



Curatorial > PROBES

With this section, RWM continues a line of programmes devoted to exploring the complex map of sound art from different points of view organised in curatorial series.

Curated by Chris Cutler, **PROBES** takes Marshall McLuhan's conceptual contrapositions as a starting point to analyse and expose the search for a new sonic language made urgent after the collapse of tonality in the twentieth century. The series looks at the many probes and experiments that were launched in the last century in search of new musical resources, and a new aesthetic; for ways to make music adequate to a world transformed by disorientating technologies.

Curated by Chris Cutler

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At the start of the seventies, Chris Cutler co-founded The Ottawa Music Company – a 22-piece Rock composer's orchestra – before joining British experimental group Henry Cow, with whom he toured, recorded and worked in dance and theatre projects for the next eight years. Subsequently he co-founded a series of mixed national groups: Art Bears, News from Babel, Cassiber, The (ec) Nudes, p53 and The Science Group, and was a permanent member of American bands Pere Ubu, Hail and The Wooden Birds. Outside a succession of special projects for stage, theatre, film and radio he still works consistently in successive projects with Fred Frith, Zeena Parkins, Jon Rose, Tim Hodgkinson, David Thomas, Peter Blegvad, Daan Vandewalle, Ikue Mori, Lotte Anker, Stevan Tickmayer, Annie Gosfield and spectralists Iancu Dumitrescu and Ana Maria Avram. He is a permanent member of The Bad Boys (Cage, Stockhausen, Fluxus &c.) The Artaud Beats and The Artbears Songbook, and turns up with the usual suspects in all the usual improvising contexts. As a soloist he has toured the world with his extended, electrified, kit.

Adjacent projects include commissioned works for radio, various live movie soundtracks, *Signe de Trois* for surround-sound projection, the daily year-long soundscape series *Out of the Blue Radio* for Resonance FM, and p53 for Orchestra and Soloists.

He also founded and runs the independent label ReR Megacorp and the art distribution service Gallery and Academic and is author of the theoretical collection *File Under Popular* – as well as of numerous articles and papers published in 16 languages.
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PROBES #3

In the late nineteenth century two facts conspired to change the face of music: the collapse of common practice tonality (which overturned the certainties underpinning the world of art music), and the invention of a revolutionary new form of memory, sound recording (which redefined and greatly empowered the world of popular music). A tidal wave of probes and experiments into new musical resources and new organisational practices ploughed through both disciplines, bringing parts of each onto shared terrain before rolling on to underpin a new aesthetics able to follow sound and its manipulations beyond the narrow confines of 'music'. This series tries analytically to trace and explain these developments, and to show how, and why, both musical and post-musical genres take the forms they do. This third programme continues to explore probes into pitch – this time through its effective obliteration through ceaseless movement, sliding tones, and radical portamenti which defy all quantisation.

01. Transcript. Studio version

[Gregorio Paniagua, 'Anakrousis', 1978]

[George Gershwin, 'Clarinet portamento opening of Rhapsody in Blue', 1924]¹

Whatever the ratios, all fixed pitch systems are rooted in the exclusion of every pitch that is not in their accepted scale. Portamento – which means sliding between notes, accepts every pitch indiscriminately – but none of them for very long. Before the twentieth century, portamenti were used sparingly in Western music, mainly as an expressive device – and usually to introduce a moment of disorientation and instability.² A glissando is a swoon; a moment of weightlessness; a kind of musical out-of-body experience, during which all the rules of stable pitch and harmony are momentarily suspended.

Here is a beautiful example, taken from Tahitian choral music

[Tahitian choir, source and date unknown]

And this from Chile

[Alflai, traditional Mapuche song, 2001/2002]

Odysseus was bound to his mast in order that he could taste oblivion and still come safe to harbour. Music does this through the tactical use of radical portamenti. And while, for Odysseus, the lure was knowledge, for most twentieth century sensibilities it has been reassurance. The more that chaos and uncertainty became the norm in a world under constant attack from itself – which is to say from the default conditions of late modernity – the more portamenti – like pitch ambiguity – came to embody an experiential response to a general sense of helplessness.

By controlling the chaos we make ourselves that much less its victims. By embracing it, we dilute its power – and make it our own.

[Edgard Varèse, 'Amériques' (excerpt), 1918-21]

It's 1919, the French composer Edgard Varèse has recently arrived in America. He has definitively broken with the baggage of tonal organisation and in its place imagines masses and parabolas that move in space. For two years he's been working on his vast *Amériques*, a prescient and revolutionary composition filled with noise and movement – and he has written a large part in it for an industrial siren. He's not looking for trouble – and surprisingly he doesn't get it. But that siren will bind sliding pitches forever into the fabric of modernity itself.



[Lev Termen]

[Grainger, 'Free Music No. 1', 1935]

The link was sealed in 1927 with the arrival in America of the theremin. This was an embodiment of science so futuristic it was more like magic. You didn't have to touch it, you just moved your hands around it – and it was as if electricity had suddenly been given a voice. It sang with an aetherial, swooping wail – like a choir of angels, or a howling banshee. It sounded like the future. Even the cautious world of art-music accepted it, and it became the first electronic performing instrument to win both popular and art-world acceptance.³ Edgard Varèse used two theremin cellos in his 'Equatorial' and the conductor Leopold Stokowski commissioned several of them for the Philadelphia orchestra.

[Joseph Schillinger, 'Airphonic Suite' (excerpt), 1929]

In 1929, Joseph Schillinger's *First Airphonic Suite* for theremin and orchestra was premiered in Cleveland. Three years later, Lev Sergeyevich Termen himself led the world's first electronic orchestra in Carnegie Hall.⁴ But the inflexibility of the instrument, and the mainly conventional uses to which it was put, stalled its progress at the level of promise. When Termen was abducted back to Russia by the Soviet secret services in 1938, its career went into decline and it soon all but disappeared. The compositional legacy of the theremin at that time still lay in the future, in the more visceral and imaginative world of cinema. Film composers valued it for its unsettling affect so – to the public at large – it soon became a soundmark for instability and the unknown:⁵

In Bernard Herrman's score for *The Day the Earth Stood Still* – the uncertainty of the future...

[Bernard Herrman, 'The Day the Earth Stood Still', 1951]

In Miklós Rózsa's *The Lost Weekend* – psychological instability, loss of self and the chaos of irrational obsession

[Miklós Rózsa, 'Lost Weekend', 1945]

And in a thousand B movies – it became the sound of science fiction, horror and suspense.

['It Came from Outer Space'. Uncredited score by Irving Gertz, Henry Mancini, and Herman Stein, 1953]

It was watching waves on a lake that set the Australian composer Percy Grainger on his lifelong mission to create a Free Music, by which he meant a music free of regular meter and formed only of what he called gliding tones.⁶ He was 17 then and it was 1899. Four years later he was in Berlin studying with Ferruccio Busoni, a figure who will crop up several times in these programmes, since the ideas in his 1907 *Sketch for a New Aesthetic of Music*, influenced several generations of experimental composers. One of these ideas was that the gradation of the octave was infinite. Natural sounds don't move in steps, he said, they glide and move in waves. In an early attempt to approximate his own ideas in this direction, Grainger re-tuned a piano in sixth tones...

[Percy Grainger, butterfly piano test, ca. late forties, early fifties]

...but soon abandoned it; he wanted waves, not steps. Strings can all slide smoothly, so in 1935 he wrote a short study for string quartet. This he found unsatisfactory too. Then he heard a theremin and immediately re-scored the piece for four of them. What we are now going to hear is a third realisation, made by Grainger himself in 1951, using a reed organ tuned in 1/8th tones controlled – like a pianola – by hand-cut paper rolls

[Percy Grainger, 'Free Music No.1 (for Four Theremins)', 1935-1951]

In the following years, Grainger worked with Lev Termen on a number of projects, producing, amongst other things, a second Free Music study, written in 1937. This time for six theremins.



[John Oswald]

But the theremin didn't give Grainger the control he wanted either so, in 1948, he teamed up with physicist Burnett Cross to invent a series of ever more elaborate Free Music Machines. These were sizeable constructions using oscillators, piano rolls, microtonally pitched Solovoxes,⁷ photocells and sewing machines – all cobbled together with Heath Robinson mechanics, to produce those polyphonic sliding lines, gliding chords and impossible rhythms that Grainger could hear but was unable to realise.

[Percy Grainger, oscillator test, 1952]

At the same time, out in the wider world, synthesisers and electronic music technologies were evolving that could – and eventually would – deliver both the sounds, and the control that Grainger wanted. When he died in 1961, his latest Free Music Machine remained unfinished. And no Free Concert works had yet been completed.

Back in the hopeful twenties, maverick American composer, Henry Cowell – who will be cropping several times in the course of this series⁸ – was on his own path to new sonorities. Amongst the many probes into the uncharted possibilities of the piano that occupied him in the first quarter of the century, was this one into extended portamenti. This is Cowell himself playing his 1925 composition, *The Banshee*, standing at the end of the piano, opposite the keyboard.

[Henry Cowell, 'The Banshee', 1925]

A close friend of Percy Grainger's and, for a time, Henry Cowell's secretary, Johanna Magdalena Beyer wrote *Music of the Spheres* in 1938. It was a piece that took few prisoners. It was scored for three unspecified electric glissando instruments, a lion's roar and a triangle. The first electronic work to be composed by a woman, it wasn't performed in her lifetime. This recording was made at its premiere in 1977. Don Buchla designed the three glissando instruments – to the thirties specifications.

[Johanna Beyer, 'Music of the Spheres', 1938]

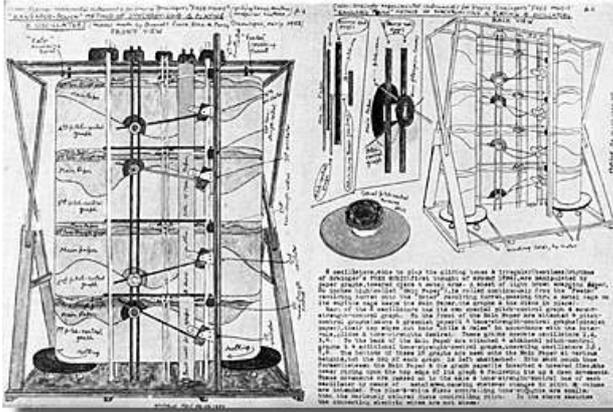
As we saw, the theremin, although sensational, was rather limited. And almost impossible to play well. Long before it migrated to Hollywood, it had already disappeared from the concert hall. A number of electronic instruments came and went at around this time, mostly all forgotten now. Although they were important steps in the evolution of a new generation of instruments, for the most part they made little or no lasting impression on the life of music in their own time.⁹ Who has heard, for instance, of the polytone, invented in 1932 by the composer Arthur Fickenscher? Although greeted with great enthusiasm by both Grainger and Cowell; and although like Jorg Mager's earlier sphärophon, it supported microtonal tuning, only the prototype was ever built, and nothing was ever written for it – even by its inventor. What did it sound like? We have no idea; no recording, if any was ever made, has survived.¹⁰

[Jolivet, 'Trois Poèmes', 1935]

One notable exception to all this electronic neglect was the onde martinot. Invented in 1928 by cellist and engineer Maurice Martinot, it was based on the same heterodyning principle as the theremin, and it produced a smooth, rather exquisite, gliding tone. The first model was essentially just a ribbon with a ring threaded through it. But after 1930 a conventional keyboard was added – along with a highly sophisticated range of timbre and expression controls.

[Olivier Messiaen, 'Fête des Belles Eaux', 1939]

Unlike most of its competitors, the onde martinot was flexible enough to grow into a true instrument – and its unique sonorities and exquisite portamenti, attracted a body of composers large enough to create a lasting repertoire that would ensure its survival. Olivier Messiaen, in particular, wrote extensively for the onde, works that are still regularly performed.



[The Kangaroo Pouch Free Music Machine (Grainger's diagram)]

Every onde has three loudspeakers – one normal, one set in a resonant enclosure with sympathetic strings, and a third using a metal gong as a resonator. These may be used alone or in any combination, and they add a unique range of timbres to this already highly distinctive instrument.

[Olivier Messiaen, 'Turangalila Symphony' (excerpt), 1946-8]

And there was another portamento effect that was observed, and occasionally probed, in the early decades of the twentieth century: gramophone records sped up and slowed down could make quite complex sounds slide through pitches – they could even produce the gliding chords that Grainger was so eager to achieve¹¹. In 1916, Dziga Vertov had experimented with disc manipulation in Russia. And in the twenties others followed, especially in Germany, though nothing of lasting substance was produced.¹² It was not until John Cage tried his hand in 1939 that turntable manipulation was successfully incorporated into an enduring work. Scored for two hand-varispeed turntables, three customised test tone recordings – and occasional Chinese cymbal and muted piano interventions – this is grandmaster John's 1939 'Imaginary Landscape No. 1'.

[John Cage, 'Imaginary Landscape No. 1', 1939]

Nine years later, simple disc manipulation would lay the foundations for Musique Concrète, a method – and a radically novel – audio aesthetic that would change music forever. Musique Concrète was the brainchild of Pierre Schaeffer, a sound engineer working in the studios of ORTF in Paris. He made works and presented them in turntable concerts and, perhaps more importantly, he underpinned the new art with a substantial body of theory. A few years later these techniques and aesthetics were shifted over into the domain of magnetic tape – a medium in which infinite gradations of pitch could be coaxed from any source at all simply by adjusting recording and playback speeds.

[John Oswald, 'Pretender' (excerpt), 1984/1988]

By the end of the fifties, extensive and non-expressive use of portamenti had become common in the musical vocabularies of many contemporary composers.

Just a few examples: Iannis Xenakis – here's a bit of his 'Metastasis' from 1955

[Iannis Xenakis, 'Metastasis', 1955]

György Ligeti – here's 'Glissandi' – one of his only tape pieces. This was made in 1957 at the WDR Studio in Koln.¹³

[György Ligeti, 'Glissandi', 1957]

And this is Krzysztof Penderecki. An excerpt from his 1960 *Threnody for the Victims of Hiroshima*, which set up a whole catalogue of extended techniques for strings, and included both written quartertones and massed portamenti.

[Krzysztof Penderecki, 'Threnody for the Victims of Hiroshima', 1960]

Finally, György Kurtág's 'Perpetuum Mobile' – yet another attempt to probe the sliding potential of the piano, this time using the keys.

[György Kurtág, 'Perpetuum Mobile', composed between 1975 and 1993]

But above all, it is in the work of the German based composer Gloria Coates, that the most thorough and comprehensive exploration of the orchestral possibilities of sliding music has been attempted. To lend compositional rigour to her pieces – which are thick with parallel layers of portamenti, all moving in different directions, and at different but closely calculated speeds – Coates returned to the polyphonic forms of late medieval and baroque music, in particular to fugues and canons – although in the absence of clear tones of course, they are virtually impossible to hear. This is an extract from her 'Symphony No. 7' written in 1990.

[Gloria Coates, 'Symphony No. 7 part 3' (excerpt), 1990]



[Tod Dockstader]

And this from her sixth string quartet, written in 1999

[Gloria Coates, 'String Quartet No. 6', 1999]

We started with a Tahitian choir. And we close this brief survey of acoustic portamenti by returning to the human voice. As a film-maker in New York, David Hykes worked for a while with Tony Conrad, who was also making films then – as well as being in La Monte Young's Theatre of Eternal Music. Hykes went on to establish the Harmonic Choir in 1975. The choir was a Just Intonation ensemble that drew directly on Mongolian and Tibetan overtone singing, and although it was rather marginal to the world of contemporary music – Hykes presented it more as a spiritual project than a musical one – it took the discipline of overtone singing into genuinely new directions, including that of controlled portamento, heard here in 'Arc Descents':

[Harmonic Choir, 'Arc Descents', 1982]

[Dan Burk, 'Squiggles', 1992]

In the world of computer processing of course, today's software can transpose or vari-speed any sound at all and have it move at any speed, over any length of time and across any range of pitches.

Here's the beginning of Karlheinz Stockhausen's 2002 composition, *Strahlen*. For Tape and Vibraphone

[Karlheinz Stockhausen, 'Strahlen (Rays)', 2002]

And this is from the fourth region of his 1966, *Hymnen* – for which, much of the source material was taken from the short wave radio environment.

[Karlheinz Stockhausen, 'Hymnen', 1966-7]

In the sixties, Stockhausen used shortwave radios quite prominently in several of his compositions – it was a time when the radio environment was particularly rich, and full of sliding pitches. Here's another piece, this one using only found radio sound, a track from Tod Dockstader's three hour epic, *Ariel*.

[Tod Dockstader, 'Whisper' (excerpt), 2002-5]

In the next programme, we'll be looking at sliding tones in popular music. And the liberation of noise.

¹ George Gershwin (1925, piano roll) accompanied by the Columbia Jazz band at the Philharmonic Hall, New York in 1974, conducted by Michael Tilson Thomas.

² 1902, Arnold Schönberg in *Pelleas und Melisande, Op. 5* calls for five trombones, indicating glissandi – one of the earliest such indications in Western music. He felt it necessary to explain: 'The glissando on the trombone is executed as follows: the note E is established by the lips as the lowest partial of the sixth draw [seventh position] and then the slide is shifted through all the positions in such a way that the chromatic intervals, as well as the quarter-tone, eighth-tone and smaller intervals in between, are clearly heard, as in the glissando of string instruments.'

³ The first significant work composed for the theremin was Andrey Paschenko's *Symphonic Mystery*, premiered in Leningrad on May 2, 1924.

⁴ Also shown was the keyboard harmonium in sixteenth tones – no piece was played in the concert though. RCA licensed the theremin for commercial production and made 500 AR-1264thereminvoxes.

⁵ First used in a film by Dmitri Shostakovich for *Odna* (1931).

⁶ 'Since the days of Bach's well-tempered tuning, no genuinely practical step forward has been made in the resourcefulness of the musical intervals at our disposal. Stravinsky has done much to liberate rhythm from the fetters of regularity. Arnold Schönberg has freed us from the inevitability of harmony. But it is obvious that Free Music – the goal towards which all musical progress is striving, consciously or unconsciously, cannot arrive until musical intervals become free also'. Letter from Percy Grainger (quote from www.rainerlinz.net/NMA/articles/FreeMusic.html).

⁷ Manufactured in the USA between 1940 and 1948, the Hammond Solovox, designed by Alan Young, was a monophonic keyboard attachment designed to be mounted on a sliding surface beneath a piano keyboard and used as an accompanying voice. The sound was generated from a single LC oscillator with a frequency several octaves. This was then passed through a series of frequency dividers to create a further two octaves.

⁸ Cowell had also experimented with sirens in around 1914 and a few years later he became closely involved with Lev Termin. Between them they invented the Rhythmicon to explore Cowell's ideas around rhythm chords, of which more in a later programme.

⁹ At least 50 between 1920 and 1950.



[Gloria Coates]

¹⁰ See Fickenscher, 'The Polytone and the Potentialities of a Purer Intonation', *Musical Quarterly*, July 1941.

¹¹ Dziga Vertov in 1916, Stephan Wolpe in 1920, Darius Milhaud (from 1922), László Moholy-Nagy at the Bauhaus (1923) and Edgard Varèse in 1936 had all experimented with disc manipulation, but none eventually employed them in a final work. Paul Hindemith and Ernst Toch did present five short *Originalwerke für Schallplatten* in Berlin at the 1930 Neue Musik Festival, but the recordings are now believed lost.

¹² Using Harald Bode's Melochord built in 1953 for the WDR Studio in Cologne.

02. Acknowledgments

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