have to start with open strings vibrating) move the bar onto the strings smoothly. This could be termed as F0 to F1. F stands for Fret. 0 meaning an open string. The opposite would be F1 to F0. The trick here is to slide the bar off the strings smoothly. There should be no *bar noise*. We can see how the opposite move has a totally different technique that is required to execute the move.

The only way to get used to sliding off and on open strings is to practice the move. The following exercises each have an open string slide to practice.

Try and visualize these techniques in your mind as you read about them. Learn to see things the way you want them to happen, in your mind, and then put those thoughts into motion. We must always be aware of the thought process. We are trying to teach the left hand to do what we want. Start slow.

## EVERY FRET

Starting at the first fret move the bar to every fret and back. The numbers are fret numbers. If we were to write them with other numbers, such as picks, we would write them with an (F) in front of them. For this study we need only concern ourselves with numbers. Here's how we write it:

The following numbers represent the frets. Practice these two separate ways. First without picking the strings and then with a string or strings vibrating. Deal with making the move. Then, deal with controlling the sound of a note. When you play

live you have to do them together, when you practice you can look at them separately. Work on the weak parts of your playing.

First fret:

1-2-1-3-1-4-1-5-1-6-1-7-1-8-1-9-1-10-1-11-1-12-1-13-1-14-

1-15-1-16-1-17-1-18-1-19-1-20-1-21-1-22-1-23-1-24-1-25-1-0-1

This makes the left hand move in both directions and work every fret. It gives us large and small movements. We have made every possible move that can be made from the first fret. We may never need them but our hand knows the move. Remember the repetition is good exercise for your hand, wrist and forearm. The following are lists of moves starting at each fret and going to the others.

Second fret:

2-1-2-3-2-4-2-5-2-6-2-7-2-8-2-9-2-10-2-11-2-12-2-13-2-14-

2-15-2-16-2-17-2-18-2-19-2-20-2-21-2-22-2-23-2-24-2-25-2-0-2

Third fret:

3-1-3-2-3-4-3-5-3-6-3-7-3-8-3-9-3-10-3-11-3-12-3-13-3-14-

3-15-3-16-3-17-3-18-3-19-3-20-3-21-3-22-3-23-3-24-3-25-3-0-3

Fourth fret:

4-1-4-2-4-3-4-5-4-6-4-7-4-8-4-9-4-10-4-11-4-12-4-13-4-14-

4-15-4-16-4-17-4-18-4-19-4-20-4-21-4-22-4-23-4-24-4-25-4-0-4



Fifth fret:

5-1-5-2-5-3-5-4-5-6-5-7-5-8-5-9-5-10-5-11-5-12-5-13-5-14-  
5-15-5-16-5-17-5-18-5-19-5-20-5-21-5-22-5-23-5-24-5-25-5-0-5

Sixth fret:

6-1-6-2-6-3-6-4-6-5-6-7-6-8-6-9-6-10-6-11-6-12-6-13-6-14-  
6-15-6-16-6-17-6-18-6-19-6-20-6-21-6-22-6-23-6-24-6-25-6-0-6

Seventh fret:

7-1-7-2-7-3-7-4-7-5-7-6-7-8-7-9-7-10-7-11-7-12-7-13-7-14-  
7-15-7-16-7-17-7-18-7-19-7-20-7-21-7-22-7-23-7-24-7-25-7-0-7

Eighth fret:

8-1-8-2-8-3-8-4-8-5-8-6-8-7-8-9-8-10-8-11-8-12-8-13-8-14-  
8-15-8-16-8-17-8-18-8-19-8-20-8-21-8-22-8-23-8-24-8-25-8-0-8

Ninth fret:

9-1-9-2-9-3-9-4-9-5-9-6-9-7-9-8-9-10-9-11-9-12-9-13-9-14-  
9-15-9-16-9-17-9-18-9-19-9-20-9-21-9-22-9-23-9-24-9-25-9-0-9

Tenth fret:

10-1-10-2-10-3-10-4-10-5-10-6-10-7-10-8-10-9-10-11-10-12-  
10-13-10-14-10-15-10-16-10-17-10-18-10-19-10-20-10-21-10-  
22-10-23-10-24-10-25-10-0-10

Eleventh fret

11-1-11-2-11-3-11-4-11-5-11-6-11-7-11-8-11-9-11-10-11-12-

11-13-11-14-11-15-11-16-11-17-11-18-11-19-11-20-11-21-11-

22-11-23-11-24-11-25-11-0-11

Twelfth fret:

12-1-12-2-12-3-12-4-12-5-12-6-12-7-12-8-12-9-12-10-12-11-

12-13-12-14-12-15-12-16-12-17-12-18-12-19-12-20-12-21-12-

22-12-23-12-24-12-25-12-0-12

Thirteenth fret:

13-1-13-2-13-3-13-4-13-5-13-6-13-7-13-8-13-9-13-10-13-11-

13-12-13-14-13-15-13-16-13-17-13-18-13-19-13-20-13-21-13-

22-13-23-13-24-13-25-13-0-13

Fourteenth fret:

14-1-14-2-14-3-14-4-14-5-14-6-14-7-14-8-14-9-14-10-14-11-

14-12-14-13-14-15-14-16-14-17-14-18-14-19-14-20-14-21-14-

22-14-23-14-24-14-25-14-0-14

Fifteenth fret:

15-1-15-2-15-3-15-4-15-5-15-6-15-7-15-8-15-9-15-10-15-11-

15-12-15-13-15-14-15-16-15-17-15-18-15-19-15-20-15-21-15-

22-15-23-15-24-15-25-15-0-15

Sixteenth fret:

16-1-16-2-16-3-16-4-16-5-16-6-16-7-16-8-16-9-16-10-16-11-  
16-12-16-13-16-14-16-15-16-17-16-18-16-19-16-20-16-21-16-  
22-16-23-16-24-16-25-16-0-16

Seventeenth fret:

17-1-17-2-17-3-17-4-17-5-17-6-17-7-17-8-17-9-17-10-17-11-  
17-12-17-13-17-14-17-15-17-16-17-18-17-19-17-20-17-21-17-  
22-17-23-17-24-17-25-17-0-17

Eighteenth fret:

18-1-18-2-18-3-18-4-18-5-18-6-18-7-18-8-18-9-18-10-18-11-  
18-12-18-13-18-14-18-15-18-16-18-17-18-19-18-20-18-21-18-  
22-18-23-18-24-18-25-18-0-18

Nineteenth fret:

19-1-19-2-19-3-19-4-19-5-19-6-19-7-19-8-19-9-19-10-19-11-  
19-12-19-13-19-14-19-15-19-16-19-17-19-18-19-20-19-21-19-  
22-19-23-19-24-19-25-19-0-19

Twentieth fret:

20-1-20-2-20-3-20-4-20-5-20-6-20-7-20-8-20-9-20-10-20-11-  
20-12-20-13-20-14-20-15-20-16-20-17-20-18-20-19-20-21-20-  
22-20-23-20-24-20-25-20-0-20

Twenty first fret:

21-1-21-2-21-3-21-4-21-5-21-6-21-7-21-8-21-9-21-10-21-11-  
21-12-21-13-21-14-21-15-21-16-21-17-21-18-21-19-21-20-21-  
22-21-23-21-24-21-25-21-0-21

Twenty second fret:

22-1-22-2-22-3-22-4-22-5-22-6-22-7-22-8-22-9-22-10-22-11-  
22-12-22-13-22-14-22-15-22-16-22-17-22-18-22-19-22-20-22-  
21-22-23-22-24-22-25-22-0-22

Twenty-third fret:

23-1-23-2-23-3-23-4-23-5-23-6-23-7-23-8-23-9-23-10-23-11-  
23-12-23-13-23-14-23-15-23-16-23-17-23-18-23-19-23-20-23-  
21-23-22-23-24-23-25-23-0-23

Twenty-fourth fret:

24-1-24-2-24-3-24-4-24-5-24-6-24-7-24-8-24-9-24-10-24-11-  
24-12-24-13-24-14-24-15-24-16-24-17-24-18-24-19-24-20-24-  
21-24-22-24-23-24-25-24-0-24

We have started at every fret and moved our bar to every other fret. These are all the moves that you have. The left hand has started at every fret and moved to every other fret on the fretboard. The trick is playing them in combinations. Try the following exercise. Start slow its pretty tricky.

## LEFT HAND EXERCISES

### Exercise #1:

12-13-12-11-12-14-12-10-12-15-12-9-12-16-12-8-12-17-

12-7-12-18-12-6-12-19-12-5-12-20-12-4-12-21-12-3-12-

22-12-2-12-23-12-1-23-24-12

### Exercise #2:

1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-

16-17-18-19-20-21-22-23-24-25-24-23-

22-21-20-19-18-17-16-15-14-13-12-11-

10-9-8-7-6-5-4-3-2-1

### Exercise #3:

1-2-3- 2-3-4- 3-4-5- 4-5-6- 5-6-7- 6-7-8-

7-8-9- 8-9-10- 9-10-11- 10-11-12- 11-12-13-

12-13-14- 13-14-15- up to 22-23-24-

### Exercise #4:

3-2-1- 4-3-2- 5-4-3- 6-5-4- 7-6-5- 8-7-6-

9-8-7- 10-9-8- 11-10-9-....up to ...24-23-22-

### Exercise #5:

24-23-22- 23-22-21- 22-21-20- 21-20-19-....

down to....3-2-1- 2-1-0-...

Exercise #6:

1-2-3-4- 2-3-4-5- 3-4-5-6- 4-5-6-7- 5-6-7-8-

6-7-8-9- 7-8-9-10- 11-12-13-14- up to 21-22-23-24-

Then back down ... 24-23-22-21- 23-22-21-20-

22-21-10-19- .....down to 4-3-2-1- 3-2-1-0.

Exercise #7:

1-2-3-4-5- 2-3-4-5-6- 3-4-5-6-7- 4-5-6-7-8-

5-6-7-8-9- ....etc..up to 20-21-22-23-24- then back

down 24-23-22-21-20- .....to 4-3-2-1-0.

Exercise #8:

1-3-5-7-9-11-13-15-17-19-21-23-25-

23-21-19-17-15-13-11-9-7-5-3-

Exercise #9:

2-4-6-8-10-12-14-16-18-20-22-24-

22-20-18-16-14-12-10-8-6-4-2-

Exercise #10:

1-4-7-10-13-16-19-22-25-22-19-16-13-10-7-4-1.

Exercise #11:

2-5-8-11-14-17-20-23-26-23-20-17-14-11-8-5-2.

Exercise #12:

3-6-9-12-15-18-21-24-21-18-15-12-9-6-3.

Exercise #13:

1-3-2-4-3-5-4-6-5-7-6-8-7-9-8-10-9-11-10-12-

11-13-12-14-13-15-14-16-15-17-16-18-17-19-

18-20-19-21-20-22-21-23-...up to 22-24-....

then back 24-22-13-21-.....to....3-1-2-0.

Exercise #14:

0-4-8-12-16-20-24-20-16-12-8-4-0

Exercise #15:

1-5-9-13-17-21-25-21-17-13-9-5-1.

Exercise #16:

2-6-10-14-18-22-26-22-18-14-10-6-2.

Exercise #17:

3-7-11-15-19-23-27-23-19-15-11-7-3-

Exercise #18:

0-12-1-13-2-14-3-15-4-16-5-17-6-18-7-19-8-20-

9-21-10-22-11-23-12-24-12-23-11-22-10-21-9-20-

8-19-7-18-6-17-5-16-4-15-3-14-2-13-1-12-0

Exercise #19:

1-2-3-4-3- 2-3-4-5-4- 3-4-5-6-5- 4-5-6-7-6-  
5-6-7-8-7- 6-7-8-9-8- 7-8-9-10-9- 8-9-10-11-10-  
9-10-11-12-11- 10-11-12-13-12- 11-12-13-14-13-  
12-13-14-15-14- 13-14-15-16-15- 14-15-16-17-15-  
16-17-18-19-18- 17-18-19-20-19- 18-19-20-21-20-  
19-20-21-22-21- 20-21-22-23-20- 21-22-23-24-23-

Now play them reading right to left starting with the last one.

Exercise #20:

1-2-3-4- 3-2-3-4- 5-4-3-4- 5-6-5-4- 5-6-7-6-  
5-6-7-8- 7-6-7-8- 9-8-7-8- 9-10-9-8- 9-10-11-10-  
9-10-11-12- 11-10-11-12- 13-12-11-12- 13-14-13-12-  
13-14-15-14- 13-14-15-16- 15-14-15-16- 17-15-16-17-  
18-19-18-17- 18-19-20-19- 18-19-20-21-20-19-20-21-  
22-21-20-21- 22-23-20-21- 22-23-24-23-

Number 20 and number 19 are the same moves but the #19 is groups of fives, and #20 is groups of four.



Here are some combinations you may find interesting.

Exercise #21:

1-4-8-13-8-4-1- 2-5-9-14-9-5-2- 3-6-10-15-10-6-3-

4-7-11-16-11-7-4- 5-8-12-17-12-8-5- 6-9-13-18-13-9-6-

7-10-14-19-14-10-7- 8-11-15-20-15-11-8-

9-12-16-21-16-12-9- 10-13-17-21-17-13-10- ....Etc....

Exercise #22:

1-8-4-13-4-8-1- 2-9-5-14-5-9-2- 3-10-6-15-6-10-3-

4-11-7-16-7-11-4- 5-12-8-17-8-12-5- 6-13-9-18-13-6-9-

7-14-10-19-10-14-7- .....Etc.....

Exercise #23:

0-3-7-12-15-19-24-

Exercise #24:

1-4-8-13-16-20-25-

Exercise #25:

2-5-9-14-17-21-26-

Exercise #26:

3-6-10-15-18-22-27-

Exercise #27:

4-7-11-16-19-23-28-

Exercise #27:

0-5-8-13-17-20-24-

Exercise #28:

1-6-9-14-18-21-25-

Exercise #29:

2-7-10-15-19-22-26-

Exercise #30:

3-8-11-16-20-23-27-

Exercise #31:

0-4-9-13-17-21-24-

Exercise #32:

1-5-10-14-18-22-25-

Exercise #33:

2-6-11-15-19-23-26-

Exercise #34:

1-3-4 2-4-5 3-5-6 4-6-7 up to 21-23-24 then back down  
24-23-21 23-22-20 etc. to 4-3-1

Exercise #35:

1-2-4- 2-3-5- 3-4-6- 4-5-7- up to 21-22-24  
back down  
24-22-21- 23-21-20- 22-20-19 etc. to 4-2-1

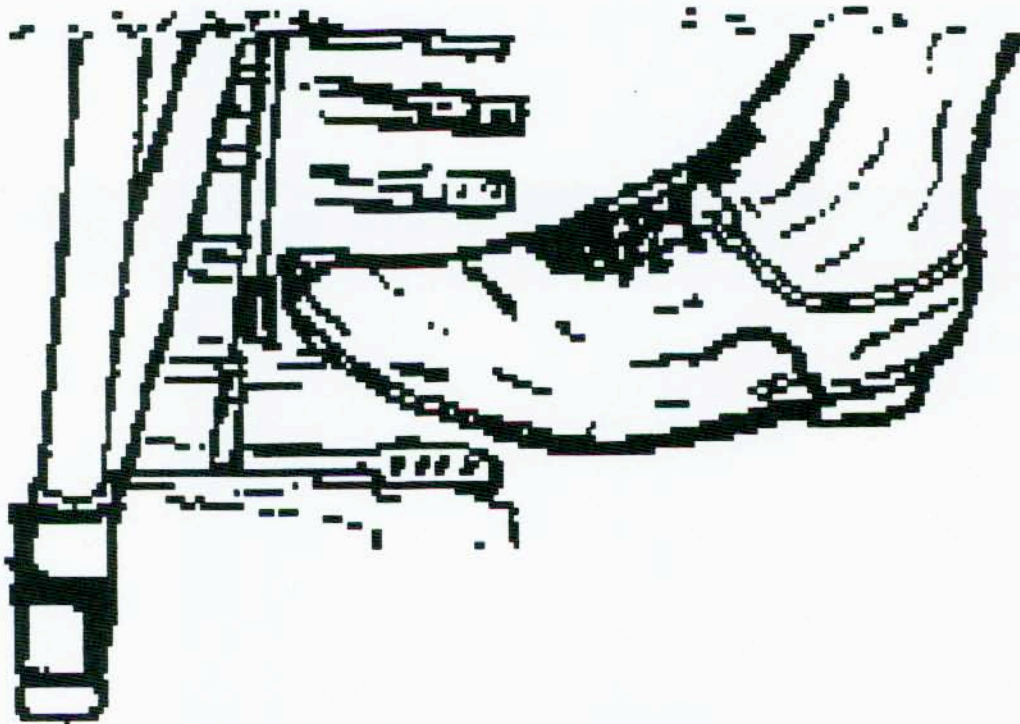
The significance of these moves will be studied further when we start the music theory section. The more moves our hands can make, the more music you can get out of your guitar. Use the previous moves as exercises to study movement and build up the muscles to perform the moves exactly the way you want to. The theory will give us a guide to know what a move can bring us *musically*.

The thing to remember working with the fretboard is that each fret is a half-step. You can use intervals to study fretboard movement. I look at all the intervals by the number of the scale tone and by the number of half-steps that the interval contains. If we place the interval in the same language of half-steps as the fretboard uses we can see more music on the steel. The more we see, the more we play.

You can really build your technique by making these moves and using two important rhythms. First, do each exercise as a straight eighth or sixteenth note, then do them with a swing feel. The fingers, wrist, and arm should learn to articulate a note. When you are sliding the picks are taken out of the picture and the left hand takes over. The straight eighth notes are easy to articulate. The swing feel takes a snap in the wrist. The dotted eighth notes get less time so to play them you need a crisper move. The section on rhythms will explain this to you more if you are having a hard time understanding.

## MY APPROACH

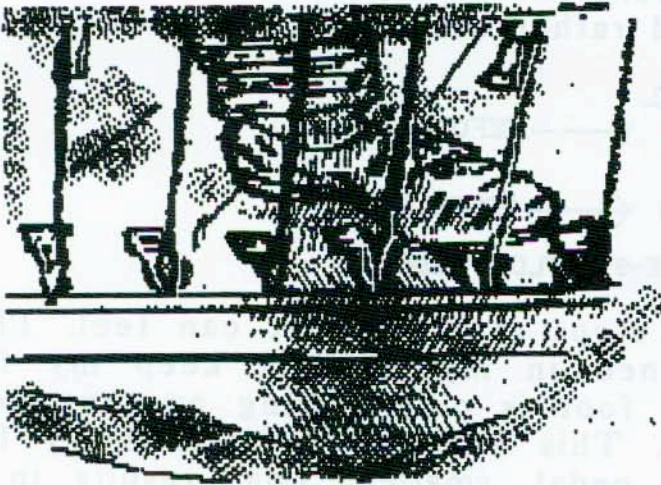
LEFT



FOOT

## THE PEDALS

As your right hand starts to get faster and stronger, you will soon find your left foot starting to get *left* behind. You'll play a lick and find the feet unable to keep up with the hands. If you have a lick that requires a rocking of the foot, you can only play that lick as fast as your foot can make the move. Getting your hand in shape without giving the foot equal time, will result in an unbalance. The faster you can move your foot, the faster you can play any lick that may require those types of movements. Taking the time to build up the muscles, can make some of those impossible licks easier to understand, and to play.



The pedal action, as its applied to the E-9th copedent, is responsible for the characteristics of steel in commercial country music. The three standard floor pedals are your bread and butter movements. The rocking movements between adjacent pedals are standardized. To study pedals and how to get more efficient at their usage, we will study the

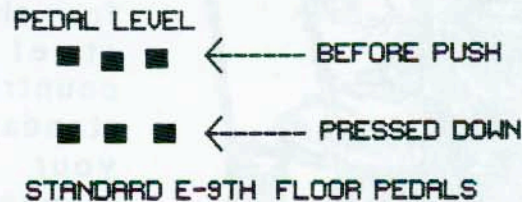
movements of the E-9th. I will then show you how it works on the universal tuning and the way I think of the whole guitar at once rather than, a ninth or a sixth tuning. The pedals, are all able to change the intervals of the strings.

As I learned the movements, I soon was able to do things with my feet that gave me different kinds of licks. I let the movement bring me the licks. Your imagination takes over after your hands are free to do the things you will soon begin to feel.

One limitation, most players encounter, is the action or feel of your pedals. It relates directly to how good you can play your guitar. The mechanics of each guitar varies from instrument to instrument. The newer models have come a long way, in terms of, the ease of working the pedals and

knees. They are no longer stiff, jerky machines. They are very precise and the precision can be felt through your foot and your legs. The ease of motion makes it easier to play faster moves on the pedals. A faster move means a lick that can be used in more situations because you can play it faster.

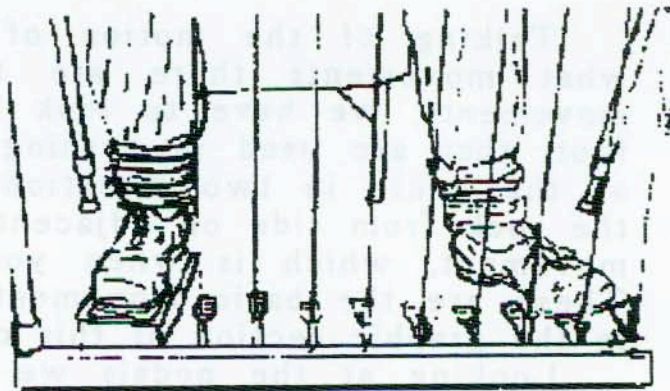
Newer guitars stay in tune better than their older counterparts, and, not having to fight a bad guitar, makes it possible for you to learn to play the steel, rather than it playing you. An out of tune guitar always makes me avoid certain pedals or strings. If they are out of tune, my ear won't let me play those places with tuning problems. When the guitar starts to play you, it's time to pack up and head to the bedroom for some more practice. The fact that you are thinking, to not use a certain pedal, you are not in control, the guitar is. Better pick-ups and amps, have also created better playing conditions. The limitations are starting to be more player oriented rather than machine.



My pedals have exact stops that my foot can feel. Their touch or feel are engrained in my mind. I keep my foot resting on the pedals. My foot is only resting on the pedals and not applying pressure. This makes the distance my foot has to move, to press a pedal, smaller. That results in an ability to move faster. The foot should have the distance any pedal travels to the stop, memorized. This theory applies to the movement of the knees. I like my pedals to have an exact stop to feel. The adjustment of your guitar is up to you.

The height of two adjacent pedals can be crucial. The best method is to experiment and see which you like best. You can loosen them all, adjust them where you want them, and then tighten them down. If you fly your guitar a lot, these will have to be checked often. I find it easier to really feel the pedals better in tennis shoes. Boots are too restrictive on the rocking of the ankle. I recommend you try playing with different shoes. You'll be surprised at some of the things you can do, if you try.

I find that the motion required to push a pedal down is natural because of gravity. The foot has to resist only the mechanics of the guitar. The move that must be considered is lifting the foot off the pedal. The muscles in the leg and ankle have got to be in control of what's going on. If your not in control you'll find yourself avoiding certain licks that are really simple if your foot is in shape. To get your foot in shape, get yourself a set of ankle weights from your nearest sporting goods store. You then need to work out your ankles on the steel with the weights on.



### PEDAL SNAP

After 3 months of working with the weights I found that my ankle had the ability to play new licks. The control I had, allowed me to actually snap the pedal to the stop. It was almost like the string was a whip and I could crack it with my foot. Your foot should be able to snap with either an inside rock or outside rock.

A harder lick to do is to get your ankle to play the pedal extremely fast. The whole secret is building up the muscles of your lower leg and ankle. The extremely fast licks can be sixteenth notes in some cases. Steel guitar licks come from the craziest places. This particular one came when I got excited playing rock and roll. In a bar in Toledo....That's another book.

## MOVING PARTS

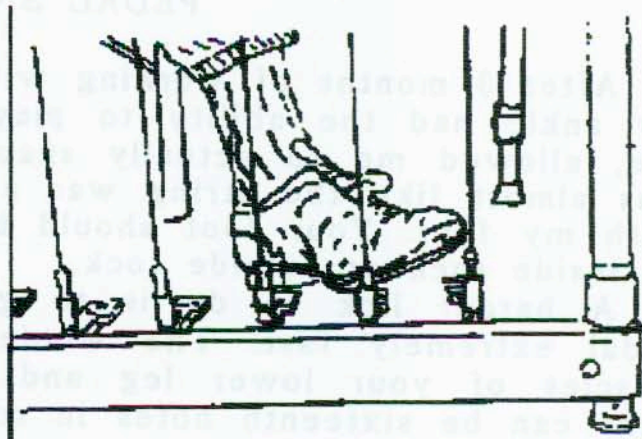
Talking of the motion of the foot, lets first look at what movements there are to think about. To see the movements, we have to look at the parts of the ankle and foot, that are used in pushing your pedals. The foot moves at the ankle in two directions for playing steel. You have the rock from side on adjacent pedals, and the up and down movement, which is when you push two pedals in unison. These are the basic movements of the foot. Each is shown in the graphic section of this chapter.

Looking at the pedals we see that there are two fixed positions, they can be: either up, or down. The third would be their movement from up to down, or vice versa. Thinking of two adjacent pedals and one foot, we can learn to see four basic ankle/foot positions.

## ANKLE/FOOT POSITIONS

1. The first position is the foot over both pedals, ready to play.

2. The second position is both pedals down, pushing them down to the stops.

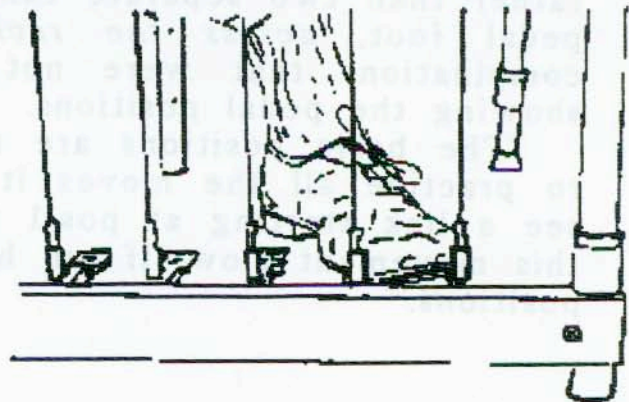


The next positions involve a very important aspect in using the pedals. That is, the rocking of the ankle.



3. The third position is the outside rock. That's pressing to your left half of your left foot. This lifts the right half of that same foot off the adjacent pedal.

4. The fourth position is the inside rock. Your right half of your foot is on the inside pedal.



These basic moves can be applied to all pedals. The only difference is that the C-6th pedals are more chord oriented than the lick oriented E-9th. To play the E-9/B-6th, you can use all the pedals at once by applying the next theory.

### ACROSS THE RACK



Another move to be learned is the across the pedal rack. The three E-9th floor pedals have only two different pedal positions. I give each of the pedals a position. I then use the rocking techniques in the horizontal pedal positions. The universal tuning, having only one neck, allows you to play more pedal combinations. You have to look at the entire guitar. On a double neck guitar you are thinking E-9th on one neck, and C-6th on the other. Start seeing the universal

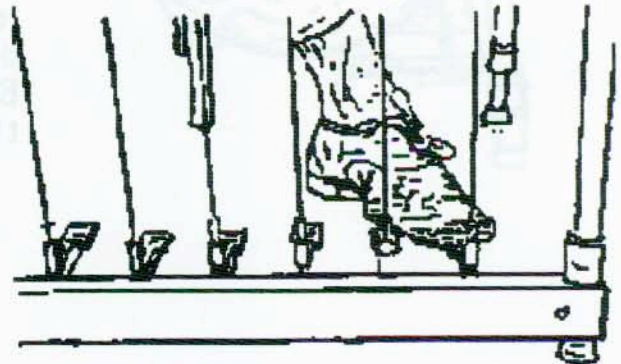
tuning as one guitar with a lot more pedal combinations, rather than two separate tunings. As you learn to move your pedal foot, *across the rack*, smoothly, you'll start seeing combinations that were not there before. See the graphic showing the pedal positions.

The basic positions are really simple and the foot needs to practice all the moves it can make. For instance, if you see a lick starting at pos-1 then to pos-4, you need to make this movement flow. If we have eight pedals, we have seven positions.

### INSIDE OUT

A bad habit that a lot of people have developed, is to play your first pedal with the inside part of your foot. When you are doing this, you have to lift your foot to play the inside pedal. The fastest position is to always play the first pedal with the outside rock. The opposite holds true on your pedal that's at the left edge of your guitar. You need the inside rock on the last pedal so you have the option of rocking to a pedal on the other half of the foot. The pedals, that have another pedal on either side of them, can be played with either an outside or inside rock. Remember, to always leave yourself the option of rocking your ankle. This is an important technique, that can bring you a lot of licks. The foot should learn to work starting in all of the four ankle/foot positions. Going from one to the other is one place where licks can come from.

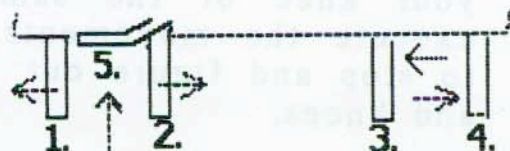
We have now looked at the physical aspect of the your foot working the pedals. We now will look at the functional aspect of the pedals. What happens to your guitar, or more importantly the strings.



## KNEE LEVERS

The secret of a steel, is the combinations of pedals we get from our feet and knees. This allows more pedals to work together physically. The number of knees you place on your guitar is entirely up to you. We'll stick with the standard ones to study how we can make them work for us. You need to consider your height and how you like to sit. You may have purchased a used guitar from a giant and never changed it. Steel's hard enough to play without having to put training blocks on your pedals. Jimmy Crawford does seminars on where, how, and why to place your knee levers. If your ever near, attend one.

The first thing to think about is their movement on the guitar. Assuming you got them adjusted exactly to your specifications, lets discuss them in a different light. Try to follow this....

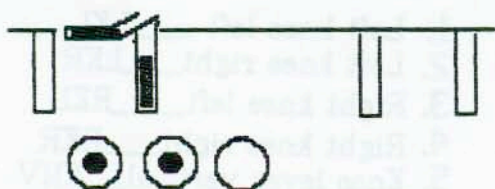
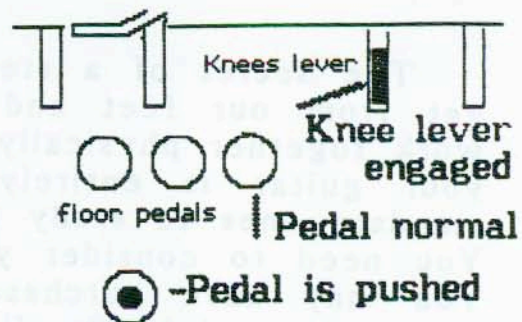


1. Left knee left \_\_\_LKL
2. Left knee right \_\_\_LKR
3. Right knee left \_\_\_RKL
4. Right knee right \_\_\_RKR
5. Knee lever vertical \_\_\_KNV

With five knees we have five different movements to consider. The five are; Left moving left, Left moving right, Right moving left, Right moving right, and Left moving up. We usually see this written as LKL, meaning L-left K-knee L-left. The other four written like this are: LKR, RKL, RKR, and KNV. (V - vertical).

Remember, we are looking only at how they move. If you have these 5 knee levers, you are going to make these moves.

We can see by writing it down this way, the actual movement required to use your knee levers. The knee levers are just like pedals, but are positioned for easier access. With the knees in on the action, we have more pedals that can be played at the same time. The ability to play combinations requires the same kind of thought and practice as does learning left foot pedal rocking. When you're rocking your ankle one way and have to move your knee of the same leg, it can get quite difficult to execute the movements. The only way to see the moves is to stop and figure out all the possible combinations of pedals and knees.



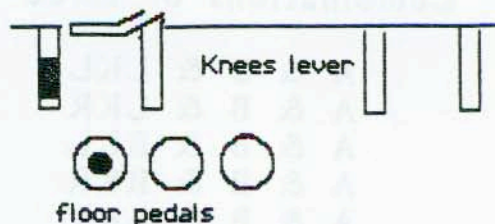
**LKR & knee up plus first second floor pedals.**

Seeing the physical separated from the function and the musical, brings us back to the *why* of pedal steel. Knowing what the physical moves are, I can play a strange pedal set-up, by first, finding the location of the basic pedals/knees, and then, rearranging the physical moves accordingly.

For instance, I flat my fourth and eighth strings (both E notes) with RKR. (R-right K-knee R-right) Most have this change on their left leg. This is usually determined by your first guitar. Mine was a MSA, and they had a standard set up they used. If you got an Emmons, your E's were lowered on the left leg. For me to play an Emmons knee lever set up. I have to adjust my thinking and change the movements I make. The two pedals have the same function, but a different move is required. We have all the same moves on every steel. The function can be whatever you decide it to be.

The same strategy can be used on the floor pedals when you want to switch from Emmons to Day setup. All you do is tell your ankle to do all its rocking, just the opposite of what you normally do. Switching moves comes easier after you train your leg and ankle with weights. Knowing what the movements are, make them easier to isolate, coordinate, control and then, exchange.

If we have a ten string E-9th with three floor and five knees and, thinking of physical directions only, we can figure out all the moves you can make.



**Play lkl and first floor.**

First, we can play them all individually. We'll call the floor pedals A, B, and C, (the original tab) and the knees as previously mentioned. (Notice how we systematically build from the single pedals to combinations).

**Individual.**

- A
- B
- C
- LKL
- LKR
- RKL
- RKR
- LKV

Combinations of any two. (Note: The A and C floor can not be played at the same time with one foot. The same applies to knee levers on the same leg. The body cannot make the move.

- |         |         |         |
|---------|---------|---------|
| A & B   | B & C   |         |
| A & LKL | B & LKL | C & LKL |
| A & LKR | B & LKR | C & LKR |
| A & RKL | B & RKL | C & RKL |
| A & RKR | B & RKR | C & RKR |
| A & LKV | B & LKV | C & LKV |

- |           |           |           |
|-----------|-----------|-----------|
| LKL & RKL | LKR & RKL | RKL & LKV |
| LKL & RKR | LKR & RKR | RKR & LKV |
| LKL & LKV | LKR & LKV |           |

Combinations of three pedals.

A & B & LKL	B & C & LKL
A & B & LKR	B & C & LKR
A & B & RKL	B & C & RKL
A & B & RKR	B & C & RKR
A & B & LKV	B & C & LKV

A & LKL & RKL	B & LKL & RKL
A & LKL & RKR	B & LKL & RKR
A & LKL & LKV	B & LKL & LKV
A & LKR & RKL	B & LKR & RKL
A & LKR & RKR	B & LKR & RKR
A & LKR & LKV	B & LKR & LKV

The following are difficult, but can be mastered.

C & LKL & RKL	LKV & LKL & RKL
C & LKL & RKR	LKV & LKL & RKR
C & LKL & LKV	LKV & LKR & RKL
C & LKR & RKL	LKV & LKR & RKR
C & LKR & RKR	
C & LKR & LKV	

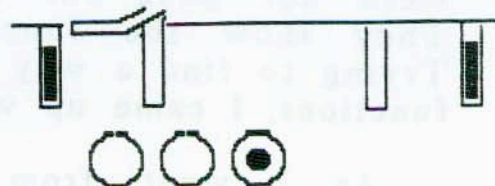
Here are four pedal combinations.

A & B & LKL & RKL	B & C & LKL & RKL
A & B & LKL & RKR	B & C & LKL & RKR
A & B & LKR & RKL	B & C & LKR & RKL
A & B & LKR & RKR	B & C & LKR & RKR
A & B & LKV & RKL	B & C & LKV & RKL
A & B & LKV & RKR	B & C & LKV & RKR
A & B & LKL & LKV	B & C & LKL & LKV
A & B & LKR & LKV	B & C & LKR & LKV

I purposely wrote them out this way so you could see how we match things together. We start with each pedal, then group them in two, threes, etc. Some of them may not be practical because of mechanical reasons, but the most important thing is the teaching of your mind. It has to know before it can teach your legs and feet to do what you want them to. Practice these moves without playing anything on the strings. Get used to the movement that is required for each of the pedals. First learn them singularly and then in combinations. Teaching your feet these basic moves before

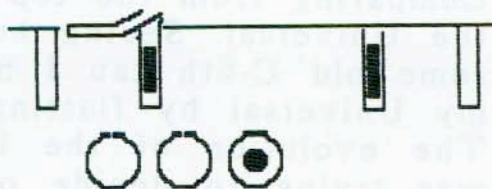
you play anything, will give your mind more time to play music. If the move is automatic, your able to do it without conscious thought. This makes your playing smoother.

If you're playing an E-9th with three and five, you have all these combinations that your body can make. The better you can execute the movements, the more solid your steel playing will be.



Watch a steel player and see how he works his pedals and knee levers. If you have a video player shut off the volume and watch it in slow motion. The movements are what makes a steel work. Their functions depend on what your copedent is, and how you've decided to place them on your guitar.

I created the section, Left Foot Works, to show you ways of using the foot to bring you licks. We'll be using the combinations of the four ankle/foot positions. Use these as exercises. As you start to practice this aspect of playing, and your foot becomes more coordinated, you'll start to see more licks on your guitar. E-9th pedal work is made up of combinations of these moves. The more you work on your physical coordination, the better your playing can be. Additional drills can be found in the exercise section.



**We all use the same moves but there are different strings being moved.**

### FUNCTION NUMBERS

The movement of the leg and foot, to push the pedals, is a physical aspect of playing. What actually takes place when you push one of your pedals? What function do the pedals do? I call this the function of a pedal. Which string does it move?

To talk about this we need to go back think of some earlier tablature. Usually they gave you a chart which defined the function of each pedal they used. It usually gave

your pedals a number or a letter. I can remember trying to play the steel when I really didn't know what the pedals were doing. The charts at the beginning of the tablature were not good for remembering what a pedal would do. They show the function and then assign a letter to it. Trying to find a way to learn my pedals and remember their functions, I came up with the function numbers.

As I went from a 12 string extended E-9th, to a Universal tuning, I was faced with learning a few new pedals. I had to get used to using the pedals that emulated the C-6th tuning. Not having played much C-6th, I needed to learn what they did. I compared the pedals by looking at their physical functions. They were alike in what they did to certain strings. If I thought from the bottom strings to the top I could see how the C-6th and Universal were alike. Comparing from the top down, I saw the E-9th similarities to the Universal. Seeing how they compared, I started to study some old C-6th tab I had laying around. I could play it on my Universal by flattening my E's and using a function chart. The evolution of the function numbers came about when I was trying to decide on a new set-up for a new guitar. I wrote out all the tunings, and I wrote out the half steps that each pedal did to a string. For instance, a pedal raising a string a half step, would get a value of +1. If it lowered a pedal a half-step, it took away a semi-tone or a -1.

The three basic tunings; E-9th, C-6th, and E-9th/B-6th, are alike in more ways than one. With the function numbers we have a logical approach to studying how their pedals compare. Starting to get serious about learning more on the steel, I wanted to have a way to remember each pedal and what options I had. I studied the chart for my Universal and wrote under each pedal the string(s) it actually worked. Looking at these, I wrote them out like in Figure XYZ. These became my function numbers. I memorized the numbers and now, when I play a pedal, I know which strings each pedal works. Looking at the strings, I know which ones can be moved. This allows more freedom to play in positions you wouldn't naturally do. And you start to see licks that weren't there before.

On the Universal, there are three pedals that work the same two strings. They are the fourth, and the eighth. One is flattening them both, one is raising them both, and one is raising one and lowering the other. I gave each the same number and added a (+) or (-), to the ones that raised or



lowered both strings. The pedal that raised one and lowered one got the plain name. They worked string four and eight so they are all 48 (four-eight) pedals. The E-9th tuning has these 48 pedals. Eventually, I started calling them forty-eight positive and forty eight negative. Every time I thought of the pedal, I thought of what it did at the same time.

Study the charts and know what your pedals do. The more a pedal does the larger the name it gets. After you get used to them, you'll be able to use abbreviations. For now, learn to pronounce them and think of them as is.

## HALF-STEP FUNCTIONS

	e.9th			c.6th				e.9th		knees
	A	B	C	D	E	F	G	H	K	K
1.					-1					
2.						+1				
3.		+1					+2			
4.			+2	+2			+2		+1	-1
5.	+2		+2		-1					
6.		+1				-1				
7.								+1		
8.				+2					+1	-1
9.					+1			-2		
10.	+2				+2			-3		

These are the pedals on the e.9th & c.6th tunings.

Knees are e.9th

# HALF-STEP FUNCTIONS

----- universal ----- knees

	A	B	C	D	E	F	G	H	K	K
1.										
2.										
3.		+1			-1					
4.			+2			+1			+1	-1
5.	+2		+2				+2			
6.		+1		+2			+2			
7.					-1					
8.						-1			+1	-1
9.	+2				.			+1		
10.		+1		+2						
11.					+1			-1		
12.					+2			-3		

## PEDAL FUNCTION

The pedals and knee levers have the same basic function when playing the steel guitar. When you activate one of them, you cause the rods to move a mechanism. This mechanism raises or lowers a string a set distance. The actual function of any pedal, can be anything you desire it to be. (Within guitar limitations). The only difference in the knees and the pedals, is the movement it takes to activate them. And, since the movements are independent of each other, (one uses the foot and one the knee) it allows your body to do the physical moves in combinations.

To see the function numbers, lets look at some building blocks in Computer Scales Section. The first one is C Major. The building blocks are what you have to see happening when you push a pedal. This method of seeing the notes you can get with a pedal will help you find new licks with your pedals.

Studying these at the guitar, you can start to learn your pedals in a different way. The pedals are variables that can change the way the music lays upon the fretboard. I think of each pedal and combinations of pedals, as a new tuning on your guitar. The music theory section will let you see how each pedal can be considered a whole new tuning. Early ancestors of the pedal steel, had one tuning per neck. With pedals you have as many as the mechanics of the guitar will allow.

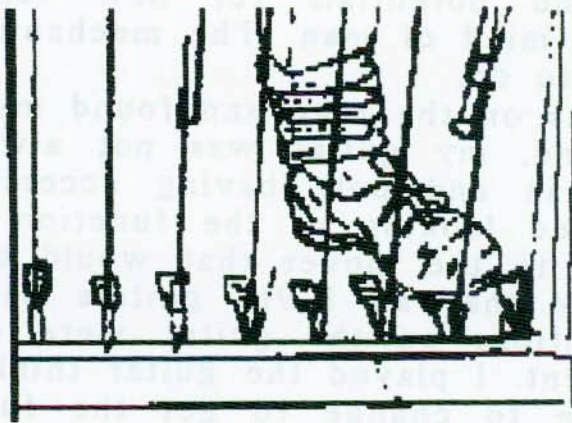
The ability of the newer guitars are making it possible for the steels to do more things to the strings. The possibilities and potentials for new tunings, are only as limited as the mind of man. The mechanics will do whatever you set them to do.

When I was on the road and found myself wanting to set in with a band, my guitar was not always around. Always ready to set in and only having access to someone else's guitar, I started looking at the function of the pedals; and applying them to the moves that would be required on each guitar. I knew that all E-9th guitars had the same pedals, but their positions on the guitar were different with each players copedent. I played the guitar thinking of the physical move I'd have to change to get the function I wanted. It was difficult but it made the adjustment a little faster.

Exercise: For coordination and learning your pedals, push each pedal and play only the strings that that pedal moves. Learn to see the strings moving. This also gets your right hand in touch with each pedal. After you've done each one separately, start going faster from pedal to pedal. Picking only the strings that the pedal moves.

Each pedal has a definite function that it can do. Lets first look at an E-9th copedent. Three floor pedals and five knees. Using building blocks we can study the physical move the guitar is making. Each square represents a string and a fret intersection. A string that's being raised, can be thought of as going up and bringing the note back to the bar. The first pedal we'll study is the E-9th 'five-ten'. The next section shows you how to read one of my block graphs. Building blocks to better playing.

# LEFT FOOT WORKS



## MY APPROACH

# LEFT FOOT WORKS

The next section deals with the movement of the left foot on the pedals. Once again, we will be learning a new graph. This graph will represent the four basic foot positions. The most important thing is the rocking of the ankle.

1.



2.



3.



4.



1. This is your foot above the pedals ready to play. I set my foot on the pedals without moving them. This makes the distance you have to travel shorter.

2. Both pedals are down. The ankle is straight.

3. This is rocking your ankle to the outside. The inside of your foot comes off the pedal. The ankle has to be flexible and in good condition to rock.

4. The opposite of the outside rocking motion is the inside. The outside of the foot leaves the pedal.

Its easy to see all the ankle positions, but the real trick is developing ankle technique. Just as someone can have a great bar hand, you can also have a great ankle. The moves are only tricky when you start to look at the math. What are the possible combinations? The way to find out is place the moves in a logical order. The first moves are the individual moves themselves. They can go together in a lot of ways.

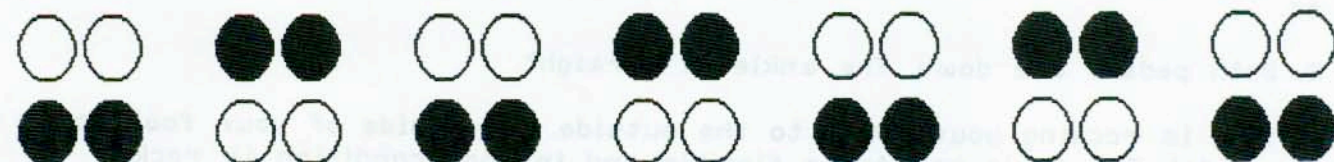
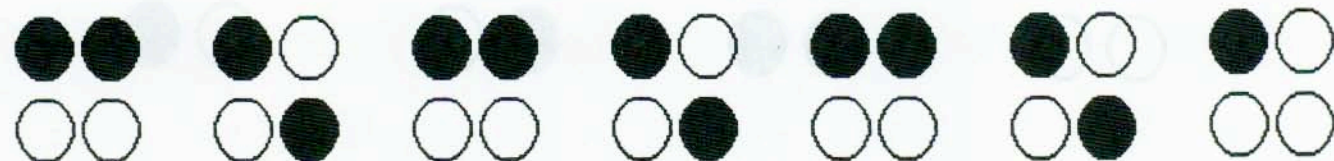
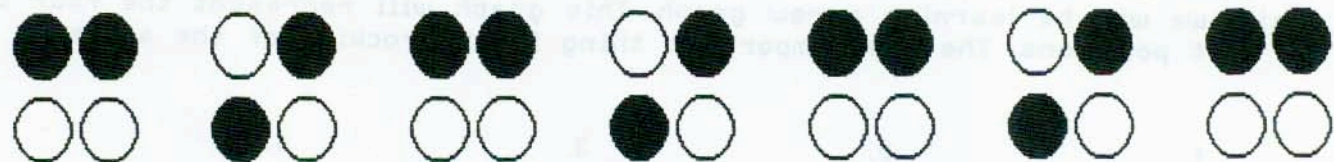
To follow the thinking we need to be able to start on any of the four positions and go smoothly to any other one, and at any time, be able to place any other one in between. Crazy? Not once you get the foot working.

Read these left to right and right to left. Work your ankle on the pedals. Use A & B to exercise on. It may be any two adjacent pedals.

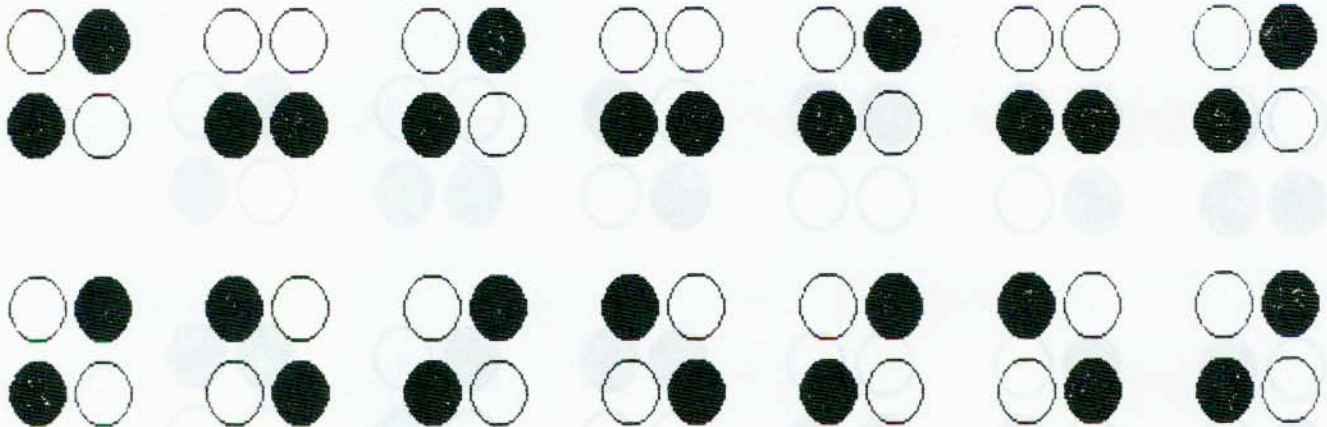


# L7 cont.

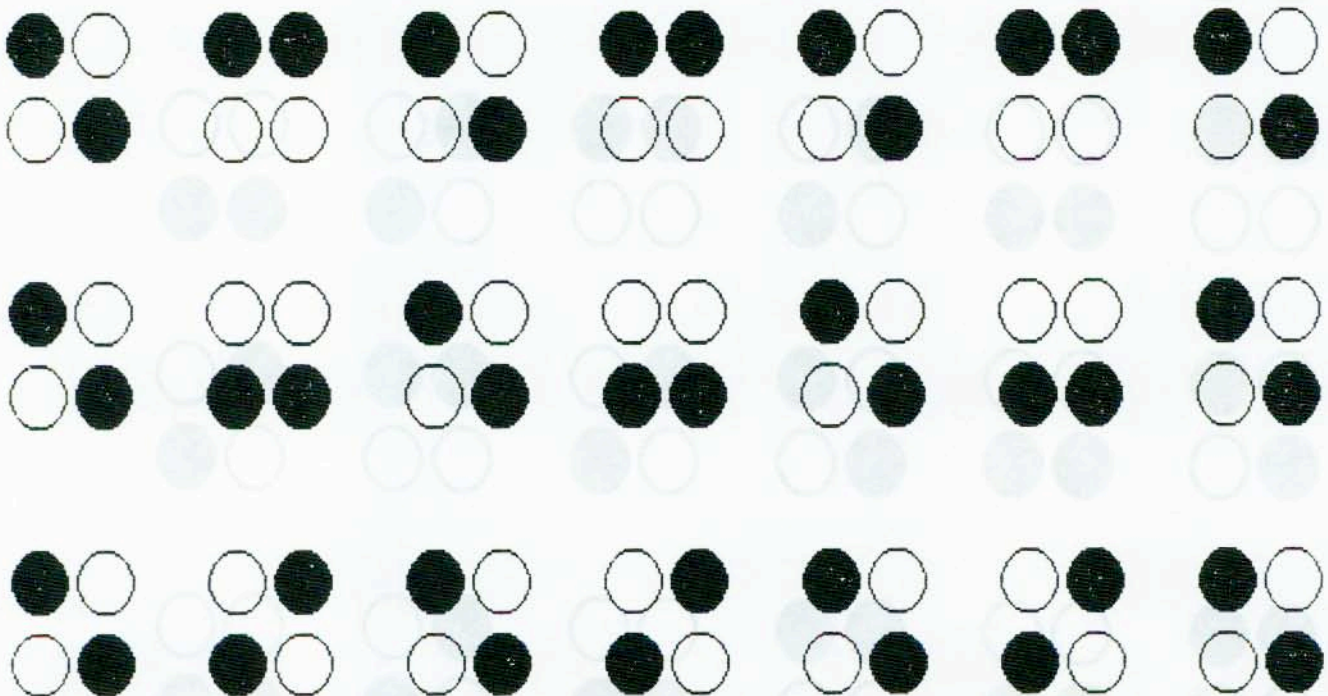
On the first example on the previous page, the graph was showing us to move the pedals up and down. The next examples will start with the foot in the up position and work from there.



As we continue, we are working the ankle, with each position as a starting point. The following move shows you using an outside rock and moving from there. It is so important to get the muscles of the foot used to going in all directions.



The above exercise is the hardest of all the moves. The ankle gets a real workout. Be sure to practice this at different speeds. The foot should do the move slow, almost like you are rolling off of one pedal to the other. Another way is to snap the ankle. As one is released, the other is depressed. Whatever the move, control is the key.



That shows us each move going to every other. Now we need to play them in combinations. When you are playing steel you are making these moves. Taking the time to study what the moves are and teaching your foot, makes it easier.

# LJ cont.

This section deals with combinations, of all four positions. The reason for the exercise is to develop flexibility in your ankle. The faster your foot (ankle), the more licks you'll have at your "feet".

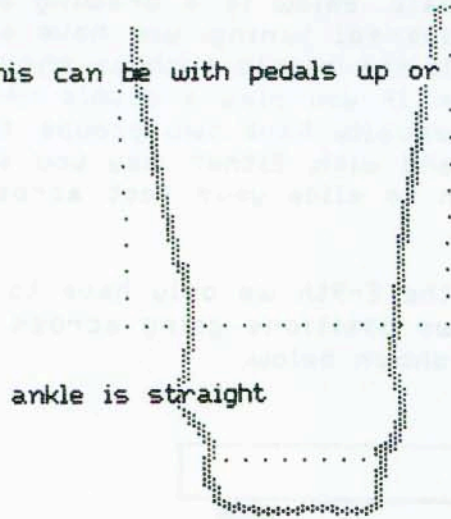
The diagram consists of a 6x6 grid of pairs of circles. Each pair represents a combination of four positions: top-left, top-right, bottom-left, and bottom-right. The circles are either filled (black) or empty (white). The combinations are as follows:

White, White	White, Black	Black, Black	White, Black	White, White	Black, White
Black, Black	Black, White	White, White	Black, White	Black, Black	White, Black
White, Black	Black, White	White, White	Black, Black	Black, White	Black, Black
Black, White	White, Black	Black, Black	White, White	White, Black	White, White
Black, Black	White, White	White, White	Black, Black	Black, Black	Black, Black
White, White	Black, Black	White, Black	White, White	White, Black	White, White
White, Black	White, White	White, Black	Black, White	Black, Black	Black, White
Black, White	Black, Black	Black, White	White, Black	White, White	White, Black
Black, Black	White, White	Black, Black	White, White	Black, White	White, White
White, White	Black, Black	White, White	Black, Black	White, Black	Black, Black



# LEFTFOOT GRAPHICS

This can be with pedals up or down.

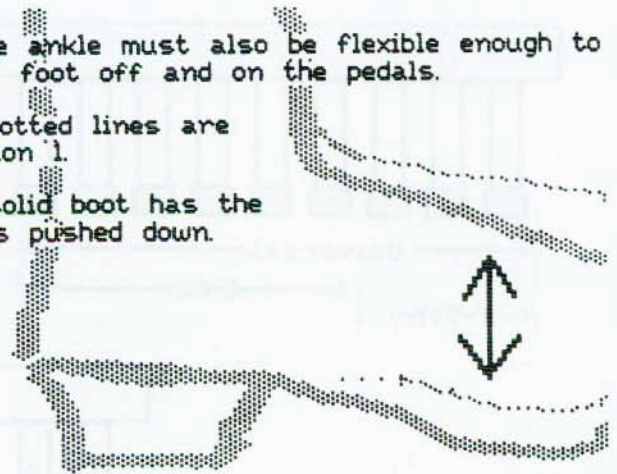


ankle is straight

The ankle must also be flexible enough to raise foot off and on the pedals.

The dotted lines are position 1.

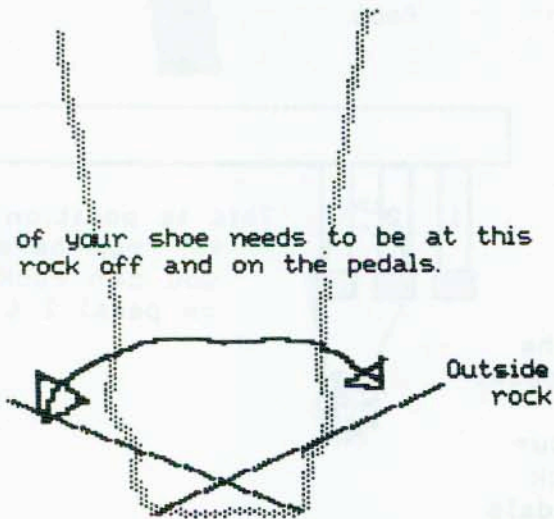
The solid boot has the pedals pushed down.



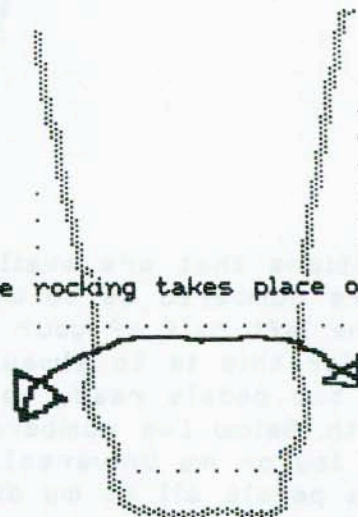
The sole of your shoe needs to be at this angle to rock off and on the pedals.

Inside rock

Outside rock



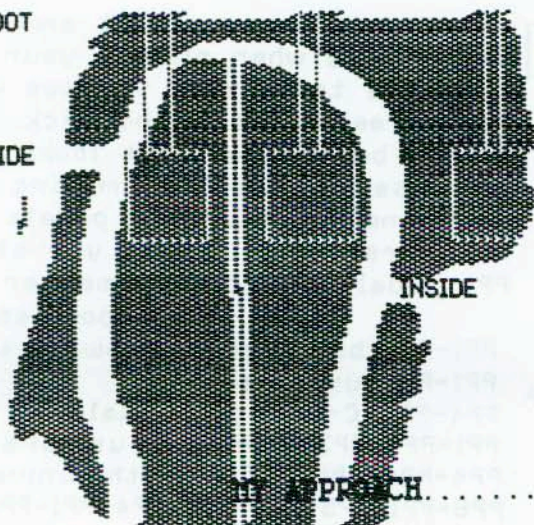
The rocking takes place on this axis.



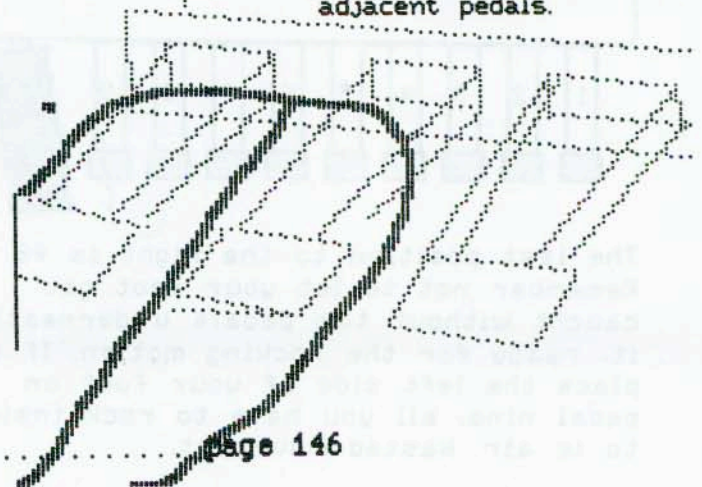
LEFT FOOT

OUTSIDE

INSIDE

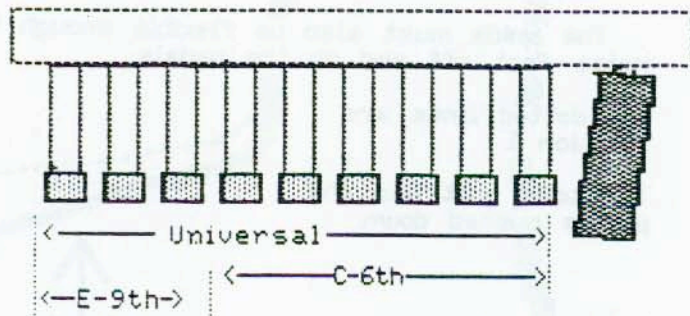


Divide the foot between two adjacent pedals.

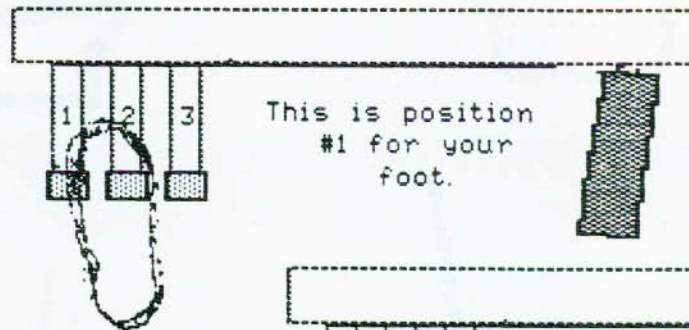


# ACROSS THE PEDALS

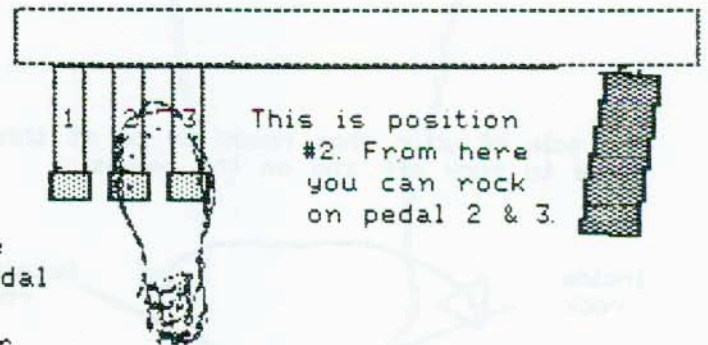
Here we deal with the foot going across the pedals. Below is a drawing of a pedal rack from the top view. If you play a Universal tuning, you have access to all the pedals without changing necks. If you play a double neck, you usually have two groups to contend with. Either way you should learn to slide your foot across the rack.



For the E-9th we only have to move to two positions going across. They are shown below.

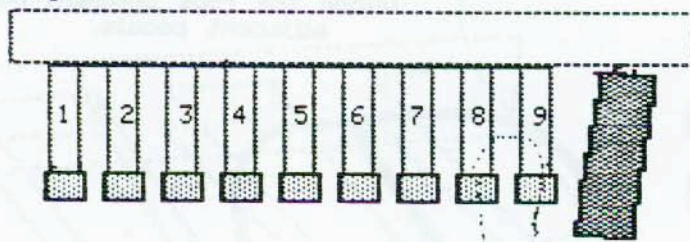


This is position #1 for your foot.



This is position #2. From here you can rock on pedal 2 & 3.

The positions that are available on the C-6th are numbered as to whichever pedal is on the left half of your foot. The reason for this is to always keep your foot on two pedals ready to rock back and forth. Below I've numbered the pedals as they lay on my Universal. One neck and nine pedals all at my disposal at anytime.



The last position to the right is #8. Remember not to let your foot get caught without two pedals underneath it, ready for the rocking motion. If you place the left side of your foot on pedal nine, all you have to rock inside to is air. Wasted movement.

To attain the greatest amount of proficiency when playing your pedals, you have to be able to move your foot freely across the rack. This should be done without looking down. I exercise this move by making up moves back and forth on the pedals.

Here are a few to get you started. PP= pedal position. (Remember to do the opposites)

- PP1-PP2 basic E-9th slow, fast, etc.
- PP1-PP3 universal
- PP4-PP7 C-6th, universal
- PP1-PP2-PP3-PP4-PP5 universal
- PP4-PP6-PP5-PP7 C-6th, universal
- PP8-PP1-PP5-PP7-PP3-PP4-PP1-PP8

# FUNCTION NUMBERS

U+	U+	U+	U+	1	2	3	4	5	6	7	8	9	U+	U+
+1														
			-1/2											
				+1			-1							
	+2				+2			+1				+1	-1	
		-1		+2		+2					+2			
				+1		+2					+2			
+1								-1						
									-2				+1	-1
			+2	+3	+2							+1		
				+1		+2						+1		
-3								+1				-1		
								+2				-3		

1 4 5 2 5 3 4 6 3 4 5 9 4 4  
 7 7 9 9 6 5 10 7 8 6 7 12 8 8  
 7 12

## FUNCTION NUMBER

Strings	Pronounced
1711	one-seven-eleven
4	four
5	five
29	two-nine
3610	three-six-ten
45	four-five
610	six-ten
371112	three-seven-eleven-twelve
48	four-eight
56	five-six
91112	nine-eleven-twelve
48	four-eight positive
48	four-eight negative

This is how I developed my function numbers. First, I wrote out my pedal set-up as you see it to the left. The numbers are each representing a half step. The value of +1 signifies a raise of a half-step. The -3 is flattening the string a step and one half. That is a minor third interval.

Immediately below each pedal I wrote the numbers of the strings that each pedal moved. You see them wrote out vertically below each column. The more a pedal does, the larger the number. I then wrote each out in longhand and gave them a name to pronounce them by. The names are long and sometimes not suitable for improvisation, but to memorize them, and to compare them to other tunings we can talk about them in this manner.

U+	U+	U+	U+	1	2	3	4	5	6	7	8	9	U+	U+
								+1						
									+1				-1	-2
				+1						+2				-1
-1		+1	+2			+2				+2				
	-1		+2		+2		-1							
				+1						-1				
											+1			
-1		+1				+2								
							+1					-1		-1
						+2		+2						

4 5 4 4 3 5 4 1 2 3 7 2 3  
 8 8 5 6 10 8 5 6 4 9 9 3  
 9 10  
 10  
 E-9th----- C-6th----- E9 C6

To the left we see a standard E-9th and C-6th copedent. We need to write them out like we did for the Universal tuning.

Strings	Pronounced	
48	forty-eight negative	
5	five	
48	forty-eight positive	
45	four-five	
36	three-six	
510	five-ten	E-9th
29	two-nine	
<hr/>		
48	four-eight	
15910	one-five-nine-ten	
26	two-six	
34	three-four	
7910	seven-nine-ten	C-6th
3	three	

Function Numbers cont=

The previous page gives you the function #'s for the E-9th, C-6th and E9/B6th tunings. We can now use these numbers to compare the tunings. The thing to remember is that you are working different strings on different tunings, but they result in the same musical values. The pedals on the Universal, work the same values but on different strings. The following chart will give you a pedal on the E-9th and then show its equivalent on the universal.

Starting with the three floor pedals, the E-9th are:

- 510 on the E-9th is 59 on the Universal. On both guitars they raise B notes to C#.
- 36 on the E-9th is 3611 on my Universal. I have three G#'s and raise them all a half.
- 45 on the E-9th is 45 on the Universal. Exactly the same.

Every guitar is set-up different, so you can use these numbers to study someone else's tuning. The two charts on the previous page show an Emmons floor pedal set-up on the top chart and a Day set-up on the bottom. The functions are the same. The only thing you would change is the physical move that brings you what you need. Also, notice the position of the knee levers. The function numbers show you that the 48+ on both E-9th and Universal tunings are doing the exact same thing to the guitar. Where you place them is based on personal preference.

To compare the pedals to see what their counterpart is on the other tuning, you have to look at the + or - values the pedal creates. Go back to the three floor pedals above and look at what each does to the strings. Each of them has a counterpart on one of the other tunings.

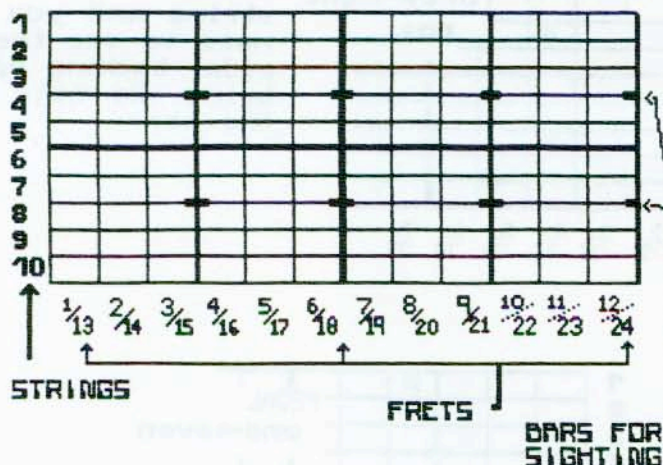
E-9th	Universal
48+	48+
48-	48-
510	59
36	36
45	45
5	5
29	29

C-6th	Universal
48	610
15910	371112
26	48
34	56
7910	91112
3	5

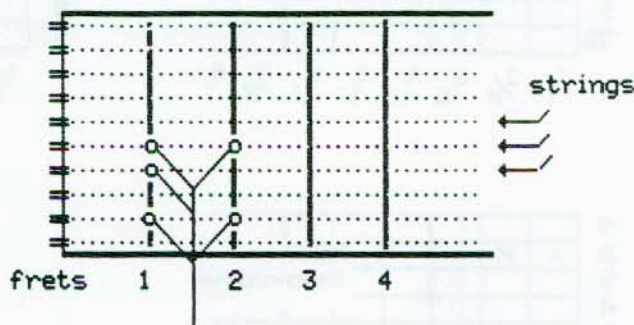
The 29 pedals on the E-9th and universal only work the same on the second string. The Universal tuning has removed the D string in the ninth position and moved the B string up. To get that D note on the ninth string from the B, you raise the B a +3. On the E-9th, you lower the ninth string a half step to a C#.

The most important thing to grasp here, is you must KNOW THE FUNCTION of all your pedals. Take the time to learn what each pedal does on your guitar. An excellent exercise for this is to play each pedal one at a time and make your fingers pick only the strings that the pedal is effecting. On the E-9th you would push pedal five-ten and pick those strings. The trick is to be able to go from pedal to pedal in any order, playing only the strings that are being moved. First, start slow and do all of the floor pedals. Then do the knees. As you do the floor you should be thinking, five-ten, three-six and then four-five. The function numbers are telling you what strings to play. Pick the strings and then hit the pedal once or twice, then do the next one. You should know all the moves and be able to associate them through your feet and fingers. This is an excellent hand/eye coordination exercise.

**Example 10 string**



← This example chart is the graph I use to study the theory on the steel. This is not like the right hand tablature. This was developed to represent the intersections of the frets and the strings.

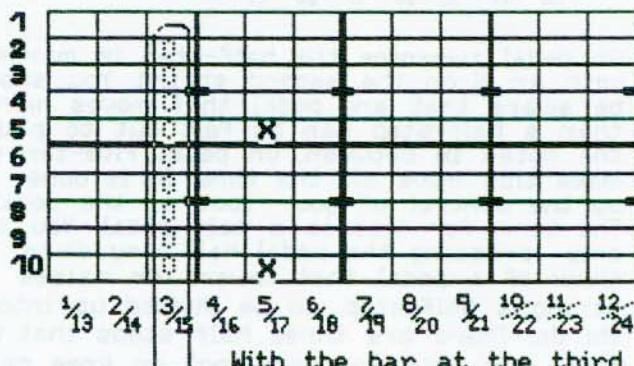


Fret/string intersections are given a square. We can then place a note value within. They represent the guitar

(o) represents the point on the the guitar where your string and frets intersect. Look to the example chart and notice that we've turned this (o) into a square to represent that value.

If you look at the color charts, you'll notice that certain squares are given a color value. This represents a scale. In this section, we are going to use the charts to see what happens when you push a pedal or knee. We will start with the standard E-9th tuning. The first pedal we will study will be the five-ten.

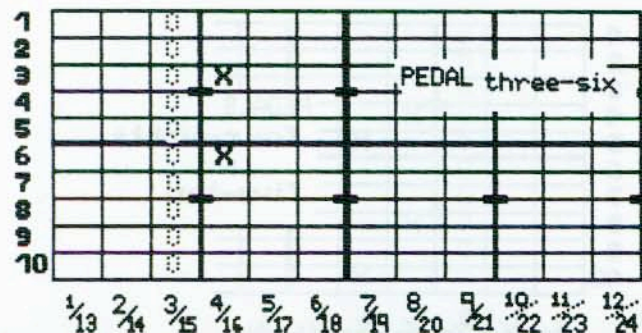
**Example 10 string**



We will be placing the bar at the third fret to study all the pedals. The trick is being able to visualize the movement that each pedal creates. As you get more familiar with the charts and music theory you'll start to see licks on your guitar. You may need a certain note in a solo and if you know your pedal and what you are trying to say musically, the ideas will start to flow.

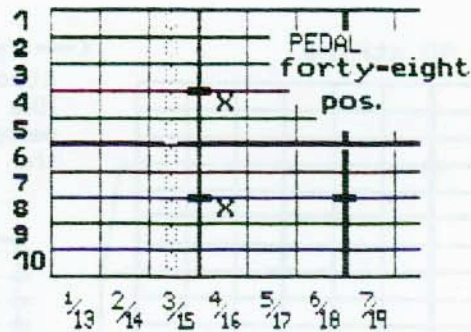
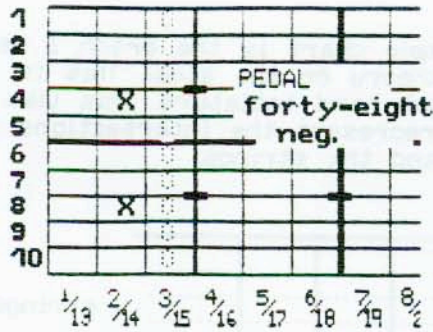
With the bar at the third fret, and using the five-ten pedal, we can see what takes place when you push the pedal. The o represents the guitar without a pedal pressed. It shows the bar at the fret. When you push the pedal, the value of the X is brought to the bar. This is the trick to remember, you have to think of a pedal or knee lever as a device to bring notes to the bar. If you're raising a string, you are going up the neck and bringing that note back to your bar. The lowering of a note should cause you to visualize going back and bring a note to your bar.

**Example 10 string**

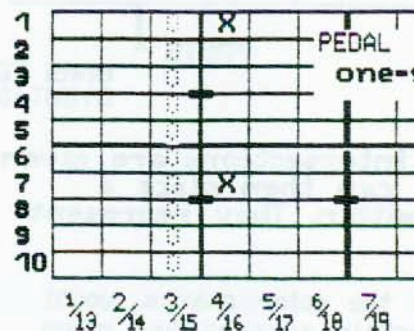
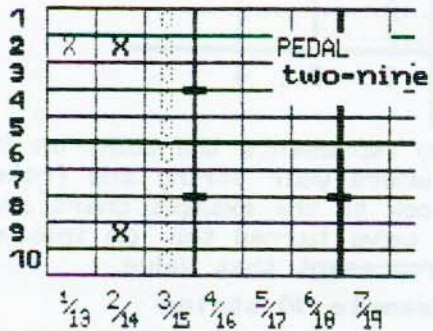


MY APPROACH..... page 150

Above we see what happens when you push pedal three-six. The bar at the third fret is used only as for the examples. The bar can be at any fret and the pedal will do the same thing. We go up and bring the note to the bar. The note that is represented by X comes to the third fret when we engage the pedal.

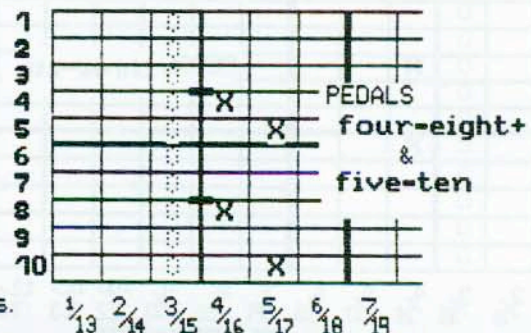
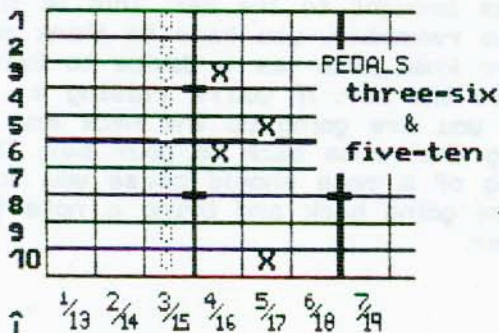
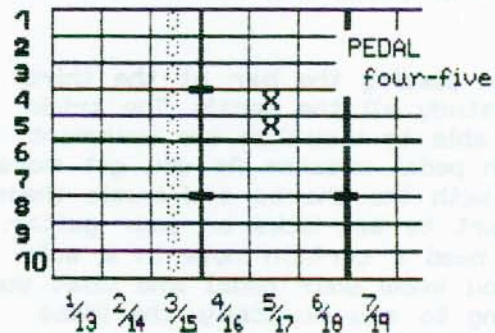


PEDALS and KNEES bring a note to the bar. Lower a string and you need to see the pedal backing up, bring the note to the bar.



I used this on my extended E-9.

On pedal two-nine the half-step is marked with an X on the second string. You should be aware that any pedal that moves more than a half-step can be felt out to play the notes in between. On pedal five-ten you make this move all the time. It is done by the control of your foot on the pedal. The term for this is a half pedal. You are only pressing the pedal half way down. I think of a pedal that lowers or raises a string a half-step, to be divided up into thirds. There are three half-steps that the pedal can move to. Your foot or knee can learn to control this move.

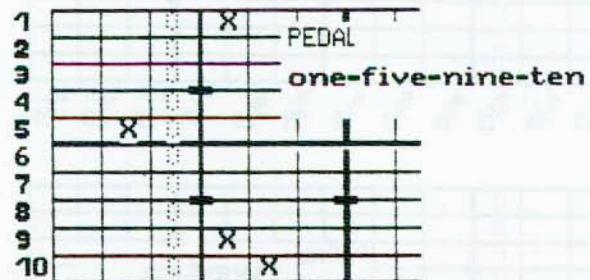
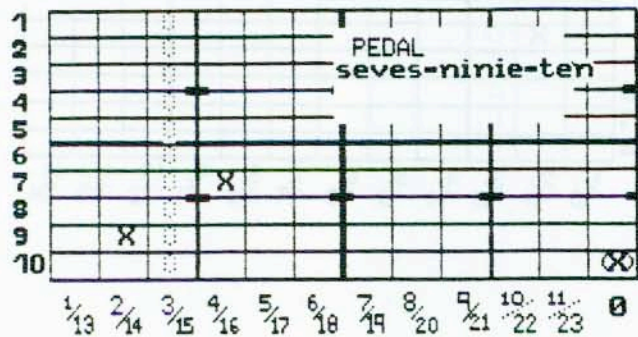


Here are two examples of pedal combinations. They are wrote out with function numbers so no matter where they are on your guitar

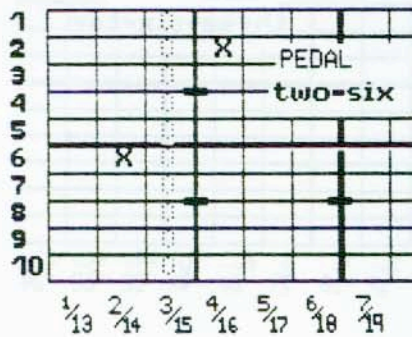
you can relate to the movement. The two examples that are used to show combinations, are the basic moves that are needed to play major chord arpeggios. There are more combinations possible, but you should learn to put them together in your mind.

# C-6TH FUNCTION NUMBERS

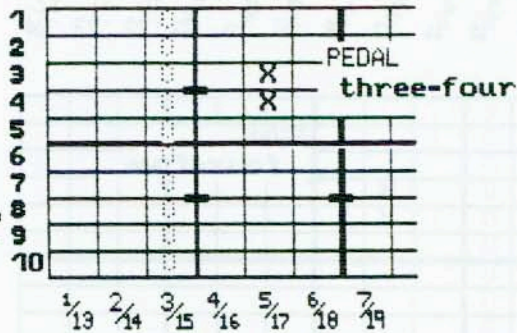
Here we have the movements that take place on the C-6th neck. The pedals are the standard Nashville moves. The X is the value that comes to the bar. The first pedal will be seven-nine-ten. The thing to notice is the X is put in the twelfth fret on the tenth string. The actual note is the same as the open tuning. The octave is left for you to decide. F0, F12, and F24 are all the same notes in three octaves. You visualize the pedal going back to bring that note to the bar. On the chart, you read it up.



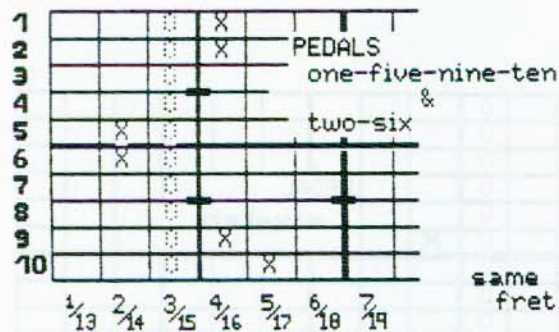
You can see in all the examples what each pedal is doing. It is important that you see each pedal and then you put together combinations.



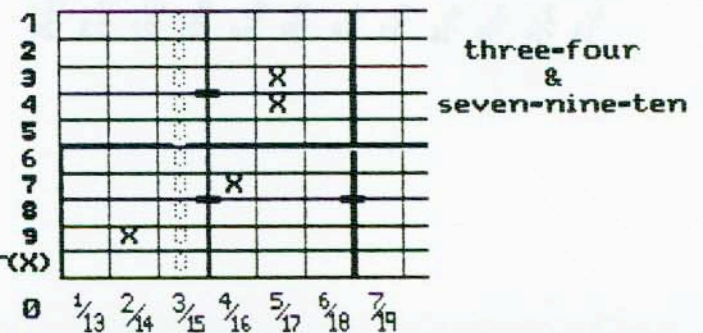
Pedal two six is pedal 48 on the Universal. The difference is the univer. has to flat the lower string a full step. The reason is the universal need to be flatted to match the intervals of the C-6th.



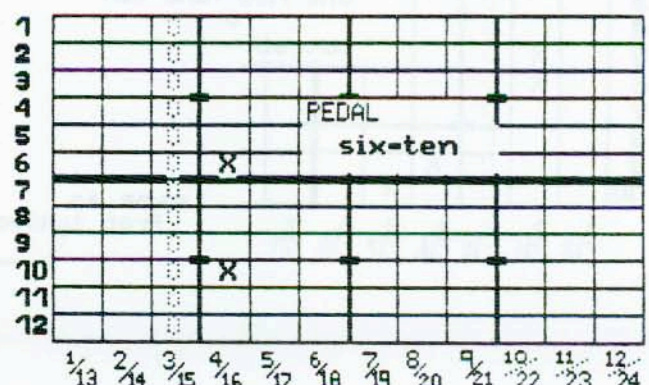
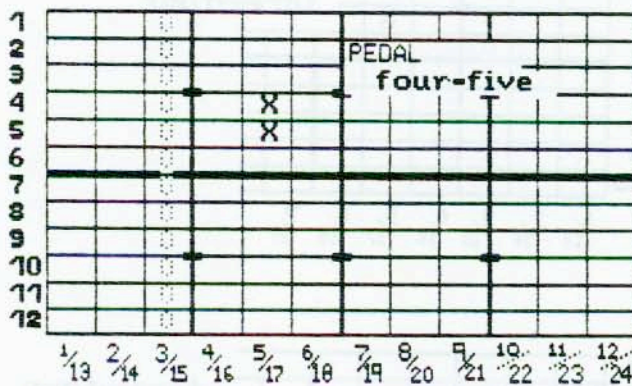
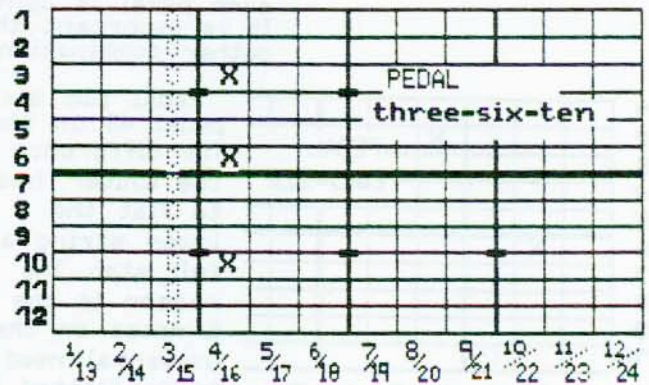
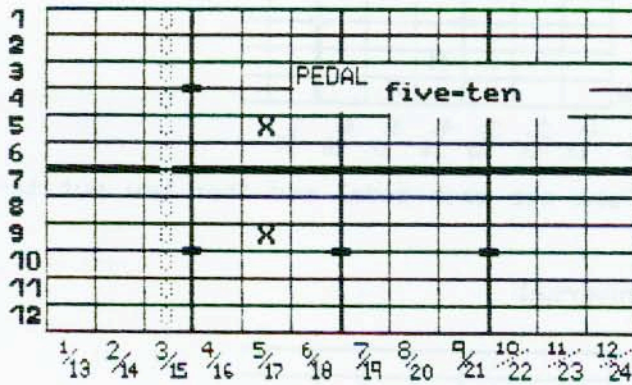
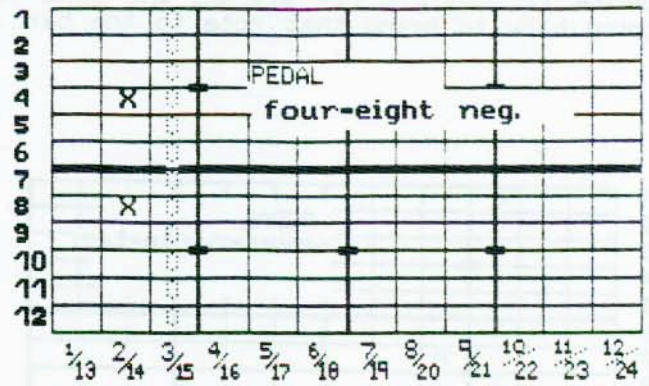
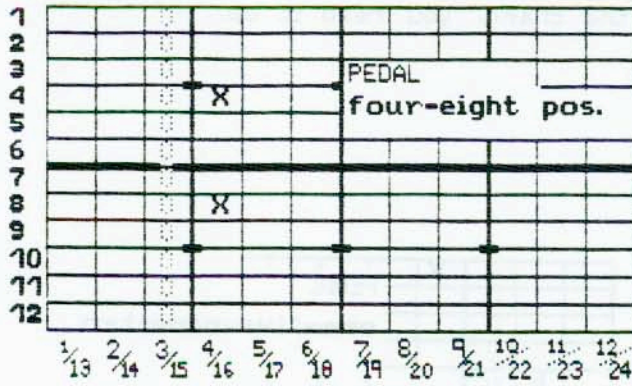
Example 10



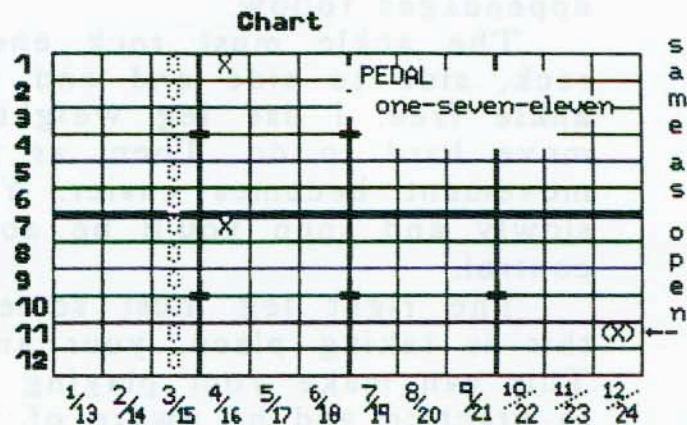
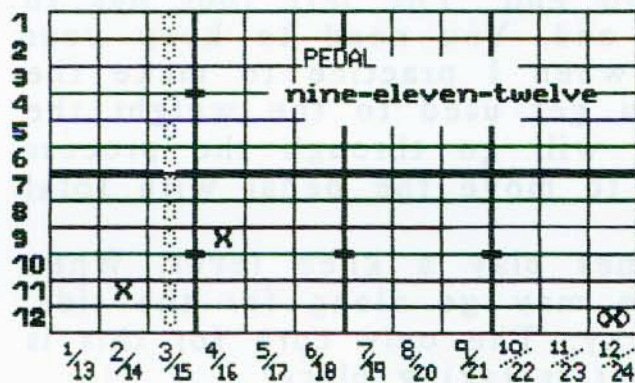
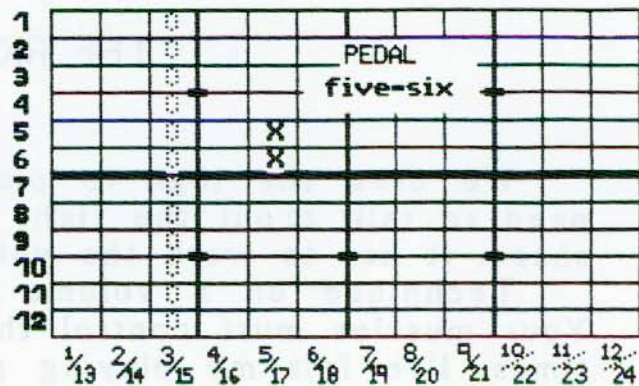
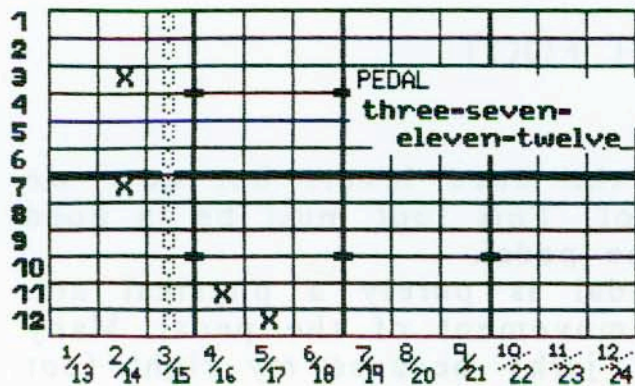
same as fret twelve



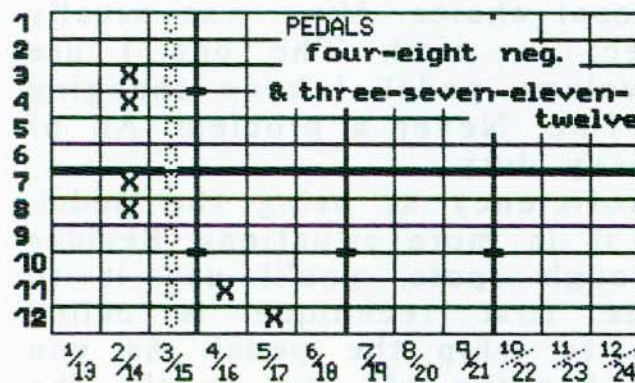
# E9/B6TH FUNCTIONS







F0 same note  
 F12 different octaves  
 F24



That gives you all of your basic pedal moves and what happens to the strings. You have to learn to see the combinations as you hit the pedals. When you start to play chords you'll see where they come from. Learn to see the strings moving underneath your hands. You are bringing the note to the bar. The pedals go and get the notes and bring them to the bar. I said it twice so you'll let it sink in.

Well, there you have another way to look at your guitar. The function numbers may seem difficult at first, but with time you'll start to see the benefits. I never really played C-6th but the function numbers let me understand what's going on with that tuning. I use them to transpose my universal licks to C-6th guitars. One more way to look at the things that are taking place with the steel guitar.

## THE RIGHT FOOT

We used the legs to play the knee levers but now we need to talk about the right foot. This foot must be in good shape. It has to work the volume pedal.

Technique on a volume pedal is purely a physical act. Your muscles must control the movement of the pedal. Many times, I've felt my playing get jerky because my right foot was tensing. The nerves in my foot froze the ability to move. Once this happens, you can bet that the rest of the appendages follow.

The ankle must rock end to end. The left foot has to rock, side to side and end to end. You need to keep your ankle free. I use leg weights when I practice to make the move hard to do. Then, as you get used to the weight the movement becomes easier. You will go through the process slowly and soon you'll be able to move the pedal with total control.

The right leg must sometimes play a knee lever. When this is taking place, your ankle may go along for the ride. This can make your playing jerky. The only cure for this is to practice and be aware of what is taking place.

I place my pedal on the floor. Some have it attached to their guitar.

There are many types of volume pedals on the market. Again, it depends on your personal choice. Mine was usually chosen with the financial aspect in mind. The one I use personally is my original MSA volume pedal. I keep changing the potentiometer and it works fine. Never a problem. All of the wires and connectors are heavy duty.

Once you build up more proficiency at using the pedal, you will find yourself utilizing it in more situations. Besides helping to smooth over the rough spots, you'll use it to accentuate different licks. The first technique is called gutting. Your ankle must learn to whip the pedal. As you pick the strings, your ankle is backing off the pedal. The sound is synonymous with the legendary Curly Chalker.

The opposite effect can be implemented, also. Rock and roll is a place to use some of the fancier volume pedal techniques. Again, I must emphasize practice and conditioning. They come hand in hand or in this case foot to foot?

To get your foot in shape you can use some of the following methods:

1. With a leg weight on each ankle, practice some of your regular licks. At first you should have a difficult time.
2. Exercise the ankle within the full range of movement. You should start slow and go as fast as you can, cleanly. Back and forth over and over.
3. Work each move with concentration placed on one of the two moves. Instead of up, down, up, down, accent down, down, down. This will build up the muscles.

## MY APPROACH

# Music Theory

## MY APPROACH

This section is devoted entirely to music theory and how it relates to the Fetal Steel. The various sections of the book are designed to be read in order, but you can jump around if you like. The book is written in a way that is easy to read and understand. It is written for people who are interested in music theory and who want to learn more about it. The book is written in a way that is easy to read and understand. It is written for people who are interested in music theory and who want to learn more about it.

We are now going to talk about the language of music. Most importantly, we are going to study it applied to the steel. The language of music is music theory. Steel guitarists have tried to avoid this subject for years. The reason being that there are more ways to find things on a steel. How can we communicate with the rest of the musical world if we can't speak the lingo ourselves?

## MUSIC THEORY

This section is devoted entirely to music theory and how it relates to the Pedal Steel. The previous sections dealt mostly with the mechanics, or, the body movements needed to activate the mechanics, and getting the body parts into shape for playing. Hopefully, you've started seeing the advantages of well conditioned hands. If, by chance you're still skeptical, this next section will soon change that.

The theory will help you tie all the moves together. Knowing theory will let you figure out what any particular move is, in relation, to how you use it at the time. You can look at any move and know what you're playing. Most important, is the fact that you will know **why** a certain lick does what it does. You can figure out what you're playing and communicate it to someone else. There was a time I didn't know what I was playing. I played only by ear and just didn't realize what I was missing. The rest of the music world studies music, why only a few steel players?

We are now going to talk about the language of music. Most importantly, we are going to study it applied to the steel. The language of music, is music theory. Steel guitarists have tried to avoid this subject for years. The reason being that there are more ways to find things on a steel. How can we communicate with the rest of the musical world, if **we** can't speak the lingo ourselves?

We are going to learn to see the music on a pedal steel guitar. Once we start seeing the music, our mind will start getting the physical and the musical working together. If your hands are not in shape, you'll see things you could have played, but didn't attempt, and other things you attempt, that you shouldn't have. If you are weak in the theory department, you'll have fewer ways to use your new hands. Theory gives you many more ways to look at things. Again, each aspect can be studied and applied to the art of playing the steel.

Learning this new language will require a great deal of understanding. Memorize a little at a time. Your mind can only accept so much. To go beyond you will only confuse yourself. Music is just like learning a foreign language. Take your time. Remember that this book is always around as a reference. Little by little.

Its not what you know, but what you understand. This means, if you have a book with the information and know how to retrieve it, and then apply it, you should be able to succeed at a given task. Learning to play steel in this case. Don't try to memorize everything, understand it! You can always come back and refresh your memory.

There are two ways to see the music on the steel. One is using each pedal combination as a separate tuning. The other is to see the pedals moving a pattern. The pedals that raise can be seen as going up and bringing a note to the bar. A pedal that lowers a note should be seen going back behind the bar and bringing a note up to the bar.

## PARTS OF MUSIC

We have to look at music as being in definite parts. We have the melody, harmony, and the rhythm.

### RHYTHM

Rhythm is the beat of the music. Music is entirely dependent on it. Without the rhythm the melody has no where, or way, to play. Rhythm is the lifeline of music. Your melody and harmony don't have much to do without some rhythm.

### MELODY

Melody is the succession of tones arranged in an effective manner. The various number of ways we can arrange a limited number of notes is unlimited.

### HARMONY

Harmony is when two notes are played at the same time. Harmonies are studied with intervals. A chord is an example of more than one note played at a time. Sometimes two melodies are played at the same time. This is referred to as counterpoint.

It is very important to realize that the strings and the pedals are fixed objects. They are tuned to a certain tone. As we get into this section, you'll soon start to see how important it is, that both the physical and the musical work together. As I discuss the theory, I'll give examples to show you what I'm talking about. These will be in tablature form. The tablature may be of any type. Remember that tab is only codes for what the hands, knees, and feet must do.

## INTERVALS

The distance between two notes is termed an interval. It can also be thought of as the difference in pitch between any two sounds. The smallest interval that we have to deal with is the semitone or half-step. The next largest is the whole tone. A whole tone is two half-steps. Intervals can be used to analyze patterns and chord movement. They are usually measured from the bottom note upward.

When I think of intervals on my guitar I break them down in terms of the number of half steps that they contain. The frets on my guitar are all half-steps and this makes the math easier to figure out. I also look at the relationship between all the strings by the number of half-steps. The pedals are used to alter the intervals between the strings. Because the pedals work strings either a half-step, whole-step, or a step and a half, I can think in terms of a plus (+) or minus (-), number of half steps. These, I see as variables. A pedal bends a string up or down a certain number of half-steps. You have a -1, -2, -3 or a +1, +2, +3. They are all that the mechanics will allow musically. This lets us see the pedals moving the music on the steel. Since I needed a logical way to study the theory, I can use numbers to guide what I know is happening on the guitar, faster than I can thinking out the actual notes. The intervals make it easier to mathematically figure out what chord you're playing.

Some words that come up in discussing intervals are diatonic and chromatic. A diatonic semi-tone is formed by two notes that have different names. (Like B to C or E to F.) A chromatic semitone is formed by two tones of the same name. (Like C and C#, or F and F#.) The words diatonic and chromatic will come up again in the scale section. It's important to see these started as types of intervals.

The distance of an interval refers to the exact number of letter names between the two notes. Listed below is a major scale with the intervals shown.

An interval can be said to be of a certain type or quality. They are: perfect, major, minor, diminished and augmented. The words describe what is happening to any certain interval. The perfect and major are counted from the first step of a major scale to any other tone in that scale.

We number them with one being the starting point. Intervals are named by the distance between the notes. Here



we see the intervals between the first tone of a major scale and all of the rest of the tones. We can study the major scale by giving each tone a number. A major scale has these intervals.

First tone to first	is in	Unison
First tone to second	is a	Major second
First tone to third	is a	Major third
First tone to fourth	is a	Perfect fourth
First tone to fifth	is a	Perfect fifth
First tone to sixth	is a	Major sixth
First tone to seventh	is a	Major seventh
First tone to eighth	is an	Octave

Minor, diminished, and augmented are terms that describe what can be done to a perfect or major interval. They are pretty much self explanatory according to their names. Reducing a major interval by a semitone, either by flattening the upper or sharpening the lower note, it becomes a minor interval. That means C to E is a major third and C to E flat is a minor third. A minor third is three half steps.

To augment something is to add to it. So an augmented interval is one that is raised. From C to G is a Perfect fifth and C to G# is an augmented fifth. The augmented fifth has eight half-steps.

To diminish means to lessen, so a diminished interval is one that has been lowered a semitone. The minor and major work the same. They are like the perfect and major, in that they are used only on certain intervals. C to D is a second and C to E is a third. C to D# and C to E flat are the same but can be thought of as either an augmented second or a minor third.

You can invert an interval by taking the top note and placing it on the bottom or taking the bottom note and placing it on the top. Perfect intervals, when inverted, remain perfect; minor intervals become major; major intervals become minor; augmented intervals become diminished, and diminished intervals become augmented.

An interval that does not exceed the distance of an octave is said to be simple. One that does exceed an octave is said to be compound. A compound can be turned into a simple by subtracting 7. A compound ninth is a simple second. (9-7=2) A compound interval can be thought of as a simple interval that has had an octave added to it.

I made a chart for myself to see what the half-steps were musically as you go up frets or if your going down. Notice that the strings on a steel and a guitar give you the opportunity to play the same note on two separate strings. This is called playing in unison.

### HALF-STEP CHART

Going up	# of Half-steps	Interval name/Symbol
*****	0	Unison
(+) or (-)	1	Diminished second flat 9
	2	Major second 9
	3	Minor third /Augmented second # 9
	4	Major third third
	5	Perfect fourth 4
	6	Diminished fifth/Augmented fourth #4/flat 5
	7	Perfect fifth 5
	8	Augmented fifth/minor sixth #5
	9	Major sixth 6
	10	Diminished seventh/Augmented sixth flat 7
	11	Major seventh 7
	12	Octave
	13	flat nine flat 9
	14	ninth
	15	sharp 9 #9
	16	tenth third
	17	eleventh 11
	18	Sharp 11 #11
	19	Twelfth
	20	Sharp 5 #5
	21	Thirteenth 13
	22	Seven flat flat 7
	23	Fourteenth 7
	24	Two octaves

The numbers on the left are half-steps. If you count from any note a number of half steps, you can see what it is in relationship to the starting note. The compound intervals are simple intervals with an octave added to it. An octave has twelve half-steps in it.

We can study the guitar by looking at the intervals that are between all the strings. Placing everything in half-steps makes it easier.

To see this I made another chart to study. The First number is the string that your starting on. The second number is the string your going to. The next number has the number of half-steps. Find the number of half-steps and find out what their relationships are.

### HALF-STEP CHART

Going up	# of Half-steps	Interval name/Symbol
	0	Unison
(+) or (-)	1	Diminished second Seventh
	2	Major second
} seventh	3	Minor third /Augmented second 6th
	4	Major third }6, #5
	5	Perfect fourth Fifth
#4/flat 5	6	Diminished fifth/Augmented fourth
	7	Perfect fifth Fourth
	8	Augmented fifth/minor sixth Third
	9	Major sixth }3, #9
	10	Diminished seventh/Augmented sixth 9
	11	Major seventh }9
	12	Octave Octave
	13	Seventh Seventh
	14	} seventh }7
	15	Sixth 13th
	16	Aug 5 #5
	17	Fifth 5
	18	#11/}5 #11, }5
	19	Fourth 4
	20	THird 3
	21	}3 #9 }3, #9
	22	Ninth 9
	23	} nine }9
	24	Two octaves

String - string = (number of half-steps)

////////////////////////////////////

E-9TH/B-6TH Universal

\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

Relationships going up

% %

12 - 1 =+31	\\	11 - 1 =+26	\\	10 - 1 =+24	\\	9 - 1 =+19	\\
12 - 2 =+28	\\	11 - 2 =+23	\\	10 - 2 =+21	\\	9 - 2 =+16	\\
12 - 3 =+33	\\	11 - 3 =+28	\\	10 - 3 =+26	\\	9 - 3 =+21	\\
12 - 4 =+29	\\	11 - 4 =+24	\\	10 - 4 =+22	\\	9 - 4 =+17	\\
12 - 5 =+24	\\	11 - 5 =+19	\\	10 - 5 =+1	\\	9 - 5 =+12	\\
12 - 6 =+21	\\	11 - 6 =+16	\\	10 - 6 =+14	\\	9 - 6 =+9	\\
12 - 7 =+19	\\	11 - 7 =+14	\\	10 - 7 =+10	\\	9 - 7 =+7	\\
12 - 8 =+17	\\	11 - 8 =+12	\\	10 - 8 =+8	\\	9 - 8 =+5	\\
12 - 9 =+12	\\	11 - 9 =+7	\\	10 - 9 =+3	////////////////////////////////////		
12 - 10 =+9	\\	11 - 10 =+4	////////////////////////////////////				
12 - 11 =+5	////////////////////////////////////						

8 - 1 =+14	\\	7 - 1 =+12	\\	6 - 1 =+10	\\	5 - 1 =+7	\\	4 - 1 =+2
8 - 2 =+11	\\	7 - 2 =+9	\\	6 - 2 =+7	\\	5 - 2 =+4	\\	4 - 2 =-1
8 - 3 =+16	\\	7 - 3 =+14	\\	6 - 3 =+12	\\	5 - 3 =+9	\\	4 - 3 =+4
8 - 4 =+12	\\	7 - 4 =+10	\\	6 - 4 =+8	\\	5 - 4 =+5	////////////////////////////////////	
8 - 5 =+7	\\	7 - 5 =+5	\\	6 - 5 =+3	////////////////////////////////////			
8 - 6 =+4	\\	7 - 6 =+2	////////////////////////////////////					
8 - 7 =+2	////////////////////////////////////							
3 - 1 = -2	\\	2 - 1 = +3	////////////////////////////////////					
3 - 2 = -5	////////////////////////////////////							

It takes some getting used to but you can learn to find the interval after hitting a certain pedal. You have to adjust the half-steps according to what the pedal does to each of the strings. On the Universal and C-6th you have a pedal that lowers your 12th string a step and a half. That's a (-3) in half steps. That makes all the intervals change as you go up the strings.

String - string = (number of half-steps)

//

Standard E-9TH

\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

Relationships going up

% %

10 - 1 =+19 \\ 9 - 1 =+16 \\ 8 - 1 =+14 \\ 7 - 1 =+12 \\ 6 - 1 =+10 //  
 10 - 2 =+16 \\ 9 - 2 =+13 \\ 8 - 2 =+11 \\ 7 - 2 =+9 \\ 6 - 2 =+7 //  
 10 - 3 =+21 \\ 9 - 3 =+18 \\ 8 - 3 =+16 \\ 7 - 3 =+14 \\ 6 - 3 =+12 //  
 10 - 4 =+17 \\ 9 - 4 =+14 \\ 8 - 4 =+12 \\ 7 - 4 =+10 \\ 6 - 4 =+8 //  
 10 - 5 =+12 \\ 9 - 5 =+9 \\ 8 - 5 =+7 \\ 7 - 5 =+5 \\ 6 - 5 =+3 //  
 10 - 6 =+9 \\ 9 - 6 =+6 \\ 8 - 6 =+4 \\ 7 - 6 =+2 //////////////////////////////////////  
 10 - 7 =+7 \\ 9 - 7 =+4 \\ 8 - 7 =+2 //////////////////////////////////////  
 10 - 8 =+5 \\ 9 - 8 =+2 //////////////////////////////////////  
 10 - 9 =+3 //////////////////////////////////////  
 //////////////////////////////////////  
 5 - 1 =+7 \\ 4 - 1 =+2 \\ 3 - 1 =-2 \\ 2 - 1 =+3 //////////////////////////////////////  
 5 - 2 =+4 \\ 4 - 2 =-1 \\ 3 - 2 =-5 //////////////////////////////////////  
 5 - 3 =+9 \\ 4 - 3 =+4 //////////////////////////////////////  
 5 - 4 =+5 //////////////////////////////////////  
 //////////////////////////////////////

String - string = (number of half-steps)

//

Standard C-6TH

\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\

Relationships going up

% %

10 - 1 =+26 \\ 9 - 1 =+21 \\ 8 - 1 =+17 \\ 7 - 1 =+14 \\ 6 - 1 =+10 \\  
 10 - 2 =+28 \\ 9 - 2 =+23 \\ 8 - 2 =+19 \\ 7 - 2 =+16 \\ 6 - 2 =+12 \\  
 10 - 3 =+24 \\ 9 - 3 =+19 \\ 8 - 3 =+15 \\ 7 - 3 =+12 \\ 6 - 3 =+8 \\  
 10 - 4 =+21 \\ 9 - 4 =+16 \\ 8 - 4 =+12 \\ 7 - 4 =+9 \\ 6 - 4 =+5 \\  
 10 - 5 =+19 \\ 9 - 5 =+14 \\ 8 - 5 =+10 \\ 7 - 5 =+7 \\ 6 - 5 =+3 \\  
 10 - 6 =+16 \\ 9 - 6 =+11 \\ 8 - 6 =+7 \\ 7 - 6 =+4 //////////////////////////////////////  
 10 - 7 =+12 \\ 9 - 7 =+7 \\ 8 - 7 =+3 //////////////////////////////////////  
 10 - 8 =+9 \\ 9 - 8 =+4 //////////////////////////////////////  
 10 - 9 =+5 //////////////////////////////////////  
 5 - 1 =+7 \\ 4 - 1 =+5 \\ 3 - 1 =+2 \\ 2 - 1 =-2 //////////////////////////////////////  
 5 - 2 =+9 \\ 4 - 2 =+7 \\ 3 - 2 =+4 //////////////////////////////////////  
 5 - 3 =+5 \\ 4 - 3 =+3 //////////////////////////////////////  
 5 - 4 =+2 //////////////////////////////////////

Below we see how three tunings compare in terms of the intervals between the strings. These are the intervals between each string with open tunings. These show the interval starting at the bottom going up. To invert the interval you need to think of the number nine. If you have a fourth going up, you'll have a fifth going down to the other octave. C to G above is a fifth. G to C is a fourth.

### E-9/B-6th

#### Intervals between strings

Second to first	is a minor third.(+3)
Third to second	is a Perfect fourth.(-5)
Fourth to third	is a Major third.(+4)
Fifth to fourth	is a Perfect fourth.(+5)
Sixth to fifth	is a Minor third.(+3)
Seventh to sixth	is a Major second.(+2)
Eighth to seventh	is a Major second.(+2)
Ninth to eighth	is a Perfect fourth.(+5)
Tenth to ninth	is a Minor third. (+3)
Eleventh to tenth	is a Perfect third.(+4)
Twelfth to eleventh	is a Perfect fourth.(+5)

### E-9th

#### Intervals between strings

Second to first	is a minor third.(+3)
Third to second	is a Perfect fourth.(-5)
Fourth to third	is a Major third.(+4)
Fifth to fourth	is a Perfect fourth.(+5)
Sixth to fifth	is a Minor third.(+3)
Seventh to sixth	is a Major second.(+2)
Eighth to seventh	is a Major second.(+2)
Ninth to eighth	is a Major second.(+2)
Tenth to ninth	is a Minor third. (+3)

## C-6th

### Intervals between strings

Second to first	is a major second.(-2)
Third to second	is a Major third.(+4)
Fourth to third	is a Minor third.(+3)
Fifth to fourth	is a Major second.(+2)
Sixth to fifth	is a Minor third.(+3)
Seventh to sixth	is a Major third.(+4)
Eighth to seventh	is a Minor third.(+3)
Ninth to eighth	is a Major third.(+4)
Tenth to ninth	is a Perfect fourth. (+5)

You'll need to know the intervals between your strings when you start to get into playing scales. Scales are made up of whole and half step intervals. The numbers at the end of each line is the number of half-steps between each of the strings. I always think of the same interval whichever way I'm going. If I go from the second string to the first, I'm going up a minor third. Going from the first to the second I think of it as going down a minor third. We can study how chords move by studying the intervals. Learning the intervals gives you one more way to study your guitar.

The following chart shows you how each of the three tunings compare.

E-9th	(B-6th)	C-6th
2-1 +5	2-1 +5	
3-2 +3	3-2 +3	
4-3 +4	4-3 +4	(+3) 2-1 +3
5-4 +5	5-4 +5	(+4) 3-2 +4
6-5 +3	6-5 +3	(+3) 4-3 +3
7-6 +2	7-6 +2	(+2) 5-4 +2
8-7 +2	8-7 +2	(+3) 6-5 +3
9-8 +2	9-8 +5	(+4) 7-6 +4
10-9 +3	10-9+3	(+3) 8-7 +3
	11-10 +4	(+4) 9-8 +4
	12-11 +5	(+5) 10-9 +5

The numbers with the dash (-) between them are the strings. The number after the (+) sign is the number of half-steps. We can see how the Universal and E-9th are alike looking from the top down. Strings 1 through 8 are exactly alike on them. The Universal and the C-6th are alike from the bottom up with the fourth and eighth strings flatted on the universal. The ( ) are denoting the B-6th mode. Universal strings 12-4 are the same as C-6th 10-2 with the lever engaged. You can see how the pedals are set to arrange the intervals alike on the two guitars. The Universal is a half-step lower than the C-6th tuning.

Before you read any further be sure you understand the intervals. If your still not sure, find a friend and ask them to explain them, to you, until you've got them.

The numbers on the major scale charts, (computer scale section) can be used to find what the interval is between any two notes. The numbers are a set series of notes. They take a major scale and transpose it through all twelve keys. To see the intervals on the charts you must be aware of simple and compound. The piano has the theory laid out in order. The pedal steel has everything laid out in a totally different way. Look at the octave chart for the E-9th neck. The numbers show you how things look on your guitar.

With the numbers representing the scale tones, you must remember that every (1) on C Major, is a C note. The octave chart (see appendix for octave charts) will help you see which octave the target notes are in. This helps you to see the music on your steel.

Here is a list of the simple (within an octave) and compound intervals, from number to number. The distance and type of interval are given. The abbreviations for type are as follows. P is perfect, M is major, m is minor, D is diminished and A is augmented. An augmented 9th is the same as a #9.



## NUMBERS & INTERVALS

Scale tone (1) up to:	Simple	Compound
(2)	M2	9th
(3)	M3	10th
(4)	P4	11th
(5)	P5	12th
(6)	M6	13th
(7)	M7	
Scale tone (2) up to:	Simple	Compound
(3)	M2	9th
(4)	m3	A9th
(5)	P4	11th
(6)	P5	12th
(7)	M6	13th
(1)	m7	
Scale tone (3) up to:	Simple	Compound
(4)	m2	m9th
(5)	m3	A9th
(6)	P4	11th
(7)	P5	12th
(1)	A5	A12th
(2)	m7	
Scale tone (4) up to:	Simple	Compound
(5)	M2	9th
(6)	M3	10th
(7)	D5	#11th
(1)	P5	12th
(2)	M6	13th
(3)	m7	

Scale tone (5) up to:	Simple	Compound
-----------------------	--------	----------

(6)	M2	9th
(7)	M3	10th
(1)	P4	11th
(2)	P5	12th
(3)	M6	13th
(4)	m7	

Scale tone (6) up to:	Simple	Compound
-----------------------	--------	----------

(7)	M2	9th
(1)	m3	A9th
(2)	P4	11th
(3)	P5	12th
(4)	A5	A12th
(5)	m7	

Scale tone (7) up to:	Simple	Compound
-----------------------	--------	----------

(1)	m2	m9th
(2)	m3	A9th
(3)	P4	11th
(4)	A4	#11th
(5)	A5	A12th
(6)	m7	

As long as the major scale pattern is in effect, these intervals will hold true ON ANY MAJOR SCALE CHART. We started on each tone and went to every other tone. To find the intervals of the notes between the numbers, you simply have to adjust the quality of a known interval. For instance, st(1) to st(5), is a P5. (st stands for scale tone) The note in between st(4) and st(6) can be seen as a P4. Use the octave charts to figure if the interval is simple or compound.

If you think you've got the intervals its time for the real fun. **THE SCALE**

## SCALES

Scales are made up of different combinations of the basic intervals placed between an octave. They are usually arranged in alphabetical order. Understanding of the scale(s), is directly related to the study of the placement of the basic intervals. We know the basic intervals as a half-step, whole step, and a minor third. Intervals are covered in more depth in a later section.

### Basic Intervals

(-3) Minor third =	(+3) ←-- # of half-steps
(W) Whole tone =	(+2)
(H) Half-step =	(+1)

When I study the scales, I use Five basic categories. Seeing the basics lets you see how we can branch off to more difficult scales. As we look at all the scales you will see how we are rearranging the intervals between the octaves. The Examples are given in the Key of C. We need to know the following symbols.

△ equals a major scale or chord.

- is a minor scale or chord.

+ is a raised fifth or augmented scale or chord.

7 is a Dominant 7 scale or chord.

o is a diminished scale or chord.

∅ is a half diminished

(Dominant 7 chords and scales are written with a 7 but contain the b7 in their formulas).

This is the way I notate chords and scales. There are many ways of looking at the same thing. There are as many as there are players.

The most commonly used scale is the major. I use the major scale to study everything off from. It is the basis for all modern music as we know it today. Lets look at the pattern of a Major scale. When we say *pattern*, we are referring to the placement of the basic intervals. The location of half and whole steps, give a scale its characteristics. We will talk only in the key of C. From a scale we get chords. That means a chord symbol also represent a scale.

Here are the 5 basic scales.

Chord	Scale type	Basic Intervals	Example in C
C	major	wwhwww	CDEFGAB
C7	dominant 7th	wwhwww	CDEFGAB <sup>b</sup>
C-	minor	whwww	CDE <sup>b</sup> FGAB <sup>b</sup>
Cø	half-dim. (locrian)	hwww	CD <sup>b</sup> E <sup>b</sup> FG <sup>b</sup> A <sup>b</sup> B <sup>b</sup>
C <sup>o</sup>	diminished (8 tones)	whwhwhwh hwhwhwhw	CDE <sup>b</sup> FG <sup>b</sup> A <sup>b</sup> AB CD <sup>b</sup> E <sup>b</sup> EG <sup>b</sup> GAB <sup>b</sup>

From all these scales we can use formulas to figure out the chords that each scale can bring. The formulas for the chords will be covered in the next section. In the next part we will concern ourselves with some choices of scales within the five basic categories.

These are the major and dominant 7th scales.

Major Scales		Basic Intervals	Example in C
C	major	wwhwww	CDEFGAB
C $\Delta$ +4(+11)	lydian	wwwwhww	CDEF $\sharp$ GAB
C $\Delta$ b6	maj.7 $\flat$ 6	whwh-3h	CDEFGA $\flat$ B
C $\Delta$ +5,+4	lydian aug.	wwwwhw	CDEF $\sharp$ G $\sharp$ AB
C+	augmented	-3h-3h-3h	CD $\sharp$ EGA $\flat$ B
C $\circ$	diminished	whwhwhw	CD $\flat$ E $\flat$ EG $\flat$ GAB $\flat$
C	blues	-3 whh -3 w	CE $\flat$ FF $\sharp$ GB $\flat$



Dominant 7th scale		Basic Intervals	Example in C
C7	dominant 7	wwhwhwh	CDEFGAB $\flat$
C7+4	lydian dom	wwwwhwh	CDEF $\sharp$ GAB $\flat$
C7 $\flat$ 6	hindu	whwhwhw	CDEFGA $\flat$ B $\flat$
C7+	whole tone	wwwww	CDEF $\sharp$ G $\sharp$ AB $\flat$
C7 $\flat$ 9	diminished	hwhwhwhw	CD $\flat$ E $\flat$ EG $\flat$ GAB $\flat$
C7 $\sharp$ 9	dim.whole tone	hwhwww	CC $\sharp$ D $\sharp$ E $\sharp$ F $\sharp$ G $\sharp$ B $\flat$
C7	blues	-3 hh -3 w	CE $\flat$ FF $\sharp$ GB $\flat$



If we are faced with a chord in the major scale category, we can see our choices that we can use to solo with. A C major chord can use an augmented scale for soloing. It depends on what you want the music to say.

Over a minor chord we have the following choices for soloing.

Minor scales		Basic Intervals	Example in C
C-	minor	whwwhw	CDE <sup>b</sup> FGAB <sup>b</sup>
C-	pure minor	whwwhww	CDE <sup>b</sup> FGA <sup>b</sup> B <sup>b</sup>
C-	melodic minor ascend	whwwwh	CDE <sup>b</sup> FGAB
C-	blues scale	-3whh-3w	CE <sup>b</sup> FF <sup>#</sup> GB <sup>b</sup>
C-	diminished	whwhwhwh	CDE <sup>b</sup> FG <sup>b</sup> A <sup>b</sup> AB
C-	harmonic	whwwh-3h	CDE <sup>b</sup> FGA <sup>b</sup> B
C-	phrygian	hwwwhww	CD <sup>b</sup> E <sup>b</sup> FGA <sup>b</sup> B <sup>b</sup>



For the Half-diminished chord, we have the Locrian scale. The locrian will be studied more in the modes section. The important thing to remember is the movement of the intervals between the octave to create different scales.

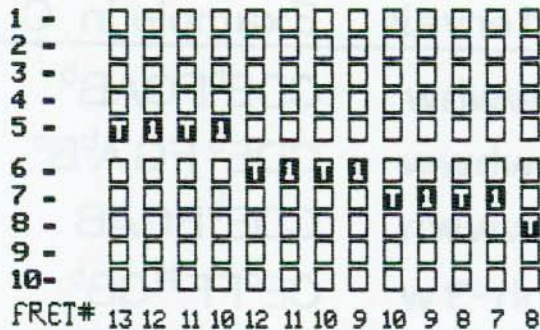
### CHROMATIC SCALE

Placing the tones together in a series of half-steps creates a scale called a Chromatic. The Chromatic scale has twelve tones. It encompasses a whole octave. A half-step interval is +1. Divide that into twelve and we get twelve. It only goes into an octave once. Therefore we have only one chromatic scale possible in an octave.

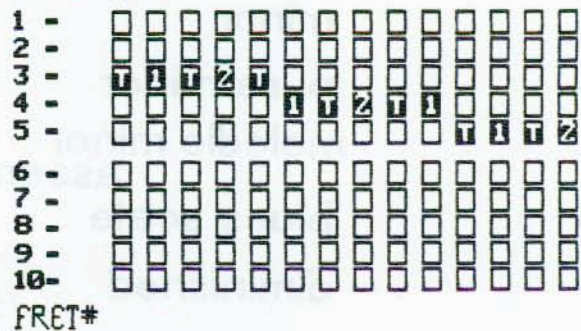
# CHROMATIC SCALE

The chromatic scale is one of the hardest scales to play on the steel. This page shows you a few ways to find them on your guitar. Below are examples for all three of the main tunings. Chromatics are best learned by studying the patterns that you can use. First, is the E-9th.

string

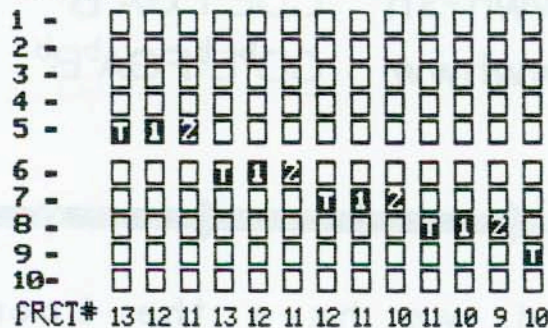


string

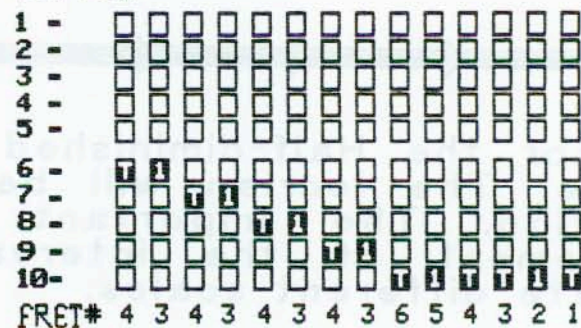


The fingerings are optional. There are many ways to articulate the notes.

string



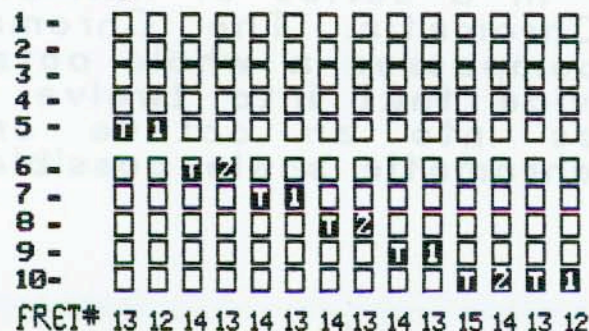
string



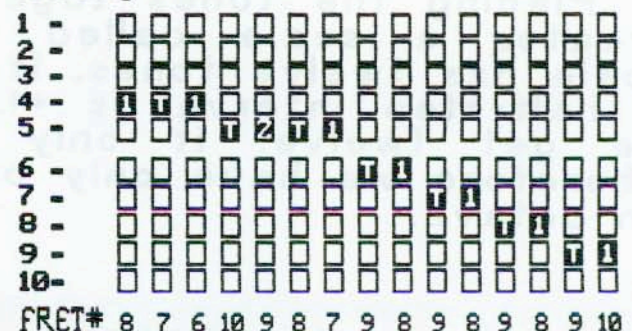
Learn to see the intervals between each string. You can see how the half-steps ascend and descend between each string.

Mix up the left and right hand articulation. You can mix the slides and picking motions.

string



string







## chromatic tricks

These show you different ways of mixing up a chromatic scale. These are all done on one string. You can use any string. Learn them slow. Get your hands in condition with some of these as exercises.

**STRING** S--» T 1 ■ T 1 ■ T 1 ■ T 1 ■  
 1 2--3 2 3--4 3 4--5 4 5--6 cont.

**STRING** S--» T ■ T ■ T ■ T ■ T ■ T ■ T ■  
 1--2 2--3 3--4 4--5 5--6 6--7 7--8

**STRING** S--» T ■ ■ T ■ ■ T ■ ■ T ■ ■ 1 ■  
 12--11--10 9--8--7 6 5 4 3 2 1

**STRING** S--» T 1 ■ T 1 ■ T 1 ■ T 1 ■ T 1 ■  
 1 2--4 2 3--5 3 4--6 4 5--6 5 6--

**STRING** S--» 1 ■ 1 ■ 1 ■ 1 ■ 2 ■ 2 ■ 2 ■  
 1--2 3--4 5--6 7--8 9--10 11--12 13--14

**STRING** S--» T 1 T 2 T 1 T 2 T 1 T 2 T 1  
 1 2 3 4 5 2 3 4 5 6 3 4 5 6

**STRING** S--» T ■ ■ T ■ ■ 1 ■ ■ 1 ■ ■  
 1--2--3 2--3--4 3--4--5 4--5--6 cont.

**STRING** S--» T ■ T ■ 1 ■ 1 ■ 2 ■ 2 ■  
 2--1 3--2 4--3 5--4 6--5 7--6 cont.

**STRING** S--» T 1 ■ 2 T 1 ■ 2 T 1 ■ 2  
 4 3--2 1 5 4--3 2 6 5--4 3 cont.

**STRING** S--» T 1 T ■ T 1 T ■ T 1 T ■  
 12 11 10--9 10 9 8--7 8 7 6--5 cont.

**STRING** S--» 1 T 1 T 1 T 1 T 1 T 1 T 1 T 1  
 12 11 10 9 8 7 6 5 4 3 2 1 0



## WHOLE TONE SCALE

The whole tone scale is derived from whole steps. A whole step has two half-steps. The octave contains (12) half-steps so dividing it by (2) we get six tones. There are two sets of six tone scales. The whole tone scale works well with augmented chords. The intervals of an augmented chord are superimposed M3. A M3 has (4) half-steps. Two is divisible by four. The math puts things together for you. The next scale is made up of the minor third intervals. The half-steps are (+3). Check the graphics for your particular tuning to see the whole tone scale. It's really interesting on the E-9th tuning. Check out strings; 9, 8, 7, and 6. Notice on the chart, that there is only two whole tone scales. We simply step through the chromatic scale every other note. This on a fretboard would be frets 1 3 5 7 9 11 or F 0 2 4 6 8 10 12.

## DIMINISHED SCALE

The diminished scale is especially interesting, in that it is totally symmetrical. In the graphics section, for your tuning, you'll see a chart that divides the steel into three. That is the diminished. The diminished scale, is an eight tone scale. It has one pattern with two ways to start it. The pattern alternates whole and half steps. This makes it easy to see what's happening. The study of chords will help you to see the diminished scale on the steel. Any diminished scale can be seen as a combination of eight of the twelve diminished chords. The inversions of a diminished chord are all the same notes with a different root. Taking a dim.chord and the dim.chord a half-step above it gives you the scale that starts with a half-step. The diminished scale should be studied in great depth. To do that, we will have to see the chords it makes and how we arrived at them theoretically. That is covered in the chord section. On the next pages we see some E-9th whole tone and diminished examples.

# WHOLE TONE SCALE

6-	□	□	□	<b>3</b>	□	□	□	6-	□	□	□	□	□	□	□	□	□	□	□	□	□	
7-	□	□	<b>2</b>	□	<b>2</b>	□	□	7-	□	□	<b>2</b>	□	□	<b>2</b>	□	□	<b>2</b>	□	<b>2</b>	□	<b>2</b>	
8-	□	<b>1</b>	□	□	□	<b>1</b>	□	8-	□	<b>1</b>	■	□	□	<b>1</b>	■	□	□	<b>1</b>	■	□	□	□
9-	<b>T</b>	□	□	□	□	□	<b>T</b>	9-	<b>T</b>	□	□	□	<b>T</b>	□	□	□	<b>T</b>	□	□	□	<b>T</b>	□
	2	2	2	2	2	2	2		5	5-7	7	7	7-9	9	9	9-11	11	11	11	13		

6-	<b>3</b>	■	□	□	□	□	□	<b>3</b>	6-	□	□	□	□	□	<b>3</b>	■	□	□	□	□	□			
7-	□	□	<b>2</b>	□	□	□	<b>2</b>	□	7-	□	□	□	<b>2</b>	■	□	□	<b>2</b>	■	□	□	□	□		
8-	□	□	□	<b>1</b>	□	□	<b>1</b>	□	8-	□	□	<b>1</b>	■	□	□	□	□	□	□	<b>1</b>	■	□	□	
9-	□	□	□	□	<b>T</b>	■	□	□	□	9-	<b>T</b>	■	□	□	□	□	□	□	□	□	□	□	<b>T</b>	■
	6-4	4	4	4	4-6	6	6	6		1-3	3-5	5-7	7-9	9-7	7-5	5-3								

5--	□	<b>1</b>	□	<b>1</b>	□	<b>1</b>	□	<b>1</b>	□	<b>1</b>	□	<b>1</b>	□	<b>1</b>	□	<b>1</b>
6--	<b>T</b>	□	<b>T</b>	□	<b>T</b>	□	<b>T</b>	□	<b>T</b>	□	<b>T</b>	□	<b>T</b>	□	<b>T</b>	□
FRET->	15	15	13	13	11	11	9	9	7	7	5	5	3	3	1	1
PEDALS	ooo	ooo	ooo	ooo	-	-	-	-	-	-	-	-	-	-	-	ooo

5-	□	□	□	□	<b>2</b>	■	<b>2</b>	■	<b>2</b>	■	3-	<b>2</b>	■	■	■	□	□	□
6-	□	□	□	<b>3</b>	<b>1</b>	■	<b>1</b>	■	<b>1</b>	■	4-	<b>1</b>	■	■	■	<b>2</b>	■	■
7-	□	□	<b>2</b>	□	□	□	□	□	□	□	5-	<b>T</b>	■	■	■	<b>1</b>	■	■
8-	□	<b>1</b>	□	□	<b>T</b>	■	<b>T</b>	■	<b>T</b>	■	6-	□	□	□	□	<b>T</b>	■	■
9-	<b>T</b>	□	□	□	□	□	□	□	□	□	7-	□	□	□	□	□	□	□
	10	10	10	10	7-11	11-15	11-7					3-7-11-15	15-11-8					
	ooo	ooo	ooo	ooo	continue							ooo	ooo	ooo	ooo	ooo	ooo	ooo

# DIMINISHED SCALE



6-	□	□	□	□	<b>2</b>	■	□	□	□	□	<b>2</b>	■	□	□	□	□	<b>2</b>	■
7-	□	□	<b>1</b>	■	□	□	□	□	<b>1</b>	■	□	□	□	□	<b>1</b>	■	□	□
8-	<b>T</b>	■	□	□	□	□	<b>T</b>	■	□	□	□	□	<b>T</b>	■	□	□	□	□
	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17									

4-	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	<b>2</b>	■	□
5-	□	□	□	□	□	□	□	□	□	□	□	□	<b>2</b>	■	□	<b>1</b>	■	□	□	□
6-	□	□	□	□	□	□	□	<b>2</b>	■	□	<b>1</b>	■	□	□	<b>T</b>	■	□	□	□	<b>T</b>
7-	□	□	□	<b>2</b>	■	□	<b>1</b>	■	□	□	<b>T</b>	■	□	□	□	□	□	□	□	
8-	□	<b>1</b>	■	<b>T</b>	■	□	□	<b>T</b>	■	□	□	□	□	□	□	□	□	□	□	
9-	<b>T</b>	■	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
	5	5-6	8	8-9	10	10-11	11-12	13	13-14	14-15	16	16-17	17-18	16						

These are some patterns to help you study the diminished scale. These are only a few. Search for more & develop licks. The scale charts done on the computer show you the scale over the entire guitar.

3-	<b>2</b>	■	□	□	□	3-	□	□	□	□	□	□	□	□	□	□	□	□	□	□
4-	<b>1</b>	<b>2</b>	■	□	□	4-	□	□	□	□	□	□	□	□	□	□	□	□	□	□
5-	<b>T</b>	<b>1</b>	<b>2</b>	■	□	5-	□	□	□	□	□	□	□	<b>1</b>	■	□	□	□	□	
6-	□	<b>T</b>	<b>1</b>	<b>2</b>	■	6-	□	□	□	□	□	□	<b>T</b>	■	□	□	□	□	□	
7-	□	□	□	□	□	7-	□	□	□	□	<b>3</b>	■	□	□	□	□	□	□	<b>T</b>	■
8-	□	□	<b>T</b>	<b>1</b>	■	8-	□	□	<b>2</b>	■	□	□	□	□	□	□	<b>1</b>	■	□	□
9-	□	□	□	□	□	9-	□	<b>1</b>	■	□	□	□	□	□	□	□	<b>T</b>	■	□	□
10-	□	□	□	<b>T</b>	■	10-	<b>T</b>	■	□	□	□	□	□	□	□	□	□	□	□	□
FRET	7	7	7	7	1	0-1	1-2	2-3	3-4	3--4	10	10-11	11-13							
PEDAL	48+	-----			NO PEDALS															

four eight positive raises E's to F's.

Learning the theory behind the scales, will help you learn how to use them. Certain tones have characteristics all their own. As you learn to see their function, it will help you use them on your guitar.

These scales are all shown in the key of C. As you get more familiar you can learn to transpose them to all keys. The pattern of a scale is the same in all keys. Later on there is a chart included for transposing. You can use it to study, or you can keep it as a reference.

At this point I would like to note the difference between scale tones and chord tones. The scale tones are derived from the interval distance between the tonic note and the scale tone. When you see a Nashville number chart, the numbers of the scale tones, are used as chord tones. To differentiate you could use Roman Numerals for the chords and numbers for scale tones. Thus,

MAJOR SCALE TONES	1	2	3	4	5	6	7
Notes in C	C	D	E	F	G	A	B

## CHORD PROGRESSION

**I VI- II- V7**  
**one/six-minor/two-minor/five-seventh**

**In Nashville:**

**1 6- 2- 5**

**For more, see the section on Nashville number system.**

## HARMONIZING A MAJOR SCALE

Lets look at a C Major scale.

CDEFGAB

Now we will place the chord tones for a major chord over the Root. We know the formula as 1, 3, 5, 7.

7 B  
5 G  
3 E  
1 CDEFGAB

The resulting chord is a C<sup>Δ</sup>.

We can write out the scale for the next row across.

7	B	7	B
5	G	5	GABCDEF
3	EFGABCD	3	EFGABCD
1	CDEFGAB	1	CDEFGAB

And the last row across is also filled in with a C scale. (Remember we study it all in C)

7 BCDEFGA  
5 GABCDEF  
3 EFGABCD  
1 CDEFGAB

We have just *harmonized* the C major scale. Notice all the tones are from the C scale. We've placed them upon each other based from the 1, 3, 5, 7 formula, that which we know to be a C<sup>Δ</sup>.

We can look at each of the chords and analyze them to see what they are in relationship to the bottom row. The chords that are formed are as follows. They all have a 1, 3, 5, 7 but the 3, 5, and 7's are either minor, augmented or diminished. Each type of chord has a different function. Here we are seeing some of the ways to study your guitar.

Here are the chord tones, chord formulas, and symbol for each one formed:

Here is a C harmonized scale

KEY OF C:

---

7 = B	7 <sup>b</sup> = C	7 <sup>b</sup> = D	7 = E	7 <sup>b</sup> = F	7 <sup>b</sup> = G	7 <sup>b</sup> = A
5 = G	5 = A	5 = B	5 = C	5 = D	5 = E	5 <sup>b</sup> = F
3 = E	3 <sup>b</sup> = F	3 <sup>b</sup> = G	3 = A	3 = B	3 <sup>b</sup> = C	3 <sup>b</sup> = D
1 = C	1 = D	1 = E	1 = F	1 = G	1 = A	1 = B
C $\Delta$	D-7	E-7	F $\Delta$	G7	A-7	B $\emptyset$

---

We see four types of chords in a harmonized major scale. There is the  $\Delta$ , -7, Dom. 7, and the  $\emptyset$ . Lets start the study of chords and see how they interrelate with the scales. They are all different ways to look at the theories.

Notice that there are:

- 2 major sevenths      C $\Delta$  & F $\Delta$
- 3 minor sevenths    D-7, E-7, A-7
- 1 dominant 7th      G7
- 1 half-diminished    B $\emptyset$

MY APPROACH



## THE MODES

This section deals directly with the major scale charts in the Computer scales section. The charts really start to shine now because you can use those charts to learn the theory behind the modes. The modes were originally Medieval church modes. Their origin is interesting, but not essential to learning them. If you are still interested in the subject, find a library.

To learn to get the different modes out of the charts, let's talk about C MAJOR (The same will apply to every CHART, the difference being a key change.) Everyone has sung, Do Re Me Fa So La Ti Do, at one time in their life. What we are singing is the major scale. It was fun to start on Do and sing it up and back. This scale can be looked on as a family.

To see the family, we must learn to relate to the scale, from each of the notes. Study each of the tones as the root of the family scale. Try singing the scale starting on the Re, the second tone. That would be the same scale, played 2 3 4 5 6 7 1. It is a C scale from a D note to a D note. We can do this for all the scale tones. Each number can be used as a starting place. When you use the notes in this way, they are called the modes. We now have to learn their names and characteristics. We use each number, of a scale family, to start a scale. Those become the different modes, and each CHART, places these modes in a different key.

NUMBER	MODAL NAME	Example in C MAJOR
1	Ionian	C
2	Dorian	D
3	Phrygian	E
4	Lydian	F
5	Mixolydian	G
6	Aeolian	A
7	Locrian	B

REMEMBER: The Key of C is the relative major key to A. So CHART 1 is C and A minor!! All the same notes, with different ways to look at them.

Lets look at a C harmonized scale.

C	E	G	C major triad
D	F	A	D minor triad
E	G	B	E minor triad
F	A	C	F major triad
G	B	D	G Major triad
A	C	E	A minor triad
B	D	F	B Dim

If we look at the notes, we notice how the notes, are all in our standard order in each vertical row. One begins on a C, one on E, and one on G. Those are the first, third, and fifth tones of a C major scale, and 1-3-5 is the major triad formula. Add the B on the C E G and make the rest of them four note chords. Ex. C E G B. If we look at the triads, there the scale tone numbers, we come up with this. We cover harmonizing a scale in various parts of the music theory section.

IF (1) is the tonic:

SCALE TONES			CHORD	TYPE
↑↑↑↑↑↑	↑↑↑↑↑↑	↑↑↑↑↑↑	↑↑↑↑↑↑	↑↑↑↑↑↑
	3	5	C	Major
2	4	6	D	minor
3	5	7	E	Minor
4	6	1	F	Major
5	7	2	G	Major
6	1	3	A	Minor
7	2	4	B	Dim

Here's the same thing using letters notation:

SCALE TONES			CHORD	TYPE
↑↑↑↑↑↑	↑↑↑↑↑↑	↑↑↑↑↑↑	↑↑↑↑↑↑	↑↑↑↑↑↑
C	E	G	C	Major
D	F	A	D	minor
E	G	B	E	Minor
F	A	C	F	Major
G	B	D	G	Major
A	C	E	A	Minor
B	D	F	B	Dim

### Creating The Modes

To create the modes, we took the major scale, and used each tone as a starting point, for a scale. Each number, is the same as, a modal name. We also, have defined a chord and seen how to find them with the numbers. The type of chord each tone start brings us, is the same, only the key changes when you change FAMILIES. Now we will see how each modal name, has a characteristic of its own.

To help understand, I'll talk about the Key of C. Lets look at the musical function of each of the modes. Study this on paper and at the guitar.

= =

◀Ionian▶  
tone # 1 (1) start Used on  
the MAJOR, MAJOR 7, MAJOR 6, and  
MAJOR 9th.

◀Dorian▶  
tone # (2) start This scale  
works well soloing over D-, D-7, D-6,  
D-9, D-13, D-11. Notice how it gives you  
a major sixth. Compare this to the  
Aeolian mode. (- = minor chord, D-).  
What CHART has C dorian? Look for  
the (2) start, in the lower left hand  
block F1,S10 on the E-9th; F1,S12 for  
the E9/B6th; and f12,s10 on a C-6th.  
That would be the D FAMILY scale  
chart.

◀Phrygian▶  
tone #3 (3) start This is a  
Filaments scale. It has a real spanish  
flavor. Have someone play an E chord  
and you solo playing a C scale. Notice  
how the scale starts with a half-step  
move. This creates tension and gives  
the scale its characteristics. C FAMILY  
and (3) start is E phrygian. The G#  
FAMILY has C phrygian. You use the  
phrygian to solo over -7b9, 11b9#9,  
b13b9 chords.

◀Lydian▶  
tone #4 (4) start. This is like  
a major scale, with the fourth tone  
raised a half step. C FAMILY, (4) start,  
you have an F lydian. To get an F  
scale, with the fourth tone raised, you  
play a C scale from F to F. To see a  
C lydian, look at the G FAMILY, the (4)  
start. The chord formed is a major 7.  
Use the scale to solo over a major 7,  
major 7#11, major 6#11.

### ◀Mixolydian▶

tone #5 (5) start. This is the dominant seventh scale. If we had a G7 chord, we would use C FAMILY, with a (5) start. The band is thinking a G to C move, and your scale is already a C major family scale. (Hint: When using a dominant 7 chord, moving to a tone a fifth higher, just play the major scale of the key your going to).

### ◀Aeolian▶

tone #6 (6) start. This scale compares to the dorian. Look at the difference. The sixth tone. The Aeolian has the flatted sixth, whereas the dorian creates a scale with a natural sixth. To better see this look at C dorian from the A# FAMILY, then C aeolian from the Eb FAMILY. With the C FAMILY, we have an A aeolian. Works over minor seventh, minor 7flat 6. Remember, a flat 6 is a #5. Minor augmented chords.

### ◀Locrian▶

tone #7 (7) start This is used over the half-diminished chords. The half-diminished, differs from the diminished in the last note. EX: B dim B D F (G#). BØ is B D F (A). Notice where the half-steps fall in the scale. Like the phrygian, we see a half-step start. Tension, that gives character.

Note: The characteristics of the modes, come from the placement of the half-steps. To really notice this, look at the ones that start with a half-step. They create tension and movement. Train your ear to hear these modes and you'll be playing them automatically.

↓↓↓↓↓↓↓↓↓ ↓↓↓↓↓↓↓↓ ↓↓↓↓↓↓↓↓

The best way to learn the modes, is to set down at your guitar and play them. Learn to hear the tension that you get from each mode. At first, they may sound weird. Soon your mind will learn the sounds and it will become part of your subconscious mind. That's where you create from. Lets look at some examples that you can use to help digest this material. Again, lets deal only with the C FAMILY. (You can learn them all by learning the C FAMILY and transposing.) If you have someone to practice with, have them play chords while you run the scale notes. Its great to take turns improvising. A tape recorder can be your assistant, also.

### Practice Examples

**IONIAN** This mode, you probably already feel comfortable with. Play a C chord, and play combinations of the scale notes. Different rhythms and patterns. Try some of the areas at the high frets. Jump around. If you like something, you have the exact note and relation to the scale instantly from the CHARTS.

**DORIAN** Play a D minor or D minor 7, and use C FAMILY, tones #2 to #2. Rock and Roll guitar favorite.

**PHRYGIAN** Play an E chord, spanish feel. #3 to #3. Remember to mix up scale tones, with chord tones. Each chord has four Chord tones, when harmonized, that make up the chords. We have already looked at the three note chords. Later, we will have lists, of all the chords by type.

LYDIAN            Play an F major 7th and  
#(4) start. Also, an F major 7th#11. #11  
is a #4 an octave up.

MIXOLYDIAN      Use G7 with C FAMILY.  
#(5) start. The Dominant 7th scale.

AEOLIAN           Play an A- or A-7 with  
#(6)start    C    FAMILY. Same as the  
natural minor.

LOCRIAN           Play a B $\emptyset$     #(7) start. B  
Half-dim is B D F (A). Do you see how  
you are playing a scale a half step up?  
B half-dim takes a C major scale.

↓↓↓↓↓↓↓      ↓↓↓↓↓      ↓↓↓↓↓      ↓↓↓↓↓↓

That's the whole family on CHART I. With each of the charts, you transpose keys. They are good for learning and working on the awkward keys. E flat, F#, etc. Whatever your not comfortable with, work on. Soon, you'll be incorporating these scales in your playing automatically. When your soloing, you'll have more areas to play in, because the charts give you the entire guitar to learn.

## PENTATONIC

Another way to use the scale charts, is for Pentatonic scales. A pentatonic scale, is made up of five tones, with no half-steps. Country music uses this scale a lot. It gives a real open sound. If we look at C MAJOR FAMILY, we have five notes that haven't been talked about much. The squares that are empty. In C MAJOR, they are equal to the black keys on a piano. There are five black keys; F#,G#,A#,C#,and D#. With closer consideration,

we see that these are the notes that make up an F# pentatonic. If you were to think in jazz terms, those notes in the key of C, are the b9, #9, #5, #11, b7. All the *outside*, or altered tones of C major. So, for every MAJOR FAMILY, we have a pentatonic scale. The white squares are it. It can also be seen as the pentatonic of the flatted-fifth's MAJOR FAMILY.

↓↓↓↓ ↓↓↓↓ ↓↓↓↓ ↓↓↓↓

Looking at all the Charts, we can say this. We learn one pattern, with seven starting points, and in 12 keys. That makes 84 scales. To know what scale your playing, I have made Reference CrossCharts, to help you find the names of the chords and scales you can apply these to.

We can also add the relative minor scales and the minor pentatonics. That's twenty four more scales, or 24 more ways to apply the CHARTS. (A minor pentatonic, is a blues scale. EXAMPLE: Chuck Berry, playing Johnny B Goode in A, uses the notes of a C pentatonic. The relative minor/major). Adding the minor applications we have 120 different scales we can find in any MAJOR FAMILY. That ought to keep you busy for awhile.

Practice Practice Practice Practice.....

↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓↓

#### NOTE

Whenever I speak of a Chart I am referring to the computer scale Charts later in the book. The modes are used on the first twelve. These are all major scales in each of the different keys. C is one. C# is two, etc.. Scale books are available for separate tunings.

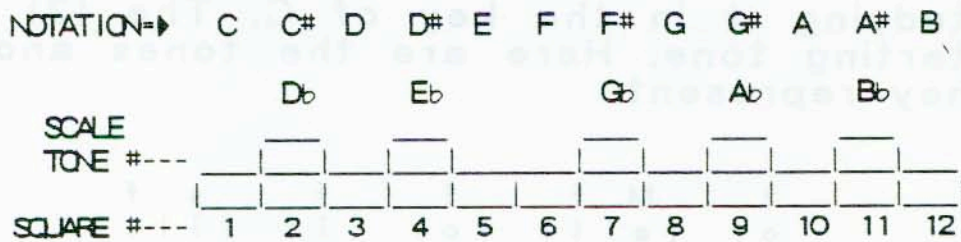


## MODES and the KEY OF C

Lets look at all of the modes starting each of them on a C. C is easy to see the differences, because you can tell the *altered* notes easier. First, let's take a look at the piano graph, in figure below, to make sure we fully understand its values. Remember this never changes. A constant. They represent the chromatic scale, theory wise. So SQUARE 1 to SQUARE 12 is C to B chromatically. It repeats in octaves as far as you imagine it to go, but the notes are just repeats of the basic 12.

The piano graph is unlike a real piano because I've placed the squares that represent the black keys of a piano, over the scale tones of a guitar string. On a real piano, the black tones are recessed on the keyboard.

### PIANO GRAPH



The following examples are given for the E-9th tuning.

Ionian

The next graph shows us C Ionian. The relationship of the scale notes to the key of C are in rows above the notes. Keep in mind how the graph relates the piano to the fretboard. You can see the structure of a major scale in the rows. Be careful to note how they change in relationship to a C beginning on all seven modes.



-----

Phrygian

Lets look at C phrygian. To find C phrygian its a (3) at F1,S10.

	t	f		f		F		f	f		f	
	o					o		i				
	n	a		a		u		f	a		a	
	i		t		t		r		t	t		t
	c					t		h				
		(9)		3		h		6		7		
SCALE												
TONE #---	1	2	3	4	5	6	7	8	9	10	11	12
	x	x	x	x	x	x	x	x	x	x	x	x
SQUARE #---	1	2	3	4	5	6	7	8	9	10	11	12

-----

Lydian

Now C lydian. To find C lydian, its (4) at F1,S10. G MAJOR FAMILY.

	t		n		M		f		s		M	
	o		i		a		i		i		a	
	n		n		j		#11 f		x		j	
	i		t				t		t		o	
	c		h				h		h		r	
SCALE												
TONE #---	1	2	3	4	5	6	7	8	9	10	11	12
	x	x	x	x	x	x	x	x	x	x	x	
SQUARE #---	1	2	3	4	5	6	7	8	9	10	11	12

-----

## Mixolydian

Looking at C mixolydian, we need to have the (5) at F1, S10. F MAJOR FAMILY.

	t		M		M	F		f		s	f	
	o		a		a	o		i		i	l	
	n		j		j	u		f		x	a	
	i				r			t		t	t	
	c		(9)			t		h		h		
SCALE						h						
SCALE	1	2	3	4	5	6	7	8	9	10	11	
SCALE	---		---		---		---		---		---	
SCALE	1	2	3	4	5	6	7	8	9	10	11	12
SCALE	x		x		x	x		x		x	x	
SQUARE	1	2	3	4	5	6	7	8	9	10	11	12

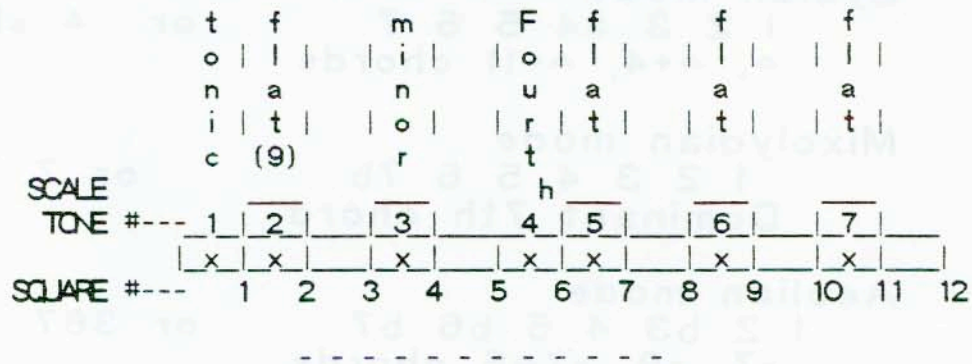
## Aeolian

Looking at C aeolian, we need to have the (6) at F1,S10. CHART IV.

	t		M	m		F		f	f		f	
	o		a	i		o		i	l		l	
	n		j	n		u		f	a		a	
	i			o		r		t	t		t	
	c		(9)	r		t		h				
SCALE						h						
SCALE	1	2	3	4	5	6	7	8	9	10	11	
SCALE	---		---		---		---		---		---	
SCALE	1	2	3	4	5	6	7	8	9	10	11	12
SCALE	x		x	x		x		x	x		x	
SQUARE	1	2	3	4	5	6	7	8	9	10	11	12

Locrian

Looking at C locrian, we need to have the (7) start in the C# MAJOR FAMILY.



ONE MORE WAY

Those are the modes looking at them through the Piano graphs. Seeing them all in the key of C, we can see their theoretical function better. The following list tells what you have to do to a major scale to get a mode. The previous charts had them, but here is another way to look at them. On any major scale to get the:

Ionian mode is natural.

scale tones = 1 2 3 4 5 6 7  
 ^ chord

Dorian mode

1 2 b3 4 5 6 b7 or 3 7 flat  
 -7, -13, -9 chords

Phrygian mode

1 b2 b3 4 5 b6 b7 or 2367 flat  
-7b9, -7b6b9 chords

Lydian mode

1 2 3 #4 5 6 7 or 4 sharp  
△, △+4, △+11 chords

Mixolydian mode

1 2 3 4 5 6 7b or 7 flat  
Dominant 7th chord

Aeolian mode

1 2 b3 4 5 b6 b7 or 367 flat  
-7, -9, -7△6 chords

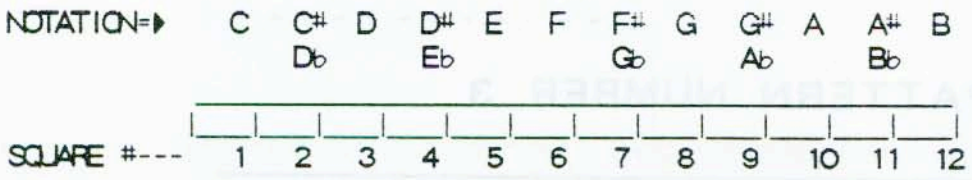
Locrian mode

1 b2 b3 4 b5 b6 b7 or 2 3 5 6 7 flat  
minor 7b5 type or ∅ chords

The numbers on the right give you another way to think of the modes. We have looked at the modes from both angles. One is the entire family and then through each tone number as a starting point. The modes, or the *tone numbers*, are constant. If you start on (3), any FAMILY, you will get a phrygian mode, the only change will be the key. The characteristics have been laid out and all that's left to do is to let your ear start to hear the different qualities that each can give you. You can use these FAMILY charts to help you learn other courses. Most theory courses show the information in the Key of C, which is in its entirety, on the C MAJOR chart. The key is Practice.

## ADVANCED SCALES

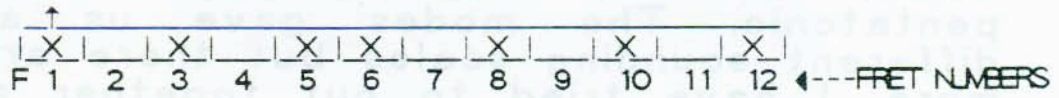
Up until now, we've dealt with the five basic scales, the modes, and the pentatonic. The modes gave us a few different sounding scales but there are still more. I have tried to put together a way of understanding scales. Lets refer back to a piano graph. This time we'll take the *black* keys off the top. See below:



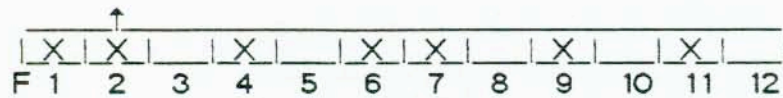
To relate this to a STEEL, lets use the 10th string on an E-9th tuning. The note is a B. The SQUARE #, is now the same as the fret number. Each square represents string/fret intersection on your steel. Below we see the MAJOR scale pattern placed over the strings in all 12 positions. After that we study different scale types in PN1.

# MAJOR SCALE PATTERN NUMBERS

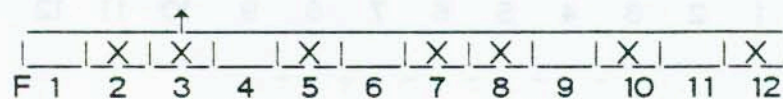
## PATTERN NUMBER 1



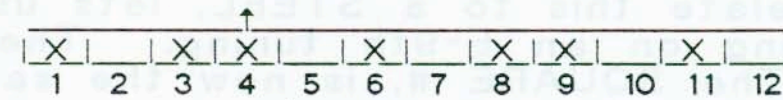
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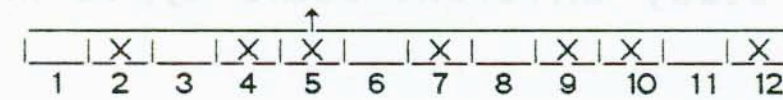
## PATTERN NUMBER 3



## PATTERN NUMBER 4

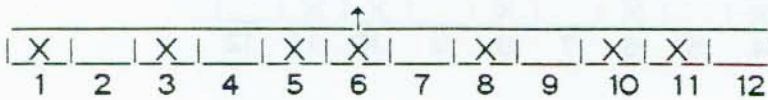


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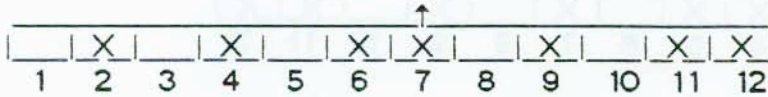




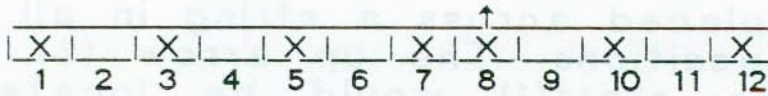
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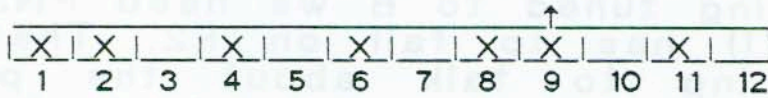
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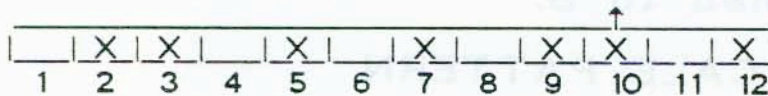
PATTERN NUMBER 8



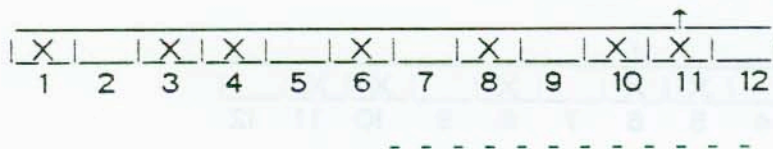
PATTERN NUMBER 9



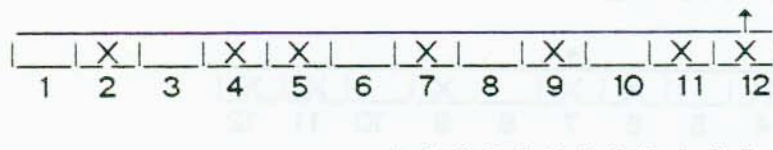
PATTERN NUMBER 10



## PATTERN NUMBER 11



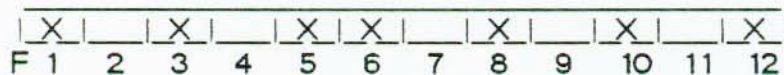
## PATTERN NUMBER 12



## SCALE PATTERNS

What we just saw was one scale pattern, placed across a string in all of its possible positions. The up arrow ( $\uparrow$ ), shows where the start(1) would be located for each pattern number. The PATTERN NUMBER is the fret or square number, where the tonic or number one is placed. For example: To place a C# major scale, on a string tuned to B we need PN2. The number (1) has to fall on F2. That's all we're going to talk about the pattern numbers. The next section shows how we can alter the major scale pattern to form new scales. We will study them all in PATTERN NUMBER 1 ONLY. Think of a string tuned to B.

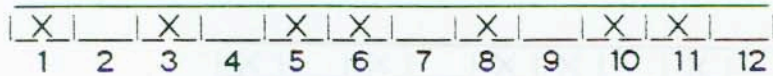
## MAJOR SCALE PATTERN



scale tones	1	2	3	4	5	6	7
KEY of C	C	D	E	F	G	A	B

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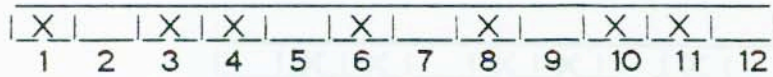
**DOMINANT 7th (mixolydian)**



scale tones            1 2 3 4 5 6 7<sup>b</sup>  
KEY of C            C D E F G A B<sup>b</sup>

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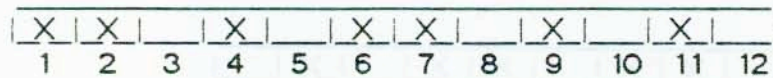
**MINOR (dorian)**            -



scale tones            1 2 3<sup>b</sup> 4 5 6 7<sup>b</sup>  
KEY of C            C D E F G A B<sup>b</sup>

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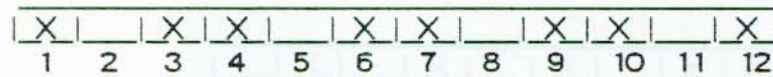
**HALF-DIMINISHED (locrian)**            ∅



scale tones            1 b2 b3 4 b5 b6 b7  
KEY of C            C D<sup>b</sup> E<sup>b</sup> F G<sup>b</sup> A<sup>b</sup> B<sup>b</sup>

-----

**DIMINISHED #1**



scale tones            1 2 b3 4 b5 6 b6 7  
KEY of C            C D E<sup>b</sup> F G<sup>b</sup> A A<sup>b</sup> B

-----

## LYDIAN

| X | | X | | X | | X | X | | X | | X |  
1 2 3 4 5 6 7 8 9 10 11 12

scale tones 1 2 3 #4 5 6 7  
KEY of C C D E F# G A B

- - - - -

## LYDIAN DOMINANT

| X | | X | | X | | X | X | | X | X | |  
1 2 3 4 5 6 7 8 9 10 11 12

scale tones 1 2 3 #4 5 6 b7  
KEY of C C D E F# G A Bb

- - - - -

## HINDU

| X | | X | | X | X | | X | X | | X | |  
1 2 3 4 5 6 7 8 9 10 11 12

scale tones 1 2 3 4 5 b6 b7  
KEY of C C D E F G Ab Bb

- - - - -

## DIMINISHED WHOLE TONE

| X | X | | X | X | | X | | X | | X | |  
1 2 3 4 5 6 7 8 9 10 11 12

scale tones 1 b2 b3 3 #4 b6 b7  
KEY of C C Db Eb E F# Ab Bb

- - - - -

## PURE MINOR (aeolian)

X		X	X		X		X	X		X	
1	2	3	4	5	6	7	8	9	10	11	12

scale tones            1 2 b3 4 5 b6 b7  
KEY of C            C D Eb F G Ab Bb

-----

## HARMONIC MINOR

X		X	X		X		X	X			X
1	2	3	4	5	6	7	8	9	10	11	12

scale tones            1 2 b3 4 5 b6 7  
KEY of C            C D Eb F G Ab B

-----

## WHOLE TONE 1 & 2

X	O	X	O	X	O	X	O	X	O	X	O
1	2	3	4	5	6	7	8	9	10	11	12

scale tones 1 2 3 b5 b6 b7  
KEY of C    C D E F# G# A#

-----

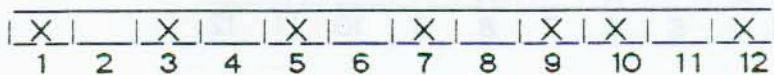
## AUGMENTED

X			X	X			X	X			X
1	2	3	4	5	6	7	8	9	10	11	12

scale tones 1 b3 3 5 b6 7  
KEY of C    C Eb E G Ab B

-----

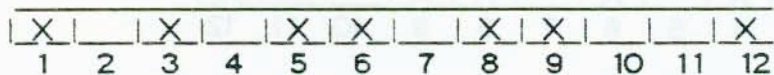
## LYDIAN AUGMENTED



scale tones 1 2 3 #4 #5 6 7  
KEY C C D E F# G# A B

-----

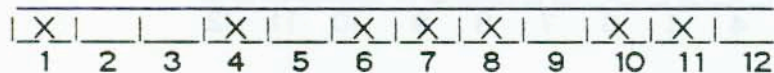
## Major 7/flat sixth



scale tones 1 2 3 4 5 b6 7  
KEY of C C D E F G Ab B

-----

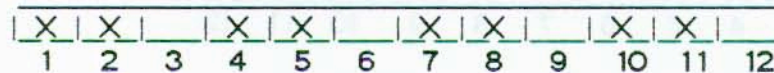
## BLUES SCALE



scale tones 1 b3 4 4# 5 6 b7  
KEY C C Eb F F# G A Bb

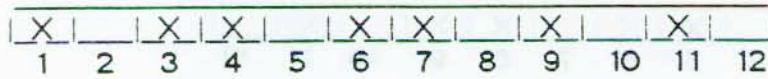
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## DIMINISHED #2



scale tones 1 b2 b3 3 #4 5 6 b7  
KEY of C C Db Eb E F# G A Bb

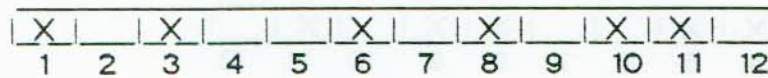
## HALF-DIMINISHED #2



scale tones      1 2 b3 4 b5 b6 b7  
KEY of C      C D Eb F Gb Ab Bb

- - - - -

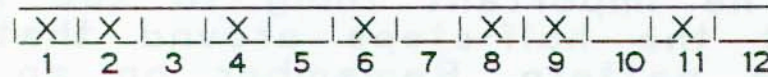
## SEVENTH SUS 4



scale tones      1 2 4 5 6 b7  
KEY of C      C D F G A Bb

- - - - -

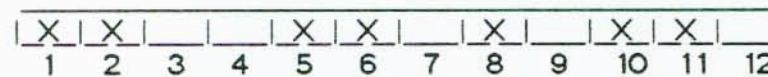
## PHRYGIAN



scale tones      1 b2 b3 4 5 b6 b7  
KEY of C      C Db Eb F G Ab Bb

- - - - -

## ALTERED



scale tones      1 b2 3 4 5 6 b7  
KEY of C      C Db E F G A Bb

- - - - -

## ALTERED

X	X			X	X		X	X		X	
1	2	3	4	5	6	7	8	9	10	11	12

scale tones      1 b2 3 4 5 b6 b7  
KEY of C      C Db E F G Ab Bb

- - - - -

## ALTERED

X	X		X	X			X	X		X	
1	2	3	4	5	6	7	8	9	10	11	12

scale tones      1 b2 b3 3 5 b6 b7  
KEY of C      C Db Eb E G Ab Bb

- - - - -

Those ought to keep you busy for awhile. The important thing to see is how you shift the half-steps around that form the scale pattern. Remember on an E-9th tuning, the first fret is a C note. This makes figuring what notes you have easier. You can compare all of your KEY of C scales' patterns with this.

REMEMBER FRET 0, F12 & F24 are all octaves of the same thing.

## MY APPROACH



## CROSS REFERENCE CHARTS

These Charts are for finding which letter represents the numbers on the major scale computer charts. The ones we are speaking of, are the first twelve. The major scale family. In the harmonized scales, remember the chord that each number produces. They are the same if you use any of the Charts, but the key is different. Here are the keys to each Chart.

C	Major	is	CHART I
C#	Major	is	CHART II
D	Major	is	CHART III
D#	Major	is	CHART IV
E	Major	is	CHART V
F	Major	is	CHART VI
F#	Major	is	CHART VII
G	Major	is	CHART VIII
G#	Major	is	CHART IX
A	Major	is	CHART X
A#	Major	is	CHART XI
B	Major	is	CHART XII

These charts are best used to study the modes on your steel. If you're playing along and need to know which chart you need to study B locrian, you can use these charts to find which CHART and we know a locrian would be a seven tone scale starting on the seven (7).

There is a cross chart to show which pentatonic scale you have on each chart. See how the blank squares are used to study a pentatonic scale.

### CROSSCHARTS 1

MODE	CHART I	CHART II	CHART III
Ionian	C	C# or D flat	D
Dorian	D	D# or E flat	E
Phrygian	E	F	F# or G flat
Lydian	F	F# or G flat	G
Mixolydi.	G	G# or A flat	A
Aeolian	A	A# or B flat	B
Locrian	B	C	C# or D flat

### CROSSCHART 1

MODE	CHART IV	CHART V	CHART VI
Ionian	D# or E flat	E	F
Dorian	F	F# or G flat	G
Phrygian	G	G# or A flat	A
Lydian	G# or A flat	A	A# or B flat
Mixolydi.	A# or B flat	B	C
Aeolian	C	C# or D flat	D
Locrian	D	D# or E flat	E

### CROSSCHART 1

MODE	CHART VII	CHART VIII	CHART IX
Ionian	F# or G flat	G	G# or A flat
Dorian	G# or A flat	A	A# or B flat
Phrygian	A# or B flat	B	C
Lydian	B	C	C# or D flat
Mixolydi.	C# or D flat	D	D# or E flat
Aeolian	D# or E flat	E	F
Locrian	F	F# or G flat	G

### CROSSCHARTS 1

MODE	CHART X	CHART XI	CHART XII
Ionian	A	A# or B flat	B
Dorian	B	C	C# or D flat
Phrygian	C# or D flat	D	D# or E flat
Lydian	D	D# or E flat	E
Mixolydi.	E	F	F# or G flat
Aeolian	F# or G flat	G	G# or A flat
Locrian	G# or A flat	A	A# or B flat

The next CROSSCHART gives you the chromatic scale, across the top, and the scale tones vertically. Think of a chord. A 1 is a Major seventh type. So all the Tonic major sevenths are across the #1 row. Find the key across the top, and the kind along the left side. Each scale tone is a certain type of chord. You want to know a scale for a E flat phrygian. CHART XII.

**CROSSCHART**

TONE #	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
1	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
2	XI	XII	I	II	III	IV	V	VI	VII	VIII	IX	X
3	IX	X	XI	XII	I	II	III	IV	V	VI	VII	VIII
4	VIII	IX	X	XI	XII	I	II	III	IV	V	VI	VII
5	VI	VII	VIII	IX	X	XI	XII	I	II	III	IV	V
6	IV	V	VI	VII	VIII	IX	X	XI	XII	I	II	III
7	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	I
	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑

**CHOOSE** scale tone number, then which key. Or vice-versa.

The best instrument for seeing the theory, is the piano. The 88 keys are good for only one note each. The octaves are easy to see, as well as, how scales work and chords move. We, as steel players, have to deal with the same theory, but with numerous ways and places to find each note. Anyway, when you can look at a guitar that you can understand, it will give you that much more creativity. Listen to other steel players and also other instruments. Watch how each person has their own technique. I use all the steel books I can find. Tablature is good to learn, but don't make any one thing the only way. If you really want to have fun, go purchase a guitar book and transpose it to a steel. Its great practice because you have to think! I even learn some solos I like, exactly like the record. To see where, he was coming from can be a beneficial learning experience. Read everything you can find about the steel, practice, and then form some opinions of your own. When you do this, your on your way to your own style.

## Numbers To Chord Type

Scale tone #

- #1, #3, #5, #7 is a Major seventh type.
- #2, #4, #6, #1 is a minor seventh type.
- #3, #5, #7, #2 is a minor seventh type.
- #4, #6, #1, #3 is a Major seventh type.
- #5, #7, #2, #4 is a Dominant seventh type.
- #6, #1, #3, #5 is a minor seventh type.
- #7, #2, #4, #6 is a half-diminished type.

## 〈Pentatonics〉

	Relative Major .....	minor (blues scale) .....
CHART I	> F# or G flat pent.	> A blues
CHART II	> G pent.	> A# or B flat blues
CHART III	> G# or A flat pent.	> B blues
CHART IV	> A pent.	> C blues
CHART V	> A# or B flat pent.	> C# or D flat blues
CHART V	> B pent.	> D blues
CHART VII	> C pent.	> D# or E flat blues
CHART VIII	> C# or D flat pent.	> E blues
CHART IX	> D pent.	> F blues
CHART X	> D# or E flat pent.	> F# or G flat blues
CHART XI	> E pent.	> G blues
CHART XII	> F pent.	> G# or A flat blues

The left column uses the major scale tones on the CHART specified. The right column of the pentatonics uses the major pentatonic as it relates to the relative minor. See EX 18 in the examples. What you are actually playing is a C pentatonic A to A to play the first, flat third, fourth, fifth and flat-seventh of A.

## Some ways to use

I use these as exercise charts, with and without the guitar. You can memorize the pattern that the numbers make. Think of the squares as building blocks and you can put them into memory better. After you get used to the music theory in numbers, you'll be able to see licks in your mind. They all start there anyway. So the mental aspect of the numbers is greatly increased, because of hand-to-eye coordination. It is beneficial to play the whole guitar on a solo. The doors of creativity stay open longer, because there are more things to go to, in your mind. The way you use the theory, is up to you. That is the part that comes from practice, study, and heart. The key is experience. Whenever you play you are gaining experience. Even study alone is an experience. That's when you can get close to your guitar. You can stop and see what you did wrong, and then correct it. The way to study is to break everything down to slow exact movements. Then bring them up to precision speed. When you practice, place the emphasis, on the precision. When your playing live, from instinct, you don't have time to worry about what went wrong. The more you practice, the more experience you get. There are different kinds of experience. One is self-study with and without the guitar. Another is the live playing. Getting used to different buildings, amps, effects, audience; while your under pressure of an employer, or worst yet other musicians.

Another thing to remember is that each family has a key signature. You can use these Charts to transpose sheet music from one key to another. To learn the key signatures I recommend a good music theory book. It will help you place music in its proper perspective. You could also read music written in one key, to another with these charts. It's a matter of getting used to using them. Eventually you won't need them, but a refresher course is always close at hand.

The more you learn to *see it on the steel*, the more knowledge of the fretboard you will have, and that will create more ways and places and thoughts about playing. The more you think about it, the more comfortable you are with your guitar. The fear of soloing will be gone. You will attempt to attack your solos, rather than meek around the guitar. The work is up to you. Of course, after you study and learn all you can learn, you'll get the job of a lifetime, playing the licks you learned at 14.

# CHORDS

## MY APPROACH

We talked a little about chords, during the right-hand session, discussed the physical Pickups. The right hand. To understand how moves of the right hand. To understand how we get the chords, we need to look at the theory of them. What is a chord?

A chord is a group of three or more notes. There are four types of groups. The groups of three notes are called triads and are labeled as follows: Major, Minor, Diminished, and Augmented. Chords which have four or more notes, are named for the largest interval they contain. The basic four are made up of superimposed thirds. The tonic note is called the root.

The chords come from a scale. To study the chords we give each tone of a scale a number. Here's a C major scale with the tone numbers written beside them. Remember, the difference between the numbering of the half-steps on a scale graph and the numbers given to scale tones.

1C	2D	3E	4F	5G	6A	7B	8C	9D	10E	11F	12G	13A
1	2	3	4	5	6	7	8	9	10	11	12	13

Take note that the odd tones are used in talking about the chords. They are the chord tones. The explanation for this is in a music theory book if you care to elaborate upon the thought. We can say that this is a standard method of

MY APPROACH..... page 214

## CHORDS

We talked a little about chords, during the Right-hand section, when we discussed the Pickgrips. The pickgrips showed us the physical moves of the right hand. To understand how we get the chords, we need to look at the theory of them. What is a chord?

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1C	2D	3E	4F	5G	6A	7B	8C	9D	10E	11F	12G	13A
1		3		5		7		9		11		13

Take note that the odd tones are used in talking about the chords. They are the chord tones. The explanation for this is in a music theory book if you care to elaborate upon the thought. We can say that this is a standard method of learning chords and scales.

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓



We must know the following forms of notation:

- b is lower a half-step
- # is raise a half-step
- b3 is a minor
- + is an augmented
- #5 is an augmented
- b7 is a Dominant 7th
- 7 is a major 7

These notations tell us what is happening to the basic chord tones. The basic three are 1, 3, and 5. Now we can study different scales and the formulas that bring us chords.

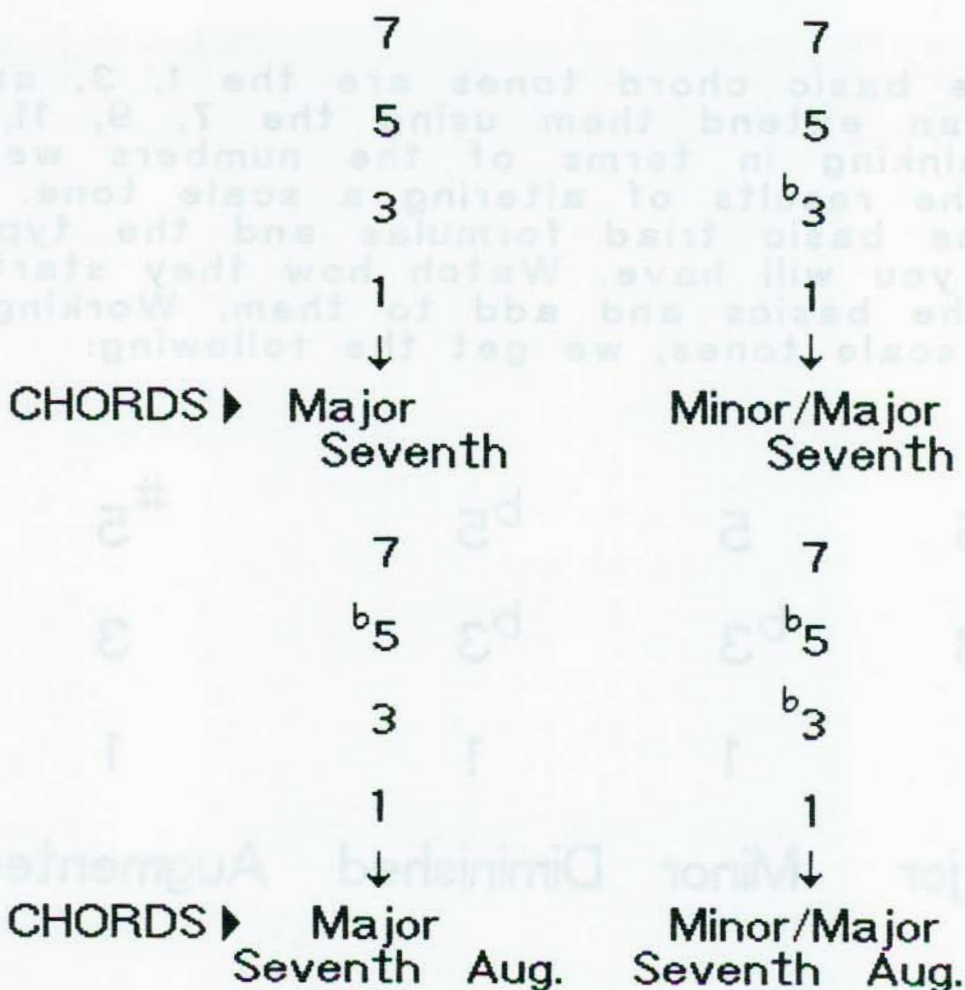
### CHORD FORMULAS

The basic chord tones are the 1, 3, and 5. You can extend them using the 7, 9, 11, and 13. Thinking in terms of the numbers we can give the results of altering a scale tone. Here are the basic triad formulas and the type of chord you will have. Watch how they start out with the basics and add to them. Working the major scale tones, we get the following:

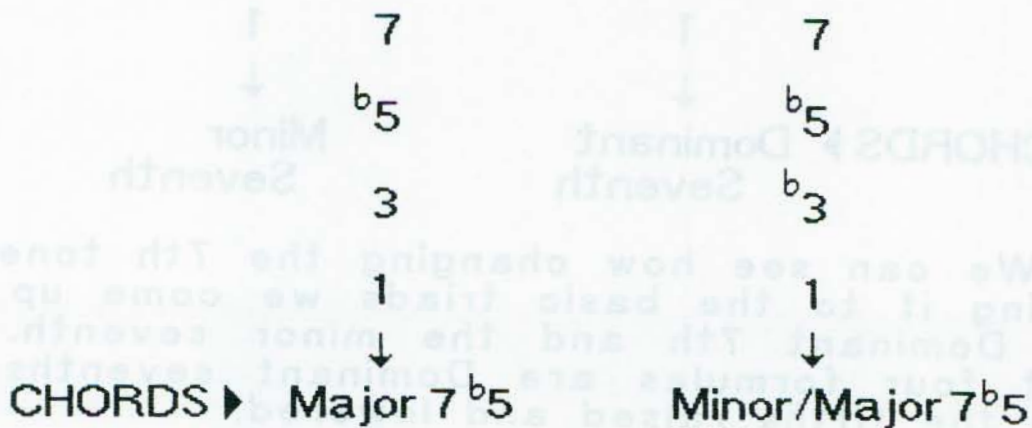
5	5	b5	#5
3	b3	b3	3
1	1	1	1
Major	Minor	Diminished	Augmented

These are the basic triads that you have to learn. Remember that you can only flat a third. Raising the third is the same as playing a fourth because of the half-step interval between the tones. The fifth tone can be raised or lowered a half-step. Going back to the major scale lets add the next scale tone to the basic major and minor triads. That would be the 7th scale tone.

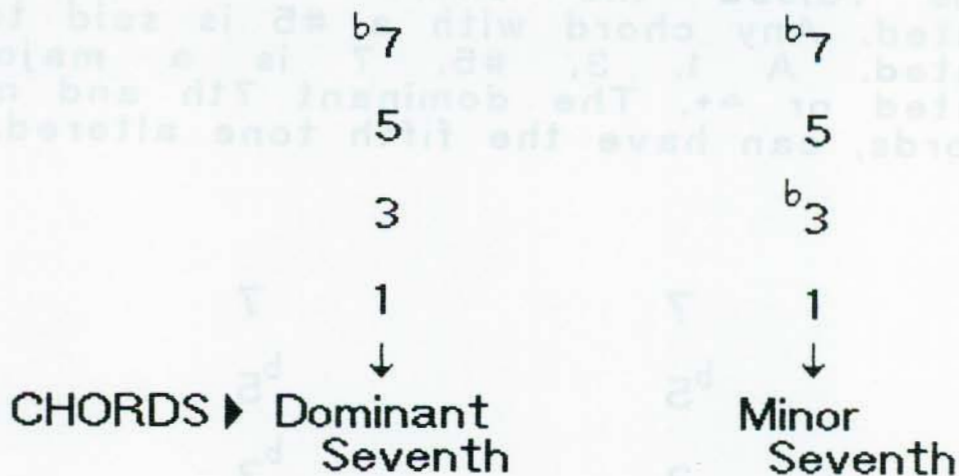
NOTE: I'm writing the chord formulas on a vertical axis. You should think of each chord tone, as a string on your steel. In the scale section we looked at the scale on one string. It all works together.



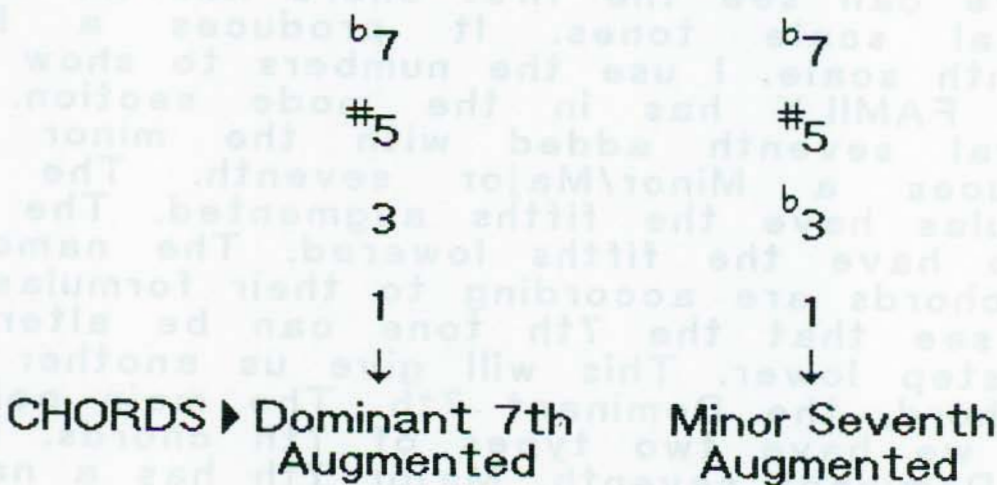
The fifth tone can be lowered or raised to alter the function of a chord. When a fifth tone is raised the chord is said to be augmented. Any chord with a #5 is said to be augmented. A 1, 3, #5, 7 is a major 7 augmented or  $\Delta^+$ . The dominant 7th and major 7th chords, can have the fifth tone altered.



We can see the first chord has all of the natural scale tones. It produces a Major seventh scale. I use the numbers to show what each FAMILY has in the mode section. The natural seventh added with the minor triad produces a Minor/Major seventh. The next formulas have the fifths augmented. The third group have the fifths lowered. The names of the chords are according to their formulas. We can see that the 7th tone can be altered a half-step lower. This will give us another type of chord, the Dominant 7th. The main point is that we have two types of 7th chords. Major and Dominant seventh. Major 7th has a natural 7; Dominant 7th has a  $b_7$ . Here are the major and minor triads with a dominant 7th added.



We can see how changing the 7th tone and adding it to the basic triads we come up with the Dominant 7th and the minor seventh. The next four formulas are Dominant sevenths (b7) with the fifths raised and lowered.





We get a diminished chord from a Dom. 7th chord. We take the basic formula of 1, 3, 5, b7 and *diminish* the 3, 5, and b7. We then have a 1, b3, b5, bb7. We have double flatted the seventh tone. The actual tone is a sixth. We can see how the diminished chord is derived from the Dominant 7th. The actual tones are 1, 3, 5, 6. A bb7 is a 6!

## INVERSIONS

All of the previous formulas were given to you in the Root position. The root is the lowest tone. The tones can be *inverted*. We can make the inversions, by moving the lowest note up an octave. The following is the major triad in all three inversions. The same can be done to all the basic triads.

### MAJOR Triad inversions

5 G	1 C	3 E
3 E	5 G	1 C
1 C	3 E	5 G
Root	First inversion	Second inversion

All chords can be inverted. The ear has a lot to do with which inversion you use in a particular situation.

## CHORDAL INTERVALS

Thinking in the key of C, lets look at the four basic chord types and the intervals that make chords take shape. The four types are Major, minor, diminished, and Augmented.

The following shows you how the four basic triads are, thinking in terms of the intervals. We use superimposed thirds. Thirds can be either major or minor. A major third is (+4) half-steps. Minor thirds are (+3) half-steps. Its another way to study the formation and structure of chords. The half-steps will become

valuable when you start looking at the intervals on a fretboard.

M = major interval. m = minor.

MAJOR			interval	MINOR			interval
fifth	G	m3		fifth	G	M3	
third	E	M3		third	E <sup>b</sup>	m3	
Root	C			Root	C		

Diminished			interval	Augmented			interval
fifth	G <sup>b</sup>	m3		fifth	G <sup>#</sup>	M3	
third	E <sup>b</sup>	m3		third	E	M3	
Root	C			Root	C		

The following, show the seventh tone added to the basic triads using the intervals.

MAJOR			interval	MINOR			interval
seventh	B	M3		seventh	B	m3	
fifth	G	m3		fifth	G	M3	
third	E	M3		third	E <sup>b</sup>	m3	
Root	C			Root	C		

The Major 7th chord has the a M3, m3, and a M3 between its tones. You can continue on in this pattern of intervals and have a really nice lick. The notes would be C, E, G, B, D, F#, A, etc.

The Major intervals start with a M3, m3, M3, m3, M3, m3, etc. The intervals to the minor chord are the opposite of the Major. They start on the m3, and then, M3, m3, M3, m3, etc.

### DIMINISHED 7th

		interval
seventh	<sup>bb</sup> B	m3
fifth	<sup>b</sup> G	m3
third	<sup>b</sup> E	m3
Root	C	

### AUGMENTED

		interval
octave	C	M3
fifth	G#	M3
third	E	M3
Root	C	

The Diminished is made up of exact intervals. They are minor thirds. We know that a minor third has three half-steps in it and an octave has twelve half-steps. If you divide the three (3) into the twelve (12), you get the number four (4) with nothing left over. The diminished chord has (3) half-steps between each of its tones. Because it is so uniform in its structure, we can see the diminished chords in three groups of four. The intervals between all of the chord tones are uniform.



This gives us a chord with four names. Their contents will be the same but you can name a Diminished chord by any of its tones.

Group 1	C	E $\flat$	G $\flat$	A	or Co, Ebo, Gbo, Ao
Group 2	C $\sharp$	E	G	B $\flat$	or C $\sharp$ o, Eo, Go, Bbo
Group 3	D	F	G $\sharp$	B	or Do, Fo, G $\sharp$ o, Bo

If you were to continue this pattern up the next octave, you'd get the same notes over again.

Looking back to the augmented intervals, we can see that it is symmetrical like the diminished. The interval that is used this time is the major third. The Major third has (4) half-steps. Divide this into the octave (12), and you get four groups.

## CHORD TONES

It is important to see how the scale brings us the chords. The symbol of the chord is also the symbol for a scale. Chords are based upon scales. If you aren't familiar with them, read the scale section.

We can study the chords by looking at different scales and using the chord tones from each. Lets look first at the chord tones of a major scale:

1, 3, 5, 7, 9, 11, & 13

From these tones we start to formulate our chords.

## MAJOR CHORDS Group 1

As with all other chords you can make inversions of all the possibilities. You can place any tone in the bass and study it from there. The group one chords can take either a Major or Lydian scale. The Lydian scale is a major scale with a #4.

NAME	FORMULA	SYMBOL
Major triad	1, 3, 5	-
Major 6th	1, 3, 5, 6	6
Major 7th	1, 3, 5, 7	ø7
Major 9th	1, 3, 5, 7, 9	ø9
Major add 9	1, 3, 5, 9	9 or add 9
Major 6/9th	1, 3, 5, 6, 9	6/9
Major 7/6/9th	1, 3, 5, 6, 7, 9 or	ø13
Major 13th	1, 3, 5, 7, 9, 13	ø7/6/9
Major 7/6th	1, 3, 5, 6, 7	ø7/6

## MAJOR CHORDS GROUP 2

Group 2 major chords are any group 1 chords with a #11 added. They use the lydian scale as a basis for improvising. Here are the chord tones you use:

1, #4, 5, 7, 9, #11, & 13  
 (2) (#4) (6)

NAME	FORMULA	SYMBOL
Major 7#4	1, #4, 5, 7	△#11
Major 9#4	1, #4, 5, 7, 9	△9#11

## MAJOR CHORDS GROUP 3

Group 3 major chords are the major chords that have had the 3rd replaced with either the 4th or the 2nd.

1, 2, 5, 7, 9, 11, & 13  
(2) (4) (6)

1, 4, 5, 7, 9, 11, & 13  
(2) (4) (6)

NAME	FORMULA	SYMBOL
Suspended	1, 4, 5	sus
2	1, 2, 5	2
Add 9 suspended	1, 4, 5, 9	9sus

The /9sus and the sus use the Major scale for improvising. The '2' takes either the Major or the Lydian.

## DOMINANT SEVENTH CHORDS

The next way we'll look at chords is through the dominant seventh scale. The dominant seventh scale is a Major scale with the seventh tone flatted a half step. The symbol for this is b7. We can arrange the dominant seventh chords into groups based on their sounds. We determine the chords by analyzing the scale tones of the dom. 7 scale.

Group 1 Dominant

1, 3, 5, b7, 9, 11, & 13  
(2) (4) (6)

NAME	FORMULA	
Dominant 7th	1, 3, 5, b7	7
Dominant 9th	1, 3, 5, b7, 9	9
Dominant 7/6th	1, 3, 5, b7, 13	7/6
Dominant 7/13th	1, 3, 5, 6, b7	7/13
Dominant 13th	1, 3, 5, b7, 9, 13	13

Group 2 Dominant

NAME	FORMULA	SYMBOL
Dom. 7 sus 4th	1, 4, 5, b7	7sus
Dom. 9 sus 4th	1, 4, 5, b7, 9	9sus
Dom. 11th	1, 5, b7, 9, 11	11
Dom. 7/6 sus 4th	1, 4, 5, b7, 13	7/13sus
	1, 4, 5, 6, b7	7/6sus
Dom. 13th sus 4th	1, 4, 5, b7, 9, 13	13sus
Dom. 11/13	1, 5, b7, 9, 11, 13	11/13

Notice the two groups of Dominant seventh chords. The second group are the same as the first with third replaced by the 4th or 11th.

Any chord containing any of (but only) these chord tones can take a dominant 7th scale for improvising.

## MINOR SEVENTH CHORDS

The minor seventh chords are very important in all types of music. They come from the minor seventh scale. The minor seventh scale is a major scale with the third flatted (b3) and the seventh tone flatted (b7). Lets look at the chord tones of the minor seventh scale:

1, b3, 5, b7, 9, 11, & 13  
 (2) (4) (6)

NAME	FORMULA	SYMBOL
Minor 7th	1, b3, 5, b7	m7 or -7
Minor 7/11th	1, b3, 5, b7, 11	m7/11 or -7/11
Minor 9th	1, b3, 5, b7, 9	m9 or -9
Minor 11th	1, b3, 5, b7, 9, 11	m11 or -11
Minor add 9th	1, b3, 5, 9	m/9 or add 9
Minor	1, b3, 5	m or -

## LYDIAN DOMINANT CHORDS

The Lydian Dominant scale is a major scale with a #4 and a b7. It is used a lot in jazz. The chord tones are as follows:

1, 3, 5, b7, 9, #11, & 13

We can use a Lydian Dominant scale over the following chords. This scale lets you see how certain chords can use more than one scale for soloing.

### Group 1 Lydian dominant

NAME	FORMULA	SYMBOL
Dominant 7th	1, 3, 5, b7, #11	7
Dominant 9th	1, 3, 5, b7, 9	9
Dominant 7/6th	1, 3, 5, 6, b7	7/6
Dominant 7/13th	1, 3, 5, b7, 13	7/13
Dominant 13th	1, 3, 5, b7, 9, 13	13

### Group 2 Lydian dominant

NAME	FORMULA	SYMBOL
Dominant 7#11th	1, 3, 5, b7, #11	7#11
Dominant 9#11th	1, 3, 5, b7, 9, #11	9#11
Dominant 7/6#11th	1, 3, 5, b7, #11, 13	7/6#11
Dominant 13#11th	1, 3, 5, b7, 9, #11, 13	13#11

### Group 3 Lydian dominant

NAME	FORMULA	SYMBOL
Dominant 7 <sup>b5</sup> th	1, 3, b5, b7	7 <sup>b5</sup>
Dominant 9 <sup>b5</sup> th	1, 3, b5, b7, 9	9 <sup>b5</sup>
Dominant 7/6 <sup>b5</sup> th	1, 3, b5, b7, 13	7/6 <sup>#11</sup>
Dominant 12 <sup>b5</sup> th	1, 3, b5, b7, 9, 13	13 <sup>b5</sup>

The Lydian Dominant scale can be used for soloing over the chords mentioned above. When I say a chord can take or use a particular scale, we are saying that the chord tones can be found in the scale. The first group of LYD/DOM scales can be used over the Dom.seventh. The Dom.seventh chord also takes the dom. 7th scale as a means for improvising. The terms *takes or used* can be thought of as a means of organizing your *series of tones* for soloing.

The third group of Lydian Dominant chords are possible because we can think of the #11 as a b5. This is another way to think about the scale tones and chord tones.

### ALTERED DOMINANT SCALE

What is an altered dominant scale? An altered dominant scale is a dominant 7th scale with any one or more of the following tones: b9, #9, b5, #5(b13).





The altered dominant #2, is a dominant 7th scale with a b9 and a b6. Notice that the 5 is natural and the sixth is altered. It contains the following scale and chord tones. Then look at some of the chords we can use this scale with. We can see a few new ones, that we haven't seen before.

## GROUP 2 ALTERED DOMINANT

SCALE TONES 1, b2, 3, 4, 5, b6, b7  
 (b9) (11) (b13)

CHORD TONES 1, 3, 5, b7, b9, 11, b13  
 (#5)

NAME	FORMULA	SYMBOL
Dominant 7th	1, 3, 5, b7	7
Dominant 7b9th	1, 3, 5, b7, b9	7b9
Dominant 7b9#5th	1, 3, #5, b7, b9	7b9+
Dominant 7b9b13th	1, 3, b7, b9, b13	7b9b13
Dominant 7#5th	1, 3, #5, b7	7+ or 7#5
Dominant 7#9th	1, 3, 5, b7, #9	7#9 or 7+9
Dominant 7#9#5th	1, 3, #5, b7, #9	7#9+
Dominant 7#9b13th		7#9#5
Dominant 11b9th	1, 5, b7, b9, 11	11b9
Dominant 11b9#5th	1, #5, b7, b9, 11	11b9+
Augmented	1, 3, #5	+

The altered dom. #3 is a dominant 7th scale with a b9, #9 and a b6. Notice that the third is natural and the sixth is altered. It contains the following scale and chord tones. Then, look at some of the chords we can use this scale with.

### GROUP 3 ALTERED DOMINANT

SCALE TONES 1, b2, b3, 3, 5, b6, b7  
(b9) (#9) (b13)

CHORD TONES 1, 3, 5, b7, b9, #9, b13

NAME	FORMULA	SYMBOL
Dominant 7th	1, 3, 5, b7	7
Dominant 7b9	1, 3, 5, b7, b9	7b9
Dominant 7#9	1, 3, 5, b7, #9	7#9
Dominant 7#5	1, 3, #5, b7	7+ or 7#5
Dominant 7b9#5	1, 3, #5, b7, b9	7b9+
Dominant 7b9b13		7b9#5
Dominant 7#9#5	1, 3, #5, b7, b9	7#9+
Dominant 7#9b13		7#9#5
Dominant 7#9b9#5	1, 3, #5, b7, b9, #9	7b9#9+
Dominant 7#9b9b13		7b9#9#5
Augmented	1, 3, #5	+

To really study your chords I provided a section called First Fret comparisons. The formulas can be used there to find out every possible chord on your guitar.

“1



# FIRST FRET COMPARISONS

The following graphs give you a different way to look at chords on your guitar. We will be studying the first fret of the E-9th and Universal. The C-6th will be studied using the open strings. The reason for this is the C note is in the bass. This makes studying everything a lot easier. The graph is telling you what takes place in each key at the first fret. The name of first fret comparisons is used to keep in mind the fact that we are analyzing chord tones at the first fret. Below we see the key and across you read the strings. Remember first fret, each key and different pedal combinations. Lets look at the first graph, No Pedals.

STRINGS	NO PEDALS											
s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B

←KEY

To use this chart you need to think at the first fret in the key of (bottom row). I have these chord tones. On this chart you are looking at the open strings and analyzing them at the first fret.

REMEMBER: This is all read at the FIRST FRET!!!!

48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B

Below we see the results of raising the fourth and eighth strings. The next pages give the rest of the pedals and combinations. We can study each pedal to see what chords we can get. In other words we can use these to find any chord that can be played with this pedal set-up. First we will do the standard E-9th

48+

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B

The picture above is showing us what chords we have with fourth and eighth strings flatted a half-step. In the key of C, we can see a 1, 3, 5. The MAJOR triad. If you're not sure of the chords go to the section on chord formulas. Remember that the steel sometimes uses only a fragment of a chord. If the formula calls for five tones, you may be able to play only four. Its something you have to get used to. (how a wing pedal steel)

# E-III First Fret

510

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <b>b</b>		E <b>b</b>			G <b>b</b>		A <b>b</b>		B <b>b</b>	

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s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <b>b</b>		E <b>b</b>			G <b>b</b>		A <b>b</b>		B <b>b</b>	

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s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <b>b</b>		E <b>b</b>			G <b>b</b>		A <b>b</b>		B <b>b</b>	

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s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <b>b</b>		E <b>b</b>			G <b>b</b>		A <b>b</b>		B <b>b</b>	

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s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <b>b</b>		E <b>b</b>			G <b>b</b>		A <b>b</b>		B <b>b</b>	

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s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <b>b</b>		E <b>b</b>			G <b>b</b>		A <b>b</b>		B <b>b</b>	



# E-IIH cont.

6

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	5	#4	4	3	b3	9	b9	1	7	b7	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

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s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

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s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

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s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

5

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

36/45/48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

# E-TH cont.

## 510/36/48+

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

## 510/36/17

s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

## 510/48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

## 510/48+

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

## 36/48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

## 36/48+

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

510/36/48+/17

s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

510/17

s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

510/29

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

36/29

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

36/45/17

s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

36/5

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

Horizontally the rows are the strings. Vertically the columns change keys. If you see a particular pattern that catches your eye, but its not in the key you need it in, you'll have to transpose. To see how to do this, look at the No Pedals chart and the key of F. To find that pattern in the key of E, you would back up your bar a half-step. The key of G would be up two frets.

Look at the tones on No Pedals in the F column. In the key of E you'll find this with the open strings. We can see why they call this tuning E-9th chromatic. The open strings have tones of 1, 3, 5, b7, 9, and natural 7.



# E-STH cont.

## 36/45/48+

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>		

## 36/45/29

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>		

## 48-/17

s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>		

## 48-/29

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>		

## 48+/17

s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>		

### NOTE:

The chord tones were all wrote with the same pattern. This means that a flat 3 and a #9 are the same.

- b6 and #5 are the same
- b5 and #4 are the same
- #4 and #11 are the same
- 6 and 13 are the same

Use them as you need them.

Remember the key changes, but the first fret remains the reference point. Each column is a pattern of a certain pedal, at the first fret, in the key along the bottom.

# E9TH B6TH FIRST FRET

No pedals

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P48+

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P29

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P59

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P3610

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P48

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P1711

s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P45

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P37112

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s12	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P91112

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b9	1	7	b7	6	#5	5	#4	4	3	b3	9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s12	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P56

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P4

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B

P610

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B

P5

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B

P3610/59

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B

P3610/45

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B

P48-59

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C# Db	D	D# Eb	E	F	F# Gb	G	G# Ab	A	A# Bb	B

P1711/48-

s1	#5	5	#4	4	3	b9	9	b9	1	7	b7	6
s2	3	b9	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b9	9	b9	1	7	b7
s4	3	b9	9	b9	1	7	b7	6	#5	5	#4	4
s5	1	7	b7	6	#5	5	#4	4	3	b9	9	b9
s6	6	#5	5	#4	4	3	b9	9	b9	1	7	b7
s7	#5	5	#4	4	3	b9	9	b9	1	7	b7	6
s8	3	b9	9	b9	1	7	b7	6	#5	5	#4	4
s9	1	7	b7	6	#5	5	#4	4	3	b9	9	b9
s10	6	#5	5	#4	4	3	b9	9	b9	1	7	b7
s11	3	b9	9	b9	1	7	b7	6	#5	5	#4	4
s12	1	7	b7	6	#5	5	#4	4	3	b9	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P3610/48+

s1	5	#4	4	3	b9	9	b9	1	7	b7	6	#5
s2	3	b9	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b9	9	b9	1	7
s4	#4	4	3	b9	9	b9	1	7	b7	6	#5	5
s5	1	7	b7	6	#5	5	#4	4	3	b9	9	b9
s6	b7	6	#5	5	#4	4	3	b9	9	b9	1	7
s7	5	#4	4	3	b9	9	b9	1	7	b7	6	#5
s8	#4	4	3	b9	9	b9	1	7	b7	6	#5	5
s9	1	7	b7	6	#5	5	#4	4	3	b9	9	b9
s10	b7	6	#5	5	#4	4	3	b9	9	b9	1	7
s11	4	3	b9	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b9	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P59 P48+

s1	5	#4	4	3	b9	9	b9	1	7	b7	6	#5
s2	3	b9	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b9	9	b9	1	7	b7
s4	#4	4	3	b9	9	b9	1	7	b7	6	#5	5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b9
s6	6	#5	5	#4	4	3	b9	9	b9	1	7	b7
s7	5	#4	4	3	b9	9	b9	1	7	b7	6	#5
s8	#4	4	3	b9	9	b9	1	7	b7	6	#5	5
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b9
s10	6	#5	5	#4	4	3	b9	9	b9	1	7	b7
s11	4	3	b9	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b9	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P3610/1711

s1	#5	5	#4	4	3	b9	9	b9	1	7	b7	6
s2	3	b9	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b9	9	b9	1	7
s4	4	3	b9	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b9	9	b9
s6	b7	6	#5	5	#4	4	3	b9	9	b9	1	7
s7	#5	5	#4	4	3	b9	9	b9	1	7	b7	6
s8	4	3	b9	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b9	9	b9
s10	b7	6	#5	5	#4	4	3	b9	9	b9	1	7
s11	9	b9	1	7	b7	6	#5	5	#4	4	3	b9
s12	1	7	b7	6	#5	5	#4	4	3	b9	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P56/91112

s1	5	#4	4	3	b9	9	b9	1	7	b7	6	#5
s2	3	b9	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b9	9	b9	1	7	b7
s4	4	3	b9	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b9
s6	7	b7	6	#5	5	#4	4	3	b9	9	b9	1
s7	5	#4	4	3	b9	9	b9	1	7	b7	6	#5
s8	4	3	b9	9	b9	1	7	b7	6	#5	5	#4
s9	b9	1	7	b7	6	#5	5	#4	4	3	b9	9
s10	6	#5	5	#4	4	3	b9	9	b9	1	7	b7
s11	3	b9	9	b9	1	7	b7	6	#5	5	#4	4
s12	6	#5	5	#4	4	3	b9	9	b9	1	7	b7
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P3610/45P48-

s1	5	#4	4	3	b9	9	b9	1	7	b7	6	#5
s2	3	b9	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b9	9	b9	1	7
s4												
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b9
s6	b7	6	#5	5	#4	4	3	b9	9	b9	1	7
s7	5	#4	4	3	b9	9	b9	1	7	b7	6	#5
s8	3	b9	9	b9	1	7	b7	6	#5	5	#4	4
s9	1	7	b7	6	#5	5	#4	4	3	b9	9	b9
s10	b7	6	#5	5	#4	4	3	b9	9	b9	1	7
s11	4	3	b9	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b9	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P91112/48

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s9	b9	1	7	b7	6	#5	5	#4	4	3	b3	9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s12	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>

P45/610

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>

P371112/610

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s7	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s11	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s12	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>

P371112/48

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s8	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s12	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>

P3610/59/48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>

P371112/48+

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s12	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>

P3610/59/48+

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

P3610/1711/59

s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

P59/3610/29

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

P59/3610/4

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

P1711/48+

s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

P3610/29

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

P3610/45/29

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P3610/59/29

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s9	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P610/45/48+

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P59/3610/1711/48-

s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P3610/48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	

P59/3610/1711/48+

s1	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s4	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s7	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s8	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s9	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s10	b7	6	#5	5	#4	4	3	b3	9	b9	1	7
s11	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>			G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>	



# B-6TH FIRST FRET

# C-6TH OPEN STRINGS

P91112/48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	b9	1	7	b7	6	#5	5	#4	4	3	b3	9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s12	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>		

C-6TH STRINGS

- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

This section can be used to find the First fret comparisons on the Universal or the OPEN STRINGS on the C-6th tuning.

The previous charts were Universal pedals that are used for E-9th style playing.

The Universal tuning with the E strings flatted(48-), places the guitar into a B-6th tuning. If you start at the bottom string(S12) and go up nine strings, you have the same intervals as the tenth thru second strings on the C-6th.

P48/48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>		

P56/48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>		

P91112/48/48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s9	b9	1	7	b7	6	#5	5	#4	4	3	b3	9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s12	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>		

P371112/48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s12	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		G <sub>b</sub>		A <sub>b</sub>		B <sub>b</sub>		

P371112/48-/48

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s7	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s8	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s12	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

P48/48-/56

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

P48/48-/56/91112

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s5	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
s6	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	b3	9	b9	1	7	b7	6	#5	5	#4	4	3
s9	b9	1	7	b7	6	#5	5	#4	4	3	b3	9
s10	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s11	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s12	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

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s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	#5	5	#4	4	3	b3	9	b9	1	7	b7	6
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s7	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s11	#4	4	3	b3	9	b9	1	7	b7	6	#5	5
s12	9	b9	1	7	b7	6	#5	5	#4	4	3	b3
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

P610P48-

s1	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s2	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s3	6	#5	5	#4	4	3	b3	9	b9	1	7	b7
s4	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s5	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s6	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s7	5	#4	4	3	b3	9	b9	1	7	b7	6	#5
s8	3	b3	9	b9	1	7	b7	6	#5	5	#4	4
s9	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
s10	7	b7	6	#5	5	#4	4	3	b3	9	b9	1
s11	4	3	b3	9	b9	1	7	b7	6	#5	5	#4
s12	1	7	b7	6	#5	5	#4	4	3	b3	9	b9
	C	C#	D	D#	E	F	F#	G	G#	A	A#	B
		D <sub>b</sub>		E <sub>b</sub>		F <sub>b</sub>	G <sub>b</sub>	A <sub>b</sub>		B <sub>b</sub>		

## ARPEGGIOS

An arpeggio is the notes of the chord played one at a time. You usually play these from the lowest to the highest or vice versa. They are very useful for improvising. The chord formulas are how we get our arpeggios. The arpeggio is based upon a scale that lays upon your steel. They are usually gotten by pedal combinations. You can learn the arpeggios without using the pedals, but the lefthand limits the speed at which you can play them. The next section will give arpeggios in the key of C. Learning in the key of C you can transpose a chord to your desired key. Arpeggios can be thought of as chord runs. They are another good way to study your guitar.

The scales and arpeggios can be used for single string playing. The arpeggios come from the scales and make interesting patterns for playing.

The section entitled *Putting it All Together* has arpeggio examples. There we see them as combinations of finger movements and pedals.

## MY APPROACH

## SUBSTITUTION

As you learn the formulas that give you your different chords, you will soon be wondering how to use those new chords in a song. The following are some rules for chord substitution. The majority of this is applied to jazz. Country music deals with this only in few instances.

Rule 1: The first is called direct substitution. The rules for this is simple. When a major chord is used you can substitute any major chord of the same letter name. Example: For a G chord you can use a G6th, G add 9, G<sup>Δ</sup>13th, etc.

Rule 2: This rule is the same as rule 1 except you apply it to minor chords. Any minor chord may be substituted for another minor chord with the same letter name. Example: For a G minor chord you can use a Gmi6th, Gmi/maj7th, Gmi add 9, etc.

Rule 3: The minor chord may be substituted for a major chord of the same letter name. Example: For G maj. you can use a Gmi, Gmi6th, Gmi7th, Gmi9th, etc. You can write mi or use a dash (-).

Rule 4: Any major chord of the same letter name may be used in place of a minor. Example: For Gmi you can use a G maj, G<sup>Δ</sup>, G9th, etc.

Rule 5: When a minor chord is used, we can substitute a Dominant 7th chord up a fifth interval. Example: For a G minor you can use a D dominant chord. Such as a D7th, D13thb5, D7#9, etc.

Rule 6: When ascending to the third degree, use a major diatonic scale. Example: Going from C to E, use Cb, D-7, E-7. Its the harmonized major scale.

Rule 7: When using a descending scale progression from the third degree, use the major diatonic scale. Example: Cb, D-7, E-7, D-7.

Rule 8: When your ascending to a fourth degree, you can use a major or minor type chord. Example: C to F can be C to F $\Delta$ , F-7, F13.

Rule 9: When playing descending half-steps from the third degree, use a chord one tone lower than the first chord. It should be of the same letter name and type. Example: Cb, E-7, Eb-7, D-7.

Rule 10: For Dominant 7th substitution you can use the following.

A. Direct substitution.

When a Dominant 7th appears you can use a Dominant chord of the same letter name. Example: For a G7th you can use a G7#9, G7b5, G13, G7#11, etc.

B. Dominant substitution a b5th higher

When a Dominant chord appears in a chord progression you can substitute any major, minor, or 7th type chord built on the b5th of the original triad. Examples: For a C7, use a Gb7 chord. For a F7, use a B7 or B7+. For a A#7, use a E7 or E13b9.

C. Minor substitution a Fifth interval higher.

When a dominant 7th appears you can substitute a minor chord a fifth higher than the original. Example: For an E7 use a B- or B-7 or B-7#11. For an A7 use a E-, E-7, E-6.

Careful attention should be used in the voicing of the chords. The trick is to please your ear. The only way to really get the feel of substitution is by experimenting. This allows you to develop your ear.

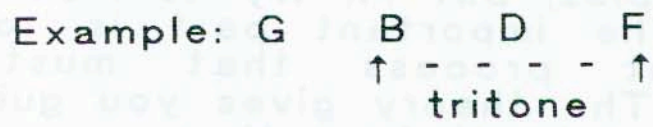
The voicing is the order of the tones of the chord. Any chord can have the tones in different positions. For instance, C major is C E G. You can also play the chord E G C. This places the third in the lowest note position.

The function of a chord is found in the basic four notes. The third of the chord determines what type, Either major or minor; and the 7th tone makes it either a dominant or a major 7th. For any basic major, minor, or dominant 7th chord, any extension may be theoretically substituted. An extension note, is a note that is not one of the basic four. The extension notes are 9, 11, 13. The thing to notice is that the more notes the more intervals. The more intervals the more tension in the chord.

For a jazzier explanation of chord substitution, we can look at some jazz terminology. The important notes in jazz are the *altered* notes. Altered notes are natural scale tones that have been altered. The dominant 7th scale is what is altered. The names that are given to them are the #9, b9, b5, #5, b13. Notice that the #5 and b13 are both listed as separate notes. The #5 could be in a chord with a natural 13th. Listen to the *tension* that's created by the interval between the #5 and 13. The opposite applies to a b13 and natural 5.

The secret to using an altered chord depends on the movement. You can use an altered dominant 7th chord if the next chord your playing has a root a fourth higher. Example: C to F. Or, if the next chord is a half-step lower. Example: C to B to Bb. And a minor may be substituted for a major.

Another interesting theory is that of the tritone. A tritone occurs between the 3rd and b7 notes of a dominant 7th scale.



The B D F notes resolve to C E G. That's a V to a I. This movement is termed resolution. Look at the way intervals resolve.

Here's an interesting theory.



The D# is an altered note that makes the tritone to want to resolve more forcefully.

### SCALE SUBSTITUTION.

When you are using a dominant 7th chord and going up a fifth, you can substitute a diminished chord a half-step above the dominant 7th. For example, G7 to C you can use a G#o chord or scale. Or, you can use a F#o to C, Bo to C. (The diminished scales for the four diminished chords are all the same. Its just a pattern of half-steps and whole-steps. The scale pattern repeats just as the chords.) Remember that you can use scales and arpeggios (chord tones) to improvise with.

Passing from a C to a F or form of (D-), you can use a Co or a C#o

To see some improvising techniques, study a progression and discuss the rules. You can buy the sheet music and work up a new instrumental. It's good practice to read the notes and place them into movement on a steel. Learning to read helps to you to understand your guitar more. The chances and ways are numerous. I'll not get to all of them in the examples, but I'll try to mention them in the text. The important part is to remember the thought process that must go into improvising. The theory gives you guidelines and you have to take it from there.

First you have to know your scales. The only way to learn them is to practice them. Scales are hard to get down on a steel but patience will win out. The scale charts will help you learn them. Stick with them and keep studying.

### EXAMPLES FOR SUBSTITUTION

#### Progression No. 1

NEW				ORIGINAL
G <sup>△</sup>	G <sup>△</sup> 6	C13	C13	GGCC
G <sup>△</sup>	G <sup>△</sup> 6	C <sup>△</sup>	C <sup>△</sup>	GGCC
D7	D7	C7	C7	DDCC

From this simple progression we can see direct substitution. Any particular lick should depend on the moment. Everything is involved.

#### Progression No. 2

NEW				ORIGINAL
G-7	E-7b5	A7add9	D13b5	GEAD
G-7	E-7b5	A7add9	D13b5	GEAD
B-7	E-7b5	A7-/ <sup>△</sup>	D13	BEAD
C-7	C#∅	D13	D13	CCDD



## MAJOR-MINOR SCALES

We've studied the modes and what takes place, but now I want to talk a little more about playing in a major or minor scale key. This is what you'll be doing in most of your modern music. Country, pop and rock all use the major and minor keys as a basis for composing their songs. For the discussion of these, we will be talking about the chords that are involved. Again lets talk about the key of C major.

In the scale section, I showed how we harmonize a major scale by continuing the scale from each of the chord tones. We then saw the chords that were formed by using each of the roots as a tonic. The modes let us see how we could rearrange the half-steps and find new sounds.

To see how major, minor, and dominant 7th chords function we need to see that they are chords built on tones of a major scale. To keep from being confused we will write the chords in Roman numerals. The Roman numerals are to remind you that we are talking about the chords that are produced by harmonizing the major scale and not the tones of a major scale. The process of building the harmonies and the chords is shown in the scale section.

Most of my playing I do that pays any money uses mostly the harmonized major or minor scale as a basis for the KEY. When someone says to me the key of C, I instantly flash these chords through my mind.

### MAJOR

I $\Delta$ 7 II-7 III-7 IV $\Delta$ 7 V7 VI-7 VII $\emptyset$

The chords on the previous page are produced from each scale tone. We can say this about the chords in any major key. There are four chord types that are possible. A minor 7th, major 7th, dominant 7th and  $\emptyset$ 7th. The minor seventh occurs on the II, II and VI degrees. A major seventh occurs on the I and IV degrees. A dominant seventh occurs on the fifth scale degree and a  $\emptyset$ 7th occurs on the VII degree. In the key of C, we would have the following.

I $\Delta$ 7    II-7    III-7    IV $\Delta$ 7    V7    VI-7    VII $\emptyset$   
 C $\Delta$     D-7    E-7    F $\Delta$     G7    A-7    B $\emptyset$

We can see that a major seventh chord can belong to two keys, functioning as either a IV or a I. The minor types can belong to three keys functioning as a II, II or VI. The dominant 7th and half-diminished function in only one key, as the V and VII chords respectively.

What we've just done is look at the chords frontwards and backwards. First to see the chords they can form, and then within their own group types. The thing to remember is that an E-7 has three functions, depending on the key your in. In C its a III-7, in D its a II-7, and in G its a VI-7. The same applies for each type of chord in each key. You should learn to spot the movement of the circle in any key. The ability to see this quickly will allow you to substitute more liberally, rather than the change passing you by. You need to see the II-7 V7 I $\Delta$  as movement within a KEY.

Thinking of the natural movement of the circle of fourths. Example C to F. In a major harmonized scale there are a lot of fourth intervals. In Roman numerals we can write them as:

I to IV, V to I, III to VI, II to V, VII to III

C to F, G to C, E to A, D to G, B to E

These are all fifth movements within a scale. In the key of C we can see them easier. You should be able to move around the circle in any key. Remember, up a fourth is also back a fifth.

In most modern day music you'll run into the use of the II-7 V7 I<sup>Δ</sup> change a lot. Another thing to remember is with the V7 to I<sup>Δ</sup> change, the V7 can take a minor chord built on the fifth of the triad as a substitution. The minor built on the fifth of the V7 chord turns out to be a II-7. The circle tells us that a II-7 moves naturally to a V7. So for very V7 we can use a II-7 V7 substitution instead of only a V7. In bebop the II V I change is used extensively. The following will give some examples as to how to approach that theory. Here is a chart listing all your II-V-I for all keys.

II-7	V7	I <sup>Δ</sup>
D-7	G7	C <sup>Δ</sup>
A-7	D7	G <sup>Δ</sup>
E-7	A7	D <sup>Δ</sup>
B-7	E7	A <sup>Δ</sup>
F#-7	B7	E <sup>Δ</sup>
C#-7	F#7	B <sup>Δ</sup>
Ab-7	Db7	Gb <sup>Δ</sup>
Eb-7	Ab7	Db <sup>Δ</sup>
Bb-7	Eb7	Ab <sup>Δ</sup>
F-7	Bb7	Eb <sup>Δ</sup>
C-7	F7	Bb <sup>Δ</sup>
G-7	C7	Fb <sup>Δ</sup>

The jazz turnaround is an interesting thing to study. There are many different kinds and, I will show you how we can substitute, to get more from a few simple ones. The most used is the I VI II V. Dealing in dominant type chords on the VI, II, and V degrees allows:

1. direct Minor for major/ major for minor
2. minor a fifth higher
3. dominant 7 a b5th higher.
4. Altered extension of any dominant 7 moving (watch your voicings)

Taking the basic I VI II V we can substitute as follows. KEY of C.

C A D G. can become  
 C /E-7alt /A[7alt /C#7alt

For the VI to II we used the used the minor up a fifth on the A (VI), it become an E-7. The (alt) simply means you can alter the tones of the scale because they are dominant 7ths and are moving up a fifth. The D is replaced by a dominant chord formed on the b5th of the triad. The flat 5 of D is Ab. The same is applied to the G7 chord.

Here are some more jazz turnarounds. We can arrive at these through chord substitution. All examples are for the key of C.

	C	A7	D7	G7
or	C <sup>Δ</sup> #4	A7#9	D-7	G13
or	E-7	Eb-7	D-7	G7+
or	C	Eb7	D7	Db7
or	C	Eb <sup>Δ</sup>	Ab <sup>Δ</sup>	Db <sup>Δ</sup>
or	C	A-7	D-7	C#-7b5

### MINOR dorian

SEVENTH	Bb	C	D	Eb	F	G	A.
FIFTH	G	A	Bb	C	D	Eb	F.
THIRD	Eb	F	G	A	Bb	C	D.
ROOT	C	D	Eb	F	G	A	Bb.
TYPE	I-7	II-7	III $\Delta$	IV7	V-7	VI-7b5	VII7 $\Delta$

The -7b5 chord is moved to the sixth degree. Lets rearrange the tones again and see what we get. The structure is: 1 2 3b 4 5 6 7. This is the harmonic major scale. It has a natural 7th. Note the new chord types, that you get with the natural B note.

### MELODIC MINOR

SEVENTH	B	C	D	Eb	F	G	A.
FIFTH	G	A	B	C	D	Eb	F.
THIRD	Eb	F	G	A	B	C	D.
ROOT	C	D	Eb	F	G	A	B.
TYPE	I-/ $\Delta$	II-7	III $\Delta$ +	IV7	V7	VI-7b5	VII-7

Starting to see how harmony comes about? The scales are all families. Lets go back to the LYDIAN DOMINANT and harmonize a the scale. The scale structure is: 1 2 3 4# 5 6 7b . Here it is in the KEY of C.

### LYDIAN DOMINANT

SEVENTH	Bb	C	D	E	F#	G	A.
FIFTH	G	A	Bb	C	D	E	F#.
THIRD	E	F#	G	A	Bb	C	D.
ROOT	C	D	E	F#	G	A	Bb.
TYPE	I7	II7	III-7b5	IV $\emptyset$	-/ $\Delta$	VI-7b5	VII $\Delta$ +

Rock and Roll music doesn't move through the cycle as does jazz. Its movements are more scalewise. They work more in the modal scales. The natural minor chords are used a lot.

The minor scales can be harmonized and chords built upon their tones. The two basic ones are the harmonic and the natural. The natural is also called the relative minor. The natural scale is the same as the aeolian mode. Lets look at the natural minor scale harmonized and the resulting chords. The scale structure is 1 2 b3 4 5 b6 b7. Lets look at the example in the key of A minor. The parent key is C major. The relative major of A is C. The relative minor of C is A. In the KEY of A minor the chords are:

Lets look at the notes built over the scale tones as the roots. This is an A minor natural scale, harmonized.

### NATURAL MINOR

SEVENTH	G	A	B	C	D	E	F
FIFTH	E	F	G	A	B	C	D
THIRD	C	D	E	F	G	A	B
ROOT	A	B	C	D	E	F	G
TYPE	I-7	II-7b5	III <sup>△</sup>	IV-7	V-7	VI <sup>△</sup>	VII7

The first thing to notice is the II V I change. The chord types are different.

We can rearrange the harmony by using another scale. Lets look at the chord types. Scale structure is: 1 2 3b 4 5 6 7b. This is like the dorian mode.

We get some interesting chords when we analyze these notes. Notice the sixth degree is a minor/major 7th. Makes for some interesting soloing. Notice the augmented chord in the seventh degree. Two of the minor chords end up to be -7b5 types.

The major scale is studied in the mode section as a family. All the scales we are harmonizing could be thought of as families. Each rearrangement of a scale structure creates a new family of chords and can be studied like the modal scales. The possibilities of tonality and harmony are fascinating and should be studied. I've made up charts that show how they lay on the steel. The pattern of the numbers will change to bring you a new structure.

Study your computer generated scales to see the patterns. In a later book, I will go into harmonizing more of the altered type scales.

## MY APPROACH

## NASHVILLE NUMBER SYSTEM

Adapted from jazz notation, the Nashville Number system is a very useful tool for any serious musician. To play together a band needs a chart or reference to keep them together. With the NNS, you have an advantage over writing out the letters. You can change keys without having to rewrite your chart.

The numbers are neutral. If you are playing a show with singers playing the song in two different keys, a number chart allows you to change your tonic or one. To see how we arrive at the NNS lets start with a C major scale.

C D E F G A B

In the NNS, we give each of these scale tones a number.

1 2 3 4 5 6 7

The numbers will stand for a chord. A symbol is given after the number to denote chord type. A 2- is a two minor. In the key of C, that would be a D minor. With the NNS you get a simple chord chart. The thing that is lacking is the ability to convey any particular lick. Everyone writes their charts differently. These are some of the methods I use.



Lets chart out the Charley Pride Song, *Kiss An Angel Good Morning*.

```

(2341)  <--- count off
KEY (E)  <--- KEY

1  1  1  1  <--- INTRO

1  1  4  4  <--- First section
5  5  1  1
1  1  4  4
5  5  1  1

1  5  4  4  1  1  <--- Chorus
1  5  4  4  1  1
Repeat

```

The intro is a lick, but we only write down the chords. On my charts I write out the count for the rest of the band. This avoids a lot of confusion in live situations.

Some parts of a song are repeated and the numbers allow you to give each section a label. Here is *Smokey Mountain Rain* by Ronnie Milsap. Notice how each section is repeated with the letters.

```

KEY (G)
Intro: 1 3- 4 1

<A>
    6- 4  1  5
    6- 4  2- 5  45

<B>
    1  3- 4  5
    1  3- 4  5  451

<A>
<C>
    4^ 1^  7b^ 3b^545
<B> instrumental
<B>

```

The repeats make things easier. Another thing we see is the split bar. This gives each chord half the measure. Underlining the two chords tells us to split them. Some use a slash to denote this but that can be confused with a 4 over 5. Lets say we want a 4 chord with a 5 bass. We could write it 4/5.

Each number represents a measure in whatever time signature is specified. Most country music is either;

$$\frac{2}{4} \quad \frac{3}{4} \quad \frac{4}{4}$$

Practice charting songs to help develop your skills in this area. You will have a better understanding of the total picture of a song. You can't get there if you don't know where you're going. As you get better at charting, you'll start to develop techniques to make your charts show more nuances of the music.

Not as good as reading music but the advantages are worth the effort of learning.

## MY APPROACH

## ATTITUDE

# ATTITUDE

## MY APPROACH

## STATE OF MIND

Your state of mind towards your playing can either make you or break you. I try to keep an open mind in all that goes on with my steel. I think more in terms of an overall effect rather than personal achievement. (Showing off is fun, cool.) You can show all day and never get anywhere if the rest of the band is not so to speak. Most of the time it's the steel player who is getting there holding back the rest of the band. He may not want to play the same songs because of his playing ability. Instead of practicing he works on exercises. (Cognition over how to approach the instrument is the biggest factor for playing bad steel. The thing you need to know have only been touched in brief. All the early chapters gave you a code to tell you what to play. They never answered the why. I look at everything in great detail and then put it all together to come up with my own theories. The more you think and experiment with your instrument the more things you'll find you can do. It all boils back to your attitude towards learning. Learning is a step by step process that takes a certain amount of time. It varies with each individual. Hard work is the only answer to

## ATTITUDE

The most important part of learning to play the steel guitar is attitude. Just as in athletics, acting, or finance, the state of mind toward what you are doing plays an important part. If you are not happy with how you play, the enjoyment may not be equal to the frustration of learning. This is the reason a lot of players give up the steel. They take it, for as long as they can handle the hardships of learning. Most get to a certain degree of proficiency on the instrument and then, place mental limits upon themselves by saying *I'll never learn to do that*. Instead of taking the time to learn, they spend the time convincing themselves they can't do something.

There are a lot of ways to approach the playing of a steel guitar and a lot of things to learn. Its a very complex instrument so don't let complications destroy your enjoyment. It takes time and attention. The best cure for your attitude is spending the time at your guitar. Learning can be fun.

## STATE of MIND

Your state of mind towards your playing, can either make you or break you. I try to keep an open mind to all that goes on with my steel. I think more in terms of an overall effect, rather than personal achievement. (Showing off is fun too!) You can show off all day and never get anywhere if the rest of the band is not up to snuff. Most of the time, its the steel player who is setting there holding back the rest of the band. He may not want to play the same songs because of his playing ability. Instead of practicing he works on excuses. Confusion over how to approach the instrument, is the biggest factor for playing bad steel. The things you need to know have only been touched in brief. All the early tablature gave you a code to tell you what to play. They never answered the why. I look at everything in great detail and then put it all together to come up with my own theories. The more you think and experiment with your instrument, the more things you'll find you can do. It all boils back to your attitude towards learning. Learning is a step by step process that takes a certain amount of time. It varies with each individual. Hard work is the only answer to

learning the steel guitar. There are a lot of things that can happen. Defining them, and clarifying what they do, to contribute to the overall picture, helps you see things in a different light.

The only problem holding anyone back, is their desire to learn. The ability to learn is there but if you really don't want to learn, the finer points of playing the steel guitar, you won't. Your attitude may be set in its ways against change. You may be afraid of losing some of the older sounds, but they will always be around. Try something new. The most fun I had playing were times I spent alone experimenting with the steel. Something is unknown until someone takes the time to grow familiar with it.

## FEAR

I used to find myself playing steel guitar while I was 100% afraid of the instrument. The inner turmoil caused by the fear of failing or looking bad, was totally in control of my mind. It, was what I thought about. To fight this problem, I needed to fight the fear with a knowledge of the subject. The only way to overcome the unknown is by making it the known. I began researching the steel guitar. I soon found myself overwhelmed in this fascinating subject. The project soon became enormous. To my knowledge, nothing like this had ever came across my eyes. I saw a book that I wish I had the opportunity to have at the age of 15. These facts were what I was looking for. Things that I could study and get my mind to start thinking for itself. The hardest part of the whole project was putting my thoughts on paper. I worked long hours just making sure you would understand the theories and principals that I think about.

Spending all my time acquiring this knowledge, took me away from my steel and placed me behind a computer. Then and only then, did I really see how the steel worked. All I did was start to understand how a computer worked and how I could apply it to a steel guitar. Seeing how a computer would have to receive the knowledge, I started to think about what it would have to know. The most important

thing is what I thought. My attitude was very open to the subject. I was already in love with the sound of the instrument, so the hardest part was facing the task of writing the book, and actually getting it done. I had this idea for a long time, and over the years of thinking about it and wanting to get it done, I started to slowly accumulate the knowledge. But first, I had to think everything out and then apply it to a steel. This process took years and a lot of questions. It was hard for me to spend this time away from the steel, but I really got a better attitude as a player by the thought away from the steel. The fascination is to constantly play the guitar, but be aware of the potential of the thought process. You need to play the guitar a lot but it doesn't hurt to think about it. In fact, its the best medicine for a stale player. You need to learn things in bits and pieces. The pieces can come to you over the period of a year or six months. You can't fight the learning process. You can only feed the information in until, one day you don't need anymore than an occasional review.

We must also mention here the fact that everything that goes into your mind has got to be processed. More easily understood is the term, *thought process*. The each mind has its own method and time duration that is required in learning. It has to go in, be processed, and then called upon. The *being processed*, can be thought of as being understood. We can't call on a technique or theory if we don't understand it.

The best method I've found for learning is the use of mental imagery. I see the image in my mind and then try to visualize my body carrying out whatever is required. What you are doing is visualizing a movement in your mind and then making it happen. The mind thinks in pictures when we think. We then use words to express what we see in our thoughts. There are lots of books out if you are interested in this subject.

The amount of information is so vast that no one could remember it all. That's the purpose of this book. Its all here when you need it. The most important thing is to at least be aware that you have to think things out. You can use the information to review and to study. No one can learn all

this in a short while, so give yourself a large time table and go for it. Base your time table on certain things you would like to improve. Don't be afraid of thought, it can be a steel players best friend. Thinking about your steel in new ways brings new ideas. New ideas mean new licks. Licks, mean jobs for steel players. Open up your mind and get into the world of steel guitar with me. I've researched all the information for you. All you have to do is study and study and study and.....

## PLAYING WITH A BAND

A thing that gets overlooked, in some players race to learn their guitar, is the inter-action amongst the other band players. In a symphony orchestra all of the music is written out for each player. This type of player has his playing dictated for him. He has to read music and interpret it with the rest of a large group. The steel player, usually will find himself in a country or rock setting. In this situation the music is sometimes charted with the structure of the tune as a guideline for playing. The music is more open, all depending on the type of band, and the people (instrumentation/proficiency) who are in the band. The players in the country band still have to interpret the music in conjunction with each other, usually without any music or chart to follow.

Road players, for an artist who records, are usually asked to reproduce what's happening on the record. The symphony player and him are doing basically the same thing. The only difference is the steel player learns his part by ear. I feel that the limited number of steel players who can read music are being held back from working in *reading* situations for these reasons. First, most composers don't understand the steel well enough to write parts for it. They are limited in what they can do because they don't have a clue what's going on. Secondly, we have the majority of *professional* players who can't read music notation. The industry knows that most steel players can't read, so the few who can are stereo-typed as a *traditional* steel player.

Third, is the fact that most people have learned to play steel without any knowledge of music theory. When they started to learn the steel they did so by playing by ear. A

good way but lacking in so many ways. This is starting to be slowly remedied as the instrument starts to grow.

All of these musical draw backs that the steel guitarist is faced with dictates what type of band we can get into. The players who read good jazz charts aren't really sure of what a steel player can do. The only way to improve upon these problems is to educate the steel players in the finer points of music. The fact is that you'll find yourself suitable for more types of music, in different types of bands.

Thinking of the modern day pedal steel, you are usually in a country band and your usually playing steel parts. Times are changing more and more and the steel guitar is starting to open up new frontiers. The further it goes, the better a player has to be. They must read a chart to work in the studio. They also need to read notation. Notation could be written by composers for steel, but first they would have to study steel and learn how it is played. They study all the instruments in an orchestra. They don't understand it so they don't write for it. They also need to study jazz to play it. The study may be only listening to it, but it goes in the mind through the ears as well as the hands and eyes.

I love Pedal Steel and its my favorite subject to talk about. Twenty-four years of playing steel (twelve of them for a living) has placed me in a lot of situations. I started playing in a trio when I was 17, that had only bass, drums, and steel. The bass player and I did the singing. I knew nothing about music theory, but played to the situation. We played every local gig we could and worked steady until the day we broke up and moved on to better things. This experience just starting out was invaluable. The different kinds of music I was faced with, was everything from country waltzes, to rockers by Deep Purple. I'd like to share my years of experience with all who care to listen. The following ideas can be used for any kind of music, as well as rock.

## TYPES OF BANDS

I've played in all kinds of bands, with many different types of instrumentation. The situations were good for learning to play with a band. Before I get into talking about



licks per se, I'd like to talk to about the attitude that they approach steel with. As much as I like the sounds of old, we must think of the future of the steel as an instrument in the world of music. This means thinking of it as an art form and as an industry. Since the age of seventeen, I've made my living playing steel guitar. The fact that I needed money to survive led me to playing with a more open mind. I found I enjoyed everything more if I tried to play everything from a positive attitude. My main goal was to be respected as a player who played all styles of music. Just because you play steel guitar, never let that get in the way of being a total musician. I don't care what kind of music I play as long as we play it good. Please think about the we of music. Playing and working with other players is what makes music feel so good. The finished product is the most important thing, whether you are playing Molly Hatchet or Ray Price. Always try to be the best you can be. The bottom line is to learn to fit yourself into a group sound.

There were no steel players around to learn from, so I had to use guitar books, theory books, piano players; whatever I could use to improve. I wanted to know the secrets of the good players I saw, no matter what instrument they played. If you want to play rock steel, you must open your mind to the music. Learn to listen to all the instruments that are in a recording and forget that you are playing a steel guitar. Try to become a part of the band. Learn to play what's called for to enhance your over all group sound.

One thing I have noticed in the years I've traveled, is the number of people who really don't know how to approach playing with a steel player. (Most people don't even know what one is.) Everyone has to make room for everyone else. Playing with Charley is totally different than a club gig. If you want to talk about boredom, play in an eight piece band with a country star. My licks are always the same, but that is what this particular situation calls for. Sometimes playing what's called for means folding my arms and smiling. Every group I've played in has brought adjustments in my playing. You have to play to acquire the feel that you all want. For instance, if you are playing blue suede shoes, you can't play Pete Drake country licks on your

steel, and the piano player can't be jamming a la Chick Corea. Extremes I know, but if the point of togetherness comes first, everyone's individuality will come out being complimented by everyone on the stage.

As a steel player, I have learned to give in to the other players more because I play according to what's needed. I played in one band for five years and with all types of instrumentation. We were a *country* show band. Not only did I play steel and sing, but we did comedy skits as well. The turnover of musicians on the road was 50 in five years. The point to be made is, that every time someone new came into the band, things would change. Once a player gets familiar with the material he can start to stretch out according to what your trying to achieve as a group. When you are being paid to play, you are producing a product and part of being a professional, is doing what has to be done.

When the band had no piano player, I would take his parts. If we had a piano without a guitar, I would take those parts. Personally, I liked it best when we were a trio. You had to play like all the instruments. Covering lots of sounds at once improves your playing, plus you divided the money fewer ways. Economics helped my style. First thing to do is change your attitude towards other musical forms as applied to the steel guitar.

I think the steel can enhance any kind of music. You have to learn to play the styles. It all comes down to what each individual wants. If you only want to play old country, then go for it. If I want to play heavy metal (personal favorite) the only thing that should matter is that I do it to the best of my ability. If we all played the same, wouldn't a steel convention be a boring event? The more steel players we have, who are not afraid to be themselves, the more chances we have to stay out of the category of a beautiful, rich sounding, extinct instrument.

Personalities are a very important part. Their discussion is best left to psychologists.

You've read this far so you have at least a curiosity about steel guitar. The only problem you have is

procrastinating on study and practice. You want to do it so bad but you just can't or won't take the time. You want to be a better player but think you don't know how or I can't learn all that. There's a lot to think about and just too much for me. You're holding yourself back from the difficult process of learning. The desire to be better is great but sometimes not enough to get you going.

The thing you need to develop is an obsessive curiosity for the instrument. The only way to get this enthusiasm, is from within. You have to master your own willpower. Some of the things I did to get me going were as follows: I would learn a new lick or idea for the steel and the new thought would excite me into learning that much more. I found that just digging in to the subject and learning something will get your mind on the subject and then as you start to understand a little bit more each time, you become hooked on it. The fear may be of the unknown that you find yourself faced with. For example, I heard about the modes scales that you could obtain from a major scale. I wanted to know them deep down inside but the fact that I didn't understand, one bit of what was being said turned me off from the theory. This continued until someone who had a knowledge of the subject explained the basics of theory to me. Once I got over the hump, I was off to the races. I couldn't get enough of it.

To get excited, I would find myself making up little challenges with myself. I would see how much I could improve in a given length of time. The thing I've found about practicing is that life won't let you do it everyday. But, you can sometimes set aside a hour, a morning, entire day, or a week for self study at your guitar. If you want anything bad enough you'll find the time and the place to make it come true.

## STUDIO PLAYING

If your interested in playing in a studio you will need to learn to make yourself a chart. The chart takes care of the structure of the tune. If you have a great memory, you can avoid this part. The section, NASHVILLE NUMBER SYSTEM,

shows you the basics for writing chord charts. Practice charting songs off the radio. It does get easier.

Everyone has a theory on how to play in a studio. I guess you have to go with the bottom line. To satisfy the man who is writing the check. You may like a certain idea but the producer may not. You lose. The thing to remember is that it takes all the players to make a record.

Think of all the players in the room as artists, each with a paint brush. If you all began painting as fast as you could, you could get done fast and impress everyone. The final result may not be very marketable. It works better if everyone uses a little brush and just *decorates* everybody else's work.

### LIVE SHOWS

There are two types of live shows that I want to deal with. The first is like variety show with a lot of acts. The second is with a regular band.

Variety shows are like talent contests. You have to rehearse with each of the acts and find an arrangement real fast. Then you have to remember to play the same thing you rehearsed. The key is preparation and organization.

1. All your charts should be in order.
2. Keys written down.
3. Fills and intros marked. (or a leader designated)

Relaxed: the singer will drop a beat anyway.

If you are playing with a large band with more than two lead instruments, someone will have to take charge of the stage as far as who plays which fill or solo. This can make things run more smoothly. A chaotic stage will not keep you working for long.

You should also consider chasers. When someone leaves the stage, go back into a little bit of their last song. Very professional sounding.

### REHEARSALS

Hopefully, you'll enter a rehearsal and the leader will have everything ready for you. Charts, keys, and special

points to work on. The chances of this actually happening are one-in-a-million. Most rehearsals I've been to have been totally unorganized. That is the reason that they can become such a drag. Wasted time in a rehearsal can bring the energy level down and make the learning harder. The more prepared you are, the better off you are.

You can have rehearsals for different types of gigs. Each type, may need a different rehearsal. A talent show can be spontaneous (on the stage), TV has limited time, Club band can use all day, and on. This could also mean learning a new song while on break.

The most important fact for all of them is organization. Learn to get your thoughts, for any playing situation, together. Rehearsals can be enjoyable if they are run efficiently.

## CLUB



This is where I got most of my training. The lifestyle that goes along with this type of playing can be both good and bad for your playing. You get ups and downs, but unlike one-nighters, you can actually get the feel of a club. You get an atmosphere for playing and a feel for the acoustics. After three or four months, in the same place, you know the building and everyone who comes in regularly. The close contact with your audience can make you play better. Being appreciated, is half of the battle of a musician.

The repetition of six nights a week give your chops a lift. The fact that you remember what you did the night before, you can start to experiment with things. Stretching out on the same solo you've played 20 times, you can dig down deeper to find new things. Your mind doesn't have to think of the chord changes. Just play.

## THEATER

This has become my favorite place to play. The acoustics are generally pretty good. Sometimes excellent. The

intimate atmosphere, makes the audience part of your playing. Its nice to feel the sound of your guitar, bouncing off the back wall. Its like your volume pedal is controlling the whole room. TIP: If you are using a soundman, place your amp facing you. Tip it back towards your face. Then play at a low volume and let the sound system do the work. This will allow your sound coming out of the PA to be stronger.

## ROAD AIR/BUS

If you've got to fly make sure to consolidate your equipment. Is it possible to rent or borrow an amp where your going? The airlines charge more for heavy bags. Could get real costly. Travelling with Charley Pride, I only take a steel and Pac-A-Seat. Luggage on long trips can bring me up to seven pieces of checked baggage. All effects are left at home. The amplifiers I use, are all part of a *rider* that is part of the contract. They can be anything from *twins* to *silvertones*.

The hard part is learning to play without your regular set-up. You learn to make whatever is there work. Haven't missed a show yet.

Your steel should be in an anvil type case. The road can be rough on them, so check your guitar constantly. I advise regular, professional maintenance.

All of these things can have a definite affect upon your attitude. Let me share this story:

Saturday, we fly into Tyler, Texas and do a show with the Oak Ridge Boys. We go on first and leave, as soon as we pack-up, to fly to Houston. We hurry to the airport and go to bed at the hotel.

Soundcheck, the next morning. The Astrodome. I open my pac-a-seat and I find no pick bag. I left it in TYLER!! No picks or bar. I used a spark plug wrench and my fingers to play sound check.

Back at the hotel I call Herbie Remington on a Sunday and He brings me a bar and a picks. The day is saved. He drives away and we get in the

limo and head to the gig. We drive in to do the afternoon show and voila, there's the crew, of the act for the evening show. The Oakridge Boys. Bit the bullet.

## MY APPROACH





## PUTTING IT ALL TOGETHER

As we've progressed through this book, we have taken a look at everything individually. We looked at the right hand, left hand, left foot, knees and right foot. This allowed us to expand our thinking and work on the separate facets that combine to play the steel. The hardest part is putting it all together and becoming a steel player. Everything must work together for the overall sound desired. Where do you start to put all the things together?

The most intriguing thing I've found to bring me more licks is the intermixing of all the facets. To see this we will start with a lick and start interchanging things to bring us more licks. To do this we will use only the abstract, that is, no lick per se. I will pick this lick at random and then change things at random, to show you this most interesting theory. Here's a right hand pattern to start with.

### STRINGS

1										
2										
3										This moves the right hand.
4		X				X	X	X	X	
5	X		X			X				The hand is doing the same thing on different strings.
6		X				X	X	X	X	
7	X		X	X						
8						X			X	
9		X		X		X	X	X		
10	X		X							
11									X	
12			X							

The previous pattern has the right hand doing the same thing only on different strings. The grips are the same, but the strings are different. Go to the section on pickgrips and try interchanging different grips to see what you can come up with.



# STRINGS

1						The pedals change. Right hand is the same.				
2										
3										
4		X				X	X			
5	X		X	X		X	X	X		
6		X				X				
7	X		X	X	X	X		X	X	X
8										
9		X			X	X	X			X
10	X		X	X		X		X	X	
11										
12				X						X
pedals	A	A	B	-	-	-	-	I	I	A
	H									

- or A A A A A
- or B B B B B
- or C A I C/I A
- or - - - - E
- or A/E A/G B/G, ETC.

For the simplification of the theoretical study, these pedals can do anything you want them to. The idea is to see how we can make different licks by interchanging all the basic movements. The previous is thought of on the universal tuning. I'll use letters for each pedal to save space. The floors are A to H, and the knees are I to M. The functions can be the usual universal or you can dream some up. Remember to open up your mind to the abstract and soon you'll see more licks on your guitar.

Try substituting different pedal/knee combinations and see what you can come up with. You may stumble on something great. Experimentation is the key to becoming your own player.

STRINGS

1						This changes the rhythm pattern.  Below are more examples.
2						
3						
4		X			X	
5	X		X	X	X X	
6		X			X	
7	X		X	X	X X X	
8						
9		X			X X X	
10	X		X	X	X X X	
11						
12				X	X	

--> 1 2 3 4 1      1 & 2 & 3  
counting.

First we see quarter notes. Then eighth notes. The sixteenth notes are; 1 e & a 2. Try substituting different rhythms.

STRINGS

1						Here we place a forward roll over our pattern.
2						
3						
4			X			
5		X		X	X	
6			X			
7	X			X	X X	
8						
9		X			X	
10	X		X	X		
11						
12					X	



this is having your body in condition to change. The physical aspect is so important to the steel. There are so many things going on, that to be in control, you have to think things out slow and condition your hands and feet to do what is required. What kind of player do you want to be?

## SCALE FRAGMENTS

In trying to find more ways to improvise I found some books that talked about scale fragments. They would use certain fragments of a scale and use them over different changes. They would give a few examples to show you what they were thinking. I decided to figure out the possible fragments that I could use. The theory behind this can be difficult to understand and I'll try to make my explanations as clear as possible. Don't get your numbers confused or you'll be in left field. Each group of numbers will be defined as to what I am thinking.

A fragment of a scale can be any number of tones. We could have a group of 2, 3, 4, or 5. As we start to *crunch* the numbers, we will start to see what we can do. The groups of two are easy to figure. Lets forget about the scale and think in terms of numbers only. For example, these numbers could stand for anything. Two cars, two houses, etc. If we have seven different house designs and want to put them on different streets in only groups of two, we would have these possibilities. (Remember, we could use letters or symbols but for simplicity we use numbers to represent our different houses).

We have designs 1, 2, 3, 4, 5, 6, & 7 to work with.

On any street with two houses we could have:

1 & 2	2 & 3	3 & 4	4 & 5	5 & 6	6 & 7
1 & 3	2 & 4	3 & 5	4 & 6	5 & 7	
1 & 4	2 & 5	3 & 6	4 & 7		
1 & 5	2 & 6	3 & 7			
1 & 6	2 & 7				
1 & 7					

The houses can be mirrored, that is, we could put the second number first. So, we have twice as many combinations as are listed. You can see if those were scale

tones, we could approach playing these seven tones in groups of two using these combinations. I tried to use the analogy of houses so you can see how we can mathematically show possibilities. We are talking in terms of music, but the numbers can represent a lot of things.

What if we had three house designs? What are the possible layouts? Here they are. We'll change up their order to show you how we arrive at the our numbers. The following gives us the mathematical possibilities of any three numbers. For any three numbers, houses, cars, or whatever, we can arrange them the following ways.

- 1 2 3
- 1 3 2
- 2 3 1
- 2 1 3
- 3 1 2
- 3 2 1

Notice how we start with each number and then change the other two. We have six ways to arrange any three numbers. The next group of numbers will show the possibilities of the three sub-groups of seven. For each of the three sub-groups, we have six possible ways to arrange each sub-group. See the bracketed (1 2 3), and remember the previous three's.

Thinking of 1, 2, 3, 4, 5, 6, & 7, we can extract these groups of three.

- |         |       |       |       |       |
|---------|-------|-------|-------|-------|
| (1 2 3) | 2 3 4 | 3 4 5 | 4 5 6 | 5 6 7 |
| 1 2 4   | 2 3 5 | 3 4 6 | 4 5 7 |       |
| 1 2 5   | 2 3 6 | 3 4 7 |       |       |
| 1 2 6   | 2 3 7 |       |       |       |
| 1 2 7   |       |       |       |       |

If you start to think of each of these as a scale tone and all the rhythms you can use, the licks are endless. There are fifteen moves that have six possibilities each in the *ythree* sub-group. Six times fifteen gives you a total of 90 ways to arrange any three tones of a seven tone scale.

Lets arrange four numbers in all the possibilities.

1 2 3 4	2 3 4 1	3 4 1 2	4 1 2 3
1 2 4 3	2 3 1 4	3 4 2 1	4 1 3 2
1 3 2 4	2 4 1 3	3 1 2 4	4 2 1 3
1 3 4 2	2 4 3 1	3 1 4 2	4 2 3 1
1 4 2 3	2 1 3 4	3 2 1 4	4 3 1 2
1 4 3 2	2 1 4 3	3 2 4 1	4 3 2 1

Now we need to look at a scale of seven tones and extract sub-groups of four. Remember any group of four can be arranged in all the previous ways. We have sixteen ways to arrange four tones. Lets see how many groups of four we have in seven tones.

1 2 3 4	2 3 4 5	3 4 5 6	4 5 6 7
1 2 3 5	2 3 4 6	3 4 5 7	
1 2 3 6	2 3 4 7		
1 2 3 7			

There are the four sub-groups. We can arrange each of them in sixteen different ways. That gives us 10 sub-groups of four arranged in 16 ways. That's 160 ways to play any four tones of a seven tone scale. Aren't numbers fun. Lets go on to fragments of five. First we need to see how we can arrange five &fi=ythings and then we'll see how many of the five sub-groups there are.



Here are five numbers and all the ways to arrange them.

1 2 3 4 5	1 3 2 4 5	1 4 3 2 5	1 5 2 3 4
1 2 3 5 4	1 3 2 5 4	1 4 2 5 3	1 5 2 4 3
1 2 4 3 5	1 3 4 2 5	1 4 3 2 5	1 5 3 2 4
1 2 4 5 3	1 3 4 5 2	1 4 3 5 2	1 5 3 4 2
1 2 5 3 4	1 3 5 2 4	1 4 5 2 3	1 5 4 2 3
1 2 5 4 3	1 3 5 4 2	1 4 5 3 2	1 5 4 3 2
2 3 4 5 1	2 4 1 3 5	2 5 1 3 4	2 1 3 4 5
2 3 4 1 5	2 4 1 5 3	2 5 1 4 3	2 1 3 5 4
2 3 5 1 4	2 4 3 1 5	2 5 3 1 4	2 1 4 3 5
2 3 5 4 1	2 4 3 5 1	2 5 3 4 1	2 1 4 5 3
2 3 1 4 5	2 4 5 1 3	2 5 4 1 3	2 1 5 3 4
2 3 1 5 4	2 4 5 3 1	2 5 4 3 1	2 1 5 4 3
3 4 5 1 2	3 5 1 2 4	3 1 2 4 5	3 2 1 4 5
3 4 5 2 1	3 5 1 4 2	3 1 2 5 4	3 2 1 5 4
3 4 1 2 5	3 5 2 1 4	3 1 4 2 5	3 2 4 1 5
3 4 1 5 2	3 5 2 4 1	3 1 4 5 2	3 2 4 5 1
3 4 2 1 5	3 5 4 1 2	3 1 5 2 4	3 2 5 1 4
3 4 2 5 1	3 5 4 2 1	3 1 5 4 2	3 2 5 4 1
4 1 2 3 5	4 2 1 3 5	4 3 1 2 5	4 5 1 2 3
4 1 2 5 3	4 2 1 5 3	4 3 1 5 2	4 5 1 3 2
4 1 3 2 5	4 2 3 1 5	4 3 2 1 5	4 5 2 1 3
4 1 3 5 2	4 2 3 5 1	4 3 2 5 1	4 5 2 3 1
4 1 5 2 3	4 2 5 1 3	4 3 5 1 2	4 5 3 1 2
4 1 5 3 2	4 2 5 3 1	4 3 5 2 1	4 5 3 2 1
5 1 2 3 4	5 2 1 3 4	5 3 1 2 4	5 4 1 2 3
5 1 2 4 3	5 2 1 4 3	5 3 1 4 2	5 4 1 3 2
5 1 3 2 4	5 2 3 1 4	5 3 2 1 4	5 4 2 1 3
5 2 3 4 2	5 2 3 4 1	5 3 2 4 1	5 4 2 3 1
5 1 4 2 3	5 2 4 1 3	5 3 4 1 2	5 4 3 1 2
5 2 4 3 2	5 2 4 3 1	5 3 4 2 1	5 4 3 2 1

Lets look at all the ways to extract five tones from a seven tone scale. We know that each one has 120 different arrangements patterns.

Using 1, 2, 3, 4, 5, 6, and 7 tones we have:

1 2 3 4 5	2 3 4 5 6	3 4 5 6 7
1 2 3 4 6	2 3 4 5 7	
1 2 3 4 7		

Six sub-groups of five with each having 120 possibilities, brings us a total of 720 ways to play five tones of a seven tone scale.

An important note is the fact that the scale could be major or minor. The only difference is whether the 3rd and 7th are flatted. For example 1, 2, 3, 4, 5, 6, 7 is a major and 1, 2, {3, 4, 5, 6, {7 is a minor. These are only two of the many scale choices you can use. The possibilities are endless.

That's all the numbers we are going to look at. Now we will look at examples of these fragments put to use to bring us music.

## RIGHT AND LEFT

The non pedal steel is a good way to think about good right/left hand technique. We need to start at the basics of pedal steel. This will give us a logical basis to build from. The non pedal guitar uses the basic movements of good right/hand technique. Good right/left hand technique can make or break a player. The bar must follow the picks. The right hand can't get in the way of the strings when you have them vibrating. The unwanted block is something to be aware of. Many times I would play a lick and the notes would not ring out. The reason being that my right hand dubbed the notes before I could slide. Strings that aren't ringing don't sound to good. Keep in mind that when you are going to slide, the right hand has to get out of the way of the vibrating strings. You don't need any more bad habits, so don't let this one develop.

I've talked about how the right and left have to work together to play steel, but I actually mean that they should work together, yet be independent of each other as well. The right hand shouldn't be dependent on the left, nor should the left be dependent of the right. Your hands should be able to go their own ways together. This freedom will give you the coordination for more licks. The hardest movements can be logically thought out, broken down and mastered.

To put the left and right hands together we need to think about the small slides and picking. Those of a minor third interval or less. On a fretboard we are talking in terms of one, two or three frets.

Once a string is set in motion, we can then articulate another note by picking again or a move with the left hand. The left hand uses a slide to articulate a note. The length of the slide depends on where you are on the guitar. The thing to see is that you have a choice of two methods to play another note. To avoid confusion you have to learn to coordinate these together. To do this we need to study the possibilities.

## FINGERINGS

2=	X	X	X - X	X - X	X	X
1=	X	X - X	X	X	X - X	X
T=	X - X	X	X	X	X	X - X
	1	2	3	4	5	6



The thing to see is that if you use a slide you are giving your picks a little rest. This is shown below using a forward and a backward roll. You can use any three strings but for now use three adjacent strings and try this drill. Use any three adjacent frets to study the moves. To see the basic moves we will use only the half-step slide. The X's are in block form and represent two frets, the line is a slide between them. Practice the move using whole and half-step slides. For example use S6 and S7 at F1 and F2. We are going to play four notes but most importantly we are going to play a slide starting off of each finger.

Number one has us picking a note with our thumb and then sliding to another fret. We then pick the other note with our other fingers. All six of these are combinations of three picking moves and one slide. That gives us four notes. We can see how the left hand right hand must coordinate their moves. If the pick is articulating the bar should stay still, if the bar is sliding you can't get the right hand in the way.

The following pages contain graphics that help bring to life *Putting it All Together*.

### MY APPROACH

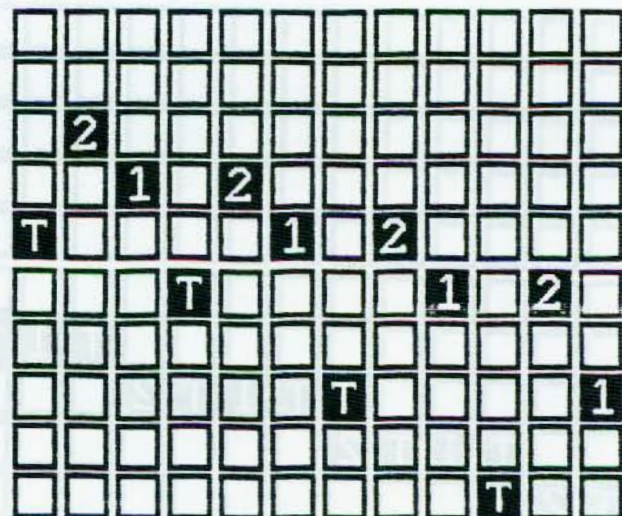
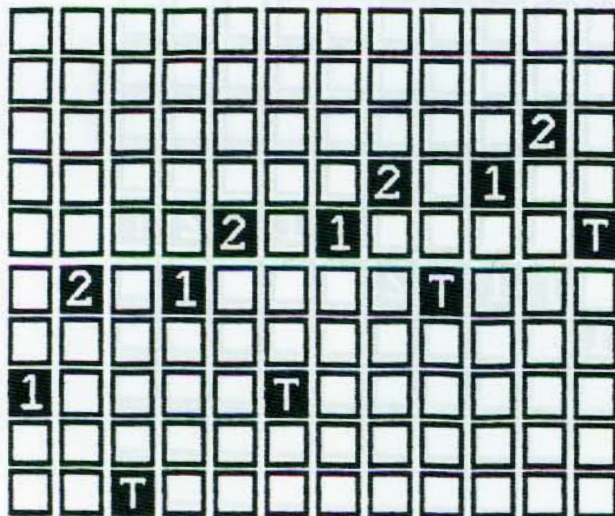




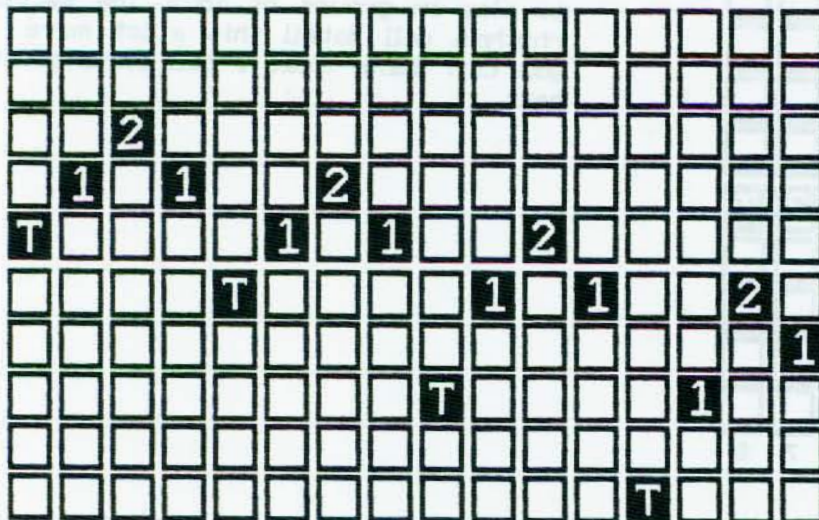




EXERCISE 6



PLAY THESE USING THE PEDALS AND FRETTS FROM EXERCISE 5.



These are all the rolls and inversions that I'll write out for you. The rest are all in the sections on right and left hand movement. The hands work together to play the music and you need to think about what's going on. The more you know the more you blow.

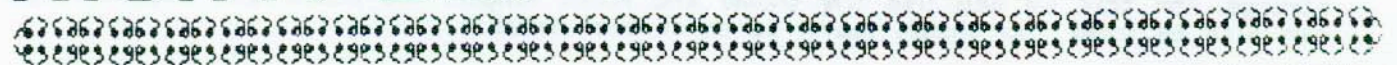
Place all the forward, backward, and forward/backward rolls over the inversions. The trick to using these in a song is having them under control at fast speeds. I play a lot of licks off of these type of rolls. You need to be listening to what sound each of these exercises brings you. As you learn a move and associate a sound to it, you'll begin to see your own licks on your guitar. Then people can use the licks that you dream up.

REMEMBER: The previous exercise used different rolls and inversions to bring you ways to play arpeggios of major chord tones. The majority of country music deals heavily in the major chord tones. Play any of the earlier steel instrumentals and notice how many times you use these inversions. The pedal steel is the only instrument that can play the inversions of a chord without picking it more than once or having to change fingerings.





# RIGHT/LEFT TOGETHER



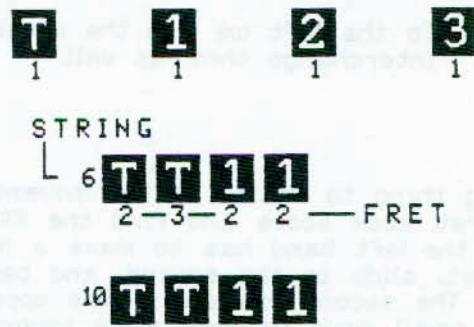
This next section deals with the smallest movement you can make on a steel. It will then start to build from there. These small movements should be seen as parts that must go together to form a whole. The whole being a lick. These are the basis for speed picking. Whenever you play a series of fast tones in a solo, you are using all these moves but not thinking in terms of the small moves. To give the mind a chance to absorb all the possibilities, we start with a basic move and try to logically get more complicated.

This section will put together the right and left hand. The pedals will be added to the right and left hands. The straight steel was here before pedals, so the hands should start to work together and then learn to 'add' the pedals to them.

Have you ever took out a sheet of tablature and had a hard time trying to read it? I have many times before. As my frustration grew, I would almost give up. Then finally I'd start to learn it a few notes at a time. Then I'd eventually be able to play it all the way through. This process was exactly what we are about to do. The only difference is that we aren't going to be playing a song. We will be looking at the licks abstractly. Since we end up doing it sooner or later, I decided that doing it from the beginning would be the most beneficial. Your hands will have a definite edge.

The smallest possible move that can be made on a steel is to play a single string at any fret. You could use any of your fingers, but for illustration we will use the thumb. Any fret may be used, but again for study we will use 1, 2, & 3. Again, remember that we use these only for the sake of argument.

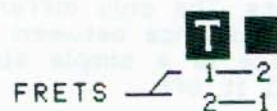
These can be on any string. These are your smallest moves. The simple striking of a string. If a number is before the row, it means the string to be played on. This can cut down the amount of space that a tab needs to take up. If your working on only three strings, we can number three rows instead of showing all ten.



These show a finger picking a string. The bar is at the first fret. Again you can use any fret number.

This method of writing tab allows us to look at just one string at a time.

The next logical move would be to place a slide after the pick. The following shows this moves in both directions. Notice how we can change a lick by changing what the left hand does. The right hand remains the same and we list alternate left hand moves.



This is a pick and a half-step slide. We change only the number of the frets to play in in the opposite direction. The line between the frets are showing a slide. A slide is an example of left hand articulation. The length of the slide can be any number of half-steps. The simplest is the half-step slide.

Here's another way to articulate this basic move. The left hand moves but the slide is not used. The articulation comes from the right hand. We pick both the notes. The sound of the slide is left out.

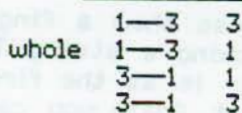
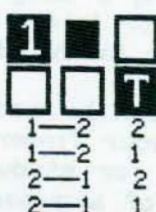
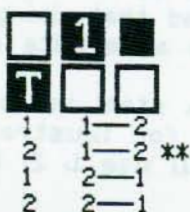


Continuing to build on the basics, we make the next logical move. We have looked at one finger on one string and what can be done. The next would be two fingers on any two strings. For this we will use the thumb and first finger. The thumb and second finger can also be used. You should learn to do it both ways.



Any two strings can be used. Notice how we can change the lick by changing the frets.

The next step is to place a slide in between a picking motion. This will give us three notes. Triplets are the most logical choice to use this technique. Below we can see the moves that can be obtained by adding everything together.



To the left we see the whole-step slide. You should learn to interchange them at will.

Another interesting thing to notice is the movement that has the left hand moving back to the starting fret. Look above and find the \*\*. This shows what I mean. The thing to think about is that the left hand has to make a move before the string gets picked. We are on the first fret, slide to the second, and before we pick the string the bar goes to the first fret. The second example is the opposite movement, but the same principle at work. That small move becomes more important as you speed up the action. Learning it now makes it easier later.

The importance of all of this is to see the value of the smallest slide. On these pages we've dealt with only the half and whole step moves. Work on all these previous moves as exercises. Take the small movement and do it over and over. Slow. Be sure to let each hand work independently. Then, it goes together. Independence is first.

These moves should be thought of as the same thing at any frets. The only difference between F1-F2 and F13-F14, should be the musical octave and the distance between the frets. The same goes for different strings. All that's taking place is a simple slide. The hands can be anywhere on the guitar and should be able to pull it off.



The following are exercises on a single string. We are moving up and down the fretboard mixing the slide in between the picking. Its coordination between the two methods of articulation. You can pick or slide. The problems come when you are not sure which one to use. If you hesitate for just a second on one of these little moves you'll throw off your solo. Practicing the moves before you actually use them is what these exercises do.

**T T T T T T T T T T**

1—2 3—4 5—6 7—8 9—10 11—12 13—14 15—16 17—18 continue up then down  
 1—2 2—3 3—4 4—5 5—6 6—7 7—8 8—9 9—10 in the same manner  
 2—4 4—6 6—8 8—10 10—12 12—14 14—16 16—18 18—20 on all of these.  
 1—2 3—4 2—3 4—5 3—4 5—6 4—5 6—7 5—6 etc.

**T T T T T T T T**

1 2—3 2 3—4 3 4—5 4 5—6 5 6—7 6 7—8 etc. up and down  
 1 3—4 2 4—5 3 5—6 4 6—7 5 7—8 6 8—9 etc.  
 24 23—22 23 22—21 22 21—20 21 20—19 20 19—18 19 18—17 etc.

**T T T T T T T T T T T**

2—1—2 2—1—2 2—1—2 2—1—2 2—1—2 2—1—2 1000 times  
 1—2—1 1—2—1 1—2—1 1—2—1 1—2—1 1—2—1  
 1—2 3 4—5 6 7—8 9 10—11 12 13—14 15 16—17 18  
 ^ ^ ^

Notice that there is no slide on the second thumb move.

**T T T T T T T**

1—2—3 2—3—4 3—4—5 4—5—6 5—6—7 6—7—8 up and back  
 3—2—1 4—3—2 5—4—3 6—5—4 7—6—5 8—7—6 up and back

**T T T T T**

1—2—3—4 2—3—4—5 3—4—5—6 4—5—6—7 5—6—7—8 up and back  
 4—3—2—1 5—4—3—2 6—5—4—3 7—6—5—4 8—7—6—5 etc.

These are examples of what your left and right hands have to do to work together. If a string is vibrating, then you have a choice of sliding to another note. Another choice is to play another string. The slide and the picking must be exactly together. The little mistakes on a fast solo can cost you. Once you 'trip' during a solo, you have to stop and regroup. Not good if you only get twelve bars a night.

The muscles of the left hand are extremely important in making these moves. The bar can articulate every note after the string is vibrating. The speed and accuracy is all controlled by the left hand muscles. Use these as exercises to build stamina. You need to have more power than what you need. To play a fast linear solo, you need to have the coordination and speed for the sudden burst.

Now we'll use two picks on two strings. The thing to be thinking is coordination. Try the exercises and make sure you are accurate. Slow but sure.

On this side I've given an alternate fingering. I use T&1 or T&2. You should be able to use both.

1—2 2—3 3—4 4—5 5—6 etc.  
 1—2 2—1 1—2 2—1 1—2 etc.  
 2—1 3—2 4—3 5—4 6—5 etc.  
 1—3 3—5 5—7 7—9 9—11 etc.  
 1—2 1—2 5—6 5—6 9—10 etc.

use frets to left.

Do all of the patterns up and back down the fretboard. It gives you plenty of repetitions.

1—2—3 3—2—1 1—2—3 3—2—1 etc.  
 1—2—3 2—3—4 3—4—5 4—5—6 etc.  
 3—2—1 4—3—2 5—4—3 6—5—4 etc.  
 2—4—5 3—5—6 4—6—7 5—7—8 etc.  
 2—4—6 6—5—4 4—6—8 8—7—6 etc.

You can also use T & 3 to work on these. Use different strings.

For this, use the above numbers.

Don't be afraid to experiment. If you've done all these exercises, your hands should begin to feel more free. If your hands tighten up, stop and rest. Then, go back and do these again. Remember to give yourself a schedule to improve by. Try to improve a little bit each day.

1—2 3—4 5—6 7—8 9—10 11—12 etc.  
 12—10 8—6 6—4 4—2 2—6 6—12

1—2—3 4—5—6 7—8—9 10—11—12 etc.  
 3—2—1 4—3—2 5—4—3 6—5—4 etc.  
 2—4—6 4—6—8 6—8—10 8—10—12 etc.  
 6—4—2 8—6—4 10—8—6 12—10—8 etc.

These mix everything together. These are just a few possibilities. Change things and see

1—2 2 2—1 1 1 2—1 2 1—3  
 3—5 5 5—4 4 4 4—5 5 5—6

what you can come up with.

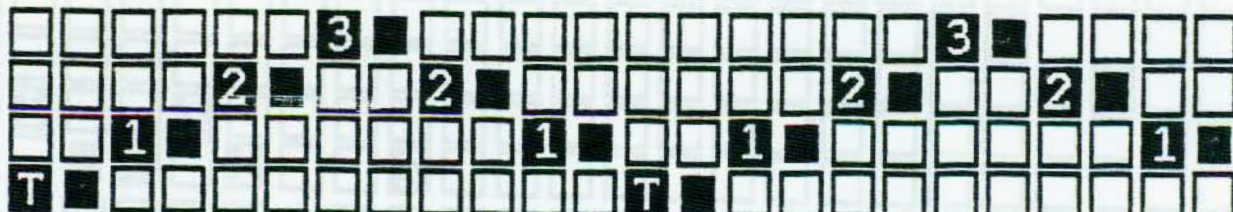
Train your hands to feel the movement.





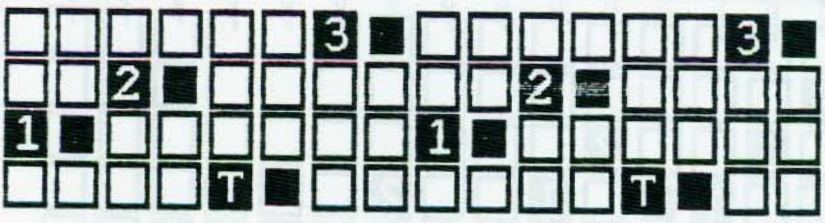
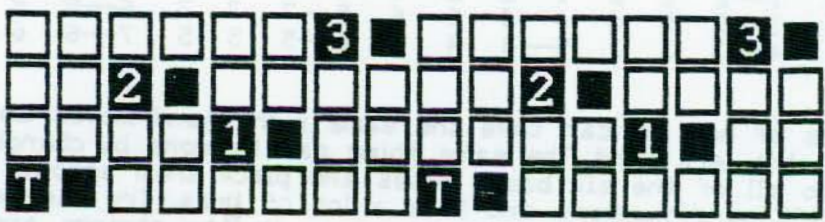


Below is an exercise I use to coordinate my right and left hands. Try it slow at first and gradually increase your speed. I've wrote it with three finger picks. Try getting used to a pick on your third finger.

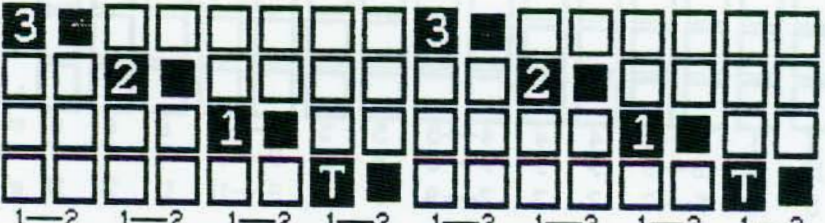


1—2    2—3    3—4    4—5    5—6    6—7    7—8    8—9    9—10    10—11    11—12    12—13    etc  
 1—2    1—2    1—2    1—2    1—2    1—2    1—2    1—2    1—2    1—2    1—2    1—2  
 1—2    2—1    1—2    2—1    1—2    2—1    1—2    2—1    1—2    2—1    1—2    2—1  
 1—3    3—5    5—7    7—9    9—11    11—13    13—15    15—17    17—19    19—21    21—23    23—25    etc

The following exercises can use the left hand numbers from the above exercise. All that has been done is to change the right hand pattern. The hands can be taught to do all these things and more if you just give them time and a lot of practice.



Experiment with the intermixing of the techniques. Change the right, left, or both and see what you can come up with. If you get frustrated stop and come back to it at another time. The mind can only absorb so much at a time. Keep at it and you'll find it getting easier.

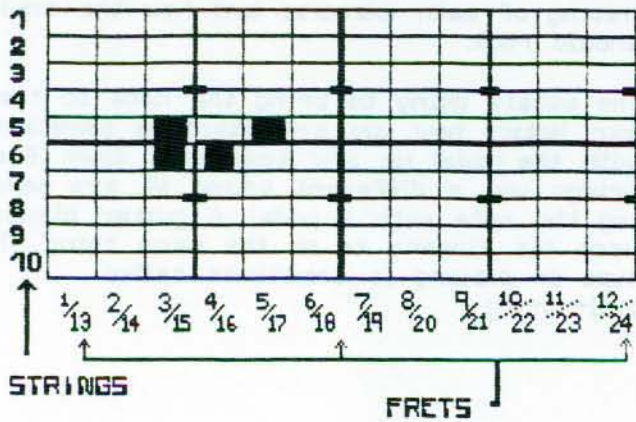


1—2    1—2    1—2    1—2    1—2    1—2    1—2    1—2  
 1—3    3—5    5—7    7—9    9—11    11—13    13—15    15—17  
 3—5    5—3    3—5    5—3    3—5    5—3    3—5    5—3

You can use various groups of four strings. They can be adjacent or they can be a wider grip. See how many different licks you can come up with.

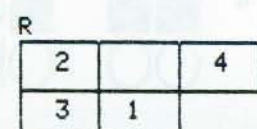
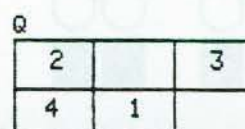
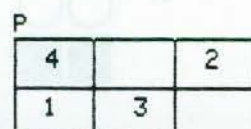
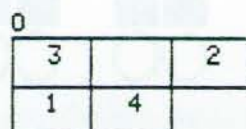
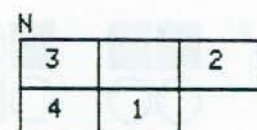
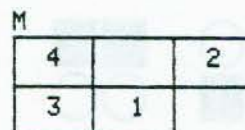
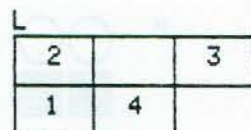
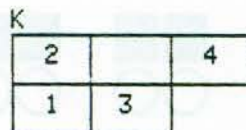
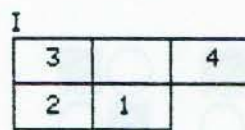
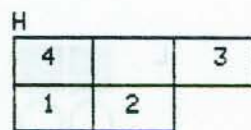
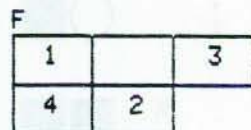
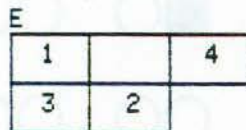
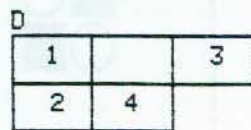
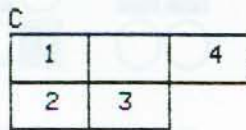
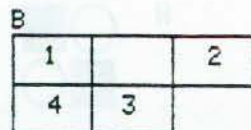
# BAR OR PEDALS???

Example 10 string



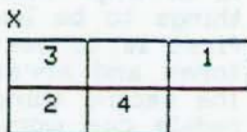
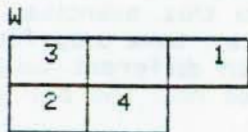
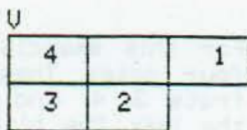
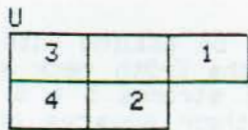
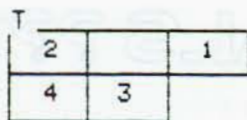
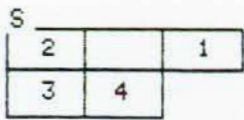
For this exercise, we will be dealing with four notes. They are on the E-9th neck at frets 3, 4, and 5, and on strings 5 & 6. To the left I've blacked out their squares on a graph. We are going to look at all the ways to arrange these four notes. There are two things to be learned from this exercise. The first is to see how we can take only four tones and arrange them in different ways. The second thing is to see how the bar and pedals can work together.

The strings I used are moved by the first two floor pedals. The majority of E-9th licks take place right at these strings. The frets are used because of their relationship to the key of C.



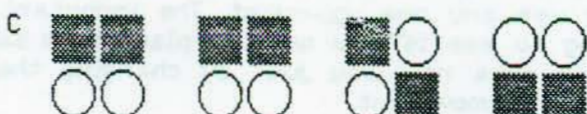
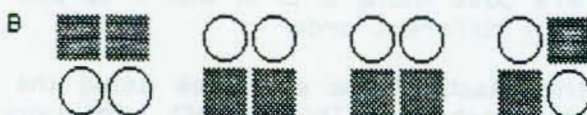
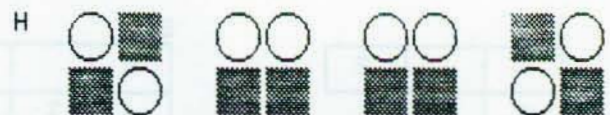
Looking at the first exercise on the left, we need to play the tones in numerical order. THESE ARE NOT the scale tone numbers, we are just using 1, 2, 3, and 4 to put them in different order.

Go thru each of the exercises using the bar to play each note. This is left hand work. Don't worry about any particular rhythm. You can use any one you want. The important thing to see is how we can play those same notes in a new way just by changing the order of movement.



Now that you've worked the left hand, go back and do each exercise without moving the bar. You will be doing the same thing only this time you will use the pedals. Remember that you have only four basic pedal positions. This will make you go thru them in different patterns. Below is a listing of each exercise and how the ankle should rock.

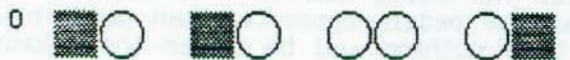
The pedals going to bring the note to the bar. Notice how you are starting sometimes with the pedal up and sometimes down. Each brings you a different sound. We are bending the note with a pedal. A guitar player uses his fingers to do the same thing. This type of playing is sometimes called pull-string.



Now that you've seen how the four basic pedal positions work, we can change the way we write it out. The next method is a simplification of the basic four. We will continue with the rest of the moves but with only one row. See the following example:



We can see that each circle is a pedal. If the circle is solid, or in this case become a square, then the pedal is pushed down. We should be thinking of the rocking movement of the ankle. Here are the rest of the pedal moves.



We can see how the notes can be played differently just by changing the order. You have a choice of sliding between notes on the same string. If you don't want to use the slide you can pick each note and not let the slide be heard. After you see how the bar can work to bring the changes, use the pedals to bring you the moves.

You can pedal each note or you can pick each of the notes and not hear the string bending.

After you get used to the pedals start to think about adding them all together. The secret of speed picking is using the three methods of articulating the strings together. It is a coordination that you have to work on. The ways we can articulate are 1. with a slide, 2. with a pedal bend, or 3. picking each note and not hearing the slide or bend whichever the case may be.

Doing these exercise with things in their simplest form, makes it easier to see how to work them together. The playing of the steel is nothing more than mixing these together. The thing to see is a lot of simple moves that go together to make up complex ones.

As we continue, we'll place movements together in more complex ways. The previous exercise is good because you are working a whole step move and a half-step move. You are doing this move with the bar and with the pedals. The bar works the slide and the pedals save the left hand a move.

# RIGHT HAND/LEFT FOOT

We've studied a section that placed the left and right hands together, and a section that showed you how the pedals or the bar could articulate a note. Now we need to look at how to build up technique between the right hand and left foot. We did this a little in the section called 'Bar or Pedals', but that was just an exercise to see we have two choices of articulation. To be more efficient in using your pedals, you have to think of them as bending notes. Just like a guitar player can bend notes, we have a mechanism that does this for us.

For this study we will think of the three main pedals on the E-9th guitar. The first raises the 5th and 10th strings a whole step. The second raises the third and sixth a half-step each. The third pedal raises the 4th and 5th pedals a full step each. Since the guitar player is bending mostly in half or whole steps our main floor pedals fit right in. We will be keeping our left hand at one fret. You can use any one you prefer. To show the pedals we will use three circles under the column that they are used. If the circle is solid then you are to depress that pedal. The setup will be a la Emmons. This places the 5-10 pedal on the left side. If you play the pedals opposite, then you'll have to adjust accordingly. If no pedal is being used then nothing will be under the column.

We will also be using a condensed tab. The strings will be listed to the left. Take a look at the following example and check out a major scale starting on the 8th string.

S1							
S2						2	
S3							
S4							1
S5				T			
S6			2				
S7		1					
S8	T						

○●○
●○○  
 ↑  
 PEDAL CODE

This is a major scale. Play it at the 8th fret and its a C major scale.

Below we can compare the Emmons and the Day pedal setups. Remember all of the examples are Emmons.

Emmons	Day
●○○	○○●
○○○	○○○
○○●	●○○
●●○	○○●
○○●	●○○

If you play a Day setup then you have to learn to use the appropriate move. This chart will help you convert the movement.

S5		1			1	
S6	T			T		

OR

●○○	●○○
●○○	●○○

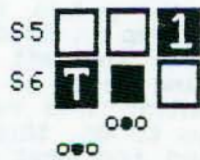
All we did was change up the pedal pattern and we get a new lick. If there is no pedal code under a column then the pedal is not depressed.

S6	1			1		
S7			T			T

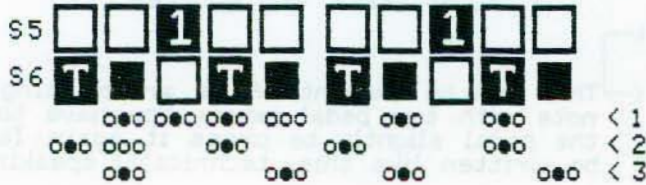
OR

○○○	○○○	○○○
○○○	○○○	○○○

On the second one we changed the starting finger and the strings that we use. Basically the same, but little things mean a lot.



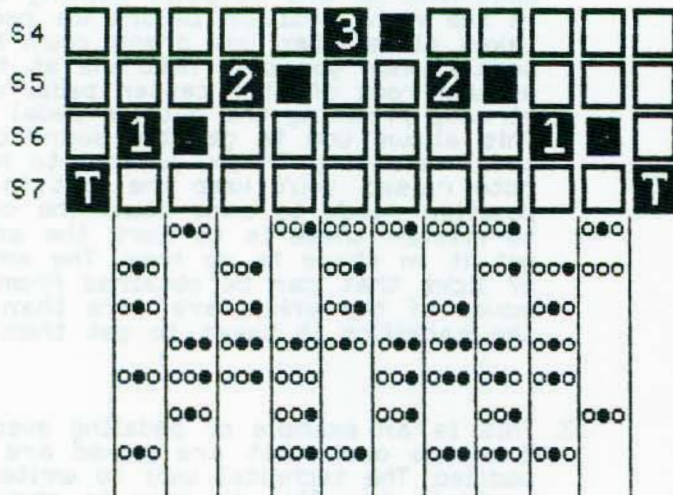
This shows the two basic pedal positions. The first starts with the pedal up. The second is with the pedal down. Its as easy as that. Play this both ways on your steel and notice the musical difference. The physical brings us the musical on the the steel.



1. The pedal codes show how you have to synch your hand and your foot. Right hand gets a rest when you press a pedal to bend a note. The code is written two different ways on #1. It is saying the same thing. The first half is telling you to hold the pedal down while you play the other string. To lift your foot off would be a wasted move. You are going to be needing it down in the next half. You need to see these kind of things as you are playing.

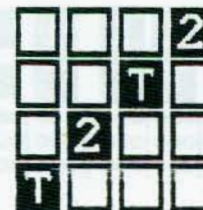
2. This code starts the lick with the pedals down. It is repeating the same pattern over and over. Be sure to try these basic moves on other pedals. We could use S4 and S5 and change the codes accordingly. The only thing different would be the musical sound that each would produce.

3. This has the pedal off whenever you pick the thumb. Then its depressed to bring you the next note. Notice how this groups itself nicely with the number five. The #2 code is more adaptable with triplets or groups of three.



The same theories can be applied to all pedals. This goes for the knee levers as well. The knees have a different physical move, but it can be focused on and improved. These three floor pedals on the E-9th neck are your basis for playing that tuning. Work on them until your foot feels like it will fall off. Then get serious.

For all you die hards you can use this alternate fingering.



If you feel creative make up your own.

These exercises give you various ways to pedal a certain fingering. Some have you rocking off of the center pedal. This rocking keeps you from wasting foot movement. Its a smaller move to rock your foot than to lift it up when you will be using it in the down position next.

The muscles of the ankle that rock and lift the pedals have to be in shape to do these moves fast. The faster the lick, the smaller the move. Learn to keep your foot over the pedals ready to attack. The less distance you travel the faster the move can be.

These exercises work the right hand and the rocking of the ankle. Be sure to keep your feet over the pedals. When you work on the rocking keep in mind the four basic positions of the left foot on a pedal. The hard thing to do is move from position to position. This requires a lot of coordination to do this fast. Placing the right hand and what it can do, adds more possibilities. Give your hands a head start with practice. Do it now while its on your mind. You can never learn any younger.

S6 **T** **T** **T** **T** **T** **T**

000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000

Use S5 for these-->

000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000

S5 **T** **P** **T** **P** **T** **P**

000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000

This can be thought of as articulating the note with two pedal moves. You have to release the pedal slightly to press it again. It should be written like this, technically speaking.

Technically: ●○○ ●○○ ●○○  
 Actual: ●○○ ●○○

Slight release is not written. You have to think it.

S5 **1** **1** **1** **1** **1** **1**

S6 **T** **T** **T** **T** **T** **T**

000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000

Use strings S4 S5

000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000

I've thought of a way to show a pedal articulation. I've put a P inside the square. The P tells you to pedal into the note. The guitar would do this with a hammer on. See the example below. P for pedal.

**P**

S5 **1** **1** **1** **1** **1** **1**

S6 **T** **T** **T** **T** **T** **T**

000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000

≡ means that a string is kept vibrating.

S3 **2** **2** **2** **2** **2** **2**

S4 **1** **1** **1** **1** **1** **1**

S5 **T** **T** **T** **T** **T** **T**

000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000

- <2. This gives you a good example of saving movement. We are actually setting the foot in the right position before we need it. It takes place when you press down both pedals when you only need one at the time. As you rock off the center pedal your already pressing the outside pedal down. This allows you to get the sound of a pedal releasing. If you wanted to hear the note raised, you'd keep the foot in the up position ready to come down. The only way to master these is to work the ankle and get it in shape to do them. The amount of licks that can be obtained from these moves of the ankle, are more than worth the sacrifice it takes to get them.

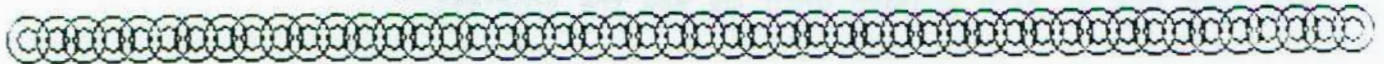
- <3. This is an example of pedaling every lick. Even the ones that are picked are also pedaled. The technical way to write it would be like this. We have to show the difference between a lick thats pedaled into and one that is just starting with the pedal down. They are two different things. Here's the pedaled in look.

S5 **T** **P** **T** **P** **T** **T**

000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000
000	000	000	000	000	000	000	000

This shows us to pedal the string that we are picking.

# RHYTHM



This section deals with the aspect of rhythm. Rhythm is the heartbeat of music. I use rhythms to bring new licks to my hands. We have seen how we can take a lick and make a new one by changing one of the parts. On all of the previous examples, we've had no time to deal with. Just a physical move to study. The lick could be played with any rhythm. To see how we can change a lick by changing up the rhythm, we need to study some basic music theory. We are not going to learn how to read music in this book, but we will be looking at time. We must first note the difference between time and rhythm.

To play music it must take place during the passage of time. If you look at sheet music you read each note left to right. This left to right axis is representing the passage of time. The pitch is on the vertical axis. We denote rhythm as the duration or length in time of an individual sound. This means what is the value of each note. To study this we have to look at what our choices are. What length can any given note be? We know it can be long or short. But how long or how short is the question.

This is how I think about rhythm. I can show you by starting with the basic notes of music. The important thing to see is the way we take a note and divide it in half. The amount of time involved is the same, but the number of notes increases.

## TYPE OF NOTE

quarter	
eighth	
sixteenth	
thirty-second	

Take note of the flags on each of the divisions of the quarter notes. An eighth note has one flag, sixteenth has two, and the thirty-second note has three. See below.

	quarter
	eighth
	sixteenth

This is another way of writing the same thing. Note the bars that divide the quarter note into sub-divisions.

We start with the quarter note. It takes up a degree of time, that degree depends on how fast we are playing the song. The time of the quarter note is then divided into two parts. The amount of time we are working with remains the same, but the number of notes we play in that time is changed.

Dividing the time of a quarter note by two we get two eighth notes. Again, the same amount of time, with more notes.

The same theory applies to the sixteenth notes and the thirty-second notes. We have taken a quarter note and kept subdividing it.

Seeing how we divide a note into sections allows us to start to see what we have to choose from in terms of rhythm. To see how we can use these notes, we have to look at how we divide up a song. The unit of measure in a song is called a measure or bar. Each bar is defined with what is called a time signature. The most commonly used time signature is 4/4. It is also called common time and denoted with a C. Lets look at the most used time signatures.

$\frac{2}{4}$

$\frac{4}{4}$

$\frac{3}{4}$  beats per measure  
beat value is a quarter note

The fraction represents two things. The top is the number of beats in a measure. The bottom is what type of note is equal to one beat.



We've looked at the basic notes and the basic time signatures. We are now going to look at one measure of 4/4 time. We will be looking at the longest note in one measure and then look at each division until we see the shortest.

4 4	o	Whole note	gets value of entire measure.
4 4	d                      d	Half note	Gets value of half the measure. 2 halves = whole
4 4	q      q      q      q	Quarter note	
4 4	e   e   e   e   e   e   e   e	Eighth note	
4 4	e   e   e   e   e   e   e   e   e   e   e   e	Sixteenth note	

All of the beats can go within a measure. The measure that we are using in this instance is a bar of four/four. The next thing we need to learn is how to count the beats. A whole note and half note are easy to count. We will start with the quarter notes.

4 4	q      q      q      q	one      two      three      four
--------	------------------------	-----------------------------------

The quarter notes are simple to count but you need to see how to divide the counting. The one, two, three, and four are all common to all.

4 4	e   e   e   e   e   e   e   e	1   &   2   &   3   &   4   &
--------	-------------------------------	-------------------------------

The eighth notes are counted using the & (and). As we move on to the sixteenth notes we insert an e (e) and an a (uh). The one and the & stay in their respective position.

4 4	e   e   e   e   e   e   e   e   e   e   e   e	1 e & a   2 e & a   3 e & a   4 e & a
--------	---	---------------------------------------

The next thing to think of is that each note value has a rest of the same amount of time. Below we look at the rests.

o = d d	- = - -
d = q q	- = e e
q = e e	e = e e
e = e e	e = e e
e = e e	e = e e

- Whole rest
- Half rest
- e quarter rest
- e eighth rest
- e sixteenth rest

The next thing we need to look at is the dotted notes. The dot is a way of increasing the value of a note. If a note has a dot after it, its value is increased by one-half. A dotted quarter note is equal to three eighth notes. The first two eighth notes are in the original quarter note and the dot gives it the third eighth note value. Below we can see what is meant by one + a half.



We see how to use the dotted notes to give a note a longer value. The different ways that we can give a note a value are expressed by note symbols. The notes can then accurately be measured against each other. To play these notes we set a tempo of the song. The tempo is the pulse or beat of the song. It can be from very fast to very slow. With the tempo set, we can figure exactly how long a note is to be played. If you have a quarter note and no specific tempo to go by, then you really don't know how long that note is going to be.

This is just the very basics of music theory. If you have more questions about how to count the notes, find someone who can sit with you and help you learn to tap out rhythms. You may not be able to read music but you should at least be able to tap out a particular rhythm. Don't be afraid to get some help to assist you in your learning.

Now we start to see how we can take a lick and just by changing the rhythm we can get a new lick.

These examples were done abstractly. The rhythms were wrote out and then I placed a lick underneath. The hands and feet do the same things but the rhythm above has been changed. The example on the left has you playing a forward roll. The secret to making it interesting is the fact that it fits naturally in a group of three but we use it to play groups of four. We see a better example of this on the following page.

3/4

3/4

The same lick is played with triplets and with sixteenth notes. As you start back down the string bank, the beginning of the triplet is placed on a different finger. This makes the accent change. Experiment with different rhythms and see how they change a lick.

The following put together some of the right and left hand moves. These are only little moves put together. The first is a C major scale played on the E-9th neck. Again, little moves are the starting point of those fancy fast licks.

1—3 2—3 3 3 3—4

10—12 12—13 13 13 12—13

8 8 8—9 8—10 7—8

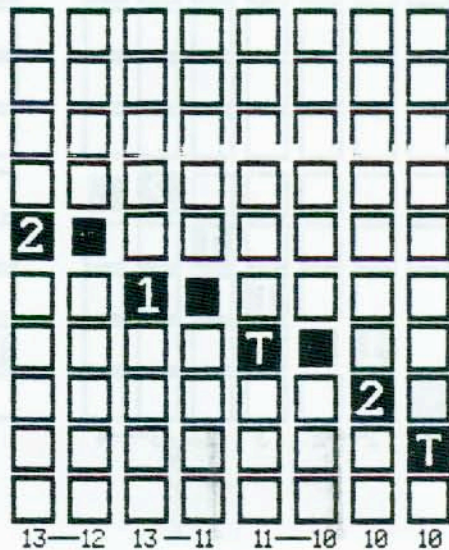
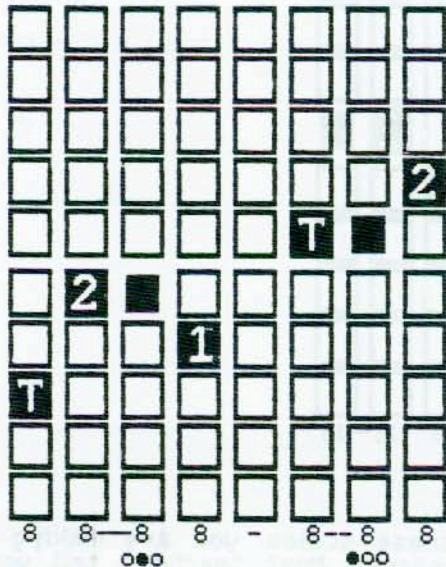
In all of these scales, you are making use of the crossover. Most teachers tell you to use only the thumb and second finger when you are playing these. This is only one way to do this. On these exercises we have two fingers crossovers and three finger crossovers. The secret is to practice them all. Make them easy to do by practicing them.

When I practice crossovers, I think in terms of the right hand moving across the strings. There is a section devoted to this concept. The important thing to see is that the right hand can learn to move across the strings and the left moves up and down the fretboard.

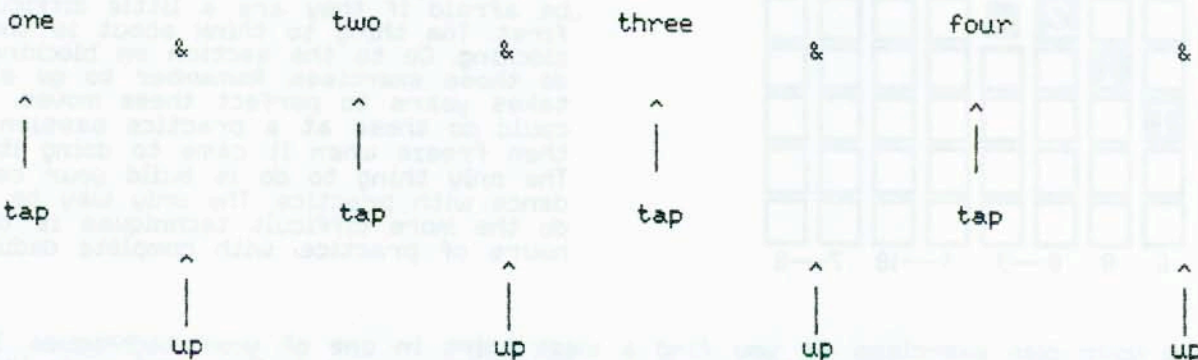
The crossover should be smooth going up the strings or back down the strings. Don't be afraid if they are a little difficult at first. The thing to think about is the blocking. Go to the section on blocking and do those exercises. Remember to go slow. It takes years to perfect these moves. I could do these at a practice session and then freeze when it came to doing it live. The only thing to do is build your confidence with practice. The only way to ever do the more difficult techniques is thru hours of practice, with complete dedication.

Make up your own exercises as you find a weak point in one of your techniques. If I notice a problem with a lick, I'll find out what little move is lacking and work that over and over again. Focusing on what's causing the problem, allow you to perfect a given technique.

This next section is showing you how you can play with the beat. The way to show you this is take the same lick and the same rhythm, and alter the starting point. You can start the lick right on beat one of a measure or move around with it. The following example shows this technique.



Everything stays the same except where you begin. The rhythm is exactly the same, pedals are the same, and the left hand remains the same. This is what I call playing with the beat. Another way to practice this is with the tapping of your foot. Most people tap their foot on every down beat. The pulse of the song is being tracked with the foot. I find that you usually place the pulse on the downward move. When your foot hits the floor, that's the beat. What about the upward movement? That's the off beat, or the &. To change where your notes lie in the meter, use the upward motion as your downbeat. This causes you to play with more of a jazz feel. It takes some time to get used to but it can be mastered. This will give you two licks instead one. Where you start your first note of a solo can be moved around. Experiment with playing with the beat. You'll soon find your playing taking on a new feel.



Your main pulse is on the tap. To turn the beat over, use the upward movement as your main pulse. It allows you to play on the other side of the beat. At first, you need to start slow with simple licks. With a little practice you'll soon be able to do it without thinking about it.

# KEY:

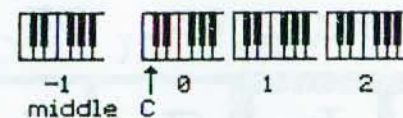
The middle C octave is using the 0 to represent how that octave falls on the fretboard. The octave with C above middle C, is designated by the number two. The octave below middle C, uses -1.

# CHART



middle C ↑

# 29TH



-1 middle C ↑ 0 1 2

0	0	0	0	0	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0	1	1	1	1
0	0	0	1	1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	1	1	1	1	1
middle c	0	0	0	0	0	0	0	0	0	0	0
-1	-1	-1	middle c	0	0	0	0	0	0	0	0
-1	-1	-1	-1	middle c	0	0	0	0	0	0	0
-1	-1	-1	-1	-1	middle c	0	0	0	0	0	0
-1	-1	-1	-1	-1	-1	middle c	-1	-1	-1	0	0
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
1/13	2/14	3/15	4/16	5/17	6/18	7/19	8/20	9/21	10/22	11/23	12/24

Note: The chart shows frets 1-13. When you read frets 12-24, you add one to each. One becomes two. Zero becomes one, etc. We can compare the way music falls on the steel by using the simplicity of the piano.

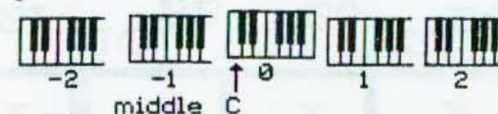
**KEY:** The middle C octave is using the 0 to represent how that octave falls on the fretboard. The octave with C above middle C, is designated by the number two. The octave below middle C, uses -1.

# CHART



middle C

# C6TH



	0	0	0	0	0	0	0	0	0	1	1	1
	0	0	0	0	0	0	0	1	1	1	1	1
C	0	0	0	0	0	0	0	0	0	0	0	1
	-1	-1	C	0	0	0	0	0	0	0	0	0
	-1	-1	-1	-1	C	0	0	0	0	0	0	0
	-1	-1	-1	-1	-1	-1	C	0	0	0	0	0
	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	C
	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	-1
	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-1
	1/13	2/14	3/15	4/16	5/17	6/18	7/19	8/20	9/21	10/22	11/23	12/24

Note: The chart shows frets 1-13. When you read frets 12-24, you add one to each. One becomes two. Zero becomes one, etc. We can compare the way music falls on the steel by using the simplicity of the piano.

C Denotes middle C.

# KEY:

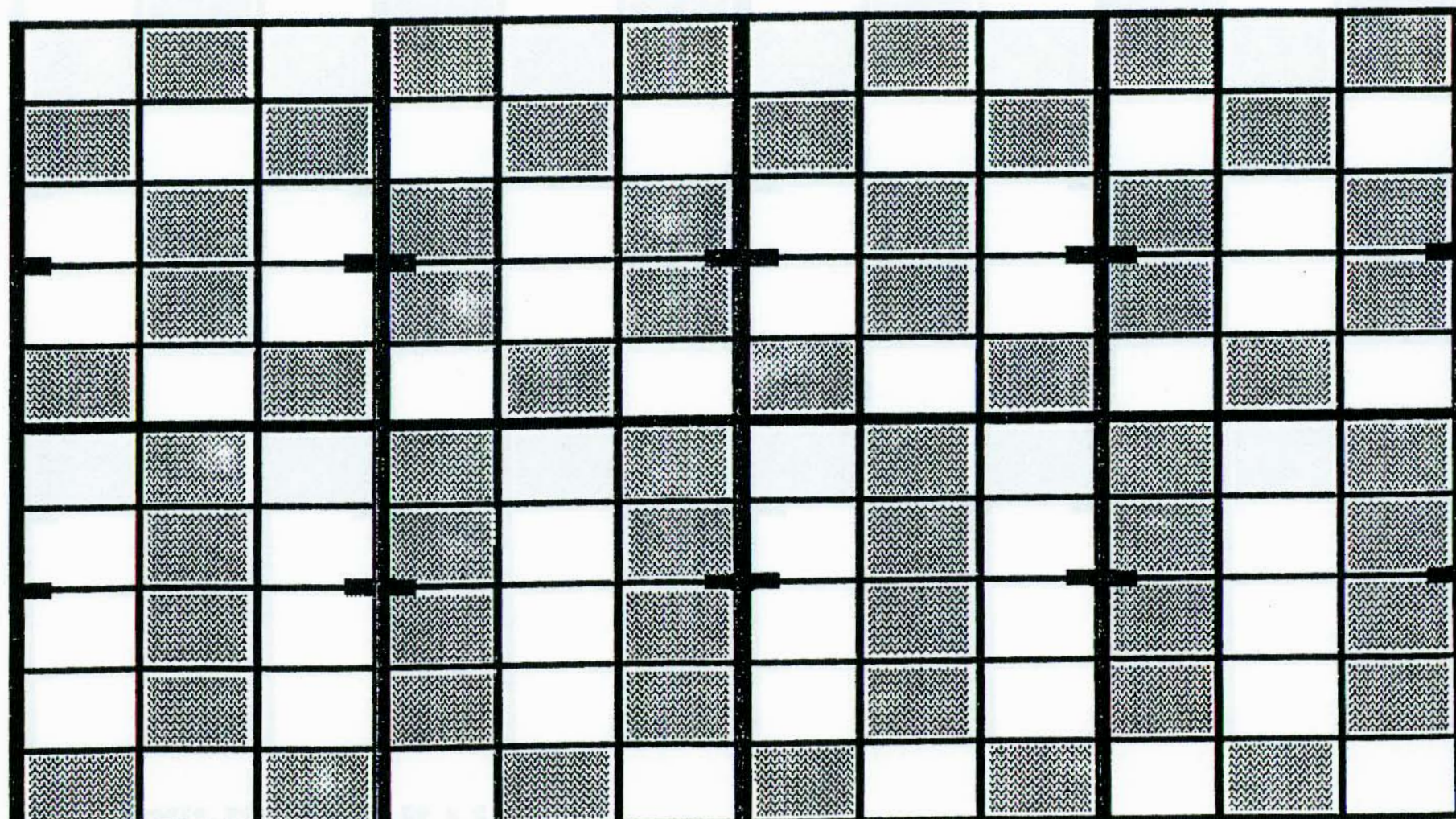
We divide each string by two to place a whole tone scale on the chart.

# CHART

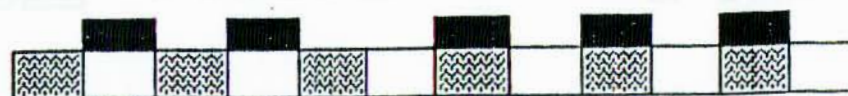
# WHOLE TONE SCALE

# 29TH

Black squares C D E F# G# A#  
White squares C# D# F G A B



1/13 2/14 3/15 4/16 5/17 6/18 7/19 8/20 9/21 10/22 11/23 12/24







# KEY:

We divide each string by two to place a whole tone scale on the chart.

Black squares C D E F# G# A#

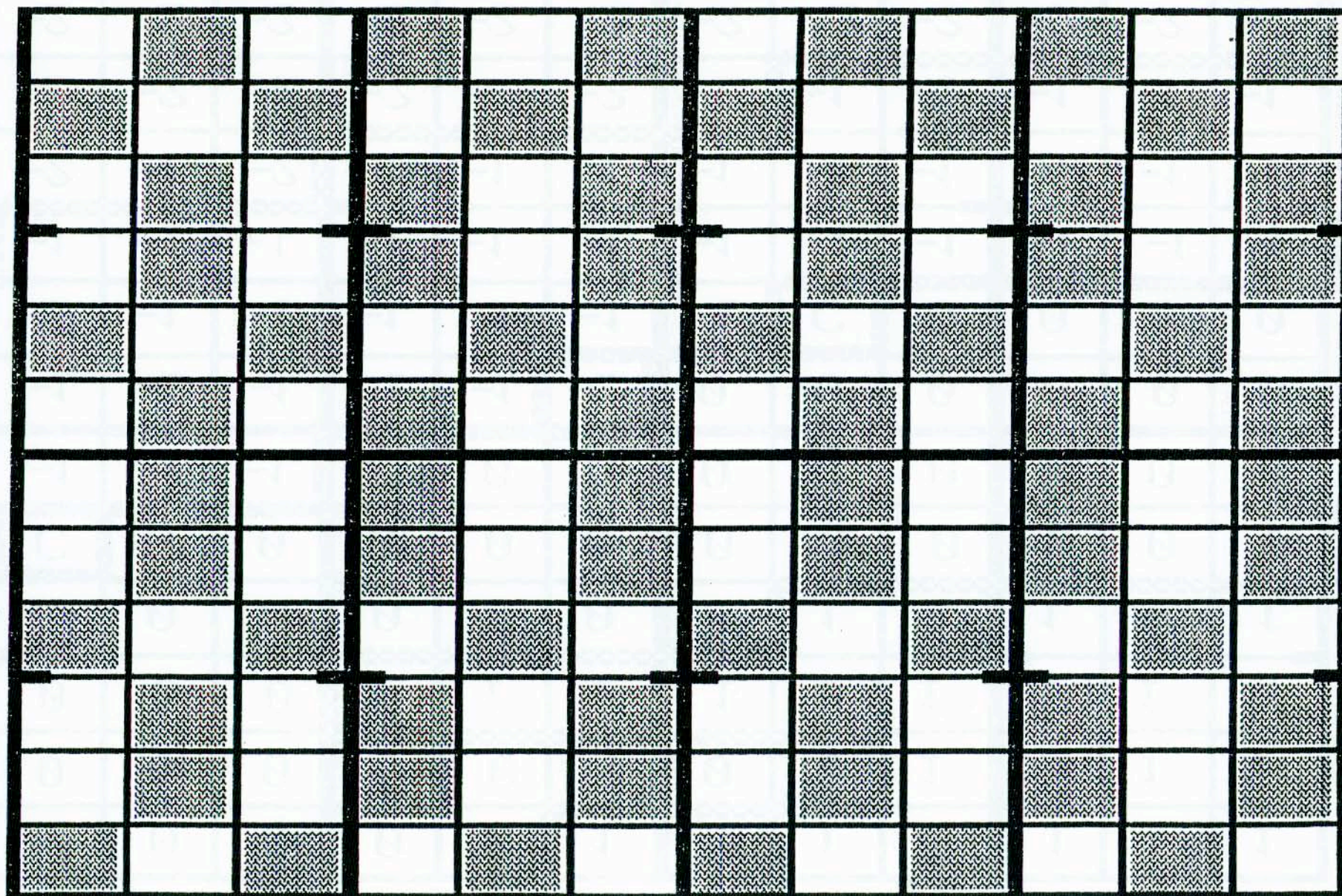
White squares

C# D# F G A B

# CHART

# WHOLE TONE

# 29TH/ 36TH

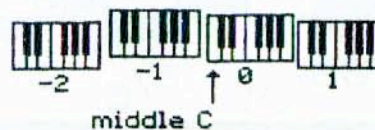


1/13 2/14 3/16 4/16 5/17 6/18 7/19 8/20 9/21 10/22 11/23 12/24



**KEY:** The middle C octave is using the 0 to represent how that octave falls on the fretboard. The octave with C above middle C, is designated by the number 1.

# CHART



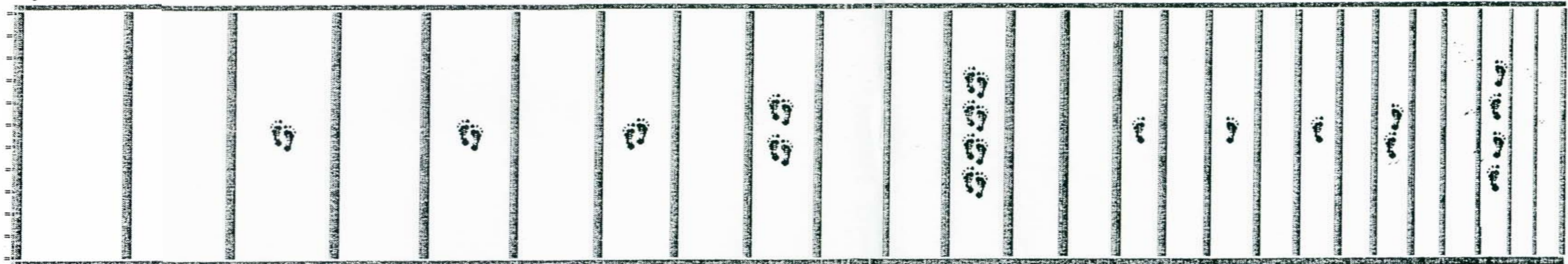
29TH/  
36TH

0	0	0	0	0	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0	1	1	1	1
0	0	0	1	1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	1	1	1	1	1
C	0	0	0	0	0	0	0	0	0	0	0
-1	-1	-1	C	0	0	0	0	0	0	0	0
-1	-1	-1	-1	-1	C	0	0	0	0	0	0
-1	-1	-1	-1	-1	-1	C	0	0	0	0	0
-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
-2	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1
-2	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1
-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2
1/13	2/14	3/15	4/16	5/17	6/18	7/19	8/20	9/21	10/22	11/23	12/24

Note: The chart shows frets 1-13. When you read frets 12-24, you add one to each. One becomes two. Zero becomes one, etc. We can compare the way music falls on the steel by using the simplicity of the piano.

# THE FRETBOARD

to Tuning Keys  
Rollers



Pickup

Wide fretlines	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	Intervals
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	Chromatic
W	T	W	T	W	T	W	T	W	T	W	T	W	T	W	T	W	T	W	T	W	T	W	T	W	T	W	Whole Tone
X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	X	Y	Z	Diminished
A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	Augmented
*	+	%	\$	&	*	+	%	\$	&	*	+	%	\$	&	*	+	%	\$	&	*	+	%	\$	&	*	Suspension	
1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	Tritone	
Q	W	E	R	T	Y	U	Q	W	E	R	T	Y	U	Q	W	E	R	T	Y	U	Q	W	E	R	T	Fifths	
1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8	1	2		
9	8	7	6	5	4	3	2	1	9	8	7	6	5	4	3	2	1	9	8	7	6	5	4	3	2	Sixths	
1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6		
11	10	9	8	7	6	5	4	3	2	1	11	10	9	8	7	6	5	4	3	2	1	11	10	9	8	Seventh	
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	Octave	