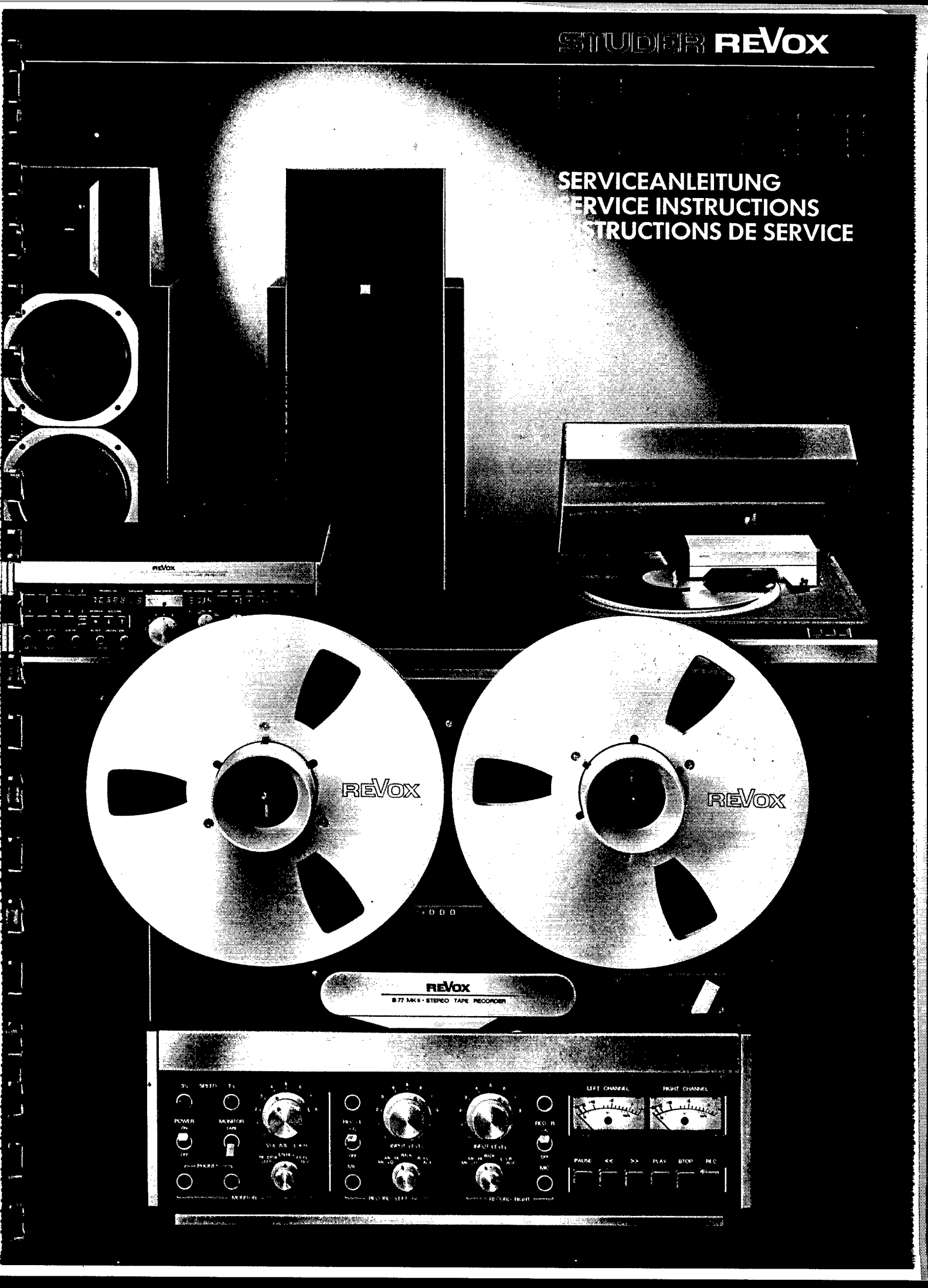
STUDER REVOX

# SERVICEANLEITUNG
# ERVICE INSTRUCTIONS
# TRUCTIONS DE SERVICE



## 2. Technische Daten

(Messwerte "über Band" mit Tonband REVOX 631)

*Laufwerk:*
3-Motoren Laufwerk, 2 AC-Wickelmotoren, 1 AC-Capstanmotor, elektronisch geregelt

*Bandgeschwindigkeiten:*
9,5 cm/s und 19 cm/s, elektronisch umgeschaltet
Toleranz der Sollgeschwindigkeit ± 0,2 %
Variable Geschwindigkeit von 6,5 ... 28cm/s

*Tonhöhenschwankungen:*
(nach DIN 45507)
bei 9,5 cm/s besser als 0,1 %
bei 19 cm/s besser als 0,08 %

*Schlupf:*
max. 0,2 %

*Spulengrösse:*
bis 26,5 cm (10,5") Durchmesser
(min. Kerndurchmesser 6 cm)
Bandzug umschaltbar
(für kleine Kerndurchmesser)

*Umspulzeiten:*
ca. 135 sec für 1100 m Tonband

*Laufwerksteuerung:*
Integrierte Logik für beliebige Funktionsübergänge mit Bandlaufsensor. Motoren kontaktlos, elektronisch umgeschaltet. Alle Funktionen fernsteuerbar. Schaltuhrbetrieb mit Fernbedienung möglich.

*Entzerrungen:*
(nach NAB)
9,5 cm/s: 90 µsec / 3180 µsec
19 cm/s: 50 µsec / 3180 µsec

*Frequenzgang:*
(über Band gemessen, bei –20 VU)

| | | |
|---|---|---|
| bei 9,5 cm/s | 30 Hz ... 16 kHz | + 2/–3 dB |
| | 50 Hz ... 10 kHz | ± 1,5 dB |
| bei 19 cm/s | 30 Hz ... 20 kHz | + 2/–3 dB |
| | 50 Hz ... 15 kHz | ± 1,5 dB |

*Vollaussteuerung:*
514 nWb/m entsprechen 6 dB über 0 VU

*Aussteuerungsanzeige:*
VU-Meter nach ASA-Norm,
mit LED Übersteuerungsanzeigen

*Klirrfaktor:*

| bei | 0 VU (257 nWb/m) | 0 VU + 6 dB (514 nWb/m) |
|---|---|---|
| bei 9,5 cm/s | < 0,5 % | < 1,5 % |
| bei 19 cm/s | < 0,2 % | < 0,5 % |

## 2. Technical Specifications

("overall" performance data as measured with REVOX 631 tape)

*Tape transport mechanism:*
3-motor tape drive; 2 AC driven spooling motors; 1 AC driven capstan motor, electronically regulated.

*Tape speeds:*
3.75 ips and 7.5 ips, electronic change-over
Tolerance from nominal ± 0.2 %
Speed variable from 2.5 ... 11ips

*Wow and flutter:*
(as per DIN 45507/consistent with IEEE standard 193-1071)
at 3.75 ips less than 0.1 %
at 7.5 ips less than 0.08 %

*Tape slip:*
max. 0.2 %

*Reel size:*
Up to 10.5 inch diameter (min. hub diameter 2.36 inches). Tape tension switchable (for small hub diameters).

*Winding time:*
Approx. 135 sec for 3600 ft of tape

*Tape transport control:*
Integrated control logic with tape motion sensor for any desired transition between different operating modes. Contactless electronic switching of all motors. Remote control of all functions and electric timer operation are possible.

*Equalization:*
(as per NAB)
3.75 ips: 90 µsec / 3180 µsec
7.5 ips: 50 µsec / 3180 µsec

*Frequency response:*
(measured via tape, at –20 VU)

| | | |
|---|---|---|
| at 3.75 ips | 30 Hz ... 16 kHz | + 2/–3 dB |
| | 50 Hz ... 10 kHz | ± 1.5 dB |
| at 7.5 ips | 30 Hz ... 20 kHz | + 2/–3 dB |
| | 50 Hz ... 15 kHz | ± 1.5 dB |

*Peak recording level:*
514 nWb/m corresponds to 6 dB above 0 VU

*Level metering:*
VU-meter as per ASA-standard, with LED peak level indicators.

*Distortion:*

| at | 0 VU (257 nWb/m) | 0 VU + 6 dB (514 nWb/m) |
|---|---|---|
| at 3.75 ips | < 0.5 % | < 1.5 % |
| at 7.5 ips | < 0.2 % | < 0.5% |

## 2. Caractéristiques techniques

(Valeurs de mesure "après bande" avec la bande REVOX 631)

*Entraînement:*
entraînement à 3 moteurs, 2 moteurs AC de bobinage;
1 moteur AC de cabestan, à régulation électronique.

*Vitesse de défilement:*
9,5 cm/s et 19 cm/s
à commutation électronique
Tolérance de la vitesse nominale: ± 0,2 %
Variation de vitesse de 6,5 à 28cm/s

*Pleurage:*
(d'après DIN 45507)
à 9,5 cm/s meilleur que 0,1 %
à 19 cm/s meilleur que 0,08 %

*Dérive:*
max. 0,2 %

*Diamètre des bobines:*
jusqu'à 26,5 cm (10.5")
Diamètre minimum du noyau: 6 cm
Tension de bande commutable
(pour les petits noyaux)

*Durée de rebobinage:*
environ 135 sec pour une bande de 1100 m

*Commande du mécanisme:*
Commande des fonctions par logique intégrée avec détecteur de mouvement.
Commande électronique (sans contact) des moteurs. Toutes les fonctions télécommandables. Fonctionnement possible de la télécommande avec interrupteur horaire.

*Corrections:*
(d'après NAB)
9,5 cm/s: 90 µsec / 3180 µsec
19 cm/s: 50 µsec / 3180 µsec

*Réponse en fréquence:*
(enregistrement-lecture, mesurée à –20 VU)

| | | |
|---|---|---|
| à 9,5 cm/s | 30 Hz ... 16 kHz | + 2 / –3 dB |
| | 50 Hz ... 10 kHz | ± 1,5 dB |
| à 19 cm/s | 30 Hz ... 20 kHz | + 2 / –3 dB |
| | 50 Hz ... 15 kHz | ± 1,5 dB |

*Niveau maximum:*
514 nWb/m, correspondant à + 6 dB VU

*Indicateurs de niveau:*
VU-mètres d'après la norme ASA, avec indicateurs LED des valeurs de pointe

*Taux de distorsion harmonique:*

| à | 0 dB VU (257 nWb/m) | + 6 dB VU (514 nWb/m) |
|---|---|---|
| à 9,5 cm/s | < 0,5 % | < 1,5 % |
| à 19 cm/s | < 0,2 % | < 0,5% |

*Geräuschspannungsabstand:*
(nach ASA-A, über Band gemessen)
2-Spur:
bei 9,5 cm/s besser als 64 dB
bei 19 cm/s besser als 67 dB
4-Spur:
bei 9,5 cm/s besser als 60 dB
bei 19 cm/s besser als 63 dB

*Übersprechdämpfung:*
(bei 1000 Hz)
Stereo besser als 45 dB
Mono besser als 60 dB

*Löschdämpfung:*
bei 19 cm/s besser als 75 dB

*Eingänge pro Kanal:*
MIC (asymmetrisch)
Position LO: 0,15 mV / 2,2 kOhm
für Mikrofone von 50 ... 600 Ohm
Position HI: 2,8 mV / 110 kOhm
für Mikrofone von 50 Ohm ... 20 kOhm
RADIO: 2,8 mV / 20 kOhm
AUX: 40 mV / 220 kOhm
Übersteuerungsfestigkeit aller Eingänge:
40 dB (1 : 100)

*Ausgänge pro Kanal:*
(Pegel bei 0 VU + 6 dB, resp. 514 nWb/m)
OUTPUT: 1,55 V / $R_i$ 390 Ohm, max. 1,5 kOhm
mit Pegelsteller regelbar, max. –26 dB
RADIO: 1,55 V / $R_i$ 4,7 kOhm
mit Pegelsteller regelbar, max. –26 dB
PHONES: (2 x) max. 5,6 V / $R_i$ 220 kOhm
kurzschlussfest, optimal für Kopfhörer
von 200 ... 600 Ohm

*Anschlüsse für:*
Fernbedienung Laufwerk-Funktionen
Fernbedienung variable Bandgeschwindigkeit
Diaprojektor oder Überblendeinheit
(nachrüstbar)

*Bestückung:*
11 IC, 1 Opto-Koppler, 4 Triac,
60 Transistoren, 33 Dioden, 5 LED,
2 Brückengleichrichter, 3 Relais.

*Stromversorgung:*
100 ... 240 V ∿ ± 10 %,
umschaltbar: 100 V, 120 V, 140 V, 200 V,
220 V, 240 V
50 ... 60 Hz ohne Umschaltung
max. 80 Watt
Netzsicherung:
100 ... 140 V: 1 AT
200 ... 240 V: 0,5 AT

*Gewicht (Masse):*
ca. 17 kg

*Signal to noise ratio:*
(weighted as per ASA-A, measured via tape)
half track:
at 3.75 ips better than 64 dB
at 7.5 ips better than 67 dB
quarter track:
at 3.75 ips better than 60 dB
at 7.5 ips better than 63 dB

*Crosstalk:*
(at 1000 Hz)
Stereophonic better than 45 dB
Monophonic better than 60 dB

*Erasure:*
at 7.5 ips better than 75 dB

*Inputs per channel:*
MIC (unbalanced)
position LO: 0.15 mV / 2.2 kohms
for 50 ... 600 ohms microphones
position HI: 2.8 mV / 110 kohms
for microphone impedances from 50 ohms to 20 kohms
RADIO: 2.8 mV / 20 kohms
AUX: 40 mV / 220 kohms
Overload margin on all inputs:
40 dB (1 : 100)

*Outputs per channel:*
(Level at 6 dB above 0 VU / 514 nWb/m)
OUTPUT: 1.55 V / $R_i$ 390 ohms max. 1.5 kohms
adjustable with preset control, max. attenuation –26 dB
RADIO: 1,55 V / $R_i$ 4,7 kohms
adjustable with preset control, max. attenuation –26 dB
PHONES: (2 x) max. 5.6 V / $R_i$ 220 ohms
short-circuit proof, optimum matching impedance 200 ... 600 ohms

*Connectors for:*
Remote control of tape transport functions
Remote control of variable tape speed
Slide projector or crossfade unit (electronics optional)

*Component parts:*
11 ICs, 1 Opto-coupler, 4 Triacs, 60 transistors, 33 diodes, 5 LEDs, 2 full wave rectifiers, 3 relays.

*Electric current supply:*
100 ... 240 V ∿ ± 10 %
voltage selector for 100 V, 120 V, 140 V, 200 V, 220 V, 240 V
50 ... 60 Hz without conversion
max. 80 watts
Main fuse:
100 ... 140 V: 1 amp slow-blow
200 ... 240 V: 0.5 amp slow-blow

*Weight:*
Approx. 17 kg / 37 lbs 7 ozs

*Rapport signal/bruit:*
(d'après ASA-A, enregistrement-lecture)
2 pistes:
à 9,5 cm/s meilleur que 64 dB
à 19 cm/s meilleur que 67 dB
4 pistes:
à 9,5 cm/s meilleur que 60 dB
à 19 cm/s meilleur que 63 dB

*Amortissement de la diaphonie:*
(à 1000 Hz)
Stéréo plus de 45 dB
Mono plus de 60 dB

*Efficacité d'effacement:*
plus de 75 dB à 19 cm/s

*Entrées par canal:*
MIC (asymétrique)
position LO: 0,15 mV / 2,2 kohms
pour microphones de 50 à 600 ohms
position HI: 2,8 mV / 110 kohms
pour microphones de 50 ohms ... 20 kohms
RADIO: 2,8 mV / 20 kohms
AUX. 40 mV / 220 kohms
Taux de surcharge de toutes les entrées:
40 dB (1 : 100)

*Sorties par canal:*
(niveau à + 6 dB VU, resp. 514 nWb/m)
OUTPUT: 1,55 V / $R_i$ 390 ohms max. 1,5 kohms
avec atténuation ajustable, max. –26 dB
RADIO: 1,55 V / $R_i$ 4,7 kohm
avec atténuation ajustable, max. –26 dB
PHONES: (2 x) max. 5,6 V / $R_i$ 220 ohms
court-circuit sans risque, pour casques de 200 ... 600 ohms.

*Raccordement pour:*
télécommande du mécanisme
variateur de vitesse
projecteur de diapositives ou fondu enchaîné (en option)

*Composants:*
11 IC, 1 photo-coupleur, 4 triacs, 60 transistors, 33 diodes, 5 LED, 2 redresseurs et 3 relais.

*Alimentation:*
100 ... 240 V ∿ ± 10 %
commutable: 100 V, 120, V, 140 V, 200 V, 220 V et 240 V
50 .. 60 Hz sans commutation
consommation max. 80 W
Fusible secteur.
100 ... 140 V: 1 AT
200 ... 240 V: 0,5 AT

*Poids:*
environ 17 kg

Änderungen vorbehalten.

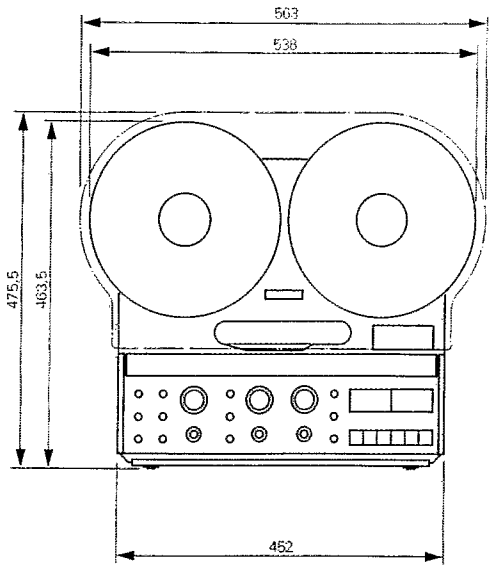
Subject to change.

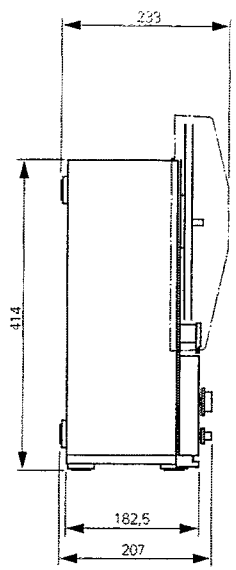
Sous réserve de modification



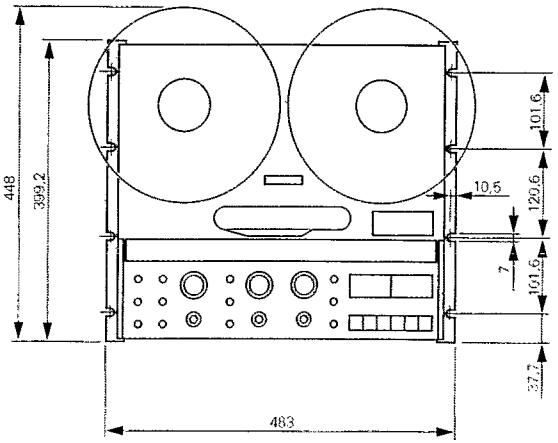
**Abmessungen** **Dimensions** **Dimensions**

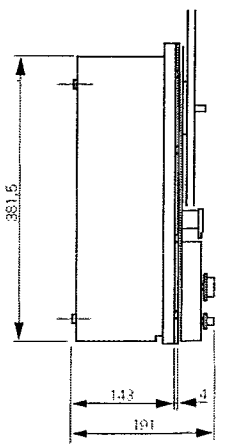
Normale Ausführung Standard Version Version normale




Rack-Ausführung Rack Version Version rack

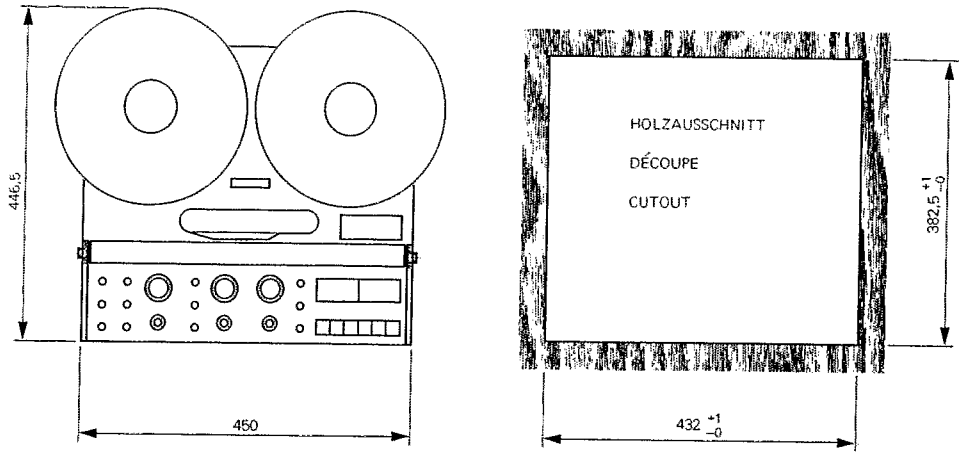


Einbau-Ausführung

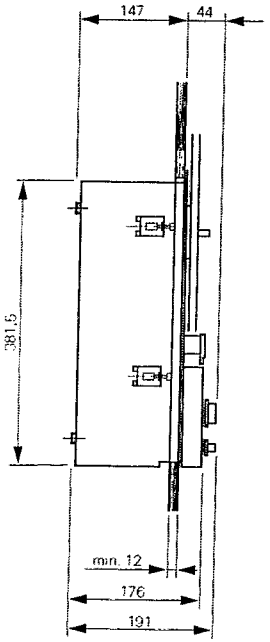
Installation Version

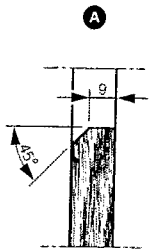
Version à encastrer

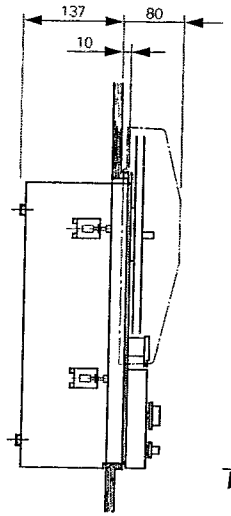


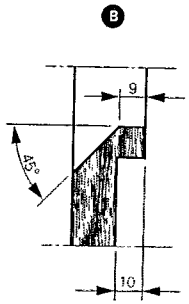







(A) Fasette nur auf der unteren Seite bei Plattendicke grösser als 12 mm

(B) Einbaumasse bei Verwendung der Abdeckhaube

(A) On panel thicknesses in excess of 12 mm, bevelled edge on the bottom side only

(B) Space requirement minimum when using the dust cover

(A) Seule la découpe inférieure nécessite un biseau pour les panneaux de plus de 12 mm d'épaisseur

(B) Dimensions requises pour l'utilisation du couvercle de protection

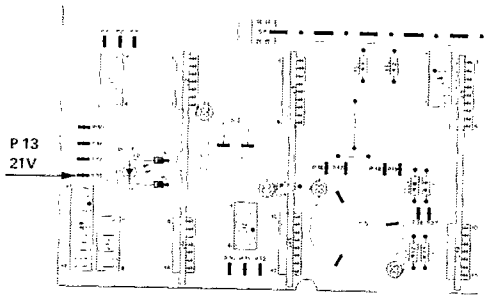



Fig. 6.2.–1

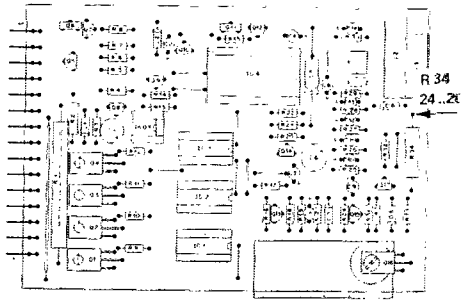



Fig. 6.2.–2

## 6. Elektrische Einstellungen und Messungen

### 6.1. Messgeräte und Hilfsmittel

- Entmagnetisierungs-Drossel
- NF-Millivoltmeter
- NF-Generator
- Klirrfaktor-Messgerät
- Oszilloskop
- Digitalzähler (Counter)
- Tonhöhenschwankungsmesser

### 6.2. Kontrolle der Speisespannungen

Stabilisierte Speisespannungen 21 V:
Auf Audio-Verbindungs-Platine (P13, Fig. 6.2.–1)
Spannung messen: 21 V ± 1 V.
Unstabilisierte Speisespannung 24 V:
Gerät in STOP-Position.
Auf Laufwerksteuerung an Widerstand R34 (Fig. 6.2.–2)
Spannung messen: 24 V ... 26 V (bei Nenn-Netzspannung)

### 6.3. Laufwerk-Einstellungen

#### 6.3.1. Kontrolle der Laufwerkfunktionen

Gerät von Umspulen auf Wiedergabe (PLAY) tasten. Die Andruckrolle darf erst nach Stillstand des rechten Wickeltellers einfahren.

Sollte die Andruckrolle das Band zu früh an die Tonwelle drücken, so ist der Abstand zwischen Sensorspule und Glocke des rechten Wickelmotors zu kontrollieren (ca. 1 ... 1,5 mm).

#### 6.3.2. Tachokopf-Einstellung (Tonmotor)

Der Luftspalt zwischen Tachokopf und Rotor soll 0,3 ... 0,4 mm betragen. Die Einstellung ist in Ordnung, wenn an den Anschlüssen P12 (braun) und P13 (blau) der Stromlaufplatine 35 ... 50 mV (bei 9,5 cm/s Tonmotor-Sollspannung) gemessen wird.

## 6. Electrical adjustments

### 6.1. Required test equipment

- Audio millivoltmeter
- Audio generator
- Distortion factor meter
- Oscilloscope
- Digital counter
- Wow and flutter meter
- Head demagnetizer

### 6.2. Checking the supply voltages

Regulated 21 V supply:
measure voltage on audio interconnection board (P13, fig. 6.2.–1), it must read 21 V ± 1 V.
Unregulated 24 V supply:
Recorder in position STOP.
Measure voltage on tape transport control board at resistor R34 (fig. 6.2.–2), it must read 24 V ... 26 V (under nominal line voltage).

### 6.3. Tape transport adjustments

#### 6.3.1. Checking the tape transport functions

Start the recorder in the fast forward wind function. After a high winding speed is attained, select PLAY – the pinch roller arm must not become activated prior to the complete standstill of the right-hand reel.

If the pinch roller presses the tape against the capstan shaft too soon, check and if necessary correct the clearance between the sensor coil and the spooling motor (approx. 1 ... 1.5 mm/0.039 ... 0.062 inches).

#### 6.3.2. Tacho head adjustment

The clearance between the tacho head and the rotor of the capstan motor should amount to 0.3 ... 0.4 mm/0.011 ... 0.0? inches. The head is correctly positioned when measuring a signal voltage of 35 ... 50 mV at 3.3/4 ips at the contacts P12 (brown) P13 (blue).

## 6. Mesures et réglages électriques

### 6.1. Appareils de mesure et accessoires

- Démagnétiseur
- Millivoltmètre BF
- Générateur BF
- Pont de distorsion
- Oscilloscope
- Compteur digital
- Scintillomètre

### 6.2. Contrôle des tensions d'alimentation

Tension d'alimentation stabilisée 21 V:
Sur le circuit d'interconnexion (P13, fig. 6.2.–1)
Tension à mesurer: 21 V ± 1 V.
Tension d'alimentation non stabilisée 24 V:
Appareil en position STOP.
Sur la commande du mécanisme à la résistance R34 (fig. 6.2.–2)
Tension à mesurer: 24 V ... 26 V (pour la tension secteur nominale)

### 6.3. Réglage du mécanisme

#### 6.3.1. Contrôle des fonctions du mécanisme

Passez du bobinage rapide en lecture (PLAY): Le galet presseur ne doit coller qu'après l'arrêt complet du plateau de bobine droit.

Si ce n'est pas le cas, et que le galet presseur colle trop tôt, contrôlez la distance entre la bobine du détecteur et la cloche du moteur (environ 1 ... 1,5 mm).

#### 6.3.2. Réglage de la tête tachymétrique

La distance entre la tête tachymétrique et la cloche du moteur doit être de 0,3 ... 0,4 mm. Le réglage est correct, lorsque l'on obtient 35 ... 50 mV (à 9,5 cm/s) entre les points P12 (brun) et P13 (bleu) du circuit d'alimentation, en appliquant la tête tachymétrique de 3 ... 4 mV.

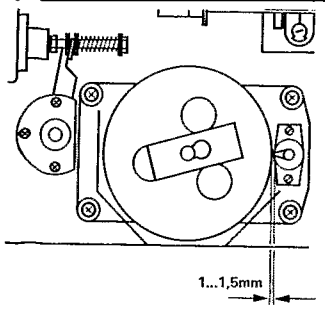



Fig. 6.3.–1

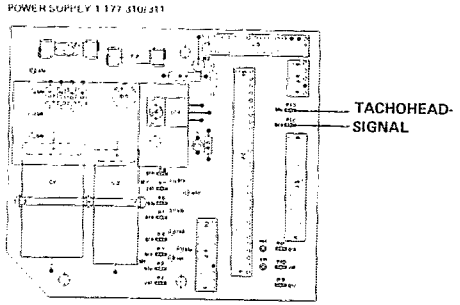



Fig. 6.3.–2

**6.3.3. Geschwindigkeits-Eichung**

– Band einlegen.
– Taste VARY SPEED lösen.
– Gerät auf hoher Bandgeschwindigkeit auf Wiedergabe starten.
– Zähler an TP1 und P5 (Masse) auf Drehzahlregelungs-Steckkarte anschliessen.
– Anzeige an Zähler muss 800 Hz sein. Einstellung an R14.
– Gerät auf kleine Bandgeschwindigkeit umschalten.
Anzeige muss 800 Hz sein.
Die Anzeige bei beiden Bandgeschwindigkeiten muss innerhalb 1 Hz liegen.

**6.3.3. Tape speed calibration**

– Load recorder with tape.
– Release push button VARY SPEED
– Connect digital counter to TP1 and P5 (ground) on the speed control board.
– Select high tape speed and start recorder in function PLAY.
– The readout on the counter must show 800 Hz. If necessary adjust R14.
– Switch recorder to low tape speed, readout must again show 800 Hz.
At both tape speeds the indicated frequency must be within 1 Hz of the nominal frequency.

**6.3.3. Réglage de la vitesse**

– Mettez une bande.
– Poussoir VARY SPEED relâché.
– Enclenchez l'appareil en lecture, en grande vitesse
– Branchez un compteur entre les points TP1 et P5 (masse) de la plaquette de régulation de vitesse.
– Le compteur doit indiquer 800 Hz. Réglage par R14.
– Commutez l'appareil en petite vitesse. Le compteur doit également indiquer 800 Hz.
La différence entre les deux vitesses ne doit pas dépasser 1 Hz.

**6.3.4. Kontrolle Bandendschalter**

Gerät mit eingelegtem Band auf Wiedergabe starten. Bei Transparentband schaltet das Gerät auf STOP. Durch Abheben des Bandes aus dem Strahlbereich der LED muss das Gerät ebenfalls auf STOP schalten.

**6.3.4. Checking the end-of-tape switch**

Load recorder with a short section of tape or prepare a reel of tape by splicing a section of transparent leader into the tape. Start recorder in function PLAY. When the transparent section reaches the light gate, the machine must STOP. This can also be simulated by trying to lift the running tape away from the light gate

**6.3.4. Contrôle de l'arrêt de fin de bande**

L'appareil étant muni d'une bande, démarrez en lecture. Sur l'amorce transparente l'appareil passe en fonction STOP. En écartant la bande du rayonnement de la diode LED, l'appareil doit également s'arrêter.

**6.4. Audio-Einstellungen**
**6.4.1. Testbänder**

Zur Einpegelung der Aufnahme- und Wiedergabeverstärker wird in der nachfolgenden Einstellanleitung das REVOX-Testband als Bezugsband verwendet. Dessen Spezifikationen sind nachfolgend festgehalten.

| Bezugspegel | | OUTPUT |
|---|---|---|
| 0 VU | = 257 nWb/m | 775 mV |
| 0 VU –20 dB | = 25,7 nWb/m | 77,5 mV |

***Alle NF- und HF-Messungen mit abgeschirmten Leitungen vornehmen.***

Alle Messwerte an OUTPUT (51) beziehen sich auf voll geöffnete Regler LEVEL (50) (Fig. 6.4.–1).

**6.4. Audio adjustments**
**6.4.1. Calibration tapes**

For adjusting the reproducing and recording amplifiers as described hereunder, use the REVOX calibration tape (part no 46001) as a reference. The recorded levels are as follows:

| Reference level | | OUTPUT |
|---|---|---|
| 0 VU | = 257 nWb/m | 775 mV |
| –20 dB from 0 VU | = 25,7 nWb/m | 77,5 mV |

***Use shielded cables for all audio and high frequency measurements.***

The signal levels specified for OUTPUT (51) are taken with the controls LEVEL (50) (fig. 6.4.–1) fully open

**6.4. Réglages audio**
**6.4.1. Bande étalon**

Pour l'alignement des amplificateurs d'enregistrement et de lecture, il est recommandé de suivre les instructions de réglage et d'utiliser la bande étalon REVOX dont les spécifications sont les suivantes:

| Niveau de référence | | OUTPUT |
|---|---|---|
| 0 VU | = 257 nWb/m | 775 mV |
| 0 VU –20 dB | = 25,7 nWb/m | 77,5 mV |

***Toutes les mesures BF et HF se font à l'aide de câbles blindés.***

Toutes les valeurs mesurées à la sortie OUTPUT (51) au réglage maximum des potentiomètres LEVEL (50) (fig. 6.4.–1).

**6.4.2. Entmagnetisierung**

***Vor jeder Messung oder Einstellung mit laufendem Band sind die Tonköpfe und Bandführungen zu entmagnetisieren!***

**6.4.2. Demagnetizing**

***Demagnetize the sound heads and tape guides prior to any adjustments or measurements with tape.***

**6.4.2. Démagnétisation**

***Il est très important de démagnétiser les têtes et les guides de bande avant de poser une bande de mesure sur l'appareil.***



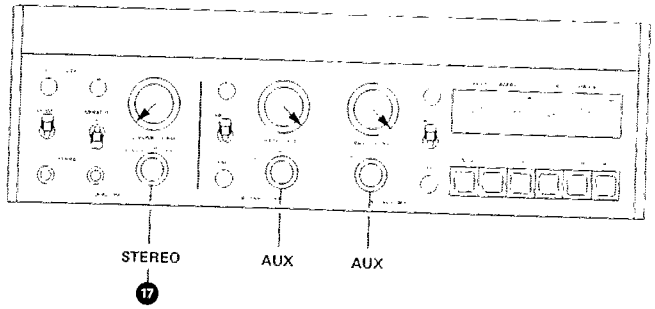
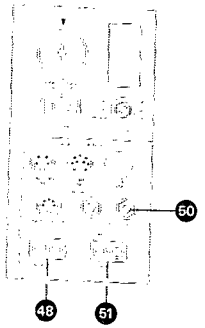



Fig. 6.4.–1




Starke Gleichfeld-Magnetisierungen verschlechtern den Geräuschspannungsabstand und den Frequenzgang. An den Bezugsbändern können zudem Beschädigungen zurückbleiben

Strong DC magnetization causes a deterioration of the signal to noise ratio and frequency response as well. Reference tapes may become permanently damaged.

De fortes inductions magnétiques ont peuvent dégrader les caractéristiques du bruit de fond et de la courbe de réponse et peuvent faire partiellement les bandes étalon

**6.4.3. Kontrolle Eingangsverstärker**

– Bedienungselemente nach Fig. 6.4.–1 einstellen.
– NF-Millivoltmeter an Ausgang OUTPUT (51) anschliessen (Regler LEVEL (50) voll geöffnet).
– NF-Generator an Anschluss AUX INPUT (48) parallel anschliessen. Generatorpegel bei 1000 Hz so einstellen, dass sich am NF-Millivoltmeter eine Spannung von 0,775 V einstellt. Für diese Spannung wird ein Eingangspegel von ca. 20 mV benötigt.

**Anmerkung:**
Der Pegelunterschied am Ausgang soll max. 0,5 dB betragen bei allen Positionen des Betriebsartenschalters MONITOR (17)

**6.4.3. Gain of input amplifier**

– Adjust operating controls as per fig. 6.4.–1.
– Connect audio voltmeter to OUTPUT (51) (potmeters LEVEL (50) fully open)
– Connect audio generator to feed the sockets AUX INPUT (48) parallel. Select frequency of 1000 Hz and adjust generator level until a reading of 0.775 V is obtained on the audio voltmeter. The required input level should read 20 mV approx.

**Note:**
At all positions of the mode selector (MONITOR (17)) the difference in output level must not exceed 0.5 dB

**6.4.3. Contrôle de l'amplificateur d'entrée**

– Effectuez les commutations selon fig. 6.4.–1.
– Branchez un millivoltmètre BF sortie OUTPUT 51 (potentiomètres LE (50) ouvert au max.).
– Raccordez un générateur BF aux en AUX INPUT (48). Réglez le générateur 1000 Hz et le niveau de façon à obtenir 0,7 au millivoltmètre BF. Le niveau d'entrée s'à environ 20 mV.

**Remarque:**
La différence de niveau à la sortie, pour to les positions du sélecteur MONITOR (17), être de 0,5 dB au maximum.

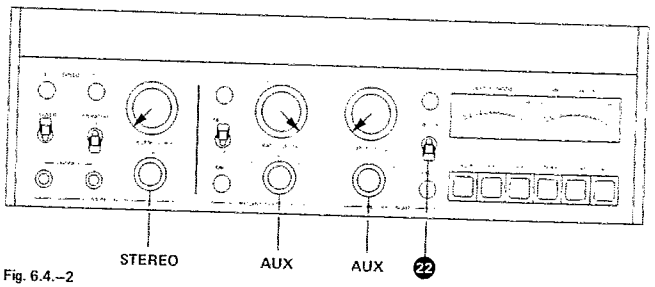



Fig. 6.4.–2

**6.4.4. Kontrolle Eingangsmischung bei einkanaliger Einspeisung**

– Bedienungselemente nach Fig. 6.4.–2 einstellen.
– NF-Generator auf gleichem Pegel belassen (1000 Hz, 0,775 V am Ausgang).
Anschluss AUX INPUT (48). Beide VU-Meter zeigen 0 VU
– Zusätzlich Aufnahmeverstärker REC–B (22) auf ON. Nur beide VU-Meter zeigen 0 VU

**6.4.4. Testing the mixing facility with a single channel feed**

– Adjust operating controls as per fig. 6.4.–2.
– Audio generator adjusted as for previous test (1000 Hz, 0.775 V output level) and connected to AUX INPUT (48). Both VU-meters indicate 0 VU
– Switch record preselector REC (22) to ON. Only the left-hand VU-meter indicates 0 VU

**6.4.4. Contrôle du mélange des entrées à l'enregistrement d'un seul canal**

– Effectuez les commutations selon fig. 6.4.–2
– Laissez le même niveau du générateur BF (1000 Hz et 0,775 V à la sortie), reliez-le aux entrées AUX INPUT (48). Les deux VU-mètres indiquent 0 VU
– Commutez le présélecteur d'enregistrement REC B (22) sur ON. Seul le VU-mètre gauche indique 0 VU

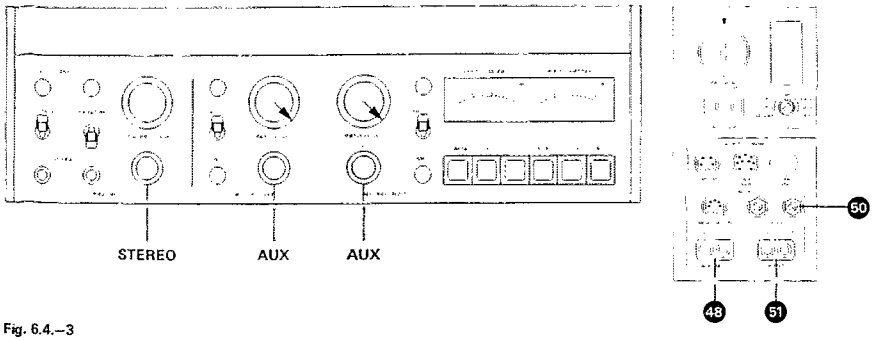



Fig. 6.4.–3

– Eingangs-Pegelregler INPUT LEVEL LEFT auf Anschlag "0".
– Eingangspegelregler INPUT LEVEL RIGHT auf Anschlag "10". Nur rechtes VU-Meter zeigt 0 VU.
– Aufnahmevorwahlschalter REC–L auf OFF. Beide VU-Meter zeigen 0 VU.

– Turn potentiometer INPUT LEVEL LEFT fully counterclockwise to position "0".
– Turn potentiometer INPUT LEVEL RIGHT fully clockwise to position "10". Only the right-hand VU-meter will read 0 VU.
– Switch record preselector REC L to position OFF. Both VU-meters indicate 0 VU.

– Tournez le potentiomètre d'entrée INPUT LEVEL LEFT sur "0".
– Tournez le potentiomètre d'entrée INPUT LEVEL RIGHT sur "10". Seul le VU-mètre droit indique 0 VU.
– Commutez le présélecteur d'enregistrement REC–L sur OFF. Les deux VU-mètres indiquent 0 VU

### 6.4.5. VU-Meter-Eichung

– Bedienungselemente nach Fig. 6.4.–3 einstellen.
– NF-Generator immer noch gleicher Pegel (1000 Hz, 0,775 V am Ausgang).
– Mit Regler METER CAL. L + R (Fig. 6.4.–4) linkes und rechtes VU-Meter auf 0 VU eichen.

### 6.4.5. VU-meter calibration

– Set operating controls as per fig. 6.4.–3.
– Audio generator still adjusted to same level and frequency (1000 Hz, 0.775 V on output).
– Adjust potentiometers METER CAL. L + R (fig. 6.4.–4) to obtain a 0 VU deflection on the respective VU-meter.

### 6.4.5. Etalonnage des VU-mètres

– Effectuez les commutations selon la fig. 6.4.–3.
– Laissez encore le même niveau du générateur BF (1000 Hz et 0,775 V à la sortie).
– A l'aide des réglages METER CAL. L + R (fig. 6.4.–4) gauche et droit, étalonnez les VU-mètres sur 0 dB.

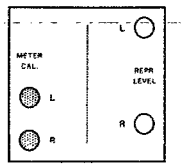



Fig. 6.4.–4

### 6.4.6. Kontrolle Übersteuerungsanzeige

Wird der Pegel um mehr als 6 dB erhöht, so müssen die Übersteuerungs-Anzeigelampen in den VU-Metern aufleuchten. Der Unterschied der Ansprechschwellen beider Lampen darf nicht grösser als 0,5 dB sein.

Bei grösserer Toleranz sind die Widerstände R37 bzw. R34 auf dem Monitorverstärker 1.177.260 zu ändern.

Bei neuerer Ausführung sind R34/R37 durch Einstellpotentiometer R30, R38 ergänzt worden.

### 6.4.6. Checking the overload indicators

When raising the signal level by more than 6 dB, the overload indicators in the VU-meters must become illuminated. The difference in triggering level between the two indicators must not exceed 0.5 dB.

When exceeding this tolerance, alter the values of resistors R37 or R34 respectively in the monitor amplifier 1.177.260

On newer versions, resistors R34/R37 are replaced by additional trimpots R30, R38

### 6.4.6. Contrôle des indicateurs de surmodulation

En augmentant de 6 dB le niveau, les indicateurs de surmodulation doivent s'allumer. L'écart entre les seuils d'allumage ne doit pas dépasser 0,5 dB

Un trop grand écart peut être réduit en changeant les valeurs des résistances R37 ou R34 de l'amplificateur moniteur 1.177.260.

Pour les nouvelles versions, les résistances R34 et R37 sont remplacées par des résistances variables, supplémentaires R30, R38

### 6.4.7. Frequenzgang-Kontrolle "Vor Band"

– Bedienungselemente nach Fig. 6.4.–3 einstellen.
– NF-Generator an Anschluss AUX INPUT (48) parallel anschliessen.
– NF-Millivoltmeter am Ausgang OUTPUT (51) anschliessen.

### 6.4.7. Frequency response "before tape"

– Set operating controls as per fig. 6.4.–3.
– Connect audio generator to both AUX INPUTs (48) in parallel.
– Connect audio millivoltmeter to OUTPUT (51).

### 6.4.7. Contrôle de la courbe de réponse des canaux d'entrée

– Effectuez les commutations selon la fig. 6.4.–3.
– Raccordez un générateur BF aux entrées AUX INPUT (48).
– Branchez un millivoltmètre à la sortie OUTPUT (51).



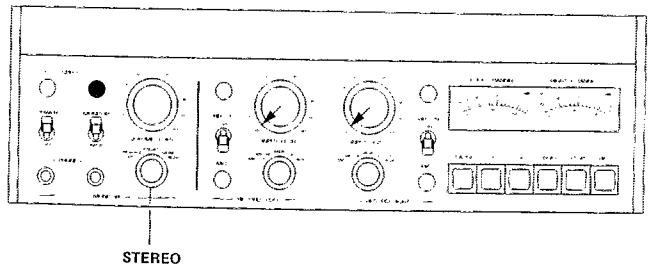



Fig. 6.4.–5

– Generator von 30 Hz bis 20 000 Hz durchstimmen. Am Millivoltmeter Frequenzgang-Abweichungen ablesen. Toleranz: + 0 dB / –1 dB.
– Frequenzgang-Kontrolle an OUTPUT L + R vornehmen.

– Sweep generator from 30 Hz to 20 000 Hz and check frequency response by observing the level variation on the audio millivoltmeter. Permissible tolerance + 0/–1 dB.
– Check frequency response on OUTPUT L + R.

– Faites varier la fréquence du générateur de 30 à 20 000 Hz et contrôlez les écarts de niveau au millivoltmètre. Tolérance: + 0 dB / –1 dB.
– Contrôlez la courbe de réponse aux sorties OUTPUT L + R.

### 6.4.8. Spaltjustierung Wiedergabekopf, grob (Pegelmaximum)

*Kontrolle:*
Der Spalt muss in der Mitte des Schleifspiegels liegen.
– Schleifspiegel mit einem Fettstift waagrecht markieren und anschliessend kurz ein Band laufen lassen. Der Spalt muss in der Mitte der durch das Band polierten Stelle liegen.
– Bedienungselemente nach Fig. 6.4.–5 einstellen.
– Testband 19 cm/s auflegen und auf Spaltjustierteil (10 kHz) vorspulen.
– NF-Millivoltmeter an Ausgang (51) OUTPUT L anschliessen.
– Wiedergabetaste PLAY drücken und an Justierschraube (P) auf Ausgangsspannungs-Maximum einstellen.

### 6.4.8. Reproducing head azimuth, coarse adjustment (Level maximum)

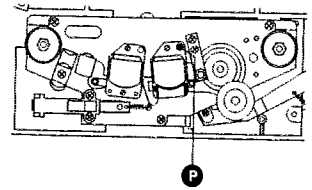
*Double check:*
Check to make sure that the head gap is centered inside the wear patter on the head.
– With grease pencil make horizontal mark on the head face, run tape for several seconds, then check position of the head gap inside the polished area. If necessary adjust head position to bring gap into center of wear area.
– Set operating controls as per fig. 6.4.–5.
– Connect audio millivoltmeter to OUTPUT L (51).
– Load recorder with calibration tape 7 1/2 ips and run azimuth adjusting section (10 kHz) by pressing button PLAY.
– Rotate screw (P) to obtain maximum output voltage

### 6.4.8. Préréglage de l'azimut de la tête lecture (Niveau maximum)

*Contrôle:*
L'entre-fer doit être centré sur la surface de contact de la bande.
– Faites un trait horizontal sur chaque piste avec un crayon gras, puis passez une bande quelques instants. Contrôlez que l'entre-fer se trouve bien centré sur les parties effacées.
– Effectuez les commutations selon la fig. 6.4.–5.
– Placez la bande étalon de 19 cm/s sur la partie réservée à l'azimut (10 kHz).
– Raccordez un voltmètre BF à la sortie OUTPUT L (51).
– Appuyez sur la touche PLAY et ajustez le niveau de sortie maximum à l'aide de la vis de réglage (P).

### 6.4.9. Spaltjustierung Wiedergabekopf, fein (Phasenmethode)

Für die Spaltjustierung nach der Phasenmethode ist es unbedingt erforderlich, dass die Spalteinstellung mit Pegelmaximum-Abgleich (6.4.8.) zuerst vorgenommen wird, damit Phasenfehler > 90° mit Sicherheit vermieden werden.
– Betriebsartenschalter MONITOR auf Stellung MONO.
– NF-Millivoltmeter an Ausgang (51) OUTPUT L + R parallel anschliessen.
– Testband auf Spaltjustierteil (10 kHz) auf Wiedergabe starten und mit Justierschraube (P) auf Ausgangsspannungs-Maximum (scharf) einstellen.




### 6.4.9. Reproducing head azimuth, fine adjustment (Phase check method)

When using the phase check method for alignment of the head azimuth, it is essential that the azimuth is first adjusted for level maximum (section 6.4.8.) so as to avoid the possibility of a phase error in excess of 90°.
– Switch mode selector MONITOR to position MONO
– Connect audio millivoltmeter to both outputs OUTPUT L + R (51) in parallel.
– Load recorder with calibration tape 7 1/2 ips and run azimuth adjusting section (10 kHz) while rotating screw (P) until a pronounced maximum in output voltage is obtained.

### 6.4.9. Réglage fin de l'azimut de la tête de lecture (Méthode des phases)

– Pour effectuer ce réglage, il est absolument nécessaire de procéder au réglage décrit précédant (6.4.8.) pour éviter une erreur de 90°.

– Sélecteur MONITOR en position MONO
– Branchez un millivoltmètre BF aux sorties (51) OUTPUT L et R.
– Passez en lecture la partie destinée au réglage de l'azimut (10 kHz) et effectuez le réglage fin (très pointu) avec la vis (P) pour obtenir le signal de sortie maximum.

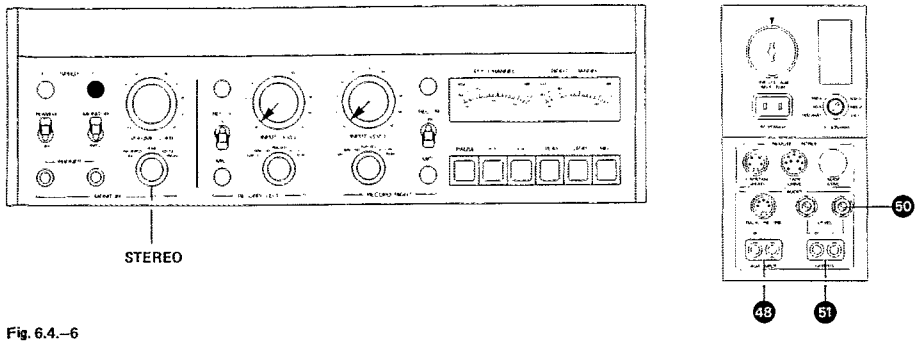



Fig. 6.4.–6

**6.4.10. Wiedergabe-Pegel ab Testband**
(REVOX-Testband Art. Nr. 46 001)

– Bedienungselemente nach Fig. 6.4.–6 einstellen.
– NF-Millivoltmeter an Ausgang OUTPUT L (51) anschliessen (1 V-Bereich).
– Testband auf Pegelteil (257 nWb/m) vorspulen.
– Gerät auf Wiedergabe starten.
– Mit dem Regler REPR LEVEL L (Fig. 6.4.–7) eine Ausgangsspannung von 0,775 V einstellen.
– NF-Millivoltmeter an Ausgang OUTPUT R anschliessen.
– Mit dem Regler REPR LEVEL R eine Ausgangsspannung von 0,775 V einstellen.

**6.4.10. Reference level from calibration tape**
(REVOX test tape no. 46001)

– Set operating controls as per fig. 6.4.–6.
– Connect audio millivoltmeter (1 V range) to OUTPUT L (51).
– Search for reference level 257 nWb/m on the calibration tape and run that section by pressing the button PLAY.
– Adjust trimpot REPR LEVEL L (fig. 6.4.–7) to obtain an output level of 0.775 V.
– Connect audio millivoltmeter to OUTPUT R.
– Adjust trimpot REPR LEVEL R to obtain an output level of 0.775 V.

**6.4.10. Niveau de référence d'après la bande étalon**
(Bande étalon REVOX Art. Nr. 46001)

– Effectuez les commutations selon la fig. 6.4.–6.
– Raccordez un millivoltmètre BF à la sortie OUTPUT L (51) (échelle 1 V).
– Bobinez la bande étalon jusqu'à la partie niveau de référence (257 nWb/m).
– Démarrez en lecture.
– A l'aide du réglage REPR LEVEL L (fig. 6.4.–7), ajustez la tension de sortie à 0,775 V.
– Raccordez le millivoltmètre BF à la sortie OUTPUT R.
– A l'aide du réglage REPR LEVEL R, ajustez la tension de sortie à 0,775 V.

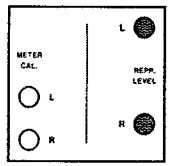



Fig. 6.4.–7

**6.4.11. Frequenzgang-Kontrolle, Wiedergabe**
(ab Testband)

– Bedienungselemente nach Fig. 6.4.–6 einstellen.
– Testband auf den Frequenzgangteil vorspulen.
– NF-Millivoltmeter an Ausgang (51) OUTPUT L + R anschliessen.
– Gerät auf Wiedergabe starten und den Frequenzgang bezogen auf 1000 Hz kontrollieren.

Es können gleichzeitig beide Kanäle gemessen werden, indem der Betriebsartenschalter MONITOR umgeschaltet wird (L/R).

**6.4.11. Reproducing system frequency response**
(measured with calibration tape)

– Set operating controls as per fig 6.4.–6.
– Search for the beginning of the frequency response section on the calibration tape.
– Connect audio millivoltmeter to OUTPUT L + R (51) in parallel.
– Start recorder in PLAY and measure frequency response relative to 1000 Hz.

The frequency response of both channels may be checked in one run by alternating the setting of the MONITOR mode selector between the positions LEFT and RIGHT.

**6.4.11. Courbe de réponse en lecture**
(d'après la bande étalon)

– Effectuez les commutations selon la fig. 6.4.–6.
– Bobinez la bande étalon jusqu'à la partie courbe de réponse.
– Raccordez un millivoltmètre BF à la sortie (51) OUTPUT L + R.
– Démarrez en lecture et contrôlez la courbe de réponse par rapport au niveau à 1000 Hz.

Les deux canaux peuvent être mesurés en une fois en commutant le sélecteur du mode de reproduction MONITOR (L/R).



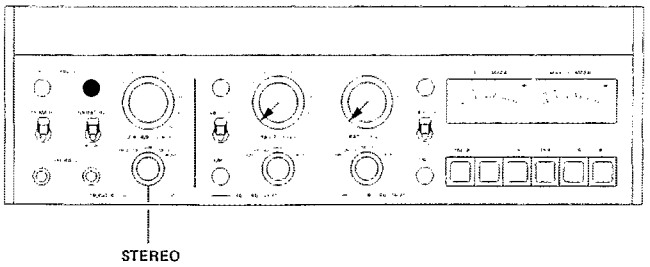



Fig. 6.4.–8

**6.4.12. HF-Spannungen und Frequenz kontrollieren**

– Bedienungselemente nach Fig. 6.4.–8 einstellen.
– Leeres Band REVOX 631 auflegen und auf Aufnahme starten.

Löschkopfspannung:

– Löschkopfspannung am Löschkopf mit Voltmeter messen:
Richtwert: 30 V ... 32 V AC

Oszillatorfrequenz:

– Oszillatorfrequenz mit Digital-Zähler oder Oszilloskop am Löschkopf messen. Die Frequenz beträgt 150 kHz ± 5 kHz. Aufzeichnung am Oszilloskop: 15 Schwingungen/100 µs.
– Bei Frequenzabweichung, mit Regelstift von T1 auf Oszillator-Steckkarte, nachjustieren. Oszillator ist dabei auf Verlängerungs-Steckkarte 1.177.241 aufzustecken.

**6.4.12. Checking oscillator frequency and RF-voltages**

– Set operating controls as per fig. 6.4.–8.
– Load recorder with blank tape (REVOX 631) and start in the recording mode.

Erase voltage:

– Use electronic voltmeter to measure the RF-voltage on the erase head:
approx. value: 30 V ... 32 V

Oscillator frequency:

– Measure the oscillator frequency on the erase head with a digital counter. The frequency must read 150 kHz ± 5 kHz. When measuring with an oscilloscope, the display must consist of 15 cycles on the 100 µsec time base.
– If the frequency deviates beyond the above limits, adjust the slug in T1 on the oscillator board. For this adjustment, the extension board 1.177.241 is required in order to gain access to the coil.

**6.4.12. Contrôle de la tension HF et de la f quence**

– Effectuez les commutations selon la
– Placez une bande vierge REVOX 631 démarrez en enregistrement.

Tension d'effacement:

– Mesurez la tension d'effacement sur tête d'effacement:
Valeur approchée 30 ... 32 V AC.

Fréquence de l'oscillateur:

– Effectuez la mesure sur la tête d'enregistrement avec un compteur digital un oscilloscope. La fréquence est 150 kHz ± 5 kHz. Sur l'oscilloscope doit obtenir 15 alternances par 100
– Une déviation de la fréquence se con à l'aide du noyau de T1 de la plaque oscillateur, qui pour le réglage sera fichée sur la plaquette de prolongat 1.177.241.

**6.4.13. HF-Sperrkreise Aufnahme**

– Bedienungselemente nach Fig. 6.4.–8 einstellen.
– NF-Millivoltmeter an Messpunkt (X) des jeweiligen Aufnahmekanals anschliessen (Fig. 6.4.–9), siehe auch Schaltbild 1.177.230.
– Leeres Band auflegen und Gerät auf Aufnahme schalten.
– Mit Reglern BIAS TRAP L und R auf Spannungsminimum einstellen (< 350 mV), Fig 6.4.–10.

**6.4.13. Adjustment of bias trap in recording amplifier**

– Set operating controls as per fig. 6.4.–8.
– Connect millivoltmeter to the test point (X) of the respective recording channel (fig 6.4.–9). Refer to circuit diagram 1.177.230.
– Load recorder with blank tape and start in the recording mode.
– Adjust the controls BIAS TRAP L + R to obtain a minimum voltage indication (< 350 mV), fig 6.4.–10.

**6.4.13. Circuit réjecteur HF d'enregistrement**

– Effectuez les commutations selon la 6.4.–8
– Branchez un millivoltmètre BF au p de mesure (X) de chaque canal d'enregis ment (fig 6.4.–9); voyez également le sché 1.177.230.
– Placez une bande vierge et démarrez enregistrement.
– Reglez les BIAS TRAP L et R au m mum de tension (< 350 mV), fig. 6.4.–10

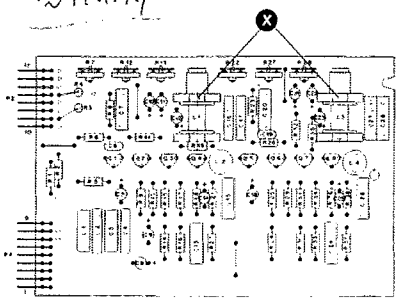



Fig. 6.4.–9

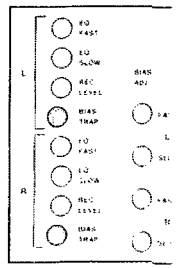



Fig. 6.4.–10

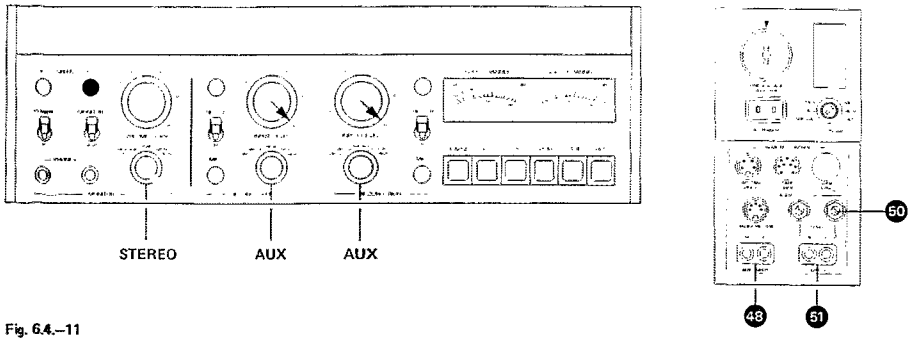



Fig. 6.4.–11

**6.4.14. Spaltjustierung Aufnahmekopf, grob** (Pegelmaximum)

– Bedienungselemente nach Fig 6.4.–11 einstellen.
– NF-Millivoltmeter an Ausgang (51) OUTPUT anschliessen. Bereich 100 mV.
– NF-Generator an Anschluss (48) AUX INPUT parallel anschliessen. Frequenz: 10 kHz.
– Leeres Band (REVOX 631) einlegen und auf Aufnahme starten. Generatorpegel so verstellen, dass sich am Ausgang eine Spannung von 77,5 mV einstellt.
– Mit Justierschraube (R) (Fig. 6.4.–12) Pegelmaximum einstellen. Anzeigeverzögerung beachten, deshalb besonders langsam einstellen.

**6.4.14. Recording head azimuth coarse adjustment** (Level maximum)

– Set operating controls as per fig. 6.4.–11.
– Connect audio millivoltmeter to OUTPUT 51 and select 100 mV range.
– Connect audio generator in parallel to AUX INPUTs (48). Select frequency of 10 kHz.
– Load recorder with blank tape (REVOX 631) and start in the recording mode. Adjust generator level to obtain an output reading of 77.5 mV.
– Rotate screw (R) (fig. 6.4.–12) to obtain maximum output level. Because there is a time lag before the effects of any alteration in record head azimuth will be shown on the meter, screw (R) should be rotated very slowly.

**6.4.14. Préréglage de l'azimut de la tête d'enregistrement** (Niveau maximum)

– Effectuez les commutations selon la fig. 6.4.–11.
– Branchez un millivoltmètre BF à la sortie (51) OUTPUT. Echelle 100 mV.
– Raccordez le générateur BF aux entrées (48) AUX INPUT. Fréquence: 10 k kHz/signal: 0,775 V à la sortie.
– Placez une bande vierge (REVOX 631) et démarrez en enregistrement.
– Ajustez le niveau du générateur de façon à obtenir à la sortie une tension de 77,5 mV.
– Tournez la vis de réglage (R) (fig. 6.4.–12) pour obtenir le signal de sortie maximum. Tournez la vis lentement en tenant compte du décalage des têtes.

**6.4.15. Spaltjustierung Aufnahmekopf, fein** (Phasenmethode)

Um Messfehler, die durch Phasenverschiebung > 90° entstehen könnten, zu vermeiden, ist es unbedingt erforderlich die Spaltjustierung nach Pegelmaximum-Methode (6.4.14.) vorzunehmen.

– Betriebsartenschalter MONITOR auf Stellung MONO.
– NF-Millivoltmeter an Ausgang (51) OUTPUT anschliessen.
– NF-Generator an Anschluss (48) AUX INPUT parallel anschliessen. Frequenz: 10 kHz / Spannung: 0 VU –20 dB.
– Leeres Band (REVOX 631) auflegen und auf Aufnahme starten.
– Mit Justierschraube (R) (Fig. 6.4.–12) die Ausgangsspannung auf Maximum (scharf) einstellen.

**6.4.15. Recording head azimuth fine adjustment** (Phase check method)

In order to avoid the possibility of phase errors in excess of 90°, it is essential that the azimuth adjustment as described under section 6.4.14. is first completed.

– Turn mode selector MONITOR to position MONO.
– Connect audio millivoltmeter to both sockets OUTPUT (51) in parallel.
– Connect audio generator to AUX INPUTs (48) in parallel. Select frequency of 10 kHz and adjust to a level of 20 dB below 0 VU.
– Load recorder with blank tape (REVOX 631) and start in the recording mode.
– Adjust screw (R) (fig. 6.4.–12) until a sharply rising, well defined maximum in output voltage is obtained.

**6.4.15. Réglage fin de l'azimut de la tête d'enregistrement** (Methode des phases)

– Pour effectuer ce réglage, il est absolument nécessaire de proceder au réglage décrit précédant (6.4.14.) pour éviter une erreur de 90°.
– Sélecteur MONITOR sur MONO.
– Branchez un millivoltmètre BF à la sortie (51) OUTPUT.
– Raccordez un générateur BF aux entrées (48) AUX INPUT. Fréquence: 10 kHz/tension: 0 VU –20 dB.
– Placez une bande vierge (REVOX 631) et démarrez en enregistrement.
– Effectuez le réglage fin (très pointu) avec la vis (R) pour obtenir le signal de sortie maximum.

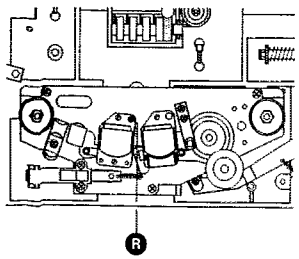
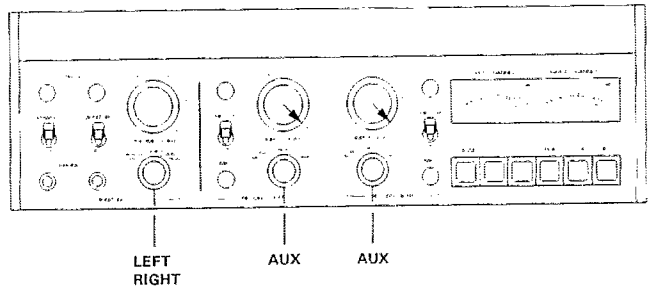



Fig. 6.4.–12





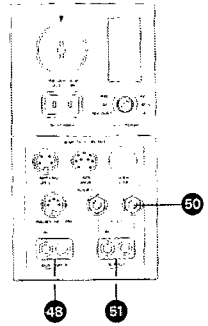




Fig. 6.4.–14

**6.4.16. Vormagnetisierung**

Da der Wiedergabepegel für hohe Frequenzen abhängig vom Vormagnetisierungsstrom in Form einer Kurve mit ausgeprägtem Maximum verläuft, kann diese Beziehung zur Festlegung des Arbeitspunktes herangezogen werden (Fig. 6.4.–13).

– Bedienungselemente nach Fig. 6.4.–14 einstellen.
– NF-Millivoltmeter an Ausgang (51) OUTPUT L bzw. R anschliessen.
– NF-Generator an Anschluss (48) AUX INPUT parallel anschliessen (10 kHz, 0 VU –20 dB).
– Leeres Band (REVOX 631) auflegen und auf Aufnahme starten.
– Mit Reglern
BIAS ADJ. LEFT (SLOW + FAST)
BIAS ADJ. RIGHT (SLOW + FAST)
vom Linksanschlag in Uhrzeigerrichtung drehen bis das NF-Ausgangsspannungs-Maximum erreicht ist. Betriebsartenschalter wahlweise auf LEFT/RIGHT, (entsprechende Bandgeschwindigkeitstaste wählen).

Man merke sich die Maximum-Anzeige und drehe nun in gleicher Drehrichtung weiter bis die NF-Ausgangsspannung um den in der Tabelle 6.4.–15 aufgeführten Wert gesunken ist (Δ U).

**6.4.16. Bias adjustment**

Since tape magnetization varies with bias current, a sharply defined maximum output is exhibited at high frequencies when gradually increasing the bias current from zero upwards. This relationship may be utilized to determine the optimum operating point (6.4.–13).

– Set operating controls as per fig 6.4.–14.
– Connect audio millivoltmeter to OUTPUT L or R (51) respectively
– Connect audio generator to AUX INPUTs (48) in parallel.
– Select frequency of 10 kHz and adjust to a level of 20 dB below 0 VU.
– Load recorder with blank tape (REVOX 631) and start in the recording mode.
– The potentiometers
BIAS ADJ LEFT (SLOW + FAST)
BIAS ADJ RIGHT (SLOW + FAST)
are to be adjusted at their respective tape speeds by turning them from their fully counterclockwise position in clockwise direction until the signal level, as measured on the recorder's output, reaches its maximum (mode selector switched to either LEFT or RIGHT as required).

After having reached the maximum, slowly keep on rotating the respective trimpot in clockwise direction until the 10 kHz output signal has dropped by the amount shown in table 6.4.–15 (ΔU).

**6.4.16. Prémagnétisation**

Le courant de prémagnétisation provoque une courbe dont le maximum très pointu influence le niveau de lecture des hautes fréquences. Il est possible de fixer avec précision son point de travail (6.4.–13)

– Effectuez les commutations selon la fig 6.4.–14.
– Branchez un millivoltmètre BF aux sorties (51) OUTPUT L ou R.
– Raccordez un générateur BF aux entrées (48) AUX INPUT (10 kHz, 0 VU –20 dB).
– Placez une bande vierge (REVOX 631) et démarrez en enregistrement.
– Tournez les réglages
BIAS ADJ. LEFT (SLOW + FAST
BIAS ADJ. RIGHT (SLOW + FAST)
dans le sens des aiguilles d'une montre, jusqu'à l'obtention de la tension de sortie BF maximum. Commutez alternativement le sélecteur de mode sur LEFT/RIGHT (conformément à la vitesse de bande choisie).

Repérez le point maximum et tournez le potentiomètre toujours dans le même sens, jusqu'à ce que la chute de tension de sortie BF corresponde aux valeurs de la tabelle 6.4.–15 (Δ U).

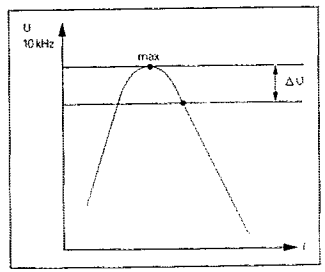
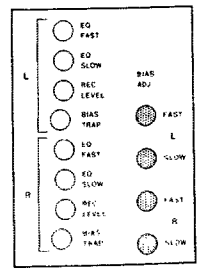
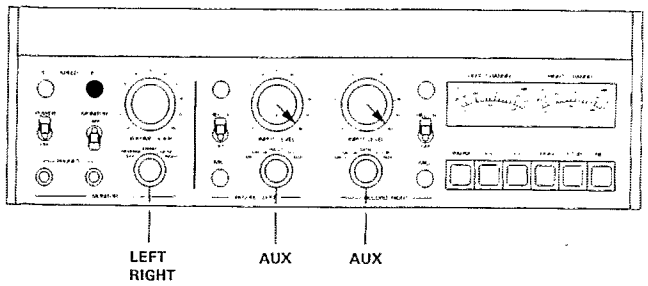



Fig. 6.4.–13

| Bandsorte<br>Type of tape<br>Type de bande | ΔU 19 cm/s<br>ΔV 3 3/4 ips | ΔU 9 cm/s<br>ΔV 1 7/8 ips | ΔU 38 cm/s<br>ΔV 15 ips |
|---|---|---|---|
| AGFA 401 | 5 dB | 4 dB | 3 dB |
| REVOX 621 | max. | 4 | 2+4 |
| REVOX 631 | 6 | 6 | 4 |
| SCOTCH 206/207 | 5 | 4 | 3 |
| SCOTCH 256 | 5 | 5 | 3 |
| SCOTCH Classic | 6 | 5 | 3 |
| AMPEX 406/407 | 6 | 5 | 3 |
| AMPEX 456 | 5 | 5 | 3+3 |
| AGFA PEM 368 | 5 | 5 | 3+3 |
| AGFA PEM 468 | 5 | 5 | 3+3 |
| BASF LPR-35LH | 5 | 4 | 3 |
| MAXELL XL-2 | 7 | 7 | 3+3 |
| MAXELL UD-XL | 6 | 5 | 3 |
| TDK AD/AR | 6 | 5 | 3 |

Fig. 6.4.–15





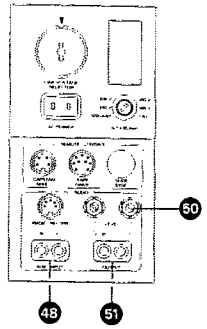




Fig. 6.4.–16

**6.4.17. Aufnahme-Pegel**

– Bedienungselemente nach Fig. 6.4.–16 einstellen.
– Wiedergabe-Pegel müssen eingestellt sein.
– NF-Generator an Anschluss (48) AUX INPUT parallel anschliessen.
– NF-Millivoltmeter an Ausgang (51) OUTPUT anschliessen.
– Leeres Band auflegen und auf Aufnahme starten.
– Generatorpegel bei 1000 Hz so einstellen, dass am NF-Millivoltmeter eine Spannung von 0,775 V erscheint.
– TAPE/INPUT Schalter MONITOR auf TAPE.
– Mit den Reglern REC LEVEL, LEFT bzw. RIGHT auf 0,775 V einstellen. Betriebsartenschalter entsprechend auf LEFT oder RIGHT.

*Kontrolle:*
Kein Pegelsprung beim Umschalten zwischen TAPE und INPUT.

Bei der Bandgeschwindigkeit 9,5 cm/s (3 3/4 ips) muss der Pegelsprung innerhalb 1 dB liegen.

**6.4.17. Recording level**

– Set operating controls as per fig. 6.4.–16.
– The levels of the reproducing system must already be adjusted as per section 6.4.10
– Connect audio generator in parallel to AUX INPUTs (48).
– Connect audio millivoltmeter to OUTPUT (51).
– Load recorder with blank tape and start in the recording mode.
– Select frequency of 1000 Hz on audio generator and adjust its level until a reading of 0.775 V is obtained on the audio millivoltmeter.
– Switch MONITOR selector to position TAPE
– Adjust the trimpots REC LEVEL, LEFT or RIGHT respectively to obtain an output level of 0.775 volts. Turn mode selector to either LEFT or RIGHT as required.

*Double check:*
There must be no level difference when switching the monitor selector between the positions TAPE and INPUT.

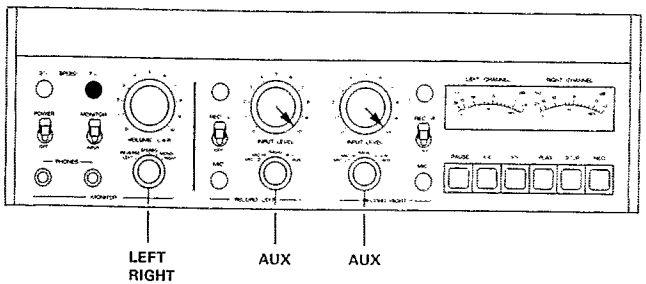
At the tape speed of 3 3/4 ips, a level difference of 1 dB is permissible.

**6.4.17. Niveau d'enregistrement**

– Effectuez les commutations selon la fig. 6.4.–16.
– Les niveaux de lecture doivent être ajustés.
– Raccordez un générateur BF aux entrées (48) AUX INPUT.
– Branchez un millivoltmètre BF à la sortie (51) OUTPUT.
– Placez une bande vierge et démarrez en enregistrement.
– Reglez le générateur BF à 1000 Hz de façon à lire une tension de 0,775 V sur le millivoltmètre BF.
– Mettez le sélecteur TAPE/INPUT sur TAPE.
– Réglez les potentiomètres REC LEVEL, LEFT et RIGHT pour obtenir 0,775 V. Le sélecteur de mode sera commuté sur LEFT et RIGHT respectivement.

*Contrôle:*
Assurez-vous qu'il n'y a aucune différence de niveau entre TAPE et INPUT.

Pour la vitesse de 9,5 cm/s (3 3/4 ips) la tolérance est de 1 dB.



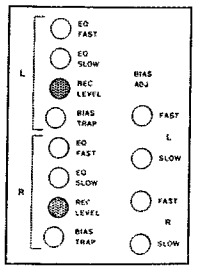




Fig. 6.4.–17

**6.4.18. Aufnahme-Entzerrung**

– Bedienungselemente nach Fig. 6.4.–17 einstellen.
– NF-Millivoltmeter an Ausgang (51) OUTPUT anschliessen.
– NF-Generator an Anschluss (48) AUX INPUT parallel anschliessen (0 VU –20 dB, 12 kHz).

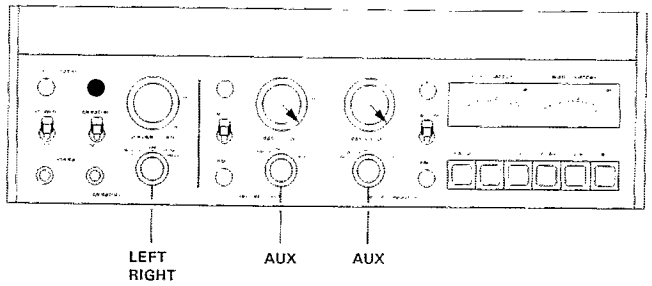
**6.4.18. Adjusting the recording equalization**

– Set operating controls as per fig 6.4.–17.
– Connect audio millivoltmeter to OUTPUT (51).
– Connect audio generator in parallel to both AUX INPUTs (48) (signal condition: 12 kHz, level 20 dB below 0 VU)

**6.4.18. Préaccentuation d'enregistrement**

– Effectuez les commutations selon la fig. 6.4.–17.
– Branchez un millivoltmètre BF à la sortie (51) OUTPUT
– Raccordez un générateur BF aux entrées (48) AUX INPUT (0 VU –20 dB, 12 kHz).





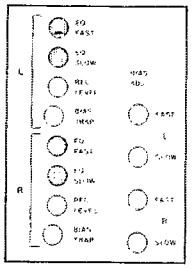




Fig. 6.4.–18

– Leeres Band auflegen und auf Aufnahme starten.
– Entsprechend der Bandgeschwindigkeit mit den Einstellreglern EQ SLOW, FAST die Ausgangsspannung auf 0 dB (77,5 mV) bis + 1 dB bezüglich 1 kHz einstellen
– Betriebsartenschalter auf RIGHT Einstellungen vornehmen für rechten Kanal.

– Load recorder with blank tape and start in the recording mode.
– While recording the 12 kHz signal, adjust the trimpots EQ SLOW, FAST at the respective tape speeds until the signal level at the recorder's output falls within the range from 0 dB to + 1 dB relative to 1 kHz (77.5 mV).
– Turn mode selector to position RIGHT and adjust equalization for the right channel as well

– Placez une bande vierge et démarrez l'enregistrement.
– Réglez les niveaux de sortie aux vitesses correspondantes EQ SLOW, FAST pour obtenir 0 dB (77,5 mV) jusqu' à + 1 dB relatif à 1 kHz
– Placez le sélecteur de mode sur RIGHT. Effectuez le réglage pour le canal droit.

**6.4.19. Frequenzgang "Über Band"**

– Bedienungselemente nach Fig. 6.4.–18 einstellen.
– NF-Generator etwa auf gleichem Pegel belassen (0 VU –20 dB)
– Leeres Band auflegen und auf Aufnahme starten.
– NF-Millivoltmeter bei 1 kHz auf ganzzahlige dB-Anzeige eichen.
– Frequenzgänge entsprechend der gewählten Bandgeschwindigkeit messen. Durch Umschalten des Betriebsartenschalters MONITOR auf Stellung LEFT bzw. RIGHT können beide Kanäle hintereinander gemessen werden.

Die Frequenzgangwerte sind aus den technischen Daten ersichtlich.

**6.4.19. Frequency response "overall"**

– Set operating controls as per fig 6.4.–18.
– Output level of audio generator remains set as for previous test (20 dB below 0 VU).
– Load recorder with blank tape and start in the recording mode.
– Calibrate audio millivoltmeter for frequency response measurement by adjusting the audio generator level at 1 kHz to obtain a convenient mid-scale deflection on the meter (e.g. –5 dB on the 100 mV range).
– Check frequency response at the two tape speeds. Both channels may be checked in one run by alternating the mode selector between the positions LEFT and RIGHT at each individual frequency.

For permissible response deviations, check section 2. Technical Specifications of this manual.

**6.4.19. Courbe de réponse "après bande"**

– Effectuez les commutations selon la fig. 6.4.–18.
– Laissez le générateur BF sur le même niveau que précédemment (0 VU –20 dB)
– Placez une bande vierge et démarrez l'enregistrement.
– Calibrez le millivoltmètre BF à 1 kHz sur un nombre entier de dB.
– Contrôlez la courbe de réponse pour les deux vitesses. En commutant le sélecteur de mode alternativement sur LEFT et RIGHT, il est possible de contrôler les deux canaux.

Comparez les valeurs avec celles des caractéristiques techniques

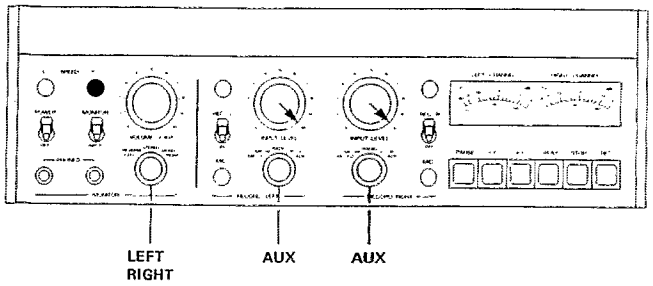



Fig. 6.5.–1

| | 0 VU<br>257 nWb/m | 0 VU + 6 dB<br>514 nWb/m |
|---|---|---|
| 9.5 cm/s | < 1 % | < 2,5 % |
| 19 cm/s | < 0,6 % | < 1,5 % |

Fig. 6.5.–2

**6.5. Messungen verschiedener Kenndaten**

**6.5.1. Klirrfaktor "Über Band"**

– Bedienungselemente nach Fig. 6.5.–1 einstellen.
– NF-Generator an Anschluss (48) AUX INPUT parallel anschliessen.
Frequenz: 500 Hz
Pegel: 0 VU + 6 dB
– Klirrfaktor-Messgerät an Ausgang (51) OUTPUT anschliessen.
– Leeres Band auflegen und auf Aufnahme starten.
– Klirrfaktor messen. Betriebsartenschalter MONITOR auf LEFT bzw. RIGHT.

Aus der Tabelle 6.5.–2 sind die zulässigen Klirrfaktorwerte entsprechend der Bandgeschwindigkeit ersichtlich.

**6.5. Measurement of various performance data**

**6.5.1. Distortion via tape**

– Set operating controls as per fig. 6.5.–1.
– Connect audio generator to AUX INPUT (48).
Frequency: 500 Hz
Level: 0 VU + 6 dB
– Connect distortion factor meter to OUTPUT (51).
– Load recorder with blank tape and start in the recording mode.
– Measure distortion on both channels. Switch MONITOR mode selector between positions LEFT and RIGHT as requried.

The permissible amount of distortion (pure third harmonic) at the respective tape speeds may be seen from table 6.5.–2.

**6.5. Mesure de différentes caractéristiques**

**6.5.1. Distorsion "après bande"**

– Effectuez les commutations selon la fig. 6.5.–1.
Raccordez un générateur BF aux prises (48) AUX INPUT.
Fréquence: 500 Hz
Niveau: 0 VU + 6 dB
– Branchez un pont de distorsion à la sortie (51) OUTPUT.
– Placez une bande vierge et démarrez en enregistrement.
– Mesurez la distorsion en commutant alternativement le sélecteur de mode sur LEFT et RIGHT. Consultez les valeurs admissibles de la tabelle 6.5.–2.

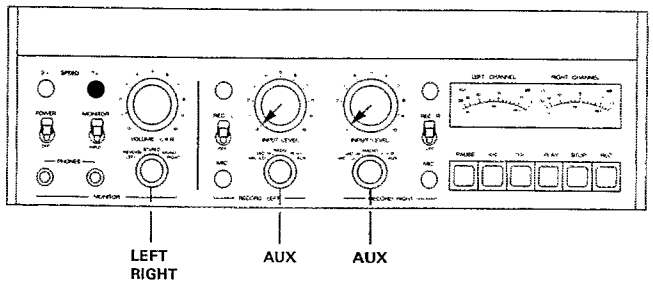
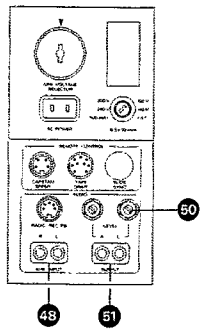



Fig. 6.5.–3




**6.5.2. Geräuschspannungs-/Fremdspannungsabstand "Über Band"**

Die Geräuschspannungsmessungen beziehen sich auf Vollaussteuerung (1,55 V; 514 nWb/m). Um Messfehler durch HF-Einstreuungen zu vermeiden, wird ein vorher auf dem Gerät gelöschtes Band verwendet.

– Bedienungselemente nach Fig. 6.5.–3 einstellen.
– NF-Millivoltmeter an Ausgang (51) OUTPUT L anschliessen.
– Gerät auf Wiedergabe starten.
– Geräuschspannung Kanal LEFT messen.
– Betriebsartenschalter auf RIGHT, NF-Millivoltmeter an OUTPUT R.

**6.5.2. Weighted and unweighted noise measurements via tape**

Noise voltage measurements are taken with reference to the peak level modulation of 514 nWb/m (output level 1.55 V). In order to avoid erroneous test results due to bias frequency pick-up, all measurements are taken by running tape, which has been erased on the recorder in a previous run.

– Set operating elements as per fig. 6.5.–3.
– Connect audio millivoltmeter to OUTPUT L (51).
– With previously erased tape on the recorder, start the machine in PLAY.
– Read noise voltage of the left channel through ASA A weighting network.

**6.5.2. Recul du bruit de fond "après bande"**

Le recul du bruit de fond se réfère au niveau maximum admissible (514 nWb/m; 1,55 V). Afin de ne pas fausser la mesure par des inductions parasites HF, utilisez une bande effacée.

– Effectuez les commutations selon la fig. 6.5.–3.
– Branchez un millivoltmètre BF à la sortie (51) OUTPUT L.
– Démarrez en lecture.
– Mesurez le bruit de fond du canal LEFT.
– Sélecteur de mode sur RIGHT, millivoltmètre BF à la sortie OUTPUT R.



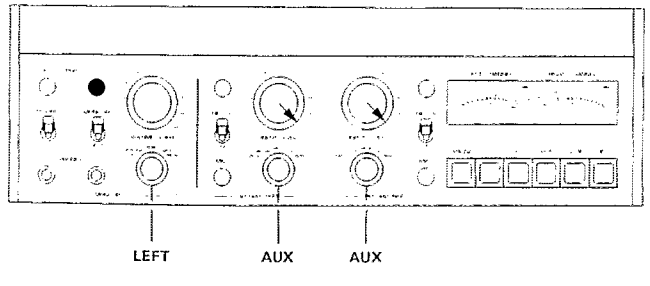



Fig. 6.5.–5

| 2-Spur<br>2-track<br>2 pistes | | 4-Spur<br>4-track<br>4 pistes | |
|---|---|---|---|
| 19 cm/s | 9,5 cm/s | 19 cm/s | 9,5 cm/s |
| dB | dB | dB | dB |
| > 66 | > 63 | > 62 | > 57 |

GEMESSEN MIT REVOX G 31

Fig. 6.5.–4

– Geräuschspannung Kanal RIGHT messen.

Messungen für die niedrige Bandgeschwindigkeit vornehmen. Die Effektiv-Werte (bewertet ASA A) sind aus der Tabelle 6.5.–4 ersichtlich.

Werden diese Geräuschspannungsabstände nicht erreicht, sind die Bandführungen und Tonköpfe nochmals sorgfältig zu entmagnetisieren.

Die folgenden Messungen
– Löschdämpfung
– Übersprechen MONO
– Übersprechen STEREO
*können nur mit einem selektiven Voltmeter (Bandbreite < 100 Hz) gemessen werden.*

– Switch mode selector to position RIGHT.
– Read noise voltage of the right channel through ASA A weighting network.
– Measure noise voltage at the second tape speed as described above. The RMS signal to noise ratios (weighted as per ASA A) can be seen from table 6.5.–4.

If the signal to noise ratios are less than those shown in the table, carefully demagnetize the heads and tape guides and repeat the test.

For the following measurements
– Erase depth
– Crosstalk MONO
– Crosstalk STEREO
*an audio millivoltmeter with a narrow band-pass filter of less than 100 Hz bandwidth (wave analyzer) will be required.*

– Mesurez le bruit de fond du c RIGHT.

Répétez les mesures pour la pe vitesse. Les valeurs effectives (pondér ASA A sont données dans la tabelle 6.5.–4 ).

S'il n'est pas possible d'atteindre valeurs, démagnétisez encore une fois et c sciencieusement les têtes et les guides de ba

Les mesures suivantes:
– profondeur d'effacement
– diaphonie MONO
– diaphonie STEREO
*ne peuvent être effectuées qu'avec un millivo mètre sélectif (largeur de bande < 100 Hz).*

**6.5.3. Löschdämpfung**

Zum Messen der Löschdämpfung wird eine Frequenz von ca. 1000 Hz aufgezeichnet und anschliessend gelöscht. Die auf dem Band verbleibende Aufzeichnung wird gemessen.

– Bedienungselemente nach Fig. 6.5.–5 einstellen.
– NF-Millivoltmeter an Ausgang (51) OUTPUT anschliessen.
– NF-Generator an Anschluss (48) AUX INPUT parallel anschliessen (1000 Hz, 0 VU + 6 dB).
– Leeres Band auflegen, auf Aufnahme starten und kurze Aufzeichnung vornehmen.
– STOP. Band an Aufzeichnungsanfang zurückwickeln.
– Regler INPUT LEVEL L auf "0".
– Maschine auf Aufnahme starten und Löschdämpfung messen. Der verbleibende Rest der Aufzeichnung soll mindestens 75 dB unter dem Pegel der Vollaussteuerung liegen (typ. Wert 80 dB).
– Betriebsartenschalter MONITOR auf RIGHT. Analoge Messvorgang für rechten Kanal vornehmen.

**6.5.3. Erase efficiency**

To measure the erase depth, a signal of approximately 1000 Hz has to be recorded at peak level and that same recording has to be erased again in a subsequent run. The residual level of that signal will then be measured.

– Set operating controls as per fig. 6.5.–5.
– Connect wave analyzer to OUTPUT (51).
– Connect audio generator in parallel to both AUX INPUTs (48).
– Select 1000 Hz and adjust level to obtain peak level indication on the VU-meter (1000 Hz, 0 VU + 6 dB).
– Load recorder with blank tape and start in the recording mode.
– Establish reference reading on wave analyzer.
– STOP and rewind to the beginning of the recording.
– Close fader INPUT LEVEL L to position "0".
– Start the machine again in the recording mode and measure the residual signal level on tape. The magnetic recording remaining on tape must be attenuated by at least 75 dB below the above established reference (typical value 80 dB).
– Switch mode selector MONITOR to position RIGHT and repeat the above measurements.

**6.5.3. Profondeur d'effacement**

Pour mesurer la profondeur d'effacement, registrez une fréquence de 1000 Hz, puis effa la bande. Ensuite, mesurez les restes de l'en gistrement.

– Effectuez les commutations selon la 6.5.–5.
– Branchez un millivoltmètre BF à sortie (51) OUTPUT.
– Raccordez un générateur aux pr (48) AUX INPUT (1000 Hz, 0 VU + 6 dB)
– Placez une bande vierge et demarrez enregistrement.
– STOP, rebobinez la bande
– Mettez le réglage d'entrée INP LEVEL sur "0".
– Démarrez en enregistrement et mesur la profondeur d'effacement. Le résidu de l'e registrement doit se trouver au moins à 75 en dessous du niveau + 6 dB (valeur typiq 80 dB)
– Commutez le sélecteur de mode MO TOR sur RIGHT, et repetez la mesure.

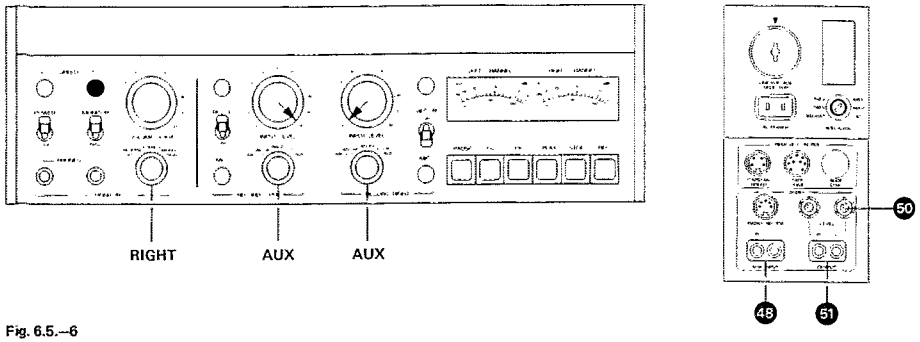



Fig. 6.5.–6

### 6.5.4. Übersprechen MONO

Zu dieser Messung wird zweckmässigerweise auf einem neuen Band auf dem linken Kanal während ca. 1 Minute und anschliessend auf dem rechten Kanal während ca. 1 Minute eine MONO-Aufnahme mit 1000 Hz und Vollaussteuerung aufgenommen. Dabei ist darauf zu achten, dass der Aufnahmevorwahlschalter des jeweils nicht benützten Kanals auf Stellung OFF steht.

– Bedienungselemente nach Fig. 6.5.–6 einstellen.
– NF-Generator auf 1000 Hz und Vollpegel einstellen.
– Leeres Band einlegen und auf Aufnahme starten.
– Nach ca. 1 Minute:
Aufnahmevorwahlschalter REC–L auf OFF.
Regler INPUT LEVEL LEFT auf 0.
Aufnahmevorwahlschalter REC–R auf ON.
Regler INPUT LEVEL RIGHT auf 10.
– Nach ca. einer weiteren Minute:
Taste STOP betätigen und an Anfang der Aufzeichnung zurückspulen.
– Selektives Voltmeter an Ausgang (51) OUTPUT R anschliessen. Auf Wiedergabe starten. Das Übersprechen L ► R messen (≥ 60 dB).
– Auf Aufzeichnung des rechten Kanals vorspulen.
– Selektives Voltmeter an Ausgang (51) OUTPUT L anschliessen. Betriebsartenschalter MONITOR auf LEFT. Gerät auf Wiedergabe starten. Das Übersprechen R ► L messen (≥ 60 dB).

### 6.5.4. Crosstalk MONO

It is advisable to use virgin (or bulk erased) tape for this test. Record a signal of 1000 Hz at peak level for approximately 1 minute on the left channel only, then record the same signal again for 1 minute on the right channel. In making that recording preselector switch of the unused channel is switched to the position OFF.

– Set operating controls as per fig. 6.5.–6.
– Select 1000 Hz on audio generator and adjust for peak level recording.
– Load recorder with tape and start in the recording mode as described above.
– After approximately 1 minute switch recording preselector REC–L to position OFF.
Turn potentiometer INPUT LEVEL LEFT to position 0.
Switch recording preselector REC–R to position ON.
Turn potentiometer INPUT LEVEL RIGHT to position 10.
– Continue to record for approximately 1 minute, then press button STOP and rewind to the beginning of the recording.
– Connect wave analyzer to OUTPUT R (51). Start recorder in PLAY. Measure crosstalk L ► R (≥ 60 dB).
– Wind forward to the recording on the right channel.
– Connect wave analyzer to OUTPUT L (51) and switch mode selector MONITOR to LEFT. Start recorder in PLAY. Measure crosstalk R ► L (≥ 60 dB).

### 6.5.4. Diaphonie MONO

Pour effectuer cette mesure, il est nécessaire d'enregistrer auparavant sur une bande neuve une fréquence de 1000 Hz à + 6 dB VU, sur le canal gauche pendant 1 minute. Puis enchaînez le même enregistrement sur le canal droit. Pendant ces opérations, commutez sur OFF le présélecteur d'enregistrement du canal non utilisé.

– Effectuez les commutations selon la fig. 6.5.–6.
– Générateur BF sur 1000 Hz,+ 6 dB VU.
– Placez une bande vierge et démarrez en enregistrement.
– Après 1 minute environ:
Présélecteur d'enregistrement REC-L sur OFF.
Réglage INPUT LEVEL sur "0"
Présélecteur d'enregistrement REC–R sur ON.
Réglage INPUT LEVEL RIGHT sur "10".
– Après 1 autre minute environ:
Pressez la touche STOP et rebobinez la bande au début.
– Branchez un millivoltmètre BF sélectif à la sortie (51) OUTPUT R. Démarrez en lecture et mesurez la diaphonie L ► R (≥ 60 dB).
– Bobinez et recherchez le début du canal droit.
– Branchez le millivoltmètre BF sélectif à la sortie (51) OUTPUT L. Sélecteur de mode MONITOR sur LEFT. Démarrez en lecture et mesurez la diaphonie R ► L (≥ 60 dB).



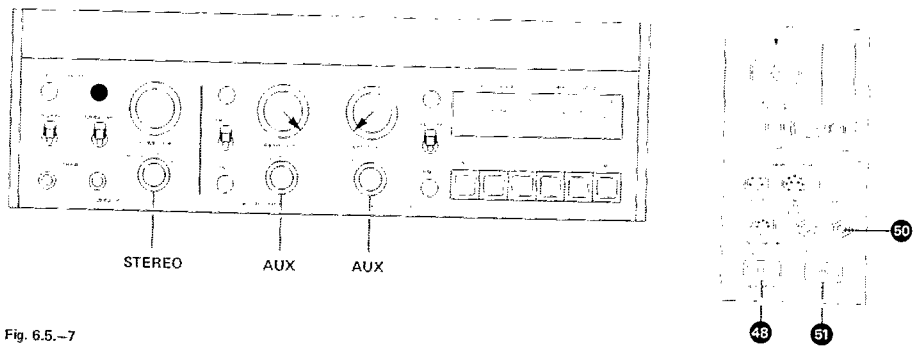



Fig. 6.5.–7

### 6.5.5. Übersprechen STEREO

Für die Messung der Stereo-Übersprechdämpfung wird der NF-Generator an den Eingang (48) AUX INPUT L angeschlossen.

– Bedienungselemente nach Fig. 6.5.–7 einstellen.
Messung L ► R
– Selektives Voltmeter an Ausgang (51) OUTPUT R anschliessen.
– NF-Generator auf 1000 Hz einstellen, Vollaussteuerung.
– Gerät auf Aufnahme starten.
– Übersprechdämpfung messen.
Der Wert soll min. 45 dB unter Vollpegel liegen.
Messung R ► L
– NF-Generator an Eingang AUX INPUT R anschliessen.
– Selektives Voltmeter an linken Ausgang OUTPUT L anschliessen.
– Regler INPUT LEVEL LEFT auf "0".
– Regler INPUT LEVEL RIGHT auf "10".
– Übersprechdämpfung messen.
Der Wert soll min. 45 dB unter Vollpegel liegen.

### 6.5.5. Crosstalk STEREO

To measure the stereo crosstalk performance connect audio generator to AUX INPUT L (48).

– Set operating controls as per fig. 6.5.–7
Crosstalk L ► R
– Connect wave analyzer to OUTPUT R (51).
– Select 1000 Hz on the audio generator and adjust for peak level recording.
– Start the recorder in the recording mode.
– The signal level appearing on OUTPUT R must be 45 dB below that of a peak level recording.
Crosstalk R ► L
– Connect audio generator to AUX INPUT R.
– Connect wave analyzer to OUTPUT L.
– Close potentiometer INPUT LEVEL LEFT to position "0".
– Open potentiometer INPUT LEVEL RIGHT to position "10".
– Continue to record 1000 Hz at peak level
– Measure crosstalk. The signal level appearing on OUTPUT L must be 45 dB below a peak level recording.

### 6.5.5. Diaphonie STEREO

Pour mesurer la diaphonie stéréo, branchez générateur BF à l'entrée (48) AUX INPUT

– Effectuez les commutations selon la 6.5.–7.
Mesure L ► R
– Branchez un millivoltmètre BF sélect La sortie (51) OUTPUT R.
– Réglez le générateur sur 1000 + 6 dB VU.
– Démarrez en enregistrement
– Mesurez la diaphonie.
La valeur doit être de 45 dB au mi mum en dessous de + 6 dB VU.
Mesure R ► L
– Branchez le générateur BF à l'entr (48) AUX INPUT R.
– Branchez le millivoltmètre BF sélect la sortie (51) OUTPUT L.
– Réglage INPUT LEVEL LEFT sur "0
– Réglage INPUT LEVEL RIGHT s "10".
– Mesurez la diaphonie.
La valeur doit être de 45 dB au mi mum en dessous de + 6 dB VU.

### 6.5.6. NF-Messwerte "Vor Band"

### 6.5.6. Audio Measurements "Before tape"

### 6.5.6. Valeurs de mesure BF "avant bande"

| Eingang<br>Input<br>Entrée | Pegel für Vollaussteuerung (0 VU + 6 dB)<br>Input voltages for peak level recording (0 VU + 6 dB)<br>Niveau pour modulation maximum (0 VU + 6 dB) | Abschlusswiderstand für Fremdspannungsmessung<br>Terminating resistance for noise measurements<br>Résistance terminale pour pour la mesure du bruit de fond | Fremdspannungsabstand* bzw. Vollaussteuerung<br>Unweighted* S/N ratios relative to peak level<br>Recul du bruit de fond* se rapportant au maximum de modulation |
|---|---|---|---|
| AUX | 38 mV | 10 kΩ | ⩾ 73 dB |
| RADIO | 2.8 mV | offen/open/ouvert | ⩾ 60 dB |
| MIC HI | 2.8 mV | 200 Ω | ⩾ 70 dB |
| MIC LO | 0.17 mV | 200 Ω | ⩾ 50 dB |
| LINE AMP. | – | Input level pot pos "0" | ⩾ 80 dB |

*B = 20 kHz linear gemessen
*B = 20 kHz linear
*B = 20 kHz mesurée linéaire

| AUSGANG<br>OUTPUT<br>SORTIE | | Pegel bei Vollaussteuerung<br>Output voltages from peak level recording<br>Niveau à la modulation maximum | |
|---|---|---|---|
| OUTPUT | LEVEL max. | 1.55 V | ± 0.75 dB |
| OUTPUT | LEVEL min. | 70 mV | |
| RADIO | LEVEL max. | ⩽ 1.55 V | ± 0.75 dB |
| RADIO | LEVEL min. | ⩽ 70 mV | |
| PHONES | | max. 5.6 V $R_L = \infty$ | |
| PHONES | | max. 2.8 V $R_L = 220\ \Omega$ | |

□ Toleranz beinhaltet Verstärkung sowie Kanalunterschied.
□ Tolerance includes differences between channels and differences in amplification factors.
□ Tolerance se rapportant à l'amplification ainsi qu'à la différence entre les canaux

### 6.5.7. Tonhöhenschwankungen

Die in den technischen Daten spezifizierten Gleichlaufwerte sind mit einem Tonhöhenschwankungsmesser nach DIN 45507 gemessen.

### 6.5.7. Wow and flutter

The wow and flutter values as specified in the technical data section are measured with test equipment which conforms to the German standard DIN 45507 (consistent with IEEE standard 193 1971).

### 6.5.7. Pleurage et scintillement

Les caractéristiques techniques se rapportant au pleurage et au scintillement ont été mesurées d'après DIN 45507.

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| DESCRIPTION | SCHEMATIC NO. | SECTION/PAGE |
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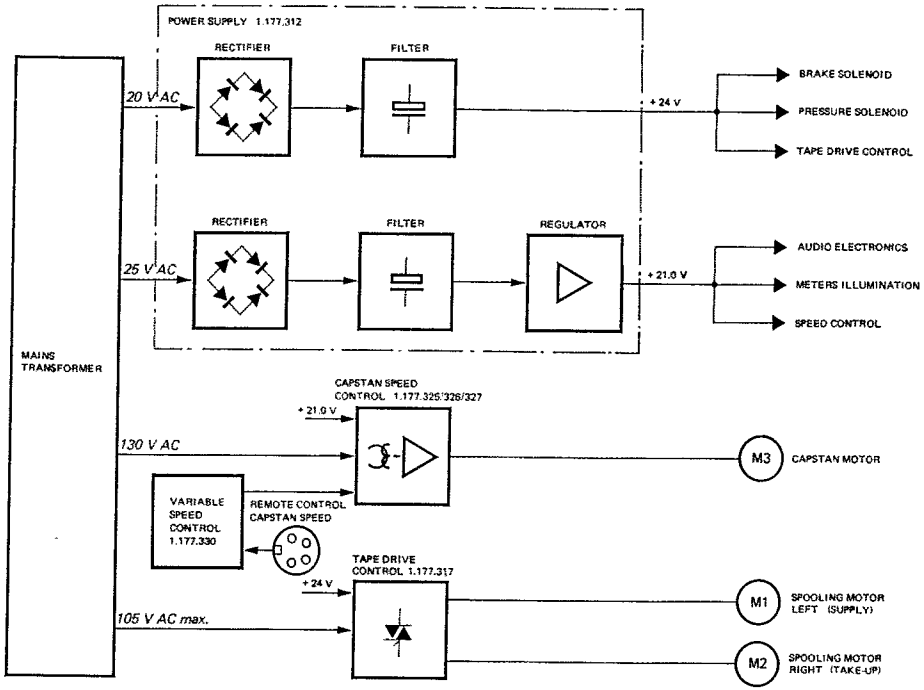
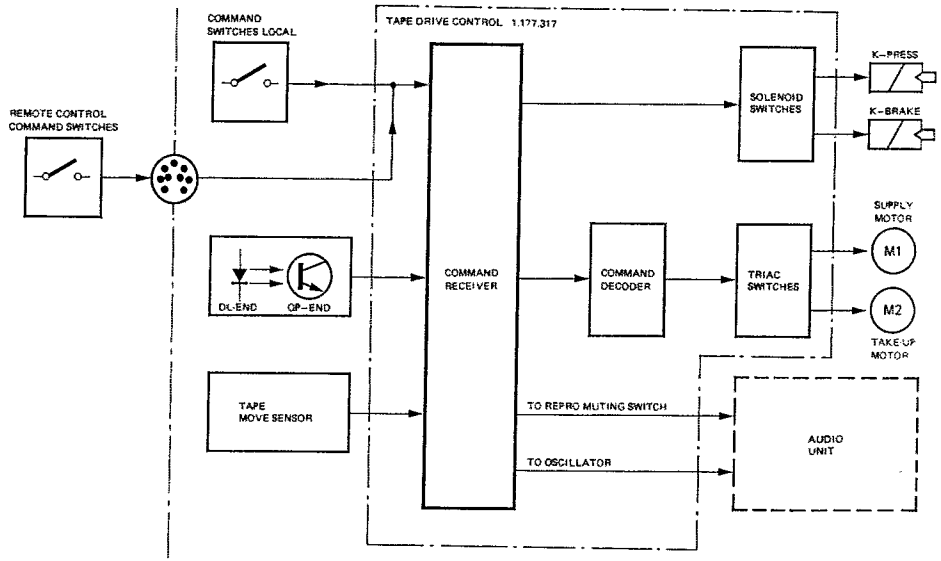
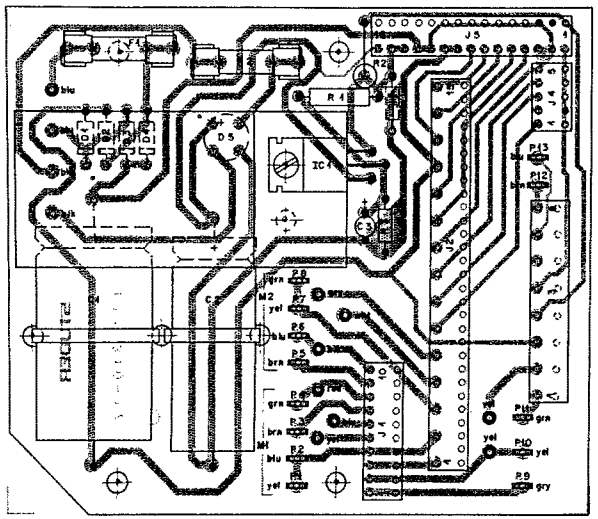
## BLOCK DIAGRAM / POWER SUPPLY AND TAPE DRIVE CONTROL



## POWER SUPPLY PCB 1.177.310

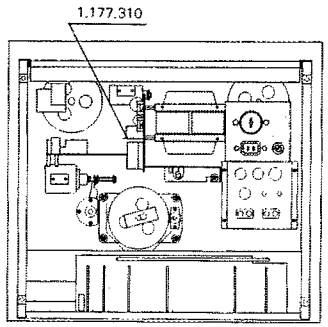


| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| C 01 | 59.25.5222 | 2200 u | -10% 35V EL | | |
| C 02 | 59.25.5102 | 1000 u | -10% 40V EL | | |
| C 03 | 59.30.1101 | 100 u | -20% 3V TA | | |
| D 01 | 50.04.0122 | 1 N 4001 | | | any |
| D 02 | 50.04.0122 | 1 N 4001 | | | any |
| D 03 | 50.04.0122 | 1 N 4001 | | | any |
| D 04 | 50.04.0122 | 1 N 4001 | | | any |
| D 05 | 70.01.0222 | BYS C 800 | | | |
| F 01 | 51.01.0119 | 1.6 AT | 5 x 20 Slow Blow | | |
| F 02 | 51.01.0114 | 500 mAT | 5 x 20 Slow Blow | | |
| IC 01 | 50.05.0242 | 7818 20 | 20V 0.5 A | | F,T |
| J 01 | 54.01.0290 | 10-Pole | Socket Strip | | |
| J 02 | 54.01.0535 | 15-Pole | " | | |
| J 03 | 54.01.0546 | 8-Pole | " | | |
| J 04 | 54.01.0348 | 5-Pole | " | | |
| J 05 | 54.01.0219 | 15-Pole | " | | |
| P 1,13 | 54.02.0320 | | Flat Pin 0.8 AMP | | |
| R 01 | 57.42.4182 | 1.8 K | 5% .33W CF | | |
| R 02 | 57.41.4220 | 22 | 5% 4 W WW | | |
| R 03 | 57.41.4820 | 82 | 5% 25W CF | | |

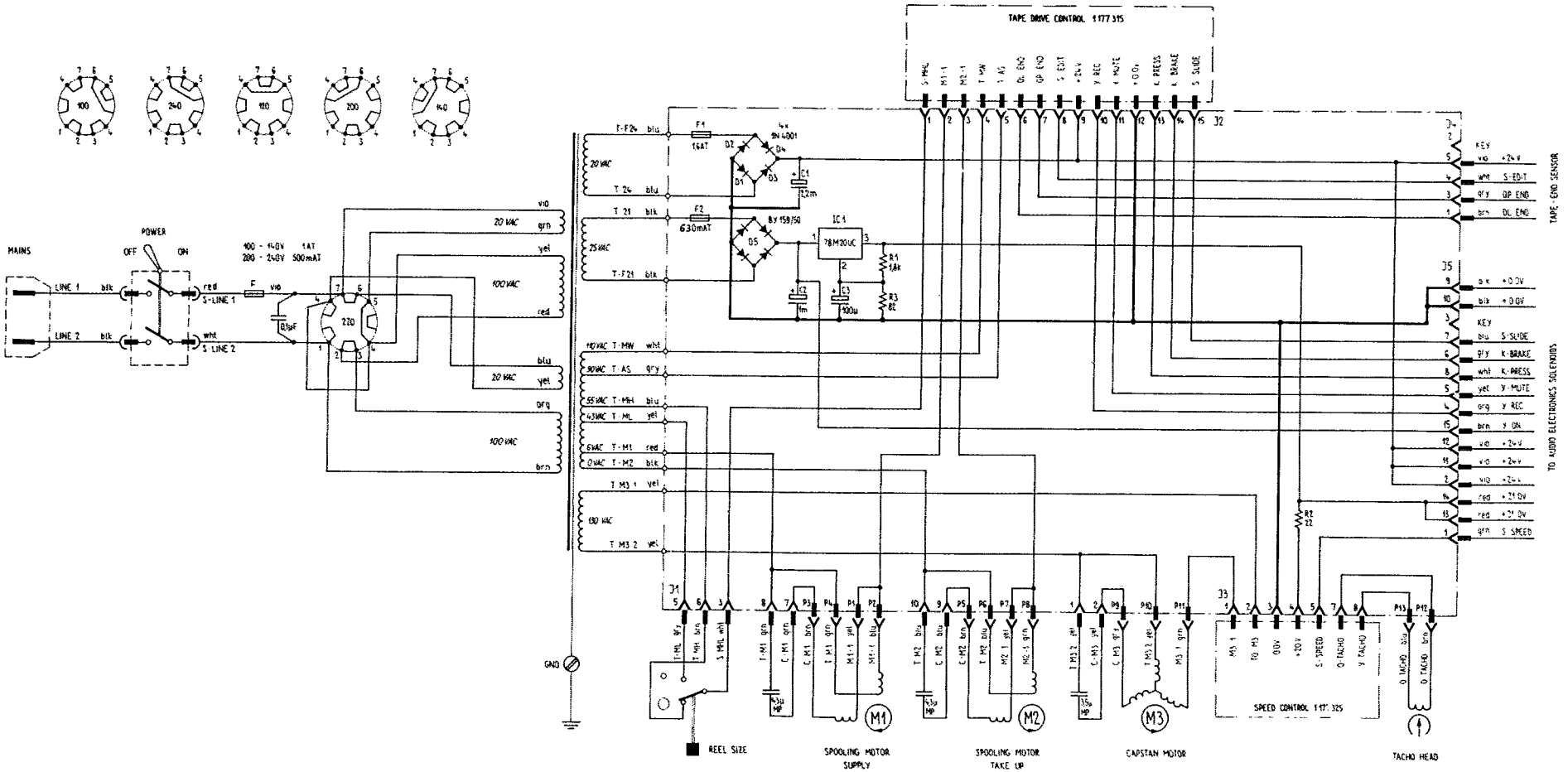
F = Fairchild , CF = Carbon Film
T = Texas Instr.,WW = Wire Wound

| INC | DATE | NAME |
|---|---|---|
| | 1.74.77 | Hartberger |

STUDER | Power Supply | 1.177.310 | PAGE 1 of 1



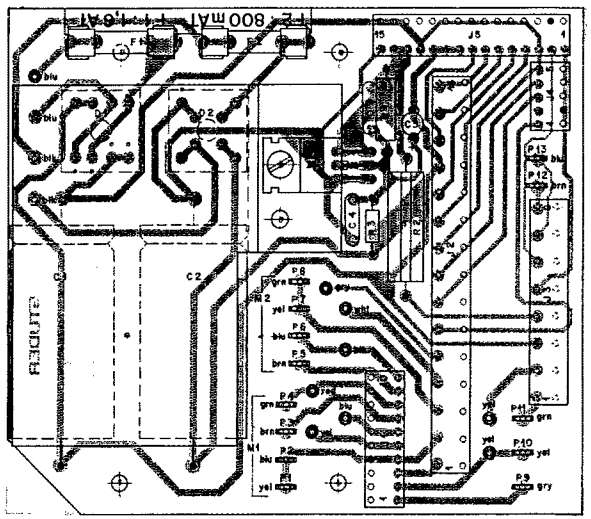
POWER SUPPLY PCB 1.177.310




VALID UP TO SERIAL NUMBER 10149

SEE SERVICE INFORMATION
48.6 : BY CHANGE OF 1.177.311

WER SUPPLY PCB 1.177.311

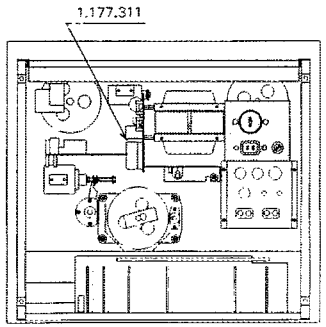



| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| C 01 | 59.25.5222 | 2200 U | -10% 35V | EL | |
| C 02 | 59.25.5222 | 2200 U | -10% 35V | EL | |
| C 03 | 59.30.1301 | 100 U | -20% 3V | TA | |
| C 04 | 59.32.3104 | 100 N | 20% 40V | CER | |
| C 05 | 59.32.3104 | 100 N | 20% 40V | CER | |
| D 01 | 70.01.0226 | 280V/2A | Bridge Rect. | SI | |
| D 02 | 70.01.0226 | 280V/2A | Bridge Rect. | SI | |
| F 01 | 51.01.0119 | 1.6AT | 5 x 20 Slow Blow | | |
| F 02 | 51.01.0116 | 800 mAT | 5 x 20 Slow Blow | | |
| IC 01 | 50.05.0242 | 78 M 20 | 20V 0.5 A | | F.T |
| J 01 | 54.01.0290 | 10-Pole | Socket Strip | | |
| J 02 | 54.01.0535 | 15-Pole | " | | |
| J 03 | 54.01.0546 | 8-Pole | " | | |
| J 04 | 54.01.0288 | 5-Pole | " | | |
| J 05 | 54.01.0219 | 15-Pole | " | | |
| P 1-13 | 54.02.0320 | | Flat Pin 0.8 MM | | |
| R 01 | 57.42.4182 | 1.8 K | 5% .33W | CF | |
| R 02 | 57.56.4220 | 22 | 5% 4 W | WW | |
| R 03 | 57.41.4820 | 82 | 5% .25W | CF | |

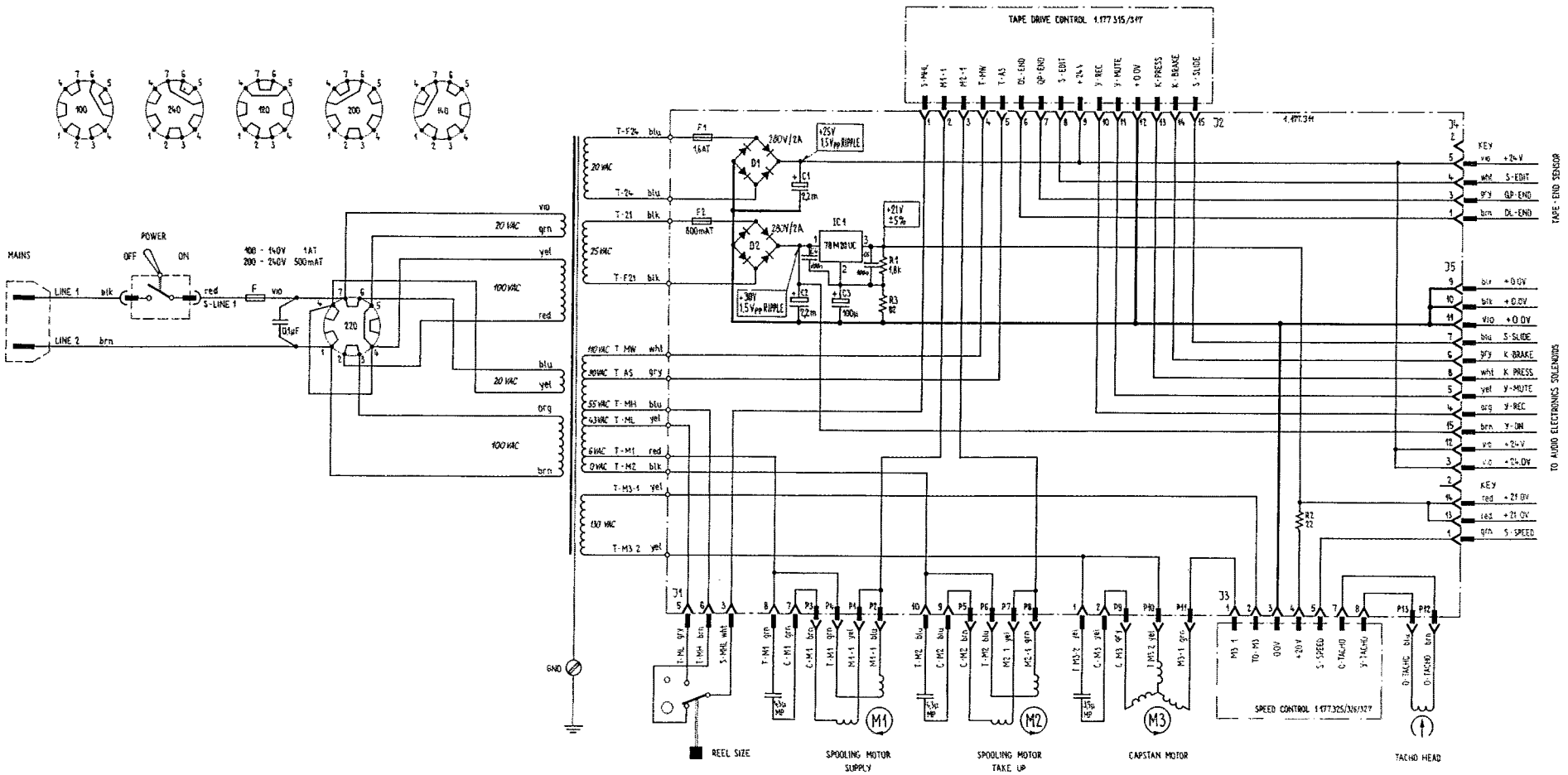
F = Fairchild
T = Texas Instr.
C = Carbon Film
W = Wire Wound

| NO | DATE | NAME |
|---|---|---|
| A | 7/10.75 | JG |
| B | 15/10.77 | LUDWIG-PC |

STUDER Power Supply 1.177.311 PAGE 1 of 1



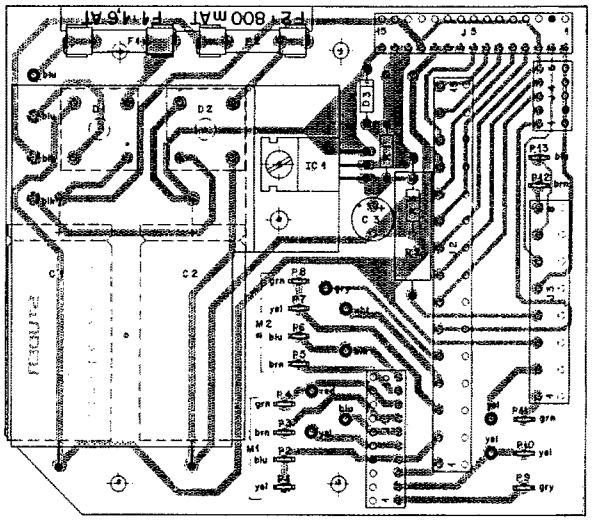
POWER SUPPLY PCB 1.177.311

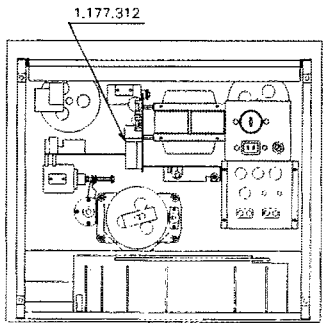



VALID FROM SERIAL NUMBER 10150 TO 107301

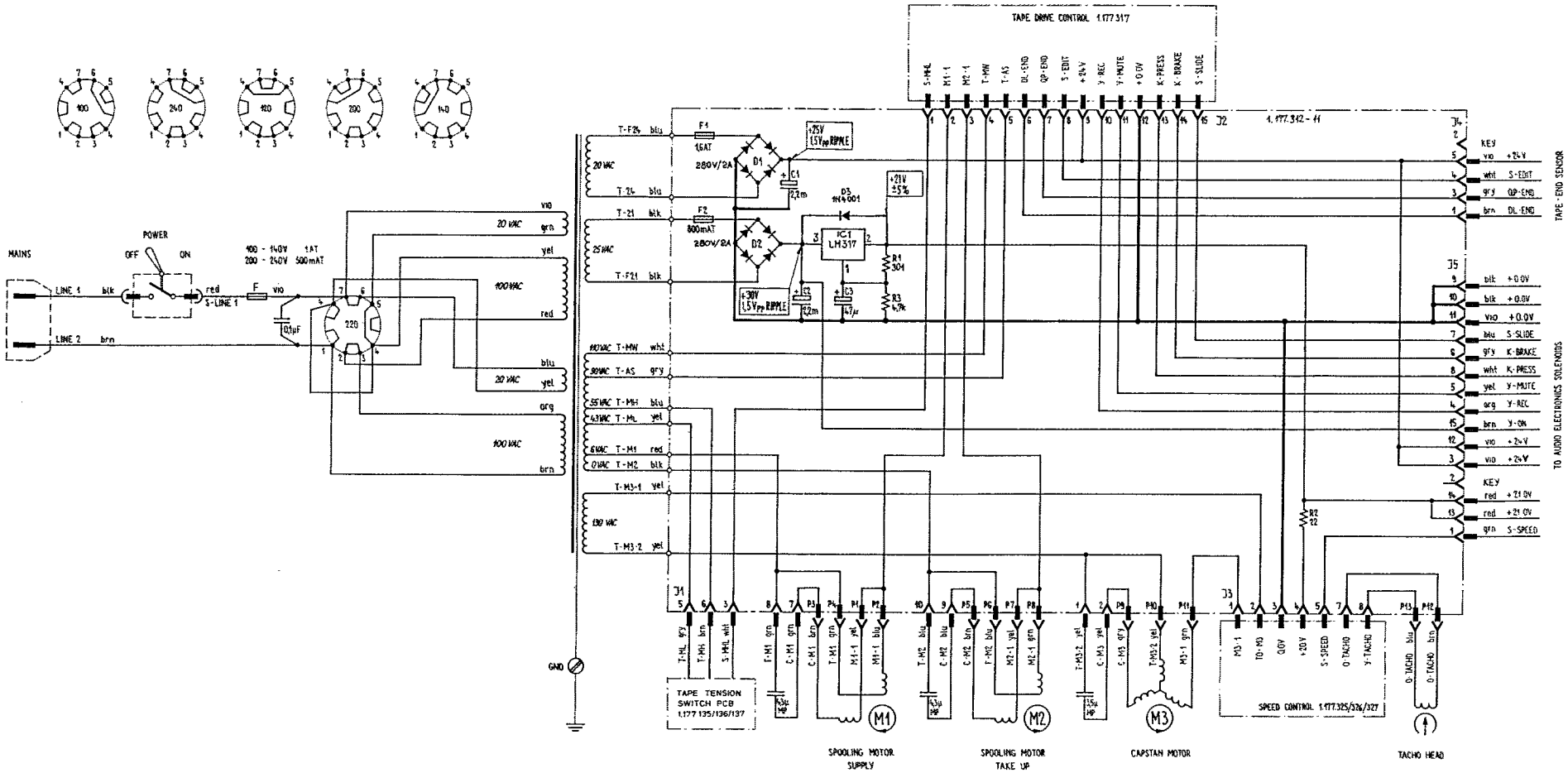
SEE SERVICE INFORMATION
57.6 : C4, C5

## WER SUPLLY PCB 1.177.312



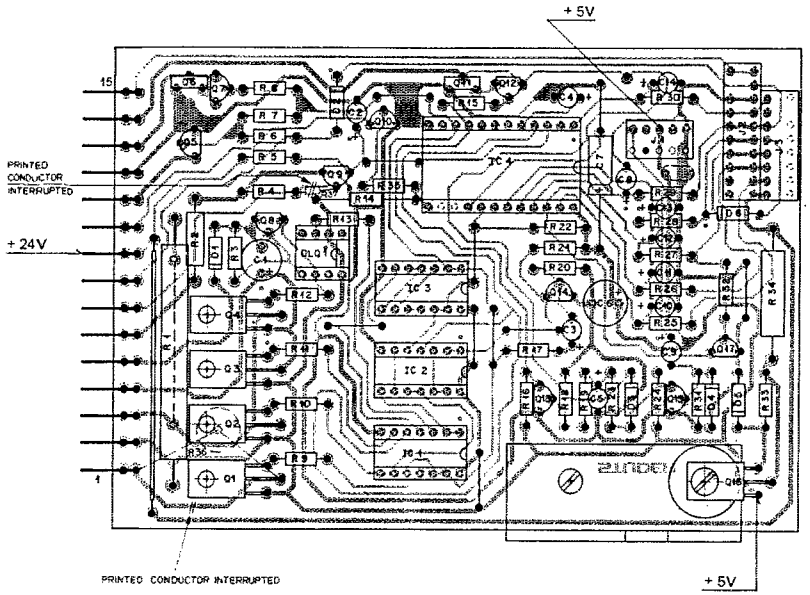



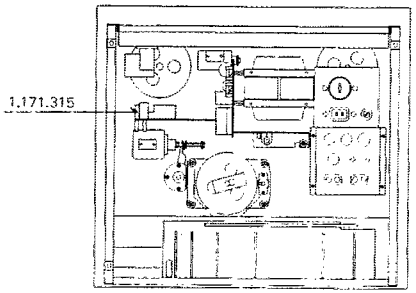
POWER SUPPLY PCB 1.177.312




VALID FROM SERIAL NUMBER 107302

## APE DRIVE CONTROL PCB 1.177.315




| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| C 01 | 59.22.4470 | 47 U | -10% 6.3V EL | | |
| C 02 | 59.30.6339 | 3.3 U | -20% 35V TA | | |
| C 03 | 59.30.4100 | 10 U | -20% 16V TA | | |
| C 04 | 59.30.6339 | 3.3 U | -20% 35V TA | | |
| C 05 | 59.30.2470 | 47 U | -20% 6.3V TA | | |
| C 06 | 59.22.3101 | 100 U | -10% 12V EL | | |
| C 07 | 59.25.4100 | 10 U | -10% 25V EL | | |
| C 08 | 59.30.6339 | 3.3 U | -20% 35V TA | | |
| C 09 | 59.30.6339 | 3.3 U | | | |
| C 10 | 59.30.6339 | 3.3 U | | | |
| C 11 | 59.30.6339 | 3.3 U | | | |
| C 12 | 59.30.6339 | 3.3 U | | | |
| C 13 | 59.30.6339 | 3.3 U | | | |
| C 14 | 59.30.6339 | 3.3 U | | | |
| D 01 | 50.04.0122 | 1 N 4001 | | | any |
| D 02 | 50.04.0125 | 1 N 4448 | | | any |
| D 03 | 50.04.0125 | 1 N 4448 | | | any |
| D 04 | 50.04.0125 | 1 N 4448 | | | any |
| D 05 | 50.04.1108 | Z 5V6 | 5.6V 5% 400mW | | |
| D 06 | 50.04.0125 | 1 N 4448 | | | any |
| OLQ 1 | 50.99.0126 | 4 N 28 | Ic/If = min.10% | TIL 118 | 0.71 |
| IC 01 | 50.06.0000 | SN74LS00 | LS-TTL | | any |
| IC 02 | 50.06.0000 | SN74LS00 | LS-TTL | | any |
| IC 03 | 50.06.0000 | SN74LS00 | LS-TTL | | any |
| IC 04 | 50.09.0143 | AY 10429 | | N-Fet | N |
| J 01 | 54.01.0288 | 5 - Pole | Socket Strip | AMP | |
| J 02 | 54.01.0242 | 10 - Pole | Socket Strip | AMP | |
| J 03 | 54.01.0262 | 8 - Pole | Socket Strip | AMP | |
| P 01 | 54.01.0481 | 15 - Pole | Pin Strip | AMP | |
| Q 01 | 50.99.0119 | 2 N 6073 B | TRIAC 400V 3A | | M |
| Q 02 | 50.99.0119 | 2 N 6073 B | | | |
| Q 03 | 50.99.0119 | 2 N 6073 B | | | |
| Q 04 | 50.99.0119 | 2 N 6073 B | | | |
| Q 05 | 50.03.0436 | BC 107 B | NPN | | any |
| Q 06 | 50.03.0478 | BD 139 | medium power NPN | | T. S |

M = Motorola
O = Optron
TI = Texas Instr.
T = Toshiba
S = Siemens

| IND | DATE | NAME |
|---|---|---|
| 0 | 7.3.78 | Pol |
| 1 | 2.10.78 | Pol./ |
| 2 | 31.3.79 | Wertberg/SW |

STUDER Tape Drive Control 1.177.315 PAGE 1 of 3

| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| | | | | | |
| Q 07 | 50.03.0436 | BC 107 B | NPN | | any |
| Q 08 | 50.03.0436 | BC 107 B | NPN | | any |
| Q 09 | 50.03.0436 | BC 107 B | NPN | | any |
| Q 10 | 50.03.0436 | BC 107 B | NPN | | any |
| Q 11 | 50.03.0478 | BD 139 | medium power NPN | | T. S |
| Q 12 | 50.03.0436 | BC 107 B | NPN | | any |
| Q 13 | 50.03.0436 | BC 107 B | NPN | | any |
| Q 14 | 50.03.0436 | BC 107 B | NPN | | any |
| Q 15 | 50.03.0436 | BC 107 B | NPN | | any |
| Q 16 | 50.03.0478 | BD 139 | medium power NPN | | T. S |
| Q 17 | 50.03.0436 | BC 107 B | NPN | | any |
| R 01 | 57.57.4122 | 1.2 k | 5% .5W CER | | |
| (2) R 02 | 57.41.4332 | 3.3 k | 5% .25W CF | | |
| R 03 | 57.41.4472 | 4.7 k | | | |
| R 04 | 57.41.4333 | 33 k | | | |
| R 05 | 57.41.4682 | 6.8 k | | | |
| R 06 | 57.41.4104 | 100 k | | | |
| R 07 | 57.41.4153 | 15 k | | | |
| R 08 | 57.41.4272 | 2.7 k | | | |
| R 09 | 57.41.4471 | 470 | | | |
| R 10 | 57.41.4471 | 470 | | | |
| R 11 | 57.41.4471 | 470 | | | |
| R 12 | 57.41.4122 | 1.2 k | | | |
| R 13 | 57.41.4181 | 180 | | | |
| (1) R 14 | 57.41.4102 | 1 k | | | |
| R 15 | 57.41.4562 | 5.6 k | | | |
| R 16 | 57.41.4223 | 22 k | | | |
| R 17 | 57.41.4472 | 4.7 k | | | |
| R 18 | 57.41.4822 | 8.2 k | | | |
| R 19 | 57.41.4223 | 22 k | | | |
| R 20 | 57.41.4223 | 22 k | | | |
| R 21 | 57.41.4392 | 3.9 k | | | |
| R 22 | 57.41.4472 | 4.7 k | | | |
| R 23 | 57.41.4104 | 100 k | | | |
| R 24 | 57.41.4 | 12 k | | | |
| R 25 | 57.41.4392 | 3.9 k | | | |
| R 26 | 57.41.4392 | 3.9 k | | | |
| R 27 | 57.41.4392 | 3.9 k | | | |
| R 28 | 57.41.4392 | 3.9 k | | | |
| R 29 | 57.41.4392 | 3.9 k | | | |
| R 30 | 57.41.4392 | 3.9 k | | | |
| R 31 | 57.41.4473 | 47 k | | | |
| R 32 | 57.41.4107 | 100 k | | | |

STUDER Tape Drive Control 1.177.315 PAGE 2 of 3

| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| R 33 | 57.41.4122 | 1.2 k | 5% .25W CF | | |
| R 34 | 57.56.4101 | 100 | 10% 5 W CER | | |
| (1) R 35 | 57.41.4102 | 1 k | 5% .25W CF | | |
| (2) R 36 | 57.99.0210 | 2.1 | PTC | | |
| (2) R 37 | 57.11.4222 | 2.2 k | 5% .25W CF | | |

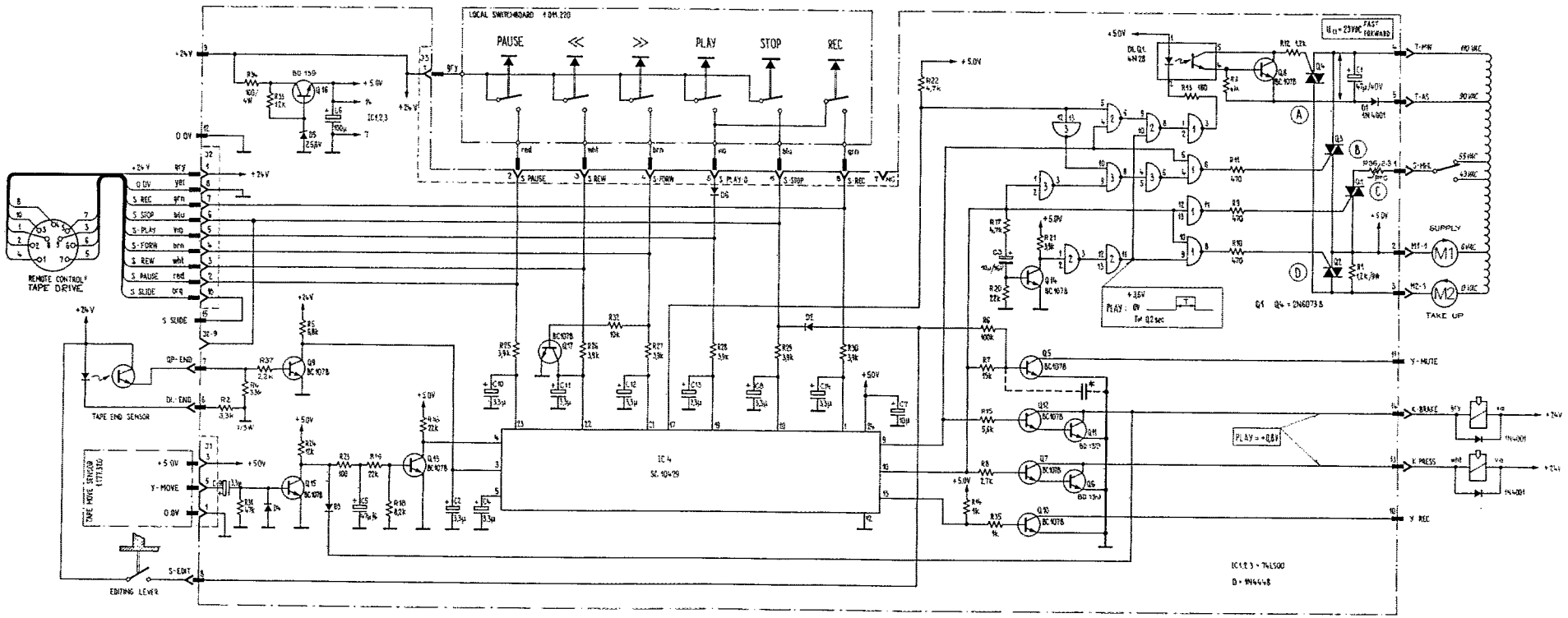
CF = Carbon Film

| IND | DATE | NAME |
|---|---|---|
| 0 | 7.3.78 | Pol |
| 1 | 2.10.78 | Pol./ |
| 2 | 31.3.79 | Wertberg/SW |

STUDER Tape Drive Control 1.177.315 PAGE 3 of 3

TAPE DRIVE CONTROL PCB 1.177.315

REVISED EDITION



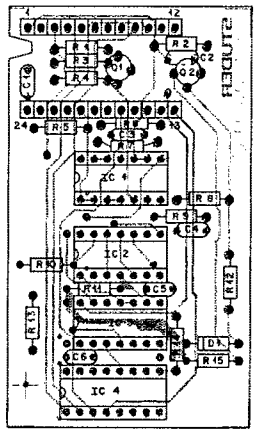

VALID UP TO SERIAL NUMBER 52699

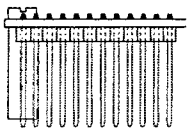
IC4 MAY BE REPLACED BY THE SUBSTITUTION LOGIC PC-BOARD 1.177.316

SEE SERVICE INFORMATION
48.9 : C*
52.6 : R2

07.03.79

## JBSTITUTION LOGIC PCB 1.177.316



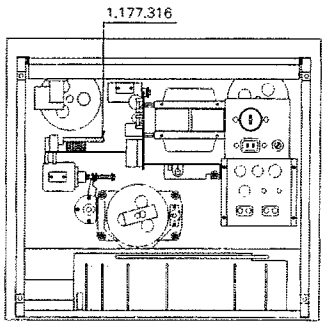



| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| C 1..6 | 59.12.3103 | 10 nF | 20% CER | | |
| D 01 | 50.04.1106 | Z 2,7 V | 5% SI | | any |
| IC 01 | 50.06.0000 | 74L800 | LS-TTL | | any |
| IC 02 | 50.06.0002 | 74L902 | LS-TTL | | any |
| IC 03 | 50.06.0078 | 74LS278 | LS-TTL | | any |
| IC 4 | 1.177.315-51 | R 0147 | PROM 32x8 Tri-State | | Stg. |
| P1..24 | 54.01.0020 | | Pin .63 x .63 | | |
| Q1,Q2 | 50.03.0438 | BC 108 B | NPN | | any |
| R 01 | 57.41.4172 | 1,2 k | 5% .25W CF | | |
| R 02 | 57.41.4681 | 680 | | | |
| R 03 | 57.41.4681 | 680 | | | |
| R 04 | 57.41.4471 | 470 | | | |
| R 05 | 57.41.4681 | 680 | | | |
| R 06 | 57.41.4681 | 680 | | | |
| R 07 | 57.41.4681 | 680 | | | |
| R 08 | 57.41.4121 | 120 | | | |
| R 09 | 57.41.4681 | 680 | | | |
| R 10 | 57.41.4332 | 3,3 k | | | |
| R 11 | 57.41.4332 | 3,3 k | | | |
| R 12 | 57.41.4121 | 120 | | | |
| R 13 | 57.41.4471 | 470 | | | |
| R 14 | 57.41.4471 | 470 | | | |
| R 15 | 57.41.4332 | 3,3 k | | | |

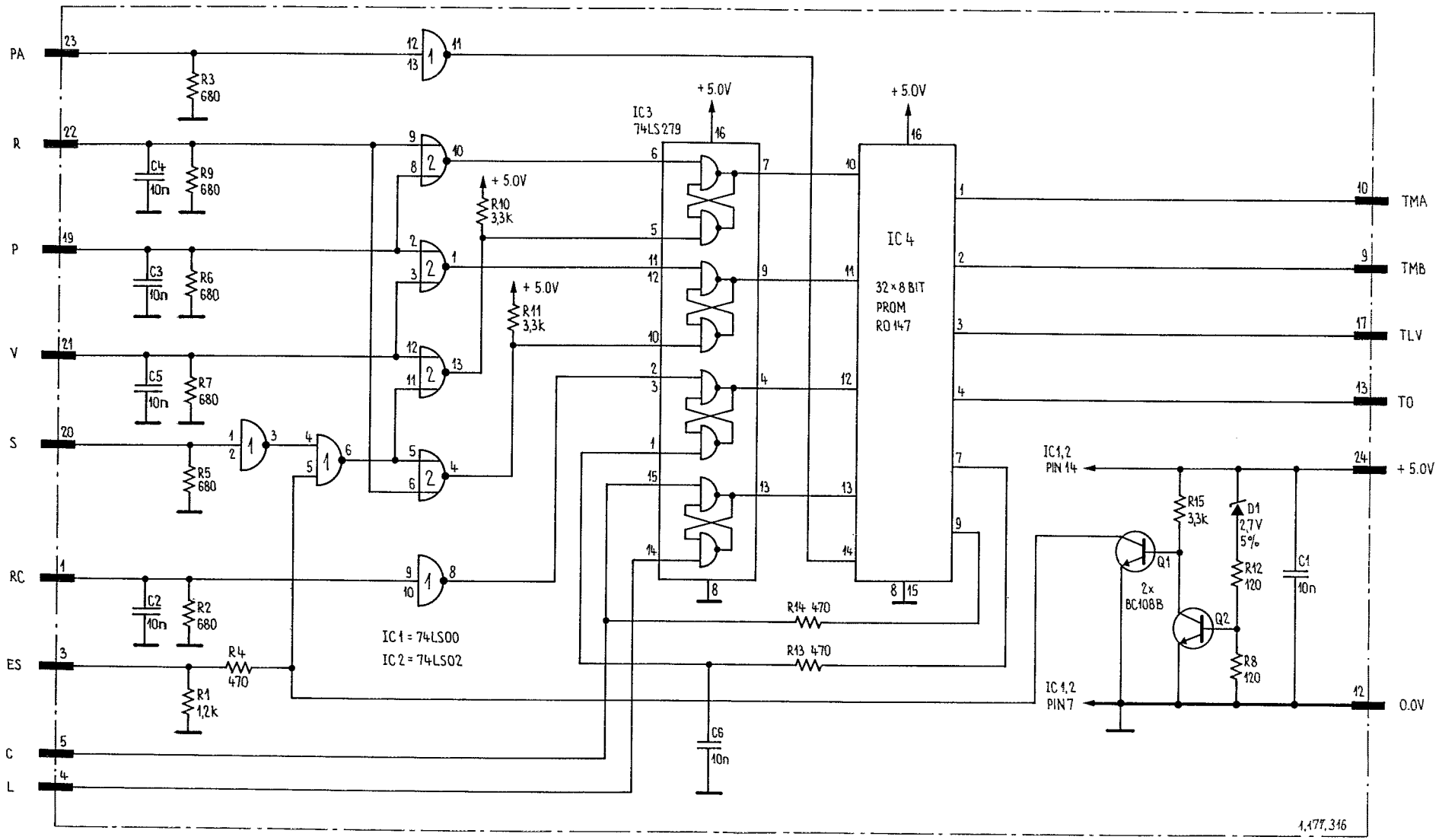
Sig_w Signetics

| IND | DATE | NAME |
|---|---|---|
| 0 | 4.11.77 | Waser/gv |

STUDER | Substitution Logic Board | 1.177.316 | PAGE 1 of 1

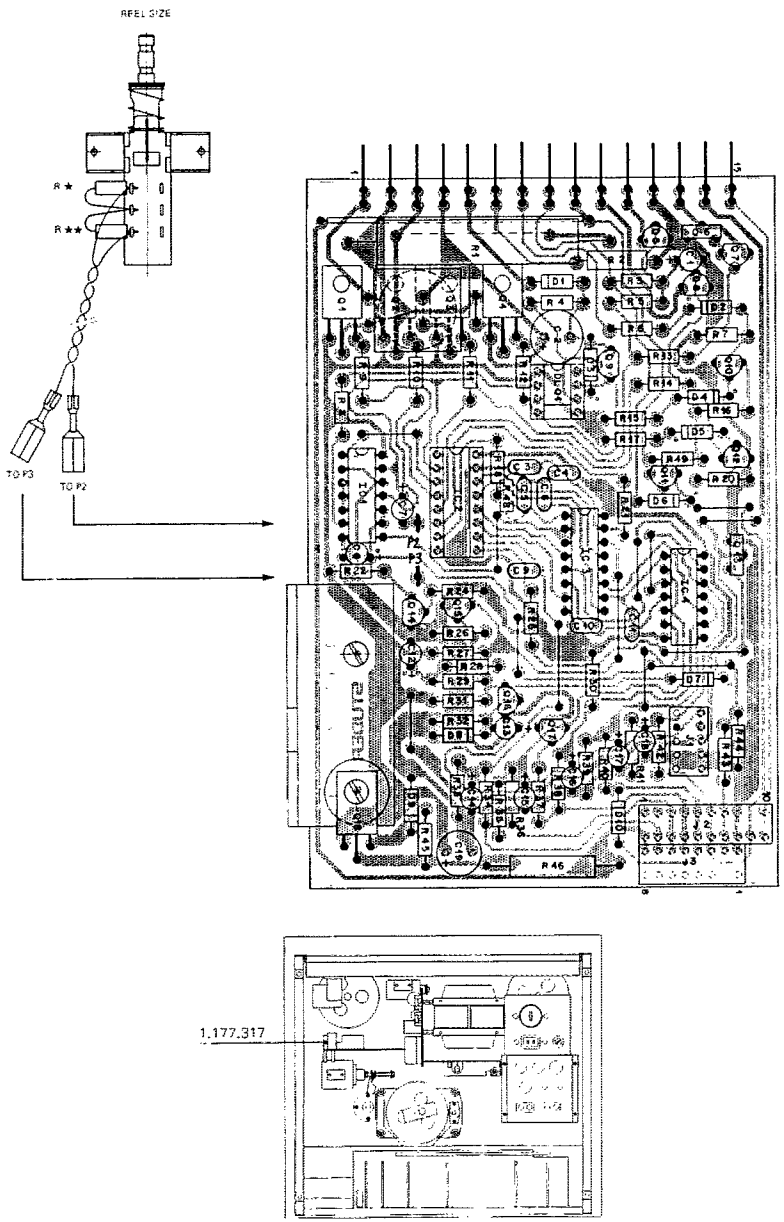


SUBSTITUTION LOGIC PCB 1.177.316




IC4 (TAPE DRIVE CONTROL PCB 1.177.315) MAY BE REPLACED BY THE SUBSTITUTION LOGIC PC-BOARD 1 177.316

## PE DRIVE CONTROL PCB 1.177.317 (B77 MKI)




| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| C 01 | 59.30.1104 | 100 µ | -20% 7V TA | | |
| C 02 | 59.22.6470 | 47 µ | -10% 40V EL | | |
| C 03 | 59.32.5103 | 10 n | -20% 40V CER | | |
| C 04 | 59.32.5103 | 10 n | | | |
| (1) C 05 | 59.30.6339 | 3.3 µ | 35V TA | | |
| C 06 | 59.32.5103 | 10 n | 40V CER | | |
| C 07 | 59.30.4100 | 10 µ | -20% 16V TA | | |
| C 08 | 59.30.6334 | 3.3 µ | -20% 35V TA | | |
| C 09 | 59.32.5103 | 10 n | -20% 40V CER | | |
| C 10 | 59.32.5103 | 10 n | | | |
| C 11 | 59.32.5103 | 10 n | | | |
| C 12 | 59.30.2470 | 47 µ | -20% 6.3V TA | | |
| C 13 | 59.30.6334 | 3.3 µ | -20% 35V TA | | |
| C 14 | 59.30.6334 | 3.3 µ | | | |
| C 15 | 59.30.6339 | 3.3 µ | | | |
| C 16 | 59.30.6339 | 3.3 µ | | | |
| C 17 | 59.30.6339 | 3.3 µ | | | |
| C 18 | 59.30.6339 | 3.3 µ | | | |
| C 19 | 59.22.3101 | 100 µ | -10% 10V EL | | |
| D 01 | 50.04.0122 | 1N4001 | | | any |
| D 02 | 50.04.1119 | Z 15 | 5% 15V 400mW | | |
| D 03 | 50.04.0122 | 1N4001 | | | any |
| D 04 | 50.04.0125 | 1N4448 | | | |
| D 05 | 50.04.1106 | Z 2.7 | 5% 2.7V 400mW | | any |
| D 06 | 50.04.0125 | 1N4448 | | | any |
| D 07 | 50.04.0125 | 1N4448 | | | |
| D 08 | 50.04.0125 | 1N4448 | | | |
| D 09 | 50.04.1108 | Z 5.6 | 5% 5.6V 400mW | | |
| D 10 | 50.04.0125 | 1N4448 | | | any |
| DRA 1 | 50.99.0126 | 4 N 28 | Ic/Ii= min 10% | TIL 119 | G. TI |
| IC 01 | 50.06.0000 | SN74L300 | LS-TTL | | any |
| IC 02 | 1.177.317.51 | 32 x 8 | Prom Tri-State | | S.M.I |
| IC 03 | 50.06.0279 | SN74LS279 | LS-TTL | | any |
| IC 04 | 50.06.0002 | SN74L802 | LS-TTL | | any |
| J 01 | 54.01.0188 | 5-Pole | Socket-Strip | AMP | |
| J 02 | 54.01.0242 | 10-Pole | Socket-Strip | AMP | |
| J 03 | 54.01.0262 | 6-Pole | Socket-Strip | AMP | |
| P 01 | 54.01.6481 | 15-Pole | Pin-Strip | AMP | |

O = Option I = Interail
TI= Texas Instr.
S = Signetics
M = NMI

CY = Carbon Film
MM = Wire Mound

| IND | DATE | NAME |
|---|---|---|
| C | 23.1.81 | Fol/gv |
| B | 12.9.79 | Fol/gv |
| A | 12.7.78 | Lu./gv |

STUDER Tape Drive Control MK II 1.177.317 PAGE 1 of 3

| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| Q 01 | 50.99.0119 | 2N6073B | TRIAC 400V/3A Igt 3mA | | Mo |
| Q 02 | 50.99.0119 | 2N6073B | | | |
| Q 03 | 50.99.0119 | 2N6073B | | | |
| Q 04 | 50.99.0119 | 2N6073B | | | |
| Q 05 | 50.01.0438 | BC107B | NPN | | any |
| Q 06 | 50.03.0478 | BD 135 | medium power NPN | 2SC 496-0 | |
| Q 07 | 50.01.0436 | BC107B | NPN | | any |
| Q 08 | 50.01.0436 | BC107B | NPN | | any |
| Q 09 | 50.01.0436 | BC107B | NPN | | any |
| Q 10 | 50.03.0438 | BC107B | NPN | | any |
| Q 11 | 50.07.0127 | BC177A | PNP | | any |
| Q 12 | 50.01.0436 | BC107B | NPN | | any |
| Q 13 | 50.03.0478 | BD 135 | medium power NPN | 2SC 496-0 | |
| Q 14 | 50.01.0436 | BC107B | NPN | | any |
| Q 15 | 50.03.0436 | BC107B | NPN | | any |
| Q 16 | 50.03.0436 | BC107B | NPN | | any |
| Q 17 | 50.01.0436 | BC107B | NPN | | any |
| Q 18 | 50.03.0478 | BD 135 | medium power NPN | 2SC 496-0 | |
| P 01 | 57.57.4821 | 820 | 5% 5W MM | | |
| (1) R 02 | 57.02.4332 | 3.3 k | 5% .33W CF | | |
| R 03 | 57.11.4104 | 100 k | 5% .25W CF | | |
| R 04 | 57.11.4472 | 4.7 k | | | |
| R 05 | 57.11.4153 | 15 k | | | |
| (1) R 06 | 57.11.4472 | 4.7 k | | | |
| (1) R 07 | 57.11.4223 | 22 k | | | |
| R 08 | 57.11.4181 | 180 | | | |
| R 09 | 57.11.4471 | 470 | | | |
| R 10 | 57.11.4471 | 470 | | | |
| R 11 | 57.11.4471 | 470 | | | |
| R 12 | 57.11.4122 | 1.2 k | | | |
| R 13 | 57.11.4272 | 2.7 k | | | |
| R 14 | 57.11.4122 | 1.2 k | | | |
| R 15 | 57.11.4332 | 3.3 k | | | |
| R 16 | 57.11.4331 | 33 k | | | |
| R 17 | 57.11.4121 | 120 | | | |
| R 18 | 57.11.4471 | 470 | | | |
| R 19 | 57.11.4223 | 22 k | | | |
| R 20 | 57.11.4121 | 120 | | | |
| R 21 | 57.11.4471 | 470 | | | |
| R 22 | 57.11.4391 | 3.9 k | | | |
| R 23 | 57.11.4822 | 8.2 k | | | |
| R 24 | 57.11.4331 | 330 | | | |
| R 25 | 57.11.4822 | 8.2 k | | | |
| R 26 | 57.11.4223 | 22 k | | | |
| R 27 | 57.11.4223 | 22 k | | | |
| R 28 | 57.11.4223 | 22 k | | | |
| R 29 | 57.11.4181 | 180 | | | |

CY = Carbon Film
MM = Wire Mound

| IND | DATE | NAME |
|---|---|---|
| C | 23.1.81 | Fol/gv |
| B | 12.9.79 | Fol/gv |
| A | 12.7.78 | Lu./gv |

STUDER Tape Drive Control MK II 1.177.317 PAGE 2 of 3

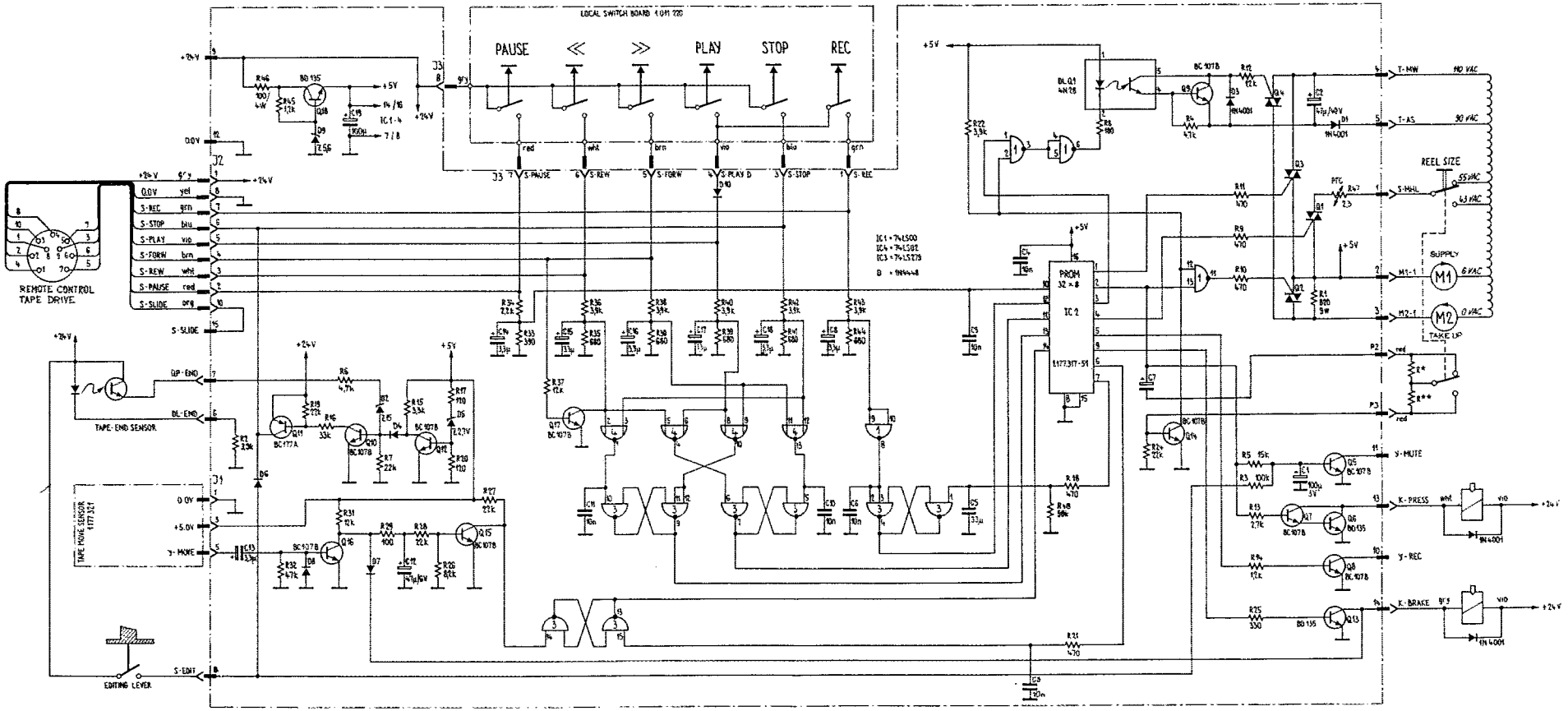
| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| (2) R 31 | 57.11.4153 | 15 k | 5% .25W CF | | |
| R 32 | 57.11.4473 | 47 k | | | |
| R 33 | 57.11.4391 | 390 | | | |
| R 34 | 57.11.4222 | 2.2 k | | | |
| R 35 | 57.11.4681 | 680 | | | |
| R 36 | 57.11.4392 | 3.9 k | | | |
| R 37 | 57.11.4123 | 12 k | | | |
| R 38 | 57.11.4392 | 3.9 k | | | |
| R 39 | 57.11.4681 | 680 | | | |
| R 40 | 57.11.4392 | 3.9 k | | | |
| R 41 | 57.11.4681 | 680 | | | |
| R 42 | 57.11.4391 | 3.9 k | | | |
| R 43 | 57.11.4392 | 3.9 k | | | |
| R 44 | 57.11.4681 | 680 | | | |
| R 45 | 57.11.4122 | 1.2 k | | | |
| R 46 | 57.56.4101 | 100 | 10% 5W WW | | |
| R 47 | 57.99.0210 | 2.3 | PTC | | |
| (1) R 48 | 57.11.4563 | 56 k | | | |

CY = Carbon Film
MM = Wire Mound

| IND | DATE | NAME |
|---|---|---|
| C | 23.1.81 | Fol/gv |
| B | 12.9.79 | Fol/gv |
| A | 12.7.78 | Lu./gv |

STUDER Tape Drive Control MK II 1.177.317 PAGE 3 of 3

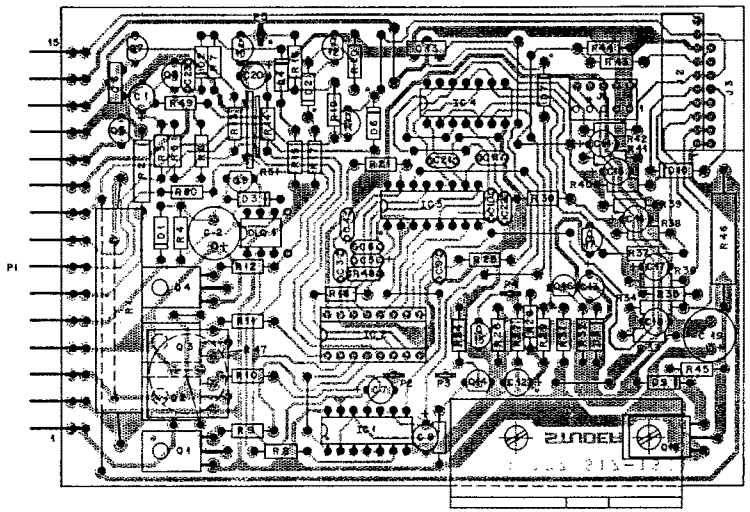
## TAPE DRIVE CONTROL PCB 1.177.317 (B77 MKI)

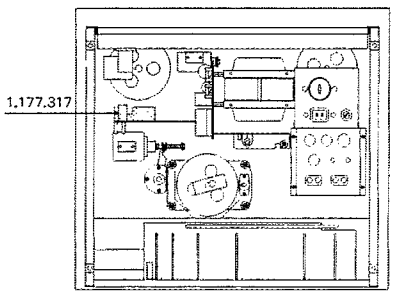



| VERSION | REEL SIZE SWITCH | R* | R** |
|---|---|---|---|
| B77 LS/SLS | 1.177.145 | 470 Ω | 470 Ω |
| B77 STD | 1.177.146 | 470 Ω | 8.2 kΩ |
| B77 HS | 1.177.147 | 3.9 kΩ | 8.2 kΩ |

VALID FROM SERIAL NUMBER 53522 TO 52699

## APE DRIVE CONTROL PCB 1.177.317-81 (B77 MKII)






| INV. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | C++++1 | 59.22.3101 | 100 uF | 100% 10V+ El | |
| | C++++2 | 59.22.8470 | 47 uF | -10%+ 40V+ El | |
| | C++++3 | 59.32.3103 | 10 nF | -20%+ 40V+ Cer | |
| | C++++4 | 59.32.3103 | 10 nF | -20%+ 40V+ Cer | |
| | C++++5 | 59.22.8479 | 4.7 uF | 10%+ 50V+ El | |
| | C++++6 | 59.32.3103 | 10 nF | -20%+ 40V+ Cer | |
| | C++++7 | 59.22.8100 | 10 uF | 10%+ 35V+ El | |
| | C++++8 | 59.22.8479 | 4.7 uF | 10%+ 50V+ El | |
| | C++++9 | 59.32.3103 | 10 nF | -20%+ 40V+ Cer | |
| | C++++A | 59.32.3103 | 10 nF | -20%+ 40V+ Cer | |
| | C++++B | 59.32.3103 | 10 nF | -20%+ 40V+ Cer | |
| | C++++C | 59.22.3470 | 47 uF | 10%+ 16V+ El | |
| | C++++D | 59.22.8479 | 4.7 uF | 10%+ 50V+ El | |
| | C++++E | 59.22.8479 | 4.7 uF | 10%+ 50V+ El | |
| | C++++F | 59.22.8479 | 4.7 uF | 10%+ 50V+ El | |
| | C++++G | 59.22.8479 | 4.7 uF | 10%+ 50V+ El | |
| | C++++H | 59.22.8479 | 4.7 uF | 10%+ 50V+ El | |
| | C++++I | 59.22.8479 | 4.7 uF | 10%+ 50V+ El | |
| | C++++J | 59.22.3101 | 100 uF | 10%+ 10V+ El | |
| | C++++K | 59.26.6A01 | A6 uF | 20%+ 6.3V+ TAL | |
| | C++++L | 59.32.3472 | 4700 pF | 20%+ 40V+ Cer | |
| | C++++M | 59.32.3472 | 4700 pF | 20%+ 40V+ Cer | |
| | C++++N | 59.32.3103 | 10 nF | -20%+ 40V+ Cer | |
| | D++++1 | 50.04.0122 | 1 N 4001 | any | |
| | D++++2 | 50.04.1138 | Z 5V6 | 5%+ 5.6V+ 400mW | |
| | D++++3 | 50.04.0122 | 1 N 4001 | any | |
| | D++++4 | 50.04.0147 | 1 N 4454 | any | |
| | D++++5 | 50.04.3106 | Z 2V7 | 5%+ 2.7V+ 400mW | |
| | D++++6 | 50.04.0125 | 1 N 4448 | any | |
| | D++++7 | 50.04.0125 | 1 N 4448 | any | |
| | D++++8 | 50.04.0125 | 1 N 4448 | any | |
| | D++++9 | 50.04.1108 | Z 5V6 | 5%+ 5.6V+ 400mW | |
| | D++++10 | 50.04.0125 | 1 N 4448 | any | |
| | DL++++1 | 50.99.0126 | 4 N 28 | Ir/It = min.10% Opto | |

| INV. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | IC++++1 | 50.06.0000 | SN74LS00 | LS-TTL any | |
| | IC++++2 | 1.177.317.53 | 32 x 8 | Prom Tri-State | S.Mat |
| | IC++++3 | 50.06.0229 | SN74LS279 | LS-TTL any | |
| | IC++++4 | 50.06.0002 | SN74LS02 | LS-TTL any | |
| | J++++1 | 54.01.0208 | 5-Pole | Socket-Strip | AMP |
| | J++++2 | 54.01.0242 | 10-Pole | Socket-Strip | AMP |
| | J++++3 | 54.01.0262 | 8-Pole | Socket-Strip | AMP |
| | P++++1 | 54.01.0481 | 15-Pole | Pin-Strip | AMP |
| | P++++2 | 54.01.0320 | | Flat-Pin | AMP |
| | P++++3 | 54.01.0320 | | Flat-Pin | AMP |
| | P++++4 | 54.01.0320 | | Flat-Pin | AMP |
| | P++++5 | 54.01.0320 | | Flat-Pin | AMP |
| | Q++++1 | 50.99.0119 | 2N6073B | Triac 400V/4A | MO |
| | Q++++2 | 50.99.0119 | 2N6073B | Triac 400V/4A | MO |
| | Q++++3 | 50.99.0119 | 2N6073B | Triac 400V/4A | MO |
| | Q++++4 | 50.99.0119 | 2N6073B | Triac 400V/4A | MO |
| | Q++++5 | 50.03.0434 | BC 107 B | NPN any | |
| | Q++++6 | 50.03.0478 | BD 135 | Medium power NPN | 2 SC 496-0 |
| | Q++++7 | 50.03.0436 | BC 107 B | NPN any | |
| | Q++++8 | 50.03.0436 | BC 107 B | NPN any | |
| | Q++++9 | 50.03.0436 | BC 107 B | NPN any | |
| | Q++++10 | 50.03.0436 | BC 107 B | NPN any | |
| | Q++++11 | 50.03.0117 | BC 177 A | PNP any | |
| | Q++++12 | 50.03.0436 | BC 107 B | NPN any | |
| | Q++++13 | 50.03.0478 | BD 135 | Medium power NPN | 2 SC 496-0 |
| | Q++++14 | 50.03.0436 | BC 107 B | NPN any | |
| | Q++++15 | 50.03.0436 | BC 107 B | NPN any | |
| | Q++++16 | 50.03.0436 | BC 107 B | NPN any | |
| | Q++++17 | 50.03.0436 | BC 107 B | NPN any | |
| | Q++++18 | 50.03.0478 | BD 135 | Medium Power NPN | 2 SC 496-0 |
| | R++++1 | 57.57.4821 | 820 Ohm | 5% 9 W MF | |
| | R++++2 | 57.11.4392 | 3.4 kOhm | 5% 0.25W CF | |
| | R++++3 | 57.11.4104 | 100 kOhm | 5% 0.25W CF | |



| INV. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | R++++4 | 57.11.4472 | 4.7 kOhm | 5% 0.25W CF | |
| | R++++5 | 57.11.4153 | 15 kOhm | 5% 0.25W CF | |
| | R++++6 | 57.11.4472 | 4.7 kOhm | 5% 0.25W CF | |
| | R++++7 | 57.11.4221 | 22 kOhm | 5% 0.25W CF | |
| | R++++8 | 57.11.4181 | 180 Ohm | 5% 0.25W CF | |
| | R++++9 | 57.13.4471 | 470 Ohm | 5% 0.5 W CF | |
| | R++++10 | 57.11.4471 | 470 Ohm | 5% 0.25W CF | |
| | R++++11 | 57.11.4471 | 470 Ohm | 5% 0.25W CF | |
| | R++++12 | 57.11.4122 | 1.2 kOhm | 5% 0.25W CF | |
| | R++++13 | 57.11.4272 | 2.7 kOhm | 5% 0.25W CF | |
| | R++++14 | 57.11.4681 | 680 Ohm | 5% 0.25W CF | |
| | R++++15 | 57.11.4332 | 3.3 kOhm | 5% 0.25W CF | |
| | R++++16 | 57.13.4333 | 33 kOhm | 5% 0.25W CF | |
| | R++++17 | 57.11.4121 | 120 Ohm | 5% 0.25W CF | |
| | R++++18 | 57.11.4471 | 470 Ohm | 5% 0.25W CF | |
| | R++++19 | 57.11.4223 | 22 kOhm | 5% 0.25W CF | |
| | R++++20 | 57.11.4121 | 120 Ohm | 5% 0.25W CF | |
| | R++++21 | 57.11.4471 | 470 Ohm | 5% 0.25W CF | |
| | R++++22 | 57.11.4392 | 3.9 kOhm | 5% 0.25W CF | |
| | R++++23 | | | | |
| | R++++24 | 57.11.4223 | 22 kOhm | 5% 0.25W CF | |
| | R++++25 | 57.11.4331 | 330 Ohm | 5% 0.25W CF | |
| | R++++26 | 57.11.4822 | 8.2 kOhm | 5% 0.25W CF | |
| | R++++27 | 57.11.4223 | 22 kOhm | 5% 0.25W CF | |
| | R++++28 | 57.11.4223 | 22 kOhm | 5% 0.25W CF | |
| | R++++29 | 57.11.4101 | 100 Ohm | 5% 0.25W CF | |
| | R++++30 | 57.11.4681 | 680 Ohm | 5% 0.25W CF | |
| | R++++31 | 57.11.4153 | 15 kOhm | 5% 0.25W CF | |
| | R++++32 | 57.11.4473 | 47 kOhm | 5% 0.25W CF | |
| | R++++33 | 57.99.0210 | 390 Ohm | 5% 0.25W CF | |
| | R++++34 | 57.11.4222 | 2.2 kOhm | 5% 0.25W CF | |
| | R++++35 | 57.11.4681 | 680 Ohm | 5% 0.25W CF | |
| | R++++36 | 57.13.4392 | 3.9 kOhm | 5% 0.25W CF | |
| | R++++37 | 57.11.4123 | 12 kOhm | 5% 0.25W CF | |
| | R++++38 | 57.11.4392 | 3.9 kOhm | 5% 0.25W CF | |
| | R++++39 | 57.11.4681 | 680 Ohm | 5% 0.25W CF | |
| | R++++40 | 57.11.4392 | 3.9 kOhm | 5% 0.25W CF | |



| INV. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | R++++41 | 57.11.4681 | 680 Ohm | 5% 0.25W CF | |
| | R++++42 | 57.11.4392 | 3.9 kOhm | 5% 0.25W CF | |
| | R++++43 | 57.11.4392 | 3.9 kOhm | 5% 0.25W CF | |
| | R++++44 | 57.11.4681 | 680 Ohm | 5% 0.25W CF | |
| | R++++45 | 57.11.4122 | 1.2 kOhm | 5% 0.25W CF | |
| | R++++46 | 57.56.4101 | 100 Ohm | 10% 5 W WW | |
| | R++++47 | 57.99.0210 | 2.5 Ohm | PTC | |
| | R++++48 | 57.11.4563 | 56 kOhm | 5% 0.25W CF | |
| | R++++49 | 57.11.4681 | 680 Ohm | 5% 0.25W CF | |
| (50) | R++++50 | 57.11.4473 | 47 kOhm | 5% 0.25W CF | |
| (01) | R++++50 | 57.11.4103 | 10 kOhm | 5% 0.25W CF | |
| | R++++51 | 58.94.0131 | 470 kOhm | 0.5Tol TCF< 1/m | |

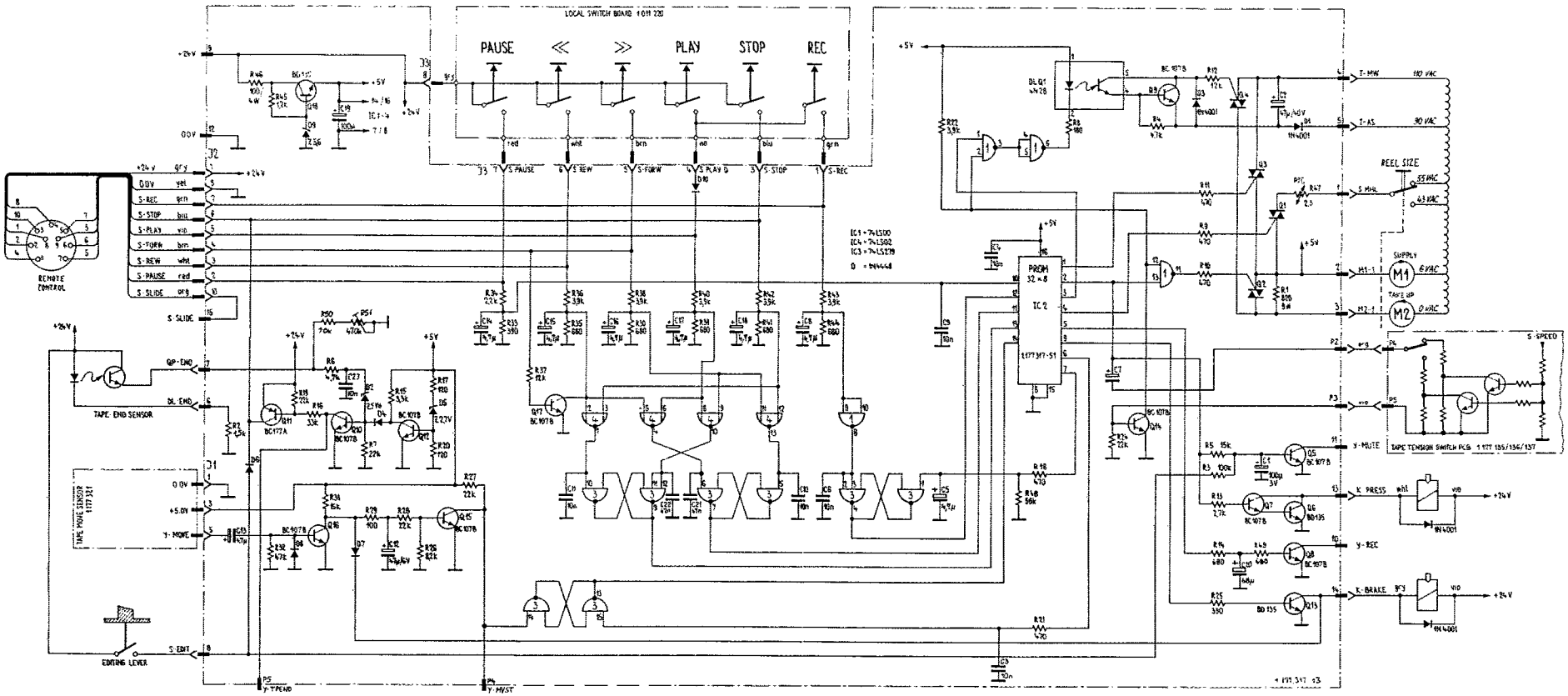
(01) 21.01.84 Adaptation for very thin tapes
Tr=Intermetallics Cer=Ceramics

Manufacturer: Op=Optron. MM=Monolithic Memories Inc.
TI=Texas Instruments Ts=Intersil. Sig=Siemetics.

DR36 83/12/01 (01) 84/01/25

## TAPE DRIVE CONTROL PCB 1.177.317–81 (B77 MKII)

VERSION 1.177.317–00:
C23 = NOT EQUIPPED
D02 = Z15V
P05 = NOT EQUIPPED
R02 = 3,3k
R50 = NOT EQUIPPED
R51 = NOT EQUIPPED
PCB = 1.177.317–12

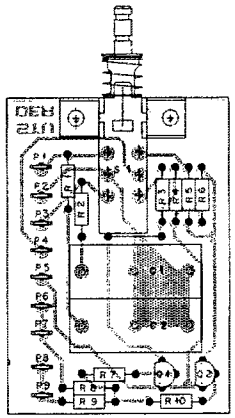


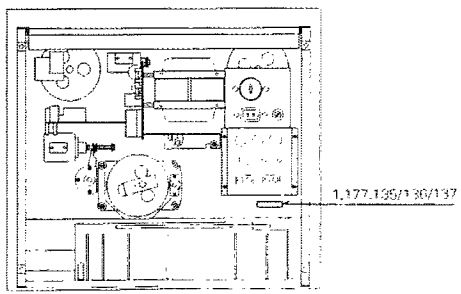

VALID FROM SERIAL NUMBER 100001

SEE SERVICE INFORMATION
67.9/67.10/69.7 : TAPE END SWITCH
57.9 : C5 (TIMER MODE)
63.5 : RECORD CLICK
68.5 : C21, C22

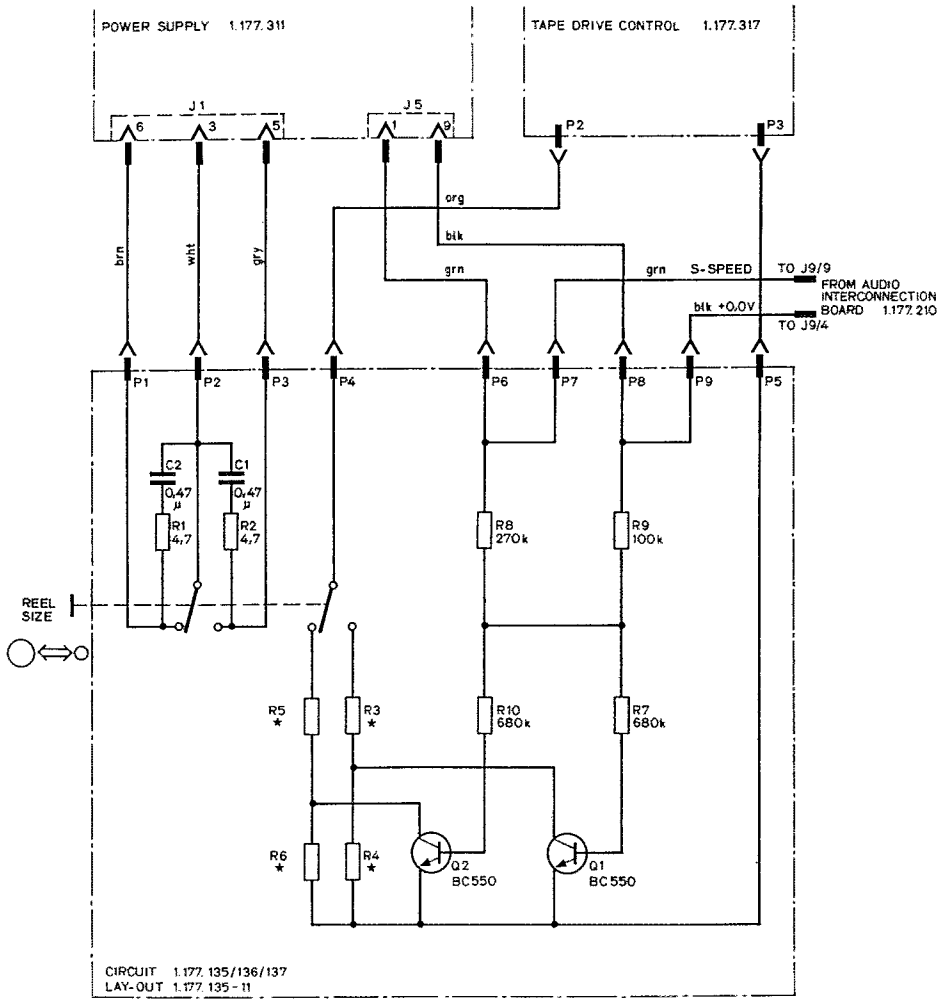
## APE TENSION SWITCH PCB 1.177.135/136/137

REEL SIZE



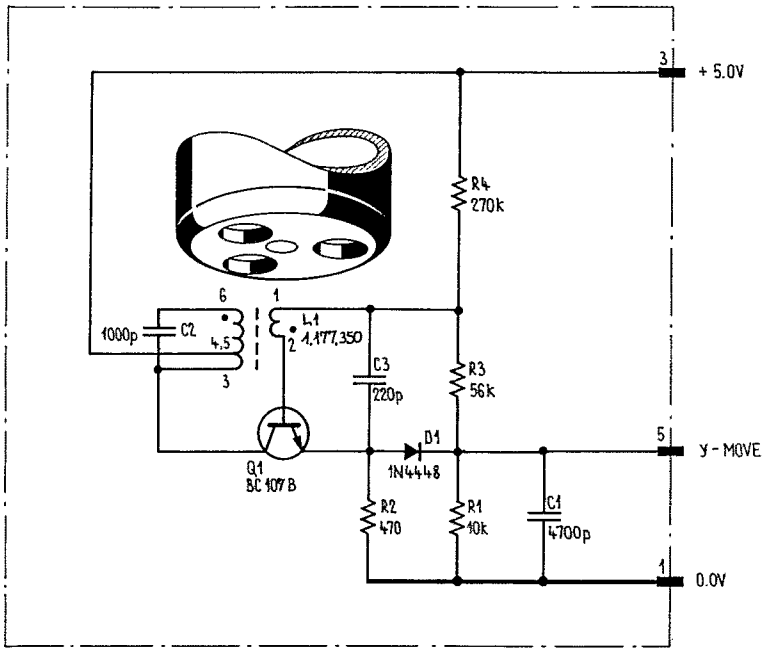



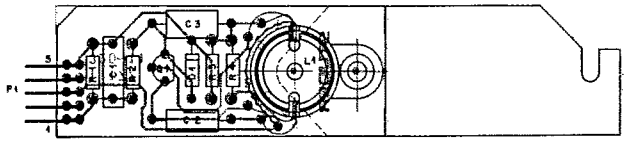
## TAPE TENSION SWITCH PCB 1.177.135/136/137




| SPEED RANGE | ★R3 | ★R4 | ★R5 | ★R6 |
|---|---|---|---|---|
| 1.177.135.00 $1^{7/8}$- $3\,^{3/4}$" | 220R | 180R | 220R | 180R |
| 1.177.136.00 $3^{3/4}$- $7^{1/2}$" | 220R | 470R | 3,9k | 3,9k |
| 1.177.137.00 $7^{1/2}$- 15 " | 1,2k | 2,7k | 3,9k | 3,9k |

APE MOVE SENSOR PCB 1.177.320



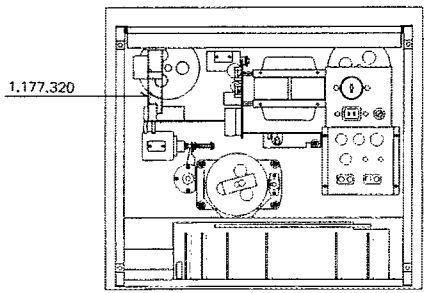




| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| C 01 | 59.31.4472 | 4700 P | 20% 160V | PETP | |
| C 02 | 59.04.7102 | 1000 P | 5% 63V | PS | |
| C 03 | 59.04.8221 | 220 P | 5% 160V | PS | |
| D 01 | 50.04.0125 | 1 N 4448 | | | any |
| L 01 | 1.177.350 | | | | S |
| P 01 | 54.01.0269 | 5 - Pole | Pin Strip | AMP | |
| Q 01 | 50.03.0436 | BC 107 B | | | any |
| R 01 | 57.41.4103 | 10 K | 5% .25W | CF | |
| R 02 | 57.41.4471 | 470 | | | |
| R 03 | 57.41.4563 | 56 K | | | |
| R 04 | 57.41 4274 | 270 K | | | |

S = Studer CF = Carbon Film
Po = polystyrene
PETP = polyester

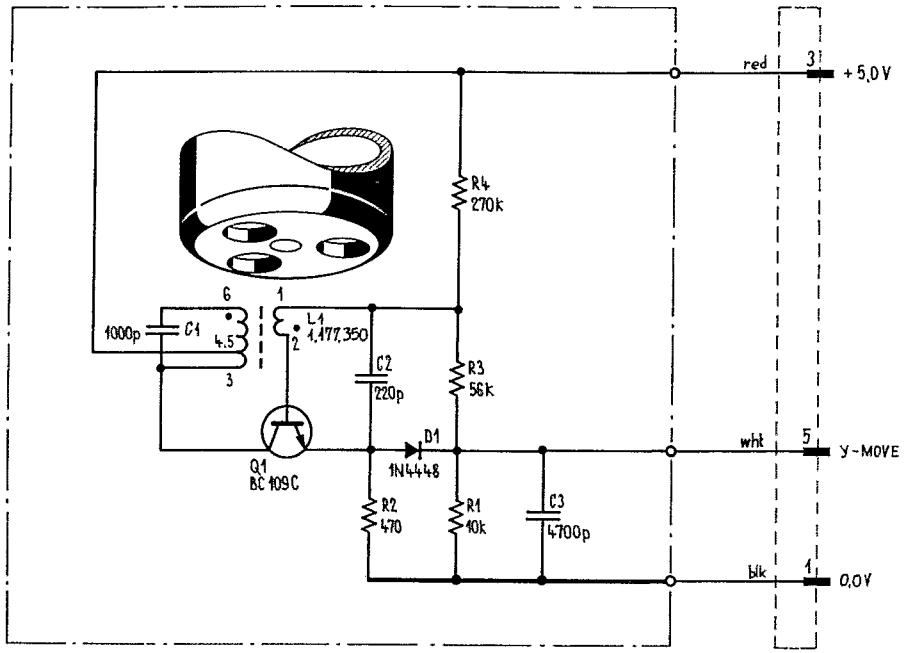
| | ING | DATE | NAME |
|---|---|---|---|
| DRAWN | | 31.3.77 | Wartburg |

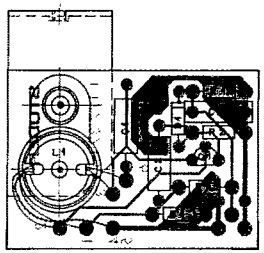
STUDER Tape Move Sensor 1.177.320 PAGE 1 of 1

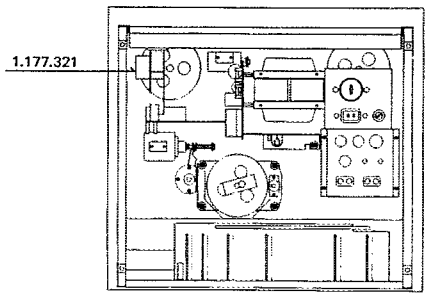



VALID ONLY UP TO SERIAL NUMBER 24029

## TAPE MOVE SENSOR PCB 1.177.321






| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| C 01 | 59.04.7102 | 1000 P | 5% 63V PS | | |
| C 02 | 59.04.8221 | 220 P | 5% 160V PS | | |
| C 03 | 59.31.4472 | 4700 P | 20% 160V PETF | | |
| D 01 | 50.04.0125 | 1 N 4448 | | | any |
| L 01 | 1.177.350 | | | | S |
| Q 01 | 50.03.0439 | BC 109 C | | | any |
| R 01 | 57.41.4103 | 10 k | 5% .25W CF | | |
| R 02 | 57.41.4471 | 470 | | | |
| R 03 | 57.41.4563 | 56 k | | | |
| R 04 | 57.41.4274 | 270 k | | | |

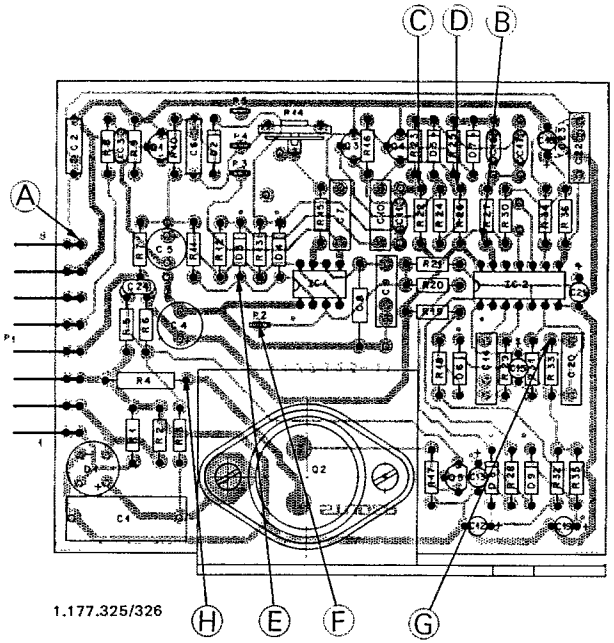
S = Studer CF = Carbon Film PS = Polystyrene PETF= Polyester

| | IND | DATE | NAME |
|---|---|---|---|
| | | Ju. 4.78 | Ea./Ge |

STUDER Tape Move Sensor 1.177.321 PAGE 1 of 1

VALID FROM SERIAL NUMBER 24030

## CAPSTAN SPEED CONTROL PCB 1.177.325/326/327 (B77 MKII)




1.177.325/326

| POS NO | PART NO | VALUE | SPECIFICATIONS | | EQUIVALENT | MFR |
|---|---|---|---|---|---|---|
| C 01 | 54.[illegible].0480 | 0.47 U | ±10% | 150V | MP | |
| C 02 | 59.31.4104 | 0.1 U | 5% | 250V | MPETP | |
| C 03 | 54.32.3472 | 4700 P | -20% | 40V | CER | |
| C 04 | 59.22.5470 | 47 U | 10% | 25V | EL | |
| C 05 | 59.22.5470 | 47 U | 10% | 25V | EL | |
| C 06 | 59.31.4104 | 0.1 U | 5% | 250V | MPETP | |
| C 07 | 59.31.4103 | 0.01 U | 20% | 160V | PETP | |
| C 08 | 54.12.8162 | 1600 P | 1% | 125V | PS | |
| C 09 | 59.11.4472 | 4700 P | 2.5% | 160V | PC | |
| C 10 | 59.31.4472 | 4700 P | 20% | 160V | PETP | |
| C 11 | 59.32.3472 | 4700 P | -20% | 40V | CER | |
| C 12 | 59.30.4100 | 10 U | -20% | 16V | TA | |
| C 13 | 59.30.6109 | 1 U | -20% | 35V | TA | |
| C 14 | 59.31.4103 | 0.01 U | 20% | 160V | PETP | |
| C 15 | 59.30.4100 | 10 U | 20% | 16V | TA | |
| C 16 | 59.32.3472 | 4700 P | -20% | 40V | CER | |
| C 17 | 59.32.3472 | 4700 P | -20% | 40V | CER | |
| C 18 | 59.30.4100 | 10 U | 20% | 16V | TA | |
| C 19 | 59.30.4100 | 10 U | 20% | 16V | TA | |
| C 20 | 59.31.1224 | 0.22 U | 20% | 100V | MPETP | |
| C 21 | 59.30.6109 | 1 U | 20% | 35V | TA | |
| C 22 | 59.31.4473 | 0.047U | 20% | 250V | MPETP | |
| C 23 | 59.32.0220 | 22 P | 20% | 500V | KER | |
| (1) C 24 | 59.32.0220 | 22 P | 20% | 500V | KER | |
| D 01 | 70.01.0223 | B 250 C800 | | | | |
| D 02 | 50.04.0125 | 1 N 4448 | | | | any |
| D 03 | 50.04.0125 | 1 N 4448 | | | | any |
| D 04 | 50.04.0125 | 1 N 4448 | | | | any |
| D 05 | 50.04.0125 | 1 N 4448 | | | | any |
| D 06 | 50.04.0125 | 1 N 4448 | | | | any |
| D 07 | 50.04.0125 | 1 N 4448 | | | | any |
| D 08 | 50.04.0125 | 1 N 4448 | | | | any |
| D 09 | 50.04.0125 | 1 N 4448 | | | | any |
| IC 01 | 50.05.0158 | NE 555 | Timer | | MC1455P | S.N |
| IC 02 | 50.05.0237 | TBA 231 | µA 739 equiv. | | SN76131N | F.A.I |
| P 01 | 54.01.0582 | 8 - Pole | Pin Strip | | AMP | |
| P 2.5 | 54.02.0330 | | FLAT-PIN 0.8 | | AMP | |
| Q 01 | 50.03.0436 | BC 107 B | | NPN | | |
| Q 02 | 50.03.0477 | M2 431 | | NPN Power | RCA 411 | M.ROM |
| Q 03 | 50.03.0436 | BC 107 B | | NPN | | |
| Q 04 | 50.03.0436 | BC 107 B | | NPN | | |
| Q 05 | 50.03.0318 | BC 378 B | | PNP | | |

M = Motorola MP = metallized paper
S = Siemetics PS = polystyrene
A = Ates CER=ceramic
T = Texas Instr PETP = polyester
F = Fairchild MPETP= metallized polyester

| CHANGE | IND | DATE | NAME |
|---|---|---|---|
| | B | 4.81 | Fol./gv |
| | | 15.6.78 | |
| | | 1.4.77 | Marthaler |

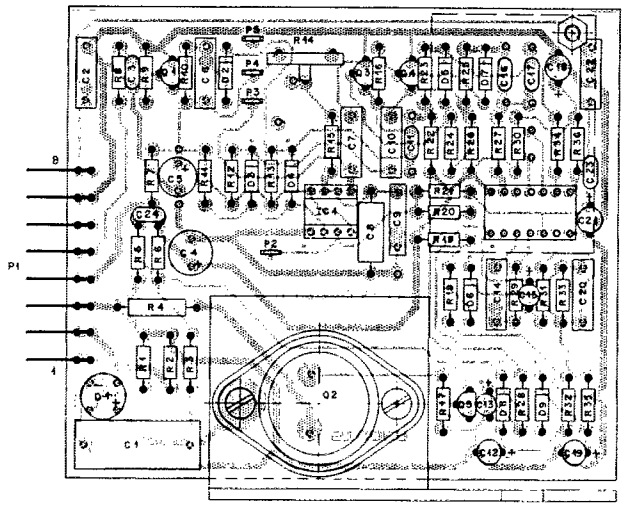
STUDER Capstan Speed Control 1.177.325 PAGE 1 of 2

| POS NO | PART NO | VALUE | SPECIFICATIONS | | EQUIVALENT | MFR |
|---|---|---|---|---|---|---|
| R 01 | 57.41.4473 | 47 K | 5% | .25W | CF | |
| R 02 | 57.41.4473 | 47 K | 5% | .25W | CF | |
| R 03 | 57.41.4683 | 68 K | 5% | .25W | CF | |
| R 04 | 57.42.4100 | 10 | 5% | .33W | CF | |
| R 05 | 57.41.4222 | 2.2 K | 5% | .25W | CF | |
| R 06 | 57.41.4102 | 1 K | | | | |
| R 07 | 57.41.4821 | 820 | | | | |
| R 08 | 57.41.4103 | 10 K | | | | |
| R 09 | 57.41.4223 | 22 K | | | | |
| R 10 | 57.41.4472 | 4.7 K | | | | |
| R 11 | 57.41.4223 | 22 K | | | | |
| R 12 | 57.41.4103 | 10 K | | | | |
| R 13 | 57.41.4103 | 10 K | | | | |
| R 14 | 56.09.0126 | 10 K | 10% | 50ppm/°C | POT | |
| R 15 | 57.99.0179 | 86.6K | 1% | 50ppm | MF | |
| R 16 | 57.41.4223 | 22 K | 5% | .25W | CF | |
| R 17 | 57.41.4152 | 1.5 K | | | | |
| (2) R 18 | 57.41.4152 | 1.5 K | | | | |
| R 19 | 57.41.4103 | 10 K | | | | |
| R 20 | 57.41.4231 | 230 | | | | |
| R 21 | 57.41.4472 | 4.7 K | | | | |
| R 22 | 57.41.4332 | 3.3 K | | | | |
| R 23 | 57.41.4223 | 22 K | | | | |
| R 24 | 57.41.4223 | 22 K | | | | |
| R 25 | 57.41.4223 | 22 K | | | | |
| R 26 | 57.41.4332 | 3.3 K | | | | |
| R 27 | 57.41.4472 | 4.7 K | | | | |
| R 28 | 57.41.4472 | 4.7 K | | | | |
| R 29 | 57.41.4330 | 33 | | | | |
| R 30 | 57.41.4103 | 10 K | | | | |
| R 31 | 57.41.4682 | 6.8 K | | | | |
| R 32 | 57.41.4222 | 2.2 K | | | | |
| R 33 | 57.41.4105 | 1 M | | | | |
| R 34 | 57.41.4103 | 10 K | | | | |
| R 35 | 57.41.4222 | 2.2 K | | | | |
| R 36 | 57.41.4103 | 10 K | | | | |

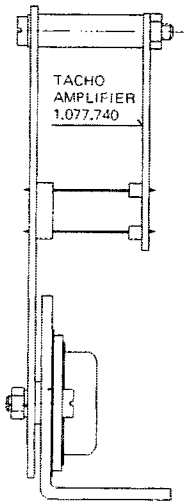
CF = Carbr. Film
POT= Pot.carbon Film
MF = Metal Film

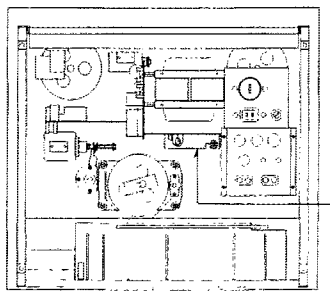
| CHANGE | IND | DATE | NAME |
|---|---|---|---|
| | B | 4.81 | Fol./gv |
| | | 15.6.78 | |
| | | 1.4.77 | Marthaler |

STUDER Capstan Speed Control 1.177.325 PAGE 2 of 2



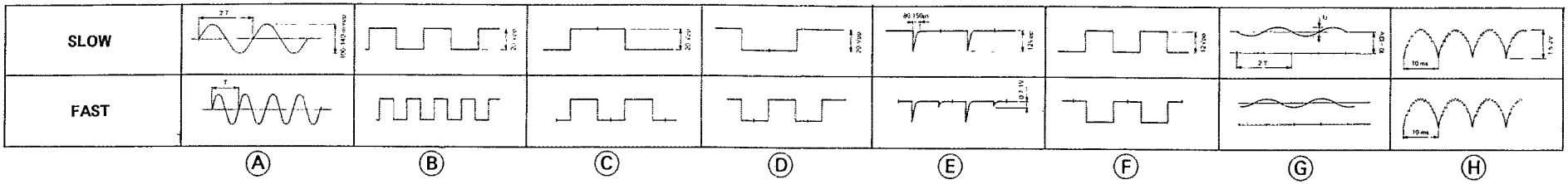

1.177.327

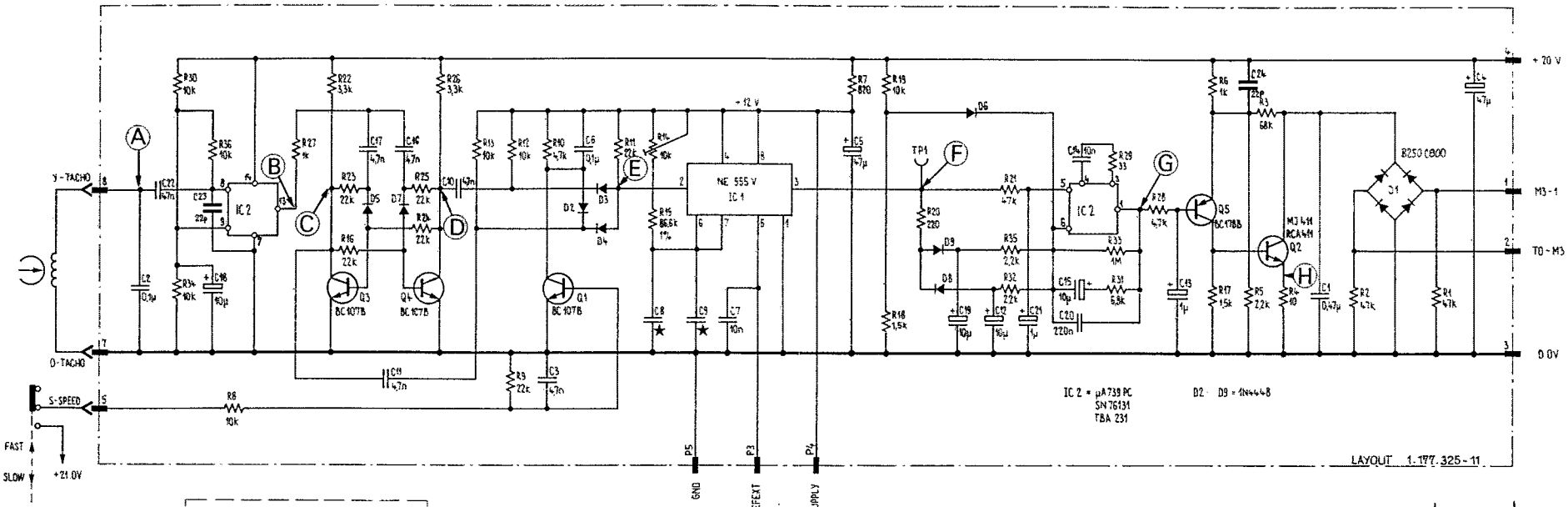


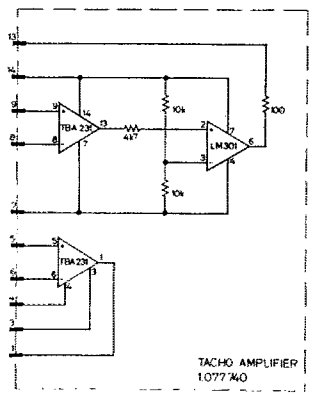



1.177.325/326/327

CAPSTAN SPEED CONTROL PCB 1.177.325/326/327 (B77 MKI)

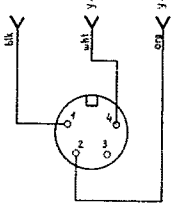



PIN CONFIGURATION
14-PIN DUAL-IN-LINE

VERSION 1.177.327:
INSTEAD OF THE REMOVED IC2 THE SUB-ASSEMBLY TACHO AMPLIFIER 1.077.740 IS PLUGGED INTO THE IC2 SOCKET




REMOTE CONTROL
CAPSTAN SPEED

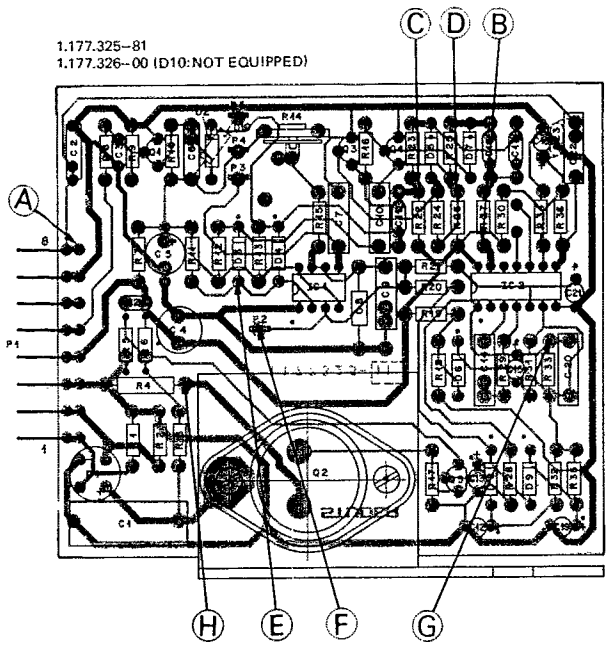
SEE SERVICE INFORMATION
63.9 : CAPSTAN START

| SPEED CONTROL | T | U |
|---|---|---|
| 1.177.325 | 625 µs | 1 Vpp |
| 1.177.326 | 833 µs | 2.5 Vpp |
| 1.177.327 | 1666 µs | 3 Vpp |

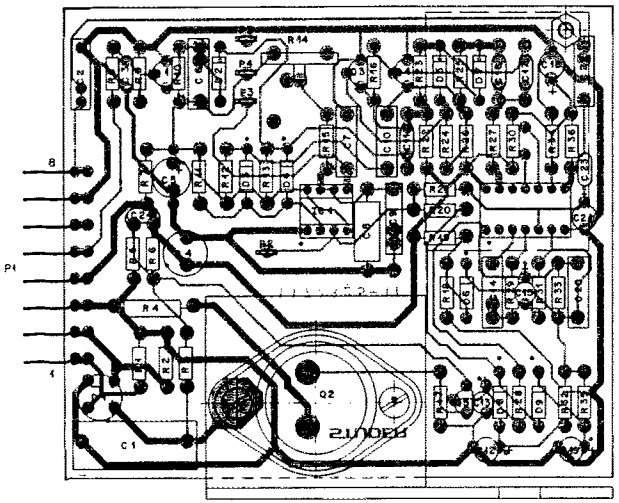
| TYPE | SPEED | CAPSTAN SHAFT ø | C-MOTOR NO. | SPEED CONTROL | C8 ★ | C9 ★ |
|---|---|---|---|---|---|---|
| HS | 7 1/2"–15" | 9.06 mm | 1.021.320 | 1.177.325 | 1.6 nF | 4.7 nF |
| STD | 3 3/4"–7 1/2" | 4.51 mm | 1.021.300 | 1.177.325 | 1.6 nF | 4.7 nF |
| LS | 1 7/8"–3 3/4" | 3.00 mm | 1.021.304 | 1.177.326 | 1.6 nF | 6.8 nF |
| SLS | 15/16"–1 7/8" | 3.00 mm | 1.021.304 | 1.177.327 | 5.6 nF | 10 nF |

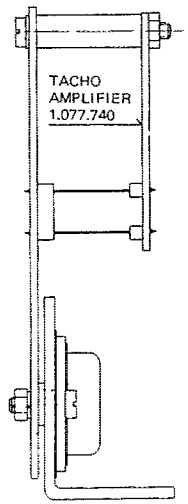
## CAPSTAN SPEED CONTROL PCB 1.177.325–00/–81/326/327 (B77 MKII)

1.177.325–81
1.177.326–00 (D10:NOT EQUIPPED)




1.177.327–00




| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| C | 1 | 59.09.0450 | 0.47 uF | 10% 160V, MF | |
| C | 2 | 59.14.4124 | 0.1 uF | 5% 250V, MKT2 | |
| C | 3 | 59.12.3472 | 4700 pF | -20% 40V, Cer | |
| C | 4 | 59.22.5470 | 47 uF | 20% 25V, ES | |
| C | 5 | 59.22.5470 | 47 uF | 10% 25V, ES | |
| C | 6 | 59.14.4154 | 0.15 uF | 5% 250V, MKT2 | |
| C | 7 | 59.14.4103 | 0.01 uF | 20% 160V, P2TP | |
| C | 8 | 59.12.8162 | 1600 pF | 1% 12%V, PS | |
| C | 9 | 59.08.0417 | 4700 pF | +/-5% 160V, PC WIMA FKC-3 type | |
| C | 10 | 59.11.8471 | 470 pF | 20% 25V, PL | |
| C | 11 | 59.11.8471 | 470 pF | 20% 40V, PL | |
| C | 12 | 59.22.6100 | 10 uF | 10% 35V, ES | |
| C | 13 | 59.22.6100 | 1 uF | 10% 50V, ES | |
| C | 14 | 59.14.4103 | 0.01 uF | 20% 160V, P2TP | |
| C | 15 | 59.22.6100 | 10 uF | 10% 35V, ES | |
| C | 16 | 59.12.3472 | 4700 pF | -20% 40V, Cer | |
| C | 17 | 59.12.3472 | 4700 pF | -20% 40V, Cer | |
| C | 18 | 59.22.6100 | 10 uF | 10% 35V, ES | |
| C | 19 | 59.22.6100 | 10 uF | 10% 35V, ES | |
| C | 20 | 59.14.1274 | 0.22 uF | 20% 100V, MKT2 | |
| C | 21 | 59.22.5109 | 1 uF | 10% 50V, ES | |
| C | 22 | 59.14.4473 | 0.047uF | 20% 25V, MKT2 | |
| C | 23 | 59.12.0220 | 22 pF | 20% 500V, Cer | |
| C | 24 | 59.12.0220 | 22 pF | 20% 500V, Cer | |
| C | 25 | | not used | | |
| D | 1 | 70.03.0223 | BZX9 C800 | | |
| D | 2 | 50.04.0125 | 1 N 4448 | 100 | any |
| D | 3 | 50.04.0125 | 1 N 4448 | 100 | any |
| D | 4 | 50.04.0125 | 1 N 4448 | 100 | any |
| D | 5 | 50.04.0125 | 1 N 4448 | 100 | any |
| D | 6 | 50.04.0125 | 1 N 4448 | 100 | any |
| D | 7 | 50.04.0125 | 1 N 4448 | 100 | any |
| D | 8 | 50.04.0125 | 1 N 4448 | 100 | any |
| D | 9 | 50.04.0125 | 1 N 4448 | 100 | any |
| D | 10 | 50.04.1319 | 15 V | 5% 400mW | Z |

| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| IC | 1 | 50.04.0159 | NE 555 | Timer | MITSUSU CSM |
| IC | 2 | 50.04.0237 | TBA 231 | 4A TYP VOLTAGE SYNTHESIZER FAIRCT | |
| P | 1 | 54.01.0582 | 8-Pole | Pin-Strip | AMP |
| P | 2 | 54.01.0320 | | Flat-Pin 0.4 | AMP |
| P | 3 | 54.01.0320 | | Flat-Pin 0.4 | AMP |
| P | 4 | 54.01.0320 | | Flat-Pin 0.4 | AMP |
| P | 5 | 54.01.0320 | | Flat-Pin 0.4 | AMP |
| Q | 1 | 50.03.0436 | BC 307 C | NPN | |
| Q | 2 | 50.03.0437 | MJE 431 | NPN-Power | MCA 431 MOTOR |
| Q | 3 | 50.03.0436 | BC 307 C | NPN | |
| Q | 4 | 50.03.0436 | BC 307 C | NPN | |
| Q | 5 | 50.03.0338 | BC 328 C | PNP | |
| R | 1 | 57.11.4471 | 47 kOhm | 5% 0.25W CF | |
| R | 2 | 57.11.4473 | 47 kOhm | 5% 0.25W CF | |
| R | 3 | 57.11.4683 | 68 kOhm | 5% 0.25W CF | |
| R | 4 | 57.12.4100 | 10 Ohm | 5% 0.33W CF | |
| R | 5 | 57.11.4227 | 2.7 kOhm | 5% 0.25W CF | |
| R | 6 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |
| R | 7 | 57.11.4561 | 560 Ohm | 5% 0.25W CF | |
| R | 8 | 57.11.4103 | 10 kOhm | 5% 0.25W CF | |
| R | 9 | 57.11.4223 | 22 kOhm | 5% 0.25W CF | |
| R | 10 | 57.11.4473 | 47 kOhm | 5% 0.25W CF | |
| R | 11 | 57.11.4223 | 22 kOhm | 5% 0.25W CF | |
| R | 12 | 57.11.4103 | 10 kOhm | 5% 0.25W CF | |
| R | 13 | 57.11.4103 | 10 kOhm | 5% 0.25W CF | |
| R | 14 | 56.49.0126 | 60 kOhm | 10% 100ppm/DEG.MELF | |
| R | 15 | 56.49.0179 | 86.6kOhm | 1% 100ppm MF | |
| R | 16 | 57.11.4223 | 22 kOhm | 5% 0.25W CF | |
| R | 17 | 57.11.4152 | 1.5 kOhm | 5% 0.25W CF | |
| R | 18 | 57.11.4152 | 1.5 kOhm | 5% 0.25W CF | |
| R | 19 | 57.11.4103 | 10 kOhm | 5% 0.25W CF | |
| R | 20 | 57.11.4221 | 220 Ohm | 5% 0.25W CF | |
| R | 21 | 57.11.4472 | 4.7 kOhm | 5% 0.25W CF | |
| R | 22 | 57.11.4332 | 3.3 kOhm | 5% 0.25W CF | |

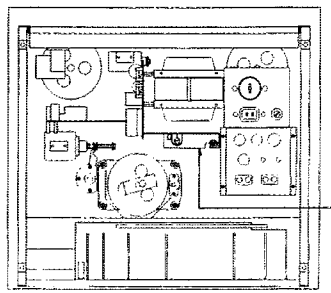
| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| R | 23 | 57.11.4223 | 22 kOhm | 5% 0.25W CF | |
| R | 24 | 57.11.4223 | 22 kOhm | 5% 0.25W CF | |
| R | 25 | 57.11.4223 | 22 kOhm | 5% 0.25W CF | |
| R | 26 | 57.11.4332 | 3.3 kOhm | 5% 0.25W CF | |
| R | 27 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |
| R | 28 | 57.11.4472 | 4.7 kOhm | 5% 0.25W CF | |
| R | 29 | 57.11.4330 | 33 Ohm | 5% 0.25W CF | |
| R | 30 | 57.11.4103 | 10 kOhm | 5% 0.25W CF | |
| R | 31 | 57.11.4682 | 6.8 kOhm | 5% 0.25W CF | |
| R | 32 | 57.11.4222 | 2.2 kOhm | 5% 0.25W CF | |
| R | 33 | 57.11.4105 | 1 MOhm | 5% 0.25W CF | |
| R | 34 | 57.11.4103 | 10 kOhm | 5% 0.25W CF | |
| R | 35 | 57.11.4222 | 2.2 kOhm | 5% 0.25W CF | |
| R | 36 | 57.11.4103 | 10 kOhm | 5% 0.25W CF | |



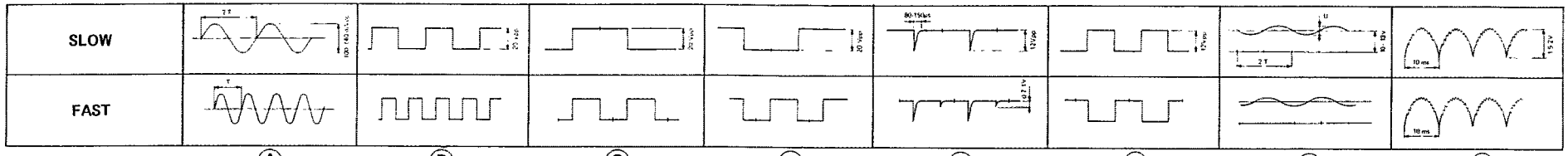

Fi=Electrolytic; Cer=Ceramic; MP=Metallized Paper; PS=Polystyrene;
MPETP=Metallized Polyester; PETP=Polyester; PC=Polycarbonate
Manufacturer: Si=Siemens; TI=Texas Instruments
A=Asahi; M=Motorola; F=Fairchild

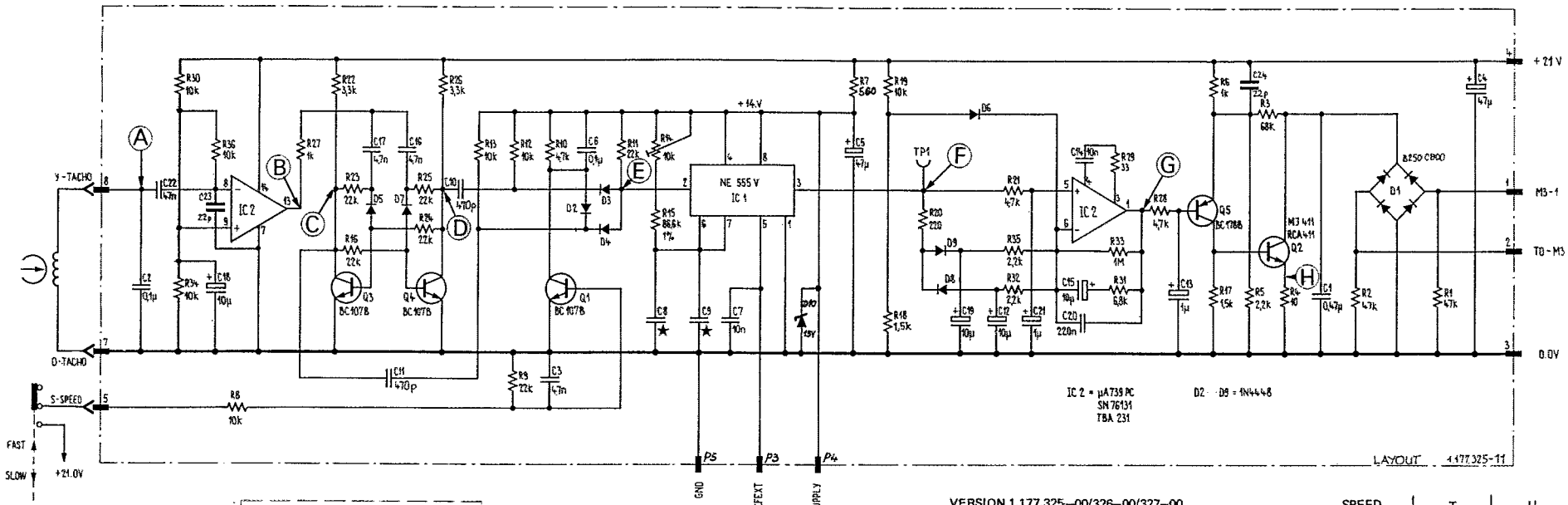
DRIG 84/03/22

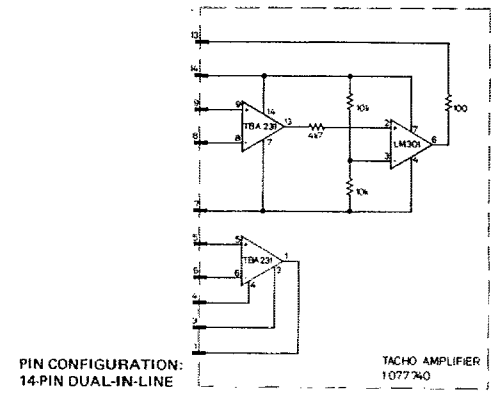




CAPSTAN SPEED CONTROL PCB 1.177.325-00/-81/326/327 (B77 MKII)




PIN CONFIGURATION:
14-PIN DUAL-IN-LINE

VERSION 1.177.327:
INSTEAD OF THE REMOVED IC2 THE SUB-ASSY TACHO APLIFIER 1.077.740 IS PLUGGED INTO THE IC2 SOCKET

VERSION 1.177.325-00/326-00/327-00
D10 = NOT EQUIPPED
R 7 = 820Ω

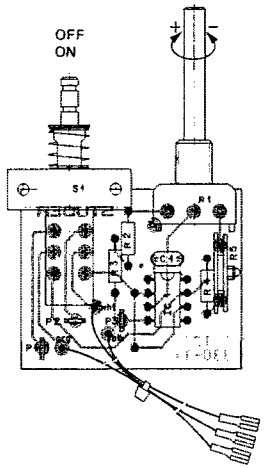
| SPEED CONTROL | T | U |
|---|---|---|
| 1.177.325 | 625 µs | 1 Vpp |
| 1.177.326 | 833 µs | 2.5 Vpp |
| 1.177.327 | 1666 µs | 3 Vpp |

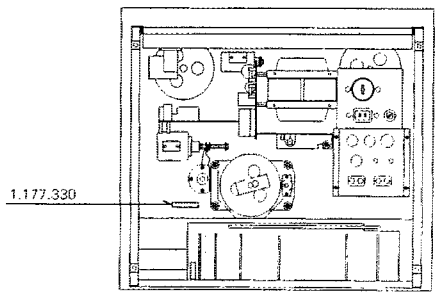
SEE SERVICE INFORMATION
63.9 : CAPSTAN START

| TYPE | SPEED | CAPSTAN SHAFT ø | C-MOTOR NO. | SPEED CONTROL | C8 ★ | C9 ★ |
|---|---|---|---|---|---|---|
| HS | 7 1/2"-15" | 9.06 mm | 1.021.320 | 1.177.325 | 1.6 nF | 4.7 nF |
| STD | 3 3/4"-7 1/2" | 4.51 mm | 1.021.300 | 1.177.325 | 1.6 nF | 4.7 nF |
| LS | 1 7/8"-3 3/4" | 3.00 mm | 1.021.304 | 1.177.326 | 1.6 nF | 6.8 nF |
| SLS | 15/16"-1 7/8" | 3.00 mm | 1.021.304 | 1.177.327 | 5.6 nF | 10 nF |

## ARIABLE SPEED CONTROL PCB 1.177.330

VARIABLE SPEED




| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | C------1 | 59.32.1680 | 68 pF | Cd | |
| | IC------1 | 40.29.0057 | LM301 | | Sig. T |
| | P------1 | 54.02.0320 | | AMP-Flat p.n | |
| | P------2 | 54.02.0376 | | AMP-Flat p.n | |
| | P------3 | 54.02.0370 | | AMP-Flat p.n | |
| | R------1 | 1.177.330.03 | 10 kOhm | | |
| | R------2 | 57.11.4332 | 3.3 kOhm | 5% 0.25W, CF | |
| | R------3 | 57.11.4563 | 56 kOhm | 5% 0.25W, CF | |
| | R------4 | 57.19.2472 | 24.3 kOhm | 1% 0.25W, CF | |
| | R------5 | 59.00.0132 | 4.7 ohm | | |
| | S------1 | 1.177.330.02 | | Push-button switch | |

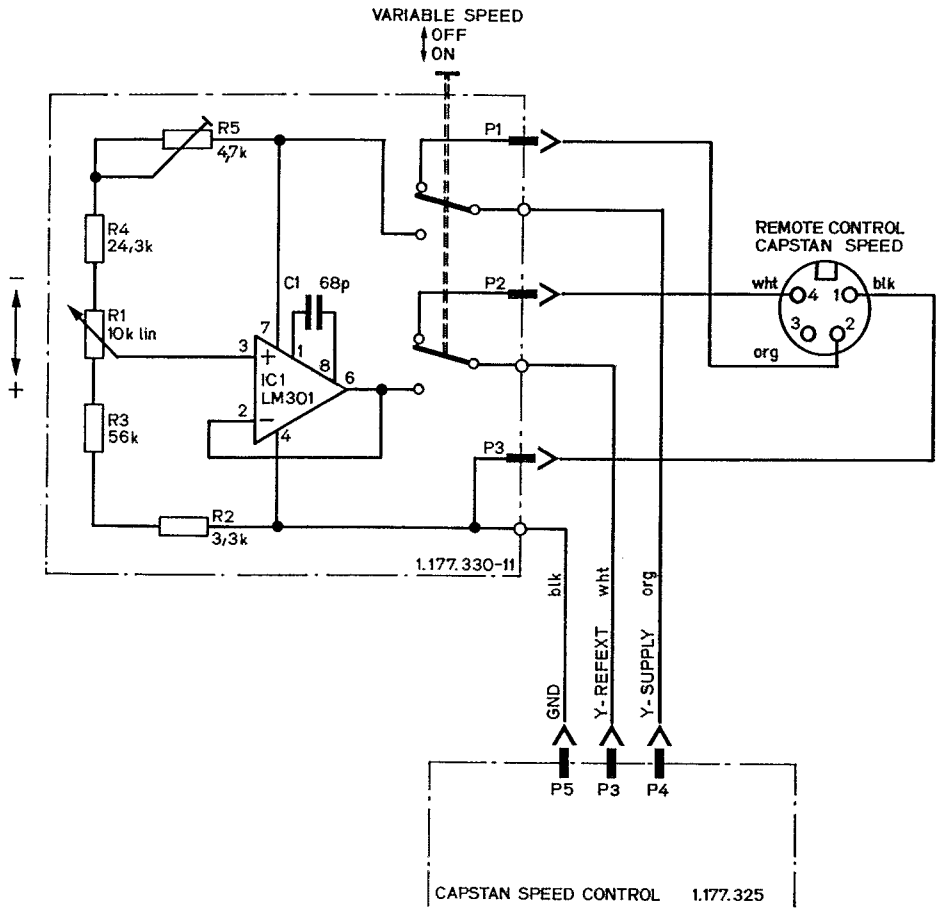
E1=Electrolytics Ce=Ceramic

Manufacturer: Sig=Siemens, TI=Texas Instruments

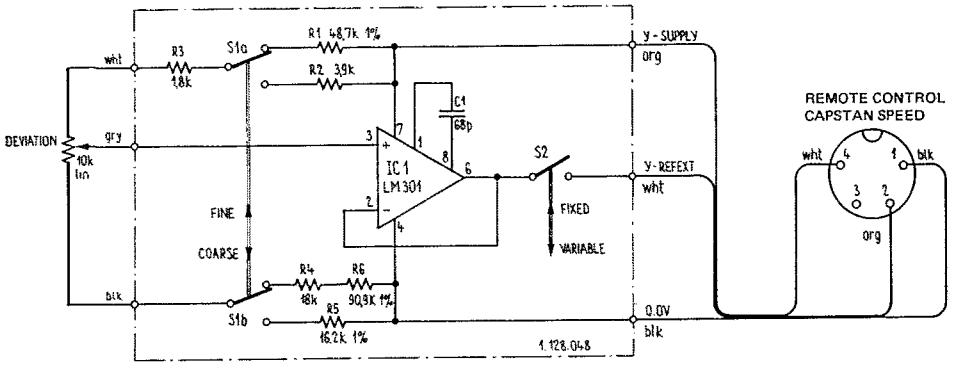
CAIC 80/09/25

S T U C E R 80/08/25 RW VARIABLE SPEED CONTROL PL 1.177.330.00 PAGE 1

VARIABLE SPEED CONTROL PCB 1.177.330



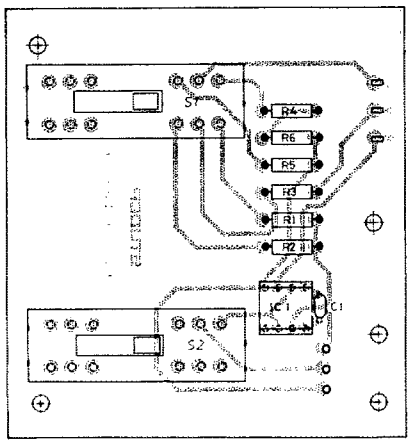
## VARIABLE SPEED CONTROL UNIT / EXTERNAL 1.128.045



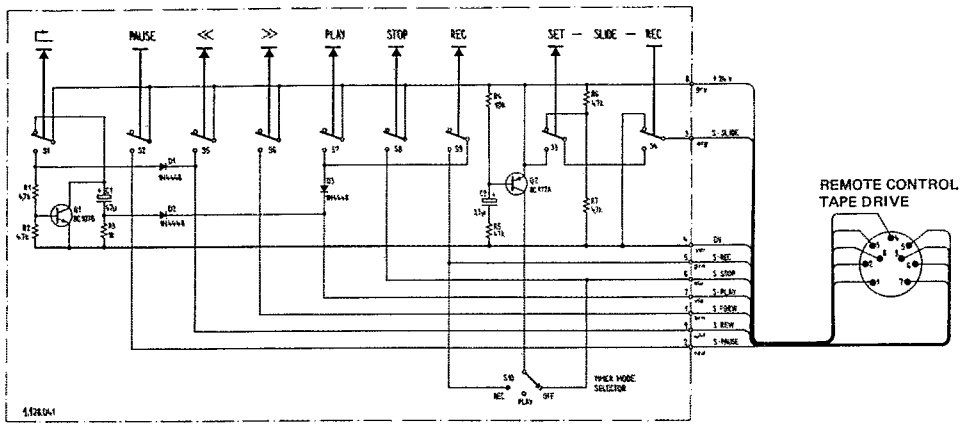

| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT MFR |
|---|---|---|---|---|
| C 01 | 59.32 1680 | 68 P | 100 50V KER | |
| IC 1 | 50.05.0144 | LM 301 AN | LIN | |
| R 01 | 57.39.4872 | 48.7 K | 25W 1% MF | (1) |
| R 02 | 57.41.4392 | 3.9 K | 5% CSCR | (1) |
| R 03 | 57.41.4182 | 1.8 K | 5% CSCR | (1) |
| R 04 | 57.41.4103 | 10 K | 5% CSCR | (1) |
| R 05 | 57.39.1622 | 16.2 K | 1% MF | (1) |
| R 06 | 57.39.9092 | 90.9 K | 1% MF | (1) |
| S 01 | 1.128.021.03 | Schiebeschalter | | |
| S 02 | 1.128.021.04 | | | |

| IND | DATE | NAME |
|---|---|---|
| | 14.9.77 | |
| | 28.11.77 | HG/SY |

STUDER Capstanregelsteuerprint 1.128.048 PAGE 1 of 1



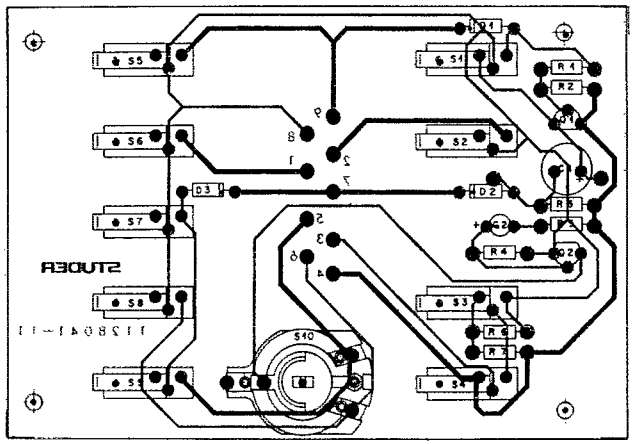
## REMOTE CONTROL UNIT / COMMAND SWITCHES 1.128.040



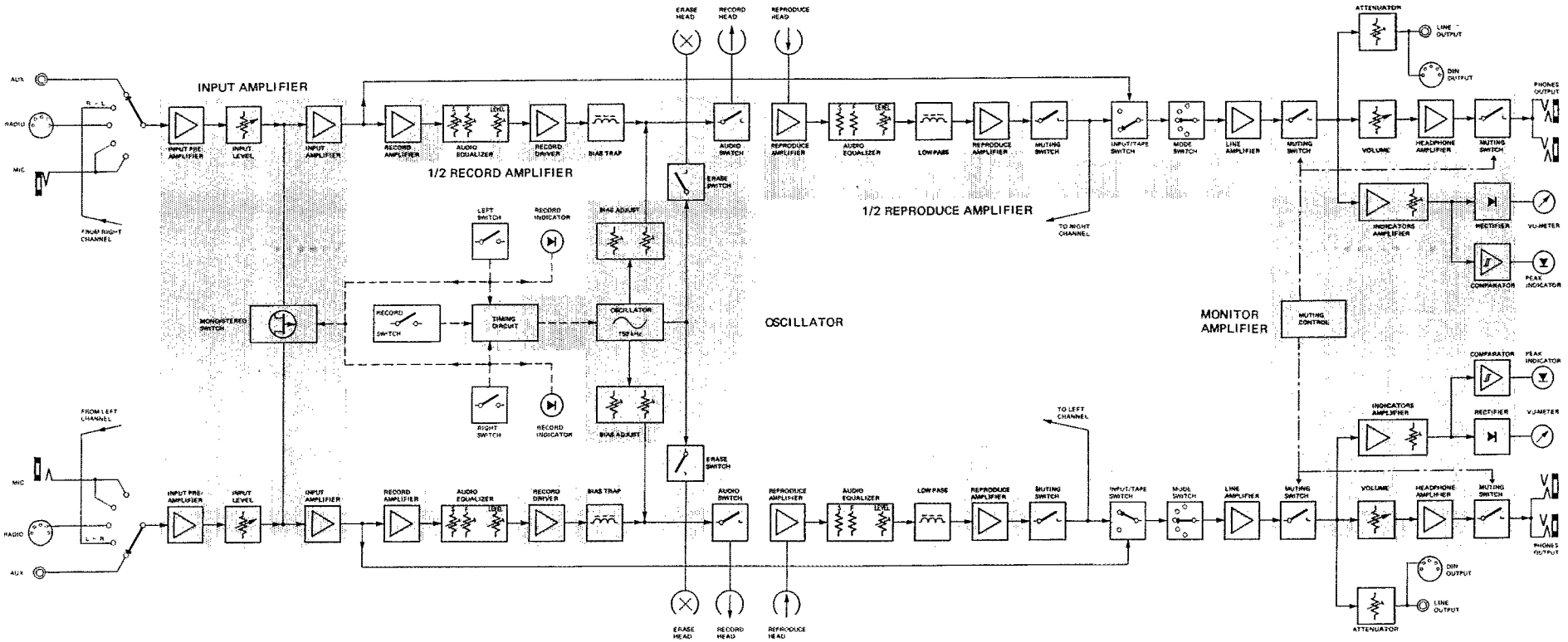

| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| C 01 | 59.22.6470 | 47 U | -10% 40V | BE | |
| C 02 | 59.30.6339 | 3,3 U | -20% 35V | TA | |
| D 01-3 | 50.04.0125 | 1 N 4448 | | SI | |
| Q 01 | 50.03.0436 | BC 107 B | | NPN | |
| Q 02 | 50.03.0317 | BC 177 A | | PNP | |
| R 01 | 57.41.4472 | 4,7 K | 5% .25W | CMH | |
| R 02 | 57.41.4472 | 4,7 K | | | |
| R 03 | 57.41.4102 | 1 K | | | |
| R 04 | 57.41.4103 | 10 K | | | (1) |
| R 05.07 | 57.41.4473 | 47 K | | | |
| S 01-09 | 55.99.0139 | 1 x U | Microsw. | AG | |
| S 10 | 55.99.0142 | 3 x U | Dreh. | UMTEB. | |

| IND | DATE | NAME |
|---|---|---|
| | 5.4.78 | |
| | 28.1.77 | |

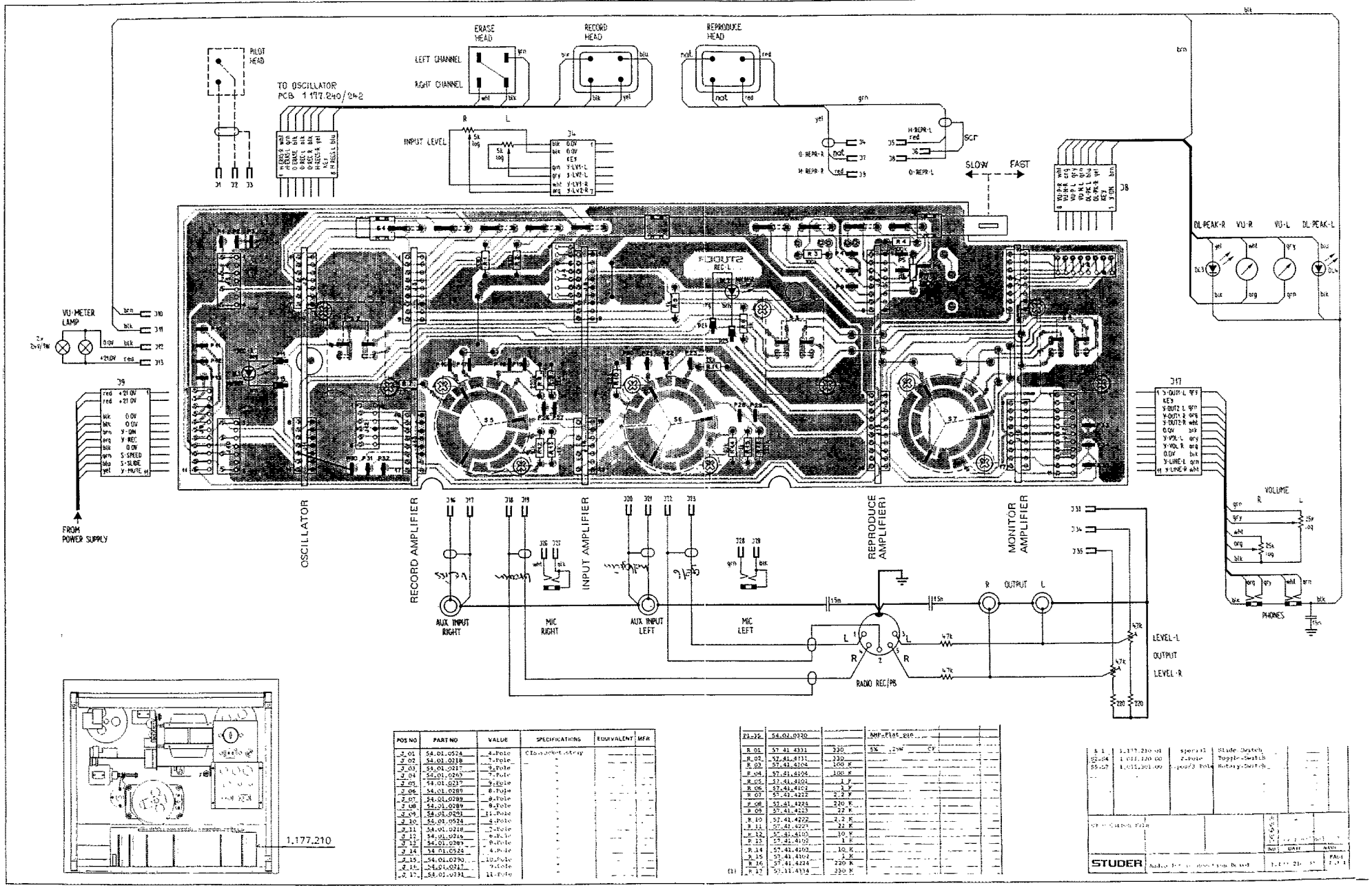
STUDER Laufwerkfernsteuerprint 1.128.041 PAGE 1 of 1



## LOCK DIAGRAM / AUDIO



## AUDIO INTERCONNECTION PCB 1.177.210–81







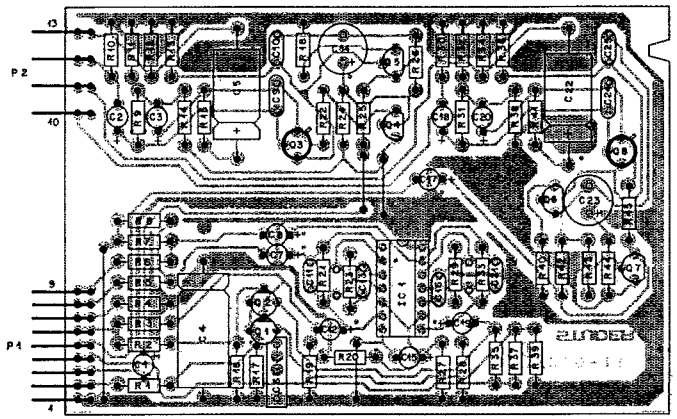
| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| J 01 | 54.01.0324 | 4-Pole | CINCH socket strip | | |
| J 02 | 54.01.0218 | 7-Pole | " | | |
| J 03 | 54.01.0217 | 9-Pole | " | | |
| J 04 | 54.01.0267 | 7-Pole | " | | |
| J 05 | 54.01.0277 | 9-Pole | " | | |
| J 06 | 54.01.0289 | 8-Pole | " | | |
| J 07 | 54.01.0289 | 8-Pole | " | | |
| J 08 | 54.01.0289 | 8-Pole | " | | |
| J 09 | 54.01.0291 | 11-Pole | " | | |
| J 10 | 54.01.0324 | 4-Pole | " | | |
| J 11 | 54.01.0218 | 7-Pole | " | | |
| J 12 | 54.01.0216 | 6-Pole | " | | |
| J 13 | 54.01.0269 | 10-Pole | " | | |
| J 14 | 54.01.0324 | 4-Pole | " | | |
| J 15 | 54.01.0290 | 10-Pole | " | | |
| J 16 | 54.01.0217 | 9-Pole | " | | |
| J 17 | 54.01.0291 | 11-Pole | " | | |

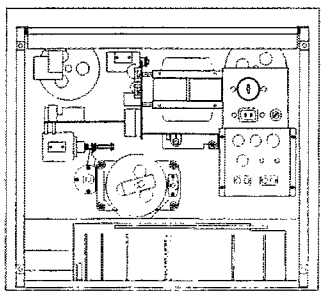
| | | | | | |
|---|---|---|---|---|---|
| P1-25 | 54.02.0320 | | | | |
| R 01 | 57.41.4331 | 330 | 5% | | |
| R 02 | 57.41.4331 | 330 | | | |
| R 03 | 57.41.4104 | 100 K | | | |
| R 04 | 57.41.4104 | 100 K | | | |
| R 05 | 57.41.4102 | 1 K | | | |
| R 06 | 57.41.4102 | 1 K | | | |
| R 07 | 57.41.4222 | 2.2 K | | | |
| R 08 | 57.41.4221 | 220 K | | | |
| R 09 | 57.41.4223 | 22 K | | | |
| R 10 | 57.41.4222 | 2.2 K | | | |
| R 11 | 57.41.4223 | 22 K | | | |
| R 12 | 57.41.4103 | 10 K | | | |
| R 13 | 57.41.4102 | 1 K | | | |
| R 14 | 57.41.4103 | 10 K | | | |
| R 15 | 57.41.4102 | 1 K | | | |
| R 16 | 57.41.4224 | 220 K | | | |
| R 17 | 57.41.4331 | 330 K | | | |

| | | | |
|---|---|---|---|
| S 1 | 1.177.210-01 | special | Slide Switch |
| 02-04 | 1.011.120-00 | 2-pole | Toggle-Switch |
| 05-07 | 1.011.301-00 | 1-pole/3 Pole | Rotary-Switch |

STUDER

## INPUT AMPLIFIER PCB 1.177.220





| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| C 01 | 59.30.4100 | 10 U | -20% 16 V | TA | |
| C 02 | 59.30.4100 | 10 U | -20% 16 V | TA | |
| C 03 | 59.30.4339 | 3.3 U | -20% 16 V | TA | |
| C 04 | 59.25.4221 | 220 U | -10% 25 V | EL | |
| C 05 | 59.25.3121 | 125 U | -10% 16 V | EL | |
| C 06 | 59.31.1104 | 0.1 U | 20% 100V | MPETP | |
| C 07 | 59.30.4100 | 10 U | -20% 16 V | TA | |
| C 08 | 59.30.4100 | 10 U | -20% 16 V | TA | |
| C 09 | 59.32.1152 | 1500P | -10% 500V | CER | |
| C 10 | 59.32.0220 | 22 P | -20% 500V | CER | |
| C 11 | 59.32.0220 | 22 P | -20% 500V | CER | |
| C 12 | 59.30.4100 | 10 U | -20% 16 V | TA | |
| C 13 | 59.32.3103 | 0.01U | -20% 40 V | CER | |
| C 14 | 59.22.5470 | 47 U | -10% 25 V | EL | |
| C 15 | 59.30.4100 | 10 U | -20% 16 V | TA | |
| C 16 | 59.32.3103 | 0.01U | -20% 40 V | CER | |
| C 17 | 59.30.4100 | 10 U | -20% 16 V | TA | |
| C 18 | 59.30.4100 | 10 U | -20% 16 V | TA | |
| C 19 | 59.30.4100 | 10 U | -20% 16 V | TA | |
| C 20 | 59.30.4339 | 3.3 U | -20% 16 V | TA | |
| C 21 | 59.32.0220 | 22 P | -20% 500V | CER | |
| C 22 | 59.25.3121 | 125 U | -10% 16 V | EL | |
| C 23 | 59.22.5470 | 47 U | -10% 25 V | EL | |
| C 24 | 59.32.1152 | 1500P | -10% 500V | CER | |
| C 25 | 59.32.0220 | 22 P | -20% 500V | CER | |
| IC 01 | 50.05.0288 | TBA 231 | | | A |
| P 01 | 54.01.0220 | 9 - Pole | PIN-Strip | AMP | |
| P 02 | 54.01.0470 | 4 - Pole | PIN-Strip | AMP | |
| Q 01 | 50.03.0329 | SFF 316 | P-Channel J-FET | P1228E | M,T |
| Q 02 | 50.03.0329 | SFF 316 | P-Channel J-FET | P1228E | M,T |
| Q 03 | 50.03.0305 | BC 179 B | | PNP | |
| Q 04 | 50.03.0436 | BC 107 B | | NPN | any |
| Q 05 | 50.03.0439 | BC 109 C | | NPN | |
| Q 06 | 50.03.0439 | BC 109 C | | NPN | |
| Q 07 | 50.03.0436 | BC 107 B | | NPN | any |
| Q 08 | 50.03.0305 | BC 179 B | | PNP | |

A = Ates
M = Motorola
T = Teledyne
TI= Texas Instr.

| IND | DATE | NAME |
|---|---|---|
| C | 29.9.76 | ZH |
| D | 5.4.77 | Wartburg |

STUDER Input Amplifier 1.177.220 PAGE 1 of 2

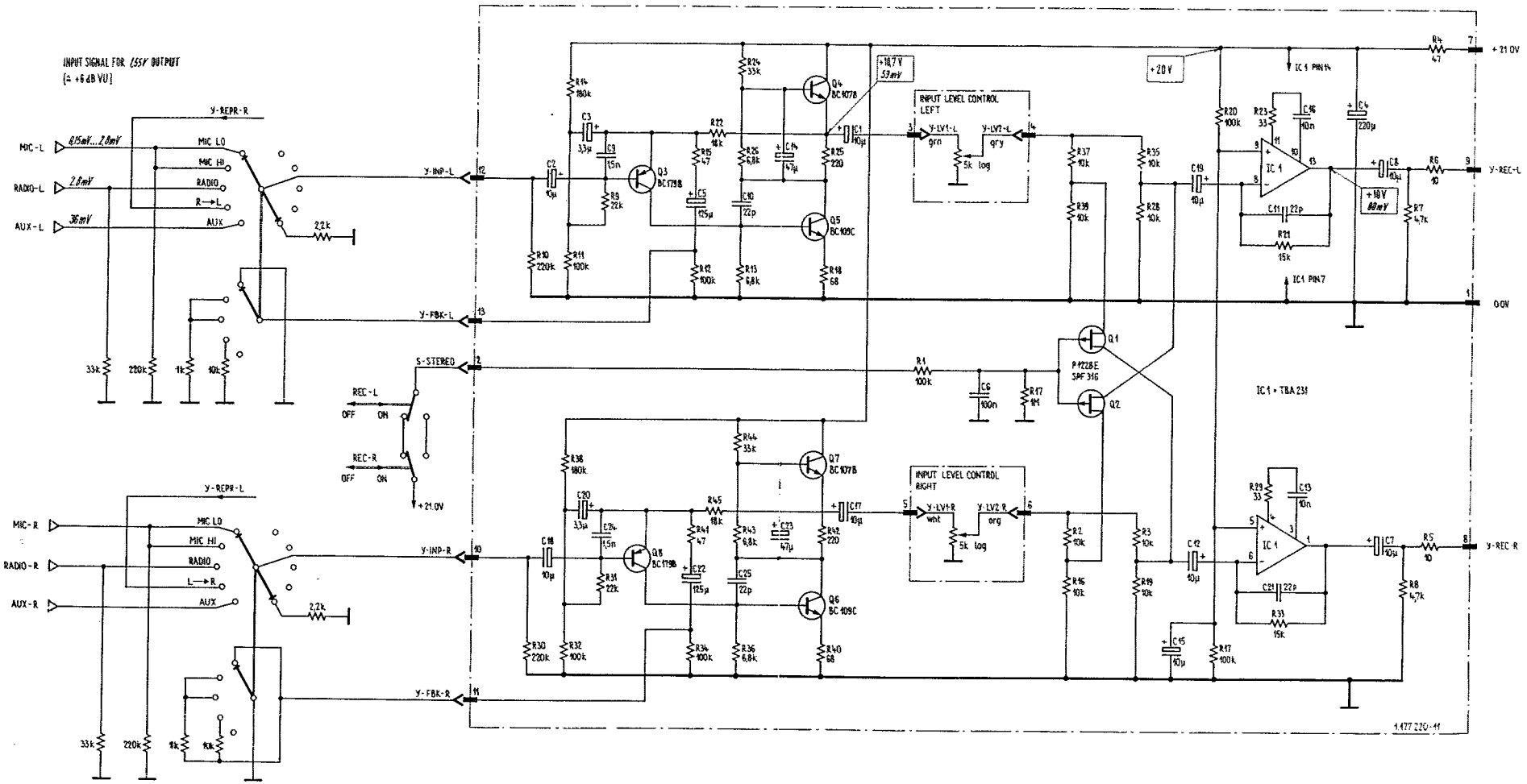
| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| R 01 | 57.41.4104 | 100 k | 5% .25W | CF | |
| R 02 | 57.41.4101 | 10 k | | | |
| R 03 | 57.41.4103 | 10 k | | | |
| R 04 | 57.41.4470 | 47 | | | |
| R 05 | 57.41.4100 | 10 | | | |
| R 06 | 57.41.4100 | 10 | | | |
| R 07 | 57.41.4472 | 4.7 k | | | |
| R 08 | 57.41.4472 | 4.7 k | | | |
| R 09 | 57.41.4223 | 22 k | | | |
| R 10 | 57.41.4224 | 220 k | | | |
| R 11 | 57.41.4104 | 100 k | | | |
| R 12 | 57.41.4104 | 100 k | | | |
| R 13 | 57.41.4682 | 6.8 k | | | |
| R 14 | 57.41.4184 | 180 k | | | |
| R 15 | 57.41.4470 | 47 | | | |
| R 16 | 57.41.4103 | 10 k | | | |
| R 17 | 57.41.4105 | 1 M | | | |
| R 18 | 57.41.4680 | 68 | | | |
| R 19 | 57.41.4103 | 10 k | | | |
| R 20 | 57.41.4104 | 100 k | | | |
| R 21 | 57.41.4153 | 15 k | | | |
| R 22 | 57.41.4183 | 18 k | | | |
| R 23 | 57.41.4330 | 33 | | | |
| R 24 | 57.41.4333 | 33 k | | | |
| R 25 | 57.41.4221 | 220 | | | |
| R 26 | 57.41.4682 | 6.8 k | | | |
| R 27 | 57.41.4104 | 100 k | | | |
| R 28 | 57.41.4103 | 10 k | | | |
| R 29 | 57.41.4330 | 33 | | | |
| R 30 | 57.41.4224 | 220 k | | | |
| R 31 | 57.41.4223 | 22 k | | | |
| R 32 | 57.41.4104 | 100 k | | | |
| R 33 | 57.41.4153 | 15 k | | | |
| R 34 | 57.41.4104 | 100 k | | | |
| R 35 | 57.41.4103 | 10 k | | | |
| R 36 | 57.41.4682 | 6.8 k | | | |
| R 37 | 57.41.4103 | 10 k | | | |
| R 38 | 57.41.4184 | 180 k | | | |
| R 39 | 57.41.4103 | 10 k | | | |
| R 40 | 57.41.4680 | 68 | | | |
| R 41 | 57.41.4470 | 47 | | | |
| R 42 | 57.41.4221 | 220 | | | |
| R 43 | 57.41.4682 | 6.8 k | | | |
| R 44 | 57.41.4333 | 33 k | | | |
| R 45 | 57.41.4183 | 18 k | | | |

CF= Carbon Film

| IND | DATE | NAME |
|---|---|---|
| C | 29.9.76 | ZH |
| D | 5.4.77 | Wartburg |

STUDER Input Amplifier 1.177.220 PAGE 2 of 2

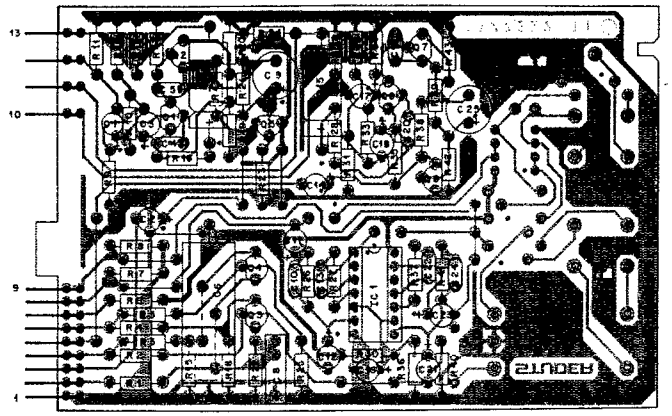
INPUT AMPLIFIER PCB 1.177.220

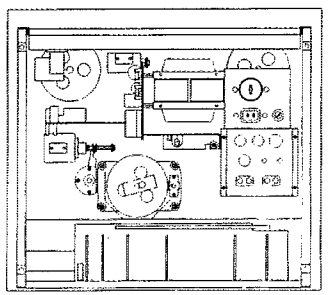



VALID TILL SERIAL No. 38284

SEE SERVICE INFORMATION
51.3 : C10,11,21,25 (OSCILLATION)

## INPUT AMPLIFIER PCB 1.177.221



| INCL. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | C-----1 | 59.22.6100 | 10 uF | 10%, 35V, El | |
| | C-----2 | 59.22.6100 | 10 uF | 10%, 35V, El | |
| | C-----3 | 59.22.4479 | 4.7 uF | -10%, 50V, El | |
| | C-----4 | 59.32.3152 | 1500 pF | -10%, 50V, Cer | |
| | C-----5 | 59.32.0470 | 47 pF | -20%, 50V, Cer | |
| | C-----6 | 59.25.4221 | 220 uF | -10%, 25V, El | |
| | C-----7 | 59.25.3121 | 125 uF | -10%, 16V, El | |
| | C-----8 | 59.51.1104 | 0.1 uF | 20%, 100V, MKT2 | |
| | C-----9 | 59.22.4479 | 4.7 uF | 20%, 25V, El | |
| | C-----10 | 59.32.0470 | 47 pF | -20%, 50V, Cer | |
| | C-----11 | 59.22.6100 | 10 uF | -10%, 35V, El | |
| | C-----12 | 59.22.6100 | 10 uF | -10%, 35V, El | |
| | C-----13 | 59.32.3103 | 0.01 uF | +80%, 40V, Cer | |
| | C-----14 | 59.27.6100 | 10 uF | -10%, 35V, El | |
| | C-----15 | 59.25.3121 | 125 uF | -10%, 16V, El | |
| | C-----16 | 59.27.6100 | 10 uF | -10%, 35V, El | |
| | C-----17 | 59.22.6100 | 10 uF | -10%, 35V, El | |
| | C-----18 | 59.22.4479 | 4.7 uF | -10%, 50V, El | |
| | C-----19 | 59.32.0470 | 47 pF | -20%, 50V, Cer | |
| | C-----20 | 59.32.3152 | 1500 pF | -10%, 50V, Cer | |
| | C-----21 | 59.22.6100 | 10 uF | -10%, 35V, El | |
| | C-----22 | 59.32.3103 | 0.01 uF | +80%, 40V, Cer | |
| | C-----23 | 59.22.6106 | 10 uF | -10%, 35V, El | |
| | C-----24 | 59.32.9478 | 47 pF | -20%, 50V, El | |
| | C-----25 | 59.22.4478 | 47 uF | 20%, 25V, El | |
| | IC-----1 | 50.05.0288 | TBA 231 | | A |
| | P-----1 | 54.01.9220 | 9-Pole | Pin-Strip | AMP |
| | P-----2 | 54.01.9470 | 4-Pole | Pin-Strip | AMP |
| | Q-----1 | 50.03.0304 | BC 179 B | PNP | |
| | Q-----2 | 50.03.0439 | BC 109 C | NPN | |
| | Q-----3 | 50.03.9329 | SPF 316 | P-Channel J-FET | MAT |
| | Q-----4 | 50.03.9329 | SPF 316 | P-Channel J-FET | MAT |
| | Q-----5 | 50.03.0416 | BC 107 B | NPN | |
| | Q-----6 | 50.03.0305 | BC 179 B | PNP | |

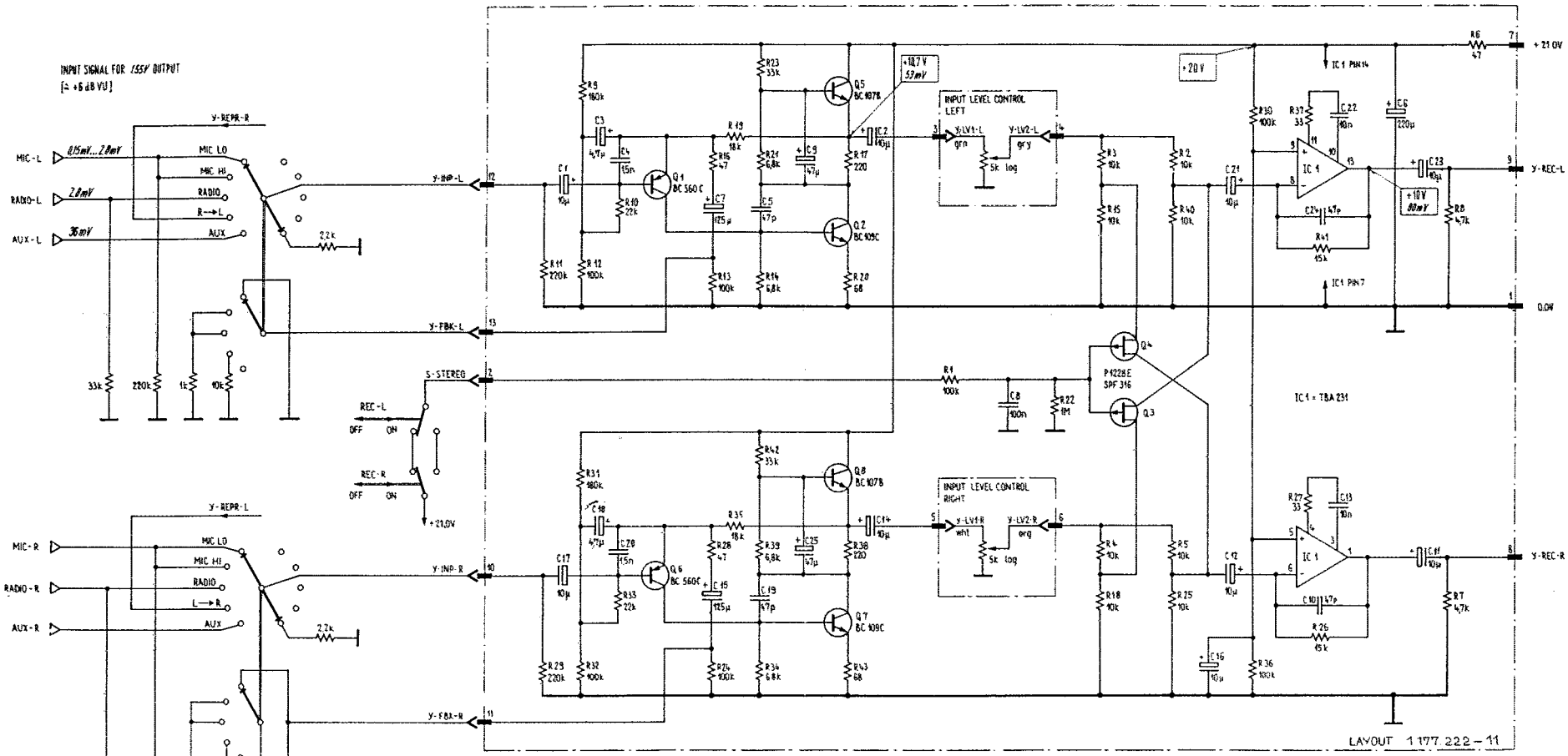


| INCL. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | Q-----7 | 50.03.0439 | BC 109 C | NPN | |
| | Q-----8 | 50.03.0416 | BC 107 B | NPN | |
| | R-----1 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R-----2 | 57.11.4103 | 10 kOhm | 5%, 0.25W, CF | |
| | R-----3 | 57.11.4103 | 10 kOhm | 5%, 0.25W, CF | |
| | R-----4 | 57.11.4103 | 10 kOhm | 5%, 0.25W, CF | |
| | R-----5 | 57.11.4103 | 10 kOhm | 5%, 0.25W, CF | |
| | R-----6 | 57.11.4470 | 47 Ohm | 5%, 0.25W, CF | |
| | R-----7 | 57.11.4472 | 4.7 kOhm | 5%, 0.25W, CF | |
| | R-----8 | 57.11.4472 | 4.7 kOhm | 5%, 0.25W, CF | |
| | R-----9 | 57.11.4154 | 150 kOhm | 5%, 0.25W, CF | |
| | R-----10 | 57.11.4223 | 22 kOhm | 5%, 0.25W, CF | |
| | R-----11 | 57.11.4224 | 220 kOhm | 5%, 0.25W, CF | |
| | R-----12 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R-----13 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R-----14 | 57.11.4682 | 6.8 kOhm | 5%, 0.25W, CF | |
| | R-----15 | 57.11.4103 | 10 kOhm | 5%, 0.25W, CF | |
| | R-----16 | 57.11.4470 | 47 Ohm | 5%, 0.25W, CF | |
| | R-----17 | 57.11.4221 | 220 Ohm | 5%, 0.25W, CF | |
| | R-----18 | 57.11.4103 | 10 kOhm | 5%, 0.25W, CF | |
| | R-----19 | 57.11.4183 | 18 kOhm | 5%, 0.25W, CF | |
| | R-----20 | 57.11.4680 | 68 Ohm | 5%, 0.25W, CF | |
| | R-----21 | 57.11.4682 | 6.8 kOhm | 5%, 0.25W, CF | |
| | R-----22 | 57.11.4105 | 1 MOhm | 5%, 0.25W, CF | |
| | R-----23 | 57.11.4333 | 33 kOhm | 5%, 0.25W, CF | |
| | R-----24 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R-----25 | 57.11.4103 | 10 kOhm | 5%, 0.25W, CF | |
| | R-----26 | 57.11.4153 | 15 kOhm | 5%, 0.25W, CF | |
| | R-----27 | 57.11.4330 | 33 Ohm | 5%, 0.25W, CF | |
| | R-----28 | 57.11.4470 | 47 Ohm | 5%, 0.25W, CF | |
| | R-----29 | 57.11.4224 | 220 kOhm | 5%, 0.25W, CF | |
| | R-----30 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R-----31 | 57.11.4184 | 180 kOhm | 5%, 0.25W, CF | |
| | R-----32 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R-----33 | 57.11.4223 | 22 kOhm | 5%, 0.25W, CF | |
| | R-----34 | 57.11.4682 | 6.8 kOhm | 5%, 0.25W, CF | |



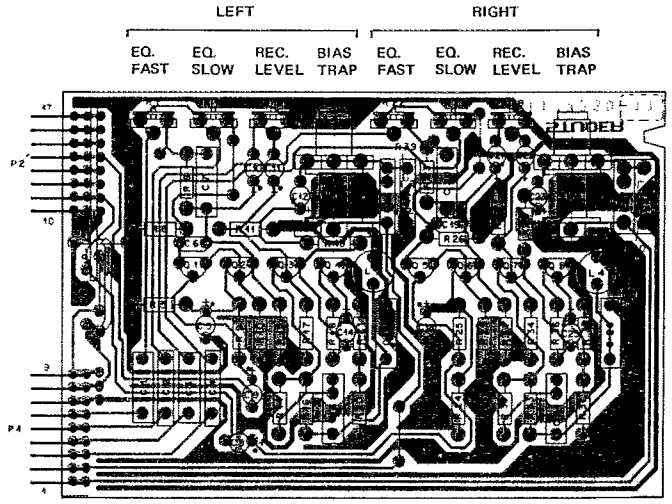
| INCL. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | R-----35 | 57.11.4183 | 18 kOhm | 5%, 0.25W, CF | |
| | R-----36 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R-----37 | 57.11.4330 | 33 Ohm | 5%, 0.25W, CF | |
| | R-----38 | 57.11.4221 | 220 Ohm | 5%, 0.25W, CF | |
| | R-----39 | 57.11.4682 | 6.8 kOhm | 5%, 0.25W, CF | |
| | R-----40 | 57.11.4103 | 10 kOhm | 5%, 0.25W, CF | |
| | R-----41 | 57.11.4153 | 15 kOhm | 5%, 0.25W, CF | |
| | R-----42 | 57.11.4333 | 33 kOhm | 5%, 0.25W, CF | |
| | R-----43 | 57.11.4680 | 68 Ohm | 5%, 0.25W, CF | |

INPUT AMPLIFIER PCB 1.177.221

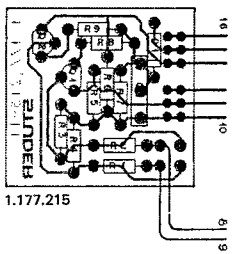



VALID SINCE SERIAL No. 38285

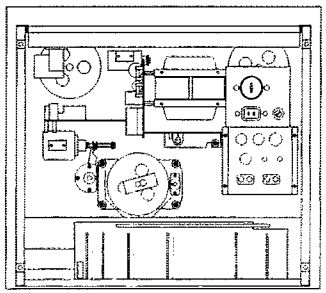
## RECORD AMPLIFIER PCB (NAB 3 3/4 - 7 1/2 ips) 1.177.230–81




1.177.230-81



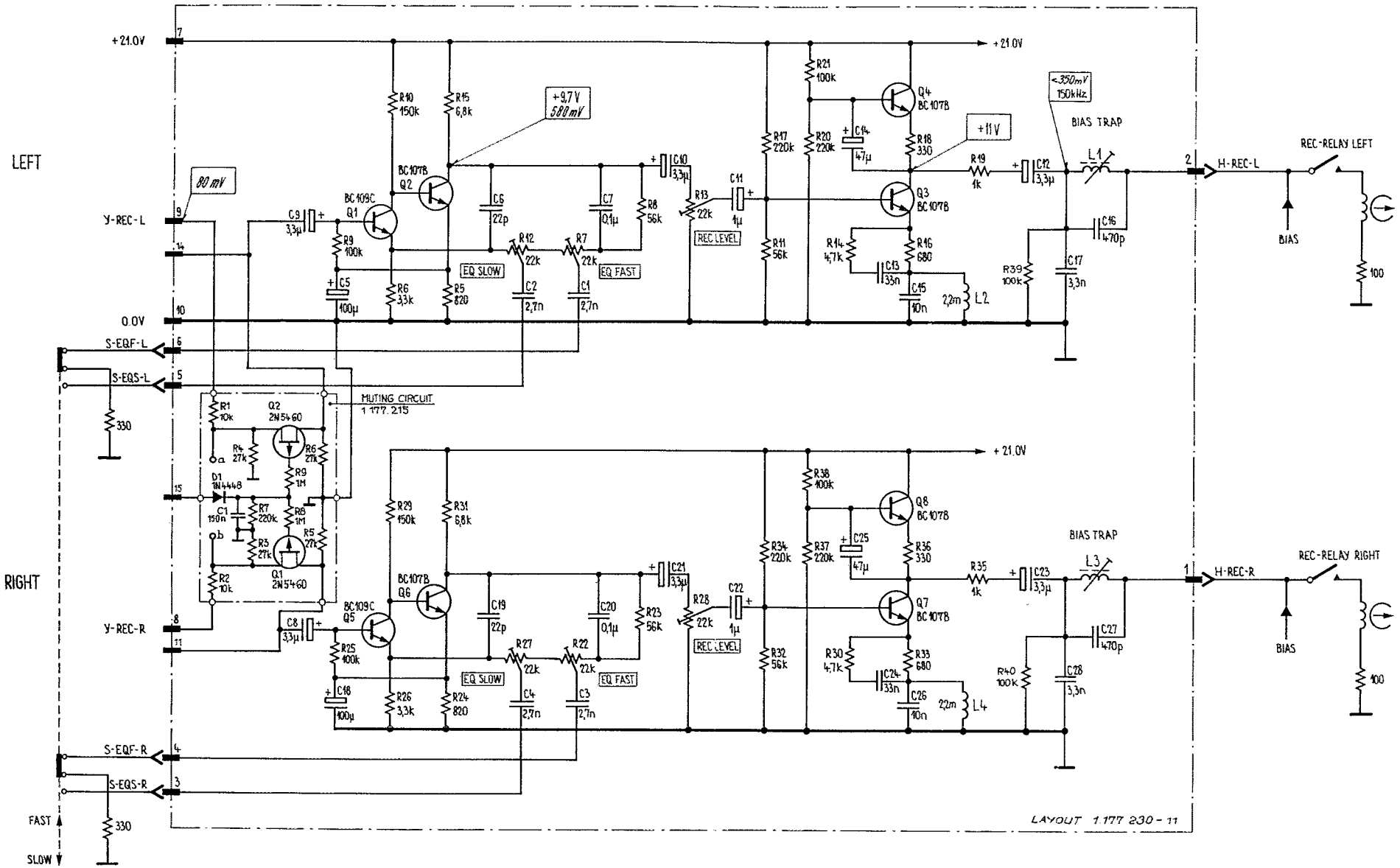

1.177.215



| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | C1 | 59.31.4154 | 150nF | | |
| | D1 | 50.06.0185 | 1N4442 | | |
| | J1 | 54.10.0227 | 3Pol | CTS | |
| | J2 | 54.10.0227 | 3Pol | CTS | |
| | Q1 | 50.03.0312 | 2N5640 | PCH Fet | |
| | Q2 | 50.03.0312 | 2N5640 | PCH Fet | |
| | P1 | 57.11.4103 | 10K | | |
| | P2 | 57.11.4103 | 10K | | |
| | R3 | 57.11.4273 | 27K | | |
| | R4 | 57.11.4273 | 27K | | |
| | R5 | 57.11.4273 | 27K | | |
| | R6 | 57.11.4273 | 27K | | |
| | R7 | 57.11.4224 | 220K | | |
| | RP | 57.11.4105 | 1M | | |
| | P1 | 57.11.4105 | 1M | | |

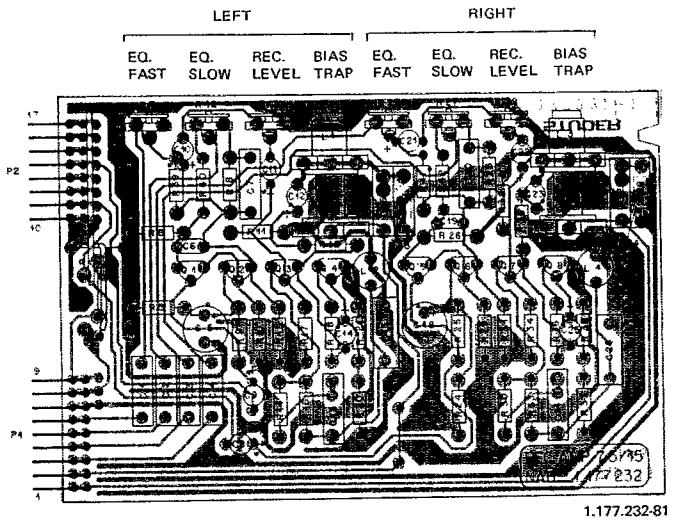
| IND | DATE | NAME | | | |
|---|---|---|---|---|---|
| (4) | | | | | |
| (3) | 12. 1 81 | Wenglhuber | | | |
| (2) | 28. 1 81 | Wenglhuber | | | |
| (1) | 16. 1 81 | Leonhardt | | | |
| | 15. 1 81 | Schmid | | | |
| | | Timing Circuit | PL | 1.177.245-00 | PAGE 1 OF 1 |

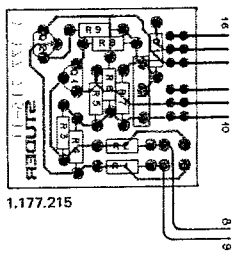
RECORD AMPLIFIER PCB (NAB 3 3/4 - 7 1/2 ips) 1.177.230–81

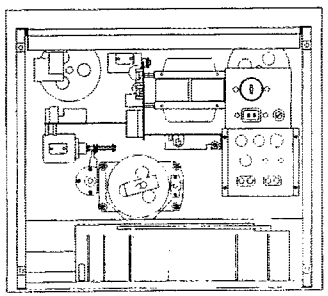



SEE SERVICE INFORMATION
63.7 : MUTING CIRCUIT 1.177.215

## RECORD AMPLIFIER PCB (NAB 7 1/2 - 15 ips) 1.177.232-81



| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| C | 1 | 56.03.0439 | BC 109 C | NPN | |
| C | 2 | 56.03.0436 | BC 107 B | NPN | |
| C | 3 | 56.03.0436 | BC 107 B | NPN | |
| C | 4 | 56.03.0436 | BC 107 B | NPN | |
| C | 5 | 56.03.0439 | BC 109 C | NPN | |
| C | 6 | 56.03.0436 | BC 107 B | NPN | |
| C | 7 | 56.03.0436 | BC 107 B | NPN | |
| C | 8 | 56.03.0436 | BC 107 B | NPN | |
| R | 1 | | | | |
| R | 2 | | | | |
| R | 3 | | | | |
| R | 4 | | | | |
| R | 5 | 57.11.4821 | 820 Ohm | 5% 0.25W CF | |
| R | 6 | 57.11.4332 | 3.3 kOhm | 5% 0.25W CF | |
| R | 7 | 58.02.4223 | 22 kOhm | 10% 0.1 W CF | |
| R | 8 | 57.11.4393 | 39 kOhm | 5% 0.25W CF | |
| R | 9 | 57.11.4104 | 100 kOhm | 5% 0.25W CF | |
| R | 10 | 57.11.4154 | 150 kOhm | 5% 0.25W CF | |
| R | 11 | 57.11.4563 | 56 kOhm | 5% 0.25W CF | |
| R | 12 | 58.02.4223 | 22 kOhm | 10% 0.1 W CF | |
| R | 13 | 58.02.4223 | 22 kOhm | 10% 0.1 W CF | |
| R | 14 | 57.11.4152 | 1 kOhm | 5% 0.25W CF | |
| R | 15 | 57.11.4682 | 6.8 kOhm | 5% 0.25W CF | |
| R | 16 | 57.11.4681 | 680 Ohm | 5% 0.25W CF | |
| R | 17 | 57.11.4274 | 220 kOhm | 5% 0.25W CF | |
| R | 18 | 57.11.4331 | 330 Ohm | 5% 0.25W CF | |
| R | 19 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |
| R | 20 | 57.11.4274 | 220 kOhm | 5% 0.25W CF | |
| R | 21 | 57.11.4104 | 100 kOhm | 5% 0.25W CF | |
| R | 22 | 58.02.4223 | 22 kOhm | 10% 0.1 W CF | |
| R | 23 | 57.11.4393 | 39 kOhm | 5% 0.25W CF | |
| R | 24 | 57.11.4823 | 820 Ohm | 5% 0.25W CF | |
| R | 25 | 57.11.4104 | 100 kOhm | 5% 0.25W CF | |
| R | 26 | 57.11.4332 | 3.3 kOhm | 5% 0.25W CF | |
| R | 27 | 58.02.4223 | 22 kOhm | 10% 0.1 W CF | |
| R | 28 | 58.02.4223 | 22 kOhm | 10% 0.1 W CF | |

STUDER 92/11/30 RW RECORD AMPLIFIER 7+5-15 NAB 1.177-232-81 PAGE 2

| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| R | 29 | 57.11.4154 | 150 kOhm | 5% 0.25W CF | |
| R | 30 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |
| R | 31 | 57.11.4682 | 6.8 kOhm | 5% 0.25W CF | |
| R | 32 | 57.11.4563 | 56 kOhm | 5% 0.25W CF | |
| R | 33 | 57.11.4681 | 680 Ohm | 5% 0.25W CF | |
| R | 34 | 57.11.4274 | 220 kOhm | 5% 0.25W CF | |
| R | 35 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |
| R | 36 | 57.11.4331 | 330 Ohm | 5% 0.25W CF | |
| R | 37 | 57.11.4204 | 200 kOhm | 1% 0.25W CF | |
| R | 38 | 57.11.4154 | 150 kOhm | 5% 0.25W CF | |
| R | 39 | 57.11.4274 | 267 kOhm | 1% 0.25W CF | |
| R | 40 | 57.11.4221 | 22 kOhm | 1% 0.25W CF | |
| R | 41 | 57.11.4274 | 267 kOhm | 1% 0.25W CF | |
| R | 42 | 57.11.4223 | 22 kOhm | 1% 0.25W CF | |
| R | 43 | 57.11.4104 | 100 kOhm | 1% 0.25W CF | |
| R | 44 | 57.11.4104 | 100 kOhm | 1% 0.25W CF | |

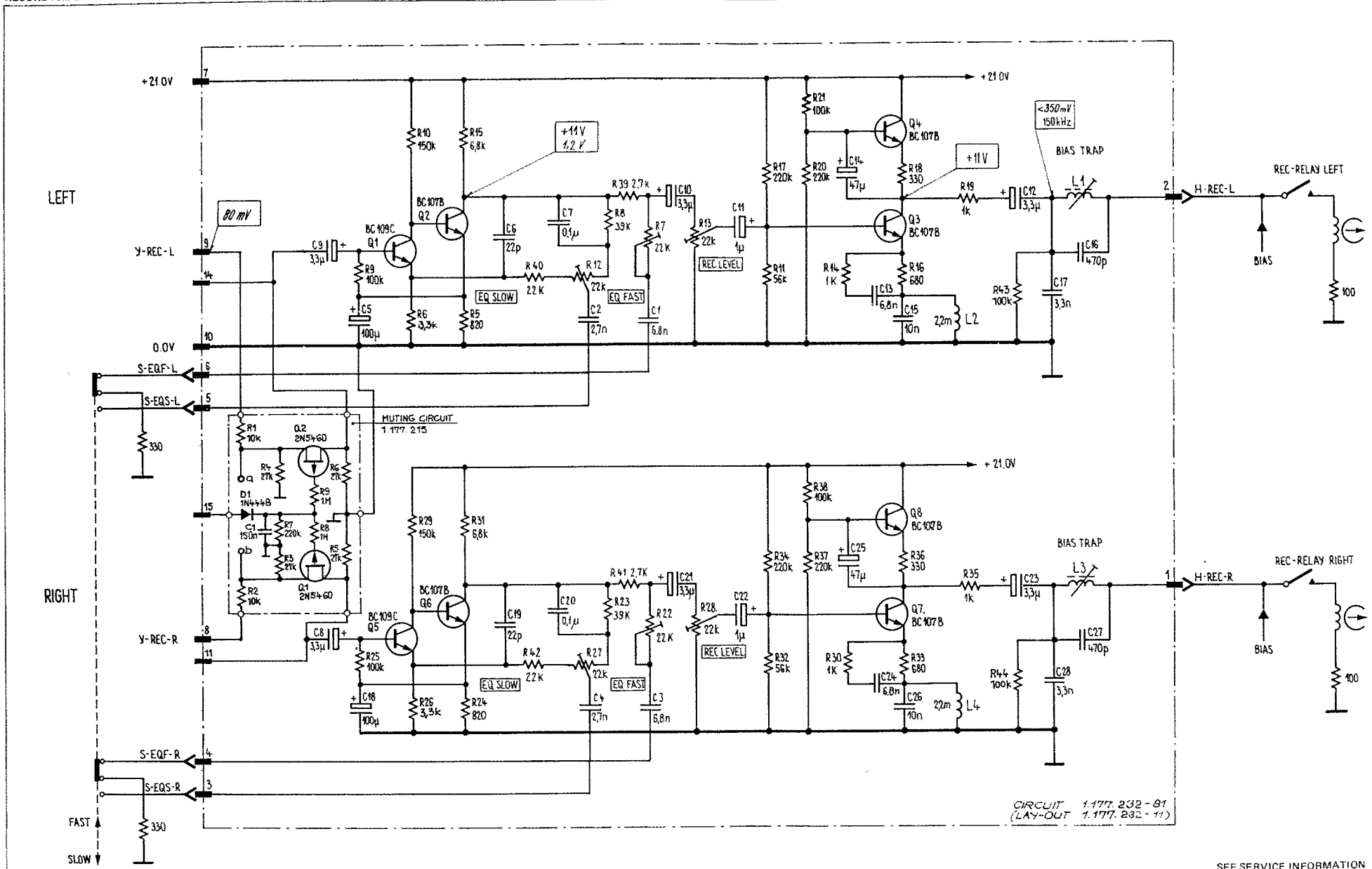
STUDER 92/11/30 RW RECORD AMPLIFIER 7+5-15 NAB 1.177-232-81 PAGE 3

| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MFR. |
|---|---|---|---|---|---|
| 3 | C 7 | 59.11.4154 | 150nF | | |
| | D 1 | 50.04.0135 | 15mA | 5 | |
| | J1 | 54.01.227 | 9PL | CCS | |
| | J2 | 54.40.31 | 3PL | CTS | |
| | Q 1 | 50.02.03 10 | 2N5401 | PNP Tst | |
| | Q 2 | 50.03.03 11 | 2N3440 | PCH Tst | |
| 2 | R 1 | 57.11.4103 | 10K | | |
| 2 | R 2 | 57.11.4103 | 10K | | |
| | R 3 | 57.11.4273 | 27K | | |
| | R 4 | 57.11.4223 | 22K | | |
| | R 5 | 57.11.4273 | 27K | | |
| | R 6 | 57.11.4233 | 33K | | |
| | R 7 | 57.11.4224 | 220K | | |
| 3 | R 8 | 57.11.4101 | 1K | | |
| 3 | R 9 | 57.11.4135 | 1M | | |

| IND. | DATE | NAME |
|---|---|---|
| 4 | | |
| 3 | 11.2.91 | Wasshuber |
| 2 | 28.1.91 | Wasshuber |
| 1 | 14.1.91 | Gaertner |
| 0 | 8.12.90 | Gaertner |

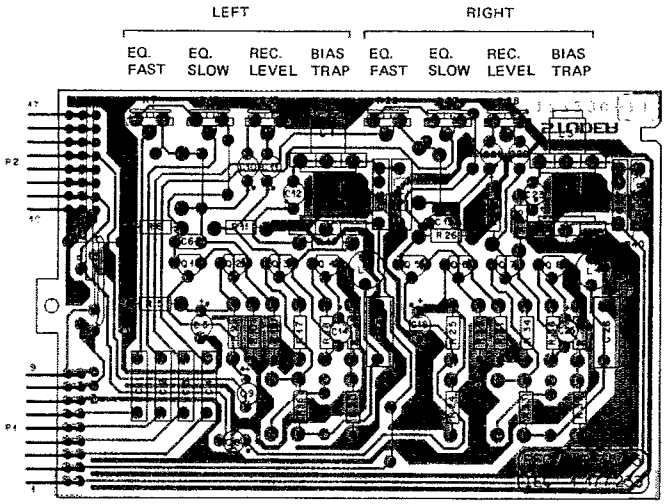
STUDER Wiring Circuit PL 1.177.245-00 PAGE 1 OF 1

RECORD AMPLIFIER PCB (NAB 7 1/2 - 15 ips) 1.177.232-81

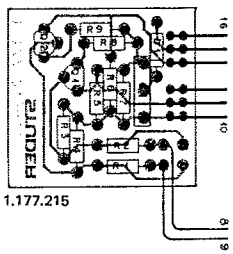



SEE SERVICE INFORMATION
63.7 : MUTING CIRCUIT 1.177.215

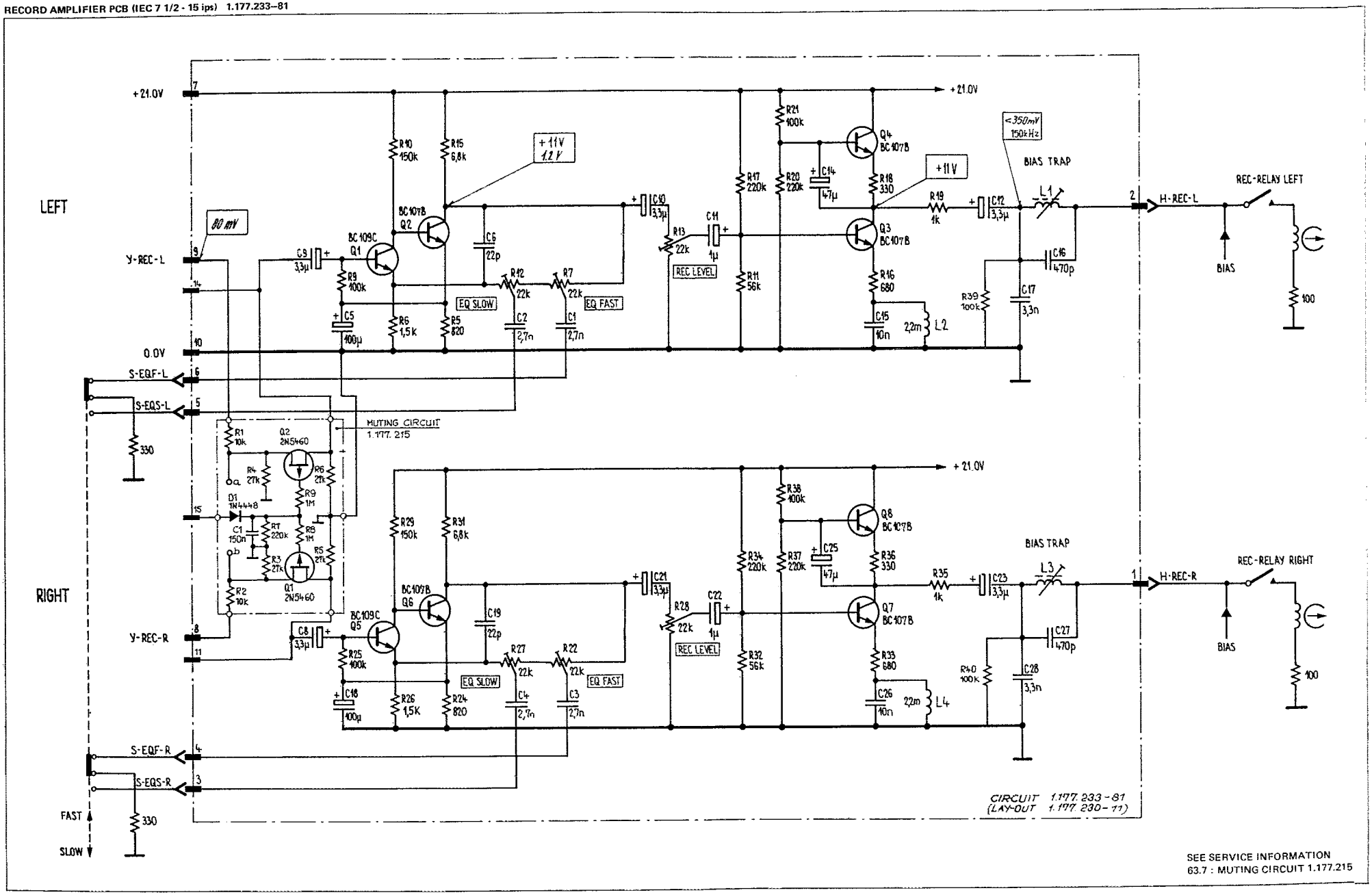
## ECORD AMPLIFIER PCB (IEC 7 1/2 - 15 ips) 1.177.233–81




1.177.233-81

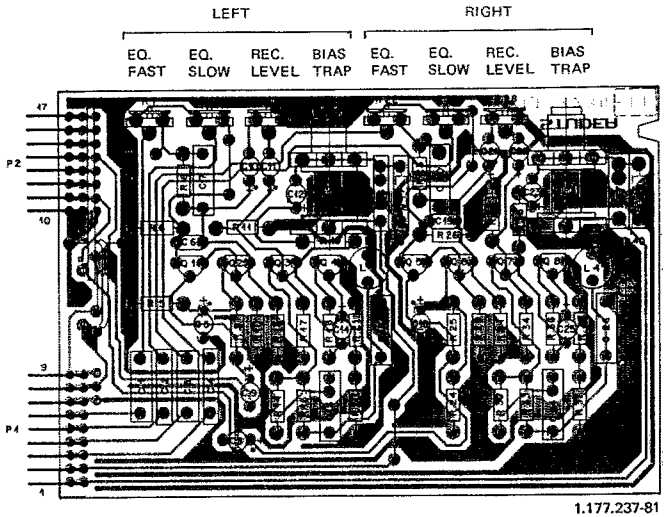


RECORD AMPLIFIER PCB (IEC 7 1/2 - 15 ips) 1.177.233–81

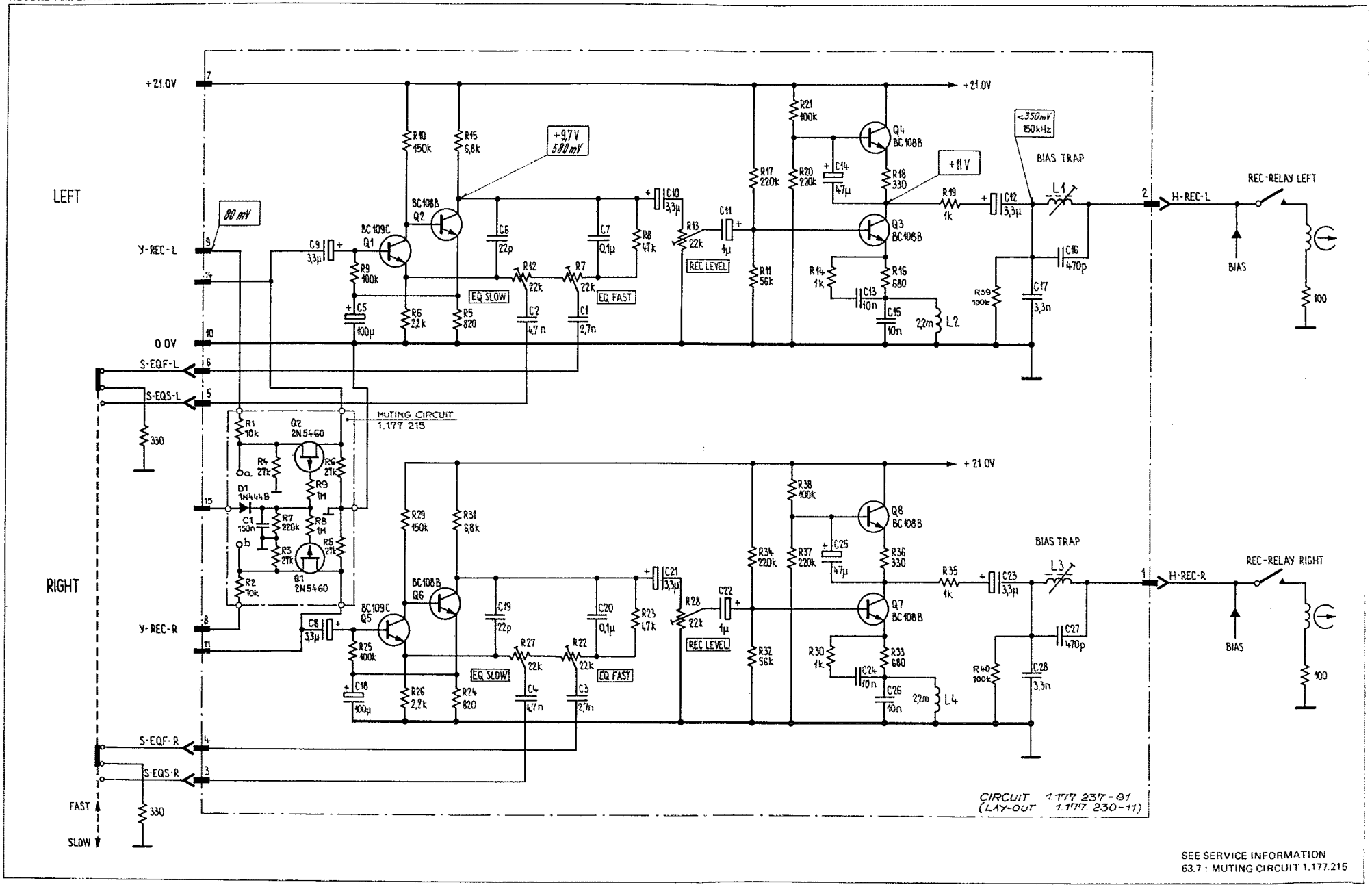



SEE SERVICE INFORMATION
63.7 : MUTING CIRCUIT 1.177.215

## RECORD AMPLIFIER PCB (NAB 1 7/8 – 3 3/4 ips) 1.177.237–81

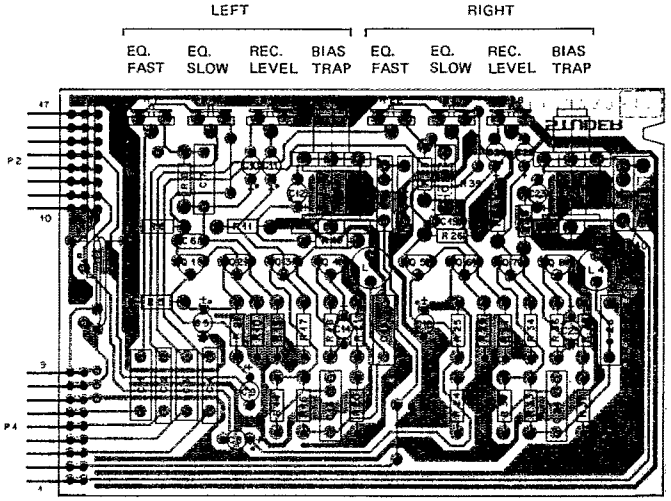


RECORD AMPLIFIER PCB (NAB 1 7/8 – 3 3/4 ips) 1.177.237–81

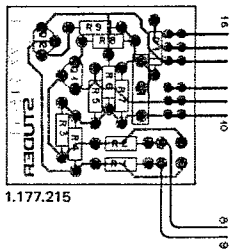



SEE SERVICE INFORMATION
63.7 : MUTING CIRCUIT 1.177.215

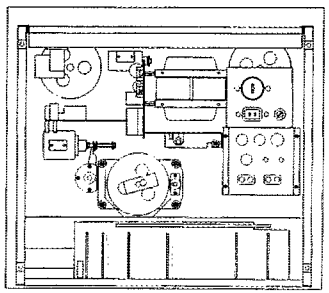
## RECORD AMPLIFIER PCB (NAB 15/16 - 1 7/8 ips) 1.177.238–81



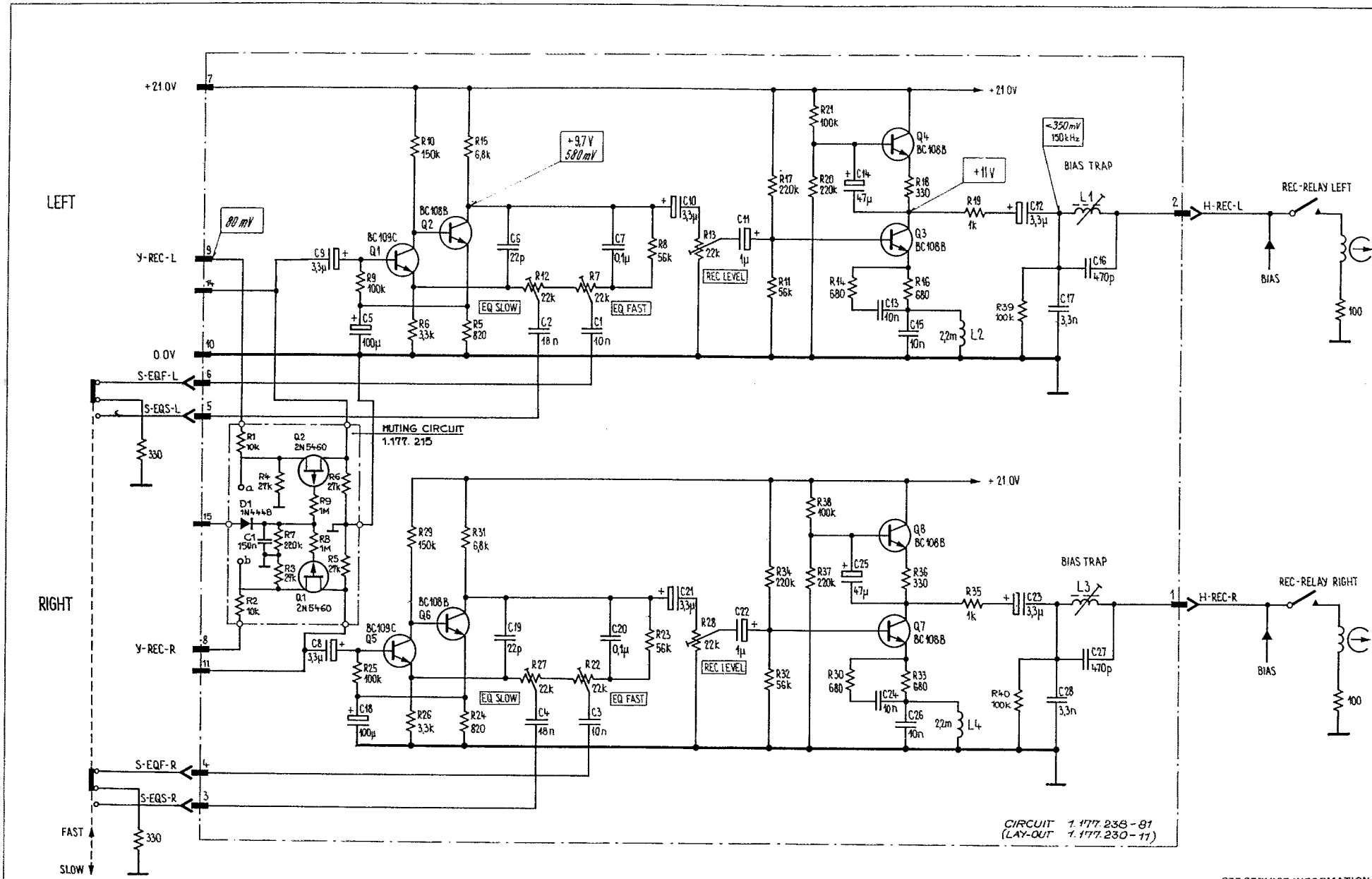

1.177.238-81




1.177.215

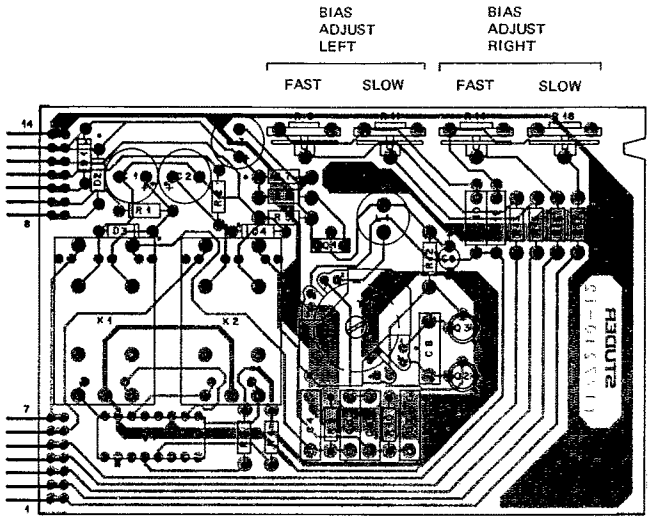


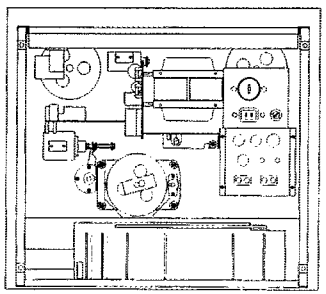
RECORD AMPLIFIER PCB (NAB 15/16 - 1 7/8 ips) 1.177.238-81




SEE SERVICE INFORMATION
63.7 : MUTING CIRCUIT 1.177.215

## OSCILLATOR PCB 4 TRACK 1.177.240 / 2 TRACK 1.177.243



| IND. | PCS. | NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|---|
| | C | 1 | 59.22.4101 | 100 uF | 10%, 16V, ES | |
| | C | 2 | 59.22.4101 | 100 uF | 10%, 16V, ES | |
| | C | 3 | 59.22.2221 | 220 uF | 10%, 6.3V, ES | |
| | C | 4 | 59.11.4472 | 4700 pF | 2.5%, 160V, PC | |
| | C | 5 | 59.11.4472 | 4700 pF | 2.5%, 160V, PC | |
| | C | 6 | 59.11.4472 | 4700 pF | 2.5%, 160V, PC | |
| | C | 7 | 59.11.4472 | 4700 pF | 2.5%, 160V, PC | |
| | C | 8 | 59.13.4682 | 6800 pF | 5%, 160V, PC | |
| 5) | C | 9 | 59.22.8479 | 4.7 uF | 10%, 50V, ES | |
| | C | 10 | 59.14.8221 | 220 pF | 5%, 160V, PS | |
| | C | 11 | 59.14.8221 | 220 pF | 5%, 160V, PS | |
| | D | 1 | 50.04.0127 | 1 N 4448 | | any |
| | D | 2 | 50.04.0125 | 1 N 4448 | | any |
| | D | 3 | 50.04.0125 | 1 N 4448 | | any |
| | D | 4 | 50.04.0125 | 1 N 4448 | | any |
| | J | 1 | 54.01.0306 | 6-Pole | Socket-Strip | AMP |
| 4) | K | 1 | 56.04.0150 | 2 x U | 500 Ohm, 12V | NAO |
| 4) | K | 2 | 56.04.0150 | 2 x U | 500 Ohm, 12V | NAO |
| | L | 1 | 62.02.2122 | 1+2 mH | 5% RDC max. 6 Ohm | |
| | P | 1 | 54.01.0223 | 7-Pole | Pin-Strip | AMP |
| | P | 2 | 54.01.0223 | 7-Pole | Pin-Strip | AMP |
| | Q | 1 | 50.03.0470 | BD 140 | Medium Power PNP | |
| | Q | 2 | 50.03.043A | BFR 18 | NPN | |
| | Q | 3 | 50.03.043A | BFR 18 | NPN | |
| | R | 1 | 57.11.4333 | 330 Ohm | 5%, 0.25W, CF | |
| | R | 2 | 57.11.4331 | 330 Ohm | 5%, 0.25W, CF | |
| | R | 3 | 57.11.4101 | 100 Ohm | 5%, 0.25W, CF | |
| | R | 4 | 57.11.4101 | 100 Ohm | 5%, 0.25W, CF | |
| | R | 5 | 57.11.4682 | 6.8 kOhm | 5%, 0.25W, CF | |
| | R | 6 | 57.11.4100 | 10 Ohm | 5%, 0.25W, CF | |

STUDER 87/11/30 RW OSCILLATOR 1.177.240.00 PAGE 1

| IND. | PCS. | NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|---|
| | R | 7 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R | 8 | 58.19.0503 | 50 kOhm | 20%, 0.15W, PCF | |
| | R | 9 | 57.11.4105 | 1 MOhm | 5%, 0.25W, CF | |
| | R | 10 | 57.11.4105 | 1 MOhm | 5%, 0.25W, CF | |
| | R | 11 | 58.19.0503 | 50 kOhm | 20%, 0.15W, PCF | |
| | R | 12 | 57.11.4153 | 15 kOhm | 5%, 0.25W, CF | |
| | R | 13 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R | 14 | 58.19.0503 | 50 kOhm | 20%, 0.15W, PCF | |
| | R | 15 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R | 16 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R | 17 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R | 18 | 58.19.0503 | 50 kOhm | 20%, 0.15W, PCF | |
| | T | 1 | 1.022.181.00 | Oscillator coil | | S |

E1=Electrolytic, CerCeramic, PS=Polystyrene, N=National, O=Omron,
PC=Polycarbonate, CF=Carbonfilm, PCF=PotCarbon Film,
Manufacturer: Ray=Raytheon, TI=Texas Instruments, AriSS=Ates,
M=Motorola, Te=Teledyne, N=National,

GMIG 82/02/08 (02) 81/12/21

STUDER 87/11/30 RW OSCILLATOR 1.177.240.00 PAGE 2

| IND. | PCS. | NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|---|
| | C | 1 | 59.22.4101 | 100 uF | 10%, 16V, ES | |
| | C | 2 | 59.22.4101 | 100 uF | 10%, 16V, ES | |
| | C | 3 | 59.22.2221 | 220 uF | 10%, 6.3V, ES | |
| | C | 4 | 59.11.4472 | 4700 pF | 2.5%, 160V, PC | |
| | C | 5 | 59.11.4472 | 4700 pF | 2.5%, 160V, PC | |
| | C | 6 | 59.11.4472 | 4700 pF | 2.5%, 160V, PC | |
| | C | 7 | 59.11.4472 | 4700 pF | 2.5%, 160V, PC | |
| | C | 8 | 59.13.0516 | 12 nF | 5%, 160V, PC | |
| 2) | C | 9 | 59.22.8479 | 4.7 uF | 10%, 50V, ES | |
| | C | 10 | 59.14.8221 | 220 pF | 5%, 160V, PS | |
| | C | 11 | 59.14.8221 | 220 pF | 5%, 160V, PS | |
| | D | 1 | 50.04.0125 | 1 N 4448 | | any |
| | D | 2 | 50.04.0125 | 1 N 4448 | | any |
| | D | 3 | 50.04.0125 | 1 N 4448 | | any |
| | D | 4 | 50.04.0125 | 1 N 4448 | | any |
| | J | 1 | 54.01.0306 | 6-Pole | Socket-Strip | AMP |
| | K | 1 | 56.04.0150 | 2 x U | 500 Ohm, 12V | NAO |
| | K | 2 | 56.04.0150 | 2 x U | 500 Ohm, 12V | NAO |
| | L | 1 | 62.02.2122 | 1+2 mH | 5% RDC max. 6 Ohm | |
| | P | 1 | 54.01.0223 | 7-Pole | Pin-Strip | AMP |
| | P | 2 | 54.01.0223 | 7-Pole | Pin-Strip | AMP |
| 4) | Q | 1 | 50.03.0510 | BD 136-16 | Medium Power PNP | |
| | Q | 2 | 50.03.043A | BFR 18 | NPN | |
| | Q | 3 | 50.03.043A | BFR 18 | NPN | |
| | R | 1 | 57.11.4333 | 330 Ohm | 5%, 0.25W, CF | |
| | R | 2 | 57.11.4331 | 330 Ohm | 5%, 0.25W, CF | |
| | R | 3 | 57.11.4101 | 100 Ohm | 5%, 0.25W, CF | |
| | R | 4 | 57.11.4101 | 100 Ohm | 5%, 0.25W, CF | |
| 4) | R | 5 | 57.11.4562 | 5.6 kOhm | 5%, 0.25W, CF | |
| | R | 6 | 57.11.4100 | 10 Ohm | 5%, 0.25W, CF | |

STUDER 87/11/30 RW OSCILLATOR B 77 2-Track 1.177.243.00 PAGE 1

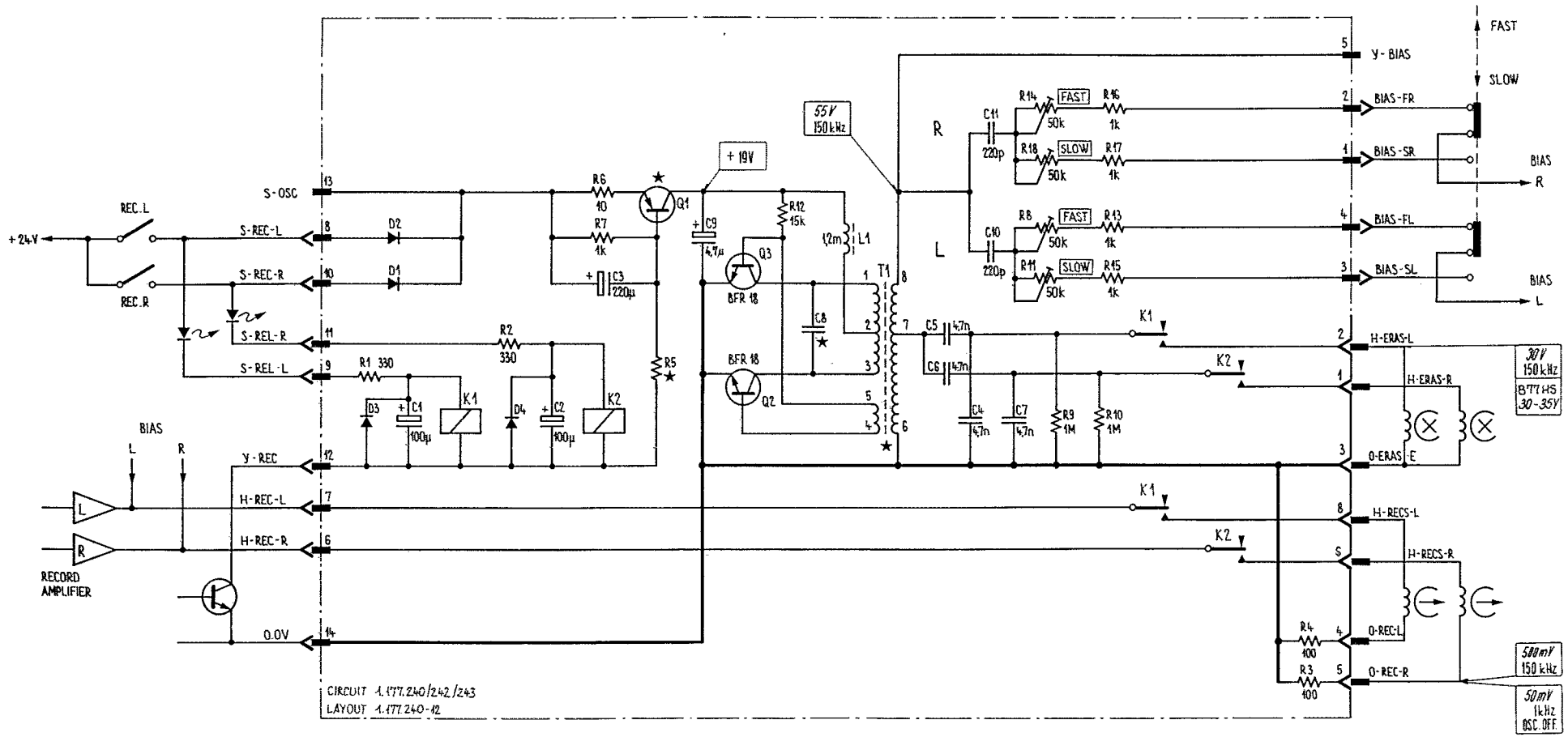
| IND. | PCS. | NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|---|
| | R | 7 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R | 8 | 58.19.0503 | 50 kOhm | 20%, 0.15W, PCF | |
| | R | 9 | 57.11.4105 | 1 MOhm | 5%, 0.25W, CF | |
| | R | 10 | 57.11.4105 | 1 MOhm | 5%, 0.25W, CF | |
| | R | 11 | 58.19.0503 | 50 kOhm | 20%, 0.15W, PCF | |
| | R | 12 | 57.11.4153 | 15 kOhm | 5%, 0.25W, CF | |
| | R | 13 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R | 14 | 58.19.0503 | 50 kOhm | 20%, 0.15W, PCF | |
| | R | 15 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R | 16 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R | 17 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R | 18 | 58.19.0503 | 50 kOhm | 20%, 0.15W, PCF | |
| | T | 1 | 1.022.203.00 | Oscillator coil | | S |

F1=Electrolytic, CerCeramic, PS=Polystyrene, N=National, O=Omron,
PC=Polycarbonate, CF=Carbonfilm, PCF=PotCarbon Film,
Manufacturer: Ray=Raytheon, TI=Texas Instruments, AriSS=Ates,
M=Motorola, Te=Teledyne, N=National,

GMIG 82/02/08 (02) 81/12/21

STUDER 87/11/30 RW OSCILLATOR B 77 2-Track 1.177.243.00 PAGE 2

OSCILLATOR PCB 4 TRACK 1.177.240 / 2 TRACK 1.177.243



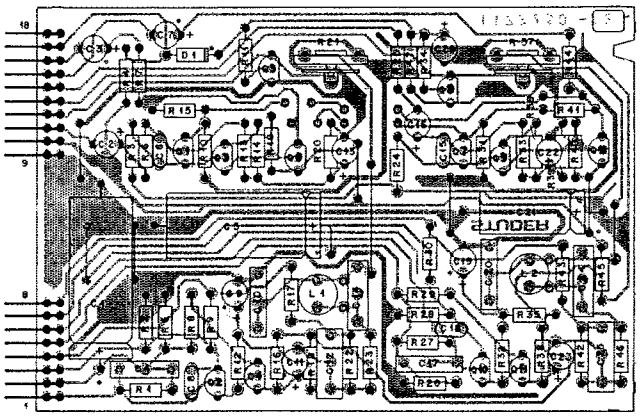

1.177.242: VALID ONLY FOR EARLIER VERSIONS B77 HS
T1 = 1.022.192.00 C8 = 8200p

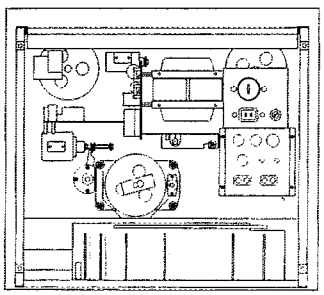
★ VALUES SEE CORRESPONDING POSITION LIST

## REPRODUCE AMPLIFIER PCB (NAB 3 3/4 - 7 1/2 ips) 1.177.250--81

REPRO LEVEL LEFT

REPRO LEVEL RIGHT



| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | C.....1 | 59.25.0102 | 1600 uF | 10%, 3V, E1 | |
| | C.....2 | 59.22.8478 | 4.7 uF | 10%, 50V, E1 | |
| | C.....3 | 59.22.4220 | 22 uF | 10%, 40V, E1 | |
| | C.....4 | 59.33.6221 | 220 pF | 5%, 400V, PC | |
| | C.....5 | 59.25.0102 | 1600 uF | 10%, 3V, E1 | |
| | C.....6 | 59.32.0101 | 100 pF | 20%, 500V, Cer | |
| | C.....7 | 59.22.4220 | 22 uF | 10%, 40V, E1 | |
| | C.....8 | 59.32.0101 | 100 pF | 20%, 500V, Cer | |
| | C.....9 | 59.22.8479 | 4.7 uF | 10%, 50V, E1 | |
| | C.....10 | 59.99.0294 | 2700 pF | 10%, 50V, PETP | |
| | C.....11 | 59.22.8479 | 4.7 uF | 10%, 50V, E1 | |
| | C.....12 | 59.33.3103 | 0.01 uF | 5%, 160V, PC | |
| | C.....13 | 59.22.3101 | 100 uF | 10%, 10V, E1 | |
| | C.....14 | 59.33.4561 | 560 pF | 5%, 400V, PC | |
| | C.....15 | 59.32.0101 | 100 pF | 20%, 500V, Cer | |
| | C.....16 | 59.22.8479 | 4.7 uF | 10%, 50V, E1 | |
| | C.....17 | 59.33.6221 | 220 pF | 5%, 400V, PC | |
| | C.....18 | 59.32.0101 | 100 pF | 20%, 500V, Cer | |
| | C.....19 | 59.22.8479 | 4.7 uF | 10%, 50V, E1 | |
| | C.....20 | 59.99.0259 | 2700 pF | 10%, 400V, PETP | |
| | C.....21 | 59.25.4101 | 100 uF | 10%, 25V, E1 | |
| | C.....22 | 59.22.3101 | 100 uF | 10%, 10V, E1 | |
| | C.....23 | 59.22.8479 | 4.7 uF | 10%, 50V, E1 | |
| | C.....24 | 59.33.4561 | 560 pF | 5%, 400V, PC | |
| | C.....25 | 59.33.3103 | 0.01 uF | 5%, 160V, PC | |
| | C.....26 | 59.36.5339 | 3.3 uF | 20%, 35V, TA | |
| | D.....1 | 50.04.0125 | 1N 4448 | | |
| | L.....1 | 62.02.1222 | 2.2 mH | 5% | |
| | L.....2 | 62.02.1222 | 2.2 mH | 5% | |
| | P.....1 | 54.01.0270 | 6-Pole | Pin-Strip | AMP |
| | P.....2 | 54.01.0271 | 10-Pole | Pin-Strip | AMP |
| | Q.....1 | 50.03.0430 | BC 109 C | NPN | |
| | Q.....2 | 50.03.0407 | BC 109 C | TO18, NPN | any |



| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | Q.....3 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....4 | 50.03.0407 | BC 109 C | TO18, NPN | |
| | Q.....5 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....6 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....7 | 50.03.0439 | BC 109 C | NPN | |
| | Q.....8 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....9 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....10 | 50.03.0407 | BC 109 C | TO18, NPN | |
| | Q.....11 | 50.03.0407 | BC 109 C | TO18, NPN | |
| | Q.....12 | 50.03.0436 | BC 107 B | NPN | |
| | R.....1 | 57.33.4224 | 220 kOhm | 5%, 0.25W, CF | |
| | R.....2 | 57.11.4331 | 330 Ohm | 5%, 0.25W, CF | |
| | R.....3 | 57.11.4154 | 150 kOhm | 5%, 0.25W, CF | |
| | R.....4 | 57.11.4682 | 6.8 kOhm | 5%, 0.25W, CF | |
| | R.....5 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....6 | 57.11.4107 | 1 Ohm | 5%, 0.25W, CF | |
| | R.....7 | 57.11.4391 | 390 Ohm | 5%, 0.25W, CF | |
| | R.....8 | 57.11.4688 | 68 Ohm | 5%, 0.25W, CF | |
| | R.....9 | 57.11.4562 | 5.6 kOhm | 5%, 0.25W, CF | |
| | R.....10 | 57.11.4470 | 47 Ohm | 5%, 0.25W, CF | |
| | R.....11 | 57.11.4123 | 12 kOhm | 5%, 0.25W, CF | |
| | R.....12 | 57.11.4184 | 180 kOhm | 5%, 0.25W, CF | |
| | R.....13 | 57.11.4154 | 150 kOhm | 5%, 0.25W, CF | |
| | R.....14 | 57.11.4680 | 68 Ohm | 5%, 0.25W, CF | |
| | R.....15 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....16 | 57.11.4123 | 12 kOhm | 5%, 0.25W, CF | |
| | R.....17 | 57.11.4472 | 4.7 kOhm | 5%, 0.25W, CF | |
| | R.....18 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R.....19 | 57.11.4153 | 15 kOhm | 5%, 0.25W, CF | |
| | R.....20 | 57.11.4182 | 1.8 kOhm | 5%, 0.25W, CF | |
| | R.....21 | 58.19.4203 | 20 kOhm | 20%, 0.15W, PCF, Tin | |
| | R.....22 | 57.11.4334 | 330 kOhm | 5%, 0.25W, CF | |
| | R.....23 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....24 | 57.11.4154 | 150 kOhm | 5%, 0.25W, CF | |
| | R.....25 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....26 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |

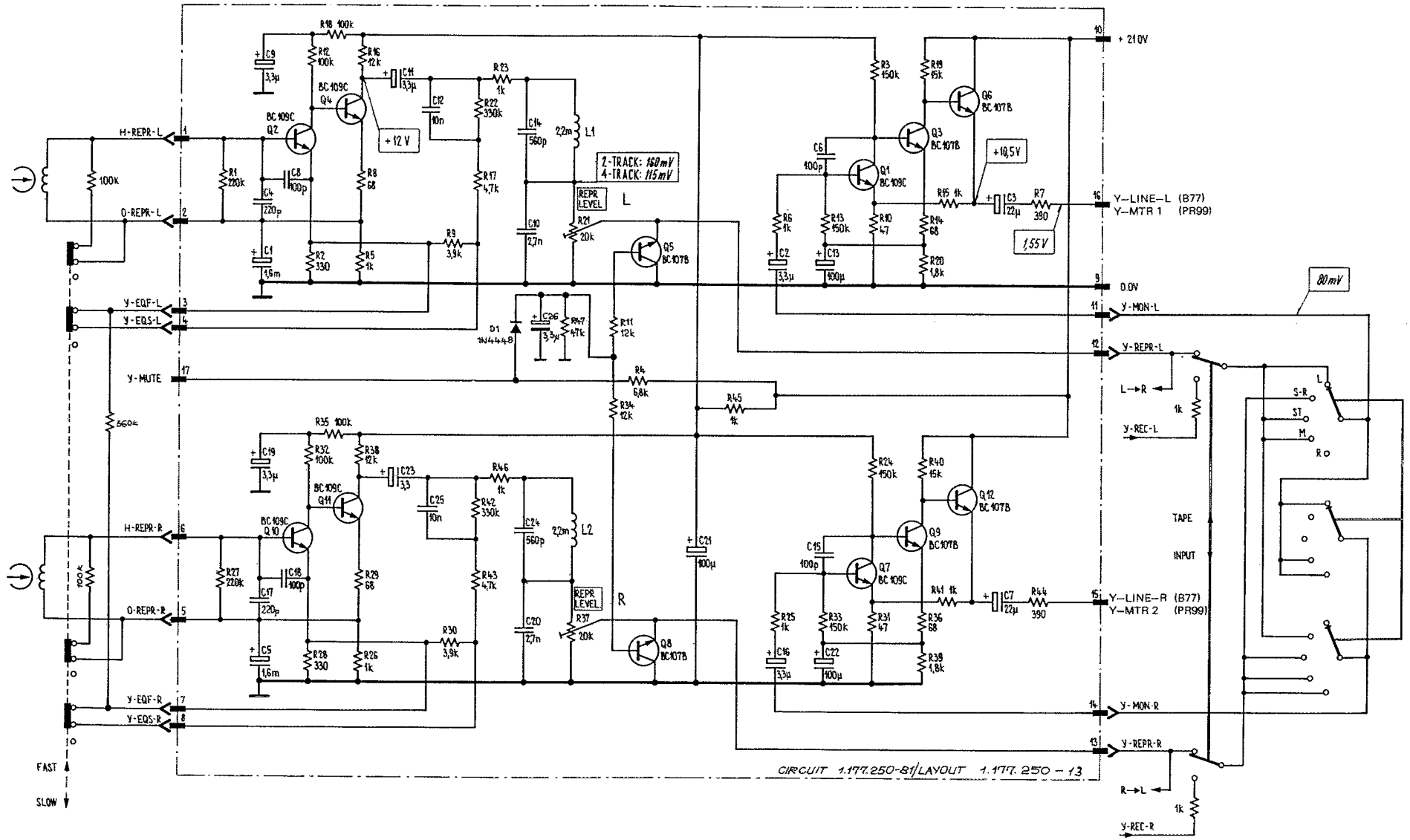


| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | R.....27 | 57.11.4224 | 220 kOhm | 5%, 0.25W, CF | |
| | R.....28 | 57.11.4331 | 330 Ohm | 5%, 0.25W, CF | |
| | R.....29 | 57.11.4680 | 68 Ohm | 5%, 0.25W, CF | |
| | R.....30 | 57.11.4152 | 1.5 kOhm | 5%, 0.25W, CF | |
| | R.....31 | 57.11.4470 | 47 Ohm | 5%, 0.25W, CF | |
| | R.....32 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R.....33 | 57.11.4154 | 150 kOhm | 5%, 0.25W, CF | |
| | R.....34 | 57.11.4123 | 12 kOhm | 5%, 0.25W, CF | |
| | R.....35 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R.....36 | 57.11.4680 | 68 Ohm | 5%, 0.25W, CF | |
| | R.....37 | 58.19.4203 | 20 kOhm | 20%, 0.15W, PCF, Tin | |
| | R.....38 | 57.11.4123 | 12 kOhm | 5%, 0.25W, CF | |
| | R.....39 | 57.11.4182 | 1.8 kOhm | 5%, 0.25W, CF | |
| | R.....40 | 57.11.4153 | 15 kOhm | 5%, 0.25W, CF | |
| | R.....41 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....42 | 57.11.4334 | 330 kOhm | 5%, 0.25W, CF | |
| | R.....43 | 57.11.4472 | 4.7 kOhm | 5%, 0.25W, CF | |
| | R.....44 | 57.11.4391 | 390 Ohm | 5%, 0.25W, CF | |
| | R.....45 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....46 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....47 | 57.11.4473 | 47 kOhm | 5%, 0.25W, CF | |

E=Electrolytic, Ce=Ceramic, PC=Polycarbonate, PETP=Polyester,
FK=Carbon Film, PCF=Pol.Carbon Film
*Manufacturer: Sig=Siemens, TI=Texas Instruments

ORIG 82/07/08

REPRODUCE AMPLIFIER PCB (NAB 3 3/4 - 7 1/2 ips) 1.177.250–81

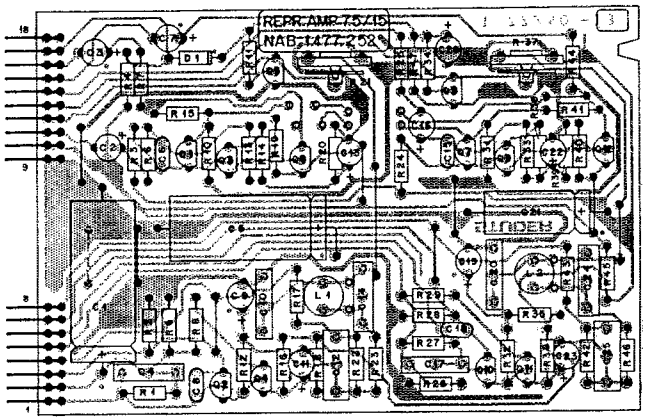


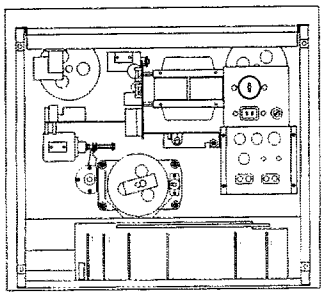

C26,D1,R47 ARE MISSING FOR VERSION 1.177.250–00

## REPRODUCE AMPLIFIER PCB (NAB 7 1/2 - 15 ips) 1.177.252–81

REPRO LEVEL LEFT

REPRO LEVEL RIGHT



| IND. | PCS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| C | 1 | 49.25.0162 | 1600 uF | 10% 3V ET | |
| C | 2 | 49.22.8479 | 4.7 uF | 10% 50V ET | |
| C | 3 | 49.22.6220 | 22 uF | 10% 40V ET | |
| C | 4 | 49.11.6271 | 220 pF | 5% 400V PC | |
| C | 5 | 49.25.0162 | 1600 uF | 10% 3V ET | |
| C | 6 | 49.12.0101 | 100 pF | 20% 400V Cer | |
| C | 7 | 49.22.6220 | 22 uF | 10% 40V ET | |
| C | 8 | 49.32.0101 | 100 pF | 20% 400V Cer | |
| C | 9 | 49.22.8479 | 4.7 uF | 10% 50V ET | |
| C | 10 | 49.49.8259 | 2700 pF | 10% 50V METP | |
| C | 11 | 49.22.8479 | 4.7 uF | 10% 50V ET | |
| C | 12 | 49.11.3103 | 0.01 uF | 5% 160V PC | |
| C | 13 | 49.22.3101 | 100 uF | 10% 10V ET | |
| C | 14 | 49.11.6561 | 560 pF | 5% 400V PC | |
| C | 15 | 49.32.0101 | 100 pF | 20% 500V Cer | |
| C | 16 | 49.22.8479 | 4.7 uF | 10% 50V ET | |
| C | 17 | 49.11.6221 | 220 pF | 5% 400V PC | |
| C | 18 | 49.32.0101 | 100 pF | 20% 500V Cer | |
| C | 19 | 49.22.8479 | 4.7 uF | 10% 50V ET | |
| C | 20 | 49.49.8259 | 2700 pF | 10% 400V METP | |
| C | 21 | 49.25.0191 | 100 uF | 10% 25V ET | |
| C | 22 | 49.22.3101 | 100 uF | 10% 10V ET | |
| C | 23 | 49.22.8479 | 4.7 uF | 10% 50V ET | |
| C | 24 | 49.11.6561 | 560 pF | 5% 400V PC | |
| C | 25 | 49.11.3101 | 0.01 uF | 5% 160V PC | |
| C | 26 | 49.28.5339 | 3x3 uF | 20% 35V TA | |
| D | 1 | 50.04.0125 | 1N4448 | | |
| L | 1 | 62.02.1222 | 2.2 mH | 5% | |
| L | 2 | 62.09.1227 | 2.2 mH | 5% | |
| P | 1 | 54.01.0270 | 9-Pole | Pin-Strip | AMP |
| P | 2 | 54.21.0271 | 10-Pole | Pin-Strip | AMP |
| Q | 1 | 50.03.0438 | BC 109 C | NPN | any |
| Q | 2 | 50.03.0407 | BC 109 C | TO18, NPN | |

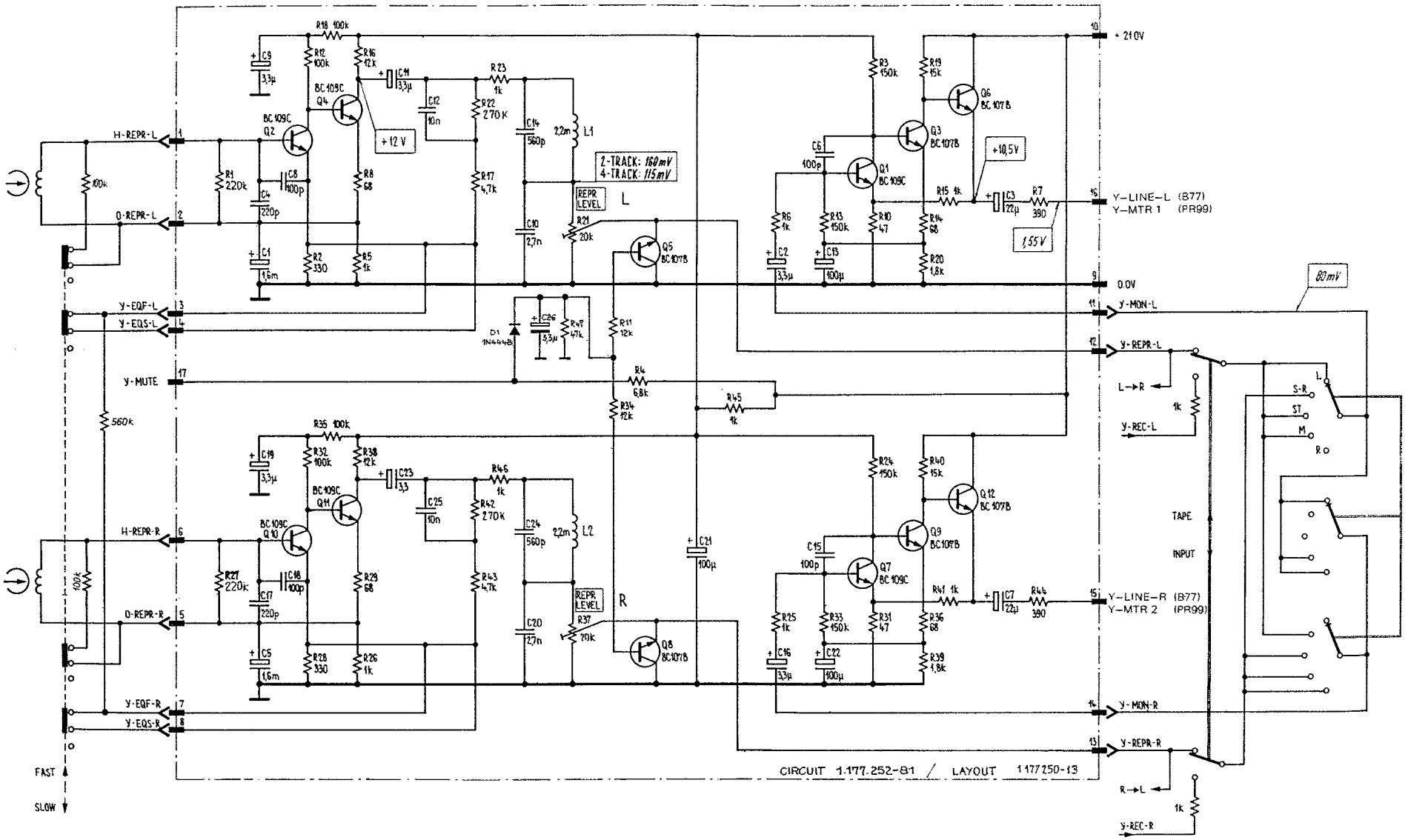
STUDER 82/11/30 Pk REPRODUCE AMPL. 7+5-15 NAB 1.177.252-81 PAGE 1

| IND. | PCS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| Q | 3 | 50.03.0436 | BC 107 B | NPN | |
| Q | 4 | 50.03.0407 | BC 109 C | TO18, NPN | |
| Q | 5 | 50.03.0436 | BC 107 B | NPN | |
| Q | 6 | 50.03.0436 | BC 107 B | NPN | |
| Q | 7 | 50.03.0438 | BC 109 C | NPN | |
| Q | 8 | 50.03.0436 | BC 107 B | NPN | |
| Q | 9 | 50.03.0436 | BC 107 B | NPN | |
| Q | 10 | 50.03.0407 | BC 109 C | TO18, NPN | |
| Q | 11 | 50.03.0407 | BC 109 C | TO18, NPN | |
| Q | 12 | 50.03.0436 | BC 107 B | NPN | |
| R | 1 | 57.11.4224 | 220 kOhm | 5% 0.25W CF | |
| R | 2 | 57.11.4331 | 330 Ohm | 5% 0.25W CF | |
| R | 3 | 57.11.4194 | 190 kOhm | 5% 0.25W CF | |
| R | 4 | 57.11.4682 | 6.8 kOhm | 5% 0.25W CF | |
| R | 5 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |
| R | 6 | 57.11.4102 | 1 Ohm | 5% 0.25W CF | |
| R | 7 | 57.11.4391 | 390 Ohm | 5% 0.25W CF | |
| R | 8 | 57.11.4680 | 68 Ohm | 5% 0.25W CF | |
| R | 9 | | | | |
| R | 10 | 57.11.4470 | 47 Ohm | 5% 0.25W CF | |
| R | 11 | 57.11.4123 | 12 kOhm | 5% 0.25W CF | |
| R | 12 | 57.11.4104 | 100 kOhm | 5% 0.25W CF | |
| R | 13 | 57.11.4154 | 150 kOhm | 5% 0.25W CF | |
| R | 14 | 57.11.4680 | 68 Ohm | 5% 0.25W CF | |
| R | 15 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |
| R | 16 | 57.11.4123 | 12 kOhm | 5% 0.25W CF | |
| R | 17 | 57.11.4472 | 4.7 kOhm | 5% 0.25W CF | |
| R | 18 | 57.11.4104 | 100 kOhm | 5% 0.25W CF | |
| R | 19 | 57.11.4153 | 15 kOhm | 5% 0.25W CF | |
| R | 20 | 57.11.4182 | 1.8 kOhm | 5% 0.25W CF | |
| R | 21 | 58.19.0203 | 20 kOhm | 20% 0.15W PCF, Tim | |
| R | 22 | 57.11.4274 | 270 kOhm | 5% 0.25W CF | |
| R | 23 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |
| R | 24 | 57.11.4154 | 150 kOhm | 5% 0.25W CF | |
| R | 25 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |
| R | 26 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |

STUDER 82/11/30 Pk REPRODUCE AMPL. 7+5-15 NAB 1.177.252-81 PAGE 2

| IND. | PCS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| R | 27 | 57.11.4224 | 220 kOhm | 5% 0.25W CF | |
| R | 28 | 57.11.4331 | 330 Ohm | 5% 0.25W CF | |
| R | 29 | 57.11.4680 | 68 Ohm | 5% 0.25W CF | |
| R | 30 | | | | |
| R | 31 | 57.11.4470 | 47 Ohm | 5% 0.25W CF | |
| R | 32 | 57.11.4104 | 100 kOhm | 5% 0.25W CF | |
| R | 33 | 57.11.4154 | 150 kOhm | 5% 0.25W CF | |
| R | 34 | 57.11.4123 | 12 kOhm | 5% 0.25W CF | |
| R | 35 | 57.11.4104 | 100 kOhm | 5% 0.25W CF | |
| R | 36 | 57.11.4680 | 68 Ohm | 5% 0.25W CF | |
| R | 37 | 58.19.0203 | 20 kOhm | 20% 0.15W PCF, Tim | |
| R | 38 | 57.11.4123 | 12 kOhm | 5% 0.25W CF | |
| R | 39 | 57.11.4182 | 1.8 kOhm | 5% 0.25W CF | |
| R | 40 | 57.11.4153 | 15 kOhm | 5% 0.25W CF | |
| R | 41 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |
| R | 42 | 57.11.4274 | 270 kOhm | 5% 0.25W CF | |
| R | 43 | 57.11.4472 | 4.7 kOhm | 5% 0.25W CF | |
| R | 44 | 57.11.4391 | 390 Ohm | 5% 0.25W CF | |
| R | 45 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |
| R | 46 | 57.11.4102 | 1 kOhm | 5% 0.25W CF | |
| R | 47 | 57.11.4473 | 47 kOhm | 5% 0.25W CF | |

REPRODUCE AMPLIFIER PCB (NAB 7 1/2 - 15 ips) 1.177.252–81

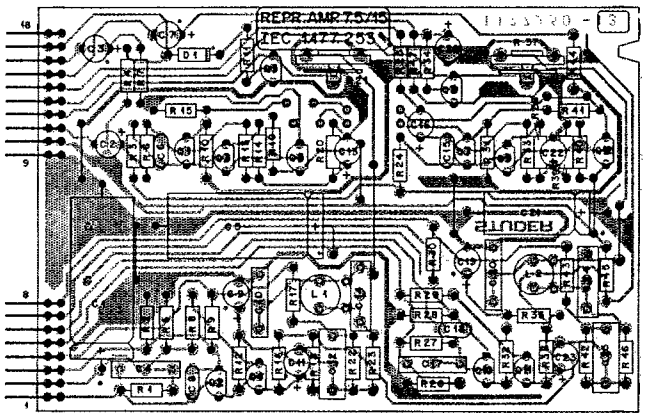


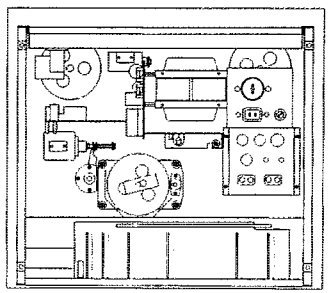

C26, D1, R47 ARE MESSING FOR VERSION 1.177.252–00

## EPRODUCE AMPLIFIER PCB (IEC 7 1/2 - 15 ips) 1.177.253-81

REPRO LEVEL LEFT

REPRO LEVEL RIGHT



| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | C.....1 | 56.24.0162 | 1600 uF | 10%  40V  E1 | |
| | C.....2 | 55.22.8479 | 4.7 uF | 10%  50V  E1 | |
| | C.....3 | 59.22.8220 | 22 uF | 10%  40V  E1 | |
| | C.....4 | 59.13.8221 | 220 pF | 5%  630V  PC | |
| | C.....5 | 59.24.0162 | 1600 uF | 10%  35V  E1 | |
| | C.....6 | 59.12.0103 | 100 pF | 20%  500V  Cer | |
| | C.....7 | 59.22.8220 | 22 uF | 10%  40V  E1 | |
| | C.....8 | 59.12.0101 | 100 pF | 20%  500V  Cer | |
| | C.....9 | 59.22.8479 | 4.7 uF | 10%  50V  E1 | |
| | C.....10 | 59.99.0259 | 2700 pF | 10%  50V  PETP | |
| | C.....11 | 59.22.8479 | 4.7 uF | 10%  50V  E1 | |
| | C.....12 | 59.11.3101 | 0.01 uF | 5%  160V  PC | |
| | C.....13 | 59.22.3101 | 100 uF | 10%  35V  EI | |
| | C.....14 | 59.11.8561 | 560 pF | 5%  400V  PC | |
| | C.....15 | 59.12.0101 | 100 pF | 20%  500V  Cer | |
| | C.....16 | 59.22.8479 | 4.7 uF | 10%  50V  E1 | |
| | C.....17 | 59.13.8271 | 270 pF | 5%  400V  PC | |
| | C.....18 | 59.12.0101 | 100 pF | 20%  500V  Cer | |
| | C.....19 | 59.22.8479 | 4.7 uF | 10%  50V  E1 | |
| | C.....20 | 59.99.0259 | 2700 pF | 10%  400V  PETP | |
| | C.....21 | 59.24.4101 | 100 uF | 10%  25V  E1 | |
| | C.....22 | 59.22.3101 | 100 uF | 10%  10V  E1 | |
| | C.....23 | 59.22.8479 | 4.7 uF | 10%  50V  E1 | |
| | C.....24 | 59.11.8561 | 560 pF | 5%  400V  PC | |
| | C.....25 | 59.11.3101 | 0.01 uF | 5%  160V  PC | |
| | C.....26 | 59.16.3539 | 3.3 uF | 20%  35V  TA | |
| | D.....1 | 50.04.0129 | 1N4448 | | JPY |
| | L.....1 | 64.02.1222 | 2x7 mH | 5% | |
| | L.....2 | 64.02.1222 | 2x7 mH | 5% | |
| | P.....1 | 54.01.0730 | 8-Pole | Pin-Strip | AMP |
| | P.....2 | 54.01.0771 | 10-Pole | Pin-Strip | AMP |
| | Q.....1 | 50.03.0439 | BC 109 C | NPN | |
| | Q.....2 | 50.03.0407 | BC 109 C | TO18, NPN | JPY |

STUDER (01) 82/12/14 Hu REPRODUCE AMPL. 7.5-15 CCIR 1.177.253.81 PAGE 1

| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | Q.....3 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....4 | 50.03.0407 | BC 109 C | TO18, NPN | |
| | Q.....5 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....6 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....7 | 50.03.0439 | BC 109 C | NPN | |
| | Q.....8 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....9 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....10 | 50.03.0407 | BC 109 C | TO18, NPN | |
| | Q.....11 | 50.03.0407 | BC 109 C | TO18, NPN | |
| | Q.....12 | 50.03.0436 | BC 107 B | NPN | |
| | R.....1 | 57.41.4563 | 56 kOhm | 5%  0.25W  CF | |
| | R.....2 | 57.41.4331 | 330 Ohm | 5%  0.25W  CF | |
| | R.....3 | 57.41.4154 | 150 kOhm | 5%  0.25W  CF | |
| | R.....4 | 57.41.4682 | 6.8 kOhm | 5%  0.25W  CF | |
| | R.....5 | 57.41.4102 | 1 kOhm | 5%  0.25W  CF | |
| | R.....6 | 57.41.4102 | 1 kOhm | 5%  0.25W  CF | |
| | R.....7 | 57.41.4391 | 390 Ohm | 5%  0.25W  CF | |
| | R.....8 | 57.41.4680 | 68 Ohm | 5%  0.25W  CF | |
| | R.....9 | 57.41.4272 | 2.7 kOhm | 5%  0.25W  CF | |
| | R.....10 | 57.41.4470 | 47 Ohm | 5%  0.25W  CF | |
| | R.....11 | 57.41.4123 | 12 kOhm | 5%  0.25W  CF | |
| | R.....12 | 57.41.4104 | 100 kOhm | 5%  0.25W  CF | |
| | R.....13 | 57.41.4155 | 150 kOhm | 5%  0.25W  CF | |
| | R.....14 | 57.41.4680 | 68 Ohm | 5%  0.25W  CF | |
| | R.....15 | 57.41.4102 | 1 kOhm | 5%  0.25W  CF | |
| | R.....16 | 57.13.4123 | 12 kOhm | 1%  0.25W  CF | |
| | R.....17 | 57.41.4392 | 3.9 kOhm | 5%  0.25W  CF | |
| | R.....18 | 57.41.4104 | 100 kOhm | 5%  0.25W  CF | |
| | R.....19 | 57.41.4153 | 15 kOhm | 5%  0.25W  CF | |
| | R.....20 | 57.41.4182 | 1.8 kOhm | 5%  0.25W  CF | |
| | R.....21 | 58.19.0203 | 20 kOhm | 20%  0.13W  PCF, lin | |
| (03) | R.....22 | 57.41.4474 | 470 kOhm | 5%  0.25W  CF | |
| (01) | R.....22 | 57.41.4684 | 680 kOhm | 5%  0.25W  CF | |
| | R.....23 | 57.41.4102 | 1 kOhm | 5%  0.25W  CF | |
| | R.....24 | 57.41.4154 | 150 kOhm | 5%  0.25W  CF | |
| | R.....25 | 57.41.4102 | 1 kOhm | 5%  0.25W  CF | |

STUDER (01) 82/12/14 Hu REPRODUCE AMPL. 7.5-15 CCIR 1.177.253.81 PAGE 2

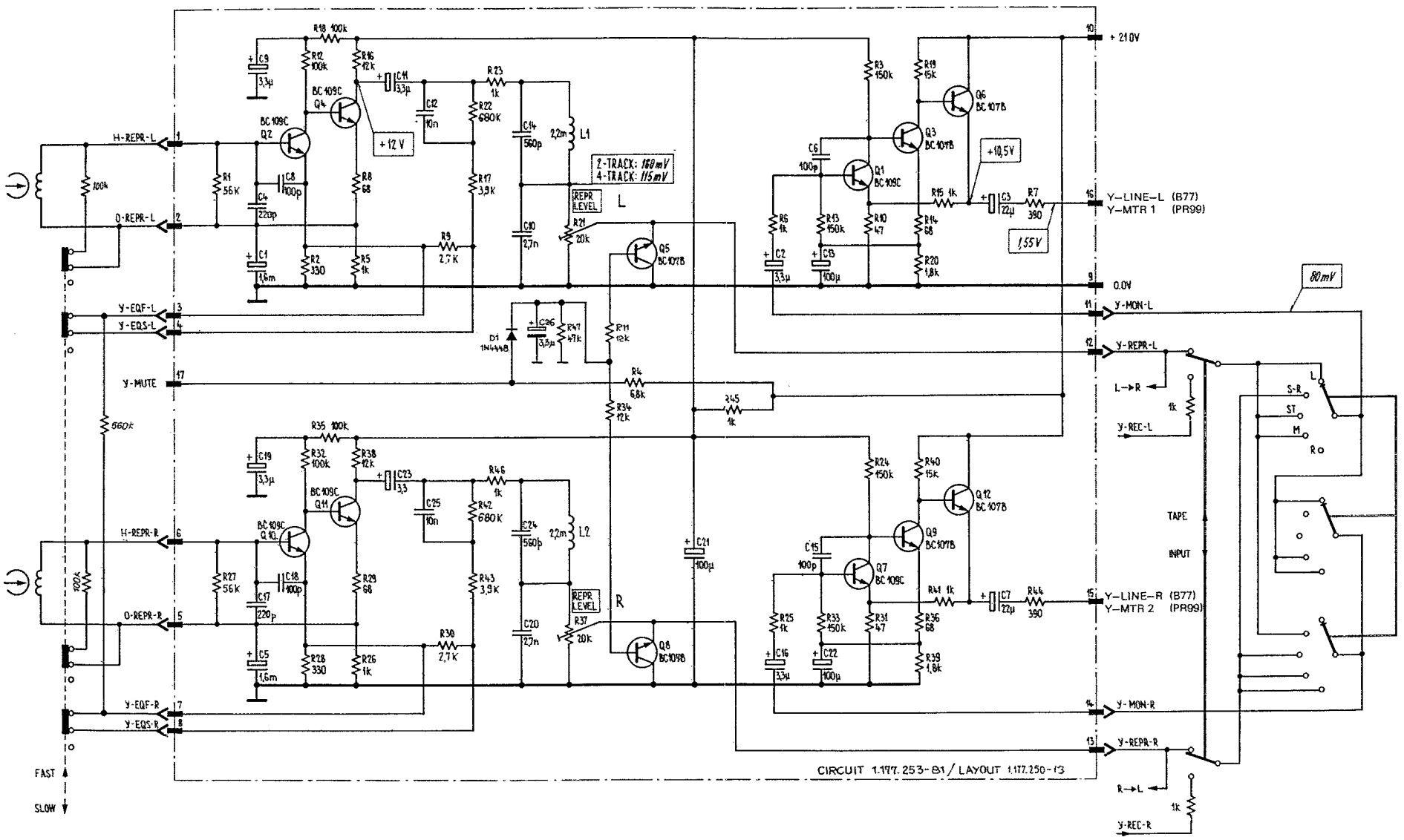
| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | R.....26 | 57.41.4102 | 1 kOhm | 5%  0.25W  CF | |
| | R.....27 | 57.41.4563 | 56 kOhm | 5%  0.25W  CF | |
| | R.....28 | 57.41.4331 | 330 Ohm | 5%  0.25W  CF | |
| | R.....29 | 57.41.4680 | 68 Ohm | 5%  0.25W  CF | |
| | R.....30 | 57.41.4272 | 2.7 kOhm | 5%  0.25W  CF | |
| | R.....31 | 57.41.4470 | 47 Ohm | 5%  0.25W  CF | |
| | R.....32 | 57.41.4104 | 100 kOhm | 5%  0.25W  CF | |
| | R.....33 | 57.41.4154 | 150 kOhm | 5%  0.25W  CF | |
| | R.....34 | 57.41.4123 | 12 kOhm | 5%  0.25W  CF | |
| | R.....35 | 57.41.4104 | 100 kOhm | 5%  0.25W  CF | |
| | R.....36 | 57.41.4680 | 68 Ohm | 5%  0.25W  CF | |
| | R.....37 | 58.19.0203 | 20 kOhm | 20%  0.13W  PCF, lin | |
| | R.....38 | 57.41.4123 | 12 kOhm | 5%  0.25W  CF | |
| | R.....39 | 57.41.4182 | 1.8 kOhm | 5%  0.25W  CF | |
| | R.....40 | 57.41.4153 | 15 kOhm | 5%  0.25W  CF | |
| | R.....41 | 57.41.4102 | 1 kOhm | 5%  0.25W  CF | |
| (09) | R.....42 | 57.41.4474 | 470 kOhm | 5%  0.25W  CF | |
| (01) | R.....42 | 57.41.4684 | 680 kOhm | 5%  0.25W  CF | |
| | R.....43 | 57.41.4392 | 3.9 kOhm | 5%  0.25W  CF | |
| | R.....44 | 57.41.4391 | 390 Ohm | 5%  0.25W  CF | |
| | R.....45 | 57.41.4102 | 1 kOhm | 5%  0.25W  CF | |
| | R.....46 | 57.41.4102 | 1 kOhm | 5%  0.25W  CF | |
| | R.....47 | 57.11.4473 | 47 kOhm | 5%  0.25W  CF | |

(1)=Tantalum (2)=Ceramic (3)=Polycarbonate (4)=Polypropylene (5)=Polyester (6)=Mineral

SPEC 82/07/08 (01) 82/12/14

STUDER (01) 82/12/14 Hu REPRODUCE AMPL. 7.5-15 CCIR 1.177.253.81 PAGE 3

REPRODUCE AMPLIFIER PCB (IEC 7 1/2 - 15 ips) 1.177.253–81



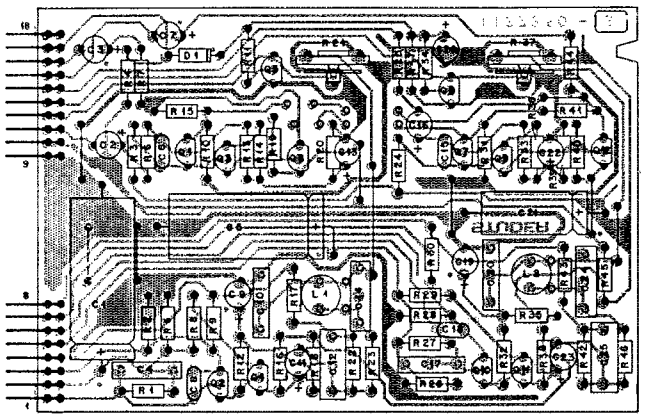

C26,D1,R47 ARE MISSING FOR VERSION 1.177.253–00

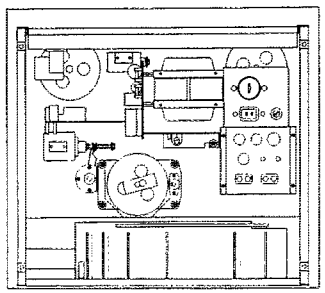
SEE SERVICE INFORMATION
63.10 : R17

## REPRODUCE AMPLIFIER PCB (NAB 1 7/8 - 3 3/4 ips) 1.177.257–81

REPRO LEVEL LEFT

REPRO LEVEL RIGHT





| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | C.....1 | 59.25.0162 | 1600 uF | 10%, 16V, El | |
| | C.....2 | 59.22.8479 | 4.7 uF | 10%, 40V, El | |
| | C.....3 | 59.22.8220 | 22 uF | 10%, 40V, El | |
| | C.....4 | 59.11.8221 | 220 pF | 5%, 400V, PC | |
| | C.....5 | 59.25.0162 | 1600 uF | 10%, 16V, El | |
| | C.....6 | 59.32.0101 | 100 pF | 20%, 500V, Cer | |
| | C.....7 | 59.22.8220 | 22 uF | 10%, 40V, El | |
| | C.....8 | 59.32.0101 | 100 pF | 20%, 500V, Cer | |
| | C.....9 | 59.22.8479 | 4.7 uF | 10%, 40V, El | |
| | C.....10 | 59.99.0259 | 2700 pF | 10%, 400V, PETP | |
| | C.....11 | 59.22.8479 | 4.7 uF | 10%, 40V, El | |
| | C.....12 | 59.31.3103 | 0.01 uF | 5%, 160V, PC | |
| | C.....13 | 59.22.3101 | 100 uF | 10%, 10V, El | |
| | C.....14 | 59.11.8761 | 560 pF | 5%, 400V, PC | |
| | C.....15 | 59.32.0101 | 100 pF | 20%, 500V, Cer | |
| | C.....16 | 59.22.8479 | 4.7 uF | 10%, 40V, El | |
| | C.....17 | 59.11.8221 | 220 pF | 5%, 400V, PC | |
| | C.....18 | 59.32.0101 | 100 pF | 20%, 500V, Cer | |
| | C.....19 | 59.22.8479 | 4.7 uF | 10%, 40V, El | |
| | C.....20 | 59.99.0259 | 2700 pF | 10%, 400V, PETP | |
| | C.....21 | 59.25.4101 | 100 uF | 10%, 25V, El | |
| | C.....22 | 59.22.3101 | 100 uF | 10%, 10V, El | |
| | C.....23 | 59.22.8479 | 4.7 uF | 10%, 40V, El | |
| | C.....24 | 59.11.8761 | 560 pF | 5%, 400V, PC | |
| | C.....25 | 59.11.3301 | 0.01 uF | 5%, 160V, PC | |
| | C.....26 | 59.76.5339 | 3.3 uF | 20%, 35V, TA | |
| | D.....1 | 50.04.0125 | IN 4448 | | |
| | L.....1 | 62.02.1222 | 2.2 mH | 5% | |
| | L.....2 | 62.02.1222 | 2.2 mH | 5% | |
| | P.....1 | 54.01.0270 | 8-Pole | Pin-Strip | AMP |
| | P.....2 | 54.01.0271 | 10-Pole | Pin-Strip | AMP |
| | Q.....1 | 50.03.0439 | BC 109 C | NPN | |
| | Q.....2 | 50.03.0407 | BC 109 C | TO18, NPN | any |



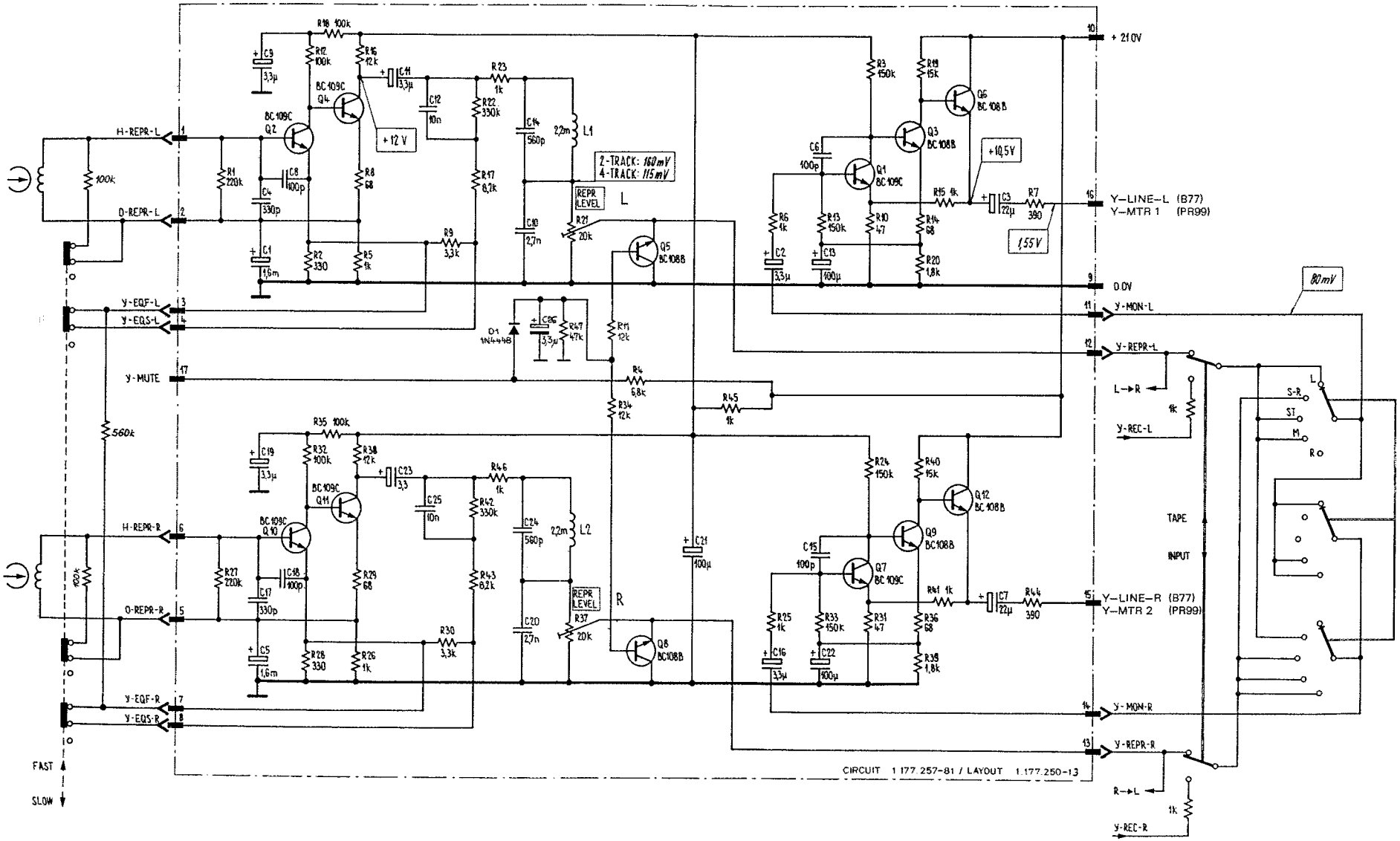
| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | Q.....3 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....4 | 50.03.0407 | BC 109 C | TO18, NPN | |
| | Q.....5 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....6 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....7 | 50.03.0439 | BC 109 C | NPN | |
| | Q.....8 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....9 | 50.03.0436 | BC 107 B | NPN | |
| | Q.....10 | 50.03.0407 | BC 109 C | TO18, NPN | |
| | Q.....11 | 50.03.0407 | BC 109 C | TO18, NPN | |
| | Q.....12 | 50.03.0436 | BC 107 B | NPN | |
| | R.....1 | 57.11.4224 | 220 kOhm | 5%, 0.25W, CF | |
| | R.....2 | 57.11.4331 | 330 Ohm | 5%, 0.25W, CF | |
| | R.....3 | 57.11.4154 | 150 kOhm | 5%, 0.25W, CF | |
| | R.....4 | 57.11.4682 | 6.8 kOhm | 5%, 0.25W, CF | |
| | R.....5 | 57.11.4103 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....6 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....7 | 57.11.4391 | 390 Ohm | 5%, 0.25W, CF | |
| | R.....8 | 57.11.4680 | 68 Ohm | 5%, 0.25W, CF | |
| | R.....9 | 57.11.4332 | 3.3 kOhm | 5%, 0.25W, CF | |
| | R.....10 | 57.11.4470 | 47 Ohm | 5%, 0.25W, CF | |
| | R.....11 | 57.11.4123 | 12 kOhm | 5%, 0.25W, CF | |
| | R.....12 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R.....13 | 57.11.4154 | 150 kOhm | 5%, 0.25W, CF | |
| | R.....14 | 57.11.4680 | 68 Ohm | 5%, 0.25W, CF | |
| | R.....15 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....16 | 57.11.4123 | 12 kOhm | 5%, 0.25W, CF | |
| | R.....17 | 57.11.4822 | 8.2 kOhm | 5%, 0.25W, CF | |
| | R.....18 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R.....19 | 57.11.4153 | 15 kOhm | 5%, 0.25W, CF | |
| | R.....20 | 57.11.4182 | 1.8 kOhm | 5%, 0.25W, CF | |
| | R.....21 | 58.19.0203 | 20 kOhm | 20%, 0.15W, PCF, Tin | |
| | R.....22 | 57.11.4334 | 330 kOhm | 5%, 0.25W, CF | |
| | R.....23 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....24 | 57.11.4154 | 150 kOhm | 5%, 0.25W, CF | |
| | R.....25 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....26 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |



| IND. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | R.....27 | 57.11.4224 | 220 kOhm | 5%, 0.25W, CF | |
| | R.....28 | 57.11.4331 | 330 Ohm | 5%, 0.25W, CF | |
| | R.....29 | 57.11.4680 | 68 Ohm | 5%, 0.25W, CF | |
| | R.....30 | 57.11.4332 | 3.3 kOhm | 5%, 0.25W, CF | |
| | R.....31 | 57.11.4470 | 47 Ohm | 5%, 0.25W, CF | |
| | R.....32 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R.....33 | 57.11.4154 | 150 kOhm | 5%, 0.25W, CF | |
| | R.....34 | 57.11.4123 | 12 kOhm | 5%, 0.25W, CF | |
| | R.....35 | 57.11.4104 | 100 kOhm | 5%, 0.25W, CF | |
| | R.....36 | 57.11.4680 | 68 Ohm | 5%, 0.25W, CF | |
| | R.....37 | 58.19.0203 | 20 kOhm | 20%, 0.15W, PCF, Tin | |
| | R.....38 | 57.11.4123 | 12 kOhm | 5%, 0.25W, CF | |
| | R.....39 | 57.11.4182 | 1.8 kOhm | 5%, 0.25W, CF | |
| | R.....40 | 57.11.4153 | 15 kOhm | 5%, 0.25W, CF | |
| | R.....41 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....42 | 57.11.4334 | 330 kOhm | 5%, 0.25W, CF | |
| | R.....43 | 57.11.4822 | 8.2 kOhm | 5%, 0.25W, CF | |
| | R.....44 | 57.11.4391 | 390 Ohm | 5%, 0.25W, CF | |
| | R.....45 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....46 | 57.11.4102 | 1 kOhm | 5%, 0.25W, CF | |
| | R.....47 | 57.11.4473 | 47 kOhm | 5%, 0.25W, CF | |

CF=Film resistor, Carbon film, PC=Precision wirewound, PETP=Polyester
CC=Carbon film, MF=Metal film, C=Carbon film
PC=Potentiometer, T=Trimmer, TF=Trimmer, TC=Trimmer

REPRODUCE AMPLIFIER PCB (NAB 1 7/8 - 3 3/4 ips) 1.177.257–81

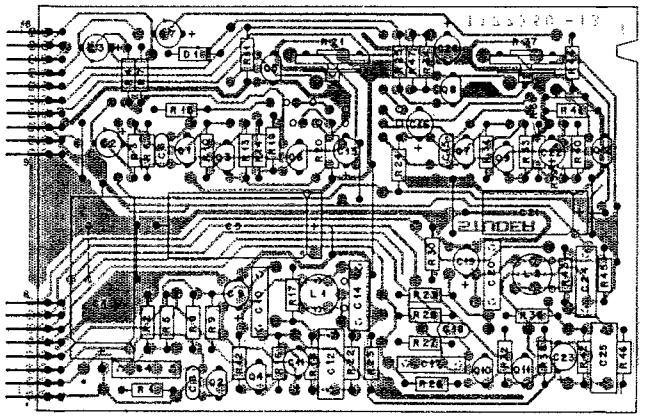


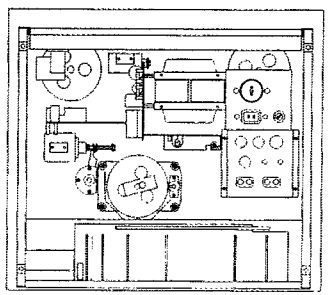

C26,D1,R47 ARE MISSING FOR VERSION 1.177.257–00

## EPRODUCE AMPLIFIER PCB (NAB 15/15 - 1 7/8 ips) 1.177.258-00

REPRO LEVEL LEFT

REPRO LEVEL RIGHT





| Indx. | Pos.No. | Part No. | Value | Specifications / Equivalent | Manuf. |
|---|---|---|---|---|---|
| | C-----1 | 59-74-3467 | 3600 uF | 10% 75V 85 | |
| | C-----2 | 59-72-8579 | 4.7 uF | 10% 50V 85 | |
| | C-----3 | 59-72-8201 | 22 uF | 10% 40V 85 | |
| | C-----4 | 58-11-4821 | 820 pF | 5% 400V PC | |
| | C-----5 | 59-74-3467 | 3600 uF | 10% 75V 85 | |
| | C-----6 | 59-72-8101 | 100 uF | 20% 50V Cer | |
| | C-----7 | 59-77-5720 | 22 uF | 10% 40V 85 | |
| | C-----8 | 58-43-0134 | 330 pF | 20% 400V Cer | |
| | C-----9 | 59-72-8479 | 4.7 uF | 10% 50V 85 | |
| | C-----10 | 59-99-0259 | 2700 pF | 10% 400V PcTP | |
| | C-----11 | 59-72-8479 | 4.7 uF | 10% 50V 85 | |
| | C-----12 | 59-11-3123 | 9.91 nF | 5% 160V PC | |
| | C-----13 | 59-72-8101 | 100 uF | 20% 10V 85 | |
| | C-----14 | 58-11-6581 | 560 pF | 5% 400V PC | |
| | C-----15 | 59-72-8101 | 100 uF | 20% 10V Cer | |
| | C-----16 | 59-72-8479 | 4.7 uF | 10% 50V 85 | |
| | C-----17 | 58-11-5821 | 820 pF | 5% 400V PC | |
| | C-----18 | 58-74-0133 | 100 pF | 20% 400V Cer | |
| | C-----19 | 59-72-8479 | 4.7 uF | 10% 50V 85 | |
| | C-----20 | 59-99-0259 | 2700 pF | 10% 400V PcTP | |
| | C-----21 | 59-72-8101 | 100 uF | 20% 25V 85 | |
| | C-----22 | 59-72-8101 | 100 uF | 20% 10V 85 | |
| | C-----23 | 59-72-8479 | 4.7 uF | 10% 50V 85 | |
| | C-----24 | 58-11-6561 | 560 pF | 5% 400V PC | |
| | C-----25 | 58-11-3161 | 0.01 uF | 5% 160V PC | |
| | C-----26 | 58-36-6539 | 1.2 uF | 20% 25V TA | |
| D811 | D-----1 | 50-04-0121 | 1N4448 | any | |
| | L-----1 | 62-02-1222 | 2.2 mH | 5% | |
| | L-----2 | 62-02-1222 | 2.2 mH | 5% | |
| | P-----1 | 54-01-0270 | 6-Pole | Pin-Strip | AMP |
| | P-----2 | 54-31-0271 | 10-Pole | Pin-Strip | AMP |
| | Q-----1 | 50-03-0439 | BC 109 C | NPN | |
| | Q-----2 | 50-03-0457 | BC 109 C | TO18, NPN | any |



| Indx. | Pos.No. | Part No. | Value | Specifications / Equivalent | Manuf. |
|---|---|---|---|---|---|
| | Q-----4 | 50-03-0438 | BC 107 B | NPN | |
| | Q-----5 | 50-03-0407 | BC 109 C | TO18, NPN | |
| | Q-----6 | 50-03-0436 | BC 107 A | NPN | |
| | Q-----7 | 50-03-0438 | BC 107 B | NPN | |
| | Q-----8 | 50-03-0439 | BC 109 C | NPN | |
| | Q-----9 | 50-03-0435 | BC 107 A | NPN | |
| | Q-----10 | 50-03-0436 | BC 107 A | NPN | |
| | Q-----11 | 50-03-0407 | BC 109 C | TO18, NPN | |
| | Q-----12 | 50-03-0457 | BC 109 C | TO18, NPN | |
| | R-----1 | 57-11-4224 | 220 kOhm | 5% 0.25W CF | |
| | R-----2 | 57-11-4331 | 330 Ohm | 5% 0.25W CF | |
| | R-----3 | 57-11-4154 | 150 kOhm | 5% 0.25W CF | |
| | R-----5 | 57-11-4682 | 6.8 kOhm | 5% 0.25W CF | |
| | R-----6 | 57-11-4392 | 3 kOhm | 5% 0.25W CF | |
| | R-----7 | 57-11-4497 | 3 kOhm | 5% 0.25W CF | |
| | R-----8 | 57-11-4391 | 390 Ohm | 5% 0.25W CF | |
| | R-----9 | 57-11-4649 | 68 Ohm | 5% 0.25W CF | |
| | R-----10 | 57-11-4103 | 10 kOhm | 5% 0.25W CF | |
| | R-----11 | 57-11-4123 | 12 kOhm | 5% 0.25W CF | |
| | R-----12 | 57-11-4104 | 100 kOhm | 5% 0.25W CF | |
| | R-----13 | 57-11-4154 | 150 kOhm | 5% 0.25W CF | |
| | R-----14 | 57-11-4649 | 68 Ohm | 5% 0.25W CF | |
| | R-----15 | 57-11-4302 | 3 kOhm | 5% 0.25W CF | |
| | R-----16 | 57-11-4123 | 12 kOhm | 5% 0.25W CF | |
| | R-----17 | 57-11-4123 | 12 kOhm | 5% 0.25W CF | |
| | R-----18 | 57-11-4104 | 100 kOhm | 5% 0.25W CF | |
| | R-----19 | 57-11-4153 | 15 kOhm | 5% 0.25W CF | |
| | R-----20 | 57-11-4687 | 1.8 kOhm | 5% 0.25W CF | |
| | R-----21 | 58-19-0203 | 20 kOhm | 20% 0.1W PCF+ Trim | |
| | R-----22 | 57-11-4334 | 330 kOhm | 5% 0.25W CF | |
| | R-----23 | 57-11-4302 | 3 kOhm | 5% 0.25W CF | |
| | R-----24 | 57-11-4154 | 150 kOhm | 5% 0.25W CF | |
| | R-----25 | 57-11-4102 | 1 kOhm | 5% 0.25W CF | |
| | R-----26 | 57-11-4152 | 1.5 kOhm | 5% 0.25W CF | |

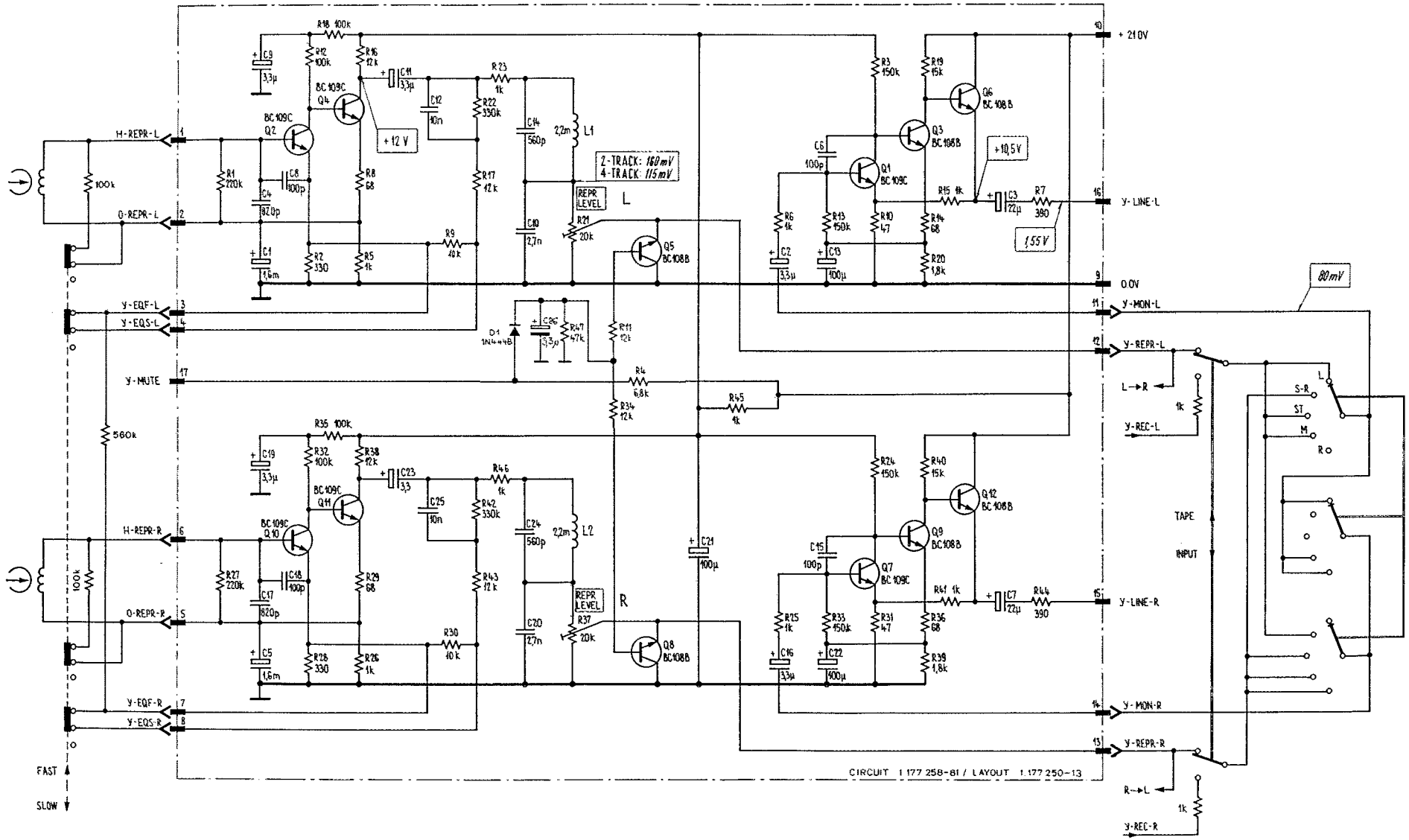


| Indx. | Pos.No. | Part No. | Value | Specifications / Equivalent | Manuf. |
|---|---|---|---|---|---|
| | R-----27 | 57-11-4224 | 220 kOhm | 5% 0.25W CF | |
| | R-----28 | 57-11-4331 | 330 Ohm | 5% 0.25W CF | |
| | R-----29 | 57-11-4649 | 68 Ohm | 5% 0.25W CF | |
| | R-----30 | 57-11-4103 | 10 kOhm | 5% 0.25W CF | |
| | R-----31 | 57-11-4479 | 47 Ohm | 5% 0.25W CF | |
| | R-----32 | 57-11-4104 | 100 kOhm | 5% 0.25W CF | |
| | R-----33 | 57-11-4154 | 150 kOhm | 5% 0.25W CF | |
| | R-----34 | 57-11-4123 | 12 kOhm | 5% 0.25W CF | |
| | R-----35 | 57-11-4104 | 100 kOhm | 5% 0.25W CF | |
| | R-----36 | 57-11-4689 | 68 kOhm | 5% 0.25W CF | |
| | R-----37 | 58-19-0203 | 20 kOhm | 20% 0.1W PCF+ Trim | |
| | R-----38 | 57-11-4123 | 12 kOhm | 5% 0.25W CF | |
| | R-----39 | 57-11-4182 | 1.8 kOhm | 5% 0.25W CF | |
| | R-----40 | 57-11-4153 | 15 kOhm | 5% 0.25W CF | |
| | R-----41 | 57-11-4102 | 1 kOhm | 5% 0.25W CF | |
| | R-----42 | 57-11-4334 | 330 kOhm | 5% 0.25W CF | |
| | R-----43 | 57-11-4123 | 12 kOhm | 5% 0.25W CF | |
| | R-----44 | 57-11-4391 | 390 Ohm | 5% 0.25W CF | |
| | R-----45 | 57-11-4102 | 1 kOhm | 5% 0.25W CF | |
| | R-----46 | 57-11-4102 | 1 kOhm | 5% 0.25W CF | |
| D811 | R-----47 | 57-11-4479 | 47 kOhm | 5% 0.25W CF | |

El=Electrolytic Condensers PC Polycarbonate MKT=Polyester
CF=Carbon Film MFF=Polystyrene Film
Manufacturer: Sa=Siemens Te=Texas Instruments

DATE 29/05/25 (CH) 81/12/21

REPRODUCE AMPLIFIER PCB (NAB 15/16 - 1 7/8 ips) 1.177.258-00

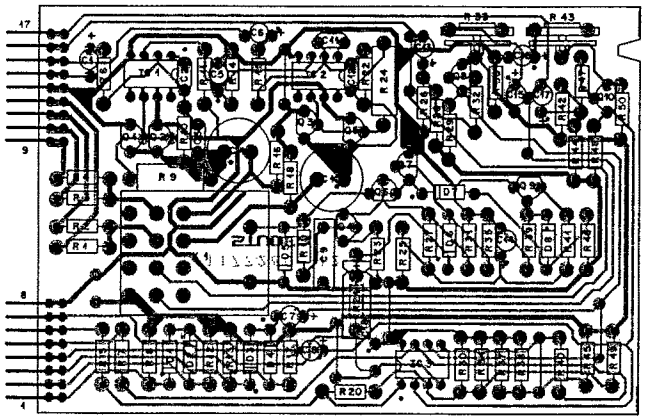


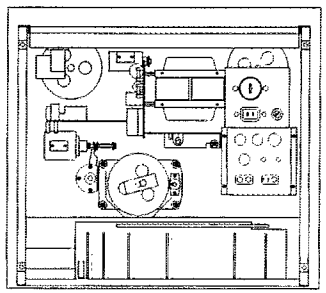

21.12.81

## ONITOR AMPLIFIER PCB 1.177.260

METER CAL LEFT

METER CAL RIGHT





| INC. | PCS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| C | 1 | 59.22.8470 | 4.7 uF | 10%, 50V, El | |
| C | 2 | 59.32.4101 | 100 pF | 20%, 400V, Cer | |
| C | 3 | 59.32.1196 | 33 pF | 10%, 400V, Cer | |
| C | 4 | 59.22.4101 | 100 uF | 10%, 25V, El | |
| C | 5 | 59.22.4100 | 10 uF | 10%, 35V, El | |
| C | 6 | 59.22.8479 | 4.7 uF | 10%, 50V, El | |
| C | 7 | 59.22.8470 | 4.7 uF | 10%, 50V, El | |
| C | 8 | 59.22.8479 | 4.7 uF | 10%, 50V, El | |
| C | 9 | 59.31.1104 | 0.1 uF | 20%, 100V, MPETP | |
| C | 10 | 59.22.4101 | 100 uF | 20%, 25V, El | |
| C | 11 | 59.32.0101 | 100 pF | 20%, 500V, Cer | |
| C | 12 | 59.32.1196 | 33 pF | 10%, 500V, Cer | |
| C | 13 | 59.22.8479 | 4.7 uF | 10%, 50V, El | |
| C | 14 | 59.22.4100 | 10 uF | 10%, 35V, El | |
| C | 15 | 59.22.4100 | 10 uF | 10%, 35V, El | |
| C | 16 | 59.22.8106 | 10 uF | 10%, 35V, El | |
| C | 17 | 59.22.8479 | 4.7 uF | 10%, 50V, El | |
| C | 18 | 59.25.9230 | 22 uF | 10%, 40V, El | |
| D | 1 | 50.04.0953 | AA 116 | GE | |
| D | 2 | 50.04.0953 | AA 116 | GE | |
| D | 3 | 50.04.0953 | AA 116 | GE | |
| D | 4 | 50.04.0953 | AA 116 | GE | |
| D | 5 | 50.04.0123 | 1 N 4448 | any | |
| D | 6 | 50.04.1309 | Z 20 V | 5% 400mW | |
| D | 7 | 50.04.0123 | 1 N 4448 | any | |
| D | 8 | 50.04.0123 | 1 N 4448 | any | |
| IC | 1 | 50.05.0257 | LM 301 | | TI:N |
| IC | 2 | 50.05.0257 | LM 301 | | TI:N |
| IC | 3 | 50.05.0245 | MC 4558 | | TI:M |
| K | 1 | 54.04.0121 | PZ 4 | 850 Ohm, 24V | |
| P | 1 | 54.01.0270 | 8-Pole | Pin-Strip | AMP |
| P | 2 | 54.01.0220 | 9-Pole | Pin-Strip | AMP |

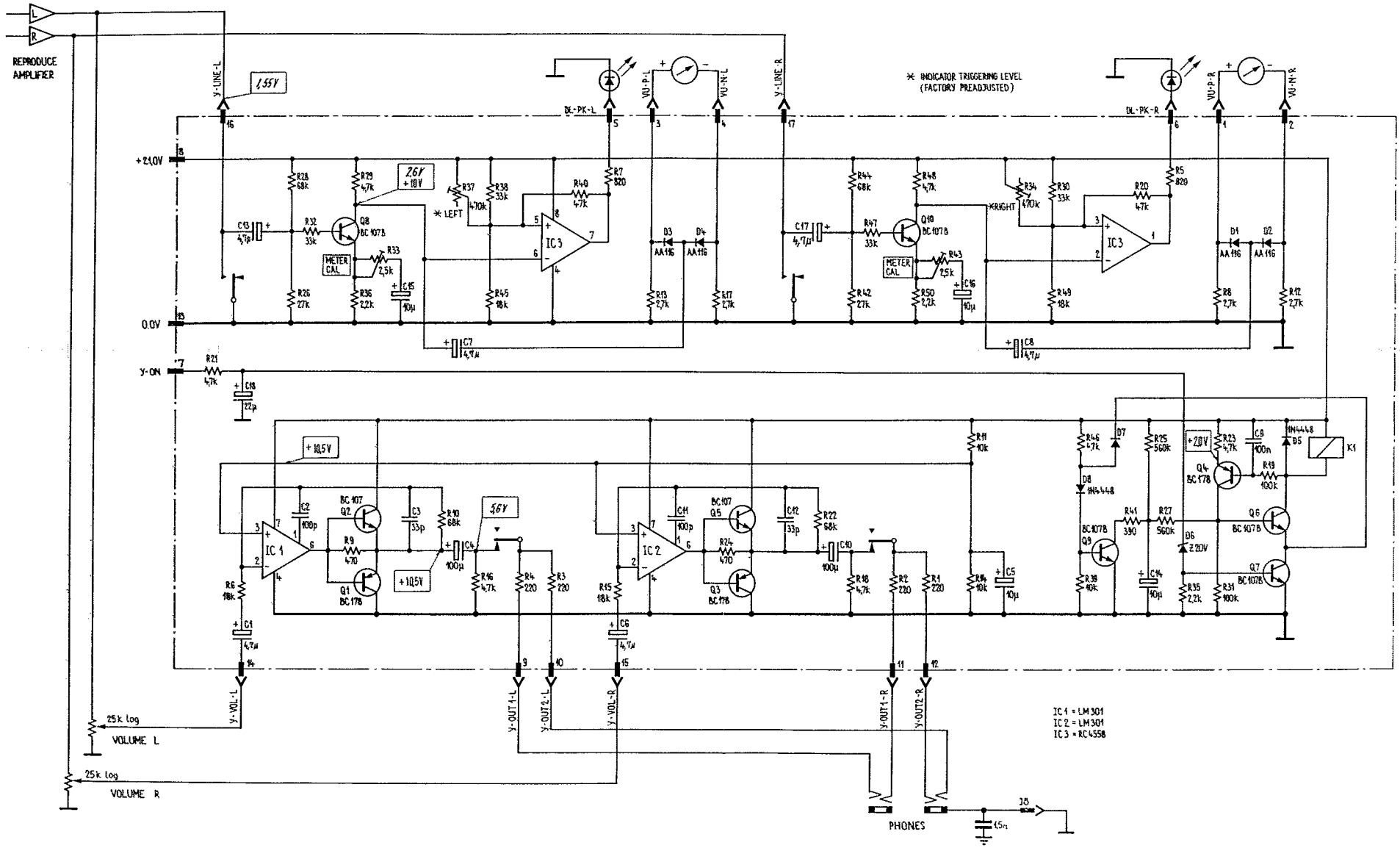
S T U D E R 82/11/30 Rw MONITOR AMPLIFIER 1.177.260.00 PAGE 1

| INC. | PCS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| Q | 1 | 50.03.0318 | BC 178 B | PNP | |
| Q | 2 | 50.03.0436 | BC 107 B | NPN | |
| Q | 3 | 50.03.0318 | BC 178 B | PNP | |
| Q | 4 | 50.03.0318 | BC 178 B | PNP | |
| Q | 5 | 50.03.0436 | BC 107 B | NPN | |
| Q | 6 | 50.03.0436 | BC 107 B | NPN | |
| Q | 7 | 50.03.0436 | BC 107 B | NPN | |
| Q | 8 | 50.03.0436 | BC 107 B | NPN | |
| Q | 9 | 50.03.0436 | BC 107 B | NPN | |
| Q | 10 | 50.03.0436 | BC 107 B | NPN | |
| R | 1 | 57.41.4221 | 220 Ohm | 5%, 0.25W, CF | |
| R | 2 | 57.41.4221 | 220 Ohm | 5%, 0.25W, CF | |
| R | 3 | 57.41.4221 | 220 Ohm | 5%, 0.25W, CF | |
| R | 4 | 57.41.4221 | 220 Ohm | 5%, 0.25W, CF | |
| R | 5 | 57.41.4821 | 820 Ohm | 5%, 0.25W, CF | |
| R | 6 | 57.41.4383 | 38 kOhm | 5%, 0.25W, CF | |
| R | 7 | 57.41.4821 | 820 Ohm | 5%, 0.25W, CF | |
| R | 8 | 57.41.4272 | 2.7 kOhm | 5%, 0.25W, CF | |
| R | 9 | 57.41.4471 | 470 Ohm | 5%, 0.5 W, CF | |
| R | 10 | 57.41.4683 | 68 kOhm | 5%, 0.25W, CF | |
| R | 11 | 57.41.4103 | 10 kOhm | 5%, 0.25W, CF | |
| R | 12 | 57.41.4272 | 2.7 kOhm | 5%, 0.25W, CF | |
| R | 13 | 57.41.4272 | 2.7 kOhm | 5%, 0.25W, CF | |
| R | 14 | 57.41.4103 | 10 kOhm | 5%, 0.25W, CF | |
| R | 15 | 57.41.4183 | 18 kOhm | 5%, 0.25W, CF | |
| R | 16 | 57.41.4472 | 4.7 kOhm | 5%, 0.25W, CF | |
| R | 17 | 57.41.4272 | 2.7 kOhm | 5%, 0.25W, CF | |
| R | 18 | 57.41.4472 | 4.7 kOhm | 5%, 0.25W, CF | |
| R | 19 | 57.41.4104 | 100 kOhm | 5%, 0.25W, CF | |
| R | 20 | 57.41.4473 | 47 kOhm | 5%, 0.25W, CF | |
| R | 21 | 57.41.4472 | 4.7 kOhm | 5%, 0.25W, CF | |
| R | 22 | 57.41.4683 | 68 kOhm | 5%, 0.25W, CF | |
| R | 23 | 57.41.4472 | 4.7 kOhm | 5%, 0.25W, CF | |
| R | 24 | 57.43.4471 | 470 Ohm | 5%, 0.5 W, CF | |
| R | 25 | 57.41.4564 | 560 kOhm | 5%, 0.25W, CF | |
| R | 26 | 57.41.4273 | 27 kOhm | 5%, 0.25W, CF | |

S T U D E R 82/11/30 Rw MONITOR AMPLIFIER 1.177.260.00 PAGE 2

| INC. | PCS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| R | 27 | 57.41.4564 | 560 kOhm | 5%, 0.25W, CF | |
| R | 28 | 57.41.4683 | 68 kOhm | 5%, 0.25W, CF | |
| R | 29 | 57.41.4472 | 4.7 kOhm | 5%, 0.25W, CF | |
| R | 30 | 57.41.4333 | 33 kOhm | 5%, 0.25W, CF | |
| R | 31 | 57.41.4104 | 100 kOhm | 5%, 0.25W, CF | |
| R | 32 | 57.41.4333 | 33 kOhm | 5%, 0.25W, CF | |
| R | 33 | 58.19.0242 | 2.4 kOhm | 20%, 0.15W, PCF | |
| R | 34 | 58.49.0131 | 470 kOhm | 20%, 0.15W, PCF | |
| R | 35 | 57.41.4272 | 2.7 kOhm | 5%, 0.25W, CF | |
| R | 36 | 57.41.4272 | 2.7 kOhm | 5%, 0.25W, CF | |
| R | 37 | 58.49.0131 | 470 kOhm | 20%, 0.15W, PCF | |
| R | 38 | 57.41.4333 | 33 kOhm | 5%, 0.25W, CF | |
| R | 39 | 57.41.4103 | 10 kOhm | 5%, 0.25W, CF | |
| R | 40 | 57.41.4473 | 47 kOhm | 5%, 0.25W, CF | |
| R | 41 | 57.41.4391 | 390 Ohm | 5%, 0.25W, CF | |
| R | 42 | 57.41.4273 | 27 kOhm | 5%, 0.25W, CF | |
| R | 43 | 58.19.0252 | 2.5 kOhm | 20%, 0.15W, PCF | |
| R | 44 | 57.41.4683 | 68 kOhm | 5%, 0.25W, CF | |
| R | 45 | 57.41.4183 | 18 kOhm | 5%, 0.25W, CF | |
| R | 46 | 57.41.4472 | 4.7 kOhm | 5%, 0.25W, CF | |
| R | 47 | 57.41.4223 | 22 kOhm | 5%, 0.25W, CF | |
| R | 48 | 57.41.4472 | 4.7 kOhm | 5%, 0.25W, CF | |
| R | 49 | 57.41.4183 | 18 kOhm | 5%, 0.25W, CF | |
| R | 50 | 57.41.4222 | 2.2 kOhm | 5%, 0.25W, CF | |

MONITOR AMPLIFIER PCB 1.177.260

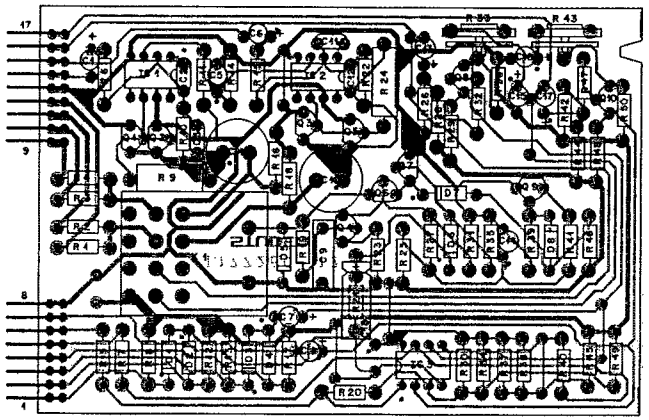


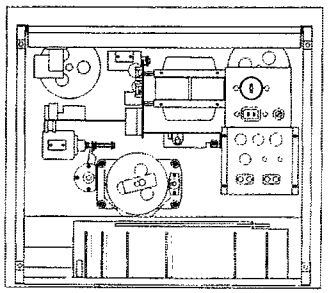

UP TO SERIAL NUMBER 20190 : D6 = Z 24V / R34, R37 = FIXED RESISTORS

## ONITOR AMPLIFIER PCB 1.177.260

METER CAL LEFT

METER CAL RIGHT





| INC. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | C----1 | 59.22.8479 | 4.7 uF | 10% 40V. ET | |
| | C----2 | 59.32.5101 | 100 pF | 20% 400V. Cer | |
| | C----3 | 59.32.5330 | 33 pF | 10% 500V. Cer | |
| | C----4 | 59.22.5101 | 100 uF | 10% 25V. ET | |
| | C----5 | 59.22.8108 | 10 uF | 10% 35V. ET | |
| | C----6 | 59.22.8479 | 4.7 uF | 10% 50V. ET | |
| | C----7 | 59.22.8479 | 4.7 uF | 10% 50V. ET | |
| | C----8 | 59.22.8479 | 4.7 uF | 10% 50V. ET | |
| | C----9 | 59.31.1104 | 0.1 uF | 20% 100V. MKT2 | |
| | C----10 | 59.22.5101 | 100 uF | 20% 25V. ET | |
| | C----11 | 59.32.8101 | 100 pF | 20% 500V. Cer | |
| | C----12 | 59.32.1330 | 33 pF | 10% 500V. Cer | |
| | C----13 | 59.22.8479 | 4.7 uF | 10% 50V. ET | |
| | C----14 | 59.22.8108 | 10 uF | 10% 35V. ET | |
| | C----15 | 59.22.8108 | 10 uF | 10% 35V. ET | |
| | C----16 | 59.22.8108 | 10 uF | 10% 35V. ET | |
| | C----17 | 59.22.8479 | 4.7 uF | 10% 50V. ET | |
| | C----18 | 59.25.4220 | 22 uF | 10% 40V. ET | |
| | D----1 | 50.04.0053 | AA 116 | GE | |
| | D----2 | 50.04.0053 | AA 116 | GE | |
| | D----3 | 50.04.0053 | AA 116 | GE | |
| | D----4 | 50.04.0053 | AA 116 | GE | |
| | D----5 | 50.04.0125 | 1 N 4448 | any | |
| | D----6 | 50.04.1109 | Z 20 V | 5% 400mW | |
| | D----7 | 50.04.0125 | 1 N 4448 | any | |
| | D----8 | 50.04.0125 | 1 N 4448 | any | |
| | IC----1 | 50.05.0257 | LM 301 | | TI-N |
| | IC----2 | 50.05.0257 | LM 301 | | TI-N |
| | IC----3 | 50.05.0249 | NJ 4558 | | TI-P |
| | K----1 | 56.04.0121 | RZ 4 | 856 Ohms 2xU | |
| | P----1 | 54.01.0270 | 8-Pole | Pin-Strip | AMP |
| | P----2 | 54.01.0220 | 4-Pole | Pin-Strip | AMP |

STUDER 82/11/30 Rm MONITOR AMPLIFIER 1.177.260.00 PAGE 1

| INC. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | D----1 | 50.03.0918 | BC 178 B | PNP | |
| | D----2 | 50.03.0936 | BC 107 B | NPN | |
| | D----3 | 50.03.0918 | BC 178 B | PNP | |
| | D----4 | 50.03.0918 | BC 178 B | PNP | |
| | D----5 | 50.03.0936 | BC 107 B | NPN | |
| | D----6 | 50.03.0936 | BC 107 B | NPN | |
| | D----7 | 50.03.0936 | BC 107 B | NPN | |
| | D----8 | 50.03.0936 | BC 107 B | NPN | |
| | D----9 | 50.03.0936 | BC 107 B | NPN | |
| | D----10 | 50.03.0936 | BC 107 B | NPN | |
| | R----1 | 57.41.4221 | 220 Ohm | 5% 0.25W, CF | |
| | R----2 | 57.41.4221 | 220 Ohm | 5% 0.25W, CF | |
| | R----3 | 57.41.4221 | 220 Ohm | 5% 0.25W, CF | |
| | R----4 | 57.41.4221 | 220 Ohm | 5% 0.25W, CF | |
| | R----5 | 57.41.4821 | 820 Ohm | 5% 0.25W, CF | |
| | R----6 | 57.41.4183 | 18 kOhm | 5% 0.25W, CF | |
| | R----7 | 57.41.4821 | 820 Ohm | 5% 0.25W, CF | |
| | R----8 | 57.41.4272 | 2.7 kOhm | 5% 0.25W, CF | |
| | R----9 | 57.41.4471 | 470 Ohm | 5% 0.5 W, CF | |
| | R----10 | 57.41.4683 | 68 kOhm | 5% 0.25W, CF | |
| | R----11 | 57.41.4103 | 10 kOhm | 5% 0.25W, CF | |
| | R----12 | 57.41.4272 | 2.7 kOhm | 5% 0.25W, CF | |
| | R----13 | 57.41.4272 | 2.7 kOhm | 5% 0.25W, CF | |
| | R----14 | 57.41.4103 | 10 kOhm | 5% 0.25W, CF | |
| | R----15 | 57.41.4183 | 18 kOhm | 5% 0.25W, CF | |
| | R----16 | 57.41.4472 | 4.7 kOhm | 5% 0.25W, CF | |
| | R----17 | 57.41.4272 | 2.7 kOhm | 5% 0.25W, CF | |
| | R----18 | 57.41.4472 | 4.7 kOhm | 5% 0.25W, CF | |
| | R----19 | 57.41.4104 | 100 kOhm | 5% 0.25W, CF | |
| | R----20 | 57.41.4473 | 47 kOhm | 5% 0.25W, CF | |
| | R----21 | 57.41.4472 | 4.7 kOhm | 5% 0.25W, CF | |
| | R----22 | 57.41.4683 | 68 kOhm | 5% 0.25W, CF | |
| | R----23 | 57.41.4472 | 4.7 kOhm | 5% 0.25W, CF | |
| | R----24 | 57.41.4471 | 470 Ohm | 5% 0.5 W, CF | |
| | R----25 | 57.41.4564 | 560 kOhm | 5% 0.25W, CF | |
| | R----26 | 57.41.4273 | 27 kOhm | 5% 0.25W, CF | |

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| INC. | POS.NO. | PART NO. | VALUE | SPECIFICATIONS / EQUIVALENT | MANUF. |
|---|---|---|---|---|---|
| | R----27 | 57.41.4564 | 560 kOhm | 5% 0.25W, CF | |
| | R----28 | 57.41.4683 | 68 kOhm | 5% 0.25W, CF | |
| | R----29 | 57.41.4472 | 4.7 kOhm | 5% 0.25W, CF | |
| | R----30 | 57.41.4333 | 33 kOhm | 5% 0.25W, CF | |
| | R----31 | 57.41.4104 | 100 kOhm | 5% 0.25W, CF | |
| | R----32 | 57.41.4333 | 33 kOhm | 5% 0.25W, CF | |
| | R----33 | 58.19.9252 | 2.5 kOhm | 20% 0.15W, PCF | |
| | R----34 | 58.19.9171 | 470 kOhm | 20% 0.15W, PCF | |
| | R----35 | 57.41.4222 | 2.2 kOhm | 5% 0.25W, CF | |
| | R----36 | 57.41.4222 | 2.2 kOhm | 5% 0.25W, CF | |
| | R----37 | 58.19.9171 | 470 kOhm | 20% 0.15W, PCF | |
| | R----38 | 57.41.4133 | 33 kOhm | 5% 0.25W, CF | |
| | R----39 | 57.41.4103 | 10 kOhm | 5% 0.25W, CF | |
| | R----40 | 57.41.4473 | 47 kOhm | 5% 0.25W, CF | |
| | R----41 | 57.41.4391 | 390 Ohm | 5% 0.25W, CF | |
| | R----42 | 57.41.4273 | 27 kOhm | 5% 0.25W, CF | |
| | R----43 | 58.19.9252 | 2.5 kOhm | 20% 0.15W, PCF | |
| | R----44 | 57.41.4683 | 68 kOhm | 5% 0.25W, CF | |
| | R----45 | 57.41.4183 | 18 kOhm | 5% 0.25W, CF | |
| | R----46 | 57.41.4472 | 4.7 kOhm | 5% 0.25W, CF | |
| | R----47 | 57.41.4333 | 33 kOhm | 5% 0.25W, CF | |
| | R----48 | 57.41.4472 | 4.7 kOhm | 5% 0.25W, CF | |
| | R----49 | 57.41.4183 | 18 kOhm | 5% 0.25W, CF | |
| | R----50 | 57.41.4222 | 2.2 kOhm | 5% 0.25W, CF | |

Abbreviations: Centercuts, Metallschicht, Miniatur, Ohm, Prozent
Polyester, Potentiometer, PCF Polycarbonat Folie,
Manufacturers: AMP/Amphenol, TI/Texas Instruments, N/National

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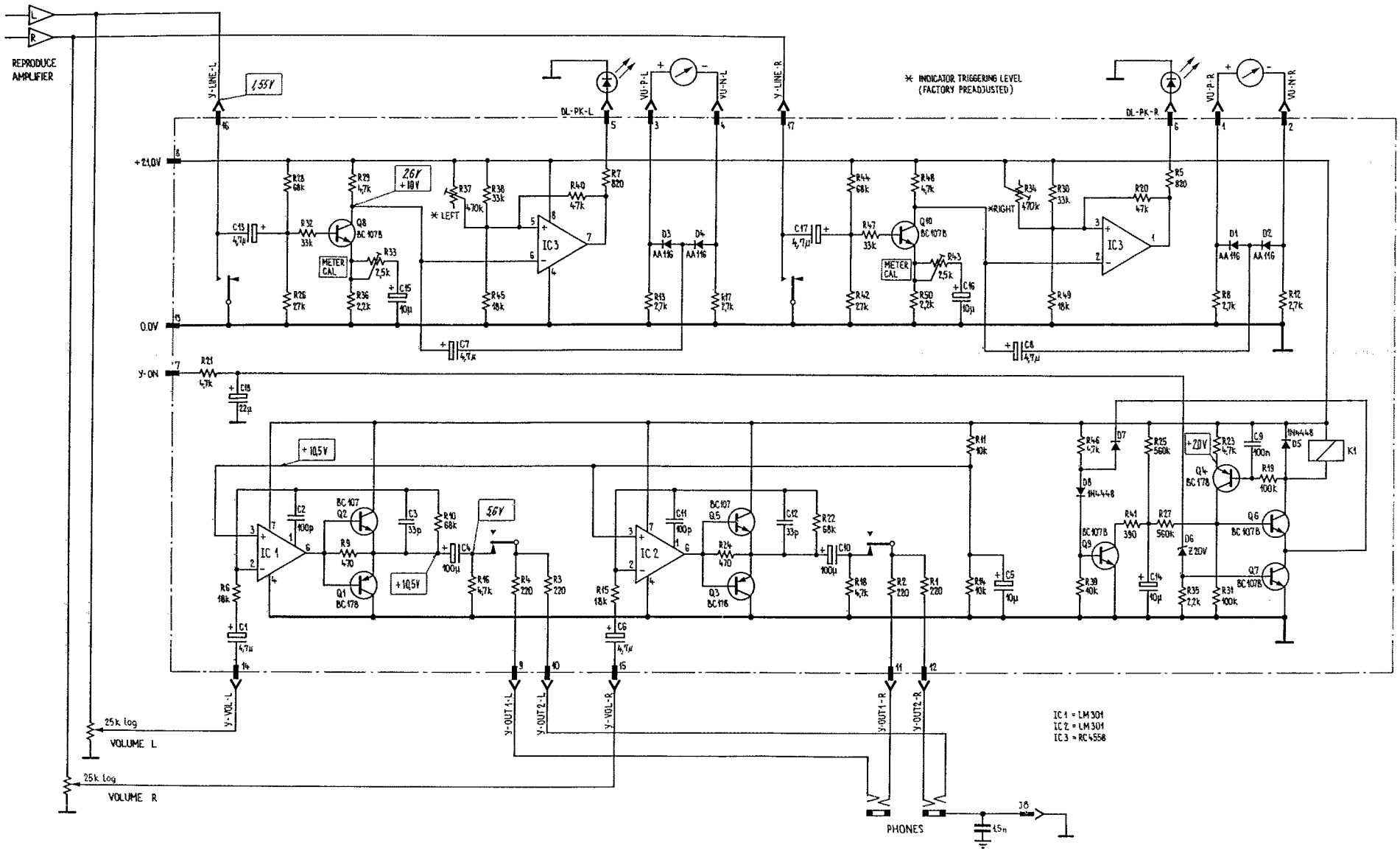
MONITOR AMPLIFIER PCB 1.177.260




UP TO SERIAL NUMBER 20190 : D6 = Z 24V / R34, R37 = FIXED RESISTORS

## INBAUANLEITUNG FÜR DIA-STEUERUNGEN

**H / Free Head**
ur "Free head"-Betrieb
estellnummern: 2-Spur 74501
4-Spur 74503

**IA / Dia-Synchro**
ur einfachen Diasteuerung
estellnummern: 2-Spur 74502
4-Spur 74504

**HA / Dissolve Head Amplifier**
ur Dia Überblendsysteme
estellnummern: 2-Spur 74495
4-Spur 74496

**llgemeines**

aufwerkabdeckung vom Tonbandgerat abneh-en.

a-Pilotkopf auf die im Nachrüstsatz enthalte-, rechteckige Montageplatte aufschrauben und ver auf der Seite der versenkten Montagelö-her

ontageplatte mit Diapilotkopf rechts von der onachse auf den Kopfträger schrauben (siehe g. 4). Die drei Federn sind an der Unterseite r Montageplatte zu verwenden.

ie am anderen Ende des Kopfkabels befindli-en Flachstecker auf dem Audio Interconnec-on Board 1.177.210 einstecken (gemäss Fig. 2, 3/Polarität beliebig). Kopfkabel kann am ossen Kabelbund fixiert werden

ach Ausbau des Audio-Anschlussfeldes die be-its mit Verbindungskabeln versehene 5- bzw. polige Buchse beim Anschluss SLIDE SYNC ontieren. Im Falle eines DHA-Bausatzes ist das geschirmte Kabel zwischen Capstan-Motor nd NF-Platine zu verlegen.
eiteres Vorgehen entsprechend der jeweiligen ausatz-variante.

**eim FH-Bausatz:**

e Kabel von der 5-poligen Buchse oberhalb s Tonmotors verlegen und den am Kabelende efindlichen Flachstecker in die Steckerleiste J1 s Audio Interconnection Boards 1.177.210 nstecken (siehe Fig. 1). Danach weiter bei atz 10

## INSTALLATION INSTRUCTIONS FOR SLIDE CONTROL ELECTRONICS

**FH / Free Head**
For "free head" operation
Order number: 2-track 74501
4-track 74503

**DIA / Dia-Synchro**
For single projector operation
Order number: 2-track 74502
4-track 74504

**DHA / Dissolve Head Amplifier**
For cross-fade systems
Order number: 2-track 74495
4-track 74496

**General**

**1.**
Remove tape transport cover

**2.**
Attach the sync head to the rectangular mounting plate contained in the kit, so that the countersink side of the holes points to its head.

**3.**
Install the sync head with its mounting plate on the right of the capstan shaft by utilizing the 3-flat head screws (see fig. 4). Use the 3 springs on the underside of the mounting plate.

**4.**
Connect the push on terminals of the head cable to the mother board 1.177.210 as shown in the drawing on page 3 of this instruction sheet (according fig. 1, 2, 3/no need to observe polarity). If found necessary, tie the head cable to the existing wire harness.

**5.**
Remove audio connector panel and install the 5-pole or 6-pole socket (depending on kit) at position 44 (SLIDE SYNC) of the connector panel. Route the shielded cable between the capstan motor and the audio boards.
Continue as described under the appropriate heading.

**FH kit**

**6.**
Place the cable from the 5-pole socket above the capstan motor and insert the flat plug at the cable's end into the upper edge J1 connector on board 1.177.210 (see fig. 1).
Continue at step 10

## INSTRUCTION DE MONTAGE POUR LES KITS DE COMMANDE DE DIAPOSITIVES

**FH / Free Head**
Pour utilisation "tête libre"
Numéros de référence: 2-pistes 74501
4-pistes 74503

**DIA / Dia-Synchro**
Pour commande dias simple
Numéros de référence: 2-pistes 74502
4-pistes 74504

**DHA / Dissolve Head Amplifier**
Pour fondu enchaîné
Numéros de référence: 2-pistes 74496
4-pistes 74496

**Généralités**

**1.**
Déposez le capot de recouvrement du mécanisme.

**2.**
Vissez la tête pilote contenue dans le kit, sur la plaque de montage rectangulaire, côté fraisé des trous de fixation.

**3.**
A droite de l'axe de cabestan, vissez la plaque de montage avec la tête pilote, sur le support des têtes (voir fig. 4), les 3 ressorts sous la plaque de montage.

**4.**
Raccordez la fiche plate de l'extrémité du câble à circuit de base 1.177.210 (conforme à fig 1, 2, 3/polarité quelconque). Attachez si nécessaire, le câble au toron principal

**5.**
Après démontage du panneau de raccordement audio, fixez la prise 5 ou 6 pôles à l'emplacement 44 (SLIDE SYNC). Pour la version DHA, tirez le câble blindé entre le moteur de cabestan et le circuit de base.
Les instructions suivantes varient selon les versions.

**Kit de montage FH**

**6.**
Placez le câble de la fiche 5 pôles au-dessus du moteur de cabestan et raccordez la fiche plate de l'extrémité du câble J1 à la partie supérieure du connecteur libre du circuit de base 1.177.210 (voir fig. 1).
Poursuivre au point 10.

**Beim DIA- sowie DHA Bausatz:**

**6.**
DIA- oder DHA-Platine (1.177.270 resp. 1.177.282) in die freien Steckerleisten J1/J10 auf dem Audio Interconnection Board 1.177.210 einstecken (siehe Fig. 2).

**7.**
Drehschalter des DHA-Bausatzes bzw. Schalter des DIA-1/4Spur-Bausatzes in das im Chassis vorhandene Loch rechts der Drucktaste "reel size" einbauen.

**8.**
Beim DIA-Bausatz das Verbindungskabel zur 6-poligen Buchse SLIDE SYNC oberhalb des Tonmotors verlegen und die beiden Flachstecker (beliebige Polung) auf dem Slide Synchronizer 1.177.270 einstecken (siehe Fig. 2)

Beim DHA-Satz den flachen, 6-poligen (CIS) Stecker in die freie Steckerleiste auf dem Interface 1.177.282 einstecken (siehe Fig. 3).

**9.**
Bei DHA- oder DIA-1/4Spur-Umrüstung auf der Laufwerkabdeckung die Lochmitte für den jeweiligen Schalter links vom Kopfträger, schräg unterhalb des Bandfühlhebels, gemäss der Massskizze Fig. 4 anreissen. Loch mit einem Durchmesser von 8,7 mm bohren und anschliessend die zutreffende Beschriftungsetikette aufkleben.

**10.**
Nach Auflegen eines Tonbandes den Diapilotkopf in der Höhe so verstellen, dass seine Ober- und Unterkante mit dem vorbeilaufenden Tonband bündig ist.
Bei den DHA- und FH-Versionen kann zur Senkrechtstellung des Spaltes die Vollspur-Aufzeichnung einer Frequenz im Bereich von 1...3 kHz abgespielt werden, wobei der Kopf mittels Taumelschraube auf maximale Ausgangsspannung einzustellen ist.
Bei der Version DIA empfiehlt sich eine Funktionskontrolle nach Bedienungsanleitung 10.2.

**11.**
Laufwerkabdeckung wieder montieren. Dabei darauf achten, dass das Kopfkabel nicht eingeklemmt wird

**DIA and DHA kit**

**6.**
Insert DIA or DHA circuit board (1.177.270 or 1.177.282) into the free socket strip J1/J10 on board 1.177.210 (see fig. 2)

**7.**
Install the 3 position rotary switch of the DHA kit or the push-button switch of the DIA-1/4track-kit in the free hole to the right of the push-button "reel size".

**8.**
When installing a DIA kit, route the interconnecting cable to the 6-pole socket SLIDE SYNC above the capstan motor and connect the two push-on terminals to the DIA electronics 1.177.270 (see fig. 2).

In case of the DHA kit connect the flat 6-pole plug to the free socket on board 1.177.282 (see fig. 3).

**9.**
When retrofitting a DHA- or DIA-1/4track-kit, mark the center of the hole for the required switch to the left of the head-block as shown on the drawing at the bottom according the dimensional drawing fig. 4. Drill a 8,7 mm (11/32 inch) diameter hole and attach the self-adhesive designation label.

**10.**
By running a tape on the recorder, adjust the sync head laterally, so that its upper and lower edges are in line with the passing tape.
On DHA and FH kits gap azimuth can be adjusted by reproducing a full-track recording of 1...3 khz and altering the heads azimuth setting until a maximum signal output is obtained.
On DIA conversions, it is suggested to run a functional check as per section 10.2 of the recorders operating instructions.

**11.**
Reinstall the plastic deck cover and take care not to pinch the head cable.

**Kit de montage DIA ou DHA**

**6.**
Enfichez la plaquette DIA (1.177.270) ou DHA (1.177.282) dans les connecteurs libres J1/J10 du circuit de base 1.177.210 (voir fig. 2).

**7.**
A droite de la touche "reel size", montez dans le trou libre du châssis le commutateur du kit DIA 4 pistes ou le commutateur rotatif du kit DHA.

**8.**
Pour le kit DIA, placez au-dessus du moteur de cabestan, le câble de la fiche 6 pôles SLIDE SYNC et raccordez les deux fiches plates (sans tenir compte de la polarité) aux connecteurs de la plaquette DIA 1.177.270 (voir fig. 2).

Pour le kit DHA, raccordez la fiche plate 6 pôles (CIS) au connecteur de la plaquette 1.177.282 (voir fig. 3).

**9.**
Les versions DIA 4 pistes et DHA nécessitent une perforation du capot de recouvrement du mécanisme, à gauche du support des têtes, endessous du tendeur de bande. Marquez le centre du trou à l'aide de l'esquisse se trouvant au dessin des dimensions fig. 4. Percez avec une mèche de 8,7 mm et collez l'étiquette correspondante.

**10.**
Après la mise en place d'une bande, ajustez la hauteur de la tête pilote, de manière à faire coincider les arrêts supérieurs et inférieurs avec la largeur de la bande.
Dans les versions DHA et FH, l'ajustage correct de l'azimut permet l'enregistrement et la lecture dans une largeur de bande allant de 1 ..3 kHz.
On réglera l'azimut au maximum de signal de sortie.
Pour la version DIA, il est conseillé d'effectuer un contrôle de fonction selon le mode d'emploi 10.2.

**11.**
Remontez le capot de recouvrement du mécanisme, en veillant de ne pas pincer le câble de la tête pilote.

FIG.1 INSTALLATION OF FREE HEAD KIT

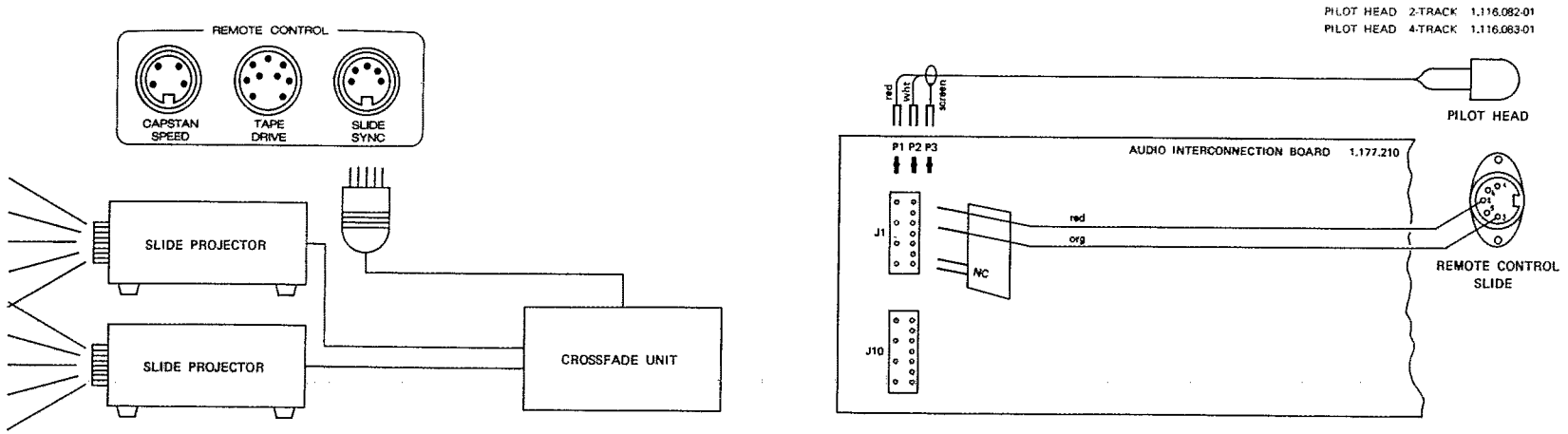
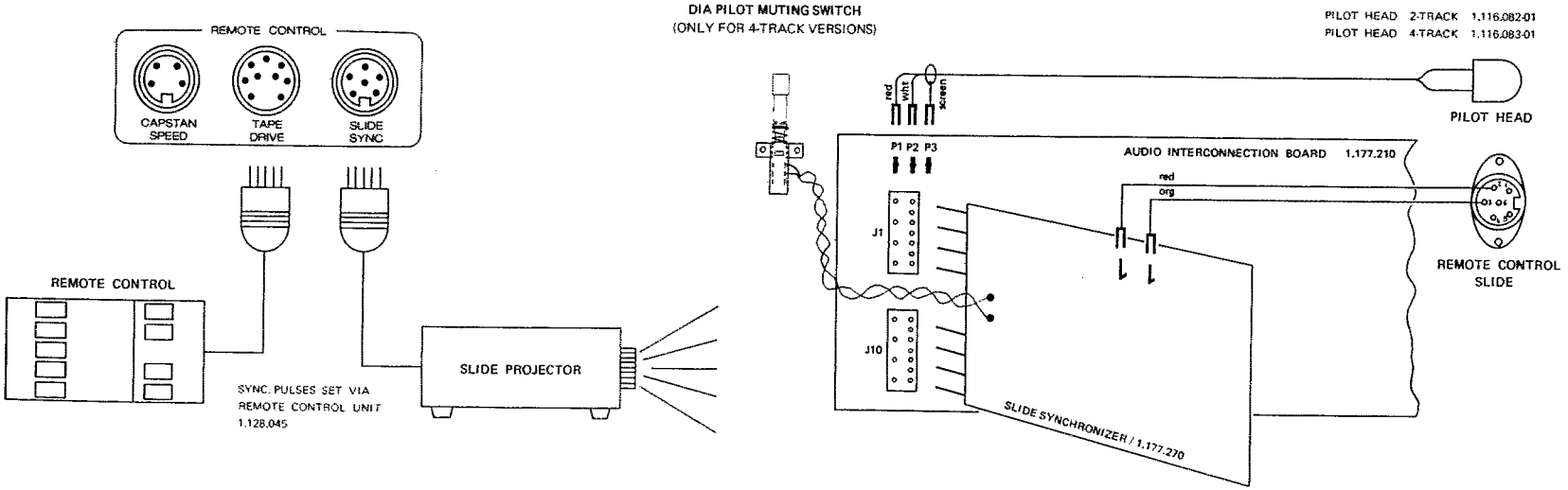
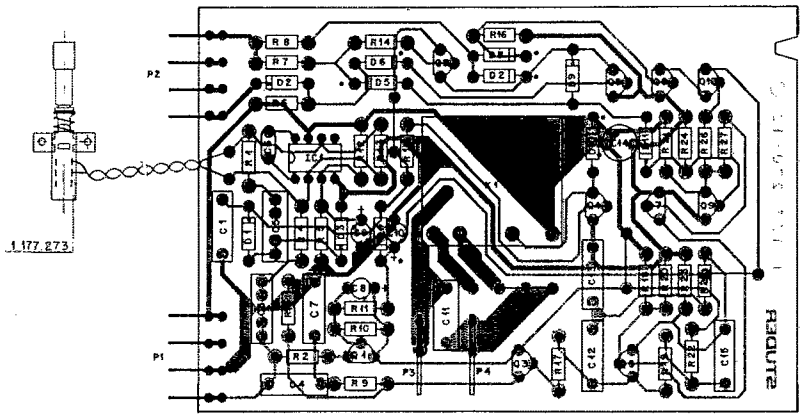



FIG.2 INSTALLATION OF DIA SYNC KIT



## SLIDE SYNCHRONIZER PCB 1.177.270




### DIASTEUERUNG 1.177.270

Mit einem eingebauten Spezial-Tonkopf und angeschlossener Laufwerk-Fernbedienung, ermöglicht diese Schaltung Steuerimpulse für den Bildwechsel bei handelsüblichen Dia-Projektoren auf Band zu bringen.

Eine Anpassung der Steuerschaltung an diverse Projektor-Fabrikate ist gewährleistet, indem über einen galvanisch getrennten Relaiskontakt geschaltet wird.

Über die beiden Steuertasten REC-SLIDE und SET-SLIDE, werden die folgenden Betriebszustände gewählt.

- Wiedergabe von Schaltimpulsen
- Sperren der Wiedergabe von bereits aufgezeichneten Schaltimpulsen (wichtig bei bespielten 4-Spur Bändern)
- Löschen sowie Setzen von (neuen) Impulsen

Es werden 1 kHz Sinussignale aufgezeichnet. Die Löschung erfolgt mit Gleichstrom.

Die genaue Funktion der Steuertasten ist aus der Tabelle ersichtlich. Ausserbetriebsetzen des Relais ohne angeschlossene Fernbedienung ist mit Schalter "DIA PILOT MUTING SWITCH" möglich.

### Slide synchronizing electronics 1.177.270

A special magnetic head in conjunction with the slide synchronizing electronics makes it possible to record control impulses on tape. Upon playback, these impulses will effect a picture change in any commercially available projector, when connected to the B77 recorder. This system is operational only in conjunction with the REVOX B77 remote control device.

Reliable operation with different makes of projectors is ensured by the fact that control of the slide advance mechanism is effected by separate relay contacts.

By means of the buttons REC-SLIDE and SET-SLIDE on the remote control device, the following operating conditions can be selected:

- Reproduction of control (switching) impulses.
- Disabling of the synchronizing circuit so as not to respond to signals scanned by the impulse head (important when playing fully recorded quarter track tapes)
- Erasure and recording of (new) control impulses

The exact function of each control button can be seen from the table. To disable the relay without a remote control device connected to the recorder, pull the "DIA PILOT MUTING SWITCH".

### Synchronisateur de diapositives 1.177.270

Ce circuit monté dans un B77 équipé d'une tête pilote et raccordé à la commande à distance, permet la commande par la bande d'un projecteur de diapositives.

La commande par les contacts du relais, isolés galvaniquement du circuit, s'adapte à n'importe quel type de projecteur.

Les deux touches de commande REC SLIDE et SET-SLIDE permettent les fonctions suivantes:

- Lecture des impulsions de commande
- Blocage de la lecture des impulsions de commande (important pour les appareils 4 pistes)
- Effacement ainsi qu'enregistrement des (nouvelles) impulsions.

Ces impulsions sont constituées par des trains d'un signal sinusoïdal de 1 kHz. L'effacement s'effectue par courant continu.

Les fonctions exactes des touches de commande sont données par la tabelle. La mise sans l'aide de la commande à distance, peut se faire avec le bouton poussoir "DIA PILOT MUTING SWITCH".

| Schalterstellung | Funktion |
|---|---|
| PLAY | Wiedergabe Steuerimpulse |
| PLAY + SLIDE REC | Wiedergabe Steuerimpulse gesperrt |
| PLAY + REC + Vorwahl | normale NF-Aufnahme |
| PLAY + REC + SLIDE REC | Loschen der Steuerimpulse |
| PLAY + REC + SLIDE REC + SET-SLIDE | Lange SET gedrückt wird Steuerimpuls gesetzt (kurz und lang möglich) |

| Effected switching | Resulting function |
|---|---|
| PLAY | Reproduction of control impulses |
| PLAY + SLIDE REC | Reproduction of control impulses disabled |
| PLAY + REC + preselector | Normal audio recording |
| PLAY + REC + SLIDE REC | Erasure of control impulses |
| PLAY + REC + SLIDE REC + SET-SLIDE | Recording of a new impulse as long as the button SET is kept depressed |

| Commande | Fonction |
|---|---|
| PLAY | Lecture des impulsions |
| PLAY + SLIDE REC | Blocage de la lecture des impulsions |
| PLAY + REC + présélecteur | Enregistrement BF normal |
| PLAY + REC + SLIDE REC | Effacement des impulsions de commande |
| PLAY + REC + SLIDE REC + SET SLIDE | Enregistrement des impulsions de commande aussi longtemps que la touche SET reste enfoncée |

| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| C 01 | 59.31.6104 | 0.1 U | 10% 100V MPETF | | |
| C 03 | 59.31.6104 | 0.1 U | 10% 100V MPETF | | |
| C 04 | 59.31.6104 | 0.1 U | 10% 100V MPETF | | |
| C 05 | 59.31.1224 | 0.22 U | 20% 100V MPETF | | |
| C 06 | 59.22.0100 | 10 P | 20% 50V CER | | |
| C 07 | 59.31.6104 | 0.1 U | 10% 100V MPETF | | |
| C 08 | 59.30.1470 | 47 U | -20% 3V TA | | |
| C 09 | 59.30.6339 | 3.3 U | -20% 35V TA | | |
| C 10 | 59.30.6339 | 3.3 U | | | |
| C 11 | 59.31.1224 | 0.22 U | 20% 100V MPETF | | |
| C 12 | 59.31.6104 | 0.1 U | 10% | | |
| C 13 | 59.31.6104 | 0.1 U | | | |
| C 14 | 59.22.5470 | 47 U | -10% 25V EL | | |
| C 15 | 59.31.6104 | 0.1 U | 10% 100V MPETF | | |
| D 01 | 50.04.0125 | 1N 4448 | | | any |
| D 02 | 50.04.0125 | 1N 4448 | | | |
| D 03 | 50.04.0125 | 1N 4448 | | | |
| D 04 | 50.04.0125 | 1N 4448 | | | |
| D 05 | 50.04.0126 | Z 15 | 15V 5% 400mW | | |
| D 06 | 50.04.0125 | 1N 4448 | | | |
| D 07 | 50.04.0125 | 1N 4448 | | | |
| D 08 | 50.04.0125 | 1N 4448 | | | |
| D 09 | 50.04.0125 | 1N 4448 | | | |
| D 10 | 50.04.0125 | 1N 4448 | | | |
| D 11 | 50.04.0125 | 1N 4448 | | | |
| IC 1 | 50.05.0287 | LM 301 | | | TI.N |
| K 01 | 56.99.0116 | I x U | 24V | | S. G |
| P 01 | 54.01.0470 | 4-Pole | Pin-Strip | AMP | |
| P 02 | 54.01.0470 | 4-Pole | Pin-Strip | AMP | |
| P 03 | 54.02.0328 | | Flat Pin 0.8 | AMP | |
| P 04 | 54.02.0328 | | Flat Pin 0.8 | AMP | |
| Q 01 | 50.03.0318 | BC178B | PNP | | any |
| Q 02 | 50.03.0436 | BC107B | NPN | | |
| Q 03 | 50.03.0436 | BC107B | NPN | | |
| Q 04 | 50.03.0436 | BC107B | NPN | | |
| Q 05 | 50.03.0439 | BC109C | NPN | | |
| Q 06 | 50.03.0436 | BC107B | NPN | | |
| Q 07 | 50.03.0436 | BC107B | NPN | | |
| Q 08 | 50.03.0436 | BC107B | NPN | | |
| Q 09 | 50.03.0436 | BC107B | NPN | | |
| Q 10 | 50.03.0436 | BC107B | NPN | | |

TI = Texas Instr. S = National S = Siemens M = Motorola
MPETF = metallized polyester TA = tantalum EL = electrolytic CER = ceramic

| IND | DATE | NAME |
|---|---|---|
| | 1.2.80 | Kol |
| A | 8.1.79 | Pol |
| B | 8.6.79 | Ing./Gev. pr |

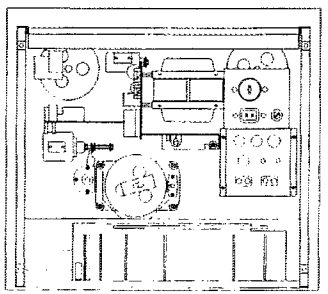
STUDER | SLIDE SYNCHRONIZER | 1.177.270 | PAGE 1 of 2

| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| R 01 | 57.41.4682 | 6.8 k | 5% .25W CF | | |
| R 02 | 57.41.4153 | 15 k | | | |
| R 03 | 57.41.4822 | 8.2 k | | | |
| R 04 | 57.41.4271 | 270 | | | |
| R 05 | 57.41.4223 | 22 k | | | |
| R 06 | 57.41.4223 | 22 k | | | |
| R 07 | 57.41.4182 | 1.8 k | | | |
| R 08 | 57.41.4103 | 10 k | | | |
| R 09 | 57.41.4472 | 4.7 k | | | |
| R 10 | 57.41.4332 | 3.3 k | | | |
| R 11 | 57.41.4333 | 33 k | | | |
| R 12 | 57.41.4223 | 22 k | | | |
| R 13 | 57.41.4105 | 1 M | | | |
| R 14 | 57.41.4223 | 22 k | | | |
| R 15 | 57.41.4333 | 33 k | | | |
| R 16 | 57.41.4332 | 3.3 k | | | |
| R 17 | 57.41.4103 | 10 k | | | |
| R 18 | 57.41.4333 | 33 k | | | |
| R 19 | 57.41.4332 | 3.3 k | | | |
| R 20 | 57.41.4183 | 18 k | | | |
| R 21 | 57.41.4103 | 10 k | | | |
| R 22 | 57.41.4182 | 1.8 k | | | |
| R 23 | 57.41.4332 | 3.3 k | | | |
| R 24 | 57.41.4332 | 3.3 k | | | |
| R 25 | 57.41.4331 | 330 | | | |
| R 26 | 57.41.4333 | 33 k | | | |
| R 27 | 57.41.4333 | 33 k | | | |

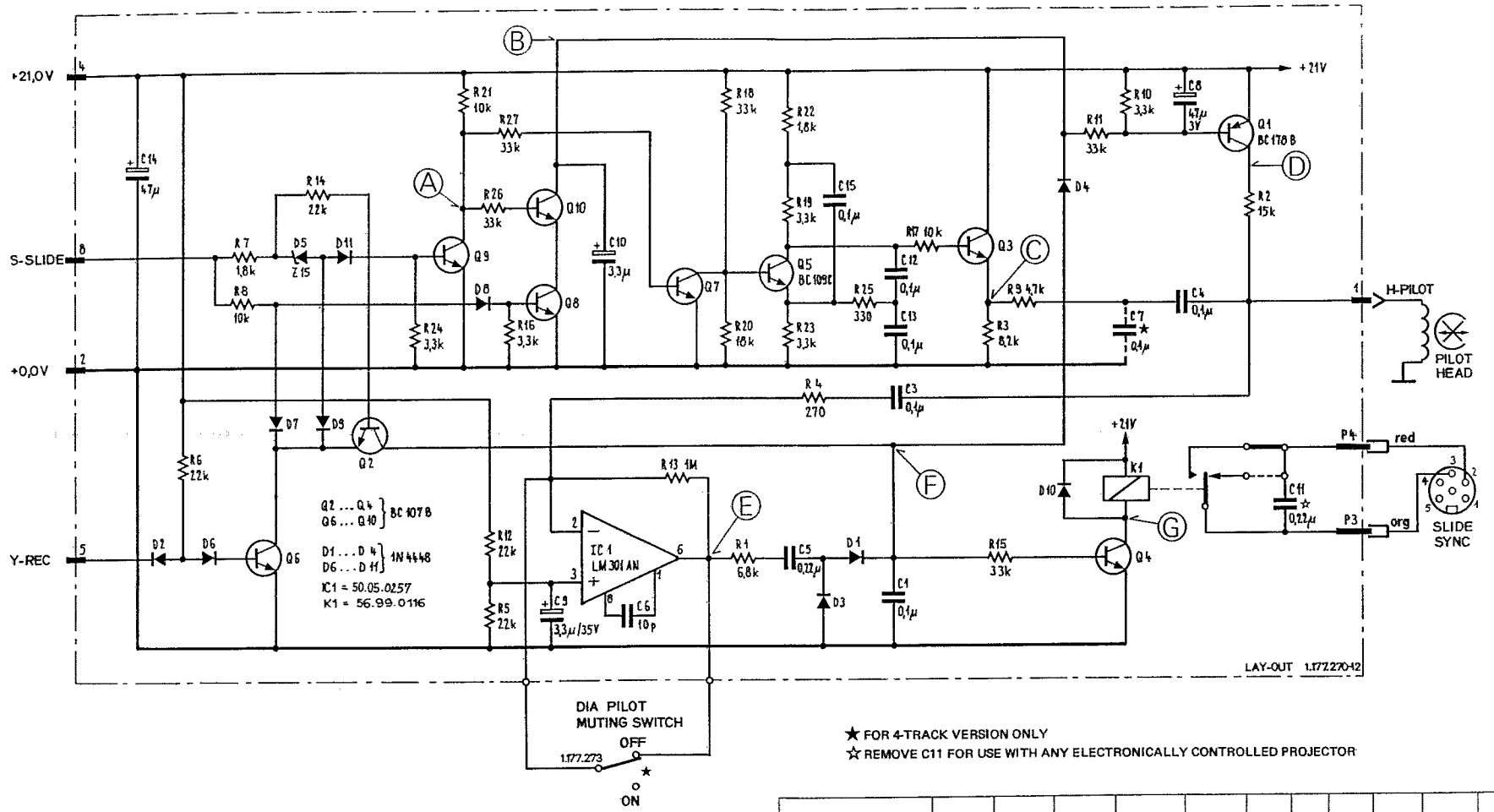
CF = Carbon Film

| IND | DATE | NAME |
|---|---|---|
| | 1.2.80 | Kol |
| A | 8.5.79 | Pol |
| B | 8.6.79 | Ing./Gev. pr |

STUDER | SLIDE SYNCHRONIZER | 1.177.270 | PAGE 2 of 2

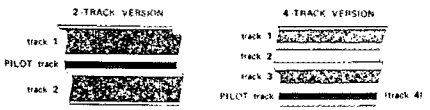


SLIDE SYNCHRONIZER PCB 1.177.270



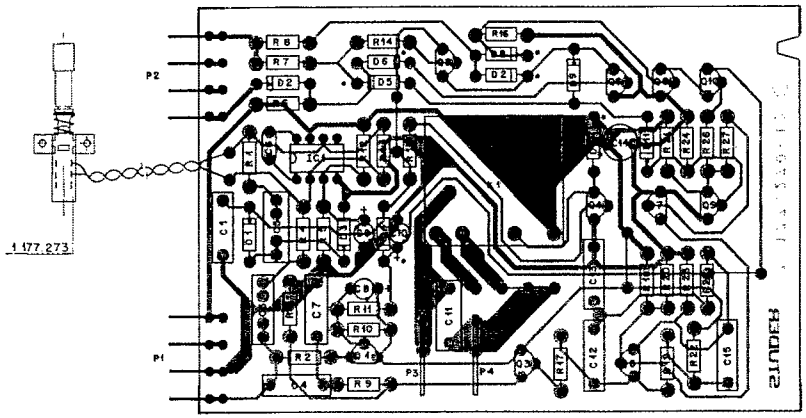

★ FOR 4-TRACK VERSION ONLY
☆ REMOVE C11 FOR USE WITH ANY ELECTRONICALLY CONTROLLED PROJECTOR

| MODE | Y–REC | S–SLIDE | RELAY | 1 kHz–OSC | DC ERASING | Ⓐ | Ⓑ | Ⓒ | Ⓓ | Ⓔ | Ⓕ | Ⓖ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PLAY | HI | 0V | (ON) | -- | -- | 15 V | 21 V | -- | 0V | 46Vrms | 1.5V AC ±0.5V | (0V) |
| RECORD + REC–SLIDE | LO | 12V | -- | -- | ON | 12.5V | 0.1V | -- | 21V | -- | 0.5V DC | 21V |
| RECORD + REC–SLIDE + SET–SLIDE | LO | 24V | ON | ON | -- | 0.1V | 21 V | 2Vrms | 0V | 15Vpp | 3 V AC ±0.7V | (0V) |
| PLAY + REC–SLIDE (CANCELS REPRO PULSES) | HI | 12V | -- | -- | -- | 15 V | 21 V | -- | 0V | -- | 0V | 21V |




2-TRACK VERSION / KIT 74502
4-TRACK VERSION / KIT 74504

## LIDE SYNCHRONIZER PCB 1.177.270




| Schalterfeld | Funktion |
|---|---|
| PLAY | Wiedergabe Steuerimpulse |
| PLAY + SLIDE REC | Wiedergabe Steuerimpulse gesperrt |
| PLAY + REC + Vorwahl | normale NF-Aufnahme |
| PLAY + REC + SLIDE REC | Loschen der Steuerimpulse |
| PLAY + REC + SLIDE REC + SET-SLIDE | solange SET gedrückt wird Steuerimpuls gelöscht (kurz und lang möglich) |

| Fonctionnement | Fonctions |
|---|---|
| PLAY | Reproduction des ordres enregistrés |
| PLAY + SLIDE REC | Reproduction des ordres enregistrés inhibée |
| PLAY + REC + présélecteur | Normal audio recording |
| PLAY + REC + SLIDE REC | Erasure of control impulses |
| PLAY + REC + SLIDE REC + SET SLIDE | Recording of a new impulse as long as the button SET is kept depressed |

| Commande | Fonctions |
|---|---|
| PLAY | Lecture des impulsions |
| PLAY + SLIDE REC | Blocage de la lecture des impulsions |
| PLAY + REC + présélecteur | Enregistrement BF normal |
| PLAY + REC + SLIDE REC | Effacement des impulsions de commande |
| PLAY + REC + SLIDE REC + SIFT SLIDE | Enregistrement des impulsions de commande aussi longtemps que la touche SET reste enfoncée |

| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| C 01 | 59.31.6104 | 0.1 U | 10% 100V | MPETP | |
| C 02 | 59.31.6104 | 0.1 U | 10% 100V | MPETP | |
| C 04 | 59.31.6104 | 0.1 U | 10% 100V | MPETP | |
| C 05 | 59.31.1224 | 0.22 U | 20% 100V | MPETP | |
| C 06 | 59.32.0100 | 10 P | 20% 500V | CER | |
| C 07 | 59.31.6104 | 0.1 U | 10% 100V | MPETP | |
| C 08 | 59.30.1470 | 47 U | -20% 3V | TA | |
| C 09 | 59.30.6334 | 3.3 U | -20% 35V | TA | |
| C 10 | 59.30.6334 | 3.3 U | | | |
| C 11 | 59.31.1224 | 0.22 U | 20% 100V | MPETP | |
| C 12 | 59.31.6104 | 0.1 U | 10% | | |
| C 13 | 59.31.6104 | 0.1 U | | | |
| C 14 | 59.22.5470 | 47 U | -10% 25V | EL | |
| C 15 | 59.31.6104 | 0.1 U | 10% 100V | MPETP | |
| D 01 | 50.04.0125 | 1N 4448 | | | any |
| D 02 | 50.04.0125 | 1N 4448 | | | |
| D 03 | 50.04.0125 | 1N 4448 | | | |
| D 04 | 50.04.0125 | 1N 4448 | | | |
| D 05 | 50.04.0119 | Z 15 | 15V 5% 400mW | | |
| D 06 | 50.04.0125 | 1N 4448 | | | |
| D 07 | 50.04.0125 | 1N 4448 | | | |
| D 08 | 50.04.0125 | 1N 4448 | | | |
| D 09 | 50.04.0125 | 1N 4448 | | | |
| D 10 | 50.04.0125 | 1N 4448 | | | |
| D 11 | 50.04.0125 | 1N 4448 | | | |
| IC 1 | 50.05.0257 | LM 301 | | | TI,N |
| K 01 | 56.89.0116 | 1 x U | 24V | | S, O |
| P 01 | 54.01.0470 | 4-Pole | PIN-Strap | AMP | |
| P 02 | 54.01.0470 | 4-Pole | PIN-Strip | AMP | |
| P 03 | 54.02.0328 | | Flat Pin 0.8 | AMP | |
| P 04 | 54.02.0328 | | Flat Pin 0.8 | AMP | |
| Q 01 | 50.03.0318 | BC178B | | PNP | any |
| Q 02 | 50.03.0436 | BC107B | | NPN | |
| Q 03 | 50.03.0436 | BC107B | | NPN | |
| Q 04 | 50.03.0436 | BC107B | | NPN | |
| Q 05 | 50.03.0439 | BC109C | | NPN | |
| Q 06 | 50.03.0436 | BC107B | | NPN | |
| Q 07 | 50.03.0436 | BC107B | | NPN | |
| Q 08 | 50.03.0436 | BC107B | | NPN | |
| Q 09 | 50.03.0436 | BC107B | | NPN | |
| Q 10 | 50.03.0436 | BC107B | | NPN | |

TI = Texas Instr.
N = National
S = Siemens
O = ORION

MPETP = Metallized polyester
TA = tantalum
EL = electrolytic
CER = ceramic

| IND | DATE | NAME |
|---|---|---|
| 1 | 8.5.78 | Pol |
| 2 | 18.5.78 | Pol/Sr/Ja |

STUDER — SLIDE SYNCHRONIZER — 1.177.270 — PAGE 1 of 2

| POS NO | PART NO | VALUE | SPECIFICATIONS | EQUIVALENT | MFR |
|---|---|---|---|---|---|
| R 01 | 57.41.4682 | 6.8 k | 5% .25W | CF | |
| R 02 | 57.41.4153 | 15 k | | | |
| R 03 | 57.41.4822 | 8.2 k | | | |
| R 04 | 57.41.4271 | 270 | | | |
| R 05 | 57.41.4223 | 22 k | | | |
| R 06 | 57.41.4223 | 22 k | | | |
| R 07 | 57.41.4182 | 1.8 k | | | |
| R 08 | 57.41.4103 | 10 k | | | |
| R 09 | 57.41.4472 | 4.7 k | | | |
| R 10 | 57.41.4332 | 3.3 k | | | |
| R 11 | 57.41.4333 | 33 k | | | |
| R 12 | 57.41.4223 | 22 k | | | |
| R 13 | 57.41.4105 | 1 M | | | |
| R 14 | 57.41.4223 | 22 k | | | |
| R 15 | 57.41.4333 | 33 k | | | |
| R 16 | 57.41.4332 | 3.3 k | | | |
| R 17 | 57.41.4103 | 10 k | | | |
| R 18 | 57.41.4333 | 33 k | | | |
| R 19 | 57.41.4332 | 3.3 k | | | |
| R 20 | 57.41.4183 | 18 k | | | |
| R 21 | 57.41.4103 | 10 k | | | |
| R 22 | 57.41.4182 | 1.8 k | | | |
| R 23 | 57.41.4332 | 3.3 k | | | |
| R 24 | 57.41.4332 | 3.3 k | | | |
| R 25 | 57.41.4331 | 330 | | | |
| R 26 | 57.41.4333 | 33 k | | | |
| R 27 | 57.41.4333 | 33 k | | | |

CF = Carbon Film

| IND | DATE | NAME |
|---|---|---|
| 1 | 8.5.78 | Pol |
| 2 | 18.5.78 | Pol/Sr/Ja |

STUDER — SLIDE SYNCHRONIZER — 1.177.270 — PAGE 2 of 2

### DIASTEUERUNG 1.177.270

Mit einem eingebauten Spezial-Tonkopf und angeschlossener Laufwerk-Fernbedienung, ermöglicht diese Schaltung Steuerimpulse für den Bildwechsel bei handelsüblichen Dia-Projektoren auf Band zu bringen.

Eine Anpassung der Steuerschaltung an diverse Projektor-Fabrikate ist gewährleistet, indem über einen galvanisch getrennten Relaiskontakt geschaltet wird.

Über die beiden Steuertasten REC-SLIDE und SET-SLIDE, werden die folgenden Betriebszustände gewählt:

- Wiedergabe von Schaltimpulsen
- Sperren der Wiedergabe von bereits aufgezeichneten Schaltimpulsen (wichtig bei bespielten 4-Spur Bandern)
- Loschen sowie Setzen von (neuen) Impulsen

Es werden 1 kHz Sinussignale aufgezeichnet. Die Löschung erfolgt mit Gleichstrom.

Die genaue Funktion der Steuertasten ist aus der Tabelle ersichtlich. Ausserbetriebsetzen des Relais ohne angeschlossene Fernbedienung ist mit Schalter "DIA PILOT MUTING SWITCH" möglich.

### Slide synchronizing electronics 1.177.270

A special magnetic head in conjunction with the slide synchronizing electronics makes it possible to record control impulses on tape. Upon playback, these impulses will effect a picture change in any commercially available projector, when connected to the B77 recorder. This system is operational only in conjunction with the REVOX B77 remote control device.

Reliable operation with different makes of projectors is ensured by the fact that control of the slide advance mechanism is effected by separate relay contacts.

By means of the buttons REC-SLIDE and SET-SLIDE on the remote control device, the following operating conditions can be selected.

- Reproduction of control (switching) impulses.
- Disabling of the synchronizing circuit so as not to respond to signals scanned by the impulse head (important when playing fully recorded quarter track tapes).
- Erasure and recording of (new) control impulses.

The exact function of each control button can be seen from the table. To disable the relay without a remote control device connected to the recorder, pull the "DIA PILOT MUTING SWITCH".

### Synchronisateur de diapositives 1.177.270

Ce circuit monté dans un B77 équipé d'une tête pilote et raccordé à la commande à distance, permet la commande par la bande d'un projecteur de diapositives.

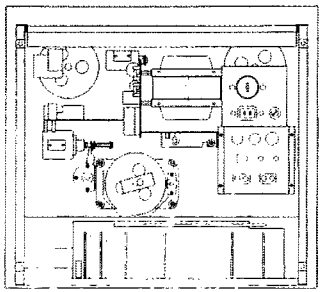
La commande par les contacts du relais, isolés galvaniquement du circuit, s'adapte à n'importe quel type de projecteur.

Les deux touches de commande REC-SLIDE et SET-SLIDE permettent les fonctions suivantes:

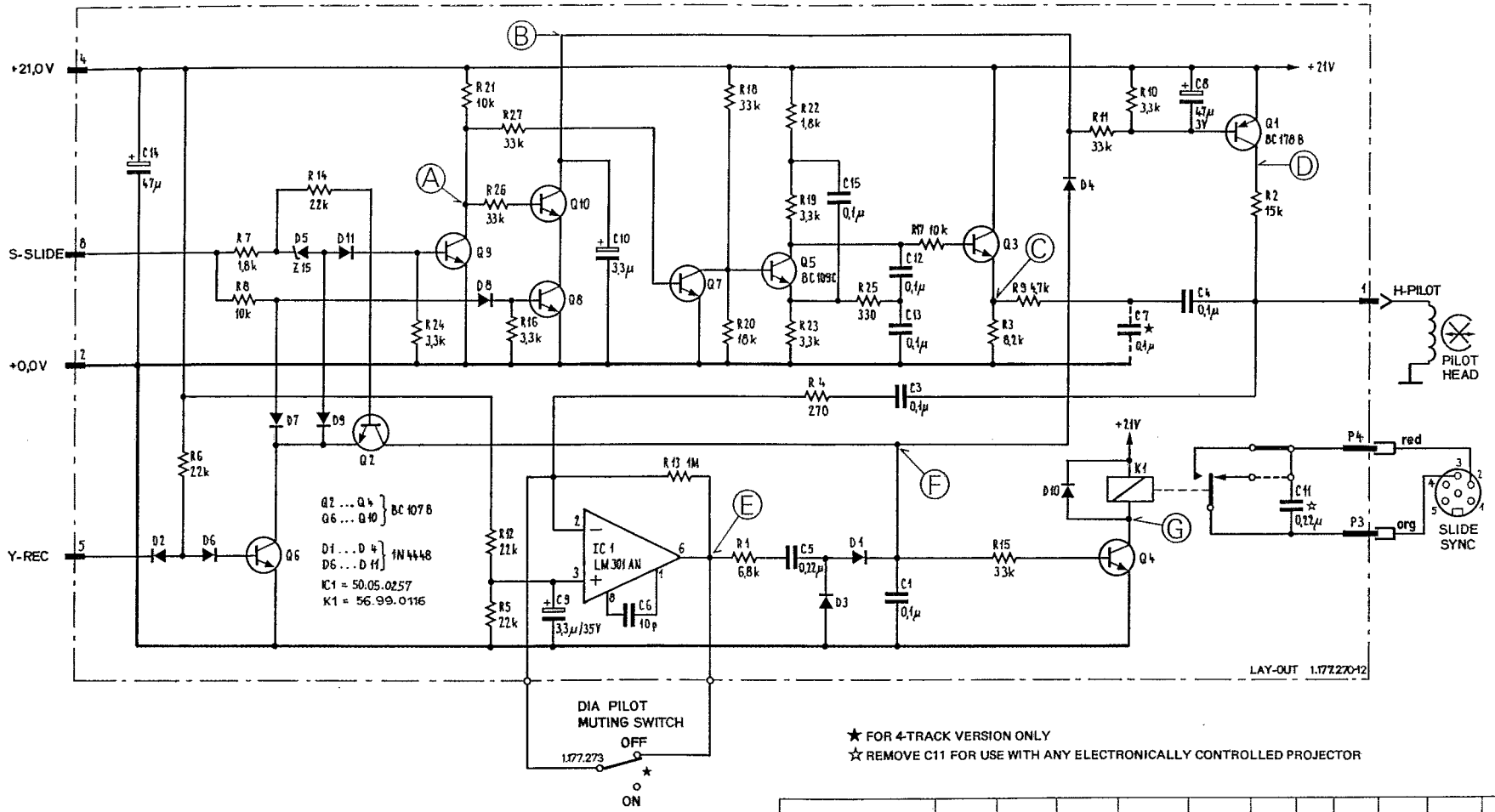
- Lecture des impulsions de commande
- Blocage de la lecture des impulsions de commande (important pour les appareils 4 pistes).
- Effacement ainsi qu'enregistrement des (nouvelles) impulsions.

Ces impulsions sont constituées par des trains d'un signal sinusoïdal de 1 kHz. L'effacement s'effectue par courant continu.

Les fonctions exactes des touches de commande sont données par la tabelle. La mise sans l'aide de la commande à distance, peut se faire avec le boutton poussoir "DIA PILOT MUTING SWITCH".

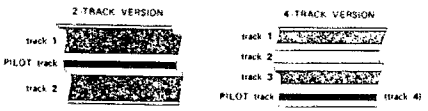


## SLIDE SYNCHRONIZER PCB 1.177.270



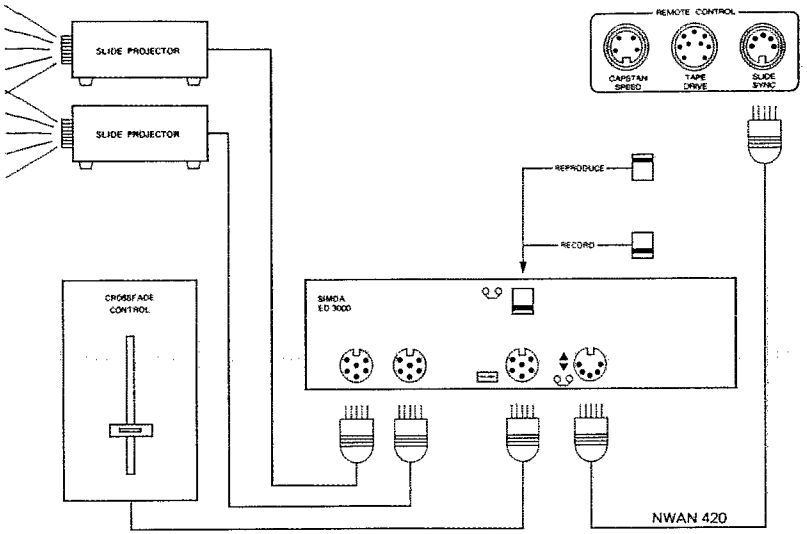

★ FOR 4-TRACK VERSION ONLY
☆ REMOVE C11 FOR USE WITH ANY ELECTRONICALLY CONTROLLED PROJECTOR

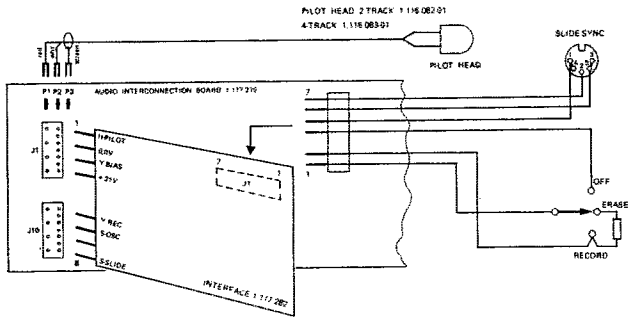
| MODE | Y-REC | S-SLIDE | RELAY | 1 kHz-OSC | DC ERASING | Ⓐ | Ⓑ | Ⓒ | Ⓓ | Ⓔ | Ⓕ | Ⓖ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PLAY | HI | 0V | (ON) | -- | -- | 15 V | 21 V | -- | 0V | 46Vrms | 1.5V AC ±0.5V | (0V) |
| RECORD + REC-SLIDE | LO | 12V | -- | -- | ON | 12.5V | 0.1V | -- | 21V | -- | 0.5V DC | 21V |
| RECORD + REC-SLIDE + SET-SLIDE | LO | 24V | ON | ON | -- | 0.1V | 21 V | 2Vrms | 0V | 15Vpp | 3 V AC ±0.7V | (0V) |
| PLAY + REC-SLIDE (CANCELS REPRO PULSES) | HI | 12V | -- | -- | -- | 15 V | 21 V | -- | 0V | -- | 0V | 21V |



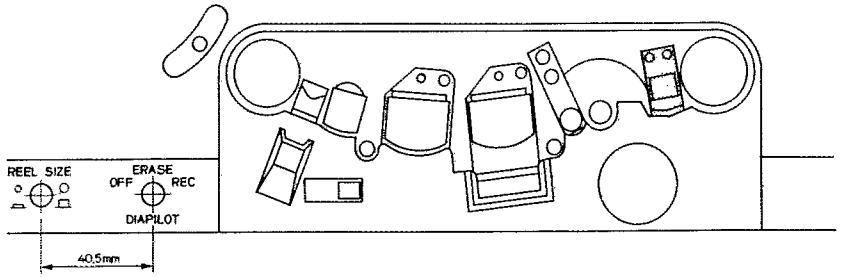

2-TRACK VERSION / KIT 74502
4-TRACK VERSION / KIT 74504

## G.3 INSTALLATION OF DISSOLVE HEAD KIT

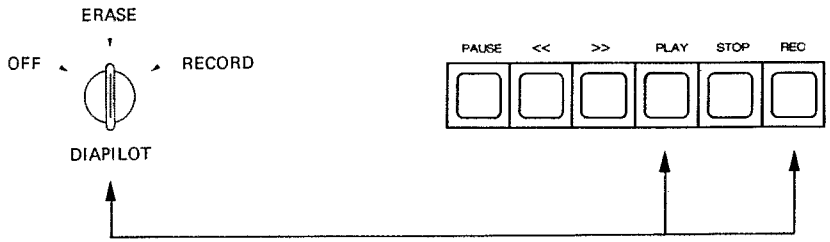



## FIG.4 HOLE DRILLING INSTRUCTIONS



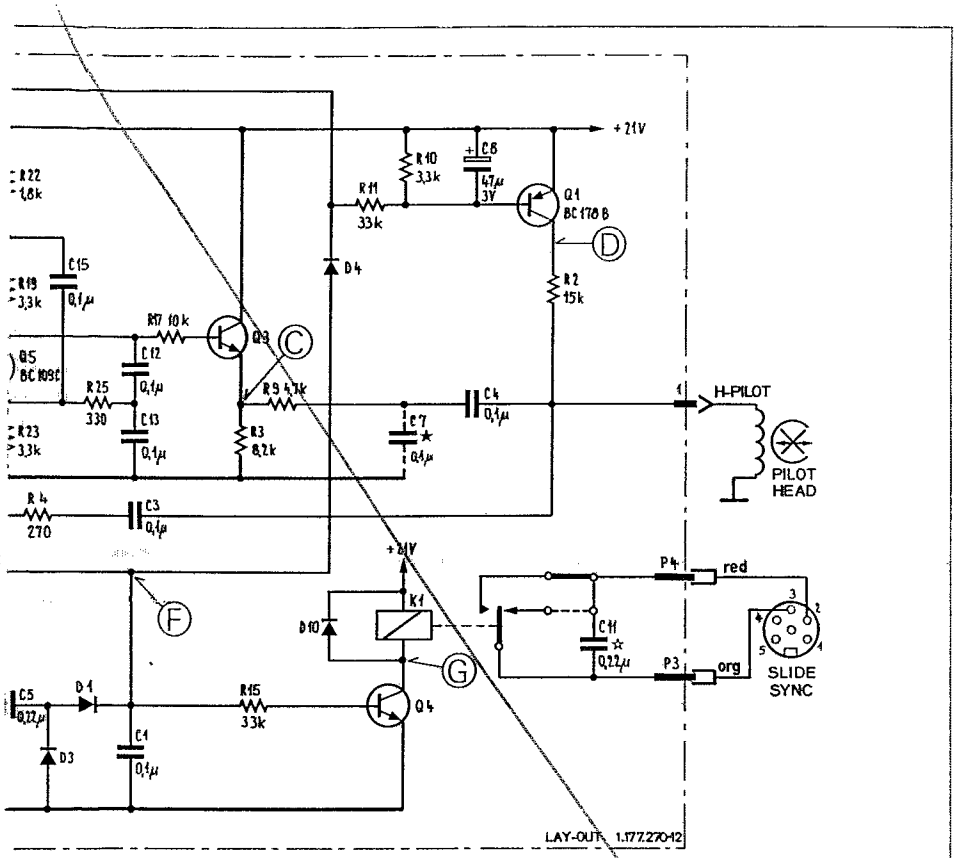

## FIG.5 DHA OPERATION




PLAY+REC ⊕ DIAPILOT "OFF" = REPRODUCTION OF PILOT-TRACK
"ERASE" = PILOT TRACK ERASED
"RECORD" = SIMDA-SIGNAL RECORDED ON PILOT-TRACK

PLAY ⊕ DIAPILOT "OFF" "ERASE" "RECORD" = REPRODUCTION OF PILOT-TRACK

POSITION OF RECORD PRESELECTORS NOT IMPORTANT FOR DIAPILOT-MODE




★ FOR 4-TRACK VERSION ONLY
☆ REMOVE C11 FOR USE WITH ANY ELECTRONICALLY CONTROLLED PROJECTOR

| MODE | Y–REC | S–SLIDE | RELAY | 1 kHz–OSC | DC ERASING | Ⓐ | Ⓑ | Ⓒ | Ⓓ | Ⓔ | Ⓕ | Ⓖ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PLAY | HI | 0V | (ON) | -- | -- | 15 V | 21 V | -- | 0V | 45Vrms | 1.5V AC ±0.5V | (0V) |
| RECORD + REC–SLIDE | LO | 12V | -- | -- | ON | 12.5V | 0 1V | -- | 21V | --- | 0.5V DC | 21V |
| RECORD + REC–SLIDE + SET–SLIDE | LO | 24V | ON | ON | -- | 0 1V | 21 V | 2Vrms | 0V | 15Vpp | 3 V AC ±0.7V | (0V) |
| PLAY + REC–SLIDE (CANCELS REPRO PULSES) | HI | 12V | -- | -- | -- | 15 V | 21 V | -- | 0V | -- | 0V | 21V |



## DISSOLVE HEAD AMPLIFIER PCB 1.177.282 (INTERFACE SIMDA ED 3000 P)

| IND | POS NO | PART NO | VALUE | SPECIFICATIONS/EQUIVALENT | MFR |
|---|---|---|---|---|---|
| | C 01 | 59.31.2103 | 10 N | 20% 100V MPETP | |
| | C 02 | 59.32.1152 | 1500 P | 10% 400V CER | |
| | C 03 | 59.11.3562 | 5,6 N | 10% 100V PC | |
| | C 04 | 59.31.1224 | 220 N | 20% 100V MPETP | |
| | C 05 | 59.30.4100 | 10 U | 20% 16V TA | |
| | C 06 | 59.30.4100 | 10 U | | |
| | C 07 | 59.31.1104 | 100 N | 20% 100V MPETP | |
| | C 08 | 59.31.1104 | 100 N | | |
| | C 09 | 59.30.4100 | 10 U | 20% 16V TA | |
| | C 10 | 59.11.6561 | 560 P | 5% 400V PC | |
| | C 11 | 59.30.1479 | 47 U | 20% 3V TA | |
| | C 12 | 59.30.4100 | 10 U | 20% 16V TA | |
| | C 13 | 59.31.1104 | 100 N | 20% 100V MPETP | |
| | D 01 | 50.04.0125 | 1N4448 | | |
| | D 02 | 50.04.0125 | 1N4448 | | |
| | D 03 | 50.04.0825 | 1N4448 | | |
| | D 04 | 50.04.0125 | 1N4448 | | |
| | D 05 | 50.04.0125 | 1N4448 | | |
| | D 06 | 50.04.0825 | 1N4448 | | |
| | D 07 | 50.04.0125 | 1N4448 | | |
| | D 08 | 50.04.1119 | 15 V | Z | |
| | J 01 | 54.01.0244 | 7-Pole | Socket-Strip AMP | |
| | IC 01 | 50.05.0245 | MC4558 | | |
| | K 01 | 56.04.0440 | 500 Ω | Relais 12V | N |

| IND | DATE | NAME |
|---|---|---|
| | | N = National |
| | 23.5.79 | R.W/gv |

STUDER Interface Simda ED3000P/B77 1.177.282.00 PAGE 1 OF 3

| IND | POS NO | PART NO | VALUE | SPECIFICATIONS/EQUIVALENT | MFR |
|---|---|---|---|---|---|
| | R 14 | 57.11.4103 | 10 k | 5% .25W CF | |
| | R 15 | 57.11.4224 | 220 k | | |
| | R 16 | 58.02.5103 | 10 k | 20% .1 W PCF | |
| | R 17 | 57.11.4104 | 100 k | 5% .25W CF | |
| | R 18 | 57.11.4224 | 220 k | | |
| | R 19 | 57.11.4153 | 15 k | | |
| | R 20 | 57.11.4223 | 22 k | | |
| | R 21 | 57.11.4224 | 220 k | | |
| | R 22 | 57.11.4103 | 10 k | | |
| | R 23 | 57.11.4332 | 3,3 k | | |
| | R 24 | 57.11.4224 | 220 k | | |
| | R 25 | 57.11.4154 | 150 k | | |
| | R 26 | 57.11.4105 | 1 M | | |
| | R 27 | 57.11.4102 | 1 k | | |
| | R 28 | 57.11.4153 | 15 k | | |
| | R 29 | 57.11.4222 | 2,2 k | | |
| | R 30 | 57.11.4104 | 100 k | | |
| | R 31 | 57.11.4332 | 3,3 k | | |

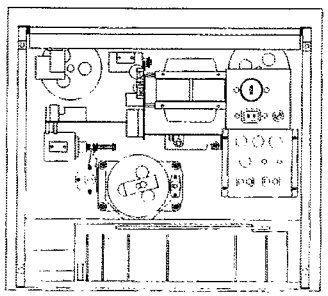
| IND | DATE | NAME |
|---|---|---|
| | 23.5.79 | R.W/gv |

STUDER Interface Simda ED3000P/B77 1.177.282.00 PAGE 3 OF 3

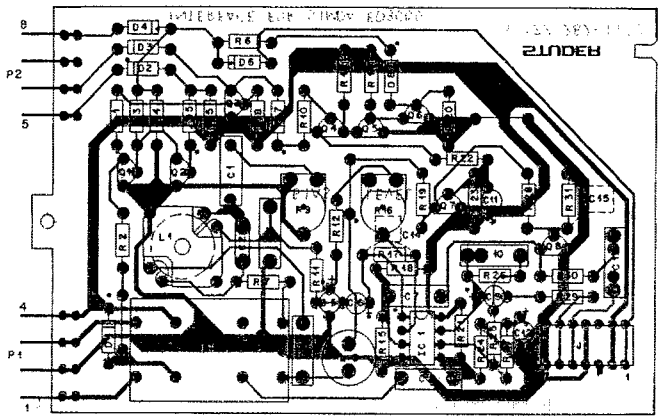
| IND | POS NO | PART NO | VALUE | SPECIFICATIONS/EQUIVALENT | MFR |
|---|---|---|---|---|---|
| | L 01 | 1.022.141.00 | | RF Transformer | |
| | L 02 | 62.02.3473 | 47 mH | | |
| | P 01 | 54.01.0470 | 4-Pole | PIN-Strip AMP | |
| | P 02 | 54.01.0470 | 4-Pole | PIN-Strip AMP | |
| | Q 01 | 50.03.0436 | BC107B | NPN | |
| | Q 02 | 50.03.0436 | BC107B | NPN | |
| | Q 03 | 50.03.0318 | BC178A | PNP | |
| | Q 04 | 50.03.0436 | BC107B | NPN | |
| | Q 05 | 50.03.0436 | BC107B | NPN | |
| | Q 06 | 50.03.0436 | BC107B | NPN | |
| | Q 07 | 50.03.0318 | BC178A | PNP | |
| | Q 08 | 50.03.0436 | BC107B | NPN | |
| | R 01 | 57.11.4472 | 4,7 k | 5% .25W CF | |
| | R 02 | 57.11.4391 | 390 | | |
| | R 03 | 57.11.4153 | 15 k | | |
| | R 04 | 57.11.4472 | 4,7 k | | |
| | R 05 | 57.11.4223 | 22 k | | |
| | R 06 | 57.11.4222 | 2,2 k | | |
| | R 07 | 57.11.4471 | 470 | | |
| | R 08 | 57.11.4223 | 22 k | | |
| | R 09 | 58.02.5103 | 10 k | 20% .1 W PCF | |
| | R 10 | 57.11.4103 | 10 k | 5% .25W CF | |
| | R 11 | 57.11.4562 | 5,6 k | | |
| | R 12 | 57.11.4472 | 4,7 k | | |
| | R 13 | 57.11.4472 | 4,7 k | | |

| IND | DATE | NAME |
|---|---|---|
| | 23.5.79 | R.W/gv |

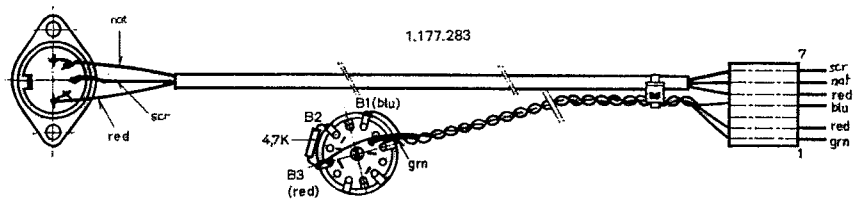
STUDER Interface Simda ED3000P/B77 1.177.282.00 PAGE 2 OF 3



## DISSOLVE HEAD AMPLIFIER PCB 1.177.282 (INTERFACE SIMDA ED 3000 P)



## WIRE HARNESS TO DHA–KIT

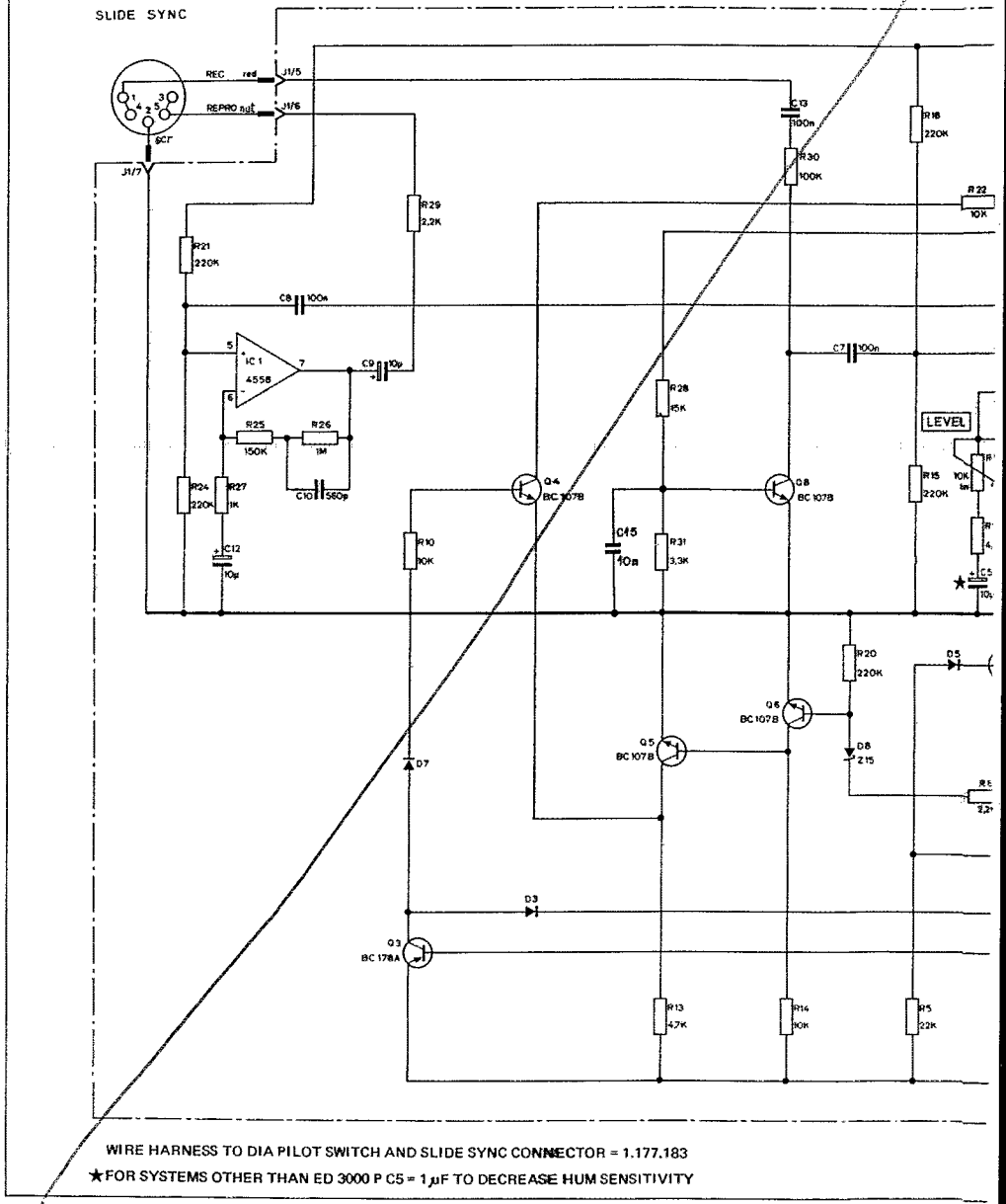



## PILOT TRACK VERSIONS





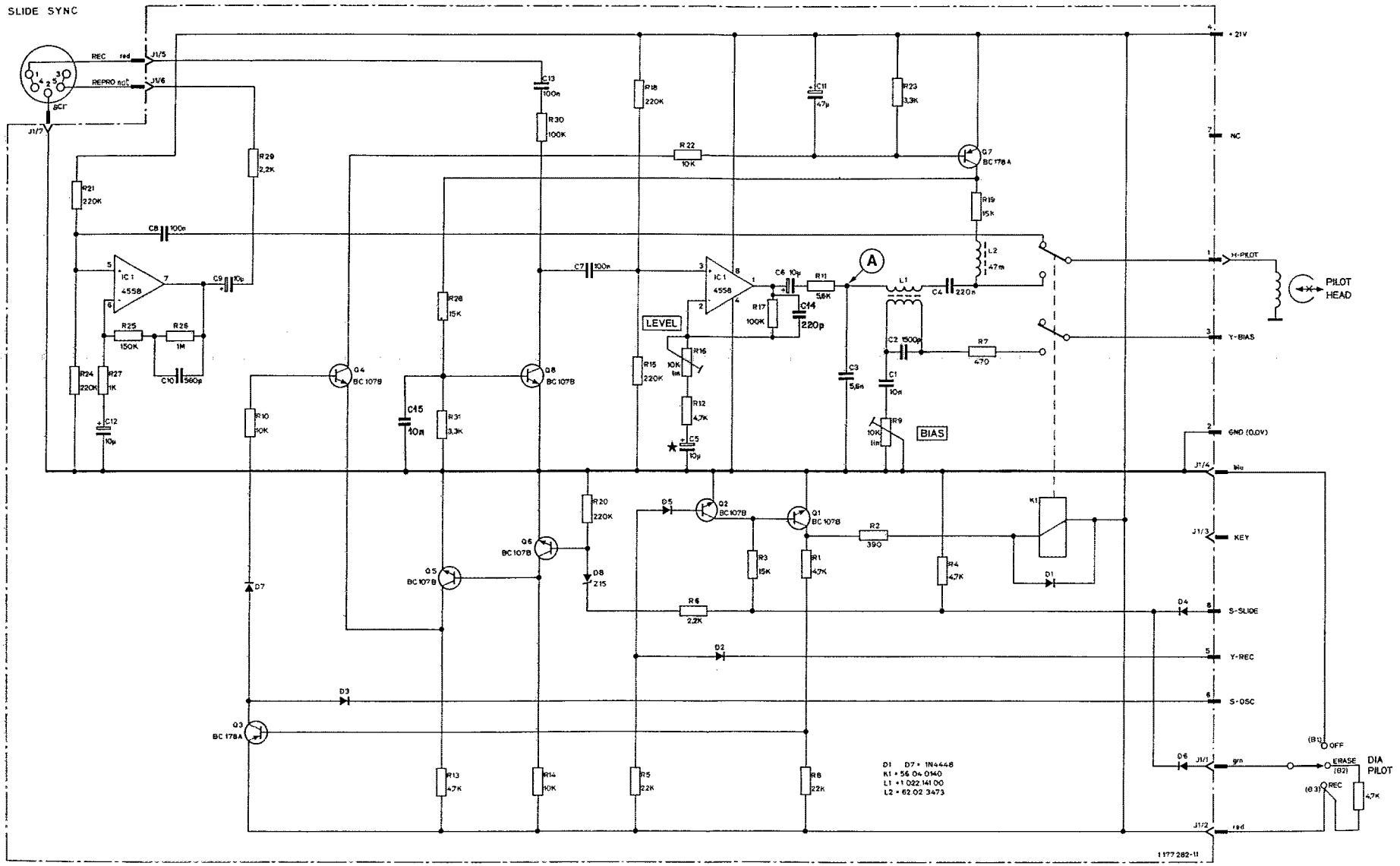

## DISSOLVE HEAD AMPLIFIER PCB 1.177.282 (INTERFACE SIMDA ED 3000 P)




WIRE HARNESS TO DIA PILOT SWITCH AND SLIDE SYNC CONNECTOR = 1.177.183

★FOR SYSTEMS OTHER THAN ED 3000 P C5 = 1 µF TO DECREASE HUM SENSITIVITY

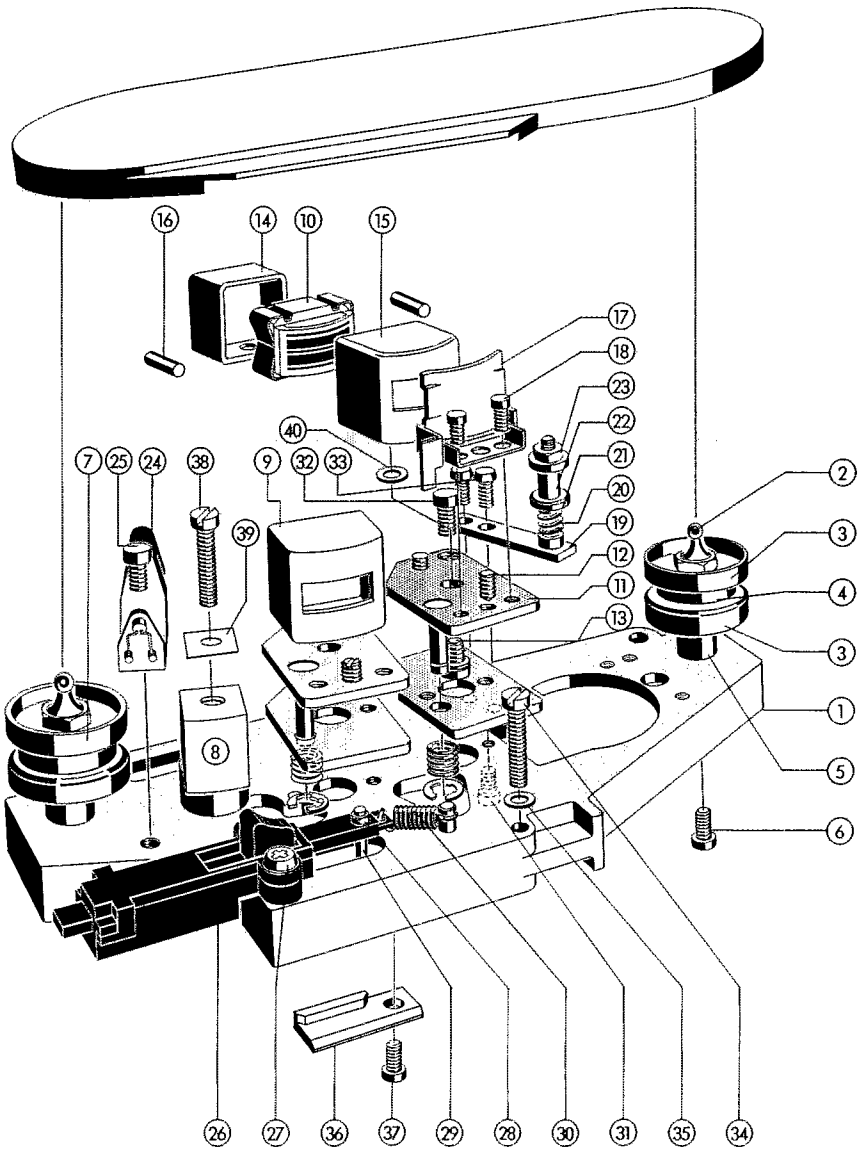
## DISSOLVE HEAD AMPLIFIER PCB 1.177.282 (INTERFACE SIMDA ED 3000 P)




WIRE HARNESS TO DIA PILOT SWITCH AND SLIDE SYNC CONNECTOR = 1.177.183

★FOR SYSTEMS OTHER THAN ED 3000 P C5 = 1 µF TO DECREASE HUM SENSITIVITY

TAPE HEAD ASSEMBLY

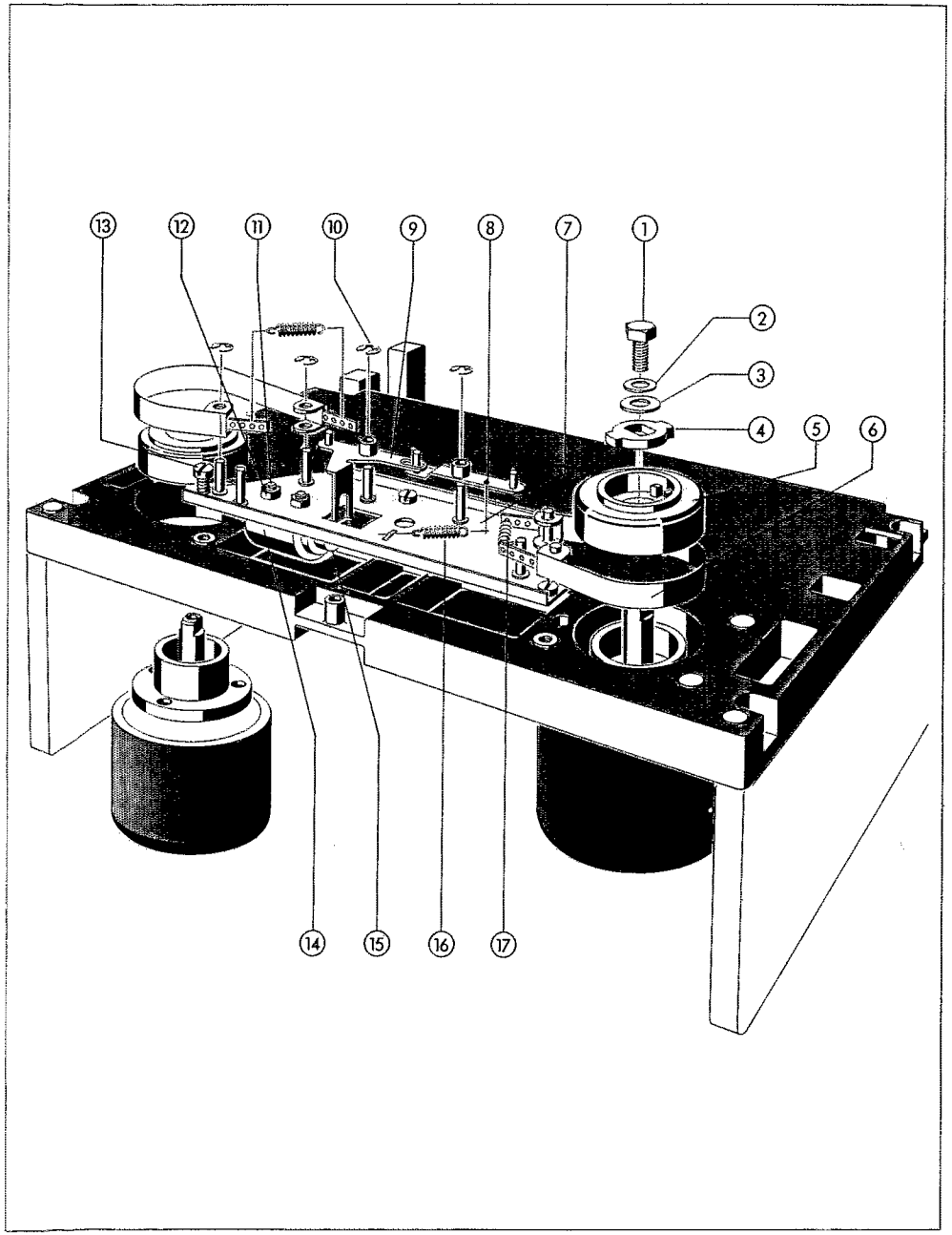





TAPE HEAD ASSEMBLY

| INDEX | QTY | | ORDER NUMBER | PART NAME |
|---|---|---|---|---|
| | | | 1.020.300.00 | Tape head assembly compl. 1/4",2-track |
| | | | 1.020.301.00 | Tape head assembly compl. 1/4",4-track |
| 01 | 1 | | 1.020.300.01 | Tape head chassis |
| 02 | 2 | | 1.020.300.06 | Centering screw |
| 03 | 4 | | 1.077.121.02 | Tape guide cup |
| 04 | 1 | | 1.077.121.04 | Spacer |
| 05 | 2 | | 1.020.300.04 | Threaded support |
| 06 | 2 | | 21.26.0455 | Screw M4x8 |
| 07 | 1 | | 41.99.0102 | Ball bearing |
| 08 | 1 | | 1.116.098.01 | Erase head 1/4",2-track |
| from | 57329 | | 1.116.098.04 | Erase head 1/4",2-track |
| | 1 | | 1.116.099.01 | Erase head 1/4",4-track |
| from | 60977 | | 1.116.099.04 | Erase head 1/4",4-track |
| 09 | 1 | | 1.116.022.00 | Record head 1/4",2-track |
| | 1 | | 1.116.042.00 | Record head 1/4",4-track |
| 10 | 1 | | 1.116.027.00 | Reproduce head 1/4",2-track |
| | 1 | | 1.116.047.00 | Reproduce head 1/4",4-track |
| 11 | 2 | | 1.020.801.00 | Head mounting plate compl. |
| 12 | 4 | | 21.18.6354 | Set screw |
| 13 | 2 | | 21.99.0118 | Screw M3x7 |
| 14 | 2 | | 1.077.155.05 | Head housing, internal |
| 15 | 2 | | 1.077.155.06 | Head housing, outer |
| 16 | 4 | | 1.077.155.07 | Plastic pin |
| 17 | 1 | | 1.020.311.00 | Shielding lid compl. |
| 18 | 2 | | 21.01.0202 | Screw M2x4 |
| 19 | 1 | | 1.020.310.00 | Clamp, riveted |
| 20 | 1 | | 1.020.820.12 | Pressure spring |
| 21 | 2 | | 1.077.145.01 | Guide disk |
| 22 | 1 | | 1.077.145.02 | Spacer sleeve |
| 23 | 1 | | 22.01.8030 | Nut M3 |
| 24 | 1 | | 1.020.320.00 | Light gate compl. |
| to above | 1 | | 23.01.3032 | Washer |
| 25 | 1 | | 21.26.0354 | Screw M3x6 |
| 26 | 1 | | 1.020.318.00 | Edit switch compl. |

BRAKE SYSTEM






BRAKE SYSTEM

| INDEX | QTY | | ORDER NUMBER | PART NAME |
|---|---|---|---|---|
| 01 | 2 | | 21.01.4455 | Screw M4x8 |
| 02 | 2 | | 23.01.3043 | Washer |
| 03 | 2 | | 37.01.0103 | Cup washer |
| 04 | 2 | | 1.067.100.27 | Driver |
| 05 | 2 | | 1.077.562.00 | Brake drum |
| 06 | 2 | | 1.077.421.00 | Brake band compl. |
| 07 | 1 | | 1.077.406.00 | Brake chassis compl. |
| 08 | 1 | | 1.077.415.00 | Brake lever |
| 09 | 1 | | 1.077.411.00 | Brake lever |
| 10 | 6 | | 24.16.3032 | Circlip |
| 11 | 2 | | 21.26.0353 | Screw (M3x5 max.) |
| 12 | 2 | | 23.01.2032 | Washer M3 |
| 13 | 3 | | 21.26.0354 | Screw M3x6 |
| 14 | 1 | | 1.014.805.00 | Brake solenoid |
| from | 21618 | | 1.014.806.00 | Brake solenoid |
| 15 | 1 | | 1.014.803.00 | Plunger to brake solenoid |
| from | 21618 | | 1.014.808.00 | Plunger to brake solenoid |
| 16 | 1 | | 1.062.210.06 | Tension spring |
| 17 | 2 | | 1.077.100-13 | Tension spring |

## 9. Spezialversionen
### 9.1. B77 mit Diasteuerung
#### 9.1.1. Allgemeines

Die B77 mit Diasteuerung ist mit einem Spezial-Tonkopf für die Steuerimpuls-Aufnahme und -Wiedergabe ausgerüstet. Die Steuerimpulse werden zwischen zwei Spuren gespeichert, dadurch ist es nicht nötig, eine Tonspur für die Steuerimpulse zu verbrauchen

Zugehörige Schemata 7–35/7–37

### 9.2. Tonbandmaschine B77 HS (High Speed)
#### 9.2.1. Allgemeines

Bei der Tonbandmaschine B77 HS mussten einige Baugruppen abgeändert werden.

Die zu Kapitel 5.1. nicht identischen Baugruppen sind:

| | |
|---|---|
| Aufnahmeverstärker | |
| Entzerrung CCIR | 1.177.233 |
| Entzerrung NAB | 1.177.232 |
| Wiedergabeverstärker | |
| Entzerrung CCIR | 1.177.253 |
| Entzerrung NAB | 1.177.252 |
| Capstanmotor 19/38 | 1.021.302 00 |

Zugehörige Schemata

| | |
|---|---|
| 1.177.232/233 | 7–23a/7–23b |
| 1.177.252/253 | 7–27a/7–27b |

#### 9.2.2. Daten

Der Einfachheit halber sind nur die von der Normalversion abweichenden Daten aufgeführt.

*Tonhöhenschwankungen:*
(nach DIN 45507)
*bei 19 cm/s*
besser als 0,08 %
*bei 38 cm/s*
besser als 0,06 %

*Frequenzgang:*
(über Band gemessen bei –20 VU)
*bei 19 cm/s*

| | |
|---|---|
| 30 Hz ... 20 kHz | + 2 –3 dB |
| 50 Hz ... 15 kHz | ± 1,5 dB |

*bei 38 cm/s*

| | |
|---|---|
| 30 Hz ... 22 kHz | + 2 –3 dB |
| 50 Hz ... 18 kHz | ± 1,5 dB |

## 9. Special Versions
### 9.1. B77 with slide synchronizing electronics
#### 9.1.1. General

For slide presentations with synchronous sound accompaniment, the B77 recorder must be equipped with a special magnetic head to record and to reproduce the sync impulses. These impulses are recorded on the "land" between the two audio tracks, which means that both tracks are available for stereophonic sound reproduction.

Relating circuit diagrams 7–35/7–37

### 9.2. Tape recorder B77 "HS" (High Speed)
#### 9.2.1. General

In the HS version of the B77 tape recorder, several subassemblies had to be changed.

The following assemblies are not identical with those described in chapter 5.1.:

| | |
|---|---|
| Recording amplifier | |
| CCIR equalization | 1.177.233 |
| NAB equalization | 1.177.232 |
| Replay amplifier | |
| CCIR equalization | 1.177.253 |
| NAB equalization | 1.177.252 |
| Capstan motor 19/38 | 1.021 302.00 |

Relating circuit diagrams

| | |
|---|---|
| 1.177.232/233 | 7–23a/7–23b |
| 1.177.252/253 | 7–27a/7–27b |

#### 9.2.2. Performance data

For the sake of simplicity, only the data differing from the standard version are listed.

*Wow and flutter:*
(per DIN 45507)
*at 7.5 ips*
less than 0.08 %
*at 15 ips*
less than 0.06 %

*Frequency response:*
(measured via tape, at –20 VU)
*at 7.5 ips*

| | |
|---|---|
| 30 Hz ... 20 kHz | + 2 –3 dB |
| 50 Hz ... 15 kHz | ± 1.5 dB |

*at 15 ips*

| | |
|---|---|
| 30 Hz ... 22 kHz | + 2 –3 dB |
| 50 Hz ... 18 kHz | ± 1.5 dB |

## 9. Versions spéciales
### 9.1. B77 avec synchronisateur de diapositives
#### 9.1.1. Généralités

Le magnétophone B77 avec synchronisateur de diapositives est équipé d'une tête magnétique spéciale supplémentaire pour l'enregistrement et la lecture des impulsions de commande. Ces impulsions sont enregistrées entre les deux pistes, laissant ces dernières absolument libres.

Schéma correspondant 7–35/7–37

### 9.2. Magnétophone B77 "HS" (High Speed)
#### 9.2.1. Généralités

Dans cette version un certain nombre de modules sont modifiés.

Les modules différents du chapitre 5.1. sont:

| | |
|---|---|
| Amplificateur d'enregistrement | |
| Norme CCIR | 1.177.233 |
| Norme NAB | 1.177.232 |
| Amplificateur de lecture | |
| Norme CCIR | 1.177.253 |
| Norme NAB | 1.177.252 |
| Moteur de cabestan 19/38 | 1.021.302.00 |

Schémas correspondants

| | |
|---|---|
| 1.177.232/233 | 7–23a/7–23b |
| 1.177.252/253 | 7–27a/7–27b |

#### 9.2.2. Caractéristiques

Afin de simplifier, seules les caractéristiques de la version standard sont données.

*Pleurage:*
(d'après DIN 45507)
*à 19 cm/s*
meilleur que 0,08 %
*à 38 cm/s*
meilleur que 0,06 %

*Réponse en fréquence:*
(enregistrement-lecture, mesuré à –20 VU)
*à 19 cm/s*

| | |
|---|---|
| 30 Hz ... 20 kHz | + 2 dB –3 dB |
| 50 Hz ... 15 kHz | ± 1,5 dB |

*à 38 cm/s*

| | |
|---|---|
| 30 Hz ... 22 kHz | + 2 dB –3 dB |
| 50 Hz ... 18 kHz | ± 1,5 dB |

*räuschspannungsabstand:*
ch ASA-A 2-Spur)
ogen auf Vollaussteuerung (514 nWb/m)

| *cm/s* | *38 cm/s* |
|---|---|
| 6 dB | > 65 dB |

*Signal to noise ratio:*
(weighted as per ASA-A, measured via tape)
half track

| *at 7.5 ips* | *at 15 ips* |
|---|---|
| > 66 dB | > 65 dB |

*Rapport signal/bruit:*
(d'après ASA-A, enregistrement-lecture)
2 pistes

| *à 19 cm/s* | *à 38 cm/s* |
|---|---|
| > 66 dB | > 65 dB |

*AS-Einstellung:*

| | ΔU-19 cm/s | ΔU-38 cm/s |
|---|---|---|
| VOX 601 | 4 dB | 2 dB |
| VOX 621 | 4 dB | 2,5 dB |
| VOX 631 | 6 dB | 4 dB |

*BIAS adjustment:*

| | ΔU-7.5 ips | ΔU-15 ips |
|---|---|---|
| REVOX 601 | 4 dB | 2 dB |
| REVOX 621 | 4 dB | 2.5 dB |
| REVOX 631 | 6 dB | 4 dB |

*Ajustement du courant de prémagnetisation:*

| | ΔU-19 cm/s | ΔU-38 cm/s |
|---|---|---|
| REVOX 601 | 4 dB | 2 dB |
| REVOX 621 | 4 dB | 2,5 dB |
| REVOX 631 | 6 dB | 4 dB |

ungen vorbehalten — Subject to change — Sous réserve de modification.

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