

***mikroport* SM 1008**

Wireless Microphone System

Operating Instructions



Sennheiser electronic

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1. Description

The SM 1008 wireless microphone system consists of a battery-operated miniature transmitter, Model SK 1008, which can be equipped with several different special microphones, and the battery/AC operated receiver, Model EM 1008, which can be operated with a variety of special antennae.

1.1 Model SK 1008 Mikroport transmitter

The Mikroport transmitter is operated from an ordinary 9 V battery. Standard units are designed for two frequencies: 36.7 and 37.1 MHz. Two plug-in microphones and seven special microphones, which can be connected via short leads, permit adaptation to even unusual applications. A plug-in antenna is supplied with the transmitter.

1.2 Microphones

Two different plug-in microphones may be combined with the Mikroport transmitter into a single unit. The combination, which is no larger than a conventional microphone, may be either held in the hand or used as a lavalier microphone via its built-in cord.

Model MD 1008 plug-in microphone, which has spherical characteristics, is preferable whenever it is essential to obtain minimum sensitivity to vibration, and where (especially during interviews) several persons speak into the microphone from different directions. However,

where there is a high ambient noise level, reverberation, or the possibility of acoustic feedback, it is recommended that the Model MD 4008 plug-in microphone, which has super-cardioid directional characteristics be employed. Where concealment of the transmitter is desired, special microphones may still be used, connected to the microphone socket of the SK 1008 transmitter via a short cable. The most frequently used unit, for this application, is the Model MD 214/1 Lavalier suspension microphone. Besides double internal suspension, which renders this microphone strongly resistant to noises produced by friction, the Model MD 214/1 dynamic lavalier microphone has a shaped frequency response that compensates for attenuation of high frequencies caused by the chin of the speaker. The Model 405-T directional hand-held microphone can be used in a similar fashion, worn in an outside pocket, permitting the transmitter to be switched on and off by means of the switch on the microphone. The Model MM 61-2 fountain pen microphone and Model MM 24-2 lapel microphone are even more inconspicuous, although their transmission quality is not as good as that of the previously-mentioned microphones. Where stringent quality requirements exist, the Mikroport transmitter may also be connected to one of our transistorized capacitor microphones via a special cable, Model KAM-1. Either the Model MKH 104 with spherical characteristics, the Model MKH 404 with cardioid characteristics, or the Model MKH 804 with ultra-directional characteristics, may be employed.

Power for these microphones is obtained from the Mikroport transmitter battery.

1.3 Model EM 1008 Mikroport receiver

This newly-developed receiver may be operated from the AC line or from a standard 9 V battery. The two antenna inputs (60-ohm and 240-ohm impedance) permit the use of different antennae. Transmitter field strength can be continuously monitored with its built-in meter. A balanced, ungrounded 1.55 V audio output provides a signal at less than 2% distortion. The signal may also be monitored simultaneously at variable volume via a built-in loudspeaker.

1.4 Antennae

The wire antenna supplied with the Mikroport receiver does not have the same reception performance as the Model TA 203 telescopic accessory antenna. If a longer antenna cable is required, e.g., for diversity reception, (See Section 4.1), it is recommended that a tuned 240-ohm dipole be prepared with a cable of suitable length.

2. Preparing the equipment for operation

Reliable operation of the entire system can only be guaranteed by the manufacturer if all parts used are original Sennheiser products and no unauthorized alterations have been made by a third party.

If the microphone spacing is increased, (or if loudness is reduced), it will be necessary to advance the control accordingly, while loud speech or a reduction in microphone distance requires a lower setting. To facilitate precise matching of the system in studio operation, it should be mentioned that correct adjustment of the sensitivity control is obtained when the audio output of the receiver supplies + 6 db (1.55 volts) at modulation peaks.

3.2 Microphones

In operating the microphones it is merely necessary to note that directional types (MD 4008, MD 405-T, MKH 404 and MKH 804) should be pointed directly at the sound source wherever possible, since they are naturally less sensitive to sounds coming from the sides and rear.

3.3 Receiver Model EM 1008

The receiver is switched on by depressing the „ON“ push button. In battery operation it is also advisable to depress the „battery test“ push button to determine whether the pointer deflects well into the red range of the indicating instrument, indicating an adequate reserve. The same channel selected on the transmitter must be selected by depressing the appropriate button on the receiver. As soon as the transmitter is switched on, the instrument will show the field strength. The pointer must

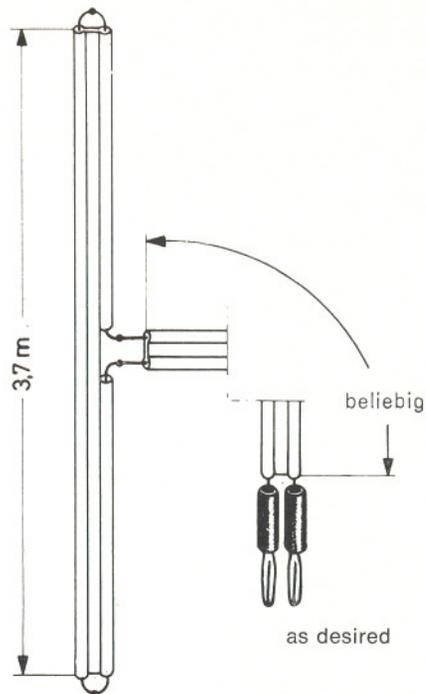
come to rest in the green section, indicating an adequate signal is present. Advancing the volume control enables the transmitted signal to be monitored by means of the built-in loudspeaker.

This output signal is available for feeding amplifier or tape recorder systems having a standard studio input level of 1.5 V (+ 6 db). To prevent noise being transmitted to the amplifiers or tape recorder systems when the transmitter is off, the 'squelch' control should be adjusted by turning it slowly clockwise, starting from position 1, until the meter needle jumps into the blue field. When the transmitter is switched on, the squelch relay will be activated and the meter will show field strength. When the automatic squelch feature is not required, the squelch control can be left at position 1. In order to reliably check operation it is advisable to switch on the transmitter and walk over the entire transmission area while a second person observes the field strength indication. Excessively low antenna voltage, indicated by a pointer on the left-hand side of the scale may be improved by reorienting the antenna.

4. Special situations

4.1 Diversity reception

For particularly important applications, where not even the slightest temporary reduction of transmission quality can be tolerated, it is possible for two or



Dipole antenna construction

more receivers to be operated in the diversity mode.

Since it is highly unlikely that field strength minima will occur simultaneously at two different antenna sites, the antennae of the two receivers should be located at a distance of several yards from each other. The two receivers must be connected to each other, the cables provided for diversity operation being inserted into the 'diversity' sockets. The equipment connected to the 'output' socket of only one receiver will then automatically be fed by this receiver, or by both receivers in common, when both receive a sufficiently high antenna voltage.

For this application, it is recommended that a folded dipole be prepared from 240-ohm TV antenna cable. This is done as indicated in Fig. 11. A 12 foot long antenna cable is shorted at both ends. Then, one of the two conductors is cut in the center and connected with the conductors of a lead-in cable of any desired length. The folded dipole thus obtained must be connected to the antenna socket on the front of the receiver marked '240 ohm'. The actual dipole section (12 feet long) should then be vertically oriented.

4.2 License

The purchaser of this equipment is responsible for obtaining the license to operate it from the appropriate authorities.

4.3 Special frequencies

While the standard carrier frequencies are set to 36.7 and 37.1 MHz, the system can also be supplied with any two frequencies between 25 and 45 MHz, (with a frequency spacing of 0.3 to 0.5 MHz), as an optional extra.

4.4 Tape recording

A changeover contact operated by the squelch circuit of the receiver is accessible at the 'auxiliary contact' socket. This changeover contact enables the transports of tape recorders to be operated by electrical remote control — both by means of the NC and NO contacts — so that they start when the transmitter is switched on and stop with it is switched off. The circuitry of this contact arrangement can be seen from the diagram located on the rear panel of the receiver.

4.5 Powering external units

A DC voltage of 4 V, at a maximum current of 30 mA, is available at contact 4 of the terminal mentioned in Section 4.4, for powering external units.

4.6 2 mV output

If the amplifier or tape recorder used with the receiver does not have a 1.55 V

input, an additional balanced, ungrounded output voltage of 2 mV, with a source impedance of 10 ohm, is available at the contacts 2 and 4 of the 'output' socket. This output can be connected to the low impedance, balanced microphone input of an amplifier.

4.7 Hum

Since the receiver is already connected to ground via the ground contact of the AC power plug, it is essential to prevent ground loops when subsequent amplifiers or tape recorders are connected. Regardless of whether the subsequent amplifier has a balanced or an unbalanced input, the shielding of the amplifier cable must be continued to the contact on the amplifier housing. On the receiver side, the screening shielding should remain unconnected and must, therefore, be kept from touching contact 2 of the standard plug.

If, on the other hand, the grounded plug is replaced by a standard plug which does not automatically ground the equipment, it will be necessary for the receiver housing to be directly grounded via a separate line, or connected via the cable shielding, to the amplifier ground connection. In this case, the shielding of the cable must be connected to contact 2 of the standard plug on the receiver side.

Technical Data SK 1008

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| Carrier frequencies, switchable | 36.7 and 37.1 MHz |
| Frequency drift at temperatures between + 68° F (+ 20° C) and + 113° F (+ 45° C) and an operating voltage deviation of 20 % | < 15 kHz |
| Radiated output | approximately 1mW |
| Type of modulation | FM |
| Noise swing | ≤ 100 c/s |
| AF input sensitivity (variable) | 1 mV/40 kHz swing |
| Transmission range ± 3 db | 35 Hz — 20 kHz |
| Pre-emphasis | 50 μsec |
| Distortion factor at 40 kHz swing | ≤ 2 % |
| Current consumption | 10 mA |
| Battery | optional: 1 dry battery Eveready No. 216, Daimon No. 333, Pertrix No. 438 or rechargeable nickel-cadmium battery Deac Tr 7/8 or equivalent |
| Battery life | 7 hours |
| Dimensions | 5.9" x 1.7" x 1.3" (without microphone) |
| Weight | 0.89 lb. (with battery; without microphone) |



Technical Data MD 1008

| | |
|---|--------------------|
| Response | 60 Hz — 14 kHz |
| Maximum deviation from specified frequency response (for lavalier microphone) | ± 3 dB |
| Field no-load transmission factor at 1000 Hz | 0.2 mV/ μ bar |
| Electrical impedance | 400 ohms |
| Directional characteristic | spherical |
| Dimensions | 1.6" x 1.7" x 1.3" |
| Weight | 0.24 lb. |

Technical Data EM 1008

| | |
|---|---|
| Input I | unbalanced, for 60-ohm source impedance, 13 mm RF jack complying with DIN 47 283 |
| Input II | balanced, for 240-ohm sources: plug diameter 4 mm; plug spacing 12 mm. |
| Output | ungrounded; internal resistance 30 ohm; nominal loading 300 ohm; 5-pole standard jack complying with DIN 41 524 |
| Output voltage with 40 kHz swing and more than 5 μ V antenna voltage | 1.55 V ± 2 dB |
| Audio frequency range | 50 Hz — 15 kHz |
| Deviation from specified frequency response (De-emphasis 50 μ sec) | ± 2 dB max. |
| Non-linear distortions at 40 kHz swing and 200 μ V antenna voltage | < 2 % |
| Spurious voltage ratio at 40 kHz swing and 2.5 μ V antenna voltage | > 26 dB |
| Spurious voltage ratio at 40 kHz swing and more than 20 μ V antenna voltage | > 50 dB |

EM 1008

| | |
|--|--|
| Signal-to-noise ratio at 40 kHz swing and more than 50 μ V antenna voltage | > 65 db |
| Reception frequencies | 36.7 and 37.1 MHz in accordance with the transmitter |
| Pull-in range of automatic tuning | \pm 100 kHz |
| Adjacent channel rejection with 0.4 MHz channel spacing | > 60 db |
| Electronic squelch circuit; Adjustable cut-off antenna voltage | 2 μ V — 1 mV (Indication by field strength meter) |
| Diversity operation | 2 or more receivers can be connected to each other at the 'diversity' jacks via a 5-pole jack complying with DIN 41 524 |
| Tape recorder remote control | Auxiliary contact jack to be connected with remote control terminal of the tape recorder; 5-pole standard jack complying with DIN 41 524 |
| Power supply | Optionally from the built-in AC power pack 110/220 V, 50–60 Hz or from 9 V battery, for example: Eveready No. 276, Daimon No. 339, Pertrix No. 439, Sonnenschein Dryfit accumulator 4 L x 2, 8 V |
| Power consumption with AC line operation | approximately 2 W |
| Line fuse | 0.035 A |
| Transistor complement | 1 x AF 102, 6 x AF 124, 6 x AC 161, 1 x matched pair AC 117, AC 175, 1 x AC 153, 2 x AC 127 |
| Diodes | 1 x OA 126/6, 1 x BA 111 2 x OA 91, 2 x AA 119, 1 x BA 100, 1 x ZF 9.1 |
| Dimensions | 11.7 x 6.6 x 3.7" |
| Weight | approximately 8.1 lb. |



Technical Data T 203

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|--|---|
| Input (unbalanced) | for 50-ohm sources |
| Output (unbalanced) | internal resistance 1 K; nominal loading 2 K |
| Output voltage with 40 kHz swing and more than 5 μ V antenna voltage | 1 V, variable |
| Audio-frequency range | 100 — 15 000 Hz |
| Deviation from specified frequency response (De-emphasis 50 usec) | $\leq \pm 2$ dB |
| Non-linear distortion at 40 kHz swing and 200 μ V antenna voltage for 1 V output voltage | ≤ 3 % |
| Signal-to-noise ratio at 40 kHz swing and more than 20 μ V antenna voltage | > 50 dB |
| Reception frequencies | 36.7 MHz and 37.1 MHz |
| 26 db signal-to-noise ratio with swing of 25 kHz | from 2 μ V |
| Adjacent channel rejection (400 kHz spacing) | approximately 50 db |
| Power supply | 9 V battery, for example Eveready No. 226, Pertrix No. 29 or 7.5 V DEAC accumulator, capacity 150 mAh |
| Operating period | Battery, approximately 20 hours; accumulator approximately 10 hours |
| Dimensions | 1.3" x 3.4" x 4.7" |
| Weight (with battery) | approximately 0.6 lb. |

Technical Data MD 4008

| | |
|---|--------------------|
| Frequency response | 80 to 12,000 Hz |
| Maximum deviation from nominal curve | ± 3 db |
| Field no-load transmission factor at 1000 Hz | .2 mV/ μ bar |
| Electrical impedance | 700 ohms |
| Directional characteristic | super cardioid |
| Dimensions | 1.6" x 1.7" x 1.3" |
| Weight | .24 lbs. |





Sennheiser electronic

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Telefon 0 51 30 - 88 41 (Umstellung etwa Anfang Mai 1968: 0 51 30 - 80 11)

Telex 9 22193 (Umstellung ab 3. April 1968: 09 24623)