7

MACROCOSMOS

GUITAR

Guitar Harmony

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Overview of Book 7

Literature on harmonic procedures are common enough and are usually explained by a keyboard. For the guitarist however this imposes certain restrictions. Apart from the bass clef, the guitar sounds an octave lower than written. There are also harmonies that a piano may easily sound that cannot be fingered on the guitar. Therefore without avoiding any theoretical proposition, this treatise makes harmony playable on the guitar.

Book 7 is an amalgamation of three different perspectives on harmony. The first is an approach that many of us take early in our development as guitarists; 'Systemic Guitar Harmony' which is often an intuitive response to harmony. It acknowledges the inherent patterning of the fret board and extends the concept of how a guitarist may unconsciously validate an idea, by placing it in a conscious context so as to justify its development.

The second is titled 'Traditional Harmony', an approach common to all forms of music study. The difference here being that it is designed specifically for guitarists. Starting with the overtones of a fundamental, to the formulation of tonal design that leads to chromaticism and transient structures. Modulation, leading tones, cadence and modes are all explained.

The third proposal is 'Intervalic Harmony'. When two tones sound together resultant tones are generated that determine two important facts. Firstly, the tonic of any interval and secondly the comparative degrees of consonance and dissonance of a chord; its tension. In this way we are able to manipulate with a high degree of certainty harmonic structures that are elusive with regards to the other two harmonic approaches.

The purpose of all the examples is to extrapolate the theoretical procedures being explained rather than to express the aesthetics of an idea; their value is theoretical rather than emotional. This is not to say that the examples are not of musical value but that their conceptual premise is different. Each example should be examined in detail, to be first understood academically and then to be played convincingly. Only in this way may one clearly hear the harmonic intent being discussed.

An important recommendation for readers of book 7 is that all harmonic advancement be comprehended so as to improvise each element on the instrument. This should become part of the ongoing educational process. To think while one feels is to nurture musical consistency.

Contents

Contents

Contents

Systemic Harmony

Systemic practice is the coding of relationships, harmony is the evaluation of those relations and the guitar is used to sound the information.

This approach focuses on the coding of harmony and its conversion to content. That is to say, if we were given a series of numbers to memorise, for example, 1235813213455 it may present problems if we were expected to do it quickly. However if a system of proportions expressing a relationship between the preceding and succeeding numbers were exposed, such as 1+2=3, 2+3=5, 3+5=8, 5+8=13, 8+13=21, 13+34=55, then a system becomes apparent and the conversion to a code is assured and the task of memorising is made easier, in fact we could extend the series to include many more sequences.

This unfolding of structure is triggered by the simple equation of permutation. Therefore by presenting one chord and understanding it as a code, a whole system may be set in motion that will expose countless other structures. These then will all be related with common values, even distant relations when examined with insight will bring about connection.

For the real time assembler the need to facilitate quick thinking is at some point essential. To hear and deduce that a single chord, say A minor, is a code that has linkage to the key of C major and as a consequence all its information is relevant and of a high priority, for it contributes to the thematic development of an idea. The timeline of code, conversion, content, communion, is indicative of systemic processes, as it stimulates sonic and durational pattern making.

For players of preconceived ideas the ability to understand music through harmonic analysis gives greater insight into the music's intention. It leads to structural awareness, clarifies fingering and the interpretation of design.

For the educator there is harmonic explanation with melodic material, by a systemic process; how scales and pitch sets evolve through string grouping reveals much about the guitaristic nature of the instrument. For students not familiar with the theoretical side of music it provides a logical way of distributing sounds with an explanation that is easy to manipulate.

Systemic harmony will not facilitate all our harmonic needs yet it will advance our understanding of the guitar in a way traditional explanations of harmony will not. It is the combination of many methods that provides the amalgamation of harmonic material best suited for the guitar.

Systemic 7th Chords

Divide the 6 strings into three closed groups for structures of four notes.

Strings 4321 = 1/4. Strings 5432 = 2/4. Strings 6543 = 3/4

The systemic process starts with the 1/4 F Major7th chord FACE in 1st position on the neck. The notes are E on 4th string 2nd fret, A on 3rd string 2nd fret, C on 2nd string 1st fret, and F on 1st string 1st fret.

To arrive at the next F Major7th chord we move each note up to the next note in the chord i.e. the E moves to F 4th string 3rd fret, the A moves to C 3rd string 5th fret, the C moves to E 2nd string 5th fret, and F moves to A 5th fret. By continuing this process we get the four inversions of F Major7th 1/4.

The starting chord for the four F Major 7ths on the 2/4 is C on 5th string 3rd fret, F on 4th string 3rd fret, A on 3rd string 2nd fret, E on 2nd string 5th fret.

The starting chord for the four F major7ths on 3/4, is the F on 6th string 1st fret, C on 5th string 3rd fret, E on 4th string 2nd fret, A on 3rd string 2nd fret.

In root position the notes of F Major7th are FACE, or 1357 of an F Major scale. By flattening the 7th note from E to Eb of all the Major 7th chords we change their chordal quality to a dominant 7th whose formula is 135b7. Therefore by altering one note the 12 F Major 7ths become 12 F7 chords.

By flattening the 3rd note A to Ab the formula now becomes 1b35b7, and the chord changes to F minor 7th, and accordingly we have 12 F minor 7ths.

Lastly, by flattening the 5th note C to B the formula changes to 1b3b5b7, revealing 12 F minor7th b5 or 1/2 diminished chords.

The only note not to change is the tonic F. Other chord formulae can be applied, 13#57, 13b5b7 or 145b7 etc.

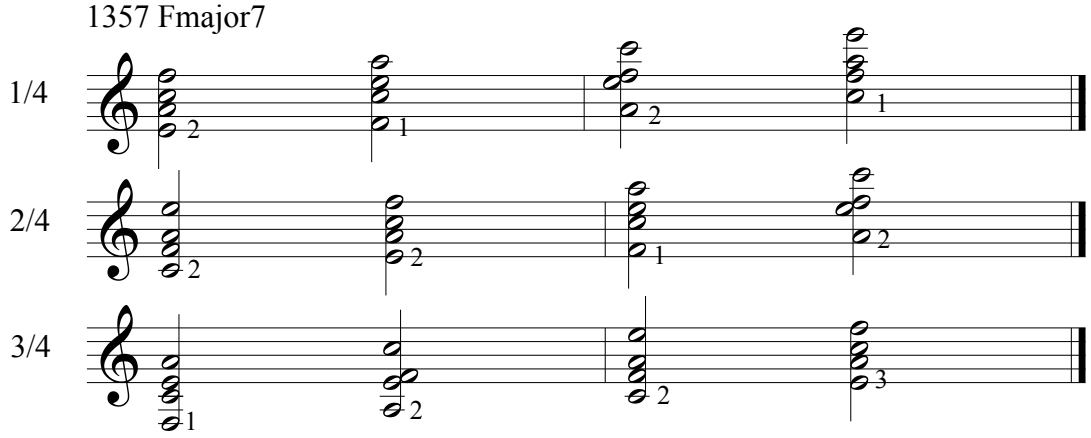
Our deduction is that from 12 major 7th chords we extrapolate another three chord qualities, dominant7, minor7 and minor7b5. These four harmonic qualities go to make up the 7th chords of a major scale. Therefore 12 x 4 equals 48 chords and 48 x 12 chromatic notes, tonics, equals 576 chords.

Again, to find the open voicing of any 7th chord i.e. 01/4, we use the expansion of voicing method that evolve closed triads to open triads; a note from the parent chord is transpose an octave above or below itself. Also notice how groupings may expand to include 1/5 and 1/6.

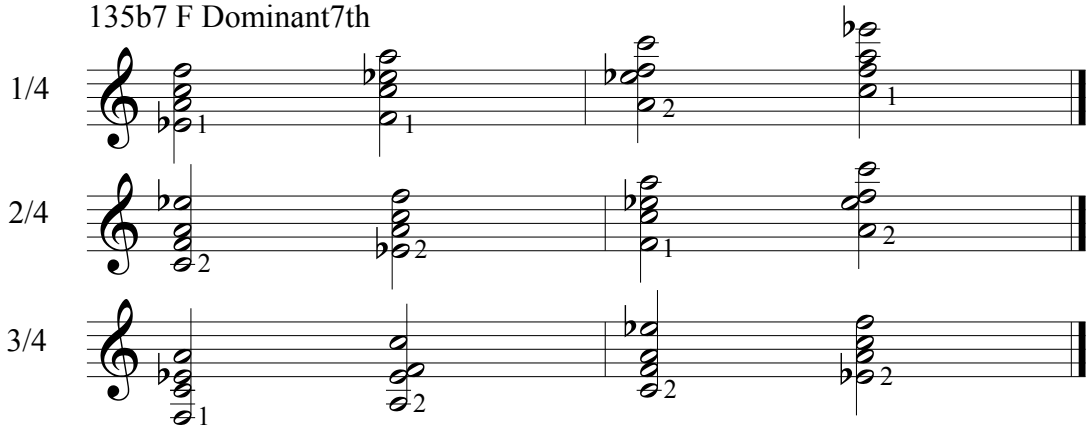
Use these chords to harmonise melodic lines extrapolating them to include all keys. Also improvise the harmonies by exploring chord scale relationships.

Closed Voicings of 7th Harmonies

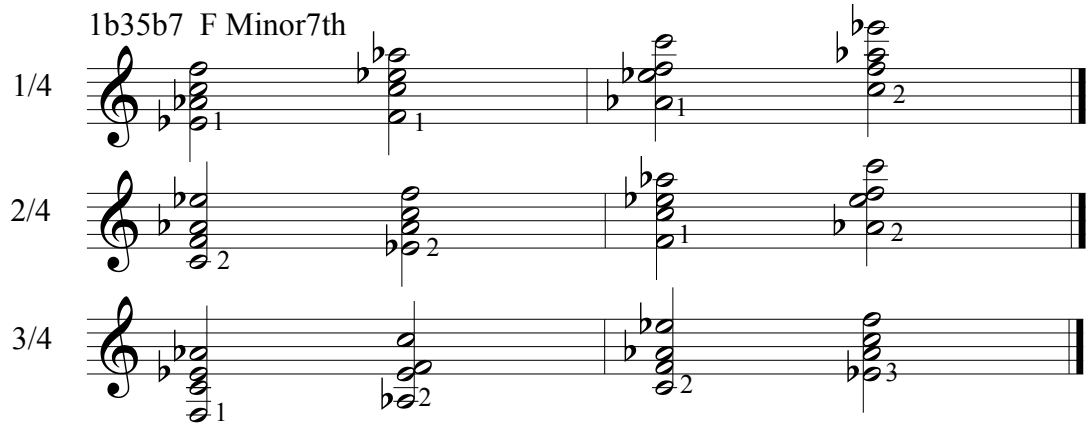
1357 Fmajor7



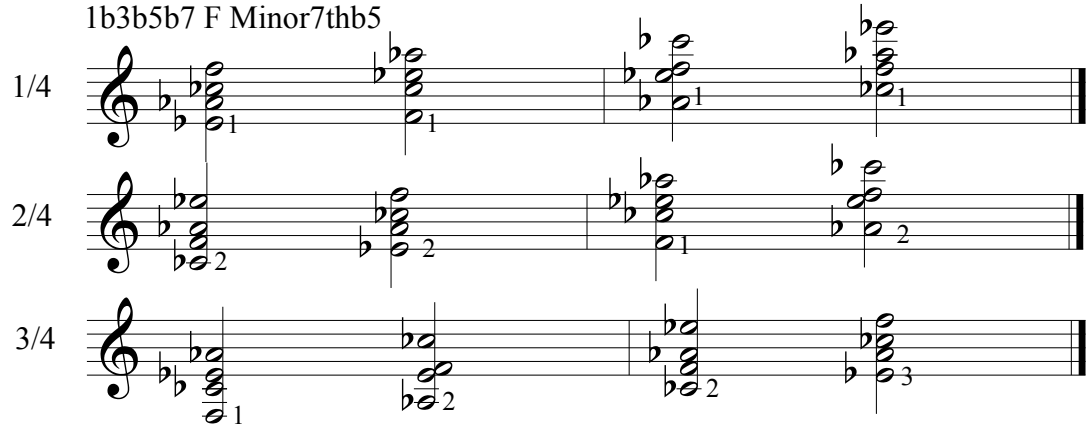
135b7 F Dominant7th



1b35b7 F Minor7th



1b3b5b7 F Minor7thb5



Diatonic Modulations

If the purpose of the cadence is to conclude then the function of modulation is to prolong. Accordingly the longevity of attraction is the evolution of sovereignty, therefore modulation is the interdependence of life cycles. One is reminded of the symbol of time as portrayed by the shape of a shell.

What we acquire is innately connected to what we have inherited. The longer the duration of an aesthetic, the greater the need for change and contrast and it is this modification via modulation that represents the evolution of an idea. The process is not one that creates a new concept or undermines an accepted authority but rather one that aims to develop and prolong an already established orthodoxy.

There are many ports of call, some more distant than others. Accepting that complication is a matter of taste, our first excursion will be within the vicinity of our original point of departure. The most seamless of these are modulations to keys that differ by one alteration, i.e. keys C to G or C to F.

Cmaj	Dmin	Emin	Fmaj	Gmaj	Amin	Bdim
Gmaj	Amin	Bmin	Cmaj	Dmaj	Emin	F#dim
I	II	III	IV	V	VI	VII

Sounding chords that are in common with both keys, i.e and C and G will express tonal ambiguity. That is to say chords without F or F# will be supportive of both keys, in C they are I III V VI and in G they will be I II IV VI. Hearing chords not in common with the initial key defines a new direction. Chords that contain F will go to support the key of C, i.e. II IV VII. Chords that contain F# go to support the key of G, i.e. III V VII.

Three chord groups that establish levels of allegiance.

Pre modulatory group
II IV VII

Neutral modulatory group
Cmaj Gmaj Amin Emin

Post modulatory group
II IV VII.

Modulations from C major to G major

In these examples the first chord always represents the key of C major although there are occasions when it can also be heard as a degree of the new key. Nevertheless we will always regard it as part of the pre-modulatory group. From here the modulation is either indirect via harmonies that are shared by both tonalities, or direct via the post-modulatory group.

In example (a) the modulation is immediate, i.e. from C to V-I in G, the succeeding chords V-I and II are not regarded as shared or neutral because modulation to the key of G has already been completed. However because the first expression of V-I is not via chords in root position the modulation may need reassurance, hence the repetition of V-I in root position.

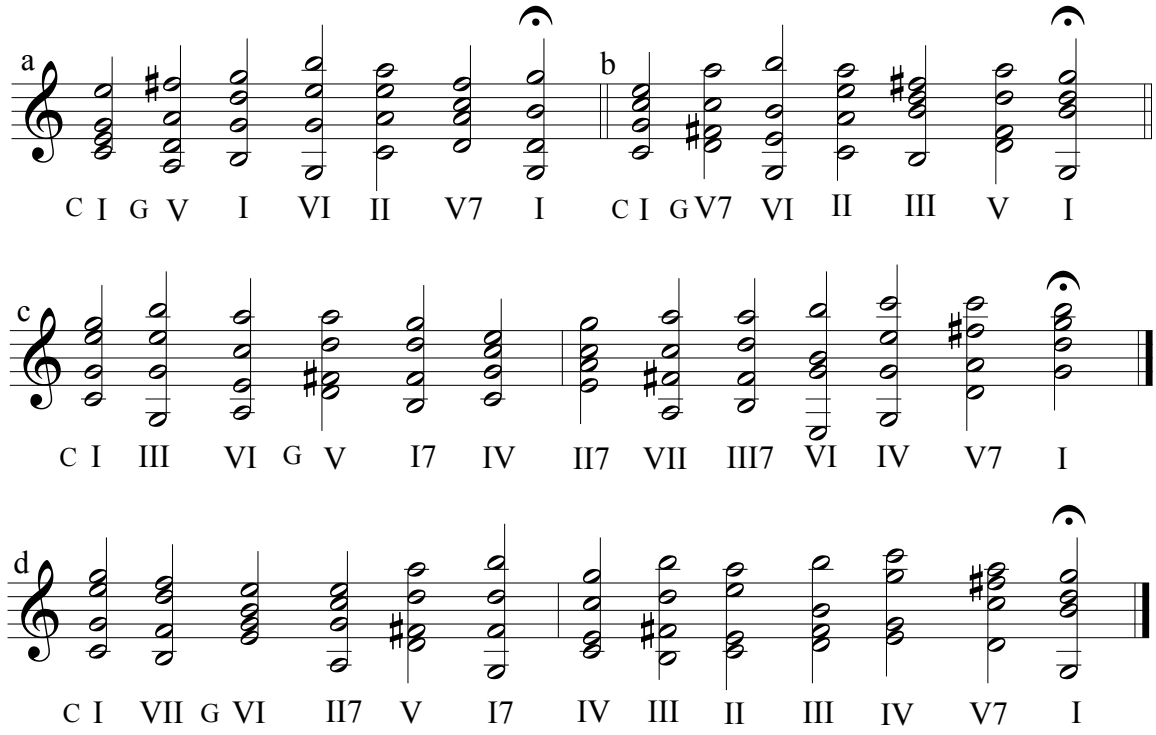
Example (b) modulation to G is immediate but less convincing than (a) as the V7 in root position is deceptive as it resolves to VI with its b3rd G in the bass, hinting at a I chord. The final cadence III-V-I is without 7ths although all are in root position presenting a sense of stability in its finality.

In (c) the neutral chords III-VI of C or VI-II of G are sounded before the V I7 where the I7 is not in root position and the 7th note finds resolve to G in IV. These procedures supply a level of unrest and in this way propel the progression forward. This modulation is assisted by the VI of C being interpreted as II in G with its root moving up a 4th to the V in root position, also as mentioned the I chord has its 3rd in the bass which belies the commitment to the new key although the 7th is reassuring in this regard. Note the deceptive cadence of II-VII to III7 with the VII and III chords being used as substitute for V and I7.

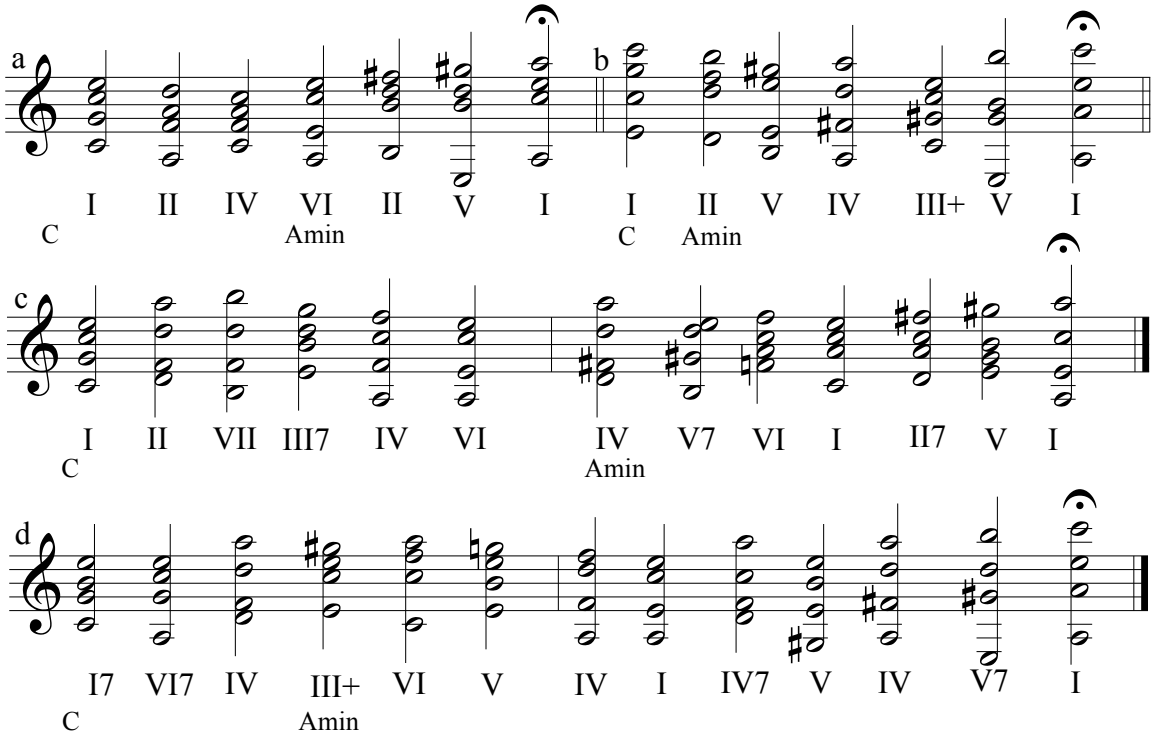
The IV chord in the 2nd bar is impossible to play with conventional fingering. The solution lies in arpeggiating the voicing from the highest note C to the lowest note with G sixth string being tapped by the index of the right hand. These techniques may appear unusual but advancement requires new approaches to be explored; creativity solves problems.

In (d) the first two chords are from C with the next two being regarded as neutral, here the VI and II7 of G could be the III and VI of C yet they are best heard as root movements in 4ths leading to a perfect cadence VI-II7-V-I7. Although the I has a 7th, suggesting that for a final chord it is somewhat restless, similar to (c). The root movement of IV-III and II-III successfully slows the progression before the final IV-V7-I.

Modulation C - G



Modulation C - Aminor



Intervalic Harmony

The method of traditional harmonic deduction is by the vertical stacking of intervals built in thirds. However there are many chords that exist even within a diatonic scale that cannot be easily evaluated using this system, like CDEb or CDBA. For these and for all harmonic evaluation analyses draws on the relationships determined by the overtone series. To extend this proposition to harmonic clusters such as the ones mentioned above, the root of a structure is assigned to the principle tone of its dominant interval.

When two concurrent tones are sounded they produce additional acoustic phenomena, called combination or resultant tones, RT. When organ builders seek a low frequency and have limited physical space and funds they sound two smaller pipes whose RT will give rise to the desired pitch.

When C_1 (256 vibrations per second) and G_1 (384 vibration per second) are sounded together they produce the RT of C (128) an octave below. This credits C as the dominant note in the interval of a 5th, C and G and if inverted as a 4th G and C the root still remains as C. The implication being that intervals with their roots on the bottom are more stable than those whose root is inverted.

Resultant Tones RT

By subtracting the vibration rate of one pitch from the vibration rate of another a resultant third tone is produced, RT, which is equal to the proportional difference between the two frequencies.

When one tone of the interval is doubled by this tone, either as a unison or an octave lower, or with some intervals both, it acknowledges the superiority of that tone over the other and is regarded as the root of that interval. Acoustically, lower frequencies carry more weight which express slower vibration rates by producing a slower movement of air.

Apart from the octave and 5th the boundaries of intervals, where they start and stop, increasingly becomes difficult to calculate. The minor third is a case in point where the frequency divide between a major 2nd, minor 3rd and a major 3rd is variable over the range of a few octaves. This inconsistency brings the theoretical and the practical into dispute. Fortunately however our aural perception of an intervals' size adjusts to these discrepancies and hears the intention of the tones.

Harmonic Tensions - HT

Harmonic significance is calculated first by the root tones of a chord as a consequence of determining the most consonant interval found within a structure. Convention tells us that the root tone is the principle tone of each chord that goes to form the degree of a progression that resolves to the tonic of a key. Traditionally these root tones support triads that have four qualities; major, minor, augmented and diminished with their harmonic tension increasing from the major to the diminished. We know this because the major and minor triads contain the strong harmonic interval of a perfect 5th. In comparison, the augmented and diminished triads include inferior harmonic intervals; altered 5ths. From our list of interval values we conclude that a major triad is more stable than the minor because it contains the superior interval of a major 3rd between the root and its 3rd, CEG. The minor triad contains a major 3rd between its 3rd and 5th EbG. In relation to the root the lower the most consonant interval is voiced the more stable the chord will be.

In comparing the harmonic constitution of triads with altered 5ths we refer again to the sequence of intervals conditioned by the RTs. The augmented triad has a major 3rd and an augmented 5th, which are more consonant than the diminished triad, which has the minor 3rd and a diminished 5th.

In this respect the degree of tension that a chord contains may be calculated. Similar to building materials and their strength to weight ratios that go to measure their suitability in regard to function and form.

Historically, harmony introduced 7ths and 9ths of both persuasions. These originally materialised as melodic formula but over time found their way into harmonic assemblage via relations with root tones.

The tritone interval defines a high degree of tension and as a result forms a specific species. These structures can extend their points of difference by the inclusion of one or more tritones, where they become the predominant interval in a chord.

These observations define the roots of chords and establish grouping of harmonic tension by way of evaluating harmonic tension. This also provides procedures that enable musicians to calculate degrees of harmonic tension from one chord to another, or a series of chords in a progressions.

Progressions from 12 NE of 3n

In example (a) seven of the 12 NE of 3n, (*book 9)* are used as source material and transposed to form the roots and chords of the progression. Each chord is assigned a number, no1 - 12, with the root of each chord enclosed in ( ). The cadence is a II-V-I with the V containing a tritone that is not resolved in conventional terms, although the I chord does have its root in the bass and is more consonant than the V.

In example (b) the same progression is used as (a) with a doubling of one of its notes to sound a four part harmony. Here the melody and voicings change but the root progression does not, note the VI-II-V-I cadence. In addition the G is given to indicate variation in harmonic tension expressed by the seven chords of the progression, G1 to G3.

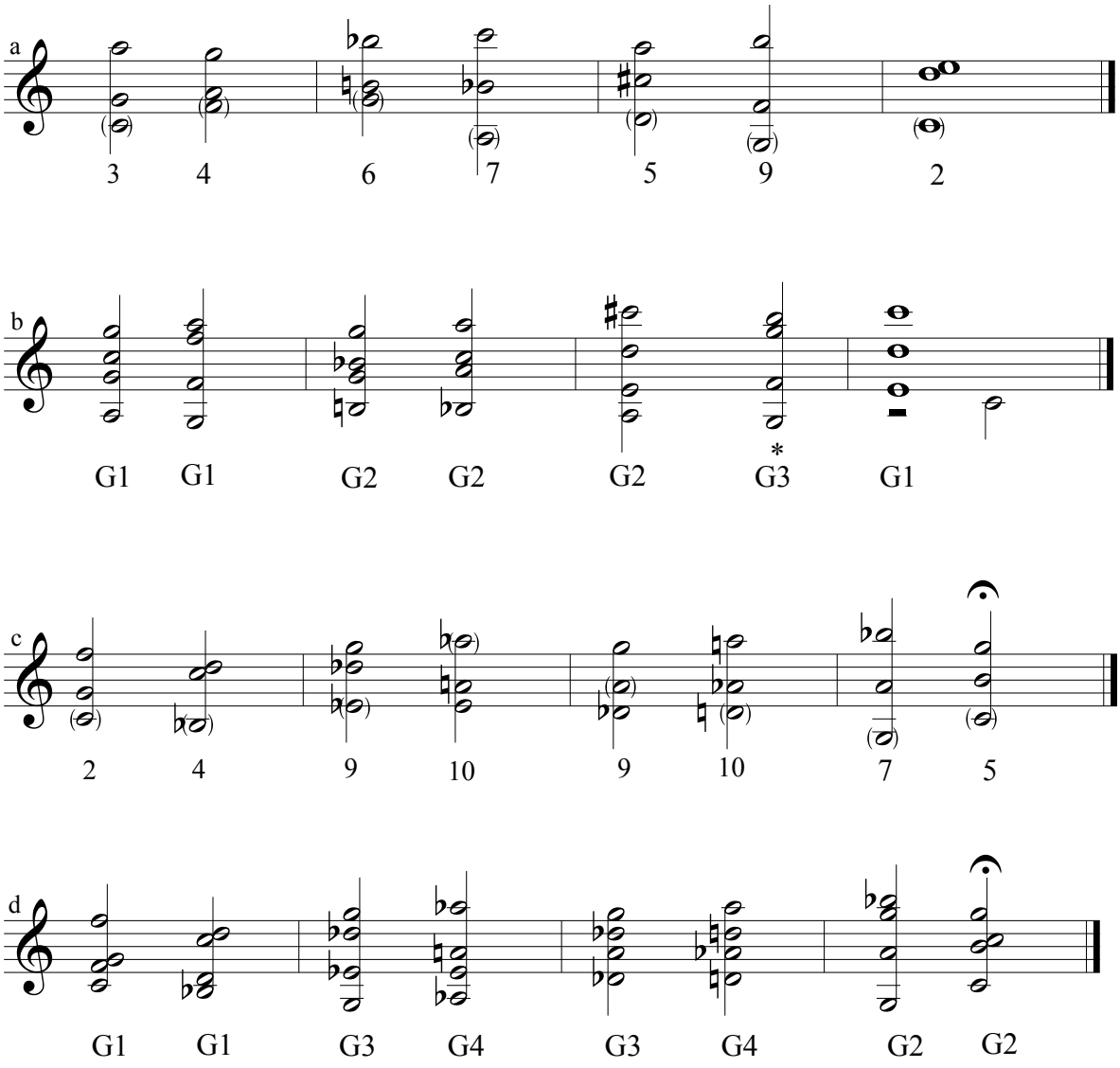
In (c) in bars 2 and 3 we find one tone from each tritone resolves by a semitone preferably to the root of the next chord, G to Ab in bar 2, or sustained, A to A in G4 to G3. In bar 3 Db resolves to D, and Ab to A in the penultimate V, similar to the traditional role of tritones in dominant 7ths.

In (d) the root progression CBbEbAbADGC initially indicates C minor with a modulation to C major in the final cadence. However apart from the roots and the first and last chords there is an uncertainty with regards to its tonal environment due to the variation between G1 to G4.

When the root is doubled as in the fourth chord, with one of its notes in the bass, the chord is tonally distinct. In this regard the other chords exchange forward motion when inverted by chromatic voice leading which serves to smooth out their sharpness and pulls the chords forward. There are always many forces at play in music and the diplomatic trade offs that occur go to define style, taste and the nuance of emotional character.

In the later developments of traditional harmony we found tonality became increasingly obscure. As a result, music became less reliant upon vertical construction and more dependent upon the horizontal plain, the melodic nature of voice leading. As the constant demands of music change so must the methods used to determine the validity of its processes and intervals offers a way of doing this. A by product of artistic necessity is the ever evolving technique of expression. In the musical journey being discussed here we find a broadening of the tonal and theoretical harmonic palette.

Progressions of 12 NE of 3n



* If the fingering is to expansive, tap the G bass note