

Practical young composers, unless working with electronic media, are well advised to use rhythmic devices which will intrigue but not discourage the players who are available to perform their music. Excessively difficult rhythms are an insurmountable barrier to group performance by any but the most expert and experienced players. Besides, some of the most effective rhythms are those which make only minor but striking departures from convention.

### *Suggested Assignments*

1. Locate and copy examples illustrating the categories of contemporary rhythm discussed in this chapter. Analyze the phrase structures of the longer examples.
2. Write a paper describing and categorizing the rhythmic procedures in a contemporary work you have played or sung. Illustrate your comments with appropriate examples.
3. Write a melody with nonmetric rhythm similar in style to Examples 69 and 70.
4. Write an exercise in which accents shift in relation to the bar lines and/or beats.
5. Write an exercise in an asymmetric meter.
6. Write an exercise in which time changes are exploited as a characteristic feature.
7. Write an exercise featuring added values in an ametrical context.
8. Compose a piece for a percussion instrument or ensemble in which frequent tempo changes are accomplished by means of metric modulation.
9. Compose a short piece exploring a variety of contemporary rhythmic devices.
10. For additional reading on rhythm see Paul Creston's book *Principles of Rhythm* (Franco Colombo, 1964).

## Chord Structure

CHORD structure is the vertical arrangement of notes sounding simultaneously. Harmonic sounds rarely occur in isolation, but a thorough understanding of chord structure is necessary before considering the more complicated problem of harmonic progression. Knowledge of conventional chord structures, including all of the triads and seventh chords with their inversions and alterations, is presumed. This chapter is concerned with the more complex sonorities required to express most contemporary musical ideas. This need, and not the search for novelty which is sometimes suspected, has caused the tremendous expansion in the harmonic vocabulary of our time.

When first hearing music in advanced twentieth-century harmonic idioms, one sometimes gets the impression that modern composers have severed all ties with tradition and the traditional music which makes up the bulk of concert programs, broadcasts, and recordings. This break is more apparent than real. The development of harmonic resources has followed a consistent course of exploiting higher and higher elements of the overtone series. In this respect contemporary composers are merely continuing a process that started with organum and magadizing and led successively to triads and chords of the seventh, ninth, eleventh, thirteenth, and beyond. The enrichment of harmonic resources through the successive inclusion of higher members of the overtone series is shown in the following example.

Though more complex chords were used sporadically before the turn of the century, the most active chord fully accepted was the dominant seventh, which is produced by the first seven tones of the overtone series. Within two decades sonorities comprising the most remote relationships were an integral part of every composer's harmonic language. The speed with which new sounds were introduced obscured the fact that they were the inevitable result of the evolutionary process. It is worth noting that

even relatively simple dissonant chords such as the dominant minor ninth involve tonal relationships which do not exist within the first sixteen overtones.

#### Ex. 95 OVERTONE SERIES

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Triad

Seventh

Ninth

Eleventh

Thirteenth

The pitches of some overtones, seven and eleven among them, are only approximated in equally tempered tuning, but because of its practical advantages equal temperament has been adopted universally, at least as far as keyboard instruments and notation are concerned. One advantage of equal temperament is that it permits the use of enharmonic spellings to facilitate reading and as used in this chapter, to simplify analysis.

In the following examples representative chord structures selected from twentieth-century works are given, usually in brief context. When required to make the underlying chord structure more apparent, the components are arranged in root position with close spacing and enharmonic spellings. Corresponding numbers identify the chords under consideration and their simplified versions shown in whole notes. This type of analysis and description is used in the absence of any convenient, standard terminology for modern chord formations.

#### *Superimposed Thirds (skyscraper chords; upper etc.)*

Contemporary chords built in thirds are most closely related to conventional harmonies since they continue the process by which triads and

seventh chords are constructed, superimposition of thirds. The study of conventional harmony usually encompasses all diatonic triad and seventh chord structures in major and minor keys though some of them, such as minor and augmented triads with major sevenths, are rare in traditional music. Chromatic alteration was used prior to the present century to make various chord structures available on each degree of the scale but not to create new harmonic formations.

Chromatic alteration of the notes in conventional seventh chords can produce new structures like that of the first chord in Example 96. Observe how effectively this chord progresses to the dominant seventh.<sup>1</sup> The B-flat in the last chord of the example appears in the score as a B-flat and also enharmonically as an A-sharp. Either way it is an unconventional spelling of a familiar sound.

#### Ex. 96 BARTOK: *Piano Concerto No. 3* (1945) p10

Copyright 1947 by Boosey & Hawkes, Ltd. Reprinted by permission of Boosey & Hawkes, Inc.

There are several other possibilities for seventh chord structures which do not occur diatonically. One favored by Gershwin consists of a diminished triad with a major seventh. Unfortunately, examples from Gershwin cannot be given because of copyright restrictions.

The addition of a third above the seventh produces a ninth chord. This structure was first used on the fifth degree of the scale, that is, as a dominant ninth. It soon became common on other scale degrees. Dia-tonically, the ninth of the dominant is major in major keys and minor in minor keys. Both forms figured prominently in early twentieth-century music, especially in the music of impressionist composers. Example 97 shows the dominant major ninth structure in its most usual arrangement, with the root in the bass and the ninth in the soprano.

1. Dominant seventh in this sense denotes a chord structure of a major triad and a minor seventh, not dominant function in a key.

Ex. 97 DEBUSSY: *Pelleas and Melisande* (1902) p7

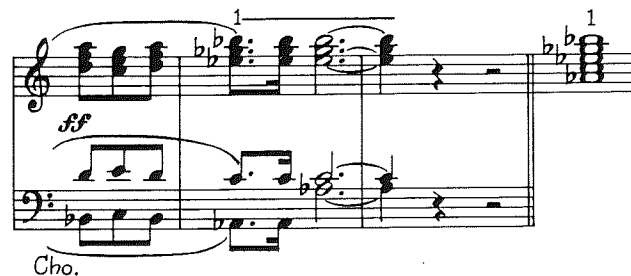
Copyright 1902 and 1907, Durand & Cie, Paris. Used by permission of the publisher. Elkan-Vogel, Inc., Sole Representative, U.S.A.

Other inversions and positions of ninth chords, such as those shown in Example 98, are not uncommon. Each chord contains a ninth, but probably only the one in the first and third measures would be perceived as a ninth chord. The one in the second measure is more apt to be heard as a whole-tone dominant seventh on A.

Ex. 98 DEBUSSY: *Pelleas and Melisande* (1902) p78

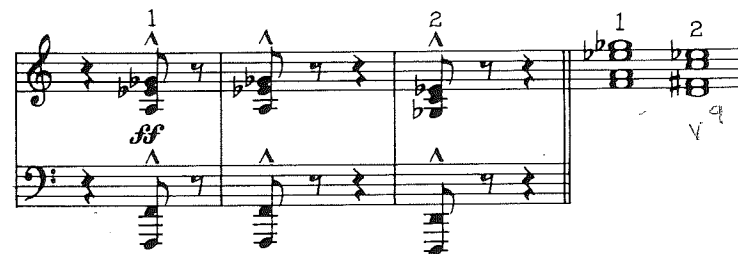
Copyright 1902 and 1907, Durand & Cie, Paris. Used by permission of the publisher. Elkan-Vogel, Inc., Sole Representative, U.S.A.

The next example, from a nonimpressionist choral work, shows a major seventh chord progressing to a major ninth chord.

Ex. 99 KODALY: *Te Deum* (1936) p8

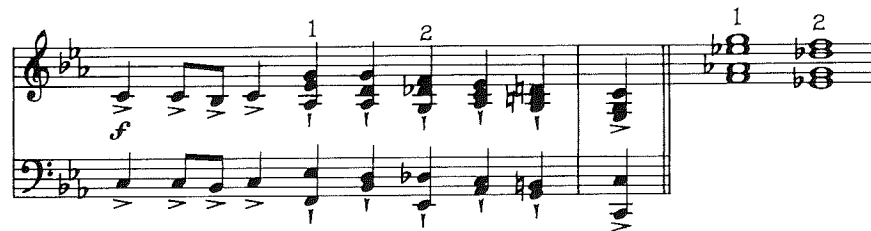
Copyright 1937 by Universal Edition, London. Used by permission of the publisher. Theodore Presser Company, Sole Representative, U.S.A., Canada and Mexico.

The dominant minor ninth is illustrated in Example 100. The last chord has the third spelled enharmonically as G-flat. The fifths of ninth chords are frequently omitted, as they are here.

Ex. 100 BLOCH: *Violin Sonata No. 1* (1920) p60

Copyright 1922 by G. Schirmer, Inc. Printed by permission.

Ninths are added to chord structures other than the dominant seventh. Example 101 has two ninth chords, the first with a minor third.

Ex. 101 TCHEREPNIN: *Bagatelles, Op. 5 No. 1* (1918)

International Music Company

The harmonic implication of the first measure in Example 102 seems to be a ninth chord on F-sharp. Though the notes do not occur simultaneously, all appear and only the D-sharp is foreign to this chord. A dominant ninth on E and its resolution occupy the second measure, with the C-sharp sounding like a free anticipation or a thirteenth.

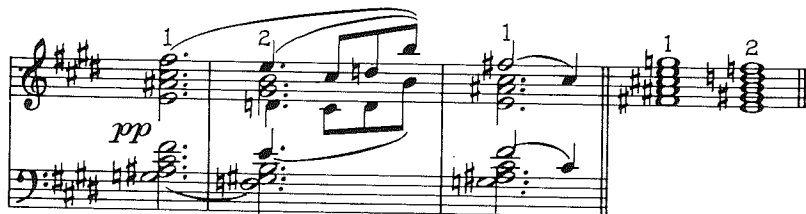
Ex. 102 RAVEL: *Piano Sonatine* (1905) p3



Copyright 1905, Durand & Cie, Paris. Used by permission of the publisher. Elkan-Vogel, Inc., Sole Representative, U.S.A.

Ninth chords frequently appear in passages where tonality is vague. In such passages they gain in interest and in freedom of progression. Ninth chords contribute to the dissipation of tonality when they do not resolve in a conventional manner. This is especially true when they progress by parallel motion to another ninth chord. Example 103 illustrates this usage.

Ex. 103 DEBUSSY: *Piano Preludes, Book II No. 2—Feuilles Mortes* (1913)



Copyright 1913, Durand & Cie, Paris. Used by permission of the publisher. Elkan-Vogel, Inc., Sole Representative, U.S.A.

The ninth chord on C-sharp in Example 104 has the structure but not the function of a dominant. The G-sharp minor chord following it has a ninth, A-sharp, but technically is not a ninth chord, because it lacks a seventh.

Ex. 104 HANSON: *Lament for Beowulf* (1925) p36



Copyright © 1925 by Carl Fischer, Inc., New York. Copyright renewed. International copyright secured. All rights reserved. Used by permission of Carl Fischer, Inc., New York.

When the fifth of a major ninth chord is lowered a semitone, a whole-tone ninth chord like the one in Example 105 results. The lowered fifth, D-flat, is also written enharmonically as C-sharp.

Ex. 105 DEBUSSY: *Piano Preludes, Book II No. 10—Canope* (1913)



Copyright 1913, Durand & Cie, Paris. Used by permission of the publisher. Elkan-Vogel, Inc., Sole Representative, U.S.A.

Ninth chords, especially nondominant ninths, can be spaced in ways that obscure their underlying structure, as in Example 106. The ear can scarcely detect the tertial derivation of these sonorities. The perception of chord 2 as a ninth chord is complicated by the major seventh and the omission of the third.

Ex. 106 RAVEL: *Piano Concerto in G* (1931) p95



Copyright 1931, Durand & Cie, Paris Used by permission of the publisher. Elkan-Vogel, Inc., Sole Representative, U.S.A.

The examples show only a few of the many possible ninth chords. Major and minor ninths can be added to all of the seventh chord structures, both diatonic and altered. The dominant ninth was the first to be incorporated into the harmonic vocabulary, but its value to serious composers is impaired by popular connotations and triteness. The pungent sounds of other less hackneyed ninth chord forms are still capable of expressiveness, even to jaded twentieth-century ears, when used with imagination.

The addition of another third above a ninth produces an eleventh chord. Like ninth chords, eleventh chords first appeared on the fifth degree of the scale as dominants, but subsequently were employed on other scale degrees and in other forms. Example 107 is a strong, tonal cadence in C-major with a supertonic eleventh and a dominant eleventh progressing to a tonic with an added sixth. The spacing of the score is preserved in the reduction.

Ex. 107 STRAVINSKY: *Petrouchka* (1911) p56



Copyright by Edition Russe de Musique. Copyright assigned to Boosey & Hawkes, Inc. Revised Edition Copyright 1947 by Boosey & Hawkes, Inc. Reprinted by permission.

The elevenths in the preceding example are diatonic, but the sharp or augmented eleventh is more resonant. Actually, the pitch of the eleventh tone of the overtone series is between that of the diatonic and augmented eleventh in equal temperament. Example 108 has the augmented eleventh with a minor ninth, written enharmonically as C-sharp in the violin part for easier reading. The omission of the chord fifth in this example and in similar structures does not alter the sound appreciably.

Ex. 108 BLOCH: *Violin Sonata No. 1* (1920) p23



Copyright 1922 by G. Schirmer, Inc. Printed by permission.

The examples illustrate typical eleventh chords, but elevenths can be added to all of the ninth chord structures. Experimentation will reveal which alterations, spacing, and inversions are most effective.

Continuing the process of chord building in thirds leads ultimately to thirteenth chords, which have one more third than eleventh chords. A diatonic thirteenth chord contains every note of the scale, but more often than not there is some chromatic alteration. A thirteenth chord with an augmented eleventh, illustrated in Example 109, is a common form.

Ex. 109 RAVEL: *Piano Concerto in G* (1931) p73

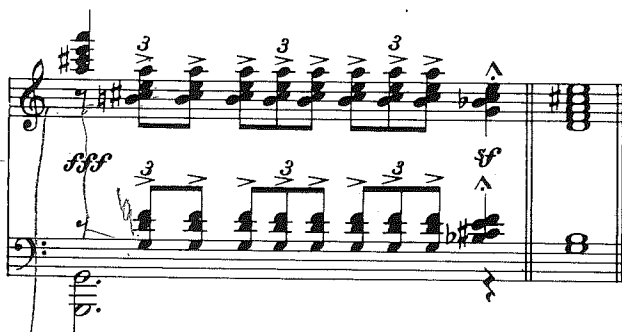


Copyright 1931, Durand & Cie, Paris. Used by permission of the publisher. Elkan-Vogel, Inc., Sole Representative, U.S.A.

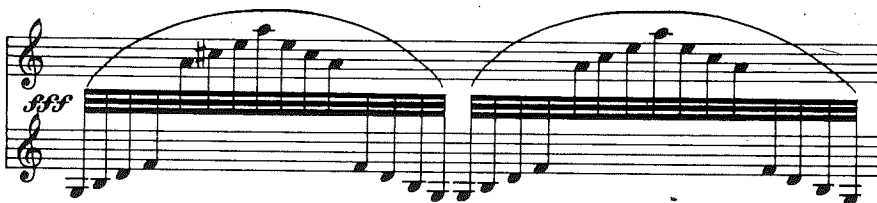
Bloch utilizes an identical structure in his *Violin Sonata*. Three versions of the same basic chord are illustrated in Example 110. The first and second are from adjoining passages; the third from the following movement.

Ex. 110 BLOCH: *Violin Sonata No. 1* (1920)

a. p42



b. p43



c. p49



Copyright 1922 by G. Schirmer, Inc. Printed by permission.

As with the other tertial sonorities, thirteenths can be added to all of the chord structures previously considered. Inclusion of seven tones in a single chord allows almost infinite variation in spacing, inversion, and alteration producing many degrees of resonance and dissonance. Since a thirteenth chord consists of a complete circle of thirds, any tonal member may be considered the root from a standpoint of abstract structure. For this reason the true root can be determined only on the basis of the sound. Consequently the bass most often is perceived as the root when thirds predominate in the spacing. When the chord members are arranged to emphasize seconds and fourths, which is equally possible, the same notes may be quite lacking in tertial implication.

The tone a third above the thirteenth is a duplication of the root two octaves higher. To construct chords in thirds beyond the thirteenth, one must resort to double inflections. That is, a natural note and the same note with a flat or sharp must be used. (Double inflections are not uncommon) but tertial sonorities with all seven tones plus double inflections are extremely rare and of limited usefulness. They are found in isolated passages of a few works such as Gershwin's *Porgy and Bess*.

Students accustomed to writing within the bounds of academic harmony discover a new and exciting realm in ninth, eleventh, and thirteenth chords. This threshold is not crossed without forfeiting some advantages of simple chord structures. The essential characteristics of conventional chords remain intact through a wide range of inversions, spacings, and doublings. This is less true of even slightly more dissonant harmonies. Formulation of precise rules applicable to all complex sonorities is not possible, but the overtone series provides a convenient and generally valid guide. Complicated chords are most resonant in root position with wider intervals below and narrower intervals above, as they occur in the overtone series. Within this spacing greater resonance results when the lower partials of the chord root are toward the bass and the higher partials are toward the soprano, approximating their location in the series. Other arrangements tend to inhibit the resonance and sharpen the dissonance of any tonal combination. Distributing chord members according to the overtone series is merely a rule of thumb, not an inviolable principle. Unusual inversions and spacings are required on occasion to produce a desired effect. In the final analysis composers rely on their ears, imagination, and taste in these matters as in all compositional decisions.

Chords of more than four tones, not counting octave doublings, are inclined to be thick and cumbersome, and nothing palls faster than a composition overladen with ninth, eleventh, and thirteenth chords. A more serious problem is that such chords virtually eliminate the possibility of vigorous counterpoint. Every note of a seven-tone scale is contained in a

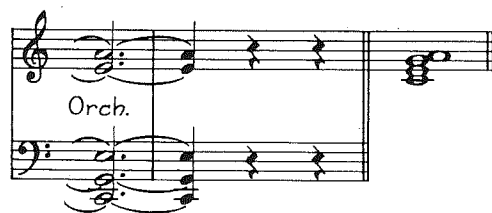
thirteenth chord, so melodic lines within the key can only go from one chord tone to another. Notes outside the key, being no more than a semitone from one of the chord tones, merely sound like neighboring tones. Because of these limitations, such lush sounds have long been out of vogue. Related sonorities which preserve their advantages and avoid their shortcomings are better suited to modern requirements.

### Chords of Addition and Omission

These apparently contradictory terms are applied to a group of closely related sonorities. Many of the chords falling in these classifications may be analyzed in either way, depending upon the point of view, as will be shown in the analysis. A simple chord to which is added one or more notes normally foreign but used as an integral part of the sonority is designated a *chord of addition*. A more complex chord from which one or more normally essential elements is omitted is designated a *chord of omission*. Added and omitted notes are identified by the interval above the root of the basic chord.

The most obvious example of a *chord of addition* is the *tonic added sixth*, the chord on which *The Song of the Earth* ends.

Ex. 111 MAHLER: *The Song of the Earth* (1908) p159



Copyright 1911 by Universal Edition, Vienna; renewed 1939 by Alma Mahler Werfel. Used by permission of the publisher, Theodore Presser Company, Sole Representative, U.S.A., Canada and Mexico.

A supertonic seventh chord in the first inversion has the same structure as a tonic added sixth, but when the function is clearly tonic as in the preceding example, the only plausible analysis is as a chord of addition. The tonic added sixth has been appropriated by composers and arrangers of popular music, but it is still a valid manifestation of a process by which many other sonorities are constructed.

Triads with added seconds are also found in popular music, but their popular connotations are less disqualifying. The half-note chord in the following example could be analyzed as a ninth chord with the seventh omitted, but analyzing it as a major triad with an added second (ninth) seems preferable. The omission of the seventh significantly alters the effect of a ninth. If, on the other hand, the fifth were omitted instead of the seventh, the effect would be very close to that of a complete ninth chord.

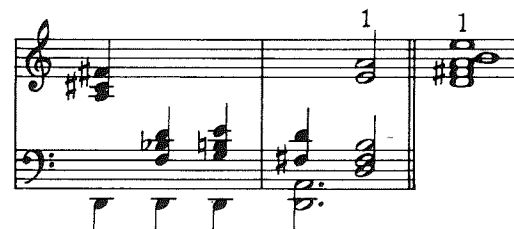
Ex. 112 KODALY: *Te Deum* (1936) p15



Copyright 1937 by Universal Edition, London. Used by permission of the publisher, Theodore Presser Company, Sole Representative, U.S.A., Canada and Mexico.

In Example 113 a sixth and a second are added to a major triad.

Ex. 113 HARRIS: *American Ballads, No. 1* (1947)



Copyright 1947 by Carl Fischer, Inc., New York. Reprinted by permission.

A minor triad with an added second is equally effective.

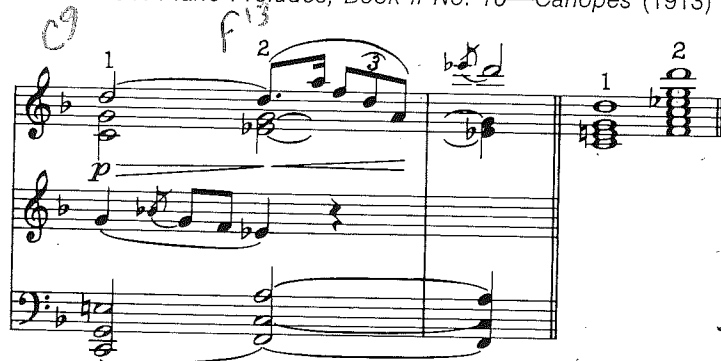
Ex. 114 DEBUSSY: *Pelleas and Melisande* (1902) p6



Copyright 1902 and 1907, Durand & Cie, Paris. Used by permission of the publisher, Elkan-Vogel, Inc., Sole Representative, U.S.A.

Example 115 shows a major triad with an added second progressing to a dominant thirteenth with the eleventh omitted, which can also be analyzed as a dominant ninth with an added sixth.

Ex. 115 DEBUSSY: *Piano Preludes, Book II No. 10—Canopes* (1913)



Copyright 1913, Durand & Cie, Paris. Used by permission of the publisher, Elkan-Vogel, Inc., Sole Representative, U.S.A.

In tertial harmonies the omission of the third evokes the greatest change. If the bass notes are analyzed as the roots, the chords in Example 116 are ninth chords with the thirds omitted. The chords can also be analyzed as major triads with added perfect fourths. The added notes in this case are below the triads, unlike those in any of the previous examples. Since notes are most often added above the basic chord and the octave doubling suggests root function for the bass notes, the analysis as chords of omission is more convincing.

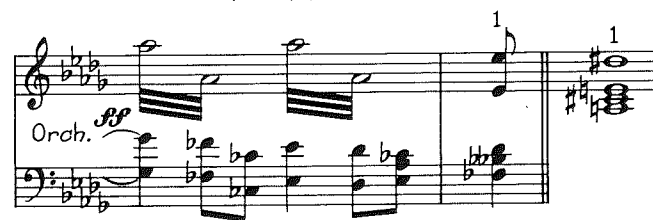
Ex. 116 COPLAND: *Violin Sonata* (1943) p13



Copyright 1944 by Aaron Copland; Renewed 1971. Reprinted by permission of Aaron Copland, Copyright Owner, and Boosey & Hawes, Inc., Sole Publishers and Licensees.

Added notes are not necessarily in a diatonic relationship to the underlying chord. Any note can be added. A major triad with an added augmented fourth, both spelled enharmonically in the analysis for greater clarity, is shown in Example 117.

Ex. 117 KODALY: *Te Deum* (1936) p13



Copyright 1937 by Universal Edition, London. Used by permission of the publisher, Theodore Presser Company, Sole Representative, U.S.A., Canada and Mexico.

The first chord in Orff's *Catulli Carmina* is a minor triad with an added augmented fourth.



Ex. 118 ORFF: *Catulli Carmina* (1943) p1



Copyright 1943 by B. Schott's Soehne, Mainz. Used by permission of Belwin-Mills Publishing Corp., Melville, New York.

A more sophisticated added-note chord is used by Bloch to close the second movement of his *Violin Sonata*. After firmly establishing the key of B-flat minor, he uses a tonic added sixth for the cadence chord, subsequently adding a major seventh and an augmented fourth.

Ex. 119 BLOCH: *Violin Sonata No. 1* (1920) p47



Copyright 1922 by G. Schirmer, Inc. Printed by permission.

Sometimes an added note is another inflection of a basic chord member as in Example 120. The chords have both major and minor thirds with the minor thirds above the major thirds, which is usual.

Ex. 120 BRITTEN: *Peter Grimes—Prologue* (1945) p2



Copyright 1945 by Boosey & Hawkes, Ltd.; Renewed 1972. Reprinted by permission.

Three chords of addition or omission over the same root are used in Example 121: a minor triad with an added second, a dominant seventh structure with an added minor third, and a thirteenth chord with the third and eleventh omitted.

Ex. 121 HARRIS: *American Ballads, No. 4* (1947)



Copyright 1947 by Carl Fischer, Inc., New York. Reprinted by permission.

These examples show some typical chords of addition and omission. Many more are possible, and this process places at the disposal of the composer an infinite variety of sonorities with an unusually wide range of consonance and dissonance. Sonorities of this type have the added advantage of a close link with tradition in their underlying basic chord. Sounds with a perceptible relation to conventional chords have more appeal for typical listeners than obtuse tonal combinations, an advantage not to be overlooked by composers still seeking recognition and without assured performances.

When three notes or more are added to a chord, they more often than not assume the form of another chord. This leads to the next classification of harmonic sounds, those that result from combining simple chords.

## Polychords

Sonorities which can best be understood as combinations of conventional chords are designated polychords. Only triads and seventh chords are united in polychordal formations. Less familiar structures lose their identity in complex associations. The elements of individual chords within a polychord are united with each other and isolated from those of other chords by spacing, register, and/or color to emphasize the distinctive polychordal quality.

Every seventh chord is in a sense a combination of two triads. For example, the dominant seventh chord on G can be analyzed as a G major triad combined with a B diminished triad. All seventh chords can be regarded as combinations of various types of triads with roots a third apart. According to this method of analysis each ninth chord encompasses three triads and two seventh chords. Eleventh chords encompass four triads, three seventh chords, and two ninth chords, and thirteenth chords encompass five triads, four seventh chords, three ninth chords, and two eleventh chords. As long as there are common tones and a close relationship between the triads, they are perceived as components of a single chord unless widely separated in register or scored in contrasting colors. The polychordal implications of such chords can be stressed deliberately by spacing and scoring.

Though interesting polychordal effects are possible with the components of ninth, eleventh, and thirteenth chords, most polychords combine elements of two keys or modes. One such polychord, consisting of two major triads in the tritone relationship, permeates Stravinsky's *Petrouchka* and provides a strong unifying element in the complete work. While trumpets and cornets play the C major figure in Example 122, horns sustain the F-sharp major triad, and strings, woodwinds, and piano play the two triads in rapid alternation. Significantly, all of the pitches in this passage are from the octatonic scale (see p. 42) on C, which has the same pitch content as the octatonic scale on F-sharp.

Ex. 122 STRAVINSKY: *Petrouchka* (1911) p60

Copyright by Edition Russe de Musique. Copyright assigned to Boosey & Hawkes, Inc. Revised Edition Copyright 1947 by Boosey & Hawkes, Inc. Reprinted by permission.

The sonority resulting from two major triads at the distance of a tritone is not so remote from those considered previously as might be expected. The sounds of Example 122 can be rearranged and spelled enharmonically as a dominant minor ninth with an augmented eleventh.

Ex. 123

The visual impression of complex chords can be changed by enharmonic spellings. The spelling of a particular chord is influenced by the way it is used, and the analysis is influenced in turn by the spelling. Such distinctions are of no great importance when dealing with isolated harmonic structures, but the spelling used by the composer is taken into account in the following analyses. The reductions are designed to reveal the underlying structure. Other interpretations are possible in some cases.

Hanson uses the augmented fourth relationship between two dominant seventh type chords in his *Romantic Symphony*. The chord is scored for full orchestra with the spacing shown first.

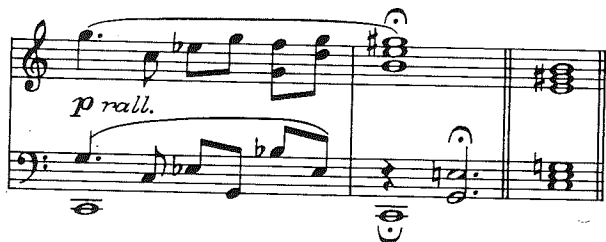
Ex. 124 HANSON: *Symphony No. 2 "Romantic"* (1930) p39



Copyright 1932 by the Eastman School of Music. Sole Agents for the World, Carl Fischer, Inc. Reprinted by permission.

The tritone is only one of the possible polychord relationships. Harris makes an effective final cadence with major triads on roots a major third apart.

Ex. 125 HARRIS: *American Ballads, No. 4* (1947)



Copyright 1947 by Carl Fischer, Inc., New York. Reprinted by permission.

Ravel uses a G major triad and a D-sharp minor seventh chord together in a piano figuration.

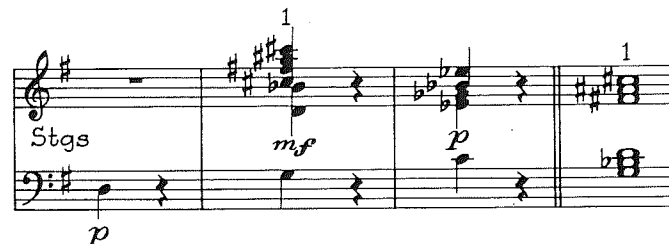
Ex. 126 RAVEL: *Piano Concerto in G* (1931) p1



Copyright 1931, Durand & Cie, Paris. Used by permission of the publisher. Elkan-Vogel, Inc., Sole Representative, U.S.A.

Later in the same work a minor triad and a major triad with roots a major seventh apart are combined in a polychord. Spelling the third of the lower triad as B-flat and the third of the upper triad as A-sharp, as Ravel does, confirms the polychord analysis even though all six notes can be arranged in ascending thirds.

Ex. 127 RAVEL: *Piano Concerto in G* (1931) p91



Copyright 1931, Durand & Cie, Paris. Used by permission of the publisher. Elkan-Vogel, Inc., Sole Representative, U.S.A.

In Example 128 contrary motion between major triads produces polychords with varied root relationships—major seventh, perfect fifth, major third, and major second. Triads with roots a fifth and a seventh apart produce chords which can be analyzed as ninth and eleventh chords respectively, but in this instance the polychord analysis is supported by the harmonic streams.

Ex. 128 SCHUMAN: *Three-Score Set, No. 2* (1943)

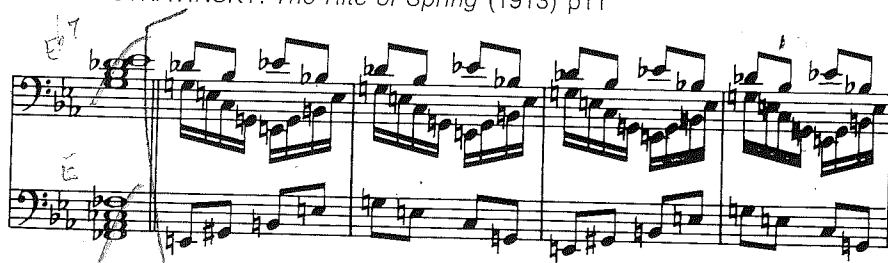


Copyright 1944 by G. Schirmer, Inc. Printed by permission.

One of the most complex polychords occurs in *The Rite of Spring* where a major triad and a dominant seventh structure with roots a major seventh apart are combined. The scoring is homogeneous. The complete polychord in the spacing shown is played by divisi strings reinforced on the accents by eight horns. After eight measures of the block chord,

broken forms of these same two chords (F-flat major now spelled enharmonically as E major) are combined with a third chord—a C major triad.

Ex. 129 STRAVINSKY: *The Rite of Spring* (1913) p11



Copyright 1921 by Edition Russe de Musique. Copyright assigned 1947 to Boosey & Hawkes, Inc. Reprinted by permission.

The process of combining triads and seventh chords in polychords adds a new dimension to the harmonic palette. This means of constructing sonorities has the potential for an unlimited range of dissonance and resonance. As with most complex chord structures the effect depends as much upon position, spacing, register, and scoring as upon pitch content. In these matters the overtone series is a less efficient guide for polychords, since they draw material from two sources, than for tertial chord structures. Testing various polychord combinations at the piano provides experience in selecting effective relationships, spacings, and registers. Studying scores and listening to recordings of works containing polychords serve to illustrate the effects of orchestral coloring in the absence of opportunities to experiment with an instrumental ensemble.

### Nontertial Sonorities

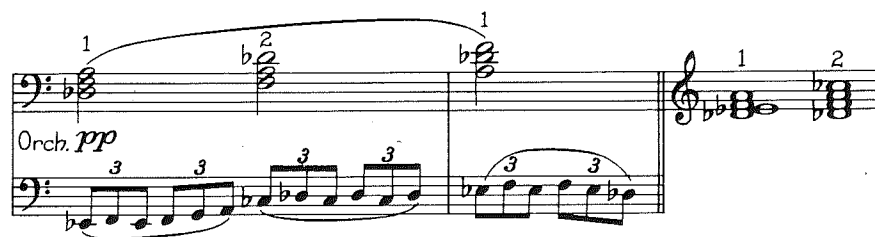
Chords built in superimposed thirds have been studied along with various additions to and combinations of such chords. Another fertile source of twentieth-century harmonic material is chord construction by intervals other than thirds. Chords constructed of other intervals are considered collectively as *nontertial sonorities*.

Nontertial sonorities are not without ancestors in more conventional chords. The second inversion of a triad with a seven-six suspension in the soprano gives a chord in fourths. When the seventh, root, and ninth of a ninth chord appear in close position in that order, a segment of a chord in seconds results. The thirteenth chord, since it contains all of the tones of a seven-tone scale, can be arranged in seconds, fourths, and fifths as well as in thirds. Regarded in this way nontertial sonorities rep-

resent a logical manner of extending harmonic resources along lines suggested in more conventional harmonies and sometimes existing in embryonic form in traditional practices.

Some of the earliest nontertial sonorities resulted when four-note chords were derived from a whole-tone scale, since only augmented triads can be produced by alternate scale tones. The nontertial structure of chord 1 in Example 130 is apparent. Chord 2 appears to be tertial, but one of the thirds is diminished and sounds like a major second. Actually, the two chords have the same underlying structure, a fact which becomes apparent if the pitches of the first chord are rearranged and spelled enharmonically—F, A, C-sharp, E-flat. This spacing and spelling reveals a structure like a dominant seventh chord with a raised fifth, the so-called *whole-tone dominant*.

Ex. 130 DEBUSSY: *Pelleas and Melisande* (1902) p3



Copyright 1902 and 1907, Durand & Cie, Paris. Used by permission of the publisher, Elkan-Vogel, Inc., Sole Representative, U.S.A.

After one conventional dominant seventh chord, Example 131 consists of a series of whole-tone dominants. While the last one is sustained, an F-sharp is added in the bass and a D appears in the repeated note figure, so all six notes of the whole-tone scale are sounding simultaneously.

Ex. 131 DEBUSSY: *Piano Preludes, Book I No. 6—Des Pas sur la Neige* (1910)

Copyright 1910, Durand & Cie, Paris. Used by permission of the publisher. Elkan-Vogel, Inc., Sole Representative, U.S.A.

Chords in seconds are not used only by impressionist composers or derived exclusively from whole-tone scales. Seconds are prominent in the harmonies of Example 132 though the sustained notes in the violin part perhaps should be regarded as pedal tones rather than chord tones.

Ex. 132 COPLAND: *Violin Sonata* (1943) p13

Copyright 1944 by Aaron Copland; Renewed 1971. Reprinted by permission of Aaron Copland, Copyright Owner, and Boosey & Hawkes, Inc., Sole Publishers and Licensees.

Seconds are used in a different fashion in Example 133.

Ex. 133 BARTOK: *Mikrokosmos, No. 107—Melody in the Mist* (1926–37)

Copyright 1940 by Hawkes & Son (London), Ltd.; Renewed 1967. Reprinted by permission of Boosey & Hawkes, Inc.

Chords of three or more consecutive seconds are known as *clusters*. The first clusters were conceived in terms of the piano, for which they are idiomatic, but soon they were being used in music for other mediums (see p 232). Example 134 shows seven-note clusters on the white keys alternating rapidly with the five black-key notes, together comprising all twelve tones of a chromatic octave.

Ex. 134 BARTOK: *Piano Concerto No. 2* (1931) p57

Copyright 1933 by Universal Edition; Renewed 1960. Copyright and Renewal assigned to Boosey & Hawkes, Inc., for the U.S.A. Reprinted by permission.

Clusters with more notes and a wider compass are illustrated in the excerpt from the accompaniment of a Charles Ives song.

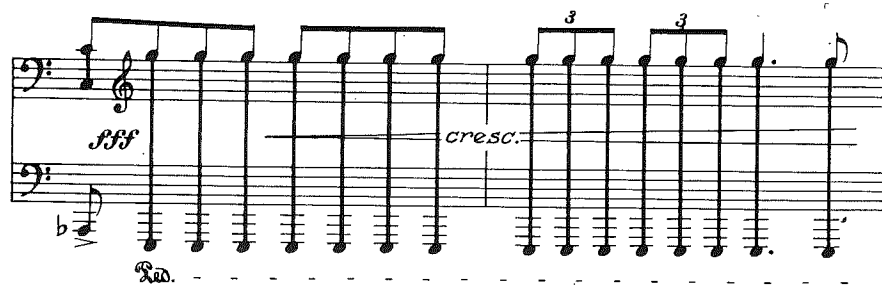
Ex. 135 IVES: 114 Songs—Majority (1922)



Composer's Edition<sup>2</sup>

Henry Cowell's piano compositions which he performed in public for the first time in 1912 included clusters, for which he devised a special system of notation. The symbols shown in Example 136 indicate that all of the keys, black and white, between the upper and lower notes are to be played simultaneously using both forearms.

Ex. 136 COWELL: *Piano Music*, No. 8—Tiger (1928)



Associated Music Publishers, Inc., New York.

Strangely enough, such tonal conglomerates as these are not perceived as dissonant in the usual sense. They neither sound active nor demand resolution, but integrated with other types of chords they add a provocative contemporary ingredient. In some more recent works the basic texture is essentially a massive cluster. This is true of Xenakis's *Metastasis*

2. A fascimile of the original edition was produced in 1970 by University Microfilms, Ann Arbor, Michigan. "Majority" is also included in *Nineteen Songs* by Charles Ives published by Merion Music, Inc., Theodore Presser Company, Sole Representative.

(1955) in which a continuously evolving sound mass is produced by 61 instrumentalists playing 61 totally independent parts.

Contemporary composers also make use of sonorities in which fourths are the primary interval. Fourth chords generally lack the resonance of tertial sonorities, because their components are not as closely related to the overtones of the root and consequently are reinforced less by them. This is particularly true when all of the fourths are perfect and when fourths are the only intervals in the structure. Fourth chords are not ordinarily used throughout a composition or even for extended passages, but they are a prize harmonic resource for intermittent use and brief passages.

*La Cathédrale Engloutie* is a familiar work in which fourth chords are used extensively. Fourths predominate in all of the chords of Example 137 except the third of the quarter-note chords. Observe that seconds result from octave doublings in fourth chords.

Ex. 137 DEBUSSY: *Piano Preludes*, Book I No. 10—*La Cathédrale Engloutie* (1910)



Copyright 1910, Durand & Cie, Paris. Used by permission of the publisher. Elkan-Vogel, Inc., Sole Representative, U.S.A.

When one of the fourths in a fourth chord is inverted and becomes a fifth, as in the whole-note chord of the preceding example, the lower member asserts itself as the root and tends to create the impression of a tertial sonority with the third omitted. For this reason the fifth directly above the bass is avoided when the distinctive fourth-chord quality is desired.

Berg runs the gamut of chords in perfect fourths, from two notes to seven, in *Wozzeck*. Since all of the motion in Example 138 is parallel, perhaps it should be considered merely melodic doubling. It cannot be regarded as a typical example of chord progression, but it illustrates with

unusual clarity extended structures in perfect fourths, though some are notated as augmented thirds.

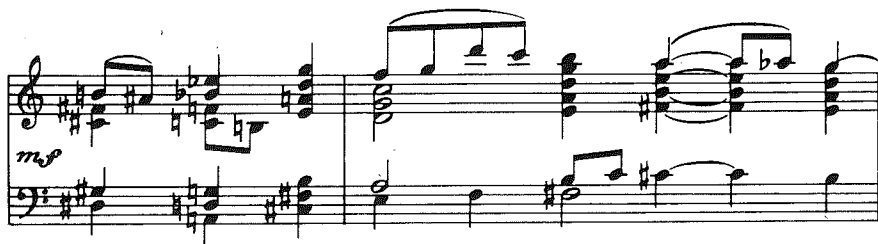
Ex. 138 BERG: *Wozzeck*—Act I Scene 4 (1914–21) p70



Copyright 1926 by Universal Edition, Vienna; renewed 1954 by Helene Berg. Used by permission of the publisher, Theodore Presser Company, Sole Representative, U.S.A., Canada and Mexico.

A more varied use of fourth chords is shown in Example 139. The basic chords are built in perfect fourths, with contrary motion and moving parts adding interest.

Ex. 139 IVES: *114 Songs*—*Majority* (1922)



Composer's Edition<sup>3</sup>

3. See fn. p. 96.

Though it hardly would be suspected from the sound, the final chord in the Schoenberg piano piece is written in fourths, one of them perfect and the other two augmented. Chords containing augmented or diminished fourths bear little resemblance in sound to those constructed in perfect fourths.

Ex. 140 SCHOENBERG: *Three Piano Pieces*, Op. 11 No. 1 (1910)



Copyright 1910 by Universal Edition, Vienna; renewed 1938 by Arnold Schoenberg. Used by permission of Belmont Music Publishers, Los Angeles, California 90049.

Scriabin's celebrated "mystic" chord has an unusually interesting structure consisting of perfect, augmented, and diminished fourths as shown at the end of Example 141. Most of the notes in this excerpt, and indeed in the entire piece, are derived from the generating "mystic" chord in various transpositions.

Ex. 141 SCRIBIN: *Poème*, Op. 69 No. 1 (1913)



P. Jurgenson, Moscow<sup>4</sup>

Chords built entirely in fifths are rare, but they do occur. One such instance is in *The Rite of Spring* where the following six-note chord in perfect fifths is used.

4. Also available in a Peters edition.

Ex. 142 STRAVINSKY: *The Rite of Spring* (1913) p13



Copyright 1921 by Edition Russe de Musique. Copyright assigned 1947 to Boosey & Hawkes, Inc. Reprinted by permission.

The first chord of Example 143 has the same structure as the preceding example, after which the harmony breaks into two streams of three-note chords in fifths in contrary motion.

Ex. 143 BARTOK: *Piano Concerto No. 2* (1931) p44



Copyright 1933 by Universal Edition; Renewed 1960. Copyright and Renewal assigned to Boosey & Hawkes, Inc., for the U.S.A. Reprinted by permission.

The final chord of Example 144 is another six-note chord in fifths, one of them diminished. The notes of the left hand must be placed above those of the right hand to realize the fifth spacing throughout.

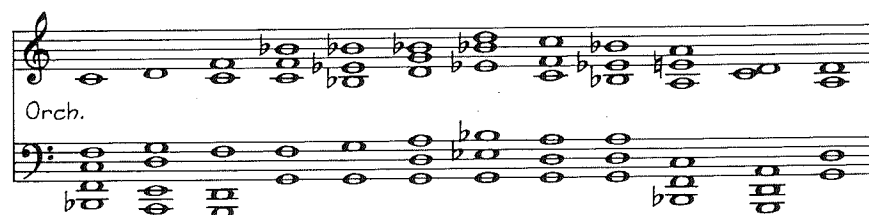
Ex. 144 SCHOENBERG: *Three Piano Pieces, Op. 11 No. 2* (1910)



Copyright 1910 by Universal Edition, Vienna; renewed 1938 by Arnold Schoenberg. Used by permission of Belmont Music Publishers, Los Angeles, California 90049.

Chord structures featuring perfect fourths and fifths are used in the *Lament for Beowulf* to evoke the archaic atmosphere of the text. Only an outline of the harmony is given. In the original these chords are repeated in a rhythmic pattern as a background to the vocal lines.

Ex. 145 HANSON: *Lament for Beowulf* (1925) p6



Copyright © 1925 by Carl Fischer, Inc., New York. Copyright renewed. International copyright secured. All rights reserved. Used by permission of Carl Fischer, Inc., New York.

A chord in fourths progresses to a chord in fifths in Example 146. Only melody notes sounding at the time the chord is struck are included in the analysis.



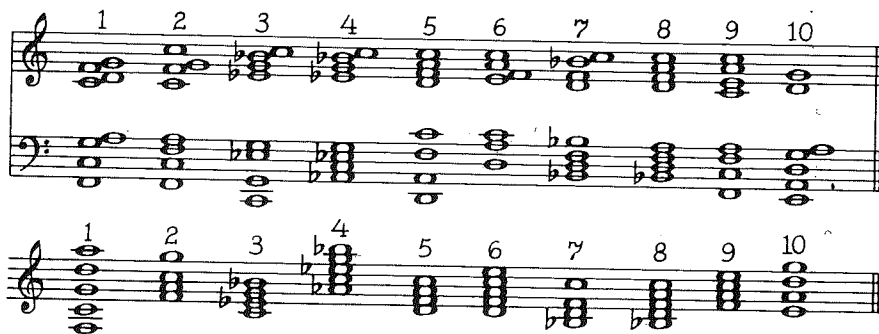
Ex. 146 SCHOENBERG: *Three Piano Pieces, Op. 11 No. 2* (1910)



Copyright 1910 by Universal Edition, Vienna; renewed 1938 by Arnold Schoenberg. Used by permission of Belmont Music Publishers, Los Angeles, California 90049.

Example 147 which shows the harmonic outline of a section of a Bartok quartet, employs some conventional structures and some discussed in this chapter between a chord in fifths and a chord in fourths. Directly below the original doubling and spacing of the chords, their components are arranged to reveal the underlying structures.

Ex. 147 BARTOK: *String Quartet No. 5* (1934) p50



Copyright 1936 by Universal Edition; Renewed 1963. Copyright and Renewal assigned to Boosey & Hawkes, Inc., for the U.S.A. Reprinted by permission.

It is when diverse harmonic structures are exploited in succession, as they are in Example 147, rather than when types are isolated that maximum effectiveness is achieved. Though this fact cannot be adequately illustrated in brief examples, it would be obvious if the complete works were examined.

## Suggested Assignments

1. Reduce the harmonic structures in Debussy's *La Cathédrale Engloutie* (*Piano Preludes, Book I no. 10*) to their simplest form and classify them according to the categories used in this chapter.
2. Analyze selected excerpts from Stravinsky's *Petrouchka* in the manner of Assignment 1. Examples 107 and 122 can serve as points of departure.
3. Locate distinctive chords in contemporary compositions and arrange their components to reveal the underlying structures.
4. Write chords illustrating each category discussed in this chapter. For each basic structure devise several effective arrangements with varied spacing and doubling and in different registers and inversions.
5. For additional reading on chord structure see Howard Hanson's *Harmonic Materials of Modern Music* (Appleton-Century-Crofts, 1960).

Bartok No. 4  
written variation for orch.  
Copied by the hand