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Utilizing The Tone Row in Jazz Pedagogy- A Technique to Create Tonal Harmony in an Atonal Environment

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ABSTRACT:

This paper examines a jazz pedagogical method, based on a Bill Evans composition, that utilizes Schoenberg's serial tone row in a harmonically tonal setting. By exploring the extensive harmonic possibilities produced by one tone row, this method guides students through the creation of harmonic options to produce tonal accompaniment against atonal melodic content. The result of this exercise establishes numerous harmonic possibilities for the tone row and may also serves as a rigorous theoretical exercise in chord construction. The paper further discusses the unique capacity of the exercise to help students connect intuitive organic music choices with empirical pedagogical elements.

Bill Evans and Tone Row Use in Jazz

Arnold Schoenberg's twelve-tone technique and the use of the tone row originated in 20th century modern classical music but the tone row has rarely made an appearance in other idioms. However, Gunther Schuller's compositions found on the album *The Birth of the Third Stream*, Lou Harrison's Symphony on G, Bob Brookmeyer's "ABC Blues," Leonard Feather's "Twelve Tone Blues" and Bill Evans' "Twelve Tone Tune" offer some examples of serial music's application in a traditionally tonal jazz environment. Of the jazz works listed, Bill Evans' "Twelve Tone Tune" is the only piece that attempts to create a tonally functional harmonic progression out of the

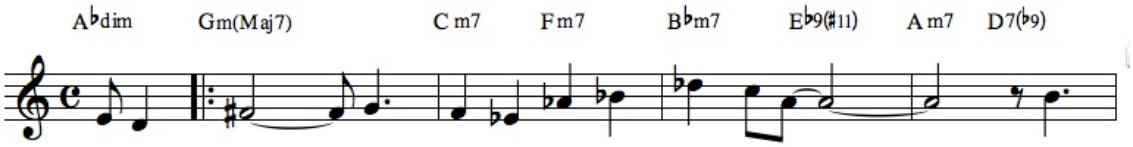
twelve-tone system (Evans 2011).

Evans' methodology for composing the "Twelve Tone Tune" was to personalize the use of the tone row in a jazz context. According to bassist Eddie Gomez, " The 'Twelve Tone Tune' was derived from a tone row that Evans harmonized so that it sounded tonal…" (Shadwick 2002). Evans' approach is the catalyst for the pedagogical technique explored in this paper. My focus is to methodically explore the process of creating harmonic functionality out of a tone row as a teaching tool based on Evans' "Twelve Tone Tune." This method can be also be utilized compositionally. Different harmonic possibilities and permutations of grouped pitches in a tone row are explored when this exercise is applied as a purely theoretical tool. The end result of this technique creates a tonal harmonic context for the tone row. The process of doing this exercise will expand student's harmonic vocabulary by creating numerous chords from the melodic parameters of a tone row. It will also aid students in their ability to understand the function of extended and altered chords as well as mode/scale relationships.

According to jazz pianist and composer Jack Reilly, serial composers like Schoenberg and Webern fascinated Bill Evans and he explored the compositional possibilities of tone row use in a harmonically jazz environment with his "Twelve Tone Tune." (Reilly 1994). Evans' tone row here is structured as follows: E D F# G F E♭ A♭ B♭ D♭ C A B. By analyzing this tone row structure, one may reasonably assume that Evans divided this row into groups of one, two, three and four pitches. He then found various harmonic implications for the divided pitch groups. For example, the first complete measure contains the pitches F# and G. Evans chose to place these two pitches in a G root note context and his harmonic choice was a Gm(Maj7) chord. In the second

measure, the C root note context for the F and E♭ pitches resulted in a Cm7, or more specifically, a Cm11 chord. The E♭ pitch's relationship to the C root note is the minor third and the pitch F is the eleventh. The following Fm7 chord contains the A♭ (minor third) and B♭ (eleventh) just like the chord tones of the Cm7. The D♭ and C pitches are placed in a B♭ root context resulting in the minor third and ninth respectively, creating a B♭m7 or B♭m9 chord. The pitch A is harmonized with an E♭ root note. Evans chose the E♭9(#11) chord for the A melody note. The final pitch B is placed in a D root context creating a thirteenth sound. Evans selected an altered dominant sound by placing a D7(♭9) chord above the B, essentially creating a D13(♭9) chord. His choices appear to have a foundation in the established jazz harmony practices that came out of the fifties and sixties in that he used minor major seventh, dominant ninth sharp eleventh and dominant seventh flat nine chords. Note Evans' division of the tone row into two, three and four pitch groups, which results in four complete measures and one pickup measure at the beginning of the piece.

Ex.1 *Twelve Tone Tune* mm 1-4

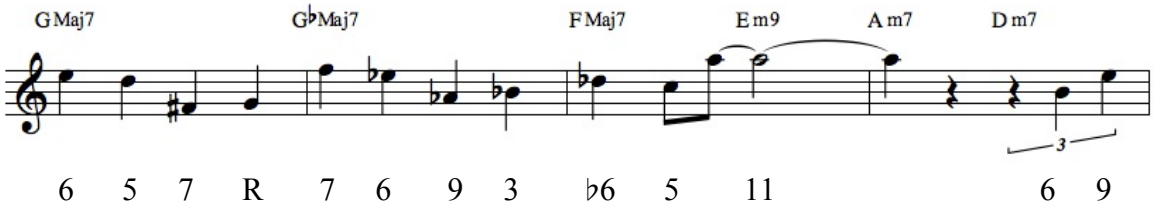


#5 #4(♭5) M7 R 11 ♭3 ♭3 11 ♭3 9 #11 13

Evans harmonized the first repeat of the tone row differently. He grouped the first four pitches together and chose to harmonize them with a GMaj7 chord rather than the A♭dim and Gm(Maj7). The next measure maintains his original four pitch cell, this

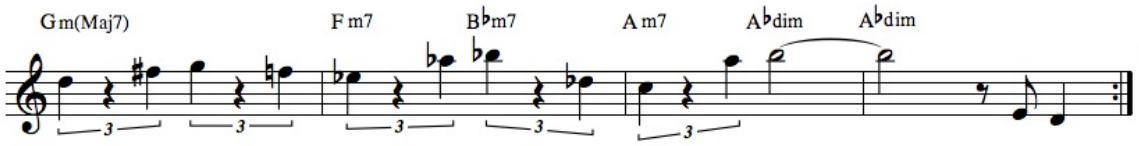
time harmonized this with a G♭Maj7 instead of the Cm7 and Fm7 chords. The third measure contains the same three pitches, but Evans harmonizes the D♭ with an FMaj7 chord, implying an FMaj7#5 chord. The pitch A is harmonized with an Em9 chord rather than the E♭9(#11) chord.

Ex.1.1 *Twelve Tone Tune* mm 5-8



The final repeat of the tone row illustrates how Bill Evans divided the pitches differently by starting the tone row on the last note of the eighth measure and shifting all pitches to the left by one note. The three different harmonizations indicate that Evans was exploring various harmonic options for the pitches of his tone row.

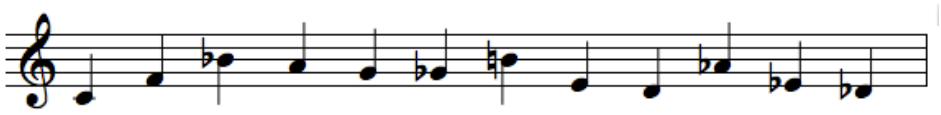
Ex.1.2 *Twelve Tone Tune* mm 9-12



Creating a Tone Row and Pitch Cells

To explore the methodology of this technique, we need to create a tone row. Schoenberg and other serial composers approached tone row construction from a purely compositional perspective with creativity, thoughtfulness and intent. This tone row was created with extensive use of interval classes 5 and 1, making it conducive to jazz harmony.

Ex. 2 (*audio)*



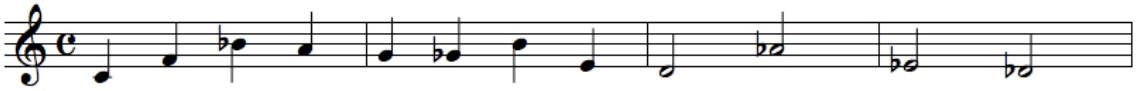
0 5 10 9 7 6 11 4 2 8 3 1

The tone row in Example 2 will be the focal point of this article. For the sake of simplification, it occupies a one-octave register. This tone row also follows the rule that no pitch should be repeated until the other eleven pitches have been used.

Now that the tone row has been created (Ex.2), the next step is to classify pitch groups or cells that will exist in measures. Pitch groups are created so that harmonic options can be derived from each cell. The pitch cells could be divided into several numeric options. A cell or measure could contain any number of pitches from the tone row; however, divisions of one, two, three and four are most practical, like Evans utilized in his "Twelve Tone Tune." As the number of pitches in a cell increase, the harmonic implications and variables decrease. Finding a single harmonic context for six pitches is more challenging than finding a harmonic context for two pitches.

The example below demonstrates one possible pitch grouping where the first four pitches (C F B♭ A) and second four pitches (G G♭ B E) are each grouped into one measure. The next four pitches (D A♭ E♭ D♭) are grouped into two measures and given half note values.

Ex. 3 Tone Row in Groups of Four and Two (*audio)*



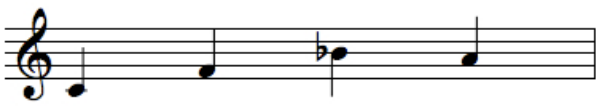
Four-Pitch Cells Two-Pitch Cells

The method for discovering all harmonic implications and permutations for each cell or measure involves examining the four-pitch groups in the context of different bass pitches. The bass pitches will start on C and move up chromatically to maintain simplicity and continuity. It does not matter which bass note is the first as long as all twelve bass pitches are examined. The remainder of this paper methodically moves through all of the harmonic elements of pitch group one and then examines possible chord progressions derived from the pitch group. All pitches in each group will be considered chord tones in this exercise. The context for chord choices will be limited to traditional jazz harmonies; because of this, some bass notes will not produce a chordal option.

Examining Bass Notes Against The Tone Row

When the first group of pitches is placed in the context of a C root note the following chordal implications occur:

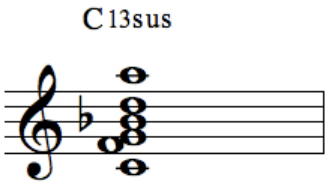
Ex.4 Pitch Group 1 C Root Context



R 4 or 11 ♭7 6 or 13

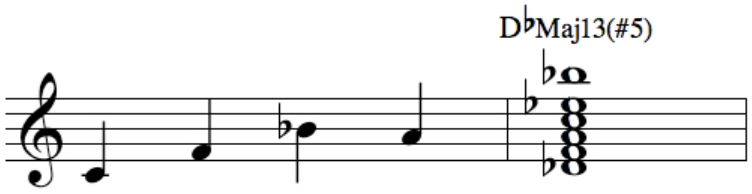
The minor seventh B♭ forces the harmony into various chordal possibilities: minor seventh, dominant seventh and half diminished. If this group of pitches is considered in the dominant seventh sonority, the F could be seen as a suspended fourth or eleventh and the A as a thirteenth (once the seventh is introduced, the A must be considered as a thirteenth, not a sixth). The resulting chord in a dominant seventh context would be C13sus. The dominant seventh suspended chord has less of a tendency for forward propulsion since the third is replaced by the suspended fourth (Waters 2005). Another option, in the same sonority, would be a simple C13. The minor seventh and half diminished chord choices are not a strong possibility in this instance because of the presence of the thirteenth. When it comes to functional jazz harmony the minor thirteenth suspended is a rarely used chord. The combined eleventh and thirteenth are generally not colorations used in a half diminished context either. The eleventh is a suitable coloration for the half diminished chord, but the sixth starts to enter the fully diminished realm.

Ex.5 (*audio)*



The next chromatic bass note context is D♭ or C#. When the pitches from group one are placed into a D♭ bass context the following harmonic implications occur:

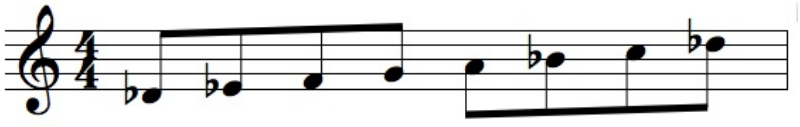
Ex.6 Pitch Group 1 D♭ Root Context (*audio)*



7 3 6 or 13 #5

Once the major seventh is a possible note, the harmonic choices would be major seventh or major/minor seventh chords. In the major seventh sonority, the F is the obvious third, the A natural is the sharp fifth and the B♭ is the thirteenth. The resulting chord is a D♭Maj13(#5). This chord could be seen as being derived from the third mode of the B♭ melodic minor scale or Lydian Augmented mode. Another approach is to think of this chord as a slash chord that forms an F triad with a D♭ in the bass (F/D♭). The notated chord includes the ninth, as thirteenth chords imply the use of the ninth. The major seventh sonority with a sharped fifth was used in the bridge section of Duke Pearson's "You Know I Care." Thelonious Monk used this sonority in the B section of "52nd Street Theme." Wayne Shorter also explored the colors of the major seventh sharp five harmonies in "Wildflower," "Prince of Darkness" and "Iris" (Strunk 2005).

Example 6.1 D♭ Lydian Augmented Mode (*audio)*

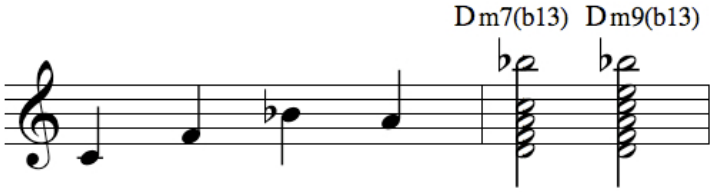


When the pitches from group one are placed in the D root note context, two possible sonorities occur: minor seventh and dominant seventh. The minor third, fifth and minor seventh could create a minor sonority. The minor third could also be considered a sharp nine, which then creates an altered dominant sonority. The B♭ would

then be considered the flat thirteen. Once the fifth is established with the pitch A and the seventh is established with the C natural, the B♭ must be considered a flat thirteen, not a sharp fifth.

The D minor possibility becomes a minor seventh with a flat thirteen. This chord is very similar to the minor flat six or minor sharp fifth chord. Jazz players would call it an Aeolian chord because the flat sixth is present in the chord itself. Two chords are provided below – one with the ninth and one without. The presence of the thirteenth implies the ninth.

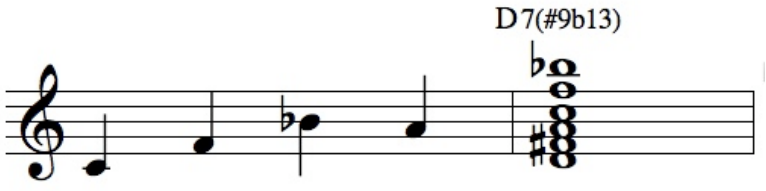
Ex.7 Pitch Group 1 D Bass Context – D Minor (*audio)*



♭7 ♭3 ♭13 5

The dominant context of the pitches contained in pitch group one could also be considered an altered dominant with a sharp ninth and a flat thirteen.

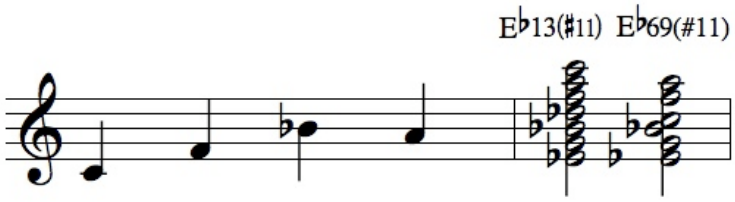
Ex. 8 Pitch Group One, D Root Context – D Altered Dominant (*audio)*



♭7 #9 ♭13 5

When E♭ is the root pitch context, two harmonic possibilities occur: a major six nine chord and a dominant thirteenth chord. The absence of a seventh (D or D♭) makes it possible to consider the pitches in the first group as both a major IV, Lydian sonority and a dominant V, Lydian Dominant sonority. The pitch C can be seen as a sixth in the major chord and a thirteenth in the dominant chord. The A natural becomes the sharp eleven in both chords because the fifth of the chord (B♭) is in the pitch group, so the pitch A cannot be considered as a flat five.

Ex. 9 Pitch Group One E♭ Root Context (*audio)*

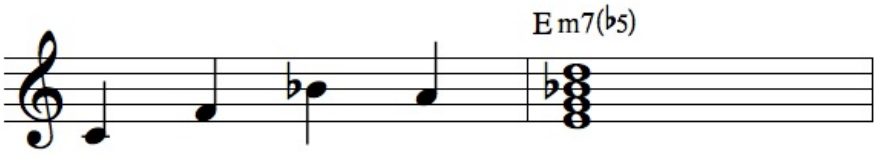


6 or 13 9 5 #11

The subsequent ascending chromatic root note E presents some interesting challenges. The pitch C is a flat thirteen or sharp fifth. The F natural becomes the flat ninth with an E root. The B♭ would become the flat fifth and the A natural would become the eleventh or suspended fourth. The flat five, sharp five and flat nine move this chord to an obvious altered dominant sonority. One's only concern might be the natural eleven/suspended fourth. The color of the sharp eleventh suggests a static dominant chord and is more synonymous with non-altered chord colorations like the natural thirteen and natural ninth. The addition of the three altered chord tones (♭5#5♭9) appears to create a less functional chord when the eleven is present. The other problem with the E11 chord basis is the implied G# in the eleventh chord spelling. One solution to this problem would be to use an E7(♭5♭9#13) chord, without the eleven and then play the

eleven in the melody only. A more plausible solution would be to look at this as an Em7♭5 chord with the additional non-chord tones (♭9 11 ♭13). Jazz theorists think of this chord as a Locrian chord because all melody pitches are consistent with E Locrian or F major. Also, the flat nine, eleven and flat thirteen are all acceptable colorations over the Locrian or half diminished chord.

Ex. 10 Pitch Group One, E Root Context (*audio)*

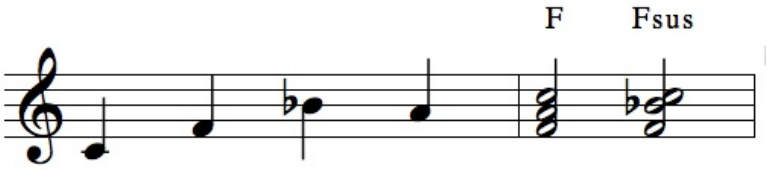


♭13 ♭9 ♭5 11

The F root note context is far less complex since the F triad is found within the four pitches of the group. The only concern here is the pitch B♭. In this case, the pure F major triad or an F suspended chord could serve as a viable harmonic background for the four pitches in the cell. Some compositional choices would be have to be considered such as:

- If the harmonic choice is Fsus, does the third in the melody sound too dissonant against the suspended fourth?
- If the harmonic choice is an F major triad, does the suspension, or natural fourth work?
- Would it be better to use the Fsus on the first three beats, then the F major triad on beat four where the resolution occurs?

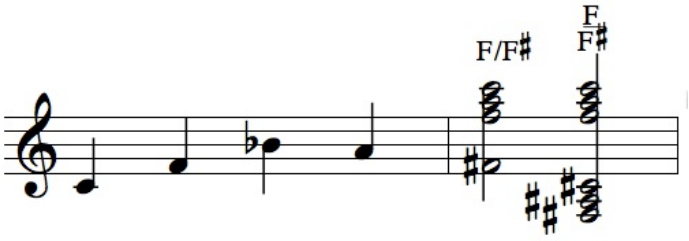
Ex. 11 Pitch Group One, F Root Context (*audio)*



5 R 4 3

The F# root note could suggest either a polychord or a slash chord. The slash chord would be an F triad with an F# root (F/F#). Once again, the B♭ would have to exist in the melody and not in the harmony. This chord also creates an F# diminished sound because the major third and perfect fifth of the F major triad (A C) become the minor third and diminished fifth of the F# triad (Schenkius 2011). The polychord is a bit of a stretch, but may work and would encompass an F# major triad over an F major triad.

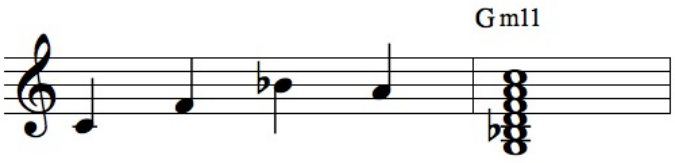
Ex. 12 Pitch Group One, F# Root Context (*audio)*



♭5 7 3 ♭3(#9)

A G root note creates a simple Gm11 chord. The presence of the guide tones F and B♭ imply a minor seventh chord, with the added nine and eleventh.

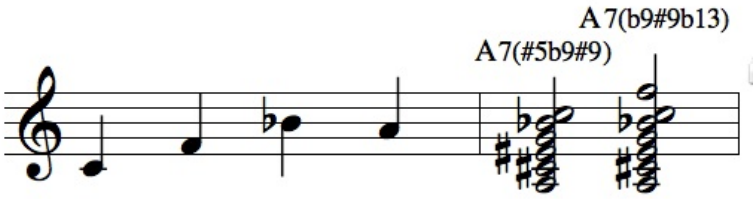
Ex.13 Pitch Group One, G Root Context (*audio)*



11 ♭7 ♭3 9

An A root note creates another occurrence of the altered dominant context. The A root note is present in the four-pitch cell. The B♭ becomes the flat ninth. The F is then the flat thirteenth or sharp fifth. The C becomes the sharp ninth, not the flat third. Once the flat ninth and sharp fifth are present, the C natural must be considered an altered upper extension of the dominant chord. The flat ninth and sharp fifth are not used in the context of a minor chord.

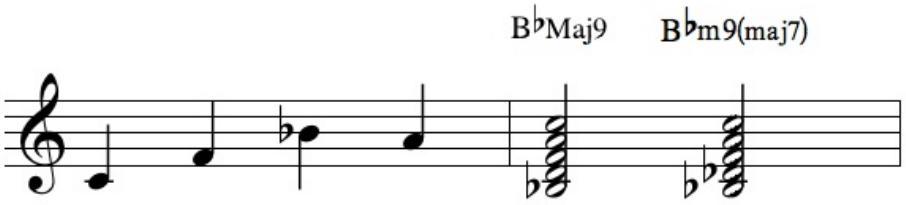
Ex.14 Pitch Group One, A Root Context (*audio)*



#9 #5 ♭9 R

The B♭ root pitch implies two harmonic possibilities: B♭Maj9 and B♭m(Maj9). The F, A and C then become the fifth, major seventh and major ninth respectively. The absence of a D or D♭ produces the possibility of using a B♭ major or B♭ minor context. The option of using a pure major ninth or minor (major nine) will provide some interesting possibilities when considering the horizontal chord progression over the entire tone row.

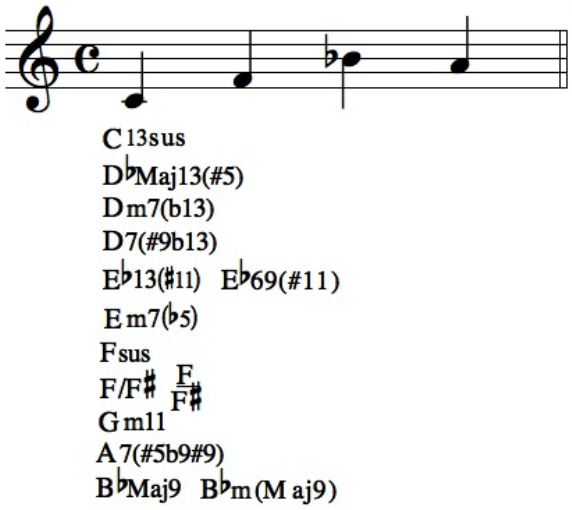
Ex.15 Pitch Group One, B♭ Root Context (*audio)*



9 5 R 7

Notice that the root notes A♭ and B have not been included as options. These two root notes have no useful harmonic possibilities when the pitches of group one are considered. The A♭ root context becomes problematic because of the presence of both the natural and flat nine. The natural and flat nine never appear in the same harmonic or melodic context in jazz practice. At this point, the harmonic context of ten bass pitches has been examined, leading to the following conclusion:

Ex.16 Summary of Harmonic Possibilities - Pitch Group One of Tone Row



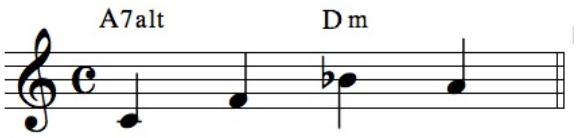
Creating Chord Progressions From Pitch Group One

The process of examining the first four pitches proved to be a challenging theoretical exercise and could then lead to an interesting compositional tool. The next steps involve creating horizontal harmonic progressions out of pitch group one and utilizing multiple chords per measure. Eventually all four pitch groups could be examined to explore chord progression possibilities for the entire tone row. In the

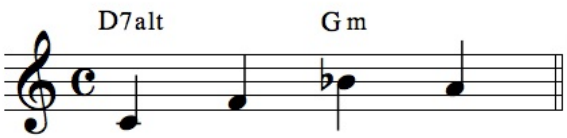
interest of time, only pitch group one will be examined. Keep in mind that the order of all four pitches in pitch group one could be rearranged to avoid non-chord tones.

There are several ways to go about choosing the chords for possible progressions. One method would be to simply experiment with random chords until finding harmonic movement that pleases the ear. This article explores a method that involves searching the chords for common jazz chord progressions. The first progressions that can be derived from this pitch group are simple functional harmony V to I and V to i progressions. C7 to F, A7 to Dm, and D7 to Gm are all possible V I(i) progressions. The pitch group even creates altered chord tones for the A7 and D7 chords. These altered pitches (♭5, #5,♭9, #9) create more tension and dissonance that accommodates the need for resolution (Waters 2005). In most of the examples below, I will use the foundation of the chord as the chord symbol rather than the extended chord from Ex.17, e.g., C7 instead of C13sus.

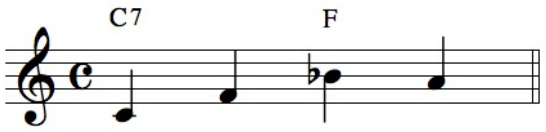
Ex.17 (*audio)*



Ex.18 (*audio)*

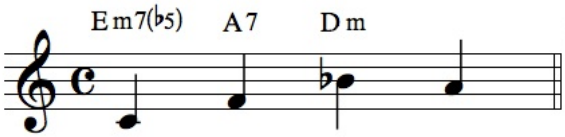


Ex.19 (*audio)*

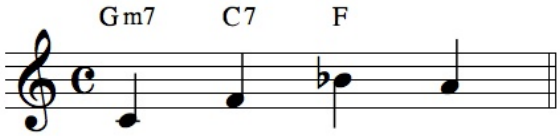


The next logical step would be to explore the possibility of the ii V I(i) progression, which is the cornerstone of jazz harmony. Two possible ii V I(i) progressions can be created from this pitch group: Em7(b5) A7 Dm and Gm C7 F. Note that the current pitch order creates non-chord tones for the first example (Em7(b5) A7 Dm). If the pitch order were changed to Bb A F C the progression would avoid non-chord tones.

Ex.20 (*audio)*

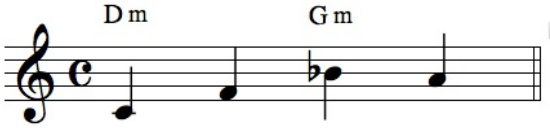


Ex.21 (*audio)*



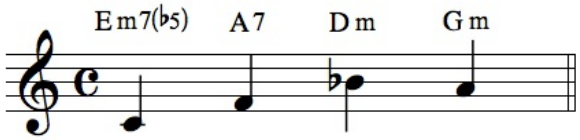
Another common chord progression found within this pitch group is a simple i to iv in D minor.

Ex.22 (*audio)*

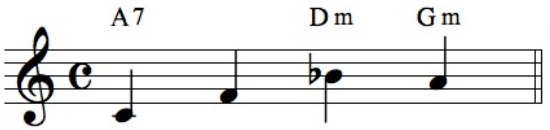


If the ii V i and i iv are combined in D minor, the end result are two common progressions: ii V i iv and V i iv.

Ex.23 (*audio)*

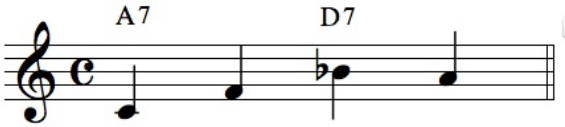


Ex.24 (*audio)*



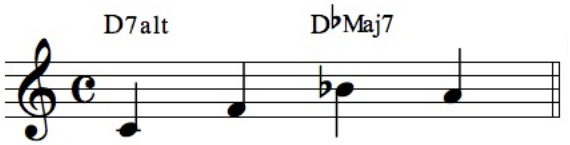
Another common jazz progression that can be derived from pitch group one is the secondary dominant V of V progression.

Ex.25 (*audio)*



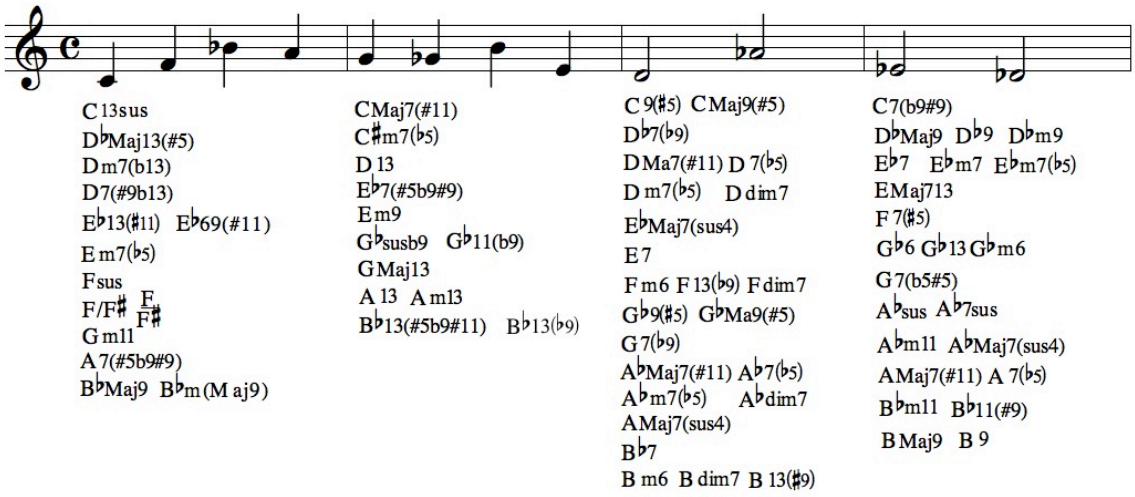
Even a tritone substitute chord progression can be found in this pitch group, using the key of Db major. The V of DbMaj7 is Ab7. The tritone substitute for Ab7 is D7 which is a possible chord in pitch group one.

Ex.26 (*audio)*



There are many more chord progression possibilities for pitch group one, beyond the common jazz harmonic progressions above. The harmonic possibilities this pitch group generates are numerous and limited only by creativity. This is only the first step in the process of harmonizing the entire tone row. The next steps would involve calculating all chordal possibilities for the other three pitch groups then examining chord progression permutations for the entire four-measure tone row. This graphic demonstrates all of the chords this single tone row would generate. Note that some of the harmonic options in each pitch group contain non-chord tones, like the D13 chord in pitch group two. The pitch group includes both the major third and suspended fourth of the D13; however, the non-chord tones work within the D Mixolydian modal context. The C#m7(♭5) in pitch group two also illustrates the use of non-chord tones. Jazz players would play a C#m7(♭5) without the eleven (F#) but would play the F# as part of the C# Locrian mode. The Em7♭5 in pitch group one is another example of a harmonic option with melodic modal non-chord tones.

Ex.27



More formal serial music techniques like retrograde, inversion and retrograde inversion could be applied to both the melodies within the cells and the entire tone row. For example, if the retrograde permutation were applied only to each cell, the harmonic options would remain the same as those in Ex.29 because all pitches in each group would maintain. The melody in measure one would be: A B♭ F C. However, the application of inversion and retrograde inversion permutations would generate an entire new list of tonal options and thus harmonic options. These methods go beyond the limits of the exercise I have presented here but I mention these as ways to further explore classroom activities.

In conclusion, this exercise can facilitate fresh musical ideas and modes of harmony for teachers and students. It is beneficial in reinforcing the fundamentals of how melody and harmony relate to each other the setting of jazz theory. It also challenges students to expand their harmonic knowledge into altered and extended chords through the examination of non-chord tones. Finally, this method can serve as an integral part of understanding the function of substitute chords and jazz reharmonization.

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