

# Guitar for Nerds

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This is volume 2 of Neale's pretentious rave about music, performance, art in general. See also volume 1, Writing for Nerds.

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## Introduction

Music is communication and like all communication needs technology, protocols and information. The protocol is rhythm. Technique provides the technology and allows you to maintain the rhythm. Play in time. You have to do it. The information is in the musicality, style, expression and rhythm.

Technique and style progress simultaneously. You need both.

## Style, Musicality and Expression

To communicate style, musicality, expression, you need to do things in your head. Imagine you are making love to a beautiful woman. Or whatever floats your boat. But really doing it in detail - every move you make you imagine how it will be received by the woman, camel, what have you, and how they will react. So you can't make some really klutzy move and expect moans of mounting pleasure. You are reaching out, not diving into some angst ridden interior that is subject to your own interpretation. You have an audience, and you are seducing the audience. In the heady days of the 1970s this is literally what guitar playing was about.

Do this, and you will not regret it. Even if you don't figure out how to play the guitar, you will have an excuse to imagine you are making love. As if one were needed.

You also have to be saying something. For example, if you have paired question and answer melodic lines going, imagine the question and answer as belonging to two different characters. Are they arguing or agreeing? Are they moving from a conflict to a reconciliation? Inform the playing with this information.

The longer term shape has to be take a meaningful form. Does it start small and move to something bigger. Is it a goddam three act structure? Is anything, for that matter? Think about it, make a decision, and carry it out.

Posture, relaxation - this is vital. You have to be doing this for hours without hurting your spine and your hands. Constantly check that you are relaxed. Be aware of your breathing. In fact do this anyway, whether you are playing guitar or not.

## General Principles

Note these are not specific to guitar playing. We are getting very zen at this point. Lots of other principles are still to come when they occur to me.

### The Principle of Least Action

Fermat and Euler were right. Do everything as efficiently as possible. Use the smallest finger movement, hand movement, wrist movement, arm movement that works. Help fight global warming and stop all that

fidgiting. But note the qualifier - it has to work. Offset this principle against the principle of physical rhythm.

## **The Principle of Physical Rhythm**

Music is rhythm, as is speech, writing, dance, movement of any kind, thought and emotion. In fact anything that is dynamic and takes place over time is rhythm, and the Principle of Physical Rhythm applies. This principle says that because we are physical entities, we experience rhythm as mechanical movements over time, as large-scale phenomena. To see rhythm, we need to watch something moving. Our brain is hard-wired to detect movement, and our body is built on a scale that predisposes to movements of a certain scale. It is possible to infer movement from a static shape, but the shapes on a canvas work because they create or suggest movement.

When we dance, or sing, our mind tunes to the rhythm and we create a feedback loop. We like music because we like being carried along by this loop of mental, experiential and physical rhythm.

So when you are playing the guitar, you have to move as if you are dancing, physicalizing the movement. Even though you only have to move a fingertip to play a note, if you move your whole arm and wrist in smooth, rhythmic movement that is part of a greater rhythmic whole, the whole thing starts to sound right and make sense and communicate. And it becomes physically and ergonomically much easier. It also becomes more communicative and meaningful.

Offset this against The Principle of Least Action and the Principle of Variation.

## **The Principle of Variation**

As we tune to rhythm we sweep along hypnotically, one with the flow of time. However we need to experience variation because our mind is hard-wired to habituate to repeated phenomena. When it habituates it transfers attention elsewhere. To avoid habituation in music we need interesting variations. We can provide the variation in the rhythm of the beat, in the pitches, harmonies, timbre, instrumentation, or any of the many dimensions of musical experience. The rhythm is the carrier, and the variation is the information communicated by modulating the carrier. If we vary so much we lose the carrier, then the line drops out. If we don't vary enough, the audience habituates.

This seems to be less of a problem for some people than it is for me. A lot of repetition is tolerated quite happily by some.

## **The Principle of Grouping**

The mind has limits on the number of objects it can hold in memory or operate on in other ways. However we can decide what those objects are. By grouping a number of objects into a single object, we make it possible to store and operate on more information. This works for lists of numbers, for lines of poetry, for anything at all.

To play fast passages on a guitar, you need to think of them as phrases rather than individual notes. To play chords smoothly you think of them as a single rhythmic event. This ties in with the Principle of Physical Rhythm, because the groups of notes form a rhythmic entity. Often a phrase has an emphasis on a single note, and that becomes the core physical focus of the phrase. The related hand movements are determined by the emphasis in the phrase.

## Guitar Rhythmic Principles

These principles are related to The Principle of Physical Rhythm. Some constant rhythmic factor in the playing, usually provided by a large scale movement of hand or wrist, provides rhythm that sets up a style and a framework for the rest of the music.

Many other guitar principles are still to come when they occur to me.

### Alternating Bass Pick

Maintain a steady 1, 8 or 1, 5 bass beat with the thumb (1,8 and 1, 5 refer to degrees of the chord mode: the root and of the chord, an octave above it, the fifth of the chord). Sprinkle on other notes as desired in the gaps or simultaneously with the thumb notes. This is a country finger pickin' technique, used by, among many others, Leo Kottke and in fact driven deeply and without a trace of humor into the ground by his mentor John Fahey. The new grass revolution has revived and legitimized this and related styles to the point where no one will turn a hair if you perform the entire Ring Cycle in alternating bass pick. At least I will, because I can take so much Wagner and no more. But I wouldn't be surprised if someone has done it already.

### Heel of Palm String Slap

Rhythmically flex the wrist and extend the wrist. On the wrist extension, bring the heel of the hand down on the strings with a slap that creates a percussive sound.

This forms the basis for many wicked awesome funky sounds.

### Wrist Rotating Thumb Thwack

This technique is used a lot in funk bass. With thumb extended, rotate the wrist from a supine position to a fully pronated position, bringing the antero-lateral edge of the interphalangeal joint down with a resounding thwack on one of the bass strings. The gross wrist rotation provides a rhythmic movement with a beat to it, and there's a lot of energy in the thwack.

Do this with the right degree of precision and you get a sound out of the guitar that you may never have heard before. Use a gentler form for strumming whole chords to get a warm, big, somewhat muffled sound that has Wes (thumbs) Montgomery written all over it.

Do a milder version of this when picking melodies, or lead, to give notes emphasis and give the melody rhythmic shape. It also helps the smooth flow.

A thumb thwack, powerful or restrained, can be the focal point of a phrase, creating the required emphasis, and determine the fingering and physical motion of play. This relates to the Principle of Grouping.

## **Finger Counterweight**

When you are trying to move the picking hand quickly, by rotating the wrist, angular momentum can be your friend. To control this, use the third, fourth and fifth fingers of the picking hand as counterweights. Extend them to create a higher angular momentum, pull them into reduce angular momentum. It's the same principle as a figure skating spin, and of you course you can wear a very short skirt while you do this, but it will not help you develop an ass like you see on those girls.

With fingers extended, flick your wrist as if you are trying to shake unwanted fluid off your distal phalanges. Note the added power in the movement from the additional angular momentum.

## **Heel of Palm Mute**

One word: space. Truth is in the silences between the sounds. To create a compelling rhythmic effect, you need to completely control the ends of the notes as well as the beginnings. The heel of your palm can mute the strings exactly when you want it to. Use the same technique of extending the wrist, but bring the palm down gently to stop the strings. You can mute strings differentially to keep a bass or melody going while creating crisp, groovy rhythms with chords on the middle strings.

## **Frailing**

This technique comes from banjo, but it can be done on guitar. Play the melody with thumb thwacks and play the chords, in the gaps between melody notes, with down strokes of the fingernails of the index and middle fingers. You can get a lot of sound this way and it gives the hand a nice rhythm.

The fingers are playing small chords on the top strings. It helps to voice these strings in fifths or fourths if you want the bluegrass frailing sound. You can extend and flex the fingers and rotate the wrist to stroke back and forth for extra rhythmic complexity.

## **Hammer-ons and Pull-offs**

Abbreviated HO and PO, hammer-ons and pull-offs are an essential way to voice notes with the fretting hand and create rhythmic and expressive effects. Some players use them a lot, some hardly at all.

Shredding emerged as a technique in which the fretting hand plays just about everything, leaving the picking hand free to manipulate the whangee bar until ready. This is fun but eventually violates The Principle of Variation.

## Stroke Through Versus Alternate Pick

Every time you move from one string to another you have another choice to make. Do you push through, with the stroke continuing in the same direction, or do you reverse the stroke direction? The Principle of Least Action says always stroke through. The Principle of Variation says maybe not always. The Principle of Physical Rhythm says stroke through or reverse depending on how it fits with the general rhythmic movement of the hand and the piece.

The choice you make determines how fast you can play, how it sounds, micro details of emphasis and rhythm and many other things. It can greatly influence how you shape melody in an improvisation. If you switch emphasis to stroke through you tend to arpeggiate chords, and add lots of hammer-ons and pull-offs. If you switch emphasis to reverse stroke you tend to play linear scales.

Switching emphasis is a way of providing variation. Different styles of playing have different emphasis. See the Django Reinhardt style for massive stroke through, John Scofield for serious hammer on and pull off, and the Doc Watson and Steve Vai styles for lots of alternating stroke.

## Learning Riffs and Songs

Youtube, online tab and music. What more can I say. It's all there. This is invaluable. Often if you see how something is played you realize it is easier than you thought, so use this excellent resource as a first line of investigation. A lot of the tab out there is nonsense, though. A few examples:

### Django Reinhardt

Django derived Gypsy guitarist, playing Minor Swing

<http://www.youtube.com/watch?v=IK9aWrlwvOs>

Note excellent posture, relaxation, plectrum least action (lots of stroke-through), and perfect Django mustache. Cool gypsy guitar goes without saying.

### Joe Pass

Joe Pass overdoes Django's Nuages in his inimitable style, so often imitated.

<http://www.youtube.com/watch?v=C42k5csCUWU>

Note what happens when you give an Italian a guitar. See also Pat Martino. Heavy use of hammer-ons and pull-offs.

### Wes Montgomery

Wes Montgomery's Four on Six

Pat Martino plays with titanium/molybdenum/granite plectrum:

<http://www.youtube.com/watch?v=z9NqDij4OGY>

Note hypnotically rhythmic extended three note riff. Pat worked with Wes a lot and bases his style heavily on Wes.

How to play it: Master the Guitar :

[http://www.youtube.com/watch?v=BaWY3PxC\\_1Q](http://www.youtube.com/watch?v=BaWY3PxC_1Q)

There is no form of guitar playing too ridiculous to appear on youtube.

<http://www.youtube.com/watch?v=i4BYMvVvMg0>

## Doc Watson

Flat picking god plays Black Mountain Rag.

<http://www.youtube.com/watch?v=XdUrg2Cqxdw>

Note clean as a whistle alternate stroking. Every note voiced, no hammer-ons or pull-offs

Stefan Grosman is not a seminal player, but he is a dedicated player and historian and has lots of online tutorials.

[http://www.youtube.com/watch?v=ltLRg\\_Yuye8](http://www.youtube.com/watch?v=ltLRg_Yuye8)

## Guitarists to Consider

Just a few samples. Not even a pretense of being comprehensive.

### Blues

Mississippi John Hurt - [http://www.youtube.com/watch?v=v-GN-BP\\_Qlk](http://www.youtube.com/watch?v=v-GN-BP_Qlk)

Candy Man: <http://www.youtube.com/watch?v=iXNfbnMFoGE>

Lightnin' Hopkins - <http://www.youtube.com/watch?v=NVF-0JKLnd4>

Big Bill Broonzy - <http://www.youtube.com/watch?v=2ryQzSYY5pQ>

Tutorial on a Broonzy rag: [http://www.youtube.com/watch?v=f\\_rLQmmvBJY](http://www.youtube.com/watch?v=f_rLQmmvBJY)

<http://www.youtube.com/watch?v=1462-zW5rMY>

<http://www.youtube.com/watch?v=YWqnjfZkY1s> Guitar shuffle.

Rev Gary Davis: [http://www.youtube.com/watch?v=\\_90D1RzApts](http://www.youtube.com/watch?v=_90D1RzApts) - Rev Gaz swings like a gate

Leadbelly - <http://youtube.com/watch?v=MmTNgJxlrCY>

Robert Johnson - <http://www.youtube.com/watch?v=4sml8W5SAwo>

Tutorial on how to play it: <http://www.youtube.com/watch?v=MERMpT6dN1g>

And so on.

There are excerpts on youtube with Pete Seeger, Donovan, Mississippi John Hurt, Rev Gary Davis and others talking and playing.

Ry Cooder - <http://www.youtube.com/watch?v=aoGkPTjZoBg>

Ry Cooder is one degree of separation from all musicians on the world, so it's worth following him just for links. Fancy slide player too. And he was the crossroads duellist with Stevie Vai.

## Country, Folk

Leo Kottke <http://www.youtube.com/watch?v=lnQTC5ICGik>

<http://www.youtube.com/watch?v=gQ-r8b2-tO8>

Doc Watson <http://www.youtube.com/watch?v=4mzGrpNZsGA> With Chet Atkins

Check out Paul Simon playing guitar, and James Taylor.

## Jazz

Pat Martino <http://www.youtube.com/watch?v=p2RRUVAD9Mc> Pat and Jon Scofield playing Sunny

Wes Montgomery <http://www.youtube.com/watch?v=XvyLUfEZIfY>

Four on Six among others: <http://www.youtube.com/watch?v=ApaPbP0CT5M>

Joe Pass <http://www.youtube.com/watch?v=aWa6aChSf1w> All the Things You Are

And bonus shirt <http://www.youtube.com/watch?v=Npy3DIV98yM>

John Scofield [http://www.youtube.com/watch?v=TF4\\_R3JAqC4](http://www.youtube.com/watch?v=TF4_R3JAqC4) Jon with Pat Metheny

Shocking terrifying technique. Amazing use of HO and PO.

George Benson: <http://www.youtube.com/watch?v=dAwXZ0Bp5hE>

<http://www.youtube.com/watch?v=y4P26OZT8ko> On Broadway

Pat Metheny <http://www.youtube.com/watch?v=MsV7Hzu7cVc>

Totally scary abilities. And a surprising amount of hair.

Don't forget Tal Farlow, Charlie Christian, John McLaughlin and all the rest.

## Rock

I'm not even going to talk about rock players. Don't forget Eric Clapton, Jimi Hendrix, Robert Fripp, Steve Vai, Frank Zappa, Joe Satriani, and all those other guys. This stuff is the area most covered by youtube and online tutorials.

## Technique

For technique, learn all the theory you can, scales and chords, cycles of fifths, harmony, chord progressions, cadences and so on. This stuff is all available online and in books from music stores.

Here is a list of topics. You can use it as a starting point and find material to fill in the details. This is a long term research project. A couple of years to work out all the theory, and several more to get it under your fingers.

## Scales

First position, all other positions. Major, harmonic minor, melodic minor, whole tone, diminished (octonic), pentatonic (blues, folk, asian, sixties jazz), and you name it, people went nuts for scales in the 70s. See John McLaughlin for impressive excess in weird scales (and don't forget unbelievable technique and zen).

## Modes

The simplest way to describe a mode is as a generalization of a scale. A mode is the notes of a scale starting not only from the first degree but from any other degree. Played on guitar, the shapes are the same as scales but the emphasis, the starting point and ending point and gravitational pull, are different.

Modes of the major scale:

- Ionian
- Dorian
- Phrygian
- Lydian
- Mixolydian
- Aeolian
- Locrian

Then you get modes of other scales. For example the Lydian Dominant is a Lydian mode with a minor 7th. It's the mode on the fourth degree of the melodic minor scale. Handy for 7#11 chords.

## Chords

Build chords in thirds from any degree of the scale.

### Three note chords

- Major

- Minor
- Diminished
- Augmented

## Four note chords

Built in thirds on degrees of major scale: Major 7th, minor 7th, dominant 7th, half-diminished

Built in thirds on other scales: diminished 7th, augmented 7th, 7b5, 7#5, minor maj-7th.

Inversions and other useful chords: Major 6th (inversion of a minor 7th chord, used when the melody is the root and you want a four note chord that does not clash), Minor 6th (an inversion of a half diminished chord)

More than four note chords (keep building in thirds beyond 7th - 9th, 11th, 13th - minor and major

Figure all this out. Make tables, make chord diagrams, make tab, write conventional music notation. Get something like Sibelius or Guitar Pro and use it to experiment with sounds. Play all the chords. Some are incredibly versatile, some you only use once in your life.

## Voice Chords in Fourths

Fifties, sixties cool jazz. - easy to play because guitar is tuned in fourths. For example:

```
--3--
--3--
--2--
--2--
-----
-----
```

This chord has the notes (from lowest note) EADG. You can call this a lot of things and use it in a lot of places. It's a C69 chord, a G69 chord, an Am11 chord, a Dm11 chord, and so on.

I use fourth chords a lot because they stand for so many things, it reduces the chances of being wrong.

## Voice chords in fifths

If you do it with no thirds, you get a rock power chord. Easy to play, mostly harmless.

If you do more than the first and the fifth of the chord you get inversions of chords voiced in fourths, also interesting. Not very easy to play.

e.g.

```
--4--  
--2--  
--x--  
--4--  
--2--  
--0--
```

## Variations, Inversions, Reversals, Permutations

For every chord, figure out every inversion (every rearrangement of the notes). For a major chord, on a guitar, you can play three inversions on three adjacent strings, or three non-adjacent strings. That gives you something like 50 possibilities to start with. Then you can double notes, playing on four strings, five strings or six strings. So for every chord there are give or take 100 ways to play it. Combinatorially this is an interesting problem, and it can keep a nerd busy for a long time. It's the glass bead game. You start to see so many things when you work through it - relationships between scales, chords, melodies you know, and in the mechanical expression on the guitar, you see relationships between the shapes of chords and scales and melodies.

The combinatorial explosion makes it impossible to practice everything, so you have to plan an itinerary.

## Counterpoint

A melodic interpretation sometimes makes more sense than interpreting music as harmony. It's a sort of wave particle thing. Vertical or horizontal: both work, but sometimes one gives you a clearer picture.

Not everything needs to be explained as chords, vertical stacks of notes. You hear counterpoint, two or more lines moving melodically each in its own direction, and you hear harmonies emerge as a consequence of the horizontal movement. Think of the harmonies as incidental, coincidental. You don't have to put a chord symbol over it. This saves you popping an artery in certain pieces where you cannot figure out what the chord is supposed to be.

## Practise Techniques

I can't claim to do this as strictly as I suggest here. I just play, but I should do this, and it's always heartwarming to receive advice that you don't intend to follow.

## Ear Training

As you work through scales, chords and other theoretical stuff, and through pieces, listen to it, and of course imagine you are making love to a beautiful your\_preference\_here. I mean really listen. You are training for the ability to listen to any music and know what is going on - follow the melody line, bass line, understand the harmonies, go home and play it on your guitar or write it down. And when you hear something in your head that you are creating, know what it is and play it or write it.

A trained ear can turn improvisation from being riff-regurgitation into free-flowing self-expression. Extremely therapeutic, and more satisfying to listen to as well. At least I think so.

There are many degrees in this ability. There are the little goddam Mozarts of this world and there are you and me. But there is no doubt that when you can recognize and name something you gain power over it. See Ursula Le Guin, Earthsea trilogy.

## Planning

Plan your practice sessions. However long you have, plan how long to spend on a particular area. Time it and stick to the plan.

Journal your practice sessions. Note what you noticed, what you achieved, what the plan was, whether you followed it. Note down questions, write the plan for the next session.

You don't have to put every area into every practice session, but it's good to be sure of what you intend so you use the time productively.

When I stick to this approach I get a lot of work done and feel tremendously smug. I think I just don't like myself when I'm that smug. Or maybe, just maybe my self-discipline isn't up to it.

## Metronome

Practice to a metronome. Start off at a speed you can manage musically and raise the metronome tempo gradually. Don't practice and make mistakes and forgive yourself and stop and start and create in your own mind a baseless illusion that you are playing listenable music.

## Balance

Balance technical work with pieces. Technical work should be practiced to a metronome, and you should listen for the sound you are making just as carefully as when you are playing pieces.

## Play Something New

Check out, and check off, some new scale or lick or song. Keep yourself thinking. Step outside your comfort zone. Uncomfortablism is the answer. Vivos los incómodos! Muerte a los spammeres!

## Scare Yourself

Most of a practice session should be within limits that allow you to play well, gently developing what you already have. In each session you should play something that scares the daylights out of you. Try sight reading something you can't manage at tempo. Play some lick as fast as it should go. It's ok to be wrong. You have to find your limits. Just don't do the whole practice session like this.