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hey, welcome to 12tone! recently, I received an email from Dr. Andrew Killick, from the University of Sheffield. Dr. Killick is an ethnomusicologist, and in his work he's been trying to redefine how we think about music, or at least how we write it down. you see, traditional staff notation has a problem. we've talked before about how we got here, but the short version is that Europeans spent over a millennium refining and evolving our system, and that process effectively baked in a lot of assumptions about how music works and what information is worth conveying.

unfortunately, those assumptions often fall apart when we look at music from outside of Europe. for instance, if we try to write down the Indonesian scale Pelog (bang) we get a rough approximation, but a lot of these notes are pretty out of tune. and it gets worse: in Indonesian Gamelan music, tuning is less fixed than in Western traditions, and different orchestras might use significantly different notes, so even if we could perfectly represent one version of Pelog in Western notation, we'd be hard pressed to capture all the others.

and tuning is just the beginning: staff notation contains fundamental assumptions about every aspect of music, from which rhythms are common to which registers are the most important. over the years we've built a lot of workarounds for when we want to do something more unorthodox, but these tend to be fairly ugly patches, because in our day-to-day experience the problems just don't come up often enough to be worth solving cleanly. but what if, instead of plugging holes one at a time, we built a whole new system, one based on the idea that any question could be important, and any answer could be correct? well, that's what Dr. Killick's been working on, and he calls his system Global Notation.

the point of Global Notation is that you can include or exclude basically any information you want. it's an open framework with as few assumptions as possible about the music it represents. this is, of course, a trade-off, sacrificing a little simplicity for the sake of flexibility, but we'll get into that in a bit. first, I want to look at how it works.

let's begin with the most basic instrument: a single drum. here, we start with a line, representing time. we can mark it as a drum part if that's important, and we can be as vague or as specific as we want with the description, but if we don't care we can just leave that blank. again, all information is optional. if we want our drum to play something, we just put a triangle above or below the line at the desired time. the triangle says we don't care about duration, since the drum's sound will just decay on its own, and placing it off the line says we don't care about pitch since, well, it's a drum.

in order to build rhythms, though, we first have to define how much time a certain length represents. we can do that directly, marking, say, this distance as a second, but that can be difficult to read, and besides, most music has some sort of rhythmic structure to it, so to

represent that we turn to a fairly familiar concept: beats and bars. I mean, why mess with a classic?

let's start with beats. these are represented with vertical lines, and if we care about tempo we can mark the first one like this, which tells us how many beats there are per minute. bars are a higher-level rhythmic division, and to include them we can just modify that tempo marking, adding another number in front to specify the number of beats per bar, kind of like a time signature, so 4/4 at 100 beats per minute would look like this. to make these bars easier to track, we also thicken and lengthen each beat line that represents the first beat of a new bar.

and just like bars divide up into beats, the beats can divide up into smaller values as well. we can try to do this freehand if we want, but to make things easier we can just modify our time signature again to tell us how to divide things up, so if we wanted four beats per bar with each beat split into three parts, all at 100 BPM, we'd just write this, and if later on in the piece those subdivisions change, we can always write a new time signature.

but moving on from drums, there's lots of other things we might need to specify. duration, for instance, is a pretty big deal for a lot of instruments, and the solution here is pretty straightforward: we take this triangle we've been using, hollow it out a bit, and wind up with a sideways T shape that we can extend as long as we want. the vertical line marks the beginning of the sound, and the horizontal line shows how long it lasts. this lets us easily specify any duration, whereas traditional Western notation is limited by the pre-defined lengths of our symbols.

but probably the most important thing missing is pitch. if you're playing an instrument that produces recognizable notes, a couple things change. first, this line we were using for time now takes on a second meaning: it shows what pitch you're playing. of course, if the line represents a single pitch, then we're gonna need some more lines. this is where things start to get a little complicated: basically, you go through the piece, determine which notes you're gonna need, and make a line for each of them. then you determine a reference pitch: that is, a note that everything else will be tuned against. if the song has a recognizable root, you make that your reference pitch, and if it's more atonal, you can just use the lowest note. either way, you make this line thicker than the others to show its importance.

the nice thing about this is that we don't actually have to specify what that reference pitch is, which means we can write music without caring about what key it's in, so we can focus on the melodic structures of the piece without getting bogged down by unnecessary details. of course, we can also specify the frequency if we want to, but traditional staff notation has no easy way of writing in relative pitch, so it's cool that this system can do both.

from there, we need to specify how far away each of our other notes is from that reference, and to do that we turn to a unit of measurement called cents. these come from the world of tuning theory, and there are exactly one hundred cents per half step, or twelve hundred per octave.

individual cents are too small to be perceived by human ears (bang) so they give us a very precise means of measuring intervals. now all we have to do is determine how many cents each note is from our reference pitch, and voila: we've got our staff. from here we can take those duration symbols from earlier, plop them on, and write melodies.

it's a fascinating system, but it's also one that's still in development, which puts us in a unique position to offer feedback before the work is complete. I've linked to Dr. Killick's website in the description, which features much more detailed explanations of his methods, including sections on other concerns like dynamics, pitch bending, and even timbre, but before I wrap up I wanted to take some time to talk about some of my own thoughts on Global Notation.

probably the most significant hole in the system right now is chords. of course, you can just write multiple note lines at once, but a chord is more than the sum of its parts. if I play this, it's not just an F#, a B, and a D: it's a B minor triad. this middle note takes on an important, foundational quality that isn't apparent just by looking at the individual sounds. Dr. Killick is, of course, aware of this problem, and I've discussed some solutions with him, including using colored lines to represent harmonic roots or introducing some sort of chord symbols to the system. it's something he's thinking about, but as of yet there's no definite solution.

another issue is handwriting. this is especially important to me because I write like a 5 year old, but in general the system seems mostly designed for digital interfaces. the placement of the lines needs to be fairly precise, and because the staff varies based on the pitch content of your music, we can't mass-produce manuscript paper like we can with the more traditional system. Dr. Killick has written out some pretty good instructions on his website for doing this by hand, which I've been trying to follow in this video, but in practice, I thinks it's probably worth at least doing the staff on a computer, even if you're writing the rest by hand.

and finally, the biggest and most important point is one I brought up at the beginning: the flexibility comes at the cost of simplicity. Global Notation is probably not a good replacement for the more specific systems that various cultures have developed to notate their own music. if you're writing parts for, say, an orchestra playing a Mozart symphony, it's probably better to stick with traditional staff notation. but that's ok: the strength of Global Notation isn't its ability to represent any particular culture's music, but its ability to represent every culture's music equally well. it lets us write music down without cultural bias, or, at least, that's the goal, and I think it does a pretty good job.

but enough about writing music down, how do you actually write music in the first place? well, one great resource is this video's sponsor, Skillshare! Skillshare is an online learning platform with over 20 thousand classes in just about everything, including plenty of courses by songwriters working in different genres. I tend to think that the more perspectives you get, the better your own work becomes, so I recommend checking out all of them, but if you're looking for a place to start, K Theory has a great course about production and songwriting in trap music. this is especially interesting here because electronic music also uses its own notation, in this

case piano roll, which is actually kinda similar to Global Notation. Skillshare also offers plenty of other musical courses, as well as lots of non-music ones, and they're offering two free months of premium membership to the first 500 12tone viewers to click the link in the description. if you want to keep going after that, premium plans start at less than 9 bucks a month. and if you don't? well, you can just cancel once the two months are up. there's no risk.

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http://globalnotation.org.uk/
http://www.neuroscience-of-music.se/pelog_main.htm