

## The Unquestioned Answer

*The Unquestioned Answer* was composed in October, 2004 for soprano and alto saxophones, C trumpet, electric guitar, 5-string bass guitar, and drums. The drum parts can be given to two or more players, or (in theory) played by one person on a trap set, although this has not yet been put to the test. This is one part of a suite in progress called *Jazz Tobacco*. The name refers to a trumpet line at the beginning of the third section which is a rough quote from Charles Ives' *The Unanswered Question*. It seemed an appropriate title for something written during an election year.

Although my aim was to create something that had a loose, jazzy feel, the structure of this piece is actually quite a bit more formal than it might at first appear. For a long time I've been interested in the musical possibilities of numerical substitution systems, fractal number series, and especially variants of the Thue-Morse series. For example, a simple number series may be constructed with the digits 0 and 1, using these rules: "0" is replaced by "1", and "1" is replaced by "01." Starting with 0, this yields the following:

1. 0
2. 1
3. 01
4. 1 01
5. 01 1 01
6. 1 01 01 1 01
7. 01 1 01 1 01 01 1 01

If a drum beat is substituted for every "1" and a rest for every zero, step 7 above may be rendered as follows:



For *The Unquestioned Answer*, I devised a more complex substitution system, looking at number pairs with three possible values. The substitution table is as follows:

00	21
01	0
02	12
10	2
11	0
12	0
20	2
21	10
22	1

A "seed" of 11 thus yields the following sequence:

1 1 0 2 1 2 1 0 0 1 0 2 2 1 0 2 1 2 1 1 0 2 1 2 1 0 ... (11→0, 10→2, 02→12, 21→10...)

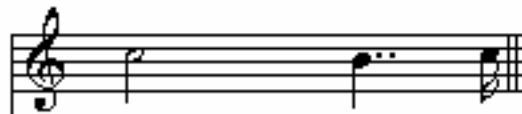








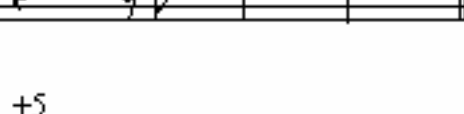
If "0" represents a descending half step, "2" an ascending half-step and "1" a continuation of the previous note, the number series fragment above translates as follows:

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The melodies played by the saxophones, and later the trumpet, are created in this way.

After creating a melodic line based on this series (and its retrograde, inversion and retrograde inversion), I applied an algorithm to assign successive notes to different parts modulo (number of parts). So for five parts total, note #1 is assigned to part 1, #2 to part 2, ... note #6 to part 1, etc. The notes in each part can then be assigned different durations and transposition. The example above would yield:

original	transposed
	-12 
	-5 
	-2 
	+2 
	+5 

This technique was used to create the guitar and bass parts.

The drum solo in the middle section was created from a different substitution, with 7 different values which represent different rhythmic figures.

To create this work, the number series was first generated by hand, then a melodic line graphed according to the rules mentioned above. Using the graph, notes were entered into Cakewalk as MIDI data. Custom algorithms (CAL files) were used to invert the lines and split them into multiple tracks. These tracks were used as the raw material for the final parts. Then the MIDI file was imported into ProTools, where some final editing was done, and the parts were recorded, using Gigastudio. Finally, the final MIDI file was exported from Pro Tools to Finale to produce the score (after copious editing).