

Music Notes

Introduction	1
Available Notes	1
Scales	1
Major scale	2
Sharps and Flats	2
Common key signatures	2
The Cycle of Fifths	4
Thirds, Fifths and suchlike	4
What's a seventh?	5
Chord sequences	5
Relative minors and relative majors	6
How can I harmonise a new tune?	6
What are modes?	7
What do people mean by modal?	7
How can we make jazz chords?	8
How do we use jazz chords?	9
Diminished and Augmented chords	10
When are diminished and augmented chords used?	10
Harmonising minor scales	10
Cheeky General Advice for Guitarists	11

Introduction

These notes are intended to demystify as much as possible the theory behind music and harmony. The motivation for writing these notes has been the frustration of trying to find sensible concise explanations for what are essentially quite simple ideas. There are many expensive books which provide insufficient information for amateur musicians to learn and progress so these notes are my contribution to making the information freely available and hopefully useful to other musicians. There's no claim to any kind of authority here – just passing on what I've found to be useful information in the hope that other's will also do the same. So let's get started...

Available Notes

In Western music we have twelve notes available to us with which we can make music.
C C# D D# E F F# G G# A A# B C

Other cultures make use of notes which fit in between those above but all western instruments are build and tuned for these notes. In what follows, we are assuming that these are the notes available to us.

Scales

There are many scales employing a variety of intervals between notes. In different cultures, the intervals can be different. Western music uses *major* and *minor* scales but there are many modified scales used by musicians. The scales used in folk music are the least complicated, the major and the natural minor.

The natural A minor scale is A B C D E F G A.

There are two other minor scales commonly used (but less so in folk music) called the melodic minor and the harmonic minor. The harmonic minor sounds odd at first. It raises the seventh note of the minor scale by a semitone.

The harmonic A minor scale is A B C D E F G# A.

Author: Bob Lloyd

Please help demystify music theory by passing on these notes to anyone who might want to know about the contents.

Note the big jump between F and G#, a tone and a half, which makes it sound odd.

There is a melodic minor scale, much easier on the ears:
The melodic A minor scale raises the 6th note by a semitone as well.

The melodic A minor scale is A B C D E F# G# A.

Major scale

These follow the pattern of intervals: tone, tone, semitone, tone, tone, tone, semitone.

Starting the scale on C gives us the C major scale:
C D E F G A B C

Starting the scale on G gives us the G major scale:
G A B C D E F# G

Starting the scale on D gives us the D major scale
D E F# G A B C# D

Sharps and Flats

Sharp means moved up a semitone, Flat means moved down a semitone. That means C# is the same as Db, G# is the same as Ab.

The key of a piece of music is identified by its key signature represented by sharps or flats on the stave next to the clef.

Major Key	Sharps
C	none
G	F#
D	F# C#
A	F# C# G#
E	F# C# G# D#
B	F# C# G# D# A#
F#	F# C# G# D# A# E#
C#	F# C# G# D# A# E# B#
G#	F# C# G# D# A# E# B# F##

Major Key	Flats
C	none
F	Bb
Bb	Bb Eb
Eb	Bb Eb Ab
Ab	Bb Eb Ab Db
Db	Bb Eb Ab Db Gb
Gb	Bb Eb Ab Db Gb Cb

Common key signatures

Below are the common key signatures found in music. It's worth trying to remember them.



Key of G major = E minor



Key of D major = B minor



Key of A major = F# minor

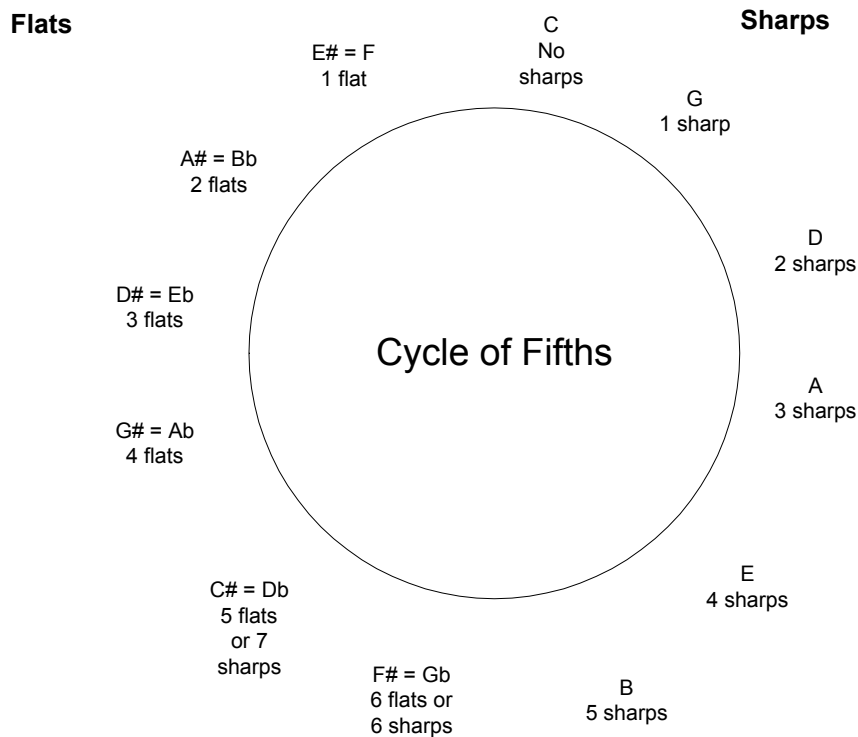


Key of F major = D minor



Key of Bb major = G minor

The Cycle of Fifths



Above is what is known as the cycle of fifths and it's useful because it relates the scales and chords together along with the key signatures you see on the music.

Going around clockwise goes up in fifths, so that C goes to the fifth note in the scale of C which is G. G goes to the fifth note in the scale of G which is D, and so on.

The number of sharps in the key signature goes up by one each time. The sharp added each time turns out to be a semitone below the note. So A has three sharps which will be F# (one less than G), C# (one less than D), and G# (one less than A).

(One trick used by trad jazz musicians is to jump across the circle and return to base by playing 7th chords. For example, C – E7 – A7 – D7 – G7 – C).

Thirds, Fifths and suchlike

Harmony is based on intervals and some pleasing intervals are the following:

Major third: two whole tones = from first to third note in the scale

Minor third: one and half tones = from first to flattened third note in scale

Major fifth: three and a half tones = from first to fifth note in the scale.

In the key of C, that means:

C	D	E	F	G	A	B	C
Tonic		3 rd		5 th			

Most harmony is based around this triad and it is modified and added to.

By keeping this triad, we can create chords which will sound OK played against each note in turn. This is the basis of harmony – automatic workable three-part harmony.

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 minor (b5)

The reason some are major and some are minor is because of the fact that between E and F, B and C, there is only a semitone. So as we move up the scale, the triad contains different intervals, sometimes making a minor third (like D to F) and sometime making a major third (like G to B). In the last chord, we've caught both of these semitone intervals (B to C, and E to F) so we end up with a chord with a flattened 5th note (known in Bach's day as the devil's chord – widely believed to have satanic influence and usually avoided – much favoured by jazz musicians!).

This means that for any melody, we can safely (if boringly) choose these chords and it will provide a safe harmony with no unpleasant clashes.

What's a seventh?

This is the seventh note in the scale but flattened by a semitone. So in the key of G, the seventh note is F# and flattened it would be F. The chord of G7 would therefore be G, B, D and F.

Sevenths are very strong chords which naturally resolve to other chords adjacent to them in the cycle of fifths. So G7 would resolve to C, D7 would resolve to G, and so on.

Typically jazz musicians build on major and minor 7th chords by adding or substituting others. For example, an A minor 7th chords, written as Am7, would be A, C, E, and G. By flattening the fifth note in the Am scale, we'd get Am7b5 which would contain A, C, Eb and G. That's all there is to working out jazz chords (matching them together is a different matter).

Chord sequences

Jazz musicians play in many different keys so rather than thinking in terms of specific chords that would be right for one key only, they often think in terms of the **sequence** of chords instead. To write down the sequence, we use the position of the chord in the scale. In the scale of C, I = C, II = D, III = E, IV = F and so on.

Looking back to the section on thirds and fifths, we can see that for any note in the scale there is a chord that naturally fits. The chords for the scale of C major are C major, D minor, E minor, F major, G7, A minor, B minor 7b5, and C major again. Writing that using the roman numbers gives a scale sequence that we can use with any key: Ima, II mi, III mi, IV ma, V7, VI mi, VII mi7b5, VIII ma.

Using that sequence we could write out the chords for any given scale. For example, the chords that fit the scale of G major are:

Gma, Ami, Bmi, Cma, D7, Em, F#mi7b5, Gma.

For D major, the chords are:

Dma, Emi, F#mi, Gma, A7, Bmi, C#mi7b5, Dma.

Lots of chord sequences appear regularly and there are some famous ones that appear in jazz all the time. Here are some especially common ones with the actual chords in C:

I, IV, V = Cmajor, Fmajor, G7.

I, VI, II, V = Cmajor, Aminor, Dminor, G7

I, III, IV, V = Cmajor, Eminor, Fmajor, G7

It worth working these out in other keys as well.

Relative minors and relative majors

There is a connection between major and minor scales. A minor scale which uses all the same notes as another major scale is called it's relative minor.

The scale of C contains:

C D E F G A B C

and if we move back two places and write it as

A B C D E F G A

we have A minor, which is called the relative minor of C.

Another example. The scale of G is

G A B C D E F# G

and if we move back two places and write it as

E F# G A B C D E

we get the scale of E minor which is the relative minor of G.

Note that both scales have the same single sharp, F#, so we are using the same notes.

Equally, the relative major of A minor is C major, and the relative major of E minor is G major.

How can I harmonise a new tune?

Lets suppose the notes in the new tune are as follows (ignoring timing for now):

C E F A G B A

We can look at each note and see which chords would contain that note. We have plenty of choices:

C	C major	C E G
	F major	F A C
	A minor	A C E

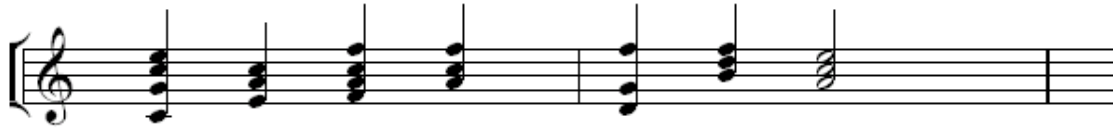
E	C major	C E G
	A minor	A C E
	E minor	E G B

F	F major	F A C
	D minor	D F A
	B minor 7b5	B D F

and so on.

One option would be

Note:	C	E	F	A	G	B	A
Chord	Cma	Am	F	F	G7	G7	Am



Another would be:

Note: C E F A G B A
 Chord: Am Am Dm Am G7 G7 Dm



Both would fit and both would sound OK. The second one would sound sadder because of the predominance of minor chords.

Now look at the changes made to the notes played when shifting from one chord to the next. In the first case, the change from C major to A minor is a one note change: the G becomes an A (notice that the E is still there, it's just moved down an octave). Going from A minor to F is also a one note change, this time an E to an F (in this case, the F is repeated an octave above).

It's very hard to visualise it like this but much easier seeing it on an instrument such as a keyboard. With a little practice, you'll spot the same changes on the music.

What are modes?

By starting and ending on each note of the scale, we generate a different feel because the tone and semitone intervals appear in a different order. The scale of A minor is simply the C scale started and stopped on the 6th note of the scale. This is also called the Aeolian mode of C. You could start and end on any note and generate all the other modes:

Using the scale of C, here are the *modes*:

C D E F G A B C	Ionian
D E F G A B C D	Dorian (beloved of folk music)
E F G A B C D E	Phrygian
F G A B C D E F	Lydian (some Scottish)
G A B C D E F G	Mixolydian (some Scottish)
A B C D E F G A	Aeolian
B C D E F G A B	Locrian (avant garde jazz...)

What do people mean by modal?

Often they don't mean anything other than it sounds different. Frequently they mean that the harmony could be major or minor because the third note of the scale is mostly missing – hence you can't tell whether it's a major third or minor third, because it isn't a third at all!

Sometimes they mean, it's played in the Dorian mode of some scale. Often a tune is played in A minor with a drop down to the G making a modal sound, so it could be the key of A minor or thought of as the Dorian mode of G.

Sometimes the phrase *modal chords* is taken to mean chords with no third, but more often it is used by those who don't know what modes are to mean DADGAD chords chosen by experiment to sound nice – these chords are frequently highly modified and often involve harmony clashes in order to resolve.

Frequently traditional songs switch modes for emphasis – a fact missed, or corrected by song and tune collectors of old (for example Cecil Sharp who often removed what he thought was a musical mistake!).

How can we make jazz chords?

Jazz chords are based on the scales and there are some very subtle adjustments made to the expected chords forming what are referred to as *altered* chords. Essentially they are still major or minor chords (with two other types which we'll come to) but with one or more of the notes sharpened or flattened. The trick to being able to work out jazz chords is to know the scale and the position of each note in it and then choose the right ones. The important ones are the first, third, fifth and seventh but there can also be ninths, eleventh, and thirteenth as well and they can be major or minor, sharp or flat. **Rather than trying to learn all the variations, it is much more productive to spot the position of the notes in each chord you already know and alter it to get the new chord.** Learning it in the abstract makes it much more difficult to apply because the thinking gets in the way so we should just tackle a few chord types at a time and learn them for different keys.

We'll look at the scale of C major but we could choose any scale. We'll start by writing it out and identifying the position in the scale of each note:

Tonic	2 nd	3 rd	4 th	5 th	6 th	7 th	Octave	9 th	11 th	13 th
C	D	E	F	G	A	B	C	D	E	F

We'll build up the family of C chords with an explanation of why they are the way they are.

C Major

Tonic	3 rd	5 th	Octave
C	E	G	C

This is a strong chord with no altered notes. It is low in tension in that it doesn't feel as though it needs to resolve into something else – some chords are high in tension.

C Major 7th

Tonic	3 rd	5 th	7 th
C	E	G	B

This is quite strong but less strident than C Major. The presence of the B makes it feel less resolved than C Major and the major 7 is very important in jazz and the basis for altered chords.

C7

Tonic	3 rd	5 th	flattened 7 th
C	E	G	B \flat

This is high in tension because of the flattened 7th and naturally resolves to another chord (F major which is an interval of one 5th below). In the same way, G7 resolves to C, D7 resolves to G, B7 resolves to E, and so on. This resolution is very common in all kinds of music but especially jazz, blues, and rock. Jazz players refer to it as the V – I change.

C Minor 7th

Tonic	flattened 3 rd	5 th	flattened 7 th
C	E \flat	G	B \flat

To make a minor 7th, take the 7th chord and flatten the third note.

Now that we have these four, we can quickly modify them to make a whole family of jazz chords:

Cm7b5

This is the C minor 7 chord with the fifth note flattened. The fifth note of the C scale is G so we change the G to Gb giving us:

Tonic	flattened 3 rd	flattened 5 th	flattened 7 th
C	Eb	Gb	Bb

C7#5

This is another chord with high tension and it consists of the C7 chord with the fifth note sharpened, in this case G to G#.

Tonic	3 rd	sharpened 5 th	flattened 7 th
C	E	G#	Bb

C7#9

This is used a lot in blues with the #9 often bent by guitarists. It is simply the C7 chord with a sharpened ninth note added so it is:

Tonic	3 rd	5 th	flattened 7 th	sharpened 9 th
C	E	G	Bb	Eb

C7/11

This one would be C7 with an eleventh note added. The eleventh note would be an F so the chord would be:

Tonic	3 rd	5 th	flattened 7 th	11 th
C	E	G	Bb	F

C9

This is built on C7 with an added 9th so it would be

Tonic	3 rd	5 th	flattened 7 th	9 th
C	E	G	Bb	D

C7b9 would be the C9 above but with the 9th flattened to Db

How do we use jazz chords?

This is often where the most skill comes in because in any situation there is more than one chord which could be used. To get started though, we should just use the rule above to find suitable chords and then modify them as we want. Although we could say there are no wrong chords, there are definitely some that fit a lot better than others the nature of harmony is the introduction and resolution of tension to make a pleasing and interesting sound. Introducing jazz chords just for the sake of it could well produce quite a lot of tension without resolution so some subtlety is required.

There are some useful rules of thumb:

For a major scale the chord progression going up the scale would be (using C major as an example):

Cma7 Dm7 Em7 Fma7 G7 Am Bm7b5 Cma7

Minor scales are a little trickier – we'll come to them a bit later but now for some major examples.

Suppose we have a chord progression like this in a song and we want to give it jazz feel:

C Am F G7 C Dm G7 C

We could make some substitutions keeping the chords the same. Here's one of many choices that could be made:

Cma7 Am7 Fma7 G7#5 Cma7 Dm7 G13b9 Cma7

By choosing the chords carefully we can introduce runs of notes throughout the chords: taking the first four chords we can see what is happening.

Cma7	Am7	Fma7	G7#5
C	A	F	G
E	C	A	B
G	E	C	D#
B	G	E	F

For guitar players, the trick is to choose positions for the chords so that the fingering changes are minimal – it's part of the fun to find new positions for the chords.

An alternative chord sequence might have been:

C6 Am7b5 F7b9 G13b9 Cma7 D7b9 G13 Cma7

So long as the root of the chord is correct, the choice will fit but the feel will be different.

The way to get into these chords is to substitute for just one or two of the usual chords until they feel comfortable, for example using major 7th chords instead of the major chords, or the minor 7th chords for the minor chords.

Diminished and Augmented chords

These are the chords with the most tension but they are useful precisely because they can resolve in any direction. A diminished chord consists of intervals of 1_ tones and an augmented chord consists of intervals of two tones.

C diminished is therefore	C	E ^b	G ^b	A
C augmented is therefore	C	E	A ^b	C

Another way of thinking of these chords is that the diminished is a Cm6b5 with no 7th and the augmented chord is a major chord with a sharpened 5th. For guitarists, the nice thing is that because of the intervals there are very few of these chords: the Cdim chords is the same as Ebdim, Gbdim and Adim, and the Caug is the same as Eaug, Aaug and Caug.

When are diminished and augmented chords used?

Big question! Frequently we want to sustain the tension between chords or pass over what would be the normal progression. Sometimes we just want to change key and there is no convenient passing chord that will let us resolve to a new key. Often it is because we want a semitone change in key. These chords are very flexible and fun to drop in.

Harmonising minor scales

Harmonising minor scales is trickier because of the sounds when resolving chords.

Major and minor scales are related together as we noted above so each scale has a relative minor. To get an idea of which chords will work on a minor scale, let's superimpose the major scale over its relative minor and look at the chords we'd expect to use:

C D E F G A B C

A B C D E F G A

Am7 Bm7b5 Cma7 Dm7 Em7 Fmaj7 G7 Am7 Bm7b5 Cma7

Now all of these chords will fit but some will sound a bit forced. For example, resolving the chords on the fifth note back to the root will mean using Em7 before Am7 which sounds pretty weak. It feels as though the right chord ought to be E7 but that includes a G#.

So let's adjust the minor scale to make it have a G# then and see what happens to the chords!

A B C D E F G# A
Am7? E7

The E7 is now fine but the first chord also ends up with a G# so its 7th is now a major 7th and the chord notes are A (tonic), C (minor 3rd), E (5th), with the last note G# (a major 7th) so we call the chord Am-ma7.

Sorted then!? Not quite! If we use this scale (the Harmonic Minor Scale), there's an awkward interval between the F and the G# which is a tone and half which will grate on the ears unless the G# is followed by the A. *Classical composers got over this problem by flattening the 7th on the way down and that scale was called the Natural Minor.*

Jazz players instead often sharpen the 6th note so that there is no problem going up or down. This scale is the *Melodic Minor Scale*.

There is a lot of jazz improvisation around the switch between melodic and harmonic minors and about the ambiguity of the chords so you should experiment and break the rules as much as your music takes you.

Cheeky General Advice for Guitarists

- Work on a small piece of theory at a time, for example trying out m7 chords but try them in lots of places on the neck.
- Do try and play the same chord sequence in different keys. For example Cma7 – Dm7 – G7 – C will transpose to Gma7 – Am7 – D7 – G. Getting used to the patterns makes the theory easier to follow.
- Don't use a dictionary of chords – work out how to make the chords yourself.
- Do learn where all the notes are on the fingerboard – there's no substitute for knowing this but learn it in stages, first five frets, then up to fret 8, then up to 12 then it repeats.
- Try to play some scales but play them accurately. If you are trying to play a major scale, don't get distracted into playing a blues scale because it sounds nice!
- Do move the chords and scales to make new ones, up two frets means up a tone. Reuse the chord shapes as much as possible.
- Don't ever get intimidated by the theory – drop it when you don't want to think about it. Don't let it limit the music.