

PHILIPS

Tape recorder

TYPE EL 3542



Four tracks

Three speeds



OPERATING INSTRUCTIONS



PHILIPS TAPE RECORDER EL 3542



PRINCIPAL FEATURES

Modifications reserved

Philips has more than 30 years experience in the field of sound recording. As long ago as the first days of the sound motion pictures Philips photographic recording equipment was widely used in film studios. Later came the Philips-Miller recorders, whose sound fidelity was long considered the highest possible by broadcasting circles.

And now there are a number of different Philips magnetic tape recorders, which are appreciated everywhere for their perfect sound and their high reliability and efficiency. Day in, day out they do their duty in film, radio and television studios throughout the world, on air fields and sports fields, in schools and shops, in offices, theatres and living-rooms....

You too now have such an excellent Philips tape recorder. It is our wish that it may be of much use to you and give you a great deal of pleasure.

In order to help you, we have produced this instruction manual. In it you will find everything you wish to know about the operation of the recorder and, in addition, many directions and tips for the use of your tape recorder in the family circle, for business and studies, for your hobbies and many other things.

Therefore, do not put this booklet aside without having read it; take your time to read it. You won't regret it for it will show you the way to enjoying your fine recorder to the full!

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This tape recorder can be adapted to mains voltages of 110 V, 127 V, 220 and 245 V, A.C. 50 c/s.

A choice of three internationally current speeds by depressing a button: $1\frac{7}{8}$ inches, $3\frac{3}{4}$ inches or $7\frac{1}{2}$ inches/sec.

Suitable for long-play or double-play tape on 3 to 7 inch reels.

Fourfold recording time thanks to the four-track system! The recorder may also be used as an amplifier for your record player or microphone!

Monitoring by means of headphones.

Playback tone control.

Four digital programme indicator.

Super-imposing (trick) facility.

Provided with a second playback head for stereo reproduction. (additional pre-amplifier required.)

Automatic stopping at the end of the tape when in the record, playback, fast wind or fast rewind position.

Frequency ranges:

$1\frac{7}{8}$ inches/sec. : 50—7,000 c/s.

$3\frac{3}{4}$ inches/sec. : 50—15,000 c/s.

$7\frac{1}{2}$ inches/sec. : 50—20,000 c/s.

Inputs (recording) for:

microphone - 0.1 megohm, sensitivity 2.5 mV; 3 pole plug.

radio/gramophone - 1 megohm, 200 mV; 2 pole plug.

Separate volume controls, mixing facilities.

Outputs (playback) for:

additional loudspeaker - 3-7 ohms, 2.5 watts; 2 pole plug;

radio/amplifier - 0.05 megohm, 1.5 V; 2 pole plug;

headphones - 1,000 ohms, 100 mV; 2 pole plug;

stereo - 1 megohm, 1 mV (166 c/s.) -

4.5 mV (8,000 c/s.) for a 100 %

modulated tape; 3 pole plug -

pin 1: "live", pin 2: screen,

pin 3: blank.

Signal to noise ratio: better than -40 dB.

Wow and flutter: less than 0.2 % at $7\frac{1}{2}$ inches/sec.

Built-in 2.5 W amplifier with 5" diameter loudspeaker.

Valves: EF 86, ECC 83, ECL 82, EM 81, EZ 80.

Power consumption: 60 watts.

Dimensions: W $15\frac{1}{2}$ ", D 13", H $6\frac{3}{4}$ ".

Weight: 30 lbs.

Tropicalized.

After you have unpacked your recorder, first of all make sure that the voltage adapter is set for the value corresponding to the local mains voltage. This voltage adapter is on the bottom panel and can be set for voltages of 110 (100—120) V, 127 (120—130) V, 220 (200—230) and 245 (235—250) V, 50 c/s.

To check, place the recorder upside down and make sure that the figure shown through the small hole in the cover plate corresponds to your local mains voltage.

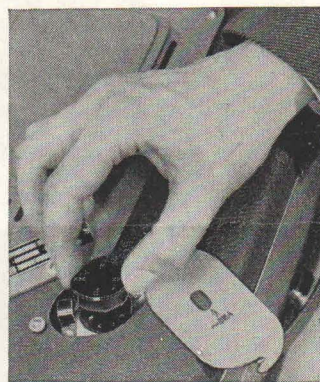
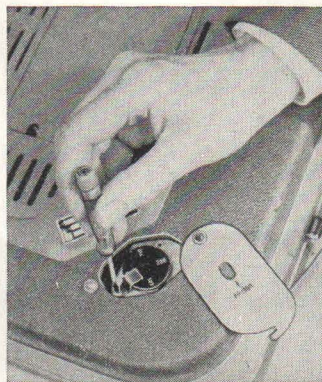
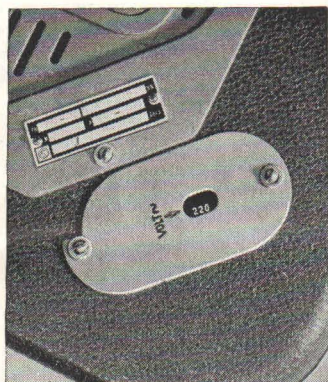
If necessary, the adjustment should be altered as follows:

1. Open the cover plate by loosening the two screws slightly. Also loosen the bracket and slide it aside.
2. Pull out the voltage adapter, turn it to the required position and push it home. Re-fit the bracket and cover and tighten the screws. The figures visible through the hole in the cover should now correspond to your local mains voltage.

Putting your recorder into operation

The storage compartment for the mains lead is on the under side of the recorder. Open the cover and pass the mains lead through the slot in the cover before closing it. The three core mains lead fitted to this recorder should preferably be connected to a 3-pin mains plug so that the RED core is connected to the "LIVE" terminal, the BLACK core to the NEUTRAL terminal and the GREEN core to the EARTH terminal.

If in doubt about the mains lead connections, ask your dealer to make the necessary connections for you.



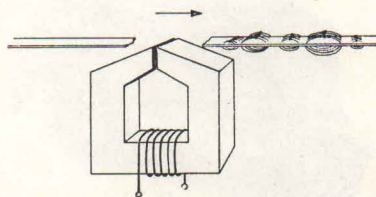
This is how your tape recorder works

In your tape recorder sound is recorded magnetically on tape specially coated with ferrous oxide. The sound vibrations which the microphone converts into electric voltage variations reach the magnetic head via electronic valves and volume controls. The sensitive side of the tape running past the magnetic head is coated with microscopic iron oxide particles; the magnetic head magnetizes these particles into the characteristic pattern of the sound vibrations.

During playback, the same head scans the magnetic pattern on the tape and re-converts it into electric voltage variations which are then made audible via the same electronic valves and controls.

A tape can be played back thousands of times

and a recording may be kept for years without any deterioration of its quality. In addition, a tape can be used over and over again for new



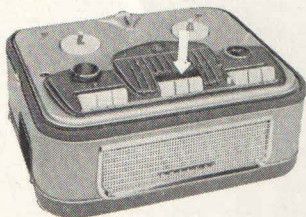
recordings. The magnetic pattern already on the tape is then automatically erased by means of an erasing head which is inoperative during reproduction.

OPERATION

All buttons, with the exception of the stop button should always be depressed completely.

They remain in this position until another button is depressed.

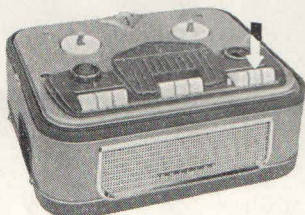
1. General



First depress the spring loaded stop button halfway and then release. This will trip any buttons that may have been left down which could cause an unexpected movement of the tape.

2. Connect the recorder by means of the mains lead and plug to your mains socket.

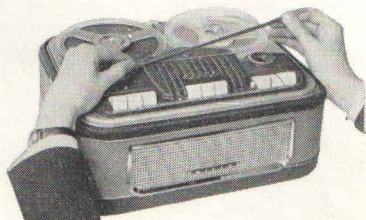
3.



Switch on the recorder. This is done automatically when one of the three speed buttons is depressed. Recordings with excellent quality can be made at a speed of $3\frac{3}{4}$ inches/sec. Press the centre button if this speed is required.

4. Take a reel of tape, unfasten the tape and place the reel on the left-hand spindle in such a way that the reel turns counter-clockwise when it is wound off. Place the empty reel on the right-hand spindle. Make sure that the reels lie perfectly flat on the spindles.

a.



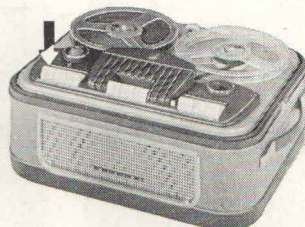
Unwind about 1 foot of the tape, hold it taut and drop it into the slot between the two halves of the cover.

b.



Pull the tape tight, insert the beginning of the tape between the flanges of the empty reel and take it outside through the slot in the upper flange of the reel. Hold on to this end of the tape and give the tape a few turns about the hub of the reel by winding the latter by hand.

c.



Press the playback button and allow the tape to run until the coloured leader is on the take-up reel. The leader is followed by the metallized switching leader which automatically stops the recorder when in the record, playback, fast wind or fast rewind position. Wind this metallized leader on the take-up reel by turning the latter by hand. If there is no metallized leader on your tape, stop the recorder by means of the stop button. The tape should now be just tight with the sensitive side turned away from you.

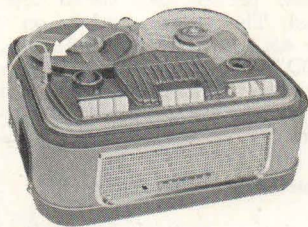
The recorder is now ready for recording or for playback.

First proceed with item 10 (playback) to check if there is any recorded material on the tape. Remember that the tape should be played back at the same speed at which it was recorded (see page 6, Four track system).

If there is already a programme on the tape do not start recording unless the previous material on that particular track is no longer required, for to do so would automatically erase the original recording. Normally, however, you will start with a new tape so that you can proceed immediately with item 5 to prepare for recording.

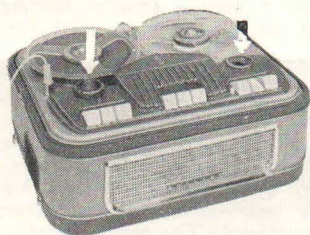
Recording

5. We suggest you start with a short recording, using the microphone. (Later we will give you instructions on how to make other recordings.)



Fit the microphone plug into the microphone socket. There is only one position in which the plug can be inserted in the socket; turn the plug, if necessary, and push it home. Place the microphone at about 1 foot from the speaker, who should speak in a normal voice.

6. You can actually adjust the recording level before you start the tape moving. This is important, for too large a volume would distort the sound, whilst too small a volume is equally undesirable.



Therefore it is wise to make a short test of a speaker or singer and adjust the volume accordingly. When using the microphone, do so with the upper volume control. The magic eye, (modulation indicator) is used for checking the volume. In this magic eye you will see two



Too small

Good

Too large

luminous sectors move in the same rhythm as the sound. The volume should be so adjusted that at the loudest passages the sectors are just barely prevented from touching. If they overlap continuously, the volume is too large, this is called over-modulation.

Sectors which move hardly at all indicate too small a volume.

7. You may start recording as soon as the recording level has been correctly adjusted, but to prevent accidental erasing of any particular track on the tape the record button is interlocked with the small safety button behind.



Press the recording button and the small interlocking button to record. It is wise to take a look at the magic eye from time to time to see that all's well. Re-adjust, if necessary, but do it gradually.

For short interruptions depress the interrupt button (↓). It can be unlocked by depressing the small button behind.

8. When your recording is completed depress halfway the stop button and then release.

9.



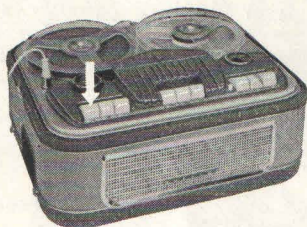
Before the tape can be played back it has to be rewound: press the rewind button. Rewind is very fast; the metallized leader ensures that the machine is stopped in time. In the absence of such a leader you will have to press the stop button before the tape comes off the right-hand reel completely.



If the tape should happen to be rewound too far or in case you want to omit a specific passage, you can wind the tape in the usual direction by pressing the fast forward wind button.

Playback

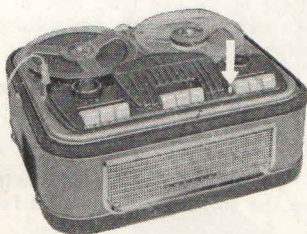
10.



Press the playback button. The built-in loud-speaker ensures a good-quality reproduction of the sound. The sound is controlled with the double control; the upper one being used for tone control, the lower one for volume control.

11. Stop the tape as required and rewind it. (If metal foil tape is used the recorder will automatically stop at the end of the tape.)

12.



If the recorder is not required for further use depress the stop button (halfway) and switch off the recorder completely by means of the small button beside the speed buttons.

Four tracks

Because this recorder works on the four-track system, the playing time of your tapes will be doubled as compared with that of the previous twin-track system. The new system is compatible for the replaying of long-play and double-play tapes previously recorded on the twin-track system. Standard-play tape may also be replayed at $7\frac{1}{2}$ inches/sec.



In order to use all four tracks, you can proceed as follows:

- a. Switch track selector in position "1-4".
- b. Record or play back track 1.
- c. Reverse tape spools.
- d. Record or play back track 4.
- e. Reverse tape spools.
- f. Switch track selector in position "2-3".
- g. Record or play back track 3.
- h. Reverse tape spools.
- i. Record or play back track 2.

Stereo

The output from the second playback head (tracks 3 or 2) is only fed to the "STEREO" socket when the track selector is in the "1-4" position. If a suitably corrected pre-amplifier is connected to this socket, pre-recorded stereo tapes may be reproduced. The pick-up sockets on the average radio are not suitable for direct connection to the "STEREO" socket. Keep the screened lead connecting the "STEREO" output to the amplifier as short as possible to prevent attenuation of the high notes.

The counting mechanism

The counter is particularly handy for quickly finding a given passage "somewhere" on the tape. The counter is coupled with the spindle of the left-hand reel, so that a given passage of the recording always corresponds to a particular number on the counter..... provided, of course, the counter has been re-set to "0000" when the tape was started; the counter is re-set by means of the knurled disc. It is recommended to re-set the counter to "0000" immediately after a reel of tape is put on the machine and make notes of the counter readings for important passages on the tape (e.g. the beginning of conversations or of a piece of music). Later it is an easy matter to find these passages by rewinding or fast forward winding of the tape.

The various important counter readings can be taken down on the boxes in which the tapes are stored.

Automatic stopping

There is a switch contact to the left of the magnetic head of the recorder and this contact is operated by means of the metallized leader at the end of the tape (metallized leaders can also be bought separately). The tape is stopped automatically when the metallized leader runs past the switch contact.

To prevent the tape from being stopped when it should not, make sure that the metallized leader is on the take-up reel before the recorder is started. Wind on by hand if necessary.

RECORDING TIME OF THE TAPE

The recording time of a tape depends on three factors, viz. the speed of the recorder, the diameter of the reel and the type of tape (long-play or double-play tape).

The table gives the recording time for any possible combination. With the help of this table you can calculate the best length of tape to buy for the recording of a programme of known duration. (It is a wise precaution, of course, if you allow for a few minutes extra playing time.) Because of the four-track system in this recorder the table gives $4 \times$ the recording time of one track as the over-all recording time of the tape. (For stereo recordings multiply playing times by two.)

3 SPEEDS - RECORDING TIME



1 7/8 inches/sec.

This is the lowest speed and it will give you the longest recording time. You will find that even at this low speed the sound quality is excellent (frequency range 50-7,000 c/s).

This speed is particularly suited to dictation, spoken letters, announcements, recording of telephone calls, speeches, radio talks, pronunciation exercises, oral reports etc. Even music which does not have to meet very stringent requirements as to quality, for instance non-stop entertainment programmes, music for festive occasions, music in shopping centres and canteens, on sports fields etc., may be recorded at this speed.



3 3/4 inches/sec.

The speed for quality recordings, the frequency range being 50-15,000 c/s. We suggest the use of this speed for the recording of gramophone records and FM radio broadcasts, for the study of music, for the recording of instrumental music, whenever the playing time of the tape permits. The only time when it is necessary to record speech at this speed, is when the tape has to be played back on another machine which does not have the lower speed.



7 1/2 inches/sec.

This speed provides even the most confirmed hi-fi enthusiast with facilities for making superlative recordings.

The frequency range at this speed is 50-20,000 c/s.



TYPE OF TAPE	REEL DIAMETER	1 7/8 inches/sec.	3 3/4 inches/sec.	7 1/2 inches/sec.
Long-play	3 inches (8 cm)	4 × 22 min.	4 × 11 min.	4 × 6 min.
	4 inches (10 cm)	4 × 45 min.	4 × 22 min.	4 × 11 min.
	5 inches (13 cm)	4 × 1 1/2 h.	4 × 45 min.	4 × 22 min.
	5 3/4 inches (15 cm)	4 × 2 h.	4 × 1 h.	4 × 1 1/2 h.
	7 inches (18 cm)	4 × 3 h.	4 × 1 1/2 h.	4 × 45 min.
Double-play	3 inches (8 cm)	4 × 1/2 h.	4 × 15 min.	4 × 7 1/2 min.
	4 inches (10 cm)	4 × 1 h.	4 × 1/2 h.	4 × 15 min.
	5 inches (13 cm)	4 × 2 h.	4 × 1 h.	4 × 1/2 h.
	5 3/4 inches (15 cm)	4 × 3 h.	4 × 1 1/2 h.	4 × 45 min.
	7 inches (18 cm)	4 × 4 h.	4 × 2 h.	4 × 1 h.

Approximate playing times.

For the best recording results use tapes mentioned in this table.

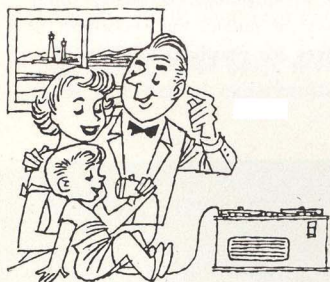
RECORDINGS BY MICROPHONE (further information)

TEN TIPS FOR OBTAINING STUDIO-QUALITY

- 1 Make microphone recordings in perfectly quiet surroundings.**
A microphone inevitably picks up all sounds including the unwanted ones. Therefore you must not set up the microphone too close to the recorder. When both the microphone and the recorder are placed on the same table, even the inaudible vibrations from the recorder motor might penetrate to the microphone.
- 2 Make sure of the acoustics of a room or hall.**
The resonance-effect, particularly annoying in an empty room, should be kept at the lowest possible value when speech or singing by a soloist is recorded. Consequently, it is best to make your recordings in a well-furnished room. Close the curtains, if necessary, and drape the hard, reverberating walls with sound-absorbing cloth.
Remember, however, that choral-singing or some instrumental music may require resonance. In this case the curtains should be open and sound-absorbing objects, such as cloth-covered armchairs and large carpets should be removed.
- 3 Instruct the speaker or soloist carefully.**
The microphone wants to be treated as a normal listener — speak in a normal voice and at about 1 foot from the microphone. Speaking, singing or playing over-loudly or too close to the microphone will affect the quality of the sound. Avoid too much moving about in front of the microphone.
- 4 This is how you speak under unfavourable conditions.**
Annoying background noise or acoustics that cannot be improved can be compensated for to a reasonable degree by speaking softly into a microphone held close to the mouth.
- 5 Make sure of the best recording level.**
Here, the magic eye is a valuable help. We have pointed it out before: at the loudest passages the luminous green sectors must just barely be prevented from touching. Keep an eye on the magic eye when recording!
Very soft passages may be given a little more volume, but never increase the volume suddenly, easy does it!
- 6 Choral singing and ensemble music require a special microphone arrangement.**
Place the microphone in front of or in the centre of the singers or musicians (or suspend it above them), with the front of the microphone facing them. Soloists may step forward temporarily, but it is better to use more than one microphone and a mixing box.
A test-recording is the best way to determine whether the recording volume is correct.
- 7 Solo instruments require test-recordings.**
The best distance between the microphone and the solo instrument depends on the type of instrument and on the strength of the sound which it produces; it may be anything between 2–7 feet. The best position for the instrument can only be found by making test-recordings!
- 8 Accompaniment should be soft!**
Accompaniment of a solo instrument or of a singer should always remain in the background and never be dominating!
- 9 Allow a cold recorder to warm up for a few minutes.**
The lubricants used are suitable for normal operating temperatures and will remain fully effective even in tropical climates. If, however, the recorder has been in a cold place for some time, it is best to allow it to warm up for a few minutes by having it switched on without recording. After a few minutes you can then be sure of an absolutely constant speed of the tape (and consequently of perfect sound).
- 10 Keep experimenting!**
Try another microphone arrangement if you're not completely satisfied with the results. Sometimes a voice comes over well only when the performer sings into or past the microphone. Make tests with other acoustical arrangements. Use your imagination and talk over your problems with other recorder-owners.... it will make all the difference to the results you obtain.

The Philips tape recorder is the ideal machine to record THE SPOKEN WORD. We have already mentioned the recording of dictation and reports, spoken letters and pronunciation exercises. There are any number of other applications: the recording of scientific papers, readings for students who are ill, oral reports on laboratory research work (much easier than written reports!), commentary given during surgical operations, medical, psychological and psychiatric applications, the recording of ecclesiastical and other ceremonies, filmstrips, instructions to personnel, spoken books for the blind, explanations at shows and exhibitions, interviews and statements by witnesses.

For the direct recording of MUSIC too, your recorder will prove to be indispensable. And think of the possibilities it has for those who study music or for those who teach it, for conductors of choirs and orchestras! Not only can anyone judge his own performance, but soloists can play their own accompaniment.



Spoken letters

You cannot give your family abroad or a sick friend a greater pleasure than sending them a spoken letter, illustrated with some music and the voices of children — let them listen to flashes from a family party. The small 3 inch reels of long-play tape are ideal for this purpose. The recording time of such a small reel, when making use of all four tracks and a tape speed of $1\frac{1}{8}$ inches/sec. is 4×22 minutes. But make sure that the recipient's recorder works on the four-track system too and has facilities for this speed. When in doubt, it is better to record on tracks 1 and 4 only and at a speed of $3\frac{3}{4}$ inches/sec. as this speed is much more universal: in this case the recording time is 2×11 minutes.

Many countries have special cheap rates for "Phono-post". Your local post office will have the necessary information.

STORAGE OF TAPE

Tapes can be used for an indefinite time. There is practically no wear, so that the quality of the sound is maintained at a constant level.

Consequently, tape is eminently suitable for filing (a particularly attractive feature for music-lovers, recorder and home movie enthusiasts, collectors of historical speeches, nature-lovers who collect the sounds of birds and other animals, etc.).

Store your tapes at room temperature (not in the sun or near a heater) and in reasonably dry surroundings. Keep the tapes in the original box.

Usually, the box has a space for making notes of the title and recording time of the tape, the recording speed, track number date and place of recording.

Apart from strong magnetic fields (e.g. very close to a loudspeaker magnet or transformer) there is very little that can harm the tapes or the recordings on them.



Using your recorder away from home

It may happen that recordings have to be made in the open air, in a hall or in a church. We can give you the following pointers:

- a. Study the situation in advance.
- b. The mains voltage on the spot where the recording has to be made may not be the one you are used to. Read the instructions for making the necessary changes on page 3.
- c. Take along an extension mains lead.
- d. Make sure that the microphone is arranged suitably, see "Ten Tips".
- e. Make certain that you have enough tape.
- f. Draw up a schedule and use the intervals to change over to another track or to a fresh reel of tape, even though the tape on the machine is not entirely filled.



Recording radio programmes

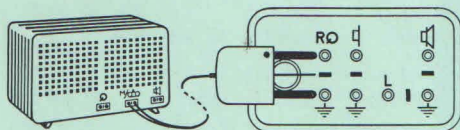
Your tape recorder can be used successfully in conjunction with a radio set. You can, for example, record radio programmes which otherwise you would have to miss because there is an interesting TV programme on at the same time, or because you have visitors or because you are away on a business trip. Another member of the family can then make this recording for you and you can play it back whenever you want to. Your little daughter may go and see the dentist and still not miss her special "children's hour" programme; her older brother can make a recording of it. Another example: there are a number of recorder

owners who are making up a collection of the voices of famous statesmen or scientists. In time their recordings will have historical value. Of equal importance, although you may not want to keep them equally long, are recordings made of Stock Exchange quotations, weather reports and suchlike. Other very useful applications of your tape-recorder are: the recording of programmes from radio stations abroad for the study of languages, the recording of background music or voices for later use in your own programmes, recordings made as an aid in the study of music, the recording of school radio programmes for playback at a later date.

Connecting up

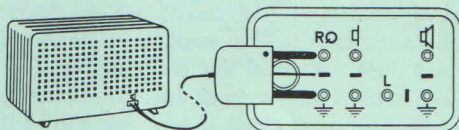
The recorder has been fitted with a socket marked "R/D", and a special screened connection lead should be used.

a.



Example of a radio set with special facilities for connecting a recorder; in this case the recorder is connected after the detection diode, so that the tone and volume controls of the radio set do not affect the recording. It is the ideal way to get good quality recordings. Moreover you can use the controls on the radio set when monitoring what you put on the tape.

b.



In the absence of a suitable recorder socket, you can make your recording as shown in the example: via the additional loudspeaker socket on your radio set. In this case there may be some deterioration in quality and, in addition, the tone and volume controls on the radio set will affect the recording. It is best to adjust the radio set to a volume of room level with mostly trebles and little bass.

Volume control

The operation and control when recording radio and gramophone music is the same as with microphone recordings, with the exception of the volume control. In the case of recordings from a radio set, you must control the volume by means of the lower of the two combined controls. The upper one then remains available for controlling the volume of the connected microphone, if any. This means that you can add announcements etc. whilst recording radio programmes. See under "Mixing", page 12.

Test-recordings

The modern tape recorder has the additional advantage that every recording can be monitored directly and that every inch of tape can be used again and again until the result is satisfactory in every respect.

Contrary to, e.g. photography, the tests cost you nothing at all!

It is therefore advantageous to precede every recording with a test-recording (record - rewind - play back - rewind - ready for further recordings). When recording radio programmes or gramophone records, you may be bothered by hum. If so, reverse the polarity of the screened lead connection: disconnect the plug from the radio set, turn it over and plug it in again. It may happen too, that one of the mains plugs needs reversing also. It is just a matter of experimenting.

The additional loudspeaker socket on your radio set should be of the low-impedance type. Usually there is a little label over the socket reading: "5 ohms", "3—7 ohms", etc. and the instruction leaflet supplied with your radio set may give you the information on the loudspeaker socket.

If you wish to connect the recorder to an AC/DC radio set, see your dealer for a safety arrangement.

It should be remembered that recording of radio programmes (and copying of gramophone records) is only permissible in so far as copyright or other rights of third parties are not thereby infringed.

Copying gramophone records

You are in a position now to record uninterrupted programmes of music for festive occasions, parties, a dance, for callisthenics or for folk-dancing. Or you may make recordings for music in theatres, music-while-you-work, music in shopping centres or in canteens, with your home movies, for ceremonies or for the study of music.

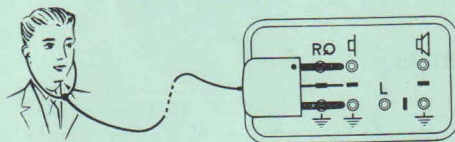
Connecting and recording is a simple matter: all you have to do is to feed the output from the pick-up lead to the "R/Q" socket of the recorder.

Further see under "Volume control" and "Test-recordings".

You can listen to the record before the recording is made by using the recorder as an amplifier! To do so depress the stop button completely; it is then locked in this position.

When ready to record depress the record and safety interlock buttons. Adjust the recording level by means of the lower control knob.

MONITORING WHILE RECORDING



It may be useful to monitor recordings, e.g. of plays, etc., while they are being made.

The best way to do so is by means of our stethoscope headphones.

Connect these headphones to the socket marked "q" on the recorder.

Any other type of headphones can be used, provided the impedance is not less than 1000 ohms.

Sound editing

Sound effects

Plays

Super-imposing

The recorder owner who does his own sound-editing and makes up plays gets full enjoyment out of his recorder. He has found a hobby which cannot be compared with any other hobby. He discovers new possibilities all the time, exchanges experiences with other recorder-owners, finds out that there is interesting literature on the subject, joins a tape recording club and from time to time surprises and amuses his friends with a new creation. The amateur-filmer, who wants to add sound to his movies, will often do his own sound editing and record all kinds of sound effects. We want to help you find your way in the fairyland of sound and therefore we are giving you a few pointers and suggestions.

Sound effects

It is really surprising how a number of sounds can be faked with simple means. A number of these effects can be obtained with the human voice alone (blowing, whistling, etc.) Interesting results can also be obtained by playing back a recording at a speed different from the one at which it was originally recorded. Other examples: crumpling up paper (fire), shaking a large sheet of tin plate (thunderstorm), switching a vacuum cleaner on and off (lift), etc.

Mixing

Plays or other composite programmes will often necessitate the recording of various sounds at the same time and at different levels. Mixing of sounds is made possible because your recorder has separate volume controls for the microphone on the one hand and the radio set or record player (or second recorder) on the other. You use this facility, e.g. for adding announcements to a programme of music.

Start by making a short test-recording to ascertain whether the various sound levels are correct. Remember or make a note of the position of the two volume controls.

When an input signal is not used, always turn the relevant volume control fully anti-clockwise. Also, the sound coming from a radio set or record player should be prevented from penetrating to the microphone when the latter is being used for making announcements.

Super-imposing

With this recorder you are able to make "trick" recordings. You can add e.g. a spoken text to a recording which was made earlier.

For this purpose, play back the existing programme until you have reached the part where you want to add your text.

Depress the button for short interruptions (↓) and the recording button with its interlocking button.



Super-impose lever

Then switch on the super-impose lever, see fig. (keep it in this position), unlock the button for short interruptions by depressing the small interlocking button behind it and add the spoken text. The recording is achieved without erasing the former recording, provided the super-impose lever is not released.

To stop super-imposing, first push the stop button and then release the super-impose lever.

If required the super-impose lever may be locked in position by inserting a thin piece of cardboard in between the slot provided at the back of the lever.

IMPORTANT- Do not leave this lever permanently locked in the forward position otherwise the tape will not be erased as the tape passes the erase head under normal recording conditions.

Erasing without recording

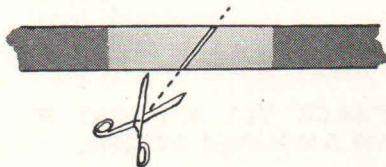
Proceed as if you were going to make a recording, but turn both volume controls full anti-clockwise. Use the highest tape speed to erase the tape in the shortest possible time. It is obvious that only one track at a time can be erased.

Reverse the reels and change the position of the track selector as required to completely erase the tape.

Splicing the tape

Use only an approved type of splicing tape and proceed as follows:

- Cut the relevant part from the tape.
- Put the two ends of the tape which you want to splice on top of each other so that they overlap and cut diagonally across this overlap, (diagonal splices are inaudible).



- Place the two ends against each other and align them carefully. Place a piece of splicing tape having a length of approx. $\frac{5}{8}$ inches on the insensitive side of the tape across the cut.

Editing

It will hardly ever be necessary to join the tape because it has broken. It may happen, of course, that you will want to cut certain passages from a tape or that you want to edit your tape and splice several short recordings together. When editing a tape, always remember that there are four tracks on each tape and that editing one track necessarily means cutting the other tracks.

Thanks to editing facilities, you may e.g. fake an amusing conversation from parts of already recorded conversations and other specially recorded ones.

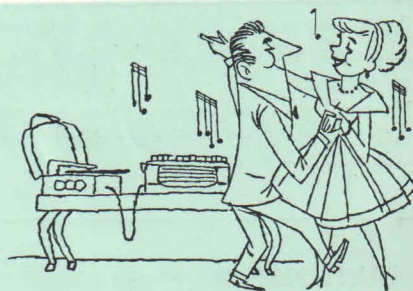
Recording via a second tape recorder

Dubbing can be done if you have a second recorder and connect its line (or loudspeaker) output with the socket "R/D" on your recorder.

In this way it is possible to make a recording consisting of parts of existing recordings and new parts recorded via the microphone.

Your recorder is also an amplifier for microphone or record player

If you depress the stop button **COMPLETELY**, your recorder is connected as a direct amplifier, which can be used for playing records or as a microphone amplifier. This is a useful facility, e.g. if you want to interrupt a programme recorded on tape for making announcements or for playing a record. The volume, both of the microphone and of the record player, can be adjusted by means of separate controls. If "howling" occurs when you use the microphone, this is caused by acoustic feedback from the loudspeaker to the microphone.



It can be avoided by not placing the microphone directly in front of the loudspeaker and by keeping the volume down.

Fidelity depends on which speed button is depressed. Generally speaking the $7\frac{1}{2}$ inches/sec. button is best. An additional loudspeaker can also be connected. You can switch back to the tape by merely pressing the playback button. The record player and the microphone may be left connected to the recorder.

ADDITIONAL LOUDSPEAKER CONNECTION

An additional loudspeaker can be connected to the sockets marked "A" on the recorder.

You can make use of this facility if you want to play back your tapes via a bass reflex cabinet or if you want to set up the loudspeaker at some distance away from the recorder, e.g. in your living-room or in a small hall.

The loudspeaker should have an impedance of about 3—7 omhs. The internal loudspeaker is inoperative when the plugs are fully inserted into the sockets.

PLAYBACK VIA A RADIO SET OR AN AMPLIFIER SYSTEM

You may happen to have a radio set with several loudspeakers and elaborate tone control or even a hi-fi installation. In that case it is worthwhile to play back your recordings via such a system.

Or you may want to connect your recorder to the amplifier system in a hall, shopping centre or sports field. For these cases the recorder has a socket marked "L", which supplies approximately the same level as a record player. The recorder is then connected to the pick-up socket of the radio set or amplifier system. The connection's polarity should be changed over if there is hum. It is also possible to improve the situation by changing over the polarity of the mains connection. In a recorder connected as described above, the built-in loudspeaker is automatically switched out of circuit, as soon as the plug is pushed fully home in the socket. The volume and tone controls of the recorder are then also inoperative. Volume and tone are then controlled from the radio set or amplifier.

If you wish to connect the recorder to an AC/DC radio set, see your dealer for a safety arrangement.

MAINTENANCE

Your tape recorder has been designed to give long service without need of attention. It is advisable however that periodically in order to maintain the maximum performance of the recorder, you clean away any oxide dust deposit that may have collected on the magnetic heads.

Access to the heads may be gained by removing the plastic moulding in front of the tape slot. The front of the heads should be cleaned with a soft brush (without metal band) or a cloth moistened

ACCESSORIES

An extensive range of accessories are available.

For instance, when buying tape, you can choose Philips band on reels of four different sizes. See under "Recording time of the tape".

In addition there is metallized, red and green leader tape and adhesive splicing tape.

If you use your recorder at the office, a telephone coil may come in handy or a footswitch to operate the tape interrupt button.

For those who regularly record music or edit tapes, the stethoscope headphones may be found useful. These headphones can be used for monitoring while recording. Another handy item is the mixing box; there are two versions of this box, one with facilities for connecting four input signals, the other for two input signals.

In shopping centres and super markets, 2 × 20 minute programmes which have to be repeated over and over again are frequently used. For this purpose we have a particularly useful accessory: the endless tape in a special container.

The following accessories if required as optional extras should be ordered from dealer.

EL 3750/00	Moving coil microphone
EL 3753/00	Crystal microphone
EL 3989/01	Mixing box for four input signals
EL 3962/01	Connecting box for two microphones
EL 3969/11	Telephone coil
EL 3984/10	Footswitch
EL 3948/01	Screened connection lead and plug
EL 3992/10	Stethoscope type headphones
EL 3963/00	Cassette with endless tape
49.302.27.	Flat 2 pin moulded plug

In order to obtain the best results always use Philips magnetic recording tape.

Details of the range of Philips magnetic recording tape will be found in the tape carton.

in methylated spirits or pure alcohol. Do not use metal tools during the cleaning process and take care not to damage the heads. Keep the cleaning fluid away from the rubber roller. While the plastic cover is off it is as well to check that the capstan drive is also free from oxide dust. You will no doubt appreciate that your recorder is a precision built instrument and although special bearings of a self lubricating type have been used, an occasional inspection of your recorder by your dealer is to be recommended.

VALVE GUARANTEE

The valves used in this apparatus are guaranteed by the valve manufacturer for a period of three calendar months from the date of purchase. This guarantee is only given in respect of faulty workmanship and material and does not cover misuse or consequential damage.

Claims under this guarantee will only be considered if the valve is returned to the valve manufacturer, preferably through the radio dealer from whom the apparatus was purchased, supported by proof of the date of purchase of the apparatus.

To ensure proper examination the right is reserved to break open any valve, if necessary, without obligation to return or replace.

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