



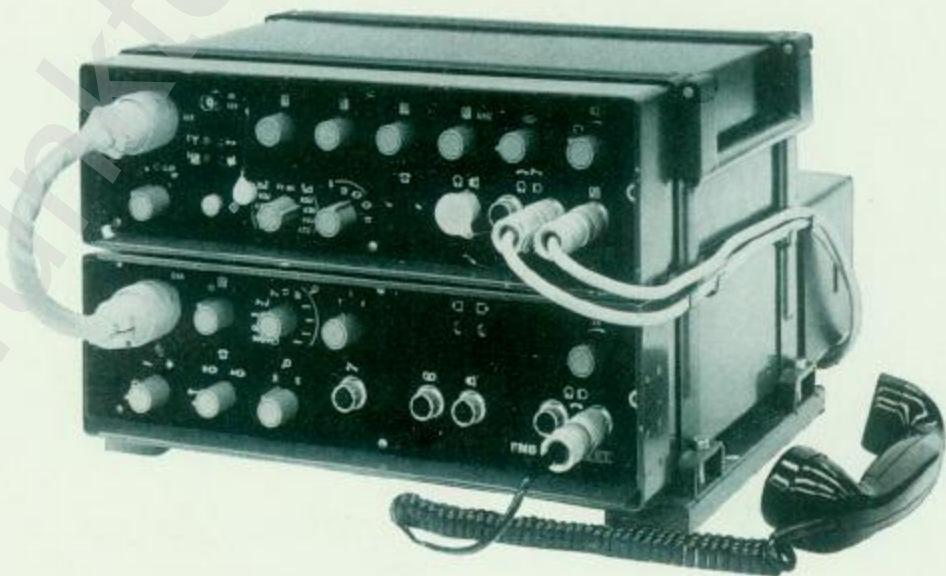
Equipment System SEG 100 D



SEG 100 D
with FMA 01



FMB 01
with ESS 100



Antenna Matching Unit, model **AAG 100**

Antenna shapes
which can be used
(with or without
earth net):

Technical
specifications:

The model AAG 100, type 1554.102, is an automatic antenna matching unit of the system SEG 100 D. It serves for the matching of unbalanced antennas with a SWR $s > 3$ (with respect to $Z = 50$ ohms). The model AAG 100 is suitable for mobile and fixed radio stations. It can be set up remote max. 25 m from model SEG 100 D.

- Wire antennas with a length of more than 6 m
- Wire antennas with a length of more than 4 m with a feed-through insulator with a capacitance of $c > 20$ pF
- Elevated 6 m rod antenna e.g. model SSA 100, type 1557.20 A 1
- 4m rod antenna for motor vehicle e.g. type 1557.16 A 2
- 2 x 4 m rod antennas on a motor vehicle
- 10 m rod antenna.

Temperature range	– 25 °C to + 55 °C
RF input power	max. 120 W
Frequency range	1.5 MHz to 12 MHz
Time for tuning	≤ 3 s
Tuning	automatic
Residual mismatch	$s < 3$, on average $s < 1.5$
Mechanical dimensions (width x height x depth)	280 mm x 460 mm x 130 mm
Weight	9.8 kg

Various additional sub-assembly groups can be supplied according to the site of assembly selected. The supplied mounting is suited for indoor assembly. An earth plate can be supplied for non-metal walls for fixing, onto which the model AAG 100 is mounted and the antenna counterpoise connected. The weather protection which can be supplied additionally prevents the model AAG 100 from undue warming-up in case of outdoor assembly or at sites with intensive sun radiation. The weather protection is suitable for wall or tubular pole assembly.



Fan Module, model LB 100

The Fan Module, model LB 100, has been designed particularly for the Transmitting/Receiving Unit, model SEG 100 D. In case of ambient temperature above $+35^{\circ}\text{C}$ and transmitting operation with continuous power, an additional cooling of the power sub-assembly groups of model SEG 100 D becomes necessary in order to prevent the protecting facility from responding. The Fan Module is mounted below the heat sink. Thermal contact with the heat sink is provided by a temperature sensor. When the prescribed temperature is exceeded, the Fan Module operates automatically and switches off automatically when the given temperature is fallen below. The Fan Module, model LB 100, is provided for being connected to the 200 VAC mains.

Technical specifications:

Mains connection	220 V, 50 Hz
Degree of protection	IP 54 TGL 165/01
Mechanical dimensions (width x height x depth)	400 mm x 140 mm x 98 mm
Weight	3.5 kg



Teletypewrite Adapter, model FSA 100

The Teletypewrite Adapter, model FSA 100, is provided for connection of a teletypewriter to the Transmitting/Receiving Unit, model SEG 100 D. The change-over of the writing direction (send or receive) is made manually. The power supply for the teletypewriter is made by way of the Teletypewrite Adapter, model FSA 100, and is controlled by the mode of transmission switch of model SEG 100 D.



Teletypewrite Attachment, model FZ 100

The following modes of operation are possible:

The Teletypewrite Attachment, model FZ 100, is an additional unit for the Transmitting/Receiving Unit, model SEG 100 D. Model FZ 100 makes provision for the connection of a teletypewriter and a punched tape transmitter. At option, the teletypewriter or the punched tape transmitter can be operated together with model SEG 100 D.

Local operation:

The Teletypewrite Attachment and the connected teletypewriter units can be operated independent from model SEG 100 D for training purposes or for the preparation of punched tapes.

Simplex operation:
(send - receive operation)

Simplex teletypewrite operation at which the necessary change-over from send to receive of model SEG 100 D is made by way of an information control from the model FZ 100. After the last character sent the send direction is kept open for 5 s or 10 s. After this time, the change-over to reception takes place.

The position of the receive signal can be reversed.

One-way teletypewriter communication:
(send operation)

The blocking of the sender is cancelled. Model SEG 100 D also sends in the writing intervals.

The send direction is blocked.

The installation is always at receive condition.

Technical specifications:

Temperature range	- 25 °C to + 55 °C
Degree of protection	IP 20 according to TGL 15 165/01
Class of protection	I according to TGL 21 366
Mechanical group of application	G II according to TGL 200-0057/04
Permissible mains voltage	220 VAC $\pm 15\%$ with protective conductor
Mains frequency	47 Hz to 63 Hz
Power consumption	20 VA
Line current	35 mA to 45 mA (constant current source)
Telegraphic speed	≤ 100 Bd
Remote installation of model FZ 100 from model SEG 100 D	max. 50 m
Mechanical dimensions (width x height x depth)	230 mm x 95 mm x 194 mm
Weight	3,6 kg



Remote Modulation Connection Unit, model FMA 01

The Remote Modulation Connection Unit, model FMA 01, is provided for the transformation of the remote modulation signals which are supplied by way of a telephony and telegraphy line. The transformed signals are fed as input signals into the local connections for the terminal units of the Transmitting/Receiving Unit, model SEG 100 D. The occupied connection sockets at model SEG 100 D are duplicated at model FMA 01, and connected with the connection sockets of model SEG 100 D at the mode of operation "local modulation". At the mode of operate "remote modulation", model FMA 01 becomes effective, and in this case, the model SEG 100 D operates only as transmitter. Telephony, Morse telegraphy, or teletypewrite operation are possible. The opening of the send direction is made by means of a telegraphy signal with telephony operation, and by means of an 800 Hz signal with teletypewrite operation involved.

Technical specifications:

Temperature range	— 25 °C to + 55 °C
Degree of protection	IP 54 according to TGL 15 165
Modes of operation	local modulation remote modulation
Connection possibilities with local modulation	Teletypewrite Adapter, model FSA 100 Teletypewrite Attachment, model FZ 100 Morse key handset fist microphone headphone
Telephony	
Input impedance	600 ohms
Input level	—12 dB to + 10 dB
Frequency range	300 Hz to 3400 Hz
Output level	— 43 dB \pm 5.5 mV
Load resistance	= 1 kohm
Frequency response	= 0.5 dB
Telegraphy	
Input impedance	1 kohm
Input current	\pm 5 mA to \pm 20 mA
Telegraphic speed	\leq 100 Bd
Mechanical dimensions (width x height x depth)	376 mm x 117 mm x 296 mm
Weight	4.9 kg



Remote Modulation Operating Unit, model FMB 01

The Remote Modulation Operating Unit, model FMB 01, makes provision for the setting up an operator's position for the commercial short-wave radio. It is equipped with sockets for the connection of terminal units for telephony, telegraphy and teletypewrite. The model FMB 01 provides to separate outputs telephony and telegraphy signals for the sender and has inputs for the connection of a receiver.

Together with the Remote Modulation Connection Unit, model FMA 01, a remote modulation facility for the Transmitting/Receiving Unit, model SEG 100 D is formed.

The model FMB 01 can be operated at the AC mains or supplied from a battery.

The following modes of operation can be made:

Telephony:

- sending of an 800 Hz level signal for tuning purposes
- sending of pre-produced information from tape
- simplex telephony, change-over of the send/receive direction by talking key

Telegraphy:

- Morse telegraphy, BK operation, internal monitoring signal for own signal is switch-selected

Teletypewrite:

- one-way teletypewriter communication in receive direction
- one-way teletypewriter communication in send direction
- simplex teletype with automatic send/receive change-over (simplex operation)
- full duplex operation (duplex operation)
- local operation

Technical specifications:

Temperature range	- 25 °C to + 55 °C
Degree of protection	IP 54 according to TGL 15 165
Class of protection	I according to TGL 21 366
Mains voltage	110 V - 15 % to 127 V + 15 % or 200 V - 15 % to 240 V + 15 %
Mains frequency	47 Hz to 63 Hz
Power consumption	40 VA
Battery voltage	24 V + 20 % - 10 % battery is connected to earth at option
Power consumption	36 W
Mechanical dimensions (width x height x depth)	376 mm x 117 mm x 405 mm
Weight	13 kg



Horizontally Polarized Dipole Antenna, model SDA 100

Technical specifications:

Frequency range	1.6 MHz to 30 MHz
Rated input impedance	$Z = 50$ ohms, unbalanced to earth
Maximum SWR	$s = 3$
Efficiency	10 % to 40 % depending on the frequency
Gain with respect to appropriately attenuated $\lambda/2$ dipole in the open space	7 dB (1.6 MHz to 12 MHz)
Power loadability	max. 120 W
RF cable connection	RF receptacle 22 TGL 25 602 (N plug-and-socket connector)
Radiation properties	horizontal diagram nearly circular within the range 1.6 MHz to 12 MHz at angles of elevation $> 45^\circ$; horizontal diagram figure of eight above 12 MHz (zero crossovers in the direction of dipole axis)
Temperature range	-25°C to $+55^\circ\text{C}$
Degree of protection	IPX according to TGL 15 165/01
Erection sites	sites of category A according to TGL 13 480 with small danger of icing

The Transmitting Dipole Antenna, model SDA 100, acts like a dipole which is arranged horizontally in front of a reflector wall. The earth serves as reflector. Both ends of the dipole are loaded capacitively (end capacitances) in order to keep the length of the dipole small. The frequency dependency of the input impedance of the antenna is compensated by the double interruption of each half of the dipole and their bridging with complex resistances. The balun and transformer in the base of the dipole are provided for matching the input impedance of the dipole to the characteristic impedance of the coaxial cable. Five versions of this antenna are offered.

Antenna type 1557.19 A 1

This antenna consists of two poles and a dipole which is suspended between the two poles. End capacitances consisting of wire ropes are arranged at both ends of the dipole. Those are led to the earth in V-type manner, and are fixed at the lateral guying points of the poles. Each pole is 9 m in height, consists of steel tube and is double-guyed to three sides. The guying points in the soil are dug-in earth anchors. The rocker bearings for the poles are fixed with earth nails.

Antenna type 1557.19 A 2

Only one pole belongs to this antenna. The second point of suspension for the dipole as well as the two fixing points for the earth capacitances are at the site of erection or must be provided.

Antenna type 1557.19 A 3

No poles belong to this version. Both suspension points for the dipole as well as the fixing points for the end capacities are at the site of erection or must be provided.

Antenna type 1557.19 A 4

This antenna corresponds to the type 1557.19 A 1. Both types are distinguished only that the guying points and pole base points with type 1557.19A4 are made as cast-in-situ concrete foundations.

Antenna type 1557.19 A 5

This antenna corresponds to the type 1557.19 A 2. Both types are distinguished only that the guying points and pole base points with type 1557.19A4 are made as cast-in-situ concrete foundations.

Mobile Transmitting Dipole Antenna, model SDA 100 m

Design and mode of operation:

The horizontally polarized model SDA 100 m is provided as transmitting/receiving antenna for the frequency range 1.6 MHz to 30 MHz. Radio communications with counterstations up to 600 km distant from the position of the antenna can be established by high-angle radiation or high-angle reception. The antenna can be loaded up to 120 W (CW). It is suited for fixed radio stations of the mobile radio service and can be erected within approx. thirty minutes by two persons.

The antenna is a single-wire horizontally polarized dipole the ends of which are loaded capacitively. The dipole is suspended between two poles. The height of the poles is 9 m. The straight length is approx. 26 m. Compensation networks are connected in each half of the dipole between end capacitance and end of dipole and at a distance of 9 m from the base of antenna. These compensation networks match the effective electric length of the antenna to the relevant operating frequency, such that the base impedance does not fluctuate too heavily.

A balun and transformer are provided at the base of antenna. By means of those the input impedance of the dipole is matched to the 50 ohms feeder cable terminating here. The feeder cable is of the type 50-7-2 TGL 200-1579.

Both halves of the dipole are connected with respect to DC by way of the transformer. Coarse spark gaps are provided for the protection against short-time atmospheric discharges in each compensation network and in the transformer. A rope is led to the ground from the transformer. Rope and poles are to be connected to the three earthing points which are to be driven in the soil.

They are to be connected electrically by means of earth ropes.

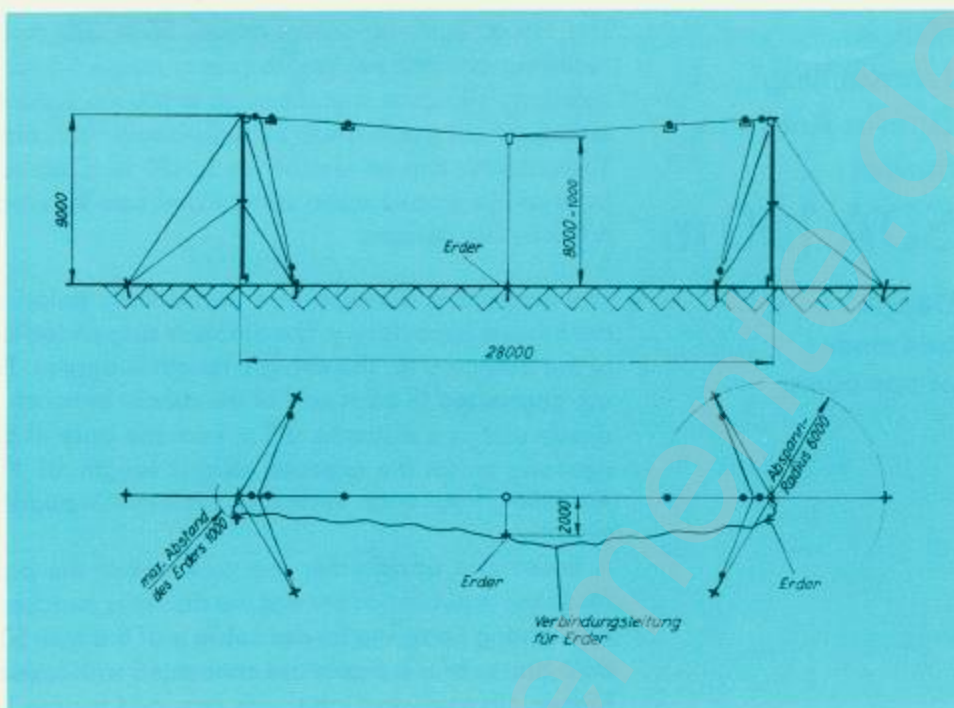
The dipole and the end capacitance are made from bronze rope. The dipole, including the compensation networks, transformer, earth rope and RF cable, can be wound on a drum.

The poles are six-part telescopic tubular poles. The parts are made of weather-resisting aluminium alloy. Each pole is guyed to three sides in two planes. The guying ropes consist of core shroud lines which are wound on reels for transportation. All parts are accommodated in eight canvas bags.

The model SDA 100 m, type 1557.21 A 1 and A 2 is also supplied with only one pole. The application of this antenna is profitable, when a telescopic mast – minimum height 9 m – is installed undetachable on the vehicle. It must be observed that fixing points for the end capacitance are to be provided.

Technical specifications:

Frequency range	1.6 MHz to 30 MHz
Polarization	horizontal
Maximum loadability	120 W
Input impedance	50 ohms, unbalanced
Maximum SWR	$s = 3$
Radiation	a) with high-angle radiation ($f < 12$ MHz) nearly circular b) with flat-angle radiation ($f > 12$ MHz) diagram with side lobes
RF connection	RF connector 11-1 TGL 25 602 type N
Application temperature range	-25°C to $+55^{\circ}\text{C}$
Weight type 1557.21 A 1	145 kg
type 1557.21 A 2	90 kg
Mechanical dimensions of the erected antenna	see figure 1



Transmitting Rod Antenna, model SSA 100

Technical specifications:

Frequency range	1.6 MHz to 12 MHz (type 1557.20 A 1) 5 MHz to 30 MHz (type 1557.20 A 2)
Rated input impedance	$Z = 50$ ohms, unbalanced to earth
Maximum SWR	$s = 2.4$ (type 1557.20 A 1) with model AAG 100 $s = 3$ (type 1557.20 A 2)
Radiation pattern	circular in the horizontal plane
Power loadability	maximum 120 W
RF cable connection	RF receptacle 22 TGL 25 602 (N plug-and-socket assembly)
Lightning protection	by means of spark gaps
Degree of protection	IPX 3 according to TGL 15 165/01
Temperature range	-40°C to $+55^{\circ}\text{C}$
Weight	approx. 120 kg (including pole)
Sites of erection	erection sites of category A according to TGL 13480 with low danger of icing

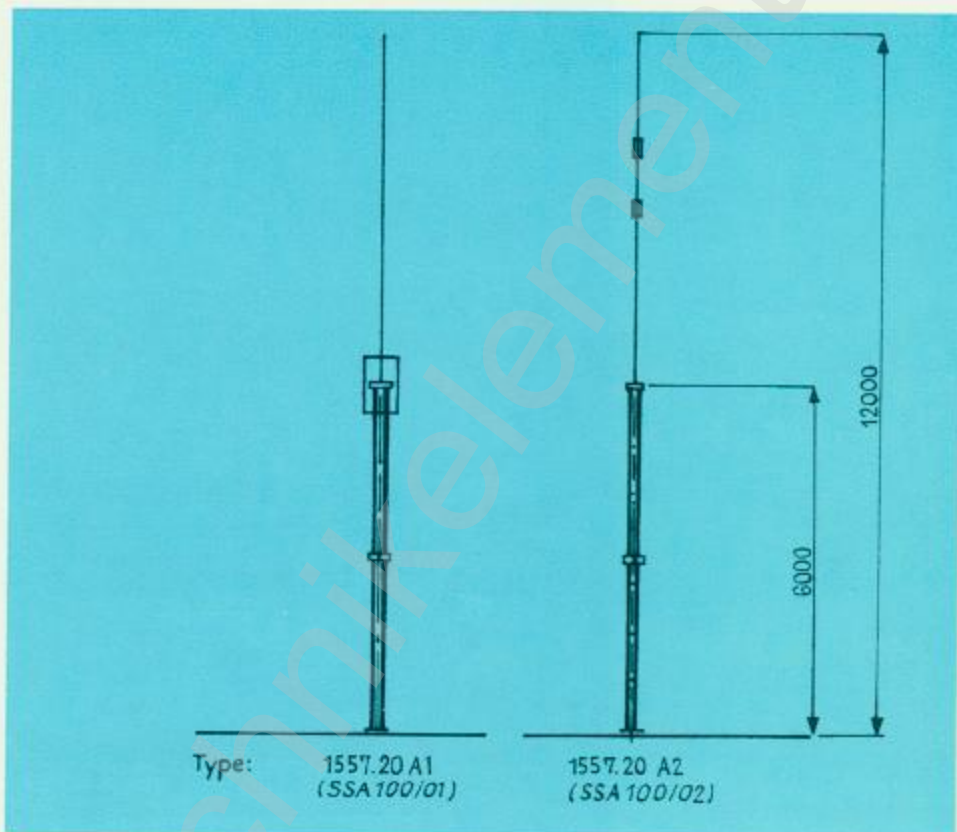
Antenna type 1557.20 A 1

The Antenna consists of a 6 m in length glass fibre reinforced polyester rod with bedded copper rope which is mounted on a pole 6 m in height. The pole consists of two steel tube courses provided with climbers. The Antenna Matching Unit, model AAG 100, is mounted at its upper end. The RF feeder cable and the supply cable for the model AAG 100 are led outside of the pole. The antenna rod and the pole form the Antenna, proper. The excitation is made between the end of the pole and the lower part of the rod (upper-end feeding). The Antenna is matched to the characteristic impedance of the feeder cable by means of the Antenna Matching Unit.

Antenna type 1557.20 A 2

With this type of antenna, the conductor of the antenna in the polyester rod is interrupted for two times and bridged by complex resistances which are arranged outside of the rod.

A transformer is arranged at the end of the pole, 6 m in height. Supply is made by means of an RF cable which is led outside of the pole (upper-end feeding). The frequency dependency of the input impedance of the antenna is kept small by the complex resistances. The matching of the antenna input impedance to the RF cable is made by means of the transformer.



Rod Antenna (4m)

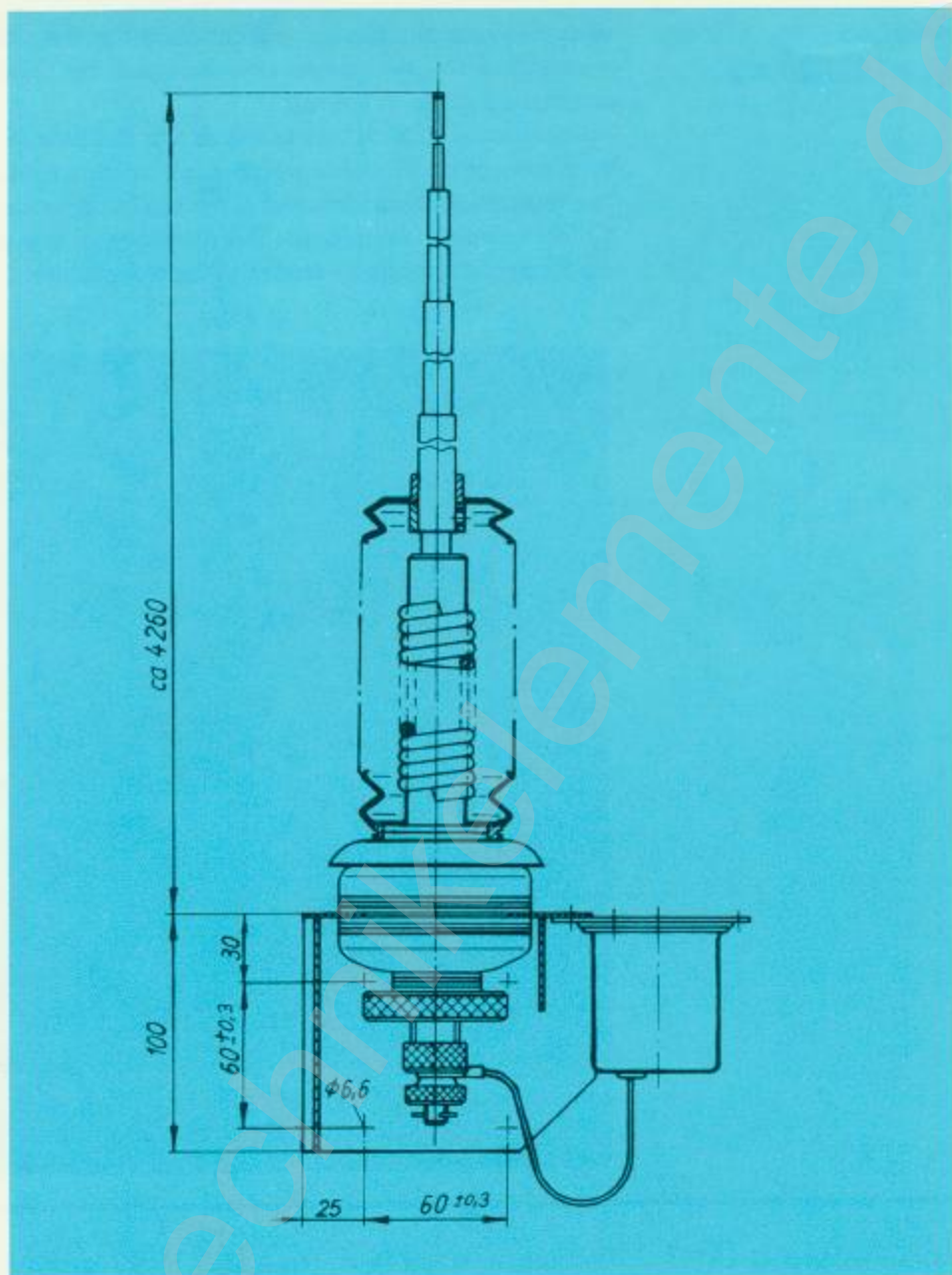
The Rod Antenna (4 m), type 1557.16 A 2 is a transmitting/receiving antenna for mobile radio stations.

Technical specifications:

Frequency range	1.6 MHz to 30 MHz
Power loadability	max. 150 W
Degree of protection	IPX 5 according to TGL 15 165/01
Temperature range	— 40 °C to + 55 °C
Mechanical ranges of application	group of application G III according to TGL 200-0057/04
Weight	approx. 3 kg

The Antenna Rod, 4 m in length, consists of four individual rods which are plugged together by means of bayonet-type connections. Each individual rod consists of glass fibre reinforced polyester resin and is covered with a copper braiding. The antenna base consists of an insulator and a spring which takes the oscillation energy of the antenna rod. The antenna can be mounted directly on the top of a vehicle. A console is supplied for a lateral mounting at a vehicle.

This antenna is provided particularly for the operation in conjunction with the Transmitting/Receiving Unit, model SEG 100 D. The transformation of the antenna base impedance to a mismatch $s < 3$ (referred to $Z = 50$ ohms) is made by means of the Antenna Matching Unit, model AAG 100.



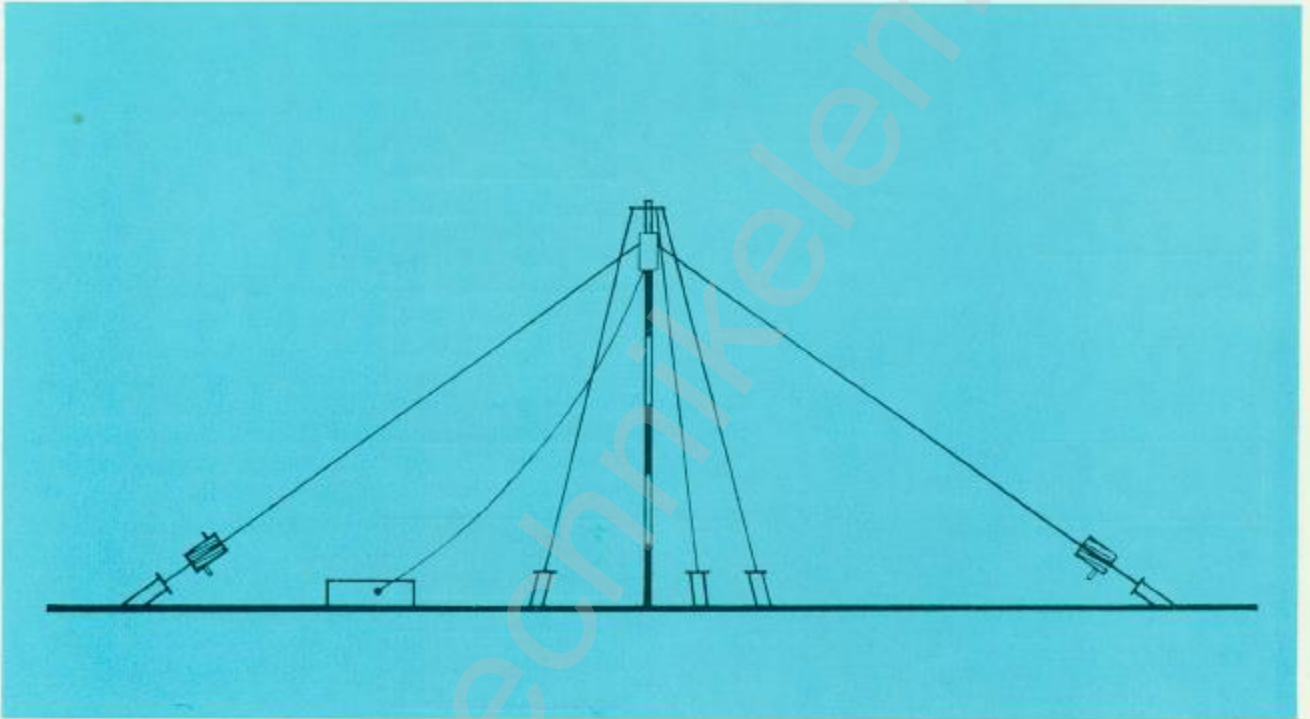
Single-Pole Dipole Antenna, model DA 02

Technical specifications:

The Single-Pole Dipole Antenna, model DA 02, is used as transmitting/receiving antenna for fixed radio stations of the mobile radio service, particularly in conjunction with the Transmitting/Receiving Unit, model SEG 100 D. The Antenna is suited for establishing radio connections up to distances of approx. 600 km.

Frequency range	1.6 MHz to 12 MHz
Rated input impedance	$Z = 50$ ohms, unbalanced to earth
Maximum SWR	$s = 3$ (tuned antenna)
Radiation pattern	circular with elevation angles $> 45^\circ$
Power loadability	max. 120 W
RF cable connection	RF connector 11-2 TGL 25 602 (N plug-and-socket connector)
Degree of protection	IPX 3 according to TGL 15 165/01
Temperature range	-25°C to $+55^\circ\text{C}$

The Antenna consists of two reels with the antenna lines, a balun, a telescopic tubular pole with guyings, the pegs and a coaxial antenna feeder. The balun is suspended to the tubular pole guyed to three sides. The antenna lines are mounted at the balun, led down and held by means of pegs in the soil. The antenna is a steeply radiating angled dipole. Its feeding takes place at the base by way of the balun. The tuning of the antenna to the transmitting/receiving frequency is made by means of changing the length of the antenna lines. These changings of length take place by winding up or off from the reels.



Possibilities for assembly and combination for systems with remote modulation facilities



without remote modulation facilities

