

Jazz Scale Theory

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Objectives:

The objective of the following discussion is to examine the application of scales and modes to the process of jazz improvisation. At the time of this writing this discussion is not intended to explain basic music theory nor does it look extensively at harmonic relationships between adjacent chords. It also does not include extensive practice exercises, though there are some suggested practice methods mentioned in passing throughout and summarized at the conclusion.

It is intended to be a thorough examination of the application of some key scales and modes as they are applied in the process of jazz improvisation, and, as such, includes all the ways that I know of looking at how scales and modes relate to each other and to chords and melodies. This means that some concepts are discussed more than once in different approaches. There are also many different diagrams designed to summarize information and to help to clarify various approaches.

One reason for using a variety of approaches is that different approaches can be more useful in different situations. For example, finding common tones is one way to approach a G7#9 to Cm7 but this approach is not so useful when you come to a Cm7 when playing modally. If you are only analyzing written music you might not need a variety of approaches because you have the time to apply any one approach of building scales and modes that you are most comfortable with. If you are using theory to help you improvise in varied settings you may find that having a variety of approaches is useful depending upon the specifics of the situation.

Each approach will tend to lead one in a slightly different direction which, through the process of exploration, will lead to different improvisation results. You can think of each approach as a valid tool and the choice of tool will affect the outcome. Ultimately the more approaches that you can assimilate, the more complete your mental concept will be.

If you are familiar with jazz scales but want to learn more, focus on the sections that approach things differently from the approach that you are most familiar with. If you are not familiar with jazz scales at all, focus on one section at a time or on similar portions of each section, such as only portions dealing with dorian modes. If you try to assimilate all of the various approaches at once you will end up confusing yourself.

Prerequisites:

Before using the information included here you should understand basic music theory. The following is a list of some of the terms used in the discussion. There are no explanations of these particular terms and concepts because it is assumed that you already understand them. Please read through the list, and, if you find some that you are not familiar with, find a basic music theory source to learn them before reading further in this document.

Chromatic scale
Major scales
Minor modes
I, II, III IV, V VI, VII
Chord construction
Inversions
Root, 3rd, 5th, 7th
Tonic
Whole step, Half step
Minor second, Major second, Minor third, Major third, Perfect fourth, Perfect fifth, Augmented fourth, Diminished fifth, Tritone, Ninth, Eleventh, Thirteenth
Superimpose, superimposition
Modulation
Dissonance, consonance

There are many possible sources for this basic music theory, including the standard general music theory text, "Harmony" by Walter Piston. You may also be able to find some internet resources.

Chapter One: Derivative Approach to Building Scales/Modes:

Modes Derived From the Major Scale:

Most chords and modes can be derived from either the major scale or the melodic minor mode.

(Note: In jazz often the terms scale and mode are used interchangeably. However, standard music analysis calls the major scale a scale, while all sequence of pitches that can be derived from the scale, including the minor mode, are not called scales but modes. All other pitch sequences such as whole tone, diminished and blues scales are called scales. I have applied this naming convention throughout primarily because it is the convention that I use by habit.)

To build modes from the major scale, simply start on a note of the scale other than the tonic and go up to the octave above using the notes of your original major scale. For example, using the C major scale start on the second note of the scale (D) and go up to an octave above using the notes of the C major scale. You have now built a D scale with the notes D, E, F, G, A, B, C, and D. Whenever you start a scale from the second note of any major scale the scale is called a dorian mode. In the key of C major the scale is called a D dorian mode because D is the starting note and because it uses the notes that are in the key of C major.

Each degree of the major scale has a mode associated with it. The major/minor scale system of Western music draws upon the music theories of the ancient Greeks, and as a result many elements of music theory still use Greek names, including the modes. The mode built from the third degree of the major scale is called the phrygian mode. The mode built from the fourth degree is called the lydian mode, the fifth the mixolydian mode, the sixth the aeolian mode (also the natural minor), and the seventh locrian mode. The series from C to C has a name too; the ionian mode, but most musicians are more familiar with it as the major scale.

So, from the key of C major you can build:

C major (ionian)
D dorian
E phrygian
F lydian
G mixolydian
A aeolian
B locrian

Or in the key of Ab major you can build:

Ab major
Bb dorian
C phrygian
Db lydian
Eb mixolydian

F aeolian
G locrian

and so on, for all twelve keys.

Mode	Key/Notes										
Major	C	Db	D	Eb	E	F	G	Ab	A	Bb	B
Dorian	D	Eb	E	F	F#	G	A	Bb	B	C	C#
Phrygian	E	F	F#	G	G#	A	B	C	C#	D	D#
Lydian	F	Gb	G	Ab	A	Bb	C	Db	D	Eb	E
Mixolydian	G	Ab	A	Bb	B	C	D	Eb	E	F	F#
Aeolian	A	Bb	B	C	C#	D	E	F	F#	G	G#
Locrian	B	C	C#	D	D#	E	F#	G	G#	A	A#

Each mode has a particular pattern of half steps (h) and whole steps (W) which defines its sound.

Mode	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Major	W	W	h	W	W	W	h
Dorian	W	h	W	W	W	h	W
Phrygian	h	W	W	W	h	W	W
Lydian	W	W	W	h	W	W	h
Mixolydian	W	W	h	W	W	h	W
Aeolian	W	h	W	W	h	W	W
Locrian	h	W	W	h	W	W	W

Note that as you move up through the sequence of modes, the location of the half steps shift downwards each time. This is something to keep in mind if you practice the modes sequentially ie. C major, then C dorian, then C phrygian, etc.

For the beginning improviser the most important modes to start with are the dorian, mixolydian and major modes. These modes provide the notes for the most common progression in jazz; the II – V – I. Learning the dorian, mixolydian modes and the major scale in all twelve keys combined with the blues scale in all keys will allow you to find a workable solution (workable but not necessarily the ideal solution) for playing over the majority of jazz standards.

The modes for the II – V – I, the V – I and the II – V progressions are all in the same key, so to simplify you may think about playing in one key over the entire progression. For example, the progression Dm7 – G7 – Cmaj7 (using D dorian, G mixolydian and C major) is all in the key of C major so you can use the notes from the C major scale. However, the limitation of relying on this simplified method is that you miss the difference in function and sound of each note relative to the chord that is sounding. In the previous example the note F will sound good over the Dm7 and the G7 since the F is important chord tone in both chords, but it will not sound as good over the Cmaj7. In fact the fourth degree of the major scale is considered an “avoid” note when used over a tonic major chord. An avoid note is one that does not sound particularly good and should be used only as a

passing tone.

Another limitation of the simplified method is that eventually you will need to learn the individual modes. If you rely on the simplified method you will have difficulty substituting modes (ie. the lydian dominant differs from the mixolydian by only the raised fourth step) or playing modally (ie. when playing modally Dm7 is not the same as C major because D is the tonal center and not C).

One thing that makes learning these three modes easier is that the parallel (parallel meaning starting with the same root such as C major, C dorian and C mixolydian) modes differ from each other by only one note. For example, if you take the C major scale and lower the seventh degree to a Bb, you have the C mixolydian. If you now lower the third to an Eb, you now have the C dorian. See the scale chart section for more information.

The aeolian mode is the natural minor that is related to the original major scale. This mode is an option whenever you have a tonic minor. The locrian mode is particularly important when you are playing in minor keys because the locrian is frequently used with the II chord in the II – V – i in minor mode. The lydian mode is often used as an alternative for the major scale because the only difference is the raised fourth degree which adds colour to the major sound and eliminates the perfect fourth degree which is an “avoid” note in the major scale. The phrygian mode is occasionally, but not frequently used. When it is used, it is often intended to impart a Spanish flavor to the music

Modes Derived From the Minor Mode:

The same approach is used to build modes from the melodic minor mode. In standard music theory the melodic minor mode has two different forms where the sixth and seventh degrees are raised in the ascending form and lowered in the descending form. In jazz theory the melodic minor is always the ascending form only. It is sometimes referred to as the “jazz minor”.

You can also think of the minor mode as the major mode with a lowered third degree. Since the ascending melodic minor or jazz minor has the raised sixth and seventh degrees (F# and G# in A minor), the only remaining difference between the parallel major and minor is the third degree which is an E in A major and an Eb in A minor.

From the key of C minor the resulting modes are:

- C melodic minor
- D phrygian #6
- Eb lydian augmented
- F lydian dominant
- G minor dominant
- A locrian #2
- B superlocrian

Mode	Key										
Melodic minor	C	C#	D	Eb	E	F	G	Ab	A	Bb	B
Phrygian #6	D	D#	E	F	F#	G	A	Bb	B	C	C#
Lydian Augmented	Eb	E	F	Gb	G	Ab	Bb	Cb	C	Db	D
Lydian Dominant	F	F#	G	Ab	A	Bb	C	Db	D	Eb	E
Minor Dominant	G	G#	A	Bb	B	C	D	Eb	E	F	F#
Locrian #2	A	A#	B	C	C#	D	E	F	F#	G	G#
Superlocrian	B	B#	C#	D	D#	E	F#	G	G#	A	A#

Mode	1-2	2-3	3-4	4-5	5-6	6-7	7-8
Melodic minor	W	h	W	W	W	W	h
Phrygian #6	h	W	W	W	W	h	W
Lydian Augmented	W	W	W	W	h	W	h
Lydian Dominant	W	W	W	h	W	h	W
Minor Dominant	W	W	h	W	h	W	W
Locrian #2	W	h	W	h	W	W	W
Superlocrian	h	W	h	W	W	W	W

Also available for use is the harmonic minor with its lowered sixth and raised seventh degrees. This creates an augmented second (minor third) between the sixth and seventh degrees.

	1-2	2-3	3-4	4-5	5-6	6-7	7-8
C Harmonic minor	W	h	W	W	h	m3	h
	C	D	Eb	F	G	Ab	B
							C

The harmonic minor and the melodic minor are so named because in standard music theory the harmonic version of the mode supplies the notes that are to be used when writing harmonies in minor keys while the melodic minor, with its ascending and descending versions, is used in melodic lines. For example in C minor a G chord would have G, B and D, an F chord would have F, Ab and C, while the melodic lines would use A and B when ascending and Ab and Bb when descending.

In jazz the melodic minor, dorian mode, aeolian (natural minor) and harmonic minor are all available for use as tonic minor scales, with the dorian and melodic minor being the most frequent choices.

The phrygian #6 (the “#6” refers to the raised 6th degree, ie. the phrygian mode but with a major 6th instead of a minor 6th) is not commonly used. Instead, the locrian mode (from the seventh mode of a major scale, see above discussion about major scale modes) is more often used in a II – V – i progression in minor keys. The locrian #2 (locrian mode with a major 2nd) sometimes serves as a substitute for the locrian mode because the major second is not as dissonant as the minor 2nd degree of the locrian mode.

The lydian dominant does not normally function as a scale for the fourth degree in minor, but instead is usually used as a substitute mode for dominant chords. The fourth degree of the mixolydian mode is another “avoid” note, and the lydian dominant, like the lydian mode, has a raised or augmented fourth degree. Not only does the raised fourth avoid the avoid note, but it also creates a semitone or leading tone beneath the fifth degree of the scale. The augmented fourth a semitone below the fifth supports fifth, and the perfect fifth, in turn, increases the strength of the root of the chord.

The minor dominant mode is not used with the dominant chord in minor mode. Instead the superlocrian is the standard scale for the V in minor mode. As a result, in C minor the II – V – i progression uses the D locrian (7th mode of Eb major), G superlocrian (7th mode of Ab minor) and C melodic minor or dorian.

When you play over a II – V – I progression in a major key, all of the pitches for the standard modes to use come from one major scale. This is not the case in minor modes. One of the difficulties in learning to play in minor mode is that the most common modes for the II and V in minor mode are not the ones that automatically come from the corresponding minor mode.

chord	mode	notes of modes in C minor						
ii	D locrian	D	E ^b	F	G	A ^b	B ^b	C
V	G superlocrian	G	A ^b	B ^b	B	C [#]	E ^b	F
i	C melodic minor	C	D	E ^b	F	G	A	B
	C dorian	C	D	E ^b	F	G	A	B ^b

So the pitches used in the modes are not all the from the same key as they are when you play a II – V – I in major keys.

chord	mode	notes reordered to compare with C minor									
ii	D locrian	C		D	E ^b	F	G	A ^b		B ^b	
V	G superlocrian		C [#]		E ^b	F	G	A ^b		B ^b	B
i	C melodic minor	C		D	E ^b	F	G		A		B
	C dorian	C		D	E ^b	F	G		A	B ^b	

Particularly notable is the fact that the superlocrian does not include the tonic (C) of the following tonic minor but instead has a half step below and above.

This relationship between pitches of the scales changes again if you substitute the locrian #2 for the locrian mode, or use the aeolian or the harmonic minor as the tonic minor. See the section on Common Tones for further discussion on the pitch relationships of these modes.

Chapter Two: Other Scales

The following scales are not derived from major or minor scales.

Blues Scale:

The easiest scale for beginning improvisers to work with is the blues scale. If you've played with it before you can probably still remember the first time you played it and how easy it was to make up something that sounded interesting. If you haven't played with it before, I recommend it as a first scale to learn when learning to improvise because it is easy to make up something that sounds good using the blues scale. At the same time it is difficult to come up with something that hasn't been done or used many times already because the blues scale has been used so much for so long, but that shouldn't discourage beginners from having fun with it and getting a start into improvising.

The blues scale is not a mode of either the major or minor scales. Like the pentatonic scales of oriental music or other ethnic scales it is a folk music scale that is not derived from the Western European common practice theory of major and minor keys. It has, however, been merged with major/minor tonal concepts.

C Blues scale	m3	M2	m2	m2	m3	M2	
	C	E \flat	F	F \sharp	G	B \flat	C

Note the chromatic step-wise sequence from the perfect fourth through the tritone to the perfect fifth, the minor seventh degree, the minor third and the absence of a second degree to the scale. All notes sound good, and there are no "avoid" notes in the scale.

The standard chord for the blues scale is the dominant seventh chord, or C7 for the C blues. Note the difference between major third (E) in the chord and the minor third (E \flat) in the scale. This contrast is one of the most characteristic elements of the blues scale when it is used in jazz. Pitch-wise, the blue third should actually lie somewhere in between the minor and major third which is something to keep in mind if you are a singer or a fretless stringed instrument player.

Also note that the C7 chord with the C blues scale does not need to resolve to an F chord but functions as a tonal center itself.

It is also possible to add a major second to the scale, or to add a major third while keeping the minor third. On the other hand in a more rock-oriented situation the tritone might need to be omitted from the scale. The appropriateness of these changes depends on the musical context. In a minor key the blues will use a m7 chord instead of a 7 chord.

Symmetrical Scales:

Symmetrical scales are scales that have a pattern that repeats within the octave.

The most essential of the symmetrical scales is the chromatic scale. Presumably you already under-

stand its construction, and the point of mentioning it here is note that one way of approaching any improvisation is to use only the chromatic scale; the key is how each note is used. Over any given chord any chromatic note will be either a chord tone or a passing tone between chord tones or between other passing tones.

You can view each chromatic note in terms of its tension and color relative to the chord. For example, over a G7 the note E has a certain color which is very different from the color and tension level of the Eb. The color and tension will also change depending on how the note is used. The Eb may want to lead to E, or down to D, or it may anticipate an F# $\bar{7}$ in the next measure, or it may be part of a Ebm chord superimposed that is superimposed over the G7, or it may be part of a sequential melodic pattern that is being carried over the G7 chord, or it may simply sit against the G7 chord.

Whole-Tone Scale:

If you use every second note of the chromatic scale you will create a whole-tone scale. For example, the C Whole Tone scale is as follows:

	<u>1-2</u>	<u>2-3</u>	<u>3-4</u>	<u>4-5</u>	<u>5-6</u>	<u>6-7</u>	
C Whole Tone	W	W	W	W	W	W	
	C	D	E	F#	Ab	Bb	C

Note that there are only 7 notes or 6 different pitches in the scale; once you reach the seventh note you have already arrived at the octave.

The other interesting thing about the whole tone scale is that there are only two. Transpose the scale up one half step and you create the other whole tone scale:

Db	Eb	F	G	A	B	Db
----	----	---	---	---	---	----

Now transpose the scale one more half step to start on D:

D	E	F#	Ab	Bb	C	D
---	---	----	----	----	---	---

and you have the same notes as you had in the C whole tone scale. D is now the root instead of C, and F# is the third instead of E, but the notes in the scale are the same so you only need to practice two in order to be able to play in all keys.

The whole tone scale lacks a leading tone anywhere in the scale (ie. the note a half step below the tonic, B in the key of C, or E in a C mixolydian mode) and does not have a perfect fifth above the root (a G above the C) which would increase the stability of the C as the root. It also has a very open, homogenous sound because of the whole steps. These all are reasons why the whole tone scale can sound as if there is no root or as if any of the notes could be the root. This can be an advantage when playing impressionistically or for modulating to remote keys.

On the other hand, if you put a C in the bass and use the E and Bb in the accompaniment it will sound like a C7 with a 9th (D), raised fourth (F#) and raised fifth (G#) in the scale. This is particularly true if the following chord is an F chord since this will sound like a V-I resolution.

Diminished Scale:

The diminished scale uses a sequence of a whole step followed by a half step repeated four times within each octave. For example, to go from C to C:

	<u>1-2</u>	<u>2-3</u>	<u>3-4</u>	<u>4-5</u>	<u>5-6</u>	<u>6-7</u>	<u>7-8</u>	<u>8-9</u>	
Diminished	W	h	W	h	W	h	W	h	
	C	D	E ^b	F	G ^b	A ^b	A	B	C

Note that there are 8 different notes in the scale, 9 notes to the octave. Because there are only 7 different letter names for notes (A, B, C, D, E, F, G), one letter name always gets used twice (in the preceding example there is an A and an A^b). The reason that there are 9 notes to the octave is that there are four half steps and four whole steps in the scale whereas the major scale has only two half and five whole steps.

The chord tones for this scale are a minor third apart (C, E^b, G^b, A), spelling out a diminished chord. Another way of creating this scale is to superimpose two diminished chords. In other words, take a C^o7 chord, superimpose a D^o7 (D, F, A^b, B) chord and you have the notes for the diminished scale.

Because the pattern repeats every minor third, there are only three different diminished scales:

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>
C	D	E ^b	F	G ^b	A ^b	A	B	C
D ^b	E ^b	E	F [#]	G	A	B ^b	C	D ^b
D	E	F	G	A ^b	B ^b	B	C [#]	D
E ^b	F	G ^b	A ^b	A	B	C	D	E ^b

When you reach the E^b diminished scale the pitches are the same as those in the C diminished scale. Therefore, you only have to practice three different diminished scales as long as you mentally adjust for which notes function as the root, 3rd, 5th, and 7th.

Half-Whole Diminished Scale:

If you start the diminished scale with the half step first and then the whole step you get a different diminished scale. Now the scale has a minor seventh instead of a major seventh, and the fourth pitch of the scale is a diminished fourth or a major third above the root. Because it includes a minor seventh and a major third, this scale will now work well within the family of dominant harmonies and scales.

This scale is called the Half-Whole Diminished (or 8 Note Dominant) because it starts with a half step followed by a whole step, whereas the usual diminished scale starts with a whole step followed by a half step.

	<u>1-2</u>	<u>2-3</u>	<u>3-4</u>	<u>4-5</u>	<u>5-6</u>	<u>6-7</u>	<u>7-8</u>	<u>8-9</u>
Half-Whole Diminished	h	W	h	W	h	W	h	W

The other method for building the scale is to start on the second note of the diminished scale. In other words, the half-whole diminished is the second mode of the diminished scale, just like the dorian is the second mode of the major scale.

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>
	D	E ^b	F	F [#]	G [#]	A	B	C	D
	E ^b	E	F [#]	G	A	B ^b	C	D ^b	E ^b
	E	F	G	G [#]	A [#]	B	C [#]	D	E

Note how the second and third pitches of the scales are notated in the chart below.

	<u>R</u>	<u>b2</u>	<u>#2</u>	<u>M3</u>	<u>#4</u>	<u>P5</u>	<u>M6</u>	<u>m7</u>	<u>8</u>
	D	E ^b	E [#]	F [#]	G [#]	A	B	C	D
	E ^b	F ^b	F [#]	G	A	B ^b	C	D ^b	E ^b
	E	F	F ^{##}	G [#]	A [#]	B	C [#]	D	E

The F^{##} is not easy to work with when you are practicing your scales but it is accurate from a theoretical standpoint. In jazz theory the flatted ninth and the raised ninth can replace the major ninth in dominant chords, and often both are used at the same time. The half-whole diminished scale consists of a root, flatted ninth, raised ninth, major third, raised fourth (or eleventh), perfect fifth, major sixth and minor seventh.

For practicing purposes you can, like the diminished scale, superimpose a diminished chord on top of a diminished chord to get the pitches of the scale (ie. E^b diminished on top of a D diminished). And, like the diminished scale, the third transposition of the scale has the same pitches as the first so from a practicing standpoint there are only three half-whole diminished scales. In fact, since the half-whole diminished scale is a mode of the diminished scale, practicing the three diminished scales covers the fingerings for all of the half-whole diminished scales as well.

However, keep in mind that the harmonic implications of the pitches are not symmetrical like they are with the diminished scale. The chord tones are not the first, third, fifth and seventh notes of the scale like they in the diminished scale, but instead are the first (root), fourth (major third), sixth (perfect fifth) and eighth (minor seventh) notes of the scale along with the flatted and raised ninths.

You may instead want to practice the half-whole diminished scale with its close relative, the superlocrian mode. Both are dominant substitutes and can often be used interchangeably. Try them one after the other and you will notice that they both start the same with the flatted and raised ninth, the major third, the raised fourth and the raised fifth. At this point the superlocrian mode progresses by whole steps.

	R			M3	#4				8
C Half-Whole Diminished	C	Db	Eb	E	F#	G	A	B	C
C Superlocrian	C	Db	Eb	E	F#	Ab	Bb		C
C Whole Tone	C	D		E	F#	Ab	Bb		C

This is why the superlocrian mode is also called the Diminished Whole Tone scale; it starts like the half-whole diminished scale, then changes to the whole tone scale after the overlap on the major third and augmented fourth. Alternatively, another way to build the superlocrian mode is to use the whole tone scale, omit the second degree and replace it with the raised and lowered ninths. See the section with the whole tone scale chart for more information on building modes from the whole tone scale.

Bebop Scales:

Bebop scales are scales with an added passing tone.

The dominant bebop scale adds a major seventh to the mixolydian mode. The result is that there is a non-chord tone between each chord tone and an even sequence of chord tones and non-chord tones throughout the scale no matter where you start in the scale. This works well particularly when you start your playing on a downbeat with a chord tone.

	1	2	3	4	5	6		7	8
Dominant bebop	C	D	E	F	G	A	Bb	B	C

The major bebop scale adds a note between the fifth and the sixth degrees of the major scale.

	1	2	3	4	5		6	7	8
Major bebop	C	D	E	F	G	G#	A	B	C

The minor bebop scale adds a major third between the minor third and the perfect fourth, adding a major quality to the sound of the scale.

	1	2		3	4	5	6	7	8
Minor bebop	C	D	Eb	E	F	G	A	B	C

The reason for the added note is to have 8 notes in each scale so that it is easy to create a line that consists of a steady stream of eighth notes or sixteenth notes. This is something that you have to play and contrast with 7 note scales to hear the difference that the added note makes. Play the C major, mixolydian and minor scales and compare them with the bebop version of each scale. Listen for how the 7 note scales seem to stop in comparison to the bebop versions which seem to want to continue on.

Chapter Three: Scales From Superimposed Chords

Building Scales From Superimposed Chords:

Another way to look at scales and modes is to think of them as two chords that are either stacked on top of each other (like an extended chord) or side by side (like a bi-tonal chord).

	7 th chord	Distance to next chord	Superimposed triad	Example	
Major	Maj7	W	m	CMaj7	Dm
Lydian	Maj7	W	M	Cmaj7	DMaj
Lydian Augmented	Maj7#5	W	M	Cmaj7#5	DMaj
Mixolydian	7	W	m	C7	Dm
Lydian Dominant	7	W	M	C7	Dmaj
Superlocrian	ø7	h	m	Cø7	Dbm
Dorian	m7	W	m	Cm7	Dm
Aeolian	m7	W	o	Cm7	Do
Melodic Minor	mMaj7	W	m	CmMaj7	Dm
Harmonic Minor	mMaj7	W	o	CmMaj7	Do
Phrygian	m7	h	M	Cm7	DbMaj
Locrian	ø7	h	M	Cø7	DbMaj
Locrian #2	ø7	W	o	Cø7	Do
Diminished	o7	W	o7	Co7	Do7
Half-Whole Diminished	o7	h	o7	Co7	Dbo7

Guitar players that are more at home thinking in terms of chords rather than scales may find this way of thinking easier to conceptualize.

Another advantage to this approach is that is easier to go from this approach to extended chords such as 11 and 13 chords. Not only will these extended chords seem less intimidating if you are already familiar with this approach, but it also makes the extensions of the chords more accessible. Focussing on the extensions is another approach to improvising or to getting different sounds out of your improvisations.

If you already know your scales and modes, you don't have to superimpose the chords in the same manner as above. For example, instead of a Dm triad over a C7 to get a mixolydian mode, you can build a B \mathbb{E} 7 or an Fmaj7 instead which will give you the same notes as Dm over C7 but will give you a different sound because of the harmonic and passing note functions of each note, assuming that you can already hear those relationships. Harmonically this can also be interesting when writing for a big band because you can put the C7 in the trombones with the Fmaj7 in the trumpets and have the saxes overlap with a B \mathbb{E} 7.

Chapter Four:

Chord / Scale Families

Key Characteristics:

There are some basic groups or families of chords and modes. Each family has an essential sound which is determined primarily by the key characteristic pitches of each. Each of the chords and modes that belong to each family have in them the key characteristics that defines the family.

The value of grouping into families is that often these chords and modes are interchangeable within the family. For example, when given a Maj7 chord your first choice would be to use a major scale. However, you can often substitute a lydian mode and have a slightly different flavour of the sound to work with.

Family	Key pitches	Chords	Scales/modes
Major	M3 and M7	Maj, Maj7, Maj6, Maj9	major, lydian, lydian augmented
		as above with #11	lydian, lydian augmented
Dominant	M3 and m7	7, 9 13, 7b9, 7#9, 7#9#5	mixolydian, lydian dominant, superlocrian, half-whole diminished, whole tone,
		7#11	lydian dominant, whole tone,
Minor	m3 and P5	m, m7, m6	dorian, aeolian, phrygian
		m, m6, mMaj7	melodic minor, harmonic minor
Half-diminished	m3 and o5	ø7	locrian, locrian #2
Diminished	o5 and o7	o7	diminished
Whole tone	M3 and #5	7#5	whole tone

The key or characteristic notes of each family are the strongest and the best notes to use in a melody or a solo if you want to identify the underlying chord. That is not meant to suggest that you should use these notes prominently all the time but rather that you should be aware that these notes will fit most strongly when you do use them.

Note that the characteristic notes of the dominant family are a tritone apart. The interesting thing about that is that the inversion of a tritone is still a tritone, which means that the dominant chord a tritone from your original chord will have the same characteristic notes. For example the characteristic notes of a G7 chord are B and F and the characteristic notes of Db7 are F and Cb or B. This is the reason that the tritone substitution, one of the most common chord substitutions in jazz, works as well as it does. If you are not familiar with the tritone substitution, the tritone substitution allows the performer or the composer to replace the dominant chord with the chord and the scale a tritone away. For example, if you are in the key of C and come to a G7 chord, you can replace the G7 with a Db7 chord and use the Db mixolydian mode.

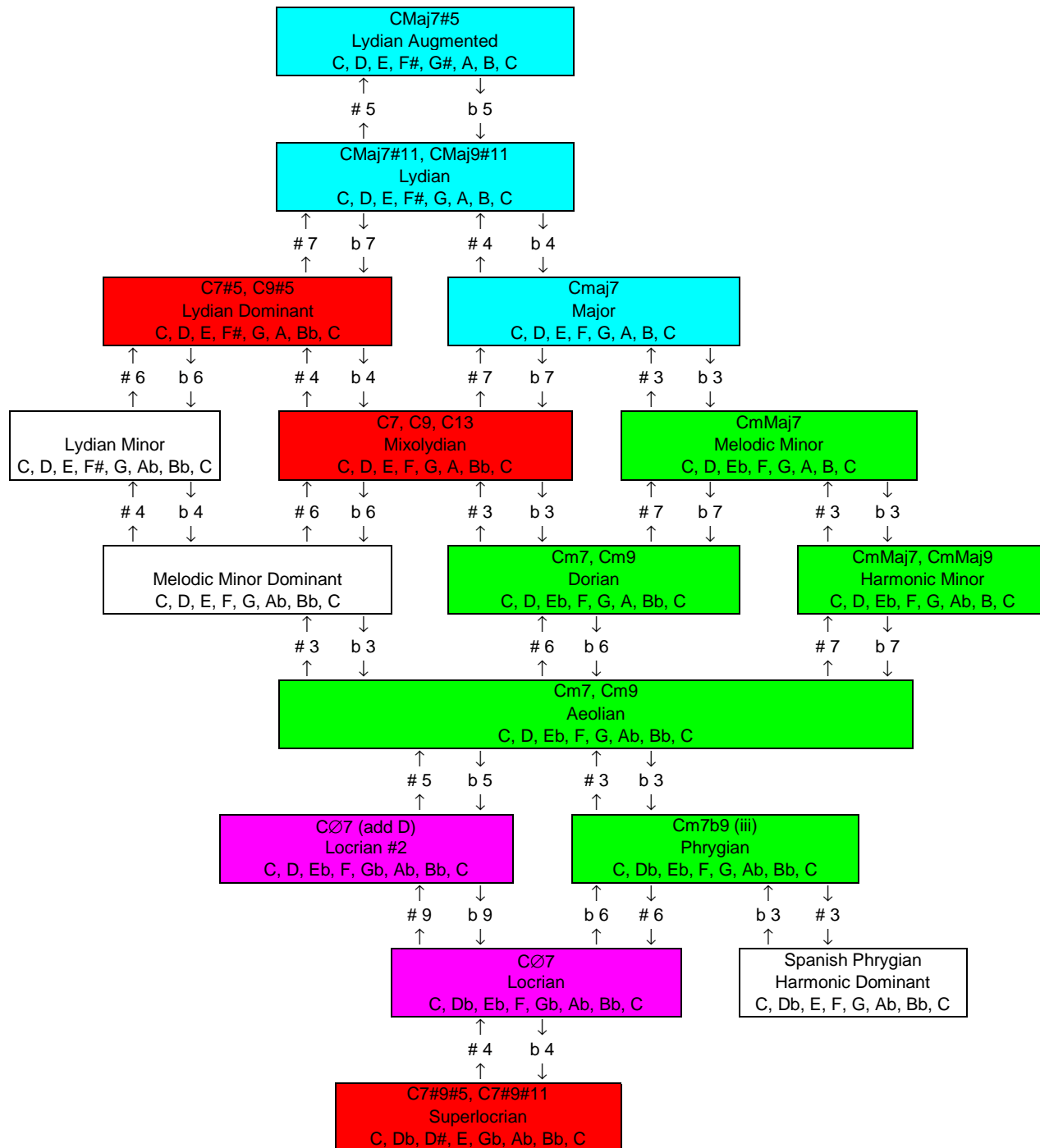
Dominant chords by nature are tension chords, traditionally seeking resolution from the tension to the tonic major or minor. The musical language of jazz, however, accepts more dissonance than

common practice harmony and in a jazz context the dominant chords do not always resolve. Still, because the dominant family is by nature a tension sound it supports more alterations and substitutions than the other families of chords. Ninths in a dominant chord and scale can be lowered or raised or both, elevenths can be raised, and even the fifth can be raised or raised and lowered at the same time, as long as the characteristic major third and minor sevenths remain present.

The other families do not accept as many alterations although 4^{ths} can be raised in major scales and 7^{ths} can be raised in minor chords and scales. Since the 4th degree of a scale or mode is not a chord tone, if a mode with a raised 4th is specifically desired by the composer the chord will often be notated with a #11 and/or there will be a #4th degree in the melody.

Chapter Five: Parallel Relationships Between Scales and Modes

Scale / Mode Relationships by Altering One Pitch



How the chart works:

- 1) Pick any mode/scale on the chart
- 2) Follow an arrow to another mode. The arrow will tell you what note of the mode needs to be raised (#) or lowered (b) in order to change the mode to the new mode.

For example, find the major scale near the top right area of the chart. Then find the melodic minor below and to the right of the major scale. The arrow that points from the to the minor mode tells you that to change the major scale to the melodic minor you lower the 3rd degree of the scale.

There is also an arrow that points in the opposite direction. This arrow tells you that in order to reverse the change and go from melodic minor to major you do the opposite change. To go from the melodic minor mode to the major scale you raise the 3rd degree of the melodic minor.

For the key of C major, the 3rd degree of the scale is E. Lower the E to an Eb and the mode becomes C melodic minor. Conversely, if you want to change a C melodic minor mode to a C major scale, raise the 3rd degree from an Eb to an E natural.

Above each scale/mode name there are one or more chords noted. These chords are the most common chords used to indicate each scale/mode.

Changes to the second degree of the scales have been noted as 9ths rather than 2nds. The reason is that 9ths are frequently added to any triad or 7th chord and the modification of the 9th often appears in the chord symbol.

When you change only one note of a scale/mode, the sound of the scale changes slightly. Modes that are located close together sound similar. For example, you can often use either the dorian or the aeolian mode for the same minor seventh chord.

If you change two notes (ie. take two steps within the chart), the sound changes even more. For example, when you lower the 3rd degree of the Major mode you get the Melodic Minor Mode. If you also lower the 7th degree, you now have the Dorian Mode. Because you've now changed two pitches from the original Major mode, the sound of the scale has changed even more.

As you move further away from your starting scale, the sound of the scale changes more. This may seem to be an obvious point but it becomes relevant when you use the chart to consider scale substitutions or scalar contrasts. For example, if you are playing over a dominant seventh chord you can use a mixolydian mode. Instead of mixolydian you may substitute a lydian dominant mode, but because there is only one note difference (the raised 4th degree; F# for a C scale) the difference in sound is not huge. Then try substituting a C Superlocrian mode (bottom right quadrant of the chart) and you will find a big difference in sound. The superlocrian mode far away from the mixolydian mode on the chart because many notes are different between the two modes so there is a big contrast in sound.

It is worth noting that the particular degree of the scale that you change is also a factor in determining how much the sound of the scale changes. For example, the change of the third degree of the scale from major to melodic minor changes the *quality* of the sound as well as the colour of the

sound of the scale, so it is a bigger change in sound than going from the dorian to the aeolian modes where the 6th degree is changed. See the section on chord/scale families for more information.

Each member of each family of chords are color coded similarly. All members of the major family are blue, all members of the minor family are green, the dominant family is red, and the half-diminished family is purple.

Three modes have no color and no chords indicated with them. The lydian minor and the melodic minor dominant are not frequently used. The third is the harmonic dominant, the mode built from the fifth degree of the harmonic minor mode. In some instances this mode is referred to as the Spanish Phrygian mode and can be used when you or the composer are seeking a Spanish or flamenco sound. Other references call this mode the Harmonic Minor Inverse and state that the Spanish Phrygian is an 8 note scale (C, Db, Eb, E, F, G, Ab, Bb, C) which is the phrygian mode with an added major third, or the harmonic dominant with an added minor third.

Note the box created by the relationship between the four tonic minor choices; dorian, melodic minor, harmonic minor, aeolian. All of these have the same first five notes and differ only with the sixth and seventh degrees. Lower both the sixth and seventh degrees and you have the aeolian. Raise both and you have the melodic minor. Raise sixth but lower the seventh and you have dorian, and lower the sixth but raise the seventh and you have the harmonic minor.

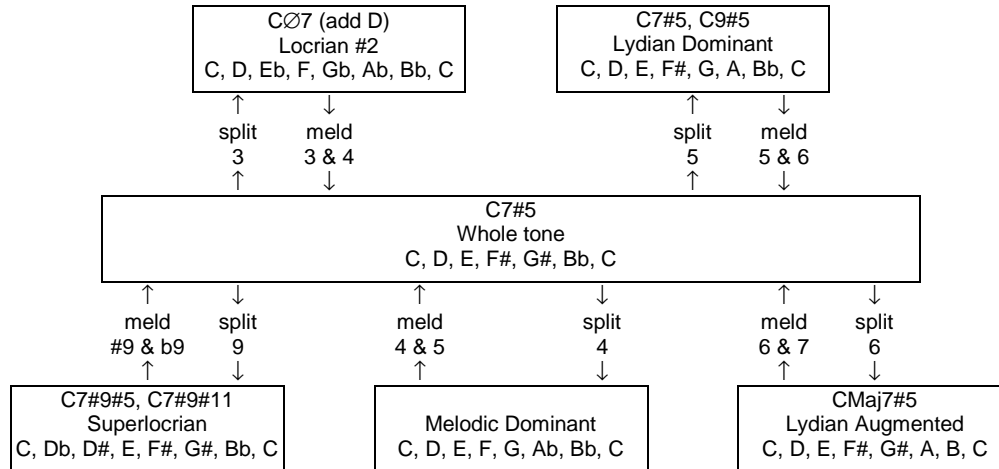
Another thing to note: the superlocrian and lydian augmented modes are at the extreme ends of the chart but same series of notes, since they are both modes derived from the melodic minor mode. By working through the chart and moving the half steps around we have moved the minor seconds from between the 5th and 6th degrees and the 7th and 8th degrees for the lydian augmented down to the root and 2nd degree and the 3rd and 4th degrees for the superlocrian mode.

Scale / Mode relationships to the Whole-Tone Scale

The following chart looks at another relationship, this one between the whole tone scale and the modes derived from the melodic minor mode, all of which include a series of 5 consecutive whole tones somewhere within the mode.

The whole tone scale has only six different pitches. By taking any one pitch and replacing it with the pitches one half step above and below the original pitch you create a seven note scale which will be one of the modes of the minor mode. Conversely you can replace particular adjacent pitches within modes derived from the minor mode and the result will be the whole tone scale.

For example, take the second degree of the C whole tone scale (D) and replace it with a Db and a D# and you have the C superlocrian mode. This was discussed earlier in the description of the half-whole diminished scale and how the superlocrian mode combines the lower portion of the half-whole diminished scale with the upper portion of the whole tone scale.



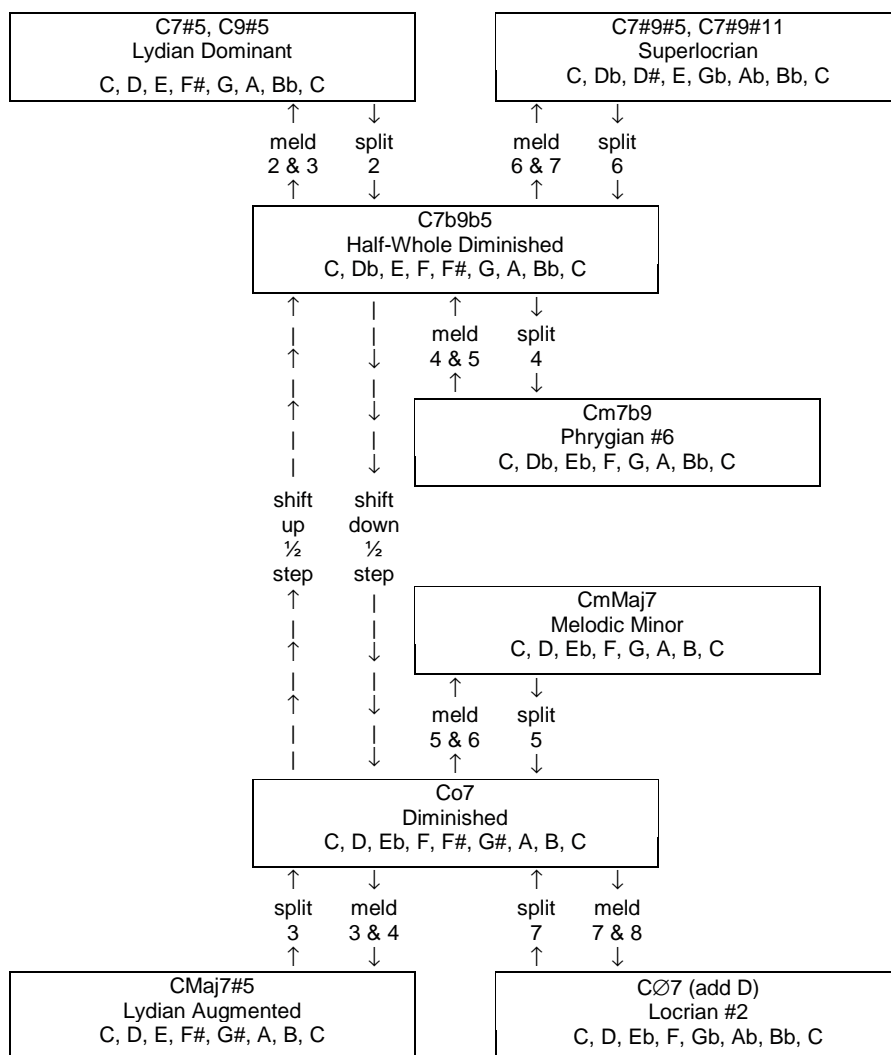
This shows how similar the whole tone scale is to the superlocrian, locrian #2, lydian dominant and lydian augmented modes and explains why these modes can have a very whole tone-like sound if you don't play the split notes (non-whole tone scale notes). For example, try to use the C superlocrian mode but don't play the Db or D# and it will be impossible for the listener to determine whether you are using the whole tone scale or the superlocrian mode since the notes that you did use are the same for both.

The two whole tone scales are relatively easy to learn and this chart may be useful when trying to find the notes for any one of the modes that you can build from it. For example, if you haven't quite learnt the superlocrian mode yet you can use the whole tone scale and then add the raised and lowered ninth.

Or, a challenging thing to try might be to start with a superlocrian mode, then leave out the raised and lowered ninths (Db and D# in a C superlocrian) effectively turning into a whole tone scale, then take advantage of the whole tone scale's ambiguity and establish a different note as the root, say the E, add the raised and lowered ninths for the E superlocrian (F and E## or G) and then resolve the E chord to A, a major third away from where you started!

Scale / Mode Relationships to the Diminished and Half-Whole Diminished Scales

This chart is very similar to the previous one but instead looks at the relationships between the diminished and half-whole diminished scales and the modes that are similar to them. Note the appearance again of the superlocrian mode.



Probably the most important part of this chart is the upper section which includes the lydian dominant, superlocrian and half-whole diminished scales. Not only are these scales related to each other as indicated in the chart, they are all common jazz scales, and they also all function as dominant scales. This means that you can often freely substitute one for the other. This is why it is valuable to understand how, by changing one or two pitches, you can change the scale and the corresponding sound of your improvisation.

Chapter Six: Common Tones

The concept of common tones looks at notes that are the same between any two or more groups of notes. The groups of notes could any type of grouping like chords, scales, a melodic fragment or an atonal tone cluster. For example, between a C7 chord and an F#7 chord there are two common tones, E and Bb or A#, and four non-common tones, C, G, F# and C#.

In most circumstances a chord has all of its tones in common with the scale or mode that will be used. The most common exception to this is the blues scale with a minor third that is used over a dominant seventh chord that has a major third.

The wider use of the concept of common tones is to look at adjacent chords or scales in a progression. For example, look at the modes in the standard II – V – I progression in minor that was discussed earlier.

chord	mode	notes reordered to compare with C minor									
II	D locrian	C		D	Eb	F	G	Ab		Bb	
V	G superlocrian		C#		Eb	F	G	Ab		Bb	B
I	C melodic minor	C		D	Eb	F	G		A		B
	C dorian	C		D	Eb	F	G		A	Bb	

Common tones between all modes are the Eb, F and G. Between the D locrian and G superlocrian Ab and Bb are also common tones. Between the G superlocrian and the C melodic minor B is also a common tone, and between the G superlocrian and the C dorian the A is also a common tone.

An analysis of common tones will give you some pitches that will work over more than one chord . This may make it simpler to play over a progression since you don't have to be as concerned about the individual chord changes, as long as you pay attention to how each note is going to work over each chord. In the example above, the Eb is going to have a lot of tension over the D half diminished chord because of the half step from the root D, but it will sound strong with the C minor chord. The F will sound good with the D and G chords but won't sound as good over the C minor chord.

Common tones also work well as long sustained notes over chord changes, or as sustained trills over the same progression.

Non-common tones are good notes to use if you want to emphasize a chord's individuality relative to the other chords. For example, the C# above exists only in the G superlocrian mode and would be a good note to use to highlight the presence of the superlocrian mode.

The same recommendations apply when selecting mode substitutions as well. For example, if you have chosen to substitute the lydian mode for the major scale, emphasizing the raised fourth degree will highlight the fact that you are making this substitution. If you don't play the raised fourth at all the substitution will not be heard at all.

One final reminder about common tones; if you use the standard dorian – mixolydian – major scale over a II – V – I progression in major, all notes will be common tones.

Chapter Seven: Choosing Which Mode to Use

- 1) Start with the key that you are in. If there is no key signature and you know the tune is not in C major or A minor, check the first and last chords of the piece for hints for the key (be aware that some pieces in minor mode may end in the related or parallel major key). Once you've determined the key, most chords that fit the key can use the scale or modes derived from that key.

Also look for modulations to other keys. Common places for this to occur are in the 5th and/or 6th bars of eight bar phrases and in the bridge or B section of an AABA, ABA or AAB form. If you know there is a modulation to another key, use the scales and modes from that key. If you've studied traditional music theory be aware that modulations in jazz are often much briefer than in traditional harmony and are often done without pivot chords. In many cases traditional theory would label jazz modulations as a tonicization rather than a full modulation.

Once you've identified a modulation, apply the scales appropriate to that key.

- 3) The II – V progression is the most common progression in jazz. Look for II – V progressions in either a major or a minor key or both. Remember the table of chord families when you look for these progressions. The II could be any chord from the minor family if the progression is in major, or from the half-diminished family if the progression is in minor, and the V chord could be any of the chords in the dominant family. You may also find the minor form of II and V (ie. half-diminished and altered dominant) resolve to a tonic major.

Often you will find a series of II – V progressions in sequence, such as a series that goes down by whole steps, down by half steps, around the cycle of fifths or through a cycle of major thirds.

If you find a progression that repeats after modulating, apply the same scales with appropriate transpositions.

- 3) Look to the melody to help determine what scales or modes would be appropriate. For example if you are given a G7 chord but there is a C# in the melody, this implies that a G lydian dominant would be more appropriate than a mixolydian mode because the lydian dominant mode includes the raised fourth, C#. When looking at melody notes, don't be confused by chromatic passing notes that don't need to be included in the harmony. There are some rules for determining whether a melody note should be considered when determining an appropriate scale for improvisation, but essentially you need to rely on your ear to tell you whether that note is a crucial part of the sound or whether it functions as a passing tone which supports a true chord tone.
- 4) If a chord sustains for a length of time you may want to consider using more than one scale or mode, perhaps beginning with the most consonant one and changing to progressively more dissonant ones as you go. You can do the same thing even if the chord doesn't sustain but instead reappears frequently. Each time the chord appears you could use a different scale. Likely candidates for this treatment are minor (especially in modal tunes) and dominant chords.
- 5) When trying to determine which mode of a family to apply, you may want to first try the one that has a key signature that is closest to the key of the piece. The one that has the closest key signa-

ture will have the most common tones with the original key and is often a safe bet.

- 6) Or, you may want to do the opposite as suggested in 5) and look for opportunities to have more contrasting notes either with the original key or with adjacent modes.
- 7) Even if you are not a good pianist, sometimes finding the best mode choice requires going to a keyboard, finding the chords for your left hand, and noodling over the chords with your right hand until you find some notes that seem to work and then trying to analyze what mode it is that you are using.

This will apply especially when trying to find the best modes to apply over a progression of chords. This is because even though one mode may seem to be usable over a certain chord, in the context of the other chords another mode may make more sense.

Chapter Eight: Practice Suggestions

Writing Out Scales:

When you are starting out as an improviser you will often have to play a solo using scales that you are not comfortable with yet. The solution to this is to write out the scale near the chord symbol or on a separate piece of manuscript. If you are somewhat but not entirely comfortable with the scales in a piece, only write out the notes for the scales that you are not comfortable with. Don't rely on the written scales when you don't need to.

If you are familiar with a scale that is similar to the one that you want to use, write only the notes that you are less familiar with. A good example are the lydian and lydian dominant modes. You may be comfortable with the major and mixolydian scales and these scales differ from the lydian and lydian dominant modes by one note; the raised fourth degree. In this case you can write down just the raised fourth degree to remind you which note is different from the major and mixolydian modes.

When Learning a New Type of Chord or Scale:

- 1) Learn to play the chord/scale in one key first. Arpeggiate chords and play the scales over the full range of your instrument (full range may not be necessary for piano).
- 2) Get familiar with the distance between each note in the sequence. For example, a minor seventh chord has a minor third, major third, minor third, major second. The dorian mode goes W h W W h W.

Try to do this without music as you are trying to develop your muscle memory, your mental concept and your inner ear. This will help you with the next step.

- 3) Learn the chord and scale in all 12 keys.

Start with scale charts if you prefer, but work towards doing this without written music. You can use written chord progressions or even just handwritten starting notes as below.

Use common sequential patterns to go through all keys. For example,

Ascending chromatically	C	C#	D	E ^b	E	F	F#	G	A ^b	A	B ^b	B
Ascending by whole steps	C	D	E	F#	A ^b	B ^b	C#	E ^b	F	G	A	B
Through the cycle of fifths	C	F	B ^b	E ^b	A ^b	D ^b	F#	B	E	A	D	G
Descending chromatically	C	B	B ^b	A	A ^b	G	F#	F	E	E ^b	D	D ^b
Descending by whole steps	C	B ^b	A ^b	F#	E	D	B	A	G	F	E ^b	D ^b
By minor thirds	C	E ^b	F#	A	D ^b	E	G	B ^b	D	F	A ^b	B
By major thirds	C	E	A ^b	D ^b	F	A	D	F#	B ^b	E ^b	G	B

At first you may want to focus on keys that you are already using in your current band because those keys will have the most immediate applicability. Keep working in all keys though because

many pieces modulate through a variety of keys or you may find that you have to play a familiar tune in an unfamiliar key to accommodate a singer or a beginner.

- 4) Explore the relationship between various pitches of the scale. Particularly important is the relationship between each note and the root of the scale. For example, the dorian mode has a M2, m3 P4, P5, m6 and m7 relative to the root. Playing the scale in thirds or doing other intervallic exercises will help with this.

The reason for this step is that you do not want to always start your solo on the root of the scale and you do not want to always move by steps through the scale. Getting familiar with all the intervals involved in the scale will help free you from these limitations and will help with the next step.

- 5) Find or create your own melodic patterns that use the scale and sound good over the chord. Practice transposing the pattern to all 12 keys using the sequential patterns in step 3). This accomplishes a number of important things:
 - a) Helps to reinforce the mental concept of the notes available in each mode.
 - b) If the pattern clearly supports the sound quality of the chord and of the mode by emphasizing chord tones and characteristic scale notes it will help develop your inner ear's concept of the qualities of the sound of the chord and scale.
 - c) If you use a variety of patterns it will further help to free you to choose notes other than the root as a starting note and to choose intervals other than stepwise motion.
 - d) The patterns themselves may give you something to "fall back on" when you encounter the chord in actual improvisation situations. The "falling back on" may happen subconsciously and flow naturally out of you playing and may not necessarily be a bad thing.

Jerry Coker's book "Patterns for Jazz" is based on this approach and includes some good patterns to use. Another source is to transcribe a pattern from a solo, or to use any solo transcription and look for interesting patterns to isolate and learn.

You can also develop your own patterns to use, but the difficulty will be the fact that you are still learning this new scale and you may have some difficulty creating something that uses enough essential characteristics of that scale so that the pattern will help develop your inner ear's concept of the sound of the scale and chord.

On the other hand, one recommended method for developing your improvisational ability is to regularly write down interesting ideas that you come across (your own or someone else's idea) so that you can build a own repertoire of patterns. You then need to be able to take these ideas and be able to use them in all keys, just like the practice patterns above.

- 6) Chords rarely exist in isolation, so determine some likely chords and scales to precede and/or follow the scale that you are working on, and then find or develop patterns to use over the entire progression. For example, to the mixolydian mode you can add the major scale (a V – I progression) or precede it with the dorian mode (II – V) or both (II – V – I).
- 7) If you have a computer, sound card, speakers and sequencing software or accompaniment software like Band in a Box, you can create or download vamps using progressions to practice with.

Create II – V, V – I and II – V – I vamps, first in major and later in minor, and transpose them to all keys.

Or, get together with some musician friends and try the same thing.

Another alternative is the first few play along issues from Jamey Aebersold. Aebersold has an entire series of play alongs with music in C, Bb, Eb and bass clef with professional musicians doing accompaniments. The first issues are good for developing the basics, while the bulk of the series is for developing your repertoire and expanding the range of your playing experience.

Mode Shifting:

Once you've started to gain some familiarity with a few scales, you may want to try mode shifting to get familiar with the differences between modes.

For example, start by playing a C7 chord. Use a metronome to make sure you are keeping good time. Then run the C mixolydian mode. Then try the C lydian dominant. Then the C superlocrian, half-whole diminished and whole tone scales. Try mixing the order by going mixolydian, superlocrian, whole tone, or any other series. The most logical sequences to try are by going from less dissonant to more dissonant but you can also go the reverse direction. Also try playing each mode in thirds or fourths, or noodling with then before going to the next scale. Try the same thing with the major, minor and half-diminished families of scales.

What you are developing here is an understanding of how the different modes relate and compare to each other, what notes are in common, what is different, and how the quality of the sound changes with each different mode. This will help you to find the notes of less frequently used modes when you need them and will also help you to know where you are heading when you want to try substituting scales.

Transcribing:

This procedure is important for learning all aspects of the art of improvisation, not just scales. The objective here is to learn what a master improviser has done while at the same time developing your own ear-to-instrument connection. The ear-to-instrument connection helps you to understand what is going on around you as well as to help you get the things that you hear in your head out through your instrument.

Transcribe solos yourself. Playing/analyzing other people's transcriptions has benefits but does not help you to internalize the solo or to develop the ear-to-instrument connection as well as the process of transcribing does.

Some tips and suggestions for transcribing;

- a) Start with less complex solos by musicians who play the same instrument as you do. Or start by just transcribing heads to songs that you don't know. Heads will have fewer notes, sim-

pler rhythms and will therefore be easier to transcribe. Work your way up to more complicated solos and ones performed on other instruments.

- b) Write it down as you go. This will help you to go back and do analysis later.
- c) If it gets difficult to pin down, find the pitches first and then go back and find the rhythm. Write down the note heads and add the stems and bar lines afterwards.
- d) The easiest way to do the actual transcribing these days is to convert an audio file from your CD into a standard computer sound file (.WAV for Windows) and then use a sound editing program such as Cool Edit or Goldwave to isolate small portions of the solo so you can listen to that portion over and over again. If the solo is at a fast tempo you can even alter the sound file to a slower tempo without changing the pitch to make transcribing easier.

Working with small fragments of a solo makes finding pitches easier but it also makes defining the rhythm more difficult, so you may have to get the pitches first and go back for the rhythm as in c).

Final Thoughts:

This is obviously not a complete discourse on jazz theory or improvisation as it has only touched on the subject of harmony and has not discussed rhythm or melody at all. This is not because these other elements are less important but because this discourse was specifically focussed on scales and modes.

In fact, between rhythm, melody and harmony, harmony is the least important element of jazz improvisation. It is entirely possible to create a valid improvisation with creative rhythm and melody over static harmony or without paying attention to correct harmony at all. Scales, an extension of harmony (scales can be viewed as chord tones plus extensions or chords tones with passing tones), are even less important but are often the first thing that beginning improvisers focus on. Partly this is because if you play a solo that is limited rhythmically and melodically but you use all the “right” notes it may sound boring but at least it doesn’t sound wrong. If you change to the right chords at the right time at least you sound like you know where you are whereas if you focus on playing interesting lines but don’t make the changes you may sound as if you are lost.

Also, the melodic contour of an improvisation is less restricted than is rhythm and harmony, and it is easier to make up rhythms that fit (ie. in time and with the correct feel) than it is to find pitches that fit, so there is a tendency to start with and to focus on harmony and scales with the assumption that rhythmic and melodic development will come later. But why wait? Spend some time playing by yourself without harmonic considerations or over single long sustained chords. If you concern yourself too much with scales you won’t pay enough attention to what you and the musicians around you are doing, and you will have a tendency to play too many notes, to not vary your rhythms and to not leave enough space. Getting scales under your fingers will help you to make the changes, but developing a good rhythmic and especially melodic sense will help you to give meaning to the notes that you are playing.

Notation/Names:

Jazz has a multitude of notational and naming conventions for exactly the same thing. For the musical elements in the left hand column this discourse uses the naming convention in the middle column. Common alternatives are in the right hand column.

	<u>Used</u>	<u>Other notations/names</u>
Major chord	Maj	M, Δ
Minor chord	m	min, Min
Diminished chord	o	Dim
Half diminished chord	∅	m7b5
Dominant 7th chord with raised 9th and 5th	7#9#5	Alt
Raised degree	#	+
Lowered degree	b	-
Superlocrian mode	superlocrian	altered, diminished whole tone
Half-Whole diminished	half-whole diminished	8 note dominant

References: (Incomplete)

“Harmony” Piston, Walter

“Patterns for Jazz”, Coker, Jerry et al

Aebersold series

Cool Edit

Goldwave

“A Jazz Improvisation Primer”, Sabatella, Marc