Chapter 1: The Basics

Microtonal Notation

There have been a number of attempts to devise logical signs for microtones but there is still limited agreement between publishers, musicologists or composers.

This situation is partly due to there being a number of ways to organise microtones in composition. The main ones are listed below:

- to divide the tone into more than 2 parts (e.g. third-tone; quarter-tone; fifth-tone; sixth-tone, etc.)

- to divide the octave into more or less than 12 parts (11-div; 13-div; 19-div, etc.)

- to use structured ‘pure’ intervals based on the harmonic series (referred to as ‘Just Intonation’)

The above represent the principal organisational categories used by microtonal composers over the past fifty years or so. It will be noted that all of those in the first category could also be described using the second (though not visa versa). In such cases, it is not uncommon for systems to be identified by reference to either the tone or the octave. For example, third-tone music may be described as 18-div and fifth-tone music as 30-div, and so on.

While there is no categorical reason why the word ‘division’ should be associated with a division of the octave as opposed to a division of a tone (or any other interval) this terminology is widely accepted. The terms ‘tet’, ‘et’, ‘edo’ or ‘equal’ are also used, as in ‘19tet’ (19 tone equal temperament); ‘19et’ (19 equal temperament); 19edo (19 equal divisions of the octave) or ‘19 equal’.

All these terms refer specifically to equal divisions of the octave. The description n-tone, in the sense that it is sometimes used to describe n-divisions of the octave (as in 19-tone), is best avoided in

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1 For two concise summaries of past and present microtonal composers and their work, see: Bob Gilmore, ‘The Climate Since Harry Partch’, Contemporary Music Review, ‘Microtones and Microtonalities’ 2003, Vol. 22, Parts 1 and 2, pp. 15-34, and Daniel James Wolf, ‘Alternative Tunings, Alternative Tonalities’, Contemporary Music Review, ‘Microtones and Microtonalities’ 2003, Vol. 22, Parts 1 and 2, pp. 3-14. Although there are many other ways to organise pitch in microtonal compositions, for example, with unequal divisions of an interval, with non-octave divisions and so on, the three approaches listed have all been regularly applied to acoustic music which is the main focus of this book.
Music in the First Category (divisions of the tone)

In music which is structured by subdividing the tone, the predominant notational method has been to design a different sign for each subdivision. This is logical enough: the known and established signs (the sharp, flat and natural) remain unchanged and new signs are devised which indicate (and usually suggest visually) a deviation from these established standard-bearers.

This can be seen clearly in the quarter- and eighth-tone signs below. In the sequence of quarter-sharp, sharp and three-quarter sharp, for example, the addition of vertical lines suggest a sequence getting sharper, in increments of a quarter-tone. The flats are less logical and there are probably a number of as-good equivalents. The choices below take Tartini's quarter flat as standard, with a three-quarter flat which is one symbol (as opposed to two, which is a common variant) and not a filled-in flat (which is also common but is too easily read as a pitch).

Example 1: Quarter-Tone signs used in this book

All the signs used are available in standard music engraving software programmes, which was one reason for their selection.

The reason why no absolute consensus has developed has been because the aspirations and objectives of composers have been different. A system devised mainly for quarter-tones may not expand naturally to third-tones, twelfth-tones or sixteenth-tones for example – the logic of the symbols may break down, or some signs may be too similar to others. Conversely, systems which have as part of their objective to normalise smaller intervals, such as twelfth-tones have often utilised non-standard quarter-tone signs, which tends to alienate performers whose excursions into microtonality are usually complicated enough.

Other issues which may affect the choice of sign are whether or not the microtones are ‘structural’ or ‘ornamental’. ‘Ornamental’ suggests that microtones are for ‘colour’ and are ‘inexact’; while ‘structural’ suggests that each pitch is equal with any other. The authors have chosen to use arrows, added to the standard sharp, flat and natural signs, to indicate ‘exact’ eighth-tones even though these signs have been used previously to represent inexact inflections, for example...
Music in the Second Category (divisions of the octave)

Pitches in the second category are generally notated using a different approach which follows the Pythagorean note-naming system (based on a cycle of fifths). The principal derives from meantone tuning systems. Historically, such systems sought to overcome the problem associated with the non-closure of a cycle of pure fifths. The premise is that the closest mathematical approximation to the fifth in the given division (a compromised or tempered fifth) forms the basis of a cycle of those intervals (written as a fifth). This is sometimes known as 'faux' or 'enharmonic' notation.

One of the consequences of this approach is that sharps and flats, which we normally recognize as being enharmonic equivalents of the same pitch (for example, D sharp and E flat), equate to different pitches. With a tuning such as 17-div this approach to notation leads to rather odd consequences in that D flat is lower than C sharp which looks very odd in an ascending sequence and would be extremely counter-intuitive to most performers.

For this reason, it is normal to use replacement signs as is common practice in another popular alternative tuning, 31-div. In the case of 19-div, one of the subjects of this study, enharmonic notation behaves logically without substitute signs and, with practice, is relatively intuitive for the performer.

If this all sounds complicated and confusing, don’t worry – we will discuss faux notation in much more detail in the sections on 19-div and we believe that the patient reader will be rewarded not only with a clear understanding of the microtonal implications of 19-div but also with an appreciation of ideas which have key in the development of western music.

Music in the Third Category (‘pure’ intervals)

Music in this category is called ‘Just Intonation’. Just Intonation has, as its basis, the pure intervals of the harmonic series (although the organisation of such intervals is usually much more sophisticated than this may imply). Although some of the pitches at the beginning of the series correspond more or less to equal tempered pitches, there are substantial differences from the seventh harmonic upwards. These intervals have mathematical relationships with each other which can be described by mathematical ratios. Historically, music composed in just intonation has often been notated using the rather musician-unfriendly language of ratios rather than stave-based notation although Ben Johnston’s notation, which is fully explained and used in the musical examples throughout David Doty’s introduction, The Just Intonation Primer is a convincing alternative. David Doty’s book is thoroughly recommended to reader’s who wish to pursue this area.

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5 Brian Ferneyhough, Cassandra’s Dream Song (London, 1975)
7 This is fully explained in the sections on 19-div although the same approach has been applied to other systems.
8 see Erv Wilson, ‘A Classification of Tonal Systems, and a Proposed Standardisation of Signatures’, Xenharmonikón, No. 2 (Autumn, 1974), unpaged
9 David B. Doty, The Just Intonation Primer (San Francisco, 1994)
10 Despite the sometimes off-putting notational complexity of just intonation, musicians should be encouraged to pursue this area because it, essentially, uses intervals which they use all the time: the beat-free, pure sounds which characterize good tuning. The techniques described in this book will encourage an open-minded and flexible approach to tuning which will enable players to find solutions to music in just intonation: this book does not concern itself with structured just intonation but it does discuss the influence of just intervals in harmonic music in relation to the 3 tuning systems covered.
This project is concerned with quarter- and eighth-tones, which fall under the first and second category (so the music is described as quarter- or eighth-tone or 24- or 48-div) and 19-div, which belongs only to the second.

In Basics 2, terminology is presented for describing intervals in quarter- and eighth-tones, thus fulfilling the need for a clear and comprehensive language with which to describe these new intervals.