



THEORY FOR TODAY'S MUSICIAN

THIRD EDITION

Ralph Turek
and Daniel McCarthy



Theory for Today's Musician

Theory for Today's Musician, Third Edition, recasts the scope of the traditional music theory course to meet the demands of the professional music world, in a style that speaks directly and engagingly to today's music student. It uses classical, folk, popular, and jazz repertoires with clear explanations that link music theory to musical applications. The authors help prepare students by not only exploring how music theory works in art music, but how it functions within modern music, and why this knowledge will help them become better composers, music teachers, performers, and recording engineers.

This broadly comprehensive text merges traditional topics such as part writing and harmony (diatonic, chromatic, neo-tonal and atonal), with less traditional topics such as counterpoint and musical process, and includes the non-traditional topics of popular music songwriting, jazz harmony and the blues. The accompanying companion website provides interactive exercises that allow students to practice foundational theory skills. Written by experienced authors, both active classroom teachers for many years, *Theory for Today's Musician* is the complete and ideal theory text to enable today's student to accomplish their musical goals tomorrow.

Updated and corrected throughout, the Third Edition includes:

- Expanded coverage of atonality and serialism, now separated into two chapters.
- Broadened treatment of cadences, including examples from popular music.
- Substantially rewritten chapter on songwriting.
- Interactive features of the text simplified to two types, "Concept Checks" and "Review and Reinforcement," for greater ease of use.
- New and updated musical examples added throughout.
- Charts, illustrations, and musical examples revised for increased clarity.
- Audio of musical examples now provided through the companion website.

The accompanying Workbook offers exercises and assignments to accompany each chapter in the book. A companion website houses online tutorials with drills of basic concepts, as well as audio.

Ralph Turek is a theorist, composer, author, jazz pianist, Professor Emeritus at The University of Akron, and a veteran of 35 years of teaching in the music theory classroom.

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Preface



TO THE INSTRUCTOR

Theory for Today's Musician was, in the year 2000, intended as a bridge across the chasm that separates the Classical repertoire from the jazz and popular repertoires in the minds of many students entering college music programs. The goal remains: To engage students on familiar ground through the music that inhabits their daily lives—popular music, jazz, rock, the music of TV and film—and guide them toward the magnificent body of art music that comprises our Western music heritage. The challenge for a textbook that addresses vernacular music in any meaningful way is to balance durability, quality, and usefulness in the selection of musical examples. And the larger challenge is to strike the perfect balance in amount of the attention parsed to vernacular and art music.

This third edition remains true to the three original premises:

1. The highest purpose of music theory is the illumination of music; the highest purpose of music is *not* the validation of music theory.
2. The book should be written in an engaging way that can be understood by the average *interested and motivated* music student.
3. Today's musician is likely to be a multi-tasking individual who may well be required to teach, perform, compose or arrange, and produce music at some point. This book should provide basic preparation for such a multifaceted career.

In this third edition:

1. We've retained our conversational style that avoids traditional "academic-speak" and theoretical jargon while yet speaking in precise, articulate prose.
2. We've updated and added examples and retained our practice of drawing "first examples" from popular and traditional song literature and jazz. We continue to draw parallels between present and past practices.

3. We've improved the look and clarity of the charts and illustrations and we've sought greater uniformity in the notation of the musical examples.
4. We've reordered topics within chapters as deemed necessary (but have not changed the basic ordering of chapters).
5. We've occasionally augmented an analysis with some basic Schenkerian concepts.
6. We've addressed errors and oversights that we've discovered or that have been brought to our attention.
7. We've divided the chapter on serial and non-serial atonality into separate chapters and expanded out coverage of both.
8. We've substantially rewritten what is now Chapter 34, "Shaping a Song."
9. We've simplified the interactive features of the text into just two basic types: "Concept Checks" (which provide an immediate test of understanding) and "Review and Reinforcement" (which tests retention).
10. We've retained other organizational features that have received a favorable reaction: "preludes" and/or "codas" for most chapters to set the table and bus it, so to speak; a list of "Terms to Know" that conclude most chapters; a Glossary of Terms; and indices by both topic and composer/composition.

Part One: In Lieu of Fundamentals

Most of the fundamentals remain situated in two Appendices. Formatted as regular chapters, complete with examples, illustrations, and workbook assignments, they differ from the other chapters only in their location in the text. *They are chapters to be accessed as needed.* Necessary but not very exciting, these chapters are at the end of the book because we'd rather the first topics to meet student eyes be ones that engage their curiosity, whet their appetites, and plant the idea that music theory can be an intriguing adventure. This includes selected information on notation and acoustics that usually fascinates students, most of whom unknowingly have had close encounters with phenomena of the acoustic kind, such as equal temperament and the harmonic series. It also introduces modes, which inject a fresh and interesting perspective on the hoary topic of scales and which turn up often enough in popular music and jazz to warrant their early attention. (Instructors who wish to do so may ignore the corresponding exercises in the Workbook at this time and treat Chapter 1 as purely informational.)

Part Two: Diatonic Harmony

Seventh chords are introduced early and reinforced continually. (It is difficult to treat jazz and popular music without them.)

Lead-sheet chord symbols and figured bass reside in the same chapter to promote and facilitate their comparison. We've subsequently accorded lead-sheet symbols a more

thorough treatment and more consistent reinforcement than is customary, with the goal that students be not merely cognizant of the system but proficient in its use.

We've broadened the treatment of cadences to include some found in today's popular music that cannot be explained as authentic, plagal, or any of the standard half cadences. The perfect-imperfect distinction "played" better to past generations than to this one. We've opted not to belabor it at this point in the belief that students can better appreciate its usefulness when phrases and periods are discussed.

Part Three: Melody

Part Three moves from general to specific, first dealing with basic melodic features, including large-scale tonal phenomena such as the step progression and large-scale arpeggiation and Schenkerian concepts such as prolongation, then moving to embellishing tones, and finally to phrasing. This first look at melodic form does so from the vantage point of the only three choices available to a composer at any point in the compositional process—to create, to vary, or to repeat.

Part Four: Voice Leading

Four-part voice leading is approached through a chapter that deals only with the soprano-bass framework (simultaneously an introduction to two-voice counterpoint). Our pared and prioritized part writing guidelines reflect today's practices. For example, we've avoided the academic distinction between close and open spacing, since acceptable spacing—whether close, open, or hybrid—automatically follows when the upper adjacent voices are kept within an octave of one another (the important goal, after all). Instead, we've encouraged students to maintain a distinct, mutually exclusive "corridor" for each voice of the texture. We've given a context to consecutive perfect consonances—absent from Baroque common practice, but present in Copland's "Fanfare for the Common Man" and rock music's "power chords."

We've introduced all important voice-leading concepts—melodic principles, chord spacing and doubling, and chord connection—in a single chapter (Chapter 11), using a popular music model. We've done this to establish voice leading's relevance immediately, but the overview can also suffice as a circumscribed study of the topic for instructors who prefer to spend more time elsewhere. Each topic presented in Chapter 11 is covered in depth in the three ensuing chapters.

Part Five: Basic Chromatic Harmony

Secondary function is covered in two chapters, the first (Chapter 15) a more or less traditional presentation, the second (Chapter 16) focusing on jazz and popular styles. This leads naturally into the first of two chapters of modulation (Chapter 17).

Part Six: Counterpoint

Chapter 18, “The Art of Counterpoint,” is a generalized and condensed species approach. In it we’ve tried to sweep aside the academic dust that seems to settle over this topic in the student mind by lacing the chapter with examples of counterpoint found in vernacular music before plunging into Bach’s Two-Part Invention, no. 6. Chapter 19, “The Fugue,” takes a closer look at Bach’s art.

Part Seven: Advanced Chromatic Harmony

This five-chapter tour of nineteenth-century harmony is conducted in roughly chronological order—mode mixture, altered pre-dominants, altered dominants, embellishing diminished seventh chords, advanced modulation, triadic extension, and linear harmonic processes. Knowing that chromatic harmony is normally challenging to students:

- We’ve pared the topics. If our search for a musical example came up lean, we took this as a sign that perhaps a particular topic does not warrant discussion, at least at this level.
- We’ve kept it simple where it *can* be simple. With altered dominants, after all, we’re talking about raising or lowering the chord fifth of a V (or V/V), which then moves up or down accordingly—only this and nothing more.
- We’ve used creative analogies where appropriate to illuminate matters.

Part Eight: Form

Chapter 25 deals with the root causes of form. By developing sensitivity to the musical processes—thematic, transitional, developmental, and cadential—that create affect, we hope to equip students to comprehend on some level the structure of any piece they hear. We’ve applied these concepts to small binary and ternary forms, which we’ve presented as outgrowths of the three composer—choices—repeat, vary, create—introduced earlier. Chapters 26 and 27 introduce sonata form and rondo. We’ve presented them as larger-scale manifestations of the same musical processes and choices while still addressing the tonal design that is commonly held to define these forms.

Part Nine: Music in the Twentieth Century and Beyond

On the concert music side are Debussy, Bartók, Stravinsky, Schoenberg, and Webern. On the vernacular side are the harmonic principles in jazz and blues, and the shaping of a popular song. The dilemma for theory today is how to add new topics without increasing the total time (four semesters) allotted to the course. This led to some scaling back of twentieth-century concepts in the first edition. Although we’re still mindful of space and time limitations, we’ve included in this edition a more generous look at the analytical tools for the analysis of non-serial atonality, including the interval vector and the Z relationship.

Jazz harmony, the blues, and song writing, of great importance for today's musician, remained largely untouched by general theory texts. These, our final chapters, go well beyond a mere nod and are likely to include concepts new or enlightening even to budding jazz majors. They reflect our belief that no music student should stride across a stage to receive a diploma without a working understanding of jazz harmony and procedures and the ability (however modest) to set a line of lyrics to music.

More about the Musical Examples

One well-chosen musical example is worth more words than we can muster. For this reason, *Theory for Today's Musician* is "example-intensive." In selecting and treating the examples, practicality and relevance have been guiding beacons. Lines and/or octave doublings have been omitted from some few Classical examples to render them more easily playable on the keyboard. Most jazz and popular examples are presented in a style likely to be heard in clubs and on television, although some original arrangements have been retained to give a proper sense of the composer's style. Many of the examples might have been presented in diluted renditions that bleach out musical interest on the altar of simplicity. We've opted, rather, to keep the music authentic-sounding and interesting, instructing students to disregard this or that, noting that such and so will be addressed later, and so on. If this is the price of greater student interest, it's probably a good buy, since a challenged and motivated student is more teachable than a bored and indifferent one.

Arrangements original with this text are indicated "Arr. R.T." We realize and respect the fact that scholars of popular music may find the use of arrangements objectionable, and we offer this apologia:

Much popular music is recorded first and notated after the fact. Transcriptions often sound nothing like the recorded version, due in part to the inability of our notation system to capture the inflections and rhythmic nuances of the performance. In fact, those nuances might be viewed by the transcriber as performance inaccuracies in need of "correction." Also, the use of arrangements in popular music and jazz has been thoroughly sanctioned by practice. This repertoire is routinely "covered" by many artists, invariably differing in the details. In fact, a particularly popular rendition may become, over time, the "definitive" version, more recognized and emulated than the "authoritative" original. Most fake books (now called "real books") contain only the most basic harmonization of a tune, which is routinely embellished by recording artists. The prefaces to these books acknowledge this and often indicate one or more important recordings that deviate from the notated version therein. All of this is because popular music and jazz are improvisational and spontaneous forms of music that invite widely divergent interpretations.

While we've tried to retain the character of the original music, we've enhanced some selections in keeping with current harmonic practice so that the music sounds fresh and up-to-date. We've done this out of no disrespect for the music or its composers but out of a desire to make the examples as useful, interesting, and informative as possible for the student.

About the Sources

Examples from the jazz and popular repertoires come from three sources: published editions, transcriptions of recorded performances, and arrangements. Passages transcribed by the authors bear a note to that effect. To the best of our knowledge, they accurately reflect the recorded performance. We take full responsibility for any inaccuracies, which are unintended and purely the result of less-than-perfect ears. Original arrangements are labeled as such. We've classified as "arrangements" even those melodies for which we've expanded the lead-sheet chord symbols or made substitutions. We made such changes either to illustrate a harmonic concept or to present the music in the way it is most often played by today's musicians.

A final word on the musical examples: Permission to use popular music is both restrictive and expensive. If an example seems to end in an odd place (a measure before a natural cadence, for example) or to be too short, it is likely due to a copyright restriction. Your understanding is appreciated.

Proposed Use

Theory for Today's Musician is a 2-year study encompassing the topics most often taught in a comprehensive course:

First Year

First Semester:

Part One: In Lieu of Fundamentals

Part Two: Diatonic Harmony

Part Three: Melody

Second Semester:

Part Four: Voice Leading

Part Five: Basic Chromatic Harmony

Second Year

First Semester:

Part Six: Counterpoint

Part Seven: Advanced Chromatic Harmony

Second Semester:

Part Eight: Form

Part Nine: Music in the Twentieth Century and Beyond

The ordering of topics in this 2-year plan is not inviolable. You are welcome to reorder as you see fit, and we've tried to write the book in such a way that this is possible. Suggestions for reordering are given in the Instructors Manual.

The Workbook assignments for each chapter correspond to divisions within the chapter, facilitating immediate reinforcement of concepts. We've also included within the chapters ample opportunity for students to apply the information as soon as it has been presented

These opportunities are termed “Concept Check” or “Review And Reinforcement.” In the earlier chapters, where students are most likely to need it, “webwork” is indicated. Here students are referred to online self-help.

Jazz Studies majors are an increasing segment of the music student population. If you have jazz piano majors in your classes, you might call upon them frequently to play the jazz and popular examples. This always adds interest to a class. Otherwise the companion website contains the bulk of the musical examples over four measures long in the text and practically all the examples in the Workbook.

Instructor’s Manual

The Instructor’s Manual follows the organization of the textbook. It provides notes on each chapter, suggestions for additional ways to use the examples and Workbook assignments, solutions to selected assignments, chapter quizzes, course plans and sample syllabi, and recommendations for additional musical examples.

A Final Word

Our hope is that this text will help to: 1) ignite students’ interest in the theory behind the music they play and hear; and 2) provide students with the skills they need to function effectively in today’s musical milieu.

We invite you to be creative in your use of the book, to amplify and condense as you see fit. We hope your need to *clarify* is minimal.

Ralph Turek and Daniel McCarthy

TO THE STUDENT

Why Music Theory?

Music has probably always come easily to you. If it has, then you may have difficulty understanding how utterly mysterious it can be to others. The fact is, the special mix of physical and mental attributes that translate into musical talent is a gift given to relatively few of the more than six billion inhabitants of this planet. It makes you a member of a special group that sees and hears in music the things most others do not. Your decision to further your study of music indicates your desire to cultivate these insights and share them with others.

Music engages us physically (muscle memory and coordination are necessary to sing or to play an instrument), mentally (we read music, we memorize it, we compose it), and emotionally (it can make us happy, sad, lonely, nostalgic, and so on). Music theory aims to deepen our mental involvement. That’s necessary because to communicate all that you

hear and feel in music, you need to understand it on many levels. A deeper and broader understanding will make you a more effective ambassador, whether as performer, teacher, or recording engineer.

Musically, much has changed since the time of Bach and Handel, Haydn and Mozart, and Beethoven and Brahms. But much has not. For example, a minor-key melody can still make the soul weep; rapid rhythms and loud dynamic levels can excite, while slow rhythms and soft dynamic levels can soothe; music with harmonies or multiple lines usually engages us more fully than single-line melodies; songs usually begin and end in the same key, often on the same harmony and so on. Music theory explains these things and much more.

Finally, we offer this observation about the music profession today: It's a jungle out there. Jobs? Never before have so many competed for so few, whether the position be an orchestra chair, a college or public school teaching job, an arts management position, or a sound engineer in a club or studio. In the music jungle, the fittest survive, and adaptability counts. Only a select few musicians today have the luxury of specializing in one kind of music, or of being only one kind of musician, whether a violinist, a composer, a conductor, or a music teacher. To join that select group, you need to be uncommonly proficient, and a little luck doesn't hurt either. Generally speaking, though, the more complete your musicianship, the better today's marketplace will treat you.

Using Theory for Today's Musician

Think of this textbook as one element in a triple alliance that also includes your instructor and you. How well the alliance works will determine the measure to which the study benefits you.

1. The book: we've written it in what we hope is a clear and engaging manner.
2. Your instructor: He or she will likely amplify and clarify and bring additional insights to bear.
3. You: You are the third and most variable part of the triple alliance. Without your efforts, the book and your instructor will be of limited value. With this in mind, permit us to suggest the following:
 - Don't wait until material is presented in class and then rely on the book for clarification. A better plan is to study the assigned material *before* class, and rely on your instructor to fill the gaps and answer questions you may have. By doing this, you enter the classroom familiar with the topic and better able to assimilate all that takes place.
 - Read thoughtfully, not quickly. Theory textbooks are not meant for speed-reading. Do all the exercises provided within the chapters for added practice; and in the Workbook, do more than just those assigned. It's through the exercises

that you apply the knowledge you gain, and it's through application that knowledge gains utility and meaning.

- Don't wait until the evening before an assignment is due to begin it. Instead, make it your practice at least to try out each of the assigned drills *prior to* the class before the due date. This leaves you time for clarification if something confuses you.
- Use the various features of the text to your best advantage. These features are described in the paragraphs that follow.

The Musical Examples

Most of the musical examples in the text and Workbook are available on the companion website. LISTEN to them. Several times. Most are given in keyboard versions that are not too difficult to play. TRY to play them, no matter how slowly. These examples come from all musical periods and from both Classical and popular styles. *All* are relevant to today's musical world.

Concept Checks, and Review and Reinforcement

In reading the text, you'll frequently come upon these interactive features. They punctuate the flow of information and contain suggested activities or questions related to the topic under discussion. Don't ignore them. Use them as talking points with classmates or as ways to gauge your level of comprehension. Answers to the questions posed and/or further discussion can be found at the ends of the chapters.

Online Drills and Reviews

You'll find numerous references directing you to interactive online sites where you'll find pertinent drills and reviews. Avail yourself of these as necessary.

Do You Know These Terms?

This question is asked at the end of each chapter. The terms introduced are listed in alphabetical order. Each term is defined in two places—within the chapter, and in the Glossary. Make it a practice to formulate your own definition of each term once you've completed the chapter. Then compare it to the definition in the Glossary. Don't worry if your definition differs slightly. *Do* worry if it differs greatly, in which case you should re-read the part of the chapter where it is introduced.

Glossary

The Glossary contains all terms introduced in the text, along with their definitions.

Indexes

The Subject Index provides quick access to the initial presentation of every topic or term. The Composer/Title Index guides you to examples listed by composer and by title.

Index of Musical Examples

The music contained in the book is listed by example number and page number.

A Final Word

The insights you gain from your study of music theory will time and again prove useful and relevant to your personal musical goals. In the world of professional music, there is no substitute for solid musicianship. This book is designed to assist in providing that foundation.

The Authors

Acknowledgments



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Ralph Turek would like to thank the users of previous editions of *Theory for Today's Musician* for their insights and helpful suggestions on ways to improve the text and for the confidence they display through their continued use of this newest edition. We hope to prove that their confidence is well placed.



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PART ONE

In Lieu of Fundamentals

1: ASSORTED PRELIMINARIES

2: INTERVALS



THE FUNDAMENTALS, MUSIC, AND YOU

You probably know something about them. You may have learned about them through your private music lessons, or through your high-school band, orchestra, or chorus. Perhaps you picked them up on your own or have taken a preliminary college music course that dealt with them. And if you're not familiar with them, then the time has come. Today, as in the past, no one can hope to become a musician without a thorough grounding in the so-called **music fundamentals**—pitch notation, the treble and bass clefs, intervals, major and minor scales, key signatures, and the basics of rhythm.

But we need to define a term. A **musician** is someone who creates or recreates music. Right? Well, yes. And this would necessarily include any 5-year-old who can sing “B-I-N-G-O.” However, we normally reserve the designation “musician” for those who have attained a higher level of musicianship.

If you've chosen to pursue a college degree in music, the road to this higher level will lead you through the study of theory and music history, added years of music lessons, and courses that develop your communication skills. That's for openers. For mere survival in today's musical environment, a musician needs more and better preparation than at any time in history.

You'll find most of the fundamentals in Appendix A, “Pitch,” and Appendix B, “Rhythm.” Your instructor may wish to devote some weeks of class to them. In any case, be advised: *If you are not completely fluent with the basics of pitch, notation, and rhythm, then your proper starting points are Appendix A and Appendix B.* Because there is no substitute for an intimate understanding of that material, we'll repeat ourselves, rather boldly:

The fundamentals are covered in complete chapters with explanations, drills, and Workbook assignments. These chapters are titled Appendix A (“Pitch”) and Appendix B (“Rhythm”).

ABOUT PART ONE

We've chosen to begin with some “appetizers,” selected topics to whet your appetite—things you'll likely find interesting, things you might not be aware of, things that are often never fully explained.

A few of these topics are merely further insights into certain aspects of the fundamentals. Others relate to musical **acoustics**—the science of sound. And still others amount to historical perspective. However, one fundamental topic—intervals—is presented in greater detail in Chapter 2. This is because intervals are the most important and basic of the musical building blocks. Fluency with them is necessary for chord recognition, which is a prerequisite to harmonic analysis, a necessary component of musical analysis. Finally, it is generally true that every student of music can, at the beginning of his or her college study, benefit from a greater command of the skills involved in recognizing, spelling, and hearing intervals.

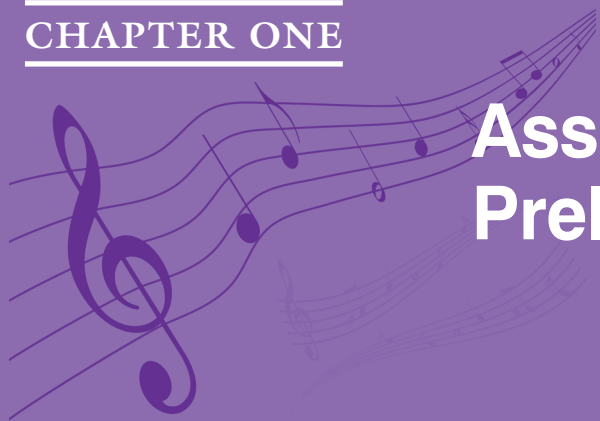


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CHAPTER ONE



Assorted Preliminaries

KEY CONCEPTS IN THIS CHAPTER

- Solmization
- Church Modes
- Meter
- The Harmonic Series
- Equal Temperament

PITCH MATTERS

Who came up with this system—five lines and four spaces on which to plant 12 pitches that fit within an octave and have only seven letter names? Our notational system is a little like a mansion that has been built over many years. As each owner adds to suit special needs, it grows into an architectural and functional monstrosity. If only we could start over!

Back in notation's infancy, seven letter names were quite sufficient to represent the music. And the **staff** was merely a gleam in the eye of Guido of Arezzo, a Benedictine monk of the eleventh century. Guido recommended first one, then two, color-coded lines as visual guides against which his choristers could gauge the highness or lowness of the symbols, called “neumes,” then used to indicate voice inflections when chanting.

The Staff and its Clefs (See also Appendix A, p. 647)

The idea worked so well that more lines were added and the colors discarded in favor of the Gothic letters G, F, or C—now our **clef** signs—placed at the beginning of the staff to show the location of those particular notes.

These early clef signs:

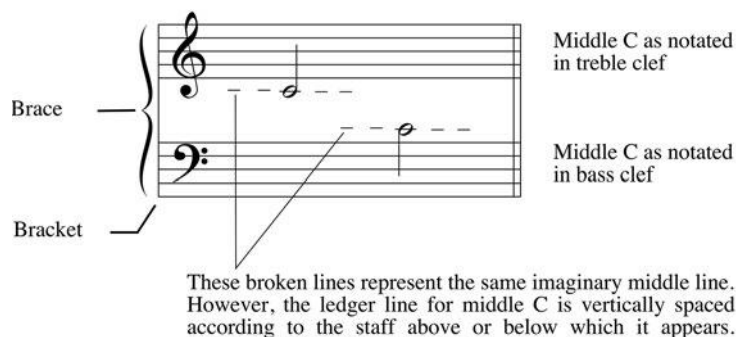


Evolved into these present-day symbols:



Over time five lines became standard. Eventually, staves were stacked, each with its own clef, to accommodate multiple parts and an expanded range. Our **grand staff** is the residue of that practice. Today's treble- and bass-clef staves are separated by an imaginary eleventh line that is home to middle C, a pitch that appears as a **ledger line** on either staff.

EXAMPLE 1-1 The Grand Staff



► For more information on clefs, turn to Appendix A.

Solmization

Besides being “the father of the staff,” Guido was the great popularizer of **solmization**—assigning syllables to pitches as an aid to sight singing. For syllables, he drew upon the hymn *Ut queant laxis*, in which each phrase begins a step higher than the preceding one.

EXAMPLE 1-2 *Ut queant laxis* (LU 1504)

Ut (Do) re

Ut que - ant lax - is re - so - na - re fi - bris

Mi fa

Mi - ra ges - to - rum fa - mu - li tu - o - rum,

Sol la

Sol - ve - pol - lu - ti la - bi - i re - a - tum,

Sanc - te - Jo - an - nes.

The Hexachord System

The six syllables—*ut-re-mi-fa-sol-la*—were applied to three interlocking **hexachords** (six-note scales):

EXAMPLE 1-3

C Hexachord: Ut Re Mi Fa Sol La

G Hexachord: Ut Re Mi Fa Sol La

F Hexachord: Ut Re Mi Fa Sol La

and so on

This served as a pedagogical aid to the choirs of Guido's day and remains the basis of our solmization system today. (The word "solmization" was coined from the syllables "sol" and "mi.")

Accidentals

Notice that the hexachords on F and G used different forms of the pitch B. The F hexachord used a “soft B,” symbolized “b.” The G hexachord used a “hard B,” symbolized \flat .

From these symbols came our signs for the flat and natural, called **accidentals**, which eventually shed their exclusive association with the pitch B.

► For assignments on pitch, turn to Workbook Appendix A.

MODES, SCALES, AND EVOLUTION

For this discussion to be meaningful, you should be thoroughly familiar with the major and minor scales and the concept of transposition. If you are not, turn to Appendix A.

Church Modes

The hexachord system provided only an accounting of the pitches available to medieval musicians. The actual basis of their music is suggested by the **church modes**, seven-note patterns involving **half steps** (the distance between E and F, and between B and C, our smallest musical interval) and **whole steps** (the distance between all other adjacent letter names, equal to two half steps). Both the hexachord system and the Church modes were theoretical constructs. The former organized the pitch gamut for purposes of solmization. The latter was an attempt to classify the pitch basis of the chants of the Catholic liturgy.

EXAMPLE 1-4

Whole note = **final**: the most important pitch of the mode, typically a chant’s point of departure and return.

Whole step Half step

Dorian

Phrygian

Lydian

Mixolydian

Notes:

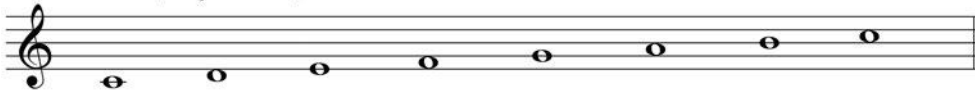
1. Each mode is a unique arrangement of whole steps and half steps. Dorian mode can be viewed as the notes of Guido's C hexachord beginning on Re, Phrygian as beginning on Mi, Lydian as beginning on Fa, and Mixolydian as beginning on Sol.
 2. The half steps occur *between the same pitches* but *at different points* within each mode.
 3. The modes are shown as originally used—involving only what would be the “white keys” on a piano or organ.
-

Example 1-5 shows the modes transposed to begin on C. Notice how they relate to present-day major and natural minor scales.

EXAMPLE 1-5

- a. Modes closely related to the major scale:

Ionian mode (major scale)



Lydian mode (major scale with raised fourth degree)

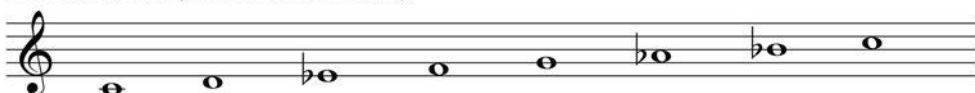


Mixolydian mode (major scale with lowered seventh degree)



- b. Modes closely related to the minor scale:

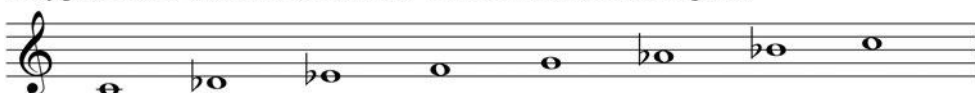
Aeolian mode (natural minor scale)



Dorian mode (natural minor scale with raised sixth degree)



Phrygian mode (natural minor scale with lowered second degree)



Musica Ficta

Although we can best understand the modes by relating them to our present-day scales, it was the modes that begat our scales, and not the reverse. The evolutionary process was gradual over a hundred or so years. It happened through **musica ficta**—a practice in which performers altered pitches according to conventions of the day. Most important were the creation of half steps leading to the final in the Mixolydian and Dorian modes and between the third and fourth notes (mi-fa) in the Guidonian F hexachord.

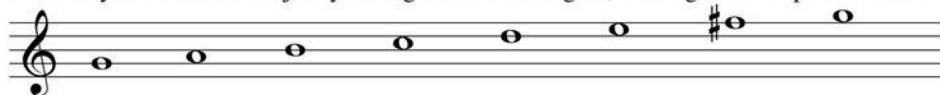
Example 1-6, though simplified, shows the effect of these rules.

EXAMPLE 1-6

a. Lydian becomes major by using "soft B" for "fa:"



b. Mixolydian becomes major by raising the seventh degree, creating a half step to the final:



c. Dorian becomes minor by raising the seventh degree, creating a half step to the final:



BACK TO BASICS 1.1

Mode
Construction
and
Identification

Today the term “mode” is used to refer both to the Church modes and the major and minor scales and their associated keys. We speak of music being “in the major mode,” or “changing from major to the parallel minor mode,” and so on.

► For assignments on modes, turn to *Workbook Chapter 1, Assignments 1A–1F*. For drills on major and minor scales, turn to *Workbook Appendix A*.

METER MATTERS

This discussion presupposes your understanding of our proportional system of rhythmic notation, accent and its role in creating meter, and the differences between duple and triple and between simple and compound meters. If any of these concepts are unclear to you, you should log some hours with Appendix B.

Meter

Meter is the grouping of a steady succession of pulses into patterns of accented and unaccented beats. The feeling for it dates to antiquity. Throughout history, two basic types of meter have been favored—binary and ternary. Which do you suppose is older?

You might guess that binary is the older. After all, the rhythms of life and nature are binary. We inhale and exhale; the heartbeat is two-part; we walk by alternately putting forward the left foot, then the right; we exert only two muscular forces—the push and the pull; what goes up comes down; tides rise and fall; night follows day.

Despite all this, ternary appears to have been the older meter. This is because our notational system and the music it enabled had its origins in a profoundly religious culture. And to the medieval mind, the number three was rife with significance (the Trinity).

The Dot

Let's start with the dot. In medieval music notation, it was called *signum perfectionis* (the sign of perfection). Its function was to “perfect” any note it followed by making it equal to *three of the next smaller division*. That function is unchanged today.

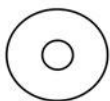


Likewise, any note without the *signum perfectionis* was imperfect—divisible into only two parts.

The dot originated as a tiny circle, which stood for closure, or completion, another manifestation of perfection. Philippe DeVitry, in his fourteenth-century treatise *Ars nova* (“The New Art”) used the circle and half circle to reflect the perfect and imperfect grouping (*tempus*) and division (*prolation*) of beats.

Early Meter Signatures

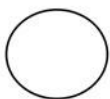
EXAMPLE 1-7



Perfect tempus (beats grouped three to a bar), major prolation (beat divided into three parts)

Today's equivalent meter: $\frac{9}{8}$

Example:



Perfect tempus (beats grouped three to a bar), minor prolation (beat divided into two parts)

Today's equivalent meter: $\frac{3}{4}$

Example:



Imperfect tempus (beats grouped two to a bar), major prolation (beat divided into three parts)

Today's equivalent meter: $\frac{6}{8}$

Example:



Imperfect tempus (beats grouped two to a bar), minor prolation (beat divided into two parts)


Today's equivalent meter: $\frac{2}{4}$


Example:

The sole survivor of these fourteenth-century meter signatures is the use of **c**, which today represents not $\frac{2}{4}$, but its close relative, $\frac{4}{4}$.

Hypermeter

Beyond the two- and three-part division and grouping of **beats**, there was what today we'd call a two- and three-part grouping of **measures**, called *modus*. This was indicated by either two or three vertical lines in front of the symbols shown in Example 1-7. For example:


 These symbols suggested a $\frac{9}{8}$ meter in which the music was organized into three-measure phrases, such as this:


Modus

 and so on

After the fourteenth century, composers turned their attention back to pitch, and this higher level of metric organization was generally not pursued. Still, theorists today speak of **hypermeter** when the measures of a work exhibit regular accentual patterns the way the beats do.¹

EXAMPLE 1-8 Harry Dacre: “Daisy Bell”

S = Strongest s = Strong w = Weak

Lively waltz tempo Hypermeasure Hypermeasure



Notice how beats (quarter notes) divisible *into two eighth notes* ($\text{quarter} = \text{eighth} + \text{eighth}$) are *grouped into measures of three quarter notes* ($\text{half} = \text{quarter} + \text{quarter} + \text{quarter}$) that form larger units, each comprising four measures. The four-measure unit (the *modus*) is a **hypermeasure**, in which measures 1 and 3 are strong relative to measures 2 and 4. This can be better seen through a transcription. In Example 1-10, each four-measure group—each hypermeasure—has been turned into a single measure. Each former measure is a beat in this larger unit.²

¹ Hypermeter is fully explained by William Rothstein, *Phrase Rhythm in Tonal Music* (New York: Schirmer Books, 1989), pp. 3–63.

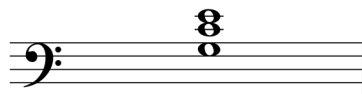
² This discussion and the use of this example owe much to Ken Stephenson, *What to Listen for in Rock: A Stylistic Analysis* (New Haven and London: Yale University Press, 2002).

EXAMPLE 1-9 Harry Dacre: “Daisy Bell”**SOUND**

Note: If you're unfamiliar with octave designations, see Appendix A.

Sound—the most fundamental of fundamentals—what do you really know about it? We'll wade just far enough into the mysterious waters of musical **acoustics**—the science of sound—to persuade you to take a deeper dip if you have the opportunity.

Sit at a piano, and silently depress C3—the octave below middle C (which is C4). Now, while holding C3 down, sharply strike the octave below it (C2) and release immediately. (Keep C3 depressed.) Listen carefully to the after-ring. Can you hear the depressed note resonating? Now depress G3 (the G below middle C) and strike C2 again. Do you hear G3 resonating? It's quite soft. Now silently depress this chord



and repeat the experiment. Can you hear the chord ringing?

Overtones

What you're hearing is the sympathetic vibration of these other piano strings. They're vibrating in sympathy with the **overtones** of the **fundamental**, C2. Most sounds consist not only of a fundamental tone, the frequency that gives a sound its basic pitch, but also its overtones. These additional frequencies are usually so soft that we don't consciously hear them (like the vibrating strings in our experiment). Yet they're what *color* the sound and impart its **timbre**. In part, they're what make a flute sound different from a flugelhorn, and a flugelhorn sound different from an oboe. Stripped of their overtones, every musical sound would resemble that of a heart monitor, which elicits **sine tones**—pure fundamentals. (How unpleasant would *that* be?)

Harmonics are overtones whose frequencies form whole-number ratios with the fundamental (2:1, 3:1, 4:1, and so on). **Inharmonics** are overtones that are non-integral multiples of the fundamental (for example, 2.7 : 1, or 3.9 : 1). The presence of inharmonics often makes us think a sound unmusical or noisy. Most “musical” tones are richer in harmonics than inharmonics.

The complex of harmonics present in musical tones is called the **harmonic series**. Here is the series above C2.

EXAMPLE 1-11

Harmonic number:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Frequency ratio:	1:1	2:1	3:1	4:1	5:1	and so on										

Third overtone = fourth harmonic
 Second overtone = third harmonic
 First overtone = second harmonic
 Fundamental = first harmonic

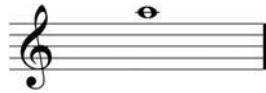
Notes:

1. The fundamental is the *first harmonic*, so the *first overtone* is the *second harmonic*, and so on.
2. Quarter notes indicate pitches that can be only approximated by our notation (more on this shortly).
3. The harmonic numbers correspond to the frequency ratios of the pitches.

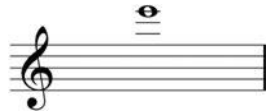
For example, our “tuning A” (A4),



at 440 cycles per second (cps), has its second harmonic A5



at 880 cps (a 2:1 ratio) and its third harmonic (E6)



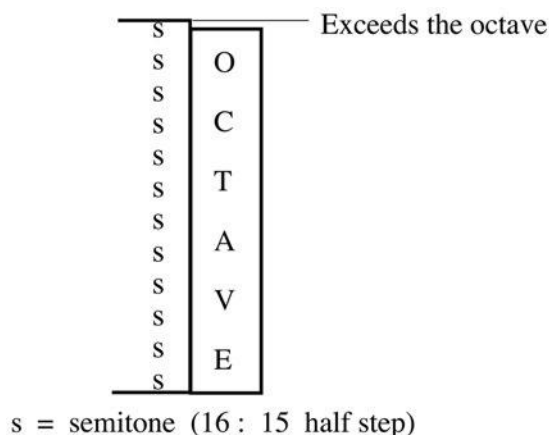
at 1320 cps (a 3:1 ratio).

Every pitch on your instrument is a fundamental tone that contains its own harmonic series. If you play a brass instrument, you can play the harmonic series above any **pedal tone** by keeping the same fingering (or slide position) and simply adjusting your embouchure. (Most pedal tones are below the standard playing range.) If you play a string instrument or a guitar, you will eventually learn how to play the open strings' harmonics by lightly touching them at appropriate points.

Equal Temperament

Overtone 15 and 16 represent the only *acoustically pure* half step in the overtone series. (Half steps are discussed in Appendix A. See p. 650) You'd think that 12 of these, stacked one atop the next, would span an octave. But they actually exceed the octave by a quarter tone (half of a half step). This is visually represented thus:

EXAMPLE 1-13



So how can each octave on the piano, for instance, be in tune with the one above or below it? The solution is **equal temperament**. To fit 12 16:15 half steps into a perfectly in tune (2:1) octave requires that each half step be tempered (made slightly smaller). That's what equal temperament does, and it's how pianos are tuned today (although the actual process involves detuning fifths rather than half steps). As a result, the only perfectly in tune intervals on a piano keyboard are the octaves.

What effect does this have? Well, after a couple hundred years, we're used to it. But cultures not attuned to equal temperament might find our beautiful music rather discordant. You've probably addressed the problem in your own music making. In fact, if you've played to the accompaniment of a piano, you've *certainly* dealt with it. You've had to make minute adjustments on your wind instrument, which produces pitches in tune with the harmonic series, or on your string instrument, which is tuned in Pythagorean (pure) fifths, in order to play "in tune" with the piano. And if you play in a brass ensemble, you're no doubt

frustrated when you play a note *exactly the same way as before*, but the note's now part of a new chord, and your director tells you you're slightly flat. Now, doesn't just knowing there's a good reason for these things help?

By the way, we're not totally locked into equal temperament. When a string quartet plays, they have the luxury of tuning to each other, and they play differently than when playing in a piano quintet. Likewise, barbershop quartets and doo-wop groups, being *a capella* (unaccompanied), often produce perfectly in tune harmonies. And orchestras generally strive for something better than equal temperament. In general, though, our musical heritage is an uneasy accommodation to "the tuning problem." We've combined instruments constructed on a variety of tuning principles, and we've adjusted our ears accordingly.

⊕ CODA

Much of this chapter has concerned notation. Many of the peculiarities and apparent inconsistencies in our notational system exist because it and the music it represents *evolved*. If we could start from scratch today, we could probably simplify many things, but the conversion would be painful. So, the beast goes on.

Meanwhile, music notation has become increasingly inadequate to present-day demands. Blues and rock vocalists sing pitches that often fall somewhere between adjacent keys or frets. Likewise, jazz players spend a lot of time in the "rhythmic cracks." This is why transcriptions of jazz solos look incredibly complex, yet give but a mere notion of the music, which is represented accurately only through audio recordings.

Still, for all its problems, an intimate understanding of our notational system remains an indispensable tool of today's practicing musician.

➤ *For additional drills on the material presented in this chapter, see Workbook Appendix A, Pitch.*

DO YOU KNOW THESE TERMS?

- | | | |
|---------------------|-------------------|----------------|
| • accidentals | • grand staff | • meter |
| • acoustics | • half step | • musica ficta |
| • Church modes | • harmonic series | • pedal tone |
| • equal temperament | • hexachord | • solmization |
| • fundamental | • hypermeter | |
| • gamut | • ledger line | |

CHAPTER TWO



Intervals

PERSPECTIVE: FIVE WAYS TO EXPRESS AN OCTAVE

An **interval** is the difference in pitch between two tones. That difference can be measured in many ways. For example, the interval between tuning A—with a frequency of 440 Hz (Hertz, or cycles per second)—and the octave higher (880 Hz) can be expressed as:

1. 440 Hz
2. 1200 cents (The cent is a measurement used by acousticians. An equal-tempered half step contains 100 cents)
3. Six equal-tempered whole steps
4. 12 equal-tempered half steps
5. Eight scale steps (“octave” means “eight”)

If you can construct a major or minor scale on any pitch, then you know at least two intervals—the whole step and half step. And from Chapter 1, you know that the equal-tempered half step is the smallest interval on the keyboard and the smallest commonly used in our music. It’s time to learn more.

KEY CONCEPTS IN THIS CHAPTER

- Interval Measurement and Designation
- Intervals in the Major Scale
- Inversion

WHITE-KEY INTERVALS

The most common way musicians identify intervals is through a two-part designation consisting of a numeric value and a qualifying term. The numeric value indicates *the number of letter names spanned*. Interval a in Example 2-1 is a third because it spans three letter names (G, A, and B); interval b is a fifth because it spans five letter names (A, B, C, D, and E); and so on. *Notice that both notes comprising the interval are included when counting letter names.*

EXAMPLE 2-1

a Third
G (A) B
letter names spanned

b Fifth
A (BCD) E
letter names spanned

c Seventh
C (BAGFE) D
letter names spanned

d Second
F E
letter names spanned

But that's not enough. Because all letter names are not a whole step apart—E–F and B–C are half steps—intervals that span *the same number of letter names* may span *a different number of half steps*. Interval a in Example 2-2 is *not* the same size of third as interval b.

EXAMPLE 2-2

a a third
(three half steps)

b a third
(four half steps)

To describe an interval's size more precisely, a qualifier is added to the numeric value. Five qualifiers are used:

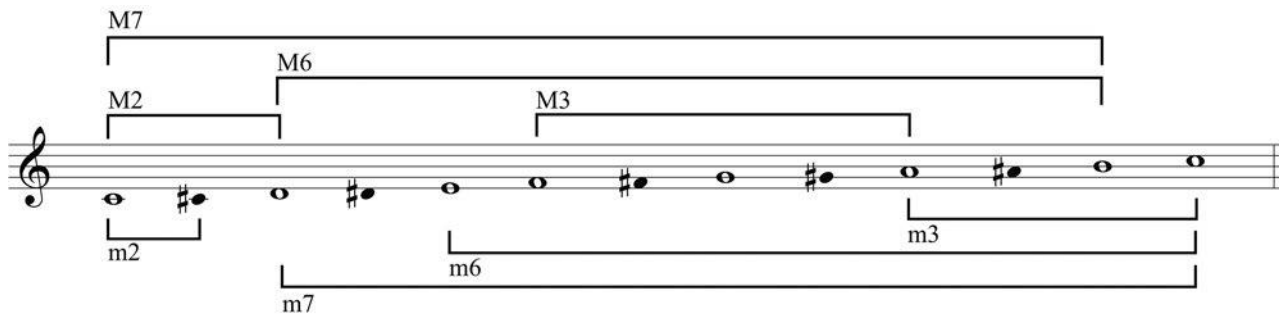
Major (M)]	apply to seconds, thirds, sixths, and sevenths (m2, M2, m3, M3, m6, M6, m7, M7)
Minor (m)		
Perfect (P)		applies to unisons, fourths, fifths, and octaves (P1, P4, P5, P8)
Augmented (+)]	can apply to any interval (+2, o5, and so on)
Diminished (o)		

One way to understand how these descriptors work is to visualize an octave on the piano, an image you should engrave in your mind's eye.

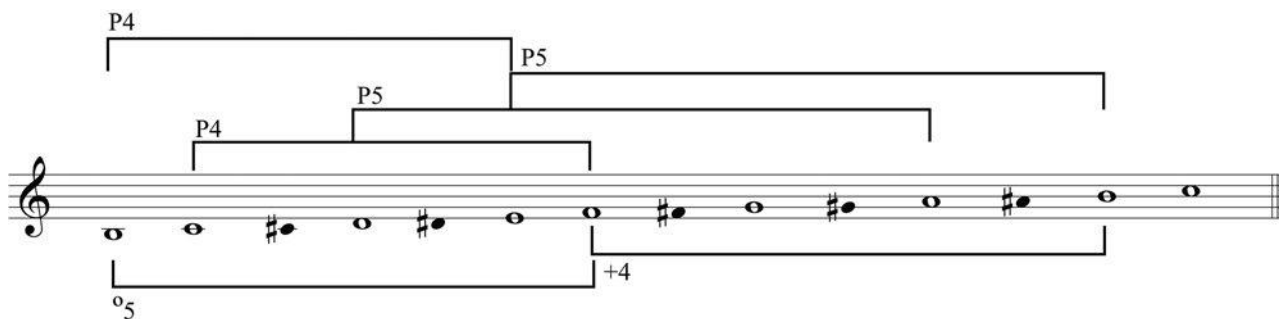


White-key intervals span from 0 to 5 black keys. Major intervals (M2, M3, M6, and M7) all span one more black key than their minor forms (m2, m3, m6, and m7). In Example 2-3, compare the major intervals (above the staff) to their minor counterparts (beneath the staff). The black keys spanned by each interval are shown as stemless quarter notes.

EXAMPLE 2-3

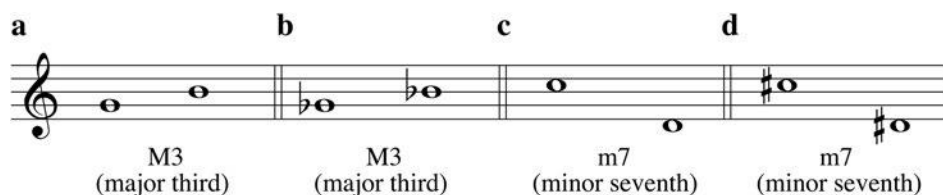


This leaves only the perfect fourth (P4) and perfect fifth (P5). The P4 spans 2 black keys and the P5 spans 3. *All* white-key fourths and fifths are perfect except the ones formed by B and F. The fourth formed by these two pitches is augmented (spanning three black keys rather than two) and the fifth is diminished (spanning two black keys rather than three).



If *both* of an interval's pitches are altered *in the same direction by the same amount*, its size remains unchanged.

EXAMPLE 2-5



Notes:

1. In **a**, the third is major (it spans two black keys instead of one). In **b**, *both* pitches are lowered by a half step, so the interval is unchanged.
2. In **c**, the seventh is minor (it spans four black keys instead of five). In **d**, *both* pitches are raised by a half step, so the interval is unchanged.

However, if *only one* of an interval's pitches is altered, the interval's size changes as follows:

smaller -----larger		
DIMINISHED (o)	MINOR (m)	MAJOR (M)
	PERFECT (P)	
	AUGMENTED (+)	

For example, a m6 expanded by a half step becomes a M6. If expanded by another half step, it becomes an +6. If contracted by a half step, a m6 becomes a o6.

Notice that perfect intervals cannot become major or minor, nor can major or minor intervals become perfect.

BACK TO BASICS 2.1

Interval
Recognition
and Spelling

CONCEPT CHECK

Using the preceding chart, name the interval in Example 2–5 that would be created in a: by lowering B one half step; in b: by raising G♭ to G♯; in c: by lowering C one half step; in d: by lowering D♯ one half step.

➤ *Assignments 1A through 1D on Workbook pp. 12–13 can be completed now.*