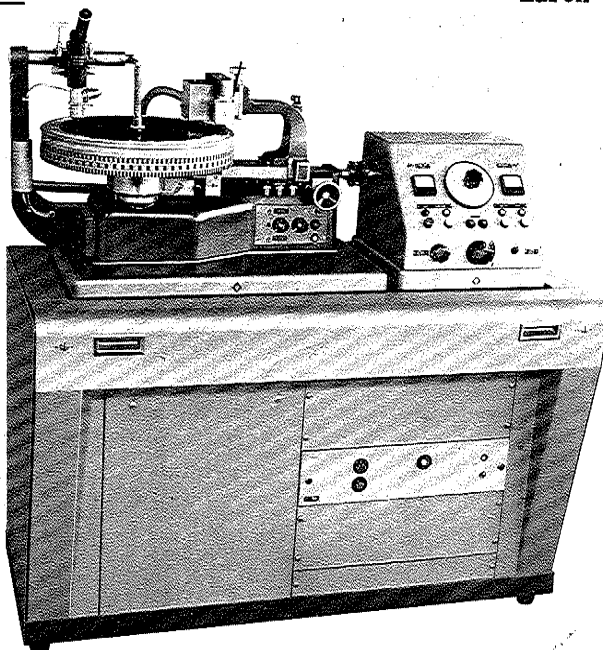


D I S K R E C O R D I N G M A C H I N E
A N D A C C E S S O R I E S

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ILLUSTRATION

March 1957



GENERAL DESCRIPTION

Twenty years of continuous experience in sound recording technique and the application of modern ideas led to the development of NEUMANN DISK RECORDING MACHINES, which are designed in accordance with internationally stipulated sound recording and reproducing standards.

The above illustration shows a complete DISK RECORDING MACHINE, which is deliberately composed of several self-contained units, at which - in any case - the RECORDING MACHINE, Model AM 32 or AM 32a, and its AUTOMATIC CUTTERHEAD MOVING UNIT, Model VA 32a, represent the basic units.

This way of construction makes it possible to take at any time individual wishes into consideration by combining the RECORDING MACHINE and its AUTOMATIC CUTTERHEAD MOVING UNIT with the various complementary units according to the intended use. Moreover, it involves some further advantages such as: best accessibility for survey and maintenance as well as most comfortable and simple operation.

These features together with the high uniformity in running and a minimum of wow and flutter make the NEUMANN DISK RECORDING MACHINES suitable for cutting cellulose- or lacquer-coated disks

of highest quality, especially those which are to be used for the purpose of making masters.

The two different kinds of cutterhead suspension arrangements - in standard design for the Model AM 32 and in special design for the Model AM 32a - allow in any case the application of the most customary cutterhead types with or without feed-back system.

On special request, the RECORDING MACHINE, Model AM 32a, can be provided with a special microscope of high quality and some additional complementary parts.

The AUTOMATIC CUTTERHEAD MOVING UNIT, Model VA 32a, drives the lead screw of the RECORDING MACHINE. With this unit the groove pitch to be recorded can continuously be varied within the limits stated below under "TECHNICAL DATA".

In order to make it possible to operate a combined TAPE PLAYBACK-AND-DISK RECORDING MACHINE by one operator only and to avoid possible errors in operating the RECORDING MACHINE and the AUTOMATIC CUTTERHEAD MOVING UNIT are furnished with pilot relays and a combined start-and-stop mechanism, which enable the machine to perform the following actions fully automatically:

- 1.) Start of the TAPE PLAYBACK MACHINE.
- 2.) Cutting of run-in spirals.
- 3.) Cutting of concentric circles.
- 4.) Lifting up of the cutterhead with simultaneous interruption of the stylus heating circuit.
- 5.) Cutting of run-in, marking= and run-off spirals with increased depth in connection with the RECORDING MACHINE, Model AM 32a, only. (With Model AM 32 mechanically by hand).
- 6.) Cutting of marking= and run-off spirals according to the number of scrolls contained in the tape to be reproduced in connection with the PHOTOCCELL CONTROL UNIT ZA 34/35.
- 7.) Variable groove pitch recording as a function of the recorded amplitude for best utilization of the disk surface in connection with the GROOVE PITCH CONTROL AMPLIFIER SV 32 and the TAPE PLAYBACK MACHINE, which has to be provided with a special head arrangement for this purpose.

TECHNICAL DATA

Turntable Diameter 16 $\frac{1}{2}$ inch. (420mm)
Turntable Speeds 33 $\frac{1}{3}$, 45 and 78 rpm (16.2/3 rpm in connection with ZA 33 unit)
Wow and Flutter < 0,5 o/oo
Disk Holding by special suctiontable
Rumble Attenuation Factor > 55 db
Start Mechanism for run-in spirals adjusted for 6.3/4", 9.3/4" and 11.3/4" disk diameter
in standard design for DIN systems calibrated in terms of "mm"
in special design for RCA a.o. systems calibrated in terms of "inch"
Cutterhead Suspension Arrangement:
on Model AM 32 standard design
on Model AM 32a special design with electrical-controlled depth of cut adjusting device

Concentric Circle automatically
Eccentric Circle mechanically by hand
Stylus Heating Current adjustable up to 1,3 A d.c.
Groove Pitch Ranges

continuously variable for modulated grooves	33 $\frac{1}{3}$ rpm: 94 ... 422 grooves/ 45 rpm: 127 ... 572 " inch 78 rpm: 58,4... 279 "
continuously variable for run-in, marking= and run-off spirals	33 $\frac{1}{3}$ rpm: 30,5... 356 " 45 rpm: 22,8... 267 " 78 rpm: 15,3... 153 "

Mains Supply 3x380 V~50 or 60 cps (for 220V single phase current in connection with ZA 32 unit)

Dimensions: AM 32 28 x 14 inch. (base plate)
VA 32a 15 x 14 inch. (base plate)
Weight: AM 32 ~95 kg without accessories
VA 32a 30 kg

TECHNICAL DETAILS

The RECORDING MACHINE has a cast iron basement, on which the turntable, the turntable bearing and the lead screw with the carriage assembly are mounted. For the purpose of shock absorbing the basement of the machine is additionally mounted on a second base plate, which is set on four adjustable rubber feet. The mechanical connection between the lead screw of the RECORDING MACHINE and the driving axle of the AUTOMATIC CUTTERHEAD MOVING UNIT is made by flexible rubber couplings, whereas the turntable bearing and the driving motor are connected by a flexible shaft assembly. The separation between the driving units and the machine itself as well as the high precision, with which all parts capable of movement are finished, guarantee a high uniformity in running.

The cutterhead suspension arrangement of the RECORDING MACHINE, Model AM 32a, is additionally provided with an electrically controlled depth of cut adjusting device, which makes it possible to pre-adjust the depth of cut desired electrically and, moreover to cut run-in, marking= or run-off spirals automatically with increased depth if desired.

All automatic actions to be performed by the spiralling motor in the AUTOMATIC CUTTERHEAD MOVING UNIT during the process of recording as well as the lifting up of the cutterhead and the interruption of the stylus heating circuit when recording has come to an end are effected by a combined start-and-stop mechanism, which is attached on a ruler on front of the RECORDING MACHINE below the carriage. The scale of the ruler is calibrated in terms of "inch" and the three starting cams as well as the adjustable stop pin of the start-and-stop mechanism are designed in their length and position according to the relative diameters of the most customary disk sizes.

The disks to be cut are held to the turntable by special suctiontables of different types, the suction areas of which can mechanically be adjusted to the different disk sizes.

The AUTOMATIC CUTTERHEAD MOVING UNIT, Model VA 32a, is also set on four adjustable rubber feet. The most essential parts of this unit are two voltage-controlled Ferraris motors, which show - due to their special circuit arrangements - a very high constancy within a large speed range. Both these motors are connected with a two-step gear, which in turn is coupled with the lead screw of the RECORDING MACHINE. The number of revolutions of the "main motor" in the VA 32a unit can continuously be adjusted by the main potentiometer on the front panel of the VA 32a unit. The dial of this potentiometer is calibrated in terms of "grooves per inch" for the three speed ranges $33\frac{1}{3}$, 45 and 78 rpm. The brake current for the "main motor" can be taken from the GROOVE PITCH CONTROL AMPLIFIER SV 32, thus effecting a speed variation of this motor dependent on the modulation to be recorded. The number of revolutions of the "spiralling motor" in the VA 32a unit, the speed of which is much higher than that of the "main motor", can be adjusted by three potentiometers for run-in and marking spirals and three further potentiometers for run-off spirals.

For best and most suitable installation, the complete RECORDING EQUIPMENT should be mounted in the CABINET ZT 32, which was deliberately designed for this purpose.

The RECORDING MACHINE consists of the following basic units:

- a) Recording Machine AM 32 or AM 32a
- b) Automatic Cutterhead Moving Unit VA 32a
- c) Suctiontable ZA1, ZA2, ZA3 or ZA4
- d) Turntable Driving Motor SM 8/3 or SM 8/3-A (auto-synchronous type)

inclusive: Chip Glass, Hose Pipes and Groove Inspection Microscope.

ACCESSORIES

- e) Cabinet ZT 32
- f) Groove Pitch Control Amplifier SV 32
- g) Phase Advancer ZA 32
- h) Vacuum Plant (S & H. Protos)
- i) Meyer Light Source Z 21
- j) Photocell Control Unit ZA 34/35
- k) Special Microscope with Stroboscope-Lamp
- l) Tone Arm with dyn. Pick-Up
- m) Supplementary Device ZA 33 for operating the equipment with $16.2/3$ rpm.
- n) Cutterhead and Accessories on special request