

SONIC DOOM

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An acoustic weapon disorients rioters and afflicts an invading army with nausea. It can create 'ghosts' and arouse animal passions. Fantastic? JACK SERGEANT, delving into the possible uses and abuses of infrasound, isn't so sure. Additional material by David Sutton.

The human ear can only hear a limited part of the sound spectrum. Above that range is ultrasound and below it is infrasound; although largely unheard, vibrations in these ranges can still affect the human body in ways that are quite different from the informational aspect of simply listening. These higher and lower registers of sound frequencies are, today, the stuff of imaginative speculation. While the conspiracy watchers believe they are the basis of secret weapons research for covert operations, mind control and other conspiratorial uses, another, more idealistic, school associates them with meditative states and magical technology. The wilder fortean literature attributes to the builders of ancient monuments everywhere the secret of levitating blocks of stone by their mastery of sound; such powers were supposedly also used by the Vedic gods to power their vimana flying ships.

The use of disconcerting noise to unsettle the enemy is hardwired into most higher animals, from the warnings and battle roars of confrontational beasts to the trumpets, drums, bugles, bagpipes, devilish war cries, taunts and piercing shrieks used by humans in their conflicts. An example that springs to mind is that of Lieutenant Colonel Kilgore in *Apocalypse Now!*, blasting Wagner from his Cavalry helicopters. And, moving from film to recent history, consider how General Noriega was bombarded with endless cycles of high-volume pop music when he sought refuge in the Vatican Embassy in Panama, as were the Branch Davidians during the fateful siege at their compound in Waco.¹

Similarly, during the Gulf War, in the prelude to the final massacre of the fleeing Iraqi forces on the road to Basra, American soldiers were reported to have blasted grunge and death rock from speakers mounted on their vehicles. Yet in these cases, for all the psychological terror the noise was intended to create, it was a crude application of volume and culturally jarring music rather than the directed application of a sound frequency as a weapon.

Possibly the earliest account in Western literature of sound itself being used as a weapon can be found in the Bible. As detailed in Joshua 6:5, Joshua leads an attack on the city of Jericho (c1400 BC) during which he commands his people, outside the walled city, to remain in total silence for seven days. On the seventh day, seven trumpets made from ram's horns give a "long blast", the people shout... and the walls of Jericho come crashing down.² (It is significant that silence is used as well as noise and perhaps even ultrasound.)

Sound is a waveform, with low infrasonic frequencies having a long wave length (measured in tens of metres), and with high ultrasonic frequencies having a short wave length (measured in millimetres). The frequencies associated with ultrasound are most familiar from their utilisation by the medical profession, chiefly for

diagnostic imaging.

While the ears are designed to detect a limited range of frequencies – the human auditory range is between 20Hz and 20,000Hz (1Hz = 1 cycle per second) – different frequencies can affect the whole body and, at volume, can be felt in almost any part of the body. Even with industrial ear protectors, sound waves are able to enter the head via the nose and mouth which are, in turn, linked to the ears by the structure of the skull. Sounds that are higher in frequency than 20,000Hz – ultrasound – are inaudible to humans, while sounds lower than 20Hz – infrasound – are inaudible but can, on occasion, be felt resonating within the body itself. Exposure of unprotected ears to infrasound can also cause an increase in pressure within the middle ear, disturbing the sense of balance.

The natural world is awash with infrasound created by thunder, earthquakes, tsunamis, volcanoes, shifting tectonic plates and even winds. The ability of animals, such as bats and dogs, to hear ultrasound is well documented, but numerous animal species can also hear – and utilise – infrasound. Elephants, have a hearing range that is believed to start from 0.1Hz, enabling them to hear the distant rumble of thunderstorms far earlier than humans can and to communicate over long distances. Other animals may even employ infrasound as a weapon: recent research suggests that tigers are able to deliver a physically-stunning 18Hz roar immediately before attacking. Similarly, sperm whales seem to use pulses of infrasound to stun the large squid that form the basis of their diet.

Scientists have developed ways of measuring infrasound associated with these phenomena to aid their research. The military use of infrasound dates back to the First World War, when the detection of such frequencies helped pinpoint the enemy's heavy artillery. The idea that infrasound could actually be used as a weapon tends to be attributed to Axis scientists [3](#), but of course much of the weapons research by the Axis powers was also of interest to Allied military scientists (see 'Sounds suspicious' panel). The potential of infrasound to affect the human body has long been apparent; as anybody who has leant against the PA at a rave will tell you, even audible sub-bass frequencies at the correct volume can churn your stomach. The theory behind infrasound weapons tends to focus on the idea that certain frequencies can be used as both a weapon and as a method of crowd control.

According to the Working Paper on Infrasound Weapons produced by Hungary for the United Nations in 1978 [4](#), the frequency that is thought to be most dangerous to humans is between 7 and 8Hz. This is the resonant frequency of flesh and, theoretically, it can rupture internal organs if loud enough. Seven hertz is also the average frequency of the brain's alpha rhythms; thus this frequency has been described as dangerous but also relaxing. Whether exposure to such infrasound can trigger epileptic seizures, as some fear, remains unclear; experimental data on exposure to such frequencies gives a variety of results. It should be noted, however, that the strobe light effect associated with triggering epileptic seizures flashes at an equivalent rhythm. Frequencies below 50Hz commonly lose their coherence and are perceived to pulse or fluctuate, which is analogous to the strobing beat of a modulated light.

It was NASA scientists in the early 1960s who produced most of the documentation of the effects of infrasound on the human body; they were particularly keen to discover how proximity to the low frequencies produced by rocket engines would affect their astronauts, especially during launching. Their extensive tests confirmed

that, at certain volumes, infrasound did indeed have various physiological consequences. According to results published by NASA researcher GH Mohr, frequencies between 0Hz and 100Hz, at up to 150-155dB, produced vibrations of the chest wall, changes in respiratory rhythm, gagging sensations, headaches, coughing, visual distortion, and post-exposure fatigue. ⁵ Subsequent research has determined that the frequency that causes vibration of the eyeballs – and therefore distortion of vision – is around 19Hz.

The effects of this specific frequency were confirmed, independently, by the work of engineer Vic Tandy while attempting to demystify a 'haunting' in his Coventry laboratory. This 'spook' was characterised by a feeling of unease and vague glimpses of a grey apparition. A spot of detective work implicated a newly installed extractor fan that, Tandy found, was generating infrasound of 18.9Hz.

Tandy believes that 'ghost hunters' could benefit from investigating the infrasound frequencies at other 'haunted' locales. Not only does the 19Hz frequency create visual disturbances by vibrating the eyeball – hence the shimmering appearance of apparitions – but the frequency could also stimulate a psychological sense of disquiet (hairs on the back of the neck rising and so forth). Even the 'drop in temperature' associated with spectral manifestations could be an effect of infrasound: "It does not cause a measurable drop in temperature of the air," says Tandy, but "the effect is caused by a reaction in the body."

Effects like these could also, theoretically, be contributing to sick-building syndrome as standing waves of infrasound can be created by architectural anomalies or frequencies set up by electronic devices. In 1978, the artist-industrial musician Monte Cazazza and the group Throbbing Gristle (above) experimented in their East London studio with the creation of both ultrasound and infrasound frequencies. Cazazza remembers during infrasound tests using an industrial tone generator that the air began to shimmer and his clothes visibly "rippled under the waves." The group's ultrasound experiments were equally notorious; using an array of piezo-electric speakers ("because they were cheap" remembers Monte), they used frequencies in excess of 20,000Hz in a 'sonic loop', creating a continual, culminating wave. Their target was some troublesome neighbours; according to the group, the neighbours' dogs began to bark and both people and animals exhibited aggressive irritability. Unsurprisingly, the unwanted neighbours moved shortly after the sonic attacks.

There is good reason to believe, then, that exposure to certain infrasound frequencies could stimulate aggression and exacerbate psychological disturbances. This might explain accounts of 'temporary psychosis' associated with some natural phenomena, such as the Mistral (in the Rhone Valley) and the Sirocco (off the Sahara), the famous winds that are said to create periods of momentary insanity. That certain gusts of wind have infrasound frequencies has been documented. ⁶

The link between periods of insanity and exposure to specific infrasound frequencies forms the basis for the 'Feraliminal Lycanthropizer', a device claimed to stimulate atavistic animality, sexual excitement, and a loss of inhibitions in its target. As described in an essay published in *Dainty Viscera* magazine, the Feraliminal Lycanthropizer creates two infrasound frequencies – 3Hz and 9Hz – which, combined, generate a lower, third frequency of 0.56Hz. The machine also uses a combination of four subliminal,

looped, audio tape recordings – playing both forwards and backwards – outside the normal audible pitch.

The legends about the machine challenge belief; besides being credited with sparking unrestrained orgies, it has – at least according to Dainty Viscera – been blamed for the sex-and-strangulation deaths of six youths. Some, who claim to have used the machine, have felt themselves become mentally stronger and their will more focused. The enigmatic author of the essay claims that “[a] Catalonian national using the machine daily over a period of five or six weeks eventually managed to ingratiate himself to Adolf Hitler, [and] persuade his quarry to adopt the swastika as high totem and emblem of the burgeoning National Socialist Conference”.⁷ Such stories are, clearly, beyond belief. There is no evidence that the Feraliminal Lycanthropizer exists or could have such effects; information on it is limited and shrouded in secrecy. Any technology or documented process, no matter how rudimentary, that can affect people, both physiologically and psychologically, at a distance is bound to attract military scientists. A search of the available literature and the Internet reveals that many conspiracy theorists, paranoiacs, and some political activists, sincerely believe that the military has developed infrasound weapons... but precisely what these weapons are, how they function, and how they would be deployed remains vague. Unlike bacteriological, chemical, atomic, laser, and even microwave warfare, little information exists on the use of infrasound as a weapon.

Unsubstantiated reports suggested that infrasound weapons, built and tested in the 1970s, went badly wrong, resulted in wide-scale devastation within a four mile (6.4km) radius including uncontrolled killing sprees. I have seen no evidence yet to back up this rumour. Vic Tandy suggests that a broadcast infrasound weapon would, indeed, “cause more trouble than it is worth.” He explains: “In open air, the energy required to drive it is enormous and the effects unpredictable, ranging from serious harm to very little depending on the individual targeted. Directing infrasound is difficult because of the long wavelength, so if the weapon is to be activated by a person holding it, it would be hard to protect them from the sound. Direct contact with the weapon might also pose vibration problems for the operator.”

There is, however, evidence to suggest that ultrasound has been considered by military and law enforcement authorities as a likely technology for so-called ‘non-lethal weapons’ for use in crowd control and ‘coercive interrogation’. ‘White noise’ is believed to have been a key element in sensory deprivation techniques since the early 1970s and ultrasonic riot control devices are also believed to have been deployed in quelling civil unrest. One such device – the ‘squawk box’ – blasts two slightly different, intolerably high-pitched ultrasound frequencies (16,000Hz and 16,002Hz) at rioters; the two, when combined in the ear, effectively produce the frequencies 32,002Hz and 2Hz. The result, as one commentator put it, is to create in the rioters “a compelling wish to be somewhere else”.⁸ Whilst the military or law enforcement officials have never admitted to its use, or even its existence, instructions on how to build a ‘Phasor Pain Field Generator’ (“intended for Law Enforcement Personal Or For Qualified Acoustical Research”) is available from Information Unlimited, as are schematics for handheld ultrasound self-defence devices.⁹

Predictably, the media image of the use of infrasound is as a weapon that disables the body and discomforts the mind; however, it has also been discussed in association with enlightened meditative states.¹⁰ The mantras and chants of monks,

priests and followers of a variety of religions are commonly believed to have a profoundly calming effect on practitioners just as some musical instruments – like Tibetan thigh bone trumpets – are thought to resonate at the same frequency as the human body, whilst Tibetan singing bowls are believed to trigger specific frequencies in the brain. A significant part of this old ‘mystical’ technology is the ritual buildings (tombs, chambers, cathedrals and temples) designed to amplify or modulate the resonances created by rhythmic chants, singing or music. 11

The activity in our brains functions at several specific frequencies 12 so it seems logical that certain frequencies of sound which are harmonics of that neural activity may influence brain-specific activities. Audiotapes are available which are designed to stimulate the relaxing frequencies associated with meditative states via a process of binaural beats. These recordings work by sending different frequencies to each ear which, when combined in the brain, produce a therapeutic ‘pink noise’. Thus, an 800Hz tone in one ear, and 810Hz in the other, would create a 10Hz frequency intended to soothe the Alpha waves. Whether these binaural tapes work depends, undoubtedly, on the listener’s susceptibility to sound and to the philosophy associated with the tapes; however, many who use them report successful results.

We might not notice it, but infrasound permeates our daily environment; the machines around us, the buildings, and the weather all generate infrasound frequencies. The effects may be as unsettling as a ghostly vision, as tiring as the pressure created before a storm, or as invigorating as a good night’s sleep. Disabling forms of infrasound may be used in future wars or to quell civil riots and demonstrations. With important consequences like these, it is unsettling to realise that we actually know far too little about the audio frequencies that surround us.

MUZAK TO MY EARS

During the Second World War, workers in munitions factories would listen to the radio as they worked, and it was observed that they seemed to keep pace with the rhythm of the broadcast music. The faster the beat, the faster the production line would move.

Much has been made of ‘muzak’ and the way in which it has been used to both soothe and motivate people in factories, office buildings and shopping malls. Muzak’s pop-derived tones are intended to create – broadly speaking – a relaxed environment. However, muzak can be used as carrier for subliminal (hidden) messages which, for example, dissuade thieves in shops. Cynics have suggested that muzak could also be exploited to convey messages urging greater consumption in shops and increased work in factories. It is almost impossible to tell how successful these anti-crime and pro-shopping messages are, but their continued existence suggests that at least some of those investing in the shopping-as-leisure industry believe they are thereby turning muzak into a global industry.

In his essay “The Electronic Revolution”, cynical libertarian William S Burroughs suggested that riots could be triggered by playing tapes of gunshots, screams, and violent altercations at strategic locations. The idea influenced German filmmaker Klaus Maeck, who based his 1984 film *Decoder* on the idea of anti-muzak that creates riots. Shooting some of the film in Berlin during the annual May Day riots, Maeck found that many of Burroughs’ ideas were already employed by the crowd, who were broadcasting tapes of conflict and riot-noise.

In May 2001, in a novel crowd control experiment, bars and clubs in Leicester,

Britain, began to play, at closing time, music from popular children's TV programmes – including Magic Roundabout, Mr Benn and Looney Tunes cartoons. The idea was to lull patrons by the associated nostalgia into avoiding violent drunken brawls. 13

SOUNDS SUSPICIOUS...

Any discussion of sonic weapons has to contend with a huge volume of internet-circulated misinformation. As one scientist put it: "One cannot avoid the impression that much of what is written on acoustic weapons is based on hearsay and misunderstandings." Discussions of the subject invariably throw up the usual suspects of conspiracy theory – Tesla, the Nazis, the US military's 'black' research projects – while remaining vague, or downright contradictory, on names and dates.

Leaving aside the wilder claims about the German secret weapons programmes of World War II, it is certainly true that scientists under Hitler's regime were involved in projects covering just about every conceivable area of weaponry. The best known were the 'V' weapons and the rocket and jet-propelled fighters like the Me163 and the Me262 – but Allied intelligence, by the end of the war, had uncovered a vast array of far more bizarre projects, the development of which had been encouraged by Germany's non-centralised and chaotic approach to R&D. In the words of one contemporary American intelligence report: "There were more crackpot notions getting political support than we would have imagined." Some of the most eccentric projects seem to have originated with an Austrian researcher called Dr Zippermeyer, whose response to the ferocious Allied air bombardment of the Reich was to experiment with both wind and sound as potential anti-aircraft weapons.

One such device was the Windkanone or 'Whirlwind Cannon' (above), which was meant to produce artificial 'whirlwinds' by generating explosions in a combustion chamber and directing them through specially designed nozzles at the target. Experiments with a small cannon supposedly shattered planks at 200-yard (183m) range, and a full-size one was built. Fortunately for British and American aircraft, the effect was impossible to reproduce at high altitudes and the project was scrapped. The huge hulk of the 'Whirlwind Cannon' itself, though, was discovered rusting and abandoned by bemused Allied forces on the Artillery Proving ground at Hillersleben in April 1945.

Experimenting with the destructive properties of sound was a logical course for Zippermeyer, whose labs also worked on the Luftkanone or 'Sound Cannon' which burned methane and air to produce a rapid series of explosions that were beamed by 'sound-mirrors' into the sky; the resulting noise built up into a high-pitched tone which, apparently, had been shown as lethal to animals at close range and uncomfortable for human beings at 300 yards (274m). Ultimately, though, the 'Sound Cannon' was doomed by the same limitations that had beset the 'Whirlwind Cannon' – the impossibility of getting the destructive effects high enough to actually attack a flying target.

To demonstrate the confusion surrounding the whole subject, other accounts speak of a 'Sound Cannon' designed by a Dr Richard Wallauschek, a 'Vortex Gun' attributed to a 'Dr Zimmermayer' and a 'Wind Cannon' built at Stuttgart that was supposedly employed defensively at a bridge on the Elbe. Most of these accounts are unreferenced, and all seem to be more or less imaginative variants on the Zippermeyer devices.

The name most often mentioned in connection with the deadly potential of infrasound is that of French robotics researcher Dr Gavreau (sometimes given as 'Gavraud'), variously credited with having made some significant discoveries "around 1957", "in 1965" and "in the early '70s". To boil the story down to its essentials, Gavreau and his team experienced inexplicable bouts of nausea in their lab. These were eventually traced to a faulty motor-driven ventilator which, with the aid of a large concrete duct, was producing an infrasonic resonance.

Blithely abandoning his official research, Gavreau devoted himself to studying the effects of infrasound on humans and designing sonic weapons. The first was a sort of giant infrasound 'organ' with pipes some six feet (1.8m) in diameter and 75ft (23m) in length. On starting the device, the entire test building was shaken and nearly destroyed, while the hapless researchers were gripped in an "envelope of death". Luckily, a brave technician managed to shut down the power supply. Gavreau and his team were dangerously ill for days, their internal organs wracked with painful spasms as a result of their body cavities having resonated at the deadly frequency. They had only just escaped being "torn apart" by their own experiment. In Lyall Watson's version of the story, one of Gavreau's team was said to have been instantly killed by a six-foot-long 'whistle', "his internal organs... mashed into an amorphous jelly by the vibrations".

Another Gavreau test, involving a device less than a cubic metre in volume, caused a large, fan-shaped portion of Marseilles to shake. Later, a mounted and remotely-controlled version was said to have "burst heavy battlements and tank interiors open with a hideous effortlessness".

While Andy Cobley, in a letter to FT ([FT83:54](#)) claims that he could find no trace of the Gavreau patents that supposedly reside in the Paris Patent Office, an angry Dr David Fisher claimed that he had himself seen them – but had no intention of sharing such dangerous knowledge with "the sort of people who read *Fortean Times*" ([FT85:52](#)).

DO THEY WORK?

Well, perhaps Dr Fisher need not worry. At the 1999 conference of the Acoustical Society of America in Berlin, Jurgen Altmann presented a paper questioning the feasibility of sonic weapons. He conceded that the US military was researching ultrasound and infrasound and envisaged their use against both civilian and military targets, but given the lack of evidence, Altmann wanted to ask a few fundamental questions: What kind of sound sources could be used? What would the effects on humans be? Could permanent damage result?

It is possible to produce extremely strong infrasound and ultrasound at volumes high enough to cause damage, but, Altmann argued, producing the sounds alone is not enough to create an actual sonic weapon. The main difficulty lies in propagating the sound waves over distance to their intended target, a possibility hampered by the tendency of low-frequency waves to expand in all directions, thus losing focused power, and of high-frequency waves to enter a "shocked state" where energy is lost to the air. So sonic weapons, even those employing ultrasound and infrasound, would only work over very short distances and, rather than resulting in the kinds of psychological or physical effects claimed by conspiracy-heads or military nuts, would probably just cause serious and permanent hearing damage. Altmann had found no evidence that human targets would be rendered incapable of action by being severely spooked or losing physical control: "I

have found no hard evidence for vomiting or uncontrolled defecation, even at levels of 170 dB or more.”

So sonic weapons, despite the oft-repeated claims, would most likely be large, cumbersome, close-range devices resulting in ruptured eardrums.

NOTES

1. Exactly what pop music was played at Koresh and his followers remains ambiguous; reports have suggested the group were bombarded with everything from pop-music to Christmas songs (although actual song titles remain elusive). Noises ranging from the sounds of clocks ticking to the screams of dying rabbits have been alleged to have been utilised in the sonic assault on the compound. See also [FT133:34-38](#) and note [10](#) below.
2. According to archæological research by Bryant G Wood, and published in *Biblical Archæology Review* (1990), these stone walls were 15ft (4.6m) high in places.
3. The belief that the Nazis developed sonic technologies appears to be largely unsubstantiated, part of a modern reflex to attribute sinister research or technology to the Nazis on no more grounds than that it is ‘the kind-of-thing-Nazi-scientists-would-do’... along with flying UFOs into the Hollow Earth.
4. This paper, and several other key texts on infrasound, are collected together in Stuart Swezey, ed, *Amok Journal: Sensurround Edition* (Amok Books: LA, 1995).
5. Dr Michael Bryan and Dr William Tempest, “Does Infrasound Make Drivers ‘Drunk’?”, in Swezey, op cit.
6. Lyall Watson, *Heaven’s Breath* (Morrow, NY; 1984, p.260ff). See also FT coverage of the ‘humadruzz’, the pervasive hum-drone-buzz reports by many people in the British countryside – [FT115:28-31](#).
7. Although authorship of the essay in Dainty Viscera is anonymous [the same essay](#) appears on the Internet under the byline of David Woodard – see .
8. Author Unknown, “Army Tests New Riot Weapon” in Swezey, op cit.
9. [Information Unlimited](#), PO Box 716, Amherst, NH 03031-0716, USA
10. According to the on-line [Waco Siege](#) chronology, during the siege at the Branch Davidian compound, the FBI broadcast Tibetan Chants at high volume.
11. Paul Devereux explored some of these ideas in [FT89:48](#) and [FT93:47](#).
12. Delta (0.5 – 4Hz), Theta (4Hz – 7Hz), Alpha (7Hz – 12Hz), and Beta (13Hz – 30Hz).
13. *The Guardian*, Society section (6 June 2001) p.12.

FURTHER READING:

Stuart Swezey, ed.; *Amok Journal: Sensurround Edition* (Amok Books, 1999)

Ian V Hogg; *German Secret Weapons of the Second World War* (Greenhill Books, 1999)

Extensive listing of articles on [sonic weapons](#).

CROWD TEASER: US Patent 6, 017, 302 (2000) for the “Subliminal Acoustic Manipulation of Nervous Systems” is referred to as a ‘non-lethal weapon to cause disorientation and drowsiness in law enforcement standoff situations.’ Another patent for an ‘Acoustic Cannon’ (1999) is said to be ‘useful as a non-lethal weapon to disperse crowds or disable a hostile target.’

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[AUTHOR BIOGRAPHY](#)

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