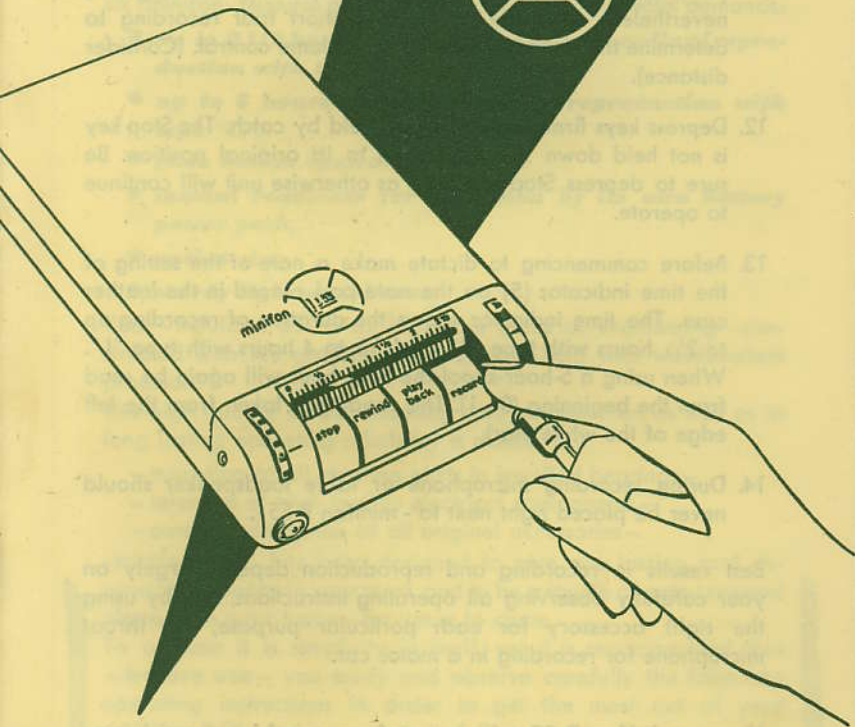


**Operating instructions**

**for Your minifon P55**



**Sole manufacturers: PROTONA GmbH · Hamburg · W. Germany**

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. . . please unfold this page and leave it open when reading the instruction booklet.

**- minifon P 55 - YOUR SECOND MEMORY, is the world's smallest sound recorder / reproducer for speech and music.**

- minifon P 55 - is so small in fact that you can conveniently grasp it with one hand and that it fits snugly into your pocket. In spite of its small size - minifon P 55 - combines all of the advantages of larger recording/reproducing units. In addition, its characteristic six - minifon - features provide the answer to your special demands:

- **up to 2 1/2 hours speech and music recording/reproduction with type "S",**
- **up to 5 hours speech recording/reproduction with type "L",**
- **push button control**
- **instant readiness for operation by its own battery power pack,**
- **pocket size,**
- **sturdy light-metal-case.**

Your - minifon P 55 - is an ingenious piece of engineering - constructed with the greatest of care - and built with watchmakers precision.

The high quality of its recording and reproduction as well as its long lasting operating reliability is assured by

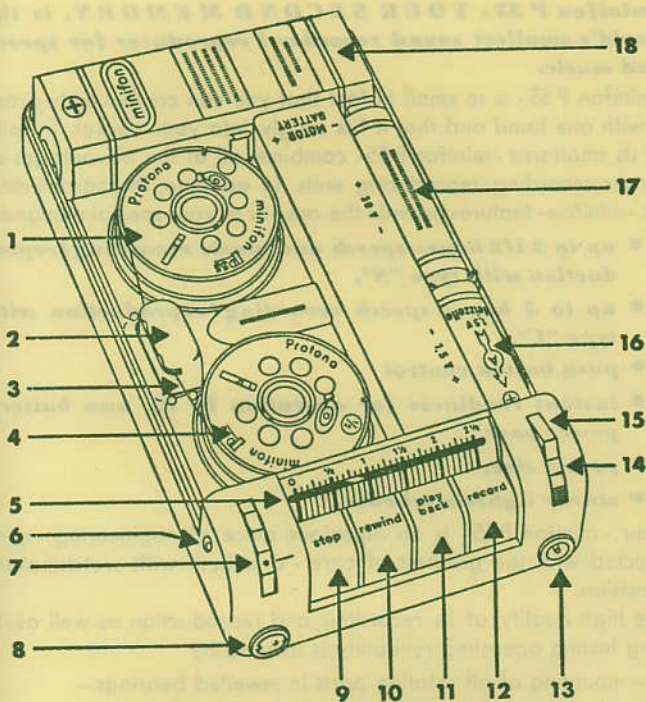
- mounting of all rotating parts in jewelled bearings -
- selection of high quality electrical components -
- careful adaptation of all original accessories -

- minifon P 55 - has been designed to give you lasting and dependable service in your work and to be a source of ever-renewed pleasure in your home - for years to come.

To operate it is simplicity in itself, yet it is recommended that - **before use** - you study and observe carefully the following operating instructions in order to get the most out of your - minifon P 55 - and enjoy it to its fullest extent.

Should you require any additional details, do not hesitate to call on us, or on any of our representatives at home or abroad.





- |                    |                            |
|--------------------|----------------------------|
| 1 Take-up Spool    | 10 Rewind Key              |
| 2 Recording Head   | 11 Play-back Key           |
| 3 Wire             | 12 Record Key              |
| 4 Supply Spool     | 13 Connection Socket       |
| 5 Time Indicator   | 14 Battery Meter           |
| 6 Lid Release      | 15 Pilot Lamp              |
| 7 Volume Control   | 16 Filament Battery (L.T.) |
| 8 Secondary Socket | 17 Anode Battery (H.T.)    |
| 9 Stop Key         | 18 Motor Battery           |

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## ***Important!***

**Before starting to use - minifon P 55 -, and during subsequent operation, please observe in your own interest the following 14 points:**

1. Press Stop key.
2. Open lid by pressing lid release (push buttons) at both sides of case simultaneously.
3. Insert filament (L.T.) - and anode (H.T.) batteries as well as motor battery, carefully observing correct polarity (i.e. + to +). Make sure that proper contact is established (if necessary slightly bend contact springs).
4. Check whether wire spools are fitted firmly on spool capstans, and are held by spring-loaded balls.
5. Make sure that recording head (2) is fully up, i. e. in its highest position.
6. Recording wire must run freely through slot of recording head (2), and at all times remain taut.
7. Check whether left edge of white mark on time indicator points to zero. With lid open you will note at one end of time roller (next to the volume control) a rubber ring which permits adjustment of time roller by hand.
8. Operate - minifon P 55 - only with lid closed. Do not interfere with recording head or spools movement.
9. Make sure that all batteries are in operational condition. The motor battery is in operational condition if the pointer of the battery meter (14) is clearly within the white field with the unit switched on. This is essential for recordings of some length, to prevent the motor from slowing down or stopping during recording due to exhaustion of the motor battery. See also **IX, 1.**

10. Insert plugs of all accessories until they click home (13).
11. Check setting of volume control (7). Its normal setting is dot to dash (•—) when using standard (crystal) microphone. When recording with other microphones (combination table loudspeaker, throat microphone, wrist-watch microphone or dynamic microphone), set the volume control one notch lower (•—) than dot to dash. Prior to an important recording it is, nevertheless advisable to make a short trial recording to determine the correct setting of the volume control. (Consider distance).
12. Depress keys firmly until they are held by catch. The Stop key is not held down but will return to its original position. Be sure to depress Stop key fully as otherwise unit will continue to operate.
13. Before commencing to dictate make a note of the setting of the time indicator (5) on the note-pad placed in the leather case. The time indicator shows the duration of recording up to 2½ hours with type "S", and up to 4 hours with type "L". When using a 5-hour-spool the 5th hour will again be read from the beginning (0-1). The reading is taken from the left edge of the white mark.
14. During recording microphone or table loudspeaker should never be placed right next to - minifon P 55 -.

Best results in recording and reproduction depend largely on your carefully observing all operating instructions, and by using the right accessory for each particular purpose, f. i. throat microphone for recording in a motor car.

**Your - minifon P 55 - is a precious machine, precision-built. Handle it carefully and protect it from shock, injury and moisture by using - minifon - leather case.**



## I. Recording of speech

### 1. Using crystal microphone (standard microphone)

The crystal microphone is highly sensitive to sound. Under favourable recording conditions and with the volume control opened fully, recordings may be made up to a distance of 24–30 feet (e.g. at lectures).



The volume control setting is dot to dash (• —) as long as the source of sound is not more than 3 feet from the microphone; during conferences at a distance up to 9 feet one notch lower (• —). For recordings at greater distances the volume control should be opened fully. At a distance of less than 2 feet do not speak directly into the microphone but always at an angle to or across the face of the microphone.

### 2. Using table loudspeaker/microphone

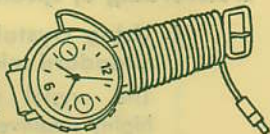
The table loudspeaker is a combination unit for acoustical speech recording and reproduction, as well as for electrical two-way telephone recording by means of a built-in induction coil. For speech recording set operating lever at bottom of loudspeaker-housing to "microphone", insert jack-plug into socket (13) and three-pin plug (S) into secondary socket (8). For setting of volume control see page 6, item 11.



### 3. Using wrist-watch microphone

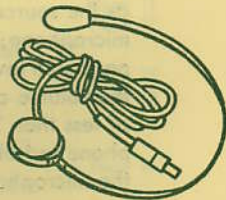
A highly sensitive crystal microphone is built into a dummy wrist-watch. For setting of volume control see page 6, item 11.

The wrist-watch microphone has a certain directional effect of about  $90^\circ$ . If, therefore, during a conference with several persons, an individual voice is to be recorded in particular, hold your arm in the direction of that person without turning, however, face of watch towards the source of sound.



### 4. Using throat microphone

This to be used wherever recordings are to be made in the midst of heavy background noises e. g. in machine shops, dictation in motor-cars, aeroplanes, trains and on-the-spot interviews.



Slip band of throat microphone around your neck, so that the microphone – with the white point facing side of throat – rests with light pressure near the larynx. Band of throat microphone can be bent to fit your neck.

Irrespective of number of persons speaking and degree of noise prevailing, the speaker's own voice only will be recorded with this microphone. The volume control should be set one notch lower than dot to dash (• —) but the speaker should speak with low voice only.

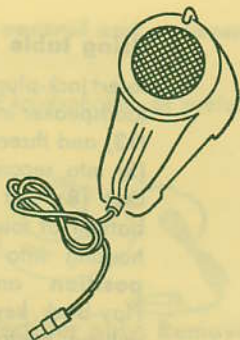
It is advisable to make a trial recording to determine the correct setting of the volume control.

### 5. Using dynamic (moving coil) microphone

The dynamic microphone, especially suitable for acou-



stical recording of music, may also be used for speech recording. In tropical climate the dynamic microphone, being fully tropicalized, is to be preferred to the crystal (standard) microphone. The volume control should be set one notch lower (• —) than dot to dash.



## **II. Rewind**

Depress Rewind key (10) firmly until held by catch. The rewind speed is 4,5 times the forward speed, i. e. 18 minutes recording correspond to about 4 minutes rewind. The time indicator is now in reverse too. When the position of the time indicator, previously noted, has been reached, press Stop key. Do not interrupt current supply during rewind, i. e. do not remove motor battery or secondary plug of transformer/rectifier from unit!

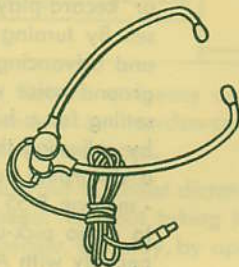
## **III. Reproduction of speech**

### **1. Using microphone**

All microphones serve not only for recording purposes but may also be used for reproduction for testing and correction. The quality of reproduction cannot, of course, be compared with that of a loudspeaker.

### **2. Using stethoset phones**

The feather weight stethoset phones (forked-prong earphones) are especially suitable for concentrated listening to recordings. The quality of reproduction is of a high order with syllables being clearly defined. Sound volume is adjusted by volume control.



### 3. Using table loudspeaker

Insert jack-plug of table loudspeaker into socket (13) and three-pin plug (S) into secondary socket (8). Set lever at bottom of loudspeaker housing into **middle position** and press Play-back key. Adjust volume control (7) to obtain clear reproduction at room volume.

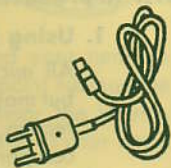
By means of tone control at rim of table loudspeaker adjust tone to your choice.



### 4. Using radio set or other amplifier

You may use any radio set fitted with "Pick-up" socket. Switch radio set to "Pick-up" or "Record-player". Insert jack-plug of radio connecting lead **W** into socket of - minifon P 55 - (13), the radio connecting plug into "Pick-up" or "Record-player" socket of radio set.

By turning back volume control of - minifon P 55 - and advancing volume control of radio set, any background noise will be eliminated. The most favourable setting for a high quality reproduction is now obtained by adjusting the tone control of your radio set. Should a disturbing humming make itself heard, even without - minifon P 55 - being switched on, reverse connection to radio pick-up; (this will assure correct earthing, especially with AC/DC sets).



#### **IV. Transcription by means of foot control and stethoset phones**

The typist uses for transcription the table loudspeaker, or preferably the stethoset phones.

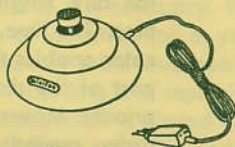
##### **1. Electrical foot control**

The electrical foot control has the advantage of easy operation and simplified handling.

**It can be used in conjunction with the transformer/rectifier only. Remove motor battery.** Insert three-pin-double-plug of foot control into secondary socket (8). Insert three-pin-plug of transformer/rectifier into plug of foot control. Depress Play-back key. By operating button of foot control the unit can now be started and stopped as required.

In rewind - minifon P 55 - may be stopped by depressing **Stop key of unit only.**

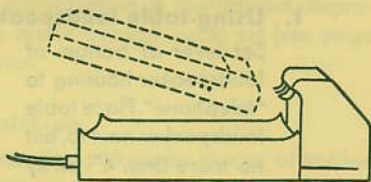
This foot control may also be used for remote-controlled recording.



##### **2. Using mechanical foot control**

a) - minifon P 55 -

is placed into table part of foot control, as illustrated. Make sure that, before operation of foot control, the bowden-

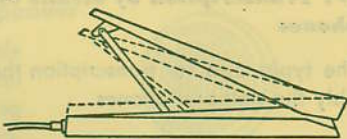


cable is completely unwound. Correct and easy operation of foot control is dependent on bowden-cable being laid out in a wide curve without loops.

b) Using foot control enables the typist to adjust dictation speed to her transcription speed. Without taking her hands off the keys of the typewriter, she may, by oper-



ating foot control, cause - minifon P 55- to operate forward or backward or stop at any moment and for any length of time. The time indi-

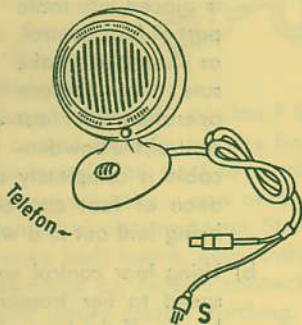


cator enables the typist to easily locate any particular part of the dictation and to type letters according to priority. Movement of the foot control is in the following order: rewind - play-back - stop - play-back - rewind. In „stop“ position (**S**) the foot pedal is parallel to ground. By gradually lifting toe and pressing heel a catch will be felt indicating “play-back” position (**W**). Lifting foot and pressing down heel further, the pedal will be arrested at an angle of about 30°. This is the “rewind” position. The foot remains in that position as long as reversing of recording is desired, and then presses pedal slightly down again until play-back position is again reached. Upon depressing pedal all the way the “stop” position is again reached.

## ***V. Two-way telephone recording / reproduction***

### **1. Using table loudspeaker**

Set lever at bottom of loudspeaker housing to “telephone”. Place table loudspeaker next to, but no more than 4” away from telephone set. Note that **back of loudspeaker** should be turned towards telephone set. Insert jack-plug into socket (**13**) of - minifon P 55 -. The



secondary 3-pin-plug must **not** be inserted upon telephone recording and is left unconnected. Separate - minifon P 55- **by whole length** of connecting cord from loudspeaker. (minifon P 55- and telephone set, if not separated, exert an electrical influence on one another resulting in a disturbance). It is necessary, first to locate approximate position of induction coil in your telephone set by varying position of table loudspeaker vis-à-vis telephone set. A clear recording and reproduction is obtained only if table loudspeaker is placed with its back against that part of telephone set where induction coil is located.

Setting of volume control: two notches lower ( : ◡ ) than dot to dash.

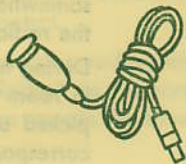
Depress Record key. Now your - minifon P 55- will record the telephone conversation of both parties without any direct connection to telephone set (electrical recording by induction). Recording is terminated by pressing Stop key. After rewind, set loudspeaker lever into **middle position** between "telephone" and "microphone", where it is held by a catch. Insert 3-pin-plug (S) into secondary socket of - minifon P 55 - (8) and press Play-back key. Now the telephone conversation is reproduced. Reproduction can also be made through radio set (see page 10) or stethoset phones.

## 2. Using telephone pick-up

Attach telephone recording pick-up by means of suction cup to telephone, as near to induction coil as possible. (In most cases induction coil is situated at back of telephone set.)

Setting of volume control: two notches lower ( : ◡ ) than dot to dash.

Insert plug of telephone recording pick-up into socket of - minifon P 55 -



(13) and press Record key. The two-way telephone conversation is now recorded.

Reproduction is made by means of table loudspeaker, radio set or stethoset phones.

## **VI. Recording of music**

Recording of music can be effected of crystal microphone or table loudspeaker/microphone. For high quality recordings and reproductions, however, the use of the dynamic (moving coil) microphone is essential.

### **1. Acoustical recording, using dynamic (moving coil) microphone**

The recording of music calls for a greater degree of care and regard to detail than is required for the recording of speech. No hard and fast rule can be laid down for setting of volume control since this is directly dependent, not only on the nature and volume of programme, f. i. in a theatre or cabaret, but also on acoustics of recording room.



Before undertaking the recording of a musical programme, it is recommended to make and play back a short trial recording in order to determine most favourable setting of volume control.

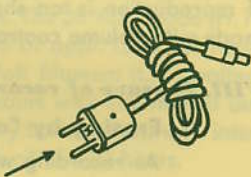
For acoustical recordings from radio by means of dynamic microphone, the radio volume control should be set somewhat above room volume, while the tone controls of the radio should be set to favour treble and reduce bass.

During music recording by microphone absolute silence in room is essential, as any extraneous noise will be picked up and recorded by - minifon P 55 - causing a corresponding disturbance upon reproduction.



## 2. Electrical direct recording from radio set or record player, using connecting lead N or H

Perfect recording and reproduction, unaffected by acoustical conditions in recording room, is obtained by electrical direct recording from radio set or record player. For this purpose a special connecting lead between radio set or record player and - minifon P 55 - is used which, according to impedance of radio set, is to be chosen of high or low impedance respectively. The corresponding figure is usually marked in Ohm (e. g.  $5\Omega$ ) at back of radio set, next to or above socket for second loudspeaker. Is the impedance between 5 - 15 Ohm the low impedance connecting lead (marked **N** on flat plug) is to be used. Is the impedance above 15 Ohm the high impedance connecting lead (marked **H** on flat plug) is to be used.



The two-pin-plug of the chosen connecting lead is inserted into the corresponding socket for the second loudspeaker of radio set, while the jack-plug is inserted into socket of - minifon P 55 - (13).

It is advisable to set the radio volume control somewhat above room volume. The tone controls should again be set to favour treble and reduce bass. The volume control of - minifon P 55 - should in general be dot to dash (•—), or one notch lower (•—). Again it is recommended to make and play back a short trial recording to determine most favourable setting of volume control.

To record a gramophone record through a radiogram turn the radiogram switch from "Radio" to "Record Player". All other recording conditions remain the same as mentioned above.

## **VII. Reproduction of music / Using radio set**

Reproduction of music can be made by table loudspeaker or stetho-set phones. For high quality music reproduction, however, the radio set switched to "Pick-up" or "Record Player", will give best results.

The two-pin plug of radio connecting lead W is inserted into pick-up socket of radio set, and jack-plug is inserted into socket (13) of - minifon P 55 -. (See III/4).

If reproduction is too shrill this indicates that the recording was made with volume control opened too far.

## **VIII. Erasure of recordings**

### **1. Erasing by "over-speaking" and new recording**

As recording wire passes through the recording head, any recording is automatically erased before a new recording is made.

Upon depressing Record key the recording wire, before reaching recording head, first passes the erasing head, so that any previous recording is always erased when Record key is depressed. Thus, during dictation, correction of words or phrases can be made simply by speaking new text over old one.

### **2. Erasing without new recording**

Separate erasing without new recording is effected as follows:

Withdraw microphone plug from - minifon P 55 -, set volume fully back, i. e. at lowest level and press Record key. This erasing operation is effected at normal forward speed.

### **3. Rapid erasing (In rewind)**

Rapid erasing of recording wire is effected by **pressing both Record and Rewind keys simultaneously**. Erasing is now effected in rewind at about **4,5 times forward speed**. This method saves both time and battery

current and is mainly used when it is desired to quickly erase a complete spool.

The erasing operations under 1, 2 and 3 are terminated by pressing Stop key.

## **IX. - minifon P 55 - and its power source**

### **1. Batteries**

- minifon P 55 - makes you independent of place and time by self-contained batteries. The 30 Volt anode (H.T.) battery has an operational life of appr. 150 - 200 hours with intermittent use, the 1,4 Volt filament (L.T.) battery an operational life of 20 - 30 hours with intermittent use. The motor battery, a 12 Volt dry battery, has, with intermittent use, an operational life of 15 - 20 hours.

All three batteries are of standard type. Well known makers are: PERTRIX, EVEREADY, BURGESS and MALLORY.

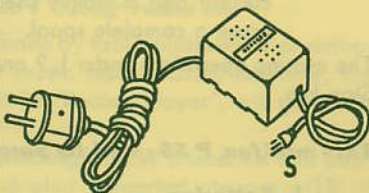
The battery meter of - minifon P 55 - (14) indicates condition of motor battery. As long as black pointer remains within white section of battery meter, - minifon P 55 - will operate satisfactorily. As soon as black pointer approaches or reaches red section of meter, motor battery has to be replaced. It is advisable upon each replacement of motor battery to replace filament battery as well, although its operational life amounts to about 30 hours. This is to avoid forgetting to exchange filament battery after it has run down. The anode battery must be replaced when the motor battery has been exchanged for the 15th time.

### **2. Transformer/rectifier**

The transformer/rectifier, adjustable from 110 to 220 Volt AC, 40 - 60 cycles, permits - minifon P 55 - to be operated from the mains. The use of this unit replaces the motor battery but does not replace anode (H.T.) and



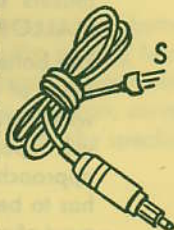
filament (L. T.) batteries which are still required. When using transformer/rectifier it is advisable to remove motor battery from - minifon P 55 -.



The 3-pin secondary plug (S) of transformer/rectifier is inserted into secondary socket (8) of - minifon P 55 -, while the wall plug is connected to the AC mains.

### 3. Connecting lead to car battery

For recording in motor car it is advisable to conserve motor battery of - minifon P 55 - by using car battery instead. The Bosch plug of connecting lead to car battery is inserted in the respective socket on dashboard of car, generally the cigarette-lighter socket, while the 3-pin plug (S) is inserted into secondary socket (8) of - minifon P 55-. The voltage of car battery may be **between 6 and 12 Volt but must not drop below 6 Volt.**



Again motor battery of - minifon P 55- should be removed.

### X. Automatic final stop

The automatic final stop is actuated by a plastic lever in the spool body which is released by the last rounds of wire or leader-thread leaving spool. The automatic final stop operates automatically in the following three cases:

1. When, after recording, the wire from supply spool (4) has all been transferred to take-up spool (1),
2. When, after rewind, wire has all been returned from take-up spool (1) to supply spool (4),

3. When, after play-back, wire has all been re-transferred from supply spool (4) to take-up spool (1).

By the automatic operation of the automatic final stop both, motor and motor battery, are cut out. Lighting of pilot lamp (17) will now indicate that both, anode (H. T.) and filament (L. T.) batteries are still connected. Cutting-out of both of these batteries is effected by pressing Stop key. Pilot lamp will now go out, indicating that -minifon P 55- is out of operation.

## **XI. Wire spools and fastening of wire**

### **1. Wire spools, short-period and long-period**

The following wire spools are available:

Article No.	Type "S"	Type "L"	Type of spool
905	10 min.	15 min.	short-period
906	20 min.	30 min.	"
907	40 min.	60 min.	"
908	60 min.	90 min.	"
909	80 min.	120 min.	"
910	100 min.	150 min.	long-period
911	120 min.	180 min.	"
912	140 min.	210 min.	"
913	-	240 min.	"
914	-	300 min.	"

All wire spools for -minifon P 55- can be used for both, type "S" and "L", but recording length will depend on type of unit used. A label indicating recording length for type "S" and "L" in red and black respectively is affixed on each spool.

For wire spools of 10 – 80 minutes duration with type "S", and 15 – 120 minutes duration with type "L" (article No. 905 – 909) the short-period spool body (article No. 915) is used. Please note that the take-up spool used must always correspond in type to that of the supply spool (short-period spool, article No. 915).

For wire spools of 100 – 140 minutes duration (article No. 910 – 912) with type "S", and 150 – 300 minutes

duration (article No. 910-914) with type "L" the long-period spool body is used (article No. 916). Again, the take-up spool used must correspond in type to that of the supply spool (long-period spool, article No. 916). This is particularly important when using spools of 100 minutes or more duration with type "S" (150 minutes and more with type "L"), since the long-period spool body only is able to take the full amount of wire held by the long-period supply spool.

## 2. Changing of wire spools

Before inserting a new wire spool, please make sure that the wire already recorded has all been returned to supply spool (4) and therefore, the supply spool (the spool next to the keys) is exchanged and not the take-up spool (1).

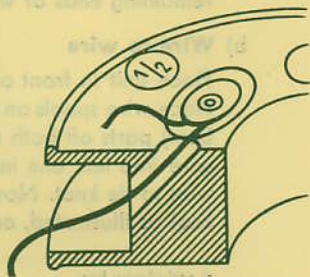
In order to save time it is, of course, possible to replace the full take-up spool (1) by an empty take-up spool. The now empty supply spool is then replaced by a full supply spool of identical type. It is advisable however, to make use of the rapid rewind for the purpose of rewinding each take-up spool, prior to placing same in your archive.

When changing spools unfasten green leader-thread from spring-clip on top of take-up spool (1) and remove supply spool (4) as follows:

Grasp supply spool (4) with right hand and lift off by pressing with one finger of left hand lightly onto center of spool-capstan. Before placing new supply spool on spool-capstan make sure that recording head (2) is fully up. Otherwise press Play-back key (11) and let unit operate until recording head has reached its highest position. Now press Stop key (9), and then place new supply spool on spool-capstan, pressing it lightly down until held by spring-loaded balls. The recording wire must run in a clockwise direction from supply spool through recording



head to take-up spool. The special leader-thread attached to either end of recording wire is placed behind the two wire-retaining-clips and lightly pressed into slot of recording head, taking care that no loops are formed. As illustrated the end of leader-thread is now run through bore in upper part of take-up spool. A loop made at the end is then placed around spring-clip and drawn tight. Make sure that



wire runs freely within spool flanges and slot of recording head, and that leader-thread is of sufficient length (at least 2 feet). Use special - minifon - leader-thread only. To facilitate changing of spools it is recommended to use complete sets of spools consisting of one full and one empty spool already connected in plexiglass container which is also suitable for mailing. In this manner both spools are exchanged at the same time and replaced by a new set.

### 3. Fastening of wire

It may happen that the special leader-thread at either end of spool breaks or becomes undone due to repeated insertion into recording head and handling when changing spools. In this case the worn or broken thread has to be replaced by a new one (2 feet). You may also happen to drop a spool, and the wire may become undone or entangled. Such "accidents" can easily be remedied as follows:

#### a) Wire to thread

Tie knot into thread about 2" from end. Take end with knot together with end of wire, holding both parallel,

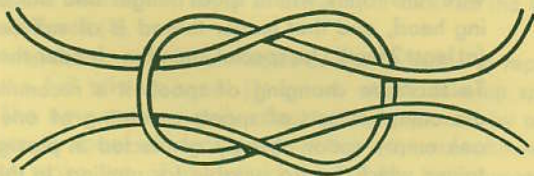
and tie a knot into both ends right in front of first knot. Check whether knot is tight. Tie free end of wire once more to thread in front of second knot. Now cut off remaining ends of wire and thread close to knots.

#### b) **Wire to wire**

Place unit in front of you with keys facing to the right. Place wire spools on capstans. Cut damaged (curled and bent) parts off both ends of wire. Now take one end of wire into left, one into right hand, allowing for enough wire to tie knot. Now tie ends **a** and **b** into a weaver's knot as illustrated, and draw tight.

a) end of wire from  
take-up spool

b) end of wire from  
supply spool



Cut off ends close to knot. This knot will run freely and without noise through recording head slot.

Draw wire taut by turning supply spool (4) by hand in anti-clockwise direction until knot is transferred to supply spool. Now insert wire into slot of recording head by slightly bending off wire-retaining-clips.

With lid still open press record key and check whether thread and wire run freely within spools and recording head.

**Any suggestions you may care to make from your own  
experience in operating - minifon P 55 -  
will always be welcome.**



**Our representatives  
in 78 countries of the world  
are at any time cheerfully  
at your service.**

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Hamburg

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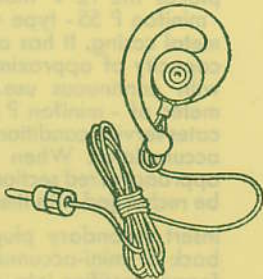
# Supplement to Operating instructions for - minifon P 55 -

Edition B 004/V/57

## Supplement to chapter III. Reproduction of speech

### 5. Using single type ear-set

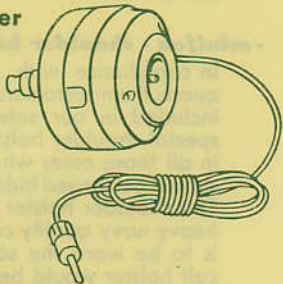
The magnetic single type ear-set, both convenient and very light in weight, can be worn at choice either on the right or on the left ear and reproduces speech in extremely good syllable intelligibility. Volume control is adjusted by means of potentiometer. Secretaries prefer this single type ear-set because it leaves one ear free to handle telephone calls at the same time.



## Supplement to chapter V. Two-way telephone recording/reproduction

### 3. Using telephone transformer

The special telephone transformer with wall plug was developed to guarantee satisfactory reception of two-way conversations both with telephones in metal casings as well as with telephone installations with several extension lines. Switch telephone transformer between wall socket and telephone plug. Insert plug of telephone transformer into socket (13) of - minifon P 55 -. Press Record key. Your two-way telephone conversation will now be recorded without interference.



**When using telephone transformer you need not pay any attention whatsoever to induction coil.**

## Supplement to chapter

### IX. - minifon P 55 - and its power sources

#### 4. Miniature accumulator

The miniature accumulator can be recharged about 500 times and replaces the 12 V motor battery in - minifon P 55 - type «S» and «L» in metal casing. It has an operational capacity of approximately 6 hours with continuous use. The battery meter of - minifon P 55 - (14) indicates service conditions of miniature accumulator. When black pointer approaches red section of battery meter mini-accumulator has to be recharged with the help of PROTONA transformer/rectifier.



Insert secondary plug of transformer/rectifier into socket at back of mini-accumulator, and power supply plug of transformer/rectifier into AC mains wall socket. **Recharging in each case takes three times of preceding operating period.** Mini-accumulator is protected against overcharging by a **built-in automatic switch**. Recharge only at temperatures above freezing point. At temperatures **below zero Celsius** operational capacity drops by a third. **Mini-accumulator is gasproof and can be used under tropical conditions.**

#### - minifon - shoulder holster

In compliance with numerous requests from customers we have now included in our sales program a special shoulder holster to be used in all those cases where - minifon - should be carried hidden from view. This shoulder holster is made from heavy navy quality cotton twill and is to be worn the same way as a colt holster would be, i. e. invisible, under a jacket or overall (see accompanying picture). It enables -minifon- users, for instance, **to make unobtrusive inventories in large stores - with both hands free for other work - even during business hours.**

