Abstract

In 1966, Red Mitchell began tuning his bass in fifths to meet the demands of film composers who required a low C. Having played in fourths for approximately twenty years, Mitchell required only nine days to adapt to fifths tuning. This thesis examines the changes that fifths tuning had on his walking bass lines through the transcription, analysis and comparison of three blues from each of Mitchell's tuning periods. The analysis will probe changes in pitch, range, intervals and motives. Other chapters include a biography of Mitchell's career and one that discusses why he chose fifths. Included in this section are brief summaries of other bassists who have adopted fifths tuning. The chapter on bass line grammar discusses those elements that were affected when Mitchell changed tunings. The concluding chapter discusses the findings showing that tuning in fifths did have an effect on Red Mitchell's walking bass lines.
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Introduction

Two bassists have left a lasting impression on my playing. Hearing Ray Brown for the first time made me want to play jazz. Classical bassist Joel Quarrington, perhaps the world's leading proponent of tuning the double bass in fifths inspired me to play orchestral music and ultimately to tune my double bass in fifths. In July of 2007, I attended the first of six, double-bass master classes taught each summer by Quarrington in Orford, Quebec. This is where I first heard his reasons for choosing this tuning. He needed the low C2 to meet the demands of orchestral repertoire but ultimately it was the improved intonation between the bass tuned in fifths and the other orchestral instruments that compelled Quarrington to play in fifths.

The first prominent bassist to pioneer tuning in fifths however was Red Mitchell, who began tuning in fifths in 1966. In *Cats of Any Color*, Mitchell recounts to author Gene Lees how he learned fifths tuning in nine days. That anyone could learn to play an instrument in a different tuning in nine days seemed incredible to me, yet Mitchell did it without affecting his job as principal bassist of the MGM Orchestra.

At that time, I was considering tuning in fifths, and wondered how the new tuning affected Mitchell's walking lines as well as my own. The purpose of this study is to examine Red Mitchell's bass lines and determine what effect tuning in fifths had on his walking bass lines.

I chose to examine only Mitchell's walking bass lines, not his solo playing. Walking bass lines in jazz are improvised, yet still follow certain predetermined conventions. These conventions provide a more consistent model than solo playing on which my research is based.
The focus of my research is to examine how Mitchell's walking bass lines were affected when he switched to fifths tuning. Transcriptions were made of blues bass lines with the same key of F major and similar tempi from Mitchell’s fourths period and from his fifths period. The blues is also well represented in Mitchell's recorded repertoire throughout his entire career. The analysis will look for changes in melodic and harmonic intervals, pitch, open strings, range, and use of motives that can be attributed to playing in fifths.

In April 2011, I changed the tuning of my bass to fifths. My intention was not to duplicate Mitchell's process but to understand it and use it in my research. The relearning of the note positions on the fingerboard and reading music presented the greatest challenges.

Applying this new tuning to my research, I played through the three transcriptions in fifths tuning, then tuned the bass to fourths and played through the three transcriptions in fourths tuning. The purpose of this exercise was to make note of fingerings, left-hand positions, and use of open strings in both tunings.

I extrapolated and notated Mitchell's left hand positions by using photographs and film footage of his playing as a model as well as from my own experience as a bassist. My research found no film footage of Mitchell playing in fourths tuning therefore my notation of his left hand positions is based on photographs of Mitchell playing and from the bass pedagogy method books he referenced in his interview with Tricia McGarvin.

The double bass is a transposing instrument, meaning that the instrument sounds an octave lower than written. The notation of examples and transcriptions throughout my
analysis will show the bass lines as written in the bass clef and where Mitchell's lines go into the upper registers of the bass I have used the treble clef.

The notation of positions was borrowed from the concept presented in Dennis Masuzzo's book, *Playing the Double Bass Tuned in Fifths CGDA*. This concept uses tablature as a visual reference where positions are comparable to frets on a bass guitar. These findings were used to produce a chart that gives a visual representation of each performance.

The evidence shows consistencies and trends in the three blues in fifths tuning that do not appear in fourths tunings. This is due to the increase in the range of notes that fall under the left-hand in a single position. The rearrangement of notes and the new positions required to access them made Mitchell adopt new shifting strategies resulting in lines that encompassed more of the upper range of the bass fingerboard. This in turn expanded Mitchell's use of open strings to facilitate these shifts.

In addition to the analysis of Mitchell's work, I have included a biographical sketch of Mitchell's life that details specific events that impacted his musical development relevant to this thesis.

The chapter entitled Reasons for Tuning in Fifths is an examination of the events that led to his decision to retune the bass. The chapter also relates the experiences of other jazz and classical bassists who also tune in fifths. I have included a chapter called Bass Line Grammar that discusses the conventions used by jazz bassists in the creation of a walking line. This is intended to give the reader an understanding of what would be considered in the analysis of Mitchell's bass lines that could be affected by the change in tuning systems.
Most of the literature I found on Mitchell is biographical in nature, with an emphasis on his expatriation to Sweden. Several authors have written about Mitchell's melodic, horn-style soloing. John Goldsby, David Hunt, and William H. Grimes have contributed articles on Mitchell's playing, providing transcriptions and analyses of his unique style. Dr. Chris Budhan and Diane Mitchell have developed the website, www.redmitchell.com, featuring recorded interviews with Mitchell, a comprehensive discography and transcriptions of Mitchell's solos by Budhan.

Although the majority of literature written about Mitchell is concerned with his soloing, the research presented here is the first to explore not only Mitchell's bass lines but also the subject of tuning the double bass in fifths and its effect on walking bass lines. It is hoped that the reader will gain an insight into Mitchell's remarkable ability as an accompanist and through his original, innovative approach to playing the double bass.
Chapter I

Biography

Keith Moore "Red" Mitchell was born on September 20, 1927 in New York City. Four years later the family moved from Brooklyn to Radburn, a mostly white town in New Jersey.¹ His father, William Davis Mitchell studied engineering in Hoboken and later became an executive at AT&T. As a boy, Mitchell shared his father's curiosity for how things worked and wanted to be an inventor. During this time Mitchell was also studying classical piano, which he did for nine years. His father, an opera enthusiast, had season tickets to the Metropolitan Opera in New York for over forty years. He studied singing and learned several languages in order to sing the operatic parts in the original language. His father's role in Mitchell's development would be important in two aspects. First, his father's love of music exposed Mitchell to music at an early age and supported Mitchell's interest with piano lessons. Secondly, his engineering and scientific background would impart a scientific approach in Mitchell, which, in later years, would ultimately influence Mitchell's decision to change tunings.²

Mitchell had nine years of piano lessons and four years of clarinet and alto saxophone lessons before his introduction to jazz. Mitchell's discovery of jazz came one day after hearing Count Basie on the radio which for him was an epiphany. "I've gotta do something like that" (Lees 1995). Mitchell would later cite the bassist he had heard on that recording, Walter Page, as one of his first influences.

At age sixteen, he and his younger brother Gordon "Whitey" began taking the twelve-mile bus trip to New York City to hear jazz in the clubs of 52nd Street and Harlem.
Mitchell quickly identified with the jazz community and appreciated the comradery he felt there, having described his hometown of Radburn as predominantly White Anglo Saxon Protestant and strange. "When I started going into New York as a teenager, going to 52nd Street and to Harlem, meeting some of those giants I'd heard on the records, they made me feel more welcome there than I had felt in my home town" (Lees 1995).

While still intent on becoming an inventor, Mitchell, with help from his father, received a four-year scholarship to Cornell University to study electrical engineering. Mitchell's first experience with playing jazz began with the piano. While at school, he would practice bebop on the piano and played clarinet in the marching band as well as his own trio. He went to Cornell for only one year, from 1945 to 1946, before being drafted into the army.

Mitchell was stationed overseas in Germany and played piano in the U.S. Army's big band that played jazz exclusively with weekly Sunday concerts. While in the band, Mitchell made the decision to take up the double bass and acquired his first bass in a trade for fifteen cartons of cigarettes.

Mitchell returned to New York from the service in 1947 and made the decision to become a professional jazz musician. At this point he had been playing bass only three months. With funding from the G.I. Bill and the full support of his parents, he attended the Julliard School of Music in New York where he studied with Frederick Zimmerman, but left after three months possibly because the school did not have a jazz program. Mitchell also cited some personal differences with Zimmerman.3

After leaving Julliard, Mitchell moved to New York to become part of the jazz community where he quickly garnered attention. Charlie Parker asked Mitchell to sit in
with his group one night and Mitchell was later approached by Miles Davis to rehearse with his group. This same group would go on to record *Birth of Cool*. Mitchell, however, did not end up on that recording date. Mitchell had his first steady gig in 1948 at the Onyx on 52nd Street, playing opposite Parker's quintet. He went on to work with Jackie Paris, Mundel Lowe, Charlie Ventura and Chubby Jackson before going on the road with Woody Herman in 1949. The tour with Herman consisted mostly of one-night performances over thirteen months and took its toll on Mitchell's health. In 1951, he contracted tuberculosis and was forced to stop playing for a year to recuperate.

While recovering at home, Mitchell experimented with a new playing style. He lowered the bass's strings closer to the fingerboard and played with a softer legato style. With lower strings, the speed with which he could articulate notes increased. It also allowed him the ability to play articulations with the left hand. He developed a two finger pizzicato technique allowing him to play faster but the lower string height decreased the volume and sacrificed some of the percussive nature of his bass sound. The new sound did not project very well in larger ensembles.

In 1952, Mitchell had relocated to the West coast and began playing with Red Norvo and Tal Farlow. His recent sickness persuaded him to limit the kind of rigorous touring he had done with Herman and he sought out work in the Los Angeles studios. His association with Norvo took him to Sweden with Billie Holiday.

Mitchell struggled to balance his studio career with his jazz career. The studio scene was very competitive and when Mitchell refused to cancel a rehearsal with Harold Land, the studio contractor replaced him, costing Mitchell a TV series.

In 1955 Mitchell began a two-year association with bebop pianist Hampton Hawes
that was an overwhelming artistic success and that led to Mitchell and Hawes as being regarded as one of the premier bass and piano pairings in jazz (Hunt 2010). The scaled-down trio gave Mitchell the vehicle to further develop and hone his unique horn influenced solo style. In all, Mitchell would make eight records with the Hawes trio which included the *Hampton Hawes Trio Vol. 1, This Is Hampton Hawes: The Trio Vol.2, Everybody Likes Hampton Hawes: The Trio Vol. 3* and the *All Night Sessions 1955*, which added guitarist Jim Hall.

Conductor and pianist André Previn employed Mitchell in his trio The André Previn Trio Jazz, and used him on eleven different recordings which included *Pal Joey* (1957), *André Previn's Trio Jazz: King Size!* 1958, *West Side Story* (1959), *Gigi* (1958). This was another successful trio in Mitchell's career and exemplifies a trend that saw Mitchell favouring smaller groups such as trios and duets. Another well received group that Mitchell was part of was his quintet with tenor saxophonist Harold Land from 1961 to 1962 producing *Hear Ye!!! Hear Ye!!!!* (1961). The brief collaboration with Land would result in a unique vision that partnered the string bass with trumpet and tenor saxophone, playing themes and melodies (Feather 1961).

In 1961 Mitchell led a recording entitled *Rejoice* where he played cello. On this recording, Mitchell played a fourths tuned cello where he is featured as a soloist. The bassist was Jimmy Bond (Discogs.com n.d.).

Mitchell found work in the TV and film studios of Los Angeles through a recommendation by guitarist Barney Kessel. In 1959 he became the principle bassist for the MGM orchestra, owing to his ability to play both electric and double bass and his familiarity with rock and roll.
In 1966 Red Mitchell changed the tuning of his bass from the standard fourths tuning to fifths. Henri Mancini had composed a chase scene for the *Peter Gunn Show*. He approached Mitchell and told him that the bass part went down to a low C. This would lead to Mitchell changing the tuning of his bass from fourths to fifths.

With so much of his time consumed by his studio work, Mitchell was beginning to become dissatisfied. He found himself having to turn down jazz dates with artists he wanted to play with in favour of keeping his studio career. The breaking point came when, after playing a six-week club date with Dizzy Gillespie, Mitchell had to turn down Gillespie's invitation to join the band and go on tour. "...He wanted me to stay with him and tour. I heard myself telling him, 'Diz, I've got this big house.' That's what I said. To pay for the house I've got to stay in the studios. Suddenly I thought, how did I get here from there? This is what I've always wanted to do, play with Dizzy" (Lees 1995).

When Red Mitchell decided to move to Sweden, there was more to the decision than the desire to play jazz. He was becoming increasingly dissatisfied with what he referred to as the institutionalism of violence and racism in America. Mitchell objected to the violent themes of the film and television shows that he played on. The turbulent political climate in America during the 1960s saw a number of events that left Mitchell deeply disturbed, such as the assassinations of John F. Kennedy, Robert Kennedy, and Martin Luther King. He became politically active with affiliations to the National Association for the Advancement of Colored People, Congress of Racial Equality, and the American Civil Liberties Union.

In 1968 Mitchell left the United States and settled in Stockholm, Sweden intent on pursuing the creative life style playing jazz that had become secondary to the studio work
he had left behind in Los Angeles. He started working almost immediately in Copenhagen with Phil Woods, then Lucky Thompson.

His playing opportunities increased and he found himself performing and recording with visiting American jazz musicians who were touring through Europe such as Dizzy Gillespie, Jim Hall, Jimmie Rowles, Wayne Marsh, Joe Beck, Clarke Terry, Hank Jones, Joe Pass and Roger Kellaway.

Mitchell was not the only musician to expatriate himself from the United States. Ed Thigpen, Ernie Wilkins, Kenny Drew, Sahib Shihib and Thad Jones had all moved to Sweden. Musician and author Bill Moody documents in his book, *The Jazz Exiles: American Musicians Abroad*, the stories and reasons so many American musicians took up residence outside the United States. Many black musicians found that there was far less racial prejudice in Europe. Others like Mitchell sought a more agreeable political climate. Mitchell felt more appreciated in Sweden, commenting, "Over here I was treated as an individual. I got grants, and on one TV show I was told I was a national treasure" (Lees 1995).

Mitchell worked with many local Swedish artists Putte Wickman, Rune Carlsson, Nils Sandstrom, Thore Swannerud and Lars Jansson. Many of the records he played on were recorded in his own apartment in Stockholm. He toured Europe with his own group called Communication from 1975 to 1985. Although he was no longer living in the United States, he made yearly visits there, playing and recording. In 1987 Mitchell began a six-year collaboration with pianist Roger Kellaway recording eight CDs.

Guitarist Jim Hall became another important partner with Mitchell. Their association spanned a twenty-one year period that began in 1957 with Hall's *Jazz Guitar*. 
The album simply titled *Jim Hall and Red Mitchell*, recorded at Sweet Basil in New York is considered one of their best, noted for the sensitive interplay between Hall and Mitchell. Hall is also included on *Rejoice*, Mitchell's debut on cello. He would also record and play with Barney Kessel, Tommy Flanagan, Phil Woods, Hank Jones Bill Mays, and Clark Terry.

Mitchell won two Swedish Grammy awards in 1986 and again in 1991, not only for his bass and piano playing, but also for his compositions and song lyrics. One of Mitchell's most interesting recordings is entitled *Declaration of Interdependence*. Recorded in 1988, Mitchell used multi-tracking to play all the instruments heard on the recording, bass, piano and vocals. In addition to his playing, Mitchell became involved with music education. He taught the Communication Seminar, which he presented three times at the annual convention for the International Society of Bassists.

In 1992, after twenty-four years abroad, Mitchell moved back to the United States. He had been learning of a renewed interest in jazz in America through his fellow musicians. There were also family reasons and the fact that racism was beginning to appear in Swedish society. Ten months after his return, Mitchell suffered a stroke and died on November 8, 1992.
Chapter II

Reasons For Tuning In Fifths

Mitchell's decision to change to fifths tuning came primarily out of necessity. The dominant concern was job related however the other rationales behind Mitchell's thinking included the superior resonance of the bass when tuned in fifths and the improved intonation with other string instruments.

The main impetus to change tuning of his bass came in 1966 while Mitchell was employed as principal bassist with the MGM Orchestra. Henri Mancini wrote a chase scene for the Peter Gunn Show that required a low C\textsubscript{2} in the bass part. The lowest note on a standard double bass tuned in fourths is E\textsubscript{2}.\textsuperscript{1} The low C\textsubscript{2} Mancini required is a major 3\textsuperscript{rd} below E\textsubscript{2}. Mitchell was obliged to accommodate Mancini to keep his position as the orchestra's principle bassist. To get the low C\textsubscript{2}, Mitchell had three options, install an extension, acquire a five-string bass, or retune the bass to fifths.\textsuperscript{2}

The first option required installing an extension on his bass. There are two kinds of extensions, fingered and mechanical and both allow the bassist to play pitches below the standard E\textsubscript{2}, as low as C\textsubscript{2} or B\textsubscript{1} depending on the design. Extensions require modification to the instrument by adding a narrow fingerboard extension from the nut, over the peg box, and extending several inches past the end of the scroll. It requires some cutting and drilling to the instrument. A special designed, longer string extends to the end of the extension, over a pulley wheel back down to the E tuning mechanism. The string is clamped with a capo at the nut when an E\textsubscript{2} is required. To access the notes below E\textsubscript{2} on a fingered extension, the bassist must reach up, release the capo and finger
the note, and do so without the comfort of the neck. Afterwards, if a low E\(_2\) is required, the bassist can play the E\(_2\) as a closed note or reset the capo, returning the bass to standard tuning. A shortcoming of this design is that the bassist may not have adequate time to release or engage the capo if there are not any pauses in bass part to permit this adjustment.

A mechanical extension consists of a telescoping tube with levers activated by pressing keys that close the string at specific points on the extension, thus eliminating the need for the bassist to extend his left hand above the nut in order to close the note. Both types of extensions require using a capo for the E and these were noisy according to Mitchell (Lees 1995). The damage and alterations that must be performed on a bass during installation can be a prohibitive factor for a bassist when deciding how to obtain a low C\(_2\). The cost can also be an issue.\(^3\) This approach did not interest Mitchell. He further rejected this solution stating it was not practical to use these lower pitches in walking lines or soloing (Lees 1995).

He dismissed the use of the five string bass with a low B\(_1\) string saying that the fifth string had a muting effect on the instrument (Clark 1980).

He chose fifths because it gave him the required low C\(_2\) and involved the least amount of modifications to the bass's setup. The bass's bridge and nut would require some minor filing to compensate for thickness of the low C\(_2\) string. Fifths tuning would also require a new set of strings that could be assembled from other existing strings that were readily available.\(^4\) Fifths tuning also presented a logical solution to the intonation issues Mitchell felt existed between the basses and the other string sections. Having played alongside the other string families for close to ten years, Mitchell had ample
exposure to hear these differences. In an interview with Gene Lees, Mitchell asserts that every symphony orchestra has tuning issues. "One day I'm going to write about this. One chapter will explain why some bass players and some cellists get along like some cats and some dogs. They could all get along fine, except they tune their instruments differently...The normal tuning today, which is causing this war between the bass players and all the other string players in the symphony orchestras – every symphony orchestra – is this difference in tuning ” (Lees 1995).

Mitchell had a keen sense of hearing even as a child. In the same interview with Lees he describes hearing violinist Jascha Heifitz on the radio and telling his father that the thirds were out of tune. His father would explain to him the differences between the tempered scale that he was familiar with and the natural scale that Heifitz was using (Lees 1995).

A further reason for tuning in fifths was the sound the bass exhibits in this tuning. Author Paul Brun, in A New History Of The Double Bass recounts a story of Mitchell's preliminary experimentation with tunings. "Somebody gave him once an old cello, which he tuned in fourths so that he could play it like a double bass. The sound immediately dropped. He wondered if the opposite would happen if he took an instrument ordinarily tuned in fourths and tuned it in fifths. So one weekend he was spending with Gary Karr experimenting with different strings, he tried the other system of tuning. The minute he heard the sound of his bass tuned in fifths, he shouted, "This is it! This is the sound I've been looking for" (Brun 2000).

The history of the double bass and its tunings is a broad subject and beyond the scope of this thesis, but there is historical evidence supporting the improved resonance of
Brun's research chronicles the development of the double bass with an historical survey on tunings, including a section on fifths tuning where the improved sonority of the bass in fifths was recognized as early as 1844. Brun names instrument makers Adolphe Sax and Gustav Bushman who built four string basses tuned in fifths. Italian bassist Isaia Billè referred to fifths tuning as "more sonorous, ampler in its vibrations and more perfect in its didactic proceedings" (Brun 2000).

London Symphony Orchestra's principal bassist Joel Quarrington is perhaps the world's leading proponent of tuning the bass in fifths. He came to fifths tuning, like Mitchell, primarily as the best solution to attain a low C without the use of extensions and the resulting damage to his valuable bass (Quarrington n.d.). Quarrington affirms Mitchell's assertion that intonation is improved when playing with other strings. "The physics are different when you are in fifths because you are in the same groove as the rest of the string section. The bass in fourths is impossible to tune – if you make the fourths perfect, your low strings will be too flat and of course will not relate to the open strings of the other instruments" (Quarrington n.d.).

Dennis Masuzzo has written a method book for playing the bass in fifths. In the preface he describes the noticeable difference in sound owing to the "consonant overtone resonance of open strings and harmonics", and that he heard a new clarity to the sound, "the instrument resonated more warmly and naturally" (Masuzzo 2004).

Paul Unger, assistant principle bassist with the Fort Worth Symphony Orchestra and freelance jazz bassist cites the acoustical superiority of the tuning stating, "once I heard my bass in fifths, I realized that fifths tuning gives it a far superior tone and ampler
vibration...The notes project farther, and the pitch is clearer and more even in all registers. This is a result of fifths tuning producing a greater number of common overtones between the open strings and the way it allows the top plate of the instrument to vibrate” (Unger 2011).

Bassist Silvio Dalla Torre makes similar claims about the bass's improved sound. Furthermore, Torre sought a scientific explanation to this phenomenon, enlisting sound engineer Carsten Storm to take an acoustic reading of Torre's bass tuned in fourths, then restrung and tuned in fifths. Torre wanted to know if his perception of a more dynamic sonority could be proven scientifically. Torre lists only the conclusions of Storm's reading on his website, confirming his impression that the bass in fifths sounds superior to the same bass tuned in fourths (Dalla Torre n.d.).

Red Mitchell played in fourths tuning from 1947 to 1966 at which time he started playing in fifths. In 1966 he arranged for a nine-day break in his playing schedule with the intent of learning the new tuning. "When I made the change in '66, I took my second wife and her son down to beach near San Diego and practiced for nine days around the clock over the sound of the surf. There's a motel there that goes out right over the surf" (Lees 1995).

There is sufficient evidence to establish why Mitchell chose tuning his bass in fifths over the available choices as a solution to obtain the low C. In reference to how he learned the new system, Mitchell himself points to the cello as a model for his approach. He was already familiar with the instrument having recorded the album Rejoice in 1961, on which he played the cello, not as a rhythm section instrument, but in a melodic, solo capacity, although tuned in fourths. He also had access to the string players in the MGM
Orchestra. Mitchell would take advantage of this important resource. He made an arrangement with MGM cellist Fred Seykora to learn cello technique in exchange for bass lessons. Mitchell would use the cello as the basis in his approach to playing the bass in fifths. "...there are all sorts of tricks and techniques used by cellists. When I made the switch to fifths, I got together with Fred Seykora...Fred and I got together everyday for a week at my house. He wanted to learn how to improvise...I wanted to learn how a cellist thinks with this fifth tuning" (Lees 1995).

Mitchell had the desire to learn the instrument in fifths. The reaction to hearing his bass in fifths for the first time, as described by Brun, was an epiphany. Mitchell had already modified his bass set-up several times suggesting that he was willing to change and adapt his playing style, technique and now, the tuning of his bass.
Chapter III

Bass Line Grammar

The left hand position conventions used in my analysis had to be applicable to fourths or fifths tuning and therefore do not refer to specific pitches on the fingerboard. Instead, the positions will indicate increments of one semitone, referenced to the open strings in either tuning. Table 11 shows fingerboard positions for both tunings. Furthermore, the numerals used will signify a position that spans a whole tone between the first finger and the fourth finger, with the second finger between them, dividing the whole tone into two semitones. The third finger will not be used until position 10. ¹

For the purposes of demonstration, I will use the D string as it is common to both tunings. In the fingerboard layout diagrams, I have borrowed the idea of identifying these semitone units with a line, similar to a fret on an electric bass guitar. The first position on the D string would an Eb₃, one semitone up in pitch from the open D₃. With the first finger on the Eb₃, the second finger plays the E♮₃ and the fourth finger plays the F₃.

To understand how the creation of a walking bass line is perceived in the mind of a bassist, it is necessary to know how the bassist perceives their role in the creation of that line. One of the conventions that most bassists agree upon is that the primary role of a bassist is that of accompanist. A bassist will construct a walking bass line using a certain set of predetermined parameters that fulfill rhythmic, harmonic and stylistic considerations. Bassists are almost unanimous in their use of the word foundation as defining their role as a bassist and their bass line within the context of a performance. The transcriptions of Red Mitchell’s bass lines within the scope of this thesis are stylistically consistent, placing him in the bebop
and post bebop genres. The remaining two parameters, rhythm and harmony, will serve as the focus of this chapter.

A walking bass line generally consists of four quarter notes per bar. These quarter notes define the pulse, tempo and provide forward motion in the music. The tuning of the bass in fifths has no effect on the pulse within the line. Mitchell's time feel was unaffected by the tuning.

**Rhythmic Elements In The Line**

The most basic unit of the walking line is the pulse. This is heard in the walking line as the quarter note. Another way to describe the pulse in jazz vernacular is time (Henderson n.d.).² The word *time* is commonly used in reference to a musician's groove or rhythmic consistency in maintaining tempo. Musicians are valued and judged by their ability to play time. One of the bass's primary roles is that of a time-keeper. Jim Stinnett takes the position that time is more important than the notes (Stinnett n.d.).

The walking bass line implies the same steady motion that one feels when a person is walking. There is a predominant use of 4/4 time in jazz and the walking bass line is characterized by four quarter notes per bar. A critical element of jazz is the swing feel. Although the walking line is expressed in quarter notes, the swing feel subdivides the quarter note into three equal subdivisions called triplets.
The bassist plays the quarter notes with this implied swing feel. A pair of eighth notes in swing is interpreted and played as the first two notes of an eighth note triplet tied together for the first eighth and the last note of the triplet played as the second eighth.  

EXAMPLE 2. Eighth note expressed in swing feel.

Classical music makes a distinction between strong beats and weak beats within a measure of 4/4. Beats one and three are considered strong and are played with more emphasis than beats two and four, which are considered weak. In a jazz walking line however, all four beats are given equal rhythmic emphasis with regards to the pulse. It is this equality that gives the line its forward motion. Gunther Schuller refers to this as the "democratization of rhythmic values "(Schuller 1968). There exists in jazz, however, a parallel to the classical convention that gives importance to beats one and three. In a jazz bass line, these beats are considered harmonically stable, resting beats. Bass students are encouraged to play the root of the chord on beat one and another chord tone on beat three. Beats two and four are considered harmonically unstable, moving beats. A further interpretation of these terms is the concept of tension and release. Notes that are unstable or moving create tension and their resolution to the stable, resting beats provides release (Coolman 1990). Rhythmically, we get a model where beat two (unstable) wants to move to beat three (stable), and beat four (unstable) wants to move to beat one (stable).

The following models explain the different results when stable and moving harmonic and rhythmic elements are combined.
EXAMPLE 3. Stable and moving pitch models.

1. Stable beat + Stable pitch = Stable note
2. Stable beat + Moving pitch = Moving note
3. Moving beat + Stable pitch = Moving note
4. Moving beat + Moving pitch = Moving note

Consequently, the first model shows that the only way to attain stability in a walking line is with a stable pitch on a stable beat (Henderson n.d.).

The bassist adds rhythmic variety to the bass line to attain motion, variety and interest. These articulations commonly take the form of eighth notes and eighth note triplets. Furthermore, each statement of these articulations reinforces the swing subdivision.

Articulations in general, draw attention to the quarter note that follows them (Coolman 1990). The examples below were taken from transcriptions of Red Mitchell playing several different articulations.


EXAMPLE 7. Delayed note. *Straight No Chaser*, m. 5.
EXAMPLE 8. Anticipation - Triplin' Awhile, mm. 156-157.

Examples 4 and 5 show two different articulations on beat four. Example 4 is an eighth note pair and is the most common rhythmic device played by bassists. The eighth note triplet on beat four of example 5 is called a drop. It is a series of eighth note triplets that descends towards a target note, in this case the C₃ on beat one. Placing these articulations on moving beats gives motion to the line and emphasis to the next quarter note, which in examples 4 and 5 is the C₃ on the down beat in the following measure. The technique of playing a drop is called a rake, denoting the right hand pizzacato technique where the plucking finger is pulled across the strings in a rake-like motion.

Example 6 is called a skip beat. It is notated with an x instead of the notehead to signify that the note is muted with the left hand so that the pitch of the note is not heard but the percussive articulation is maintained. The term ghost note is used in cases where even though the note is muted, the ear is able to subconsciously fill in the pitch. The rhythmic duration of ghost notes are maintained to preserve the flow and forward motion of the walking line.

In example 7, the B♭₂ is delayed by an eighth note. Example 8 shows the opposite where the B♭₇ chord on beat one is anticipated by an eighth note. Both examples are used to create tension in the line which is resolved once the quarter note rhythm is resumed.
Harmonic Elements In The Line

The most basic elements that bassists use in the formation of their lines are derived from chord tones, scales and chromatic tones. Chord tones are the notes that define the chord. Most chords are triad-based. Jazz chords often use upper extensions to add colour and tension to the sound. Upper extensions are typically left out of the walking line although the bassist must be aware of them. A bassist's choice of what notes to play over a chord will usually default to notes that define root motion and the harmony of the chord.

The most effective way to support the harmony is playing the root, third and fifth of the harmony. In essence, the bassist spells the chord as a triad. Because jazz chords are so heavily seventh based, the chord spelling must be expanded to include the seventh. 4

A chord-tone arpeggio is a horizontal representation of the chord and the most basic method of defining the harmony.

EXAMPLE 9. B♭7 root position arpeggio. Low and Inside, m. 130.

In the above example, beats one and three are root and fifth. These notes define the root motion of the harmony. The third and seventh define the quality of the chord. A B♭ root and F fifth can appear in many different chords including B♭6, B♭m6, B♭7, B♭m7, B♭maj7, and B♭minmaj7. Therefore the third and seventh are important notes for the bassist to use. A four note seventh chord arpeggio can be played in twenty-four different inversions.
A second major component of the walking line is the scale. The scalar approach involves building the walking line using the scale or mode that the harmony was originally derived from. The scalar line in example 10 is based on the F Mixolydian mode.

**EXAMPLE 10. F7 descending scalar line. Low and Inside, m. 41.**

![F7 descending scalar line](image)

The D₃ on beat three is not a chord tone but the motion and melody of the line define the F7 harmony.

**EXAMPLE 11. Diatonic and chromatic scalar line. Low and Inside, mm. 103-104.**

![Diatonic and chromatic scalar line](image)

In example 11, Mitchell combines diatonic and chromatic scales. Scales give walking lines a different character than a chord-tone arpeggiated bass line. Scales express linear motion more effectively than arpeggios. Arpeggios express vertical representations of the harmony in a linear fashion.

The third essential ingredient in the walking line is chromatic passing tones. Returning to the discussion of stable and moving beats, chromatic notes can be used on beat two resolving to three and on beat four resolving over the bar to beat. Chromatic passing tones resolve by half-step, from above or below, to chord tones. These tones function as leading tones and create very strong resolution points. In example 12, Mitchell creates a flowing ascending line employing chromatic leading tones. In the first measure, the B₂ (beat two - unstable) resolves to C₃ (beat three - stable); the D₃ (beat four - unstable) resolves to Eb₃ in the second measure (beat one - stable); the Eb₃ (beat two - unstable) resolves to F₃ (beat three - stable).
The F₃ and A₃ on beats three and four create a very strong resolution point to the B♭₃ in the third measure as both F₃ and A₃ are harmonic tones and the A₃ resolves by semi-tone to the B♭₃.


![Chromatic passing tones](image1)

The resolution points shown in the preceding example appear on a larger scale in the form of a delayed resolution in example 13. This occurs when the bassist extends the current harmony over the barline and delays the resolution of the new chord change until the second, third or fourth beat of the bar.


![Delayed resolution](image2)

In this example, Mitchell extends the G minor harmony over the bar with a prolongation of the Gm7 harmony, resolving chromatically from the D♭₃ on beat two to the C₃ on beat three.

There are many ways to combine the chordal, scalar and chromatic elements to create a functioning, supportive line. In the transcriptions of Red Mitchell's bass lines, he uses all three elements to great effect. He also contradicts many of the guidelines mentioned thus far. Because there are so many possibilities in an improvised walking line, a bassist will use their ears and musicality to imply the harmony in the line. When the bass line is heard within the larger context of the song with other instruments, the line will be heard as successful in
conveying the harmony, regardless of questionable note choices or any conventions that may have been broken.

There are additional elements within a bass line that require further discussion. In the analysis of a bass line there are terms that identify specific parts and functions within the line.

Each note in a walking bass line may be categorized as harmonic or nonharmonic. A nonharmonic tone is a note in the line that is not part of the harmony. In example 12, the B♭₂ on beat two of measure 251 and the E♮₃ on beat two of measure 252 are chromatic passing tones and are not part of the F7 harmony. Similarly, the F♯₄ and G♮₄ passing tones in measure 254 are not part of the B♭₇ harmony.

Passing tones are nonharmonic tones that occur in stepwise motion, up or down, between two chord tones and are diatonic or chromatic.

**EXAMPLE 14.** Diatonic and chromatic passing tones. *Low and Inside*, mm. 103-104.

In example 14, the B♭₃ on beat two in measure 103 is a diatonic passing tone between the A₃ and C₄. In the next measure, the E♭₄ on beat two is a chromatic passing tone between the E♭₄ and the F₄.

Neighbour tones, like passing tones are diatonic or chromatic. A neighbour tone moves stepwise between two chord tones of the same pitch. An upper neighbour tone lies above the chord tones whereas a lower neighbour tone lies below the two chord tones.
Example 15. Diatonic neighbour tone. *Low and Inside*, m. 7.


Cambiatas and escape tones both function to delay resolutions within the line. In the case of example 17, a cambiata, the G₃ delays the resolution of the E♭₃ on beat three to the F₃ on beat one of the next measure. The G₃ moves in the same direction as the resolution.⁴


The escape tone in example 18 acts in a similar fashion, the exception being that the tone moves in a contrary motion to that of the resolution.⁵


Closely related to the cambiata and escape tone is the appoggiatura in which the bass line leaps to a nonharmonic tone, then resolves to a chord tone. Example 19 is a diatonic appoggiatura where the D₃ on beat three resolves to C₃ on beat four. Example 20 illustrates a chromatic appoggiatura where the nonharmonic F♯₃ on beat three resolves to G₃ on beat four.
A double stop is a two note chord played on the bass. It is unusual to play double stops within the context of a walking bass line on a bass tuned in fourths for several reasons. Firstly, the fingering and execution of consecutive double stops would be difficult at most tempos, and the harmonic colour of the stop would have limitations based on the chord changes. Perfect fourths and fifths stops span two adjacent strings but add limited harmonic colour. Secondly, major and minor sixth-based stops span three strings and cause the left hand to play in awkward positions. However, these stops can become easier to play in thumb position. Major and minor tenths span four strings and put the average size left hand into difficult and unsustainable stretches.

A bass tuned in fifths has a definite advantage over a fourths tuned bass when it comes to certain double stops. The harmonic colour of the major and minor third, realized through their inversions, major and minor sixths, are easily playable. Major and minor sixths can be played easily between the first and third, or second and third fingers on two adjacent strings as demonstrated by Red Mitchell in example 21.
Mitchell also plays major and minor tenths. These stops, on a fifth tuned bass, span three strings. They are not quite as easy to play in a line as major and minor sixths, but can be used for short parts of the line as Mitchell does in example 22.

In addition to double stops, Mitchell played tenths melodically as well, as in this blues, he frequently played major 10ths over the C7 chord measure 10 of most choruses. This example shows him playing a melodic 10th between beats three and four.

The use of open strings on a bass allows a bassist to perform necessary position shifting while maintaining the consistancy of the time feel. Due to the size of the double bass's fingerboard, shifting from a high thumb position back to half position can cover a substantial distance. Using the open string provides the bassist time to reposition the left hand. In example 24, Mitchell uses the open D3 string on beat two of the Gm7 chord to shift back to play the A3 on beat three. This particular shift is dramatic due to the high register that Mitchell shifts down from to the open D3. It should mentioned here that, as a strategy,
bassists will use open strings when ever possible when playing walking lines because it allows shifting, releasing the left hand from the fingerboard allows the hand to rest, and the open string will be in tune. Open string harmonics perform a similar function.

EXAMPLE 24. Open string shifting. _Straight No Chaser_, mm. 366-369.

The last two measures of the twelve bar blues harmonic structure are called the turn around. This structure which usually consists of a I-VI-ii-V chord progression, leads back to the top of the chorus. With two chords in each bar, the turnaround creates a strong sense of motion as it resolves to the tonic at the beginning of the next chorus.
Chapter IV

Analysis

The analysis of Red Mitchell's walking bass lines was carried out by comparing transcriptions of his bass lines when tuned in fourths to those tuned in fifths. To that end, I have chosen to use the blues as a harmonic structure for several reasons. Firstly, as a form, most musicians observe its traditional twelve-bar harmonic structure that offers a sense of continuity. Secondly, the relatively short twelve bar form repeats more frequently in a performance, and these repetitions provide a good pool of material to analyze. Thirdly, Mitchell recorded many blues throughout his career and therefore the blues was a logical choice and it was easy to find a sufficient quantity in similar tempi and in the same key.

My analysis will cover six blues transcriptions, three of which were recorded prior to 1966 from Mitchell's fourths period and three from 1966 to 1992, Mitchell's fifths period. All performances are in the key of F major. My analysis will be limited to Mitchell's improvised walking lines and will not look at his soloing. Another consideration of the transcriptions is the arrangements. In several of the transcriptions, the bass plays prearranged parts in the introduction and in the head arrangements at the beginning and ending of the performance. To this end, only complete twelve bar walking choruses will be used in the analysis. The harmonic progression of the blues will be based on the following progression.
EXAMPLE 25. F major twelve bar blues progression.

Throughout my analysis I will refer to pitches by pitch name and octave number as shown in example 26.


The Transcriptions

The six performances presented here are in chronological order of their date of recording. The first three are from Mitchell's fourths tuning period prior to 1966. The final three performances are from his fifths tuning period, 1966 to 1992. The actual recordings were purchased and downloaded from the iTunes store in MP3 format. The MP3s were then converted to WAV files using the software program Waveburner. Next the WAV files were imported into a program called The Amazing Slow Downer. This program was used for all six transcriptions as it allowed slowing down the tempo without affecting the pitch. The completed transcriptions were inputted into the notation program Sibelius for editing, formatting and printing. The fingerboard position graphs were created in Excel.
These six songs were chosen because they are all in the key of F major and have medium swing tempos. Harmonically, all the recordings employ the traditional twelve-bar jazz blues chords, and all show an adherence to the harmony avoiding any radical chord substitution. All tempos listed refer to quarter notes with regards to beats per minute.

The Songs

The first song is "Blues the Most", written by Hampton Hawes. The LP, *The Hampton Hawes Trio, Volume 1*, was released on the Contemporary Records label, June 25, 1955. The album's personnel features Hampton Hawes on piano, Red Mitchell on double bass and Chuck Thompson on drums. The song is five minutes, forty-five seconds in length and begins with an eight bar piano and bass intro. The song's twelve bar head is heard two times, followed by eight choruses of piano solo, three choruses of double bass solo, a final chorus of piano and the restatement of the head which is repeated to end the song.

The second song is from Mitchell's association with André Previn. It is called "Low and Inside" and is from the Contemporary Records 1959 recording *King Size, the André Previn Trio Jazz*. The nine-minute recording begins with a four bar drum intro. Previn plays the first eight bars of the melody before Mitchell comes in for the last four bars of the chorus. The head is repeated again. Previn solos first, taking ten choruses before Mitchell's three choruses. Previn solos over two more choruses before playing the head twice to end the song.

The third song, "Triplin' Awhile" is a Harold Land composition from the Red Mitchell, Harold Land Quintet recording entitled *Hear Ye!!!! Hear Ye!!!!*, released in 1961 on the
Atlantic label. The quintet is comprised of Harold Land on tenor saxophone, Red Mitchell on double bass, Carmell Jones on trumpet, Frank Strazzeri on piano, and Leon Pettis on drums. The head arrangement was innovative, utilizing the bass as a melodic texture, playing the melody in unison with the saxophone, something that Mitchell and Land discussed during the inception of the quintet (Feather 1961).

The song begins with Mitchell and Land playing the head for the first chorus. In the second statement of the head, the rest of the ensemble plays with Mitchell relinquishing his melodic role and beginning his walking line. The tempo is approximately 170 beats per minute and the recording is seven minutes and forty-five seconds long, giving each player five choruses to solo, the exception being drummer Leon Pettis who get two choruses. The composition ends with the ensemble playing the head and in a mirror image of the song's opening, the last instance of the head features just bass and tenor saxophone playing the melody with the remaining ensemble returning for the last five bars to end the piece.

All three songs chosen to represent Mitchell's fifths period show not only a change in tuning but in the sound of the bass as well. Mitchell changed his playing style considerably at the same time he began tuning in fifths. He began sitting on a stool while playing and employed the use of pickups and amplification in tandem with a lower string height. He altered his right-hand pizzicato technique to where he plucked the strings further away from the end of the fingerboard, down the neck. This new position facilitated another development in his technique. By having his arm and hand perpendicular to the strings, he was able to augment his right hand two-finger technique to include strumming strings for double stops.

DVD are leader and song composer Benny Carter on alto saxophone, Red Mitchell on bass, Red Norvo on vibraphone, Nat Adderly on trumpet, Horace Parlan on piano and Ronnie Gardiner on drums. "Stockholm Riff" is the opening song of this live performance and lasts four minutes and thirty-two seconds with a tempo of approximately 174 beats per minute. It begins with two choruses of piano solo before introducing the theme, a four bar riff. After repeating the head a second time, both Carter and Adderly solo over four choruses, followed by Mitchell taking two choruses for his solo. The head is stated twice to end the song.

The next piece chosen is a Count Basie, Eddie Durham blues entitled "Swinging the Blues" from the 1986 Enja Records album To Duke and Basie. This recording is a duo with Clark Terry on trumpet and Red Mitchell on bass. It is the shortest and fastest of the pieces in this analysis, lasting two minutes and fifty-four seconds at a tempo of 210 beats per minute. Terry plays the head two times and then solos over three choruses. Mitchell also solos for three choruses. Clark and Mitchell trade fours in the next two choruses followed by two statements of the head.

The sixth song in the analysis is Theolonius Monk's "Straight No Chaser". It was recorded at the Birdland Club in Hamburg, Germany in 1986 featuring leader Herb Geller on alto saxophone, Red Mitchell on bass, Michael Meltzer on guitar and vocalist Harold Smith. The song did not appear on the original Enja Records album Birdland Stomp, but was added when Enja reissued the recording in 2008. The song's duration is nine minutes and thirty-four seconds with an approximate tempo of 166 beats per minute. After Meltzer and Geller's statement of the "Straight No Chaser" theme, Smith sings four choruses of a blues lyric with brief melodic references to Monk's original theme. The following twenty-five choruses
feature solos by Meltzer, Mitchell, Geller and Smith who scat sings for seven choruses before ending the song with two verses of lyrics.

Positions

The six blues used in this analysis are all in the key of F major. A bassist can play an F major blues in fourths tuning at the first position without shifting the left hand. In fifths tuning, the F is located at the fifth position on the C string. Moving laterally across the fingerboard layout, four of the five roots of the F blues harmonic progression are found at fifth position. Mitchell's playing in fifths does reveal a concentration in this area.

To fully understand the differences between the two tunings, I played through the transcriptions in the same tunings used by Mitchell, marking his fingerings and left hand positions based upon my own experience as a bassist and with reference to film footage of Mitchell playing. In the course of my research, I found no film footage of Mitchell playing during his fourths period, therefore my position and finger markings of the fourths material were derived from methods I was taught by jazz and classical teachers. Mitchell was taught classical technique by Frederick Zimmerman while at Juilliard and later in Los Angeles by Herman Rheinshagen, both of whom had been principal bassists for the New York Philharmonic (Lees 1995). Mitchell mentions two method books that he used while learning bass. The first was Bob Haggart's Bass Method. The second was Simandl's New Method for String Bass. I have referenced these method books as they support the positions I have used in my notation of Mitchell's blues in fourths tuning. Both books show fingerings for one-octave scales in F major and B♭ major using only half-position. In my analysis, half position
is comparable to my first position. Blues in the keys of F and B♭ can be played entirely in first position. Ron Carter emphasizes playing in a single position without shifting in his method book (Carter 1998).

The positions and fingerings I used for fifths were extrapolated from film footage showing Mitchell playing in fifths, specifically measures 69 through 76. There are two DVDs of Mitchell in his fifths period, Zoot Sims. In a Sentimental Mood filmed in Liningö, Sweden in 1984 and Benny Carter All-Stars filmed in Stockholm, Sweden in 1985. The song "Stockholm Riff", from the Benny Carter DVD was chosen for my study as it met my selection criteria but equally as important because it reveals footage of Mitchell's left hand while playing the song. In example 27, I have notated measures 69 through 76 using the fingering, strings, and positions used by Mitchell. In example 27 his fingering is notated with numbers, the corresponding strings used with those fingerings are notated with Roman numerals, and positions are marked by numbers with dotted lines. I used this as a model to notate his use of positions for the songs in fifths.

EXAMPLE 27. Stockholm Riff. Positions and fingering mm. 69-76

![Example 27](image-url)
In the "Stockholm Riff" footage, Mitchell shows a preference for the use of open strings whenever possible. The analysis (Table 2) also reveals that Mitchell's use of open strings in the composition of his lines more than doubled in fifths tuning. It can be suggested that he incorporated open strings in the line as part of his approach to deal with the increase in shifting down the neck, and as a result, Mitchell was able to maintain the forward momentum and rhythmic continuity of the walking line.\textsuperscript{5}

**Range**

It is clear from my analysis that Mitchell's playable range was not only extended in fifths tuning but also exploited as well in his walking lines. Table 12 shows a breakdown of the available pitches Mitchell uses in the six transcriptions. The table displays four, one octave ranges starting from C\textsubscript{2} up to B\textsubscript{5}. The highest note Mitchell plays is an A\textsubscript{b4} in "Straight No Chaser". The percentages were calculated by counting the number of notes for specific pitches each song. These pitch ranges were grouped by octave as follows, C\textsubscript{2} to B\textsubscript{2}, C\textsubscript{3} to B\textsubscript{3}, C\textsubscript{4} to B\textsubscript{4} and C\textsubscript{5} to B\textsubscript{5}. The totals for each of the four groups were summed together providing the total number of notes in each song. The total for each octave was divided by this song total, yielding percentages for each of the four octave ranges that appear in the transcription. This procedure was repeated for all six transcriptions.

The playable range of the bass increases when tuned in fifths. The low C\textsubscript{2} in fifths tuning extends the lower range of the bass a major third below the E\textsubscript{2} from fourths tuning, while the first A string is a whole tone higher than its G string counterpart in fourths tuning.
In the analysis of the three blues in fifths tuning chosen for this study, Mitchell makes greater use of the upper range of the instrument, increasing the range in his lines by an interval of a minor 7th higher than in fourths tuning. Table 12 shows that Mitchell uses pitches in all four ranges in fifths tuning with 3.6% of his lines falling in the C₅ to B₅ range. His use of the lower pitches, from Eb₂ to C₂ is very limited. Some of these upper pitches would be easier to reach because of the increased upper range in fifths tuning. However, these pitches were available to him in fourths tuning. The table points to the fact that Mitchell used the full range of the bass. Notes that were previously two positions further up the fingerboard were now further down the fingerboard. Mitchell capitalized on this, and as a result, used this as a springboard to take his bass lines into these higher registers. The three transcriptions in fourths tuning reveal no pitches in the C₅ to B₅ octave compared to 3.6% in that range in fifths. The octave below this range, C₄ to B₄, shows a significant difference between the two tunings. Mitchell played 20.5% of his lines in this register while in fifths compared to 7.6% in fourths, a difference of 12.9%. The overall trend is that Mitchell used far less of his bass's available range when he tuned in fourths, showing the heaviest concentration of pitch material between C₃ to B₃ at 75% with 23% between E₂ to B₂. These percentages can be linked to the left-hand positions that bassists use while learning and subsequently performing blues in F major. The fourths fingerboard chart shows that Mitchell could play every pitch from E₂ to B♭₃ without shifting his hand, using only the first position and open strings. This approach to playing in one position is one that is espoused by bassist Ron Carter, "by playing in a position (in this case) half-position as long as possible...you are assured of more consistent pitch, more combinations of notes and a more consistent level of good tone" (Carter1998).
The extended range that Mitchell uses in his lines while in fifths also has an effect of the shape of his line. His excursions into the upper range result in longer phrase lengths of three to five bars in length. With more room to manoeuvre in the upper register, he uses more chromaticism in his lines.


He also aimed to have his lines peak between bars 5 to 9 over the subdominant section of the blues. These ascending lines are characteristic of his playing in fifths tuning.

The same example shows another effect the tuning has in the composition of Mitchell's lines. The transcriptions show that his lines became more target oriented. The composition of his lines shows a trend of setting up an ascending line, typically beginning in the third measure of the chorus leading towards target tones in the subdominant area of the chorus, measures 5 and 6 over the B♭ harmony or further to measures 7 and 8 over the F7 and D7 harmonies.

The transcriptions show that Mitchell uses this approach twenty-three times throughout the three blues in fifths tuning. In each case, his line ascends from the F harmony towards the B♭ harmony. Mitchell arrives at the B♭3 nineteen out of twenty-three times by an A3, the chromatic leading tone to the B♭3. By using the first string for the A3, Mitchell has an open string to shift on, playing the B♭ in first position. Once he reaches B♭3, he continues up the fingerboard on the first string. At this point in the form, Mitchell has two measures of B♭7 in measures 5 to 6, choosing the third of the B♭7 harmony, D4, seventeen times, and in each of
the twenty-three instances of this approach, he continues up through F₄. Both D₄ and F₄ are played on the first string and are not as far up the fingerboard as they would be in fourths tuning. For this reason, Mitchell takes advantage of the register because it extended his range before having to go into thumb position.

Intervals

Bassist Paul Unger states that one of the characteristics of a bass tuned in fifths is the ability to play larger intervals (Unger 2011). Owing to the bass's extended range in both registers, it is possible to cover almost two octaves in a single hand position while tuned in fifths. The fingerboard charts in examples 29 and 30 show the span of the left hand between the first and fourth strings in first position. On a fifths tuned bass, the range between the first and fourth fingers in a single position, Dᵇ₂ to C₄, is twenty-three semitones, almost two octaves. This is in contrast to example 30, showing the same interval span in a fourths tuned bass where the first finger plays F₄ and the fourth finger plays Bᵇ₃, a range of seventeen semitones.

**EXAMPLE 29.** Interval span in fifths.

**EXAMPLE 30.** Interval span in fourths.

<table>
<thead>
<tr>
<th>Fifths Fingerboard Layout</th>
<th>Fourths Fingerboard Layout</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Open</strong></td>
<td><strong>Open</strong></td>
</tr>
<tr>
<td>C² → G² → D³ → A³</td>
<td>E² → A² → D³ → G³</td>
</tr>
<tr>
<td>1ˢᵗ position</td>
<td>1ˢᵗ position</td>
</tr>
<tr>
<td>Dᵇ² → Aᵇ² → Eᵇ → Bᵇ³</td>
<td>F² → Bᵇ → Eᵇ → Aᵇ³</td>
</tr>
<tr>
<td>2ⁿᵈ position</td>
<td>2ⁿᵈ position</td>
</tr>
<tr>
<td>D² → A² → E³ → B³</td>
<td>Gᵇ → B³ → E³ → A³</td>
</tr>
<tr>
<td>3ʳᵈ position</td>
<td>3ʳᵈ position</td>
</tr>
<tr>
<td>Eᵇ² → Bᵇ → F³ → C³</td>
<td>G² → C³ → F³ → Bᵇ³</td>
</tr>
</tbody>
</table>


This comparison demonstrates that fifths tuning provides the bassist with a greater range of notes in a single position. Furthermore, as the bassist plays up the neck, the smaller distances between intervals could enable the playing of intervals larger than two octaves.

An analysis of the melodic intervals in each of the six transcriptions was made and the results are listed in Table 1. Intervals were recorded according to type and divided into four categories comprising perfect, major, minor and diminished. Mitchell's bass lines utilized eighteen different melodic intervals. Totals for each of the eighteen intervals in each song were divided by the number of notes in each song, giving the average number of times that melodic interval occurred in that song. Further to this, interval totals for each tuning were combined, yielding average occurrences of these intervals for the transcriptions in fourths and fifths tuning.

The results of this study indicate that Mitchell used larger melodic intervals while in fifths tuning, whereas the figures in fourths tuning point to a reliance on smaller intervals in his line. The noticeable exception is Mitchell's use of minor 2nds, showing a significantly higher use of this interval in fifths tuning as opposed to fourths. This is due in part, to the high degree of chromaticism Mitchell used in his upper register lines. It can be attributed to his use of chromatic leading notes that he used to approach his target notes.

Another finding shows that intervals larger than an octave are almost completely absent from his lines in fourths tuning, with the lone exception being one minor 9th in "Triplin Awhile". The trend shows that he favoured intervals of a diminished 5th or higher in fifths tuning. These larger intervals are more prevalent in his lines in fifths. As mentioned previously in Chapter III, it is easier to play major and minor 10ths in fifths tuning. It is not surprising to find that Mitchell used major 10ths in his lines fourteen times, placing them at
the same location in the chorus, the third beat of the tenth measure on the C7 chord. The one exception was the 11th measure of the same chorus over the D7 chord, shown in example 31.

**EXAMPLE 31. Melodic 10ths Stockholm Riff, mm. 142-143.**

That Mitchell used this interval consistently can be explained by the fact that fifths tuning allowed him to play this interval very easily without a shift or awkward stretch in the left hand.

The unisons are repeated notes and show that Mitchell used these with no significant difference between the two tunings. The use of minor 2nds is significant, showing that Mitchell used minor 2nds 11.6% more in fifths. This suggests that Mitchell's lines used more chromatic passing tones and leading tones.

Mitchell used major 2nds in his lines 9% more in fourths indicating that Mitchell's lines are more scalar in design in fourths tuning.

Minor 3rd intervals appear 7.02% more in fourths than in fifths. This may be explained by Mitchell's use of the first position where minor 3rds are found between open strings and notes in this first position.

**EXAMPLE 32. Minor 3rds in first position in fourths**
In example 32, minor thirds appear between A₂ and C₃, D₃ and F₃, and G₃ and B♭₃ and also between G♭₂ and A₂, B₃ and D₃, and E₃ and G₃. In "Blues the Most", 75% of the minor 3rd intervals detailed in example 32 are found in the first position without a left hand shift. In a similar comparison 46% of the minor 3rds in "Stockholm Riff" use open strings in fifths tuning. The remaining 54% of minor 3rds did not use open strings meaning that each of these minor 3rds involved a shift of the left hand. This finding adds to the conclusion that Mitchell's lines traversed a greater range of the bass in fifths. Given these facts, Mitchell's bass lines in fifths tuning encompassed a greater use of the fingerboard and were not as reliant on one position as in fourths tuning. The pitch range study listed in Table 12, shows that an average of 75% of his bass lines in fourths tuning were concentrated in the first position between the pitches F₂ to B♭₃.

**Harmonic Intervals**

In the comparison of the six transcriptions, Mitchell's use of harmonic intervals or double stops, was limited to the blues in fifths. The study found no double stops in fourths tunings. One possible explanation for their absence was the limitation of playable double stops in fourths tuning within the context of playing a walking bass line.
Examples 33, 34 and 35 show the layout of the fingerboard in fourths tuning with reference to a single hand position, specifically, the span of notes available within the reach of the first and fourth fingers of the left hand. The physical size of the neck on a double bass places limitations on how the left hand can play double stops in a walking line. However, in thumb position the bassist can use the thumb in combination with the first, second, and third fingers to play larger double stops. Mitchell did not use this technique or any double stops in the three songs in fourths tunings. Within the first position, the available double stops in an F major blues are the perfect 5ths from F₂ to C₃, B♭₂ to F₃, and D₃ to A₃, and the perfect 4ths between F₂ and B♭₂, G₂ and C₃, A₂ and D₃, C₃ and F₃, D₃ and G₃, and F₃ and B♭₃. Although these stops are playable in other positions and registers on the bass, their usefulness is limited.
due to their root and fifth character. The major 10th from F₂ and A₃ and the minor 10th from 
F₂ to A₃ are harmonically preferable to perfect fifths, but the required stretch between the 
fourth and first strings makes their playability unsuitable within a walking line and confined 
to the region of the fingerboard from the low E₂ to the D₃ on the fourth string.

Mitchell’s playing stance is another consideration regarding the execution of double 
stops. The double bass sound on the three recordings in fourths sounds acoustic, and un-
amplified. The album cover of *Hear Ye!!!!Hear Ye!!!!* shows Mitchell in a traditional 
standing playing stance. It can be hypothesized that Mitchell stood while playing during the 
time period when these recordings were made which would have made plucking double stops 
other than fourths or fifths in the context of a walking line difficult. Mitchell later adopted a 
sitting playing position that facilitated his strumming of double stops in fifths.

Example 36. Multiple double stops in fifths tuning. *Straight No Chaser*, mm. 84-88.

Example 36, from "Straight No Chaser" demonstrates the variety of double-stops that 
Mitchell was able to play in fifths tuning, showing five different qualities including a triple 
stop over the B♭7 in measures 82. Mitchell played this by baring B♭₂ and the F₃ with the first 
finger and playing the D₄ with the fourth finger. He played this triple stop in third position. 
This has relevance because is demonstrates that once Mitchell had realized the potential of 
double stops in fifths, he made extensive use of them, particularly in the upper register of the 
bass.
Example 37 shows eight bars of major and minor 6ths, all in thumb position. He also used similar runs of 10ths as shown in example 38 from "Swinging the Blues" where Mitchell uses almost the entire lower range of the fingerboard from the Bb2 up to the F3.

Example 38. 10ths in fifths tuning. Swinging the Blues, mm. 137-140.

It is clear that tuning in fifths not only gave Mitchell the ability to play larger intervals but that he used these frequently in his lines. Furthermore, the harmonic and melodic possibilities afforded by this, propelled him to utilize more of the double bass's range. The double stops Mitchell used in the three songs in fifths were perfect 4ths, diminished 5ths, perfect 5ths, major and minor 6ths, and major and minor 10ths. The majority of double-stops were perfect 5ths and higher. There were no major or minor 3rd double-stops found in the transcriptions.

The analysis of Mitchell's left-hand positions in fifths reveals that he had formed, whether consciously or not, a type of formulaic design for his choruses. The information gathered when I played through each transcription, was inputted into an Excel spreadsheet
creating a graph that displays a visual landscape, chorus by chorus, of each transcription (Tables 3 through 10). Using the X-axis, one cell is equal to one-quarter note of Mitchell's walking bass line. A complete twelve bar chorus is then forty-eight cells in length. The Y-axis represents each chorus in the transcription.

Using the data from the fingerboard position analysis, the position number assigned to each quarter-note was entered into the cell. In addition, colour shadings were added to enhance the visual description. The shading was assigned to each position on a scale that shows lighter shades beginning at the lowest positions, becoming darker as the positions increased up the fingerboard.

Each chorus was sub-divided into three, four-bar units consisting of measures 1 to 4, measures 5 to 8 and measures 9 to 12. In comparing all three, there emerges a pattern that is consistent for all three songs in both tunings. A comparison of the position fingerboard graphs, Tables 9 and 10, shows distinct differences in Mitchell's left hand positions in how he played his bass lines in the two tunings.

Red Mitchell used a significant amount of repetition of one and two bar motives in fifths tunings. The study of all six transcriptions reveals that certain motives repeat within a song.

The analysis shows that Mitchell uses four different motives in all three transcriptions with regularity within the first three measures of each chorus. With few exceptions, Mitchell begins the downbeat of each chorus with the root of F7, either F₂ or F₃.

EXAMPLE 39. Motive 1 Straight No Chaser, mm 1-3.

EXAMPLE 40. Motive 2 Swinging the Blues, mm 121-123.
Mitchell begins a chorus with one of these four motives, forty-five times, making their appearance significant. In motive 1, the line ascends from F\(_3\) to B\(_b\)\(_3\) using diatonic and chromatic passing tones. From the B\(_b\)\(_3\) the line falls a minor 6\(^{th}\) to D\(_3\), moving to the A\(^b\)\(_3\), the flat 7\(^{th}\) of B\(_b\)7 and also a chromatic leading tone to the A\(^\#\)\(_3\), the major 3\(^{rd}\) of F7 on beat 1 of measure 3. Motive 2 begins on F\(_3\) and descends by scale to B\(_b\)\(_2\) where, like motive 1, the line ascends to the A\(^\#\)\(_3\). Motive 3 begins on F\(_2\) and ascends by scalar motion to B\(_b\)\(_2\) and also ascends to A\(_3\). The last motive, number 4, appears in a number of variations but all instances features an arpeggiation of the F7 harmony beginning on F and ascending to C on the second beat, either by direct leap or by appoggiatura to D\(_3\) and then to C\(_3\) before arriving at the root. The common target pitch of all four examples is the A\(_3\) on the downbeat of the third measure that Mitchell usually plays as the open first string. An important feature of these four motives as shown in the fingerboard position graph, is Mitchell's use of open strings to shift positions in each of the three bars in all four motives. The fingerboard position graph in Table 10, shows that he shifts on open strings consistently, often as many as four times in the first four bars. Within these first four measures he stays mostly in the first five positions.

The fourth measure of the chorus shows Mitchell repeating a motive consistently in each of the three songs in fifths tuning.
This group of motives begins on Eb3, the flat 7 of F7 and moves to the root via the chromatic passing tone E♭3 then to the A4, the 3rd of F7. He uses three other variations of this motive, all of which move to A2 or A3 on the fourth beat. Mitchell repeats this motive type, nineteen times. The leading tone on the fourth beat resolves to B♭ in measure 5 of the chorus. This part of the blues form moves to the subdominant.

The second grouping in the fingerboard position graphs, measures 5 to 8, indicate that Mitchell is making deliberate use of the bass's upper register. Furthermore, the graphs show that he is using the whole range of the bass from first position up to twentieth position. The majority of his upper range pitches occur in these middle four measures consistently in all three songs in fifths tuning. One hypothesis is that Mitchell felt inspired by the expanded range provided to him in fifths tuning. Another explanation is that the A4 located at the first string's twelfth position which happens to be the major 3rd of F7, gave Mitchell a landmark, becoming another target pitch.

Mitchell's pitch choices and positioning at measure 5 in the chorus are similar to those in fourths tuning.
EXAMPLE 47. B♭ major triad in both tunings.

\[
\begin{array}{c|c|c|c|c}
\text{Fifths Fingerboard Layout} & \text{Open} & \text{Fourths Fingerboard Layout} & \text{Open} \\
C^2 & G^2 & D^3 & A^3 & F^2 & A^2 & D^3 & G^3 \\
\hline
B♭^3 & A♭^3 & E♭^3 & B♭^3 & F^3 & B♭^3 & E♭^3 & A♭^3 \\
\hline
D^3 & A^3 & E^3 & B^3 & G♭^3 & B^3 & E^3 & A^3 \\
\hline
E♭^3 & B♭^3 & F^3 & C^4 & G^2 & C^3 & F^3 & B♭^3 \\
\end{array}
\]

This explains the use of the B♭ arpeggio in measures 5 and 6 that appear ten times in the three songs in fifths tuning.

EXAMPLE 48. B♭ motives at m. 4.

\[
\begin{align*}
&F^7 \\
&\text{Example 49}
\end{align*}
\]

Mitchell uses two similar motives, both based on the B♭ triad, to prepare his lines to go into the higher registers. The first motive is a root position B♭ triad that begins on B♭₃ in first position on the A string. Using the DVD footage of "Stockholm Riff" as a model, example 49 shows how Mitchell would play the first three notes of this measure with his first finger, beginning at B♭₃ in first position, shifting to D₅ at fifth position, and shifting again to ninth position to play the F₄ and the G₄. Mitchell now has the A♭₄, the flat 7 of B♭₇ available to him on the downbeat of measure 366, becoming another target note as his line continues to ascend.
Example 50 is a three measure, upper register motive that appears seven times in his lines in bars 6 to 8 of all three songs in fifths tuning. The motive begins on F₄ and moves chromatically up to A₄, the major 3rd of F7. Once Mitchell arrives at the A₄, he moves chromatically to the D₅ on the third beat of measure 8 in two shifts. The D harmonic on beat 4 of measure 128 can be played on the D string at the twelfth position by reaching back with the thumb. This functions like an open string shift, granting Mitchell time to change positions. This regular occurrence of upper range pitches can be attributed to the fact that the tonic F₄ and subdominant B♭₄ pitches are easier to reach on a fifths tuned bass, extending the range of pitch choices.

The last four bars of the fingerboard position graph, table 10, show a distinct concentration in the fifth position.

The ninth bar of each chorus, the Gm7 chord shows Mitchell adopting two different approaches to his line over this harmony. Using a comparison of the two tunings, the style of lines used in fourths tuning are more scalar in nature, often descending and are localized in or near the first position.
Mitchell approaches the same measure in fifths tuning with a greater amount of repetition, specifically the open G\textsubscript{2} in combination with the octave G\textsubscript{3}.

These six examples, and other slight variations appear thirty-six times in the three songs Mitchell played in fifths. The G\textsubscript{3} played at the fifth position is the first occurrence of this note on the fingerboard. Additionally, these motives are based around one or more open strings. Mitchell was able to play the closed G\textsubscript{3} and the open strings at the fifth position. The frequency with which he plays these motives at measure 9 leads to the conclusion that Mitchell's note choices were impacted by position.

The motives at measures 10 and 12 demonstrate similar components to each other and to the make-up of the motives at measure 9. Both groups of motives are based around three notes, G, Db and C. The study of the motives at measure 10 show that in twenty-six of the twenty-seven occurrences of this motive, the downbeat begins on G\textsubscript{3}. Occasionally Mitchell adds rhythmic variation to beat one of this motive with a D\textsuperscript{\flat} providing more chromatic
motion to the Db\textsubscript{3} on beat 2. Next, the line falls by augmented 4\textsuperscript{th} to Db\textsubscript{3} on the second beat, resolving chromatically by semitone to C\textsubscript{3}. The fourth beat of measure 10 resolves to the F7 harmony of the first beat of measure 11, consistently by an augmented 4\textsuperscript{th} leap down to F\#\textsubscript{2} resolving to F\textsubscript{2}, or by a diminished 5\textsuperscript{th} leap up to F\#\textsubscript{3} resolving to F\textsubscript{3}. Mitchell's other choice is playing an E\textsubscript{4}, a major 10\textsuperscript{th} from the C\textsubscript{3}.

EXAMPLE 53. C7 Motives at m.10.

In a comparison of the motives found at measure 12, the study shows that Mitchell often uses a formulaic approach. There are several features that dominate this group of motives found at measure 12. Firstly, the downbeat is G\textsubscript{2} or G\textsubscript{3}, Secondly, the second beat is Db\textsubscript{3} which is arrived at by augmented 4\textsuperscript{th} or diminished 5\textsuperscript{th} depending upon the octave of the preceding G. Thirdly, the third beat is always C\textsubscript{3}. And lastly, fourth beat moves to F\#\textsubscript{2} by augmented 4\textsuperscript{th} or, to F\#\textsubscript{3} by diminished 5\textsuperscript{th}. In summary, within this group of motives, the second and third beats are consistently Db\textsubscript{3} and C\textsubscript{3}, a minor second apart. The first beat is G\textsubscript{2} or G\textsubscript{3} and the fourth beat is F\#\textsubscript{2} or F\#\textsubscript{3}. The other defining quality is the tri-tone interval found between beats one and two, and between beats three and four.
EXAMPLE 54. Motives at m.12.

Similarities between the motives at measures 10 and 12 can be explained by Mitchell's preference of playing the last four bars of each blues chorus mostly in fifth position. Although he chose this position to play the $D_b^3$ and $C_3$ pitches, it allowed him to play the ii-V-I and turnaround progressions with little if any shifting by relying on open strings.
Conclusions

The findings in my research have been organized into specific areas concerning range, positions, open strings and motives and each of these areas are inter-related.

The first noticeable finding was that Mitchell's use of the upper range of the bass in his lines increased in fifths tuning. What makes this finding significant is that even though the change in tuning from fourths to fifths expands the range of the bass by two whole tones in the lower register and one tone in the higher register, Mitchell's bass lines expanded into the octave C₅ to B₅. This range is not found in the three recordings in fourths.

The increase in pitch range can be linked to the left hand positions Mitchell adopted once he changed to fifths tuning. The Fingerboard Position Graph shows that Mitchell's bass lines in fourths are concentrated in the first position. The conclusions from the graph show that when he adopted fifths tuning, the fifth position became a starting and end point for many of Mitchell's lines. The fifth position on a fifths tuned bass places the bassist's hand position further up the fingerboard. The notes that fall under the bassist's fingers are higher in pitch than on a fourths tuned bass.

The new layout of the fingerboard in fifths had a further effect on Mitchell's range. Mitchell was now able to play the Bᵇ₄ at the 12th position with his third finger before going into thumb position. Consequently, Mitchell expanded and continued the range of his bass lines up the neck into the C₅ to B₅ octave range.

Mitchell used open strings more frequently in fifths tuning. This helped him deal with the increase in shifting he experienced with the redistribution of pitches in fifths
tuning. The increased use of open strings gave Mitchell a strategy to preserve the forward momentum of his line while dealing with the geography of the fingerboard in fifths. In addition, the greater use of open strings added to the overall resonance of Mitchell's sound.

Mitchell's use of melodic and harmonic intervals changed when he switched to fifths tuning. The conclusions drawn from my comparison between the two tunings reveal that his bass lines used larger melodic intervals than those lines in fourths tuning. The contributing factors in this finding include the two octave range of available pitches playable by the left hand in a single position, and Mitchell's increased use of open strings.

The Interval Analysis Table shows that Mitchell's lines employed a higher degree of the melodic intervals between a diminished 5th up to a perfect 12th and including two perfect 16ths.

In the six transcriptions, only those in fifths contain double-stops. Harmonic intervals became an integral part of Mitchell's bass lines. Mitchell consistently and successfully incorporated the use of major and minor 6ths and 10ths into his walking lines. These intervals were possible but not practical in fourths in the context of a walking line.

Mitchell's use of phrasing in the middle of the chorus shows a consistency across all three songs in fifths tunings. The research shows that he frequently takes his walking lines into the higher ranges C4 to B5 over the subdominant harmony, typically in measures 5 to 8 in the 12 bar form. These phrases also indicate that Mitchell was constructing longer phrase lengths, composed of ascending and largely chromatic pitches when going into the upper register.
His walking lines traversed the entire range of the bass. The larger intervals between the strings in fifths tuning were responsible for these lines moving into the higher register. The tuning gave Mitchell the ability to play certain crucial double stops more easily than on a bass in fourths. He used these to great effect in his playing, creating walking bass lines comprised of double-stops that encompassed the entire fingerboard and maintained the forward motion of the line. To conclude, the effect the tuning had on his bass lines is clear. The research shows conclusively that Mitchell's lines were affected by the change in tuning from fourths to fifths.

Red Mitchell was the first prominent bassist to tune in fifths. Since then, other bassists have adopted the tuning in the jazz and classical idioms, most notably Joel Quarrington, principal bassist with the London Symphony Orchestra. Both Quarrington and Mitchell have stated that a fifths tuned bass exhibits better intonation with other members of the orchestra, particularly the string sections who tune in fifths. Further studies in this area of research could explore the sonic ramifications of an entire bass section tuned in fifths interacting with the rest of the orchestra.

Throughout my research, I discovered no scholarly writing on Red Mitchell or on bassists who tune in fifths. The writings I found on the bass in fifths were confined to the history of the evolution of the double bass in European art music. I believe that the research presented here is the first of its kind. There is however a growing interest in fifths tuning that can be attributed to artists like Joel Quarrington, Paul Unger, Dennis Massuzo, and Larry Holloway. These artists are producing recordings of their instruments tuned in fifths. In addition, they have websites that advocate the benefits of fifths tuning. Quarrington's recording, Garden Scene, won the 2010 Juno Award for Best
Classical Recording. Furthermore, Quarrington was recently appointed principal bass of the London Symphony Orchestra. This highly visible position in such a world-renowned orchestra signals the acceptance of this once abandoned tuning. It is hope that the reader will see this research as a new chapter in the evolution of the bass not only in classical music but jazz as well.
Endnotes

Chapter One: Biography.

1. Radburn, N.J. is a planned community located within the borough of Fair Lawn, N.J.
2. Roger Kellaway describes Mitchell as having a scientific mind. Mitchell must have had a high IQ for he made the Dean's list in his first year at Cornell admitting to never having done any homework. (Lees 1995).
3. Zimmerman did not think Mitchell had a future playing bass and told him to find another profession. (Lees 1995).
5. These articulations would be likely hammer-ons, pull-offs and a combination of both.
6. The trip would have a lasting effect on Mitchell who would later relocate there.
7. Mitchell had a preference for duos, stating economic considerations and calling the duo "the smallest possible society. It's a matter of being both selfish and groupish at the same time." (Moody 1993).

Chapter Two: Reasons for Tuning in Fifths.

1. Two different sources define the standard or normal tuning of the double bass as fourths, E A D G (Slatford n.d.) (Adler 2002).
2. Scordatura tuning would have been another available option, but Mitchell makes no mention of this regarding his own decision. In the transcription of "Triplin' Awhile", Mitchell appears to play notes below E2 at measure 172 that cannot be explained other than by scordatura.
3. When I priced the installation of an extension on my own bass in 2010, the labour and materials for fingered extension was approximately $1500. The mechanical extension adds another $1500 to the cost.
4. The A or first string can be taken from a solo tuning string set. The D or second string comes from a standard orchestral fourths set. The G or third string would also come from the F# of a solo tuning set and tuned up a semitone to G, and the fourth string is a low B, taken from a five string set and tuned up a semitone to C. The Thomastik-Infeld string company produces a Red Mitchell 5ths string set.

Chapter Three: Bass Line Grammar.

1. The third finger is used in positions ten or higher. These positions are referred to as thumb positions. The term thumb position describes a left hand technique where the bassist uses the thumb on the fingerboard to press down the strings, lessening the string height, facilitating easier playing by the first, second and third fingers. A bassist uses thumb position at the point on the bass neck where it attaches to the body. From this point on there ceases to be a neck for the bassist to grip using the thumb.
2. Professor Alan Henderson has written a brief unpublished paper on the construction of walking bass lines which was very helpful in this paper.
3. It must be noted that swung eighth notes in jazz scores are notated the same as regular eighth note and are usually identified on the score as Swing.

4. In the majority of twelve-bar blues charts that appear in the Real Book, every chord is spelled with a seventh.

5. There are twenty-four combinations of root, third, fifth and seventh.

   \[
   \begin{align*}
   1357 & \ 3157 \ 5137 \ 7135 \\
   1375 & \ 3175 \ 5173 \ 7153 \\
   1537 & \ 3517 \ 5317 \ 7315 \\
   1573 & \ 3571 \ 5371 \ 7351 \\
   1735 & \ 3715 \ 5713 \ 7513 \\
   1753 & \ 3751 \ 5731 \ 7531
   \end{align*}
   \]

6. A cambiata is also called a changing tone. (Gordon 1992).

7. An escape tone is also known as an échappée. (Gordon 1992).

8. By harmonic colour, I am referring to thirds and sevenths.


**Chapter Four: Analysis.**

1. The reason for this conversion is that the degraded file and audio quality of the MP3 caused glitches and instability during playback in the Amazing Slow Downer. When the files were converted to WAV format, the problem disappeared.

2. In photographs of Mitchell on the album covers of *Hear Ye!!!! Hear Ye!!!!* and *Presenting Red Mitchell*, Mitchell is seen in a traditional playing stance, standing up with his right hand at the end of the fingerboard.


4. The term half-position is a standard term used in double bass pedagogy when referring to the left hand position one semi-tone up the neck from the open string.

5. For clarification, shifting down the neck means toward the scroll. Shifting up the neck means towards the bridge.
**Discography**


Sims, Zoot. *In a Sentimental Mood*. Gazelle Films MDV5209D. 2010, DVD.
Bibliography


Muranyi, Joseph P. Liner Notes. *Jam For Your Bread.* Bethlehem Records BCP-38, 1955, LP.


Table 1. Melodic Intervals

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<th>Unisons</th>
<th>Minor 2nd</th>
<th>Major 2nd</th>
<th>Minor 3rd</th>
<th>Major 3rd</th>
<th>Perfect 4th</th>
<th>Dim. 5th</th>
<th>Perfect 5th</th>
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<td></td>
<td>7.94%</td>
<td>24.12%</td>
<td>21.41%</td>
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<td><strong>Difference</strong></td>
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The averages represent the total number of occurrences of that melodic interval in each song. Totals for each tuning were determined by adding the average percentages for all three songs and dividing by 3. The shaded values represent the higher of the two percentages. The difference displays the amount of difference between the higher value and the lower value.
Table 2. Open String Shifting in Red Mitchell's Walking Bass Lines

<table>
<thead>
<tr>
<th></th>
<th>Straight No Chaser 5ths</th>
<th>Stockholm Riff 5ths</th>
<th>Swinging the Blues 5ths</th>
<th>Triplin' Awhile 4ths</th>
<th>Low and Inside 4ths</th>
<th>Blues the Most 4ths</th>
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<tr>
<td>Average per Song</td>
<td>11.19%</td>
<td>7.47%</td>
<td>13.99%</td>
<td>4.98%</td>
<td>5.03%</td>
<td>2.55%</td>
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<td>Average per</td>
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<tr>
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<td>10.88%</td>
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<td>4.11%</td>
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</table>

The percentages in Average per Song were derived by counting the number of open string shifts in each chorus. Each shift constituted a quarter note value. The number of shifts was divided by 48, the number of quarter notes in a chorus, showing the percentage of open string shifts that Mitchell used in that chorus. This was done for each chorus. The averages for each chorus were added and divided by the number of choruses, giving a total percentage of open string shifting for each song. Totals for each tuning were determined by adding the average percentages for all three songs and dividing by 3.
been noticed in these graphs. Tables 9 and 10 show the six songs grouped by unique.

represent open strings that Mitchell used to start position. The instances where he used open strings but did not shift position have not

influence the graph, providing a global view of Mitchell's left hand positions throughout the entire performance. The white squares

Gray shading where lower positions have higher shading and higher positions are assigned darker shading. This was done to visually

note, the numeric values in the graph represent the left hand fingerboard position as shown in Table 11. Position numbers were assigned

chords. The line below displays bar numbers 1 through 12 with each bar subdivided into four squares, each representing one quarter-

The six graphs in Tables 3 through 8 provide a visual reference of the left hand positions used in Mitchell's walking bass. The top line shows the chord

Explanation of Graph Notation

Table 3. Blues the Most Fingerboard-Position Graph.
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</tbody>
</table>

**Table 4: Low and Inside Fingerboard-Position Graph**
Table 5. Titanic's afterburner ringboard-position graph.
Table 6. Stockholm Ritz Fingerboard Position Graph
Table 9. Fingerboard Position Graph. Fourths Tuning.
Table 10. Fingerboard Position Graph. Fifths Tuning.

<table>
<thead>
<tr>
<th>Stockholm Riff</th>
<th>Straight No Chaser</th>
<th>Swinging the Blues</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>Chorus 1</td>
<td>Chorus 1</td>
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<td>Chorus 2</td>
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<tr>
<td>Chorus 12</td>
<td>Chorus 12</td>
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</table>

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# Table 11. Fingerboard Layouts

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<tr>
<th>Fifths Fingerboard Layout</th>
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<th>Fourths Fingerboard Layout</th>
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<td><strong>G</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
<td><strong>D</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td><strong>A</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
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<td><strong>Eb</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td><strong>Bb</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; position</td>
<td><strong>F</strong>&lt;sup&gt;2&lt;/sup&gt;</td>
<td><strong>Bb</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td><strong>Eb</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td><strong>Ab</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
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<td><strong>A</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; position</td>
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<td><strong>D</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
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<td><strong>D</strong>&lt;sup&gt;4&lt;/sup&gt;</td>
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<td><strong>F</strong>&lt;sup&gt;4&lt;/sup&gt;</td>
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<td><strong>Bb</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td><strong>Eb</strong>&lt;sup&gt;4&lt;/sup&gt;</td>
<td>8&lt;sup&gt;th&lt;/sup&gt; position</td>
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<td><strong>Gb</strong>&lt;sup&gt;4&lt;/sup&gt;</td>
<td>9&lt;sup&gt;th&lt;/sup&gt; position</td>
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<td><strong>E</strong>&lt;sup&gt;4&lt;/sup&gt;</td>
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<td><strong>G</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
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<td><strong>Gb</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td><strong>Db</strong>&lt;sup&gt;4&lt;/sup&gt;</td>
<td><strong>Ab</strong>&lt;sup&gt;4&lt;/sup&gt;</td>
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<td><strong>Eb</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td><strong>Ab</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
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<td><strong>C</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td><strong>G</strong>&lt;sup&gt;3&lt;/sup&gt;</td>
<td><strong>D</strong>&lt;sup&gt;4&lt;/sup&gt;</td>
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<td>12&lt;sup&gt;th&lt;/sup&gt; position</td>
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Table 12. Pitch Range in Red Mitchell's Walking Bass Lines

<table>
<thead>
<tr>
<th>Octave</th>
<th>Straight No Chaser 5ths</th>
<th>Stockholm Riff 5ths</th>
<th>Swinging the Blues 5ths</th>
<th>Triplin' Awhile 4ths</th>
<th>Low and Inside 4ths</th>
<th>Blues the Most 4ths</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. C2 – B2</td>
<td>15.7%</td>
<td>21.4%</td>
<td>13.9%</td>
<td>18.5%</td>
<td>20.2%</td>
<td>11.5%</td>
</tr>
<tr>
<td>2. C3 – B3</td>
<td>59.4%</td>
<td>58.9%</td>
<td>58.6%</td>
<td>73.8%</td>
<td>73.2%</td>
<td>80%</td>
</tr>
<tr>
<td>3. C4 – B4</td>
<td>20.7%</td>
<td>18.5%</td>
<td>22.2%</td>
<td>7.7%</td>
<td>6.6%</td>
<td>8.6%</td>
</tr>
<tr>
<td>4. C5 – B5</td>
<td>4.2%</td>
<td>1.2%</td>
<td>5.3%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

This table shows the total number of pitches that appeared in each octave for each song. The percentages were calculated by dividing the number for each of the four octave groups by the total number of walking line pitches in the song.

Octave      | Blues the Most          | Octave      | Stockholm Riff         |
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>C2 – B2</td>
<td>51 ÷ 444 = 0.1148</td>
<td>C2 – B2</td>
<td>139 ÷ 650 = 0.2138</td>
</tr>
<tr>
<td>C3 – B3</td>
<td>355 ÷ 444 = 0.7995</td>
<td>C3 – B3</td>
<td>383 ÷ 650 = 0.5892</td>
</tr>
<tr>
<td>C4 – B4</td>
<td>38 ÷ 444 = 0.0855</td>
<td>C4 – B4</td>
<td>120 ÷ 650 = 0.1846</td>
</tr>
<tr>
<td>C5 – B5</td>
<td>n/a</td>
<td>C5 – B5</td>
<td>8 ÷ 650 = 0.0123</td>
</tr>
</tbody>
</table>

Octave      | Low and Inside          | Octave      | Straight No Chaser     |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>C2 – B2</td>
<td>138 ÷ 682 = 0.2023</td>
<td>C2 – B2</td>
<td>233 ÷ 1487 = 0.1566</td>
</tr>
<tr>
<td>C3 – B3</td>
<td>499 ÷ 682 = 0.7316</td>
<td>C3 – B3</td>
<td>883 ÷ 1487 = 0.5938</td>
</tr>
<tr>
<td>C4 – B4</td>
<td>45 ÷ 682 = 0.0659</td>
<td>C4 – B4</td>
<td>308 ÷ 1487 = 0.2071</td>
</tr>
<tr>
<td>C5 – B5</td>
<td>n/a</td>
<td>C5 – B5</td>
<td>63 ÷ 1487 = 0.0423</td>
</tr>
</tbody>
</table>

Octave      | Triplin' Awhile         | Octave      | Swinging the Blues     |
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>C2 – B2</td>
<td>170 ÷ 921 = 0.1845</td>
<td>C2 – B2</td>
<td>55 ÷ 396 = 0.1388</td>
</tr>
<tr>
<td>C3 – B3</td>
<td>680 ÷ 921 = 0.7383</td>
<td>C3 – B3</td>
<td>232 ÷ 396 = 0.5858</td>
</tr>
<tr>
<td>C4 – B4</td>
<td>71 ÷ 921 = 0.0770</td>
<td>C4 – B4</td>
<td>88 ÷ 396 = 0.2222</td>
</tr>
<tr>
<td>C5 – B5</td>
<td>n/a</td>
<td>C5 – B5</td>
<td>21 ÷ 396 = 0.0530</td>
</tr>
</tbody>
</table>
Appendix A

Blues the Most
Red Mitchell's bassline

Hampton Hawes
(1928-1977)

Fourths Tuning:
E A D G

Intro and head arrangement - incomplete walking line

1

2

3

33

34

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52

Transcription by Stephen Bright
Fourth tuning:
E A D G

Blues the Most

\[\text{Gm7} \quad \text{C7} \quad \text{F7} \quad \text{D7} \quad \text{Gm7} \quad \text{C7}\]

\[\text{F7} \quad \text{Bb7} \quad \text{F7} \quad \text{D7} \quad \text{F7}\]

\[\text{Bb7} \quad \text{Bb7} \quad \text{F7} \quad \text{D7}\]

\[\text{Gm7} \quad \text{C7} \quad \text{F7} \quad \text{D7} \quad \text{Gm7} \quad \text{C7}\]

\[\text{F7} \quad \text{Bb7} \quad \text{F7} \quad \text{F7}\]

\[\text{Bb7} \quad \text{Bb7} \quad \text{F7} \quad \text{D7}\]
Fourths tuning:
E A D G

Blues the Most

Gm7  C7  F7  D7  Gm7  C7

7  F7  Bb7  F7  F7

81  82  83  84

Bb7  Bb7  F7  D7

85  86  87  88

Gm7  C7  F7  D7  Gm7  C7

89  90  91  92

F7  Bb7  F7  F7

93  94  95  96

Bb7  C7  F7  D7

97  98  99  100
Fourths tuning:
E A D G

Blues the Most

Gm7  C7  F7  D7  Gm7  C7

F7  Bb7  F7  F7

Bb7  F7  D7

Gm7  C7  F7  D7  Gm7  C7

F7  Bb7  F7  F7

Bb7
Fourths tuning: E A D G

Blues the Most

Bass solo - no walking line

Head arrangement - incomplete walking line
Appendix B

Low and Inside
Red Mitchell's bass line

Fourths tuning:
E A D G

Andre Previn
(1929 -)

Intro and head arrangement - incomplete walking line

F7
B♭7
F7
F7

B♭7
B♭7
F7
D7

Gm7
C7
F7
D7
Gm7
C7

F7
B♭7
F7
F7

B♭7
B♭7
F7
D7

Transcription by Stephen Bright.
Fourths tuning: E A D G

Low and Inside

$\text{Gm}^7$ $\text{C}^7$ $\text{F}^7$ $\text{D}^7$ $\text{Gm}^7$ $\text{C}^7$

$\text{F}^7$ $\text{Bb}^7$ $\text{F}^7$ $\text{F}^7$

$\text{Bb}^7$ $\text{Bb}^7$ $\text{F}^7$ $\text{D}^7$

$\text{Gm}^7$ $\text{C}^7$ $\text{F}^7$ $\text{D}^7$ $\text{Gm}^7$ $\text{C}^7$

$\text{F}^7$ $\text{Bb}^7$ $\text{F}^7$ $\text{F}^7$

$\text{Bb}^7$ $\text{Bb}^7$ $\text{F}^7$ $\text{D}^7$
Fourths tuning: E A D G

Low and Inside
Fourths tuning:
E A D G

Low and Inside

\[ \text{Gm7} \]

\[ \text{C7} \]

\[ \text{F7} \]

\[ \text{D7} \]

\[ \text{Gm7} \]

\[ \text{C7} \]

\[ \text{F7} \]

\[ \text{Bb7} \]

\[ \text{F7} \]

\[ \text{F7} \]

\[ \text{Gm7} \]

\[ \text{C7} \]

\[ \text{F7} \]

\[ \text{D7} \]

\[ \text{Gm7} \]

\[ \text{C7} \]

\[ \text{Gm7} \]

\[ \text{C7} \]

\[ \text{F7} \]

\[ \text{Bb7} \]

\[ \text{F7} \]

\[ \text{Gm7} \]

\[ \text{C7} \]

\[ \text{F7} \]

\[ \text{Bb7} \]

\[ \text{Bb7} \]

\[ \text{F7} \]

\[ \text{D7} \]
Fourths tuning:
E A D G

Low and Inside

F#m7 - C7 - F7 - D7 - G#m7 - C7

F7 - Bb7 - F7 - F7 - G#m7 - C7

Bb7 - Bb7 - F7 - D7

F7 - Bb7 - F7 - D7 - G#m7 - C7

Bb7 - Bb7 - F7 - D7
Fourths tuning: E A D G

Bass solo - no walking line

89
Fourths tuning: E A D G

Head arrangement - incomplete walking line
Appendix C

Triplin' Awhile
Red Mitchell's bass line

Foursths tuning:
E A D G

Harold Land
(1928 - 2001)
Fourths tuning:
E A D G

Triplin Awhile

[Music notation]
Fourths tuning:
E A D G

Triplin Awhile
Fourths tuning:
E A D G

Triplin Awhile

F7 Bb7 Bb7 F7 F7

Bb7 Bb7 F7 D7

Gm7 C7 F7 D7 Gm7 C7

F7 Bb7 F7 F7

Bb7 Bb7 F7 D7

Gm7 C7 F7 D7 Gm7 C7

F7 Bb7 F7 F7
Fourths tuning: E A D G

Triplin Awhile

149
150
151
152

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14
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175
176
Fourths tuning:
E A D G
Fourths tuning: E A D G

Head arrangement - bass plays melody
Stockholm Riff
Red Mitchell's bass line

Fifths tuning:
C G D A

Benny Carter
(1907 - 2003)
Fifths tuning:
C G D A

Stockholm Riff

101
Fifths tuning:
C G D A

Stockholm Riff

F7  Bb7  F7  F7

Bb7  Bb7  F7  D7

Gm7  C7  F7  D7  Gm7  C7

F7  Bb7  F7  F7

Bb7  Bb7  F7  D7

Gm7  C7  F7  D7  Gm7  C7

103
Fifths tuning:
C G D A

Stockholm Riff

104
Fifths tuning:
C G D A

Stockholm Riff

105
Fifths tuning:
C G D A

Stockholm Riff

Bass solo - no walking line

F7 Bb7 F7 F7

Bb7 Bb7 F7 D7

Gm7 C7 F7
Appendix E

Straight, No Chaser
Red Mitchell's bass line

Theolonius Monk
(1917-1982)

Fifths tuning:
C G D A
Straight No Chaser

Fifths tuning:
C G D A

\[
\begin{align*}
3 & \quad F^7 & Bb^7 & F^7 & F^7 \\
25 & & & & \\
Bb^7 & Bb^7 & F^7 & D^7 \\
29 & & & & \\
Gm^7 & C^7 & F^7 & D^7 & Gm^7 & C^7 \\
33 & & & & & \\
4 & F^7 & Bb^7 & F^7 & F^7 \\
37 & & & & & \\
Bb^7 & Bb^7 & F^7 & D^7 & \\
41 & & & & & \\
Gm^7 & C^7 & F^7 & D^7 & Gm^7 & C^7 \\
45 & & & & & \\
\end{align*}
\]
Fifths tuning:
C G D A

Straight No Chaser
Straight No Chaser

Fifths tuning:
C G D A

---

110
Fifths tuning:
C G D A

Straight No Chaser
Straight No Chaser

Fifths tuning:
C G D A

Bass solo - no walking line
Fifths tuning:
C G D A

Straight No Chaser

Fifths tuning:
C G D A
Straight No Chaser

Fifths tuning:
C G D A
Straight No Chaser

Fifths tuning:
C G D A

Gm7  C7  F7  D7  Gm7  C7

F7  Bb7  F7  F7

Bb7  Bb7  F7  D7

Gm7  C7  F7  D7  Gm7  C7

F7  Bb7  F7  F7

Bb7  Bb7  F7  D7
Fifths tuning:
C G D A

Straight No Chaser

Fifths tuning:
C G D A
Fifths tuning:
C G D A
Fifths tuning:
C G D A

Straight No Chaser

120
Appendix F

Swinging the Blues
Red Mitchell's bass line

Fifths tuning:
C G D A

Count Basie and Eddie Durham

Transcription by Stephen Bright

121
Fifths tuning:
C G D A

Swinging the Blues

122
Fifths tuning:
C G D A

Swinging the Blues

Bass solo - no walking line
Bass and trumpet trade fours
Fifths tuning:
C G D A

Swinging the Blues