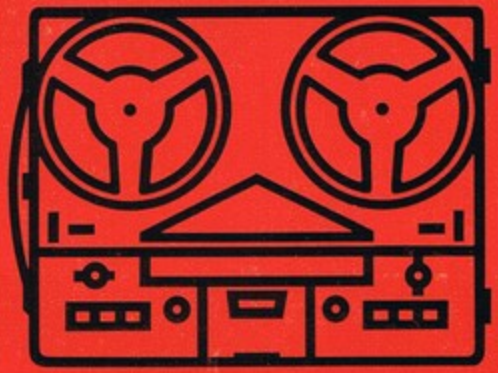
AEG Magnetophon 85



Bedienungsanleitung
Operating Instructions
Mode d'emploi
Instrucciones de manejo

Lieber Magnetophon-Freund!

Es freut uns, auch Sie als Mitglied der großen Magnetophon-Familie begrüßen zu dürfen.
Mit dem Tonbandgerät Magnetophon 85 haben Sie ein Gerät aus der Spitzenklasse der Magnetophon-Serie erworben. Unsere langjährigen Erfahrungen beim Bau von Studiogeräten geben Ihnen die Gewähr, ein Tonbandgerät zu besitzen, das durch seine hochwertigen mechanischen und elektrischen Eigenschaften höchsten Ansprüchen gerecht wird.
Die nachfolgende ausführliche Bedienungsanleitung soll Ihnen helfen, die Möglichkeiten Ihres Tonbandgerätes voll auszuschöpfen und Ihnen gleichzeitig einen umfassenden Überblick über den Einsatz unseres sinnvoll zusammengestellten Zubehörprogrammes vermitteln.

Operating Instructions Magnetophon 85

To the user of Magnetophon Tape Recorders.
We are happy to welcome you in the large family of Magnetophon friends.
In the Magnetophon 85 you have a tape recorder of the highest quality. Years of experience in constructing, and designing of studio tape recorders give you the guarantee that your Magnetophon 85 is a tape recorder meeting the highest requirements in the mechanical and electrical field.
This detailed operating instruction booklet will help you to make full use of this quality tape recorder, and at the same time acquaint you with the wide range of useful accessories.

Mode d'emploi du Magnetophon 85

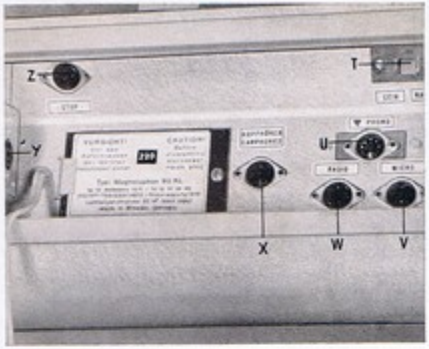
Cher client,
Nous sommes heureux de vous compter parmi les amateurs de nos « Magnetophon ».
Avec l'enregistreur Magnetophon 85 vous avez acquis un appareil de grande classe de la série des enregistreurs domestiques.
Notre longue expérience dans la construction des appareils de studio vous garantit que vous possédez maintenant un enregistreur qui, par ses propriétés mécaniques et électroniques, répondra aux demandes les plus exigeantes.
Ce mode d'emploi est destiné à vous aider à utiliser au maximum les propriétés de votre enregistreur et en même temps à vous procurer une vue d'ensemble des possibilités d'adaptation des différents accessoires inscrits à notre programme de fabrication.

Instrucciones de manejo Magnetophon 85

Estimado amigo y dueño de la grabadora Magnetophon:
Nos alegramos de poder saludar también a Vd. como miembro de la gran familia de los entusiastas de las grabadoras Magnetophon.
Con la grabadora Magnetophon 85 ha adquirido Vd. un aparato perteneciente a la categoría suprema de la serie de grabadoras de cinta de uso particular.
Nuestras experiencias de largos años en la fabricación de grabadoras de cinta de estudio le darán a Vd. la garantía de poseer una grabadora de cinta, que justifica hasta las aspiraciones mayores debido a sus cualidades extremas tanto de orden mecánico como eléctrico.
Las instrucciones de manejo detalladas, que siguen a continuación, tienen por objeto ayudarle a aprovechar todas las posibilidades, que le brinda su grabadora de cinta, proveyéndole a Vd. además de una orientación detallada sobre nuestro programa de accesorios, especialmente adaptado a las exigencias de un amateur de cinta moderno.

Kurzanleitung

A Zählwerk
B Aussteuerungsregler (Radio, Mikrofon)
C Eingangswahlschalter
D Aussteuerungsregler (Phono)
E Aussteuerungsanzeige
F Schnellstoptaste
G Höhen-Regler
H Lautstärkeregler
I Vor- und Rücklaufschieber
K Baß-Regler
L Aufnahmesperre und Tricktaste
M Aufnahmetaste
N Halt-Taste
O Wiedergabetaste
P Volle Bandspule
Q Geschwindigkeits-umschalter
R Leerspule
S Bandklebeschiene
T Entzerrungsumschalter
U Phono-Eingang
V Mikrophon-Eingang
W Radio-Eingang
X Kopfhörer-Anschluß
Y Lautsprecher-Anschluß
Z Fernbedienungsbuchse



Instruction summary

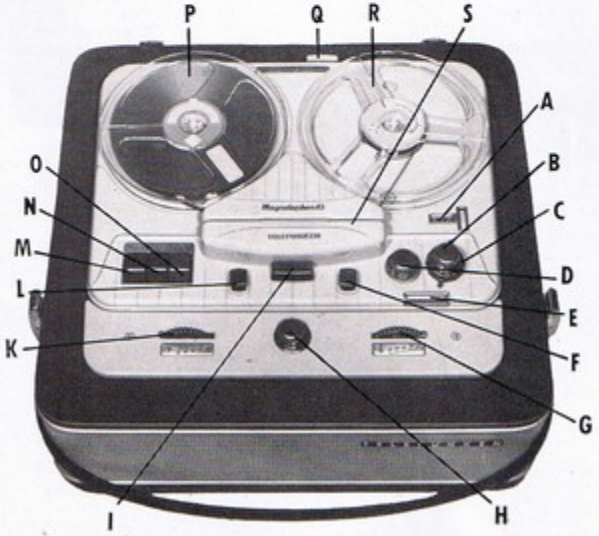
A Counter
B Level control (radio, microphone)
C Input selector
D Level control (pick up)
E Recording level indicator (magic band)
F Quick stop button
G Treble control
H Volume control
I Rewind/forward wind
K Bass control
L Record block button and trick button
M Record button
N Stop button
O Playback button
P Full reel
Q Tape speed selector
R Empty reel
S Tape splicing groove
T Equalization switch
U Phono input socket
V Microphone input socket
W Radio input socket
X Earphone socket
Y Loudspeaker socket
Z Remote control socket

Sommaire

A Compteur
B Potentiomètre de modulation (radio, micro)
C Commutateur de choix d'entrée
D Potentiomètre de modulation (phono)
E Indicateur de la modulation
F Touche d'arrêt rapide
G Potentiomètre des aiguës
H Réglage de la puissance
I Commutateur d'avance/retour
K Potentiomètre des basses
L Verrouillage de l'enregistrement et touche de trucage
M Touche d'enregistrement
N Touche d'arrêt
O Touche de reproduction
P Bobine pleine
Q Commutateur de vitesses
R Bobine vide
S Fente de collage des bandes
T Commutateur de correction
U Entrée phono
V Entrée micro
W Entrée radio
X Prise « écouteur »
Y Prise « haut-parleur »
Z Prise de télécommande

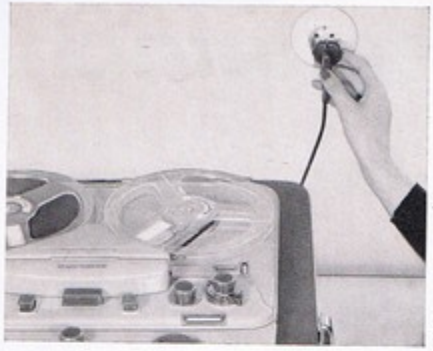
Instrucciones de manejo en breve:

A Mecanismo contador
B Control de grado de amplificación de grabación (radio, micro)
C Conmutador de selección de entradas
D Control de grado de amplificación de grabación (fono)
E Indicador de grado de amplificación de grabación
F Tecla de parada inmediata
G Control de agudos
H Control de volumen
I Deslizador de avance y retroceso rápidos
K Control de bajos
L Bloqueo de grabación y tecla de trucos
M Tecla de grabación
N Tecla de parada
O Tecla de reproducción
P Rollo de cinta lleno
Q Conmutador de velocidades
R Rollo de cinta vacío
S Riel de empalme de cintas
T Conmutador de corrección de distorsiones
U Entrada de fono (pick-up)
V Entrada de micrófono
W Entrada de radio
X Conexión de auriculares
Y Conexión de altoparlante
Z Enchufe de conexión de mando a distancia



1. Netzanschluß

Bevor Sie Ihr Magnetophon 85 an das Lichtnetz anschließen, überzeugen Sie sich bitte davon, daß Sie in Ihrer Wohnung Wechselstromanschluß und eine Netzspannung von 220 V haben. Für diese Spannung wurde Ihr Gerät im Werk eingestellt. Im Zweifelsfalle sehen Sie auf einem Ihrer Elektrogeräte oder auf dem Typenschild Ihres elektrischen Zählers nach. Ist die Netz-Wechselspannung in Ihrer Wohnung nicht 220 V sondern beispielsweise 110 V, können Sie das Magnetophon 85 mit wenigen Handgriffen auf die richtige Spannung einstellen:



1. Mains connection

Before connecting your tape recorder to the mains, make sure that it is set to the correct voltage. A small window in the rear cover of the voltage selector tells you what voltage the recorder is set on. Compare this visible figure with the current in your home by checking other electrical appliances or the electric meter. If the recorder is not set on the required voltage, change the setting according to the next paragraph.

1. Raccordement réseau

Avant de raccorder votre enregistreur au réseau, assurez-vous que votre installation est bien en courant alternatif, 220 V. L'appareil est réglé sur cette tension réseau. Dans le doute, effectuez la vérification en consultant un de vos appareils électroménagers ou la plaque montée sur le compteur de votre installation électrique. Si la tension réseau n'est pas de 220 V, vous pourrez, en très peu de manipulations, régler l'appareil sur la tension adéquate.

1. Conexión a la red de alimentación

Antes de conectar su grabadora Magnetophon 85 a la red de alimentación, sírvase cerciorarse, de que en su casa posee Vd. corriente alterna con una tensión de 220 Voltios. Para esta tensión de alimentación ha sido conmutada de fábrica su grabadora. En caso de duda respecto a estos datos, no hay más que controlar el cartelito indicador de tipo de uno de sus aparatos eléctricos domésticos o comparar con las indicaciones, que se encuentran sobre el contador de electricidad. En caso de que la tensión de corriente alterna en su casa no sea de 220 Voltios sino por ejemplo de 110 Voltios, puede Vd. adaptar su grabadora mediante una corta serie de simples operaciones a esta tensión de alimentación.

2. Umstellen auf andere Netzspannungen

Dabei ist es zu Ihrer eigenen Sicherheit sehr wichtig, daß vorher der Netzstecker aus der Steckdose gezogen ist.
Nach Lösen der Halteschraube der rückwärtigen Abdeckplatte läßt sich das Magnetophon 85 auf eine der fünf Netzspannungen 110/127/150/220/240 V einstellen. Die runde Scheibe mit den fünf Spannungsbezeichnungen wird mit einem Geldstück gedreht, so daß die erforderliche Voltzahl auf den weißen Punkt zeigt.
Wenn Sie die Abdeckplatte wieder aufgesetzt haben, muß die eingestellte Spannung im Fenster sichtbar sein.

2. Change-over to a different voltage

First be sure that the machine is not plugged in. Then remove the rear cover of the voltage selector by loosening the securing screw. With the aid of a coin, turn the voltage selector, until the small mark is opposite to the desired voltage 110—240 V. After the rear cover has been secured again, the correct voltage should now be visible in the window.

2. Conversion à d'autres tensions réseau

Il est d'abord très important pour votre propre sécurité que la fiche réseau soit retirée de la prise du secteur. Après avoir dévissé le panneau arrière, le réglage sur une des tensions suivantes: 110 / 127 / 150 / 220 / 240 V se fera facilement. Tournez le disque portant l'indication des tensions que nous venons de mentionner au moyen d'une pièce de monnaie, de sorte que le chiffre du voltage voulu indique le point blanc.

Quand vous aurez remis le panneau arrière, il faut que le chiffre de la tension réglée soit visible dans le voyant.

2. Conmutación a conexión a otras tensiones de red

Al hacer esto resulta de importancia primordial para su propia seguridad personal, el haber extraído anteriormente la clavija de red de su enchufe. Después de soltado el tornillo de sujeción de la tapa de revestimiento posterior, puede ajustarse la grabadora Magnetophon 85 a una de las cinco tensiones de alimentación 110 / 127 / 150 / 220 / 240 Voltios. El disco redondo con las cinco denominaciones de tensión se girará con ayuda de una moneda de tal forma, que el valor de tensión deseado se encuentre frente al punto de marcación blanco. Una vez vuelta a colocar la tapa de revestimiento quitada, habrá de resultar legible la tensión ajustada a través de la ventanilla posterior.

3. Umstellen auf 60 Hz

Wollen Sie Ihr Magnetophon auf der nächsten Reise im Ausland benutzen, so ist, falls erforderlich, eine Umrüstung auf die Netzfrequenz von 60 Hz leicht möglich. Mit Hilfe des Umrüstsatzes 60 Hz (Bestell-Nr. 7 266 746) und der diesem beigefügten viersprachigen Anweisung kann die Umrüstung von jeder Fachwerkstatt durchgeführt werden.

3. Changeover to a different mains frequency (50 or 60 cps)

Travelling in foreign countries may necessitate a change-over to a different mains frequency.

1. The domestic model is changed by
   a) Exchanging the motor pulley on the motor shaft and the motor belt.
   b) The motor condenser has to be replaced (50 cps = 1 µF/60 cps = 0,7 µF)
2. The export model is changed by
   a) Exchanging the motor pulley on the motor shaft and the motor belt.
   b) Moving the four contact springs located near the right turntable to the respective figures "50" or "60".

3. Conversion à 60 périodes

Si vous désirez utiliser votre appareil dans un pays étranger, il sera peut-être indispensable que vous modifiez le réglage de la fréquence réseau. Ce sera facile: à l'aide d'un jeu de conversion 60 périodes (N° de commande 7 266 746) et des instructions en 4 langues jointes au jeu, cette modification sera aisément effectuée dans un atelier spécialisé.

3. Conmutación a 60 c/s

En caso de que Vd. desee emplear su grabadora Magnetophon 85 en su próximo viaje al extranjero en un país, en que se disponga de corriente de alimentación de red de 60 c/s, puede efectuarse una adaptación de esta clase con toda facilidad. Con ayuda del juego de piezas de conmutación de 60 c/s (No. de pedido 7 266 746) y de las instrucciones de montaje en 4 idiomas, que lo acompañan, puede ser efectuada esta conmutación por cualquier taller especializado en la materia.

4. Einschalten des Gerätes

Das Gerät ist eingeschaltet, wenn Sie den Drehknopf (B) nach rechts drehen, bis seine Nase auf ⊙ zeigt. Den Deckel Ihres Tonbandgerätes legen Sie natürlich während des Betriebes nicht auf.

4. To turn on the tape recorder

The set is turned on when turning knob (B) to the right until it points to ⊙. Of course, the tape recorder can be operated only, with the lid open.

4. Mise sous tension

L'appareil est mis sous tension lorsque vous tournez le bouton (B) vers la droite jusqu'à ce que l'ergot indique le signe ⊙. Evidemment, le couvercle ne doit pas rester sur l'enregistreur pendant le fonctionnement.

4. Conexión de la grabadora (puesta en marcha)

La grabadora se encuentra en funcionamiento en el momento de girar el botón giratorio (B) hacia la derecha, hasta que su saliente señale al punto marcado ⊙. Naturalmente no volverá Vd. a colocar la tapa sobre su grabadora durante el tiempo, que ésta se encuentre en servicio.

5. Einlegen des Tonbandes

Ihr Magnetophon 85 nimmt Spulen bis 18 cm Durchmesser auf. Achten Sie bitte darauf, daß Leerspule und volle Spule die gleiche Größe haben.
Auf den linken Wickelteller legen Sie die volle Spule

5. To thread the tape

You may use reels with a dia up to 7" (18 cms). Please see that the empty reel, and the full reel are of the same size. Place the full reel (P) on the left hand turntable, and the empty reel (R) on the

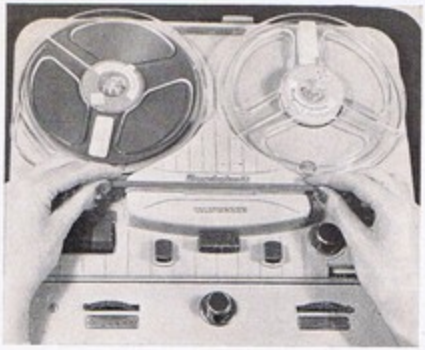
5. Mise en place de la bande

Votre Magnetophon 85 peut recevoir des bandes ayant jusqu'à 18 cm de diametre. Attention les deux bobines doivent être de même dimension. Poser la bobine pleine (P) sur le plateau

5. Colocación de la cinta de grabación

En su grabadora Magnetophon 85 pueden colocarse rollos de cinta con un diámetro de hasta 18 cms. Sírvase poner atención en que los tamaños de rollo vacío y rollo lleno sean

(P) und auf den rechten Wickelteller die Leerspule (R). Dann wickeln Sie etwa 40 cm Band ab, halten es straff und führen es senkrecht in den Schlitz der Abdeckkappe ein.

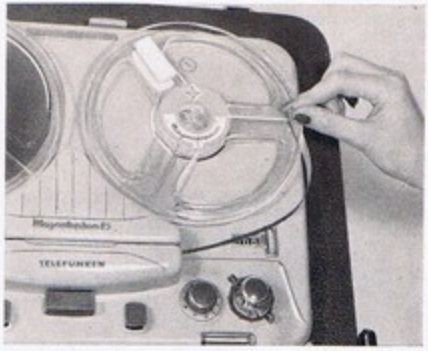


right hand turntable. Then unwind abt. 15" (abt. 40 cms) of the tape, holding it taut, and inserting it vertically into the slot of the cover.

gauche et la vide (S) sur le plateau droit. Puis enroulez env. 40 cm de bande, maintenez-la tendue et introduisez-la dans la fente du capôt.

los mismos. Sobre el plato de arrollamiento izquierdo se colocará el rollo de cinta lleno (F) y sobre el plato de arrollamiento derecho el rollo de cinta vacío (S). A continuación se desenrollarán unos 40 cms de cinta del rollo lleno, los cuales se mantendrán tensados y así se introducirán verticalmente desde arriba en la ranura de la tapa de revestimiento superior.

Das farbige Vorspannband fädeln Sie dann wie abgebildet in die Leerspule (R) ein.



After that, thread the leader into the slot of the empty reel (R) (see illustration).

Puis enroulez le début de la bande (partie colorée), comme indiqué sur la figure, sur la bobine vide (G).

La cinta de trailer coloreada del principio se enhebrará después en el núcleo del rollo de cinta vacío, tal como se muestra en la figura.

Das kurze Bandende, etwa 10 mm, drücken Sie mit dem Finger nieder und drehen die Leerspule entgegen dem Uhrzeigersinn, bis das Ende der silbernen Schaltfolie rechts vom Geräteschlitz erscheint.

The short, remaining end — abt. 3/8" (abt. 10 mms) — of the leader press down with your finger, and turn the empty reel anti-clockwise, until the silver switch foil appears to the right of the recording slot.

Appuyez sur le petit bout de bande d'environ 10 cm et faites tourner la bobine vide dans le sens contraire des aiguilles d'une montre jusqu'à ce que l'extrémité de la partie métallique argentée apparaisse à droite de la fente de l'enregistreur.

El extremo de cinta corto, que sobresale, se oprimirá con la yema del dedo sobre la superficie del rollo vacío, haciendo girar a éste a continuación en sentido opuesto al de las manillas del reloj, hasta que aparezca el extremo de la cinta de desconexión plateada al lado derecho de la ranura de la grabadora.

Dann stellen Sie das Zählwerk (A) auf 000, damit Sie später bestimmte Stellen auf dem Band schnell wiederfinden können.

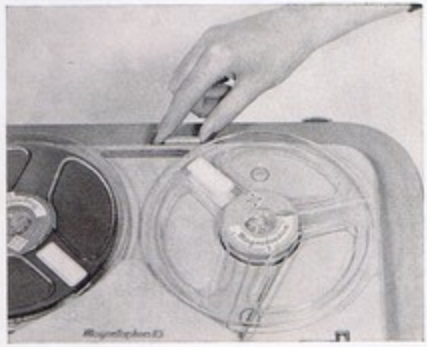
Then turn the counter (A) to 000, enabling you to locate certain desired points on the tape later.

Puis, mettez le compteur (A) sur 000, afin que vous puissiez repérer plus tard, facilement, un emplacement déterminé sur la bande.

A continuación se ajustará el mecanismo contador (A) a la posición 000, para poder de esta forma localizar posteriormente con facilidad determinados puntos de la grabación.

6. Einstellen der Bandgeschwindigkeiten

Das Magnetophon 85 kann auf die beiden Bandgeschwindigkeiten 9,5 cm/s und 19 cm/s umgeschaltet werden. Die niedrige Bandgeschwindigkeit wird oft für den Austausch von Tonbandbriefen sowie für die Aufnahme von Unterhaltungsmusik verwendet. Soll eine Aufnahme jedoch höchste Ansprüche erfüllen, wählen Sie die Bandgeschwindigkeit 19 cm/s. Die beiden Geschwindigkeiten des Magnetophon 85 sind an dem breiten Schieber (Q) an der Rückseite des Gerätes umzustellen.



6. Speed selection

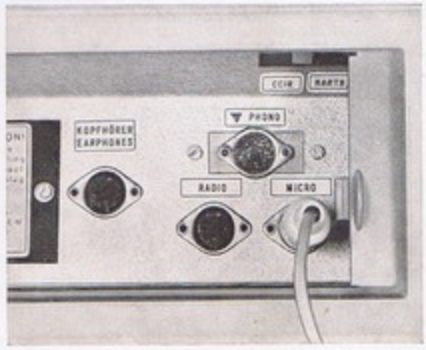
Magnetophon 85 can be switched to the two speeds 3.3/4 ips (9,5 cm/sec), and 7½ ips (19 cm/sec). The lower speed is mostly used for tape correspondance, and recording light music. To obtain reproduction that suits highest requirements, choose tape speed 7½ ips (19 cm/sec.). The tape speed can be changed by means of tape speed selector (Q) at the rear side of the tape recorder.

6. Réglage de la vitesse de bande

Le Magnetophon 85 peut être également réglé sur une des deux vitesses de bande 9,5 cm/s ou 19 cm/s. La vitesse de bande la plus faible est généralement employée pour les échanges de correspondance par bande ou de musique d'ambiance. Vous choisirez 19 cm/s pour les enregistrement de qualité. Le réglage de la vitesse de bande se fait au moyen du bouton-poussoir (Q) placé au dos de l'enregistreur.

6. Conmutación de las velocidades de grabación de la cinta

La grabadora Magnetophon 85 puede conmutarse a las dos velocidades de grabación de 9,5 y 19 cm/s. La velocidad de cinta mas reducida se emplea frecuentemente para la correspondencia mediante cintas grabadas magnéticamiente asi como para la grabación de música ligera y de entretenimiento. En caso de que sin embargo se desee, que una grabación satisfaga hasta las exigencias mas extremas en cuanto a su cualidad, se empleará la velocidad de cinta de 19 cm/s. Las dos velocidades de grabación se conmutan mediante el deslizador ancho (Q), que se encuentra en la parte posterior de su grabadora Magnetophon 85.



7. Aufnahme-Vorbereitungen

a) Mikrofonanschluß

Sie können grundsätzlich jedes in der Zubehörliste angebotene Mikrofon C 15, D 9 A, D 11 C, D 19 C und D 9 F verwenden.
Den Mikrofonstecker führen

7. Preparations for recording

a) Microphone connection

You can use any of the microphones offered in our accessories list, i. e. C 15, D 9 A, D 11 C, D 19 C, and D 9 F.
Plug in the microphone into

7. Préparatifs à l'enregistrement

a. Raccordement du microphone

Vous pouvez utiliser un des modèles indiqués dans la liste d'accessoires: C 15, D 9 A, D 11 C, D 19 C et D 9 F.

7. Preparaciones para la grabación

a. Conexión del micrófono

En principio puede Vd. emplear cualquiera de los micrófonos, que se enumeran en las listas de accessorios, es decir tanto C 15, como D 9 A, D 11 C, D 19 C o D 9 F.

Sie bitte in die mit „Micro" bezeichnete Buchse (V) an der Rückseite Ihres Tonbandgerätes ein und schalten den dreistufigen Eingangswahlschalter (C) in Stellung ⊙| (Mikrofon). Das Diktatmikrofon D 9 F Automatic ist mit zwei Anschlußsteckern versehen, von denen der mit einem roten Punkt versehene Stecker in die Buchse „Stop" (Z) des Tonbandgerätes eingeführt wird. Mit diesem Mikrofon läßt sich das Magnetophon 85 fernbedienen, wobei die Schnellstoptaste (F) eingerastet werden muß (s. Absatz 13).

the socket (V) marked "Micro" at the back of your tape recorder, and turn the three stage input selector (C) to position ⊙| (microphone). The dictation microphone D 9 F Automatic is provided with two plugs, one of which (the one marked with a red dot) is to be put into the remote control socket "Stop" (Z) of the tape recorder. With this microphone you can also control the tape recorder electronically, whereby the quick stop button has to be in locked down position (see para 13).

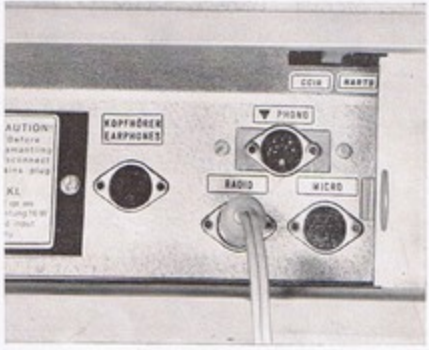
Introduisez la fiche micro dans la prise indiquée « micro » (U) placée au dos de l'enregistreur et connectez le commutateur de choix d'entrée à trois positions (C) sur la position ⊙| (micro).

Le micro D 9 F Automatic est pourvu de 2 fiches de raccordement. Celle qui est marquée d'un point rouge sera introduite dans la prise « stop » (Z) de l'enregistreur. C'est grâce à cette prise que l'on pourra télécommander le Magnetophon 85, après avoir bloqué la touche d'arrêt rapide (F) (voir paragraphe 13).

La clavija de conexión del micrófono se introducirá en el enchufe marcado "Micro" de su grabadora (U), que se encuentra en la cara posterior, conmutando a continuación al conmutador de tres posiciones de selección de entradas (C) a la posición marcada ⊙| (micrófono). El micrófono de dictado D 9 F Automatic está provisto de dos clavijas de conexión, de las cuales una de ellas (la provista del punto de marcación rojo) se introducirá en el enchufe de conexión "Stop" (Z) de la grabadora. Con ayuda de este micrófono puede gobernarse su grabadora Magnetophon 85 a distancia, para lo cual sin embargo hay que hacer encajar la tecla de parada rápida (F) de la grabadora (véase párrafo 13.)

b) Radioanschluß

Für die Aufnahme von Rundfunksendungen verbinden Sie die Buchse „Radio" (W) Ihres Tonbandgerätes mit der Diodenbuchse des Rundfunkempfängers mittels der beiliegenden Ton- und Überspielleitung. Hierbei drehen Sie den Eingangswahlschalter (C) in Stellung ⊏|. Fehlt an Ihrem Rundfunkempfänger der heute allgemein übliche Diodenanschluß, so kann er nachträglich von Ihrem Fachhändler eingebaut werden (s. Zubehörliste).



b) Radio connection

To record radio programs, connect the radio input socket (W) of your tape recorder with the diode socket of your radio, by means, of an audio lead enclosed with Magnetophon 85. Then turn the input selector (C) to position ⊏|. Should your radio not be provided with a diode socket, it can be installed easily by your dealer (s. accessories list).

b. Raccordement radio

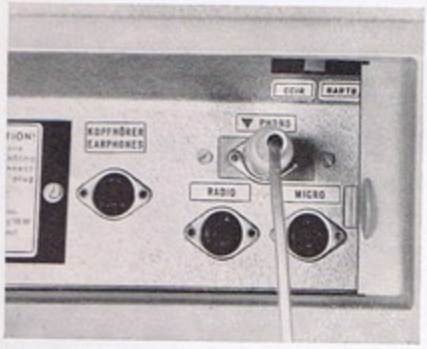
Pour enregistrer des émissions de radiodiffusion, relier la prise « radio » (W) de votre enregistreur à la prise diode du récepteur radio au moyen d'un câble de couplage et de son. Tournez en même temps le commutateur de choix d'entrée (C) en position ⊏|. Si votre radio est dépourvue de prise diode montée sur tous les appareils un peu récents, votre technicien vous fera ce montage (cf. liste d'accessoires).

b. Conexión de radio

Para la grabación de transmisiones radiofónicas se conectará el enchufe de conexión marcado "Radio" (W) de su grabadora con el enchufe de diodo de su radioreceptor con ayuda del cable de audiofrecuencias y de transposición adjunto a la grabadora. Además se conmutador el selección de entradas a la posición ⊏|. En caso de que su radioreceptor no disponga aún del actualmente común enchufe de diodo, podrá ser montado éste con gran facilidad en su receptor por su taller proveedor de materia radiofónica (v. Lista de piezas de accesorios).

c) Anschluß eines Plattenspielers oder eines zweiten Tonbandgerätes

Der Phonoeingang (U) dient zum direkten Anschluß eines Plattenspielers oder eines zweiten Tonbandgerätes.



8. Aussteuerung und Aufnahme

Die Aussteuerung für Mikrofon- und Rundfunkaufnahmen wird mit dem Drehknopf (B) geregelt, mit dem Sie vorhin das Gerät eingeschaltet haben. Für die Aussteuerung von Aufnahmen über die Phonobuchse dient der Regler (D). Durch Trennung der beiden Regler (B) und (D) können Sie zwei verschiedene Schallereignisse, beispielsweise Sprache oder Gesang (Mikrofon über Regler [B]) und Musik (Plattenspieler oder zweites Tonbandgerät über Regler [D]) miteinander mischen. Die Aussteuerung ist richtig, wenn sich die Leuchtbalken des Magischen Bandes (E) gerade berühren.

c) Connection of a record player and a second tape recorder

The phono input socket (U) serves for connection with a record player or a second tape recorder.

8. Volume control and recording

Adjust the input volume for microphone- and radio recordings with the same button (B), with which you turned on the set before, and control the volume of recordings via the phono input socket with level control knob (D). Having two separate level controls (B) and (D), you can mix two different kinds of sound, e. g. speaking or singing (microphone via knob (B)), and music (record player or second tape recorder via knob (D)) with each other. The recording level is adjusted properly, when the two luminous sectors of the "magic band" are just about to touch each other.

c. Raccordement d'un pick-up ou d'un deuxième enregistreur

L'entrée « phono » (U) sert à raccorder directement un tourne-disque ou un deuxième enregistreur.

8. Modulation et enregistrement

Pour les enregistrements microphoniques ou radiophoniques la modulation est réglée avec le bouton (B), avec lequel vous aurez préalablement mis l'enregistreur sous tension. Pour moduler les enregistrements faits par l'intermédiaire de la prise phono, utilisez le potentiomètre (D). En séparant les potentiomètres (B) et (D), vous pourrez mélanger deux effets d'écho séparés, par exemple parole ou musique (microphone par le potentiomètre [B]) et musique (pick-up ou deuxième enregistreur par le potentiomètre [D]). Le réglage de la modulation est exact lorsque les secteurs de l'oeil magique parviennent à se toucher (E).

c. Conexión de un tocadiscos o de una segunda grabadora de cinta

La entrada de pick-up (U) se emplea para la conexión directa de un tocadiscos o cambiadiscos o de una segunda grabadora de cinta magnética.

8. Control del grado de amplificación de grabación y efectuado de una grabación

El control del grado de amplificación de grabación para grabaciones microfónicas o desde un radioreceptor se efectua con ayuda del botón giratorio (B), con ayuda del cual ya había Vd. puesto en funcionamiento su grabadora anteriormente. Para el control de grado de amplificación de grabación de grabaciones efectuadas a través del enchufe de conexión de entrada de pick-up, se emplea el elemento de regulación (D). Debido a la disposición separada de los dos controles (B) y (D) puede Vd. mezclar dos eventos musicales simultáneos, p. ej. locuciones habladas o de canto (grabación microfónica, controlada mediante [B]) y música (tocadiscos o cambiadoscos resp. segunda grabadora de cinta, controlados mediante [D]). El grado de amplificación de grabación será correcto, si las franjas luminosos de la cinta mágica (E) se tocan en los puntos de mayor volumen, no llegando sin embargo a superponerse.

Nun beginnen Sie mit der Aufnahme, indem Sie gleichzeitig die Taste (M) und die Aufnahmesperre (L) drücken. Achten Sie bitte darauf, daß die Taste (L) während der Aufnahme nicht eingerastet bleibt, da sie in diesem Falle als Tricktaste wirksam ist.

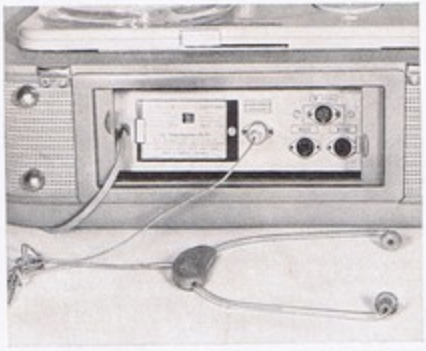
Now you can start recording, by simultaneously pressing record button (M), and the record block button (L). Please see that button (L) does not remain in locked position, where it would act as a trick button (see para 6).

Vous pouvez maintenant commencer l'enregistrement en appuyant en même temps sur la touche (M) et sur le verrouillage d'enregistrement (L). Veiller à ce que la touche (L) ne reste pas bloquée car, dans ce cas, elle ferait fonction de « touche de trucage ».

Ahora podrá Vd. comenzar con la grabación, para lo cual se oprimirán simultáneamente las teclas (M) y la de bloqueo de grabación (L). Sírvase poner atención en que la tecla (L) no permanezca encajada durante la grabación, ya que en este caso hace las funciones de tecla de efectos de truco.

9. Abhörkontrolle während der Aufnahme

Wenn Sie während der Aufnahme über Kopfhörer mithören wollen, schließen Sie den Kopfhörer Teleset 3 an die Kopfhörerbuchse (X) an der Rückseite des Tonbandgerätes an. Sie können auch während der Aufnahme über die eingebauten Lautsprecher mithören, doch besteht bei Mikrofonaufnahmen die Gefahr, daß akustische Rückkoppelung (Pfeifton) auftritt, wenn Mikrofon und Tonbandgerät im selben Raum aufgestellt sind. Für das Mithören über Lautsprecher muß der Drehknopf (H) nach oben gezogen und entsprechend aufgeregelt werden.



9. To monitor during recording

If you want to monitor your recordings by earphones, plug earphone Teleset 3 into the earphone socket (X) at the rear side of your tape recorder. Another way of monitoring, is via the built- in loudspeakers. However, the latter may cause acoustic feedback (disturbing noise), when, during recordings by microphone, both tape recorder and microphone are placed in the same room. When monitoring via the loudspeakers, adjust volume with control knob (H).

9. Contrôle d'écoute pendant l'enregistrement

Si vous désirez écouter l'enregistrement en cours au moyen d'un écouteur, raccordez l'écouteur « Teleset 3 » à la prise « écouteur » (X) placée au dos de l'enregistreur. Vous pouvez également écouter pendant l'enregistrement au moyen du haut-parleur incorporé, mais au cours des enregistrements microphoniques il existe toujours le danger que des interférences acoustiques entrent en jeu (sifflement) lorsque le microphone et l'enregistreur sont dans la même pièce. Pour écouter au moyen du haut-parleur, tirez sur le bouton (H) et effectuer le réglage.

9. Escucha simutánea de observación durante la grabación

En caso de que Vd. desee escuchar simultáneamente las piezas grabadas durante la grabación misma, no tendrá Vd. mas que enchufar el juego de auriculares Teleset 3 al enchufe de conexión de auriculares (X), que se encuentra en la cara posterior de su grabadora. También puede efectuarse una escucha de observación mediante los altoparlantes incorporados. Sin embargo al hacer ésto se corre el peligro en grabaciones microfónicas, que aparezca una realimentatión acústica, que se hace sentir mediante un silbido desagradable de gran intensidad, en caso de que grabadora y micrófono se encuentren en un mismo recinto cerrado (habitación, p. ej.). Para la escucha simultánea a través de altoparlantes incorporados habrá de tirarse del botón de control (H) hacia arriba, abriéndolo después en forma conveniente.

10. Anhalten des Tonbandes

Durch Niederdrücken der Taste (N) wird der Bandlauf beendet.

10. To stop the tape

By pressing down button (N), the tape will stop moving.

10. Arrêt de la bande

La bande s'arrête lorsque vous appuyez sur la touche (N).

10. Parada de la grabadora

Oprimiendo la tecla de parada (N) se para automáticamente la cinta en su recorrido.

11. Schneller Rücklauf
Den Anfang der soeben fertiggestellten Aufnahme erreichen Sie, indem Sie das Tonband zurückspulen. Dazu schieben Sie den Vor- und Rücklaufschieber (I) nach links, bis er einrastet. Um den Bandlauf zu unterbrechen, drücken sie wieder die Taste (N) nieder. Das Zählwerk (A) hilft Ihnen, im richtigen Moment anzuhalten.

12. Wiedergabe

Zur Wiedergabe Ihrer Aufnahme brauchen Sie nicht unbedingt ein Rundfunkgerät. Das Magnetophon 85 besitzt zwei eingebaute Lautsprecher von hoher Klangqualität.
Zum Abhören Ihrer Aufnahme drücken Sie die Taste (O) und stellen die gewünschte Lautstärke mit dem Regler (H) ein.
Die Klangfarbe können Sie am Baßregler (K) und dem Höhenregler (G) beliebig variieren.
Beim Anschluß eines Zweitlautsprechers an die Buchse (Y) können Sie sowohl die eingebauten Lautsprecher mittönen lassen als auch abschalten, indem Sie den Anschlußstecker des Zweitlautsprechers um 180 Grad gedreht in die Lautsprecherbuchse einführen.
Natürlich ist zur gleichen Zeit auch eine Wiedergabe über das angeschlossene Rundfunkgerät möglich, wenn Sie bei diesem die Taste „Tonband" bzw. „Platte" drücken. Dabei wird die Lautstärke und die Klangfarbe in gewohnter Weise am Rundfunkgerät eingestellt. Als Verbindung dient, wie unter „Radio-

11. Rewind

To return to the beginning of a recording, you will want to rewind the tape. Press button (I) to the left, until it engages. To stop the tape, press stop button (N). The counter tells you when to stop.

12. Playback

To playback what you have recorded, you do not need to have a radio. The Magnetophon 85 has two built-in loudspeakers of high quality.
To hear your recording, press button (O), and control the desired volume of playback with button (H). You can adjust the tone colour with the bass control (K), and the treble control (G).
When connecting an extra loudspeaker to socket (Y) you may switch off the built-in loudspeakers by reversing the plug of the external speaker.
Of course, you can, at the same time, also hear a playback through the loudspeaker of a connected radio, by pressing the button "tape" or "phono" on the radio.
You may then adjust the tone colour, and volume on your radio in the usual way.
As connection between Magnetophon 85, and the radio serves the audio lead — see description under "radio connection".

11. Retour rapide

Vous retrouverez rapidement le commencement d'un enregistrement en rebobinant la bande. Pour cela, poussez le commutateur glissant d'avance/retour (I) jusqu'à ce qu'il soit enclenché. Pour arrêter la bande, appuyez de nouveau sur la touche (N). Le compteur (A) vous aidera à arrêter la bande au moment voulu.

12. Reproduction

Pour reproduire votre enregistrement, il n'est pas absolument indispensable que vous possediez une radio. Le Magnetophon 85 est équipé de deux haut-parleurs incorporés d'excellente qualité.
Pour l'écoute, appuyer sur la touche (O) et régler le volume adéquat avec le potentiomètre (H). Vous pourrez varier la tonalité au moyen du réglage des basses (K) et de celui des aigues (G). En raccordant un deuxième haut-parleur à la prise (Y), vous pourrez aussi bien employer le haut-parleur incorporé pour l'écoute que le déconnecter en tournant de 180° la fiche du haut-parleur supplémentaire lorsque vous l'introduisez dans la prise haut-parleur.
Naturellement, il est également possible d'effectuer une reproduction en même temps par le poste de radio, si vous appuyez sur la touche « enregistreur » ou « pick-up ». Il faut alors régler la tonalité et le volume sur le poste de radio. Pour la liaison, on se sert, comme nous l'indiquons au paragraphe

11. Retroceso rápido

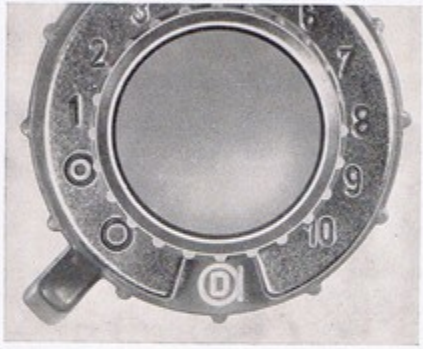
El comienzo de la grabación, que acaba Vd. de finalizar, volverá Vd. a encontrarlo haciendo retroceder la cinta rápidamente a su principio. Para ello se desplazará el deslizador de avance y retroceso (I) hacia la izquierda, hasta que encaje. Para interrumpir ahora la marcha de la cinta, no habrá que hacer más que volver a oprimir la ya conocida tecla de parada (N). El mecanismo contador (A) le yudará a encontar en el acto el punto deseado de la grabación.

12. Reproducción

Para la reproducción de su grabación efectuada no precisa Vd. indispensablemente un radioreceptor. La grabadora Magnetophon 85 posee dos altoparlantes incorporados de alta cualidad acústica.
Para la escucha en reproducción de su grabación oprimirá Vd. la tecla (O), ajustando a continuación el control de volumen (H) a la posición deseada. La tonalidad puede adaptarse a sus deseos especiales con ayuda del control de bajos (K) y el de agudos (G), ambos de paso continuo.
Al conectar un altoparlante exterior al enchufe de conexión (Y) puede Vd. hacer marchar conjuntamente los altoparlantes incorporados, o en caso de no desearlo, desconectarlos. Para ello no precisa Vd. mas que hacer girar en 180° la clavija de conexión del altoparlante exterior e introducirla así en el enchufe de conexión.
Naturalmente puede efectuarse simultáneamente una reproducción a través de un radioreceptor, que se encuentre conectado, para lo cual no se precisará mas

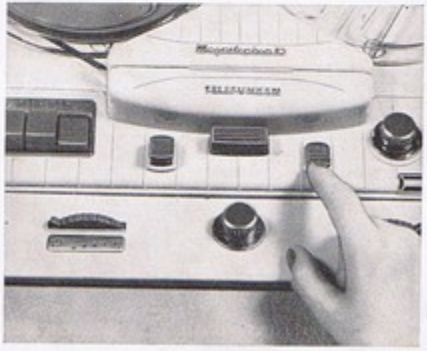
anschluß" beschrieben, wieder die an die Radiobuchse Ihres Tonbandgerätes Magnetophon 85 angeschlossene Tonleitung.

Wenn Sie den Eingangswahlschalter in Stellung D bringen, können Sie bei Verwendung von Kopfhörer oder Verstärkeranlage am Aussteuerungsregler (B) zusätzlich die Lautstärke regeln.



13. Schnellstop

Um Ansagen und unerwünschte Stücke zu überspringen, wird die Taste (F) niedergedrückt, und schon bleibt das Band in den Stellungen Aufnahme oder Wiedergabe stehen. Dauert die Pause etwas länger, so wird die Taste nach dem Niederdrücken lediglich nach hinten geschoben, bis sie einrastet. In dieser Stellung kann die Schnellstoptaste ohne Gefahr längere Zeit verbleiben. Die Ausrastung erfolgt durch kurzes Niederdrücken und gleichzeitiges Ziehen



« raccordement radio » de nouveau du câble de son que vous avez raccordé à la prise « radio » de votre enregistreur Magnetophon 85.

13. Arrêt rapide

Si vous voulez éviter des annonces ou des parties inutiles de l'enregistrement, appuyez sur la touche (F). La bande s'arrête immédiatement, l'appareil restant sur le réglage primitivement fait, c'est-à-dire en position enregistrement ou reproduction. Si l'interruption devait durer assez longtemps, poussez la touche complètement vers le bas jusqu'à ce qu'elle soit coincée. La touche d'arrêt rapide peut rester longtemps dans cette position sans danger.

que oprimir en él la tecla marcada pick-up resp. grabadora. Al hacer esto se controlará tanto el volumen de reproducción como la tonalidad de ésta en forma acostumbrada en el receptor mismo. Como cable de conexión se empleará, tal como ya se mencionó en el párrafo de « Conexión a radioreceptor », el cable de audiofrecuencias enchufado en el enchufe de conexión de radio de su grabadora Magnetophon 85.

Si se lleva el conmutador de entradas a la posición D, puede controlarse además el volumen adicionalmente al conectar a la grabadora instalaciones de auriculares o de amplificadores, empleando el control de grado de amplificación de grabación.

13. Parada inmediata

Para no tener que grabar locuciones habladas indeseadas de un programma radiotónico o piezas musicales de poco interés, se oprimirá la tecla (F), hecho lo cual se parará la cinta magnética en el acto en la posición de grabación o reproducción, en que se encontraba anteriormente. En caso de que la interrupción sea de una duración algo mayor, no habrá mas que desplazar la tecla oprimida ligeramente hacia atrás, hasta que encaje. En esta posición puede permanecer la tecla de parada inmediata por mayor duración de tiempo, sin que por ello sufra daño su grabadora.

nach vorn; sobald die Taste losgelassen wird, läuft das Tonband weiter.
Da Ihr Magnetophon 85 über einen elektrischen Schnellstop verfügt, können Sie diesen auch über die Stopbuchse (Z) mittels der Fußtaste oder des Fernbedienungsmikrofones D 9 F fernsteuern, wenn vorher die Schnellstoptaste eingerastet wurde.

you may control your recorder remotely by a foot pedal, or by microphone D 9 F, using stop socket (Z) with the quick stop button depressed.

Vous décoincerez la touche en appuyant brièvement dessus tout en tirant vers l'avant; dès que la touche est lâchee, la bande reprend sa course.
Comme votre Magnetophon 85 dispose d'un arrêt rapide électrique, vous pouvez également actionner celui-ci par l'intermédiaire de la prise Stop (Z) au moyen de la pédale ou du microphone de télécommande D 9 F, si la touche d'arrêt rapide a été préalablement coincée.

La vuelta a la posición inicial se efectuará mediante una corta opresión y simultáneo desplazamiento hacia adelante; en cuanto vuelva a soltarse la tecla, velverá a ponerse en marcha la cinta inmediatamente.
Ya que su grabadora Magnetophon 85 dispone de una parada inmediata de accionamiento eléctrico, puede Vd. gobernar esta función también mediante mando a distancia a través del enchufe de conexión de stop (Z), conectando a éste el pedal de accionamiento o el micrófono de mando a distancia D 9 F, para lo cual habrá que encajar sin embargo anteriormente la tecla de parada inmediata de la grabadora.

14. Schneller Vorlauf

Den schnellen Vorlauf werden Sie benutzen, um eine beliebige Stelle auf dem Band — deren Zählwerkzahl Sie kennen — rasch aufzufinden.
Den Ihnen bekannten Vor-Rücklaufschieber (I) drücken Sie nach rechts, bis er einrastet. An der gewünschten Stelle stoppen Sie den Bandlauf durch Niederdrücken der Taste (N).
In diesem Zusammenhang sei bemerkt, daß die automatische Endabschaltung mittels Schaltfolie bei allen Lauffunktionen — also Aufnahme, Wiedergabe, schneller Vorlauf, schneller Rücklauf — wirksam ist. Beim Durchlauf der Schaltfolie wird der Bandlauf automatisch unterbrochen.

14. Forward wind

In order to find a specific place somewhere on the tape, press the rewind/forward wind (I) to the right, until it engages. When the counter will show you that you are almost at the desired place, again stop the tape, by pressing button (N). Important to note: the silver strip of switch foil that you see at the beginning, and at the end of our tapes, will automatically stop the tape during recording, playback, forward wind and rewind.

14. Avance rapide

Vous utiliserez l'avance rapide pour retrouver rapidement sur la bande un emplacement déterminé — et à condition que vous connaissiez le chiffre du compteur.
Appuyez vers la droite le commutateur d'avance/retour (I) jusqu'à ce qu'il soit coincé. A l'emplacement voulu, arrêtez le défilement de la bande en appuyant sur la touche (N).
Noter à ce sujet que l'arrêt automatique en fin de bande au moyen des extrémités de bande métallisées est effectif pour toutes les phases du mouvement de la bande: enregistrement, reproduction, avance rapide et retour rapide. Lorsque la partie métallisée défile la bande est automatiquement stoppée.

14. Avance rápido

El avance rápido lo empleará Vd. para encontrar un punto determinado de la cinta — cuyo posición del mecanismo contador le sea conocida — rápidamente. El deslizador de avance y retroceso rápidos (I), que Vd. ya conoce, se desplazará hacia la derecha, hasta que encaje. Al llegar al punto deseado de la cinta, se oprimirá la tecla de parada de cinta (N), con lo que se parará ésta en el acto. Al hablar de esto nos permitimos observar, que la desconexión mediante lámina de plata de comienzo y final de cinta actúa en todas las posiciones de desplazamiento de la cinta, es decir tanto en grabación como en reproducción, avance rápido y retroceso rápido. Al pasar la lámina de desconexión a través de la grabadora se desconectará por tanto ésta siempre, no importando, qué clase de servicio se esté efectuando.

15. Ausschalten

Zuerst sollten Sie die Halt-Taste (N) betätigen. Danach drehen Sie den Drehknopf (B) in die Stellung O. Jetzt beherrschen Sie die Bedienungsgrundlagen Ihres Gerätes, jedoch sind die vielseitigen Möglichkeiten noch lange nicht erschöpft. Für eine ruhige Stunde sollten Sie sich das Studium der nachfolgenden Punkte vormerken:

16. Tricktaste

Die Aufnahme-Sperrtaste (L) arbeitet in gedrückter und eingerasteter Stellung als Tricktaste. Dadurch kann beispielsweise beim Vertonen in eine bestehende Musikaufnahme hineingesprochen werden, so daß später Sprache und Musik zusammen wiedergegeben werden.

17. Das Magnetophon 85 als Phonoverstärker

Sie können Ihr Magnetophon 85 auch als Verstärker für Platte, Mikrofon oder Radio verwenden. Hierzu verbinden Sie die betreffende Tonquelle mit dem Tonbandgerät und steuern — wie bereits beschrieben — mit dem Regler (B) bzw. (D) aus, ohne jedoch die Aufnahmetaste (M) zu drücken. Dann ziehen Sie den Knopf (H) hoch und regeln mit ihm die gewünschte Lautstärke ein. Das Klangbild stellen Sie an den Reglern (G)

15. To turn off the tape recorder

First press the stop button (N). Then turn button (B) to position 0.
You are now familiar with the operation of your tape recorder, however, the many possibilities, your Magnetophon 85 offers for service, are not yet exhausted. For use during a quiet hour, we want to acquaint you with some of the ways, in which your tape recorder can be of use for you.

16. Trick button

In pressed and locked down position, the record block button (L) will act as a trick button. This enables you to speak for instance onto an already recorded piece of music so that both the music, and the spoken commentary will be played back together.

17. Magnetophon 85 used as an amplifier

You can also use your Magnetophon 85 as an amplifier for records, and radio, or as a public address system. For this purpose, connect the relative sound source with the tape recorder, and control the volume with button (B) resp. (D), as explained already, however, without pressing the record button (M). The tone colour can be adjusted with knobs (G), and (K). The program can be heard via the built-in loudspeakers, and external

15. Arrêt

Actionnez tout d'abord la touche d'arrêt (N). Puis mettez le bouton (B) en position O.
Maintenant vous connaissez les principes de fonctionnement de votre appareil, mais toutes les possibilités d'emploi ne sont pas épuisées. Nous vous conseillons de lire attentivement ce qui suit:

16. Touche de trucage

La touche de verrouillage de l'enregistrement (L) fonctionne lorsqu'elle est abaissée et bloquée comme « touche de trucage ».
On peut donc, ainsi, au cours de la sonorisation, insérer un texte parlé sur un fond de musique, de telle sorte que, par la suite, on puisse reproduire ensemble paroles et musique.

17. Emploi du Magnetophon 85 en tant qu'amplificateur phono

Vous pouvez également utiliser votre Magnetophon 85 comme un amplificateur pour disques, microphone ou radio.
Pour cela, relier la source de son avec l'enregistreur et mettez en route, comme déjà indiqué, avec le potentiomètre (B) ou (D), sans cependant appuyer sur la touche d'enregistrement (M), puis, tirez sur le bouton (H) et servez-vous-en pour régler la puissance. Les potentiomètres (G) et

15. Desconexión

Primero se oprimirá la tecla de parada (N). A continuación se hará girar el botón de conexión (B) a la posición marcada O.
Ahora domina Vd. las funciones básicas de funcionamiento de su grabadora. Sin embargo no ha llegado Vd. ni con mucho a aprovechar todas las ventajas, que ésta le brinda. Para unas horas, que Vd. tenga libres, le recomendamos prevea el estudio detallado de las instrucciones, que vamos a facilitarle a continuación:

16. Tecla de intercalación de trucos

La tecla de bloqueo de grabación (L) trabaja en posición oprimida y encajada como tecla de intercalación de trucos. De esta forma puede intercalarse p. ej. al sonorizar una locución hablada en cualquier grabación musical, de forma que a continuación se reproducirán locución hablada y música simultáneamente.

17. La grabadora Magnetophon 85 como amplificador de pick-up

Su grabadora Magnetophon 85 puede emplearse además también como amplificador para discos fonográficos, micrófono o radioreceptor. Para ello se conectará la fuente sonora en cuestión con su grabadora de cinta, controlando el grado de amplificación — tal como ya se describió — con los controles (B) resp. (D), sin oprimir sin embargo la tecla de grabación (M). A continuación se tirará hacia arriba

und (K) ein.
Das Programm kann sowohl über die eingebauten Lautsprecher, über einen zweiten Lautsprecher außerhalb des Tonbandgerätes, als auch über einen Kopfhörer Teleset 3 abgehört werden.

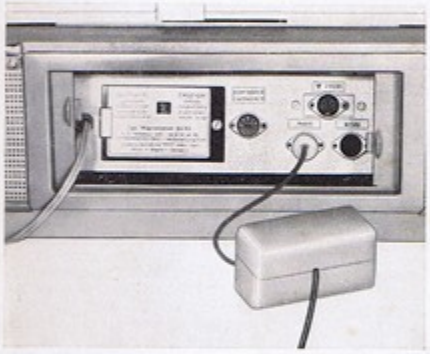
loudspeaker, or via the earphones Teleset 3.

(K) servent au réglage de la tonalité. Le programme peut être écouté aussi bien par un haut-parleur incorporé, par un haut-parleur supplémentaire, que par un écouteur Teleset 3.

del botón giratorio (H), controlando con él el volumen de sonido de reproducción deseado. La tonalidad del evento musical se controlará de acuerdo con el gusto personal con ayuda de los reguladores (G) y (K). El programa musical podrá ser escuchado o a través de los altoparlantes incorporados, a través de un altoparlante exterior o a través de un juego de auriculares Teleset 3.

18. Aufnahme von Telefongesprächen

Zur Aufnahme von Telefongesprächen führen Sie den Stecker des „galvanischen Telefonadapters U" (s. Zubehör) in die Buchse (V) oder (W) (Radio oder Micro) des Tonbandgerätes Magnetophon 85 ein. Wie unter Aufnahme bereits beschrieben, stellen Sie die Aussteuerung mit dem Aussteuerungsregler (B) ein. Sie können nun das Telefongespräch aufnehmen und als weiteren Anwendungsbereich Ihr Magnetophon 85 als Telefonverstärker benutzen. Leise ankommende Ferngespräche beispielsweise hören Sie in einer guten Lautstärke, wenn Sie den Regler (H) entsprechend bedienen.



18. To record telephone conversations

Insert the plug of the "telephone adapter" into the radio or into the microphone socket.
Then proceed as already described under "recording". Adjust the recording level with the kontrol knob B. Here again, the Magnetophon 85 can be used as an amplifier. If the telephone connection is poor, or if several people want to listen to the conversation at once, simply increase the volume by turning control knob H, and the telephone call will be amplified through the loudspeaker.

18. Enregistrement de conversations téléphoniques

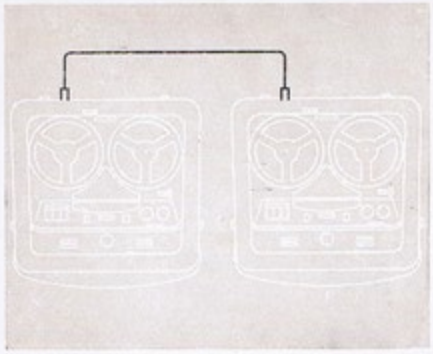
Pour enregistrer une conversation téléphonique branchez la fiche de l'adapteur galvanique dans la prise « radio » ou « micro ». Comme nous l'avons déjà indiqué dans le chapitre « enregistrement », la modulation se régle au potentiomètre B. Ici encore existe la possibilité d'utiliser l'enregistreur comme amplificateur supplémentaire. Les communications faiblement audibles peuvent être amplifiées en actionnant le potentiomètre de volume H.

18. Grabación de conversaciones telefónicas:

Para la grabación de conversaciones telefónicas sírvase introducir la clavija de conexión del adaptador galvánico de teléfono en el enchufe «Radio» o Micro. Como ya descrito en el párrafo de grabación, se conseguirá el valor correcto de modulación con ayuda del control de modulación B. Aquí se presenta una nueva posibilidad de aplicación de la grabadora Magnetophon 85 como amplificador. Si se trata por ejemplo de conversaciones telefónicas de larga distancia, que llegan débilmente, puede Ud. conseguir hacerlas perfectamente audibles, manejando el control de volumen H en forma apropiada.

19. Überspielen auf ein anders Tonband

Wollen Sie Ihre Tonbänder auf ein anderes Tonband kopieren, benötigen Sie hierzu ein zweites Tonbandgerät Magnetophon sowie die Ton- und Überspielleitung. Die Radioanschlüsse der beiden Tonbandgeräte werden mit dieser Leitung verbunden. Verwenden Sie Ihr Magnetophon 85 als Aufnahmegerät, ist es günstiger, die Ton- und Überspielleitung bei diesem Gerät in den Phonoeingang einzuführen (Aussteuerungsregelung mit Regler [D]). Bei dem wiedergebenden Tonbandgerät stellen Sie den Aussteuerungsregler auf größte Lautstärke. Sollten Sie vom Magnetophon 85 auf ein Fremdgerät kopieren, dessen Radiobuchse nicht normgerecht beschaltet ist, erfolgt auch hier die Überspielung von der Radiobuchse auf den Plattenspielereingang des anderen Gerätes.
Schallplatten können Sie unter Beachtung der Urheberrechte ohne Mühe auf Ihr Tonbandgerät Magnetophon 85 überspielen. Am einfachsten geschieht dies über den Phonoeingang Ihres Gerätes oder aber über Ihren Rundfunkempfänger, an den der Plattenspieler und das Tonbandgerät ohnehin angeschlossen sind.



19. To copy a tape on to another tape

To do this, you need a second tape recorder Magnetophon, as well as the audio and copy lead. With this lead, connect the radio sockets of both tape recorders. In case you use your Magnetophon 85 for recording, it is better to insert the audio and copy lead into the phono socket of this set (input volume to be controlled with button (D)). The volume of the set used for playback should be turned up as far as possible.
Should you copy to a set other than Magnetophon, the socket of which does not match, transfer the recording by connecting the radio socket of the set used for playback, and the record player input socket of Magnetophon 85.
Phonograph records can be copied on your Magnetophon 85 as well, without difficulty (be sure to comply with copyright laws). The simplest way to do this, is via the phono input socket of your set, or via your radio, to which your record player, and your tape recorder are connected anyway.

19. Copie d'une bande sur une autre

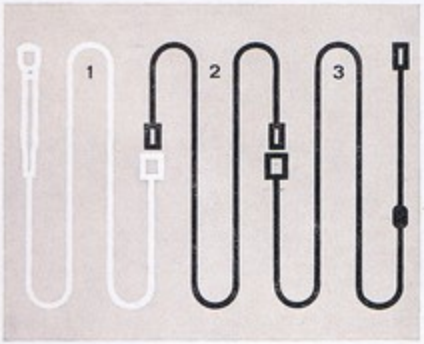
Si vous désirez copier vos bandes, il vous faut un deuxième enregistreur ainsi qu'un câble de son et de copie. Les prises radio des deux enregistreurs sont reliées au moyen de ce câble. Si vous employez votre Magnetophon 85 pour effectuer l'enregistrement, il est préférable d'introduire le câble de son et de copie sur cet appareil dans l'entrée phono (réglage de la modulation avec le potentiomètre [D]). Si votre enregistreur vous sert pour la reproduction, mettez le réglage de modulation sur la puissance maxima.
Mais si vous désirez effectuer la copie du Magnetophon 85 sur un appareil d'une autre marque dont la prise radio n'est pas normalisée, la copie se fera également entre la prise radio et l'entrée pick-up de l'autre appareil.
Vous pouvez recopier des disques (attention aux droits d'auteurs!) très facilement avec votre enregistreur Magnetophon 85. Ce sera fait le plus simplement possible par l'entrée phono de votre enregistreur ou par votre poste radio auquel vous aurez raccordé le pick-up et l'enregistreur.

19. Transposición a una cinta de grabación distinta

En caso de que Vd. desee copiar sus cintas grabadas sobra una segunda cinta, se precisará para ello una segunda grabadora de cinta Magnetophon así como un cable de audio y de transposición. Los dos enchufes de conexión de radio se conectarán entre sí mediante este cable de conexión. En caso de que Vd. vaya a emplear su grabadora Magnetophon 85 como grabadora, resulta mas ventajoso introducir el cable de transposición en el enchufe de conexión de fono (control de grado de amplificación de grabación mediante control [D]). En la grabadora, que hace las veces de reproductora, se ajustará el control de grado de amplificación de grabación a volumen máximo. En caso de que vaya a copiarse de la grabadora Magnetophon 85 a una grabadora de marca de fabricación distinta, cuyo enchufe de conexión de radio no posea las conexiones normalizadas, también se efectuará la transposición desde el enchufe de conexión de radio al enchufe de conexión de fono (pick-up) de la otra grabadora.
Discos fonográficos pueden transponerse con toda comodidad a su grabadora de cinta Magnetophon 85, cuidando de tener en consideración las prescripciones legislativas respecto a reserva de derechos de autores. La forma mas sencilla de efectuar una transposición tal, es a través de la entrada de pick-up de su grabadora o a través de su radioreceptor, al cual se encuentra conectado de todas formas tanto su tocadiscos como su grabadora.

20. Verlängerung der Mikrofonleitung

Zur Verlängerung des Mikrofonkabels bei dynamischen Mikrofonen dient die 5-m-Mikrofonverlängerung mit Schnurübertrager, bei deren Verwendung weitere Verlängerungen ohne Übertrager bis zu etwa 200 m zwischengeschaltet werden können. Es ist jedoch zu beachten, daß der Schnurübertrager unmittelbar an das Magnetophon 85 angeschlossen wird.



20. Extension for the microphone lead

The 16 ft (5 meters) extension lead with matching transformer serves for the extension of dynamic microphones. In addition, further extensions can be connected up to abt. 1,000 ft (300 meters) without transformer. Please see, however, that the matching transformer is connected next to the Magnetophon 85.

20. Rallonge du câble microphonique

Pour rallonger le câble microphonique sur les microphones dynamiques, utilisez la rallonge de 5 m avec transfo de câble. Grâce à cette rallonge, vous pourrez rajouter jusqu'à 200 m de câble, sans qu'il soit nécessaire d'intercaler d'autres transfos de câble. Il faut cependant noter que la partie de la rallonge qui contient le transfo doit être raccordée directement à l'enregistreur.

20. Prolongación del cable de micrófono

Para la prolongación del cable de conexión de micrófonos se emplea en caso de micrófonos dinámicos el cable de prolongación de 5 metros con transformador de cable, empleando el cual pueden intercalarse prolongaciones sucesivas hasta un total de 200 metros, sin emplear un transformador de cable adicional. Sin embargo hay que poner atención en que el transformador de cable se encuentre siempre en el trozo de prolongación, que está conectado inmediatamente al micrófono.

21. Bandklebeschiene

Die eingebaute Bandklebeschiene erleichtert das Kleben von Tonbändern. Nachdem Sie die zu verbindenden Tonbandenden mit der blanken Seite übereinandergelegt haben, durchschneiden Sie diese schräg mit einer unmagnetischen Schere (s. Zubehör). Dann legen Sie die Enden so in die Bandklebeschiene ein, daß die Schnittkanten sauber aneinanderstoßen und die blanke Seite nach oben zeigt. Über die Schnittstelle legen Sie jetzt ein ca. 2 cm langes Klebebandstück und drücken es besonders an den Rändern fest an. Bitte achten Sie darauf, daß das Klebeband sauber mit dem Rand des Tonbandes abschließt.

21. Tape splicing groove

The built-in groove facilitates tape splicing remarkably. Hold the two ends of the tapes to be spliced, shiny sides up, slightly overlapping each other, and make a diagonal cut with non-magnetic scissors. Then insert the ends of it into the track, in a way that the cut edges fit exactly against each other, and the shiny sides show up again. Now put a 1'' long splicing tape on the cut ends, and press down firmly, especially at the edges of the tape, and the joints. Please see that the splicing tape lines up exactly with the edges of the tape.

21. Fente de collage des bandes

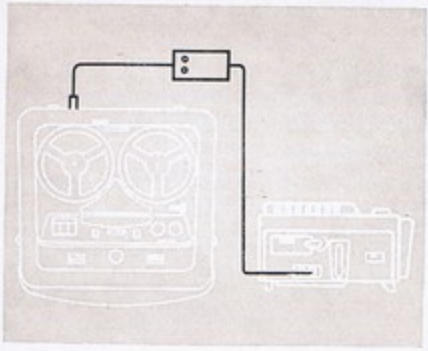
La fente de collage des bandes incorporée dans l'enregistreur facilite les raccords. Quand vous avez posé l'une sur l'autre les deux extrémités des morceaux de bande à coller, coupez-les en biais avec des ciseaux antimagnétiques (voir accessoires). Puis posez les extrémités dans la fente de collage de telle façon qu'elles se touchent très proprement et que le côté brillant soit placé sur le dessus. Collez maintenant sur l'emplacement à raccorder un petit morceau de bande adhésive d'environ 2 cm et appuyez dessus, en particulier sur les bords et à la jonction. Attention que les bords de la bande adhésive coincident bien avec ceux de la bande magnétique.

21. Riel de empalme de cintas

El riel de empalme de cintas incorporado en la grabadora facilita grandemente el emplame de cintas de grabación. Después de haber superpuesto los dos extremos de cinta a empalmar con sus caras brillantes, se cortarán éstos conjuntamente en diagonal con ayuda de unas tijeras amagnéticas (véase lista de piezas de accesorio). Después se introducirán los dos extremos de tal forma en el riel de empalme de cintas, que los bordes de corte se toquen limpiamente y las caras brillantes se encuentren señalando hacia arriba. Ahora se recubrirá el corte con un trozo de cinta adhesiva de unos 2 cms de longitud, oprimiéndolo fuertemente sobre los dos extremos, especialmente en los bordes y en el punto de corte. Sírvase poner atención especial en que la cinta adhesiva no sobresalga lateralmente por encima de los bordes de la cinta de grabación.

22. Steuerung automatischer Dia-Projektoren

Das Magnetophon 85 ist für den Anschluß des Steuergerätes Diachron 2 vorgesehen. Diese Ausrüstung wird auf Wunsch von Ihrem Fachhändler vorgenommen. Sie können dann alle automatischen Dia-Projektoren synchron zum Bandablauf steuern, indem Sie einmalig auf die untere freie Tonspur Impulse setzen. Das Tonband wird dabei ohne Herausführen von Bandschlaufen wie üblich in das Gerät eingelegt.



22. To control automatic slide projectors

The Magnetophon 85 is designed for connection of the control unit Diachron 2. The connection can be made by your dealer, on demand. You can then control the automatic slide projector in line with the relative commentaries etc. on the tape, by imposing pulses on its lower unrecorded track. The tape can be threaded into the tape recorder as usual, i. e. there is no need of providing any external loops.

22. Télécommande des projecteurs de dias automatiques

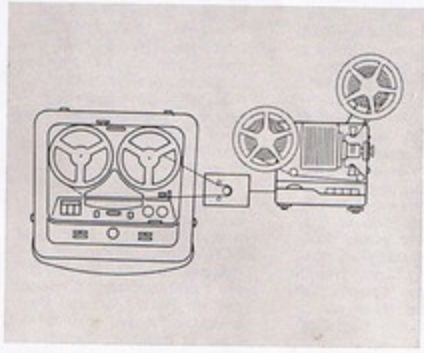
Le Magnetophon 85 est prévu pour être raccordé avec le Diachron 2, appareil à télécommander la projection des dias. Cet accessoire vous sera présenté par votre technicien sur votre demande. Vous pourrez télécommander en synchronisme avec le défilement de la bande la projection automatique des dias, en inscrivant préalablement des impulsions sur la piste de la bande qui aura été laissée vierge. La bande sera introduite dans l'appareil normalement, c'est-à-dire sans que vous soyez obligés d'effectuer une boucle.

22. Gobierno de proyectores automáticos de diapositivas

La grabadora Magnetophon 85 está prevista para la conexión del aparato de gobierno Diachron 2. El equipado con este aparato puede ser efectuado a voluntad por su taller especializado en la materia. Con ello puede Vd. gobernar todos los proyectores automáticos de diapositivas en forma sincronizada con la marcha de la cinta, para lo cual no hay mas que grabar una vez sobre la pista inferior libre impulsos de gobierno. La cinta de grabación se colocará también para este caso en la forma acostumbrada en la grabadora, sin tener que extraer para ello bucles de cinta algunos al exterior.

23. Synchronisieren von Schmalfilmen

Das Magnetophon 85 eignet sich wegen der guten Konstanz der Bandgeschwindigkeit auch für Schmalfilmvertonungen in Verbindung mit allen handelsüblichen Tonkopplern. Diese werden beim Betrieb an der rechten Seite des Tonbandgerätes angestellt. Einzelheiten entnehmen Sie bitte den Bedienungsanleitungen der Schmalfilmgeräte oder den Fachbüchern.



23. To synchronize moving pictures

The precision of the tape speed of the Magnetophon 85 makes is highly qualified for synchronization with moving pictures in conjunction with any of the standard synch attachments. During operation, these are placed to the right of the tape recorder. Please take further details from the operating instructions of your projector, or from other technical literature.

23. Sonorisation des films petite largeur

Le Magnetophon 85 par suite du déroulement de la bande constant, est particulièrement adéquat à la sonorisation des films petite largeur en liaison avec tous les appareils en vente habituellement dans le commerce. Pendant le fonctionnement, le projecteur est placé à droite de l'enregistreur. Vous trouverez tous les détails dans les modes d'emploi des projecteurs de films et dans la littérature spécialisée.

23. Sincronización de películas de amateur

La grabadora Magnetophon 85 resulta especialmente apta para la sincronización de películas de amateur debido a su alta constancia de marcha de cinta, empleándola en combinación con todos los acopladores de sonido de uso común en el mercado. Estos se colocarán en el servicio al lado derecho de su grabadora Magnetophon. Todos los detalles pertinentes sírvase tomarlos de las intrucciones de manejo de las cámaras de proyección de películas de amateur resp. de la literatura especializada.

24. Wie Sie Ihr Magnetophon 85 pflegen und warten

Nach jeweils etwa 50 bis 100 Betriebsstunden nehmen Sie die vordere Abdeckplatte mit dem Firmenschriftzug nach oben ab.

24. Care and maintenance of Magnetophon 85

After every 50—100 hours of operation, remove the front head cover, by lifting it upwards. Dust on the heads, and tape guides

24. Entretien et surveillance

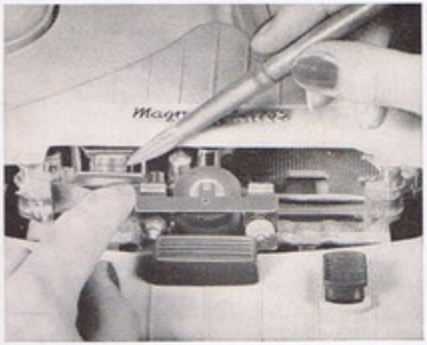
Après 50 à 100 heures de fonctionnement, ôtez le capôt avant portant le nom de la firme en le soulevant vers le haut. Enlever la poussière de bande qui s'est déposée sur les têtes

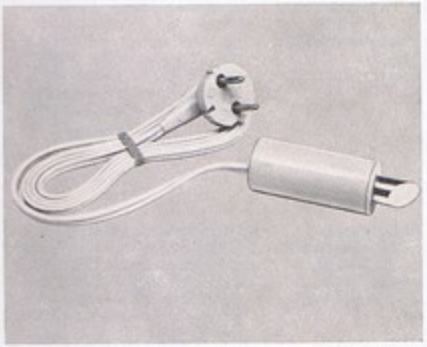
24. Como cuidor y mantener su grabadora Magnetophon 85

Después de cada 50 a 100 horas de servicio sírvase quitar la tapa de revestimiento anterior, que lleva el rótulo de la casa constructora, tirando

Bandstaub an den Köpfen und an den Bandführungen entfernen Sie mit einem alkoholbefeuchteten Pinsel oder Läppchen. Bitte berühren Sie die Tonköpfe und Bandführung nicht mit harten oder metallischen Gegenständen, da diese sonst verkratzt oder aufmagnetisiert werden können. Eine Aufmagnetisierung macht sich durch unangenehmes Rauschen bemerkbar. Ist dieser Fall wirklich einmal eingetreten, hilft Ihnen die Entmagnetisierungsdrossel. Alle Lager des Gerätes besitzen Dauerschmierung und brauchen daher nicht nachgeölt zu werden. Denken Sie aber bitte daran, daß von Zeit zu Zeit eine gute Fachwerkstatt — ähnlich wie beim Auto — nach dem Rechten sieht. Ihr Magnetophon 85 wird es Ihnen durch andauernde Betriebsbereitschaft danken.
Und nun viel Freude und Erfolg mit Ihrem Tonbandgerät Magnetophon 85.

Fachliteratur
Weitere Einzelheiten über Ihr neues interessantes Hobby können Sie in den Büchern
Werner W. Diefenbach „Tonband-Hobby"
Dr.-Ing. Hans Knobloch „Der Tonbandamateur"
nachlesen.





should be removed with some alcohol on either a fine brush, or a clean cloth. Please do not touch the heads, and tape guides with any hard or metallic instruments, as these could be marred or magnetized. The latter will be noted by disturbing noises during operation. A demagnetizing coil will help you in such cases.
All bearings are permanently lubricated so that there is no need of oiling them. Please do not forget, however, that, every now and then, your dealer should have a look at your tape recorder — as if it were your motor car — to see that everything is in order.
And now we wish you much pleasure, and success with your new tape recorder Magnetophon 85.

et sur les guide-bande en employant un pinceau ou un petit chiffon imbibé d'alcool. Surtout ne touchez pas les têtes ou les guide-bande avec des outils durs ou métalliques, ils pourraient être éraflés ou magnétisés. Vous décèlerez une magnétisation intempestive au ronflement désagréable produit sur la bande. Si c'est le cas, utilisez la bobine de démagnétisation. Tous les paliers de l'enregistreur sont auto-lubrifiants et ne nécessitent aucun graissage. Mais, de temps en temps, il est indispensable de faire effectuer une vérification par un bon technicien — comme pour une voiture. Si vous entretenez bien votre appareil vous n'en aurez que plus de satisfaction.
Maintenant, nous vous souhaitons beaucoup de succès et de plaisir dans l'emploi de votre nouvel enregistreur Magnetophon 85.

de ella hacia arriba. El polvo de magnetita, que se haya acumulado en los cabezales o en las conducciones de cinta, se quitará con ayuda de un pincel blando mojado en alcohol o con un trapito. Sírvase poner atención en no tocar ni los cabezales ni las conducciones de cinta con objetos duros o metálicos, ya que se corre el peligro de arañarlos o imantarlos. Una imantación de estas piezas se hace sentir por un ruido de fondo desagradable en las grabaciones. En caso de que sin embargo alguna vez no haya podido evitarse una imantación tal, le ayudará el self de desimantación. Todos los cojinetes de su grabadora poseen lubrificación permanente, por lo que no precisan aceitados suplementarios. Sin embargo sírvase tener en cuenta que de cuando en cuando un taller especializado en la materia se cuide de poner su grabadora al tanto, al igual a como lo hace Vd. con su automóvil. Su grabadora Magnetophon 85 se lo agradecerá mediante una permanente disposición de servicio.
Y ahora no nos resta mas que desearle mucha alegría y buen éxito con su nueva grabadora Magnetophon 85.

25. Kleine Bedienungstips

Konferenzschaltung
An das Magnetophon 85 können Sie dynamische, Kristall- und Kondensator-Mikrofone anschließen. Es kann sowohl der Micro- (V) als auch der Radio-Eingang (W) mit je einem Mikrofon belegt werden (Konferenzschaltung).

25. Small hints on operation

Recording conferences etc.
You may connect dynamic, crystal, and condenser microphones to your tape recorder. Both the microphone- and the radio input socket can be used for connection of each one microphone. These are then controlled via the input

25. Petites indications

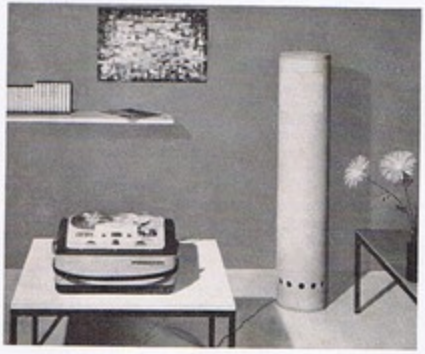
Pour une conférence
Vous pouvez raccorder à volonté soit un micro dynamique, soit un micro à cristal et à condensateur. Vous pouvez aussi bien charger l'entrée micro (V) que l'entrée radio (W) avec un microphone (branchement « conférence »). Les

25. Pequeños tips especiales para el manejo

Conexión para conferencias
A su grabadora Magnetophon 85 puede Vd. conectar micrófonos dinámicos, de cristal y de condensador. Tanto al enchufe de conexión de micrófono (V) como al de radio (W) puede conectarse un micró-

Hierbei werden die Mikrofone über den Eingangswahlschalter (C) umgeschaltet, so daß die jeweilige Diskussionsgruppe klar verständlich auf das Tonband gebracht wird.

Ausgangsleistung
Die aus der Gegentaktendstufe verfügbare Ausgangsleistung ist so groß, daß sie in voller Höhe von den eingebauten Lautsprechern allein nicht verarbeitet werden kann und bei zu großer Lautstärke einige Geräteteile zum Mitschwingen anregt. Zur vollen Ausnutzung der Leistung der Endstufe empfiehlt sich daher der Anschluß der Klangsäule.



Zusatzlautsprecher
Zusatzlautsprecher mit einer Impedanz von 3—5 Ω sind am besten geeignet, doch können auch Lautsprecher bis zu 15 Ω verwendet werden.

Entzerrungsumschalter
Der Entzerrungsumschalter (T), der normalerweise in der Stellung NARTB steht, ist dann auf CCIR zu schalten, wenn Tonbandaufnahmen, die auf Fremdgeräten aufgenommen wurden, bei der Wiedergabe auf Ihrem Tonbandgerät dumpf klingen sollten. Der Entzerrungsumschalter ermöglicht Ihnen also eine Anpassung der Wiedergabebedingungen des Magnetophon 85 an bestimmte Fremdgeräte.

selection switch, in a way that the relative discussion group is properly covered by them.

Output power
The power delivered by the push pull output stage is such that it can not be handled by the built-in loudspeaker alone, and thus may cause some vibration of certain parts of the recorder. To fully utilize the power of the output stage, it is recommendable to take a extension speake for connection.

Additional loudspeaker
Additional loudspeakers with an impedance of 3—5 Ω are most suitable, however, you can use others of up to 15 Ω as well.

Equalization switch
The equalization switch (T), which is normally in position NARTB, should be switched to CCIR, when recordings, taken by sets other than MAGNETOPHON, should sound dull during playback with your tape recorder. Hence, the equalization switch enables you to accommodate the playback conditions of Magnetophon 85 to those of certain other models.

microphones doivent être alors commandés par le commutateur de choix d'entrée (C) de sorte que toutes les personnes du groupe soient clairement entendues.

Câble de sortie
Le câble disponible à la sortie de l'étage final est tellement grand qu'il ne peut pas être utilisé dans toute sa longueur dans le haut-parleur incorporé. Lorsque les puissances sont trop fortes certaines pièces de l'enregistreur peuvent entrer en oscillation. Pour utiliser complètement le câble de l'étage final, nous recommandons d'employer les colonnes sonores.

Haut-parleur extérieur
Ce sont les haut-parleurs extérieurs ayant une impédance de 3 à 5 Ohms qui conviennent le mieux, mais on peut également utiliser des haut-parleurs ayant une impédance allant jusqu'à 15 Ohms.

Commutateur de correction
Le commutateur de correction (P), qui normalement est placé sur « NARTB » devra être placé sur « CCIR » si les enregistrements qui ont été faits sur d'autres enregistreurs, sont « étouffés » à la reproduction sur votre enregistreur. Le commutateur de correction vous permet donc une adaptation des conditions de reproduction du Magnetophon 85 à celles des appareils d'autres marques.

fono simultáneamente (conexión de conferencias). Al hacer esto se conmutan los dos micrófonos mediante el conmutador de selección de entradas (C), de forma que se puede llevar claramente a la cinta cada uno de los grupos, en que se esté desarrollando la conversación.

Potencia de salida
La potencia de salida, de la que se dispone al final de la etapa de salida en push-pull es tan grande, que no puede ser consumida en su totalidad por los altoparlantes incorporados en la grabadora, produciendo oscilaciones de algunas partes de ésta al abrir el control de volumen demasiado. Para aprovechar enteramente la potencia de salida de esta etapa se recomienda por tanto el epleo de la columna sonora.

Altoparlante exterior adicional
Altoparlantes exteriores con una impedancia de unos 3 a 5 Ohmios son los que preferentemente habrán de emplearse. Sin embargo también da buenos resultados la conexión de altoparlantes con impedancia de hasta 15 Ohmios.

Conmutador de corrección de distorsiones
El conmutador de corrección de distorsiones, que por lo general se encuentra colocado en la posición NARTB, habrá de ser conmutado a la posición CCIR en todos aquellos casos, en los que grabaciones efectuadas en grabadoras ajenas han de aparecer con sonido profundo al reproducirlos en su grabadora Magnetophon 85. El conmutador de

Löschen von Aufnahmen
Natürlich wird jedes Tonband bei Neuaufnahme automatisch gelöscht. Wenn Sie ein Tonband lediglich löschen wollen, ohne eine neue Aufnahme zu machen, lassen Sie es einfach in Stellung Aufnahme mit auf O gedrehten Reglern (B) und (D) durchlaufen.

To erase recordings
Each tape is, of course, automatically erased, when a new recording is made. In case you want to erase a tape, without simultaneously recording it again, have it run through the recorder by turning control knobs (B) and (D) to 0.

Effacement des enregistrements
Naturellement, lors d'un enregistrement, les bandes sont automatiquement effacées de tout enregistrement préable. Mais, si vous voulez « effacer » simplement une bande sans effectuer d'autre enregistrement, laissez la bande défiler en position « enregistrement », les potentiomètres (B) et (D) restant sur O.

Borrado de grabaciones
Naturalmente se borra toda grabación, que se encuentra sobre una cinta, al grabar a ésta de nuevo. Sin embargo en caso de desear Vd. borrar una grabación determinada sin efectuar en su lugar una grabación nueva, no precisa Vd. mas que hacer marchar la cinta en posición de grabación de la grabadora, encontrándose los dos controles (B) y (D) ajustados a O (cero).

Technische Daten

Bandgeschwindigkeiten:
19 cm/s und 9,5 cm/s umschaltbar

Laufzeit:
4 Stunden 20 Minuten mit Doppelspielband

Frequenzgang:
40—16 000 Hz bei 9,5 cm/s
40—18 000 Hz bei 19 cm/s

Dynamik:
≧ 55 dB

Klirrfaktor:
≦ 5 %

Tonhöhenschwankungen:
19 cm/s ± 1,5 ‰
gehörrichtig bewertet
9,5 cm/s ± 2 ‰
gehörrichtig bewertet

Aufnahmeeingänge:
2 mV an 2 M Ω (Mikrofon)
2 mV an 47 k Ω (Radio)
500 mV an 1 M Ω (Phono)

Wiedergabeausgänge:
ca. 1,5 V an 18 k Ω
(Radio-Buchse)

Technical Data

Tape Speeds:
7½ and 3.3/4 ips (19 cm/s and 9,5 cm/s)

Playing time:
4 hours 20 minutes with double play tape.

Frequency range:
40—16 000 cps at 3.3/4 ips.
40—18 000 cps at 7½ ips.

Signal to noise ratio:
≧ 55 dB

Harmonic destortion:
≦ 5 %

Wow and flutter:
7½ ips ± 1,5 ‰
3.3/4 ips ± 2 ‰

Recording inputs:
2mV into 2 MOhms (microphone)
2mV into 47 KOhms (radio)
500mV into 1 MOhm (phono)

Playback outputs:
approx. 1,5 Volts (no load) internal resistance 18 KOhms (radio socket).
approx. 0,5 Volts, output loded 5 KOhms (earphones).
approx. 6 Watts, output loaded with 5 Ohms (loudspeaker).

Caractéristiques techniques

Vitesses de bande:
19 cm/s et 9,5 cm/s commutable

Durée du fonctionnement:
4 heures 20 minutes avec une bande Double Durée

Passage des fréquences:
40—16.000 Hz en 9,5 cm/s
40—18.000 Hz en 19 cm/s

Dynamique:
≧ 55 dB

Facteur de distorsion:
≦ 5 %

Oscillation des aigues:
19 cm/s ± 1,5 ‰
évalué à l'oreille
9,5 cm/s ± 2 ‰
évalué à l'oreille

Entrées enregistrement:
2 mV à 2 MOhms (micro)
2 mV à 47 kOhms (radio)
500 mV à 1 MOhms (phono)

Datos Técnicos

Velocidades de cinta:
19 cm/s y 9,5 cm/s conmutables

Duración de grabación:
4 horas y 20 min con cinta de grabación doble

Respuesta de frecuencias:
40—16 000 c/s a 9,5 cm/s
40—18 000 c/s a 19 cm/s

Dinámica:
≧ 55 dB

Factor de distorsiones:
≦ 5 %

Fluctuaciones de la altura de tono:
a 19 cm/s: ± 1,5 ‰, medidos psofométricamente
a 9,5 cm/s: ± 2 ‰, medidos psofométricamente

Entradas de grabación:
2 mV a 2 MOmios (micrófono)
2 mV a 47 kOhmios (radioreceptor)

ca. 0,5 V an 5 k Ω Last
(Kopfhörerbuchse)
ca. 6 Watt an 5 Ω Last
(Lautsprecherbuchse)

Netzspannungen:
110, 127, 150, 220, 240 V
Wechselstrom 50 Hz
umrüstbar für 60 Hz

Leistungsaufnahme:
ca. 55 W

Röhrenbestückung:
EF 86, ECC 83, ECC 83,
ECC 81, EM 87, 2×EL 95

Gleichrichter:
B 250, C 65/110 K
B 25/20-0,8 R
E 30, C 5, K 1

Sicherungen:
220—240 V — 0,4 A
mittelträge
150 V — 0,6 A
mittelträge
110—127 V — 0,8 A
mittelträge

Abmessungen:
Höhe 200 mm,
Breite 455 mm,
Tiefe 411 mm

Gewicht:
ca. 15 kg

Zubehörteile für Ihr Tonbandgerät Magnetophon 85

Bestimmt werden auch Sie den Wunsch haben, die vielseitigen Anwendungsmöglichkeiten Ihres Tonbandgerätes Magnetophon 85 durch Zubehörteile zu erweitern. Eine Auswahl dieser Zubehörteile haben wir auf dieser Seite für Sie zusammengestellt.

Mains voltages:
110, 127, 150, 220, 240 Volts, AC, 50 cps, with change-over facilities to 60 cps.

Power consumption:
approx. 55 Watts

Tubes:
EF 86, ECC 83, ECC 83,
ECC 81, EM 87, EL 95.

Rectifiers:
B 250, C 65/110 K
B 25/20 — 0.8 R.
E 30, C 5, K 1

Fuses:
220—240 Volts — 0.3 A
150 Volts — 0.6 A
110—127 Volts — 0.8 A
slo-blow

Dimensions:
height:
abt. 8" (200 mm)
width:
abt. 17.3/4" (455 mm)
depth:
abt. 16¼" (411 mm)

Weight:
abt. 33 lbs (abt. 15 kilos).

Accessories for your tape recorder Magnetophon 85

You too will certainly want to make full use of your Magnetophon 85, by taking advantage of the optional equipment. Here you find a list of the accessories we have selected for you:

Sorties reproduction:
env. 1,5 V à 18 kOhms
(prise radio)
env. 0,5 V à 5 kOhms
de charge (prise casque)
env. 6 Watts à 5 Ohms
de charge
(prise haut-parleur)

Tensions réseau:
110, 127, 150, 220, 240 V
alternatif, 50 périodes
(ou 60 périodes)

Consommation:
env. 55 W

Tubes:
EF 86, ECC 83, ECC 83,
ECC 81, EM 87, EL 95

Redresseurs:
B 250, C 65/110 K
B 25/20—0,8 R
E 30, C 5, K 1

Fusibles:
220—260 V — 0,4 A
à inertie moyenne
150 V — 0,6 A
à inertie moyenne
110—127 V — 0,8 A
à inertie moyenne

Dimensions:
hauteur: 200 mm,
largeur: 455 mm,
profondeur: 411 mm

Poids:
env. 15 kg

Accessoires pour l'enregistreur Magnetophon 85

Vous avez certainement le désir d'élargir les possibilités d'utilisation de votre enregistreur en acquérant des accessoires. Nous avons pour vous établi une liste de ces accessoires:

500 mV a 1 MOhmio
(pick-up)

Salidas de reproducción:
unos 1,5 Voltios
a 18 kOhmios (enchufe de conexión de radio)
Unos 0,5 Voltios
a 5 kOhmios carga (auriculares)
unos 6 Watios
a 5 Ohmios carga (enchufe de conexión de altoparlantes)

Tensiones de alimentación:
110, 127, 150, 220 y 240 Voltios corriente alterna 50 c/s, conmutables a 60 c/s.

Consumo de potencia:
unos 55 Watios
aproximadamente

Equipado de válvulas:
EF 86, ECC 83, ECC 83,
ECC 81, EM 87, EL 95

Rectificadores:
B 250 C 65 / 110 K
B 25 / 20 — 0,8 R
E 30 C 5 K 1

Fusibles:
220—240 Voltios — 0,4 Amp.
de acción semiretardada
150 Voltios — 0,6 Amp.
de acción semiretardada
110—127 Voltios — 0,8 Amp.
de acción semiretardada

Dimensiones:
altura 200 mm,
anchura 455 mm,
profundidad 411 mm

Peso:
unos 15 kgs

Lista de piezas de accesorio para su grabadora Magnetophon 85
Con toda seguridad tendrá también Vd. el deseo de ampliar las múltiples posibilidades de aplicación de su grabadora Magnetophon 85 con ayuda de piezas de accesorio especialmente diseñadas con este propósito. Una selección de estas piezas de accessorio la hemos compuesto a continuación para Vd. en la página siguiente.

Bezeichnung	Kurzbeschreibung	Bestell-Nr.	accessory	brief description	part Nr.
Kondensator-Mikrofon C 15	Goldblatt-Membran-Mikrofon	933 120 850	Condenser Microphone C 15	Microphone with gold-mesh diaphragm	933 120 850
Dynamisches Mikrofon D 9 A	Kugelcharakteristik, Sprachaufnahmen	933 120 000	Dynamic Microphone D 9 A	Omni directional speech mike	933 120 000
Fernbedienungsmikrofon D 9 F Automatic	Quecksilberschalter für automatischen Start/Stop	933 120 110	Remote Control microphone D 9 F automatic	with mercury switch for automatic start and stop	933 120 110
Dynamisches Richtmikrofon D 11 B	Nierencharakteristik, Musik/Sprache/Telefonumschalter	933 120 300	Dynamic directional microphone D 11 B	Cardioid characteristic with switch for music, speech and telephone effect	933 120 300
Dynamisches Breitband-Richtmikrofon D 19 C	Kardioidcharakteristik, stufenlose Baßblende	933 120 510	Dynamic wide-range directional microphone D 19 C	Cardioid characteristic with continous bass control	933 120 510
Microport-junior	drahtlose Mikrofonanlage	933 120 900	Microport junior	wireless microphone equipment	933 120 900
Mikrofon-Fußbodenstativ St 201	Zusammenlegbar für D 9 A, D 11 C, D 19 C	933 120 600	Floor stand St 201 for microphone	Folding type, for D 9 A, D 11 B, and D 19 B	933 120 600
Mikrofon-Stativanlage	Für optimale Ausnützung des Mikrofons	933 120 610	Microphone stand equipment	for optimal use of microphones	933 120 610
Schnurübertrager mit 5 m Verlängerung	Zur Verlängerung des D 9 A, D 11 C, D 19 C	933 123 500	Matching transformer with 16 ft extension lead	lead for extension of D 9 A, D 11 B, D 19 B	933 123 500
Mikrofonverlängerungsleitung niederohmig	Weitere Verlängerung von Bestell-Nr. 933 123 500	933 123 000	Microphone extension lead (low impedance)	lead for further extension of article nr. 933 123 500	933 123 000
Ton- und Überspielleitung für monaurale Geräte	Verbindung Tonbandgerät/Tonbandgerät oder Tonbandgerät/Radio	933 123 200	Mono transcription and copy lead	connection tape recorder/tape recorder or tape recorder/radio	933 123 200
Kupplungsstück für Tonleitung	Tonleitungsanschluß an ältere Rundfunkgeräte	933 123 300	Matching piece for sound lead	connection of old-type radio receivers	933 123 300
Diodenanschlußplatte	Einbau in ältere Rundfunkgeräte	933 121 700	Diode socket plate	installation into old-type radio receivers	933 121 700
Fernseh/Allstrom-Diodenanschlußplatte FAD	Tonbandgeräte-Anschluß an FS- und Allstrom-Empfänger	933 123 920	AC/DC-diode socket plate FAD	for connection of tape recorder to AC/DC receivers, and TV-receivers.	933 123 920
Zweikanal-Mischpult	Für alle Tonquellen (Mikro, Radio, Phono, Tonband, Telefon)	933 123 600	Two channel mixer	for all sound sources (mike, radio, phono, tape, telephone)	933 123 600
Echomixer	3-Kanalmischpult mit getrennter stufenloser Nachhalleinregelung auf 2 Kanälen	933 123 630	Reverberation mixer	3-channel mixing device with reverberation effects in studio-type manner	933 123 630
Endlos-Bandkassette	Endlos-Betrieb 9,5 cm/s = 16 min	933 122 010	Endless tape magazine	non-stop play 3.3/4 aps = 16 minutes	933 122 010
Transportvorrichtung	Zum Betrieb des Steuergerätes Diachron 2 mit Endlos-Bandkassette	933 122 020	Transport device	recommended device by using endless tape with DIACHRON	933 122 020
Trickblende 85	Studiomäßige Einblendeffekte	933 123 800	Tric control 85	studio-type fade-in effect	933 123 800
Diachron 2	Vollautom. Dia-Steuerung	933 122 815	Diachron 2	full automatic control of slides	933 122 815
Aussteuerungshilfe für Sehbehinderte	Akustische Aussteuerung der Aufnahmen	933 121 150	Modulation aid for the blind	modulation of recording by hearing	933 121 150
Klangsäule	Raumton-Lautsprecher mit vollendeter Baßwiedergabe	933 124 510	Loudspeaker column	loudspeaker with perfect reproduction of basses	933 124 510
„Teleset 3"	Beidohriges Mithören der Aufnahme und Abhören bei Wiedergabe	933 124 240	"Teleset 3"	Monaural monitoring during recording and playback	933 124 240
Schaltuhr	Tonaufnahme zu vorbestimmter Uhrzeit	933 122 860	Time switch	to start recording at a certain, fixed time	933 122 860
Fußtaste	Fernbedienung für Start/Stop	933 122 300	Foot pedal	remote control for start/stop	933 122 300
Galvanischer Telefonadapter M	Aufnahme von Telefongesprächen	933 121 110	Telephon Adapter		933 121 110

ALLGEMEINE ELEKTRICITÄTS-GESELLSCHAFT

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Änderungen vorbehalten
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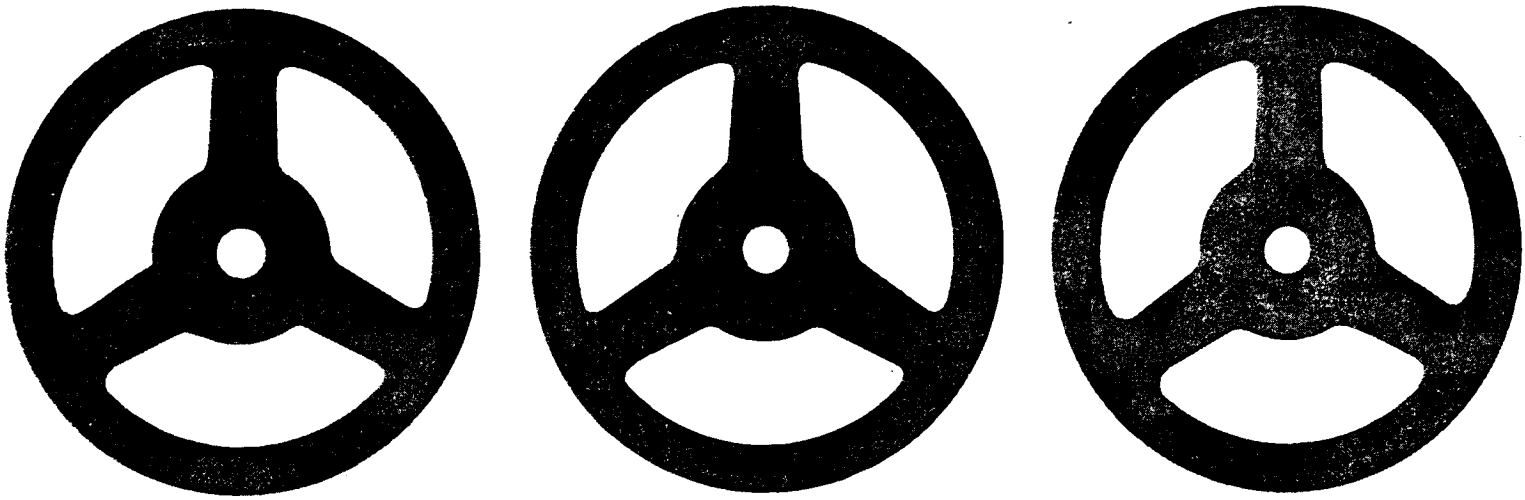

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For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
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Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk

Instructions for Servicing and List of Spare Parts

TELEFUNKEN

Tape Recorder

Magnetophon 85

with two Tape Speeds

PREFACE

Dear Business Friend!

The new tape recorder MAGNETOPHON 85, produced by TELEFUNKEN is a recording and playback machine especially designed for pretentious recordists. Due to its high precision mechanics and its well-weighted electronic assembly studio-like recordings are achieved with this instrument.

The advantages of the MAGNETOPHON 85 regarding sound quality are: a high signal to noise ratio, an extremely low rate of flutter and wow, and a remarkable frequency range on both tape speeds.

With the aid of this service manual the service technician should be able to locate and repair any fault, which might develop during use and maintain the high standard for which the tape recorder MAGNETOPHON 85 was designed.

TELEFUNKEN
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Geschäftsbereich Geräte
Export

CONTENTS

I. TECHNICAL CHARACTERISTICS

Models:
1. Table model MAGNETOPHON 85 T, intended to be used in conjunction with a radio receiver.
2. Portable model MAGNETOPHON 85 K with ordinary power stage and two incorporated loudspeakers.
3. Portable model MAGNETOPHON 85 KL with push-pull power stage and two incorporated loudspeakers.

Mains Supply: Changeable by a voltage selector on 110/127/150/220 or 240 volts, 50 cycles AC. (also deliverable for 60 cycles AC)

Power Consumption:
1. Table model: 40 watts approx.
2. Portable model: 55 watts approx.

Radio Connection: By "audio lead" with two identical standardized plugs. The "audio lead" includes recording and playback lead.

Tape Speeds: 3¾ "/sec = 9.5 cm/sec
7½ "/sec = 19 cm/sec

Track Position: Dual track. The upper track is recorded first when the tape is moving from left to right. (international standards)

Playing Time: 2 x 45 minutes with a 1,700 ft "long play" tape (7 " reel) at 7½ "/sec tape speed.
2 x 90 minutes at 3¾ "/sec tape speed.

Wind and Rewind Time: 3 minutes approx. with a 1,700 ft "long play" tape.

Valve Complement: EF 86, ECC 83, ECC 81, EM 71 a,
AEG selenium rectifier B 250 C 65 K 1
Power Stage: ECL 82 (ordinary)
ECC 83, 2 x EL 95 (push-pull)

Frequency Response: 30 to 20,000 cycles/sec at 7½ "/sec
30 to 15,000 cycles/sec at 3¾ "/sec

Flutter and Wow: below ± 0.2% at 7½ "/sec
± 0.4% at 3¾ "/sec
} Measured with flutter and wow meter EMT J 60 a

Recording Inputs: Input level:
2.5 mv approx. at 2 MΩ (microphone)
2.5 mv approx. at 100 kΩ (radio)
150 mv approx. at 1 MΩ (pick-up)

Playback Outputs: Output level:
1.5 v approx. at 18 kΩ (audio lead)
10 v approx. at 100 kΩ (crystal earphone)
5 v approx. output loaded with 2 kΩ (magnetic earphone)

Output Power: Ordinary power stage:
3 watts approx. output loaded with 4.5 Ω
Push-pull power stage:
5 watts approx. output loaded with 4.5 Ω

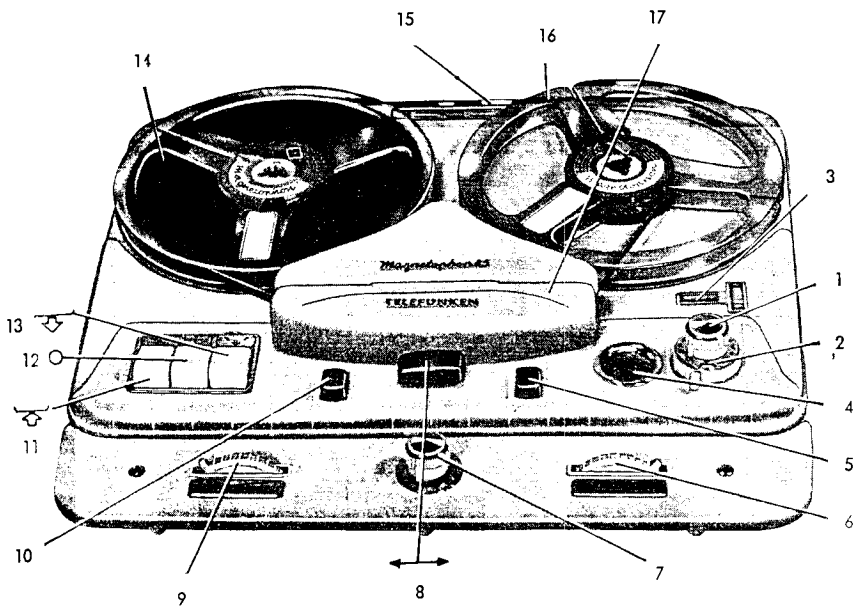
Distortion: below 5% at playback output (audio lead)

Signal to Noise Ratio: Unweighted better than 50 db (300 : 1) below normal operating level.
(DC heating of the audio amplifier valves)

Fuses: 220 and 240 v: 0.4 apms.
150 v: 0.6 amps.
110 and 127 v: 0.8 amps.
} semi-delayed action type

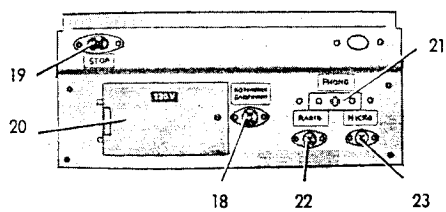
II. OPERATING INSTRUCTIONS

Fig. 1



1 On/off-switch and recording level control
2 Input selector switch for microphone, radio, pick-up, and monitor control during "playback" with the recording level control
3 Counter (tape length indicator)
4 Magic eye for recording level indicating
5 Quick stop button

Fig. 2



6 Treble control
7 Volume control
8 Rewind/fast forward key
9 Bass control
10 Record safety button (to be depressed when operating the "record" button) and "Trick" button when latched, allowing a second recording to be superimposed on one existing
11 Record button
12 Stop button
13 Playback button
14 Supply turntable with 7 " tape reel
15 Tape speed selector key
16 Takeup turntable with an empty 7 " reel
17 Tape splicing device
18 Eearphone jack
19 Remote control jack
20 Mains supply voltage selector
21 Pick-up input socket
22 Radio input jack
23 Microphone input jack

III. CONSTRUCTIONAL DETAILS AND MODE OF OPERATION

A. Constructional Details

The tape recorder MAGNETOPHON 85 consists of the driving assembly and the amplifier. Both are joined together to one constructional unit. When repairing the recorder it is usually not necessary to remove the amplifier from the driving assembly because nearly all components are accessible for replacement without removing the amplifier.

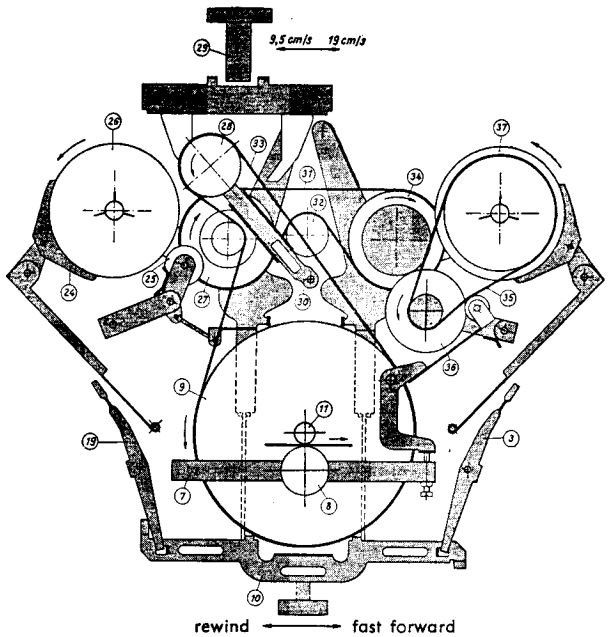


Fig. 3 Driving Assembly in Playback Position

B. Mode of Operation

1. Driving Mechanism

A two-pole asynchroneous motor (32) drives the two idlers (27) and (34) by a flat rubber belt (31). These idlers are provided with different diameter steps on their upper parts (diameter ratio 1 : 2). When operating the tape speed selector (29) at the rear of the machine a second belt (33), leading from an idler (28) on the tape speed selector arm (30) to the fly wheel (9) of the capstan shaft (11), may be brought into contact either with the small diameter step of the left idler (27) for 3¾"/sec, or with the larger step of the right idler (34) for 7½"/sec tape speed.

2. Position "Stop" (O)

When the recorder is switched on, power is applied to the motor and amplifier. The capstan (11) is already rotating, but a threaded tape is not moving forward because the capstan idler (8) is lifted off the capstan (11). In stop position the amplifier is prepared for recording to be able to set the recording level before starting the tape.

3. Position "Record" and Playback

When the "record" or "playback" button is depressed, a contact (18) at the left side of the press button assembly (17) closes the circuit of the capstan idler magnet. The magnet pulls the armature on the lower side of the capstan idler lever, thus forcing the capstan idler (8) against the tape and the rotating capstan (11), so that the tape starts moving.
The takeup reel has to take up the tape, fed to it by the capstan. By the movement of the capstan idler lever (7) a belt is stretched, forcing the driving pulley (36) against the the rotating right idler (34). This belt (35) is designed to slip on a small nylon diameter step of the pulley (36) in order to transmit the necessary torque to the takeup turntable (37).

The supply turntable (26) is slightly braked by the left-side brake (24) to give the tape a sufficient tension. Two tape pressure posts (20) on the capstan idler lever (7) provide a correct tape positioning against the erase head (21) and the recording/playback head (22). (see fig. 5)

4. Quick Stop and Remote Control

The "quick stop" button (6) enables a quick stop and start of the tape during recording or playing back. Being depressed, the button breaks a spring contact S 7 (6) in the magnet circuit. The capstan idler lever (7) moves back into its resting position. The capstan idler (8) is lifted off the capstan (11) and the slipping belt (35) is released, so that the tpe stops immediately.

If a remote control switch is connected, the "quick stop" button must remain depressed. Then start and stop may be operated from the remote control.

5. Rewind and Fast Forward

When the "rewind/fast forward" key (10) is moved to rewind the left idler (27) is moved to the left. Simultaneously the reversing idler (25) is forced between the supply turntable (26) and the left idler (27), thus driving the supply turntable in clockwise direction.

In "fast forward" position of the slide key (10) the right idler (34) is forced directly against the takeup turntable (37) in a similiar way in order to drive this turntable in anti-clockwise direction.

When the "rewind/fast forward" key is operated, the slide rod of the key (10) is locked at the locking lug of the press button assembly (17) and remains in this position until the "stop" button is depressed. Then the key moves back to its central position by spring tension.

The rewind/fast forward key can't be operated, when the "record" or "playback" button is depressed. Therefore it is necessary to depress the stop button first when changing from recording or playback to wind or rewind. This safety feature, caused by a mechanical locking is important to avoid formation of loops or tape break.

The brake of the respectively winding up turntable is out of action by a brake release (3) or (19) during the rewinding or winding forward process. The brake becomes effective again when the stop button is depressed.

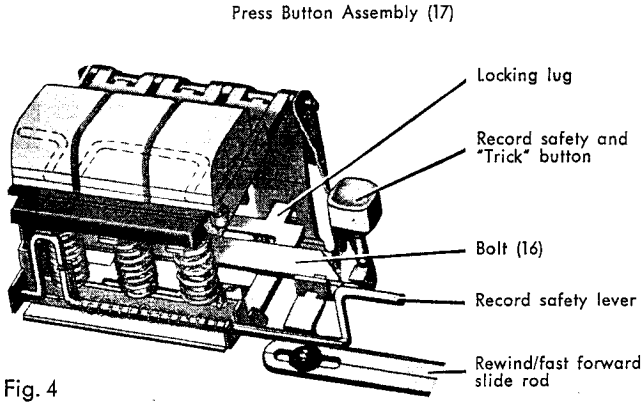


Fig. 4

6. Automatic Tape-End Stop

The right tape guide (4) consists of two insulated parts. As soon as the contact foil, fixed at both ends of the tape, passes this guide, the tape-end stop magnet below the press button assembly pulls the locking lug and releases the depressed button or the slide rod of the rewind/fast forward key. Thus the machine is in stop position, yet power is applied further on to motor and amplifier. The circuit of the tape-end stop magnet is immediately disconnected by switch contacts S 6 (18) when the "record" or "playback" button returns to the stop position, or by switch contacts S 5 b after having rewound or wound forward.

C. Mechanism of the MAGNETOPHON 85

All parts of the driving assembly are accessible when the main hood is removed.

1. To remove the main hood:

a) Unscrew the 4 large retaining screws (*).
b) Pull off the rewind/fast forward key and the control knob.
c) Remove the main hood together with the input selector knob (upward pull).

2. To remove the recorder from the case (cabinet or portable case)

a) Remove the main hood (see C 1).
b) Loosen the 4 lateral screws (**).
c) Pull the recorder upwards out of the cabinet.
When dismantling a portable recorder, place the recorder chassis first on the edge of the case in order to pull the plug of the power stage connection out of the socket in front of the recorder.

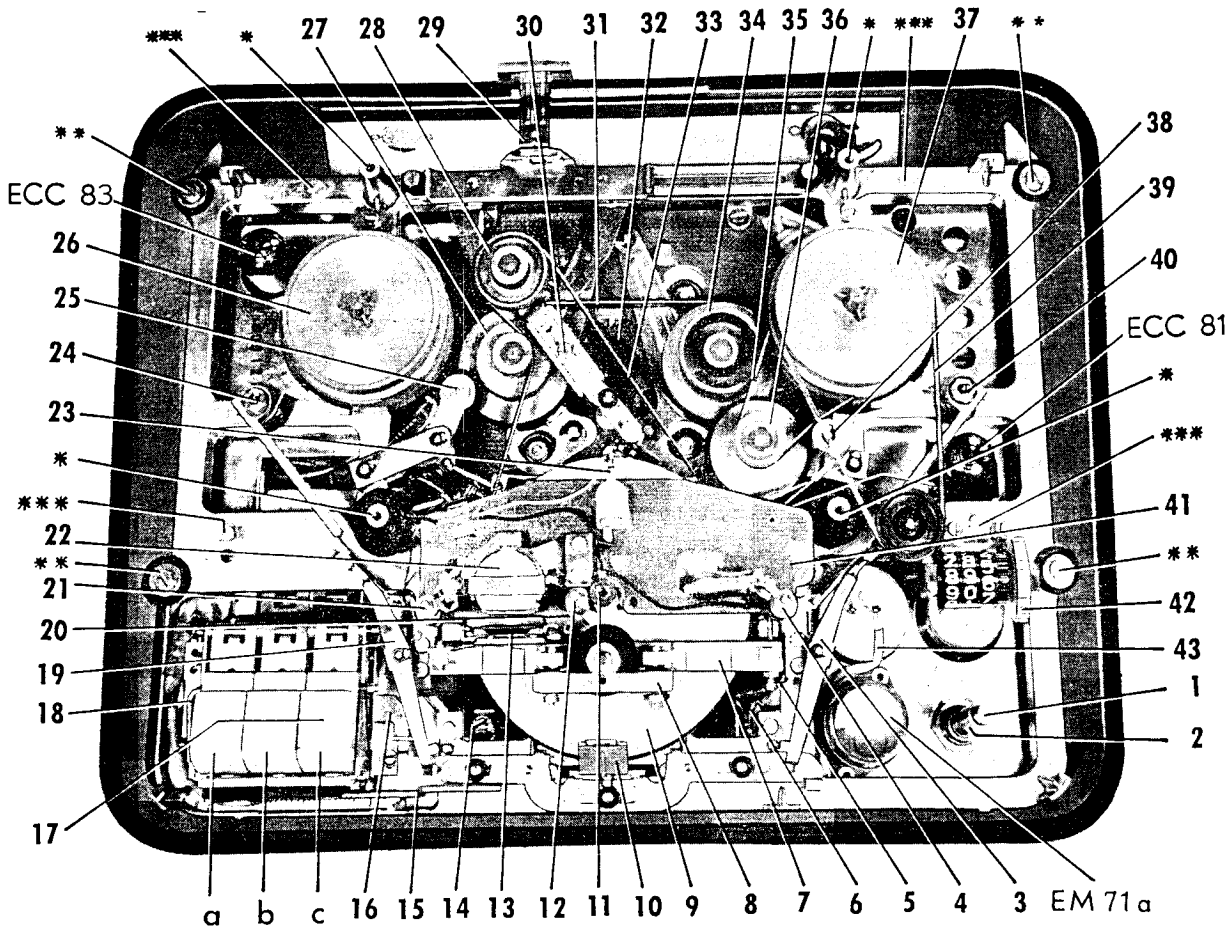


Fig. 5 View of the Driving Assembly (main hood removed)

1 On/off switch and recording level control
2 Input selector switch for microphone, radio, pick-up and monitor control
3 Right-side brake releasing lever
4 Right-side tape guide and tape-end stop contacts
5 Adjustment screw for takeup turntable torque
6 Quick stop contact (S 7)
7 Capstan idler lever
8 Capstan idler with holder
9 Fly-wheel
10 Rewind/fast forward key
11 Capstan
12 Third tape guide
13 Screening flap
14 "Trick" contacts
15 Record safety lever
16 Bolt of the rewind/fast forward slide rod
17 Press button assembly
a = record, b = stop, c = playback
18 Contact S 6 for magnet circuit
19 Left side brake releasing lever
20 Tape pressure posts
21 Erasing head
22 ULTRA-recording/playback head inside the screening case
23 Trimmer C 10 for bias adjustment
24 Left-side brake lever
25 Reversing idler
26 Supply turntable
27 Supply turntable idler
28 Pulley on the tape speed selector arm
29 Key of the tape speed selector
30 Tape speed selector arm
31 Motor belt
32 Motor pulley (rubber)
33 Fly-wheel belt
34 Takeup turntable idler
35 Slipping belt
36 Drive pulley for slipping belt
37 Takeup turntable
38 Slipping belt stretch lever
39 Counter belt
40 Right-side brake lever
41 Head assembly plate
42 Counter
43 Auxiliary phase capacitor

(*) Threads for main hood fastening (**) Cabinet mounting screws (***) Amplifier mounting screws

D. Description of the Schematic Diagram

1. Recording

With the four step input selector switch the amplifier input may be connected either to the microphone, radio or pick-up input socket. (In the fourth position the recording level control W 21 is additional acting as playback volume control via contacts S 1 b of the input selector switch.) During recording the incoming signal voltage is fed to the grid of the first amplifier stage (EF 86) via contacts Wc 1/2 and Wa 1/2 of the press button switch unit. Behind this stage the amplified signal enters the second stage (½ ECC 83) via the recording level control (i) and contacts Wb 5/6. The negative feed back network, consisting of several capacitors and resistors, between plate of the third (½ ECC 83) and cathode of the second amplifier stage effects the necessary treble boosting for recording, the cut off frequency of which is changed by the equalization switch G (Ga) according to the tape speeds 7½ and 3¾"/sec. The variable resistor W 44 enables an adjustment of the recording equalization at 7½"/sec tape speed.

Behind the third amplifier stage the signal voltage is applied to the earphone socket (poles 3/2 = crystal earphone) for monitoring the signal being recorded, and to the magic eye circuit (EM 71 a). Lastly the recording/playback head is fed from the network C 9, W 14, W 11 via contacts Ab 2/3. The variable resistor W 34 in the grid circuit of the magic eye serves for adjusting the maximum recording level at which tle luminous sectors should just be closed.

2. Bias and Erasing Oscillator

The bias and erasing oscillator (ECC 81) is a LC push-pull oscillator operating at 63 kc approx. The bias and erase energy is tuned out via separate windings of the oscillator coil. The bias level may be adjusted to the necessary value by the trimmer C 10. When the "Trick"-button (S 8) of the recorder is latched the S. P. D. T-switch S 8 disconnects the erasing head and loads the oscillator with a corresponding resistor (W 46).

3. Playback

The e. m. f. of the playback head, generated by the passing tape, is fed to the grid of the first amplifier stage (EF 86) via contacts Ac 1/2 and Wa 2/3 of the press button switch unit. In order to obtain the desired flat playback frequency response several frequency compensations are necessary. Bass boost for 3¾"/sec is introduced by the anode equalization C 7, W 18. When changing to 7½"/sec tape speed the time constant of this circuit is altered by shunting the resistor W 20 to W 18 with the equalization switch G (contacts Gb 5/6).

Due to the extremely short gap of the ULTRA-head a compensation of the gap effect (treble loss) is only necessary at the lower tape speed 3¾"/sec. The treble boost is effected by resonance of the head with the capacitor C 3. At 7½"/sec this capacitor is disconnected by the contacts Gc of the equalization switch.

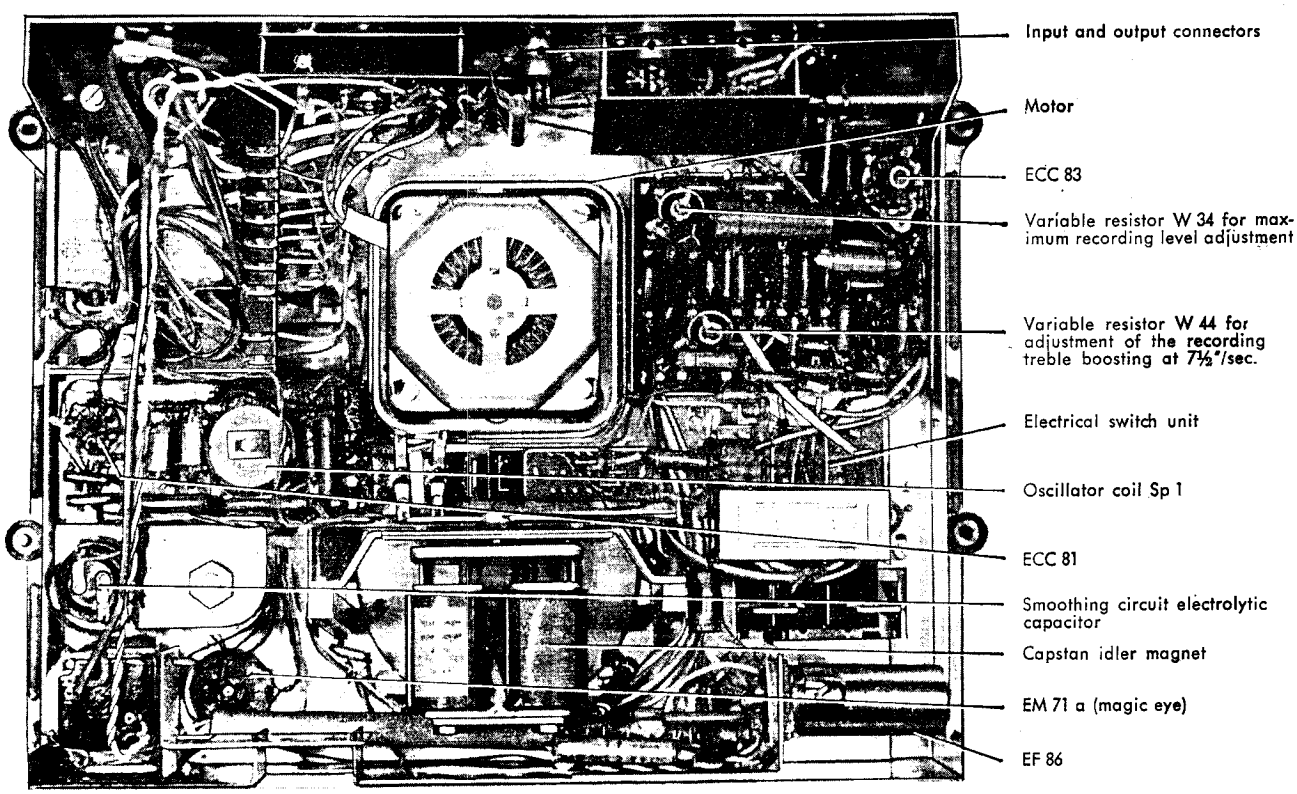
Behind the third amplifier stage (ECC 83) the playback output signal is fed to the earphone output (poles 2/3 for crystal earphone, poles 1/2 for magnetic earphone) and to the audio lead connectors 2/3 of the radio jack via contacts Wd 6/7.

In order to obtain a level control when reproducing through earphones the recording level control can be used as a volume control in the fourth position of the input selector switch. During reproducing through a radio receiver or through the incorporated loudspeakers of a portable recorder this volume control should not be used in order to avoid double a controlling. If the power amplifier receives a too low signal voltage the physiologic volume control will not work correctly.

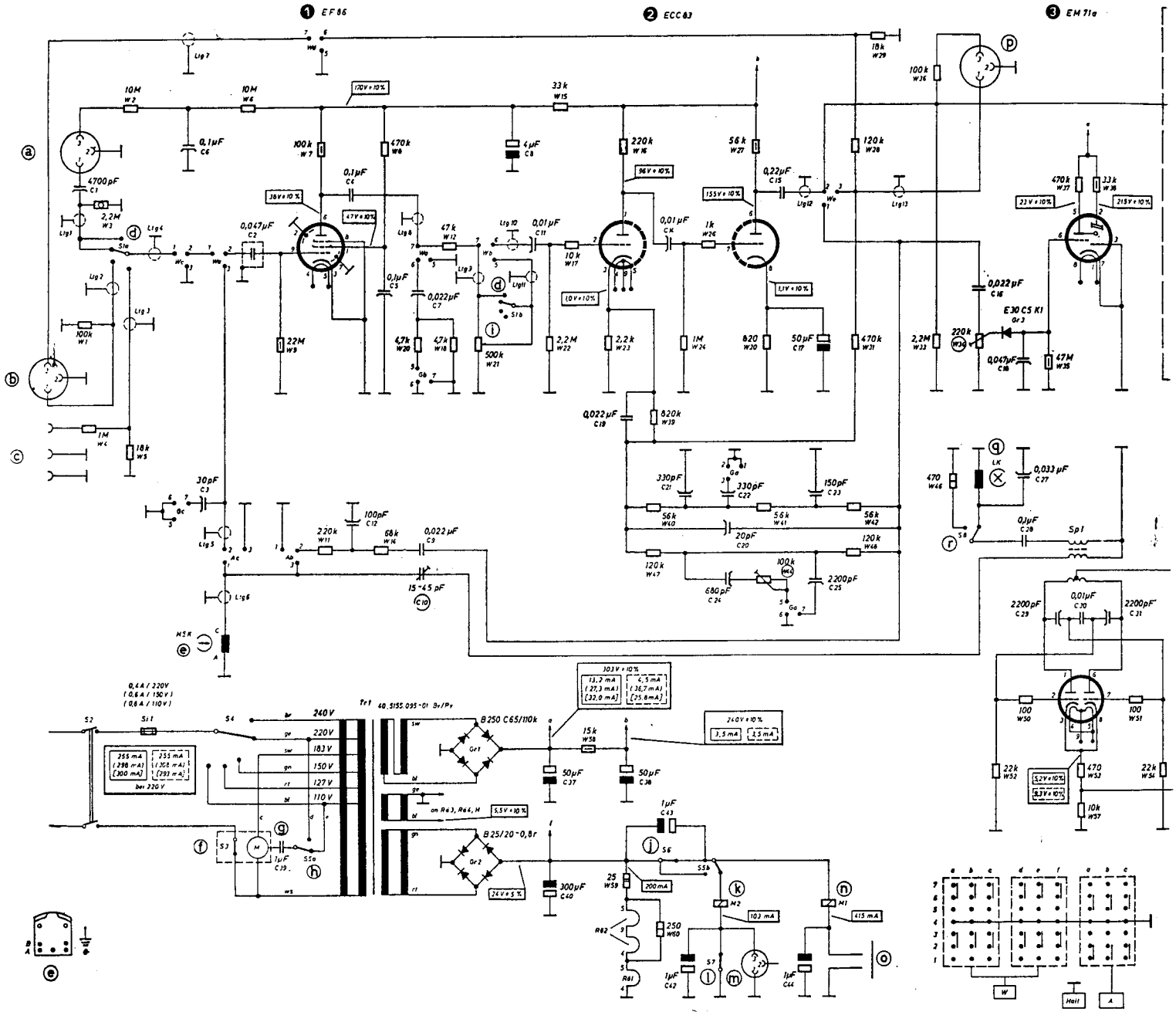
4. Motor Circuit

The driving motor is designed to be operated on 183 volts AC. In the recording and playback position the auxiliary phase receives a voltage of 110 volts only in order to obtain a smooth rotation. During rewinding or winding-on an overload voltage (220 volts) is applied to the auxiliary phase, this way raising the torque of the motor the short duration of high speed winding. A thermal safety switch inside the motor prevents the motor from being overheated if the motor is dragging or continuous operated with the high auxiliary phase voltage. The thermal switch disconnects the power supply circuit of the Magnetophon 85 and switches on again automatically after a cooling pause of 30 minutes approx.

Fig. 6 Magnetophon 85 Bottom View



TELEFUNKEN *Magnetophon* 85

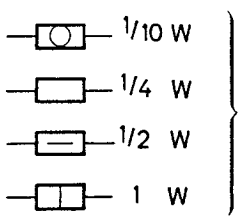


Motor auxiliary phase capacitor

50 Hz	60 Hz
1 µF	0,7 µF

Power consumption:

Table model approx. 40 watts
Portable model approx. 55 watts



Power rating of resistors

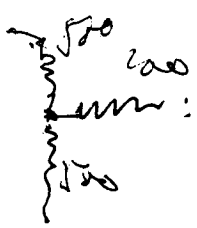
Values measured with instrument 1,000 ohms/v

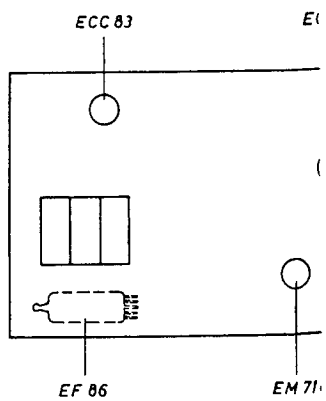
▭ = **Record**

⋯⋯ = **Playback**

( ) = **with ordinary power stage**

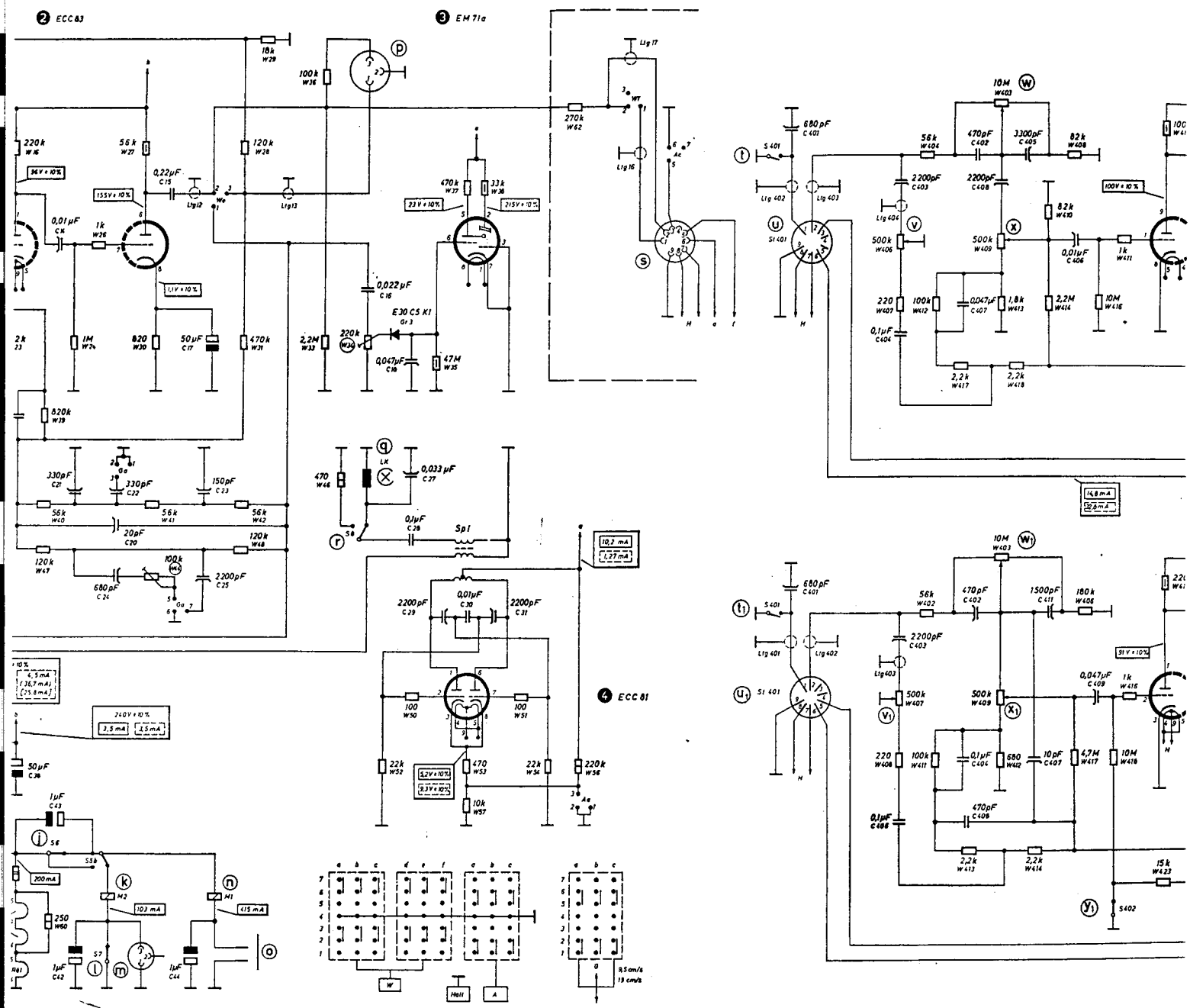
[ ] = **with push-pull power stage**





Positions of valves on the rec

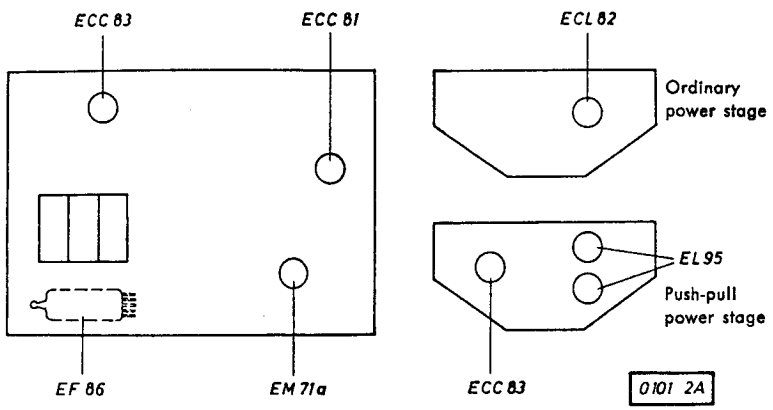
KEN *Magnetophon* 85 Schematic Diagram with Current and



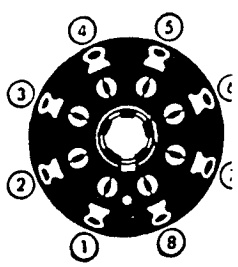
Electric switch unit.
Switches in playback position

Tape/speed/equalization switch
(switch position 7½"/sec)

er rating
esistors



Positions of valves on the recorder chassis and on the power stages

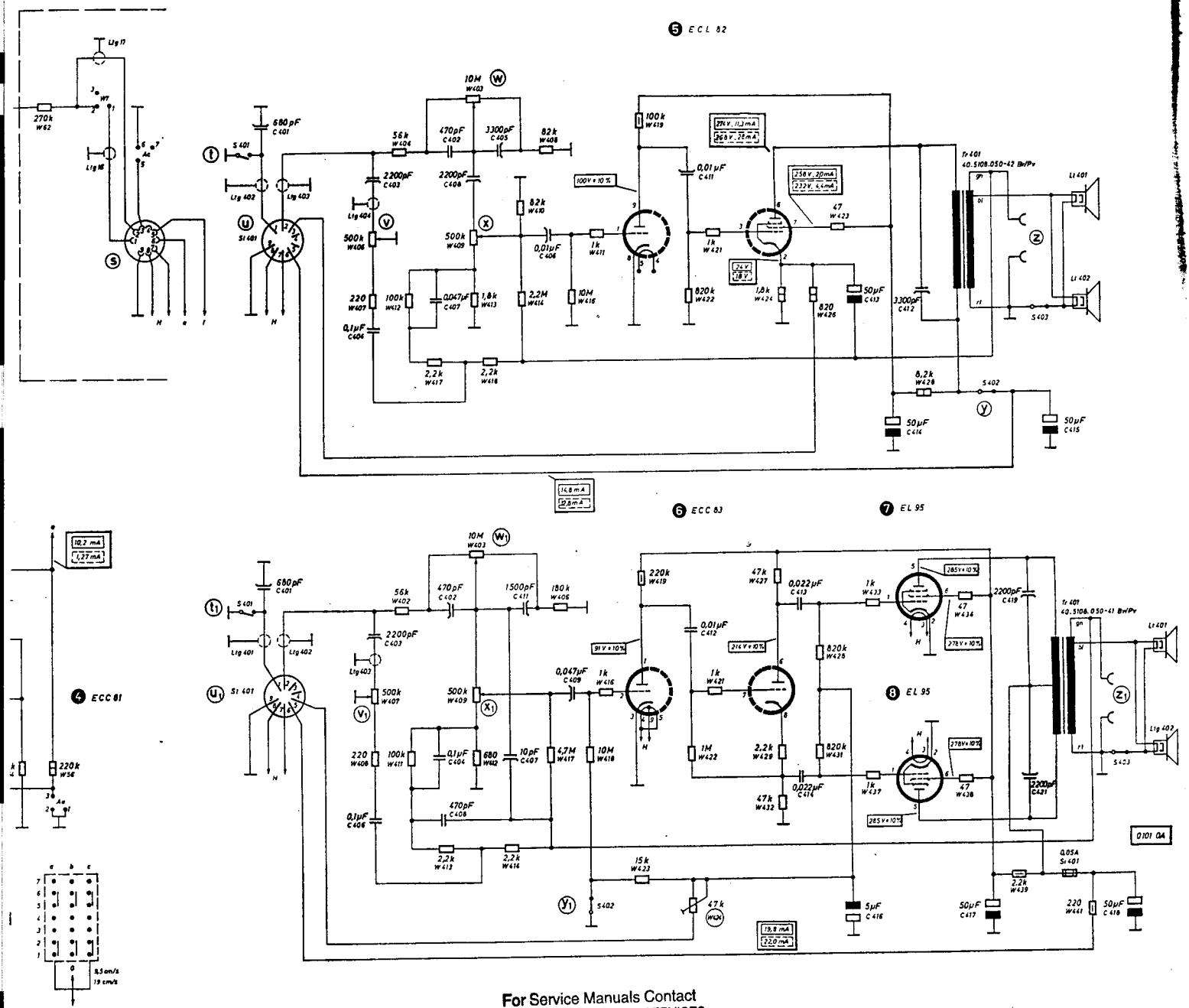


Socket of magic eye

valve EM 71 a

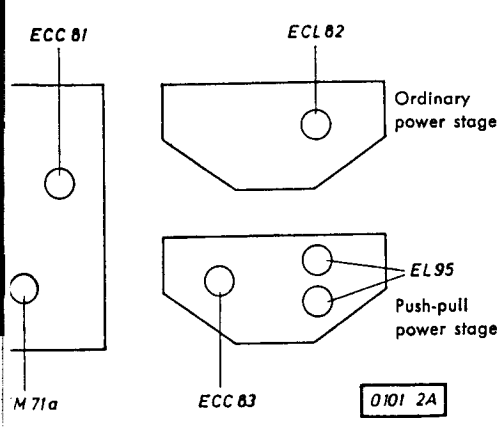
Valve sockets: bottom view

Schematic Diagram with Current and Voltage Data

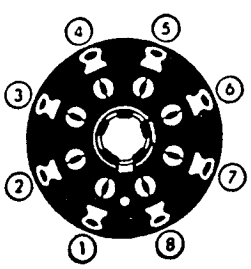


Tape/speed/equalization switch
(switch position 7½"/sec)

For Service Manuals Contact
MAURITRON TECHNICAL SERVICES
8 Cherry Tree Rd, Chinnor
Oxon OX9 4QY
Tel:- 01844-351694 Fax:- 01844-352554
Email:- enquiries@mauritron.co.uk



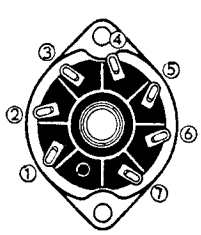
e recorder chassis and on the power stages



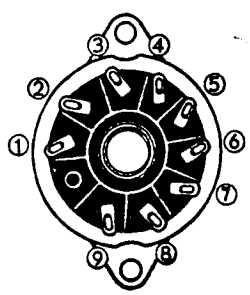
Socket of magic eye

valve EM 71 a

Valve sockets: bottom view



Pico 7
valve EL 95



Pico 9
valves EF 86, ECC 83,
ECL 82

a: microphone jack

b: radio jack

c: pick-up socket

d: input selector switch

e: recording/playback head

f: thermal overload switch S 3 (inside the motor)

g: motor auxiliary phase capacitor C 39

h: S.P.D.P.-switch for the auxiliary phase voltage of the motor (operated by the rewind/fast forward key)

i: recording level control W 21

j: switch for magnet circuit (S 6)

k: capstan idler magnet M 2

l: quick stop button S 7

m: remote control jack

n: tape-end stop magnet M 1

o: tape-end stop contacts

p: earphone jack 1—2 magnetic earphone
3—2 crystal earphone

q: erasing head

r: trick-button S 8

s: power stage connection socket

t: monitor switch S 401 (push and pull switch, coupled with the volume control)

u: power stage connecting plug

v: treble control W 406

w: bass control W 403

x: volume control W 409

y: on/off-switch for power stage (coupled with the volume control)

z: socket for external loudspeaker (low impedance)

IV. HINTS FOR MAINTENANCE AND SERVICING

A. General

If you receive a recorder Magnetophon 85 for repairing, please observe following hints:

1. By all means ask your customer for the symptom of the incorrect working. This way you save time and pain.
2. Troubles in the amplifier or at the ULTRA-head occur very seldom, as we know from experience. Objections like distorted reproduction or missing treble will result preponderant in mechanical defects (soiled heads or too low tape tension).
3. If you can't identify a defect, start for a test recording from a radio receiver, using an immaculate tape. When this test recording will be reproduced with the normal quality, ask your customer, what type of tape he has used. According to experience, often tapes are used which are not suitable for domestic tape recorders with low tape speeds.

For an optimum performance of the Magnetophon 85 following conditions are of most importance and should be checked in turn, when repairing the recorder:

a) The heads and the tape guides must be clean (not soiled) (Cleaning of the heads and tape guides see IV B 1, maintenance).

b) The tape tension should be within the given limits (see tape tension measurement IV C 2).

c) The tape, driven by the capstan, should smoothly run over the head surfaces. It should not flutter or oscillate up and down in the tape guides.

The tabulation of faults with their causes, listed on the pages 18 and 19, will help you to locate and repair a fault in a minimum of time.

B. Maintenance

1. Removing Accumulation of Tape Coating Residue from the Heads and Tape Guides

For cleaning purposes the front hood is to be removed by pulling off. Following parts should be cleaned with a soft cloth and a brush: the head assembly plate, the capstan, the capstan idler, the control pins of the brakes, the tape guides and the head surfaces. If the dirt is hard or caked and will not come off with a dry cloth, dampen the cloth slightly with methylated spirit or ethyl alcohol. Do not use metal tools for cleaning, and avoid to bend the control pins of the brakes!

2. Don't lubricate the Driving Parts

Since all rotating parts are provided with oil impregnated sintermetal bearings a further lubrication is normally not necessary. Nevertheless, should a bearing become dragging, replace the whole rotating part. Don't try to repair it by lubricating, since oil splashes might fall on the driving parts and rubber belts, thus causing slippage in the drive mechanism. Then the recorder may not work properly.

3. Cleaning of the Driving Assembly

When repairing a recorder it should be inspected, if dust or rubber shaving is accumulated inside. This harmful dust should be removed carefully with brush and cleaning cloth. We recommend to clean the surfaces of the turntables and idlers as well with a clean dry cloth.

4. Inspection of the Braking Surfaces

In order to obtain a constant smooth fricton, especially between the supply turntable and the left-side brake, it is important that the braking surfaces of the turntables are absolutely clean and free from any grease. If, in an individual case, the braking momentum during one revolution of the turntable has become irregular, or if the tape tension is fluctuating, the turntable should be cleaned with a cloth, slightly moistened with methylated spirit during winding-on or rewinding. Avoid to touch the braking surface with your fingers! If the linings of the brake shoe are soiled, remove the brake lever (see V 3) and brush out the linings carefully in tape pull direction.

5. Demagnetization

If the control pins of the brakes, the tape guides, the capstan and especially the heads have become magnetized by contact with magnetic tools, these parts must be demagnetized. Magnetic parts, touching the tape, may cause a permanent noise on it thus decreasing the quality of the reproduction considerably. It is then necessary to demagnetize these parts by means of a demagnetizer, plugged into any source of 220 volts AC power. The demagnetizer is switched on by depressing the button.

The core of the demagnetizer should be passed slowly along the parts to be demagnetized, as close as possible, but not in complete contact with the surface of the recording/playback head. Then withdraw the magnetizer very slowly and switch off at a distance of 1 ft. at least.

By the permanent changing of AC-power polarity, fed to the coil of the demagnetizer, and the slow withdrawal a thorough demagnetization is achieved.

Special care should be taken when demagnetizing the recording/playback head. The demagnetizer should not jerk against the head surface, since the head could be damaged. For this reason it is advisable to cover the core with adhesive tape. The whole process should not last longer than two minutes because the coil would otherwise develop excessive heat, due to its high power consumption.

As long as the demagnetizer is kept switched on, it should not be brought near to recorded tapes because of its high erasing effect.

C. Mechanical Measurements and Adjustments

1. The Function of Brakes

All tape recorders for domestic use, manufactured by TELEFUNKEN, are equipped with a patented brake system, controlled by the tape tension, with following functions:

a) Recording and playback: The left-side brake is designed and adjusted to produce a tape tension in front of the heads of 70 to 100 g (2.5 to 3.5 oz.). The control pin, over which the tape is led, keeps this tension on a constant value over the entire tape length. Without this control feature the tape tension would continually increase with decreasing tape winding diameter. As the diameter ratio of a full 7" tape reel to an empty one amounts 1 : 3, the tape tension would vary in the same ratio without the automatic tape tension control thus raising the tension to an intolerable value.

The control pins are angled by about 2° to permit a proper positioning of the tape in the guides. Thus the tape is prevented from oscillating up and down within the tape guides.

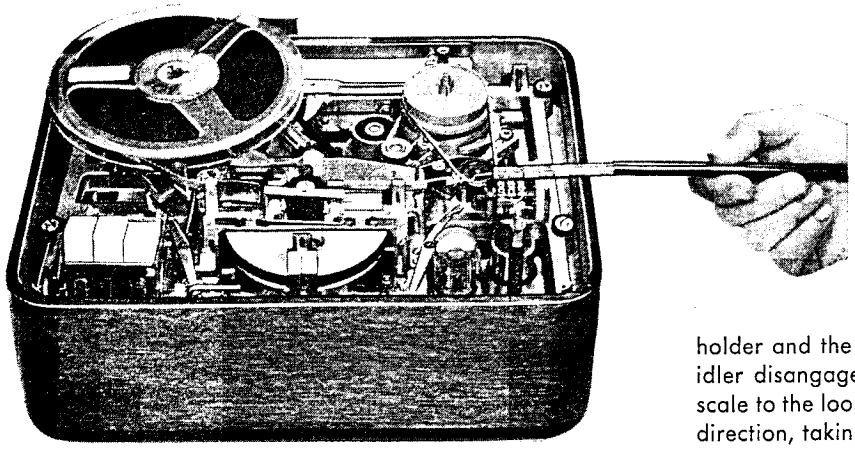


Fig. 8

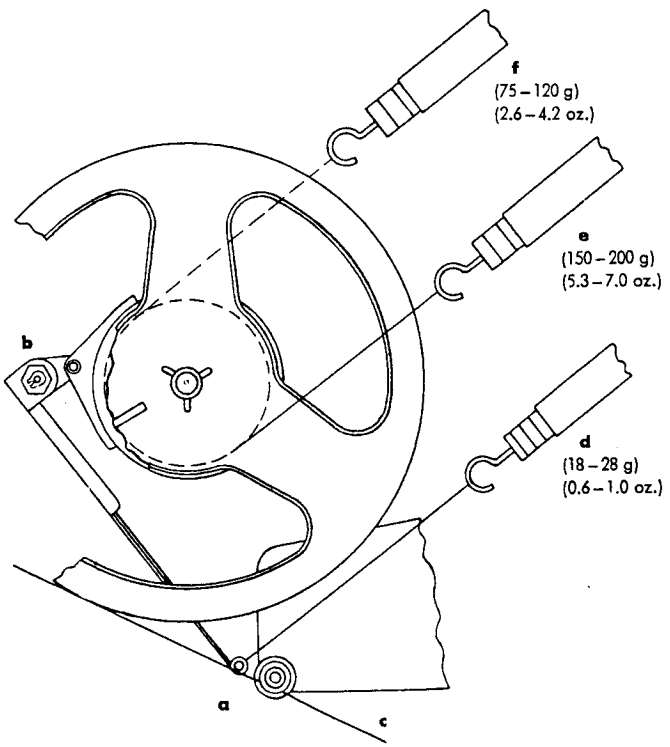
b) Fast forward and rewind: The function of the brake at the respectively winding off turntable during "fast forward" or "rewind" is quite the same as those of the left-side brake for recording and playback, thus effecting a homogeneous tight tape reeling. The brake of the winding up turntable is out of action by a brake release. Another advantage of this braking system is to limit the tension peak occuring in that moment, when the rewind/fast forward key is operated and the tape is speeded up in a split second. This way the tapes never will become too much stretched.

c) Stop: In order to avoid formation of loops during the stopping process it is important that the winding off turntable receives a stronger braking force than the winding up turntable. This is achieved by the design of the brakes in a wedge like manner, so that the braking force becomes dependent on the rotating direction of the turntables.

2. Checking the Tape Tension (see fig. 7)

The tape tension is checked in the playback position of the recorder, first with a full 7" tape reel and later on with a reel containing a few windings of tape only. Place the tape reel on the supply turntable and tie a loop to the end of tape. During the measurement the capstan idler must be lifted off the capstan by clamping a bifurcated metal piece No. 7 266 865 between idler holder and the cast frame of the idler lever, so that the capstan idler disangages the capstan completely. Attach a 100 g spring scale to the loop at the tape end and pull the scale in tape driving direction, taking the reading while the scale is in steady motion. Tape tension may vary between 70 and 100 g (2.5 to 3.5 oz.) full and empty reel respectively.

Fig. 7



If these values cannot be obtained, the left-side brake needs to be readjusted. In case of a too low tape tension it must be supposed that the position of the control pin has altered. This should be corrected by adjusting the eccentric bush, as described in chapter C 3 b. If the tape tension is too high, it may be possible that the force of the torsion spring is too high (ref. to C 3 d) or that the braking surface of the supply turntable is soiled (cleaning see: IV B 4).

3. Adjustment of Brakes

The brakes normally require no adjustment when the tape tension is within the given limits and when a full 7" reel is completely rewound and wound forward without formation of loops when operating the stop button. In case the brake lever is worn and has to be replaced, a total adjustment of the brake becomes necessary which should be accomplished as follows:

a) Angle control pin of the brake lever by about 2° by means of a gauge (No 72 666 15) vertically to the brake lever in the direction to the tape.

b) Adjust the eccentric bush, so that . . .

c) the control pin gets a definite position. For adjusting this, hold a piece of tape tight between outer diameter of a 7" reel, placed on the turntable, and the near tape guide. Then the control pin of the brake should just touch the tape.

d) Tighten the torsion spring and fix its end into a groove of the rack disc. Attach a spring scale 50 or 100 g to the control pin and measure the force vertically to the brake lever at which the brake shoe disangages the turntable. The spring scale should indicate 18 to 28 g (0.6 to 1.0 oz). This value may be adjusted by fixing the end of the torsion spring into a corresponding groove of the rack disc.

e/f) Measure the brake momentum at the turntable occasionally in clockwise and anti-clockwise direction by means of a measuring hub (empty 7" reel, on which a piece of string, approximately 2 ft. long, is wound with a small loop tied to the end).

The forces, being indicated on the the attached spring scale should be in proportion of 1 : 1.7 to 1 : 2 (wedging effect!) If this proportion cannot be obtained, readjust the eccentric bush (b). When the brake lever moves towards the tape guide, proportion will become smaller, in opposite direction — greater.

If the eccentric bush needs to be readjusted, the control pin should be brought in the correct poistion (c) by bending the flat part of the brake lever.

The forces, noted on fig. 8 (e and f) are general directions to meet the conditions of the tape tension measurement (see: IV C 2).

Supply- and takeup turntable brake adjustments are similar, except that the higher momentum is achieved in anti-clockwise direction at the supply turntable and in clockwise direction at the takeup turntable.

Fig. 9

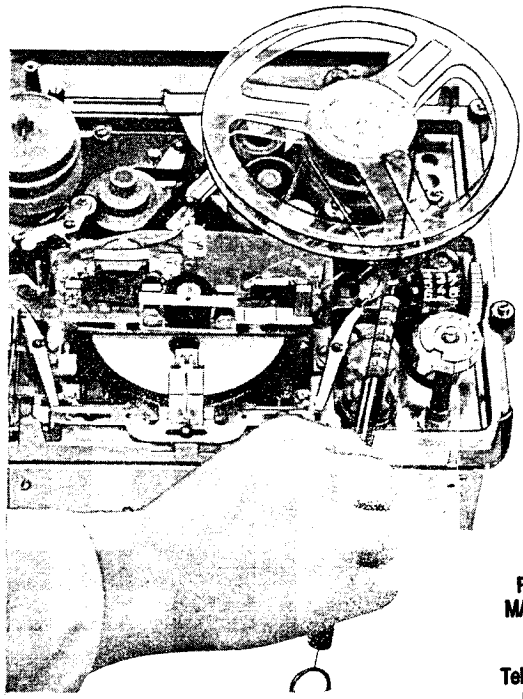
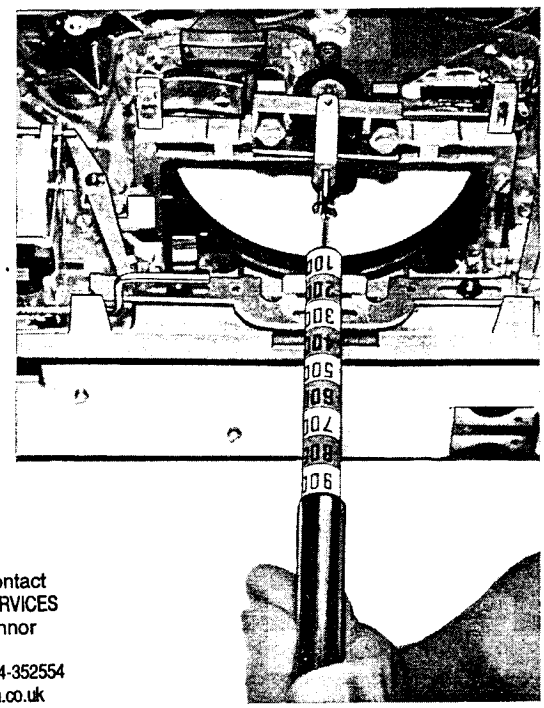


Fig. 10



4. Adjustment of the Slipping Momentum

In the recording and playback condition the takeup turntable has to take up the tape, fed to it by the capstan. The necessary torque may be adjusted with the adjustment screw on he capstan idler lever. The measurement is made in playback position by means of a measuring hub and a 250 g — spring scale. The string is wound off and the spring scale attached to the end. Then the torque (slipping momentum) is measured, allowing the scale to move in with it (see fig. 9). The force, indicated on the spring scale when using a tape reel of 2.36" inside diameter for measurement, should be 80 to 120 g approx. (2.8 to 4.1 oz.). That means a slipping momentum of 240 to 360 cmg.

Before adjusting the slipping momentum, loosen the lock nut on the adjustment screw and tighten it again afterwards.

It should be observed that the slipping belt stretch lever is not pressed against the right-side head assembly plate mounting post, otherwise the free movement of the capstan idler lever will be stopped. A clearance of at least 0.2 mm (0.01") is necessary.

If the slipping momentum is too low and cannot be adjusted to the necessary value with the adjustment screw, it will help to bend the plate spring of the strech lever towards the slipping belt, short behind the centre of motion. The plate behind the spring should be bent too, so that the clearance between spring and plate amounts approx. 1 mm (0.04") in playback position.

5. Adjustment of the Capstan Idler Pressure

The pressure of the capstan idler against the capstan is measured in operating position playback without running tape. Unscrew the upper part of the rewind/fast forward key and clamp a special bow (No. 72 665 52) into the two holes in the capstan idler holder and attach a spring scale (1 kg), as fig. 10 shows. Pull the capstan idler off the capstan and reduce the force so, that the capstan idler begins to engage the capstan again. The spring scale should indicate 800 to 1,000 g (1.8 to 2.2 lb).

If this value cannot be obtained, adjust the right hand screw of the capstan idler holder.

6. Tape Guides

The three tape guides on the head assembly plate are made to conform correctly to the positions of the head tracks in the factory. Thus it is usually not necessary to readjust the tape guides. The height of the recording/playback head is lined up with the tape by two height adjustment screws under the head housing. The upper edge of the mu-metal head core should be perfectly level with the upper edge of the tape during recording and playback. On the other hand the height of the head and the tape guides is adjusted so, that the tape runs in the middle of both tape reels. The third tape guide directly near the capstan contains an eccentric hole for adjusting the tape contacting angle, which should be very small at this guide. The tape should just touch the shaft of the third tape guide.

It is very important that the tape guides, the surface of the recording/playback head and the tape pressure posts on both sides of the head are parallel to the capstan and as near perpendicular to the tape as possible. If it is not, the tape might be damaged at one edge, resulting in a fluttering movement. When testing the tape run, don't use such one-edge stretched tapes!

7. Adjustment of the Brake Releases

a) The rewind/fast forward key actuales two brake releasing levers, which are designed to lift off the brake shoe of the respective winding-up turntable during rewinding or winding-on. In all other operating positions the releasing levers should disengage the brake levers and not touch them. The clearance between the releasing levers and the brake levers in the not actuated positions should be approx. 2 mm (0.08"). This adjustment is made by bending the flat part of the releasing levers.

b) In order not to reduce the torque of the takeup turntable in recording and playback position by the right-side brake, this brake is inactivated by a spring wire fixed at the slipping belt stretch lever. This spring wire should move the brake lever towards the head assembly plate, thus lifting the control pin off the tape. Check this during playback with a small winding diameter at the takeup tape reel. The spring wire must not touch the brake lever in the other operating positions.
(Clearance approx. 1 mm = 0.04".)

8. Adjustment of the Reversing Idler and Check of the Rewind/Fast Forward Functions

a) In stop position the reversing idler should neither touch the supply turntable nor the turntable idler. This may be adjusted by bending the stop of the reversing lever near its crack.

b) During rewinding the reversing idler should come into complete contact with the supply turntable and the turntable idler, in order to transmit the necessary torque to the supply turntable. If the friction is insufficient the pressure of the reversing idler may be increased by bending the flat part of the arm, which carries the supply turntable idler and actuates the push rod of the reversing idler lever.

c) It should be checked that the tape of a full 7" reel is completely rewound and wound-on.

D. Electrical Adjustments

During recording and playback operation the tape abrades the heads, especially the recording/playback head because of the necessary small depth of its gap. The accuracy life of the recording/playback head amounts to approx. 1,000 hours of operation. A perceptible abrasion of this head cannot be valued that a head is useless. If a loss of treble occurs, first check the playback quality of the head by test-tape measurements. To ensure, that the treble loss is not caused by a fault in the amplifier, check if the recorder works correctly with a new head. When it is ascertained that the head is excessively worn, so that is must be replaced, a complete checking of the electrical adjustments is advisable.

Due to the close tolerances of the amplifier and the ULTRA-head data it is possible to replace a head without making any measurement, but checking the tonal quality by recording and reproducing a hi-fi broadcast programme. Usually this method will give satisfactory results, but it should be used in individual cases only. In order to maintain the top quality of the recorder regarding frequency range and signal-to-noise ratio we recommend to make the following measurements when the ULTRA-head has been replaced:

Test equipment requirements:

1 Audio oscillator

1 Vacuum tube voltmeter (VTVM), smallest measuring range 10 mV

1 Test tape No. 72 667 91 (or KL 65 X-test tape No. 92 666 73).

1. Playback Level Check and Head Azimuth Adjustment at 3¾"/sec tape speed

Befor threading the test tape on the recorder, it is advisable to demagnetize the heads, tape guides, capstan, as well as all metal parts touching the tape. Also the screwdriver to be needed for head azimuth adjustment should be demagnetized.

Then thread the test tape. It should once be rewound in the recorder to be checked before making the measurements. Start the recorder for playback. The first tone on the test tape is a 1,000 cycles/sec.-tone 100% modulated. Adjust the azimuth screw left hand near the head housing for maximum output as seen on the VTVM, being connected to the playback output. (Input selector not being switched to the monitor position.) The output voltage should be 1.0 volt or more. (Notice the indicated value!)

The next tone is a 12,000 cycles/sec-tone for final head azimuth adjustment. Having adjusted the azimuth screw at 1,000 cycles/sec, it is easy to find out the maximum position at 12,000 cycles/sec by carefully turning the screw in a very small range. The level of the 12,000 cycles/sec-tone is 20 db below the normal operating level as indicated in the measurement before.

2. Playback Response Check

The next tones in the following sequence: 80, 1,000, 10,000 and 12,000 cycles/sec at a level 20 db below the normal operating level are for playback response checking. The output voltages of these frequencies, measured with the VTVM, should be equal and not exceed ± 3 db, as compared with the 1,000 cycles/sec-reference tone.

3. Recording Treble Boosting

For recording, frequencies above 300 cycles/sec are boosted. The treble boosting should be checked with plugged out oscillator valve and turned-on level control. Terminate the earphone output (terminals 2/3) in 1 kΩ and connect the VTVM across this load.

Checking conditions:

a) at 3¾"/sec tape speed:

Connect an audio oscillator, tuned to 300 cycles/sec to the phono input of the recorder and set the input selector to the appropriate position. Adjust the input level at the audio oscillator for a VTVM reading 20 mv. Then tune the audio oscillator to 14,000 cycles/sec at the same input level. The output voltage, indicated on the VTVM should be 120 to 160 mv. (Input level approx. 15 mv.)

b) at 7½"/sec tape speed:

Using the same method for measuring as for 3¾"/sec, feed an input signal of 19,000 cycles/sec instead of 14,000 cycles/sec to the phono input. The output voltages should be:

20 mv at 300 cycles/sec. 40 to 70 mv at 19,000 cycles/sec.

4. Measurement of the "Over All"-Frequency Response

a) at 3¾"/sec tape speed:

For checking the over all frequency response record the two frequencies 1,000 and 14,000 cycles/sec with an equal input level on the unmudulated section of the test tape. The input voltage, fed to the phono input, should be approx. 8 mv (1/20 or — 26 db of the normal operating level). The level control of the recorder should be turned fully on. Rewind the tape and measure the playback output voltages of these two frequencies with the VTVM, being connected to the playback output. The deviation of the indicated output levels should not exceed ± 3 db. If this cannot be obtained, repeat the recording after having adjusted the bias trimmer C 10 by only a few degrees. *)

Turning anti-clockwise: more treble reproduced.

Turning clockwise: less treble reproduced.

b) at 7½"/sec tape speed:

After selecting the tape speed to 7½"/sec use the same method of measurement as described before (D 4 a). Record the two frequencies 1,000 and 18,000 cycles/sec on the unmodulated section of the test tape and measure the output levels in playback position. The deviation should also not exceed ± 3 db. If this cannot be obtained, repeat the recording after having adjusted the 7½"/sec treble control (variable resistor W 44) in a small range.

Turning anti-clockwise: less treble reproduced.

Turning clockwise: more treble reproduced.

The adjustment of the bias trimmer should not be varied now.

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*) Foot note: The bias level influences the treble recording. This way it is possible to adjust the treble response with the bias trimmer. Since the bias level is critical regarding playback output voltage and distortion it should be varied only in a very small range when treble correction becomes necessary.

5. Recording Level Adjustment (at 3¾"/sec)

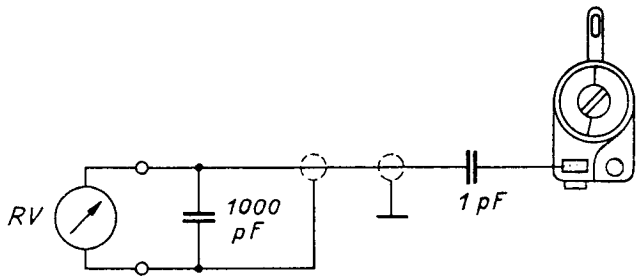
After having adjusted the over all frequency response record once more a 1,000 cycles/sec-tone on the unmodulated section of the test-tape with an input level of 150 mv approx. When playing back this recorded signal, the indicated output level should be equal to the normal operating level of the test-tape, ascertained by playback level checking (see section D 1). If this value cannot be obtained, repeat this measurement with an appropriate input level, until the normal playback operating level is indicated on the VTVM. At this input level adjust the variable resistor W 34 of the magic eye circuit in such a position, that the luminous sectors of the magic eye are now just closed.

6. Checking the Bias Level

The bias level normally needs not to be checked when the measurements 1 to 5 are made in a correct manner. But if a fault in the HF oscillator circuit is supposed, we recommend to check the approximately bias voltage in the recording position. Measure the bias voltage across the recording/playback head (trimmer pole to ground) by connecting a capacitor voltage divider as figured.

Measuring circuit with a capacitor voltage divider:

Fig. 11



Value, indicated on the VTVM (RV): approx. 70 to 140 mv.

7. Checking the Erasing Current

The erasing current should not require adjustment unless some component of the oscillator circuit or the erasing head is replaced. The value of the erasing current is not too critical but on the one hand the current should not be too high in order to avoid too much warmth of the head and, on the other the erasing current must guarantee a sufficient erasure of the tape.

The erasing current should be 220 to 350 ma, measured directly at the erasing head. An accurate measurement is achieved by means of a thermo-couple current meter. An approximate measuring result at a deviation of ± 10% can be obtained when using the AEG universal instrument (1,000 ohms/v) for erasing current measurement.

8. Checking the Noise Level

In order to minimize the hum level a DC heater supply is used for the amplifier valves. Therefore a hum balance adjustment is not necessary in the Magnetophon 85-recorder.

a) Checking of the playback hum level:

The hum level (hum and noise) is checked without running tape in playback position of the recorder. The input selector is switched to the fourth position for monitoring and the hum level measured at the playback output with a VTVM.

The hum level at turned-off level control should be: ≦ 1 mv

The hum level at turned-on level control should be: ≦ 5 mv

b) Checking the recorded hum:

Connect a VTVM to the earphone terminals 2/3 (output unloaded), remove the oscillator valve and turn the level control fully on. When the recorder is switched to the recording position the VTVM should indicate less than 100 mv. (This should be achieved in the "micro", "radio", and "phono"-positions when actuating the input selector. Note, that the microphon input should be loaded with a well screened 47 kΩ-resistor during this measurement.

E. Adjustment Equipment

Part	Order No.	Part	Order No.
Bow for capstan idler pressure measurement	72 665 52	Spring scale 100 g	62 665 17
Gauge for control pin adjustment	72 665 54	Spring scale 250 g	62 665 41
Bifurcated metal piece, needed for tape tension measurement	72 668 65	Spring scale 1,000 g	62 665 55
Tool for removing the motor pulley	72 668 64	Demagnetizer	72 665 55
Pliers for locking rings, system Benzing Za 11		Test-tape	72 667 91

V. Replacement of Components

1. Turntables

The turntables form complete units, which are placed loosely on their shafts and secured with semicircle-shaped washers. For replacing a turntable, loosen a single screw and turn the securing washer by 180°. Then the turntable may be removed by pulling off.

Before replacing the takeup turntable the counter belt, the slipping belt as well as the right-side brake lever (V 3) should be removed first.

2. Head Assembly Plate

For replacement of several components the head assembly plate must be taken off. Unscrew two retaining screws and turn up the head assembly plate to the left. It is not necessary to break the solder on any connections.

3. Brakes

Unhook the torsion springs at the brake levers and remove the locking rings from the shafts of the brake levers with special pliers Za 11. Then the brake levers may be removed by pulling them upwards. Reassembly should be made in a corresponding way.

The brake linings wear extremely well. If, however, they are worn out, we recommend replacing the whole brake lever.

(Adjustment of brakes see chapter IV C 3.)

The adjustment should be checked after several hours of continuous operation (at least 6 hours). Ref. to IV 2 and 3 c.

4. Drive Belts

a) Slipping belt:

Remove the counter belt and then take the slipping belt off. After replacement the slipping momentum (see IV C 4) should be adjusted.

b) Fly-wheel belt:

Pull this belt off the pulley on the tape speed selector arm, unscrew the head assembly plate (see V 2) and replace the belt.

If the fly-wheel belt has become too loose after a certain period of operation it may be tightened by elongating the tape speed selector arm. This is done by loosening the screw on the rear part of the selector arm and moving this part towards the rear. (The force exerted on the pulley of the tape speed selector arm by the belt tension should amount 400 to 600 g = 0.9 to 1.3 lb.)

c) Motor belt:

Remove the motor belt from the driving pulley, rotate the supply turntable idler manual to the left, so that the belt moves off the idler and slips through between this idler and the reversing idler. Then the belt may be removed by pulling it to the right and moving it between takeup-turntable and idler. The new belt should be incorporated in the reverse mode. The force, exerted on the motor pulley by the belt tension should amount 600 to 750 g approx. (1.3 to 1.65 lb.).

If the belt tension is too low, the belt may be stretched by moving the motor assembly to the rear. This is done by loosening the four screws of the motor screening and moving the motor assembly within elongated holes to the rear.

5. Idlers and Pulleys

The turntable idlers, the slipping belt pulley as well as the pulley on the tape speed selector arm are fixed on their shafts with a snab locking. It is very easy to remove these rotating parts by upward pulling. The new parts are assembled by fixing them until the snab lockings click to. Before removing the supply turntable idler the tension spring of the reversing idler lever should be unhooked. Then press the reversing idler against the supply turntable idler in direction to the head assembly plate until the reversing idler slips through. Remove the motor belt from the supply turntable idler and pull the idler off.

Before replacing the takeup turntable idler, following components must be removed first:

a) the right-side brake lever (see V 3)

b) the counter belt and the slipping belt (see V 4 a)

c) the takeup turntable (see V 1)

d) the motor belt (see V 4 c)

The slipping belt pulley as well as the pulley on the tape speed selector arm may be replaced without removing other components. Only the respective belts should be pulled off.

6. Press Button Assembly

Dismantling should be done in stop position of the recorder. Remove the four lateral retaining screws and pull the press button assembly upwards. If a total removal of the press button assembly is necessary, unsolder the leads of the tape-end stop magnet or remove the magnet from the press button assembly by loosening the two screws in front, holding the magnet. If only the locking rod of the rewind/fast forward key has to be replaced, it is not necessary to separate the tape-end stop magnet.

The re-assembling of the press button assembly should be carried out as follows:

a) Put the levers of the "record" and "playback" button carefully into the slots of the electric switch unit's rods, and hook the locking rod into the bar of the rewind/fast forward key. Insert the four screws but don't tighten them completely.

b) Place the main hood loosely on the machine, adjusting it to fit the counter and both turntables into the appropriate cutouts. Then fit the press button assembly into the cutout of the main hood, remove the main hood and tighten the four screws.

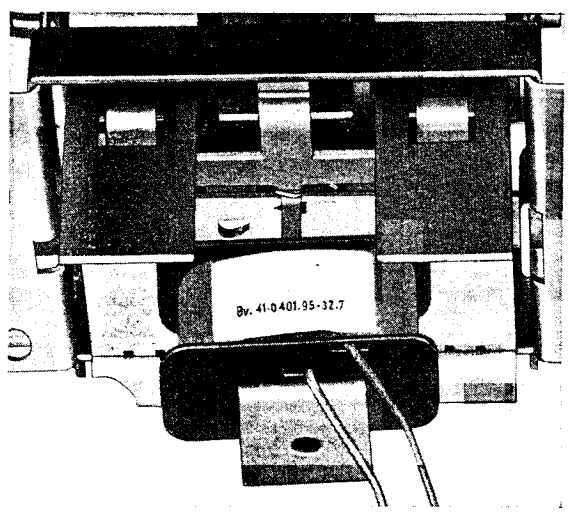
c) Turn the machine over, and loosen the two diagonal arranged retaining screws of the electric switch unit. Move the switch unit in a small range and adjust its position as follows:

When the "record" and "playback" button are depressed simultaneously, the rods of the electric switch unit should have a play of 0.5 mm (0.02") up to their end stops.

d) Check the correct working of each button and the rewind/fast forward key.

7. Tape-End Stop Magnet

For replacement of the tape-end stop magnet the press button assembly must be taken out (see V 6). Remove the two screws in front of the press button assembly and replace the magnet. The new magnet requires to be adjusted within elongated holes. The clearance between the locking lug and the core of the magnet, positioned below, should be as small as possible, but observe that the two cams of the locking rod require a definite stroke of the locking lug, so that the rod is released when the magnet pulls the locking lug. Adjust the magnet, while one cam of the locking rod presses the locking lug down (fig. 12). In this position the clearance between magnet core and locking lug should be 0.1 mm approx. 0.004"). Tighten the screws of the magnet and fix the press button assembly (see V 6). Check, if the automatic tape-end stop works correctly.



Tape-End Stop Magnet

8. Capstan Idler Lever and Magnet

a) Remove the metal sheet, which carries the armature of the capstan idler magnet. (Accessible from the amplifier side of the recorder.)

b) Remove the hinges at both sides of the capstan idler lever (accessible from the mechanism side), and separate the capstan idler lever by pulling upwards.

c) The new capstan idler lever is re-assembled in an analogous way. Following adjustments should be made:

d) Clamp a 3 mm (0.12") — separator piece between the holder of the capstan idler and its right-hand fastening post, and loosen the two screws of the magnet. Hold the armature against the magnet surface and move the magnet within elongated holes until the capstan idler engages the capstan. In this poistion tighten the magnet screws and remove the separator piece.

It should be checked that the capstan idler lever and the two tape pressure posts, fixed on it, are parallel aligned to the capstan and the tape guides when the recorder is operated as for playback. If not, it is possible to correct the alignment after loosening the lateral hinges and moving them in a very small range forwards or backwards.

e) When the capstan idler magnet has been replaced, the same procedure should be used for adjusting it. To remove the capstan idler magnet, loosen two screws and unsolder the two magnet leads.

f) In the stand by position of the capstan idler lever the clearance between capstan idler and capstan should be approx. 5 to 6 mm (0.2 to 0.24") in order to achieve a proper tape threading. This may be adjusted by bending the stop at the left side of the capstan idler lever.

9. Capstan Shaft Bearing with Capstan and Fly-Wheel

To replace the capstan shaft bearing the head assembly plate must be loosened (see V 2) and the capstan idler lever taken out (see V 8). The three screws of the capstan shaft bearing are accessible through holes in the fly-wheel. Remove these screws and pull the fly-wheel belt off. Then the whole capstan unit may be taken out.

10. Drive Motor

To replace the motor, pull off the motor belt and remove four nuts. Unsolder the four motor leads, accessible from the amplifier side, and take the motor out from this side. The motor is rubber buffer mounted in order to keep motor vibrations away from the driving assembly. Therefore don't screw-on the fastening nuts too tight when incorporating a new motor. Further more tighten the nuts equally so that the motor shaft is positioned parallel to the idler shafts. The motor belt should run in about middle position on the motor pulley and the turntable idlers.

11. Motor Pulley

The rubber pulley is tightly fixed on the motor shaft. If the pulley should be replaced as for altering to 60 cycles/sec mains supply operation, we recommend using a special tool for removing this pulley (see adjustment equipment). It will be necessary to remove the tape speed selector arm (see V 12) during this procedure.

12. Tape Speed Selector Arm

Remove the locking ring from the centre shaft of the tape speed selector arm and pull off the fly-wheel belt. Then the tape speed selector arm may be taken out. When incorporating this component depress the spring with the guide washer over it on the tilt lever, so that the pin on the end of the tape speed selector arm guides into the slot of the tilt lever. Then fix the locking ring and thread the fly-wheel belt.

13. Reversing Idler

The reversing idler may be replaced after removing two locking rings, one from the centre shaft of the reversing idler lever and one from the push rod. Adjustment of the reversing idler (see IV C 8).

14. Switch Unit, actuated by the Rewind/Fast Forward Key

This switch unit is placed between the amplifier chassis and the cast frame of the driving assembly below the rewind/fast forward key. There is not enough clearance for removing this switch unit without further ceremony. Therefore it is necessary to loosen (not remove) the four screws, holding the amplifier chassis to the cast frame. Lift the front of the driving assembly somewhat up, remove two screws, holding the switch unit and pull the switch unit to the front. The left screw is accessible through a slot in the rewind/fast forward slide rod, when moved to rewind, the right one may be unscrewed in the same way in the fast forward position. Unsolder the leads of the switch unit and connect them to the new switch, which should be incorporated in a corresponding way. Before tightening the screws completely, adjust the switch unit within elongated holes, so that the cam of the switch is actuated in the rewind and fast/forward position. In the central position of the rewind/fast forward key the cam should be disengaged. The correct adjustment may be watched through slots in the cast frame.

15. Recording/Playback Head (ULTRA-Head)

If the recording/playback head has to be replaced, remove the clamp of the head housing by pressing it to the front. Then the upper part of the head housing as well as the head itself may be pulled off. Insert the new head, close the head housing and press the clamp down, until the hooks on both sides of the clamp click to.

Make measurements, according to chapter IV C, page 13.

16. Erasing Head

Unsolder the two leads of the erasing head, remove the nut on the left-side tape guide and pull the erasing head off. The nut should not be tightened completely until the new erasing head is turned in such a position that its surface comes in complete contact with the tape in recording position.

17. Valves

The replacement of the amplifier valves is performed in the usual manner. Due to the use of a DC heater supply it is not necessary to balance the hum level after replacing one of the audio amplifier valves.

When removing the valve ECC 83, the recorder should be switched off to avoid overloading of the shunted resistor W 60.

18. Fuses

The voltage selector and the fuses are accessible from the rear of the recorder after removing the cover plate, which is fastened with a single screw. The ampere rating of the fuses should be adapted to the mains supply voltage as follows:

110/127 volts	0.4 amps.	semi-delayed action type
150 volts	0.6 amps.	
220/240 volts	0.8 amps.	

VI. Further Hints

A. Tolerances of Mains Supply Voltage

The tape recorder MAGNETOPHON 85 ist tested in the factory for troublefree operation at up to ± 10% deviation from the rated value. Greater deviations are not guaranteed to give satisfactory performance.

B. 60 Cycles Mains Operation

If the MAGNETOPHON 85 should be operated at a 60 cycles mains supply, the motor voltage must be altered as follows:

Main phase (red motor lead): from 183 to 220 volts.

Transformer connection of the auxiliary phase capacitor:

a) recording and playback: from 110 to 127 volts.

b) Rewind and fast forward: from 220 to 240 volts.

In consequence of the 20% higher motor speed at 60 cycles the motor pulley must be exchanged by a pulley with a smaller diameter. The motor belt too has to be exchanged by a shorter one.

Auxiliary phase capacitor: 0.7 μF instead of 1.0 μF.

A complete set, including all components for adapting the recorder from 50 to 60 cps mains operation is available. A detailed mounting instruction will be found inclosed.

C. Providing Radio Receivers with a Diode Output

Since summer 1955, all radio receivers beyond a certain size are equipped with a standardized recorder socket (DIN 41 524). In order to achieve highest tonal quality, it is strongly recommended, that a diode jack is subsequently installed in receivers of previous years. For this purpose a diode socket plate, order No. 91 452 64, may be obtained which is provided with an additional pick-up socket. After removing the existing pick-up socket of the radio receiver, this diode socket plate can easily be installed in its place.

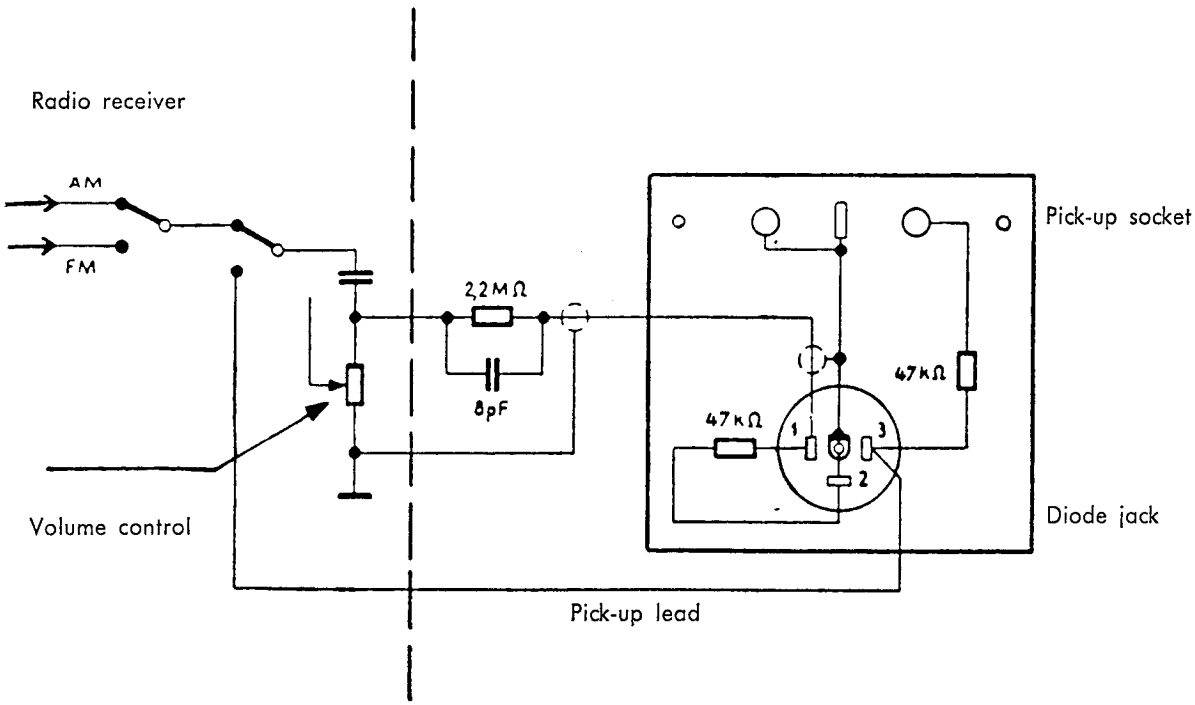
The wiring has to be modified as follows:

a) The 2.2 Megohm resistor located at the end of the shielded line is to be connected with the live end of the volume control of the radio, while the shielded line is connected with the dead end.

b) The live pick-up wire is to be connected with pole 3 of the diode jack.

Diode Socket Plate

(as seen onto the soldering lugs)



VII. Hints for Trouble Shooting

Trouble	Cause	Remedy
1. Recorder does not shut off at the end of tape.	1. Metal foil at the end of tape does not make contact with the right-side tape guide.	Check, if tape-end stop works correctly when bridging the two parts of the right tape guide with a screwdriver or a piece of metal.
	2. Too much clearance between locking lug and tape-end stop magnet.	Check the clearance. See V 7 page 15.
2. Tape is forming loops when changing from "rewind" to "stop".	1. Right-side brake not adjusted properly.	Adjust the brake. See IV C 3, page 11.
	2. Wedge effect of the left-side brake not adjusted properly.	Adjustment see IV C 3 e and f, page 11.
3. Tape is forming loops when changing from "fast forward" to "stop".	1. Left-side brake not adjusted properly.	Adjust the brake. See IV C 3, page 11.
	2. Wedge effect of the right-side brake not adjusted properly.	Adjustment see IV C 3 e and f, page 11.
4. Tape too slowly or insufficient rewound.	1. Takeup turntable too much braked.	Adjust the right-side brake. Adjustment see IV C 3, page 11.
	2. Mains voltage too low.	See hint VI A, page 17.
	3. Tension of the motor belt insufficient or motor belt worn.	Tighten the belt or replace. See V 4 c, page 15.
	4. Reversing idler soiled or worn.	Clean the surface of the reversing idler, see IV B 3, page 10, or replace (see V 13, page 16).
	5. Reversing idler not adjusted properly.	Adjustment see IV 8 b, page 13.
	6. Rewind/fast forward key not actuating the switch unit. Therefore too low power applied to the motor.	Adjust the switch unit. See V 14, page 16.
5. Tape too slowly or insufficient wound forward.	1. Supply turntable too much braked.	Adjust the left-side brake. Adjustment see IV C 3, page 11.
	2. Mains voltage too low.	See hint VI A, page 17.
	3. Rewind/fast forward key not actuating the switch unit. Therefore too low power applied to the motor.	Adjust the switch unit. See V 14, page 16.
6. No tape movement at all.	1. Thermal switch inside the motor has interrupted the mains circuit. (Too much heat inside the recorder, possibly caused by missing air intake.)	Thermal switch closes the mains circuit automatically after approx. 30 minutes. (Place the recorder on even surfaces only, not on rough blancets or pillows, otherwise the motor cooling will become ineffectual.)
	2. Motor belt has jumped off the turntable idlers.	Place the belt to the idlers and check, if the shafts of the idlers are parallel to the motor shaft (see V 10, page 16). If necessary, raise the belt tension (see V 4 c, page 15).
7. Takeup turntable not rotating correctly during "recording" or "playback".	1. Slipping momentum not adjusted properly.	Adjustment see IV C 4, page 12.
	2. Brake is not lifted off the takeup turntable.	Adjustment see IV C 7, page 12.
	3. Slipping belt has jumped off its pulley.	Position the slipping belt to its pulley.
8. Slipping momentum too high.	1. Rubber particles on the tissue side of the belt.	Replace the slipping belt. See V 4 a, page 15.
	2. Slipping belt worn.	Replace the slipping belt. See V 4 a, page 15.
	3. Nylon groove of the slipping belt pulley soiled.	Clean this part carefully with methylated spirit.
9. Wow during reproduction.	1. Left-side brake not adjusted properly.	Adjustment see C 3, page 11.
	2. Linings of the left-side brake worn.	Replace the brake lever. See V 3, page 15.
	3. Oil on driving belts or idlers.	Clean the driving parts with methylated spirit.
	4. Pressure of the capstan idler against the capstan too low.	Adjustment see IV C 5, page 12.

Trouble	Cause	Remedy
10. "Quick stop" does not work.	1. Contacts of the quick stop button soiled.	Rub contacts with emery. If necessary, raise the pressure of contacts.
	2. Remote control still connected and not switched to "stop".	Set the remote control to "stop".
11. Capstan idler magnet inoperative (recording or playback).	1. "Quick stop" button still depressed.	Release the button.
12. Counter out of action.	1. Counter touches the main hood.	Adjust the main hood to the counter position after loosening the retaining screws on the main hood.
	2. Counter belt broken.	Replace the counter belt.
13. A tape reel is dragging over the main hood.	1. Reel warped.	Replace the reel.
	2. Screws on the main hood not tightened completely.	Tighten the screws.
14. Tape not erased properly.	1. Nut of the left-side tape guide loose. Surface of the tape does not touch the erasing head.	Set the erasing head to the correct position and tighten the nut again.
	2. Gap of the erasing head is soiled.	Clean the head. See IV B 1, page 10.
	3. Oscillator valve defective.	Replace the valve.
	4. Trouble in the oscillator circuit.	Check the oscillator circuit.
15. Distorted reproduction.	1. Defective tape.	Use immaculate tapes only.
	2. Recording/playback head soiled.	Clean the head. See IV B 1, page 10.
	3. Tape tension not within the limits.	Check the tape tension. See IV C 2, page 11. If necessary readjust the left-side brake. See IV C 3 b/c, page 11.
	4. Trouble in the amplifier.	Thread a tape, known as well recorded, and check wether defect appears in playback.
16. Bad or fluctuating treble reproduction.	1. Recording/playback head not adjusted properly.	As the recorder is equipped with a combined head, treble response is not influenced by head alignment. If previous recordings, known as correctly recorded, show a bad treble response, head alignment has possibly altered.
	2. Recording/playback head soiled.	Clean the head. See IV B 1, page 10.
	3. Tape tension too low.	Check the tape tension. See IV C 2, page 11.
	4. Tape pressure posts do not press the tape correctly against the recording/playback head.	Check the position of the capstan idler lever. See V 8 d, page 16.
17. Playback level varying.	1. One-edge stretched tape used.	Use another tape.
	2. Tape tension too low.	Check the tape tension. See IV C 2, page 11. If necessary, readjust the left-side brake. See IV C 3 b/c, page 11.
18. Hum reproduced.	1. Hum already recorded on tape.	Check by playing a previously made good recording.
	2. Modulation on tape too weak.	Make a new recording at correct level setting.
19. Whistling noise heard through the radio receiver when reproducing.	1. This may be possible when the low impedance loudspeaker output of a radio receiver is used for recording.	Best results can be obtained only with a diode connection. See VI C, page 17.
	2. Trouble in the amplifier. (Dry joint, or ground connection missing.)	Check the amplifier.
20. Engine noise audible in the loudspeaker.	1. Noise is recorded from the microphone	Don't place the microphone near the recorder.
	2. Screening flap does not close the head housing completely.	Adjust the screening flap.
	3. First or second stage valve shows a microphone effect.	Replace the valve.

VIII. LIST OF SPARE PARTS

The index numbers are corresponding to the figures 3 to 5 and to the schematic diagram.

Index No.	Part	Order No.
	Case	
	Main hood, complete	70 426 87
	Rear cover hood with sign MAGNETOPHON 85	70 427 64
	Front hood with sign TELEFUNKEN	70 426 88
	Wooden cabinet for table model	70 426 86
	Lattice cover for cabinet bottom	60 859 26
	Rubber foot for cabinet	62 702 86
	Gasket ring for air intake	60 858 05
	Cover for voltage selector	70 427 58
	Sign MAGNETOPHON 85	60 859 11
	Sign TELEFUNKEN	60 851 40
	Escutcheon for press button assembly	60 856 87
	Escutcheon for magic eye	60 857 98
	Escutcheon for counter	60 857 90
	Escutcheon for tape speed selector	60 856 37
	Screw for main hood fastening	72 702 87
	Knob for input selector switch with spring	60 859 08
	Felt washer for selector knob	62 702 88
	Escutcheon for selector knob	60 857 93
	Felt washer for selector escutcheon	60 856 85
	Control knob for recording level with spring	60 858 07
	Felt washer for control knob	60 856 38
	Rewind/fast forward key	60 851 01
	Key for tape speed selector	60 858 48
	Record safety- or quick stop button	60 858 43
	Push rod for record safety- or quick stop button	60 858 67
	Pressure spring for record safety- or quick stop button	60 856 65
	Washer for pressure spring	70 228 54
	Cam for quick stop button	60 858 03
	Cam for record safety button	60 859 03
	Press Button Assembly	
17	Press button assembly, complete	70 427 07
	Press button	68 013 79
	Pressure spring for record and stop button	60 851 47
	Pressure spring for playback button	60 851 53
	Tension spring for locking lug	60 851 46
	Spring for record safety lever	60 851 52
18	Switch contacts for magnet circuit	60 856 79
	Coil for tape end-stop magnet	70 358 64
16	Locking rod for rewind/fast forward key	70 227 77
	Electric switch unit	60 857 97

Index No.	Part	Order No.
	Capstan Idler Lever	
	Capstan idler magnet	70 429 88
7	Capstan idler lever, complete	70 427 03
8	Capstan idler with holder	70 427 46
	Pressure spring for capstan idler	68 013 53
	Guide washer for pressure spring	70 220 74
13	Screening flap for recording/playback head	70 427 47
20	Tape pressure posts	70 227 59
	Head Assembly Plate	
41	Head assembly plate, complete, without head, screening cover and clamp	70 427 02
	Cover for screening case	70 427 05
	Recording/playback head (ULTRA-head)	97 450 00
21	Erasing head	60 858 71
22	Head screening case with balance plate	70 426 81
	Clamp for screening case	70 227 01
	Roller for slipping belt stretch lever	70 427 45
4	Right tape guide and tape-end stop contact	70 423 70
12	Third tape guide	70 227 47
	Further Mechanical Parts	
	Standard 3-pole jack	68 003 91
	Socket for pick-up connection	70 400 10
	Connector designations (1 set)	60 856 53-58
42	Counter	60 857 01
	Knurled reel for counter	62 702 89
39	Belt for counter	70 227 12
37	Takeup turntable	70 426 98
26	Supply turntable	70 426 97
	Washer for turntable play limit	70 227 08
24	Left-side brake lever, complete	70 426 99
40	Right-side brake lever, complete	70 427 00
	Torsion spring for brake lever, left	60 857 62
	Torsion spring for brake lever, right	60 857 63
19	Brake releasing lever, left	70 227 09
3	Brake releasing lever, right	70 227 10
	Spring for brake releasing lever, left	60 856 73
	Spring for brake releasing lever, right	60 856 75
36	Slipping belt pulley	70 427 19
	Lever for slipping belt pulley	70 426 95
	Hold back spring for slipping belt pulley	60 856 74
35	Slipping belt	60 858 82
31	Motor belt (length for 50 cps operation)	60 858 80
	Motor belt (length for 60 cps operation)	62 702 93

List of Spare Parts

The index numbers are corresponding to the figures 3 to 5 and to the schematic diagram.

Index No.	Part	Order No.
33	Fly-wheel belt	60 858 79
32	Motor pulley (for 50 cps operation)	70 227 17
	Motor pulley (for 60 cps operation)	72 702 90
27	Supply turntable idler	70 427 25
34	Takeup turntable idler	70 427 28
25	Reversing idler, complete with lever	70 426 96
	Spring for reversing idler	60 856 77
	Push rod for reversing idler	70 228 52
	Arm of the supply turntable idler, compl.	70 427 11
	Arm of the takeup turntable idler, compl.	70 427 12
	Tension spring between the arms of the turntable idlers	60 856 66
30	Arm of the tape speed selector, complete with pulley	70 427 13
28	Pulley of the tape speed selector	70 427 30
	Rubber ring for tape speed selector	62 702 91
	Tilt lever for tape speed selector	70 427 14
	Pressure spring for tilt lever	60 856 76
	Guide washer for tilt lever spring	70 227 16
	Slide fork of the tape speed selector	70 427 08
	Rubber end-stop for slide fork	62 702 91
10	Rewind/fast forward slider	72 702 92
	Motor screening	70 427 17
	Rubber shock mounting for drive motor	60 854 07
	Washer for motor mounting	70 220 40
9	Fly-wheel, complete with bearing	70 427 01
	Plastic bottom for capstan shaft	68 013 37
	Ball for capstan shaft	62 702 95
	Locking ring No. 2 system Benzing	70 316 88
	Locking ring No. 3 „ „	70 317 47
	Locking ring No. 4 „ „	70 318 16
	Electrical Parts	
	Fuse 0.4 amps. (semi-delayed action type)	60 429 25
	Fuse 0.6 amps. (semi-delayed action type)	60 429 30
	Fuse 0.8 amps. (semi-delayed action type)	60 429 32
	Voltage selector	70 422 99
	Motor	60 858 81
	Power transformer	70 359 02
	Selenium rectifier B 250 C 65/110 K 1	60 423 54
	Selenium rectifier B 25/20 0.8 r	60 423 16
	Selenium rectifier E 30 C 5 K 1	60 423 11
C 8	Small electrolytic capacitor 4 MF 350/385 v	60 419 51
C 42	Small electrolytic capacitor 1 MF 35 v	62 702 96
C 17	Small electrolytic capacitor 50 MF 6/8 v	60 421 27
C 40	Small electrolytic capacitor 300 MF 30/35 v	60 422 53
C 43/44	Small electrolytic capacitor 1 MF 70/80 v	60 418 77
C 37/38	Electrolytic capacitor 2 x 50 MF 350/385 v	70 422 15
W 21	Potentiometer with input selector switch 500 kilohms	60 858 99
W 34	Variable resistor 220 kilohms	60 431 02
W 44	Variable resistor 100 kilohms	62 702 94
C 10	Trimmer 15/45 pF	60 430 97
G	Equalization switch unit	60 858 16
14	Trick contacts	60 856 80
6	Quick stop contacts	60 856 81
	Rewind/fast forward switch assembly	60 856 84
C 39	Auxiliary phase capacitor for motor 1 MF 450 v (for 50 cps operation)	60 419 00
C 39	Auxiliary phase capacitor for motor 0.7 MF 500 v (for 60 cps operation)	60 418 66
	Oscillator coil	70 359 03
	Portable Case	
	Plastic cover plate for power stage, complete	70 427 70
	Bass control emblem	62 702 99
	Treble control emblem	62 703 00
	Escutcheon for volume control	60 856 94
	Cover plate mounting screws	70 231 39
	Knurled reel for bass and treble control	62 703 01
	Power stage (ordinary), complete without valve	70 429 81
	Push-pull power stage, complete without valves	70 429 85
	Case lock with screws	62 703 02
	Case hinge with screws	62 703 03
	Rear slide foot	62 703 04
	Case rubber foot	62 703 05
	Slide shutter with frame	68 594 56
	Catch for slide shutter, complete	70 430 10
	Escutcheon for slide shutter catch	62 703 10
	Knob for slide shutter catch	60 859 67
	Case lining, perforated	70 229 64
	Ornamental border (1 set)	62 703 06
	Carrying handle, complete	60 859 59
	Loudspeaker (oval)	62 703 07
	Loudspeaker connection socket	70 221 63
	Case lid, complete	62 703 08
	Portable case, empty, complete	62 703 09
	Power Stages	
W 409	Volume control 500 kilohms with switch	62 703 11
W 406	Treble control 500 kilohms	62 703 12
W 403	Bass control 10 megohms	62 703 13
	Output transformer for ordinary power stage	70 359 04
	Output transformer for push-pull power stage	70 359 05
W 424	Variable resistor 47 kilohms	60 425 21
C 414/415	Electrolytic capacitor 2 x 50 MF 350/385 v	70 422 15
C 413	Small electrolytic capacitor 50 MF 30/35 v	60 421 45
C 416	Small electrolytic capacitor 5 MF 30/35 v	60 419 52
	Fuse 0.05 amps.	62 703 14

Alterations reserved!