



Georg Neumann GmbH | Berlin

10000 80203

**Operating Instructions for NEUMANN
Condenser Microphones of the fet 80[®]-
series, KM 83 i, KM 84 i, KM 85 i, KM 86 i,
KM 88 i, KMS 84 i**

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1. General

All Neumann Condenser Microphones are high-quality studio microphones. Because of the wide range of different characteristics available, an appropriate Neumann microphone can be found for every application in the broadcasting, television, film and recording fields. The small size makes these microphones especially advantageous. The KM 88 i has nickel membranes. All other models have gold coated polyester (Mylar) membranes. All microphones mentioned in these instructions operate with 48 V phantom powering according to DIN 45 596. Detailed information can be obtained from our information leaflet "Compatible Central Powering for Neumann Condenser Microphones of the fet 80-Series" No. 10000 80801.

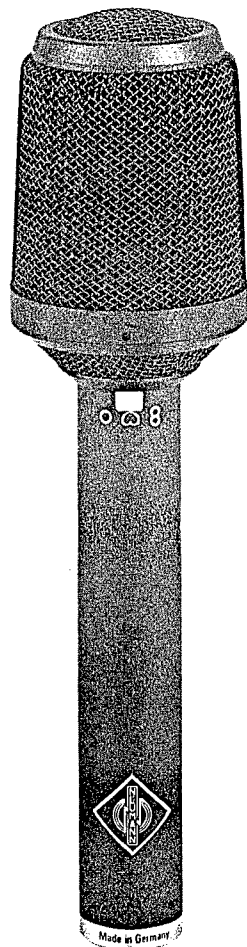
KM 83 i, KM 84 i and KM 85 i

Externally, these three microphones are identical. All three capsules are interchangeable simply by screwing them onto the same amplifier. The KM 83 i is omnidirectional; the KM 84 i and the KM 85 i are both cardioids. The KM 85 i incorporates a low frequency roll-off which reaches about 12 dB at 50 Hz. This microphone is therefore much less sensitive to low frequency interference which may be encountered outdoors or in public address applications, while at close talking range, the characteristic low frequency boost present in all pressure gradient transducers, is compensated. The "linear admittance" characteristic of the KM 84 i and the KM 85 i units provides for unaltered sound quality regardless of the direction from which the sound impinges on the microphone.

KM 86 i

Two back-to-back, individual capsules permit the three directional characteristics: omni, cardioid and figure-8 to be electrically selected by means of a switch located below the capsule head. The KM 86 i is especially noteworthy in that it reproduces low frequencies equally well for all three directional characteristic even at a great distance from the sound source. High frequency response is virtually linear both in the diffuse as well as the free sound field. In contrast to KM 83 i, KM 84 i, and KM 85 i microphones, the "axis of maximum sensitivity" is at right angles to the microphone body.

The front side of the microphone is that side on which the NEUMANN insignia is located.



KM 86 i mt



KM 84 i

KM 88 i

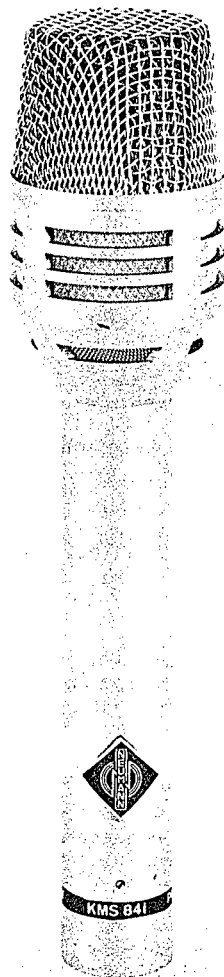
In spite of the KM 88's three-pattern switchability - omni, cardioid and figure-8 - it is notably small in its outside dimensions. The switch is recessed to protect it from inadvertent operation. Therefore it is necessary to use a ball point pen or other sharp pointed instrument to operate the switch. The directional symbols are engraved on the microphone housing. The diameter is the same as the KM 83 i, KM 84 i, and the KM 85 i. The capsule's dual membranes are metal with a thickness less than $1\text{ }\mu\text{m}$ (0.04 mils). A slight boost in the upper part of the frequency range gives the sound quality produced with this microphone a special brilliance. The axis of maximum sensitivity is at right angles to the microphone body. The front side of the microphone is that side on which the NEUMANN insignia is located.

KMS 84 i

The soloist microphone KMS 84 i is especially designed for hand held, closetalking applications. The direction of maximum sensitivity is in line with the axis of the microphone body. An acoustical filter in front of the condenser capsule and the use of an overloadproof operational amplifier prevent overloads caused by the sub-audio parts of sibilants and explosives. At the same time, however, the individual speech characteristics of the vocalist are transmitted with the brightness typical of condenser microphones. The microphone capsule is suspended elastically in the microphone head. The protecting grille can be unscrewed and replaced with grille available in red, yellow, green, blue, dark matt finish and matt satin-nickel finish, to facilitate microphone identification on stage. The microphone is equipped with a KK 84 cardioid capsule.

2. Overload Protection Switch

On the back of the amplifier housing of all microphones there is a 10 dB overload switch. This switch is recessed and, therefore, protected from inadvertent operation. The microphones can then tolerate sound pressure levels of up to 131 dB (= Pressure of 71 Pa) without distortion. (KMS 84 i: 148 dB).



KMS 84 i

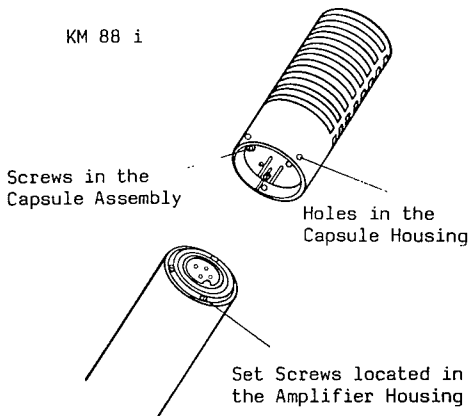


KM 88 i mt

After removing the capsule head, turn the three screws located on the bottom of the housing inward and pull the amplifier out the bottom of the housing. Re-assembly of the microphone is done in reverse order: i.e., the capsule is plugged in last. If the capsule is replaced first, the amplifier could bend the thin pins located on the capsule head. Be careful that the capsule head is not misaligned when attempting to assemble it onto the housing. Be sure that the three holes at the bottom of the capsule head align with the three set screws in the top of the housing containing the amplifier and the screws holding the capsule assembly.

The amplifier of the soloist microphone KMS 84 i can be removed after screwing in the three screws towards the connectors' end. The capsule head is connected with the amplifier housing by means of a thread. From the capsule head the grille can be removed, then the elastically suspended capsule KK 84 is accessible.

KM 88 i



Position of the Capsule Connector

Attention:

The isolated elements close to the microphone capsule and the other extremely high impedance parts are by no means to be touched since even a minimum of dirt or grease may diminish the insulation and cause parasitic leakage voltage.

5. Microphone versions and Output wiring

These versions are available:

KM 83 i	} Standard version with male 3-pole connector insert as per IEC 268-12. Requires Switchcraft A3F female connector (XLR type).
KM 84 i	
KM 85 i	
KM 86 i	
KM 88 i	
KMS 84 i	

Microphones wired per IEC 268-12 (pin conn. 130-x-IEC 02) or DIN 45 599 I, respectively:

Modulation is connected to pins 2 and 3, the shield to pin 1. A sudden sound pressure rise in front of the (front) membrane causes a positive voltage to appear at pin 2.

KM 83 i mt	} As above, but with dark matt finish.
KM 84 i mt	
KM 85 i mt	
KM 86 i mt	
KM 88 i mt	
KMS 84 i mt	

As special versions are available:

KM 83	} with male 3-pole connector insert per DIN 41 524. Requires Binder 09-0006-00-03 or Tuchel 3261001 female connectors.
KM 84	
KM 85	
KM 86	
KM 88	
KMS 84	

Microphone wired per DIN 45 599 N: Modulation is connected to pins 1 and 3, the shield to pin 2.

As sudden sound pressure rise in front of the (front) membrane causes a positive voltage to appear at pin 1.

KM 83 mt	} As above, but with dark matt finish.
KM 84 mt	
KM 85 mt	
KM 86 mt	
KM 88 mt	
KMS 84 mt	

The portable power supplies for the microphones Type "i" carry also the suffix "i".

6. Microphone Cables

The following cables are available for the microphone:

- IC 3 10 m (33 ft.), without swivel mount, Switchcraft connectors. May also be used as extension cable.
- KT 1 10 m (33 ft.), without swivel mount, with 3-pole connectors per DIN 41 524 at both ends. May also be used as extension cable.

These cable are also available with a dark matt connector at the microphone end. They are then referred to as IC 3 mt and KT 1 mt, respectively.

Other cable lengths on special order.

The cable length between microphone and following preamplifier should not exceed 300 m (980 ft.). The capacitance of greater cable length could affect the frequency response and, in conjunction with the leakage inductance of the microphone's output transformer, would result in a rise at the upper end of the frequency range.

7. Power Supply

The microphones operates on 48 volt phantom power (P 48, IEC 268-15A, DIN 45 596). With phantom powering the dc from the positive supply terminal is divided via two identical resistors, one half of the dc flowing through each audio (modulation) conductor to the microphone, and returning to the voltage source via the cable shield. As a consequence, the effect of dc supply voltage noise superimposed on the microphone output voltage is reduced by the common mode rejection factor (≥ 60 dB). Phantom powering provides a fully compatible connecting system, since no potential differences exist between the two audio conductors. Studio outlets so powered will therefore also accept dynamic microphones and ribbon microphones as well as the modulation conductors of tube-equipped condenser microphones without the need to switch off the dc supply voltage. No harm is done even if a phantom power supply is connected to an outlet which is centrally phantom powered.

AC Supply Operation

All P 48 power supplies according to IEC 268-15A and DIN 45 596 are suitable for powering the microphones.

Current consumption for each microphone in the range of 0.5 mA.

The Neumann P 48 power supply unit bears the designation N 452 i. It is designed to power one or two microphones. It operates from 110 V or 220 V $\pm 10\%$ power lines. Switching of the line voltage is easily accomplished by changing the line fuse which is accessible after removing the supply cover. Four screws must be removed for this purpose.

Modulation polarity at the power supply output is identical with that at the microphone (see chapter 5).

It is recommended that a permanently wired central powering be utilized when powering numerous microphones (see our bulletin No.10000 808.. "Central Powering"):

N 448 a ac mains operated central powering unit, maximum current output 100 mA. Available versions: plug-in PC board as well as various modules.

GW 2448 ka dc-to-dc converter using 24 Vdc operating voltage. Maximum current output 50 mA. Available versions: plug-in PC board as various modules.

Models GW 2448 ka and N 448 a are improved later models of the discontinued GW 2448 k, NK 48 a or N 448, respectively.

8. Battery Operation

Neumann condenser microphones also be operated from batteries using the BS 945 i battery supply.

This battery supply provides 48-volt-phantom powering for any of the fet 80R-series condenser microphones. It requires two ordinary IEC 6 F 22 9-volt-batteries which may be readily obtained everywhere. The 48-volt potential required is produced by a dc converter. Battery life depends mainly on the type of battery used. It is at least 15 hours operating time for most fet 80R-series microphones. Decreasing battery voltage is indicated by a flashing LED. The use of mercury batteries increases battery life fourfold. Instead of batteries, rechargeable NiCd batteries may be

used. They may be recharged via the built-in charging jack in the power pack, using a Beyer Dynamic SLG 150/180 battery charger.

Modulation polarity at the power supply output is identical with that at the microphone.

Technical Specifications

N 452 i

Operating voltage	110 V/220 V $\pm 10\%$ 50/60 Hz
Power consumption	max. 5 VA
dc voltage output	2x48 ... 53 V
Current output	max. 2x10 mA
Ripple	$\leq 0,2 \text{ mV}_{\text{rms}}$
Dimensions	135 mm long (5.3") 125 mm wide (5") 65 mm high (2.6")
Weight	approx. 750 g (1.65 lbs.)

BS 945 i

Operating voltage	18 V
dc voltage output	48 V $\pm 4 \text{ V}$
Maximum current output	1 mA
Batteries	2x9 V (IEC 6 F 22)
Dimensions	120 mm long (4.7") 67 mm wide (2.6") 24 mm high (0.9")
Weight	
(without batteries)	approx. 170 g (6 ozs.)

N 448 a

Operating voltage	110 V/220 V $\pm 10\%$ 50/60 Hz
Power consumption	max. 15 VA
dc voltage output	48 V $\pm 0,5 \text{ V}$
Current output	max. 100 mA (max. 50 mA shorted)
Ripple	$\leq 0,3 \text{ mV}_{\text{rms}}$
Fuse	220 V: 0.1 A, slo-blo 110 V: 0.2 A, slo-blo
Connector	15-pole male DIN 41612
Mating connector required	15-pole female DIN 41612
Dimensions of PC board	100 mm long (4") 160 mm wide (6.5") 36 mm high (1.4")
Weight	approx. 300 g (11 ozs.)

GW 2448 ka

Operating voltage	24 V (21 ... 28 V)
Current consumption	max. 230 mA
dc voltage output	48 V $\pm 1 \text{ V}$
Current output	max. 50 mA (max. 60 mA shorted)
Ripple	$\leq 0,1 \text{ mV}_{\text{rms}}$
Connector	31-pole male S 31 DIN 41 617
Mating connector required	31-pole female FL 31 DIN 41 617
Dimensions of PC board	100 mm long (4") 160 mm wide (6.5") 36 mm high (1.4")
Weight	approx. 190 g (7 ozs.)

9. Operation with Unbalanced and Center Tap Grounded Inputs

With phantom powering both modulation leads of the microphone cable, as well as the outgoing modulation leads of the power supply, are at +48 volt potential. This is of no consequence with regard to the balanced, floating amplifier and console inputs commonly used in studio equipment. If, however, the supply voltage is applied to unbalanced or center tap grounded amplifier inputs, it will be shorted and the microphone so connected will not work.

In center tap grounded equipment with input transformers (e.g. some NAGRA models) this ground connection may be lifted without any negative effect on equipment performance.

There are two ways of connecting a phantom-powered condenser microphone to unbalanced amplifier inputs:

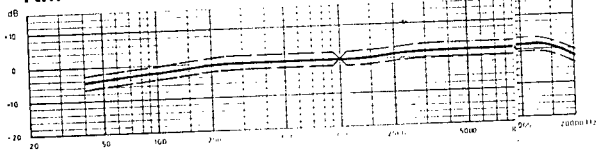
- Insert a high-quality AT 8/1 i-type 1:1 cable transformer in the outgoing modulation lead. Since there exist a great number of different microphone input connectors, the secondary side of the cable transformer comes with tinned wire ends (see "Accessories" section).
- Microphone and power supply may be adapted to unbalanced inputs by means of some minor alterations at our factory. This is recommended if microphones are intended exclusively for use with unbalanced inputs commonly found in semi-professional or hometype equipment.

		KM 83i	KM 84i	KM 85i	KMS 84i	KM 86i	KM 88i
Acoustical operating principle		Pressure transducer	Pressure gradient transducer	Pressure gradient transducer	Pressure gradient transducer	Pressure gradient transducer	Pressure gradient transducer
Polar pattern		Omni	Cardioid	Cardioid	Cardioid	Omni/cardioid/figure-8	Omni/cardioid/figure-8
Frequency range	Hz	40 ... 20 000	40 ... 20 000	40 ... 20 000	40 ... 18 000	40 ... 20 000	40 ... 16 000
Sensitivity at 1 kHz ¹⁾	mV/Pa	7	10	9	5	9,5	6,5
Source impedance switchable to	ohms	200 50	200 50	200 50	150	200 50	200 50
Minimum load impedance	ohms	1000 / 250	1000 / 250	1000 / 250	1000	1000 / 250	1000 / 250
S/N ratio according to DIN 45 590 (ref. level 1 Pa)	dB	67	70	69	69	68	68
DIN 45 405 (1967)	dB	27	24	25	25	26	26
Equivalent loudness level due to inherent noise	CCIR 468-1 (1976) dB	31	28	29	29	30	30
IEC 179	dB-A	20	17	18	18	19	19
Max. SPL for less than 0.5 % THD at 1 kHz ²⁾	with pre-attenuation dB	123 133	120 130	120 130	138 148	121 131	124 134
Power supply (P 48 DIN 45 596)	V	48±4	48±4	48±4	48±4	48±4	48±4
Current consumption	mA	0.4	0.4	0.4	0.5	0.4	0.45
Minimum operating time on battery supply BS 945i	hours	15	15	15	15	15	15
Weight	g	80	80	80	210	200	130
Dimensions							
Version with Switchcraft connectors	diameter mm length mm	21 110	21 110	21 110	21/40 177	21/47 185	21 170
Version with Binder connectors	diameter mm length mm	21 110	21 110	21 110	21/40 177	21/47 175	21 165

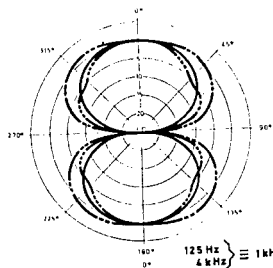
¹⁾ 1 Pa $\triangleq$ 94 dB SPL

²⁾ THD of the microphone amplifier when an input level equivalent to the capsule output at the specified SPL is applied

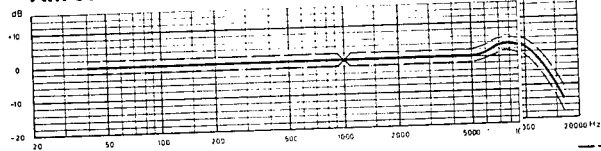
KM 86 i



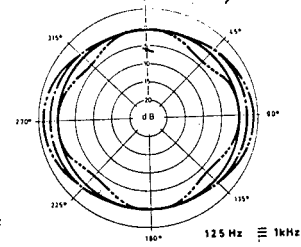
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KM 88 i

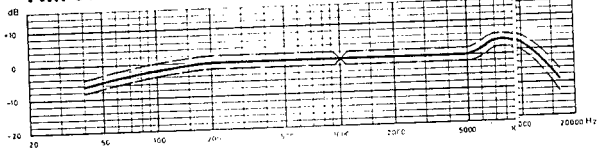


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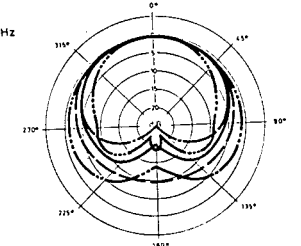


— 125 Hz
— 1 kHz
— 4 kHz
— 8 kHz
— 12.5 kHz

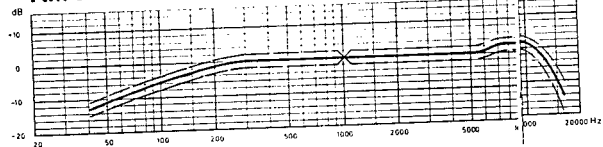
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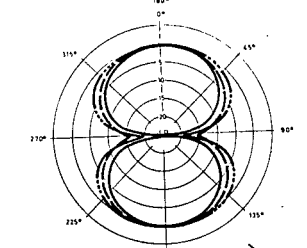
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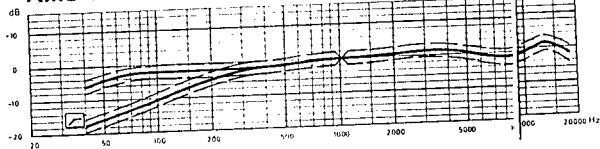
KM 88 i



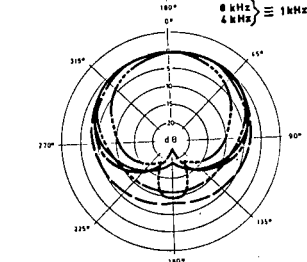
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KMS 84 i

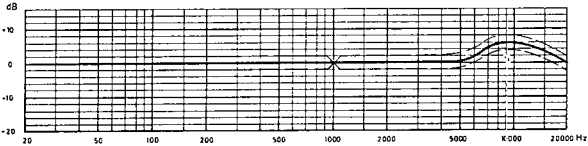


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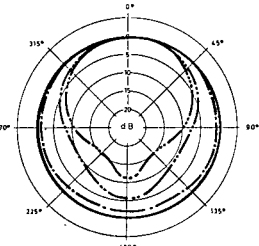


11. Frequency Responses and Polar Patterns

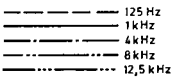
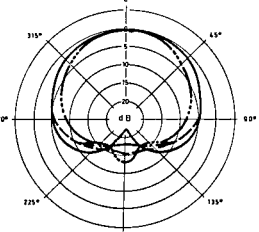
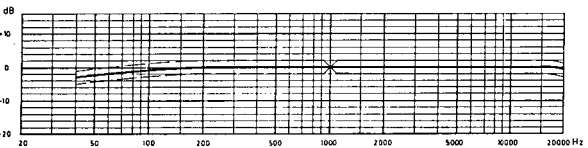
KM 83 i



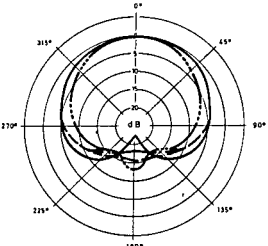
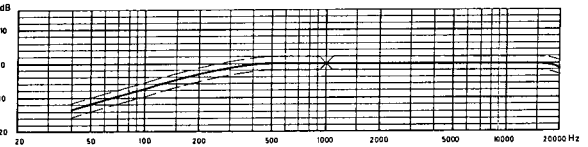
125 Hz 1 kHz



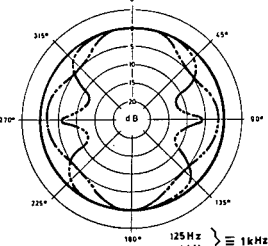
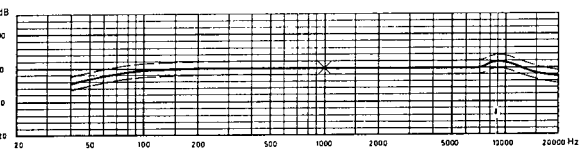
KM 84 i



KM 85 i

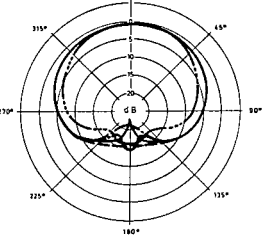
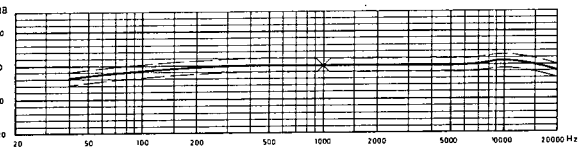


KM 86 i



125 Hz 1 kHz

KM 86 i



12. Accessories

Most of the table stands, floor stands, etc. have a 5/8"-27 thread. An adapter (Parts Catalog No. 8421400018) can be supplied to provide compatibility with 3/8" and 1/2" threads.

Table Stands

MF 1

Table stand with bell-shaped cast-iron base, 0.9 kg (2 lbs.), 115 mm (4.5") in diameter.

The stand is black wrinkle finish lacquer and non-slip due to a rubber ring attached to the bottom. A reversible stud having two different threads permits use of two thread standards. Thread combinations: 1/2" and 5/8"-27 or 3/8" and 5/8"-27.

MF 2

Table stand, solid brass, 0.35 kg, 60 mm (2 3/8") diameter with isolation against structure born sound, for all miniature microphones. The stand is matt black lacquer and does not slip due to rubber attached to the bottom. Thread stud: 1/2".

MTS 21

Table stand, tripod type with plastic clamp, 21 mm (13/16") diameter, for mounting Neumann miniature microphones.

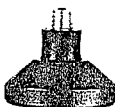
Floor Stands

M 214/1

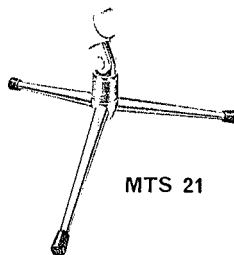
Extremely stable folding stand. Length when folded 1.2 m (4 ft.). Weight 6 kg (13 lbs.). Maximum height 2.2 m (87"), minimal working height 1.3 m (51"). The tripod is black lacquer finished. The height-adjustable upright is nickel-plated and has a 1/2" thread stud for mounting a microphone or the M 212 c boom attachment. Floor stand and boom attachment together bear the designation M 212. This unit may be used for all microphones.

M 212 c Boom Attachment

Boom attachment for M 214/1 folding floor stand. Boom extends from 1.1 m to 1.8 m (43.3" to 71"). With counterweight for heavy microphones. 3/8" thread stud for mounting microphone. Weight 4.3 kg (9.7 lbs). Nickelplated with black lacquer finish.



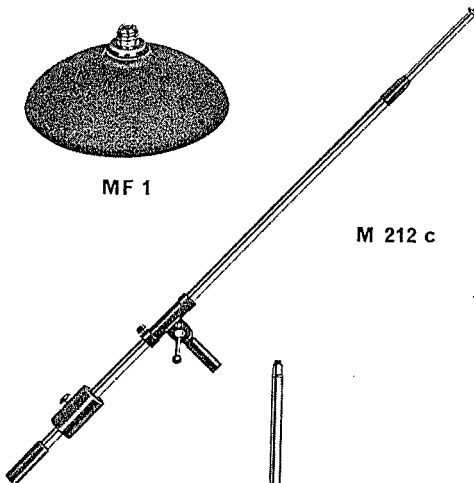
MF 2



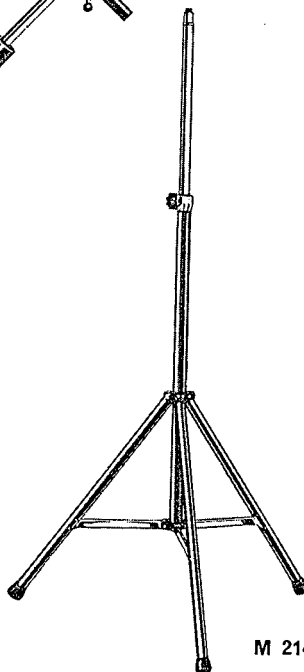
MTS 21



MF 1



M 212 c



M 214/1

M 31

Floor stand with tripod, hammertone lacquered cast-iron base. Weight 4 kg (8.8 lbs.). Nickel-plated tube shock mounted for dampening structure-borne vibrations. Height adjustable from 1.1 m to 1.8 m (43.3" to 71"). The stand is equipped with a reversible thread stud having a 1/2" and a 3/8" thread for mounting the microphone. Shorter versions as well as an "mt" version with a matt black tube are also available.

M 32

Folding floor stand, weight 2.7 kg (6 lbs.). The length of the folded stand is 0.9 m (35"), its maximum height is 1.8 m (71").

The stand is nickel-plated and has a threaded 1/2" stud for microphone mounting.

M 35

Extremely stable folding stand, nickel-plated, weight 9 kg (19.8 lbs.). Maximum height 5 m (16 ft), minimum working height 1.4 m (55"), length when folded 1.65 m (65"). The stand has a 1/2" thread stud for mounting the microphone.

G 35 Boom Attachment

Boom attachment for M 35, nickel-plated, weight 8 kg (17.7 lbs.). Boom extends sideways to 2.5 m (8.3"). With 1/2" stud on swivel joint.

M 135

Similar to M 35, but with a maximum height of 10 m (32' 10"). Minimum working height 1.60 m (63"), length when folded 1.75 m (69"). Weight 27.5 kg (60.6 lbs.).

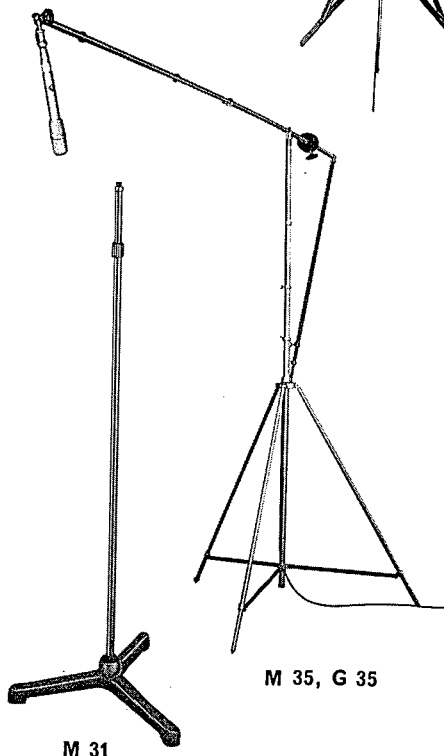
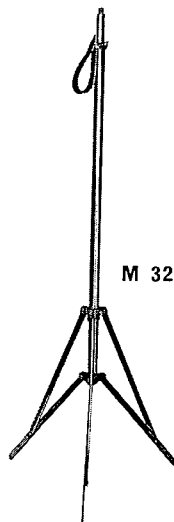
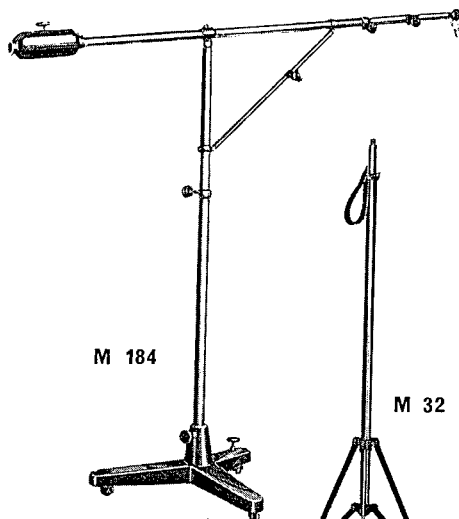
Studio Booms

M 184

Studio boom, on rubber casters, three legged cast-iron base, black wrinkle finish lacquer, nickel-plated tube black lacquered. Adjustable from 1.8 m to 2.5 m (6 ft. to 8 ft.). Boom extends from 1.2 m to 2.9 m (4 ft. to 10 ft.), maximum height when set at an angle approx 4.5 m (14' 9"). 1/2" thread swiveling stud for microphone mounting. Weight approx. 60 kg (132 lbs.).

M 185

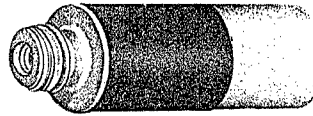
Similar to M 184, but its total weight is only 30 kg (66 lbs.).



M 31

Z 26 Rubber Shock Mount (Elastic Mount)

The Z 26 shock mount is used to prevent mechanical vibration interference between the stand and the swivel mount. It has a 1/2" stud and a 5/8"-27 female thread. A reducer for 1/2" and 3/8" threads is provided. A 5/8"-27 male stud is available.



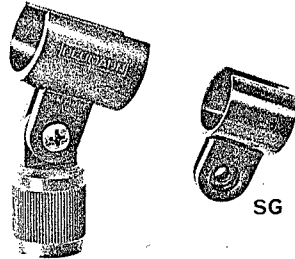
Z 26

SG 21/17 Swivel Mount

For the swivel mount two plastic clumps with 21 (13/16") or 17 mm (11/16") inside diameter respectively are supplied. These can be mounted by choice on the socket of the swivel mount and are provided to accept Neumann-miniature microphones (SG 21) or the microphone cable connector (SG 17).

SG 21/17 mt

Same as SG 21/17, however matt black.



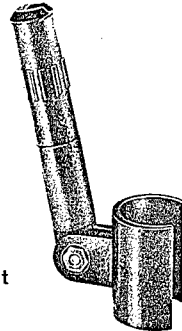
SG 21/17 mt

MNV 87 Auditorium Hanger

The MNV 21 auditorium hanger comprises a tilting microphone clamp with an inner diameter of 21 mm which accepts a Neumann miniature microphone, and a cable guide with ring fastener. The MNV 21 allows the microphone tilt to be adjusted with the microphone freely suspended from its own cable.

MNV 21 mt

Same as MNV 21, however made of black plastic.



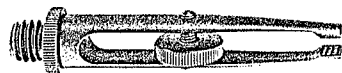
MNV 21 mt

MNV 21 Auditorium Hanger

The MNV 87 auditorium hanger is suitable for all makes of microphones using a microphone cable with a swivel mount or the SG 21/ 17 swivel mount. It consists of a cable clamp and a stud with which it is screwed into the threaded coupling of the swivel mount. The microphone can then be tilted as needed because it is freely suspended from its own cable. Available with 1/2" or 5/8"-27 thread stud.

MNV 87 mt

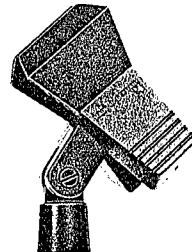
Similar to MNV 87, however matt black.



MNV 87

MKV Swivel Mount

This swivel mount can be attached to all microphone stands and allows clamping for all miniature microphones. It may be used on stage and for stand- and hand held applications of the microphones.



MKV

M 252

Folding floor stand with boom attachment. The stand tube can be extended twice, minimum height 0.65 m (25.5"), maximum height 1.6 m (63"). The boom attachment extends from 0.32 m (12.5") to 0.64 m (25"). Floor stand and boom attachment have a 3/8" threaded stud for mounting the microphone. The stand is suitable for all Neumann miniature microphones. The length of the folded stand is 0.56 m (22"). The weight is 3.2 kg (7.1lbs). Black and nickel finish.

M 252

M 210/1 Floor Stand with Boom Attachment

Floor stand with boom attachment, 3,4 kg (7.5 lbs), nickel-plated. Stand is adjustable in height from 0.9 m (35") to 1.6 m (63"), boom extend to 0.7 m (27 1/2"). The boom attaches to the 3/8" thread stand stud and has at its end a 3/8" thread stud for mounting the microphone.

M 210/1

MFS 3 i

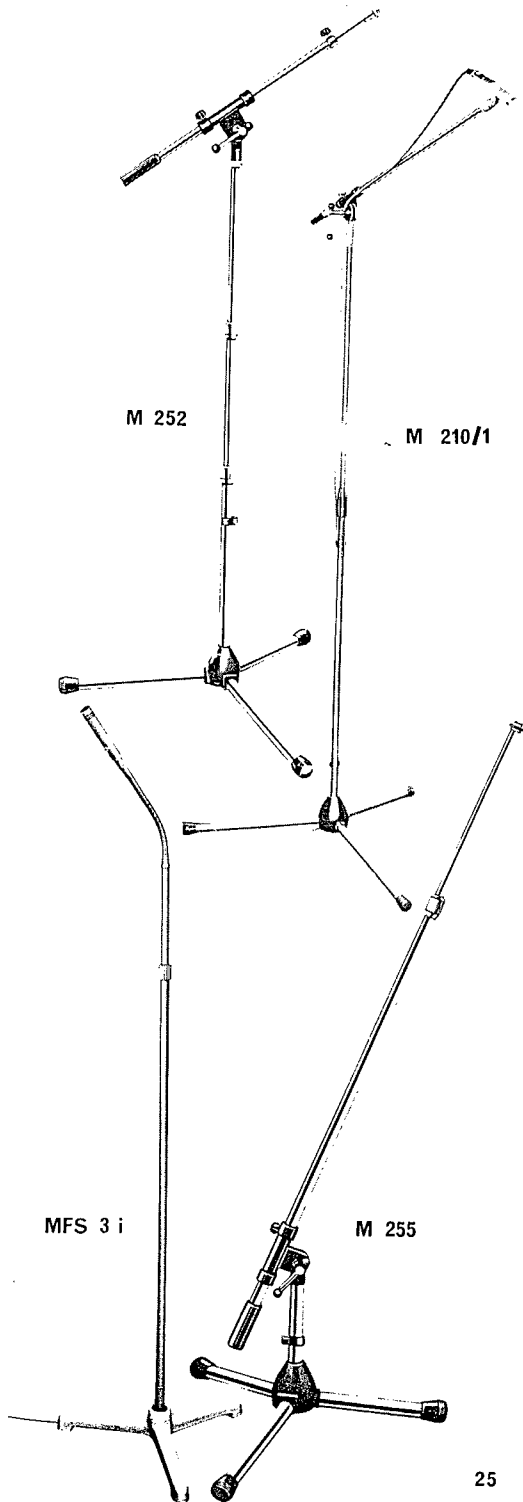
Floor stand with gooseneck, weight 5 kg (11 lbs). The stand has three-legged cast-iron base with hammertone lacquer finish. The upright tube is nickel-plated, and is shock-mounted to its base to dampen external vibrations. Length of the gooseneck is 20 cm(8"); the overall height may be extended between 1.25 m to 2.05 m (49" to 81"). The head of the gooseneck is equipped to accept a microphone. The microphone cable is led out at the base, length 10 m (33 ft.).

MFS 3 i

M 255

Folding floor stand with boom with 3/8" threaded stud for microphone fastening. The height of the horizontal boom is 0.43 m (17"). The boom extends from 0.73 m (29") to 1.4 m (55") so that the height with vertical boom can be adjusted between 0.85 m (33.5") and 1.73 m (68"). The stand is suitable for all Neumann miniature microphones. The length of the folded stand is 0.85 m (33.5"). The weight is 3.9 kg (8.6 lbs), black and nickel finish.

M 255



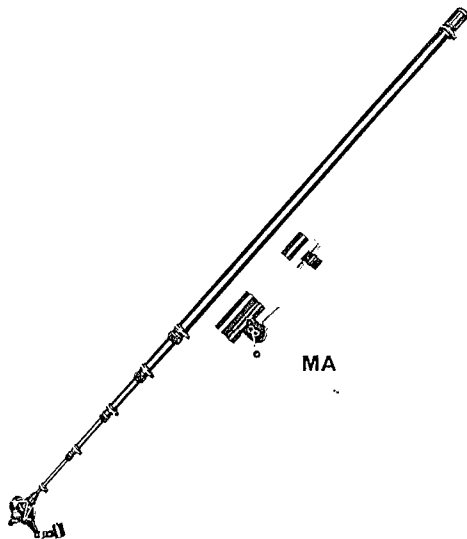
MA Telescoping "Fishpole" Boom

The MA "Fishpole" consists of 5 telescoping fiber glass tubes. It can be extended to any working length up to 3.75 m (12 ft. 4 in.). The telescoped length is 1.25 m (4 ft.). Weight 0.55 kg (1 lb 3 oz.). An elastic suspension is attached to the front end of the "Fishpole" permitting the mounting of microphones up to 21 mm (13/16") in diameter. Microphone accessories such as a swivel mount and a power supply holder are available.

The swivel mount, permits using the "Fishpole" as a boom. It has a rugged plastic clamp which permits rapid fastening and removal of the "Fishpole". Tilt may be varied between 0° and 180°.

Connector: 5/8"-27 thread reducer for 1/2" and 3/8" threads.

The power supply holder, is fastened on to the "Fishpole" by means of a rugged plastic clamp and accommodates a BS 945 i battery supply.



Windscreens

Open-cell polyurethane foam windscreens are available to guard against disturbances that may be caused by wind, close talk applications, or rapid boom movements. These windscreens have no disturbing resonances and only slightly affect the frequency response (-1 dB at 10 kHz for the WNS 21). These are the models available for the individual microphones:

WS 21, WNS 21	KM 83 i, KM 84 i,
	KM 85 i, KM 88 i
WS 86	KM 86 i, KMS 84 i

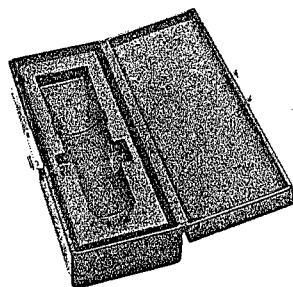
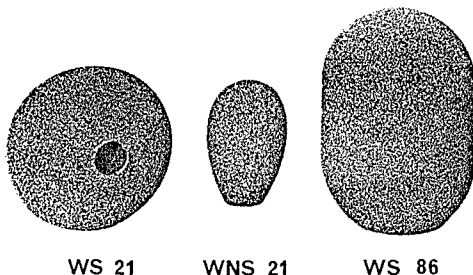
The WNS 21 wind and pop guard is available in black, red, green, yellow and blue. Wind noise suppression (without electrical filter)

WNS 21	18 dB
WS 21	23 dB
WS 86	30 dB

measured in pulsating air currents produced by a noiseless wind machine at 20 km/h.

Microphone Case

A jeweller's case with insert and metal locking is available as special accessory.



DS 21 Dual Microphone Mount

The DS 21 dual microphone mount provides for a neat arrangement when two Neumann miniature microphones (21 mm diam.) are required in the same place, as is the case in broadcasting applications where a spare microphone is mandatory. The dual mount can be attached to table and floor stands as well as to booms. It can also be used to combine two miniature microphones and two bent capsule extension tubes into one fixed assembly for stereo recordings. The DS 21 fits all stands and booms with 5/8"-27 thread. An adapter for 1/2" and 3/8" threads is provided.

DS 21 mt

same as DS 21, however matt black.

Capsule Extension Tubes

Capsule extension tubes are available for special applications requiring particularly unobtrusive placement of the KM 83 i, KM 84 i and KM 85 i miniature microphones. The extension tubes screw into the microphone's preamplifier and accept the microphone capsule at the upper end. Models KV 18, KV 38 and KV 58 have bent capsule ends, providing for a tilted microphone capsule position with the preamplifier section vertical. The extension tube KV 40 is straight and measures 40 cm.

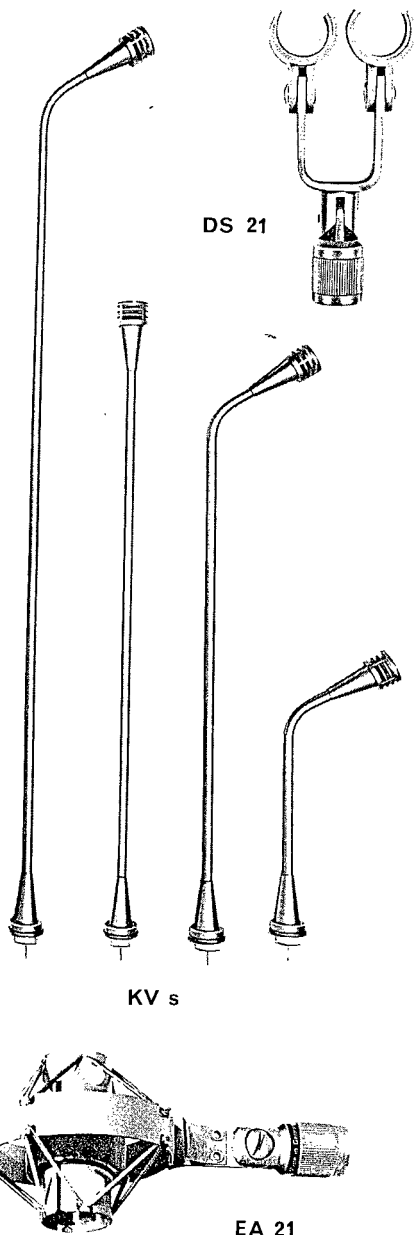
A typical application for microphones equipped like this is the unobtrusive microphone placement in the footlights or in the wings of a theater and on announcer's desks. By means of the elastic suspension EA 82 the microphone amplifier can be mounted below the table so that only the microphone capsule protrudes.

EA 21, EA 2124 Elastic Suspension

The use of an elastic microphone suspension is recommended to prevent the microphone from being exposed to mechanical vibrations caused by shock waves. The following elastic suspensions have tilting 5/8"-27 female thread. A thread reducer for 1/2" or 3/8" studs is included. The EA 2124 designates that the diameter of the microphone can be either 21 or 24 mm (13/16" or 15/16").

EA 21 mt, EA 2124 mt

Same as above, however matt black.



AT 8/1 i Line Transformer

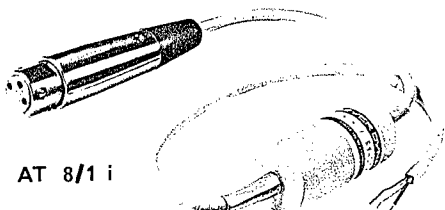
Line transformer 1:1; 0.5 m (20") long, Switchcraft A3F female connector primary, tinned end secondary, for 150...250 ohms microphone.

Max. input voltage: 300 mV (40 Hz)

Transmission range: 30...16,000 Hz

Connects to unbalanced or center tap grounded equipment input.

This cable transformer is also available with Binder connector and is then referred to as AT 8/1.



Test Adapters

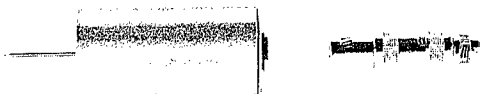
The MA test adapters are used to replace the capsule of each microphone when testing the amplifier. A test adapter prevents acoustical interference that would come from a capsule. It has the same impedance as the capsule so that the amplifier can be tested under operating conditions giving precise values for power drawn, gain, output capability, and weighted as well as unweighted noise voltages.

The following test adapters are available:

MA 84	for KM 83 i, KM 84 i, KM 85 i KMS 84 i microphones
MA 86 i	for KM 86 i microphone
MA 86	for KM 86 microphone
MA 88	for KM 88 i microphone

If you would like more information on this subject ask for the brochure "MA Test Adapters for Condenser Microphones";

No. 10000 806...



MA 84 i with test connector

Errors excepted. Subject to changes.