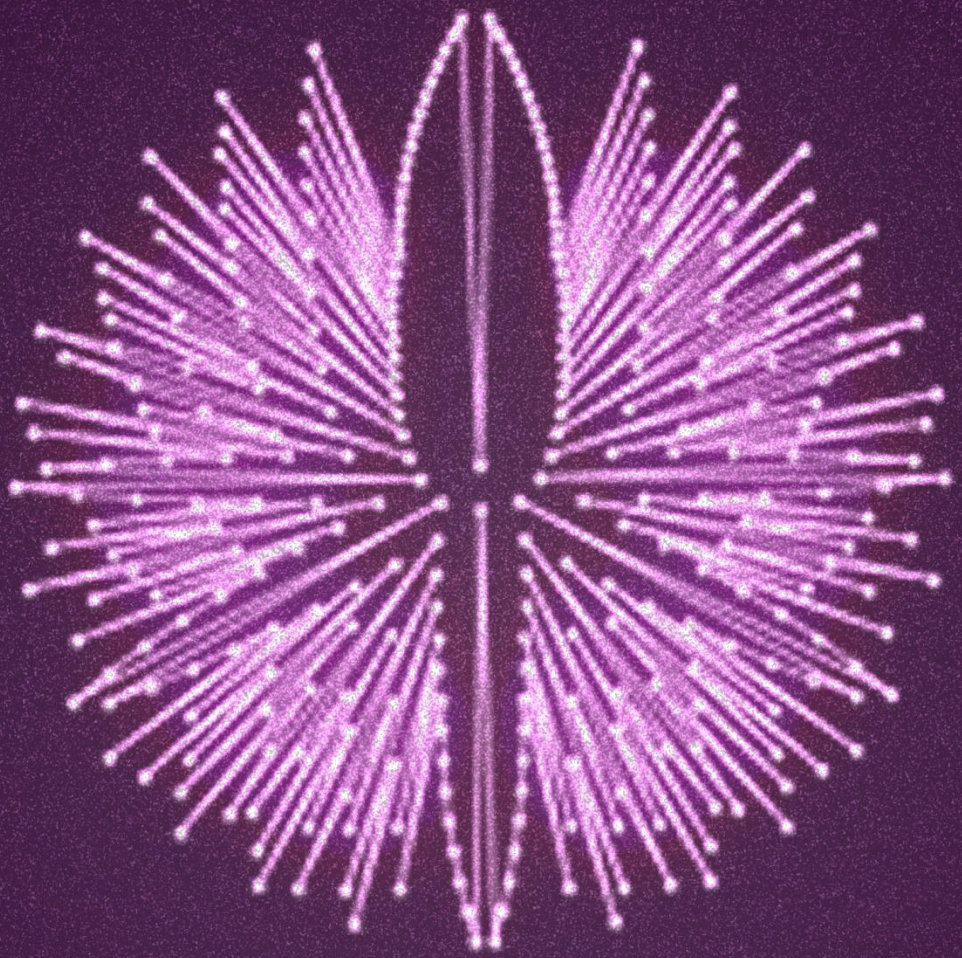

regular temperaments
MTS pack

This free pack contains new tunings and scales for your Xen-Arts virtual synthesizer.

Information

So you're already asking - what on Earth is a regular temperament? You shouldn't feel foolish for asking, as regular temperaments are a recent idea within microtonal music. And generating these scales is a mindboggling mathematical feat that only a few experts can understand. But it's young, fresh territory and still mostly unheard.

Have a very quick look at this:

> *"Regular temperaments are non-Just tunings wherein the infinite number of intervals in p-limit Just intonation (or any subgroup thereof) are mapped to a smaller (though still infinite) set of tempered intervals, by "tempering" (deliberately mistuning) some of the ratios such that a comma (or set of commas) "vanishes" by becoming a unison."*
> *- Xenharmonic Wiki*

Almost perfectly impossible to understand, no?

Put simply, regular temperaments *deliberately* mistune some pure intervals. This makes scales smaller and interesting harmonies easier to find. But as a result - **and this is the crazy bit** - it causes musical puns where

melodies end up in places they shouldn't. For example, let's look at minor thirds in the normal Western tuning. If we stack two minor thirds on top of each other, we'll get a tritone. Stack three, and we'll get a major sixth. That's all good and well, but now let's suppose we perform the same exercise in a regular temperament scale called "porcupine." When we stack three minor thirds on top of each other, we'll get a minor seventh!

If you used this movement by minor thirds as the basis of a melody or chord progression, then you could break expectations by arriving at a different place than expected. Sometimes this effect just gives a subtly different flavour. Sometimes it can sound trippy in a way that music hasn't sounded since childhood.

With these scales, if you find a chord you like, then you can probably find that chord at many other places in the scale.

Scales from Western pop music all exist in, what regular temperament theory calls, *meantone temperament*. We have been exploiting this one temperament for 100's of years now and still going strong. So if meantone can continue to fuel pop records and classical music for this time, then this tuning pack, containing 20 unique regular temperaments, should provide enough new harmonic and melodic content to last us until about the year 6000.

Meet the Regular Temperaments

This pack contains: blackwood, father, flattone, lemba, machine, mavila, meantone, orwell, pajara, porcupine, sensi, and superpyth, plus some tantalising "high-accuracy" temperaments.

Those who aren't scared to get neck-deep in microtonal theory can read *a lot* more about regular temperaments on the Xenharmonic Wiki. There you'll also find many recorded examples of these tunings.

I will attempt to briefly represent each regular temperament with a short description. However, you might choose to simply jump in now and start jamming.

Meantone

The meantone family includes modern Western standard tuning (12-tone equal temperament) and historical well-temperaments. Included in this pack is a version which extends out to 19 notes per octave.

Mavila

Mavila is meantone's anti-matter. It can invert the major scale TTsTTTs into ssTsssT so that all major chords become minor, all minor chords become major, and

diminished becomes augmented. Yes, you can play inside-out versions of tunes you already know.

Blackwood

Crazy patterns. You can make a minor or major triad from any root position in the scale. You can go up and up forever, without ever hitting a diminished chord like you would on a regular piano! Crazy modulations everywhere. Blackwood is formed by 2 interlocking chains of 5-TET (equal pentatonic scale).

Superpyth

In some ways similiar to meantone, but the fifths are subtly sharper. In turn, this makes the major thirds very sharp, and the minor thirds very flat. It's great if you want your major to be jarringly bright, and your minor to be gloomy. Familiar but more vivid.

Flattone

Like meantone and superpyth, flattone is generated by a chain of fifths. These fifths are flat enough that they slightly diminish the notes in the scale. You may find different shades of familiar sounds here.

Pajara

I included 2 Pajara scales from Paul Erlich's paper on 22-TET tonality. These scales have 10 notes each. Pajara takes some notes that are found in blues melodies, and uses them to extend harmony as we know it. The chords can sound familiar, but progressions fit together in new ways. All of this is grossly oversimplified, so check out Paul's paper.

Machine

This scale sounds a bit like a stretched major scale which finishes after 6 notes. It also sounds a bit like a whole-tone scale. If that doesn't mess with your head, it features the 7th and 11th harmonics. The 7th harmonic is 1/6th of a tone flatter than a minor seventh on a piano – a "barbershop seventh". The 11th harmonic is a quarter tone sharper than a perfect fourth – a semi-augmented fourth! This scale is full of chords which sound like dom9#11(no3, no5) chords but better.

Orwell

Orwell also has those 7th and 11th harmonics – and adds subminor thirds to the mix. While it doesn't have recognisable major or minor thirds, it has many many possibilities for chords and sounds pleasing for melody too.

Porcupine
It contains a few familiar chords, though mixed up in a different order. It extends those chords to include the 11th harmonic, a semi-augmented fourth.

Father

Father is generated by a circle of extremely flat fourths, creating an 8 tone scale which sounds somewhat diatonic but with an extra semitone squashed in.

Lemba

Lemba repeats at the half-octave (tritone), rather than at the octave. If you play a whole octave of the lemba temperament, you'll have played a symmetrical scale. Lemba has 3 kinds of thirds to choose from.

Sensi

Sensi has an abundance of chords that resemble extended jazz harmonies without the root note. Tritones come in two flavors, both sweeter than the familiar 12-tet tritone. This 11-note scale produces a few major and minor chords as well as the more intensified "supermajor" and "subminor" chords similar to what's found in superpyth.

The high-accuracy scales

When creating this pack, I asked microtonal musicians for feedback. Some said there was too much focus on the trippy-sounding regular temperaments, and not on the accurate ones. To round this pack out, I took suggestions for other scales to include. Few people have played these scales until now. Now they're available for you to try.

12-Adams. Here you'll find a large variety of step sizes and three different major scales. The idea is that these scales will sound very consonant, but modulating away from them will sound the opposite.

zeus7tri. This has very few familiar perfect fourths and fifths, but a good selection of different flavoured thirds, the 11th harmonic, and a few intervals related to the 7th harmonic. All within a compact scale of 7 notes.

oktone. "Highly accurate with a good deal of symmetry."

elfmadagascar9. (Also barbados[9]). Here, two (very flat) subminor thirds add up to one perfect fourth. It has many subminor and supermajor triads.

glummamarvwoo. A tempered version of Gene Smith's Glumma scale. Rather full of variety.

Parapyth12. Play the white keys and you'll hear something recognisable. But the thirds are somewhat subminor/supermajor, and you can find the 7th and 11th harmonics in places.

Notes

The filenames may look confusing at first, but the numbers give useful information about each scale.

What does the *n TET* mean?

TET scales (more recently they're being called EDO scales) divide the octave into an equal number of notes. The standard Western tuning divides the octave into `12` equal notes. We then can give the notes names, C, C#, D, etc. When we use a different number to divide the octave, we can get bigger or smaller notes to play with. Different sizes of notes means different feelings.

What does the *[n]* mean?

The number within square brackets shows the number of notes in the scale. So [6] means that there are 6 notes in the scale. This means if you play two notes on your keyboard, 6 keys apart, you'll hear an octave.

Here's an example: "`11` TET Machine[6]" means that we first divided the scale into `11` equal parts. Then we selected 6 notes from those `11` to create the scale.

What do the strings of numbers (e.g. *2 2 1 2 2 2*) mean?

This shows the shape of the scale. Let's use "11 TET Machine[6] 2 2 1 2 2 2" as an example. We can visualise the pitches of 11 TET as a grid. Each cell in the grid is one note.

1	1	1	1	1	1	1	1	1	1	1

← 11 notes = one octave →

We know that "Machine[6]" uses 6 notes, because we can read [6]. But what six does it use?

2		2		1	2		2		2	
1	1	1	1	1	1	1	1	1	1	1

Here's another example. "22 TET Pajara[10] Std Pentachordal Maj 2 2 3 2 2 2 3 2 2 2". We can see that the octave was divided into 22 equal notes. Then 10 notes were selected from those 22. So what does the scale look like?

2		2		3			2		2		2		3			2		2		2	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Why does all this matter?

Suppose you have been playing one of these regular temperaments for a while, and your ear has adjusted to its sound. You feel ready to alter notes and modulate around, like a microtonal modal jazz player!

Just look at the regular temperament you're using. If it says "`11` TET Machine" then you can load the "`11` TET" scale and get access to the full `11` notes. Now you can modulate and explore as much as you like. So consider the scale files in this pack to be training wheels.

Depending on your own learning style, you might find these visual explanations and counting games useless. But no matter how you choose to understand regular temperaments, you can always simply jam and find something that tickles your ear. The golden rule of music:

"If it sounds good, it is good."

The possibilities of Regular Temperaments

The regular temperaments in this pack are just a few drops in an ocean of possibilities. Actually, this pack mostly contains scales called rank-two temperaments. If you wish to move beyond what I've given here, you could try to learn to use Scala and study regular temperament theory from the Xenharmonic Wiki.

Thanks

Kind thanks to the people at the Xenharmonic Alliance facebook group who read an early version of this document and offered feedback and corrections.

Thank you to Jacky Ligon for creating the Xen-Arts VSTi synthesizers. As I compiled this pack, I had it in mind that these scales would sound cool with Xen-FMTS 2.

In particular thanks to Scott Thompson, Claudi Meneghin, Dustin Schallert, Gene Smith, Andrew Heathwaite, Cryptic Ruse, Graham Breed, Prent Rodgers and Mike Battaglia whose comments and suggestions I worked directly into this tuning pack.

Thanks to all those who are pushing microtonal music theory forward. Most of these folks seem to be hobbyists, tirelessly opening up entirely new worlds of licks and progressions for players to mess with.

Sorry if your favourite regular temperament didn't make it into this pack. Remember – it's just a taster!

This pack of microtunings was downloaded from **sevish.com** – Head there for more tuning packs and to check out my microtonal music.

The microtuning files (.mid) are designed to work with the outstanding, free VST synthesizers from Xen Arts. Download them and make some microtonal music!