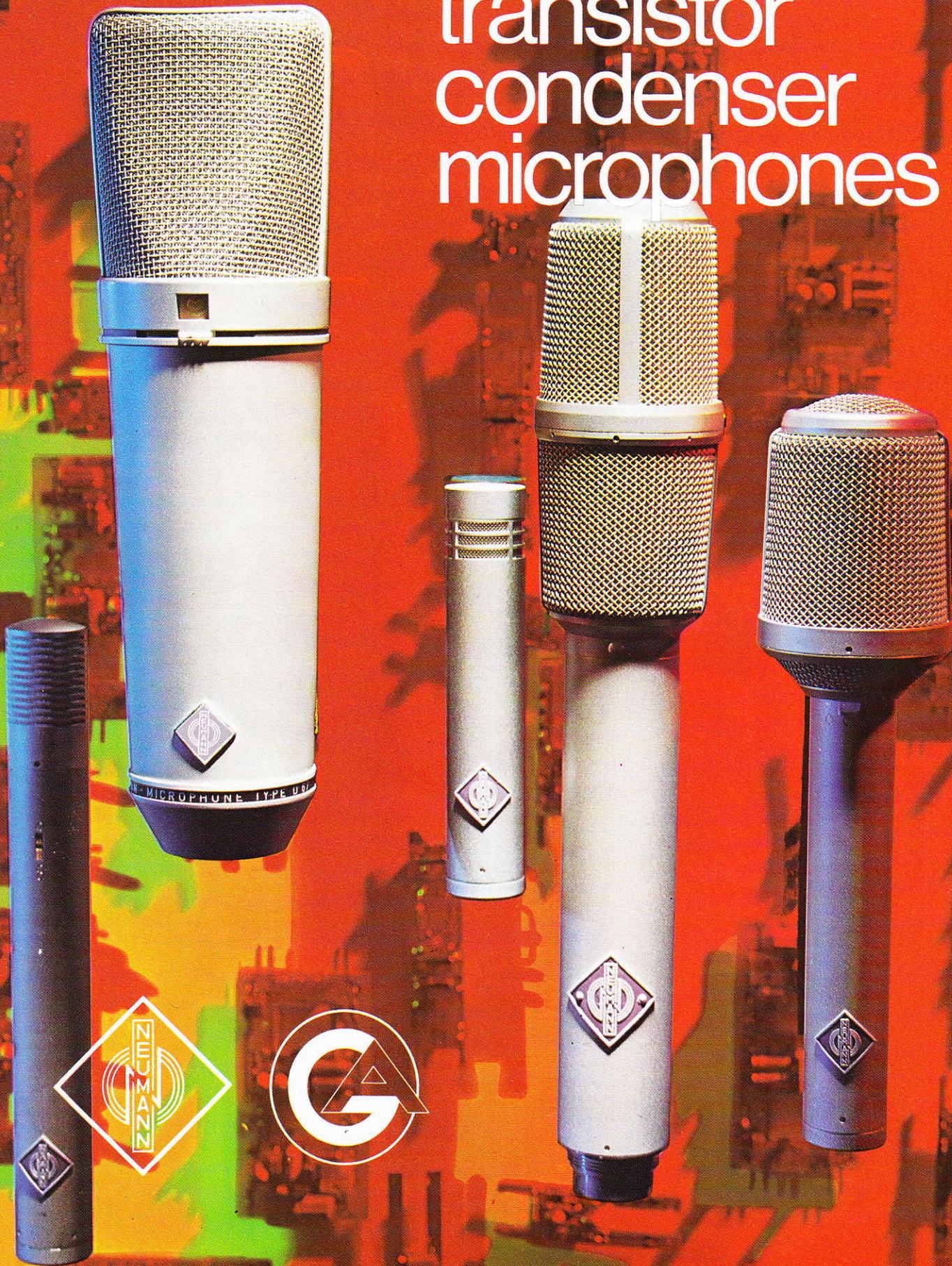


neumann

transistor
condenser
microphones



Neumann fet 80 condenser microphones

**KM 83
KM 84
KM 85**



KM 86



KM 88



These miniature condenser microphones all have the same electronics, and are dimensionally identical but utilize three different interchangeable screw-on capsules. The KM 83 is an omni-directional unit, while the KM 84 and KM 85 are both cardioids; the KM 85 incorporates a low frequency roll-off which reaches about 12 dB at 50 Hz. The KM 85 is therefore much less sensitive to low frequency interference which may be encountered outdoors or in public address applications. The "linear admittance" characteristic of the KM 84 and KM 85 units provides for unaltered sound quality regardless of the direction from which the sound impinges on the microphone. It is this feature first introduced in 1964 on the Nuvistor U 64 microphone which has proven to be the breakthrough in cardioid capsule development. These models also feature a 10 dB switchable protector against close-talk overload. The three types of capsules are available separately to permit field conversion from one type to any other.

The three directional characteristics: cardioid, figure 8 and omni, are electrically selected by a switch located below the capsule head. The KM 86 is especially noteworthy in that it reproduces low frequencies equally well for all three directional characteristics even at great distances from the sound source. This makes it the ideal microphone for serious music recording, church choirs and organs and all applications where the distance to the sound source is no closer than three feet. High frequency response is virtually linear both in the diffuse as well as the free sound field. The capsule membranes are evaporated gold on polyester film. Axis of maximum sensitivity is at right angles to the microphone body. The two condenser elements are identical to those used on the model KM 84, but their arrangement in a larger screened head changes the KM 86 pick-up quality significantly from that of the KM 84, even in the cardioid pattern. The KM 86 is also equipped with a -10 dB switch which prevents overload of the internal preamp at high sound pressure levels.

The model KM 88 three-pattern miniature microphone is the successor to the KM 56 tube model. In spite of its three-pattern switchability (cardioid, figure 8, omni) it is notably small in its outside dimensions. The capsule's dual membranes are made of nickel, the only such on any fet-80 microphone, and give the KM 88 its characteristic brightness. Its axis of maximum sensitivity is at right angles to the microphone body. A 10 dB overload switch, protected against inadvertent operation, is also a feature of this new fet-80 model.

for 48 V phantom[®] powering



KMS 85



U 87



U 47 fet

This is a newly developed cardioid fet-80 microphone especially designed to solve the difficult problems encountered in the pick-up of high level rock music. A multi-stage mechanical filter in front of the condenser capsule provides unprecedented protection against popping and other explosive sounds. The microphone housing is of dual wall construction separated by damping material. This, together with the elastic suspension of the capsule, provides suppression of noise so commonly found in hand held applications with rock soloists. The low frequency sensitivity has been rolled off somewhat to compensate for proximity effect (bass rise). Available 1972.

The solid state condenser microphone model U 87 is the best known and most widely used of the fet-80 series. The dual membrane capsule uses evaporated gold on polyester film which has proven to be the most heat and aging resistant material. Three switches are provided beneath the capsule itself: for selecting the three directional characteristics, frequency response and sensitivity. Its high frequency response is practically linear even in its cardioid and figure-8 positions. The response below 30 Hz is rolled off to prevent low frequency blocking. This roll-off may be switched to 200 Hz to allow compensation for the bass rise common to all directional microphones at close range. The U 87 is usually used in studio close miking applications where high sound pressure levels are commonly encountered.

The U 47 fet continues the tradition of the world famous Model U 47, built from 1947-1960, which rightfully is credited with revolutionizing the world's recording and broadcasting industries. Its exterior strongly resembles its predecessor, but its technical properties represent the state-of-the-art today. It is protected against wind and pop interference; its capsule is elastically mounted to isolate it against mechanical shock disturbances; it features both a 10 dB overload protection switch at the input of its internal electronics and a 6 dB switchable output pad to permit matching to highly sensitive microphone input circuits. A low-frequency roll-off of 12 dB at 50 Hz is provided by a third switch. The result is a versatile unit which will take most microphone applications in stride. The dual membrane capsule is a pressure-gradient transducer with cardioid characteristic. Available 1972.

**SM 69 fet****KMA****SWA**

The stereo condenser microphone, SM 69 fet, consists of two completely separate and independent microphone capsule systems mounted one above the other. The upper element may be rotated up to 270° with respect to the lower. This enables the user to apply the various intensity stereo recording techniques — such as M-S or X-Y — without the danger of arrival time (phase) differences between the systems. Both microphone systems are remote controllable. They may be switched independently of one another in 9 steps to cardioid, figure 8 and omni patterns and six characteristics in between. The microphone may also be used as two mono units; for example, when two microphones with differing directional patterns are needed in the same place. Axis of maximum sensitivity is at right angles to the microphone body. A portable power supply, NS 69, provides powering and remote pattern control. The CU 48, remote controller permits the

SM 69 fet to be connected to Phantom® powered microphone inputs directly. The SM 69 fet is highly recommended for all stereo recording applications where the original sound picture, in its natural acoustics, is to be accurately reproduced. This microphone makes possible the use of the MS/XY intensity stereo technique. It is the only method which guarantees mono compatibility while providing unprecedented three-dimensional localizability.

KMA

The condenser clip-on microphone was developed to ease the problem of picking up reporters or actors working on stage or on camera in TV and film studios. Lavalier microphones worn close to the body produce an unusual

sound pressure characteristic for frequencies above 1000 Hz. This has been compensated in the KMA through the application of new structural techniques. The microphone is extremely small, unobtrusive, and weighs just over one ounce (30 g). Its dark colored matte surface makes it inconspicuous when worn on clothing, and it is largely insensitive to clothing noise. The KMA may be used in wireless operation in conjunction with the BEYER TS-83 and TS-83/1 transmitters. In such applications the power for the KMA is obtained from the transmitter batteries. The KMA may also be powered from standard 48 V Phantom® power supplies using the SWA adapter, while the BS 18 will supply battery power.

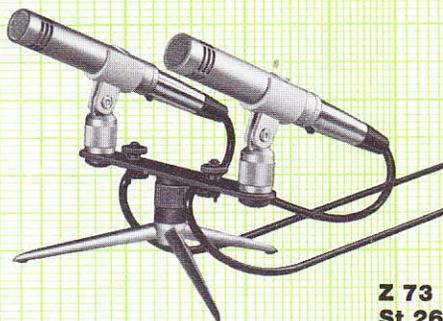
KV 18 | 38 | 58



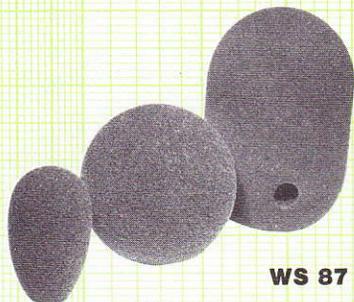
KV 20 | 40 | 60



N 452



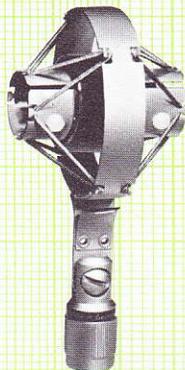
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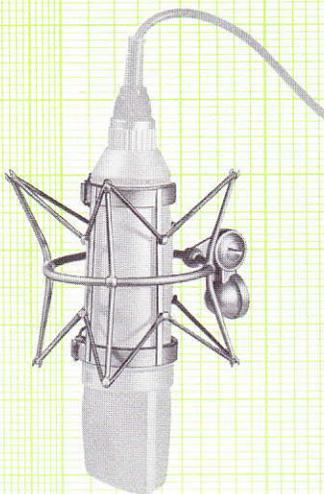
WS 87

WS 21

WNS 21



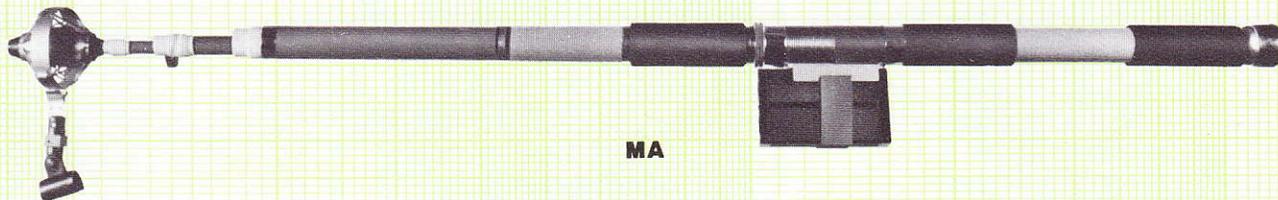
EA 21
EA 30



Z 48



MNV 87



MA

Microphone Accessories

Phantom® 48 VDC Power Supplies:

- N 452 portable AC supply for 2 mikes
- N 454 Miniature wired supply for 5 mikes
- NK 48 a Central AC supply for 40 mikes
- GW 2448 k Central 24 VDC supply for 40 mikes
- SWA Phantom® powering adapter for KMA
- SW 4812 Phantom® powering adapter for fet 70 microphones
- CU 48 Remote controller for SM 69 fet

Wind and Pop Screens:

- WNS 21 Pop screen for KM 83/4/5/8 available in grey, blue, red, green, yellow
- WS 21 Wind screen for KM 83/4/5/8 (3" dia.)
- WS 47 Wind screen for U 47 fet
- WS 87 Wind screen for U 87
- WS 86 Wind screen for KM 86
- WS 69 Wind screen for SM 69 fet

Stands, Booms and Mounts:

- MFS 3 Wired goose neck stand with XLR-type connector, 7 ft. tall, fits all microphones
- ST 260 Collapsible tripod table stand
- Z 73 Dual microphone mounting bracket
- Sh 31 dw 12" goose neck, internally wired with 25' cable + XLR-type connector
- MA Telescoping "Fishpole" boom, 9 1/2'-12 ft reach, only 1 3/4 lbs. with mount for KM series mikes.

Capsule Extension Tubes:

- (Matte nickel plated to match KM 83/4/5)
- Straight: KV 20/8", KV 40/16", KV 60/24"
- Bent: KV 18/8", KV 38/16", KV 58/24"

Microphone Suspensions:

- EA 21 Elastic Suspension for all KM
- EA 30 Same as above for SM 69 fet
- Z 48 Same as above for U 87
- MNV 87 Auditorium cable hanger for all microphones
- MNV 21 Auditorium hanger for KM mikes

Microphone Connecting Cables:

- Specially made for fet 80 series but ideal for all microphones: 3-conductor double Reussen layer shielded, extremely supple cable with Switchcraft Q-G connectors:
- IC 3/10', IC 3/25', IC 3/50', IC 3/100'
- For SM 69 fet:
- SC 1a/33', SC 1a/66', SC 1a/100', SC 6/33' with swivel mount connector.
- Available by the foot: BV 246 I

The 48 V "Phantom"® powering system according to DIN 45 596

Phantom® powering is a power supply system in which the current flows from the positive supply terminal via the electrical center of the two modulation leads to the microphone. This is accomplished by connecting it through two equal resistors to the modulation terminals. The return is through the cable shield. Any interference in the microphone output caused by noise superimposed on the powering voltage is thereby reduced by the common mode re-

jection which, for NEUMANN microphones, exceeds 80 dB! Only Phantom® powering provides a fully compatible microphone connection technique since there is no difference of potential between the two modulation leads. Microphone outlets equipped with Phantom® powering will accept dynamic, ribbon and the outputs of any of the tube-equipped condenser microphones without the necessity of turning off the power supply voltage.

Specifications

a Type	KM83	KM84 KM85	KMS85 ³⁾	KM86	U87	KM88	U47 fet ¹⁾	SM69 fet	KMA	
b Directional patterns	○	⊂	⊂	⊂⊂	⊂⊂	⊂⊂	⊂	2x ⊂⊂	○	
c Acoustical operating principle	pressure transducer	pressure gradient transducer							pressure transducer	
d Frequency range	40...20 000 Hz	40...20 000 Hz	40...16 000 Hz	40...20 000 Hz	40...16 000 Hz	40...16 000 Hz	40...16 000 Hz	40...16 000 Hz	40...16 000 Hz	
e Eff. output level ref. level 10 dyne/cm ²	-38 dBm	-38 dBm	-38 dBm	-41 dBm	-38 dBm	-39 dBm	-38 dBm	-41 dBm	0.5 mV open circ. voltage	
f EIA rating G _M	-137 dBm	-137 dBm	-137 dBm	-140 dBm	-137 dBm	-138 dBm	-137 dBm	-140 dBm		
g Output impedance (needs floating ampl. input.) ¹⁾	150 Ohms balanced	150 Ohms balanced	150 Ohms balanced	150 Ohms balanced	150 Ohms balanced	150 Ohms balanced	150 Ohms balanced	2 x 150 Ohms balanced	intern. imp. 800 Ohms unbal. load imp. ≥ 2.7 kOhms	
h Equivalent loudness level due to inherent noise ²⁾	IEC 179 approx. 18 dB - A	approx. 18 dB - A	approx. 18 dB - A	approx. 21 dB - A	approx. 19 dB - A	approx. 16 dB - A	approx. 18 dB - A	approx. 15 dB - A	approx. 26 dB - A	
i	DIN 45405 approx. 25 dB	approx. 25 dB	approx. 25 dB	approx. 28 dB	approx. 26 dB	approx. 23 dB	approx. 25 dB	approx. 22 dB	approx. 33 dB	
k S/N-ratio (A-weighted) ref. level = 10 dyne/cm ² at 1 kHz	76 dB	76 dB	76 dB	73 dB	75 dB	78 dB	76 dB	79 dB	68 dB	
l Max. SPL for less than 1% THD ³⁾	133 dB	133 dB	144 dB	133 dB	132 dB	134 dB	154 dB	121 dB	120 dB	
m Total dynamic range of the microphone amplifier ⁴⁾	115 dB	115 dB	126 dB	112 dB	113 dB	118 dB	136 dB	106 dB	94 dB	
n Power supply	+48 $\frac{+6}{-8}$ VDC 0.4 mA	+48 $\frac{+6}{-8}$ VDC 0.4 mA	+48 $\frac{+6}{-8}$ VDC 0.5 mA	+48 $\frac{+6}{-8}$ VDC 0.4 mA	+48 $\frac{+6}{-8}$ VDC 0.4 mA	+48 $\frac{+6}{-8}$ VDC 0.45 mA	+48 $\frac{+6}{-8}$ VDC 0.5 mA	+120 V 1 mA	+48 V 0.8 mA	+16...+24 VDC 0.33 mA
o Operating time with battery-supplies, approx.	200 hours	200 hours	160 hours	200 hours	200 hours	180 hours	160 hours	100 hours	180 hours	
p Weight	3 ozs (80 g)	3 ozs (80 g)	10.4 ozs (295 g)	7.1 ozs (200 g)	20 ozs (550 g)	3.5 ozs (100 g)	24.6 ozs (695 g)	16 ozs (460 g)	2 ozs incl. cable and conn.	
q Dimensions	dia. $\frac{7}{16}$ " length $4\frac{3}{8}$ "	dia. $\frac{7}{16}$ " length $4\frac{3}{8}$ "	dia. 1" and $1\frac{1}{4}$ " length $8\frac{1}{4}$ "	dia. $\frac{7}{16}$ " and $1\frac{3}{4}$ " length $7\frac{1}{4}$ "	dia. $2\frac{1}{4}$ " length 8"	dia. $\frac{7}{16}$ " length $5\frac{7}{16}$ "	dia. $2\frac{1}{2}$ " length $6\frac{1}{4}$ "	dia. $1\frac{3}{16}$ " and $1\frac{7}{16}$ " length 10"	$\frac{3}{8}$ " x $\frac{3}{4}$ " x $1\frac{1}{4}$ "	

¹⁾ not required with KMA, SM 69 fet, when powered by NS 69 or N 69k and with U 87, when powered by built-in batteries.

²⁾ 0 dB $\hat{=} 2 \cdot 10^{-4}$ dyne/cm²

³⁾ preliminary data

⁴⁾ Referred to IEC 179 weighted equivalent loudness level (line h)

⁵⁾ THD of the microphone amplifier, when an input level equivalent to the capsule output at specified SPL is applied.



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