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VINYL CUT PRO

BEING A PRIMER ON ODDLY GROOVED RECORDS

DISCUSSED: *Infinite Audio Loops*, *Sgt. Pepper's Lonely Hearts Club Band*, *Turntablist Culture*, *A Fetishized Drum Machine*, *Mind-Bending Inside-Out Cuts*, *Usenet*, *Monty Python*, *Post-Listening Situational Comedy*, *Johnny's 256 Possible Outcomes*, *Mute Amnesiacs*, *Trick Grooves*

You've probably heard about how the sales of newly pressed vinyl records have been trending upward in the past few years, despite the tailspin in which the rest of the music industry has found itself. The reemergence of this most physical of mediums just as musical playback has settled into a firmly nonphysical experience makes a certain kind of sense: there is an artisanal quality to the creation of records that often goes overlooked.

Most people couldn't begin to explain how records are made—the titular character in Jean-Pierre Jeunet's 2001



film *Amélie* imagined a sort of thick black batter applied via a single circular stroke of a wooden crêpe-spreader. In actuality, the grooves are first cut out of a smooth blank disc coated in nitrocellulose lacquer (a by-product of cotton) using ruby needles driven by purpose-built lathes. Once completed, inverted molds of the lacquer master are created by plating it with silver and nickel. These plates are then turned into the stampers that a pressing plant will use to squeeze hundreds of hockey-puck-size wheels of vinyl into identical records. This last step is the process that most people think of as “making records,” but every step beyond the initial cutting of the master is merely an exercise in reproduc-

ing it with as much accuracy as possible—it's in the cutting of the master lacquer that a record's quality is truly determined.

I recently spoke with Louis Bell at Aardvark Record Mastering, a four-person, two-cat, one-dog operation based in Denver, Colorado. Aardvark doesn't press records—it sticks to cutting and plating the masters. Master lacquers are cut in real time, meaning that as the audio is played to the cutting stylus, the mastering engineer is simultaneously monitoring signal level, groove depth, spacing, and other variables. Before beginning the actual cut, Bell listens twice to each track he masters to familiarize himself with changes in level (particularly bass-heavy sections) or anything else that might af-

SONG TITLES THAT COULD ALSO BE MEAN EMAIL SUBJECT LINES

- ★ "I Hate Children"
—The Adolescents
 - ★ "You Stupid Jerk"
—Angry Samoans
 - ★ "Get Out My House"
—The Streets
 - ★ "You've Sealed My Fate"
—Swervedriver
 - ★ "Deathblow to Your Pride"
—Superdrag
 - ★ "Note to Self: Don't Die"
—Ryan Adams
 - ★ "I Believe She's Lying"—Jon Brion
 - ★ "Die on a Rope"—The Distillers
 - ★ "Get Out of My Life"—D.O.A.
 - ★ "I'll Replace You with
Machines"—Guided By Voices
- list compiled by Debbie Swift Hampton

fect the cut. "I follow the process I'd want someone to follow on my record," he says. When asked about the tools of the trade, Bell emphasizes what a specialized endeavor record mastering is: "They aren't making this equipment anymore, and when you do find it, it doesn't come with a manual." Founder Paul Brekus acquired and assembled the bulk of Aardvark's gear in the mid-1980s, and has steadily added an impressive repertoire of unusual grooving techniques to its standard offerings.

Large-scale liner notes are commonly understood to be the greatest loss associated with the music industry's shift away from vinyl, but album art has been scanned and preserved. Trick grooves are among the only attributes of the vinyl format that an MP3 legitimately cannot approximate—and in some cases they are central to the work itself.

LOCKED GROOVES

At the end of a side, as the grooves move in toward the center of the record, the very last section of the spiral is usually cut as a perfect circle that feeds back into itself. This is commonly known as a locked groove, because once the needle enters it, the record will spin through the same path indefinitely. The practical purpose for locked grooves, which are usually silent, is to keep the needle in place until someone has a chance to lift it off the record, but artists eventually realized that they could use them to create infinite audio loops at the end of their records. Perhaps

the most notorious locked groove can be found on original mono U.K. pressings of the Beatles' *Sgt. Pepper's Lonely Hearts Club Band*. On these pressings, "A Day in the Life" ends in a locked groove of overlapping tape loops that were later scrutinized as possible clues to the "Paul is dead" rumor. The loop didn't make it onto the U.S. pressings.

At thirty-three rpm, a locked groove contains exactly 1.8 seconds of audio, so targeting a locked groove with any specific bit of audio necessitates brevity. In 1981, the English band Heaven 17 ran the last chorus of "We're Going to Live for a Very Long Time"—the final song on their *Penthouse and Pavement* album—into a locked groove that endlessly repeats the line "For a very long time..." (the track length on the sleeve was listed as infinity). Like-minded references to the eternal nature of locked grooves include the never-ending standing ovation cut into the end of ABBA's *Super Trouper* album, and the infinitely dripping faucet that concludes "Alan's Psychedelic Breakfast"—the final song on Pink Floyd's *Atom Heart Mother*.

Some artists have used the side-ending locked groove to directly reference the record itself: the final sketch at the end of side two of Monty Python's *Another Monty Python Record* ends with one of the Pythons deliberately halting the sketch by scratching the record. The looping bit in this case is "Sorry, squire, I scratched the record...." The James Gang's 1969 debut, *Yer' Album*, has locked grooves at the end of both sides that creatively anthro-

pomorphize the record. At the end of side one, the locked groove repeats, “Turn me over....” Side two loops, “Play me again....”

Locked grooves can also be cut as stand-alone loops anywhere along the surface of the record: silent locked grooves have occasionally been used as a sort of punctuation between tracks, forcing the listener to manually advance the stylus.* In 1978, Graybeat records released a pioneering 7" called *Pagan Muzak*, a one-sided record consisting of seventeen locked grooves nested inside each other. The record was credited to Non (the nom de plume of experimental sound musician Boyd Rice) and has become a touchstone of sorts for both noise enthusiasts and records-as-art nerds alike. In interviews, Rice has recounted the difficulty he had in finding someone to master the record, working his way through several mastering houses before finding one willing to take it on as a professional challenge of sorts.

A similar collaboration has borne some of the most extreme examples of locked-groove records, created by noise label RRRrecords and Brekus at Aardvark Mastering. The *RRR-100* compilation is a 7" consisting of (as the title suggests) 100 locked grooves by various artists—50 per side. Brekus cut the master at no

* Jack White's latest musical project, the Dead Weather, took this concept of preventative punctuation to the extreme on the vinyl pressing of its latest album, *Sea of Cowards*. Following the silent locked grooves that conclude each side, two short songs have been cut into the actual labels at the very center.

charge because he “wanted to see if it could be done.” When the master plates to *RRR-100* were accidentally destroyed by the pressing plant that was storing them, Brekus and RRR upped the ante by creating *RRR-500*, an LP featuring a ridiculous 250 locked grooves per side. Take a minute to allow the staggering impracticality of such a record to soak in: 250 grooves that can only be advanced manually, by lifting and dropping the needle. Also consider that to create a usable master for each side of the record, Brekus had to cut 250 individual, concentric grooves without making a single mistake. He summarized the process thusly: “It took two solid days of cutting, and I think I had a nervous breakdown—untreated, of course.” In 2009, RRRrecords, again with the help of Brekus, released *RRR-1000*, a 12" record with 500 locked grooves on each side.

Turntablist culture has also embraced the locked groove as an important tool of the trade: “battle records” of multiple locked grooves exist to keep frequently used samples handy during live remixing. In addition to the expected drum patterns, these records often contain loops of single notes, the pitch of which can be shifted by speeding up or slowing down the record spin. Skilled DJs can improvise music using such grooves, playing them as they would an instrument. The Roland TR-909 Drum Machine, fetishized in house-music circles, has inspired a 12" record dedicated solely to its bass drum sound: the audio in the single locked groove on *TR-909 BASS*

DRUM is a looping kick-drum pattern in 4/4 time.

INSIDE-OUT GROOVES

Of all of these techniques, the easiest to appreciate is the inside-out groove. These grooves play from the center of the record to the outer edge, demanding attention before the stylus is even placed on the record. Records cut in this way often end with a locked groove along the outer edge, preventing the stylus from being thrown off the record as it reaches the end, though this is optional. Aardvark is happy to make the cut either way.

Inside-out cuts are deceptive in their simplicity—analyzing their true functionality turns out to be fairly mind-bending. In a traditional cut, grooves spiral from the outer edge toward the center in a counterclockwise fashion. In making an inside-out cut, the grooves are still cut in a counterclockwise spiral, but the spiral moves outward instead of inward. Bell at Aardvark summarized the process of making this sort of cut succinctly: “Boy, are those confusing to do.”

One of the most commonly referenced uses of this technique is a pair of compilations issued by Mercury Records in the early 1980s. Both records were titled *Counter-revolutionary Music*—one contained previews of the label's forthcoming rock releases, the other its R&B releases. Both sides of the records played inside out, and the text on the sleeves was reversed.

The origin of inside-out grooves appears to be practical in nature. In the heyday of radio, syndicated programming was pre-recorded for distribution to local stations on sixteen-inch master transcription discs, and similarly large-scale records were also sometimes played alongside silent films. Many of these records have one side cut normally and the other cut inside out, with directions on where to drop the needle (i.e., START) carved directly into the record surface.

Discussions taking place in the dark, record-obsessed corners of *Usenet* reveal that many of these artifacts likely date from the days before hot-stylus cutting was widely adopted (in the 1950s), meaning that the quality of audio would deteriorate as the cut progressed. Because of this, recordings long enough to necessitate more than one side of a record were often cut in an every-other fashion, meaning one side outside in, the next inside out, and so on. The end result was that, rather than jumping back to high quality every fifteen minutes, the audio would drift gradually back and forth—a much less jarring experience for the listener.

Inside-out grooves require almost no additional work on the part of the recording artist; the same audio is supplied to the mastering house regardless of whether the grooves run inside out or outside in. Consequently, this technique tends to surface more frequently than others in modern use, often as a feature of limited-edition singles. The visual reversal of watching a record

play out from the center is at first vaguely unnatural, and in this way, the inverted groove truly becomes a part of the packaging and experience of the record *containing* the audio, without affecting playback.

PARALLEL AND ROULETTE GROOVES

Having examined the possibilities of both changing where grooves start and nesting lock grooves inside each other, the next frontier of ridiculousness in record cutting is to nest multiple grooves inside each other as they spiral toward the center of the record. To visualize how such grooves would be cut, imagine two of the light cycles from the movie *TRON* starting along the outer edge of a record and spiraling inward without crashing into each other. (Failing this, visualize the on-ubiquitous cell-phone time-killer *Snake*, but with two snakes spiraling inward, side by side.) Two grooves cut in this fashion are commonly referred to as “parallel” grooves, and they allow two audio tracks to begin seemingly at the same point. This practice doesn’t appear to have a practical origin—it is purely the result of creative mastering—and the records it produces are unique in their unpredictability: each drop of the needle has a fifty-fifty chance of hitting either groove.

The most commonly cited example of a parallel-groove record is Monty Python’s *Matching Tie and Handkerchief*, the second side of which features two completely dif-

ferent programs in parallel grooves. This isn’t called out in any way on the packaging, which sets up some nice post-listening situational comedy—attempting to compare notes on side two with a friend, for example.

Records with *more* than two parallel grooves exist, and these are called “roulette” records. While boring old parallel grooves are usually cut to begin at the same point along the edge of the record, the spacing that goes into cutting roulette records usually results in the starting points spreading around the circumference of the record—visually suggesting a roulette wheel. In theory, you could cut as many parallel spirals as spacing would allow, but since the amount of surface area on a record never increases, the addition of each groove cuts the playback time a little more. For example, each track on a roulette record with four grooves can play for

LATE-’70s PUNK BANDS REFERENCED IN JENNIFER EGAN’S *A VISIT FROM THE GOON SQUAD* (2010)

- ★ Eye Protection
- ★ The Sleepers
- ★ Flipper
- ★ The Mutants
- ★ The Nuns
- ★ Negative Trend
- ★ Crime
- ★ The Avengers
- ★ The Stranglers
- ★ The Germs

—list compiled by
Debbie Swift Hampton

a quarter of the length of a normally grooved record.

As the number of grooves scales up, the odds of dropping the needle into any particular groove becomes relatively random, making them a fertile medium for toying with outcomes. A particularly well-remembered roulette-groove record came with *Mad* magazine's 1980 "Super Special" issue. "It's a Super-Spectacular Day" was a flexi-disc featuring eight interlaced grooves, each beginning identically ("It's a great big beautiful wonderful incredible super spectacular day!"), but concluding with different disastrous events ("You develop a twitch and a horrible itch / And you're covered with spots and you're getting the trots.... So you call an M.D. and he says 'don't ask me' / If it gets any worse you can speak to my nurse / And you manage to say as you wither away / That it's not such a super-spectacular day!").

Perhaps the most ambitious example of creatively embracing the randomness of roulette records is a children's record called *The Ever-So-Many Amazing Adventures of Johnny*. The four sides of the double-record set tell a story, which, played through in order, is fairly unremarkable. On subsequent listenings, however, the story can be drastically different: every side contains four interlaced grooves, each featuring diverging bits of the story. Four sides with four possibilities each yield 256 possible combinations, all culminating (spoiler alert!) in Johnny's mother waking him from his dream at the end of

side four. (The audio for all of the different grooves, along with playlists for all 256 outcomes, have been made available at kiddierecords.com.)

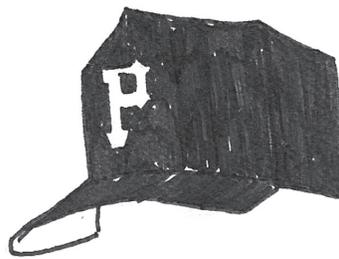
The randomness that roulette records offer makes them a natural medium for re-creating games of chance. Play-at-home, record-centric versions of bingo, roulette, horse racing, and baseball were pressed under a variety of lofty trade names (e.g., Secret Spiral Records, Multi-Track Sound Enterprises). In the 1990s, legendary engineer Ron Murphy—known for cutting the masters to hundreds of pioneering Detroit techno records—attempted to put a trade name to the parallel-groove technique, calling it "NSC-X2 Groove Technology."

The roulette-groove principle was also used in smaller form to add vaguely randomized "talking" to children's toys. The most familiar example of this in practice is the See 'n Say—a pull-string toy with an arrow in the center that spins around, randomly playing back recordings announcing letters of the alphabet ("Apple! A!"). Inside its plastic case, this device housed a tiny, twenty-

six-groove roulette record made out of hard plastic. No electronics were involved in playing the record—a tiny needle transmitted the vibrations to a plastic cone that acted as the speaker.

The use of grooves of this sort outside the domain of children's records and games of chance is somewhat limited, but when instances do pop up, they tend to be pretty inspired. In 1981, Rush released a promotional record with excerpts of six songs cut parallel to one another on each side. The title: *Rush 'N' Roulette*. British prog-rockers Marillion embraced the technique by incorporating it into their creative process. The last side of their 1994 album *Brave*, a concept album about a mute amnesiac, ends with two grooves running parallel—one features a happy ending, and the other a less-happy one. The CD reissue contains both versions, for cheaters.

When artists make the effort to integrate their content with trick grooves like this, the end result can have a huge impact on the way listeners experience a record, adding an unexpected physical dimension to the standard audio. Divergent or looping playback simply isn't possible within a standard MP3, and deviation from the MP3 specification can result in a corrupt file. In order to achieve any of the effects described above in a self-contained sound recording, artists still have no option but this most primal of playback technologies—simple grooves carved into a physical object. ★



Chuck D