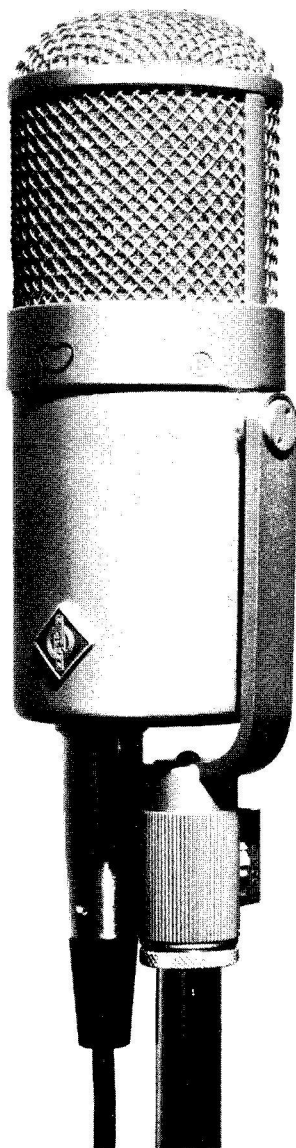


OPERATING INSTRUCTIONS
for NEUMANN Model U 47 fet Condenser Microphone



Technical Data

11244-920-002.00

Directional pattern	hypercardioid
Acoustical operating principle	pressure gradient transducer
Frequency range	40...16000 Hz
Sensitivity	8 mV/Pa ¹⁾ (4 mV/Pa) ²⁾
EIA rating G_M	-133 dBm (-139 dBm) ²⁾
Output impedance	150 Ω balanced and floating
Equivalent loudness level due to inherent noise ³⁾	IEC 179: approx. 18 dB-A DIN 45405: approx. 25 dB
S/N-ratio (A-weighted) ref. level = 1 Pa ¹⁾ at 1 kHz	76 dB
Max. SPL for less than 0,5 % THD ⁴⁾	148 dB (154 dB) ²⁾
Total dynamic range of the microphone amplifier ⁵⁾	130 dB (136 dB) ²⁾
Power requirement	48 ⁺⁶ / ₋₈ VDC 0,5 mA
Operating time with battery-supplies, approx.	160 hours
Output connector	Amphenol Tuchel NT 3262 (Switchcraft A3M 3-pin) ²⁾
Microphone Stand Thread	5/8" -27, 1/2", 3/8"
Weight	24.6 ozs. (695 g)
Dimensions	dia. 2 1/2" length 6 1/4"
Case	Genuine leather

¹⁾ 1 Pa (Pascal) = 10 μ bar = 10 dyn/cm²

²⁾ ip version (reduced sensitivity)

³⁾ 0 dB = 20 μ Pa

⁴⁾ THD of the microphone amplifier, when an input level equivalent to the capsule output at specified SPL is applied.

⁵⁾ Referred to IEC 179 weighted equivalent loudness level.

1. General

The U 47 fet is the modern version of the world famous U 47 first released in 1947 and combines its acoustically desirable qualities with the state-of-the-art in electronics. Through the use of operational amplifiers the microphone is able to reproduce the highest sound pressure levels encountered in rock music without distortion. This holds true even for extremely close distance sound sources.

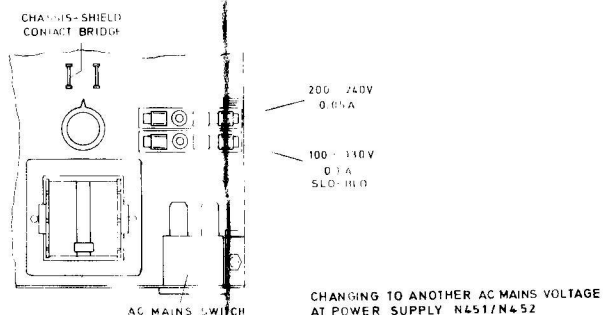
The designation "i" in NEUMANN microphones stands for "International" and refers to the use of a Switchcraft XLR-type connector. The designation "p" stands for "pad" and refers to the 56 ohm series resistors found in the output leads of NEUMANN microphones to satisfy the requirements of many inputs for termination in their rated impedance which lies between 150-250 ohms.

The axis of maximum sensitivity is at right angles to the microphone body. The cardioid directional pattern is oriented with its front at the NEUMANN insignia.

2. Operation with Power Supplies

Two portable power supplies - N 541 and N 542 are available. Typ N 451 is for connection of one microphone. One or two microphones can be connected to the N 452 power supply.

If the power voltage is to be changed, the transformer primary can be changed merely by inserting the fuse in the appropriately labeled fuse holder. Provision is made for operation with 100...130 and 200...240 V. The units are opened by removing the four screws located on the upper cover.



3. Phantom Powering from Central Supplies

Where more than two microphones are to be operated, these may be Phantom Powered from either a NK 48a or GW 2448k central power supply capable of powering up to 40 microphones.

Phantom Powering is the unique system which permits an unlimited number of microphone inputs to be connected permanently to a central power supply in such a way that such powering in no way interferes with the operation of any make or model microphone plugged into them. Any NEUMANN fet 80 microphone plugged into such a powered input will automatically receive proper power without in any way affecting cross-talk between such powered microphones. The Model NK 48a Power Supply, for example, may be permanently wired to hundreds of microphone inputs in any number of studios simultaneously, and will power up to 40 fet 80 microphones plugged into any of these.

Special instructions (10000-912-002.) for connection and operation are provided with these Phantom supplies.

4. Battery Power Operation

The U 47 fet cannot be powered from self-contained batteries as is the case for the U 87. The Battery Supply BS 45a is used for that purpose. It may be opened by a left turn of its cover screw using a coin, after which the cover can be removed. Insert two 22 1/2 V batteries of the international type IEC 15F20 (e.g. Eveready 412, Burgess U15, etc) available in camera supply stores (used for photo-flash units) making sure to adhere to the indicated polarity!

Operation with batteries is for 160 hours continuous, in intermittent service considerably longer.

5. Cables

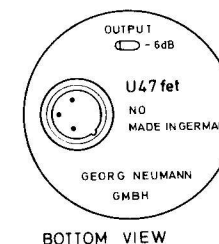
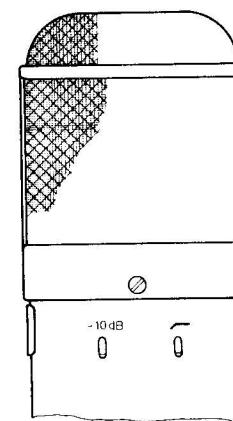
Phantom Powered microphones require cables with guaranteed continuity of shield, since it is the shield which carries the powering return. All NEUMANN cables are of the 3-conductor type (not just a pair) and so the ground conductor is wired in addition to the shield connection. These IC-3 Model cables feature double Reusen RF shielding and are extremely supple under all temperature conditions.

Interconnecting cable length between the microphone and preamplifier input may be up to approx. 650 feet (200 m). If this length is exceeded there will first be a rise and then a roll-off at the upper end of the frequency response range.

6. Switches for:
- | | | |
|---------------------|---|--------------------------------------|
| Overload Protection |) | at the back of the housing |
| Bass Roll-Off |) | |
| Output Level | | on the bottom plate of the amplifier |

The switches are mounted recessed and are secured against unintentional operation. They may be switched using any sharp, pointed object, especially a ball point pen tip.

The left hand switch at the back (-10 dB) inserts a 10 dB loss pad ahead of the microphone's internal amplifier thereby permitting sound pressure levels up to 148 dB (ip version: 154 dB).



The right hand switch effects a 9 dB drop at 50 Hz as protection against low frequency high level signals at the amplifier's input (e.g. popping or wind). For sound sources within 4-6 inches (10-15 cm) of the microphone this switch restores linear low frequency response, since directional microphones exhibit a low frequency rise for close proximity sound sources.

The switch at the base of the microphone "-6 dB" reduces the output level of the microphone. For extremely high sound pressure levels this switch will protect the input of your microphone preamplifier against possible overload.

Operating the "-10 dB" overload protection switch will deteriorate the signal-to-noise ratio of the microphone and should therefore be applied only in situations where the microphone's internal amplifier is in danger of overload. This will hardly ever happen considering the unique overload handling capability of this microphone! The "-6 dB" output level switch may be left on or off depending on the input sensitivity of your console on the one hand and the intensity of sound being picked up on the other. The sound characteristic of the U 47 fet does not change as a result of operation of either of these switches.

Important: All mixer and master level controls are designed to operate within a limited rotational or slide range. It is generally true that rotary controls must be operated in the upper half of their rotational range, and slide attenuators in the upper third of their slide patch. Operating with full output level from the mixer and the controls below these points will result in overloading of the amplifier preceding them. On consoles equipped with an input vernier control, this should be used to provide fader operation within the proper range. If not so equipped, use the "-6 dB" output switch to reduce microphone output level to that of the average dynamic type. If this still is not enough it is a fair indication that the microphone's internal amplifier may be overloaded and the "-10 dB" switch should be used.

7. Polarity (Phasing)

The polarity of the microphone output connector corresponds to the German DIN 45596 standard. For rising pressure on the front membrane of the microphone, PIN 1 obtains a POSITIVE voltage (+) (ip version: PIN 2).

8. Operation with Unbalanced and Center Tap Grounded Microphone Inputs

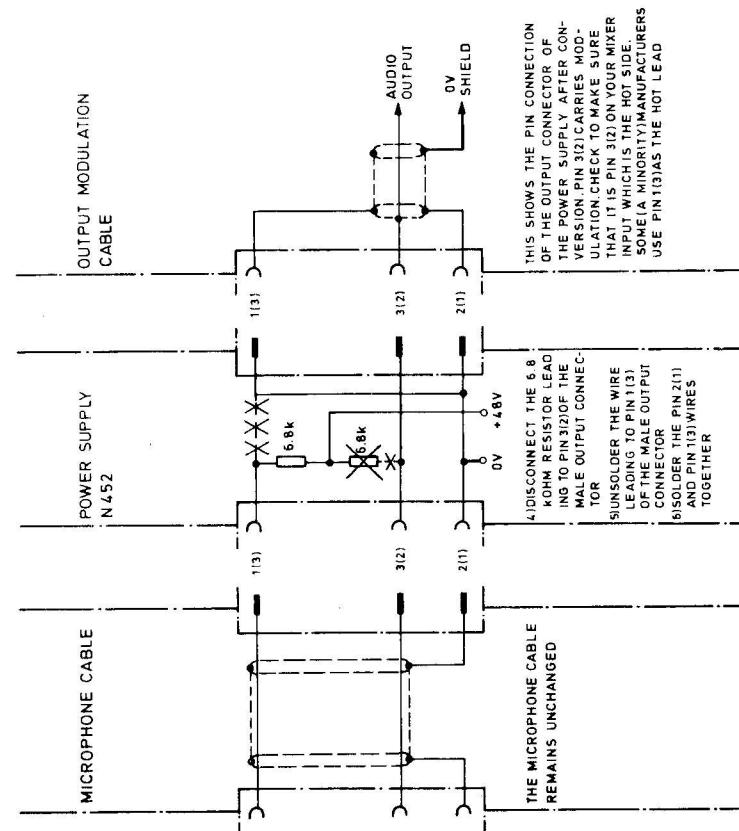
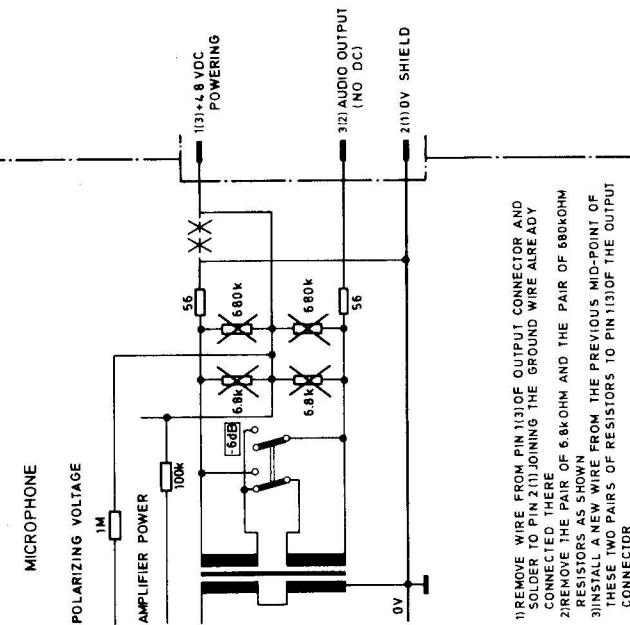
Phantom Powering provides for +48 V potential to be applied to both sides of the output cable by the power supply. Connecting such a cable to an input with either one side or the center tap at ground potential would short out this supply voltage, and render the microphone inoperative. The following measures may be used to correct this situation:

For units in which the center tap of the input transformer is grounded (for example Nagra III and IV, and some broadcast mixers), such grounds may be removed without any adverse effect on the operation of the recorder or amplifier.

For connection to unbalanced inputs (no transformer used) or balanced inputs without transformer (differential amplifiers), two remedies are available:

- Conversion of the microphone and power supply to unbalanced operation (see figure next page), or
- Insertion of a high quality 1 : 1 transformer between power supply and unbalanced input. We recommend the type AT 8/1.

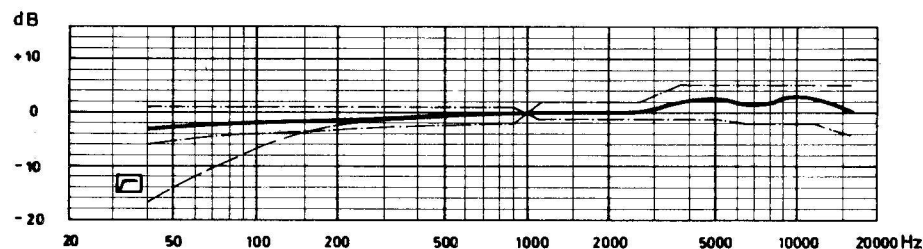
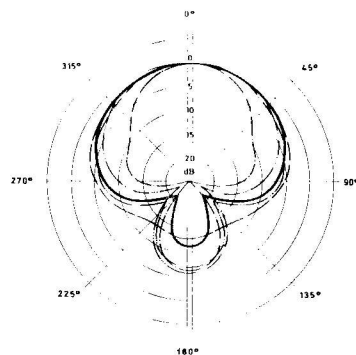
CONVERSION OF THE U47fet AND ITS POWER SUPPLY FOR OPERATION WITH UNBALANCED MICROPHONE INPUTS



MICROPHONES CONVERTED ACCORDING TO THESE INSTRUCTIONS CAN THEN BE OPERATED ON BALANCED MICROPHONE INPUTS, BUT WILL UNBALANCE THESE INPUTS IN THE PROCESS

(...) FOR 1-VERSION (XLR-TYPE CONNECTORS) FIGURES IN BRACKETS ARE VALID

9. Frequency Response and Directional Characteristic



10. Accessories

AC Power Supply for one microphone Model N 451

AC Power Supply for one or two microphones Model N 452

AC Phantom Central Supply for up to 40 microphones Model NK 48a

DC Phantom Central Supply for up to 40 microphones Model GW 2448k
(powered from 24 VDC)

DC Battery Supply for one microphone Model BS 45a

Microphone extension cable KT 1 (Amphenol-Tuchel)

Elastic suspension Model LA 47 offers effective protection against mechanical shock interference, fits 3/8", 1/2", and 5/8"-27 thread.

Table stands M 181 and M 1 are for placing the microphone U 47 fet on conference tables, speaker's desks and the like. The stands have 1/2" threaded pin.

The microphone floor stand M 31 is adjustable in height from 1 m to 1,80 m. In order to attenuate impact sound the tubular stand is mounted in rubber at the foot. The stand has a 3/8" and 1/2" threaded pin.

The M 32 stand is collapsible and can be extended from 1,15 m to 1,8 m (46" to 72"). The stand has a threaded end for microphone cable or swivel connection.

The M 210 tripod floor stand with boom attachment can take 75 cm (30") boom attachment. The boom has a threaded end for attachment of the microphone cable or swivel.

The M 35 Floor stand with the G 35 boom attachment can be extended to a height of 5 m (16'). The G 35 boom attachment allows a lateral extension of 2,5 m (8'). The 1/2" threaded end is for attaching the microphone cable, swivel or elastic suspension.

M 184 studio boom on rubber casters. The height is adjustable from 1,80 m (72") to 2,90 m (115"). The lateral reach is from 1,20 m (48") to 2,90 m (115"). The height in a slanted position is approximately 4,50 m (15'). Weight is approximately 60 kg (132 lb).

Wind and Pop screen Model WS 47 made of open pore polyurethane foam. Practically no influence on frequency response (-1 dB at 10 kHz, resonance free). Highly recommended for all close talking or vocal applications to protect the microphone element against moisture which will cake on dust.

Measuring adapter MA 47 fet: Plug in Module for amplifier measurements

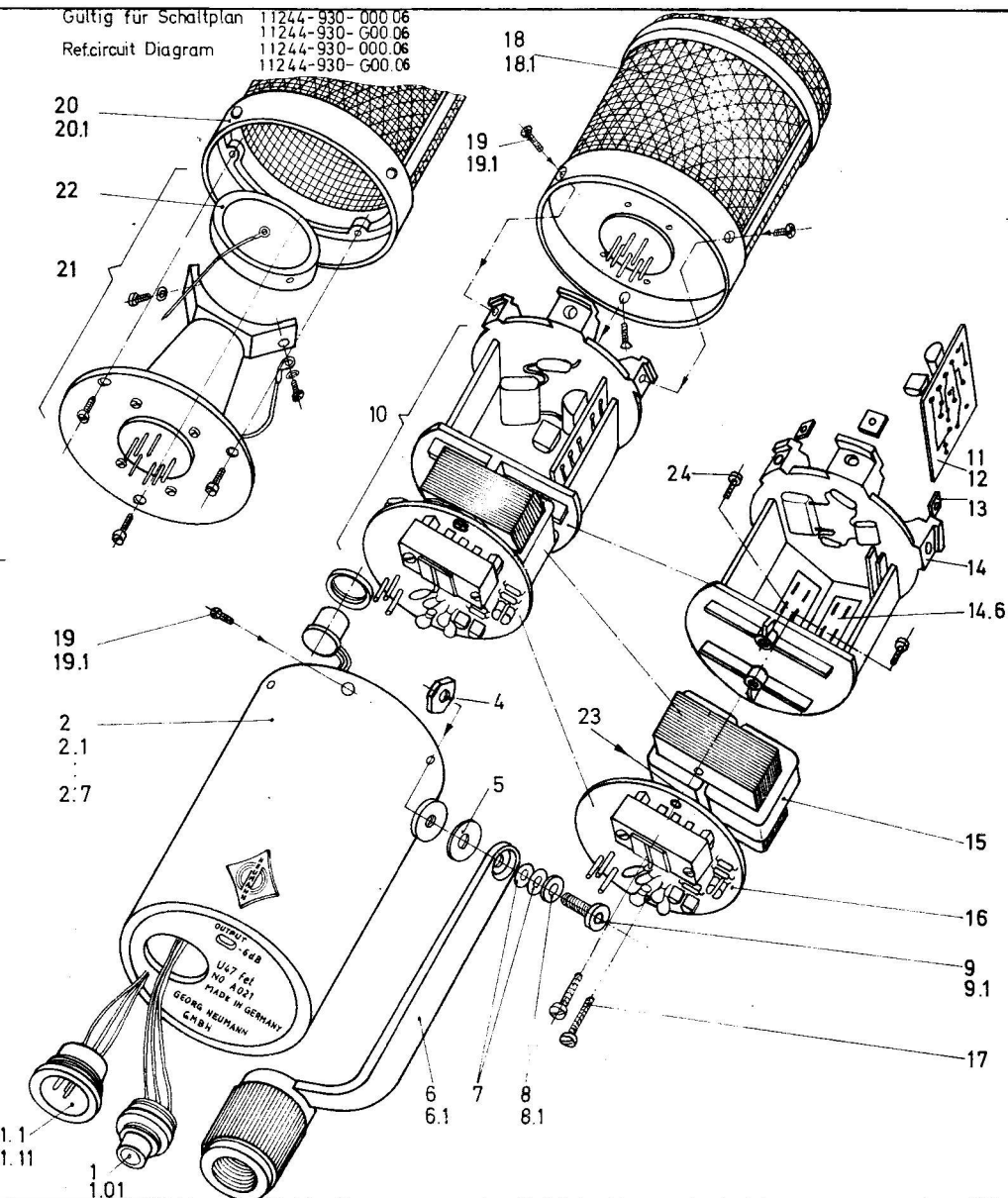
Auditorium cable hanger Model MNV 87 permits U 47 fet or any microphone with a 5/8-27 thread to be suspended from its own cable while being tilted to any angle desired.

Ersatzteile U47 fet
Spare Parts U47 fet

1 1244 - 003 - 099.08 BL1



Gültig für Schaltplan 11244-930-000.06
Ref.circuit Diagram 11244-930-G00.06
11244-930-000.06
11244-930-G00.06



GEORG NEUMANN GMBH · BERGING · WFS

POS.	STCKZ. QTY.	BENENNUNG DESIGNATION	BESTELL- NR. CAT. NO.	
1	1	Anschlußarmatur, vollst. U47fet, U47fetp	8001800003.2	
1.01	1	3-pol. Flanschdose M	8871003310.2	
1.1	1	Anschlußarmatur, vollst. U47feti, U47fetip	8001800004.1	
1.11	1	3-pol. Steckereinsatz	8160400021.4	
2	1	Gehäuserohr U47fet No. A..	8570900158.4	
2.1	1	Gehäuserohr mt U47fet No. B..	8570900160.0	
2.2	1	Gehäuserohr U47feti No. C..	8570900162.8	
2.3	1	Gehäuserohr mt U47feti No. D..	8570900164.6	
2.4	1	Gehäuserohr U47fetp No. E..	8570900158.4	
2.5	1	Gehäuserohr mt U47fetp No. F..	8570900160.0	
2.6	1	Gehäuserohr U47fetip No. G..	8570900162.8	
2.7	1	Gehäuserohr U47fetip No. H.. mt	8570900164.6	
4	1	Sechskantmutter	6004390003.6	
5	1	Scheibe	8681100018.9	
6	1	Haltebügel, vollst.	8052300010.6	
6.1	1	Haltebügel, vollst. mt	8052300012.4	
7	2	Tellerfeder	8201100006.3	
8	1	Scheibe	8681100020.5	
8.1	1	Scheibe mt	8681100021.4	
9	1	N-Zylinderschraube	8683700031.2	
9.1	1	N-Zylinderschraube	8683700032.1	
10	1	Innenaufbau, vollst.	8001700006.5	
11	1	Zwischenplatte U47fet, U47feti	8530900022.1	
11.1	1	Leiterplatte	8530300149.3	

POS.	STCKZ. QTY.	BENENNUNG DESIGNATION	BESTELL- NR. CAT. NO.	
11.2	5	Durchführung	8202800003.7	
11.3	8	Lötstift	8380900002.3	
11.4	1	Kunststofflitze ge	8381240200.4	
11.5	1	" " gn	8381250250.9	
11.6	1	" " ws	8381290200.9	
11.7	1	" " rt	8381220200.4	
11.8	1	" " vi	8381270300.6	
11.9	1	" " bl	8381260250.4	
11.10	1	Transistor S 2436	8280800008.2	
11.11	1	Transistor BC 212 B	8280100007.5	
11.12	1	Elyt-Tantal-Kondens. 2.2 / 50V	8344650225.7	
11.13	1	Widerstand 6.8 k	8902968015.2	
11.14	1	Widerstand 33 M	8904033052.2	
11.15	1	Widerstand 68 M	8904068052.7	
11.16	1	Styroflex-Kondens. 33 p / 160 V	8347913304.8	
11.17	1	Styroflex-Kondens. 18 p / 160 V	8347911804.1	
12	1	Zwischenplatte U47fetp, U47fetip	8530900023.0	
12.1	1	Leiterplatte	8530300149.3	
12.2	5	Durchführung	8202800003.7	
12.3	8	Lötstift	8380900002.3	
12.4	1	Kunststofflitze ge	8381240200.4	
12.5	1	" " gn	8381250250.9	
12.6	1	" " ws	8381290200.9	
12.7	1	" " rt	8381220200.4	
12.8	1	" " vi	8381270300.6	

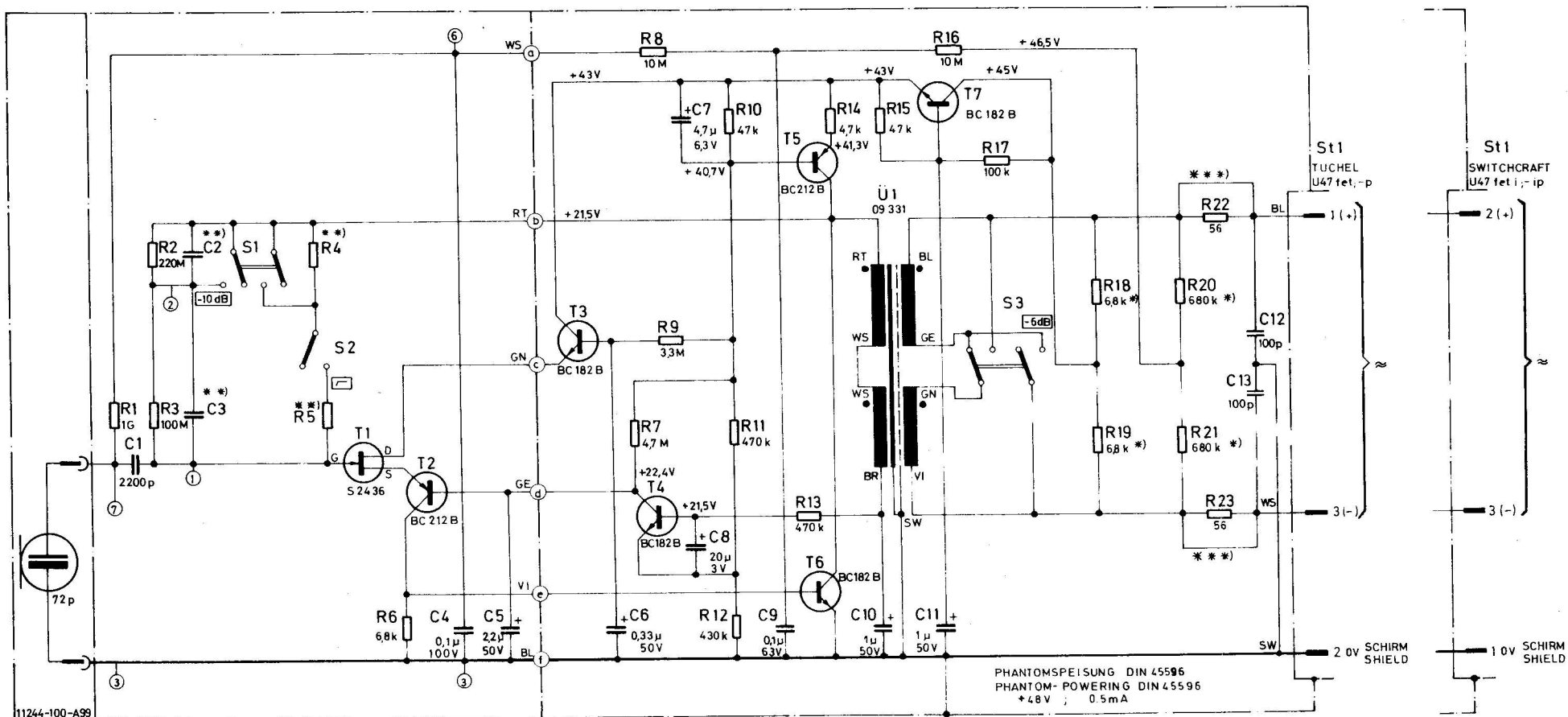
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12.9	1	Kunststofflitze bl	8381260250.4	
12.10	1	Transistor S 2436	8280800008.2	
12.11	1	Transistor BC 212 B	8280100007.5	
12.12	1	Elyt-Tantal-Kondens. 2,2 / 35 V	8344635225.7	
12.13	1	Widerstand 6,8 k	8902968015.2	
12.14	1	Widerstand 18 M	8904018052.2	
12.15	1	Widerstand 33 M	8904033052.2	
12.16	1	Styroflex-Kondens. 68 p / 160 V	8347916804.1	
12.17	1	Styroflex-Kondens. 33 p / 160 V	8347913304.8	
13	4	Vierkantmutter M 2,6	6005620004.5	
14	1	Innengehäuse	8240300003.9	
14.1	5	Kelchfeder, verg. Nr. 10565-015	8201200009.4	
14.2	1	Widerstand 1 G	8900910072.4	
14.3	1	Widerstand 100 M	8900910062.6	
14.4	1	Kondens. FKS 2 2200 p / 100V	8348200027.2	
14.5	1	Kondens. MKS 0,1 µ / 100V	8348500013.0	
14.6	2	Schiebeschalter	8680800003.1	
14.7	2	Abschirmfeder	8201100007.2	
14.8	2	Schaltschieber	8681600001.8	
14.9	4	Senkschraube M2x12 DIN963-5.8	6009630020.2	
14.10	4	Sechskantmutter M2 DIN 934-5D	6009340007.2	
15	1	Übertrager 09331	8780900070.5	
16	1	Unterplatte	8530900033.0	
16.1	1	Leiterplatte	8530300213.2	
16.2	3	Steckerstift	8730900006.3	

POS.	STCKZ. QTY.	BENENNUNG DESIGNATION	BESTELL- NR. CAT. NO.	
16.3	1	Schaltschieber	8681600001.8	
16.4	2	Nietmutter	8421500021.6	
16.5	1	Schiebeschalter	8680800003.1	
16.6	2	Senkschraube	6009630020.2	
16.7	1	Widerstand 4.7 M	8902947045.0	
16.8	2	Widerstand 10 M	8902910055.1	
16.9	1	Widerstand 3.3 M	8902933045.1	
16.10	2	Widerstand 47 k	8902947025.4	
16.11	2	Widerstand 470 k	8902947035.2	
16.12	1	Widerstand 430 k	8902943035.8	
16.13	1	Widerstand 4.7 k	8902947015.6	
16.14	1	Widerstand 100 k	8902910035.5	
16.15	1	Satz Widerstand auf gl.Wert auss. 6.8k	8905100001.7	
16.16	1	Satz Widerstand auf gl.Wert auss. 680k	8905100002.6	
16.17	2	Widerstand 56	8902956095.9	
16.18	1	Elyt-Kondens. 0.33 μ F / 50 V	8344650334.3	
16.19	1	Elyt-Kondens. 4.7 μ F / 6.3 V	8344606475.2	
16.20	1	Elyt-Kondens. 20 μ F / 3 V	8344603206.3	
16.21	2	Elyt-Kondens. 1 μ F / 50 V	8344650105.4	
16.22	4	Transistor BC 182 B	8280000017.9	
16.23	1	Transistor BC 212 B	8280100007.5	
17	2	Zylinderschraube M2x4 DIN 84-5.8	6000840043.1	
18	1	Kapselkopf, vollst.	8351900003.9	
18.1	1	Kapselkopf, vollst. mt	8351900004.8	
19	4	N-Senkschraube	8686000003.7	

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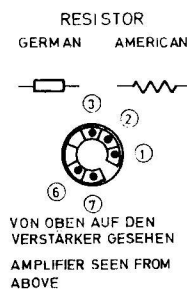
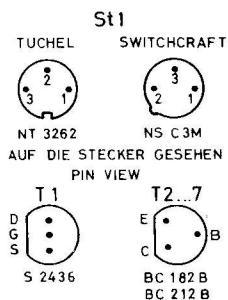


BEI ERSATZTEILBESTELLUNG BITTE GERÄT-NR. UND POS.-ZAHLEN ANGEBEN!
FOR REPLACEMENT PLEASE ALWAYS GIVE SERIAL & PART NUMBER!

*) PAARWEISE AUF GLEICHEN WERT ($\leq 0,4\%$) AUSGESUCHT
SELECT IN PAIRS OF IDENTICAL VALUE ($\leq 0,4\%$)

	U47 fet U47 fet i	U47 fet p U47 fet ip	*** DIESE BRÜCKE ENTFÄLLT BEI U47 fet p, U47 fet ip REMOVE BRIDGE FOR U47 fet p, U47 fet ip
C2	18 pF	33 pF	
C3	33 pF	68 pF	
R4	68 M	33 M	
R5	33 M	18 M	

(+)=POLARITÄT BEI DRUCKANSTIEG VOR DER MEMBRAN
POLARITY AT SUDDEN RISE OF SOUND PRESSURE
BEFORE THE DIAPHRAGM



COLORS

GERMAN	AMERICAN
RT	RED
WS	WHT
SW	BLK
BL	BLU
GE	YEL
GN	GRN
VI	VIO



KONDENSATOR-MIKROPHON U47 fet
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1 1244 - 930 - 000.06

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