

## ABSTRACT

Title of dissertation: "AMBER LEAVES" FOR SOLO SITAR AND ELECTRONICS

Thomas Regulski, Doctor of Musical Arts, 2012

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*Amber Leaves* is a composition for solo sitar and live electronics. The work constitutes a fusion between Western musical composition and Indian classical music, which I have been studying simultaneously for the past seven years.

The sitar's music draws heavily upon its traditional performance technique, while also introducing a number of extended techniques developed specifically for this piece. Compositionally, I rely minimally on the tonal elements of Indian music, choosing instead an approach to tonality consistent with my recent work.

The instrument is amplified by four loudspeakers, which are positioned in a square around the audience. At the same time, a microphone is picking up the sound and sending it to a computer, where it is modulated in various ways. Once processed, the computer sends the sound out to the same loudspeakers. The speakers themselves play an important role in the composition, as the sound is constantly moving from one to another.

A large portion of the electronic processing occurs in a patch that I programmed in Max/MSP. The patch creates a variety of musical responses based on a real-time spectral analysis of the sitar performance. This initial process establishes a fundamental relationship between the synthesized sound and the sitar's music. Furthermore, I make use of the programming language *Lisp* to perform a number of algorithms that aid in the generation of these sounds.

AMBER LEAVES  
FOR SOLO SITAR AND ELECTRONICS

by

Thomas Regulski

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## Instructions for Performance

*Amber Leaves* is a composition for sitar and live electronics. The piece utilizes both Max/MSP and the programming language Lisp, which work together to provide real-time responses to the music played on the sitar. The music is picked up by a contact microphone that is to be secured near the main bridge of the sitar, below the sympathetic bridge. The Max patch outputs to four channels, and placement of the loudspeakers should be in a square around the audience. The Max patch requires the performer to trigger events at specified moments, which can be done by footswitch or OSC device.

### Sitar Symbols

- FT Move or tap second and third fingers on the "pickguard" area of the sitar.
- T/// Move thumb across sympathetic strings. The primary sound should be that of friction, with sparse pitched sound.
- ✱ Tap on the back of the neck with the second and third fingers of the left hand.
- ♯ Slide the index finger of the left hand along individual fret ties on the back of the neck.
- h "Hammer-on." Lower r.h. middle finger forcefully on the fret to produce the notated pitch.
- + Krintan (Left-hand pizzicato)
- ‡ Slide mizrab (pick) length-wise in between the baj and jora (first two main strings), such that it is scraping against both. This should be done in the normal picking area. However, for dramatic purposes, the player may move over the frets such that the mizrab catches the frets as it moves over them.
- fret Insert right-hand fingernail into the notch of the top fret and, using the thumb to create resistance, "flick" the nail out, creating a resonant sound.
- tarab Pluck the tarab (sympathetic string) that corresponds to the notated pitch.
- knock Use the right-hand second and third fingertips to knock the soundboard.
- = — Slow tremolo, medium tremolo, and fastest tremolo
- Gradual change (i.e. fast tremolo to slow tremolo)
- ‡ 1/4 sharp
- ♭ 1/4 flat
- ↘ ↗ When used in conjunction with ♯, this indicates to quickly slide the finger either up or down the length of the neck, across several fret ties.

Allow all notes to decay naturally

Two notes connected by a glissando line indicates sliding to the fret of the second note. When the notes are connected by a slur as well, the performer is to *meend* (bend) to the target pitch.

The sitar part is scored using traditional western notation. However, it can be read as sargam, letting middle C = middle Sa. This way the sitarist may keep his or her sitar tuned to whichever Sa is best for the instrument, rather than having to tune to C to play this piece.

While *Bilawal Thaati* (major scale) is a suitable tuning for the sympathetic strings, the performer is encouraged to find his or her preference.

Dynamics that appear in brackets indicate that the passage is to be performed *ad libitum* within the given range of dynamics.

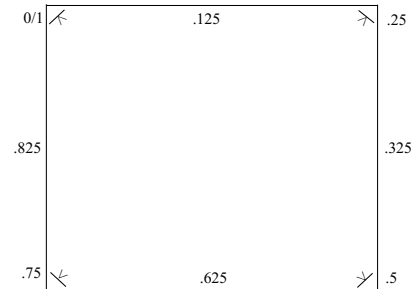
### Max Symbols

- A Amplified Signal
- GA Granulated amplified signal
- ST Sustained tone
- GS Granulated sustained tone
- SD Sustained density
- W White noise
- CH Chaotic sequence

Normally, Max is randomly turning its signal detection on and off. An underlined symbol indicates that Max is continuously picking up a signal.

Numbers are used in the spatialization field to indicate which speaker is sounding.

Speaker arrangement:



# Amber Leaves

<sup>f1</sup> Begin with smooth, sweeping gestures, slowly introducing tapping. Articulate the high tarabs subtly. Increase tapping and introduce scratching during the crescendo. Ad lib for the diminuendo

<sup>f2</sup> Develop the relationship between these articulations. Suggestion for : Begin by going back and forth across four fret ties and gradually narrow in on one. This will help create the diminuendo.

<sup>f3</sup> Allow synthesized timbres to fully decay before the next articulation. Silence may be inserted as desired, keeping 7<sup>n</sup> as a suggested maximum per instance.

<sup>64</sup>  
*ppp-fff* *p* *ff > p* *f* *p* *pp* *f* *p*  
 \* (A) GA (ST) ST \*  
 Str. .125 → 0 → .5 .125  
 Max .5 → 0 → .75

<sup>64</sup>  
*ff* *pp* *ppp* *p* [*pp-ff*] *f* *p* *p* *f* *p*  
 SD ST \* GA GA →  
 Str. → 0 → .125 → surround

<sup>64</sup> Allow synthesized sound to fully decay before the next articulation. If any pitch does not trigger a response from Max, continue to rearticulate it slowly, as if playing alap. In these rearticulations, the performer may include the previous pitch (except for the D, which is the first pitch of the sequence) to allow for meend or slides.



tarab T///  $\uparrow$   $\overset{3}{\text{tabli}}$  fret ord.  $8^{th}$   $\frac{1}{2}$  ad lib  $\overset{3}{\text{ord.}}$  T///

*p*  $\overset{3}{\text{trill}}$  *f* *p* *f* *p* *pp*  $\langle p \rangle$  *ppp* *ff* *p*

\* \* ST SD S (GA) W (360) A

Str.	→ .625	.5	→ .25	→ .25	.75	→
Max					.75	→

ord. h  $\overset{3}{\text{knock}}$   $\overset{3}{\text{ord.}}$  fret  $\overset{\text{approx. } 10''}{\text{T/// FT}}$  ad lib  $\text{ord. } \text{♩} = 48$  *p* *ppp*

*f* *f* *p* *f* *f* *p* *ppp*

$8^{th}$  \* (A) W W

Str.	→ 1/0	→ .5	→	→	→	→
Max		→ .5				



ord. *pp* *f* *ppp* *f* *ff* [ *pp-ff* ] *f p f p* gradually becoming faster

approx. 15"  $\text{♩} = 48$

T/// (♯) ad lib (♯) 3 3 3 (♯)

ST (M10)
Str. (.125)
Max (.625)

(♯) *f p* *p mp f > p f p mp p f ppp f h h p*

tabli \* T/// 3 † T/// > (♯) 3 3 3

(Λ)

Str.
Max

Musical notation for the first system, featuring a treble clef and a series of notes with dynamic markings and articulations. The notes are grouped with slurs and triplets. Dynamic markings include *f*, *p*, *mp*, *f*, *ff*, *f*, *mp*, *p*, *f*, *p*, and *f*. Articulations include *8<sup>th</sup>*, *15<sup>th</sup>*, and *3*.

	* (A)
C	CH →
Str. (.125)	→ .5
Max	.625 → .325 → .75 → .825

Musical notation for the second system, featuring a treble clef and a series of notes with dynamic markings and articulations. The notes are grouped with slurs and triplets. Dynamic markings include *f*, *mp*, *f*, *p*, *pp*, *pp*, *f*, *p*, *f*, *ff*, and *ppp*. Articulations include *3*, *tabli*, *↑*, and *T///*. A bracket labeled "approx. 60''" spans the final notes.

(CH)	A → GA → *
	PC → PC →
Str.	→ .75 .825
Max	→ .25

The first system of music consists of a treble clef staff with a 4/4 time signature. The notes are: G4 (p), A4 (mp), B4 (p), C5 (mp), D5 (p), E5 (p), F5 (p), G5 (p), A5 (p), B5 (p), C6 (p), D6 (p), E6 (p), F6 (p), G6 (p), A6 (p), B6 (p), C7 (p), D7 (p), E7 (p), F7 (p), G7 (p), A7 (p), B7 (p), C8 (p). Dynamics range from *p* to *f*. There are two trills marked with  $8^{th}$  and  $3$ . The amplitude graph below shows a series of peaks corresponding to the notes, with a shaded area under the curve. The graph is divided into two sections by a vertical line labeled 'PC'. The first section has a peak of .125, and the second section has a peak of .25. The maximum amplitude is .75.

Str. (.825)	.125	.25
Max	.75	

The second system of music consists of a treble clef staff with a 4/4 time signature. The notes are: G4 (p), A4 (p), B4 (p), C5 (p), D5 (p), E5 (p), F5 (p), G5 (p), A5 (p), B5 (p), C6 (p), D6 (p), E6 (p), F6 (p), G6 (p), A6 (p), B6 (p), C7 (p), D7 (p), E7 (p), F7 (p), G7 (p), A7 (p), B7 (p), C8 (p). Dynamics range from *p* to *f*. There is a trill marked with  $3$ . The amplitude graph below shows a series of peaks corresponding to the notes, with a shaded area under the curve. The graph is divided into two sections by a vertical line labeled 'ST'. The first section has a peak of .125, and the second section has a peak of .625. The maximum amplitude is .625.

Str.	0	.125
Max		.625

<sup>15</sup> Play the G's in m. 84 on the fifth (Pachikari) string. In m. 87 alternate between that and Pa on the baj. The performer will most likely find that the baj is preferable for the louder notes.

A musical score for a single melodic line on a treble clef staff. The piece consists of several measures with various dynamics and articulations. The first measure has a dynamic marking of *p*. The second measure has a dynamic marking of *pp* and an instruction *8<sup>tb</sup>* above the staff. The third measure has a dynamic marking of *ppp*. The fourth measure has a dynamic marking of *p* and an instruction *15<sup>mb</sup>* above the staff. The fifth measure has a dynamic marking of *pp*. The sixth measure has a dynamic marking of *f* and an instruction *15<sup>mb</sup>* above the staff. The seventh measure has a dynamic marking of *ppp*. The eighth measure has a dynamic marking of *p*. A vertical dashed line with an asterisk (\*) is positioned between the fourth and fifth measures. Below the staff, there are three horizontal lines. The first line contains the text "(SI)" and a vertical bar line. The second line contains the text "(.125)". The third line contains the text "(.625)".

*p* *pp* *ppp* *p* *pp* *f* *ppp* *p*

*8<sup>tb</sup>* *15<sup>mb</sup>* *15<sup>mb</sup>*

(SI)

(.125)

(.625)