In Search of the Lost Chord

The Emergence of the Dominant Seventh Steel Guitar Tuning

A presentation by Guy Cundell, MPhil, B.Mus (hons), Grad Dip Ed

To the international musicology conference

INSTRUMENT OF CHANGE
The International Rise of the Guitar (c. 1870-1945)

11/12/2016

https://blogs.unimelb.edu.au/instrument-of-change/

Abstract:

This paper explores the development during the 1920s of alternative steel guitar tunings, specifically, the dominant seventh. Faced with the increasing harmonic complexity of the emerging jazz repertoire, steel guitarists needed to expand the existing triadic tunings of Hawaiian music. Transcription and analysis of an obscure solo guitar piece reveals the moment when the dominant seventh tuning emerged. The paper then provides evidence of its subsequent adoption by Hawaiian ensembles across America

Good afternoon. My name is Guy Cundell. I am currently a PhD candidate at the Elder Conservatorium in Adelaide embarked on a study of the steel guitar in western swing. This presentation is based on research that I conducted for my Master's thesis entitled "Across the Pacific: The transformation of the steel guitar from Hawaiian folk instrument to popular music mainstay" which was published in 2014.

I will start with a remarkable video, made in 1926, which represents at one time, a curiosity, an organological *cul de sac* and a portent of significant change that overtook steel guitar stylings in the 1930s which, it can be argued, greatly contributed to the later diminution of the instrument's fortunes.

https://www.youtube.com/watch?v=qgBLqbYUPS8

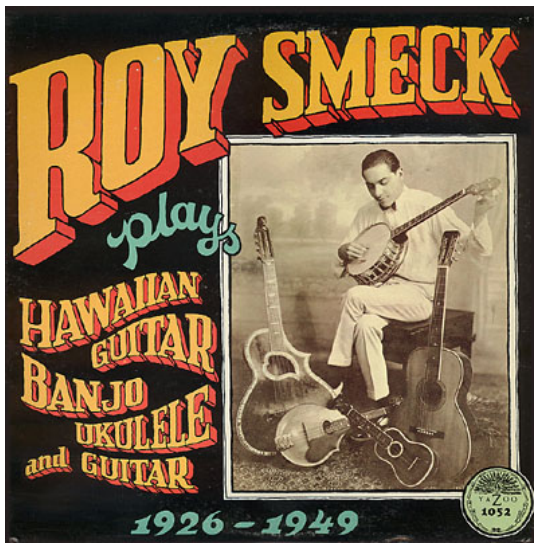
A Curiosity

As a curiosity, this performance was included in the initial public demonstration of Vitaphone, the first mechanical system employed to synchronize film with a soundtrack. This system was used for *The Jazz Singer*, released in 1927, which is widely regarded as the first "talkie".

We have just seen part of the composition 'Laughing Rag', which began Roy Smeck's contribution to an hour long program of instrumental and vocal music in which the steel guitar was the sole representative of guitar culture, an indication of the instrument's agency at that time.

A *Cul de sac*

The organological *cul de sac* to which I referred is the eight string configuration of Smeck's acoustic instrument. Known as an 'Octo-chorda', this instrument is believed to have been manufactured for Smeck in New York by The House of Strathpoulo which later became the Epiphone Banjo Company.

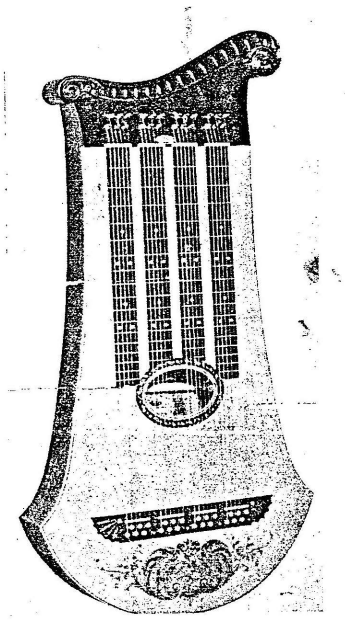


The only other known octo-chorda was built by American harp makers Lyon and Healy and belonged to Sam Moore, the composer of 'The Laughing Rag". These images show, firstly, Moore's octo-chorda leaning up in the corner of the group of musicians, and secondly, Moore playing a Lyon and Healy bell-shaped guitar in 1924. Moore will re-enter this story a little later.

This instrument was a *cul de sac* in that, despite the success of Moore's recordings, Smeck's film appearance and his subsequent recordings with the instrument, no manufacturers took up its production. It wasn't until years later that such instruments were available.

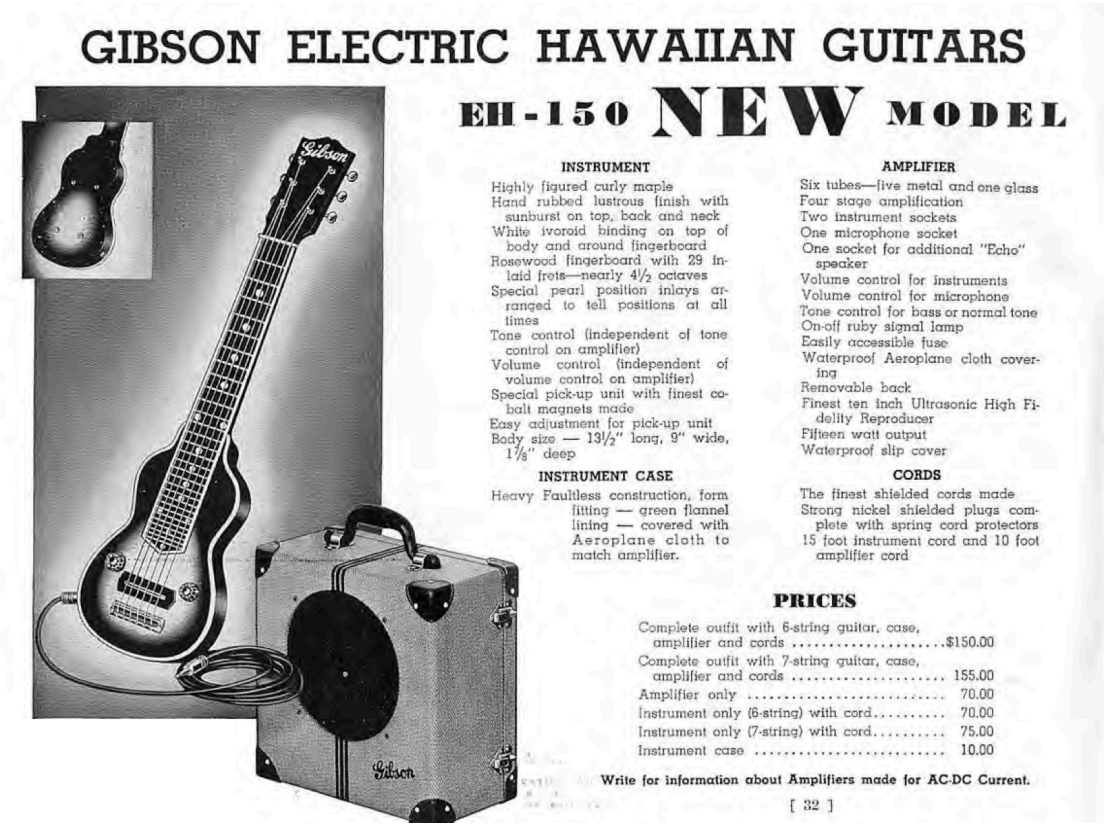
From the beginning, open tunings were a crucial element of steel guitar style, but they were also a constraint to both harmonic and melodic expression. In response, professional players could carry multiple instruments in different tunings and some sought solutions in bespoke instrument design. The following image shows another Lyons and Healy construction, a four-neck instrument made for Jack Pennewell in the mid 1920s.

The octo-chorda represents another experiment in this direction, expanding the harmonic possibilities with extra strings.



"Big Four-Neck Guitar" made by Lyon & Healy, Chicago, Illinois.

But it was not until the middle of the 1930s, in the era of electric amplification, that Gibson, Epiphone and Rickenbacker started offering guitars with more than six strings in their catalogues. This image is from Gibson's 1937 catalogue.



GIBSON ELECTRIC HAWAIIAN GUITARS

EH-150 NEW MODEL

INSTRUMENT

Highly figured curly maple
Hand rubbed lustrous finish with sunburst on top, back and neck
White ivoroid binding on top of body and around fingerboard
Rosewood fingerboard with 29 inlaid frets—nearly 4½ octaves
Special pearl position inlays arranged to tell positions at all times
Tone control (independent of tone control on amplifier)
Volume control (independent of volume control on amplifier)
Special pick-up unit with finest cobalt magnets made
Easy adjustment for pick-up unit
Body size — 13½" long, 9" wide, 1⅞" deep

INSTRUMENT CASE

Heavy Faultless construction, form fitting — green flannel lining — covered with Aeroplane cloth to match amplifier.

AMPLIFIER

Six tubes—five metal and one glass
Four stage amplification
Two instrument sockets
One microphone socket
One socket for additional "Echo" speaker
Volume control for instruments
Volume control for microphone
Tone control for bass or normal tone
On-off ruby signal lamp
Easily accessible fuse
Waterproof Aeroplane cloth covering
Removable back
Finest ten inch Ultrasonic High Fidelity Reproducer
Fifteen watt output
Waterproof slip cover

CORDS

The finest shielded cords made
Strong nickel shielded plugs complete with spring cord protectors
15 foot instrument cord and 10 foot amplifier cord

PRICES

Complete outfit with 6-string guitar, case, amplifier and cords	$150.00
Complete outfit with 7-string guitar, case, amplifier and cords	155.00
Amplifier only	70.00
Instrument only (6-string) with cord	70.00
Instrument only (7-string) with cord	75.00
Instrument case	10.00

Write for information about Amplifiers made for AC-DC Current.

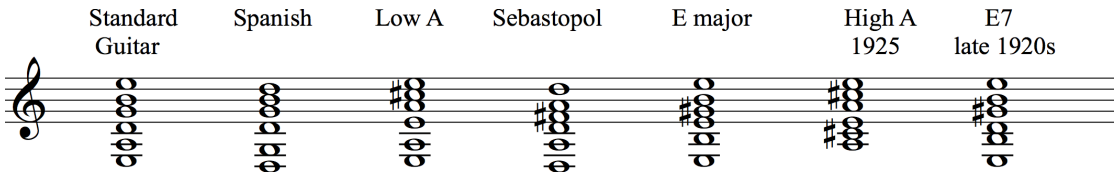
[32]

The first commercial double neck models were released by these companies in 1937 and 1938. In contrast, eight string acoustic steel guitars have only become a standard commercial offering within the last twenty years. This is one of the first Gibsons, supplied in 1938 (without legs), which I found for sale in Gruhn's Guitars, Nashville, last week.

Portent of Change

To illustrate Smeck's instrument as a portent of change, I must provide some context. By the 1920s, the steel guitar had become an international phenomenon due to the advocacy of Hawaiian musicians who toured globally.

The repertoire that they exhibited included Hawaiian melodies, classical airs and popular Tin Pan Alley tunes. They used triadic tunings at first, derived from two popular Spanish guitar open tunings, Sebastopol and Spanish. Of the two, the predominant tuning, Low A, based on Spanish tuning (which had the same intervallic structure but was a tone lower, in G), was disseminated through the production of scores and method books by publishers across America and elsewhere in the world including Australia.



With time, these tunings became inadequate to express the growing harmonic complexity of popular tunes of the 1920s. It was generally accepted that the first move towards accommodating dominant seventh chords was the adoption of High A tuning, the earliest example of which I have found is in the first recordings of Sol Ho'opi'i in 1925. The following image is from Gibson's Steel Guitar Method, published in 1937, showing ways of approaching dominant seventh harmony. This tuning, while still triadic, afforded performers access to many dominant seventh chord voicings through the use of a slanted bar.

TABLE OF NOTES IN EACH SEVENTH CHORD

	Root	third	fifth	seventh
C7 contains	C	E	G	B♭
C♯7 contains	C♯	E♯	G♯	B
D♭7 contains	D♭	F	A♭	C♭
D7 contains	D	F♯	A	C
D♯7 contains	D♯	F𝄪	A♯	C♯
E♭7 contains	E♭	G	B♭	D♭
E7 contains	E	G♯	B	D
F7 contains	F	A	C	E♭
F♯7 contains	F♯	A♯	C♯	E
G♭7 contains	G♭	B♭	D♭	F♭
G7 contains	G	B	D	F
G♯7 contains	G♯	B♯	D♯	F♯
A♭7 contains	A♭	C	E♭	G♭
A7 contains	A	C♯	E	G
A♯7 contains	A♯	C𝄪	E♯	G♯
B♭7 contains	B♭	D	F	A♭
B7 contains	B	D♯	F♯	A

The table at the left shows the names of the notes that comprise each seventh chord. Notice that the first three notes of the chord are the same as the major chord of the same name — the fourth note is two half tones or frets lower than the octave of the root or name of the chord.

The chords bracketed together are played in the same manner and contain exactly the same notes, but they are written differently.

Chords and notes that are played and sound alike, but which are printed differently are referred to as ENHARMONIC notes and chords — thus G♯ is the enharmonic of A♭, G♯ chord is the enharmonic of the A♭ chord, and G♯7 chord is the enharmonic of A♭7 chord.

HOW TO HARMONIZE NOTES OF THE SEVENTH CHORD

Inasmuch as the first three notes of a seventh chord are also found in the major chord of the same name, the root, third, and fifth of the seventh chord may be harmonized exactly the same as the root, third, and fifth of the major chord as explained under major chord construction. The chart at the left shows additional ways of harmonizing notes of a seventh chord.

With the exception of a few formations that make use of the open strings, it is, of course, impossible to play all four notes of a seventh chord on the Hawaiian guitar unless a seventh tuning is used. You can, however, get the effect of the seventh chord by playing two and on some positions three notes that are contained in the seventh chord. One of these notes is the seventh of the root which may be played together with any of the other intervals of the seventh chord.

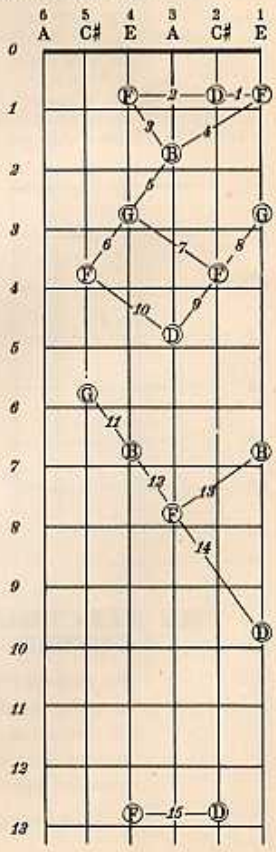
The example at the right shows several positions which may be played together and produce the effect of a G7 chord. The notes in the G7 chord are G B D F — G is the root, B is the third, D is the fifth, and F is the seventh.

When the seventh of the root is played on the first string, it may be harmonized by adding the fifth on the second string as in No. 1 — by adding the fifth on the second string and an extra seventh on the fourth string by combining No. 1 and No. 2 — or by adding the third one fret higher on the third string as in No. 4. When the root of the chord is played on the first string, it may be harmonized by adding the seventh one fret higher on the second string as in No. 8 or the first, second, and third strings may be played together by combining No. 8 and No. 9. When the third of the chord is played on the first string, it may be harmonized by adding the seventh one fret higher on the third string as in No. 13. When the fifth of the chord is played on the first string, it may be harmonized by adding the seventh two frets lower on the third string as in No. 14 — this formation contains the same notes as No. 15 played on the second and fourth strings.

When the fifth of the chord is played on the second string, the seventh may be added on the fourth string as in No. 2. When the seventh of the chord is played on the second string, the root may be added one fret lower on the fourth string as in No. 7 or the fifth may be added one fret higher on the third string as in No. 9.

When the third of the chord is played on the third string, the seventh may be added one fret lower on the fourth string as in No. 3 or the fifth and seventh may be added by combining No. 5 and No. 6. When the fifth of the chord is played on the third string the seventh may be added one fret lower on the fifth string as in No. 10. When the seventh of the chord is played on the third string the third and root may be added by combining No. 11 and No. 12 — this formation is used quite frequently.

When harmonizing a melody note with a seventh chord, any note of the seventh chord may be added — the two most important notes being the third and seventh.



By the end of the 1920s an E7 tuning based on Sevastopol became widely adopted. The tuning substituted a minor seventh for tonic in the middle of the voicing. This permitted the playing of dominant seventh chords with a perpendicular bar.

In 2012, in the light of this tuning orthodoxy, I was conducting research for my master's thesis on the steel guitar in popular music. While examining the 1925 recordings of Sol Ho'opi'i, I came across two recordings on the same obscure Californian record label, Sunset Records, by Charles Diamond, another Hawaiian player. These two examples of Diamond's style stand as a transition between the style of the first generation of Hawaiian players and the second generation who evolved a new 'hot' style in the later 1920s, in keeping with the emerging jazz age. The first of these recordings was virtuosic performance of Star Spangled Banner in the standard low A tuning.

The second recording, entitled 'Sleep', appeared at first glance to be a more sedate Spanish guitar and steel guitar duet.

https://www.youtube.com/watch?v=-feyScNX7Zs

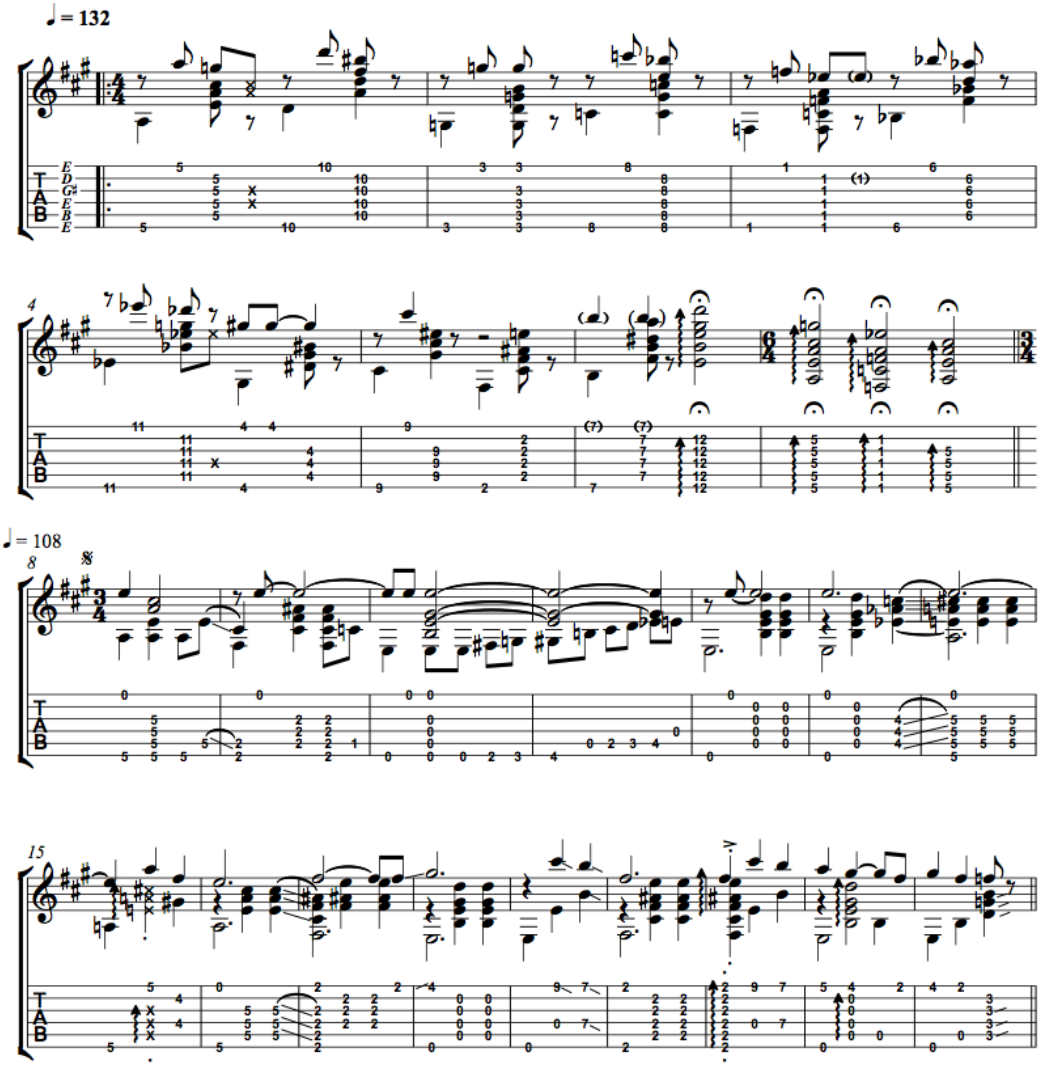
Closer examination revealed it to be a carefully crafted solo steel guitar piece with a strong independent bass line. After transcribing the tune I found that it could not be performed on the common tunings of the era. With some experimentation, I determined that it was performed on an E7 tuning of which I was not previously aware and for which I could find no mention in any literature. It was the earliest example of a non-triadic tuning that I had encountered at that stage.

Sleep

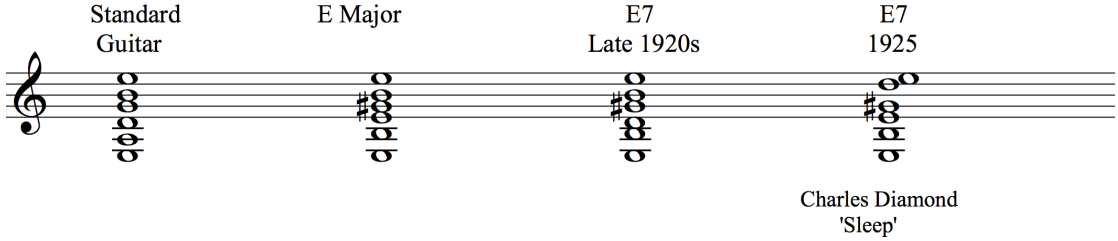
Steel Guitar Solo: Charles Diamond

Hollywood 20100
c1925

Transcribed: Guy Cundell



In this tuning, the minor seventh is situated on the second string, between the tonic and the fifth. The voicing of the top four notes of this tuning is quite distinctive. With the sound of the tuning in my head I examined my collection of early steel guitar recordings and was excited to be able to identify four other examples of the same tuning, each by different musicians, in New York and Chicago in 1926, in San Francisco in 1927 and in Dallas in 1928. This shows that, while the use of this tuning may not have been not particularly common, its usage was geographically wide spread.



Charles Diamond
'Sleep'

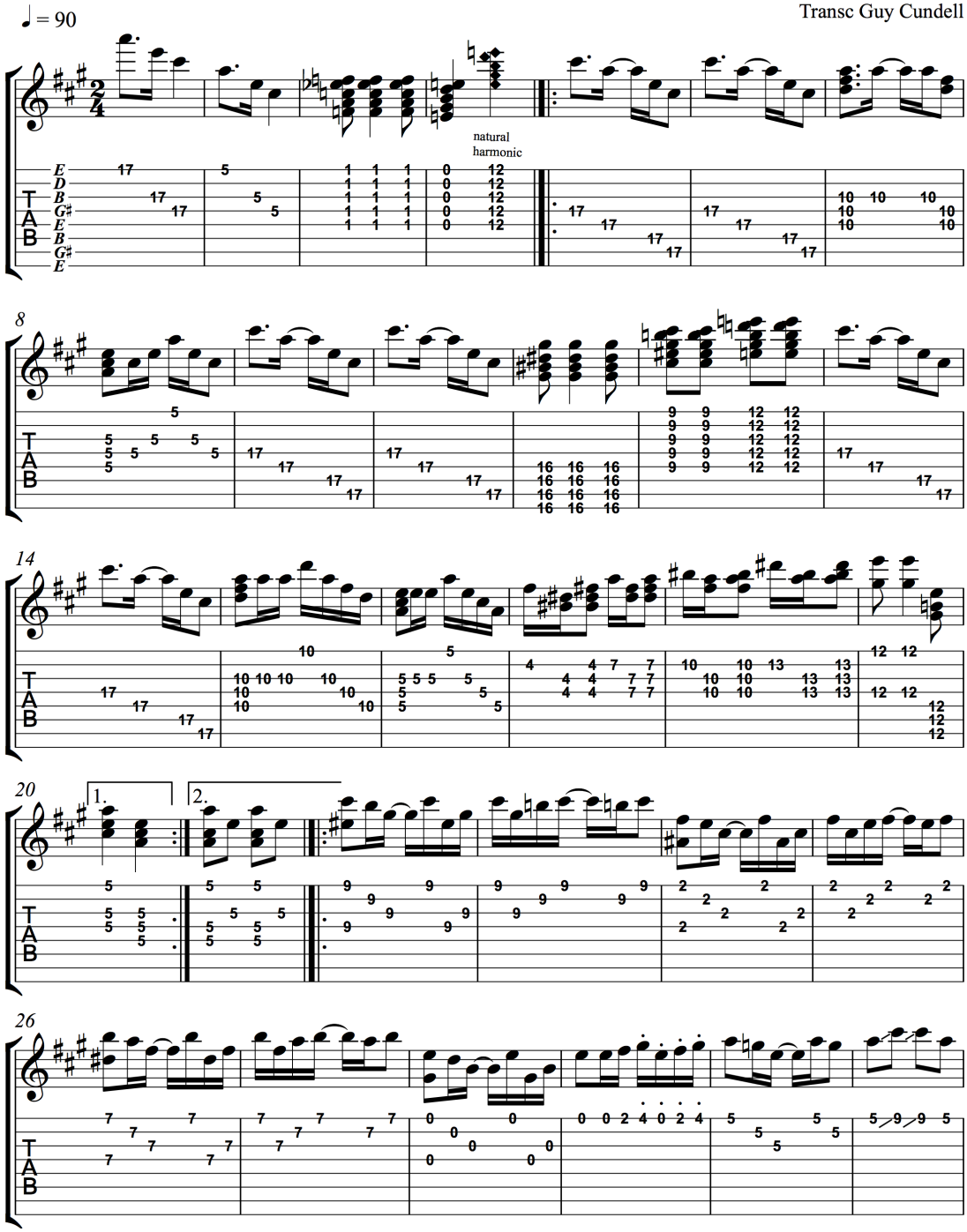
Subsequent investigations revealed a similar tuning in an even earlier recording that, as I now posit, may have been the source on which subsequent performers drew. That recording was Sam Moore's 'Laughing Rag' recorded for Victor in New York in 1921.

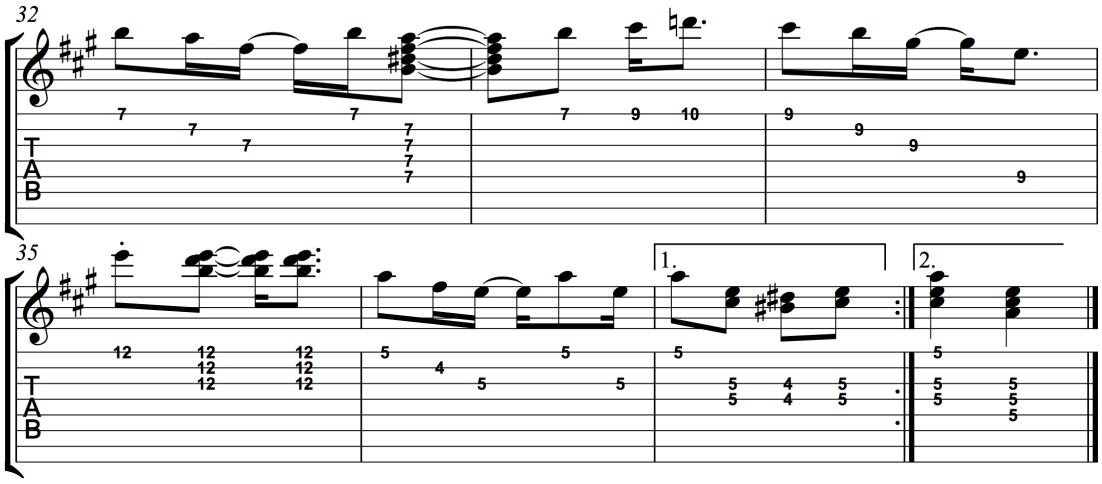
https://www.youtube.com/watch?v=jmir19aX7RY

Laughing Rag

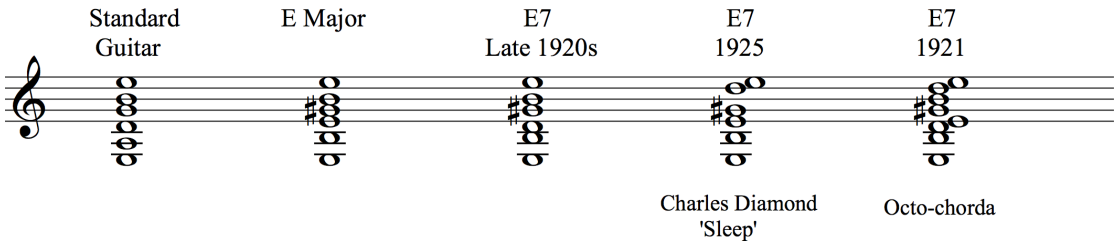
Octo-chorda
E7 Tuning

Sam Moore
Victor 18849 B-25543/1
New York, 24/8/21
Transc Guy Cundell





The relationship between the tuning of Moore's octo-chorda and Diamond's can be seen in the following image.



The placement of the minor seventh on the second string is the same. However Diamond's six configuration necessitates some omissions which are the low major third and the high perfect fifth. The placement of the minor seventh is both distinctive and problematic. It is hard to avoid in any strumming motion thus making pure triads difficult to play. The E7 tuning which became de rigueur in the 1930s differed in that the minor seventh islocated on the fourth string, retaining a major triad on the top strings and yet still providing a dominant chord. This tuning proved to be much more versatile tuning and was subsequently popularized in many published methodologies and scores.

To tie up a loose end, Smeck entered this story after his first encounter with Moore in 1923, when he accompanied Moore on a recording session on guitar. It is likely that this led to Smeck's interest in the Moore's octo-chorda and also the tune 'Laughing Rag'. Smeck first recorded on the octo-chorda with Moore's E7 tuning in 1926. As Diamond had made his recording in 1925, it is possible that Moore's performance provided the inspiration for Diamond's tuning and that of subsequent Hawaiian groups. As such, 1921 may have seen the first divergence from triadic tunings, setting a president for the diverse tunings that followed.

Diminishing Fortunes

In my introduction I mentioned that although Smeck's performance was a portent of significant change, it also held the seeds of decline of the instrument. In my thesis I argue that the long-term fortunes of the steel guitar were adversely affected by the development and proliferation of different tunings. The fortunes of the steel guitar stand in stark contrast to those of the Spanish guitar. The Spanish guitar, in the 19th century, can described as an instrument of diverse performance practice and custom and that the standardization of tuning and notation opened the way for the explosion of its popularity. Standardization provided the means to the development of a global culture through cross-pollination whereby pedagogy and repertoire could flourish. In contrast, by the 1920s the steel guitar had already achieved wide spread popularity. The standardization of tuning and notation had ensured that a culture of pedagogy and repertoire was developing strongly. An explosion of steel guitar tunings subsequently resulted in a fractured culture consisting of pockets of adherents to particular tunings, the demise of music notation, with tablature, by necessity, replacing it. This effectively locked the instrument out of the musical mainstream, confining its performers to a mainly oral culture that persists today.

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Further details of this investigation can be found in my master's thesis

'Across the Pacific: The transformation of the steel guitar from Hawaiian folk instrument to popular music mainstay'

https://digital.library.adelaide.edu.au/dspace/handle/2440/86478