Music Theory Unplugged
By Dr. David Salisbury

Functional Harmony Introduction

One aspect of music theory is the ability to analyse what is taking place in the music in order to be able to more fully understand the music. This helps with performing the music because as a player you then can follow the logic of the music. Also it give musicians knowledge into the inner workings of music and enables them to then apply this information in their own music. One of the ways in which we analyse contemporary music is by using by designating chords to certain functions, which is why we call this system functional harmony.

1.1 Functional Harmony

Functional harmony relates to the way in which chords interact and we have three categories that all of the chords in a tonal series fall into. We have already introduced terms such as tonic and dominant. These are two of the three functional categories of harmony. The third category is sub-dominant and it is how each category or area of harmonic character creates certain conditions or expectations in the ear of the listener that gives us a basis to analyse a series of chords or chord progression. In contemporary music, in contrast to classical music which focuses on melodic structures as the main compositional tool, we use chords and chord progression as the main compositional tool or focus. So it is easy to see as we have already established the prominence of tonic as a main focus in the organisation of music that the first and foremost category of harmonic function is known as tonic function.

1.1.1 Tonic Function

The tonic function has the same main characteristic as the tonic pitch that is resting or resolution. This often means the conclusion of a music thought, sentence or phrase and in this case series of chords. In the ‘C’ Ionian Modal Scale as outlined in previous chapters there is a chord built on each degree of the series (Example 2.13) and if we take the chords built on the first, third and sixth degrees we get a relationship as displayed in (Example 3.0).
In (Example 3.0) the relationships to the tonic chord are clearly seen. The chord built on the third degree Em7 contains three of the four notes found in the original tonic chord CMa7 in fact the upper three notes ‘E’, ‘G’, ‘B’. The chord built on the sixth degree Am7 also contains three of the four notes found in the original tonic chord CMa7, this time the three lower notes ‘C’, ‘E’, ‘G’ actually the ‘C’ Major Triad. What this means is that these three chords have similar characteristics that allow for a level of interchangeability or chord substitution. If a chord progression went Fma7, G7, CMa7, then potentially it is possible to substitute one of the other tonic function chords for the CMa7, ending with either Fma7, G7, Em7 or Fma7,G7,Am7. This is a very simple example and not necessarily a satisfying solution but a plausible one. The Fma7,G7,Am7 substitution sounds more final than the Fma7, G7, Em7 substitution but both are acceptable. This brings us to subdominant functioning chords.

1.1.2 Subdominant Function

The subdominant functioning chord has a function of action, unrest or leading to another chord. Often a subdominant functioning chord will lead to a dominant functioning chord. Similar to the tonic functioning chords there are two subdominant functioning chords which are built on the second and fourth degrees of the Ionian Modal Scale. To go back to our ‘C’ Ionian Modal Scale and building seventh chords on both degrees we get the following (see Example 3.1).
Music Theory Unplugged
By Dr. David Salisbury

(Example 3.1)

As you can see again there are three common tones between the chords. If we then use our previous chord progressions only this time add a resolution back to the tonic chord CMa7 the following progression are possible: Dm7, G7, CMa7 or Dm7, G7, Em7 and Dm7, G7, Am7 FMa7, G7, CMa7 or FMa7, G7, Em7 and FMa7, G7, Am7.

One of the elements that gives these chords a level of unrest is the fact that the fourth degree of the ‘C’ Ionian Modal Scale is either the tonic of the FMa7 chord or the third of the Dm7 chord. This is significant because the fourth degree sit only a semi-tone above the third of the tonal centre of the ‘C’ series. The significance of this is the fact that this pitch creates a dissonance with the resting harmony of the tonal centre chord. This brings us to the chords with dominant function.

1.1.3 Dominant Function

The dominant functioning chord is the most active or unrestful and usually leads to a resolution. Often a dominant functioning chord will lead to the tonal centre chord, tonic functioning chords or another dominant functioning chord. There are two dominant functioning chords which are built on the fifth and seventh degrees of the Ionian Modal Scale. To go back to our ‘C’ Ionian Modal Scale and building seventh chords on both degrees we get the following (see Example 3.2).
Music Theory Unplugged  
By Dr. David Salisbury

(Example 3.2)
Once more there are three common tones between the two chords. If we still use our previous chord progressions and substitute the alternate dominant functioning chord we can generate the following possibilities:

- **Dm7, Bm7b5, CMa7 or Dm7, Bm7b5, Em7 and Dm7, Bm7b5, Am7**
- **Dm7, G7, CMa7 or Dm7, G7, Em7 and Dm7, G7, Am7**
- **FMa7, Bm7b5, CMa7 or FMa7, Bm7b5, Em7 and FMa7, Bm7b5, Am7**
- **FMa7, G7, CMa7 or FMa7, G7, Em7 and FMa7, G7, Am7**

In summary there are three main functional areas in contemporary harmony: **tonic** – utilising three chords built on the **first**, **third** and **sixth** degrees of the **Ionian Modal Scale**, the **subdominant** – built on the **second** and **fourth** degrees and the **dominant** – built on the **fifth** and **seventh** degrees. This brings to level of analysis that we call **roman numeral analysis**.

### 1.2 Roman Numeral Analysis

The use of **roman numeral analysis** has been well established in classical theory. The difference is that classical theory uses upper and lower case roman numerals to differentiate between major and minor chord structures. In contemporary theory we use only upper case roman numerals but add the qualifying information with it. An example would be the **subdominant functioning chords** (see Example 3.3).
In (Example 3.3) the Dm7 chord uses an upper case roman numeral but also shows that it is a minor seventh chord with the inclusion of the (m7) next to the roman numeral II. Similarly the FMa7 chord uses an upper case roman numeral and also includes the (Ma7) next to the roman numeral IV.

Let us just digression here about chord symbols. There are many systems of chord symbols but there is always one good rule to follow and that is the most clearly understood system is the better system to use. For example there is a system of chord symbols that use a (–) minus sign to indicate minor but if hand written quickly or placed to close to the (7) on a seventh chord might be mistaken to lower the seventh of the chord only or not even recognised at all with possible disastrous results during a performance.

Therefore common practice shows the usage of Min, min, Mi, mi and even a lower case (m) to be acceptable ways to indicate a minor chord. It must be noted though that the use of the lower case (m) begins to move back to a similar situation as with the (–) minus sign because the intent of the composer or arranger may be misunderstood to the quality of calligraphy.

Similarly it is common to see Maj, Ma and M for a major chord even though some still use (Δ) a triangle to indicate a major seventh chord. However it is still common practice to use a (+) plus sign to indicate an Augment chord such as G+7, which is a G Augmented Triad with a Minor Seventh.

To continue with our discussion on roman numerals, if we attach a roman numeral to the chords built on each degree of an Ionian Modal Scale we would get the following result (see Example 3.4).
Now that we have established the basics of roman numerals and the categories of each of the chords within the Ionian Modal Scale series, we can move on to diatonic analysis.

1.2.1 Diatonic Analysis

Another term that is used consistently in classical and contemporary music theory is the term diatonic. One internet site defines diatonic in the following fashion:

'We (Greek ancients) tune panpipes in the lydian and hyper-lydian modes. That is because more tunes are composed in those two modes than in the seven other modes combined. We created the modes by dividing the octave into two relatively equal perfect 4\textsuperscript{th} intervals known as tetrachords. The tonic and fourth tones hold the melodic importance in our music because they define the tetra chord the way your tonic and octave tones define your scale. We realized the octave via the doubling of the tetra chord. The octave is of value to us in that it contains two tetra chords … The (Genera) Diatonic has the form of two whole-tones and a semitone’

(http://www.pan-pipes.com/Greek_Ancient_Modes%A0.htm)

If we refer back to (Example 1.18) in Chapter I the following series was presented:

\[ \begin{align*}
\text{C} & \quad \text{D} & \quad \text{E} & \quad \text{F} & \quad \text{G} & \quad \text{A} & \quad \text{B} & \quad \text{C} \\
\text{C} & \quad \text{D} & \quad \text{E} & \quad \text{F} & \quad \text{G} & \quad \text{A} & \quad \text{B} & \quad \text{C} \\
\end{align*} \]

If you split the above series into two groups of four letters you have the basis of the diatonic system, or to put it another way two whole tones and one semi-tone, that result in the following grouping of two tetrachords (see Example 3.5).

\[ \begin{align*}
\text{C} & \quad \text{D} & \quad \text{E} & \quad \text{F} & \quad \text{G} & \quad \text{A} & \quad \text{B} & \quad \text{C} \\
\text{Tetrachord} & \quad \text{Tetrachord} \\
\end{align*} \]

Another definition of diatonic has to do with Pythagoras and the overtone series mentioned in Chapter 1. In order to assess each interval, the measurement of distance has to involve two pitches or tones (di a = dual and tonas = tone). In the framework described above diatonic analysis simply means the ability to analyse chordal and melodic structures that normally occur in the Ionian Modal Scale system. Therefore if all the musical material stays with in the diatonic system it will fall into the functional and roman numeral categories already established. In summary we are still discussing terminology and the main fact here is that we have an established system of nomenclature or terms and measurements, in this case distances. The example below shows the analysis of a traditional tune ‘Lord Randall’ with
roman numeral analysis in italics below the melody with the chord symbols above the melody and the functional analysis below the roman numerals in parenthesis (see Example 3.6).

(Example 3.6)

Example 3.6 above shows all the necessary information for a musician to translate into a performance. Although the lyrics are not indicated the melody is clearly represented along with the chord symbols. The analysis shows that all of the chords stay within the ‘C’ Ionian Modal Scale series or ‘C’ diatonic system. Notice that all three tonic chords are used in this song. No sooner have we established diatonic analysis and then we find that we have chords that don’t occur in the diatonic system such as the bVII Major 7 chord. This is due to the fact that contemporary music tends to borrow from all modal scales in any musical situation. This brings to our first non-diatonic chord the bVII Ma7.
1.2.2 Non-Diatonic Chords (bVII Major 7)

The first non-diatonic chord that will be introduced is the bVII\textsuperscript{Ma7}, which is a chord that is based on the VII\textsuperscript{m7b5} chord introduced earlier in this chapter. If you recall the VII\textsuperscript{m7b5} contains the pitches ‘B’, ‘D’, ‘F’ and ‘A’, which contains a diminished triad with a minor seventh. However if we lower the root pitch or bottom pitch of this chord by a semi-tone the result would be ‘Bb’, ‘D’, ‘F’ and ‘A’ with the following outcome (see Example 3.7).

\begin{example}
\begin{align*}
\text{(Bm7b5)} & \quad \text{(BbMa7)} \\
A & \quad A \\
\text{M3} & \quad \text{M3} \\
F & \quad F \\
\text{m3} & \quad \text{M7} \\
\text{D5} & \quad \text{D} \\
>\text{m3} & \quad \text{m3} \\
\text{D} & \quad \text{D} \\
>\text{m3} & \quad \text{Bb} \\
\text{B} & \quad \text{B}
\end{align*}
\end{example}

Note that in (Example 3.7) the roman numeral analysis reflects the lowered root or bottom note in other words instead of being a normal seventh degree VII it is now a flat seventh degree bVII. In this way we still have the three top notes of the original chord ‘D’, ‘F’ and ‘A’ in both chords but a ‘B’ natural in the VII\textsuperscript{m7b5} and a ‘Bb’ in the bVII\textsuperscript{Ma7}. This changes the quality of the chord from a diminished quality to a major quality and although it weakens the leading tone resolution there is still a strong resolution tendency. To conclude although we have built another type of chord on the seventh degree it is quite acceptable to use these types of chords in contemporary music practice.

There are other non-diatonic chords commonly used in contemporary music that would involve us in an extended discussion, but this will take place in a later chapter. Now that we have established the relationship of chords in a
Music Theory Unplugged
By Dr. David Salisbury

diatonic system let’s see how they can work in other ways in chord progressions. In order to do this we must first introduce the concept of chord inversions.

1.3 Chord Inversions
We have already discussed the concept of inverting intervals but now we will apply it to chord structures. The reason for this is so that we can adjust chords in a progression to move more smoothly from one chord to another and to help the range of some of the chords to help the harmony and ultimately voice leading.

1.3.1 Root Position
So far all of the chords presented in this and chapter two have been in root position. If you recall in chapter two each note in a chord had a label such as tonic, third, fifth, sixth and seventh and when the tonic is the bottom note we say it is in root position. In other words the bottom note of the chord is the root note that the chord is based or built on. In the ‘C’ Ionian Modal Scale the root notes or tonics of each chord in the series correspond with each degree of the modal scale: ‘C’, ‘D’, ‘E’, ‘F’, ‘G’, ‘A’, ‘B’, are the roots or tonics for all of the chords built in the series as was shown in (Example 3.41). This brings us to the next type of chord structure the first inversion chord.

1.3.2 First (1st) Inversion Chords
If instead we place the third of the chord on the bottom and build the rest of the chord tones above it we then have a first inversion chord using the ‘C’ Ionian Modal Scale we get the following results (see Example 3.8).

![Example 3.8](image)

Note that in (Example 3.8) the chord symbol reflects the inversion by showing the name and quality of the chord (CMa7) and then the bottom or bass note after the slash (/ E). In this way we are telling the rhythm players what the chord is and the bass player what note to play underneath the chord. However the roman numeral analysis does not need to reflect this as we are only identifying the name and quality of the chord in roman numeral analysis. To relate this back to intervallic inversions another aspect of this inverted chord is that we have inverted the original bottom note or tonic/root of the
chord ‘C’ up an octave in relation the third of the chord ‘E’, which is now the bottom note of the chord. Now the interval that was a major third from ‘C’ – ‘E’ is a minor sixth from ‘E’ – ‘C’, so that the structure of the chord has the following intervallic attributes (see Example 3.9).

It is also important to point out that after we are no longer in root position that there is now a major second or minor second interval in the structure due to the distance of the seventh degree to the octave. In addition there are also a perfect fourth and a minor sixth intervals in the chord structure Another tip for future analysis is that if you are looking for the tonic/root of the chord it will be the top note of a major second or minor second pairing in a seventh chord. Now that we have established the fact that a chord can be built on any of the notes contained within it let’s go on to second inversion chords.

1.3.3 Second (2nd) Inversion Chords
Just as we built the first inversion chords on the third of the chord second inversion chords are built on the fifth of the chord. Similarly we are just inverting the previous bottom note up an octave with the following results (see Example 3.10).

Again in the second inversion chord structure the same principles apply. The previous bottom note in the first inversion chord structure, the third of the chord is now inverted up an octave in relation to the fifth of the chord, which is now the bottom note of the chord structure (see Example 3.11).
As in the \textit{first inversion chord} the \textit{second inversion chord} has some interesting aspects to it in the case of the \textit{major seventh} chord shown above. Although there is still a \textit{minor} second there is no longer a \textit{perfect fifth} in the structure but instead two \textit{perfect fourths} and there is no longer a \textit{minor third} but instead two \textit{major thirds} as well as a \textit{major sixth}. This brings to the final inversion category, the \textit{third inversion chord} structure.

\subsection*{1.3.4 Third (3\textsuperscript{rd}) Inversion Chord Structure}

As in the \textit{second inversion chord} structure the same principles apply to the \textit{third inversion chord} structure. The previous bottom note in the \textit{second inversion chord} structure, the \textit{fifth} of the chord is now inverted up an octave in relation to the \textit{seventh} of the chord, which is now the bottom note of the chord structure (see Example 3.12).

\begin{center}
\includegraphics[width=\textwidth]{example3.12.png}
\end{center}

(Example 3.12)

Again the \textit{roman numeral} analysis only reflects the original quality of the chord and does not reflect the inversion. However the chord symbols now reflect that these are \textit{third inversion chords} with the new bass note after the slash (/) in this case the \textit{seventh} of the chord structure. There are also some subtle changes in the intervals contained within the \textit{third inversion chords} (see Example 3.13).

\begin{center}
\includegraphics[width=0.5\textwidth]{example3.13.png}
\end{center}

(CMa7/B)
(Example 3.13)

In the above chord structure the **perfect fifth** has returned as well as the **minor third** and **minor sixth**. This completes our discussion regarding inversion of chord structures except to say that each of these chords has its own unique quality due to the intervals contained within them and the bottom or bass note that each is built upon. Experiment with these possibilities as contemporary music uses these structures quite extensively. In particular is the usage of **first inversion chord** structures as an approach to a resolution chord, which will be explained at length in a later chapter. Now that we have established the necessary elements needed we can now move on to **voice leading techniques**.