

= Yamaha NS @-@ 10 =

The Yamaha NS @-@ 10 is a loudspeaker that became a standard nearfield studio monitor in the music industry among rock and pop recording engineers . Launched in 1978 , the NS @-@ 10 started life as a bookshelf speaker destined for the domestic environment . It was poorly received but eventually became a valuable tool with which to mix rock recordings . The speaker has a characteristic white @-@ coloured mid ? bass drive unit .

Technically , it is known as a speaker that easily reveals poor quality in recordings . Recording engineers sought to dull its treble response by hanging tissue paper in front of it , resulting in what became known as the " tissue paper effect " , a type of comb filtering . The NS @-@ 10 has been used to monitor a large number of successful recordings by numerous artists , leading Gizmodo to refer to it as " the most important loudspeaker you never heard of " . Yamaha discontinued the product in 2001 .

= = History = =

Originally conceived as a domestic hi @-@ fi speaker , the NS @-@ 10 was designed by Akira Nakamura and launched in 1978 . It was sold at the \$ 400 price point . The speaker was poorly received and its commercial life was short . However , it took five years for its popularity to be established with professional users . As recording engineers came to rely on the NS @-@ 10 as a benchmark , it dominated the mixing of pop and rock music throughout the world for at least 20 years .

The NS @-@ 10 displaced the Auratone 5C Sound Cube as the nearfield monitor of choice in the 1980s and was recognised for its ability to reveal shortcomings in recordings . It probably first reached American shores through a recording engineer 's visit to Japan . The engineer , likely to have been Greg Ladanyi , monitored a recording session through the speaker in a Japanese studio and brought a pair back on his return to the US . Ladanyi then began using the speakers in a Los Angeles studio . Other engineers heard the NS @-@ 10 for the first time and were impressed by its sound . Its use spread to New York where the NS @-@ 10 was adopted at The Power Station and other studios .

Early use of the NS @-@ 10 among engineers include Bob Clearmountain , Rhett Davies , and Bill Scheniman in the US , and Nigel Jopson in the UK . Clearmountain , then a rising star in record production , is often credited for the popularity of the NS @-@ 10 ; Phil Ward , writing in Sound on Sound , suggested that Clearmountain was probably not the earliest , but was certainly the most influential early adopter . It became a legend that Clearmountain had chosen it because it was the worst speaker he could find . He was one of a new breed of creative freelance recording engineers and producers who would travel from studio to studio equipped with their own gear that included microphones , and a pair of Yamaha NS @-@ 10 , as a reference .

Recording studios around the world , particularly those specialising in rock and pop music , adopted the speaker as the standard . In excess of 200 @,@ 000 pairs were sold throughout the world . Gizmodo referred to it as " the most important loudspeaker you never heard of " .

Yamaha stopped manufacturing the speaker in 2001 , citing problems sourcing the wood pulp for the drivers . Even years after it was discontinued , the speaker continued to be found in studios everywhere . Mix reported in 2008 that variants of the NS @-@ 10 were still commercially available in the Japanese consumer market .

= = Design and construction = =

The NS @-@ 10 is an 8 @-@ ohm two @-@ way loudspeaker with a 10 @.@ 4 @-@ litre Sealed cabinet measuring 382 × 215 × 199 millimetres ( 15 @.@ 0 × 8 @.@ 5 × 7 @.@ 8 in ) and weighing 6 kilograms ( 13 @.@ 2 lb ) . Its 2 @.@ 5 cm ( 0 @.@ 98 in ) particle @-@ board cabinet has a wood veneer skin with seven black finishing layers . The domestic version of the speaker was vertically orientated , and came factory fitted with a grille .

Its two drivers are a 180 mm paper woofer and a 35 mm soft dome tweeter . The woofer 's diaphragm , weighing 3 @. @ 7 g , is manufactured from a flat sheet of pressed pulp paper . Unconventionally , it is formed into conical shape not through moulding or pressure , but by curling and then gluing the two ends together . Against the black finish of the cabinet , the white bass / mid driver cone is a distinctive and iconic feature of the product .

The network is second @-@ order passive , crossing over at 2 kHz . The frequency range is quoted from 60 Hz to 20 kHz , and rated power handling is 25 ? 50 W. The early version of the speaker has press @-@ down type output terminals ; later models had screw terminals .

= = Signature sound = =

In simplistic terms , the NS @-@ 10 possesses sonic characteristics that allow record producers to assume that if a recording sounds good on these monitors , then it should sound good on most playback systems . Whilst it can reveal any shortcomings in the recording mix as well as the monitoring chain , it may lead to listener fatigue with prolonged use in the domestic setting .

The NS @-@ 10 does not have a perfectly flat frequency response . The sound of the NS @-@ 10 is slightly heavy in the midrange , and like other sealed @-@ box speakers of similar size its bass extension is limited . It has a + 5 dB boost in the midrange at around 2 kHz , and the bottom end starts rolling off at 200 Hz . The midrange response is so open that it exposes the frequencies that are the most problematic and worst @-@ sounding to the human ear .

On a practical level for the music professional , the speaker is analytic and clinical @-@ sounding . Gizmodo likened the NS @-@ 10 to music editors who reveal the weaknesses of recordings , so that engineers would be forced to either make necessary compensation in the mix or otherwise rework them .

A 2001 report by Newell et al. at Southampton University undertaken for Studio Sound in 2001 found that the NS @-@ 10 had excellent time @-@ domain response at low frequencies ? its ability to start and stop in response to signal input was found to be superior to that of most other nearfield monitors . Part of this was related to its closed @-@ box design . The researchers held that the extremely fast decay time of the speaker in the low frequencies ensures that the bass instruments ( guitar and drums ) are correctly balanced in the mix .

= = Product revisions = =

There were many other versions of the NS @-@ 10 , the best known of which were the " NS @-@ 10M Studio " and the " NS @-@ 10M Pro " , both introduced in 1987 . Technically identical to the " Studio " , the " Pro " comes fitted with a speaker grille and is meant to be used in a vertical orientation .

The " professional " version launched some nine years after its first introduction on the back of the popularity of the NS @-@ 10 among engineers . The revised version , with everything including the logo and connection panel orientated horizontally , was badged " NS @-@ 10M Studio " . Improvements included a new tweeter and crossover to address the problem in the treble , better connection terminals , and a sturdier cabinet that no longer accommodates grilles . The Studio reincarnation also has improved power handling ? 60 ? 120 W. In excess of 200 @, @ 000 pairs of " Studio " alone were sold throughout the world .

Also in the product line @-@ up were NS @-@ 10T , NS @-@ 10M X , NS @-@ 10MC , NS @-@ 10MT . The NS @-@ 10M X is a " Studio " with magnetic shielding and a different tweeter . In the 1990s Yamaha introduced the NS @-@ 10MT , a bass @-@ reflex version of the 10M X with a different tweeter and grille . Designed for home cinema , it has bass response down to 43 Hz , nominal impedance of 6 ohm and maximum power handling rated at 180 W. A miniature version named Natural Sound Surround Speaker NS10MM was launched in 1997 or 1998 .

= = Reception = =

The sound quality of the NS @-@ 10 has polarised opinions , characterised as " love them or hate them " . Many professionals find it indispensable , even though they may not particularly enjoy listening to it ; others refuse to give it space in their studio but will happily admit that it is an effective professional tool . The reliance on the NS @-@ 10 by top independent producers became a viral phenomenon ; thousands of studios equipped themselves with NS @-@ 10s to attract big named producers , making the speakers an industry standard .

= = Tissue paper effect = =

Clearmountain was said to have been one of the first recording engineers to hang tissue paper over the tweeters of the NS @-@ 10 to tame the over @-@ bright treble . Covering the tweeters with tissue paper was said to produce treble @-@ deficient mixes when replayed on normal domestic hi @-@ fi . The phenomenon became the subject of hot debate . Recording engineer Bob Hodas investigated the alleged sonic effects of tissue paper . He found inconsistent results with different paper , but said that tissue paper generally demonstrated an undesirable effect known as comb filtering , where the high frequencies are reflected back into the tweeter instead of being absorbed . Hodas derided the tissue practice as " aberrant behaviour " , saying that engineers usually fear comb filtering and its associated cancellation effects . He also suggested that more controllable and less random electronic filtering would be preferable . Newell et al. noted that had the speakers ' grilles been used in studios , where they are routinely removed , they would have had the same effect on the treble output as the improvised tissue paper filter .

= = Influence = =

The speaker came to be relied on by independent engineers , who worked in different studios and needed equipment they were familiar with as a reference point . Throughout the 1980s , engineers and producers worked widely with the speaker to monitor " [ almost ] any album you love from the 80s or 90s " ? from Born in the U.S.A. ( Bruce Springsteen ) , Avalon ( Roxy Music ) Let 's Dance ( David Bowie ) , to Big Bam Boom ( Hall and Oates ) .

The NS @-@ 10 , and the Auratone before it , are two of the most influential nearfield monitors used in the professional mixing of sound recordings . In 2008 , the NS @-@ 10 was inducted into the Mix magazine TECnology Hall of Fame . Also reflecting its influence , the speaker won a Technical Grammy for Yamaha in 2007 . In 2008 , the speaker was found " in almost every studio " .