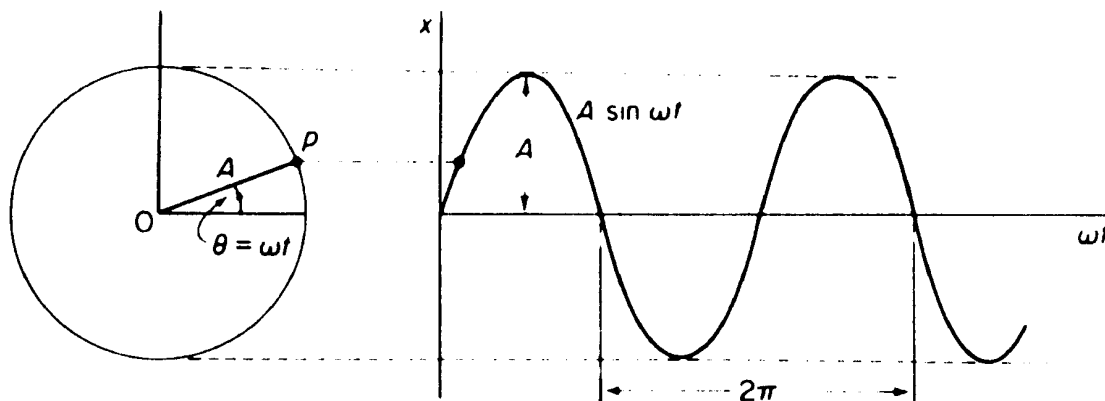


A Method for Graphically Notated Theremin



Graphic notations for theremin indicate variations in pitch and volume over time, generally as curved lines where time progresses along the line, which may or may not correspond to left to right across the paper. Individual curves correspond to musical phrases, which can be simple or composited from shorter phrases. Phrases may be singular or repeated, with or without variation.

They convey information about general volume and pitch range, from low to high, and also rate of change of pitch and volume - the velocity of a phrase from moment to moment, and how this varies throughout the phrase - the acceleration. Control of these is necessary to interpret the phrase musically, and to imbue it with emotional meaning.

One might consider naturally occurring (concrete) sounds of variable pitch and volume (phrases), and ones which have specific meanings associated with them, as well as more abstract phrases, not directly reminiscent of some familiar sound. Instances of concrete phrases include birdsong, whale song, cat's chorus, wolf howls, sirens, taxi-hailing whistles, wolf whistles, baby cries, the Wilhelm scream, cartoon sound effects, falling bombs and so on, all of which have an emotional content. So birdsong can be chirpy and light or frantic and alarmed, whale song can be mysterious or plaintive, wolf whistles can be lascivious or sultry or menacing or cheeky, and so on.

Similarly the basic qualities of a phrase or phrase fragment convey an emotional content - rising pitches are more positive than falling pitches, a phrase in the contralto range conveys a different feeling to the same phrase in, for example, the soprano range. An abrupt change in direction differs in tenor from a smooth deceleration and acceleration. Bold, confidently played phrases sound just that way, as do timid, uncertain movements. Crescendo and diminuendo, a pulsing, throbbing beat or choppy, staccato playing, all ways in which a phrase can become more meaningful.

In an idealised model of the pitch field, movements toward and away from the pitch rod correspond linearly to changes in pitch, and movements parallel to the pitch rod result in no change in pitch. Consider describing a circle in the pitch field with the pitch hand moving at a constant speed. This combines movements both towards and away from the pitch rod and parallel to it. When the hand is at 12 o'clock and 6 o'clock it is moving at its maximum velocity towards or away from the pitch rod, and then smoothly decelerates for a quarter of a circle until it is momentarily stationary while it changes from moving towards the pitch rod to moving away from it, or vice versa, and then steadily accelerates up to maximum velocity again. These four quarter circles, from 12 to 3 to 6 to 9 to 12 o'clock are basic phrases, and are, starting with 12 to 3, decelerating rising pitch, accelerating falling pitch, decelerating falling pitch and accelerating rising pitch.

Drawing the circle repeatedly with a steady volume would give a siren sound, and combining it with appropriate steady increases and decreases in overall pitch range and volume (a repeated composite phrase combined with a singular composite phrase) would result in a phrase reminiscent of a police siren exhibiting Doppler effect as it approaches and recedes from a listener.

Another example of a repeated phrase element is vibrato, and here we note that the graph of pitch against time for a vibrato may be approximately sinusoidal, or it may be closer to a square wave for instance, depending on the method used to generate the vibrato - horizontal or vertical arm movements or a twisting back and forth of the forearm, for instance. With a fast vibrato this will generate an audible difference in the timbre as the waveform varies as its frequency changes, and most markedly so with quick, abrupt changes, less so with slow, smooth variation.

It should be mentioned for the classically trained thereminist that if graphically notated theremin is being played in conjunction with fixed pitch instruments that the points in a phrase with varying pitch where the pitch is momentarily steady, including the start and end of the phrase, are identified by the listener as significant and should therefore correspond to appropriate note pitches for a harmonious effect.

While the theremin is noted for being one of the more difficult instruments to play "in tune" it may be that a classical thereminist who has trained exclusively on music with traditional notation might find it hard to overcome the tendency to instinctively correct their pitch. For this reason, and to take best advantage of the pitch field, I suggest using a pen holding grip rather than an aerial fingering technique, as drawing curves in the air is akin to the patterns one practiced drawing in readiness to learning handwriting. One might even practice whilst holding a pen, to reinforce the different mindset from playing traditionally notated music.

Playing a phrase is, to borrow Paul Klee's words, taking a line for a walk. Two lines, in fact, as a phrase is a combination of changes in both pitch and volume. They are of equal importance, and work together, each performing different roles, just as one uses a knife and fork, each being used differently, but also used together, in a synchronised fashion.

The geometry of the volume field has a similar model to the pitch field - movements toward and away from the loop give corresponding changes in volume, while movements parallel to the loop do not. Therefore applying the same circle drawing example as above to the volume hand would result in a slow tremolo which varies in volume sinusoidally. Doing this synchronously with drawing a circle with the pitch hand would give a siren sound where rising pitches get louder in the middle and falling pitches would get quieter in the middle. Varying the phase of the two circle drawing movements would vary the parts of the siren sound that are emphasised and muted.

The volume field has an additional feature; the field to the side of the volume loop is more compressed than the field above the loop. This means that more legato playing is best suited to playing above the loop, using small finger movements for subtle changes, and the whole hand for larger variations in volume, while the side of the loop is better suited to rapid changes in volume, using, for instance the Pamela Stickney technique for staccato, which gives a subtle "plucking" sound because of the very rapid accelerations it generates, or by fluttering the extended fingers above and below the loop for a rapid sinusoidal tremolo, for example. For maximum effect the size of the pitch field should be made smaller than is typical for classical playing, where large gestures are used for playing that is both sonically and visually very expressive.

As with any method, playing improves with practice, familiarity and understanding.