

STUDER

# A810

## OPERATING AND SERVICE INSTRUCTIONS





Prepared and edited by  
STUDER INTERNATIONAL  
(a division of STUDER REVOX AG)  
TECHNICAL DOCUMENTATION  
Althardstrasse 10  
CH-8105 Regensdorf-Zürich

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**SICHERHEIT UND ERSTE HILFE****SICHERHEIT**

Durch Entfernen von Gehäuseteilen, Abschirmungen etc. werden stromführende Teile freigelegt. Aus diesem Grunde müssen die folgenden Sicherheitsvorschriften unbedingt beachtet werden:

1. **Eingriffe in ein Gerät** dürfen nur von Fachpersonal vorgenommen werden.
2. **Vor Entfernen von Gehäuseteilen:** Gerät ausschalten und vom Netz trennen.
3. **Bei geöffnetem Gerät:**
  - Netzteil- oder Motorkondensatoren mit einem passenden Widerstand entladen.
  - Bauteile grosser Leistung, wie Leistungstransistoren und -widerstände sowie Magnetspulen und Wickelmotoren erst nach dem Abkühlen berühren.
4. **Servicearbeiten bei geöffnetem, unter Spannung stehendem Gerät:**
  - Keine blanken Schaltungsteile berühren
  - Isolierte Werkzeuge verwenden
  - Metallene Halbleitergehäuse nicht berühren, da sie hohe Spannungen aufweisen können.

**ERSTE HILFE** (bei Stromunfällen)

1. **Bei einem Stromunfall die betroffene Person raschmöglichst vom Strom trennen:**
  - Durch Ausschalten des Gerätes
  - Ausziehen oder Unterbrechen der Netzzuleitung
  - Betroffene Personen mit isoliertem Material (Holz, Kunststoff) von der Gefahrenquelle wegstossen
  - Nach einem Stromunfall sollte immer ein Arzt aufgesucht werden.

**ACHTUNG**

EINE UNTER SPANNUNG STEHENDE PERSON DARF NICHT BERÜHRT WERDEN, SIE KÖNNEN DABEI SELBST ELEKTRISIERT WERDEN!

2. **Bei Bewusstlosigkeit des Verunfallten:**
  - Puls kontrollieren,
  - bei ausgesetzter Atmung künstlich beatmen,
  - Seitenlagerung des Verunfallten und Arzt verständigen.

**SAFETY AND FIRST AID****SAFETY**

There are no user serviceable components inside the equipment, live parts are laid open when removing protective covers and shieldings. It is essential therefore to ensure that the subsequent safety rules are strictly observed when performing service work or repairs.

1. **Servicing of electronic equipment** must be performed by qualified personnel only.
2. **Before removing covers:** Switch off the equipment and unplug the mains cable.
3. **When the equipment is open:**
  - Discharge power supply- and motor capacitors through a suitable resistor.
  - Components, that carry heavy electrical loads, such as power transistors and resistors as well as solenoid coils and motors should not be touched before a cooling off interval, as a precaution to avoid burns.
4. **Servicing unprotected and operating equipment:**
  - Never touch bare wires or circuitry
  - Use insulated tools only
  - Never touch metal semiconductor cases because they may carry high voltages.

**FIRST AID** (in case of electric shock)

1. **Separate the person as quickly as possible from the electric power source:**
  - by switching off the equipment,
  - unplugging or disconnecting the mains cable,
  - pushing the person away from the power source by using dry insulating material (such as wood or plastic).
  - After having sustained an electric shock, always consult a doctor.

**WARNING:**

DO NOT TOUCH THE PERSON OR HIS CLOTHING BEFORE POWER IS TURNED OFF, OTHERWISE YOU STAND THE RISK OF SUSTAINING AN ELECTRIC SHOCK AS WELL!

2. **If the person is unconscious**
  - Check the pulse,
  - reanimate the person if respiration is poor,
  - lay the body down and turn it to one side, call for a doctor immediately.

**SÉCURITÉ ET PREMIERS SECOURS****SÉCURITÉ**

Si les couvercles de protection sont enlevés, les parties de l'appareil qui sont sous tension ne sont plus protégées. Il est donc d'une nécessité absolue de suivre les instructions suivantes:

1. **Les interventions dans les appareils électriques** doivent être faites uniquement que par du personnel qualifié
2. **Avant d'enlever les couvercles de protection:** Couper l'interrupteur principal et débrancher le câble secteur.
3. **Après avoir enlevé les couvercles de protection:**
  - Les condensateurs de l'alimentation et des moteurs doivent être déchargés à l'aide d'une résistance appropriée.
  - Il est prudent de laisser refroidir les composants de haute puissance, par ex.: transistors de puissance, résistances de puissances de même que des électroaimants et les moteurs de bobinage.
4. **S'il faut que l'appareil soit sous tension pendant les réglages internes:**
  - Ne jamais toucher les circuits non isolés
  - Travailler seulement avec des outils isolés

**PREMIERS SECOURS** (en cas d'électrocution)

1. **Si la personne est dans l'impossibilité de se libérer:**
  - Couper l'interrupteur principal
  - Couper le courant
  - Repousser la personne de l'appareil à l'aide d'un objet en matière non conductrice (matière plastique ou bois)
  - Après une électrocution, consulter un médecin.

**ATTENTION**

NE JAMAIS TOUCHER UNE PERSONNE QUI EST SOUS TENSION, SOUS PEINE DE SUBIR ÉGALEMENT UNE ÉLECTROCUTION

2. **En cas de perte de connaissance de la personne électrocutée:**
  - Contrôler le pouls
  - Si nécessaire, pratiquer la respiration artificielle
  - Mettre l'accidenté sur le côté latérale et consulter un médecin.

**KORRIGENDA**

Notieren Sie bitte die untenstehenden Korrekturen an den angegebenen Stellen im Buch und beachten Sie die Hinweise auf die in Kapitel 9 aufgeführten neuen Elektronik-Baugruppen. Diese Blätter können bei Bedarf in den Kapiteln 5 - 7 an den betreffenden Stellen eingereicht werden.

**CORRECTIONS**

Please note the corrections below at the indicated places in the manual, and take notice of the references to the new electronic assemblies which are listed in Section 9. These sheets can be inserted at the corresponding places of Sections 5...7, if required.

**CORRECTIONS**

Veuillez noter les corrections dans le livre aux places nommées ici, et aussi les circuits électroniques neufs placés dans la Section 9 et indiqués ici. Ces feuilles peuvent, selon les besoins, être insérées à leurs places respectives dans les sections 5 à 7.

**P. 1/12 D**

Entzerrungs-Zeitkonstanten:

76.2 cm/s (30 ips)	38.1 cm/s (15 ips)	19.05 cm/s (7.5 ips)	9.525 cm/s (3.75 ips)
AES: 17.5/ $\frac{\mu}{s}$	CCIR: 35/ $\frac{\mu}{s}$	70/ $\frac{\mu}{s}$	90/3180 $\mu$ s
AES: 17.5/ $\frac{\mu}{s}$	NAB: 50/3180 $\mu$ s	50/3180 $\mu$ s	90/3180 $\mu$ s

**P. 1/14 D, E, F**

Klirrfaktor: (Aufnahme-Wiedergabe, 1 kHz, gemessen mit Band AGFA PER 528)  
Distortion: (Record-reproduce, 1 kHz, measured with tape AGFA PER 528)  
Distorsion: (Enregistrement-Lecture, 1 kHz, mesurée avec bande AGFA PER 528)

CCIR:	76.2cm/s (30 ips)	38.1cm/s (15 ips)	19.05cm/s (7.5 ips)	9.525cm/s (3.75 ips)
Vollspur, Full track, Pleine piste (320 nWb/m):	≤ 1.0%	≤ 1.0%	≤ 1.5%	≤ 2.0%
Stereo/2-Spur, Stereo/2-track, Stéréo/2 pistes (510 nWb/m):	≤ 1.0%	≤ 1.0%	≤ 1.5%	≤ 2.0%
(Aufnahme-Wiedergabe, 1 kHz, gemessen mit Band SCOTCH 3M 226) (Record-reproduce, 1 kHz, measured with tape SCOTCH 3M 226) (Enregistrement-Lecture, 1 kHz, mesurée avec bande SCOTCH 3M 226)				
NAB:	76.2cm/s (30 ips)	38.1cm/s (15 ips)	19.05cm/s (7.5 ips)	9.525cm/s (3.75 ips)
	400 nWb/m	510 nWb/m	510 nWb/m	510 nWb/m
Vollspur, Full track, Pleine piste:	≤ 0.5%	≤ 0.5%	≤ 0.5%	≤ 0.5%
Stereo/2-Spur, Stereo/2-track, Stéréo/2 pistes:	≤ 0.5%	≤ 0.5%	≤ 0.5%	≤ 0.5%

**P. 2/30: D, E, F**

Geänderte und neue Befehle:

Modified and new commands:

Ordres modifiés ou neufs:

Befehl Command Ordre	Antwort Answer Réponse	Bedeutung Meaning Sens	seit since dès
SMA<No.>	<CR><LF>	Setzen der Geräte-Seriennummer auf <XXXXXX> (6 Ziffern HEX) Set the recorder's serial No. to <XXXXXX> (6 digits HEX) Mettre le numéro de série de la machine sur <XXXXXX> (6 chiffres HEX)	40/85
EDT	<CR><LF>	Bandabhebelbolzen zurückgefahren Tape lifter defeated Ecarteur de bande ramené au repos	40/85
LFT	<CR><LF>	Bandabhebelbolzen normale Funktion Tape lifter normal function Ecarteur de bande fonction normale	40/85
ST?	00H<CR><LF> 80H<CR><LF> 02H<CR><LF> 82H<CR><LF> 04H<CR><LF> 84H<CR><LF> 06H<CR><LF> 86H<CR><LF> 08H<CR><LF> 88H<CR><LF> 0AH<CR><LF> 8AH<CR><LF> 0CH<CR><LF> 8CH<CR><LF> 0EH<CR><LF> 8EH<CR><LF> 10H<CR><LF> 90H<CR><LF> 12H<CR><LF> 14H<CR><LF> 94H<CR><LF>	Status-Abfrage/status request/demande état = TAPE OUT = TAPE OUT ACHIEVED = TAPE LOAD = TAPE LOAD ACHIEVED = STOP = STOP ACHIEVED = REWIND = REWIND ACHIEVED = FORWARD = FORWARD ACHIEVED = PLAY = PLAY ACHIEVED = RECORD = RECORD ACHIEVED = EDIT = EDIT ACHIEVED = LOCATE = LOCATE ACHIEVED = LOCATE + PLAY = TAPE DUMP = TAPE DUMP ACHIEVED	40/85

**P. 3/18 D, E, F**

4. Abschnitt:

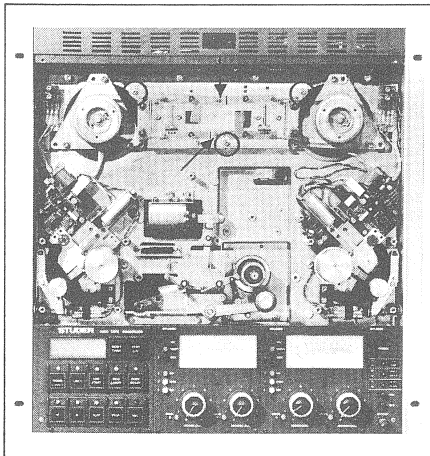
- Leichter Druck auf die beiden Bremshebel (Pfeile) löst die Bremsen so weit, dass das Bremschassis vorsichtig abgehoben werden kann.

4th paragraph:

- Press lightly on the two brake levers (arrows) to release the brakes to the point where the brake chassis can be carefully lifted.

4ième paragraphe:

- Une légère pression sur les deux leviers de freinage (flèches) détend les freins se telle sorte que le chassis des freins puisse être soulevé avec soin.





**P. 3/41 D, E, F**

Der folgende Abschnitt ersetzt den 4. Abschnitt:

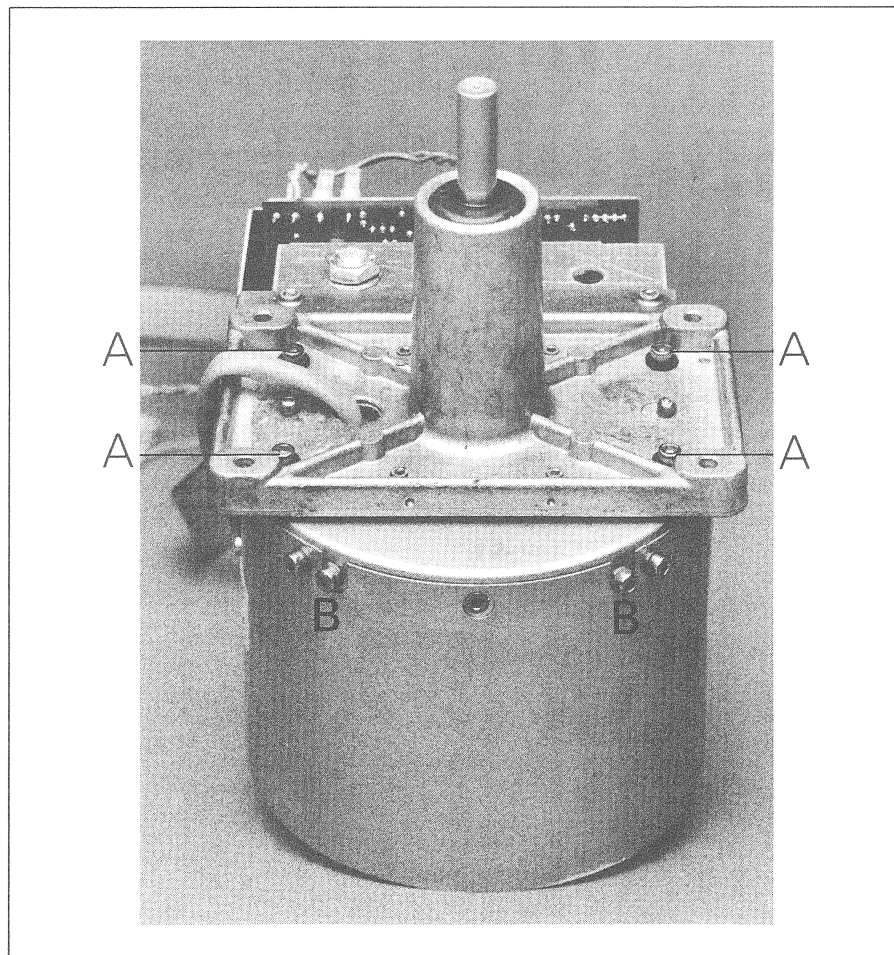
- Spulenkern von L1 im Uhrzeigersinn vorsichtig bis zum Anschlag eindrehen. Von dieser Position aus den Spulenkern 2 volle Umdrehungen im Gegenuhrzeigersinn zurückdrehen. Oszilloskop an TP1 des Tonmotor-Steuerungsprints anschliessen (Frequenz ca. 6 MHz). Das Signal darf nicht verschwinden, wenn die Isolation der beiden verdrehten Litzen zum kapazitiven Abtaster berührt wird.

The following paragraph replaces the 4. paragraph:

- Carefully turn the tuning core of L1 to the clockwise stop. Starting from this position, turn the core two complete turns counterclockwise. Connect oscilloscope to TP1 of the capstan motor control (Frequency approx. 6 MHz). The signal should not disappear when touching the insulation of the two twisted stranded wires that lead to the capacitive sensor.

Le 4ième paragraphe est remplacé par le suivant:

- Tourner soigneusement le noyau d'accord au sens des aiguilles d'une montre jusqu'à l'arrêt. De cette position, tourner le noyau 2 tours au sens inverse des aiguilles d'une montre. Raccorder l'oscilloscope à TP1 de la commande du moteur de capstan (fréquence env. 6 MHz). Le signal ne doit pas disparaître lorsqu'on touche l'isolation des deux câbles torsadés du capteur capacitif.

**P. 3/42 F**

2 vis marquées "[B]".

**P. 5/8 D, E, F**

T-BUSSW Bus switching signal; 1 = RS232, 0 = Data save.

T-DRVENB Drivers ser. IF enable/disable; 1 @ drivers enabled.

**P. 5/41 D, E, F**

STABILIZER PCB 1.810.770-81 (page 5/41) -> 1.810.770-82 (page 9/1)

Modified components:

- IC6: IPS 3524 BN.
- R44: 4.7 k $\Omega$ , 57.11.4472 .

New components:

- Inductor L3: 62.01.0115. Inserted between IC6/pin8 and Ground terminal of C14 (2200  $\mu$ F).

STABILIZER PCB 1.810.770-82 (page 9/1) -> 1.810.770-83 (page 9/1)

Modified components:

- C10: 47  $\mu$ F, 59.26.0470 .
- D2: 12 V, 50.04.1117 .
- D4: 12 V, 50.04.1117 .
- R1: 1.5 k $\Omega$ , 57.11.3152 .
- R6: 1.5 k $\Omega$ , 57.11.3152 .

STABILIZER PCB 1.810.770-83 (page 9/1) -> 1.810.770-84 (page 9/3)

Modified PCB, 1.810.770-13 .

**P. 5/51 D, E, F**

- Modified title:

MP UNIT A810 PCB 1.820.780-82 GR20 ELM01 "ESE"  
1.810.780-20/-21 GR20 ELM01 .

- Delete: "~~Has been modified for 1.820.752-84~~".

New or modified components for 1.820.780-82:

- C5: 10  $\mu$ F, 59.26.2100 .
- C8, C9: 33 pF, 59.34.2330 .
- Y1: 4.9152 MHz, 89.01.0560 .

MP UNIT A810 PCB 1.820.780-82 (page 5/51) -> 1.810.780-20 (page 5/51):

- Same circuit, new software 40/85 .

MP UNIT A810 PCB 1.810.780-20 (page 5/51) -> 1.810.780-21 (page 5/51):

- Same circuit, new software 25/86 .

**P. 5/69 D, E, F**

SERIAL REMOTE CONTROLLER 1.810.751-00 (page 5/69) -> 1.810.751-81 (page 9/5)

Modifications on PCB:

- Cut conductor between IC3, pins 9/10 .
- Make new connection from IC2, pin8 to IC3 pin9.

SERIAL REMOTE CONTROLLER 1.810.751-81 (page 9/5) -> 1.810.751-82 (page 9/5)

New components:

- R33 2.2 k $\Omega$ , 57.11.4222, from IC4 pin9 to ground.

**P. 6/6 D, E, F**

Correct designation of connectors P5 and P6:

- P5: Tape tension sensor right
- P6: Tape tension sensor left.

**P. 6/7 D, E, F**

D24, BAV20, not used.

SPOOLING MOTOR CONTROLLER 1.810.760-81 (page 6/7) -> 1.810.760-82 (page 9/7)

New components:

- L3, from connection point ACA-125 (red) to fuse F1.

**P. 6/8 D, E, F**

Correct designation of connectors P5 and P6:

- P5: Tape tension sensor right
- P6: Tape tension sensor left.

**P. 6/9 D, E, F**

TAPE TENSION SENSOR PCB LEFT 1.810.730-82 GRP27 "ESE":

Modified components:

- C1: 22 nF, 59.06.0223 .

**P. 6/17 D, E, F**

VARISPEED CONTROL PCB 1.810.762-81 (page 6/17) -> 1.810.762-82 (page 9/9):

Modified components:

- C3: 1000  $\mu$ F, 59.99.1700 .

Modifications on PCB:

- Cut conductor from IC2, pin7 to switch S1a, pin7 (upper connection point in diagram).
- Make new connection from IC4, pin1 to switch S1b, pin4 (upper connection point in diagram).

**P. 7/5 D, E, F**

Modified components:

- C2: 47  $\mu$ F (bipolar), 59.99.0401 .

REPRODUCE AMPLIFIER PCB 1.820.710.00/-81/-82 (page 7/5) -> 1.820.710-83 (page 9/19):

Modified components:

- C5: 100  $\mu$ F, 59.99.5101 .
- R17: 10 k $\Omega$ , 57.11.4103 .

New components (refer to component layout diagram, page 9/20):

- D4: BAT85, 50.04.0127 (Anode to emitter Q1, cathode to ground).
- Q3: J111, 50.03.0216 .

REPRODUCE AMPLIFIER PCB 1.820.710-83 (page 9/19) -> 1.820.710-84 (page 9/21):

Modified components:

- PCB 1.820.714-14 .
- C8: 47 pF, 59.34.2470 .
- C9: not used.
- D4: 1N4448, 50.04.0125 .
- Q1: BC550C, 50.03.0407 .
- Q2: BC337, 50.03.0516 .
- Q3: J111, 50.03.0216 .
- R3: 130 k $\Omega$ , 57.11.3134 .
- R4: 180 k $\Omega$ , 57.11.4184 .

Additional components:

- C44: 0.1  $\mu$ F, 59.06.0104 .
- D5: 24 V, 50.04.1121
- Q4: BC550C, 50.03.0407 .
- R65: 10 M $\Omega$ , 57.11.5106 .
- R66: 2.2 k $\Omega$ , 57.11.4222 .
- R67: 1.0 k $\Omega$ , 57.11.4102 .

**P. 7/43 D, E, F**

Insert following text (below the diagram):

For 1.820.722.00:

- IC2: MC6803, 50.16.0105
- Y1: 4.000 MHz, 89.01.0550



**P. 8/10 D, E, F**

Pos. 17:

- 1 1.020.850.24 Umlenkbolzen rechts  
Right-hand tape guide pin

**P. 8/16 D, E, F**

Pos. 05:

- 1 1.810.115.81 Dämpfungspumpe links kompl.  
Dashpot left compl.

**P. 8/14 D, E, F**

- 1 1.810.150.81 Umlenkrolle rechts kompl.  
Right-hand guide roller compl.

Pos. 04:

- 1 1.810.116.81 Dämpfungspumpe rechts kompl.  
Dashpot right compl.

**P. 8/35 D, E, F**

Pos. 17 (Zusätzlich / in addition):

- 1 1.820.570.02 Blindplatte für Monitor  
Dummy plate monitor

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■=ELECTROSTATICALLY SENSITIVE ASSEMBLY

SI (Service information) No. 95/86 (A810 Software 40/85)

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## 1. GENERAL REFERENCES

### 1.1 QUICK-REFERENCE DESCRIPTION

By virtue of its compact and highly rigid construction, its inherent system flexibility, and the superior operating convenience achieved by the microprocessor control system, the STUDER A810 tape recorder is universally suited for applications in broadcasting or television, for use in studios or on OB vans, in theaters, film studios, and scientific institutes.

Some of its outstanding features include:

- Highly rigid, die-cast aluminium alloy chassises for tape transport, head-block assembly, pressure roller assembly, and other assemblies.
- Manually manipulatable head shield above record and reproduce heads; can stay closed during spooling.
- Capstan motor servo control with quartz-controlled reference and capacitive sensing tacho system for highly accurate tape speeds.
- Gentle tape handling is ensured by electronically controlled tape tension, servo-controlled AC spooling motors, and non-contacting tape tension sensors. Pulse-width-modulated spooling motor control minimizes power dissipation and requires no separate heat sinking.
- Accurate electronic tape timer with real-time display; photoelectric scanning of guide roller rotation by opto switches.
- Convenient editing: four spooling speeds; the high end of the reproduce frequency response is de-emphasized for speaker protection; tape lift during spooling can be defeated either by pressing a button or mechanically by shifting the pressure roller.  
Blocked tape tension sensors and decreased braking torque in STOP mode.  
A tape marker and built-in tape scissors are available as options.
- Monitor speaker built into tape transport cover (except console versions with penthouse where the monitor speaker is built into the panel)

The high system flexibility means that a suitable A810 version is available for any type of application:

- Standard types in mono, 2-channel or stereo versions, with or without VU-meter panel.
- Operates in any position from horizontal to vertical, suited for 19" rack or console mounting. Available as a box-mounted model with removable lid or portable model with lateral handles or wooden side panels with handles.
- LS versions:
  - 3 Tape speeds (3.75 - 7.5 - 15 ips) selectable with front-panel rotary switch. Time code operation not possible at 3.75 ips.
- HS versions:
  - 4 Tape speeds (3.75 - 7.5 - 15 - 30 ips) selectable with front-panel rotary switch. Time code operation not possible at 3.75 ips.
- Inputs and outputs balanced and floating, available with or without input/output transformers.
- Switch for NAB or CCIR equalization (7.5 and 15 ips).
- Tape bias switch for two tape formulations with different calibration data.
- Sync facility, zerolocator, and 4-address transferlocator (autolocator) included as standard features.
- Output selector buttons: INP (input), REP (reproduce) and SYNC.
- VU-meter panel with SAFE/READY switch, record and reproduce level controls, buttons for bypassing the level controls (calibrated, with line level). Internally switchable level meter: VU or PPM indication.
- Selectable line voltage: 100, 120, 140, 200, 220, 240 VAC  $\pm 10\%$ , 50...60 Hz.
- Terminals for connecting fader start, parallel remote control and varispeed control.

The following features are available as options:

- For synchronizing: time code system for 2-channel models; code channel as third track between the stereo audio channels.
- Mono/stereo switch for stereo and 2-channel recorder.
- Test generator (60, 125 Hz, 1, 10, 16 kHz).
- Remote controller to serial interface: for storing (e.g. on tape) audio parameters for quick audio setup or for operation in conjunction with a terminal (RS 232 interface).

Maximum operating convenience due to microprocessor control:

- The last operating state of the recorder is preserved when power is switched off: tape counter, locator addresses, audio parameters, speed, mono/stereo or tape A/B and NAB/CCIR.
- If a channel controller exists, the audio signal is automatically switched to REPRO and SAVE when power is switched on again.
- Drop-in activated by pressing only the REC button in reproduce mode or by pressing PLAY and REC (depending on internal programming).
- Drop-out from record mode by pressing the PLAY key.
- Reduced spooling speed: the full spooling speed (approx. 10 m/s) can be switched down to 7, 4 or 1 m/s.
- Zerolocator: automatic search of tape address (timer reading) 00:00.
- Transferlocator LOC 1 ... LOC 4: for storing and automatic searching 4 different tape addresses. Stored addresses can be displayed without executing the actual search command.
- Soft keys: the following internally programmable functions can be assigned to the keys LOC 2 ... LOC 4:
  - LOC START (search last PLAY address)
  - LIFTER (defeats tape lift during spooling)
  - FADER (local command keys disabled, only fader start possible)
  - TAPE DUMP (dump edit mode, take-up motor is switched off)
  - REM CONTR (local command keys disabled, operation only with remote control)
  - CODE READY (enables recording on time code channel)These keys feature special recesses for attaching self-adhesive function labels.
- Audio setup via microprocessor. The following audio parameters can be programmed with the keys accessible from the front below the operator panel (NAB and CCIR equalization each for two types of tape):
  - Reproduction / Sync: LEVEL, TREBLE, BASS, EQUALIZATION
  - Recording: LEVEL, TREBLE, BIAS, EQUALIZATIONResolution 256 steps each, hexadecimal format on tape timer display. The audio parameters remain stored even after the recorder has been switched off. They can also be saved by copying them through the serial remote port to an external storage medium from where they can subsequently be reloaded; this means that automatic and reproducible audio set-up of the A810 is possible.
- Internal confidence test system with error diagnostics for the main functions:
  - Automatic check for correct functioning when the recorder is switched on; a subset of the test is periodically repeated.

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## 1.2 STANDARD VERSIONS

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### A810-1 FULL-TRACK VERSIONS

#### A810-1

Article No. 60.118.10110

Portable recorder for 6.25 mm tape. Full-track. Audio channel control (INPUT/-SYNC/REPRO/READY/SAFE). Built-in monitor speaker. Chassis version.  
Three tape speeds 3.75 - 7.5 - 15 ips selectable with front-panel rotary switch.

#### A810-1 HS

Article No. 60.118.10111

Portable recorder for 6.25 mm tape. Full-track. Audio channel control (INPUT/-SYNC/REPRO/READY/SAFE). Built-in monitor speaker. Chassis version.  
Four tape speeds 3.75 - 7.5 - 15 - 30 ips selectable with front-panel rotary switch.

#### A810-1 VU

Article No. 60.118.10120

Portable recorder for 6.25 mm tape. Full-track. VU-meter including audio channel control (INPUT/SYNC/REPRO/READY/SAFE). Built-in monitor speaker. Chassis version.  
Three tape speeds 3.75 - 7.5 - 15 ips selectable with front-panel rotary switch.

#### A810-1 VU HS

Article No. 60.118.10121

Portable recorder for 6.25 mm tape. Full-track. VU-meter including audio channel control (INPUT/SYNC/REPRO/READY/SAFE). Built-in monitor speaker. Chassis version.  
Four tape speeds 3.75 - 7.5 - 15 - 30 ips selectable with front-panel rotary switch.

#### A810-1 VUK

Article No. 60.118.10130

Recorder for 6.25 mm tape. Full-track. VU-meter including audio channel control (INPUT/SYNC/REPRO/READY/SAFE) and monitor speaker built into external panel. Recorder prepared for installation in console with penthouse.  
Three tape speeds 3.75 - 7.5 - 15 ips selectable with front-panel rotary switch.

#### A810-1 VUK HS

Article No. 60.118.10131

Recorder for 6.25 mm tape. Full-track. VU-meter including audio channel control (INPUT/SYNC/REPRO/READY/SAFE) and monitor speaker built into external panel. Recorder prepared for installation in console with penthouse.  
Four tape speeds 3.75 - 7.5 - 15 - 30 ips selectable with front-panel rotary switch.

A810-0.75 STEREO VERSIONSA810-0.75

Article No. 60.118.10210

Portable recorder for 6.25 mm tape. Stereo, 0.75 mm track separation. Full-track erase head. Audio channel control (INPUT/SYNC/REPRO/READY/SAFE). Built-in monitor speaker. Chassis version. Three tape speeds 3.75 - 7.5 - 15 ips selectable with front-panel rotary switch.

A810-0.75 HS

Article No. 60.118.10220

Portable recorder for 6.25 mm tape. Stereo, 0.75 mm track separation. Full-track erase head. Audio channel control (INPUT/SYNC/REPRO/READY/SAFE). Built-in monitor speaker. Chassis version. Four tape speeds 3.75 - 7.5 - 15 - 30 ips selectable with front-panel rotary switch.

A810-0.75 VU

Article No. 60.118.10230

Portable recorder for 6.25 mm tape. Stereo, 0.75 mm track separation. Overlapping erasure. VU-meter including channel control (INPUT/SYNC/REPRO/READY/SAFE). Built-in monitor speaker. Chassis version. Three tape speeds 3.75 - 7.5 - 15 ips selectable with front-panel rotary switch.

A810-0.75 VU HS

Article No. 60.118.10240

Portable recorder for 6.25 mm tape. Stereo, 0.75 mm track separation. Overlapping erasure. VU-meter including channel control (INPUT/SYNC/REPRO/READY/SAFE). Built-in monitor speaker. Chassis version. Four tape speeds 3.75 - 7.5 - 15 - 30 ips selectable with front-panel rotary switch.

A810-0.75 VUK

Article No. 60.118.10250

Recorder for 6.25 mm tape. Stereo, 0.75 mm track separation. Overlapping erasure. VU-meter including channel control (INPUT/SYNC/REPRO/READY/SAFE) and monitor speaker built into external panel. Recorder prepared for installation in console with penthouse. Three tape speeds 3.75 - 7.5 - 15 ips selectable with front-panel rotary switch.

A810-0.75 VUK HS

Article No. 60.118.10260

Recorder for 6.25 mm tape. Stereo, 0.75 mm track separation. Overlapping erasure. VU-meter including channel control (INPUT/SYNC/REPRO/READY/SAFE) and monitor speaker built into external panel. Recorder prepared for installation in console with penthouse. Four tape speeds 3.75 - 7.5 - 15 - 30 ips selectable with front-panel rotary switch.



A810-2/2 TWO-TRACK VERSIONSA810-2/2

Article No. 60.118.10310

Portable recorder for 6.25 mm tape. Two-track, 2mm track separation, overlapping erasure. Audio channel control (INPUT/SYNC/REPRO/READY/SAFE). Built-in monitor speaker.

Chassis version.

Three tape speeds 3.75 - 7.5 - 15 ips selectable with front-panel rotary switch.

A810-2/2 HS

Article No. 60.118.10311

Portable recorder for 6.25 mm tape. Two-track, 2mm track separation, overlapping erasure. Audio channel control (INPUT/SYNC/REPRO/READY/SAFE). Built-in monitor speaker. Chassis version.

Four tape speeds 3.75 - 7.5 - 15 - 30 ips selectable with front-panel rotary switch.

A810-2/2 VU

Article No. 60.118.10320

Portable recorder for 6.25 mm tape. Two-track, 2mm track separation, overlapping erasure. VU-meter incl. channel control (INPUT/SYNC/REPRO/READY/SAFE). Built-in monitor speaker. Chassis version.

Three tape speeds 3.75 - 7.5 - 15 ips selectable with front-panel rotary switch.

A810-2/2 VU HS

Article No. 60.118.10330

Portable recorder for 6.25 mm tape. Two-track, 2mm track separation, overlapping erasure. VU-meter incl. channel control (INPUT/SYNC/REPRO/READY/SAFE). Built-in monitor speaker. Chassis version.

Four tape speeds 3.75 - 7.5 - 15 - 30 ips selectable with front-panel rotary switch.

A810-2/2 VUK

Article No. 60.118.10340

Portable recorder for 6.25 mm tape. Two-track, 2mm track separation, overlapping erasure. VU-meter incl. channel control (INPUT/SYNC/REPRO/READY/SAFE) and monitor speaker built into external panel. Recorder prepared for installation in console with penthouse.

Three tape speeds 3.75 - 7.5 - 15 ips selectable with front-panel rotary switch.

A810-2/2 VUK HS

Article No. 60.118.10350

Portable recorder for 6.25 mm tape. Two-track, 2mm track separation, overlapping erasure. VU-meter incl. channel control (INPUT/SYNC/REPRO/READY/SAFE) and monitor speaker built into external panel. Recorder prepared for installation in console with penthouse.

Four tape speeds 3.75 - 7.5 - 15 - 30 ips selectable with front-panel rotary switch.

**A810-2 TC TWO-TRACK VERSIONS WITH TIME CODE****A810-2 TC**

Article No. 60.118.10410

Portable recorder for 6.25 mm tape. Two-track, 2mm track separation. Audio channel control (INPUT/SYNC/REPRO/READY/SAFE). Code channel control by means of programmable key (READY/SAFE). Built-in monitor speaker. Chassis version. Three tape speeds 3.75\* - 7.5 - 15 ips selectable with front-panel rotary switch.

\* Time code operation not possible at 3.75 ips!

**A810-2 TC HS**

Article No. 60.118.10411

Portable recorder for 6.25 mm tape. Two-track, 2mm track separation. Audio channel control (INPUT/SYNC/REPRO/READY/SAFE). Code channel control by means of programmable key (READY/SAFE). Built-in monitor speaker. Chassis version.

Four tape speeds 3.75\* - 7.5 - 15 - 30 ips selectable with front-panel rotary switch.

\* Time code operation not possible at 3.75 ips!

**A810-2 TC VU**

Article No. 60.118.10420

Portable recorder for 6.25 mm tape. Two-track, 2mm track separation. VU-meter including audio channel control (INPUT/SYNC/REPRO/READY/SAFE). Code channel control by means of programmable key (READY/SAFE). Built-in monitor speaker. Chassis version.

Three tape speeds 3.75\* - 7.5 - 15 ips selectable with front-panel rotary switch.

\* Time code operation not possible at 3.75 ips!

**A810-2 TC VU HS**

Article No. 60.118.10421

Portable recorder for 6.25 mm tape. Two-track, 2mm track separation. VU-meter including audio channel control (INPUT/SYNC/REPRO/READY/SAFE). Code channel control by means of programmable key (READY/SAFE). Built-in monitor speaker. Chassis version.

Four tape speeds 3.75\* - 7.5 - 15 - 30 ips selectable with front-panel rotary switch.

\* Time code operation not possible at 3.75 ips!

**A810-2 TC VUK**

Article No. 60.118.10430

Recorder for 6.25 mm tape. Two-track, 2mm track separation. VU-meter including audio channel control, code channel control (INPUT/SYNC/REPRO/READY/SAFE), and monitor speaker built into external panel. Recorder prepared for installation in console with penthouse.

Three tape speeds 3.75\* - 7.5 - 15 ips selectable with front-panel rotary switch.

\* Time code operation not possible at 3.75 ips!

**A810-2 TC VUK HS**

Article No. 60.118.10431

Recorder for 6.25 mm tape. Two-track, 2mm track separation. VU-meter including audio channel control, code channel control (INPUT/SYNC/REPRO/READY/SAFE), and monitor speaker built into external panel. Recorder prepared for installation in console with penthouse.

Four tape speeds 3.75\* - 7.5 - 15 - 30 ips selectable with front-panel rotary switch.

\* Time code operation not possible at 3.75 ips!

### 1.3 OPTIONS

#### Varispeed

- For chassis and portable versions: part No. 20.810.871.00. Not possible for recorders with 2 VU-meters!  
Filler panel (1 module, part No. 1.810.002.04) included.
- For console versions: part No. 20.810.872.00.

#### Channel control

For separate control of the second audio channel on A810.0.75 recorders, or separate control of the time code channel on A810-2 TC recorders with TIME CODE READ/WRITE UNIT 1.810.724 and LC display part No. 20.810.933.00.

For separate control of the time code channel on A810-2 TC recorders with TIME CODE READ/WRITE UNIT 1.820.721.81/82/83/84 and LED indicator part No. 20.810.934.00.

A filler panel (1 module, part No. 1.810.002.04) must be ordered separately for the A810-2 TC.

#### Tape scissors, marking device

Tape scissors, part No. 20.810.891.00.

Marking device, part No. 20.810.892.00

Tape scissors and marking device, part No. 20.810.893.00.

#### Mono/stereo switch, test generator

Mono/stereo switch, part No. 20.810.902.00.

Test generator, part No. 20.810.903.00 (for full-track and 2-channel recorders).

Mono/stereo switch and test generator, part No. 20.810.903.00 (for recorders with mono/stereo selector).  
Only possible with software release 13/83 or later.

#### Interface for serial remote control

Printed circuit board 1.810.751.00 and cable harness with connectors, part No. 20.810.881.00.

#### Control for noise reduction system

- For chassis and portable versions, part No. 20.810.943.00
- For console versions, part No. 20.810.944.00.

## 1.4 ACCESSORIES

### Supplied accessories

(Part No. 20.020.302.25)

Allen key 2.0 mm	1 pc.	(Part No. 26.06.1020)
Allen key 4.0 mm	1 pc.	(Part No. 26.06.1040)
Stud driver 3.0 mm	1 pc.	(Part No. 10.258.003.10)
Stud driver 2.5 mm	1 pc.	(Part No. 10.258.003.09)
Microfuse 500 mA, 5x20 mm	5 pcs.	(Part No. 51.01.0114)
Microfuse 1.6 A, 5x20 mm	5 pcs.	(Part No. 51.01.0119)
Microfuse 3.15 A, 5x20 mm	5 pcs.	(Part No. 51.01.0122)
Microfuse 5.0 A, 5x20 mm	5 pcs.	(Part No. 51.01.0124)
NAB adapter	2 pcs.	(Part No. 89.01.0354)
Power cord, 2.5 m, 3x1 mm <sup>2</sup> EU-plug	1 pc.	(Part No. 10.223.001.01)
Spare bulb for VU meter	2 pcs.	(Part No. 51.02.0144)
Conversion kit parallel remote control connector	1 pc.	(Part No. 1.810.071.00)

### Console

Any chassis version of the tape recorder can be installed in the basic console version. It is equipped with lockable casters. Height: 840 mm. Part No. 1.038.880.00.

In addition the following items must be ordered:

- Rack base, Part No. 1.038.890.00 (for installing the synchronizer and/or noise reduction system),
- and
- Rear cover plate, part No. 1.038.885.00 (no ext. VU panel), or
- Rear cover plate with shelf for tapes, etc. part No. 1.038.884.00 or
- Low penthouse, part No. 1.038.886.00 (ext. VU panel), or
- High penthouse, part No. 1.038.888.00 (ext. VU panel and synchronizer control panel).

### Wooden side panels

A set of wooden side panels with hinged handles is available as a complete set, part No. 1.810.077.00.

### Handles for chassis versions

A set of handles (not hinged) is available for the A810 chassis versions, part No. 1.810.075.00.

### Tape transport remote control

The tape transport remote control 1.328.200.81 in the desk-top housing, with a 15 m cable, supports the remote control of all tape deck functions, including

- Decreasing the spooling speed (in 3 steps below the standard speed)
- RECAP (fast rewind for as long as key is held down, then PLAY)
- LOC 1 (storing and automatic search of a tape address)
- LIFTER (defeats tape lift during spooling)
- VARISPEED (with external TTL signal)

### Adapter for self-supporting pancake

A reel flange (adapter) part No. 1.013.046.00 is required for flangeless hubs (DIN 45 515).

**Extension board**

Part No. 1.820.799.00, used in conjunction with alignments on audio and logic assemblies.

**REVOX tape splicing kit**

Comprises a professional cutting and splicing block, a cutting blade, splicing tabs, and a wax pencil; kit No. 10.030.452.40.

**STUDER cleaning kit in carrying case**

Comprises 1 bottle of soundhead cleaner, 1 bottle of aluminite cleaner, lint-free nonwoven fleece, one buckskin, kit No. 10.496.010.00.

- |   |                        |
|---|------------------------|
| ■ Soundhead cleaner, replacement bottle | Part No. 10.496.021.00 |
| ■ Soundhead cleaner, 1 liter            | Part No. 10.496.022.00 |
| ■ Aluminite cleaner, replacement bottle | Part No. 10.496.025.00 |
| ■ Aluminite cleaner, 1 liter            | Part No. 10.496.026.00 |

**Aluminium case for A810**

Three types of aluminium carrying cases are available:

- Aluminium case for transporting a portable A810 equipped with wooden side panels: Part No. 10.386.001.03.
- Aluminium case for transporting an A810 chassis version: Part No. 10.368.002.04.
- Aluminium case for installing an A810 chassis version: Part No. 10.386.001.01.

The recorder can be put into operation after the cover and the rear panel have been removed.

Kit No. 1.810.076.00 is required for installing the chassis version into the carrying case 10.386.001.01.

**Cover for portable version**

Wooden cover, protects headblock and tape guidance elements during transport. Two 26.5 cm ciné or 10.5" NAB reels can be stored in the cover; or DIN spindles and cables can be accommodated by rescwing the three-pronged adapter.

**Tool case**

- Part No. 20.020.001.06 (220 V version)
- Part No. 20.020.001.56 (110 V version)

Comprises:

1 Set of hexagon-socket-screw keys, spare fuses, replacement lamps, small parts, 1 extension board, 1 demagnetizing choke, various screwdrivers, various pliers, one pair of tweezers, cylindrical flashlight, soldering iron (WELLER) with holder, spring dynamometers, various open-end wrenches, screwdriver for recessed-head screws (PHILLIPS), cleaning material, gauges for adjusting the tape tension sensors, etc.

**Additional manuals**

- Operating and service instructions, ENGLISH, No. 10.23.5211 (Ed. 1185)
- Operating and service instructions, FRENCH, No. 10.23.5221 (Ed. 1285)
- Operating and service instructions, GERMAN, No. 10.23.2961 (Ed. 1185)
- Operating instructions, ENGLISH, No. 10.23.2951
- Operating instructions, FRENCH, No. 10.23.5230
- Operating instructions, GERMAN, No. 10.23.2941

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**1.5 TECHNICAL SPECIFICATIONS**

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These specifications apply for operation in horizontal position

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**Tape speeds:**

## Type HS:

30 - 15 - 7.5 - 3.75 ips  
(76.2 - 38.1 - 19.05 - 9.525 cm/s)

## Type LS (standard programming):

15 - 7.5 - 3.75 ips  
(38.1 - 19.05 - 9.525 cm/s)

## Variable speed (with varispeed option):

±7 semitones from nominal speed

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**Tape speed deviation:**

max. ± 0.2% from nominal speed

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**Tape slip:**

max. 0.1%

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**Tape reels:**

NAB, EIA (CINE), DIN

max. diameter 11.1 " (282 mm)

max. reel capacity 3280 ft. (1000 m) with professional-quality tape

(tape thickness: 50 µm)

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**Tape width:**

1/4 " (6.3 mm)

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**Wow and flutter:**

Peak weighted according to DIN 45507 or IEC Publ. 386, ambient temperature 68° F (20° C)

30 ips	15 ips	7.5 ips	3.75 ips
(76.2 cm/s)	(38.1 cm/s)	(19.05 cm/s)	(9.525 cm/s)
max. 0.04%	max. 0.05%	max. 0.07%	max. 0.12%

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**Start time:**

max. 0.5 s for 15 ips and 1000 m tape on DIN hub or  
730 m tape on NAB reel  
(to attain double value of flutter specification)

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**Tape timer:**

5-digit LCD displays hours, minutes and seconds for all tape speeds  
counts past zero with leading negative sign.  
Range: 1 h 59 min 59 s to -1 h 59 min 59 s

or

5-digit LED display, same as LCD except:  
Range: 9 h 59 min 59 s to -59 min 59 s  
Time code level indicated with LED behind last seconds position.

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**Winding time:**

approx. 150 s for 1000 m tape; approx. 120 s for 730 m tape.

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**Stopping time from spooling:**

max. 3 s

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**Tape tension:**

Reproduce and record:

0.75 N (75 p) nominal, adjustable  $\pm 0.15$  N ( $\pm 15$  p)

Spooling:

0.75 N (75 p) nominal, adjustable 0.4 – 1.0 N (40 – 100 p)

Peak tape tension for start, stop, and reversal of spooling  
direction:

6 N (600 p) nominal, adjustable 3 – 6 N (300 – 600 p)

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**Inputs:**

Balanced and floating

Impedance  $\geq 10\ \Omega$ , 30 Hz ... 20 kHz

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**Input level:**

- Nominal input level relative to reference magnetic flux:  
+6, +10, +14, +16 dBm; internally programmable
- Nominal input level relative to operating level (according  
to NAB):  
0, +4, +8, +10 dBm; internally programmable  
(internal adjustment range of the magnetic flux with above input  
levels: 100 – 1000 nWb/m)

Recorders with VU-meter panel and input/output level controls:  
max. 10 dB increase in input sensitivity with input level control  
in uncalibrated mode.

Maximum input level:

- with input transformer: +24 dBm
  - without input transformer: +28 dBm (+26 dBm, if the nominal input  
level relative to operating level is set to 0/6 dBm)
- 

**Outputs:**

balanced and floating, with output transformer

Impedance  $\leq 50\ \Omega$ , 30 Hz ... 20 kHz

Load  $\geq 200\ \Omega$

or

electronically balanced, without output transformer

Impedance  $\leq 30\ \Omega$ , 30 Hz ... 20 kHz

Load  $\geq 200\ \Omega$ .

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**Output level:**

- nominal output level relative to reference magnetic flux:  
+6, +10, +14, +16 dBm; internally programmable
- nominal output level relative to operating level (according  
to NAB):  
0, +4, +8, +10 dBm; internally programmable  
(internal adjustment range of reproduce gain for operating  
magnetic flux of 100 – 1000 nWb/m)

Recorders with VU-meter panel and input/output level controls:  
max. 10 dB increase in reproduce gain with output level control  
in uncalibrated mode.

Maximum output level:

- with output transformer: +24 dBm (load  $\geq 200\ \Omega$ )
  - without output transformer:
    - balanced load  $\geq 200\ \Omega$ : +26 dBm
    - unbalanced load  $\geq 200\ \Omega$ : +24 dBm
    - balanced load  $\geq 600\ \Omega$ : +30 dBm (+26 dBm, if the nominal  
output level relative to operating level is set to 0/6 dBm)
    - unbalanced load  $\geq 600\ \Omega$ : +24 dBm
- 

**Equalizations:**

NAB and CCIR, switch-selectable

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## Equalization time constants:

30 ips (76.2 cm/s)	15 ips (38.1 cm/s)	7.5 ips (19.05 cm/s)	3.75 ips (9.525 cm/s)
AES: 17.5/∞ us	CCIR: 35/∞ us	70/∞ us	90/3180 us
AES: 17.5/∞ us	NAB: 50/3180 us	50/3180 us	90/3180 us

## Frequency response:

## Record-reproduce:

30 ips (76.2 cm/s)	15 ips (38.1 cm/s)	7.5 ips (19.05 cm/s)	3.75 ips (9.525 cm/s)
±2 dB: 40 Hz ... 22 kHz	30 Hz ... 20 kHz	30 Hz ... 16 kHz	30 Hz ... 10 kHz
±1 dB: 40 Hz ... 20 kHz	30 Hz ... 18 kHz	30 Hz ... 12 kHz	30 Hz ... 8 kHz

## Reproduction from record head (SYNC reproduction)

## - Amplifier programmed for "narrow band":

30 ips (76.2 cm/s)	15 ips (38.1 cm/s)	7.5 ips (19.05 cm/s)	3.75 ips (9.525 cm/s)
±2 dB: 60 Hz ... 12 kHz	30 Hz ... 12 kHz	30 Hz ... 8 kHz	----- -----

## - Amplifier programmed for "wide band":

30 ips (76.2 cm/s)	15 ips (38.1 cm/s)	7.5 ips (19.05 cm/s)	3.75 ips (9.525 cm/s)
±2 dB: 60 Hz ... 20 kHz	30 Hz ... 18 kHz	30 Hz ... 12 kHz	----- -----

## Signal-to-noise ratios:

CCIR {Equalization according to CCIR (AES at 30 ips), measured with  
tape AGFA PER 528, BASF LGR 50, or equivalent type}

30 ips (76.2cm/s)	15 ips (38.1cm/s)	7.5 ips (19.05cm/s)	3.75 ips (9.525cm/s)
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Full track (320 nWb/m)  
track width 6.3 mm (1/4")

- Linear, RMS, 30 Hz - 20 kHz	63 dB	61 dB	61 dB	57 dB
- Quasi-peak, weighted according to CCIR 468-1 (DIN 45405)	54 dB	52.5 dB	51 dB	50 dB
- RMS value, A weighted according to DIN 45633 as per IEC Publ. 179	68 dB	67 dB	65 dB	62 dB

Stereo (510 nWb/m)  
track width 2.75 mm

- Linear, RMS, 30 Hz - 20 kHz	65 dB	63 dB	62 dB	57 dB
- Quasi-peak, weighted according to CCIR 468-1 (DIN 45405)	55.5 dB	54 dB	52.5 dB	51 dB
- RMS value, A weighted according to DIN 45633 as per IEC Publ. 179	69 dB	67 dB	65 dB	62 dB

Two-track (510 nWb/m)  
track width 2.0 mm

	30 ips (76.2cm/s)	15 ips (38.1cm/s)	7.5 ips (19.05cm/s)	3.75 ips (9.525cm/s)
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- Linear, RMS, 30 Hz - 20 kHz	63 dB	61 dB	61 dB	56 dB
- Quasi-peak, weighted according to CCIR 468-1 (DIN 45405)	54 dB	52.5 dB	51 dB	50 dB
- RMS value, A weighted according to DIN 45633 as per IEC Publ. 179	68 dB	66 dB	64 dB	61 dB

NAB {Equalization according to NAB (AES at 30 ips), measured with tape  
SCOTCH 3M 226 or aequivalent type}

	30 ips (76.2cm/s)	15 ips (38.1cm/s)	7.5 ips (19.05cm/s)	3.75 ips (9.525cm/s) (referred to 510 nWb/m)
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Full track (1040 nWb/m)  
track width 6.3 mm (1/4")

- Linear	74 dB	72 dB	74 dB	61 dB
- RMS, weighted according to ASA-A	78 dB	74 dB	76 dB	66 dB

Stereo (1040 nWb/m)  
track width 2.75 mm

- Linear	71 dB	68 dB	70 dB	57 dB
- RMS, weighted according to ASA-A	75 dB	71 dB	73 dB	62 dB

Two-track (1040 nWb/m)  
track width 2.0 mm

- Linear	70 dB	67 dB	69 dB	56 dB
- RMS, weighted according to ASA-A	74 dB	70 dB	72 dB	61 dB

Signal-to-noise ratios: (record-SYNC reproduction)  
(Amplifier programmed to "narrow band")

NAB {Equalization according to NAB (AES at 30 ips), measured with tape  
SCOTCH 3M 226 or aequivalent type}

	30 ips (76.2cm/s)	15 ips (38.1cm/s)	7.5 ips (19.05cm/s)	3.75 ips (9.525cm/s)
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Full track (1040 nWb/m)  
track width 6.3 mm (1/4")

- Linear	69 dB	69 dB	69 dB	-----
- RMS, weighted according to ASA-A	75 dB	72 dB	72 dB	-----

Stereo (1040 nWb/m)  
track width 2.75 mm

- Linear	66 dB	66 dB	66 dB	-----
- RMS, weighted according to ASA-A	72 dB	69 dB	69 dB	-----

Two-track (1040 nWb/m)  
track width 2.0 mm

- Linear	65 dB	65 dB	65 dB	-----
- RMS, weighted according to ASA-A	71 dB	68 dB	68 dB	-----

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**Distortion:** (Record-reproduce, 1 kHz, measured with tape AGFA PER 528)

CCIR:	30 ips (76.2cm/s)	15 ips (38.1cm/s)	7.5 ips (19.05cm/s)	3.75 ips (9.525cm/s)
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Full track (320 nWb/m):	≤ 2.0%	≤ 1.5%	≤ 1.0%	≤ 1.0%
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Stereo/2-track (510 nWb/m):	≤ 2.0%	≤ 1.5%	≤ 1.0%	≤ 1.0%
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(Record-reproduce, 1 kHz, measured with tape SCOTCH 3M 226)

NAB:	30 ips (76.2cm/s) 400 nWb/m	15 ips (38.1cm/s) 510 nWb/m	7.5 ips (19.05cm/s) 510 nWb/m	3.75 ips (9.525cm/s) 510 nWb/m
------	-----------------------------------	-----------------------------------	-------------------------------------	--------------------------------------

Full track:	≤ 0.5%	≤ 0.5%	≤ 0.5%	≤ 0.5%
-------------	--------	--------	--------	--------

Stereo/2-track:	≤ 0.5%	≤ 0.5%	≤ 0.5%	≤ 0.5%
-----------------	--------	--------	--------	--------

---

**Cross-talk attenuation:** (at 1 kHz, according to DIN 45521)

Stereo recorders: ≥ 55 dB

Two track recorders: ≥ 65 dB

---

**Erase efficiency:** (at 1 kHz and 510 nWb/m, 15 ips)

Stereo recorders with full-track erase head: ≥ 80 dB

Two-track recorders with overlapping erase head: ≥ 75 dB

---

**Erase and bias frequency:**

153.6 kHz for all tape speeds

---

**VU-meter:**

Switchable between VU indication (according to IEC recommendation 268, Part 10, Section 4) and PPM (peak programme meter) (according to IEC recommendation 268, Part 10, Section 3, except for 24,1, scale division).

---

**Power supply** (line voltage selector):

100 V, 120 V, 140 V, 200 V, 220 V, 240 V; ±10% ; 50 or 60 Hz

---

**Power consumption:**

Stop:	80 W
Recording on 2 channels:	160 W
Spooling:	190 W
Peak tape tension during spooling:	240 W

---

**Disturbed operation:** (transient line voltage failure)

Operating status unaffected by line voltage failures up to 100 ms.

---

**Ambient temperatures:**

50° F ... 104° F (+10° C ... +40° C)

---

**Relative humidity:**

20% ... 90%, non-condensing

---

**Safety standard:**

according to IEC recommendation, publication 65, degree of protection I (line filter, power switch, power fuse, power transformer and line voltage selector conform to type I and II).

---

**Weight:** (portable version)

Net:	30 kg ... 31 kg, depending on configuration
Gross:	34 kg ... 35 kg, depending on configuration (air freight)
	52 kg ... 53 kg, depending on configuration (sea freight)

---

---

**Technical data of the time code channel**

---

The time code channel conforms to IEC publication 461, DIN 45511, Part 7.

---

**Track width/location:**

0.38 mm, center of tape

---

**Code format:**

SMPTE/EBU 80 bits address code (selectable 24 / 25 / 29.97 / 30 frames/second)

---

**Tape speeds:**

30 - 15 - 7.5 ips  
(76.2 - 38.1 - 19.05 cm/s)

---

**Magnetic flux of time code track:**

CCIR: 729 nWb/m pp  $\pm 3$  dB

---

**Time code channel input:**

Balanced and floating, with transformer  
Input impedance  $\geq 10$  k $\Omega$

---

**Input level:**

nom.: 500 mV pp  
min.: 150 mV pp  
max.: 4.0 V pp

---

**Time code channel output:**

Balanced and floating, with transformer  
Output impedance  $\leq 40$   $\Omega$

---

**Output level:**

2 V pp, Load impedance  $\geq 200$   $\Omega$

---

**Cross-talk attenuation code channel to audio:**

$\geq 90$  dB for all components of the time code signal,  
relative to 510 nWb/m magnetic flux of sound track.

---

**Coincidence error between code track and audio:**

{with tape travel time compensation electronics (TIME CODE DELAY UNIT) enabled}

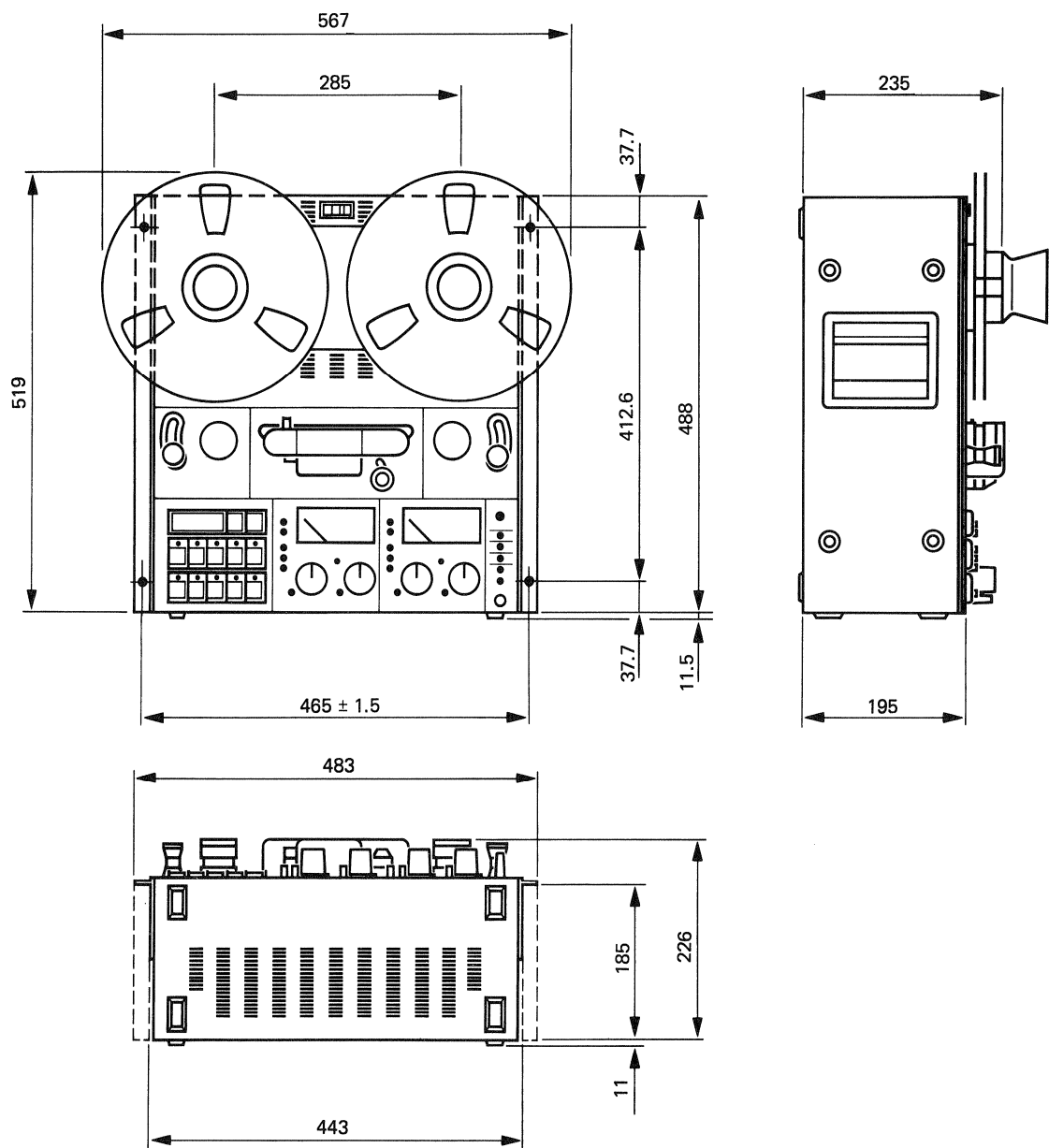
max. 4 ms at 15 ips

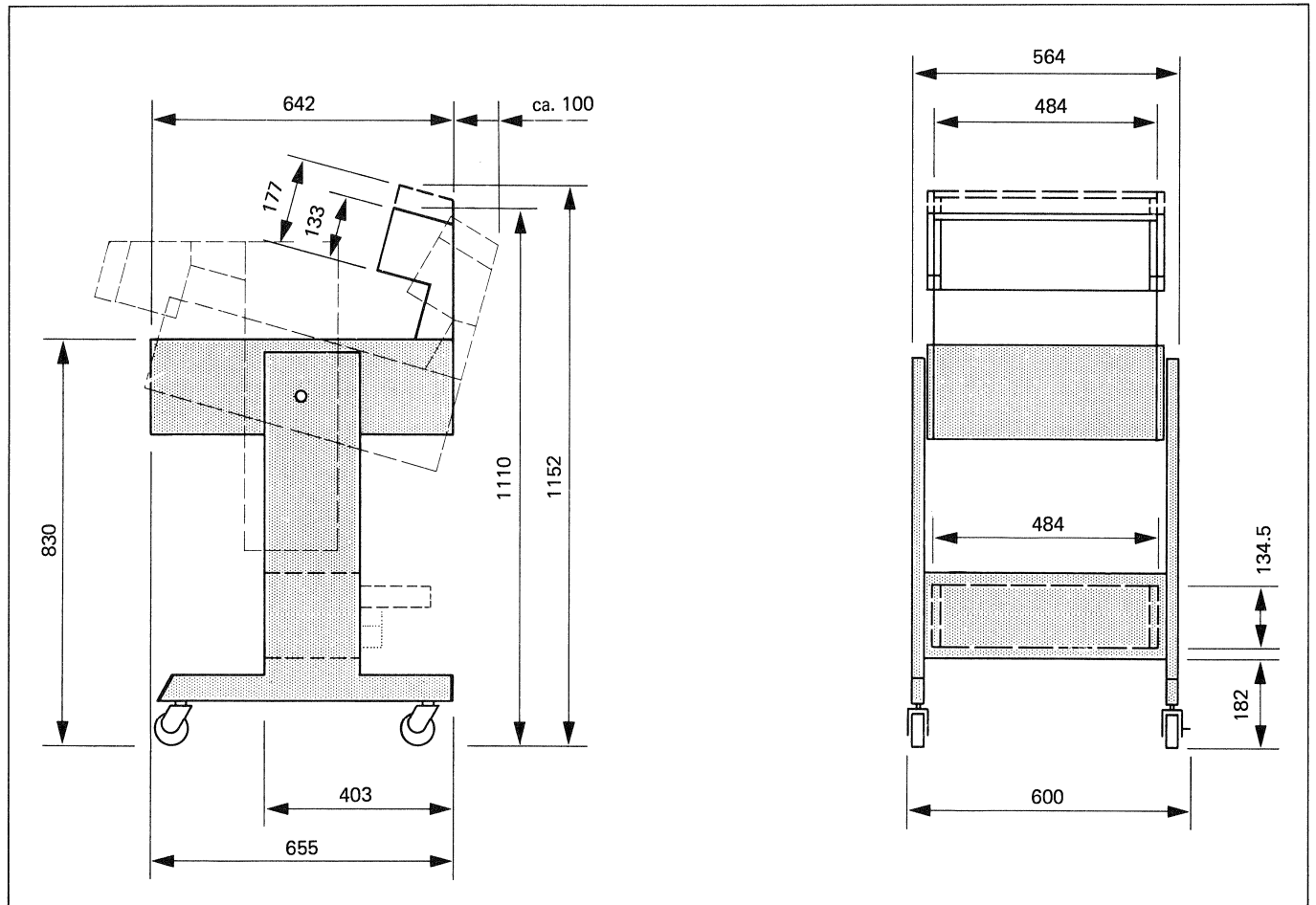
switchable tape travel time compensation for:

- coincident time code and audio channel recording and reproducing, resp., at 24 / 25 / 29.97 / 30 frames/second
  - M15A-TC compatible time code and audio channel recording and reproducing, resp., at 24 / 25 / 29.97 / 30 frames/second
-

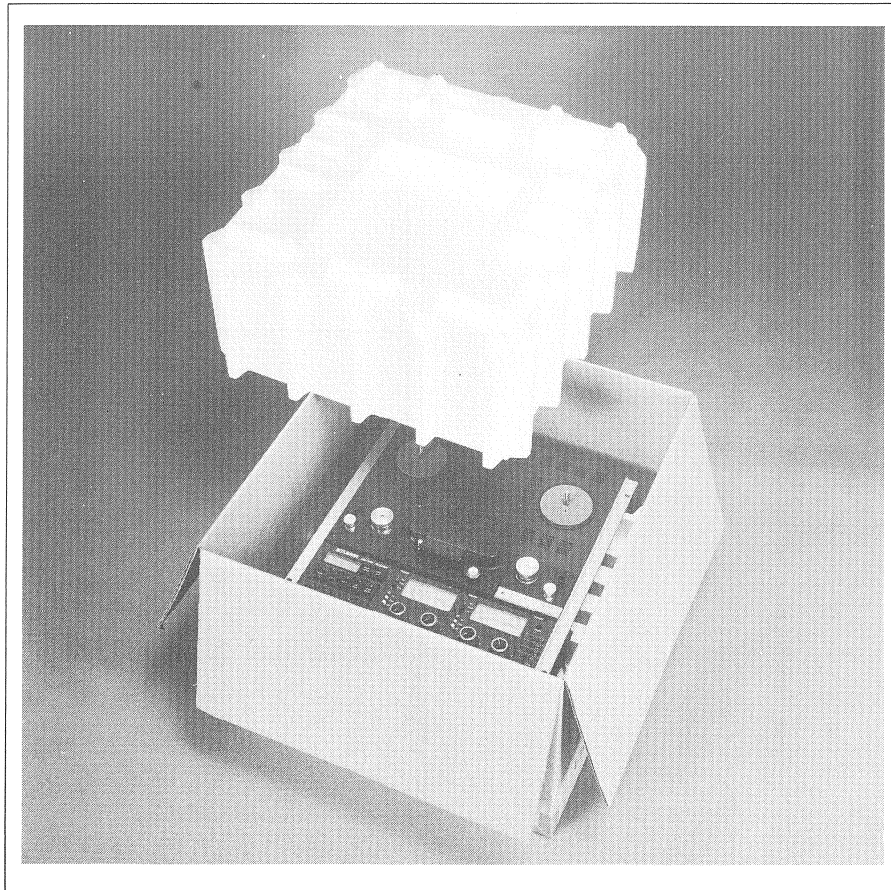
1.5.1 Dimensions

A810



Console of A810

### 1.5.2 Packing



#### Air freight

A810, portable version:

Carton 64 x 62 x 46 cm

Gross weight, depending on configuration: 34 kg to 35 kg

A810, console version:

Carton 64 x 62 x 46 cm

Gross weight, depending on configuration: 34 kg to 35 kg

Console (and possibly VU-meter panel):

Carton 102 x 74 x 38 cm

Gross weight, depending on configuration: 39 kg to 46 kg

#### Ocean freight

A810, portable version:

Box 82 x 78 x 72 cm

Gross weight, depending on configuration: 52 kg to 53 kg

A810 console version:

Box 82 x 78 x 72 cm

Gross weight, depending on configuration: 52 kg to 53 kg

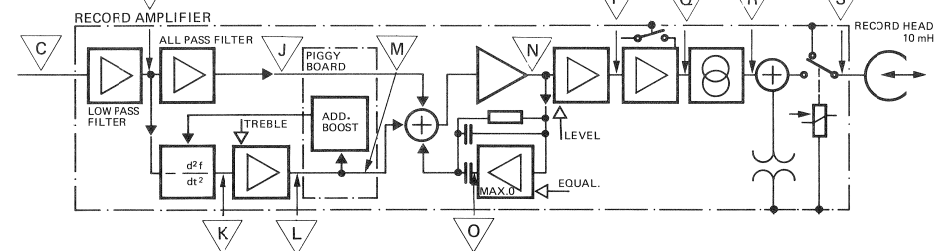
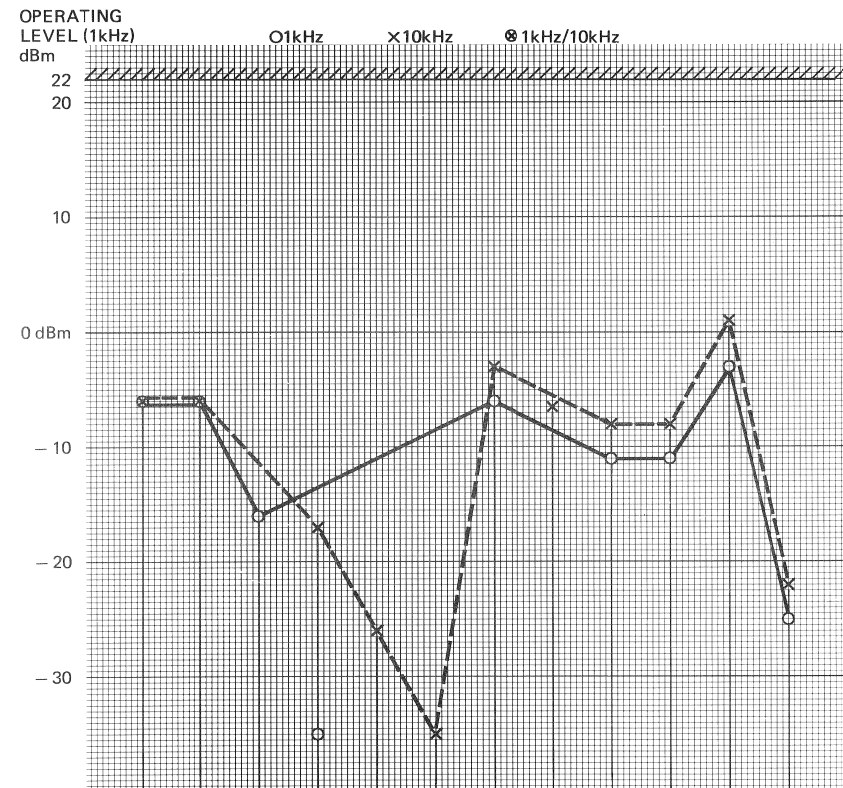
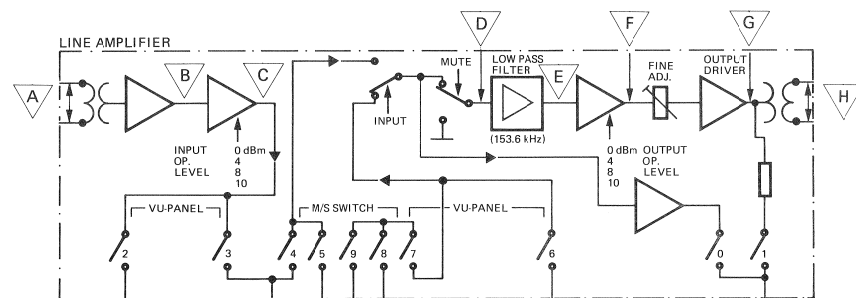
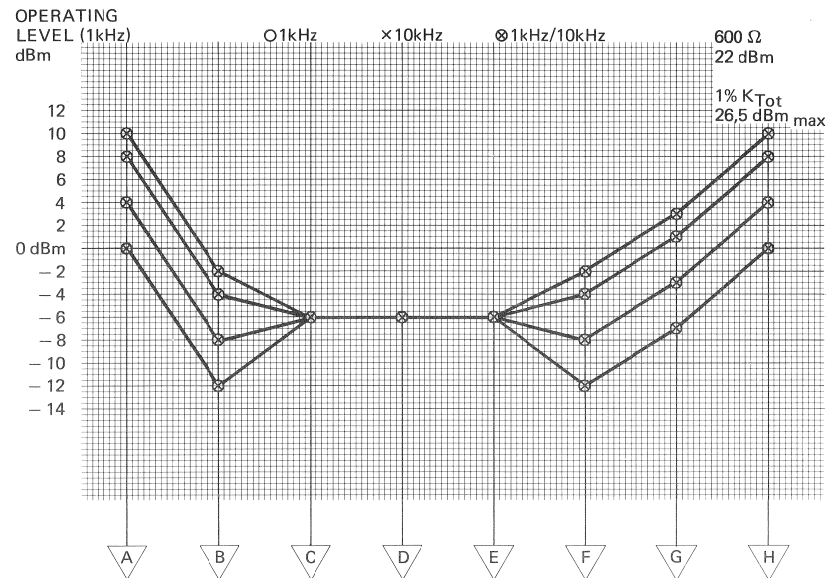
Console (and possibly VU-meter panel):

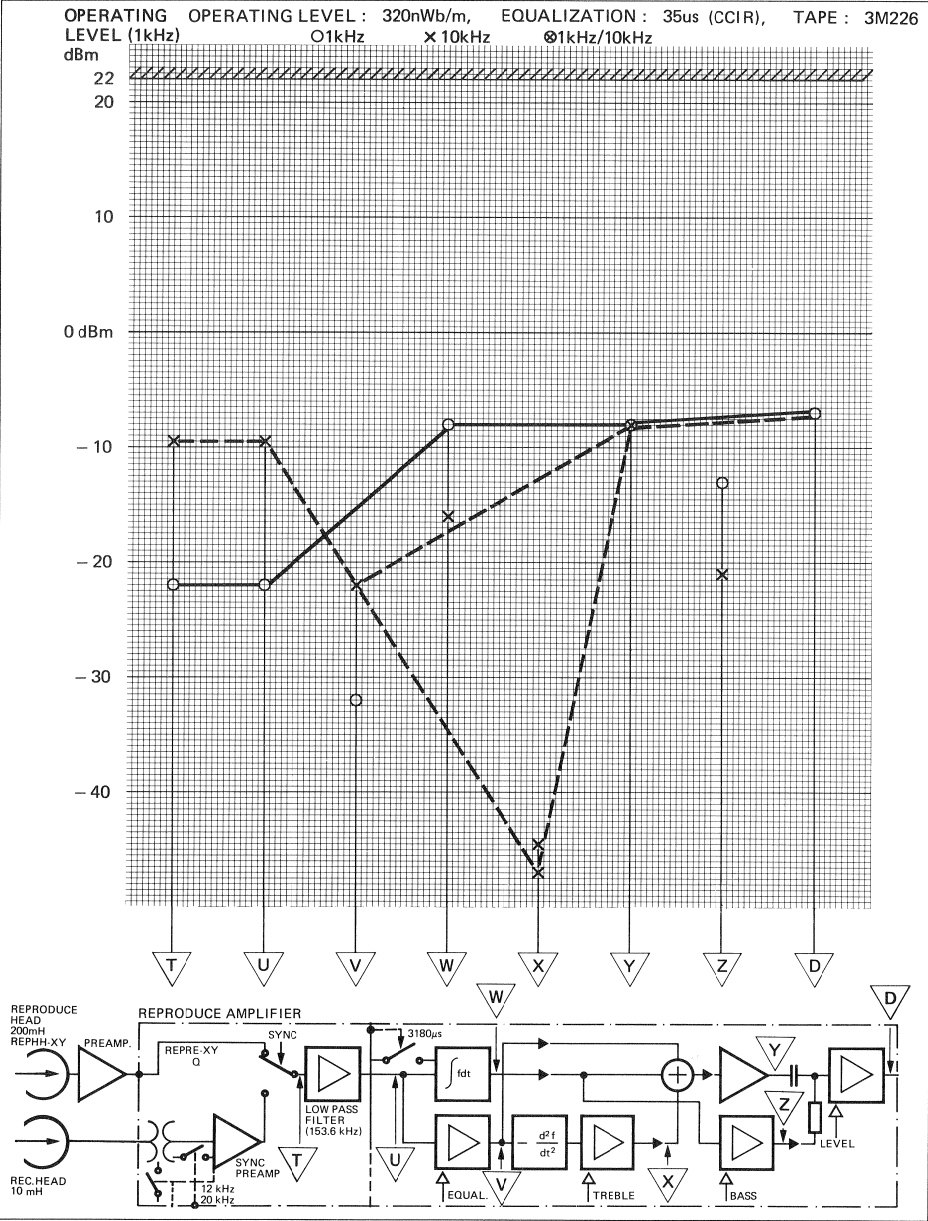
Box 110 x 82 x 46 cm

Gross weight, depending on configuration: 57 kg to 72 kg



## 1.5.3 Level diagrams





1.6 STANDARD CALIBRATION VALUES

The numbers in the following table represent hexadecimal values, i.e. they are in the same format as the numbers appearing on the tape timer display when the corresponding calibrations are performed. These values refer to 2mm - 2-channel recorders, reference level (operating level) 320 nWb/m (or 257 nWb/m at 3.75 ips), tape type 3M 226.

Speed	Mode	Equal.	Level	Treble	Bass	Equal.
3.75	REPRO		82	70	90	95
3.75	RECORD		26	80	30	8B
3.75	SYNC		00	00	00	00
7.5	REPRO	CCIR	66	39	80	87
7.5	RECORD	CCIR	30	A0	3E	75
7.5	SYNC	CCIR	62	50	96	87
7.5	REPRO	NAB	66	39	80	61
7.5	RECORD	NAB	30	A0	3E	99
7.5	SYNC	NAB	62	50	96	61
15	REPRO	CCIR	66	30	6A	44
15	RECORD	CCIR	30	54	46	BA
15	SYNC	CCIR	62	50	88	44
15	REPRO	NAB	66	30	6A	61
15	RECORD	NAB	30	54	46	99
15	SYNC	NAB	62	50	88	61
30	REPRO		66	38	48	26
30	RECORD		30	1B	50	DE
30	SYNC		62	50	60	26
Speed	Mode	Equal.	Level	Treble	Bass	Equal.

## A810 – Updated EQ Values

During the manufacturing period of the A810 tape recorder several software versions have been available. In addition the 1.318... series sound heads have been introduced after the production end. The different versions require the equalization (EQ) parameter settings according to the table below.

Tape Speed	EQ	Mode	SW up to 25/86	SW 01/88	SW 46/90, 25/91	Heads 1.318...
3.75 ips 9,5 cm/s	NAB/ CCIR	Repro	95	AB	AB	AE
		Record	BB	BB	BB	BB
		Sync	00	00	00	00
7.5 ips 19 cm/s	CCIR	Repro	87	87	87	82
		Record	75	75	75	A9
		Sync	87	87	87	85
	NAB	Repro	61	6D	6D	68
		Record	99	99	E0	BE
		Sync	61	61	61	70
15 ips 38 cm/s	CCIR	Repro	44	44	44	44
		Record	BA	BA	BA	C6
		Sync	44	44	44	44
	NAB	Repro	61	61	61	68
		Record	99	99	B1	A5
		Sync	61	61	61	68
30 ips 76 cm/s	NAB/ CCIR	Repro	26	26	26	29
		Record	DE	DE	DE	D5
		Sync	26	26	26	29

The values given here correspond to the (outdated) rightmost column of the table in chapter 1.6 of the A810 operating and service manual. *You may possibly want to insert this sheet after chapter 1.6 of your manual copy.*

For information on how to enter the parameters, please refer to the A810 operating and service manual.

---

1.7 MAINTENANCE HINTS FOR THE SERVICE PERSONNEL

---

1.7.1 Abbreviations

---

A	assembly
ANT	antenna
B	bulb
BA	battery, accumulator
BR	optocoupler (bulb --> LDR)
C	capacitor
D	diode, DIAC
DL	LED
DLQ	optocoupler (LED --> phototransistor)
DLR	optocoupler (LED --> LDR)
DLZ	LED array, 7 segment display
DP	photodiode
DZ	rectifier
E	electronic part
EF	headphones
F	fuse
FL	filter
H	head (sound-, erase-)
HC	hybrid circuit (thick/thin film)
HE	hall element
IC	integrated circuit
J	jack (female)
JS	jumper
K	relay, contactor
L	inductor
LS	loudspeaker
M	motor
ME	meter
MIC	microphone
MP	mechanical part
P	plug (male)
PU	pick up
Q	transistor, FET, thyristor, TRIAC
QP	phototransistor
QPZ	phototransistor array
R	resistor
RP	light depending resistor (LDR)
RT	temperature sensitive resistor
RZ	resistor array
S	switch
T	transformer
TL	delay line
TP	test point
W	wire, stranded wire
X	socket, holder
XB	lamp socket
XF	fuse holder
XIC	IC-socket
Y	quartz, piezoelectric element
Z	network, array

These abbreviations may be combined (max. 3 characters).

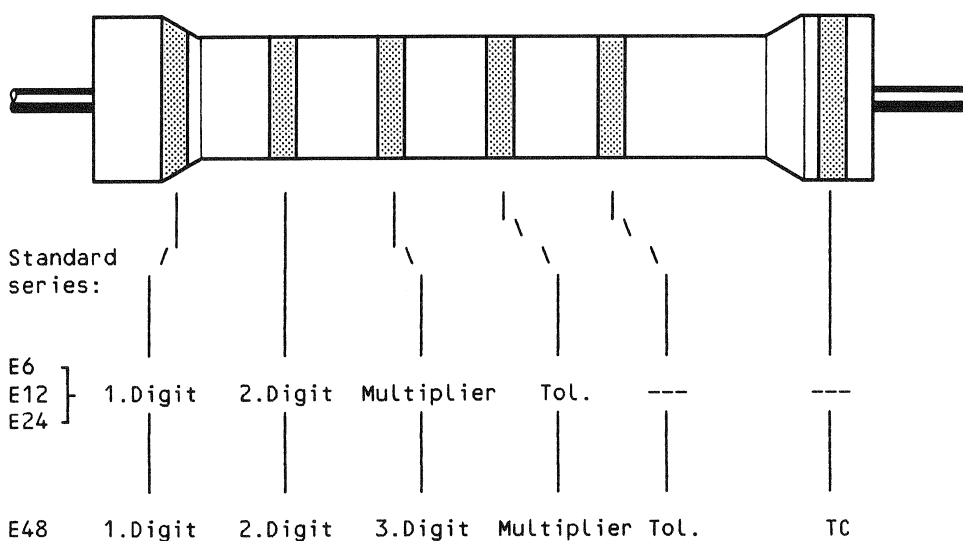
## 1.7.2 Powers of ten

Name	Abbreviation	Value
Tera-	T	$10^{+12}$
Giga-	G	$10^{+9}$
Mega-	M	$10^{+6}$
Kilo-	k	$10^{+3}$
Milli-	m	$10^{-3}$
Mikro-	$\mu$	$10^{-6}$
Nano-	n (m $\mu$ #)	$10^{-9}$
Pico-	p ( $\mu\mu$ #)	$10^{-12}$
Femto-	f	$10^{-15}$

# frequently used in the United States

## 1.7.3 Code letters and colors

## Resistors



Color	Digit	Multiplier	Tolerance	Temp.-coefficient
gold	-	0,01	5 %	-
silver	-	0,1	10 %	-
black	0	1	-	-
brown	1	10	1 %	$100 * 10^{** -6} / K$
red	2	100	2 %	$50 * 10^{** -6} / K$ ##
orange	3	1 k	-	$15 * 10^{** -6} / K$
yellow	4	10 k	-	$25 * 10^{** -6} / K$
green	5	100 k	0,5 %	-
blue	6	1 M	0,25 %	-
violet	7	10 M	0,1 %	-
grey	8	-	-	-
white	9	-	-	-

## either no mark for temperature coefficient, or red

### Capacitors

The tolerance category is sometimes specified by a letter after the rated capacitance.

D = 0,5 %  
 F = 1 %  
 G = 2 %  
 J = 5 %  
 K = 10 %  
 M = 20 %

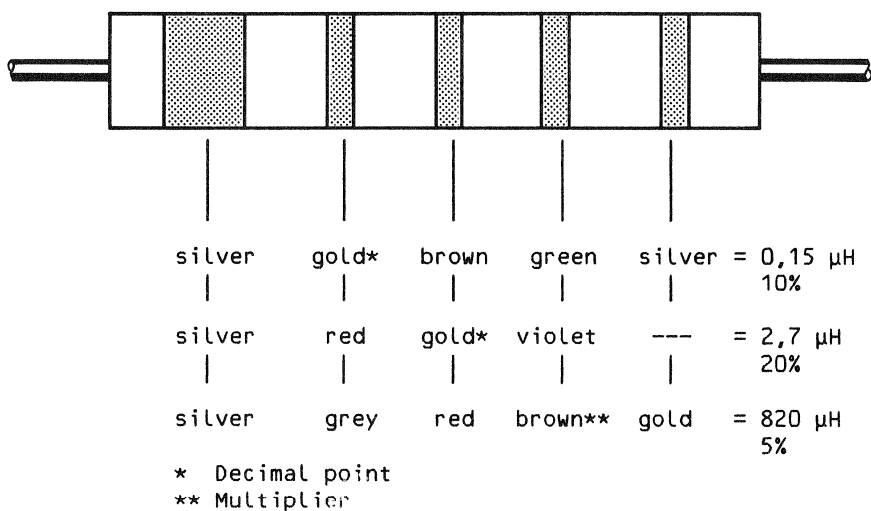
### Inductors, transformers

#### Molded RF coils

A wide silver-colored ring and 4 thin, differently colored rings identify molded RF coils. The wide silver ring indicates the start of the counting direction. The second, third, and fourth ring indicate the inductance in micro Henry ( $\mu\text{H}$ ), where two of the three rings represent the numeric value, the third one either a multiplier or the decimal point. In the latter case it has a golden color. The fifth ring identifies the tolerance in percent ( $\pm$ ).

Color	Digit	Multiplier	Tolerance
black	0	1	-
brown	1	10	1 %
red	2	100	2 %
orange	3	$10^{**3}$	-
yellow	4	$10^{**4}$	-
green	5	$10^{**5}$	0,5 %
blue	6	$10^{**6}$	-
violet	7	$10^{**7}$	-
grey	8	$10^{**8}$	-
white	9	$10^{**9}$	-
gold	,	-	5 %
silver	-	-	10 %
any (nat).	-	-	20 %

#### Examples:



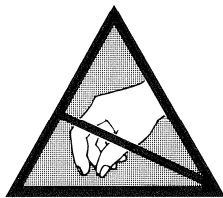
#### Inductors, transformers on ferrite cores

Inductors and transformers on ferrite cores are marked with three colored dots (for color codes, refer to the table in the section "Resistors", the two left-hand columns). These dots represent the last three digits of the STUDER standard number, the largest of them identifying the start. The first digits of the standard number (1.022.---) are always the same.

E.g.: Driver Transformer, 150 kHz.  
Standard number: 1.022.211  
Color code: red (large dot), brown, brown

Terminal 1 of the winding form is usually identified by a lobe; if not the winding form features a yellow dot near terminal No. 1.

#### 1.7.4 Electrostatically sensitive semiconductor devices "ESE"



MOS (Metal oxide semiconductor) devices are very sensitive to electrostatic charges. The following precautions should, therefore, be observed:

1. Electrostatically sensitive semiconductor devices and assemblies ("ESE") are stored and shipped in protective packing material. This protective packing is identified with the label illustrated above.
2. Strictly avoid contact of the connector pins with plastic bags and foils or other statically chargeable materials.
3. Ensure that your wrist is grounded before touching the connector pins.
4. Use a grounded, conductive plastic pad as a work surface.
5. Never unplug or insert printed circuit boards while the equipment is under power! The equipment must have been switched off for at least 5 seconds before any PCBs are pulled out or inserted!



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## 2. INSTALLATION, PUTTING INTO OPERATION, QUICK-REFERENCE DESCRIPTION

---

### 2.1 UNPACKING AND TESTING

---

The A810 tape recorder is shipped in special packing material that protects the unit from damage in transit. Unpack the recorder carefully to avoid marring the equipment surfaces.

Compare the content with the packing slip to ensure that the equipment is complete. Save the original packing material since it provides the best protection for your recorder for subsequent shipment.

Examine the complete content for possible transit damage. The forwarding company and the nearest STUDER dealer should be notified immediately in the event of damage.

### 2.2 PLACE OF INSTALLATION

---

The A810 tape recorder should preferably be installed in a dust-free location with adequate ambient ventilation. The technical specifications of the recorder are valid for an ambient air temperature range of 10 to 40°C. The relative humidity should be between 50% and 90% (noncondensing).

The recorder must not be placed in close proximity to strong electromagnetic fields. General sources of such interference are: strong load fluctuations on adjacent power lines, high-power transformers, elevator motors, as well as nearby radio and television transmitters.

Install the recorder in a location where there is sufficient clearance around it so that the cooling air can circulate freely. The minimum clearance at the ventilating louvers is 15 mm, at the lateral heatsinks 10 mm.

### 2.3 INSTALLING THE TAPE RECORDER

---

The equipment specifications are guaranteed for any operating position between vertical and horizontal.

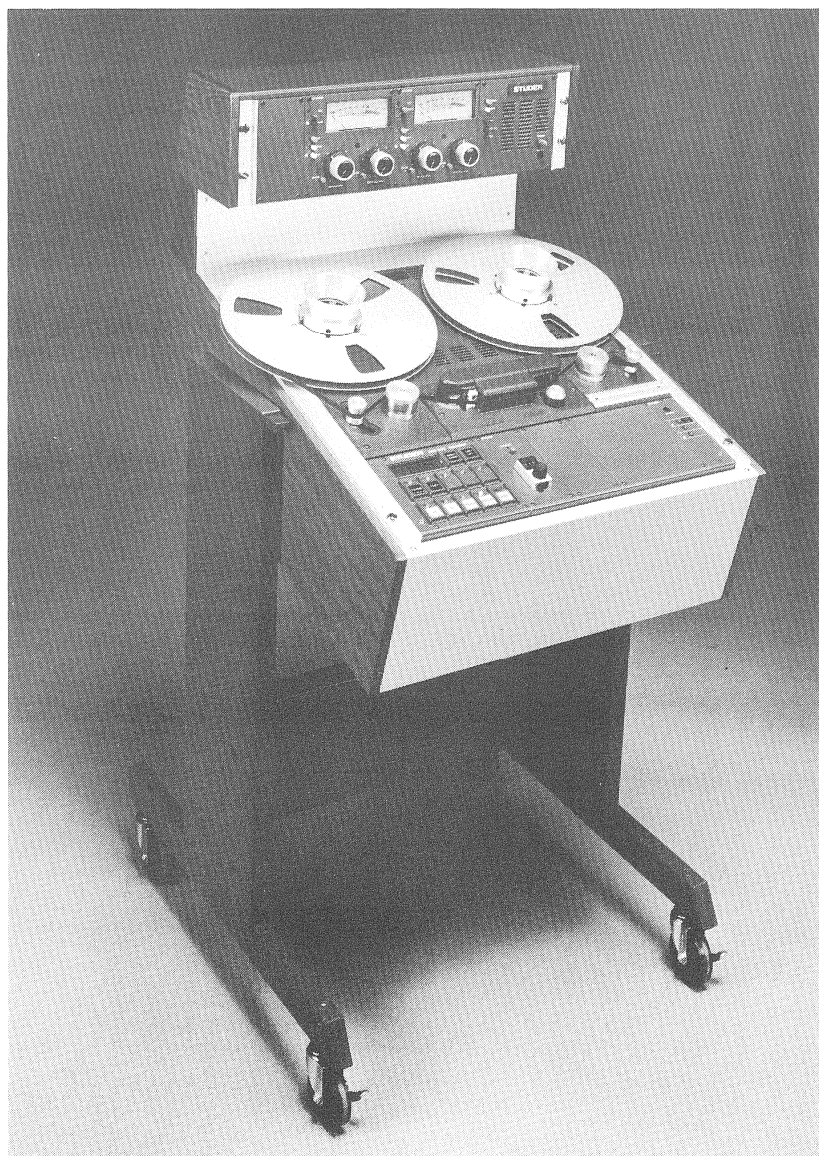
#### 2.3.1 Portable versions

---

After unpacking and visual inspection, the recorder can be installed in the desired place without further mechanical preparations.

### 2.3.2 Installation into console





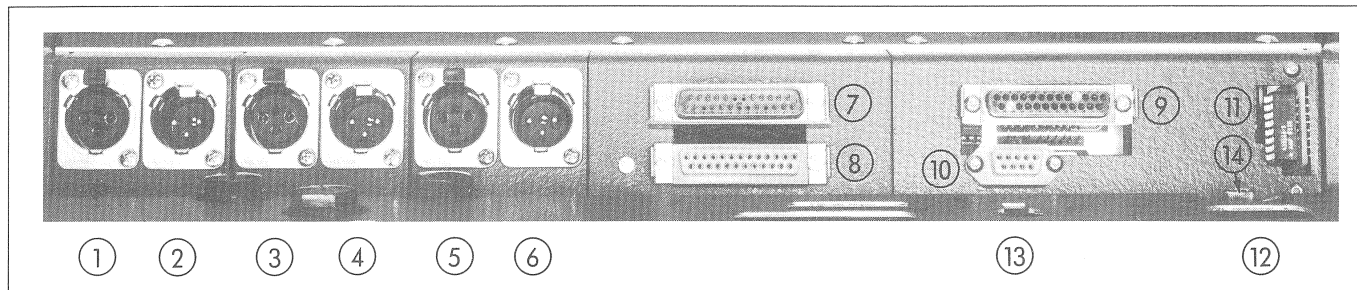
Procedure:

- Position console horizontally.
- Remove front panel of the console (4 screws M4, hexagon-socket-screw key 2.5 mm).
- Carefully slide recorder in from the front and secure with 4 slotted-head screws M6.
- Reinstall cover.

Consoles with penthouse:

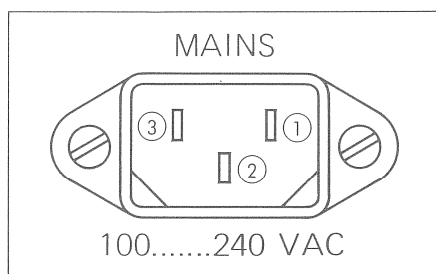
- Guide cable harness and flat cable of the panel from the top through the penthouse.
- Secure panel with 4 slotted-head screws M6.
- Position console vertically (maintenance position). The connector panel of the tape recorder becomes accessible. Plug in cable harness and flat cable (two 25-pin connectors).

## 2.4 CONNECTOR PANEL



- (1) Audio input CH1
- (2) Audio output CH1
- (3) Audio input CH2
- (4) Audio output CH2
- (5) Time code channel input
- (6) Time code channel output
- (7) Connector for VU panel (audio)
- (8) Connector for VU panel
- (9) Connector for parallel remote control
- (10) Connector for serial remote control
- (11) Address board
- (12) AC power inlet
- (13) Voltage selector
- (14) Ground socket

### 2.4.1 AC Power, voltage selector



- No. 1 Phase
- No. 2 Ground
- No. 3 Neutral

#### CAUTION

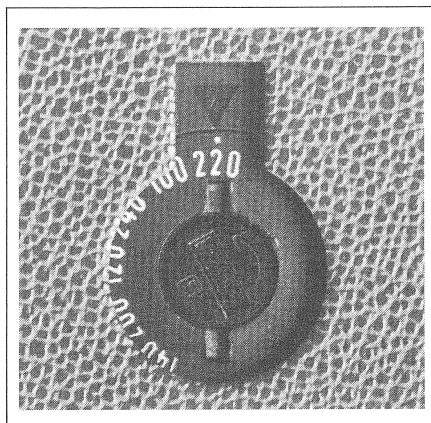
Before the recorder is connected for the first time, verify that the setting of the voltage selector on the rear panel of the recorder matches the local line voltage.

One of the following line voltages can be selected:  
100, 120, 140, 200, 220, 240 VAC

Remove the power fuse before changing the voltage selector setting. Check the rating of the fuse before you reinstall it:

100 ... 140 VAC: T 3.15 A SLOW

200 ... 240 VAC: T 1.6 A SLOW

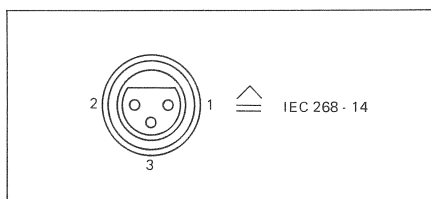


#### 2.4.2 Line input

The balanced inputs are terminated on XLR-type sockets conforming to the IEC recommendation 268-14.

- No. 1 Audio ground
- No. 2 A-line (hot)
- No. 3 B-line (cold)

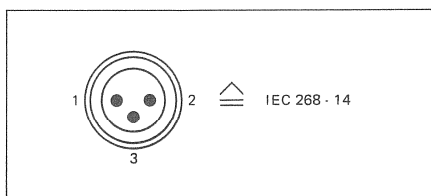
(The A Line is hot if the recorder is connected to an unbalanced source.)



#### 2.4.3 Line output

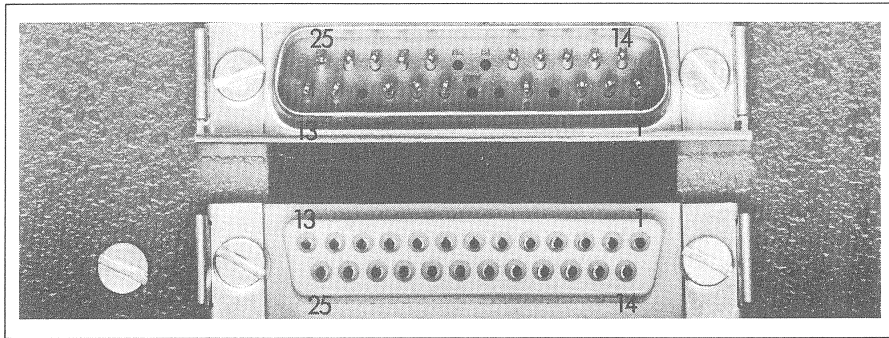
The balanced outputs are terminated on XLR-type jacks conforming to the IEC recommendation 268-14.

- No. 1 Audio ground
- No. 2 A-line (hot)
- No. 3 B-line (cold)



#### 2.4.4 Connectors for VU-meter panel

Two 25-pin connectors (subminiature, type D) are used for connecting the external VU-meter panel.



Signal names of connector GR 34 (audio, male):

01	TAPMS-01
02	+ 0.0
03	INPAD-01
04	-
05	LOUFA-01
06	-
07	-
08	TAPMS-02
09	+ 0.0
10	INPAD-02
11	-
12	LOUFA-02
13	GND
14	TAPAD-01
15	+ 0.0
16	INPDI-01
17	+ 0.0
18	LOUFB-01
19	-
20	-
21	TAPAD-02
22	+ 0.0
23	INPDI-02
24	+ 0.0
25	LOUFB-02

Signal names of connector GR 33 (digital, female):

01	+ 0.0
02	+ 5.6
03	+ 15.0
04	T-SADA
05	T-SADC
06	T-WRTSL
07	T-DT-CH2
08	T-DT-MP
09	-
10	-
11	T-VARSPD
12	T-REFEXT
13	+ 0.0
14	+ 0.0
15	+ 5.6
16	- 15.0
17	T-SADB
18	T-READSL
19	T-DT-CH1
20	T-DT-CH3
21	-
22	-
23	+ 0.0
24	+ 0.0
25	+ 24.0

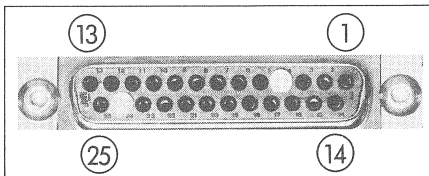
#### 2.4.5 Remote control connectors

##### Socket for parallel remote control

A 25-pin connector (subminiature, type D) is used for connecting the parallel remote control which offers the following facilities:

- Remote control of the tape transport functions with feedback
- Storing and automatic searching of the address LOC 1
- Varispeed control
- Fader start control in reproduce mode
- Cancellation of the tape lift (only nonlocking push button)

Connector set (screw-type)	Part No. 20.020.303.06
Connector set (bayonet type)	Part No. 20.020.303.17
Conversion kit (from screw-type to bayonet type or vice versa, for one connector)	Part No. 1.810.071.00

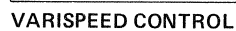


Signal names of parallel remote control connector GR 23 (female):

- |    |          |
|----|----------|
| 01 | + 0.0    |
| 02 | BR-REW   |
| 03 | BR-FORW  |
| 04 | KEY      |
| 05 | SR-VRSPD |
| 06 | SR-TRANS |
| 07 | TO-CLK   |
| 08 | BR-FAD   |
| 09 | BR-REC   |
| 10 | TO-DIR   |
| 11 | FAD1     |
| 12 | FAD2     |
| 13 | T-REFEXT |
| 14 | + 0.0    |
| 15 | BR-PLAY  |
| 16 | BR-STOP  |
| 17 | SR-LIFT  |
| 18 | SR-LOC 1 |
| 19 | SR-REC   |
| 20 | SR-REW   |
| 21 | SR-FORW  |
| 22 | SR-PLAY  |
| 23 | SR-STOP  |
| 24 | KEY      |
| 25 | + 24.0   |



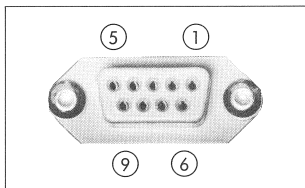
NOTE:  
If light bulbs are used as acknowledgement lamps, their inrush current should not exceed 0.3 A!



#### Socket for serial remote control

The serial remote control connector (9-pin, subminiature type D) can be used to connect a tape recorder for saving the stored audio parameters or a terminal equipped with an RS 232 interface. The signal assignment corresponds to the EIA recommendation 449.  
For change-over refer to Section 4.2.9.

Connector set (screw-type)	Part No. 20.020.303.07
Connector set (bayonet type)	Part No. 20.020.303.09
Conversion kit (from screw-type to bayonet type or vice versa, for one connector)	Part No. 1.810.071.00



Signal names of serial remote control connector GR 22 (female):

01	SHIELD
02	SDATA
03	RCCOMM
04	STUBUS1
05	N.C.
06	STUBUS2
07	SNCOMM
08	RCVDATA
09	GND

Pins for transferring the audio parameters:

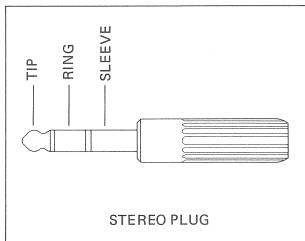
1, 4, 6

Pins for RS 232 interface connection:

2, 3, 7, 8, 9

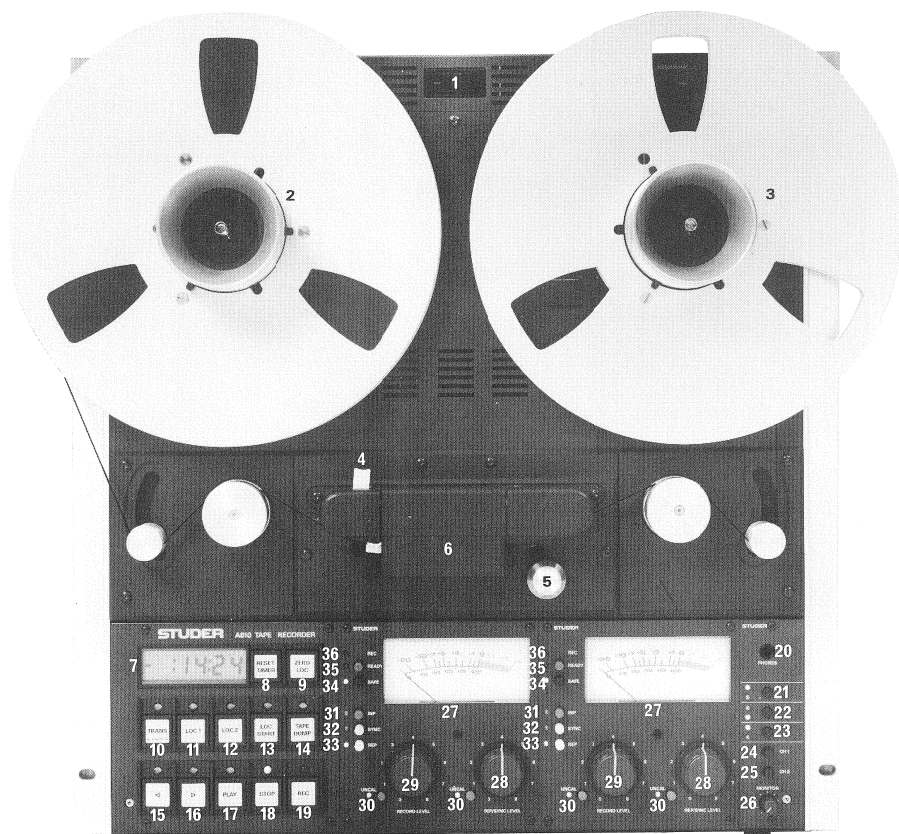
#### 2.4.6 Headphones socket

TIP = left  
RING = right  
SLEEVE = Ground



## 2.5 OPERATING INSTRUCTIONS

## 2.5.1 Controls



- (1) Power switch ON/OFF
- (2) Left-hand spindle (supply motor)
- (3) Right-hand spindle /take-up motor)
- (4) Tape lift slider
- (5) Pressure roller: For easier editing can be manually shifted toward the capstan during spooling.
- (6) Head shield, can be closed or opened manually.
- (7) Tape timer display, 4 1/2 positions (LCD) or 5 positions (LED) with leading negative sign.
- (8) RESET TIMER: Reset key for (7).
- (9) ZERO LOCATOR: Initiates automatic search of tape address 00.00.
- (10) TRANS <REDUCED>: multifunction key. Pressed together with LOC 1 ... LOC 4: the current tape address is stored; pressed together with one of the spooling keys during fast wind: reduces the spooling speed in three steps; pressed together with ZERO LOC: the operating hours (actual transport operation time) are displayed.

- (11) LOC 1: automatic search of the address stored with (10). The locate address is displayed while this button is pressed.
- (12) LOC 2: same as LOC 1  
Or  
LOC START: Automatic search of the tape address at which the play or the record function was last entered from STOP or spooling mode.  
Or  
LIFTER: Defeating the tape lift during spooling (internally programmable as a momentary or flip-flop push button).  
Or  
FADER: Change-over key for fader start. Disables local keyboard.  
Or  
TAPE DUMP: dump edit mode, right-hand spooling motor is switched off.
- (13) LOC 3: same as LOC 1  
Or  
LOC START, LIFTER, FADER, TAPE DUMP  
Or  
REM CONTR: Selector switch for parallel remote control. Local keyboard is disabled.
- (14) LOC 4: same as LOC 1  
Or  
LOC START, LIFTER, FADER, TAPE DUMP, REM CONTR  
Or  
CODE READY: recording on time code channel enabled.
- (15) < Rewind key.
- (16) > Fast forward key  
4 spooling speeds: if TRANS <REDUCED> is pressed in conjunction with < or >, the recorder switches to the next lower spooling speed. When activated in STOP or PLAY mode: after pressing < or >, the recorder starts spooling at the lowest speed (1 m/s). Can be cancelled with TRANS, STOP or PLAY.
- (17) PLAY: activates reproduce mode.
- (18) STOP: has priority over all tape transport commands. Enables recorder for fader start. If STOP is pressed in conjunction with LOC START or LOC 1...4, the stored locator addresses are displayed.
- (19) REC: record key; only effective together with PLAY. Drop-in (internally programmable): in play mode it is possible to switch directly to recording by pressing REC.
- (20) PHONES: headphones socket (stereo). Volume not adjustable. Internal monitor muted.
- (21) CCIR/NAB: selector switch for equalization at 7.5 or 15 ips.
- (22) MONO/STEREO: selector switch for mono or stereo mode, or changeover to different tape type TAPE A / TAPE B
- (23) 15 ips / 7.5 ips (or other combination): selector switch for tape speed; or rotary switch for three or four tape speeds (located above CCIR/NAB switch).
- (24) CH 1: connects channel 1 to the monitor speaker.
- (25) CH 2: connects channel 2 to the monitor speaker.  
It is possible to connect both channels to the monitor speaker.
- (26) MONITOR: volume control for monitor speaker.
- (27) Output meter: VU or PPM indication, internally selectable.
- (28) REPRO/SYNC LEVEL: level controller for reproduce or sync output signal.
- (29) RECORD LEVEL: level controller for input signal (to be recorded).
- (30) UNCAL: activates the level controller. In OFF position: calibrated line level.

## Output selector switches:

- (31) INP: Input signal
- (32) SYNC: Sync signal
- (33) REP: Reproduce signal

## Track mode selector switches:

- (34) SAFE: recording on channel disabled.
- (35) READY: Recording on channel enabled.
- (36) REC Lamp: Record pilot Lamp, Lights up after PLAY and REC have been pressed.

### 2.5.2 Power switch

#### CAUTION!

Before switching on the recorder, check that the setting of the AC voltage selector on the back of the recorder matches the local line voltage.

If the setting of AC voltage selector is changed, also check the rating of the power fuse.

The power switch is located at the top edge of the tape transport cover. The recorder is switched on by shifting the switch handle to the right (-). To switch the recorder off, shift the switch handle to the left (0).

When power is switched on, the previously active operating state is activated and indicated.

Exceptions: The recorder is always switched to STOP mode. If it is equipped with a SAFE/READY switch always SAFE and REPRO are activated.

The microprocessor automatically performs a confidence test of the main functions when power is switched on.

### 2.5.3 Tape timer display

The tape timer display consists either of a 4 1/2 position liquid crystal display (LCD) or a 5 position LED display. It indicates the actual tape position in hours, minutes, and seconds independent of the selected tape speed. Numbers smaller than zero are identified by a negative sign.

Display range: -1 h 59 min 59 s to 1 h 59 min 59 s (LCD version)  
- 59 min 59 s to 9 h 59 min 59 s (LED version)

Fractional seconds are rounded to the nearest second.

When power is switched on, some random numbers appear, followed by a date (calendar week and year). This is the release date of the microprocessor software (program). After five seconds the tape address is displayed which was active before the last power off.

On time code versions equipped with the LED tape timer display and with the new time code amplifier 1.820.721-81/82/83/84, the far right decimal point turns on when a code signal is available at the input or is being read from the tape (depending on the position of the INP/SYNC/REP selector switch).

Should a malfunction be detected in the recorder operation, this will be indicated by an alphabetic/numeric combination.

#### Examples of tape timer readings:

1:01:56 (LCD) or 1.01.56 (LED) indicates the last active tape address recorder ready.  
:01:56 Upper display limit has been exceeded (LCD),  
- :01:56 Lower display limit has been exceeded (LCD),  
H.01.56 Upper display limit has been exceeded (LED),  
L.01.56 Lower display limit has been exceeded (LED), recorder ready  
0.35.56. In PLAY mode the last decimal point is on = time code on tape.  
EE 01 (LCD) or EEED1 (LED): stored information has been lost. Refer to DEGRADED OPERATION, Section 2.7.

### 2.5.4 Pilot lamps

Any number of pilot lamps as well as READY or REC can briefly turn on after the microprocessor has been started. The recording function is electronically disabled during this sequence. The following pilot lamps (LEDs) turn on to indicate the current operating status of the tape recorder:

STOP: Stop function is active. If this LED flashes, both tape tension sensor are in their end positions (no tape present or threaded loosely).

CCIR or NAB: indicates the type of equalization selected.

STEREO or MONO

or on recorders without mono/stereo selector switch,

TAPE A or TAPE B: tape type selector.

Depending on the recorder configuration the following may also be illuminated:

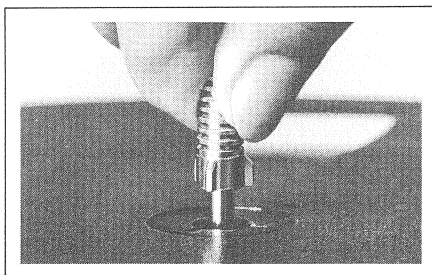
- Tape speed: e.g. 15 or 7.5 ips
- Output meters
- On track selector: SAFE
- On output selector: selected output (INP, SYNC or REC)
- UNCAL (if selected).

#### 2.5.5 Mounting the tape

##### Three-pronged reel with flange:

(DIN 45514, 45517)

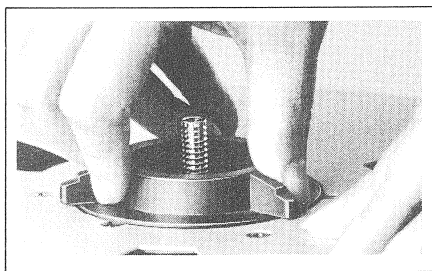
Mount full reel on the left-hand spindle, the empty reel on the right-hand spindle. Pull out three-pronged guide and lock it with a 60° rotation.



##### NAB reel:

Mount NAB adapters on spindles and lock three-pronged guides.

Mount NAB tape reel (or NAB hub if self-supporting pancake is used) on the adapter and rotate top section of adapter clockwise until it locks in place.

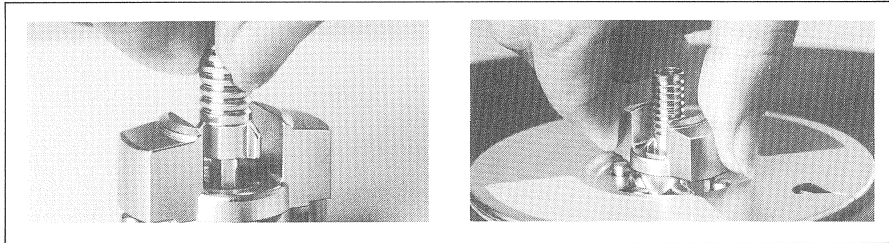


Self-supporting pancake:

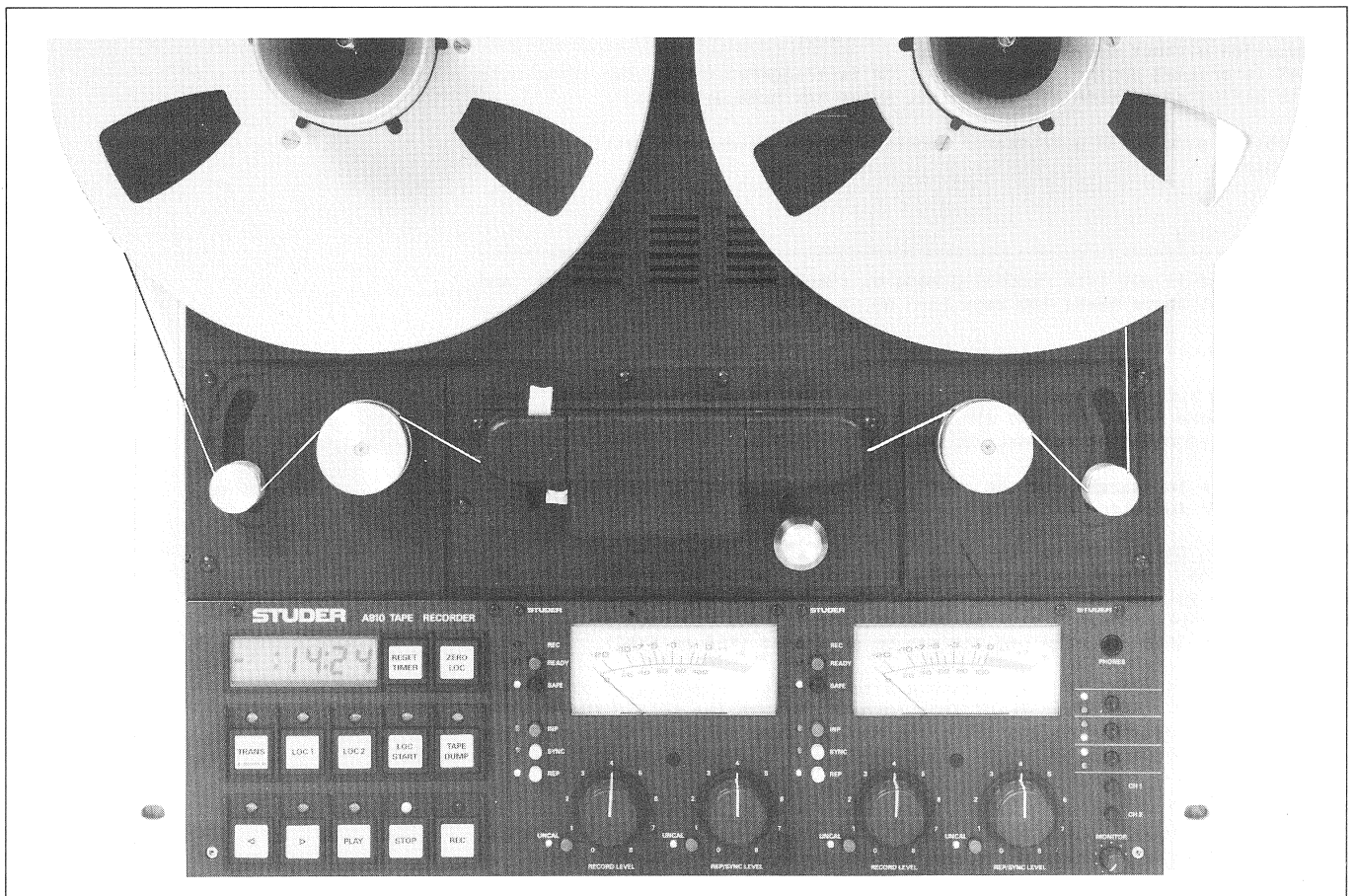
(According to DIN 45515)

Set pancake platters on spindles, engage the two driving lugs of the platter into the holes of the spindle and lock three-pronged guide.

Mount full pancake on the left-hand side, lift flap and rotate it by 90° until it rests on the guide pins. Repeat preceding steps for mounting a pancake platter and an empty hub on the right-hand side.

Threading the tape:**IMPORTANT:**

The head shield must be lifted off the soundheads before threading the tape.



Thread tape according to illustration. The leading tape end is placed on the right-hand reel and secured with a few counterclockwise rotations. Tapes with a transparent leader should be wound forward to the start of the oxide coating. Set tape timer to zero by pressing RESET TIMER. Lower shield to cover soundheads.

### 2.5.6 Tape speeds

Three or four tape speeds are available in the following versions:

- Low-speed (LS) version (with 4-pole tacho motor):  
3.75 / 7.5 / and 15 ips
- Four-speed version (with 2-pole tacho motor):  
3.75 / 7.5 / 15 / and 30 ips

(The speed is selected on the rotary switch). The pilot lamp "PLL CAPSTAN" turns on as soon as the tacho motor has attained the nominal speed.

On older versions with two-speed panel, any two speeds (3.75 / 7.5 / 15 / 30 ips) can be selected by means of DIL switches. The speed is changed over by pressing the corresponding button.

### 2.5.7 Play mode

The recorder is switched to play mode either with the local PLAY key, a remote control key or a fader start device, and the lamp above the PLAY key turns on.

The play mode can be cancelled by pressing the STOP button.

If PLAY is pressed while a recording is in progress, the recorder switches to reproduction without delay.

If PLAY is pressed during spooling, a STOP is triggered (PLAY lamp turns on); PLAY is activated as soon as the nominal speed has been attained.

The spooling mode or an autolocator function can be selected directly from the PLAY function.

### 2.5.8 Recording

The machine is put into recording mode by simultaneously pressing PLAY and REC. The lamps above these two keys turn on.

The record function is cancelled by pressing the STOP key.

If PLAY and REC are pressed during spooling, the recorder enters stop mode (the lamps above PLAY, REC and STOP turn on). Recording mode is automatically activated as soon as the nominal tape speed is reached.

It is possible to switch from the record function directly to spooling mode or an autolocator function.

#### Recorders with SAFE/READY switch:

Recording on corresponding channel can be disabled by pressing the SAFE button. The yellow SAFE lamp turns on. When PLAY and REC are subsequently pressed, the tape transport starts, however, the signals recorded on the track protected with SAFE are retained and can be monitored (REP or SYNC).

Recording on a channel is only possible after the corresponding READY button has been pressed. The green READY lamp turns on. When the record function is activated by pressing PLAY and REC, the red REC lamp turns on to signal that recording is in progress.

The SAFE function can be enabled for either channel while a recording is in progress. To reenale recording on this channel, the READY button must first be pressed. After the READY lamp turns on, either the PLAY and REC key or only REC key must be pressed, depending on the internal programming.

On 2-channel recorders, the internal programming determines whether this feature works on both channels in parallel or separately for each channel.

#### Drop-out from record mode:

Click-free changeover from the record function to playback or sync reproduction is possible by pressing the the PLAY key. Depending on the internal programming the erase and record head are switched off concurrently, or the record head switches off with a speed-dependent delay in such a way that the two soundheads drop out at exactly the same tape address. If the recording function is terminated with STOP, both soundheads are always switched off concurrently.

#### Drop-in:

Click-free change-over from reproduction to sync reproduction or recording is possible. Two methods can be implemented through internal programming: PLAY and REC must be pressed concurrently or the recording function is activated by REC alone (prerequisite: the machine is already in play mode!). Depending on the internal programming, the erase head and the recording head are either switched off concurrently or the recording head switches off with a speed-dependent delay so that the drop-in occurs exactly at the same location.

#### Overlapping drop-in "FADE IN/FADE OUT" (mechanical):

If e.g. an applause is to be faded in at the end of a production, the tape can be lifted off the erase head with the tape lift slider (4). The machine is subsequently started in record mode. When the slider is slowly released, the tape contacts the record head first, i.e. the new modulation is added to the existing signals (e.g. music selection). After the music selection has faded away, the tape lift slider is released completely so that the tape comes in contact with the erase head. Unwanted noise will be eliminated and only the applause is recorded.

### 2.5.9 Sync reproduction

Sync reproduction mode is entered by pressing the SYNC button. In this mode, the tape induces an audio signal in the recording. This signal is amplified and equalized in the reproduce amplifier. Accurate drop in is possible since there is no speed-dependent offset between the record and the reproduce head.

The bandwidth for sync reproduction is limited to approx. 12 kHz. For special mixdowns it is possible to extend the bandwidth to 20 kHz with the aid of a jumper (refer to Section 4.2.9). At frequencies above 12 kHz, strong cross talk from the audio channel to the sync reproduction channel must, however, be expected.

#### Sync preselection:

A channel that has been switched to recording mode cannot be switched to sync reproduction. If the SYNC button is pressed during a recording, the output of the corresponding channel is connected to the input (INP). This channel is automatically switched to sync reproduction when the recording mode is cancelled (PLAY, SAFE, STOP).



### 2.5.10 Spooling mode

Rewinding is activated by pressing the < key; fast forward by pressing the > key. The corresponding pilot lamp turns on.

*The spooling function is cancelled by pressing the STOP key.*

Direct change-over from rewind to fast forward and vice versa or from reproduction or recording to spooling is possible.

It is possible to switch from spooling mode directly to recording or reproduction. The pilot lamp of the selected function turns on, the tape is braked, and the new function is activated as soon as the tape travels at the nominal speed.

#### Decreasing the spooling speed:

The search for a specified tape address can be made easier by decreasing the spooling speed from 10 m/s (standard) to 7, 4, or 1 m/s. This is accomplished by pressing TRANS <REDUCED>, followed by one of the spooling keys.

TRANS <REDUCED> is active as long as the corresponding pilot lamp is on.

#### Example:

In order to decrease the maximum spooling speed to 1 m/s, the keys are pressed in the following order: TRANS <REDUCED> and 3 times < or >.

The slowest spooling speed can be activated directly from STOP or PLAY: press TRANS <REDUCED> and the corresponding spooling key.

Spooling at full speed can be resumed by pressing TRANS (or STOP or PLAY).

#### Tape lift:

The tape is automatically lifted during spooling in order to minimize wear on the soundheads.

If the beginning or the end of a recording is to be searched, the pressure roller cover can be pressed manually against the capstan but the pressure roller cannot, however, touch the capstan. As a consequence, the tape lift pins are retracted, the tape is pushed against the heads and the modulation becomes audible.

The tape lift pins can be retracted electrically by pressing the LIFTER key (internally programmable as a momentary or flip-flop key).

### 2.5.11 Stop mode

The STOP key has top priority and cancels other operating modes such as reproduction, recording, spooling, and autolocator. After this key has been pressed, the STOP pilot lamp turns on and tape braking is initiated.

When the tape has come to a stop, the braking torque is automatically decreased and the tape tension sensor are locked. This makes it easier to shift the tape for editing purposes.

Any new operating mode entered during braking will be stored and immediately activated when the nominal speed has been attained.

The STOP key can also be pressed in conjunction with locator keys to read out the locator addresses.

### 2.5.12 Autolocator

The following modes are supported by the autolocator function:

- ZERO LOC: Zerolocator. This key initiates a rewind (or fast forward) to the tape address corresponding to the timer reading 00:00.
- LOC START (programmable): this key activates a fast rewind (or forward wind) to the tape address at which play or record was last activated from STOP.
- LOC 1 ... LOC 4 (programmable): Transferlocator. Up to four tape addresses can be stored and automatically searched in spooling mode by pressing one of these keys.

#### Programming:

Search desired tape address and press the TRANS key when the approximate position has been reached. The address can be stored as long as the TRANS pilot lamp is on.

As soon as the exact position has been found, press one of the keys LOC 1 ... LOC 4. The TRANS pilot lamp turns off to acknowledge that the address has been transferred into memory. The TRANS key must be pressed again before a new address can be stored.

The stored address can be read out:

Either by pressing the corresponding LOC key again after the search has been completed or by holding down the STOP key, followed by the corresponding LOC key.

#### Play Preselection

If the PLAY key is pressed while a locate function is in progress (ZERO LOC, LOC START, LOC 1 ... 4), the recorder switches automatically to reproduction after the corresponding tape address has been found. Recording mode (REC) cannot be preselected.

All locate addresses are retained in memory even after the recorder has been switched off.

#### CAUTION!

Since the stored tape address relate to the tape timer content, undesirable offset will occur if the RESET TIMER key is pressed unintentionally!

### 2.5.13 Dump editing

The right-hand spooling motor is switched off in dump edit mode and unusable tape segments can be played into the waste basket.

When the TAPE DUMP key (internally programmable) is pressed, the recorder switches to reproduction but the take-up motor is switched off.

In TAPE DUMP mode the tape must be pulled gently to the right until the pinch roller presses the tape against the capstan.

The TAPE DUMP function can be cancelled by pressing one of the command keys (e.g. STOP) or by pressing TAPE DUMP a second time.

#### 2.5.14 Monitor

The monitor speaker of portable or chassis versions is built into the tape transport cover.

The key CH 1 connects channel 1, CH 2 connects channel 2 to the monitor speaker. If both keys are pressed, channel 1 and channel 2 are mixed in the monitor amplifier. The monitor speaker always reproduces the signal from the selected output (INP/SYNC/REP).

The volume can be adjusted with the MONITOR control.

The monitor speaker of three- and four-speed panel versions is muted in fader start mode.

The monitor speaker of console models is built into the console panel. Reproduction or input can be activated with the REPRO/INPUT selector switch (the signal is tapped before the corresponding level controllers).

Channel 1 (CH 1), channel 1+2 (CH 1 + 2) or channel 2 (CH 2) can be monitored.

The volume is adjusted with the MONITOR control.

No automatic muting of the monitor speaker is possible in fader start mode.

#### 2.5.15 Tape timer

The electronic tape timer always displays the real time in hours, minutes, and seconds, regardless of the selected nominal tape speed.

The display capacity is -1 h 59 min 59 s to 1 h 59 min 59 s (for the LCD version) or -59 min 59 s to 9 h 59 min 59 s (LED version).

Values outside the display capacity are indicated without the hours digit on the LCD version, e.g. :56:20 or - :03:10; an "H" appears on the LED version in place of the hours if the value is too high or an "L" if the value is too low for indication, e.g. H.56.20 or L.03.10.

Fractional seconds are rounded up or down.

The tape timer stops automatically when the end of the tape is reached, if the tape tears, or in dump edit mode (TAPE DUMP).

The timer can be reset to 00.00 by pressing the RESET TIMER key.

On time code versions equipped with the LED tape timer display and with the new time code amplifier 1.820.721-81/82/83/84, the far right decimal point turns on when a code signal is available at the input or is being read from the tape (depending on the position of the INP/SYNC/REP selector switch).

#### 2.5.16 VU-meter panel

The level meter can be internally switched to function as a peak program meter (PPM) or a VU-meter.

UNCAL: When this button is pressed, the corresponding level control is activated and the pilot lamp turns on.

When the UNCAL button is released, the level control is bypassed and the input or the output level is set to line level.

##### Output selector:

INP: Connects the input signal of the recorder to the output and to the VU-meter.

SYNC: Connects the sync signal to the output and the VU-meter. This mode can be preselected for the record function.

REP: Connects the reproduce signal to the output and the VU-meter.

Source/tape monitoring can be conveniently activated during recording by pressing the INP and REP buttons.

The INP, SYNC, and REP buttons always cancel each other.

In 2-channel models, the operating procedure is determined by the internal programming, i.e. it affects either both channels together or each individual channel.

#### 2.5.17 Remote controls

The tape recorder can be started remotely in play mode with the aid of the fader start circuit.

The following functions can be activated remotely from the parallel remote control: reproduction, recording, spooling, stop, LOC 1, and LIFTER (defeating the tape lift during spooling).

- a) Operation with programmable keys FADER and/or REM CONTR:  
When one of these keys is pressed, the corresponding pilot lamp turns on, the local keyboard is disabled.

If FADER or REM CONTR is pressed a second time, the local keys are reactivated and the pilot lamps turn off. The fader start switch and the remote control switch are disabled in this condition.

- b) Operation without FADER and/or REM CONTR keys:  
The fader start circuit is only enabled if the recorder is in STOP mode. The remote control keys and the local keys have equal priority.

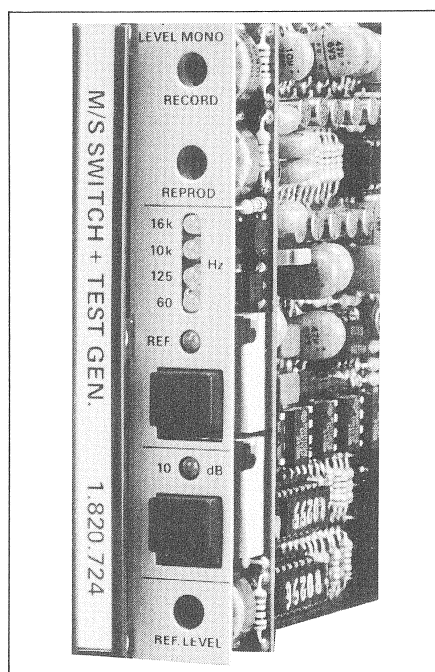
#### 2.5.18 Mono-Stereo switch (option)

Stereo models can be equipped with a mono/stereo switch. The last operating mode in effect will be automatically reestablished and indicated after the recorder is switched on.

The MONO/STEREO button is a flip-flop switch, i.e. it changes from mono to stereo or vice versa. This switch can be actuated in any operating mode.

If the mono/stereo module is not installed, the corresponding pilot lamps STEREO and MONO remain dark.

#### 2.5.19 Mono/stereo switch with test generator (option)



The test generator is switched on by pressing the upper button (REF pilot lamp turns on, i.e., the reference frequency, normally 1 kHz, is selected). The following switch settings can be established by repetitive pressing of this button:

- 60 Hz - 125 Hz - REF - 10 kHz - 16 kHz - OFF - 60 Hz - etc.

With the lower button the generator level can be switched over from nominal level to nominal level -10 dB. If -10 dB is selected, the gain in the reproduce branch of the mono/stereo switch is automatically boosted by 10 dB; this means that the reference value of the VU-meter display is again 0 dB for measurements with tape.

The lower button is only enabled if the test generator has previously been switched on with the upper button. After switching the generator off and on again with the upper button always nominal level is present at its output.

#### 2.5.20 Time code channel (option)

On recorders with 2 mm guard track without built-in time code operating panel, the time code channel is always controlled (INP/SYNC/REP switch) in parallel with the two audio channels.

In 2-track versions without built-in time code operating unit, the time code channel (INP/SYNC/REP) is always controlled in parallel with audio channel 1. For example if sync reproduction is to be achieved for audio channel 2, audio channel 1 will have also to be switched to sync reproduction.

##### Time code recording

On recorders without built-in time code operating unit, press the (internally programmable) CODE READ key (pilot lamp turns on). Recording can subsequently be started by pressing PLAY and REC. If recording is already in progress, time code recording is activated by pressing CODE READY and REC + PLAY. (CODE READY pilot lamp flashes).

On recorders equipped with a time code operating unit, press the READY button (READY lamp turns on) and start the machine in record mode by pressing PLAY and REC. If recording is already in progress, press READY and REC + PLAY.

##### Time code reproduction

Press REP or SYNC and start recorder in reproduce mode with PLAY.

#### 2.5.21 Varispeed control (option)

The varispeed control is activated either with the built-in VARISPEED button or the VARISPEED remote control key. With an external reference frequency of 9600 Hz, the tape speed corresponds to the selected nominal speed (3.75; 7.5; 15; or 30 ips). The tape speed can be varied by  $\pm 7$  semitones by increasing or decreasing the external generator frequency (+50% / -33%).

The pilot lamp of the nominal frequency turns on as soon as the capstan motor is in synchronism with the external reference frequency.

The drop-in/drop-out sequence (refer to 2.5.8) is fixed and depends on the nominal speed which means that no matching is executed in varispeed mode!

## 2.6 EDITING, SPLICING

### 2.6.1 Procedure for searching a tape address

Easy and quick searching of a specified tape address were basic criteria in the design of the A810 tape recorder:

- Four spooling speeds are available for accurate and fast search of the desired tape address.
- For cueing in spooling mode, the automatic tape lift can be manual defeated by pressing the LIFTER key or by pressing against the cover of the pressure roller.
- Unusable tape segments can be played into the waste basket in PLAY mode (programmable TAPE DUMP key).
- The autolocator function enables accurate search of the desired tape addresses at any tape speed.
- The tape tension sensors are locked in STOP mode and the braking torque is decreased: this makes it easier to shift the tape by hand and to cut it. The locking force of the sensors was selected so (500 p or 5 N) that the tape will not be damaged in the event of jerky movement.

Caution:

If the tape marker is used and for physical cutting of the tape, the recorder must be switched from sync reproduction to normal reproduction by pressing the REP buttons.

Searching a tape location with spooling:

If the desired tape position is approximately known (e.g. the beginning or the end of a program), it can be approached with the spooling function. The maximum tape speed can be reduced during spooling to 7, 4, or 1 m/s by pressing TRANS <REDUCED> and < or > (also refer to Section 2.5.10!).

Press LIFTER key or push pressure roller cover with your hand against the capstan so that the tape lift pins are retracted behind the soundheads and the modulation can be cued. Avoid contact with the rubber pinch roller!

As soon as the cue point is reached, the tape can be accurately positioned by repetitively pressing < and >. Press STOP and bring the tape into the exact cutting position by carefully rotating the two reel flanges by hand.

Search with PLAY:

If certain segments with unknown locations are to be cut out of a program, they can be searched with normal PLAY mode. When one of these segments has been located, press the STOP key and position the tape into the correct cutting position by carefully rotating the two reel flanges by hand.

If longer tape segments are to be eliminated, switch the recorder to dump edit mode (internally programmable) by pressing the TAPE DUMP key. The right-hand spooling motor will be switched off and the tape is played into the waste basket on the right-hand side.

The functions spooling, autolocator, remote control, and fader start are disabled while the dump edit mode is active (refer to Section 2.5.13).

Search with autolocator:

(Also refer to 2.5.12)

The tape address 00.00 can be automatically searched with the ZERO-LOC key.

The start of a program is automatically stored in memory and can be automatically searched with the internally programmable LOC START button, provided the recording was not interrupted.

While a program is being recorded, 1 to 4 tape addresses can be stored directly, depending on the internal programming, by pressing TRANS and LOC 1 (...4).

When the corresponding LOC button is pressed, the desired tape address is automatically searched; the exact editing position can now be adjusted by hand.

### 2.6.2 Cutting the tape

The following features have been provided, for easy cutting and splicing of the tape:

- A tape marker and scissors built into the headblock are available as options.
- Built-in splicing block with a cutting groove below the right-hand guide roller.  
The distance from the right-hand index finger stop of the head shield to the reproduce head is the same as the distance from the right-hand splicing block stop to the cutting groove.
- A tape loosely inserted after splicing will be automatically and correctly drawn in when the PLAY key or one of the spooling keys are pressed.

The tape can be cut once the correct splicing point has been established. This is accomplished by one of the procedures outlined below:

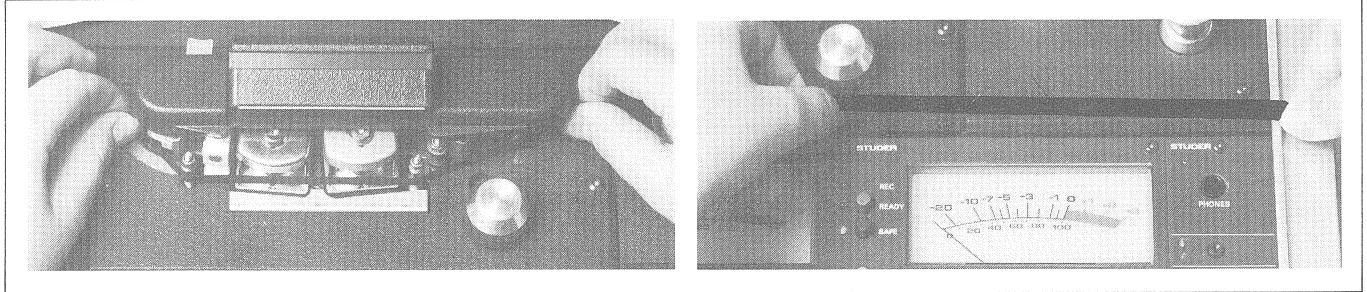
Cutting at the reproduce head

Lift the tape lightly off the reproduce head with antimagnetic scissors and cut it exactly at the gap (center of the head face) at an angle of 45°. A special cut-out is located to the right of the reproduce head so that the scissors can be inserted for lifting the tape.

Marking the tape

Mark the center of the reproduce head face on the tape with the aid of a marker (option) or a soft pencil. Now draw the tape away from the soundhead and cut it at an angle of 45°.

### Splicing block with cutting groove



With thumb and index finger of each hand, pick up the tape on the right- and the left-hand side of the head shield and pull it out gently. Without letting the tape slip out of your hand, insert it into the splicing block in such a manner that the index finger of your right hand barely touches the edge of the block. The cutting position is now exactly over the cutting groove and the tape can be cut with a razor blade.

### Built-in tape scissors (option)

Mark the cutting position of the tape with the marker or a soft pencil or memorize the location from the printing on the back. Carefully rotate the right-hand spindle (take-up direction) to advance the cutting position to the scissors. The tape is cut by pushing the scissors button.

### 2.6.3 Splicing the tape

The splicing block with the cutting groove is located below the right-hand guide roller.

The two tape segments are placed into the splicing block with the printed side facing up. Join the two ends (without overlapping) and secure them with a piece of splicing tape (approx. 3/4" (20 mm) long, 1/4" wide).

After the splicing operation the tape is reinserted and tensioned.



## 2.7 DEGRADED OPERATION

This Section describes the extent to which the A810 tape recorder can be operated in the event of a malfunction in one of the assemblies.

"Degraded operation" is not possible if

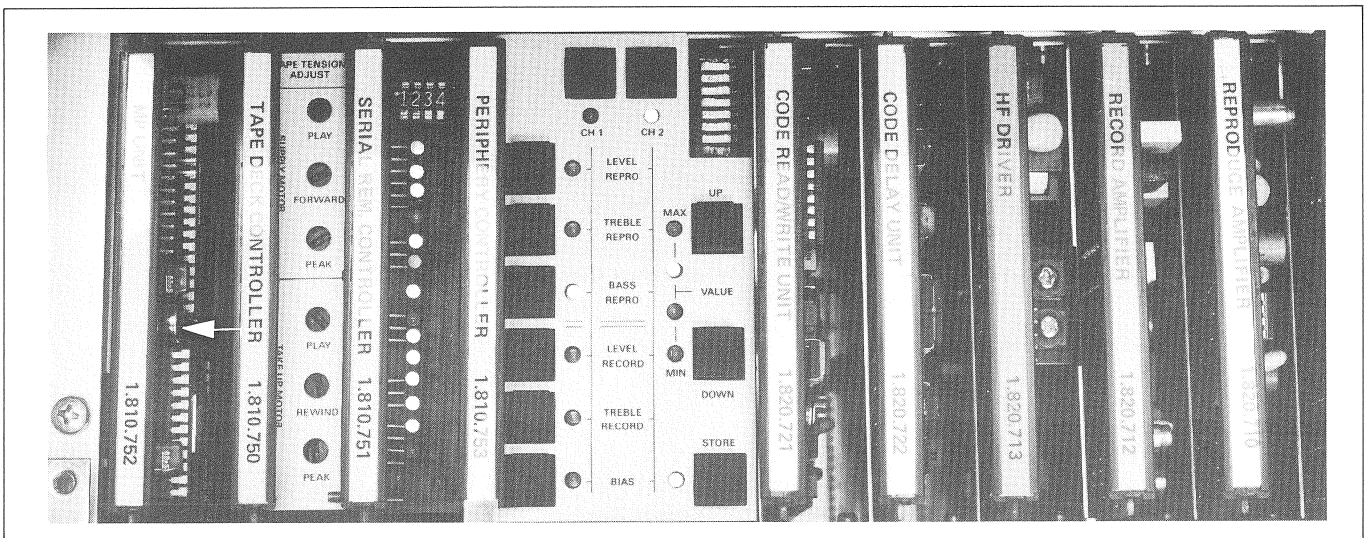
- One or several supply voltages are failing
- If the control for the spooling motors or the capstan motor is defective.

Important:

A defective tape recorder should only be operated in emergencies and be forwarded to an authorized service location as soon as possible.

Should one of the following error messages appear when the recorder is switched on (except EE 01, EE 02, and EE 03 on the LC display or EEE01, EEE02, and EEE03 on the LED display; refer to 2.7.1!), switch the recorder off, wait a few seconds, and switch it on again. If the error message disappears, normal operation can be resumed (the error may have been caused by fluctuations or transients in the line voltage during the initialization of the microprocessor).

Normal operation may also be restored by reinitializing the microprocessor by pressing the RESET key located below the lower front panel on the circuit board MP UNIT 1.810.752/1.820.780.



Error messages can be cleared by pressing TRANS <REDUCED> and STOP, however they may reappear after a certain time.

### 2.7.1 Error messages appearing on the tape timer display

**EE 01 (LCD) or EEE01 (LED):**

Data error in RAM; is only displayed when the recorder is switched on or after a RESET.

To keep the recorder operational, the standard audio parameters permanently stored in the machine program are loaded into the amplifiers. Record and reproduce mode are still possible, however minor deviations from the guaranteed technical data may occur because of the changed audio parameters.

A test recording should be made.

Also check the stored locate addresses.

The tape recorder must eventually be recalibrated or the audio parameters stored on tape must be reloaded. (Refer to Section 4.2.)

- EE 02 (LCD) or EEE02 (LED):  
Occurs only during calibration. Refer to 4.2.1.7.
- EE 03 (LCD) or EEE03 (LED):  
A data error has been detected during the cyclic testing of the RAM.  
Same effect and remedy as for EE 01!

Important:

The error messages EE(E)01, EE(E)02 and EE(E)03 are cleared after the recorder is switched OFF and ON or after RESET. It should be remembered, however, that the standard audio parameters will be loaded!

- EE 04 (LCD) or EEE04 (LED):  
---
- EE 05 (LCD) or EEE05 (LED):  
Failure of a supply voltage. No operation is possible. Check the secondary fuses and the supply voltages. Exception: failure of the 5.6 V supply.
- EE 06 (LCD) or EEE06 (LED):  
Error in the transmission of data when reading saved audio parameters from tape. Repeat the read operation (refer to 4.2.7).
- EE 07 (LCD) or EEE07 (LED):  
Error in the transmission of data when saving audio parameters on tape. Repeat save operation (refer to 4.2.7).
- EE 08 (LCD) or EEE08 (LED):  
Error in the comparison of the saved audio parameters with the data stored in RAM (refer to 4.2.7).
- EE 13 (LCD) or EEE13 (LED):  
External VU panel not plugged in or jumper on BUS CONNECTOR PCB set to "EXTERN" rather than "INTERN" (refer to Section 4.2.9.8).
- EE 14 (LCD) or EEE14 (LED):  
Master panel not plugged in (BUS CONNECTOR BOARD).
- EE 15 (LCD) or EEE15 (LED):  
Data transmission error (in conjunction with serial remote port).
- EE C1 (LCD) or EEEC1 (LED):  
Failure in audio channel 1. Recording on channel 1 is inhibited by the microprocessor. Reproduction of channel 1 or recording and reproduction on channel 2 are still possible.
- EE C2 (LCD) or EEEC2 (LED):  
Failure in audio channel 2. Recording on channel 2 is inhibited by the microprocessor. Reproduction of channel 2 as well as recording and reproduction on channel 1 are still possible.
- EE C3 Time code channel defective.
- EE Ei (LCD) or EEEEi (LED):  
(i = 1, 2, 3, or 4) data error in one of the EPROMs 1, 2, 3, or 4. Further operation of the recorder is not possible if this error occurs during the power-on sequence of the recorder.  
If the error occurs after the recorder has been switched on: mount a tape (with trivial content). Check functions such as play, record (also the SAFE function!) and spooling. Check braking action (loop format-  
ion!).  
The recorder can be put into operation if no apparent problem is found, however the service agency should be notified as soon as possible.

OTHER MESSAGES OF THE TAPE TIMER DISPLAY

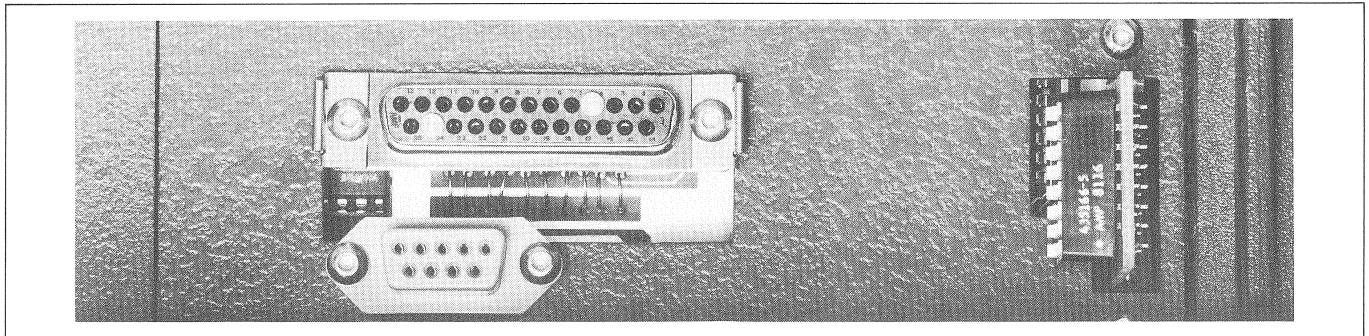
- b0 b0 (LCD) or b0b0b (LED):  
This value is displayed while the audio parameters are being read from tape.

- bb bb (LCD) or bbbbb (LED):  
Acknowledgment for correct reading of the audio parameters from tape.  
All data have been stored in RAM.
- CO CO (LCD) or COCO (LED):  
This value is displayed while the audio parameters are being saved on tape.
- CC CC (LCD) or CCCCC (LED):  
Acknowledgment for correct copying of the audio parameters to tape. All audio data have been recorded thrice.
- d0 d0 (LCD) or d0d0d (LED):  
This value is displayed while the audio parameters stored on tape are being compared for verification purposes with the data stored in RAM.
- dd dd (LCD) or ddddd (LED):  
Acknowledgment that the audio parameters recorded on tape have been successfully compared with the data stored in RAM.

## 2.8 OPERATION WITH SERIAL REMOTE CONTROLLER

With the latest version of the serial remote controller (1.810.751), the recorder can be interfaced to a terminal (RS 232) and the audio parameters can be saved on tape.

Changeover between RS 232 and parameter saving is effected with the program switches on the address PCB.



### 2.8.1 Data protection

The audio parameters stored in RAM can be copied to magnetic tape via the 9-pin connector for serial remote control, or new audio parameters can be loaded into the recorder (refer to Sections 4.2.7 and 4.2.8).

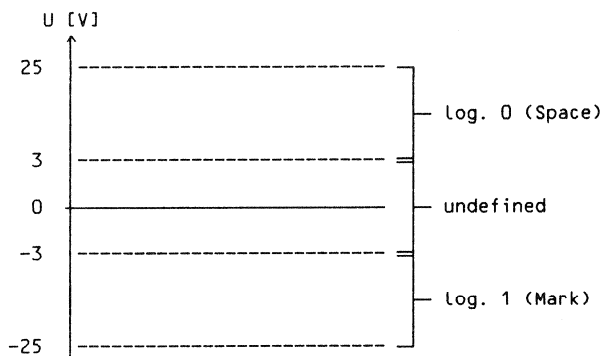
### 2.8.2 RS 232 interface

The term "RS 232" defines a link between a "terminal" and a "modem". The corresponding standards also define:

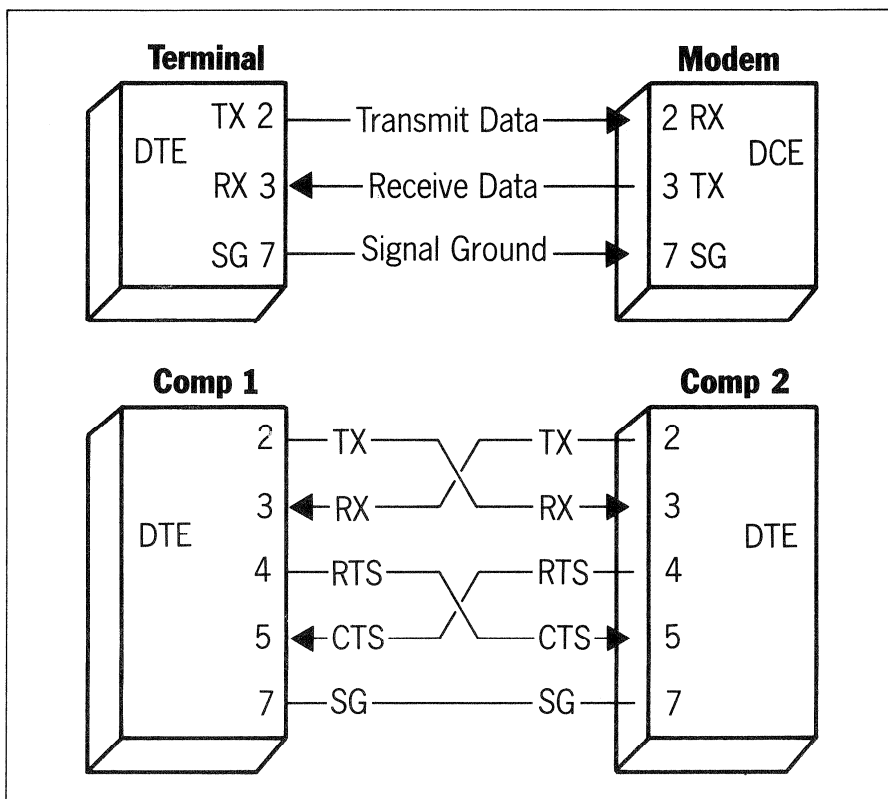
- electrical characteristics (level, lines),
- mechanical characteristics (connectors)
- signal descriptions and
- standard connections

The interface is capable of transmitting data at speeds up to 20 kbit/s and over cables with a length of up to 15 m.

The signal levels are defined as follows:



The 25-pin connector can accommodate various interface structures, however, the full pin assignment is rarely used today. Modern systems frequently use minimum structures for the terminal-modem and terminal-terminal connection respectively as illustrated in the next Figure.



All extensions (e.g. baud rate, code, synchronous/asynchronous connection, number of start/stop bits, parity, hardware/software handshake) are defined by the corresponding manufacturer.

#### Serial remote controller of the A810

The serial interface (remote controller) of the A810 recorder uses a 9-pin connector according to SMPTE in place of the 25-pin connector. The user can thus decide by means of an adapter cable whether the unit is to function as a terminal or as a modem.

Recorder 9-pole		Terminal 25-pole		Modem 25-pole	
Signal	Pin No.	Signal	Pin No.	Signal	Pin No.
SNDATA	2	Trans. Data	2	Trans. Data	3
RCVDATA	8	Rec. Data	3	Rec. Data	2
GROUND	9	Sig. Ground	7	Sig. Ground	7

No additional handshake lines are used. A software handshake (X ON / X OFF protocol) is implemented for all baud rates, but only necessary for 9.6 kbaud.

X ON = 0001 0001 (ASCII DC 1) = continue

X OFF = 0001 0011 (ASCII DC 3) = stop

When the recorder receives an X OFF it can still transmit up to two characters. After the recorder itself has transmitted X OFF it can still receive 5 characters without losing a command.

The transmitted data string contains:

- 1 start bit
- 8 data bits
- 1 stop bit (no parity)

The following baud rates can be set: 300, 1200, or 9600.

Only data in ASCII character format will be accepted.

#### Putting the ASCII serial remote controller 1.810.751 into operation

Set up the computer or terminal as follows:

- 1 Start bit, 8 data bits, 1 stop bit (no parity bit), baud rate 300, 1200, or 9600. Echo mode yes or no. Set handshake lines CTS and RTS to low.

SERIAL REMOTE CONTROLLER 1.810.751:

- This PCB contains the receiver and driver for the Studer interface for audio parameter saving as well as the receiver and driver for the RS 232 interface. It is possible to select between these two functions by means of the jumper JS1 as follows:

- Manual (position X)

Changeover with DIL switch 2 of the switch assembly SZ 1,

ON: Studer interface for data protection

OFF: RS 232

or

- automatic (position H)

Automatic changeover is not implemented in the software up to and including release 13/83 which means that the position X has to be used.

- Plug in the circuit board, switch on the LED monitor display with DIL switch 1: both LEDs RX and TX turn on.
- Set DIL switch 2 to the OFF position for changeover to RS 232.
- Connect the computer or terminal via the adapter cable to the 9-pin RS 232 sockets. If the link is in order, the RX and TX LED turn off.
- On the address board plugged into the rear of the recorder, program the same baud rate as used for the computer or terminal.

Addr. Board Switch	1	2	3	4	5	6	7	8
9600 Bd with echo	0	0	0	0	0	0	0	0
9600 Bd without echo	1	0	0	0	0	0	0	0
1200 Bd with echo	0	0	0	0	0	0	1	0
1200 Bd without echo	1	0	0	0	0	0	1	0
300 Bd with echo	1	1	0	0	0	0	0	1
300 Bd without echo	1	0	0	0	0	0	0	1

ON - 1

- The following message appears on the screen after a reset (power OFF plus power ON):

A810

The desired commands (refer to command list below) can now be entered via the terminal keyboard. The commands are not executed until the carriage return key (ENTER or LINE FEED) is pressed.

#### Instruction set

Order (_ = blank)	Meaning	in soft -ware since
LCD	Local keyboard disabled	46 82
LCE	Local keyboard enabled	46 82
STP	Stop	46 82
RWD	Rewind	46 82
FWD	Wind forward	46 82
PLY	Play (reproduce)	46 82
REC	Record	46 82
TPL	Tension loosely threaded tape ("tape load")	46 82
LOC_<address>	Locate to <(-)hh(:)( )(/)mm(:)( )(/)ss>	46 82
LMV_<counter reading>	Locate on move roll counter reading <xxxxxx>, (3 bytes HEX)	46 82
STM_<address>	Set tapetimer to <(-)hh(:)( )(/)mm(:)( )(/)ss>	46 82
SHS	Set higher capstan speed	46 82
SLS	Set lower capstan speed	46 82
SMN	Set Mono/Stereo-switch to MONO	46 82
SST	Set Mono/Stereo-switch to STEREO	46 82
SNB	Set equalization to NAB	46 82
SCR	Set equalization to CCIR	46 82
SVS	Set VARISPEED mode	46 82
CVS	Clear VARISPEED mode	46 82
SRH	Set REHEARSAL mode	46 82
CRH	Clear REHEARSAL mode	46 82
DST	Display the status of the recorder on terminal (clear with CNTL X); possible with MP UNIT 1.820.780 only!	13 83
REA_{i}	Channel i READY (i = 1, 2, or 3)	46 82
SAF_{i}	Channel i SAFE (i = 1, 2, or 3)	46 82
INP_{i}	Channel i INPUT (i = 1, 2, or 3)	46 82
SYN_{i}	Channel i SYNC (i = 1, 2, or 3)	46 82
REP_{i}	Channel i REPRO (i = 1, 2, or 3)	46 82
MTN_{i}	Channel i MUTE (i = 1 or 2)	46 82
MTF_{i}	Channel i MUTE off (i = 1 or 2)	46 82
TDN	Time Code Delay on	46 82
TDF	Time Code Delay off (bypassed)	46 82
CONTINUED ON NEXT PAGE		

## Instruction set (continued)

Order (_ = blank)	Meaning	in soft -ware since
SAP_<i,j,k>	Set D/A converter <j>, channel <i>, to <k> (i = 1 or 2; j = 0: LEVEL REPRO 1: TREBLE REPRO 2: BASS REPRO 3: EQUALISATION REPRO 4: LEVEL RECORD 5: TREBLE RECORD 6: BIAS 7: EQUALISATION RECORD; k = 2 digits HEX, corresponds to the two least significant digits of the counter dis- play in audio adjust mode)	46 82
SMA_<Address>	Set machine address to <XXXXXX> (6 Digits HEX)	40 85
SCK_<time>	Set clock to <hh(:)( )(/)mm(:)( )(/)ss>	46 82
ST?	Request for status	46 82
TM?	Request for tape counter	46 82
CL?	Request for clock	46 82
PR?	Request if pressure roller engageable (Y=yes, N=no)	46 82
CS?	Request if capstan sync (Y=sync, N=not sync)	46 82
NS?	Request for nominal speed (0 = 3.75 ips; 1 = 7.5 ips; 2 = 15 ips; 3 = 30 ips)	46 82
TH?	Request for Time Code source (0 = left head; 1 = right head wide; 2 = right head narrow; 3 = Line Input)	46 82
MV?	Request for move roll counter reading (3 Bytes HEX)	46 82
AP?_<i,j>	Request for audio parameters channel <i>, D/A converter <j> (i = 1 or 2; j = 0: LEVEL REPRO 1: TREBLE REPRO 2: BASS REPRO 3: EQUALISATION REPRO 4: LEVEL RECORD 5: TREBLE RECORD 6: BIAS 7: EQUALISATION RECORD; Recorder replies with 2 digit HEX number)	46 82
MA?	Request for machine address	40 85
MAN	Muting all channels on	40 85
MAF	Muting all channels off	40 85
D_108_26E	SPECIAL ORDERS: Display RAM content on terminal (see examples)	46 82
UAP_<HEX Addr, Data>	Update audio parameters (see examples)	46 82
P_108_26E	Display RAM content on terminal in MOTOROLA EXORCISER format (see examples)	46 82
L	Reload audio parameters from terminal to rec- order in MOTOROLA EXORCISER format	46 82

The above list of orders is not complete and will be enlarged as re-  
quired.

Examples:

FWD = Fast forward

LOC\_01:43:00 = Autolocator to Address - 1.43.00

SAF\_3 = Time code channeln SAFE (recording inhibited)

AP?\_1\_4\_XX = Request for audio parameters channel 1, D/A converter 4 (LEVEL RECORD); XX = hexadecimal reply of the recorder (e.g. A9)

SAP\_1\_4\_A3 = Set audio parameters channel 1, D/A converter 4 (LEVEL RECORD); new value A3 (old value A9 from the foregoing example will be overwritten!)  
CAUTION !!! All other parameters such as SYNC or REPRO, tape speed, tape type, equalisation, must be selected at the recorder itself.

D\_108\_26E = All audio parameters are displayed on the terminal in hexadecimal format, e.g.:

```

      0 1 2 3 4 5 6 7 8 9 A B C D E F
0100 xx xx xx xx xx xx xx xx 82 70 90 95 26 80 30 BB ...'.....&00;
0110 00 00 00 00 66 39 80 87 30 A0 3E 75 62 50 96 87 .....9..0 >..P..
0120 66 39 80 61 .. .. .. .. ..
0130 .. .. .. .. ..
```

The address of a parameter can be computed as a decimal value by means of the formula below (and must be subsequently translated to a hexadecimal value!):

$$\text{RADR} = \text{ARAM} - 12 + \text{IDAC} + \text{ISYNC} * 8 + \text{CCAB} * 12 + \text{SPEED} * 24 + \text{CHNL} * 72 + \text{TAPE} * 144$$

whereby:

RADR = Address of the parameter (in decimal form)  
 ARAM = 264 (108 hex), start address of parameter range in the RAM  
 IDAC = 0 for LEVEL REPRO  
       = 1 for TREBLE REPRO  
       = 2 for BASS REPRO  
       = 3 for EQUALISATION REPRO  
       = 4 for LEVEL RECORD  
       = 5 for TREBLE RECORD  
       = 6 for BIAS RECORD  
       = 7 for EQUALISATION RECORD  
 ISYNC = 0 for REPRO MODE  
       = 1 for SYNC MODE  
 CCAB = 0 for CCIR equalization (automatically = 0 @ 30 ips)  
       = 1 for NAB equalization (automatically = 1 @ 3.75 ips)  
 SPEED = 0 for 3.75 ips (9.5 cm/s)  
       = 1 for 7.5 ips (19 cm/s)  
       = 2 for 15 ips (38 cm/s)  
       = 3 for 30 ips (76 cm/s)  
 CHNL = 0 for channel 1  
       = 1 for channel 2  
 TAPE = 1 for tape sort A  
       = 0 for tape sort B

The address of TREBLE REPRO, SYNC, NAB, 38 cm/s, channel 1, tape sort A, is thus computed as follows:  
 $264 - 12 + 1 + 1 * 8 + 1 * 12 + 2 * 24 + 0 * 72 + 1 * 144 = 465 = 01D1 \text{ (hex)}$

UAP\_01D1\_5C = Update above audio parameter to 5C

P\_108\_26E = All audio parameters are displayed on the terminal in hexadecimal form in the MOTOROLA EXORCISER format. This format results in more reliable data transmission because possible errors can be recognized from the CHECKSUM.



Same example as above:

```

S11B01088270909526B030BB000000006639808730A03E75625096870B
S11B01206639806130A03E996250966166306A44305446BA62508844AD
S11B01386630.....

```

Diagram illustrating the structure of the hexadecimal string S11B01386630:

- Address (hex):** S11B01386630 (the entire string)
- BYTE COUNT, number of bytes incl. address and CHECKSUM (hex):** 30
- CHECKSUM:** 30
- Data:** (The remaining 16 bytes of the string, 66306A44305446BA62508844AD)

for: HEADER RECORD=S0, DATA RECORD=S1, END RECORD=S9

## 2.9 DAILY CARE

Daily care is limited to cleaning the soundheads, the capstan shaft, and the tape guidance elements.

Dust and oxide particles from the magnetic tape coating accumulate principally on the soundheads and the tape guides. In record mode this can cause so-called drop-outs.

Cleaning should be performed daily or more frequently if contamination is visible.

We recommend the STUDER cleaning kit (part No. 10.496.010.00) for this purpose. This kit contains all utensils necessary for cleaning the tape recorder as well as a sound head cleaning fluid and aluminite cleaner.

### Procedure

Moisten the yellow piece of cloth with the head cleaning fluid and clean all tape guidance elements. Then wipe the cleaned parts with a dry section of the yellow rag.

Coarse accumulations in the grooves of the right-hand time code head can be removed with a hard brush, the bristles of which have been shortened to approx. 5 mm.

### Cleaning the capstan shaft

Clean the rotating capstan shaft with the aid of the yellow piece of cloth and some cleaning fluid.

The capstan shaft normally does not turn when no tape is threaded and if the jumper JS2 (on CAPSTAN MOTOR CONTROL PCB) is in the CAPSTAN SHUT OFF position. In this case the left-hand tape tension sensor is to be lifted lightly by hand; the capstan motor runs until the recorder is switched off or one of the tape command keys (except STOP) is pressed.

### Important

Ensure that no cleaning fluid runs into the capstan shaft bearing. The cleaning fluid can also damage the transparent panels of the VU-meters.

### Cleaning the scrape flutter roller

For easy cleaning of the scrape flutter roller we recommend to thread an old piece of tape and to insert it behind the left-hand tape lifter. Press PLAY and clean the scrape flutter roller with a felt stick.

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### 3. POWER SUPPLY, TAPE TRANSPORT CONTROL

#### 3.1 FUNCTIONAL DESCRIPTION

##### 3.1.1 Power supply

###### Line voltages:

100, 120, 140, 200, 220, 240 V  $\pm 10\%$ , 50 ... 60 Hz

###### Internal supply voltages

+5.6; +15; -15; +24 V; all stabilized

125 VAC for spooling motor control

130 VAC for controlling the 4-pole capstan motor or

140 VAC for controlling the 2-pole capstan motor

###### Power supply unit

The line voltage is taken from the 3-pin AC inlet (GR 01) through the 2-pole power switch (GR 02), the line filter (GR 03), an the line voltage selector with the primary fuse (GR 04) to the power transformer (GR 05).

The secondary side of the power transformer supplies the following voltages: 25.6 V; 35.2 V; 130 V; 125 V; 10 V (spare).

The 25.6 V and the 35.2 V are rectified and smoothed (GR 06). All stabilized voltages are generated on the stabilizer board (GR 07) from these two rectified voltages:

25.6 VAC: +5.6 V, +24 V;

35.2 VAC: +15 V; -15 V.

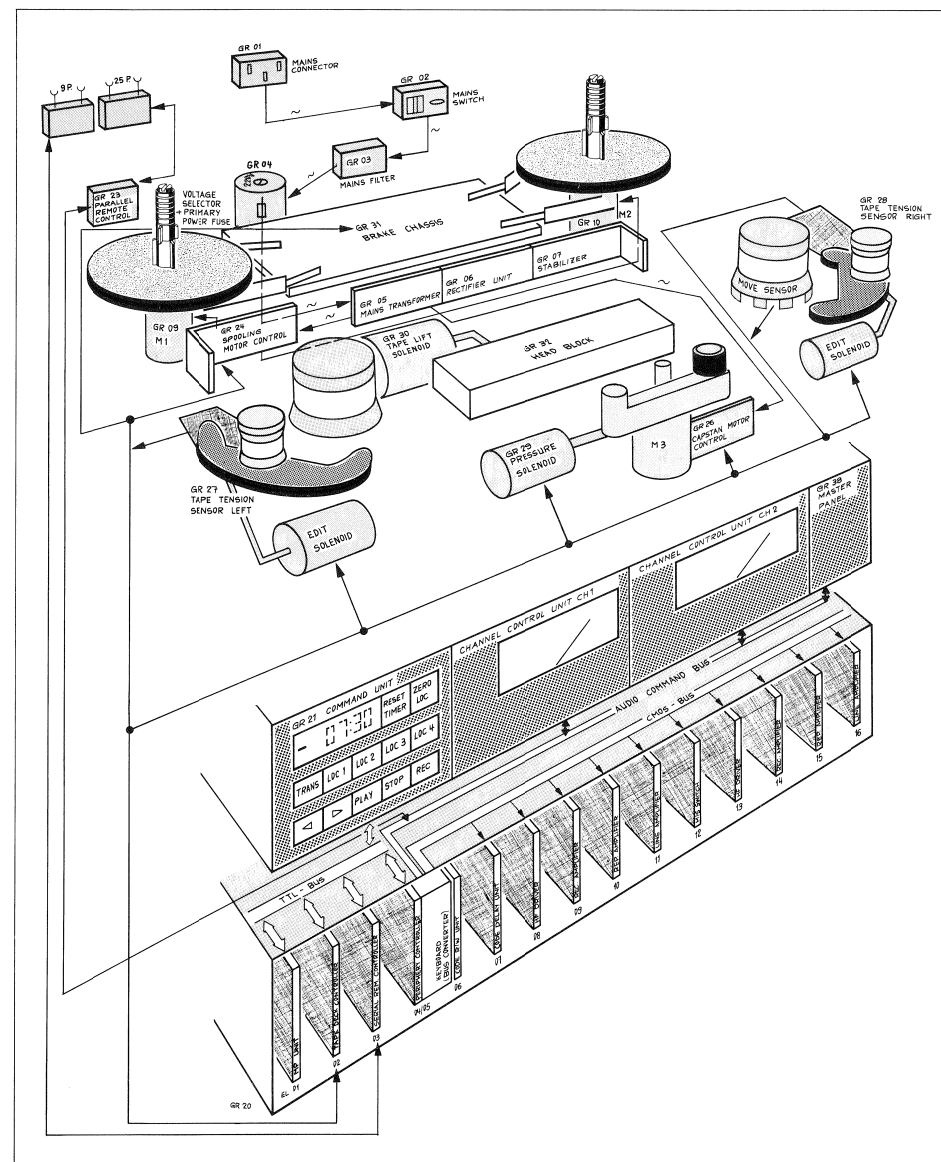
The +5.6 V for the microprocessor are generated by a switching regulator with pulse width modulation. The output current is limited to approximately 7 A.

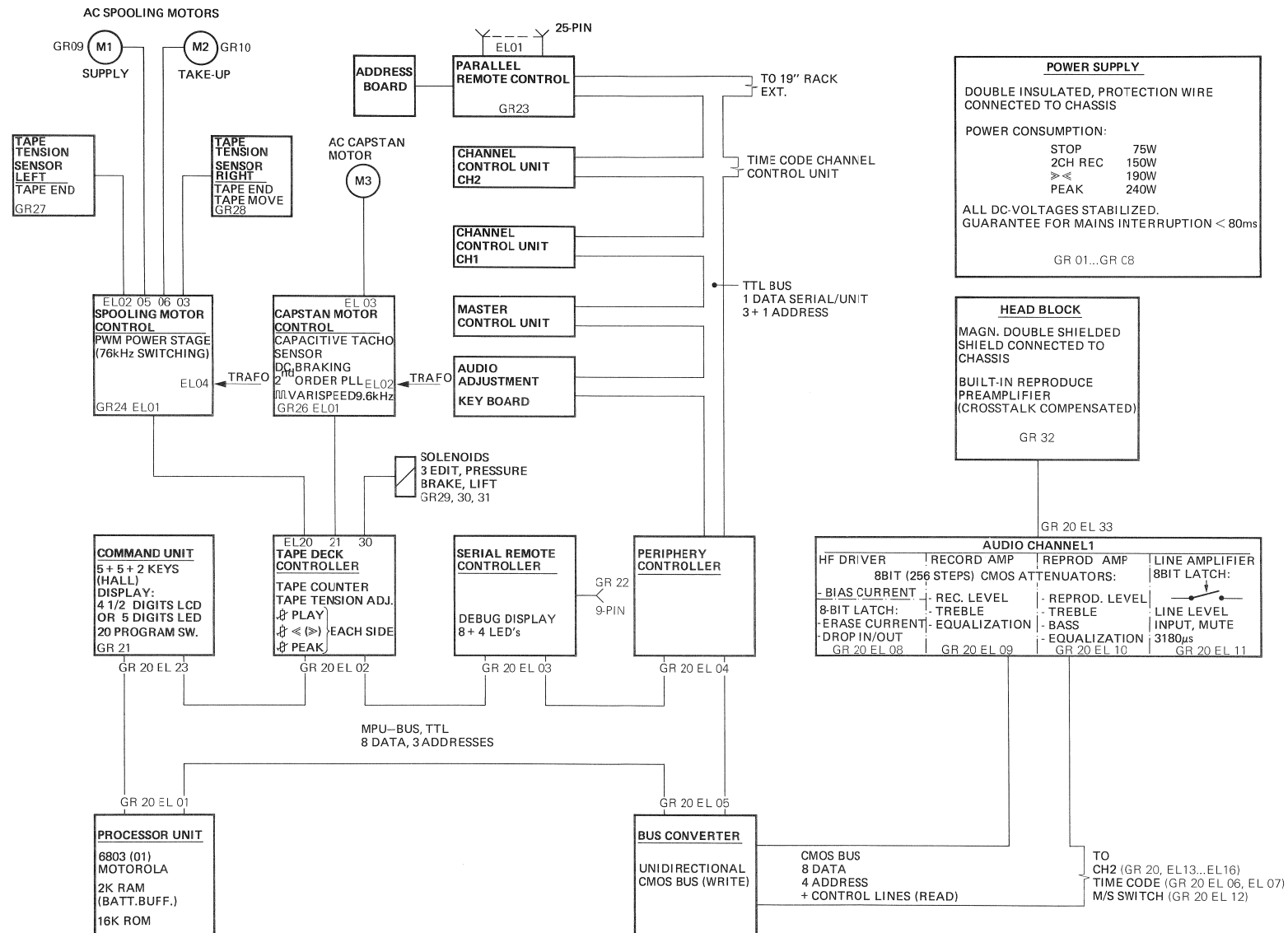
Voltage regulators with fixed settings generate the +24 V and the  $\pm 15$  V. The circuit for the  $\pm 15$  V has been designed so that the currents flowing through the two regulators are identical.

A stabilized voltage that rises inadmissibly because of a defect, will be automatically short-circuited. If the current limiter of the corresponding voltage regulator is defective, the corresponding secondary fuse blows. The connected assemblies are, therefore, protected from consequential damage.

Should one of the stabilized voltages fail, the microprocessor attempts to switch the recorder from any operating mode to STOP and SAFE, if this is still possible.

The line voltage is monitored. The logic state of the recorder is unaffected by transient line voltage failures of less than 80 ms. For longer failures, the recorder automatically enters STOP and SAFE mode before being switched off.





### 3.1.2 MP Unit GR 20 EL 01

1.810.752/1.820.780

The MPU logic converts the input commands into logic signals for the control; it stores the audio parameters, the locate addresses, and, whenever the recorder is switched off, also the momentary operating status. The clock frequency of the microprocessor is also the central control for the recorder timings: Capstan motor control, switched spooling motor output stage, audio, time code.

Bus and select lines connect the:

- Tape deck controller
- Audio controller
- Command unit
- Serial remote controller

The TTL MPU bus features 8 data lines and 3 address lines as well as separate select lines to the individual controllers.

#### Microprocessor

The MC 6803 is a bidirectional, bus-oriented 8-bit parallel microprocessor with 16 address bits. It is implemented in NMOS technology, is TTL compatible, and requires only one supply voltage (+5 V). Seven different addressing methods are possible and its internal instruction set comprises 72 commands. The internal 128 byte RAM is not required for this application and is ignored by the program. External memory up to 64 K can be addressed with the 16 address bits.

In the implemented operating mode (EXPANDED MULTIPLEXED MODE No. 2), PORT 3 functions as a time-division multiplex address/data bus.

The internal clock frequency is 1.2288 MHz which is derived by dividing the external quartz frequency of 4.9152 MHz by four.

The clock frequency is further divided down to the following frequencies:

- :4 = 307.2 kHz (reference frequency for the HF driver, erase and bias frequency)
- :16 = 76.8 kHz (clock frequency for spooling motor output stage)
- :120 = 9.6 kHz (reference frequency for capstan motor control).

#### External memories

The external memories comprise 4 x 4K PROM and 2K RAM (1.810.752) or 3 x 8K PROM and 2K RAM (1.820.780) respectively plus a rechargeable buffer battery. The battery is charged by the +5.6 supply voltage and feeds the RAM when the recorder is switched off.

The complete machine program is stored in PROM. The audio data, the tape timer information, the selected functions, the locate addresses, and the tape transport status are stored in RAM.

#### RESET

The RESET input fulfils two functions:

- Correct initialization of the microprocessor during the power-on sequence; the RESET input must be kept below 0.8 V until the supply voltage V/CC has reached at least 4.75 V so that the internal clock generator can stabilize itself during this time.
- If the microprocessor functions incorrectly, it is reinitialized either automatically or with switch S2, and the program is restarted.

### INTERRUPT

An interrupt routine is initiated if a line voltage failure is detected by the power supply (T-PWRON = 0). The current instruction is completed before the program branches to the interrupt routine. The operating condition at the time of the interrupt is stored in the RAM and a STOP command is automatically transmitted to the tape transport after 80 ms. If the line voltage returns before the 80 ms have elapsed, the INTERRUPT routine is cancelled and normal program execution continues.

The new version of the MPU board 1.820.780 supports the following additional features:

- Either LED or LCD tape timer display (selectable with jumper on TAPE DECK CONTROLLER).
- Automatic MUTING during spooling.
- Displaying the equipment status on the connected terminal (with the DST command).

### 3.1.3 TAPE DECK CONTROLLER GR20 EL02

1.810.750

The TAPE DECK CONTROLLER is responsible for transmitting the commands from the microprocessor to the tape transport and for reporting the tape transport status to the CPU. It fulfils the following functions:

- Setpoint input for spooling motor control with 2 x 3 trimmer potentiometers. Control of tape transport solenoids (brake, 3 x EDIT, pressure and tape lift).
- Reading in tape transport status.
- Data for capstan motor control.
- Interpretation of tape move sensor.
- Supply voltage monitoring.
- Monitoring the limit switches of the tape tension sensors (torn tape!).

### 3.1.4 BUS CONVERTER GR 20 EL 05

1.810.754

TTL/CMOS bus converter (CMOS bus with 8 data bits and 4 address bits). Interface to audio section; transmits only data from microprocessor to audio section (WRITE only).

The audio parameters transmitted by the MPU are written into the audio amplifier through the TTL data bus, the bus converter, and the CMOS bus:

- Input and output level 0, 4, 8 or 10 dBm
- Change-over INP, SYNC, REP
- MUTE
- Equalization 3180  $\mu$ s
- Erase current
- Drop-in or drop-out

The following alignments are performed by digital/analog converters (256-step attenuators):

- Reproduce level
- Reproduce frequency response (treble, bass)
- Reproduce equalization
- Record level
- Record frequency response (treble)
- Record equalization
- Bias current

The bus converter essentially consists of an interface circuit PIA (PERIPHERAL INTERFACE ADAPTER) and subsequent TTL/CMOS converters.

### 3.1.5 PERIPHERY CONTROLLER GR 20 EL 04

#### 1.810.753

The PERIPHERY CONTROLLER is the interface to the serial TTL bus (1 serial data bit per peripheral unit; 3 address bits; 1 READ SELECT line and 1 WRITE SELECT line).

Data, address and READ/WRITE select lines connect the following units:

- Audio controller keyboard; device for inputting audio parameters.
- Channel control unit CH1; keys and status indicator lamps channel 1.
- Channel control unit CH2; keys and status indicator lamps channel 2.
- Channel control unit CH3; push buttons and status indicator lamps for time code channel.
- Master panel; push buttons and status indicator lamps for tape speed, mono-stereo switch (or tape bias selector), and CCIR/NAB equalization.
- Remote interface; interface to parallel remote control.

The PERIPHERY CONTROLLER essentially consists of the interface circuit PIA (PERIPHERAL INTERFACE ADAPTER).

Input device for audio parameters (1.810.755):

Comprises 11 keys, 13 status indicator lamps (LED), and 8 code switches. The audio parameters programmed with the keys are acknowledged with status indicator lamps. The code switches are used for:

- Changing over the erase current for full-track, 2-track, and 2-track with time code, as well as timing for drop-in and drop-out offset.
- Selecting the erase current for full-track, 2-track, and 2-track with time code.
- Operating the track mode and output selectors individually for each channel or in parallel for both channels.
- Setting the line level for inputs and outputs.
- Same audio parameters for CCIR and NAB equalization.
- Enabling automatic muting (AUTO MUTE) of the outputs during spooling.
- Enable the input device.

Audio command bus:

The information of the track mode selectors (SAFE/READY), the SAFE/READY switch of the time code channel, the output selector (INP, SYNC, REC) as well as the switches of the master panel are transmitted to the MPU through the audio command bus, the PIA, and the MPU TTL bus.

Remote interface GR 23 (1.810.738):

The interface of the parallel remote control is connected through the audio command bus to the PIA of the PERIPHERY CONTROLLER.

The following functions can be controlled remotely by this unit:

Reproduce, record, spooling, stop, fader start, TRANS <REDUCED> (all with status indication); as well as LOC 1, LIFTER (tape lift defeat), and varispeed mode.

Address board (option):

Six code switches are available for entering an address so that several units can be operated on a serial bus. Two additional code switches have been provided for setting the baud rate of the serial interface: 300, 1200, and 9600 (factory setting).

### 3.1.6 COMMAND UNIT GR 21

#### 1.810.300/1.810.303

Comprises 12 (Hall) keys and the tape timer display (1.810.300: LCD, 4 1/2 positions; 1.810.303: LED, 5 positions) with leading negative sign. Status indicator lamps for keys (without RESET TIMER and ZERO LOC).

Twenty code switches are located on the bottom of the COMMAND UNIT:

- Standard selector for time code (film, Europe, USA black/white, USA colored NTSC)
  - Code track type STUDER or PILOT (1.2" offset)
  - LIFTER button, momentary or flip-flop button
  - Drop-in sequence
  - Drop-out sequence
  - Tape type "A" or "B" at low speed
  - Tape type "A" or "B" at high speed
  - Selection of the two or changeover between three/four tape speeds
  - Drop-in directly from PLAY by pressing REC key
  - Reprogramming the LOC 2, LOC 3, LOC 4 keys
- Refer to Section 4.2.9.

The COMMAND UNIT is connected to the microprocessor unit through the MPU bus.

#### Tape timer display

#### 1.810.736/1.810.768

The display (1.810.736: LCD, 4 1/2 positions; 1.810.768: LED, 5 positions) with leading negative sign is controlled by the MPU through the MPU bus. It displays either the momentary tape address or an error message (in the event of a malfunction in the recorder). The audio parameters entered from the keyboard are displayed in hexadecimal format.

On time code versions equipped with the new time code amplifier 1.820.721/81/82/83/84, the far right decimal point of the LED tape timer display turns on when a code signal is available at the input or is being read from tape (depending on the setting of the INP/SYNC/REP selector).

### 3.1.7 SERIAL REMOTE CONTROLLER GR 20 EL 03

#### 1.810.751

Interface for serial remote control

- Connection to a terminal
- Data saving on tape
- Expanded test system

#### Saving the audio parameters on tape

The audio parameters stored in RAM can be copied to tape through the 9-pin serial remote control connector. Pins 4 and 6 of the 9-pin connector must be linked with the RECORD input of the tape recorder. Also refer to Section 4.2.7.

The stored audio parameters can be compared with the RAM content or be re-loaded into the RAM by connecting the 9-pin serial remote connector to the REPRODUCE output of the tape recorder. Also refer to Sections 4.2.7 and 4.2.8.

#### RS 232 terminals

Connector pins 2, 3, 7, 8, and 9 are required for connecting an external terminal equipped with an RS 232 interface. SNDATA is the send line, RCVDATA the receive line.

The two status indicator lamps SEND and RECEIVE indicate whether the microprocessor is sending data to or receiving from the serial interface.



#### DEBUG display 1.810.757

The DEBUG display equipped with LEDs indicates the status of the data bus, the address bus, and the 3 select lines.

The setting of a code switch determines whether the WRITE or the READ signals of the MPU bus are displayed.

#### 3.1.8 Capstan motor control GR 26

1.810.761.00/81, 1.810.766.00

A 2nd order PLL (PHASE LOCKED LOOP) circuit permits phase-locked synchronization of the capstan speed with the internal or external reference frequency.

A capacitive sensor detects the movement of a toothed ring that is rigidly coupled to the capstan shaft. The change in the capacitance of the sensor causes a frequency modulation at the input of the capstan motor control. The signal is demodulated in an FM demodulator; the resulting voltage is converted to a square-wave signal that is proportional to the frequency of the capstan speed, and constitutes the actual value of the closed loop.

The 9.6 kHz reference frequency which is divided down by a ratio that depends on the selected nominal frequency, constitutes the reference value of the closed loop. The control signal is developed in a phase comparator from the actual value and the reference value, and the capstan lock indication and acknowledgement is generated.

The capstan motor is a maintenance-free AC motor that is supplied by the fuse-protected 130 VAC of the power transformer. The motor current flows into a bridge rectifier and as a pulsating DC current through the control transistor and back into the transformer winding.

DC braking is initiated when the recorder is switched from high to low speed or if rapid speed reduction occurs in varispeed mode.

#### 3.1.9 Spooling motor control GR 24

1.810.760

The switched spooling motor control with pulse-width modulation is arranged on a single circuit board. This module ensures low-loss control of the spooling motors and accurate tape tension in any operating mode as well as four different spooling speeds.

The pulse-width modulator processes the analog signals AN-RFTTL/R (REFERENCE TAPE TENSION LEFT/RIGHT = reference value) from the TAPE DECK CONTROLLER and AN-TTL/R (TAPE TENSION LEFT/RIGHT = actual value) from the tape tension sensors. Comparison of the reference value to the actual value yields analog control signals (AL/AR) which are proportional to the required motor power.

Limiting the spooling speed:

The signal T-CLK-1 of the tape move sensor (square-wave signal with frequency proportional to the tape speed) is converted by a pulse shaper operating with double-edge interpolation into a pulse train of doubled frequency. A pulse of constant width is formed from each edge of T-CLK-1. A DC voltage (B) proportional to the tape speed is generated in a low-pass filter (actual value). The two reference speed bits of T-TPSPD-1/2 are converted in a D/A converter into a DC voltage. This voltage can be adjusted with a trimmer potentiometer determines the maximum spooling speed (reference value). The signals DL/DR are formed by comparing the reference value to the actual value. These lower the control voltage AL or AR when the preset spooling speed is reached and decrease the driving of the output stage. The signals AN-RFTTL/R determine through differential stages which of the motors (take-up motor) requires reduced driving.

The clock frequency TD-CLK (from the MPU) is 76.8 kHz; noise voltages are eliminated through a Schmitt trigger after which the frequency is taken to a generator which converts the square-wave voltage into a delta voltage. This voltage (E) which is fully balanced relative to neutral is taken to the two modulators and converted by these to pulses of variable width. The pulse width is proportional to the magnitude of the control voltage AL, AR; the maximum width (cyclic duration factor = ED) is 95% and is a function of the amplitude of the (adjustable) delta voltage. If the c.d.f (ED) is less than 2%, the pulses become so small that the spooling motors are no longer driven. The control pulses are taken to the FETs of the output stage through Schmitt triggers, driver stages, and isolating transformers.

The output stage is supplied directly by the 125 VAC of the power transformer. The 50 ... 60 Hz AC voltage is taken through a fuse to the bridge rectifiers and switched on and off by the NMOS power FETs with a frequency of 76.8 kHz. The motor windings and the storage choke L act as a load. This circuit arrangement has the effect that a pulsating DC current continues to flow through the power FET. This current is switched by the control pulses. The wider the control pulses, the higher the switched power and thus the motor output.

At the instant the current is switched off, the magnetic fields in the storage choke collapses. As a result, a voltage with inverse polarity is induced in the choke. This voltage is eliminated by the current flowing through the free-wheeling diodes, the commutation circuit, and the motor. The commutation circuit ensures that no dangerous voltage spikes occur.

### 3.1.10 Tape tension sensors GR 27, GR 28

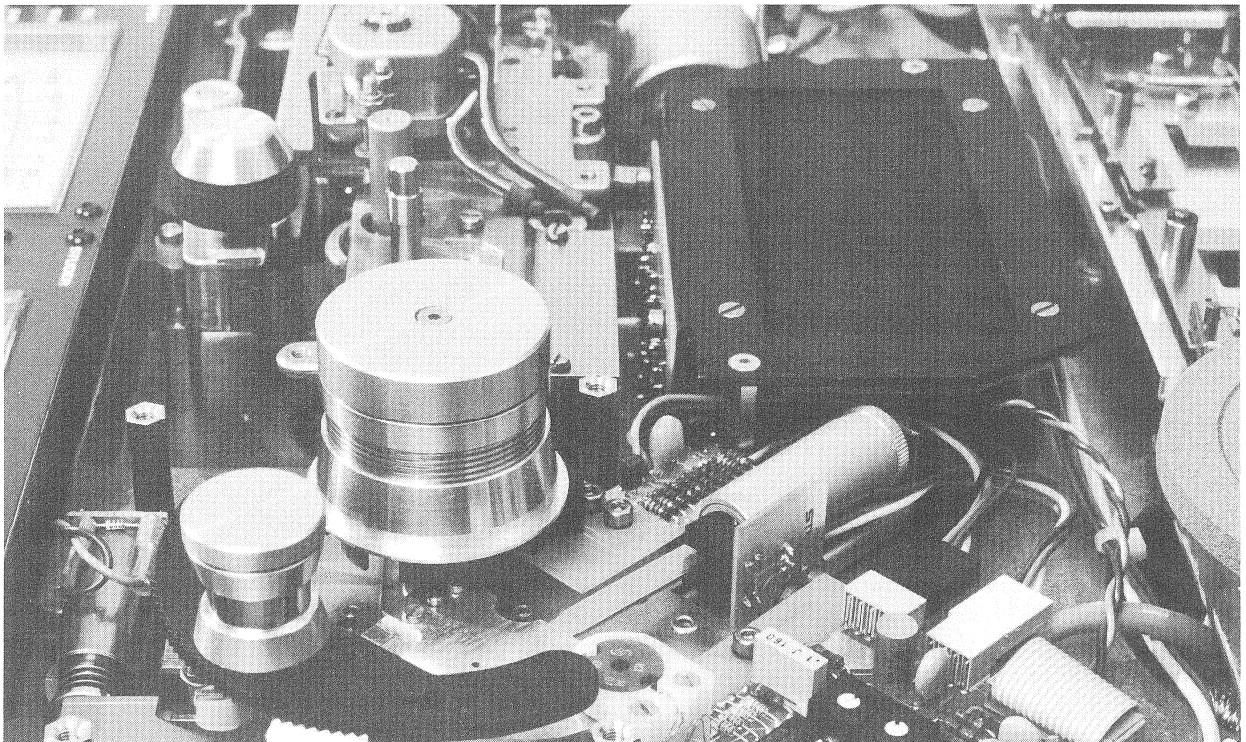
1.810.728/730

The tape tension sensors comprise:

- Sensor arm with inductive position sensor
- Non-contacting end-of-tape sensor

The tape tension sensor consists of an oscillator circuit, a decoupling circuit, and a screening plate that is mechanically connected to the sensor arm. The movement of the sensor arm causes a change in the coupling of the two circuits, and an electrical image of the sensor arm deflection becomes available at the output (signal AN-TTL/R).

The sensor arm is coupled to the piston of a dash pot between which an infrared light barrier is located. The sensor arm interrupts the light beam when it leaves its neutral position. The light barrier responds either when the end of the tape is reached or if the tape tears (signal T-TENDL/R).



### 3.1.11 Tape move sensor GR 28 EL 05

1.810.731

The tape move sensor consists of two infrared light barriers and a toothed ring that is coupled to the right-hand guide roller. Two square-wave signals offset by 90° are output (10 pulses per revolution or 16 Hz at 7.5 ips). The following information is extracted (TAPE DECK CONTROLLER) from these square-wave signals:

- Tape timer display
- Tape speed (for spooling motor control)
- Direction of tape travel

### 3.2 REMOVING THE TAPE TRANSPORT ASSEMBLIES

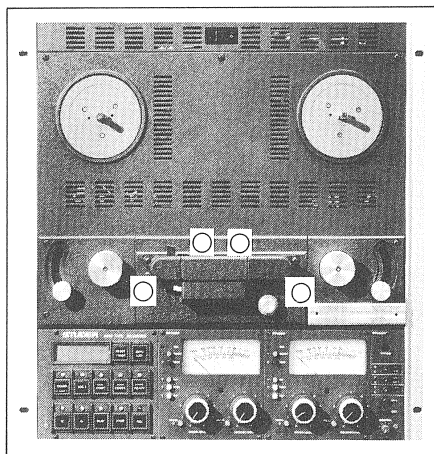
#### 3.2.1 Covers

##### **WARNING**

DISCONNECT POWER CORD BEFORE REMOVING ANY HOUSING COVERS!

The designations of the covers refer to the recorder in upright position.

##### Headblock cover

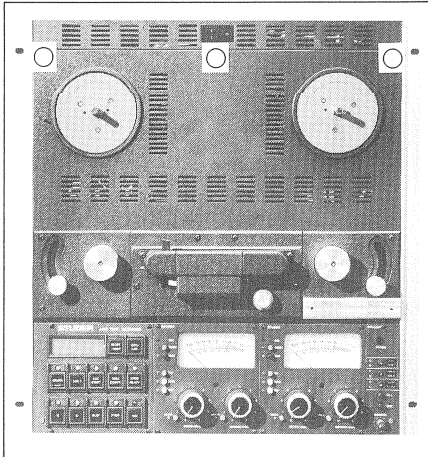


- Unscrew cover of pressure roller (without tools) and remove roller.
- Unfasten 4 screws M4 (hexagon-socket-screw key 2.5 mm)

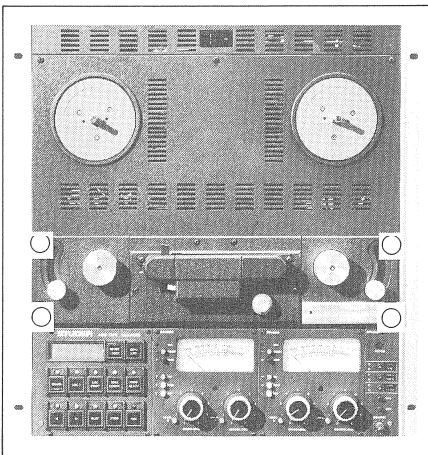
##### Head cover

Only the head cover needs to be removed when aligning the azimuth of the soundheads.

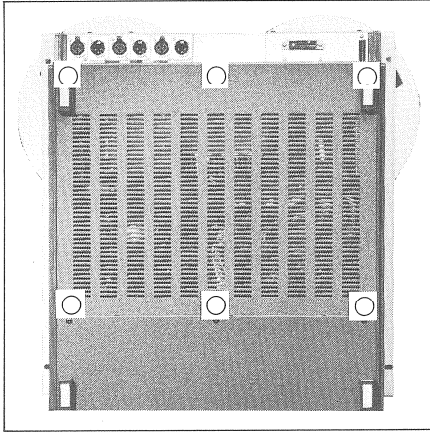
- Unfasten 2 screws M4 (hexagon-socket-screw key 2.5 mm) on the left and the right of the head shield.
- When reassembling ensure that the conductors leading to the heads are not pinched (especially in time code versions).

Tape transport cover

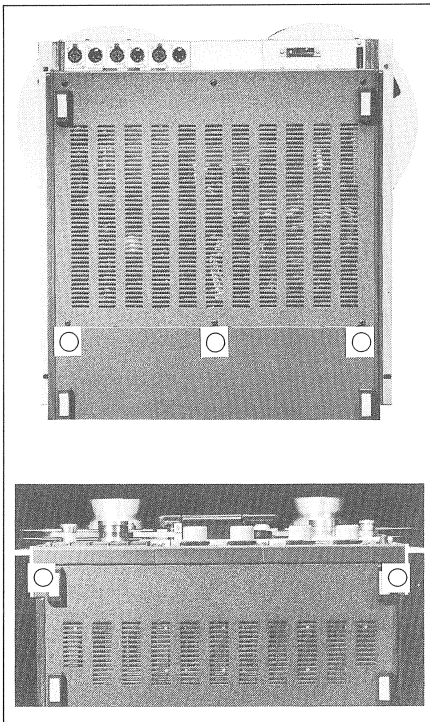
- Unfasten 3 screws M4 (hexagon-socket-screw key 2.5 mm).
- Lift off tape transport cover.

Cover of the tape tension sensor

- Remove headblock cover.
- Unscrew cover of guide roller (without tools) and remove roller.
- Unfasten two screws M4 (hexagon-socket-screw key 2.5 mm).
- Remove cover.

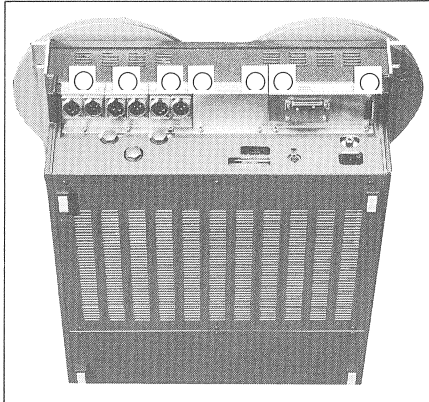
Rear cover, upper

- Unfasten 6 screws M4 (hexagon-socket-screw key 2.5 mm).
- Remove rear cover.

Rear cover, lower**CAUTION**

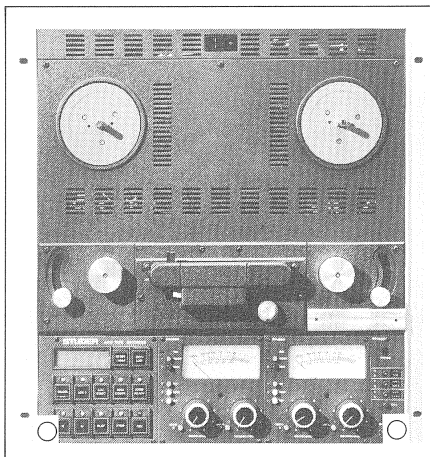
This cover should only be removed by trained maintenance engineers because it exposes the basis board with the CMOS bus!

- Unfasten 5 screws M4 (hexagon-socket-screw key 2.5 mm).
- Remove rear cover.

Top cover

Remove this cover only if the power switch or the power supply unit needs to be dismantled!

- Unfasten 7 screws M4 (hexagon-socket-screw key 2.5 mm).
- Lightly raise cover and slide it out toward the back.

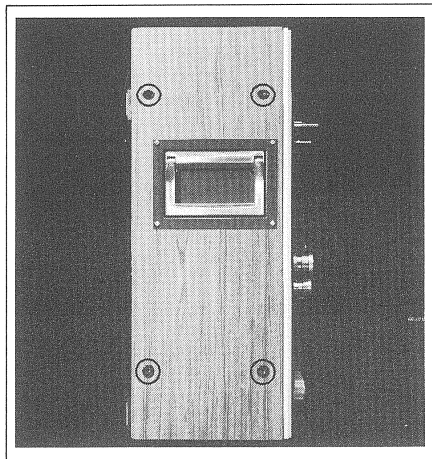
Panel flap

- The panel flap can be opened and locked in two positions by loosening the two captive special screws (hexagon-socket-screw key 2.5 mm). The flap is released lightly upward on the support (on the right-hand side of the flap). Secure the flap with your left hand to prevent it from slamming shut.

Important: If the marking stamp is still installed, it must be removed before the panel is folded up.

- Each of the panel modules is secured to the panel flap with two or four screws M3 (hexagon-socket-screw key 2 mm).

### Wooden side panels



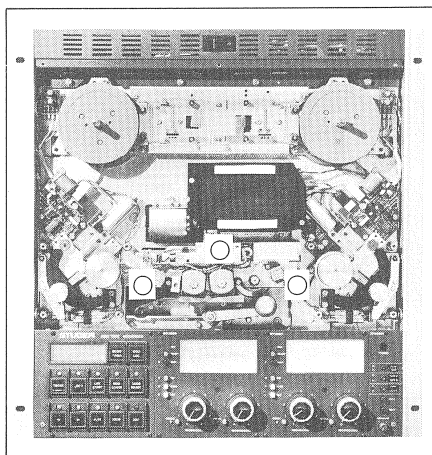
- Unfasten 2 screws M5 x 20 and 2 screws M5 x 35 (hexagon-socket-screw key 4 mm).
- Remove side panels.

### 3.2.2 Headblock

- Remove cover of headblock assembly (3.2.1.)

#### CAUTION

To prevent inadmissible magnetization of soundheads, switch the recorder off before removing or installing the headblock!



- Unfasten 3 screws M4 (hexagon-socket-screw key 3 mm).
- Carefully slide out headblock assembly so that the capstan shaft will not be damaged.
- Do not turn headblock upside down, otherwise the 3 screws fall out.

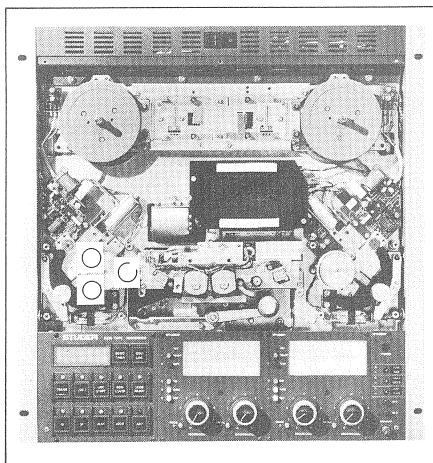


### 3.2.3 Tape tension sensors

- Remove covers of headblock, tape transport, and tape tension sensors as well as upper rear cover as described in Section 3.2.1.

#### Left-hand tape tension sensor

- Unplug the flat cable labeled TAPE TENSION LEFT at the top connector of the spooling motor control board.
- Pull off two stranded connecting wires (grn, vio) of the EDIT solenoid.



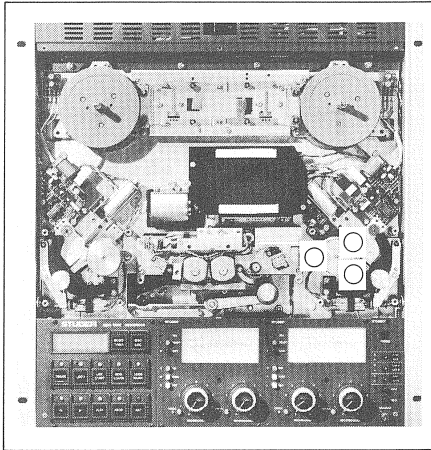
- Unfasten 3 screws M3 (hexagon-socket-screw key 2.5 mm), lightly lift tape tension sensor and guide flat cable carefully through the tape transport chassis.
- Remove tape tension sensor.
- Do not place tape tension sensor upside down, otherwise the 3 screws fall out.

When reinstalling, ensure that:

- Polarity of EDIT solenoid connections is not confused (vio = +).
- Flat cable is plugged into the upper connector (relative to machine in upright position) on the spooling motor control board.

Right-hand tape tension sensor

- Unplug the flat cable labeled TAPE TENSION RIGHT at the lower connector of the spooling motor control board.
- Pull off two stranded connecting wires (grn, vio) of the EDIT solenoid.
- Remove cable duct covers and guide out the flat cable.



- Unfasten 3 screws M3 (hexagon-socket-screw key 2.5 mm), lightly lift tape tension sensor and carefully guide flat cable out through the tape transport chassis.
- Remove tape tension sensor.
- Do not place tape tension sensor upside down, otherwise the 3 screws fall out.

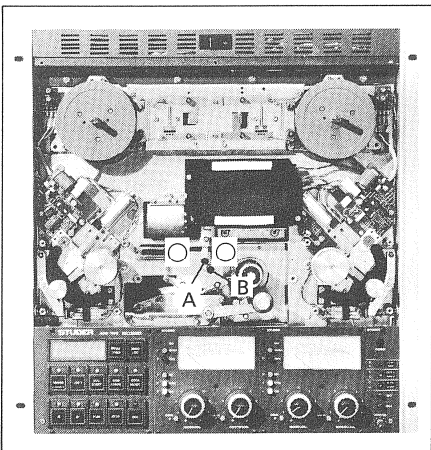
When reinstalling ensure that:

- Polarity of EDIT solenoid connections is not confused (vio = +).
- Flat cable is plugged into the lower connector (relative to the upright machine) on the spooling motor control board.

### 3.2.4 Tape lift assembly

Lifter assembly

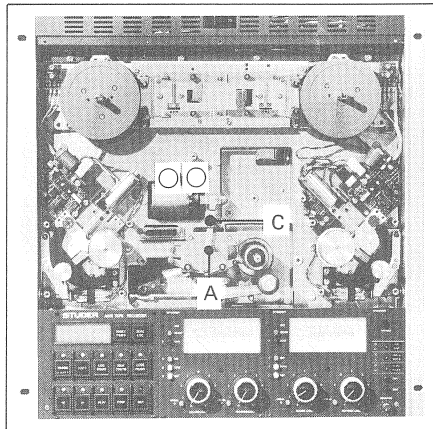
- Remove headblock cover (3.2.1) and headblock (3.2.2).
- Unhook return spring on pressure arm.



- Unfasten 2 screws M3 (hexagon-socket-screw key 2.5 mm).
- Slide lifter assembly out toward the left while simultaneously disengaging the plastic lug at the pressure arm pin.
- When reinstalling ensure that the coupling pin (A) is located to the left of the roller (B).

#### Lifter solenoid

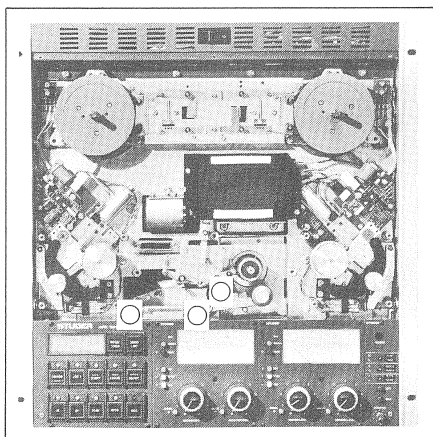
- Remove monitor unit (3.2.11) if installed.



- Remove circlip (C).
- Lift Lever (A).
- Unfasten 2 screws M4 (hexagon-socket-screw key 3 mm), draw out solenoid from the front.  
Do not tilt solenoid, otherwise the armature drops out.
- Pull off 2 stranded connecting wires (wht, vio).
- When reinstalling ensure that polarity of connections is not confused (vio = +).

#### 3.2.5 Pressure roller assembly

- Remove headblock cover, headblock and upper rear cover (3.2.1).
- Remove tape lift assembly.
- Pull off 2 stranded connecting wires (gry, vio) of the pressure solenoid.
- Unhook return spring at pressure arm.



- Unfasten 3 screws M4 (hexagon-socket-screw key 3 mm).
- Carefully draw pressure unit out toward the front.

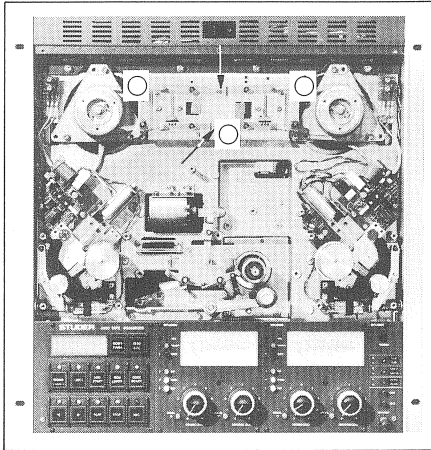
When reinstalling ensure that:

- The pin on the pressure arm is seated into the plastic lug.
- The polarity of the pressure solenoid connections is not confused (vio = +).

### 3.2.6 Tape brakes

The recorder must be positioned horizontally in order to remove the brakes!

- Remove tape transport cover (3.2.1).
- Remove reel supports, 3 screws M3 each (recessed head).



- Unfasten 3 screws M3 (hexagon-socket-screw key 2.5 mm).
- Press lightly on the two brake levers (arrow) to release the brakes to the point where the brake chassis can be carefully lifted.

#### CAUTION

Ensure that the brake bands are not kinked and avoid touching the contact surface with your fingers!

Kinked brake tapes must be replaced. Clean contaminated tapes with ethanol!

- Pull off connecting wires of EDIT solenoid (grn, vio) and brake solenoid (brn, vio).
- When reinstalling ensure that the polarity is correct (vio = +).

#### IMPORTANT

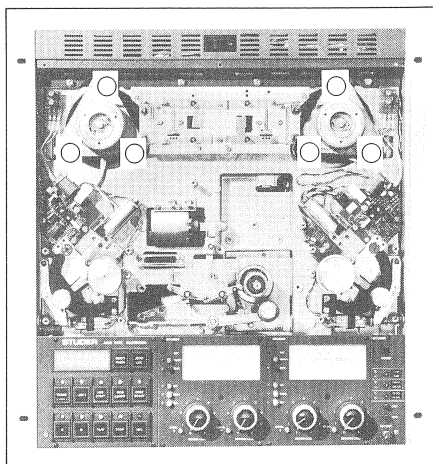
The brakes require readjustment after the brake chassis has been installed (3.3.1).

### 3.2.7 Spooling motors

Position the recorder horizontally in order to remove the spooling motors!

- Remove tape transport cover (3.2.1).
- Remove brake chassis (3.2.6).
- Pull off 4 stranded leads on each connecting board.

**Note:** The sequence of the wires is not always the same to minimize hum-field interference. Please note sequence before disconnecting!

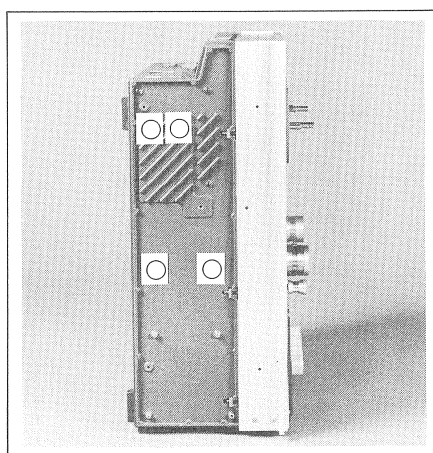


- Unfasten 3 screws M4 each (hexagon-socket-screw key 3 mm).
- Lift out motor toward the top without touching the brake roller.

### 3.2.8 Spooling motor control

Remove the complete assembly if fuse F1 (T 1.6 A SLOW) on the spooling motor control board requires replacement.

- Remove rear upper panel and left-hand wooden side panel if installed (3.2.1).

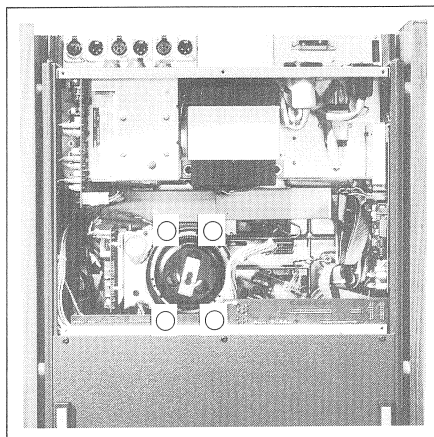


- Unfasten 4 screws (hexagon-socket-screw 3 mm). The stranded connecting leads of the motor control PCB are long enough so that they need not be disconnected for replacing the fuse.
- Unscrew shock protection element (2 x M3, hexagon-socket-screw key 2.5 mm).

### 3.2.9 Capstan motor

Remove the complete assembly if the fuse F1 (T 500 mA SLOW) on the capstan motor control board requires replacement.

- Remove upper rear panel (3.2.1).
- Unplug flat cable CAPSTAN CTR (on basis board, second connector from the right).
- Open cable duct, guide out flat cable.
- Lift shock protection element off the lower power transformer terminals.
- Pull off 2 blue stranded wires (power transformer terminals 10 and 19 for the 4-pole capstan motor, 12 and 17 for the 2-pole capstan motor).



- Unfasten 4 screws (hexagon-socket-screw key 3 mm) (the lower two screws are accessible through holes in the basis board).
- Draw capstan unit (ground capstan shaft) carefully toward the rear.
- Remove shock protection (2 x M3, hexagon-socket-screw key 2.5 mm).
- Proceed carefully when reinstalling to ensure that the capstan shaft will not be damaged.
- No specific polarity (!) is required when reconnecting the two blue stranded wires (terminals 10 and 19 or 12 and 17 on the power transformer).

### 3.2.10 Power supply unit

- Remove upper rear panel, top cover and if installed also the wooden side panels (3.2.1).
- Unplug connecting leads on power switch.
- Unscrew all connector panels or filler panels (7 x M4, hexagon-socket-screws 3 mm).
- Remove stabilizer board (multipoint connector and 6 stranded connecting leads, from top to bottom: blu, red, org, brn, yel, grn), 2 screws M4 (hexagon-socket-screw 3 mm) on the right-hand side panel.
- Unscrew spooling motor control PCB, 4 x M4 (hexagon-socket-screws 3 mm) on the left-hand side panel. The connecting leads are long enough; do not detach them.
- Lift shock protection of the lower power transformer terminals, detach 2 x stranded blu (terminals 10 and 19 or 12 and 17 respectively, stranded blk (terminal 14), and stranded red (terminal 15) connecting lead.
- Unfasten 6 mounting screws M4 (hexagon-socket-screw key 2.5 mm, 3 each on the left and on the right side wall). Hold power supply unit so that it will not drop into the recorder.
- Carefully slide power supply unit out through the rear until the two rear mounting holes in the side walls are aligned with the two front tapped holes in the power supply; then secure the power supply temporarily with 2 of the mounting screws.
- Disconnect leads on the two phase-shift capacitors (terminals on each from the top or No. 2: org, bottom terminal or No. 1: brn).
- Unfasten temporary mounting screws and remove power supply unit toward the top.
- When reinstalling, ensure that the stranded connecting leads of the phase-shift capacitors are not pinched.
- No specific polarity (!) is required for the two blue stranded connecting wires (power transformer terminals 10 and 19 or 12 and 17).

### 3.2.11 Monitor unit

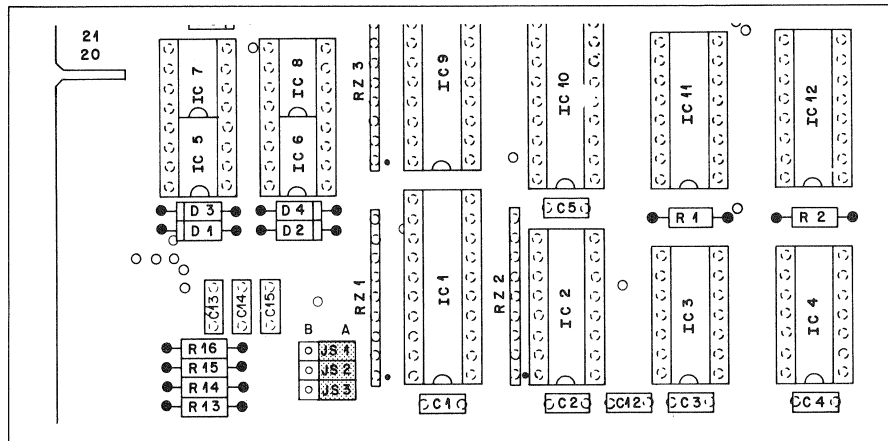
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- Unfasten rear upper panel and tape transport cover (3.2.1).
- Unplug monitor terminal (on basis board, second connector from the left).
- Open cable duct, guide out monitor cable harness.
- Unfasten 2 screws M3 (hexagon-socket-screw key 2 mm), remove monitor unit, and carefully guide cable harness out of the tape transport chassis.

### 3.3 MECHANICAL ADJUSTMENTS

#### Note:

Jumper JS 3 of the TAPE DECK CONTROLLER must be removed for making the following adjustments. As a result, the monitoring functions (tape tension, tape movement, etc.) are interrupted to prevent triggering of stop commands if deviations from the reference values occur because of the adjustment work.



#### 3.3.1 Tape brakes

Inadequate maintenance or incorrect adjustment of the tape brakes can lead to tape tangles or torn tapes. Check in regular intervals that the braking action is smooth and that no loops are formed even when the diameters of the two pancakes differ widely. Check brake bands for wear and contamination.

The tape brakes are self-adjusting: the braking action remains constant over wide ranges even with varying friction coefficients.

#### Preparatory steps

Remove tape transport cover; remove covers of the tape tension sensors. Detach 3-pin connector of the end-of-tape sensor in the left-hand tape tension sensor.

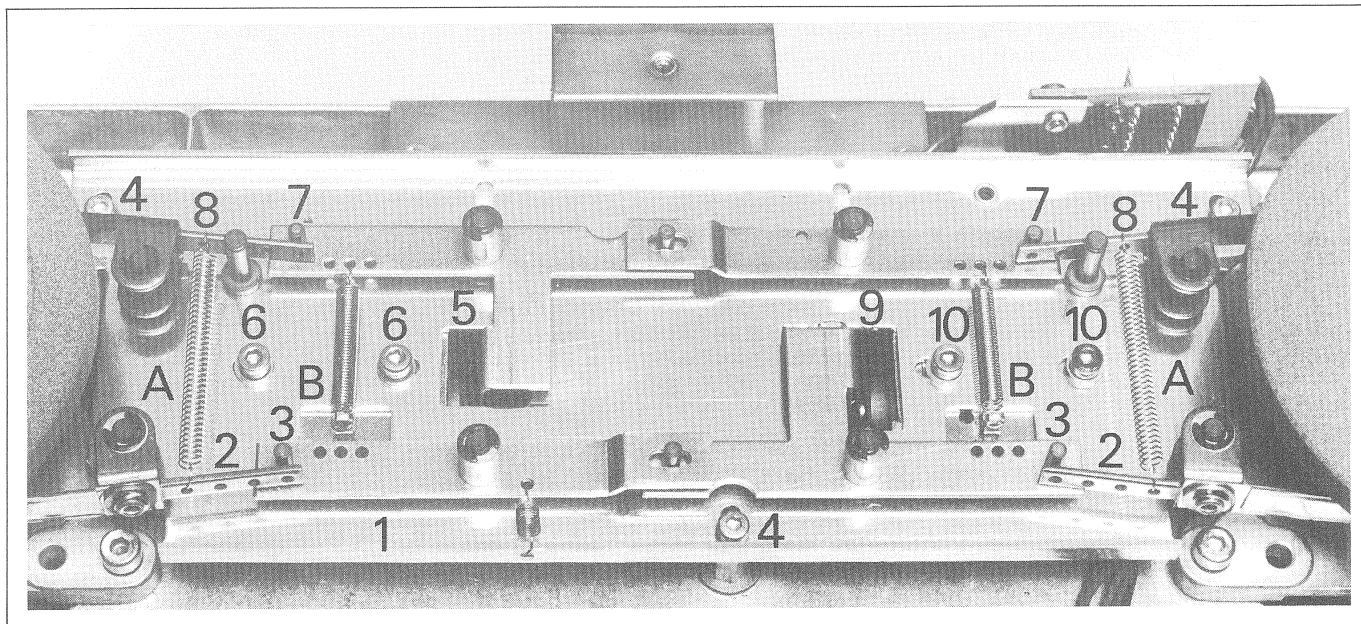
The brake bands and the brake linings must be absolutely clean and free of grease. Contaminated brake bands and brake linings can be cleaned with ethanol. Avoid touching them after they have been cleaned. The brake bands should be free of kinks. Contact with the brake lining along their full width is required.

When replacing the brake drum ensure that there is no residual glue on the new brake drum.

Should the braking action be insufficient after the brake bands have been replaced, they can be roughened with SCOTCH pot cleaning pads.



The braking deceleration can be adjusted by hooking the brake springs into three different positions. Refer to picture below with springs (A) in the maximum position, springs (B) in the middle position.



#### Basic adjustment of the brake chassis

Switch tape recorder off.

Shift brake chassis (1) so that the distance between the two brake levers (2) and the lifting pin (3) is approx. 1 mm. Secure the setting with three hexagon-socket-head cap screws (4) (key size 2.5 mm). Ensure that the chassis is only shifted parallel. Switch recorder on.

Check that the two brake systems are released simultaneously by the two lifting pins. Should this not be the case, check that the spooling motors are positioned correctly. If minor differences still remain they can be corrected by lightly bending the levers (2).

#### Adjusting the EDIT solenoid

The edit solenoid (5) must be energized for adjusting it: connect power cord and switch power on.

The two fixing screws (6) (hexagon-socket 2.5 mm) of the solenoid (5) should be shifted in such a way that a clearance of approximately 1 mm is obtained between the lifting pin (7) and the brake lever (8). The lever (2) must contact the pin (3).

Retighten the two fixing screws (6).

#### Adjust the brake solenoid

Also detach the 3-pin connector on the right-hand tape tension sensor! The PLAY key must be pressed (brakes released) for adjusting the brake solenoid.

Unfasten the two mounting screws (10) (hexagon-socket-screw key 2.5 mm) of the brake solenoid (9) and shift it so that the tip of the lever (2) travels 2 to 3 mm between the neutral position and released brake. Retighten the two mounting screws (10).

The two spooling motors should rotate freely when the brake system is released. Both brake levers should lift in parallel.

Correct functioning of the brakes can be checked by brief forward and backward rotation of the spindles (power switched off).

#### Measuring the braking torques

Switch recorder on (STOP lamp illuminated for measuring the EDIT braking torque).

Mount an empty reel with a hub diameter of approx. 100 mm that contains approximately 2 to 3 m of tape in the take-up or supply direction.

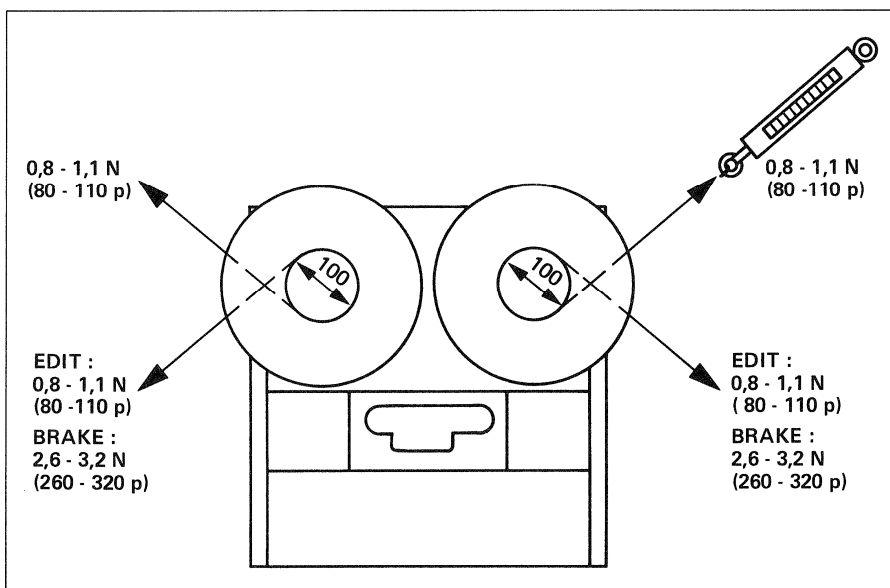
Hook spring dynamometer (0 ... 5 N) into leading end of tape and pull gradually forward (in direction of the arrow).

The EDIT braking torque should measure 0.8 to 1.1 N (80 ... 110 p) in the take-up or the supply direction. Correction is possible with spring (A).

Reconnect the 3-pin connectors of the tape-end sensors of both tape tension sensors before measuring the braking torque.

The tape tension sensors must be in their neutral position.

The braking torque in the supply direction should measure 2.6 to 3.2 N (260 ... 320 p). The difference in braking torque between the left and the right side should not exceed 0.5 N (50 p). Correction is possible with spring "B".



### 3.3.2 Pressure unit

The pinch roller arm is actuated by a solenoid. The pinch roller force is determined by a built-in spring.

#### Adjusting the pinch roller force

Switch recorder off. Remove tape transport cover and pinch roller cover; detach the 3-pin connectors of the two tape tension sensors. Fasten a piece of nylon string to the pinch roller shaft and hook spring dynamometer 0 ... 20 N (0...2 kp) into a loop of the string.

Switch recorder on. Select PLAY. Pull spring dynamometer perpendicularly to the pinch roller arm until the arm lifts off the capstan shaft. The spring dynamometer should give a reading of 8...10 N (800...1000 p). Should the spring force be stronger or weaker, loosen 2 fixing screws of the pinch roller solenoid (hexagon-socket 3 mm) by a few turns and slightly shift the pinch roller solenoid until the desired spring force is attained. Retighten the screws of the pinch roller solenoid.

Ensure that the arm returns smoothly to the neutral position. Should this not be the case, the solenoid may be twisted.

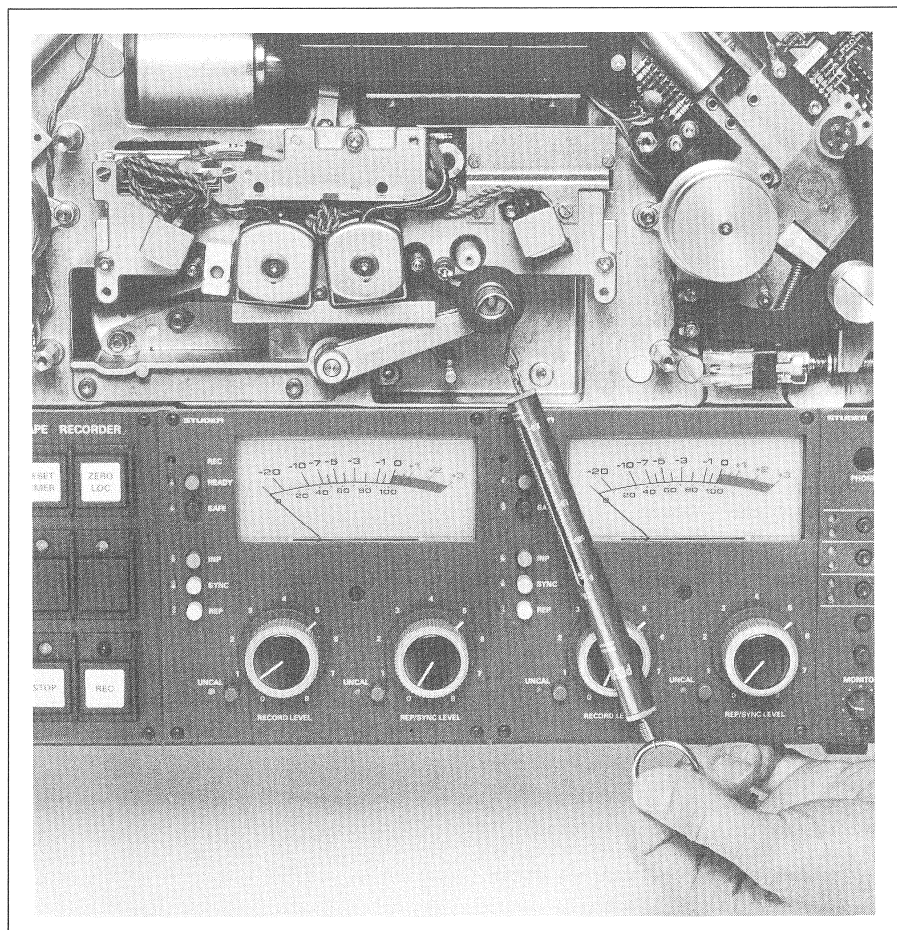
#### Check:

Remove jumper JS3 on TAPE DECK CONTROLLER. With your index finger lightly press the pinch roller arm against the capstan shaft so that the pinch roller just starts to turn.

Press PLAY key: the pinch roller arm should visibly move another small amount toward the capstan shaft. This means that the pinch roller solenoid functions correctly so that only the tension spring in the solenoid plunger provides the coupling between the pinch roller arm and the solenoid plunger (no mechanical contact between the two).

Check this play by repeatedly pressing STOP and PLAY.

The pinch roller force must be increased if no visible play exists.

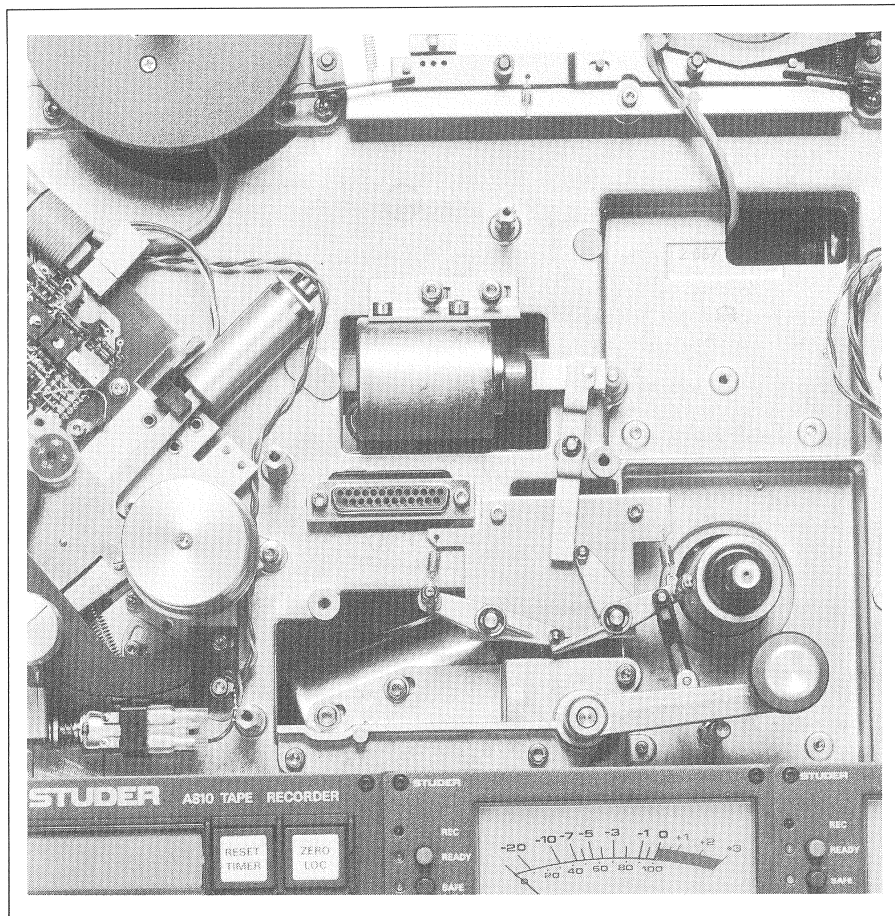


### 3.3.3 Tape lift

During spooling, the two tape lift pins are moved by the tape lift solenoid so that the tape no longer contacts the face of the soundheads. This prevents unnecessary wear of the soundheads.

#### Preparatory steps

Switch recorder off.



#### Adjusting the tape lift solenoid

Mount tape (reel diameter 18 cm) and switch recorder on.

Press one of the spooling keys.

Push pressure roller by hand against the capstan up to the stop position. The tape should contact neither the pressure roller nor the capstan. Should this still be the case, loosen the two mounting screws (hexagon-socket-screw key 3 mm) of the tape lift solenoid. Press one of the spooling keys and shift tape lift solenoid slightly to the left. Retighten mounting screws and repeat check.

- **Important:** On recorders equipped with a time code read head, the lifter solenoid must be adjusted in such a way that the lifting pin lifts the tape approximately 1 mm off the capstan shaft. The tape may touch the pinch roller when the latter is manually pressed to the stop position.

When the lifter solenoid is de-energized, the left-hand lifting pin must contact neither the scrape flutter roller nor the erase head.

Press STOP key and check that the armature movement is not restricted; if necessary loosen one mounting screw of the tape lift solenoid and slightly twist solenoid, until the armature moves freely. Retighten the mounting screw.

### 3.3.4 Tape tension sensors

**Note**

The illustrations always refer to the left-hand tape tension sensor.



#### Checking the mechanical functions

Mobility of bearing and dash pot:

Manually push the tape tension sensor from its neutral position to the end stop. No grinding or rattling noise should be audible. The protective flap should not touch anywhere; the tape tension spring and the stop spring should not touch any other parts.

Damping:

Check the continuous and immediate damping in tension direction and also the function of the non-return valve in the dash pot cylinder.

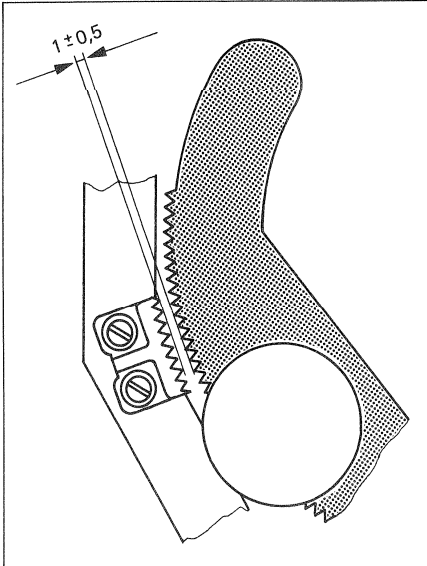
A replacement dash pot requires no adjustments since these have been made at the factory.

CAUTION:

Ensure that the cylinder base is not twisted when installing the dash pot!

Checking the tape travel:

With the tape tension sensor installed and a tape mounted, visually check the tape travel (height adjustment) in PLAY mode on the idler roller and on the small guide roller.

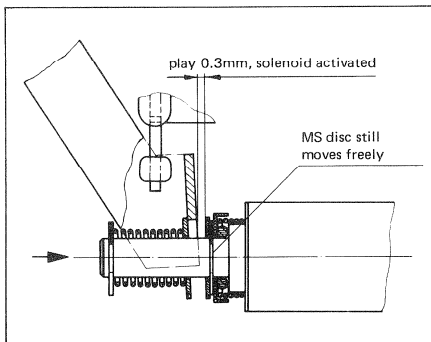
EDIT solenoid

With the EDIT solenoid in the neutral position, the gear segment must be adjusted so that the teeth mesh correctly and parallel into the serration of the toothed disc (slot cover).

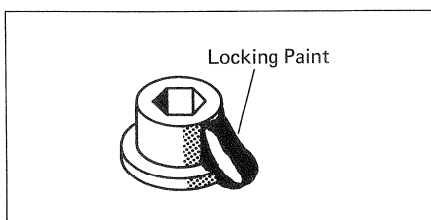
The distance between the tips of the teeth of the gear segment and the toothed disc must be  $1 \text{ mm} \pm 0.5 \text{ mm}$  throughout the entire rotating range of the tape tension sensor.

Adjusting the EDIT solenoid:

**CAUTION:** Shift the solenoid only parallel to the base plate!



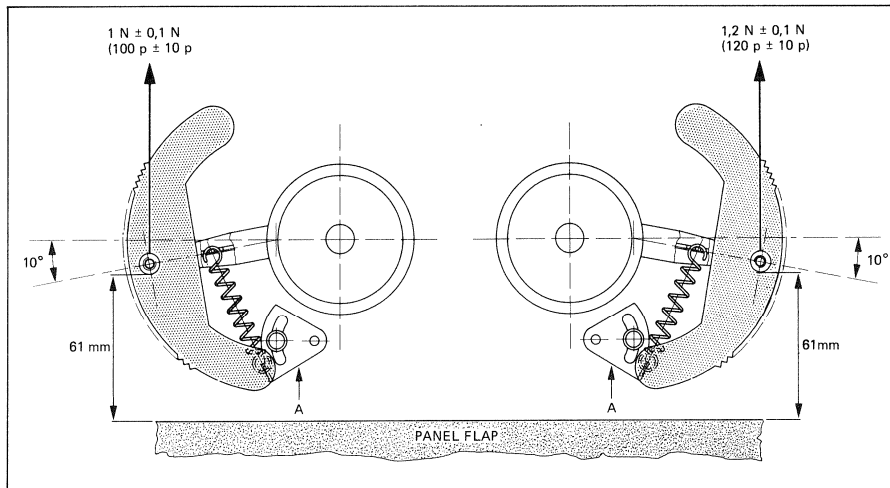
Press the solenoid plunger with your finger to the stop position. Unfasten the two hexagon-socket-head screws (2.5 mm) and shift the solenoid in parallel until the Ms disc still moves freely (corresponds approximately to the play shown in the drawing). Retighten the two screws and secure them laterally with locking paint.



#### Adjusting the tape tension spring

Switch recorder off. Remove guide roller, reinstall cover. Mount tape tension alignment gauge, hook spring dynamometer to the shaft and pull parallel to the lateral edge of the tape recorder.

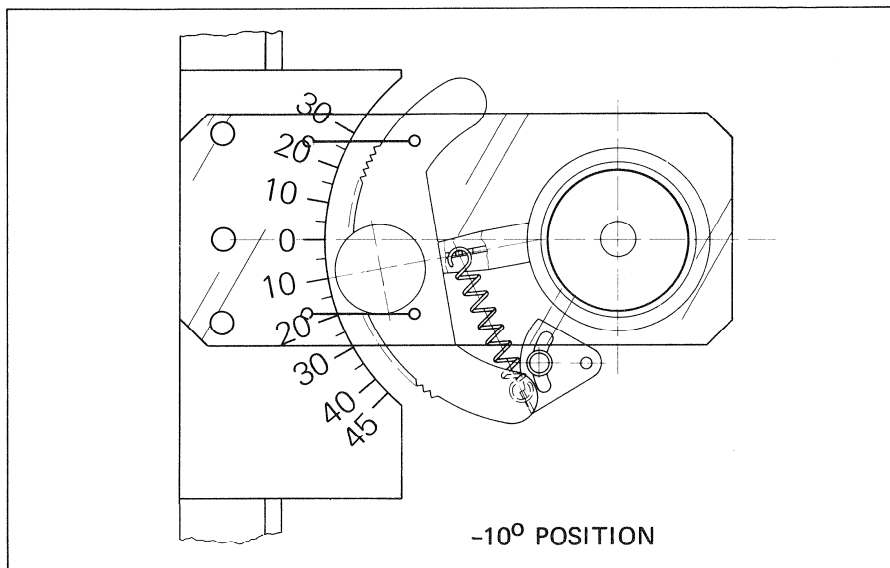
The tape tension spring is adjusted with the turnbuckle {A}. Please note that the left-hand tape tension sensor is to be adjusted to a value of  $1 \text{ N} \pm 0.1 \text{ N}$  ( $100 \text{ p} \pm 10 \text{ p}$ ), the right-hand tape tension sensor to  $1.2 \text{ N} \pm 0.1 \text{ N}$  ( $120 \text{ p} \pm 10 \text{ p}$ ) when the tape tension sensors are deflected to  $-10^\circ$  (corresponds to the cover touching the lower line of the gauge).



The measurement may only be taken in the wind-up direction because of the hysteresis of the spring dynamometer!

After the adjustment has been made, tighten the screw of the turnbuckle and secure it with locking paint.

Gauges with scale division in degrees for adjusting the tape tension can be ordered under the part number 10.010.001.15.

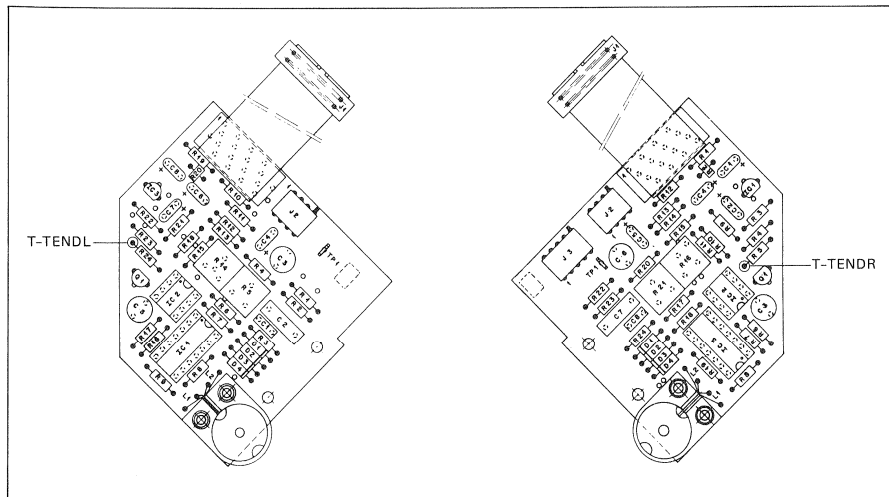


**End-of-tape sensor**

(Circuit board on the dash pot)

Switch recorder on.

Move arm of tape tension sensor approx. 2 to 2.5 mm from its end stop and adjust limit switch PCB so that the signal T-TENDL (left-hand tape tension sensor) or T-TENDR (right-hand tape tension sensor) just switches to logic 1 (HIGH).

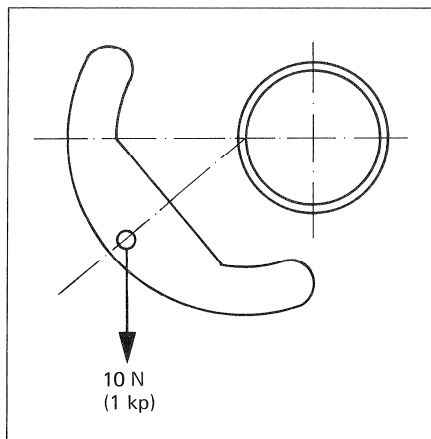


Pretension arm with spring dynamometer (10 N  $\pm$  1 N or 1 kp  $\pm$  100 p). The signal T-TEND should remain at logic 0 (LOW).

Tighten adjusting screw and secure it with locking paint.

Reinstall guide roller.

For electrical adjustments of the tape tension sensors refer to Section 3.4!

**IMPORTANT**

Reinstall jumper JS3 on TAPE DECK CONTROLLER!

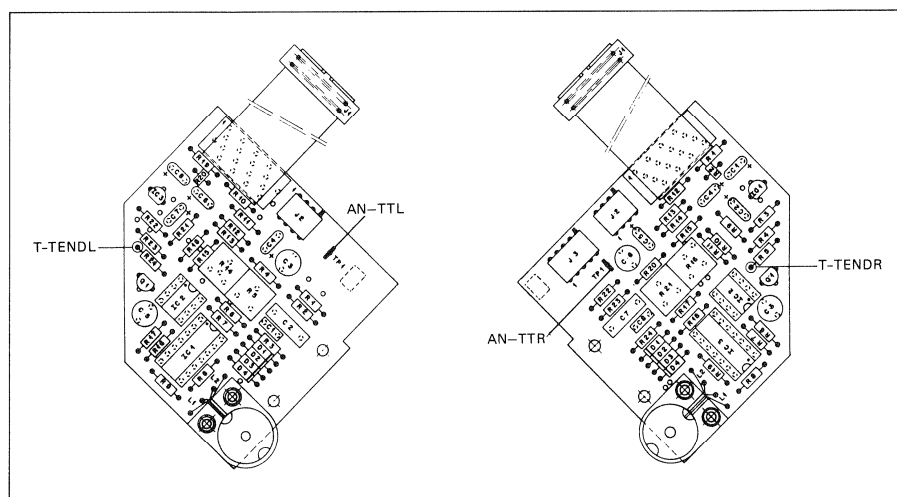


**Adjusting the dash pot:**

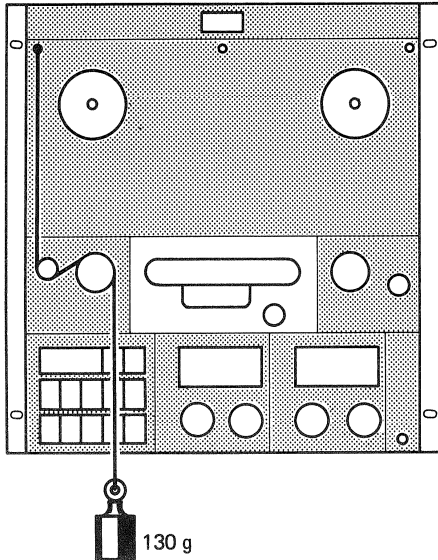
Before adjusting the dash pot check or adjust the tape tension spring and the electrical alignment of the tape tension sensor (3.4.2)!

The following adjustments of the damping action refer to the left-hand tape tension sensor; deviations for the right-hand tape tension sensor are indicated in brackets!

- Remove cover of the tape transport and the tape tension sensors; turn the top left and right mounting screws of the tape transport cover 2 to 3 turns into the corresponding tapped hole. Place recorder upright on the edge of the work bench so that the front panel is flush with the edge of the bench.
- Calibrate oscilloscope in the DC setting (DC voltage coupling) so, that the voltage readings 0.0 V and +2.4 V fall on the scale lines on the bottom and the top edge of the screen. Adjust sweep rate to 0.1 s per scale division, trigger input to "EXTERN" and "positive slope".
- Connect oscilloscope to TP1 (TP1) of the tape tension sensor, signal AN-TTL (AN-TTR), trigger input of oscilloscope at T-TENDL (T-TENDR), as shown in diagram.



- Tie a loop into both ends of an approximately 1 m long piece of tape. Hook one loop into the left-hand (right-hand) screw of the tape transport cover, thread tape vertically down around the idler roller of the tape tension sensor and the guide roller, then further vertically down. Hook a weight of 130 g (part No. 10.010.001.19) into the second loop (refer to diagram).



- Remove TAPE DECK CONTROLLER PCB.
- Switch recorder on.
- Manually press guide roller of the tape tension sensor against the lower stop (neutral position) and relax it. The curve appearing on the screen should intersect with the calibrated 2.4 V line at  $0.6 \text{ s} \pm 0.1 \text{ s}$  ( $1.0 \text{ s} \pm 0.1 \text{ s}$ ).  
Should this not be the case, the remedy depends on the type of dash pot:
  - Dash pot with hole in the cylinder base:  
Rotate cylinder until the specified damping is attained.
  - Dash pot with grub screw:  
Turn grub screw (hexagon-socket-head key 1.5 mm) until the specified damping is attained (turning in the grub screw increases the damping action).
  - Dash pot with adjustable nozzle:  
Loosen locknut (wrench size 5.5 mm). Turn hexagon screw of nozzle (wrench size 5.5 mm) until the specified damping is attained (turning in the nozzle screw increases the damping action). Secure nozzle screw with locknut.
- Switch recorder off.
- Reinsert TAPE DECK CONTROLLER PCB.

### 3.3.5 Headblock

#### CAUTION

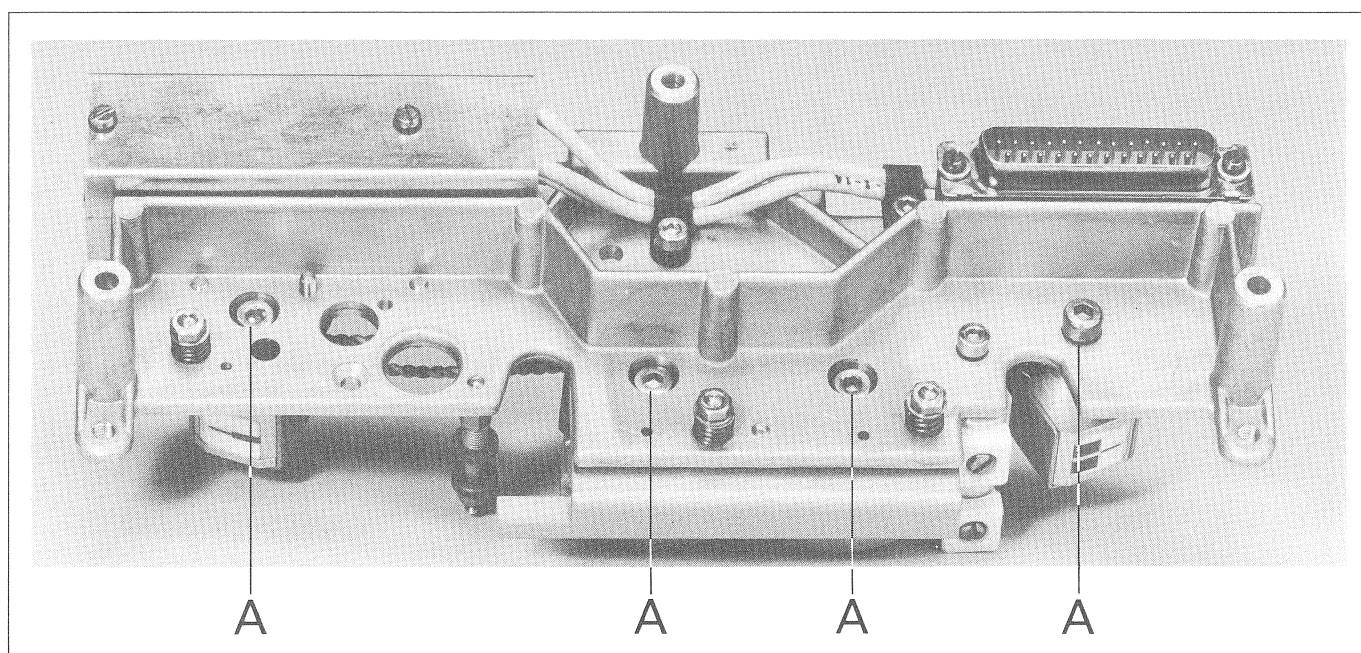
To avoid inadmissible magnetization of the soundheads, switch the recorder off before removing or installing the headblock!

#### Replacing the soundheads

Remove headblock cover (4 hexagon-socket-head cap screws, 2.5 mm).

Remove headblock after the 3 hexagon-socket-head cap screws (3 mm) have been unfastened.

The soundheads can be removed after the hexagon-socket-head cap screw (A), accessible from below, have been unfastened.

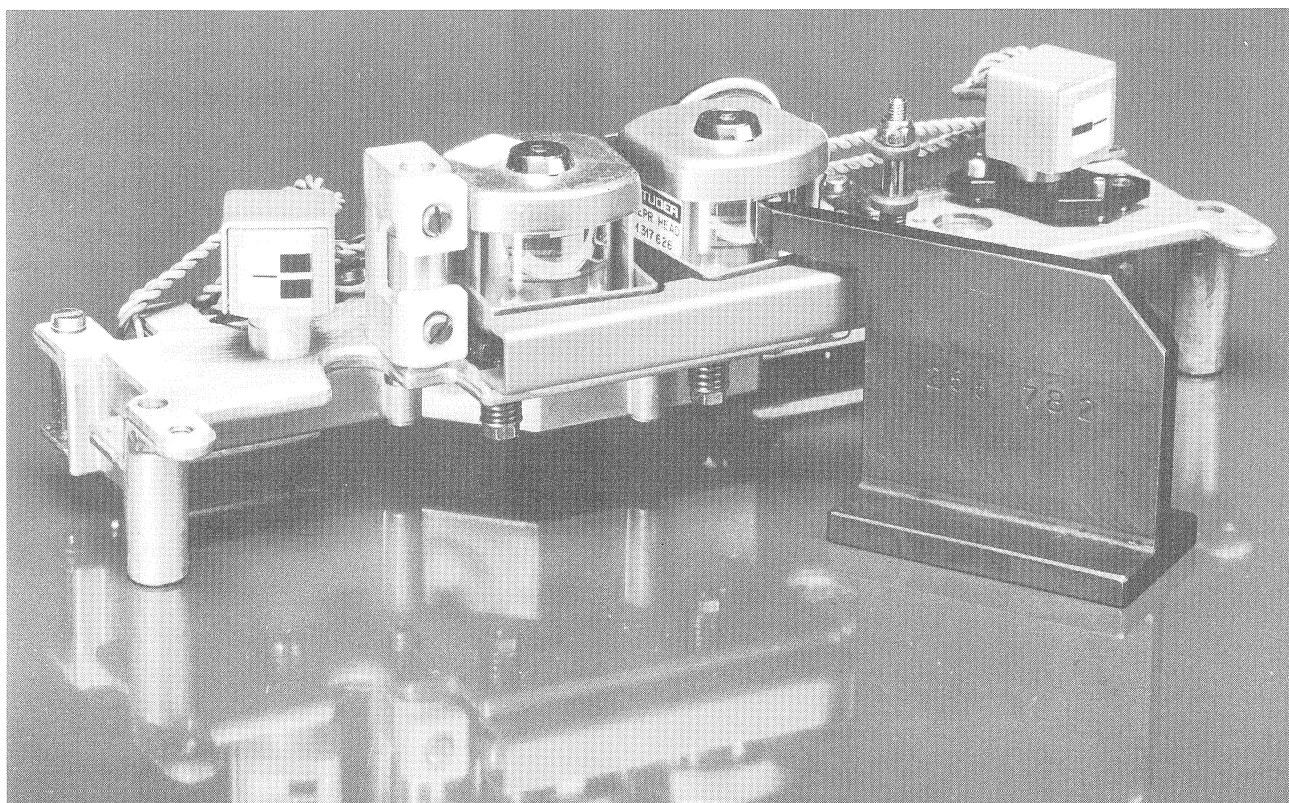


**IMPORTANT**

Do not shift the black azimuth alignment plate when replacing a soundhead. The distance between the head support and the head face is milled to the exact same dimensions. Adjustment of the head azimuth should, therefore, be unnecessary.

After the soundhead has been replaced, check with the tape path alignment gauge (part No. 10.010.001.17) that the head face is perpendicular and that the azimuth is correct.

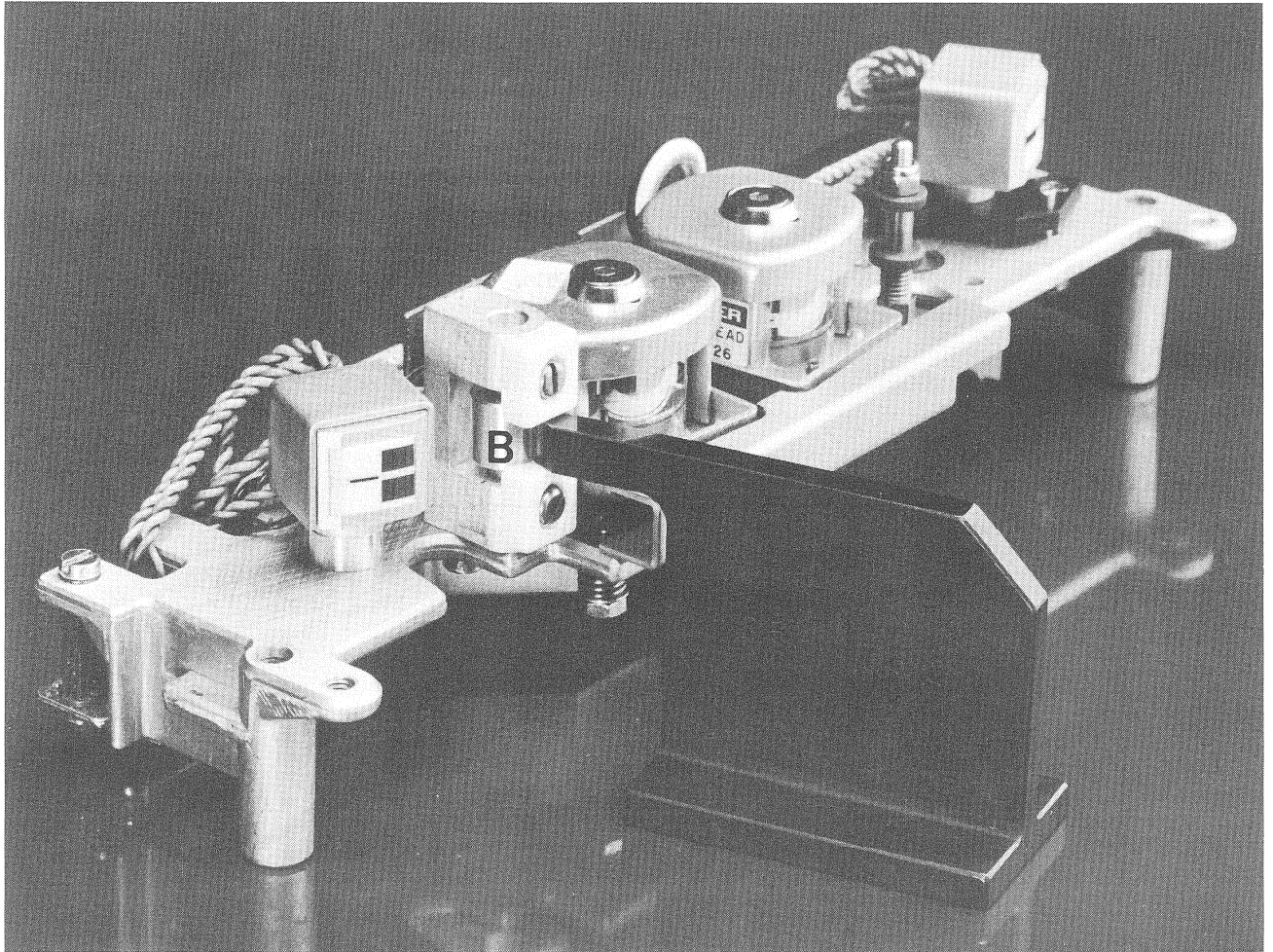
For this check, the headblock and the gauge should be placed on a leveling block or in an emergency on a flat glass plate.



The azimuth alignment is described in Section 4.2.

Tape guidance

Check tape guidance {B} with the tape path alignment gauge (part No. 10.010.001.16). Adjust the height of the ceramic parts with a screwdriver for slotted-head screws.

Anti-scrape flutter roller

The anti-scrape flutter roller can be removed after unfastening the 3 mm hexagon-socket-head cap screw accessible from below.

It is not necessary to check the height of the anti-scrape flutter roller after the roller has been replaced because this adjustment was made by the factory.

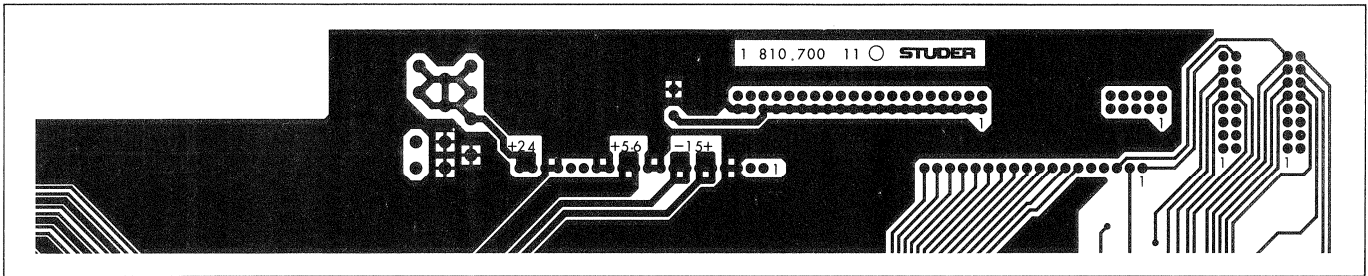
The mounting support for the anti-scrape flutter roller must be positioned parallel to the record head, otherwise insufficient space remains for the left-hand tape lift pin.

Check with the tape path alignment gauge (part No. 10.010.001.16) that the anti-scrape flutter roller is perpendicular on all sides.

### 3.4 ELECTRICAL ADJUSTMENTS

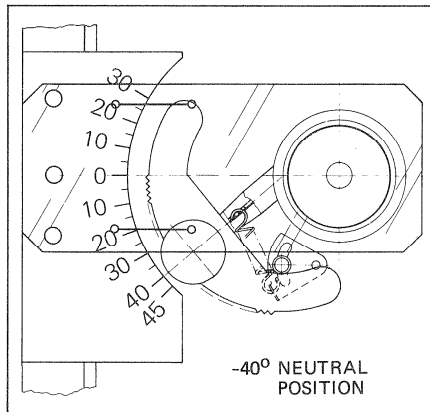
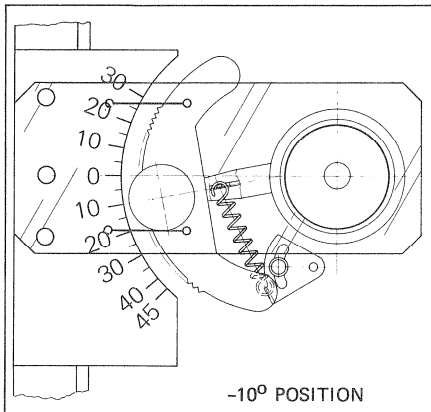
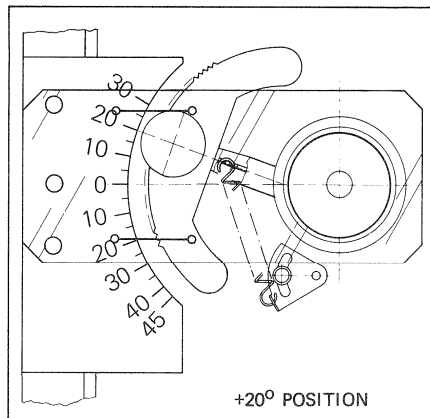
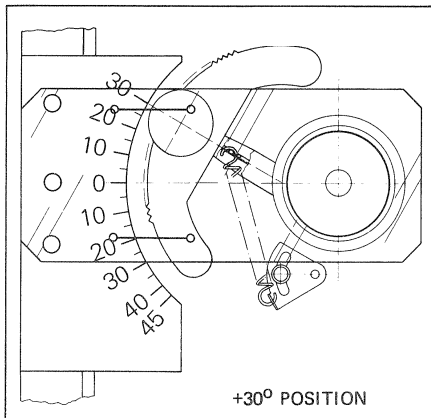
#### 3.4.1 Checking the supply voltages

Remove upper rear panel (3.2.1). Four test points are marked on the basis board: +24 V, +15 V, -15 V, +5.6 V. The maximum deviation is  $\pm 100$  mV for each. The +5.6 V can be adjusted with the trimmer potentiometer that is accessible from the rear on the stabilizer board.



#### 3.4.2 Tape tension sensors

Do not make any electrical adjustments to the tape tension sensors unless the basic mechanical adjustments according to Section 3.3 have been performed.



Neutral position:

With the tape tension sensors in neutral position, adjust the signals AN-TTL or AN-TTR (each on TP1 of the corresponding tape tension sensor) with R5 or R21 respectively to

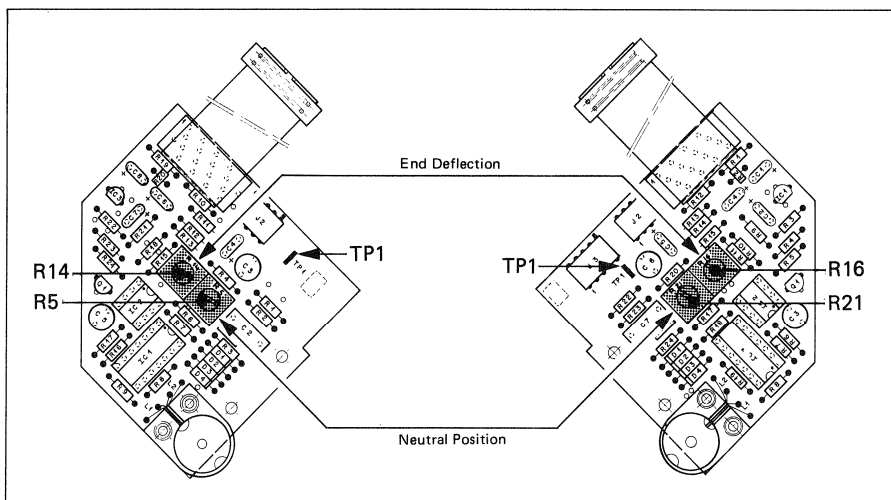
$$0 \text{ V} \pm 50 \text{ mV}$$

Max. deflection

The signals AN-TTL and AN-TTR (each measured on TP 1 of the corresponding tape tension sensor) are adjusted with R14 or R16 respectively to

$$4 \text{ V} \pm 50 \text{ mV}$$

with the tape tension sensors in the 30° position (top edge of roller is flush with the top edge of the alignment gauge).

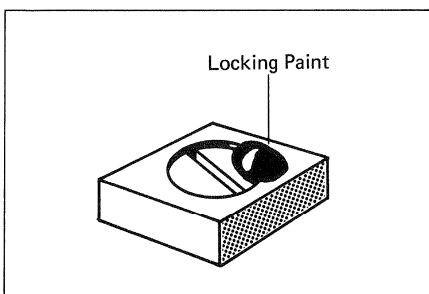
Neutral position:

Check and readjust if necessary; AN-TTL/R =  $0 \text{ V} \pm 50 \text{ mV}$ .

Max. deflection:

Check and readjust if necessary; AN-TTL/R =  $4 \text{ V} \pm 50 \text{ mV}$ .

Secure the setting of the trimmer potentiometers with a dab of locking paint (diam. 2 mm) after the adjustments have been made.

CAUTION:

Leave slots of trimmer potentiometers open.



3.4.3 Tape move sensor

Checking the TTL signals.

	CLOCKWISE	COUNTER-CLOCKWISE	TAPE DECK CONTROLLER
T-CLK 1			PIN 1
T-CLK 2			PIN 2

10 pulses per revolution.

Checking the tape counter:

The tape counter should increment and decrement correctly in all tape transport functions.  
Manually stop the right-hand guide roller in PLAY mode. The tape counter should no longer increment and the recorder should enter the STOP function.  
If not: check that the jumper JS3 on the TAPE DECK CONTROLLER is in the correct position.

3.4.4 Tape-end sensor

Switch recorder on, tape transport in STOP mode.  
Both tape tension sensors in their neutral position. The EDIT solenoid of the brake chassis should drop out and the status lamp of the STOP key should flash.

Move left-hand tape tension sensor out of its neutral position. The EDIT solenoid of the brake chassis should pick up, the tape tension sensors should engage, and the STOP lamp should light up continuously. Restore the tape tension sensor to the neutral position and perform the same check with the right-hand tape tension sensor.



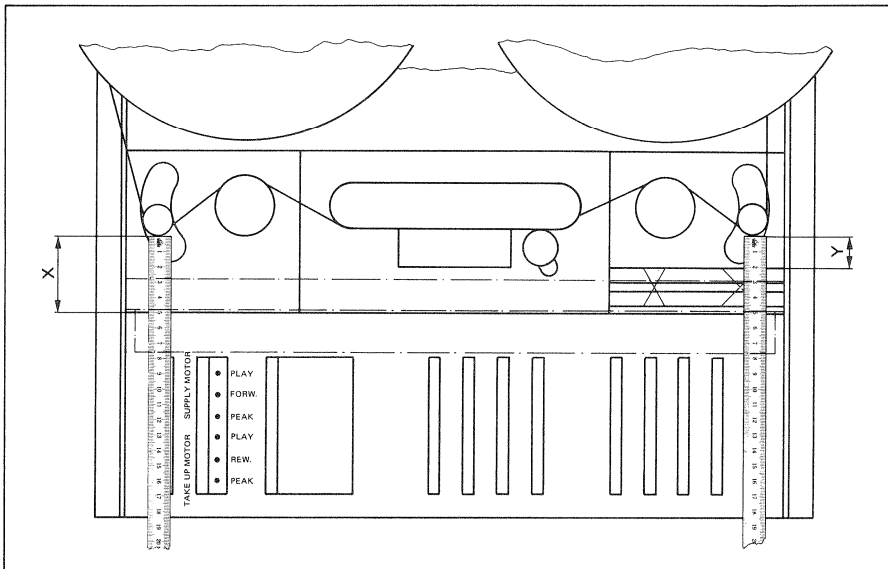
### 3.4.5 Tape tension adjustments

Remove jumper JS3 on the TAPE DECK CONTROLLER PCB or plug it into position B.

#### PLAY tape tension

Mount the alignment gauges on the two tape tension sensors and mount a reel of tape (hub diameter 100 mm). Spool forward to the middle of the tape, select PLAY, and adjust the two trimmer potentiometers "PLAY" of the TAPE DECK CONTROLLER in such a way that both tape tension sensors are in the  $-10^\circ$  position.

The adjustments can also be made with a measuring rod when the machine is flat on a bench and the hinged panel cover is open: the measuring rod can be pushed in below the hinged panel cover. On the left-hand tape tension sensor the distance between the bottom edge of the guide roller and the bottom edge of the tape tension sensor cover should be 50 mm (X); on the right-hand tape tension sensor the distance between the bottom edge of the guide roller and the top edge of the splicing rail should be 22 mm (Y).



#### Back tension

Press fast forward > and adjust the left-hand tape tension sensor to  $-10^\circ$  by means of the "FORWARD" trimmer potentiometer on the TAPE DECK CONTROLLER. Press rewind < and adjust the right-hand tape tension sensor to  $-10^\circ$  by means of the "REWIND" trimmer potentiometer on the TAPE DECK CONTROLLER. Or use the measuring rod for adjusting the back tension analogously to the PLAY tape tension.

#### Peak tape tension

Rewind the tape to the beginning (right-hand hub diameter 100 mm). Manually keep the left-hand reel from turning and press fast forward >. Adjust the right-hand tape tension sensor to  $+20^\circ$  by means of the "TAKE UP PEAK" potentiometer on the TAPE DECK CONTROLLER; or use the measuring rod, analogously to the adjustment of the PLAY tape tension, distance Y = 42 mm.

Spool tape forward to the end (left-hand hub diameter 100 mm). Manually keep the right-hand reel from turning and press rewind. Adjust the left-hand tape tension sensor to  $+20^\circ$  by means of the "SUPPLY PEAK" potentiometer on the TAPE DECK CONTROLLER; or use the measuring rod, analogously to the adjustment of the PLAY tape tension, distance X = 70 mm.

### Check measurements

Check PLAY tape tension with tentelometer. Insert tentelometer between the supply reel and the left-hand guide roller or the right-hand guide roller and the take-up reel.

Desired values: Left: 0.6 ... 0.7 N (60 ... 70 p)  
right: 0.8 ... 0.9 N (80 ... 90 p)

Important: The difference between the left-hand and right-hand tape tension must be 0.2 N (20 p)!

Should these values not be attained, the tape tension spring must be readjusted with the turnbuckle {A} (refer to Section 3.3.4, page 3/29).

After these adjustments have been made, the adjusting screw of the turnbuckle must be tightened and secured with a drop of locking paint.

Reinsert jumper JS3 on the TAPE DECK CONTROLLER PCB.

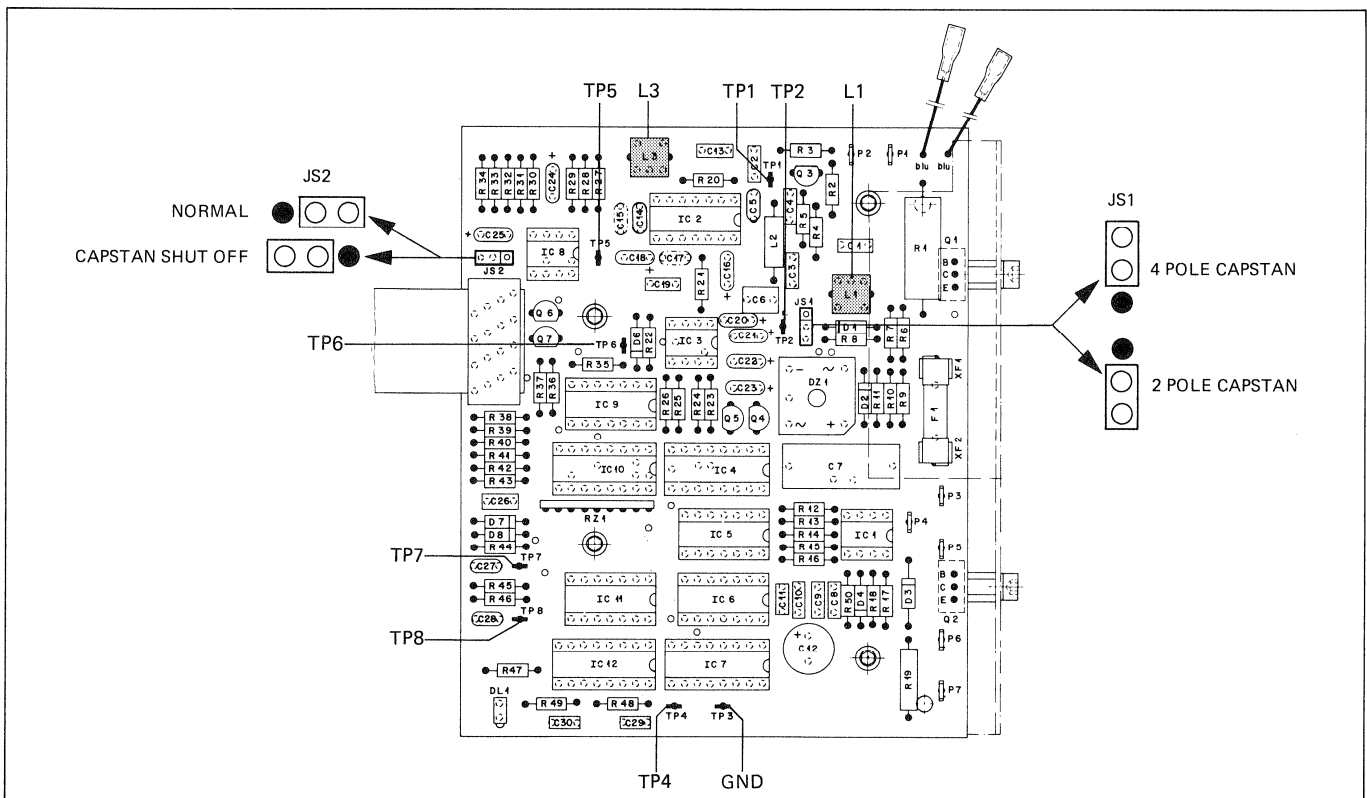
### 3.4.6 Capstan motor control

#### CAUTION

Ensure that proper electrical insulation and excellent thermal contact with the heatsink bracket is achieved when replacing the power transistors (Q1, Q2). Mica washers coated on both sides with heat-conduction paste are, therefore, essential! After installation check insulation with continuity tester or ohmmeter!

The capstan motor control requires realignment after the capstan motor or the capstan motor control has been replaced.

Completely remove capstan motor together with capstan motor control (3.2.9), do not disconnect connectors (flat cable, 2 blue stranded wires to the power transformer).



### Adjustments

- Position jumper JS2 on capstan motor control so that the capstan motor switches off for TAPE OUT (CAPSTAN SHUT OFF).
- Bring both tape tension sensors into their neutral position.
- Switch recorder on, capstan motor should not rotate.
- Connect oscilloscope to TP1 of the capstan motor control, adjust signal with L1 to approx. 5.5 MHz  $\pm$ 500 kHz. The signal should not disappear when touching the insulation of the two twisted stranded wires that lead to the capacitive sensor.
- Move tape tension sensors out of their neutral position (or change the setting of jumper JS2 if this is preferred) so that the capstan motor rotates (capstan lock indicator on MASTER PANEL and LED DL1 on the capstan motor control board turn on as soon as the motor has reached nominal speed).
- Connect oscilloscope to TP5. Adjust audio signal (1600 Hz at 38 cm/s) with L3 for maximum amplitude (400 mV p/p  $\pm$ 200 mV p/p).

### Check measurements

- TP7: square-wave signal, same frequency as signal on TP5, cyclic duty factor approx. 50%.
- TP8: reference signal from microprocessor; short positive pulses.  
Only available when motor is running!
- TP4: output signal of phase comparator; cyclic duty factor approx. 50% when motor is running without load, i.e. pressure roller not engaged. If capstan motor too fast: LOW, if too slow: HIGH.
- TP2: DC signal, mean value of signal on TP4. Approx. 7 ... 8 VDC when motor operates without load.

### Exchanging the capstan motor or the capstan motor control

- The capstan motor control 1.810.761 is designed for operation with an integral capacitive sensor, the control 1.810.766 for operation with a split capacitive sensor.

If a capstan motor with integral sensor is replaced by one with a split sensor, the control board 1.810.761 should be replaced by a control board 1.810.766. It is not recommended to operate the motor with split sensor in conjunction with board 1.810.761, although this is not impossible (capstan lock problems can occur when the motor runs without load, i.e. pressure roller not engaged).

Both terminals of the capacitive sensor must be connected to P1 of the capstan motor PCB, and P2 to the chassis ground.

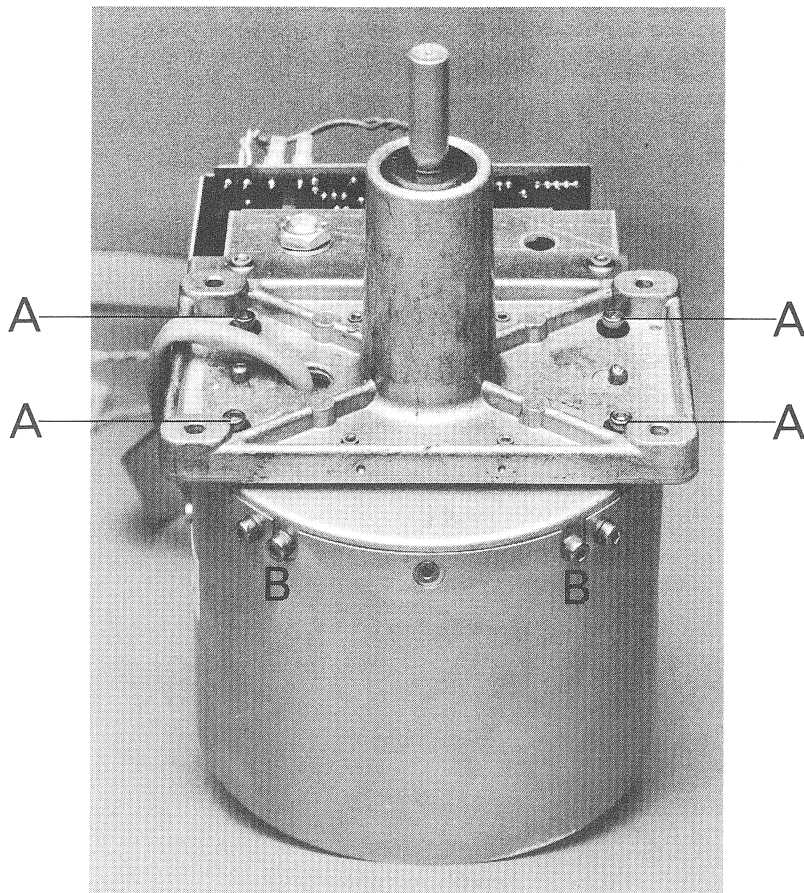
It is not possible to operate the capstan motor with integral sensor in conjunction with the capstan motor control 1.810.766.

- If a 4-pole motor is replaced by a 2-pole motor, change the setting of jumper JS1 on the capstan motor control. Unplug the power transformer leads (2 x blu) from terminals 10 and 19 and connect them to terminals 12 and 17, and interconnect power transformer terminals 10 and 11 as well as 18 and 19. An additional screening plate 1.810.001.05 as well as 4 screws 21.53.0354 and lockwashers 24.16.1030 are required because the 2-pole motor has a stronger stray field. This screening plate is installed between the capstan motor and the amplifier cage and must be secured to the existing 4 hexagon bolts.
- The phase shift capacitor must be changed from 4.5  $\mu$ F (part No. 59.99.0452) for 4-pole capstan motors to 8  $\mu$ F (part No. 59.14.6809) for 2-pole capstan motors.

Centering the capacitive sensor.

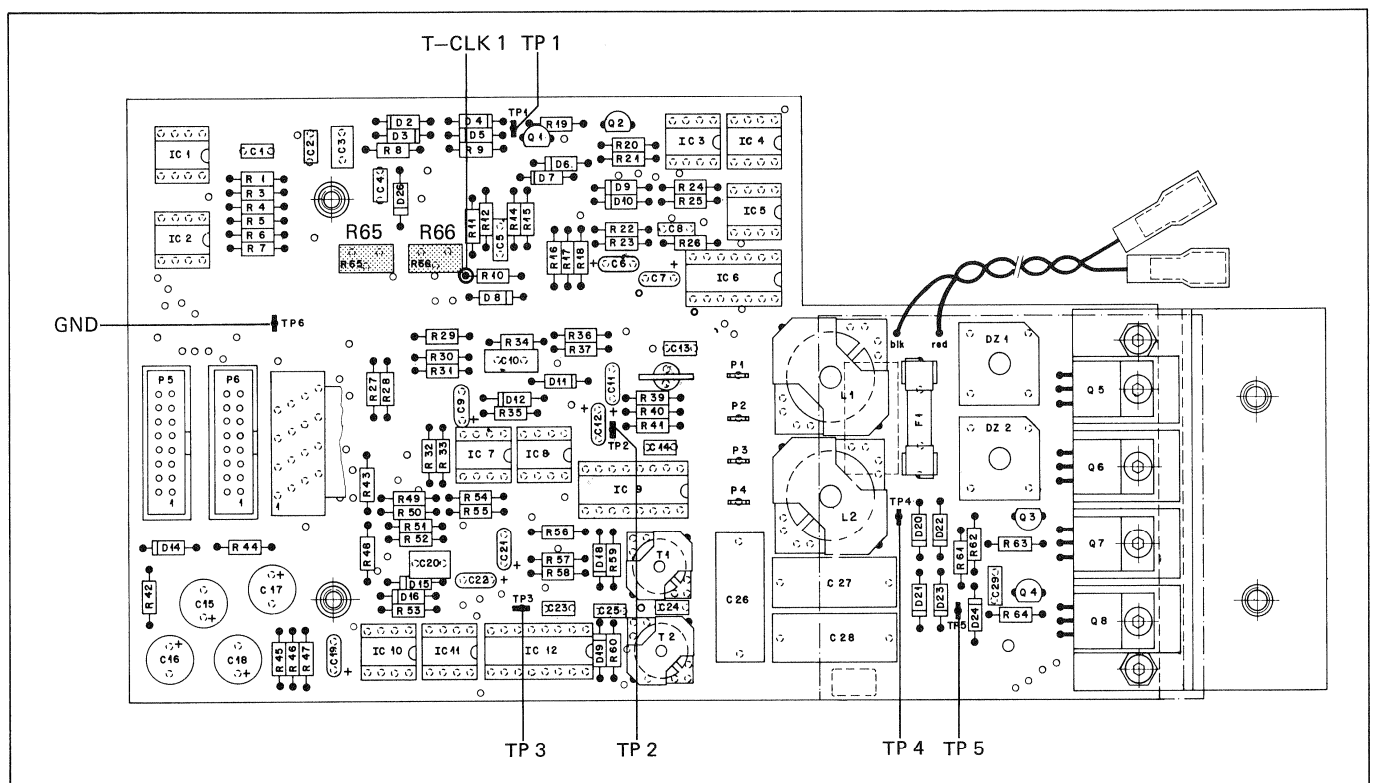
Remove the capstan motor but leave it connected to the machine for adjusting the capacitive sensor. The ring sensor can be adjusted with the two screws (B) after the four screws (A) have been lightly loosened. Connect oscilloscope to TP5 of the capstan motor control and adjust to minimum amplitude modulation (in practical terms: definition of the curve minima and maxima as sharp as possible).

Subsequently retighten the four screws (A) and secure all 6 screws with a dab of locking paint (ensure that no paint flows into the hexagon socket head!).



### 3.4.7 Spooling motor control

- Switch recorder off.
- Remove spooling motor control (3.2.8) and unscrew shock protection.
- Disconnect the two twisted stranded wires (0 V, blk; 130 V, red) on the power transformer terminals.
- Do not disconnect the leads of the spooling motors (P1 ... P4)! When the spooling motor control operates without load, C27 and L1 or C28 and L2 are resonant circuits through which high currents may flow!



- Switch recorder on, connect oscilloscope to TP1. Balanced delta signal, 76 kHz, 10 V p/p. The DC component on TP1 should not exceed +150 mV.
- Switch recorder off, pull IC10 out of its base; interconnect terminals 7 and 8 on the base of IC10 with a piece of wire. Switch recorder on, connect oscilloscope to TP3, and measure cyclic duty factor of the square-wave voltage. Adjust to 95% with R65. Switch recorder off, reinsert IC10 into its socket.
- Perform the same measurements analogously with IC7 and TP2. If the cyclic duty factor on TP2 is greater than 95%, decrease it to 95% with R65.
- Switch recorder off. Reconnect power transformer Leads (blk terminal 14, red terminal 15). Replace fuse F1 by a power resistor 100  $\Omega$ , > 10 W (part No. 1.010.001.14). Remove jumper JS3 on the TAPE DECK CONTROLLER PCB or plug it into position B. Mount tape, switch recorder on, and select PLAY mode.

**CAUTION:** Dangerous voltages are present on the spooling motor control board!

- Connect oscilloscope to TP4. A switched signal is measured that has a sinusoidal envelope curve. If the signal is unbalanced or if it has a DC component, this is caused by a defective commutating circuit (around Q3, 4, 7, 8).

**CAUTION:** If the measurements are made in the commutating circuit, replace fuse F1 by a series resistor (100 ohm) in order to prevent damage to the circuit!

- Connect oscilloscope to TP5 and perform the same measurements as above.
- After correct functioning has been ascertained, repeat the above 2 measurements without the series resistor (fuse F1 reinserted).
- Connect frequency counter to the terminal of R10 that is located nearer to the trimmer potentiometer R66 (signal T-CLK1). Select slowest spooling speed (STOP, TRANS <REDUCED> and < or >). Adjust frequency with R66 to approx. 85 Hz (or any other value if desired).
- Check with the other spooling speeds: STOP, < or >, TRANS <REDUCED> and < or >; frequency approx. 440 ... 470 Hz. Press < or >; frequency approx. 190 ... 210 Hz.
- Reinsert jumper JS3 on TAPE DECK CONTROLLER.

### 3.5 CIRCUIT DESCRIPTIONS

#### 3.5.1 Power supply

##### Line voltages:

100, 120, 140, 200, 220, 240 V  $\pm 10\%$ , 50 ... 60 Hz

##### Internal supply voltages

+5.6; +15; -15; +24; all stabilized

125 VAC for spooling motor control

130 VAC for 4-pole capstan motor control or

140 VAC for 2-pole capstan motor control

The line voltage is taken from the 3-pin power inlet (GR 01) through the 2-pole power switch (GR 02), the line filter (GR 03), the line voltage selector with the primary fuse (GR 04) to the power transformer (GR 05).

The secondary side of the power transformer supplies the following voltages:  
25.6 V; 35.2 V; 130 V; 125 V; 10 V.

The 25.6 V and the 35.2 V are rectified and smoothed (GR 06) and produce the stabilized voltages +5.6 V, +24 V and  $\pm 15$  V on the stabilizer circuit board (GR 07).

#### 3.5.2 STABILIZER GR 07

##### +5.6 V Stabilizer

The supply voltage for the microprocessor is generated by a switching regulator with pulse width modulation. The controlling element is IC6 (regulating pulse width modulator) with built-in reference voltage source, oscillator, error amplifier, and current limiting circuit. The output of IC6 controls the two power transistors Q4 and Q3. The circuit elements Q6, 9, 10, 12, and 13 switch the regulator off as soon as the input voltage drops below approx. 8 V in order to prevent destruction of the series transistor Q4 because of instabilities. The output voltage can be adjusted to 5.6 V with R69.

Triac Q11 short-circuits the output (current limiter of the controller responds; if the latter is defective the 25.6 VAC fuse F1 blows), if the output voltage rises above approximately 7 V because of a defect in the circuit. The output current is limited to approximately 7 A. R58 is the current measuring resistor.

##### 24 V Stabilizer

The +24 V are created from the rectified 25.6 VAC by IC3 which is a voltage regulator with a fixed setting.

##### $\pm 15$ V Stabilizer

The  $\pm 15$  V are produced from the rectified 35.2 VAC by means of the voltage regulators with fixed setting IC1, IC2. The output currents of the two regulators are identical.

Should a defect occur that causes an increase in the output voltages, the triac Q5 short-circuits the output (the current limiter of the controllers responds; if the latter are defective the 35.2 VAC fuse F2 blows).

#### Monitoring the supply voltages

The circuit with IC4 monitors the availability of the stabilized supply voltages. If one of the voltages fails or drops below approx. 70% of the nominal value, the signal T-SUPVON becomes 0. This sets up an interrupt in the microprocessor and tape braking is activated immediately. At the time the recorder is switched on, the signal T-SUPVON must be 1 before the microprocessor enables the functions of the tape recorder.

#### Monitoring the line voltage

Line voltage failures of less than 80 ms do not influence the logic state of the recorder. Correct switching to STOP mode is ensured for longer failures.

A pulsating DC voltage is tapped on the 25.6 V rectifier (ACB-25.6 and STABIN-6). C12 in the circuit with IC5 is charged by R34, R27 and periodically discharged by the pulsating DC voltage. As soon as a half-wave is missing (10 ms at 50 Hz, 8.33 ms at 60 Hz), the signal T-PWRON becomes 0 and sets up an interrupt in the microprocessor and tape braking is automatically initiated after 80 ms.

### 3.5.3 MP UNIT GR 20 EL 01

1.810.752/1.820.780 [specifications that differ for 1.820.780 are indicated in brackets]

The MPU logic processes the entered commands into logical signals and stores the audio parameters, locate addresses, and, when the recorder is switched off, also the last operating state. The operating time of the tape transport can be read out on the operating hours meter.

The clock frequency of the microprocessor is also the central timing source for the recorder:

Capstan motor control, switched spooling motor output stage, audio, time code.

Bus and select lines lead to:

- Tape deck controller
- Audio controller
- Command unit
- Serial remote controller

The TTL MPU bus features 8 data and 3 address lines as well as separate select lines to the individual controllers.

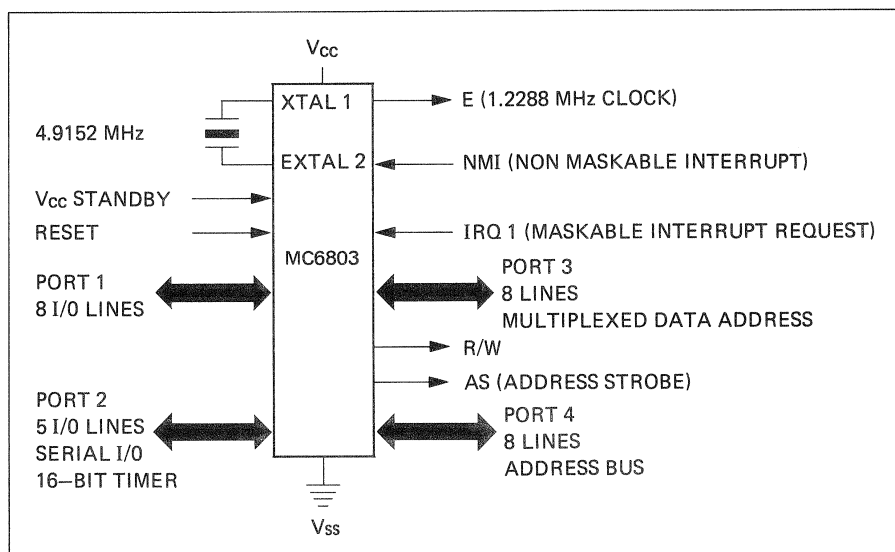


### Microprocessor

The MC 6803 is a bidirectional, bus-oriented 8-bit parallel microprocessor with 16 address bits. It is implemented in NMOS technology, is TTL compatible, and requires only one supply voltage (+5 V). Seven different addressing methods are possible and its internal command register can decode 72 commands.

The internal 128 byte RAM is not used for the present application and is ignored by the program. Up to 64 K external memory can be addressed with the 16 address bits.

In the operating mode selected (EXPANDED MULTIPLEXED MODE No.2), PORT 3 (lines P30 ... P37) operate as a time-division address/data bus.



The internal clock frequency is 1.2288 MHz which is derived from the 4.9152 MHz quartz frequency by dividing it by 4.

### External memories

The external memories comprise 16K PROM (IC3 ... IC6) and 2K RAM (IC2) [24K PROM (IC8, IC10, IC12, IC14) and 2K RAM (IC6)] as well as a rechargeable buffer battery BA1. The battery is charged by the +5.6 supply voltage and feeds the RAM when the recorder is switched off.

The complete machine program is stored in PROM. The RAM stores the audio data, the tape timer information, the selected command, the locate address, and the tape transport status. The R/W signal (READ/WRITE) determines whether data is sent from the microprocessor to the RAM (WRITE) or is received from the RAM (READ).

IC14 [IC11] (OCTAL TRANSPORT LATCH WITH 3-STATE OUTPUTS) is the address interface for PORT 3 (Address bits 0 ... 7) and is controlled by AS (ADDRESS STROBE).

When E = 0 and AS = 1, PORT 3 is an address bus; with E = 1 and AS = 0 it is a data bus.

In contrast to address bits 0 ... 11 which are primarily used for addressing the memories and for the address bus of the tape recorder, address bits 12 ... 14 in IC10 (1-OF-8 DECODER/MULTIPLEXER) [address bits 12 ... 15 in IC9 (1-OF-16 DECODER/DEMUTIPLEXER)] generate the information for the selected lines of the PROMs and the controllers.

IC1 [IC3] (OCTAL BUS TRANSCEIVER WITH 3-STATE OUTPUTS) establishes the connection to the 8-bit MPU data bus. IC7 [IC2] (OCTAL BUFFER/LINE DRIVER) places the address and select bits on the MPU address/select bus. IC1 [IC3] is controlled by R/W, address bits 11, 14, 15 and the MPU clock [R/W, address bits 14, 15 and the MPU clock]. IC7 is controlled by address bits 11, 14, 15 [IC2 by address bits 14, 15].

The clock frequency of 1.2288 MHz is divided down in IC13 [IC5] (DUAL DECADE COUNTER) to the following frequencies:

:4 = 307.2 kHz (reference frequency for HF driver, erase and bias frequency)  
:16 = 76.8 kHz (clock frequency for spooling motor output stage)  
:128 = 9.6 kHz (reference frequency for capstan motor control)

#### RESET

The RESET input fulfils two functions:

- Clean initialization during power-on of the microprocessor; the RESET input must be kept below 0.8 V until the supply voltage V/CC has reached at least 4.75 V so that the internal clock generator (Clock) can stabilize during this time.
- If the microprocessor does not function correctly, reinitialization is performed either with switch S1 or automatically, and the program is restarted. An automatic RESET is initiated if no tape timer scan occurs within approx. 20 ms (also refer to 3.5.4 TAPE DECK CONTROLLER).

During the power-on sequence, the RESET input must be kept low for at least 8 cycles of the internal clock frequency (min. 6.5  $\mu$ s). The program counter is loaded with the last two addresses (FFFE, FFFF) during this time. The program starts with the first instruction two cycles after a positive voltage (log. "1") is available on the RESET input.

#### INTERRUPT

An INTERRUPT routine is initiated if a line voltage failure is detected by the power supply (T-NM [T-PWRON] = 0). The current instruction is completed before the INTERRUPT routine starts. The momentary operating status is stored in RAM and a STOP command is output to the TAPE DECK CONTROLLER after 80 ms. If the line voltage failure is shorter than 80 ms, the INTERRUPT routine is cancelled and normal program execution continues.

Only the NMI (NON-MASKABLE INTERRUPT) rather than the T-IRQ (MASKABLE INTERRUPT REQUEST) is used.

T-TX (send line) and T-RX (receive line) lead to the serial interface.

The output P20 is taken via IC8 (IC4) as the signal T-DRVENB to the serial remote controller and switches the latter's output on.

The new version of the MPU board 1.820.780 supports the following additional features:

- Either LED OR LCD tape timer display (selectable with jumper on the TAPE DECK CONTROLLER)
- Automatic MUTING during spooling operations.
- Display of the recorder status on the connected terminal (with DST command).

### 3.5.4 TAPE DECK CONTROLLER GR 20 EL 02

#### 1.810.750

Set point generator for spooling motor control with 2 x 3 trimmer potentiometers. Controls the tape deck solenoids (brake, 3 x EDIT, pinch roller, and tape lifter).

Reading the tape deck status.

Data for capstan motor control.

Interpreting the tape move sensor signals.

#### Spooling motor control GR 24

Analog servo loop comprising: tape tension sensors GR 27/GR 28, spooling motors GR 09/GR 10, motor control with pulse-width modulation (clock frequency supplied by MPU).

The TAPE DECK CONTROLLER supplies the following information:

Set point for tape tension left and right (analog) for PLAY, spooling and PEAK. Reduced spooling speed (2 bits each for tape speed and spooling speed). Transmitting the tape movement and direction to the MPU. Driving the solenoids.

#### Capstan motor control GR 26

2nd order phase-locked loop (PLL), quartz reference 9.6 kHz from MPU, speed change-over through frequency division.

Capacitive tacho sensing. DC braking when switching to low speed or in vari-speed mode.

4-pole capstan motor for 3.75, 7.5, 15 ips  
2-pole capstan motor for (3.75), 7.5, 15, 30 ips

#### Tape move sensor GR 28 EL 05

The tape move sensor supplies two square-wave voltages (T-CLK1, T-CLK2) that are offset by 90°. Their frequency is proportional to the tape speed. The diameter of the guide roller has been dimensioned so (37.9 mm) that a tape speed of 3.75 ips results for a frequency of 8 Hz. The following pulse rates are thus obtained:

3.75 ips: 8 pulses/sec.  
7.5 ips: 16 pulses/sec.  
15 ips: 32 pulses/sec.  
30 ips: 64 pulses/sec.

The signal T-CLK1 is buffered and is available as T0-CLK on pin 7 of the connector for the parallel remote control.

	CLOCKWISE	COUNTER-CLOCKWISE	TAPE DECK CONTROLLER
T-CLK 1			PIN 1
T-CLK 2			PIN 2

From the 90° offset square-wave signals of the tape move sensor, direction-dependent pulse trains are formed via IC2, IC3, IC4 which are stored in the two binary counters IC11, IC12 (max. 255 pulses). The counter outputs are connected through a buffer/driver (IC10) to the data bus. The microprocessor requests a tape timer scan in intervals of 20 ms and receives the data bits available on the data outputs of IC10.

An address decoder IC13 (1-OF-8 DECODER/DEMULIPLEXER) decodes the address output by the microprocessor when the signal T-TDSTR (TAPE DECK CONTROLLER STROBE) is 0. The data outputs of IC10 are enabled with T-RW (PROCESSOR READ/WRITE) = 1, and the microprocessor receives the stored data.

The following logic status must exist on the address decoder so that the microprocessor can receive the content of the tape timer:

T-TDSTR = 0  
T-RW = 1  
T-ADRX = 0  
T-ADRY = 0  
T-ADRZ = 1

TDOR4-R thus becomes 0 and enables the buffer/driver IC10.

Microprocessor data (commands) are transmitted with T-RW = 0.

The following logic states must exist on the address decoder so that the microprocessor can reset the binary counters:

T-TDSTR = 0  
 T-RW = 0  
 T-ADRX = 0  
 T-ADRY = 0  
 T-ADRZ = 1

TD04-W thus becomes 0 and resets the counters IC11, IC12.

IC14 (OCTAL D-TYPE FLIP-FLOP) with the address TD07-W = 0 decodes the commands that have been output by the microprocessor through the data bus for the spooling motor control such as:

Play, fast forward, rewind, and stop, as well as 2 information bits for the spooling speed:

Tape speed	max.	7	4	1	m/s
T-TPSPD1	0	1	0	1	
T-TPSPD2	0	0	1	1	

Both bits are reset to 0 (10 m/s) by switching off TRANS or with STOP and PLAY.

IC9 with the address TD06-W = 0 decodes the commands output by the microprocessor for the six tape transport solenoids (control through open-collector drivers IC5 ... IC8) and the information for the capstan motor control:

T-CAPON = 0 (capstan motor control on)

T-REFSEL = 0 (capstan motor controlled by external reference frequency;  
 9.6 kHz corresponds to the nominal speed set with the 2 bits  
 T-SPDSL1, T-SPDSL2).

T-SPDSL1, 2 determine the tape speed:

Tape speed	30	15	7.5	3.75	ips
T-SPDSL1	0	0	1	1	
T-SPDSL2	0	1	1	0	

Through the buffer/driver IC1 with the address TD05-R = 0, the following information is received by the microprocessor in addition to the tape travel direction:

T-SUPVON (supply voltage monitoring, "1" = all on)

T-SYNCAP (capstan motor speed, "0" = synchronous running)

T-TENDL/R (limit switch of tape tension sensors, "0" = neutral position)

The multivibrator IC18 monitors the correct functioning of the microprocessor: the tape timer is scanned in intervals of approx. 20 ms with the address TD04-R = 0. The same signal is also used to trigger the monostable multivibrator IC18. If no timer scan occurs, the output 2Q of IC18 switches the signal T-RESET to "0". This causes a RESET in the microprocessor, i.e. the program is restarted.

Through the output 1Q of IC18, the RESET pulse also resets the two 8-way D-flip-flops IC9 and IC14 and the machine is switched to STOP mode.

### 3.5.5 BUS CONVERTER GR 20 EL 05

1.810.754

TTL/CMOS bus converter, (CMOS bus with 8 data and 4 address bits). Interface for audio section, transmits only data from the microprocessor to the audio section ("WRITE" only).

The audio parameters output by the MPU are written into the audio amplifiers through the TTL data bus, the bus converter and the CMOS bus.

- With 8-way D-flip flop:
  - Input and output level 0, 4, 8, or 10 dBm
  - Change-over INP, SYNC, REP
  - Muting MUTE
  - Equalization 3180  $\mu$ s
  - Erase current
  - Drop-in or drop-out
- With 8-bit digital/analog converter (256 step attenuator):
  - Reproduce level
  - Reproduce frequency response (treble, bass)
  - Reproduce equalization
  - Record level
  - Record frequency response (treble)
  - Record equalization
  - Bias current

The bus converter essentially consists of the interface circuit IC5 (PERIPHERAL INTERFACE ADAPTER = PIA) and the CMOS bus drivers IC4, 5, 8.

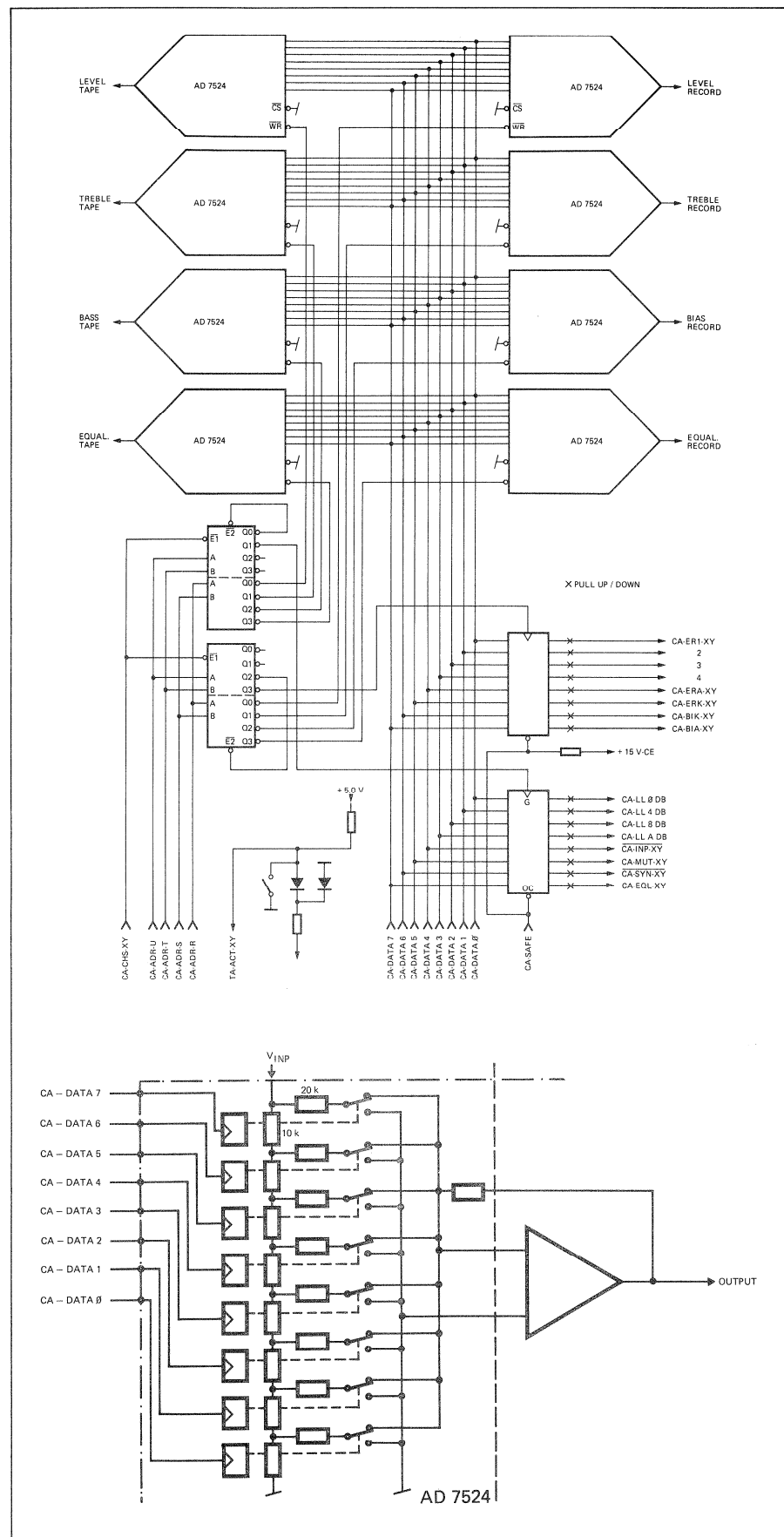
MPU signals to the PIA:

- Data bits: T-DATA-0 ... T-DATA-7 (MPU bus TTL).
- T-ENB: MPU clock frequency, 1.2288 MHz.
- T-RW: The data transmitted by the MPU can be placed on the CMOS bus by the PIA when READ/WRITE = 0.
- T-RESET: all register bits of the PIA are set to 0 when this signal is = 0.
- T-ACSTR: (AUDIO CONTROLLER STROBE) = 0 and T-ADR-Z = 0 enable the PIA.
- T-ADR-X and T-ADR-Y address the internal registers of the PIA.

Output signals of the PIA:

- CA-DATA 0 ... CA-DATA 7: 8-bit CMOS data bus.
- CA-ADR-R, S, T, U: 4-bit CMOS address bus.
- CA-CHSO1, 02, TC: channel selection 1, 2, and time code channel.
- CA-MONO: mono/stereo switch ("0" = mono).

Stand-by signals (TTL) from: CH1, CH2, time code (recording) and mono/stereo switch are transmitted through IC1 (3-STATE HEX BUFFER) to the PIA and received by the microprocessor.



### 3.5.6 PERIPHERY CONTROLLER GR 20 EL 04

1.810.753

The PERIPHERY CONTROLLER is the interface to the serial TTL bus (1 serial data bit per peripheral device; 3 address bits; 1 READ SELECT line, and 1 WRITE SELECT line).

Bus and address lines lead to the following units:

- Audio controller keyboard; input section for audio parameters.
- Channel control unit CH1; keys and status indicator lamps, channel 1.
- Channel control unit CH2; keys and status indicator lamps, channel 2.
- Channel control unit CH3; keys and status indicator lamps, time code channel.
- Master panel; keys and status indicator lamps for tape speed, mono/stereo switch (or tape type selector), and CCIR/NAB equalization.
- Remote interface; interface to parallel remote control.

The periphery controller essentially consists of an interface circuit (PERIPHERY INTERFACE ADAPTER = PIA).

MPU signals transmitted to PIA:

- Data bits: T-DATA-0 ... T-DATA-7 (MPU bus TTL).
- T-ENB: MPU clock frequency, 1.2288 MHz.
- T-RW: The data sent by the MPU can be placed on the serial TTL bus with READ/WRITE = 0; with READ/WRITE = 1 the MPU can receive data bits from the PIA.
- T-RESET: all register bits of the PIA are set to 0 when this signal is = 0.
- T-ACSTR: (AUDIO CONTROLLER STROBE) = 0 and T-ADR-Z = 1 enable the PIA.
- T-ADR-X and T-ADR-Y address the internal registers of the PIA.

Peripheral lines of the PIA:

- Seven (+ 1 spare) serial I/O data lines (channel controls, master panel, remote interface).
- DATA ENB (OUTPUT).
- DT JMP, DT ACK1, 2; data lines of the input unit for the audio parameters (INPUT).
- A, B, C; address lines (OUTPUT).
- READ, WRITE.

Input section for audio parameters (1.810.755):

The input section comprises 11 keys, 13 inductor lamps, and 8 code switches. The audio parameters are programmed with the keys, the indicator LEDs are used for status indication. The code switches fulfil the following functions:

- 1, 2: Changeover of the erase current for full-track, 2-track, and 2-track with time code, as well as delay time for sequential drop-in and drop-out.
- 3: Implementing the track and output selection individually for each audio channel or for both channels in parallel.
- 4: Spare
- 5, 6: Setting the line levels for inputs and outputs.
- 7: The same audio parameters apply to CCIR and NAB equalization if this switch is set.
- 8: Enables the input section.

The 11 keys are connected via IC3, 4 (8-INPUT MULTIPLEXER to the serial TTL bus).

Example: when the STORE button is pressed, the input D4 (IC4, PIN 5) changes to 0. In order to transmit this information to the line DT ACK2, the address bits must be A = 0, B = 0, C = 1, and READ = 0. As a result DT ACK 2 changes to 0 and IC4 is activated.

T-RW must also be set to 1 so that the microprocessor can receive this information from the PIA.

The pilot lamps are controlled via IC7, IC8 (ADDRESSABLE PERIPHERAL DRIVER). To acknowledge the STORE command, for example, T-RW must be 0 (PIA transmits data sent by the MPU); DT ACK2 must be 1 on the data input D (IC8, PIN 13). The STORE lamp is turned on with WRITE = 0 and the address bits A = 0, B = 1, C = 0. IC7, IC8 have open-collector Darlington outputs.

When WRITE = 1, the output states of IC 7, IC 8 remain latched. The pilot lamp is switched off with the address A = 0, B = 1, C = 0 and WRITE = 0, as well as DT ACK2 = 0.

The code switches are connected through IC5 (8-INPUT MULTIPLEXER WITH 3-STATE OUTPUT) to the serial TTL bus.

Example: S8 must be switched on for programming the audio parameters (S-AKBENA = 0). To enable transfer of this information to the line DT JMP, the address bits must be A = 1, B = 1, C = 1, and READ = 0, resulting in DT JMP = 0.

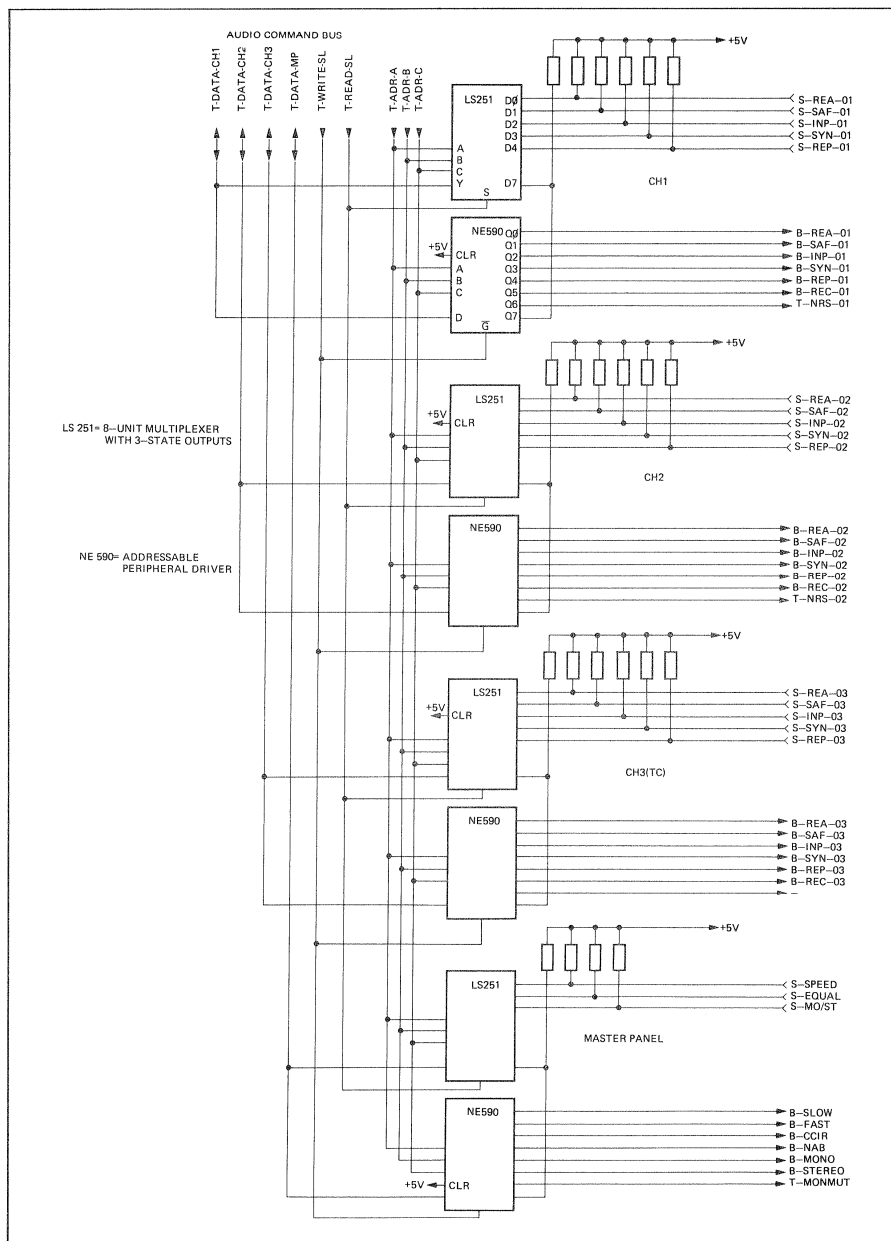
Audio command bus:

The peripheral device lines of PIA are connected through IC2 (OCTAL BUS TRANSCEIVER) to the bidirectional audio data bus. The address lines are connected through IC1 (OCTAL BUFFER/LINE DRIVER WITH 3-STATE OUTPUT) to the audio address bus.

The MPU receives the information of the track mode selectors (SAFE/READY), the SAFE/READY switch of the time code channel, the output selectors (INP, SYNC, REC), as well as the switches of the master panel through the audio command bus, the PIA, and the MPU-TTL bus.

The switches are connected through multiplexers (8-INPUT MULTIPLEXER WITH 3-STATE OUTPUT) to the corresponding bus lines.

The MPU sends the commands for the status indicator lamps through the MPU TTL bus, the PIAs, and the audio command bus to the lamp drivers (ADDRESSABLE PERIPHERAL DRIVER).





Remote interface GR 23 (1.810.738):

The interface of the parallel remote control is connected to the PIA of the periphery controller via the audio command bus. The corresponding data lines are T-DT-RP1, 2. The data line DT-SJM is connected to IC9 (8-INPUT MULTIPLEXER WITH 3-STATE OUTPUT). The inputs of IC9 are programmed by SZ1/1...8 and transmit the address (SZ1/1...6) required when several machines are operated on a serial bus; the two remaining inputs 7 and 8 determine the baud rate for the data transmission (300, 1200, or 9600). The address board is plugged in from the back of the recorder into J2 of the remote interface.

The remote control keys are connected to the data bus T-DT-RP1 via IC8 (8-INPUT MULTIPLEXER WITH 3-STATE OUTPUT). When the PLAY remote control key is pressed, for example, the input D2 changes to 0. With the address T-ADR-A, B, C, = 0 and T-READ-SL = 0, the output T-DT-RP1 changes to 1.

The feedback lamps are switched on via T-DT-RP1 and IC5 (8-BIT ADDRESSABLE LATCH). When the PLAY command is accepted, the data bit T-DT-RP1 = 1 is transmitted with the address T-ADR-A, B, C = 0, 1, 0, and T-WRITE-SL = 0. As a result the output Q2 of IC5 changes to 1 and switches on the PLAY pilot lamp via the open-collector driver IC2. The lamp remains on until the data bit T-DT-RP1 = 0 is transmitted via the PIA with the address T-ADR-A, B, C = 0, 1, 0, and T-WRITE-SL = 0.

The signals SR-VARSP (varispeed on) and SR-TRANS and SR-REM-DIS (disable remote control) are connected to the data line T-DT-RP2 via IC7 (8-INPUT MULTIPLEXER WITH 3-STATE OUTPUT).

SR-REM-DIS is not wired on the 25-pin REMOTE CONTROL connector.

The fader start circuit is connected through a rectifier bridge with D1 ... D4 to the optocoupler IC1. The output transistor of IC1 controls input D6 of IC8. The fader start circuit can be powered either externally from the mixing console or by the internal supply of the tape recorder (+24 V on connector pin 25).

### 3.5.7 COMMAND UNIT GR 21

1.810.300/1.810.303

12 (Hall) keys and display (1.810.300: 4 1/2 position LCD; 1.810.303: 5-position LED) with leading negative sign. Status indicator lamps for all keys (except RESET, TIMER and ZERO-LOC).

Twenty code switches are located on the underside of the command unit:

- Standard selection for time code (film, TV Europe, TV USA black/white, TV USA color NTSC).
- Code track audio and time code without offset (1,2" offset)
- LIFTER (momentary or flip-flop button)
- Record drop-in sequence
- Record drop-out sequence
- Tape type "A" or "B" at slow speed
- Tape type "A" or "B" at high speed
- Mono/stereo selector or tape type selector
- Tape speed selection
- Drop-in directly from PLAY with REC
- Reprogramming of LOC 2, LOC 3, LOC 4 keys.

Also refer to Section 4.2.9.

The command unit is connected to the microprocessor through the MPU bus.

The 12 keys and the 20 code switches are arranged in four groups. Each group is connected to the data bus by a buffer/driver IC2, 3, 6, 7 (OCTAL BUFFER-/LINE DRIVER WITH 3-STATE OUTPUTS).

Two 8-bit registers IC4, 5 turn on the 10 status indicator lamps (LED) through driver stages.

If signal T-CUSTR (COMMAND UNIT STrobe) = 0, the address decoder IC1 (1-OF-8 DECODER/DEMULTIPLEXER) decodes the address sent by the microprocessor through the address bus (in intervals of approx. 20 ms). Data (activated keys) can be received from the microprocessor with T-RW (PROCESSOR'S READ/WRITE) = 1, and the data output by the MPU (status indicator lamps, display) are processed with T-RW = 0.

#### Example of a command transmission:

T-RW = 1; address bits T-ADR-X, Y, Z are 1, 0, 1. T-SL5 is, therefore, 0 and enables IC2 (OCTAL BUFFER/LINE DRIVER WITH 3-STATE OUTPUTS). If the PLAY key is pressed, then T-DATA-2 = 0.

As soon as the microprocessor has accepted the PLAY command it transmits the address 1, 0, 1 and T-DATA-2 = 1; with T-RW = 0, T-SL2 becomes 0 and enables the 8-bit register IC4. The available data bit T-DATA-2 = 1 is transferred into the register with the rising edge of T-SL2. B-PLAY is switched on through the driver stage IC2. It remains on until the switch-off command (T-DATA-2 = 0, T-RW = 0, T-ADR-X, Y, Z = 1, 0, 1) arrives.

#### Tape timer display (LCD version)

The 4 1/2 position liquid crystal display with leading negative sign is controlled by the three address bits T-ADR-X, Y, Z as well as T-CUSTR and the 8 data bits. The address decoder of the command unit also requires the signal T-SL1.

The digits are selected with T-ADR-X, Y, Z; the segments with T-DATA-0, 1, 2, 3. If both T-ADR-Z and T-CUSTR are low, the available data are read in; if one of the two signals changes to high, the stored data are written on the outputs. The display decoder/driver for four digits with built-in oscillator (approx. 60 Hz) is implemented in CMOS-LSI technology and can directly select the four digits of the LC display.

The data T-DATA-4, 5, 6, 7 are read into the 4-bit D-flip-flop IC2 during the rising edge of T-SL1. They define the two colons, the leading negative sign and the digit 1 (hour).

Display example: -:43:10 (-43 minutes, 10 seconds)

DISPLAY	ADDRESS			DATA BITS							
	Z	Y	X	7	6	5	4	3	2	1	0
- : :	1	0	0	1	0	1	1	X	X	X	X
4	0	0	0	X	X	X	X	0	1	0	0
3	0	1	0	X	X	X	X	0	0	1	1
1	0	0	1	X	X	X	X	0	0	0	1
0	0	1	1	X	X	X	X	0	0	0	0

X = "dont care"

The control frequency of the LC display can be varied by changing the rating of the capacitor C1 on the DISPLAY BOARD 1.810.736 in order to optimize the contrast of the display to various viewing angles.

The rating selected for C1 has been optimized to a horizontally installed machine (perpendicular and lightly slanted viewing from the front). For other applications, the rating of C1 should be determined empirically, however 220 pF should not be exceeded.

#### Tape timer display (LED version)

(Only applicable in conjunction with the new MPU board 1.820.780).

This 5-position LED display with leading negative sign is controlled by the three address bits T-ADR-X, Y, Z as well as T-CUSTR, T-RW, T-MODESL and the data bits T-DATA-0 ... 3 and T-DATA-7.

The digits are selected with T-ADR-X, Y, Z; the segment with T-DATA-0, 1, 2, 3, and 7. The 8-position display decoder/multiplexer/driver IC1 is implemented in CMOS technology and directly controls the five 7-segment LED displays.

Display example: -43.10 (-43 minutes, 10 seconds)

DIGIT	ADDRESS Z Y X	T-MODESL	DATA BITS				
			7	3	2	1	0
-.	1 0 0	0	0	1	0	1	0
4	0 1 1	0	1	0	1	0	0
3.	0 1 0	0	0	0	0	1	1
1	0 0 1	0	1	0	0	0	1
0	0 0 0	0	1	0	0	0	0

On time code versions equipped with the new time code amplifier 1.820.721.81/82/83/84, the far right decimal point of the LED display turns on when a code signal is available at the input or is being read from tape (depending on the position of the INP/SYNC/REP selector).

### 3.5.8 SERIAL REMOTE CONTROLLER GR 20 EL 03

1.810.751

Interface for serial remote control

- Audio parameter saving on tape
- Connection to a terminal
- Expanded test system

#### Copying data on tape

The audio parameters stored in RAM can be copied for backup purposes to a tape via the 9-pin connector of the serial remote controller. Pins 4 and 6 of the 9-pin connector must be connected to the RECORD input of the tape recorder (or an external cassette recorder). Also refer to Section 4.2.7.

When the 9-pin connector is plugged into the REPRODUCE output of the tape machine (or the cassette recorder), the stored data can be read back into the RAM. Also refer to Section 4.2.8.

The transmit line T-TX of the microprocessor is connected to IC1 (QUAD LINE DRIVER with 3-STATE OUTPUTS). The output of the latter is enabled by the signal T-DRVENB = 1. The balanced output of the line driver is connected to the output terminals via an isolating transformer.

When no data are transmitted, the signal T-DRVENB is 0, and the output of IC5 has high impedance.

The receive path leads from the connector terminals via the transformer to the line receiver "A" of IC4 (Quad RS 422/423 LINE RECEIVER WITH 3-STATE OUTPUT). The output of the latter is connected to the microprocessor via the receive line T-RX. The internal hysteresis improves the signal-to-noise ratio of IC4.

#### RS 232 connector pins

The connector pins 2, 3, 7, 8, and 9 are used for connecting an external terminal equipped with an RS 232 interface. SNDATA is the transmit line. The line driver "A" of IC3 (QUAD LINE DRIVER) processes the transmit signal (T-TX) of the microprocessor. RCVDATA is the receive line. The receive signal is taken via the line driver "B" of IC4 to the receive line T-RX of the microprocessor.

DEBUG display

The LEDs of the DEBUG display indicate the status of the data bus, the address bus, and the three selector lines.

T-RW and switch 4 (WRITE/READ) decide whether the WRITE or the READ signals of the MPU bus are to be represented.

IC7 and IC8 (OCTAL D-TYPE FLIP-FLOP WITH 3-STATE OUTPUTS) control the LEDs via driver circuits. The STROBE signals of the SELECT lines together with the T-RW time the IC5 and IC7. The representation of the STROBE signals (40 ns) is delayed by IC9 (HEX INVERTER) in order to compensate the clock preparation delay (IC8).

The DEBUG display can be switched ON/OFF with switch 1.

The two pilot lamps SEND and RECEIVE indicate whether or not data are transmitted on the T-TX and T-RX lines.

3.5.9 CAPSTAN MOTOR CONTROL GR 26

PLL control loop of the second order.

A toothed ring coupled to the capstan shaft induces capacitive changes in the tachosensor (GR 26, EL 06). This variable capacitance determines the frequency of an HF oscillator with Q3. The change in capacitance causes a frequency modulation of the oscillator signal which is demodulated in IC2 (FM-IF AMPLIFIER AND DEMODULATOR). The AF voltage, the frequency of which is proportional to the capstan speed, is shaped into a square-wave signal and constitutes the actual value of the control loop.

The reference is prepared by dividing the 9.6 kHz reference frequency of the microprocessor. The reference frequency T-REFINT is divided in IC 4 (PROGRAMMABLE DIVIDE-BY-N COUNTER) TO 3200, 1600, 800 OR 400 Hz, depending on the selected tape speed (corresponds to 30, 15, 7.5, and 3.75 ips respectively). The dividing ratio is determined by the signals T-SPSL1 and T-SPSL2:

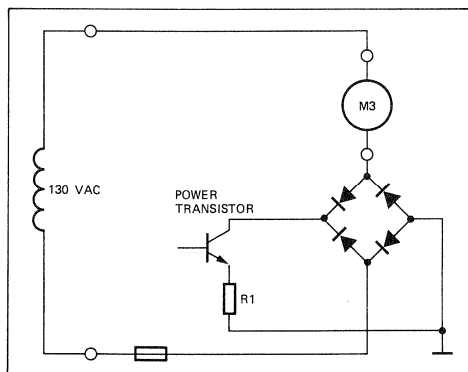
RATIO OF DIVISION	:3	:6	:12	:24
T-SPSL1	0	0	1	1
T-SPSL2	0	1	1	0

IC10 converts the TTL level to CMOS level.

The actual value and the reference value are compared in a phase comparator circuit (IC5/2, IC6, and IC7). A control signal results on the output of IC7 (PARALLEL-IN / PARALLEL-OUT SHIFT REGISTER). This signal is taken through a low-pass filter to IC1/1, an integrator, and IC1/2.

The speed signals T-SPSL1, 2 influence the control characteristic via Q4, Q5.

The output signal of IC1/2 controls the motor transistor Q1. The motor current flows from the 130 VAC (4-pole capstan) or 140 VAC (2-pole capstan) transformer winding through the capstan motor winding, the rectifier bridge DZ1, and in the form of a pulsating DC current through the motor transistor Q1. The voltage drop at R1 is an image of the motor current.



DC braking is activated when switching to a lower tape speed or if fast speed reduction is initiated by the varispeed control. The brake transistor Q2 is controlled through IC3; a pulsating DC current flows from the auxiliary phase through D3, Q2, and R19.

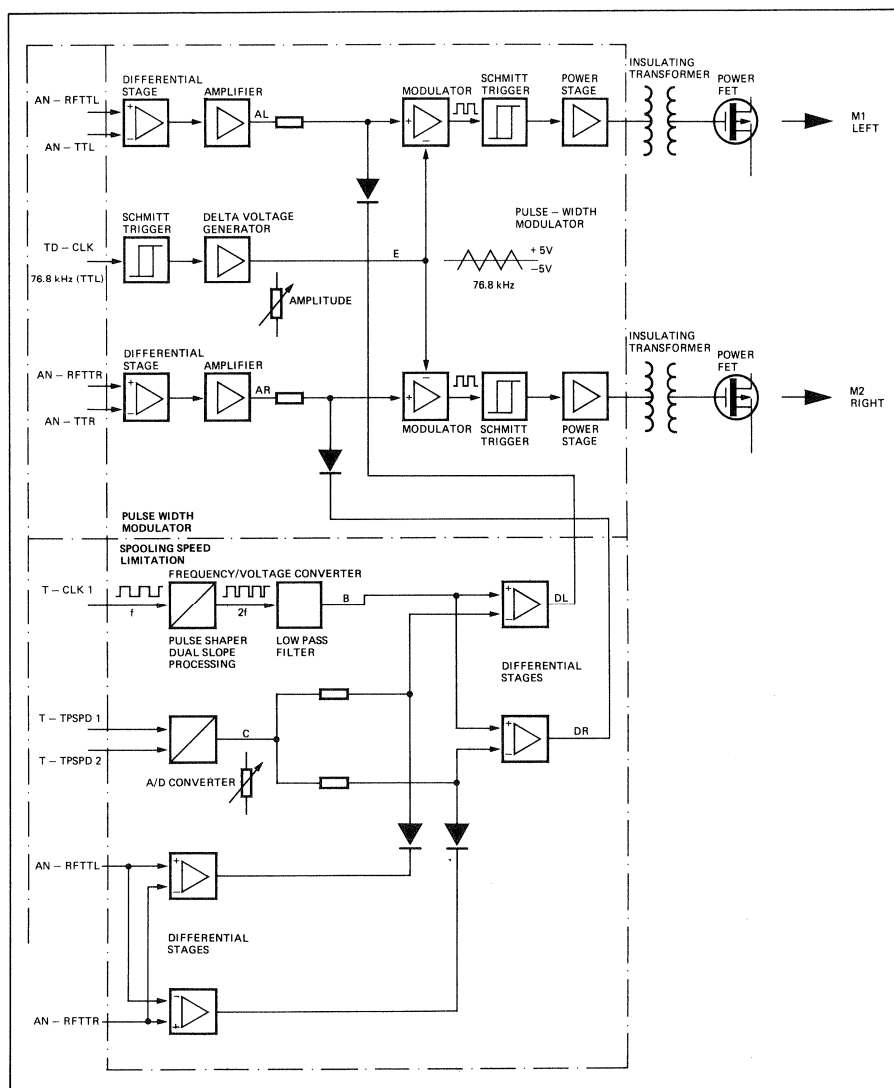
The circuit with IC12/2 (RETRIGGERABLE / RESETABLE MONOSTABLE MULTIVIBRATOR) and Q6 enables Q2 only if the speed is reduced through T-SPSL1, 2 or T-REFEXT.

Through IC12/1, the control signal on the output of IC7 controls the status indicator lamp DL1 and the signal T-SYNCAP which informs the microprocessor that the capstan lock has been achieved.

### 3.5.10 SPOOLING MOTOR CONTROL GR 24

The operating frequency of the switched spooling motor control is 76.8 kHz. This frequency is obtained by dividing the microprocessor clock frequency.

The 125 V, 50...60 Hz spooling motor voltage is switched on and off with the clock frequency. The generated motor output depends on the width of the ON pulses.



Pulse width modulator:

From the signals AN-TTL (AN-TTR) (actual tape tension) and AN-RFTTL (AN-RFTTR) (reference tape tension), a differential signal is created that is amplified in IC7/2 (IC10/2).

A Schmitt trigger (IC 2) removes noise from the TD-CLK signal (76.8 kHz) that has been derived from the microprocessor clock frequency, and the signal is subsequently taken to a triangular-wave generator (IC1, Q1, Q2, D2...D5). The triangular-wave generator converts the 76.8 kHz square-wave voltage to a delta voltage that is symmetrical relative to zero and which has the same frequency. The amplitude of this voltage can be adjusted with R65.

In the pulse width modulator IC8 (IC11), the delta signal is modulated with the differential signal (AN-RFTT - AN-TT). With the differential signal (AN-RFTT - AN-TT), control pulses are formed through an additional Schmitt trigger IC9/1 (IC12/1) and the power stage IC9/2 ... 6 (IC12/2 ... 6). These signals are of proportional duration, i.e. a large differential signal results in wide control pulses or high motor output.

The amplified differential signal (AN-RFTTL - AN-TTL or AN-RFTTR - AN-TTR) is clamped with diodes D15 and D12 or D16 to  $4.3 \text{ V} + 0.7 \text{ V} = 5 \text{ V}$ . The amplitude of the delta voltage is adjusted so that the cyclic duty factor of the control pulses does not exceed 95%.

Limiting the spooling speed:

The spooling speed can be reduced from the maximum speed (approx. 10 m/s) to 7, 4, or 1 m/s by pressing TRANS <REDUCED> and one of the spooling keys.

The spooling speed is maintained exactly at the selected value by reducing the duty factor of the control pulses (motor output!).

The speed information is supplied by the tape move sensor coupled to the right-hand guide roller. The square-wave T-CLK1 is converted by a pulse shaper with two-edge interpolation IC6/1, 2 into a pulse train of doubled frequency, i.e. a pulse of constant width is formed from each edge of T-CLK1.

A low-pass filter C7/R22/C6 converts these pulses to a DC voltage that is proportional to the tape speed (actual value). This voltage is applied to the differential stages IC3/1, 2.

The two signals T-TPSD1, T-TPSD2 determine the spooling speed. They are converted into a DC voltage (reference value of the spooling speed) by the digital/analog converter IC5. The reference value is adjustable with R66 and is taken through R14, R15 to the differential stage IC3/1, 2.

The signals AN-RFTTL, AN-RFTTR (tape tension reference value) determine through the differential stages IC4/1, IC4/2 the motor (take-up side) for which the driving must be reduced.

The output signals of the differential stages IC3/1 and IC3/2 limit the differential signals (AN-RFTTL - AN-TTL or AN-RFTTR - AN-TTR respectively) and directly influence the width of the control pulses.

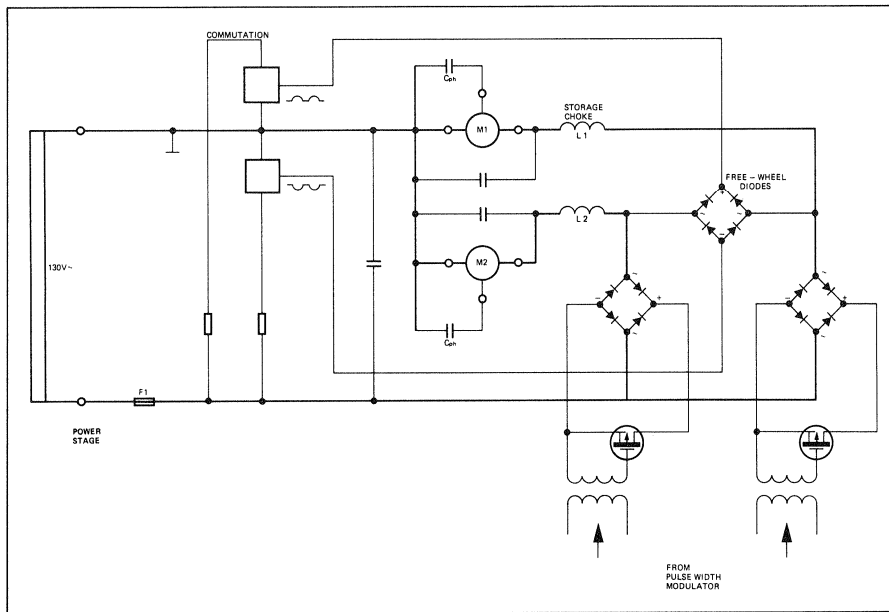
Spooling motor output stage:

The spooling motor output stage is supplied directly from the 125 VAC voltage of the power transformer. This AC voltage is taken via fuse F1 to the rectifier bridges DZ1, DZ2. The variable-width control pulses are taken via T1, T2 to the NMOS power FETs Q6, Q5.

These FETs are switched on and off with a frequency of 76.8 kHz and supply the spooling motors with a current, the mean value of which is proportional to the ON ratio (pulse width) of the FETs.

This arrangement with rectifier bridges ensures that the current switched on and off by the FETs always flows in the same direction (pulsating DC current) even though the polarity of the 125 V motor voltage changes.

The motor current flows through the storage chokes L1, L2 and the spooling motors back into the transformer winding. A magnetic field is built up in the storage chokes L1, L2 while FETs are switched on. This field is eliminated at the moment the FETs are switched off, thereby inducing in the choke a voltage of inverse polarity. This voltage causes a current to flow through the free-wheeling diodes D20 ... D23, the commutator circuit, and the motor winding. The commutator circuit with Q3, Q7 (for the negative half-wave) and Q4, Q8 (for the positive half-wave) shape this free-wheeling current so, that no dangerous voltage spikes can occur, i.e. also the free-wheeling current is a DC current that pulsates with the frequency of the line voltage.



### 3.5.11 TAPE TENSION SENSORS GR 27, GR 28

IC 1/1 and IC 1/2 together with C5, R16, and R17 constitute the oscillator that operates with a frequency of approximately 833 kHz. The oscillator signal is amplified and induces a pulsating magnetic field. Depending on the tape tension sensor, the decoupling coil L2 is attenuated more or less by the screening plate connected to the sensor arm. The bridge D1 ... D2 rectifies the output signal of L2. The signal is amplified in IC2/1 and IC2/2 and noise voltages are eliminated. The signal AN-TTL/R is adjusted with R5 to  $0 \pm 50$  mV (no deflection) and with R14 to  $+4$  V  $\pm 50$  mV ( $+30^\circ$  deflection).

### 3.5.12 TAPE MOVE SENSOR GR 28, EL 05

The 10 teeth of the serrated ring interrupt the two light barriers DLQ 1 and DLQ 2 for when the right-hand guide roller is rotating. As a result they switch Q1 and Q2 on and off. The light barriers are arranged so that the output signals (T-CLK1 and T-CLK2) are offset by  $90^\circ$ .

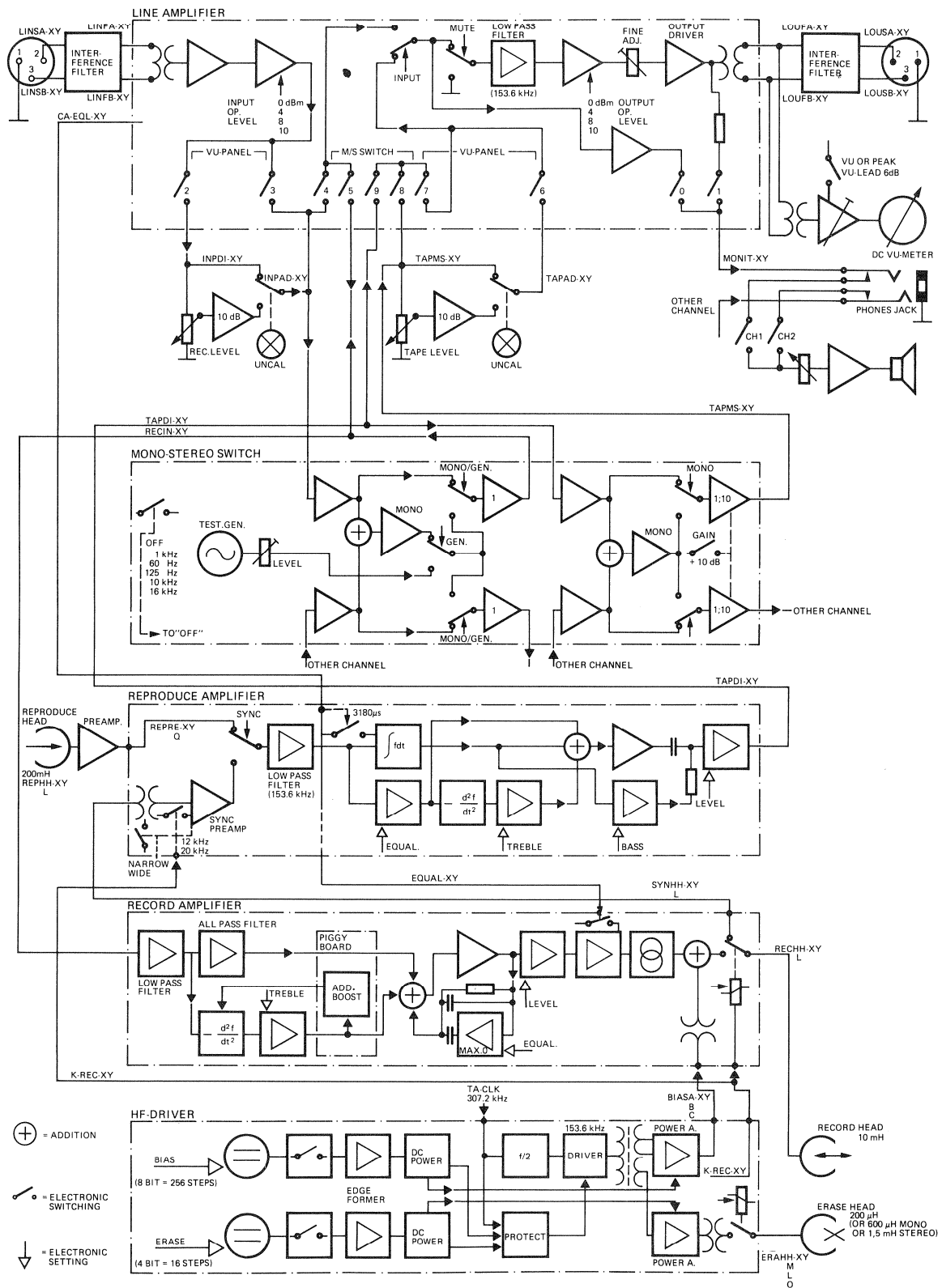
### 3.5.13 TAPE END SENSOR GR 27, EL 04, GR 28 EL 06

When the tape end sensor is in the neutral position, the light barrier (GR 27, EL 04 or GR 28, EL 06) is switched on and the output signal T-TENDL/R = 0.

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#### 4.1 CIRCUIT DESCRIPTIONS

The audio section comprises:

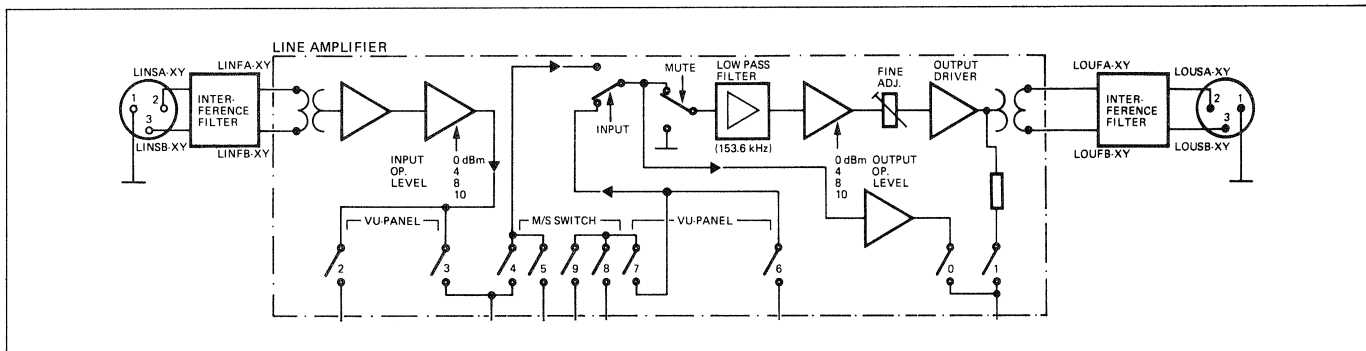
- LINE AMPLIFIER
- REPRODUCE AMPLIFIER
- MONO/STEREO SWITCH (Option)
- RECORD AMPLIFIER
- HF DRIVER
- CODE READ/WRITE UNIT and CODE DELAY UNIT (Option)

It also includes the following peripheral assemblies:

- Headblock
  - Level meters
  - Monitor amplifier
  - Record level control
  - Reproduce level control
- } depending on version

##### 4.1.1 Line amplifier GR 20 EL 11, EL 16, input and output terminals

1.820.714 (with input/output transformer)



The following settings are made by the microprocessor through an 8-way D-flip-flop (IC1):

- CA-DATA0 ... 3 switches the Line level of the input and output to 0, 4, 8, or 10 dBm.
- CA-DATA4 switchover from INP to REP/SYNC.
- CA-DATA5 muting of line output.
- CA-DATA6 switches the reproduce amplifier from REP to SYNC.
- CA-DATA7 switches NAB equalization (3180  $\mu$ s) on.

The flip-flop transfers the data available on the D-inputs to the Q-outputs with the rising edge of the clock pulse.

The input signal is taken from the input connector through a noise filter to the Line amplifier. The noise filter prevents high-frequency voltages generated by nearby transmitters from entering into the tape recorder through the connecting cable.

Noise frequencies are eliminated by a low-pass filter ahead of the input transformer.

The input amplifier with IC3/1 is followed by the trimmer potentiometer R51 with which the manufacturing tolerances of the input transformer are compensated. The gain factor of IC3/2 is switched to the desired line level by the flip-flop outputs and Q1, Q2, and Q3. Switch S1 matches the line amplifier to the corresponding recorder configuration: with or without VU-meter panel or mono/stereo switch.

IC4, IC5 and IC7 switch the line amplifier output from INP to REP/SYNC; IC2, IC6, and IC8 mute the output.

The input selector/muting switch is followed by a low-pass filter with IC10/1. This filter is adjusted with trimmer C22 to maximum attenuation of the 153.6 kHz erase frequency. The gain of IC10/2 is switched to the desired line level by the flip-flop outputs and Q6, Q7, and Q8.

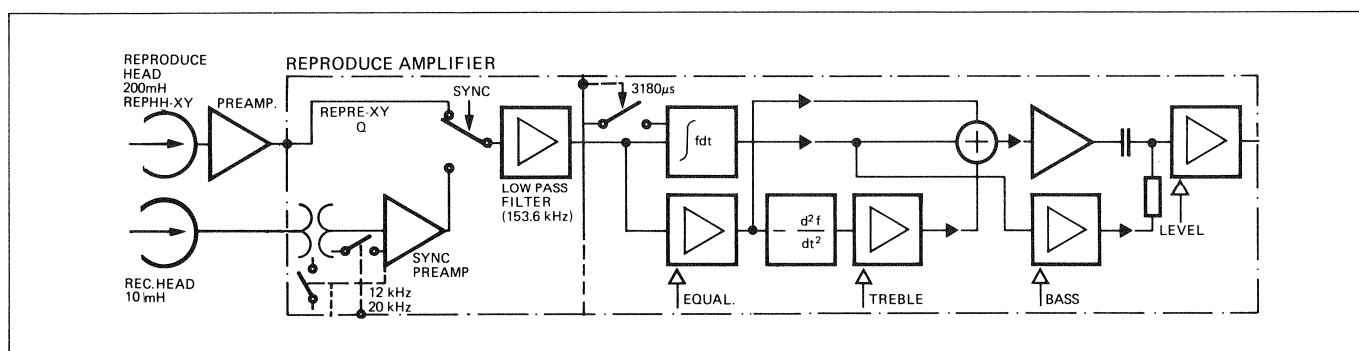
Fine-adjustment of the output level is made with R84. IC9/2 drives the complementary output transistors. The signal is taken to the output socket through a line balance transformer and an additional interface filter.

The signal for the headphones socket and the internal monitor amplifier is tapped before the transformer. The level meters are supplied by the balanced output signal.

The headphones/monitor signal can be switched to the output of IC9/1 with JS0 and JS1 of S1. In this case the monitor level is not affected by the line level adjustment and the muting of the output.

#### 4.1.2 Reproduce amplifier GR 20 EL 10, EL 15; preamplifier in headblock

##### 1.820.710



A reproduce preamplifier 1.810.710/711 (GR 32 EL 2) is located between the reproduce head and the reproduce amplifier. This preamplifier which is mounted directly on the headblock (GR 32) produces a gain of approx. 30 dB. Q1 and Q4 are low-noise transistors; IC1 is a low-noise compensated dual opamp. The preamplifier is linear up to approx. 25 kHz.

The preamplifier is only switched on when both supply voltages ( $\pm 15$  V) are present (D1, Q2). This prevents current from flowing through the head winding and hence magnetizing of the reproduce head if one of the supply voltages is missing.

Cross talk between the two channels is adjusted to the minimum with trimmer potentiometer R14.

The reproduce signal is taken through screened lines to the reproduce amplifier.

The reproduce amplifier is designed so that it can process either the reproduce signal or the sync reproduce signal. The input signal is switched over from normal reproduction to sync reproduction by the signal CA-SYN-01 (-02) through IC10 and the FET switches IC5 and IC6. The sync signal is conducted through the input transformer T1 and the sync amplifier with Q1, Q2, and IC7/2. The bandwidth of the sync amplifier can be switched over from 12 kHz to approx. 20 kHz by means of a jumper; however, strong cross talk is to be expected between the record and the sync reproduce channel on 2-channel recorders.

The reproduce signal is taken through a low-pass filter with IC14/2. This filter is adjusted with trimmer C31 to maximum attenuation of the 153.6 kHz erase frequency.

The signal CA-EQL-01 (-02) switches the 3180  $\mu$ s time constant (IC14/1) through IC9 and FET switch IC4.

A signal of the auxiliary path (inverting, two-fold differentiating circuit) is added to the signal of the main path (integrator with IC14/1) for phase-linear gap loss correction of the reproduce amplifier.

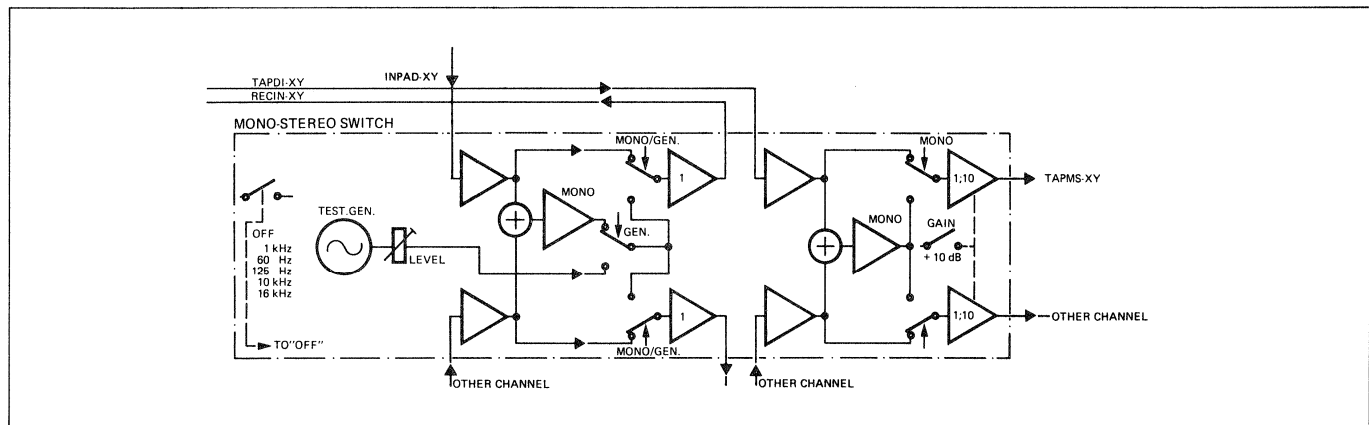
The equalization time constant is set with IC16, IC15/1; the reproduce frequency response is set with IC13, IC15/2 (treble) and IC8, IC7/1 (bass). The parameters stored in RAM are transmitted from the MPU to the corresponding 256-step attenuators.

The reproduce level (resolution 256 steps) is set with IC11, IC12/2.

IC2 (DUAL BINARY TO 1-OF-4 DECODER/DEMULTIPLEXER) decodes the address of the corresponding digital/analog converters IC8, 11, 13, or 16 from the address lines of the CMOS bus (CA-ADR-R, -S, -T, -U), and enables the D/A converters for data transmission.

#### 4.1.3 Mono/stereo switch GR 20 EL 12 (Option)

1.820.720/724



The mono/stereo switch processes the two input signals and the two reproduce signals in separate branches.

The input signals INPAD-01, 02 are taken with internal reference level 0 dBm from the outputs of the two line amplifiers to the mono/stereo switch. The signals buffered by the impedance transformer IC3/1, 3/2 are taken in stereo mode directly to IC6/1, 6/2. In mono mode they are added with resistors R42 and R37 and amplified in IC25/1. The level of the mono signal is matched by R205. Mono/stereo switching is initiated by IC19 (PROM) and comparators IC13/1, 16/2 with the aid of FET switches.

The operating mode is selected with jumper JS2: mono signal INPAD-01 + INPAD-02 or INPAD-01 only.

The signals RECIN-01, 02 which are taken with internal reference level to the record and line amplifiers are developed from the output signals of IC6/1 and IC6/2.

The reproduce signals TAPDI-01, 02 are taken from the reproduce amplifiers to the inputs of the impedance transformers IC10/1, 10/2 after which they are decoupled and added with R81 and R80 to a mono signal. The mono signal is amplified in IC31/1; the level can be adjusted with R206. FET switches are used for change-over between mono and stereo.

The operating mode is selected with jumper JS3; the mono signal can either be connected to channel 1 + 2 (TAPMS-01, 02) or to channel 1 only (TAPMS-01).

The signals TAPMS-01, 02 are taken to the output stages of the line amplifiers.

### TEST GENERATOR (1.820.724 only)

The test frequencies are generated by the function generator IC2. The balance is adjusted with R8, the sine shape with R20. The frequencies are switched over by IC20 (PROM) and Q1 ... Q5. The frequency generator is switched on by pressing the FREQUENCY button (REF status indicator lamp turns on, i.e. reference frequency, normally 1 kHz, has been selected). Each subsequent pressing of this button switches the frequency as follows:

- 60 Hz - 125 Hz - REF - 10 kHz - 16 kHz - OFF - REF - 60 Hz - etc.

The generator level (nominal level or nominal level -10 dB) can be selected with the LEVEL button. (When -10 dB is selected, the gain in the reproduce branch of the mono/stereo switch is automatically increased by 10 dB; the reference value of the VU-meter is thus again 0 dB when calibrating with tape).

The LEVEL button is only enabled after the test generator has previously been switched on with the FREQUENCY button.

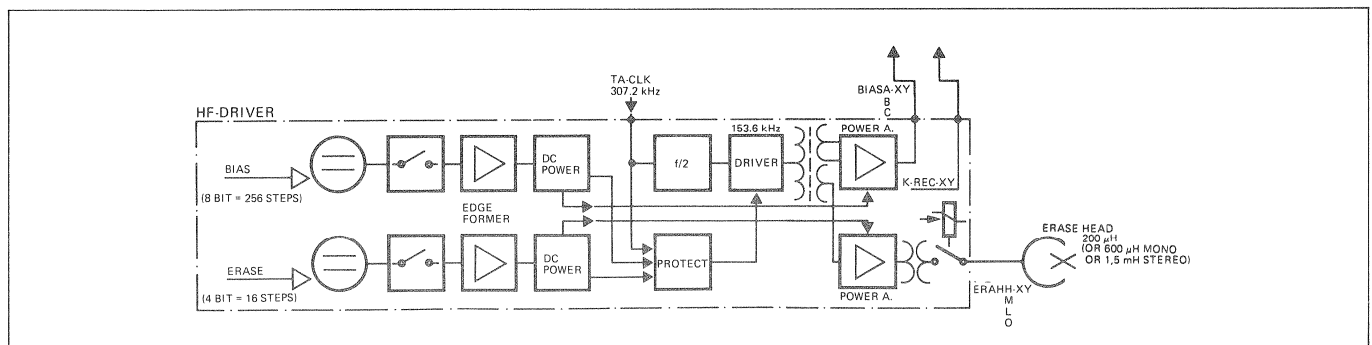
The output signal of the function generator is taken through IC31/2 and IC25/2 to the mono branch. The output signals of IC7/1, 23/2 determine whether the input signals (INPAD-01, 02) or the test signal is input to the record amplifiers (RECIN-01, 02). FET switches are used for change-over.

The generator level is set with R208.

The operating instructions for the test generator can be found in Section 2.5.19.

#### 4.1.4 HF driver GR 20 EL 08, EL 13

1.820.713



The erase and the bias current are prepared on the HF driver.

The microprocessor quartz reference TA-CLK with 307.2 kHz is divided in IC3 (DUAL JK NEGATIVE EDGE-TRIGGERED FLIP-FLOP) to 153.6 kHz. The outputs of the IC are connected to the HF driver IC11.

The erase and bias output stages are controlled by the windings of transformer T2.

The DC supply voltage for the erase current is defined with IC1 (OCTAL D-TYPE FLIP-FLOP) and IC6/2 (in 16 steps; data lines CA-DATA-0 ... 3). The DC supply voltage for the bias current is defined by the 256-step attenuator IC2 according to the parameters stored in RAM.

IC1 also decodes the commands for switching on the erase and the bias current. CA-SAFE = 0 enables IC1.

The DC voltage level defined by the microprocessor are switched on or off by Q1 (erase current). IC9/1 or IC10/1 respectively shape the on or off edge in such a way that clickfree "soft" drop-in and drop-out is achieved. IC9, Q13, and IC10, Q12 supply the DC currents for the corresponding power output stages. These DC currents are proportional to the required output currents. Q11 or Q10 respectively monitor these currents and switch the HF driver IC11 off through D12 and comparator IC8/1 if an overload occurs.

The clock signal (IC3, pin 9) is monitored ; if it is missing or corrupted, the HF driver is also switched off by IC8/1.

The stand-by signal TA-ACT-01 (-02) is connected through by IC8/2 in order to signal to the microprocessor the operating status of channel 1 or 2. TA-ACT checks that the record amplifier is inserted in the recorder.

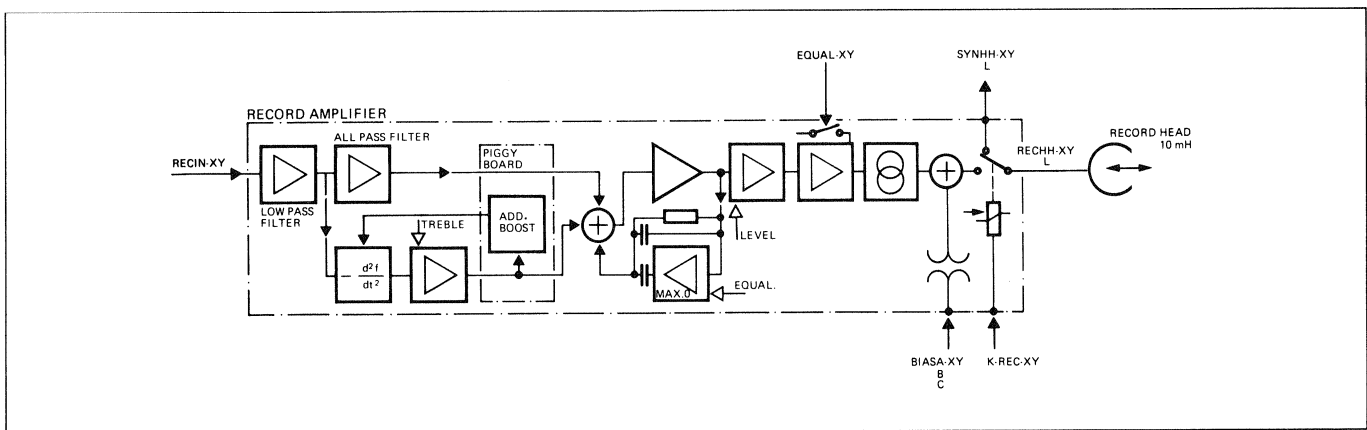
The erase current is amplified by Q5 and Q8 and conducted through T1 to the output.

IC7, IC4, and relay K1 switch the erase current on or off.

The bias current is amplified by Q3 and Q4 and taken to the output.

#### 4.1.5 Record amplifier GR 20 EL 09, EL 14

1.820.712



The audio signal RECIN-01 (-02) arriving from the line amplifier is conducted through a low-pass filter with IC7/1. The low-pass filter is designed for maximum attenuation of the 153.6 kHz erase frequency.

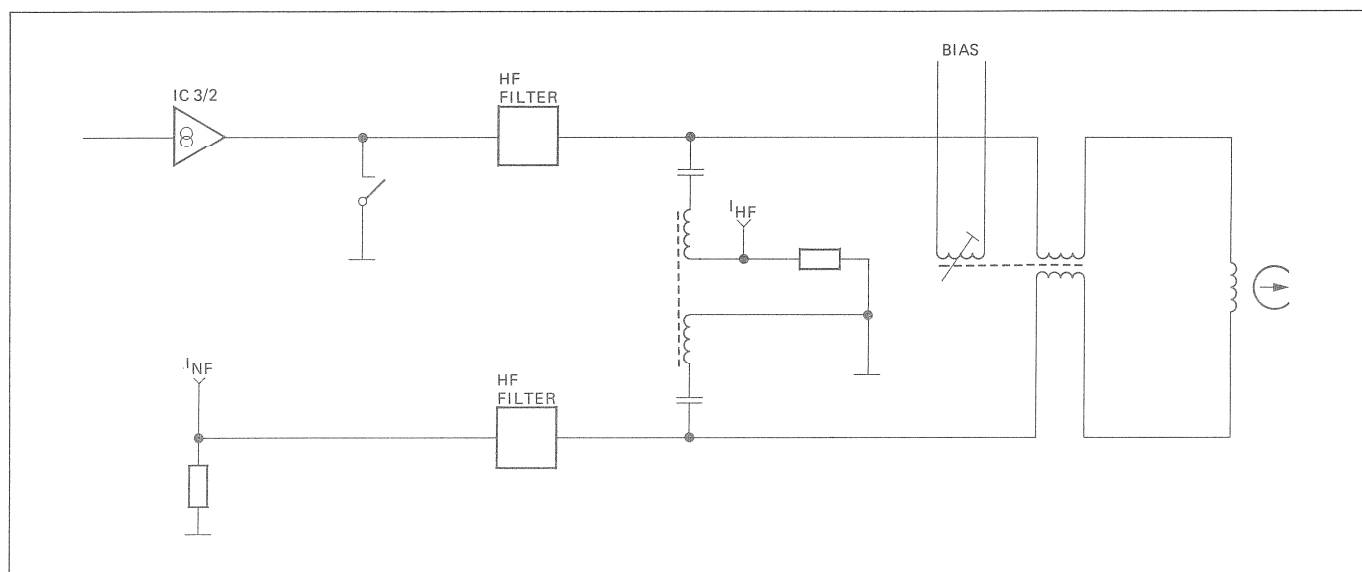
The treble losses caused by the air gap in the record head are compensated by a phase-linear correction section. The inverting, two-fold differentiating circuit (IC10) is followed by the final control element for the treble setting IC8, IC9/1 (record frequency response). A portion of the audio signal is mixed as a positive feedback through the plug-in ADAPTATION BOARD into the input of IC10/2 in order to improve the sharpness of the treble correction. The added components of the corrected recording signal are amplified by IC9/2.

The equalization time constant is set by IC5, IC6/1, the recorder Level with IC3, IC6/2. The audio parameters stored in RAM are transmitted by the MPU to the corresponding 256-step attenuators.

The 3180  $\mu$ s time constant is set by the FET switch IC2 with EQUAL-01 (-02).

The record signal is taken to the opamp IC4/2 which functions as a current source.

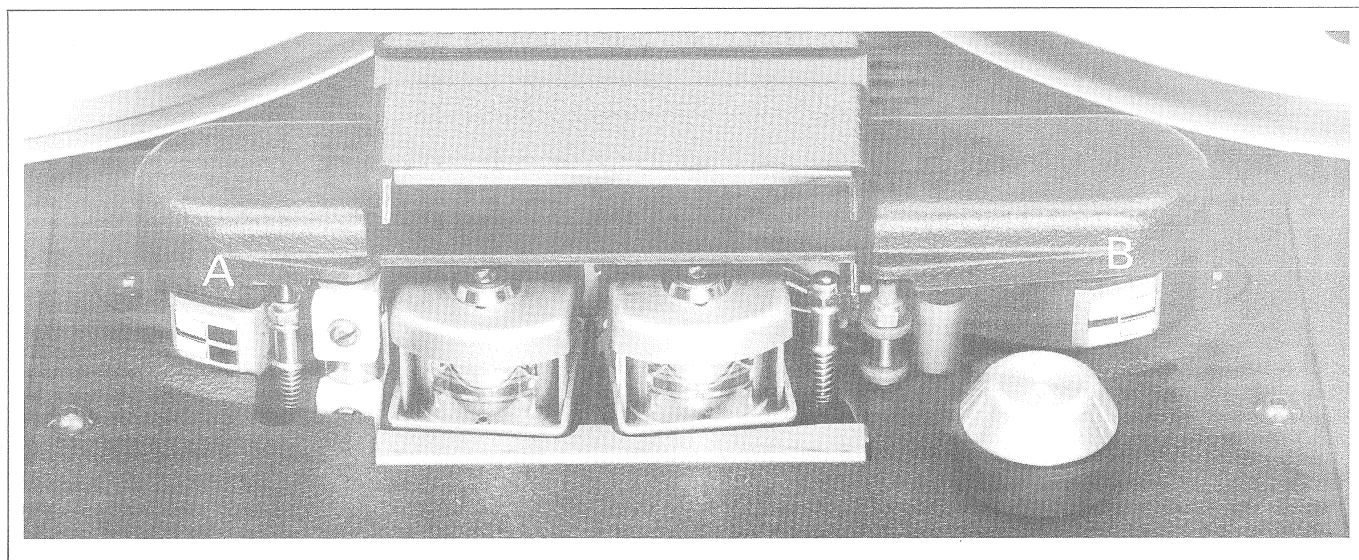
The signal AFCSW-01 (-02) (AUDIO FREQUENCY CURRENT SWITCH) connects the record current through Q1. The record and bias current are added through T1. The two RF filters with L3 and L4 prevent strew-in of the bias frequency into the other circuit components. The bias current is drained through the series-resonant circuit with L2; a closed bias circuit is thus formed by the two windings of T1 and the winding of the record head.



#### 4.1.6 Time code channel

##### General

Two-channel recorders can be equipped with the time code option. The 0.38 mm wide code track is arranged between the two audio tracks. The time code signal (80 bits according to SMPTE) is recorded through biphase modulation with bias. The tape flux is 729 nWb/m peak-to-peak  $\pm 3$  dB.



A reproduce (read) head is integrated in the audio erase head {A}. This head "reads" during audio reproduction/recording and slow forward editing. A second time code head is arranged on the far right side of the headblock {B} and is a combined erase/reproduce/record head (read/write head). This head "reads" during spooling and slow reverse editing and is responsible for recording the time code signals.

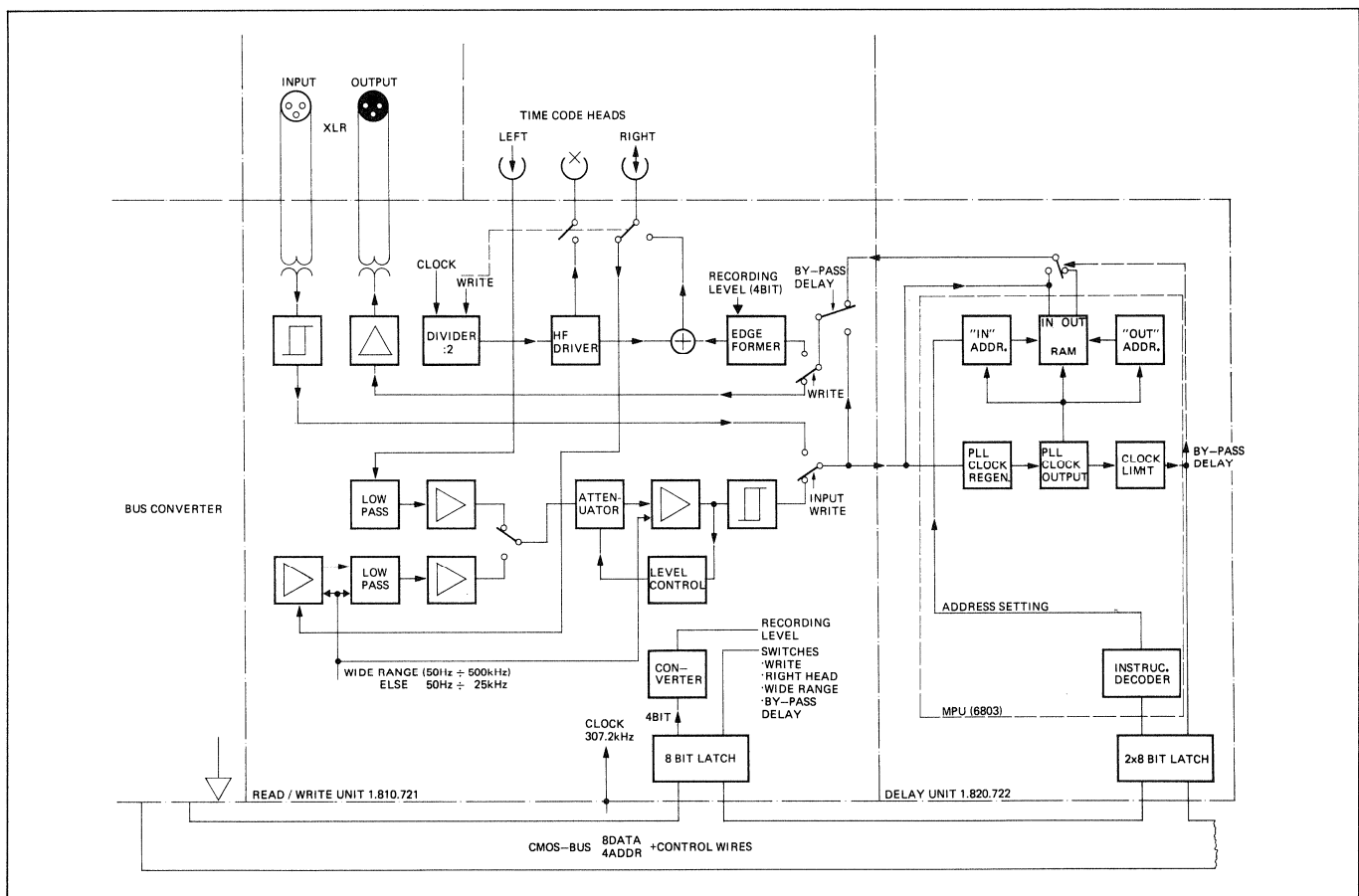


**CODE READ/WRITE UNIT GR 20 EL 06**  
**1.820.721.81/82/83/84**

**Time code reproduction:**

The signal REPHH-TC, REPHL-TC of the left-hand code head (active during audio reproduction or recording) is input to a low-pass filter/amplifier IC15/1. The low-pass filter suppresses the 153.6 kHz erase frequency (cross-talk between audio erase frequency and time code reproduction). The signal RECHH-TC, RECHL-TC of the right-hand code head is taken to a low-pass filter/amplifier IC12, IC16. The bandwidth of the filter is automatically switched over with Q7. The bandwidth is wide for spooling and narrow for slow reverse editing.

The outputs of the two filter/amplifiers (signal of the left-hand or right-hand code head) are connected by FET switches Q10, Q11 to the limiter (IC13, changeover switch IC4/2, IC11, IC14, Q9). Even at variable reading speeds (spooling) this limiter supplies a constant-level output signal that is converted to a square-wave signal in a Schmitt trigger (IC6/1, IC10, IC7). Either directly or via the CODE DELAY UNIT (jumper JS2 or changeover switch IC4/1), the time code reproduce signal is taken to the line output amplifier IC2, the line balance transformer T2, and as the signal LOUFA-TC, LOUFB-TC to the balanced and floating output connector.



**Time code recording:**

The recording signal LINFA-TC, LINFB-TC is taken via the balanced and floating input connector, the input transformer T1 and the changeover switch IC4/2 to a Schmitt trigger (IC6/1, IC10, IC7) and via the CODE DELAY UNIT.

The output signal of the CODE DELAY UNIT is connected with changeover switch IC4/3 to the input of the record amplifier. The edges are shaped with Q5, IC9 in such a way that a trapezoidal recording signal is obtained.

The TA-CLK signal from the MPU is divided in IC8 from 307.2 kHz to 153.6 kHz and converted to an erase and a bias current signal in the RF amplifier IC5. The erase current is decoupled via T3 and taken as the signal ERAHH-TC, ERAHL-TC via screened lines to the erase head. The bias current from the secondary winding of T3 is added to the trapezoidal recording signal via the trimmer capacitor C9. The changeover relay K1 determines, whether the combination head is to function as a reproduce or record head. The output signal RECHH-TC, RECHL-TC is taken via screened lines to the combination head.

The following settings are made by the MPU via the CMOS bus (via 8-way flip-flop IC1, address decoder IC3):

- Recording level (4 bits, of which three are used), adjustable with R2 (7.5 ips), R8 (15 ips), and R10 (30 ips)
- Recording (CA-WRTTC = 1)
- Slow reverse editing, right-hand code head, narrow-band (CA-RS2TC = 1)
- Spooling, right-hand code head, wide-band (CA-RS1TC = 1)
- Bypassing the DELAY UNIT (CA-BPDTTC = 1)
- INPUT, input signal to output (CA-RS1TC = CA-RS2TC = CA-BPDTTC = 1)

For bias and level adjustment refer to Section 4.2.6.

#### CODE DELAY UNIT GR 20 EL 07

1.820.722

The CODE DELAY UNIT delays the time code signal in such a way that the audio and the time code signals on the tape coincide, i.e. the head spacing is automatically compensated.

A second microprocessor (IC2) (6803) performs this function.

A PLL (PHASE LOCKED LOOP) with clock regeneration is implemented by software.

The external memory of the microprocessor comprises 2K PROM (IC18) and 8K RAM (IC14). 8192 half-bits = 51 frames can be stored in the RAM.

Data from the MPU (1.810.752 or 1.820.780 respectively) are transmitted through the TTL bus, the bus converter, and the CMOS bus to two 8-bit latches IC8, IC9 of the DELAY UNIT and specify:

- Required delay
- Direction of tape travel
- Bypass command

Delay accuracy:  $\pm 1/4$  bit.

## 4.2 CALIBRATION

The audio parameters are copied from RAM and loaded into the registers of the audio amplifiers each time the recorder is switched on, after a microprocessor reset, or when changing the tape speed, the tape type, or the equalization.

When new parameters are entered through the keyboard or through the serial interface, the old parameters stored in the RAM and in the registers of the audio amplifiers are overwritten with the new data.

If the parameters in the RAM are destroyed, the standard parameters are automatically loaded from the PROM. Also refer to Section 2.7.

### 4.2.1 Introduction

#### 4.2.1.1 General

On recorders equipped with a tape marker, remove the latter (plug-in unit!) before opening the panel flap.

It is assumed that the all mechanical adjustments of the recorder to be calibrated are correct (especially with respect to tape tension and tape guidance).

The soundheads and the tape guidance elements should be cleaned and demagnetized before the recorder is calibrated.

The calibrating steps should always be performed in the following order:

##### REPRODUCTION:

Tape speed FAST

- Level
- Azimuth alignment of the reproduce head\*
- Frequency response

Tape speed SLOW

- Level
- Azimuth alignment of the reproduce head\*
- Frequency response

\* Minor deviations between the various speeds can occur, depending on the type of calibration tape used. Should this be the case, align the azimuth to the preferred studio speed.

##### RECORDING:

Tape speed 7.5 or 15 ips (or preferred studio speed)

- Record level preadjustment
- Azimuth alignment of the record head
- Bias
- Record level
- Frequency response

Tape speed 3.75 or 30 ips (or 2nd speed)

- Record level preadjustment
- Bias
- Record level
- Frequency response

##### SYNC REPRODUCTION

The following adjustments can be made for the three tape speeds 7.5 ips, 15 ips, and 30 ips:

- Level
- Frequency response

Sync operation is not calibrated for the tape speed 3.75 ips. (all parameters at 00).

#### 4.2.1.2 Level

Applies to VU-meter lead of 6 dB!

$$0 \text{ dBm} = 0.775 \text{ V}$$

OPERATING LEVEL dBm		PEAK RECORDING LEVEL dBm
0	=	6
4	=	10
8	=	14
10	=	16

#### 4.2.1.3 Equalizations

Equalization networks have been built into the reproduce paths for correcting the frequency response.

The attack points are referred to as transition frequencies and transition time constants ( $1/2\pi f$ ) and have been standardized by various organizations (IEC, NAB, AES, CCIR).

TAPE SPEED	TRANSITION FREQUENCIES, LOW; HIGH (TRANSITION TIME CONSTANTS)		
	IEC-1968	NAB-1965	NAB-1975
3.75 ips 9.53 cm/s	50 Hz; 1800 Hz (3180 $\mu$ s; 90 $\mu$ s)	50 Hz; 1800 Hz (3180 $\mu$ s; 90 $\mu$ s)	— (—)
7.5 ips 19.05 cm/s	0 Hz; 2240 Hz ( $\infty$ ; 70 $\mu$ s)	50 Hz; 3150 Hz (3180 $\mu$ s; 50 $\mu$ s)	0 Hz; 3150 Hz ( $\infty$ ; 50 $\mu$ s)
15.0 ips 38.10 cm/s	0 Hz; 4500 Hz ( $\infty$ ; 35 $\mu$ s)	50 Hz; 3150 Hz (3180 $\mu$ s; 50 $\mu$ s)	— (—)
30.0 ips 76.2 cm/s	0 Hz; 9000 Hz ( $\infty$ ; 17.5 $\mu$ s)	AES-1971 0 Hz; 9000 Hz ( $\infty$ ; 17.5 $\mu$ s)	— (—)

#### 4.2.1.4 Magnetic reference flux

A tape recorded with reference level should produce operating level on the output in play mode.

The following standard settings are made at the factory:

NAB OPERATING LEVEL (0 VU) nWb/m	CCIR PEAK RECORDING LEVEL (+6 VU) nWb/m
250 (200 @ 7.5, 3.75 ips)	510 (400 @ 3.75 ips)

#### 4.2.1.5 Calibration tapes

Calibration tapes are used for aligning the reproduce path of tape recorders. Such tapes are magnetized across their full width. A separate tape is used for each speed.

##### CAUTION

To prevent unintentional erasure of valuable tapes, all channels should be switched to SAFE while adjustments are being made! On recorders without SAFE button, set the two channel switches JS01 and JO2 of the PERIPHERY CONTROLLER to 0. (Also refer to Section 4.2.9.2).

Calibration tapes are divided into the following test sections:

##### Reference level test section:

(Reference flux = 320 nWb/m for 7.5, 15, and 30 ips, 257 nWb/m for 3.75 ips) should produce operating level on the output in play mode. The output level is adjusted to the required operating level during the reproduction of this test section that has a length of approx. 60 to 180 s. NAB calibration tapes with a reference flux of 200 nWb/m should yield an output level of -4 VU (reference level -10 dB).

Reference frequencies: 333 Hz or 500 Hz at 3.75 ips, 1 kHz at 7.5 ips through 30 ips (there are also NAB calibration tapes with a reference frequency of 700 Hz).

##### Azimuth alignment test section:

For adjusting the vertical alignment of the reproduce head gap. This test section is divided into a short segment containing the reference frequency (for coarse adjustment) and a long segment with 10 kHz for fine-adjustment. NAB calibration tapes may be formatted differently. The level of this section is normally 10 dB below the operating level.

The head is aligned to maximum output voltage with the azimuth adjustment screw.

Important: If significant changes in the reproduce head azimuth are made, other voltage maxima with lower levels occur!

With correct equalization of the reproduce amplifier, the reproduce level is identical for recordings with reference frequency and with 10 (8; 16) kHz.

##### Frequency response test section:

For determining and adjusting the reproduce response at specific frequencies. NAB calibration tapes exist that contain frequencies other than those listed in the following table.

REFERENCE TAPE	CCIR				NAB			
TAPE SPEED cm/s; ips	9.5	19	38	76	3.75	7.5	15	30 (AES)
REFERENCE LEVEL SECTION: REF. FREQUENCY REF. FLUX nWb/m	333 Hz 257	1 kHz 320			500 Hz 200	1 kHz (700 Hz) 200		
AZIMUTH ALIGNMENT SECTION: (-10 dB)	333 Hz 10 kHz	1 kHz 10 kHz			250 Hz 4 kHz 8 kHz	500 Hz (700 Hz) 8 kHz 16 kHz		
FREQUENCY RES- PONSE SECTION: (CCIR: -20 dB) (NAB: -10 dB)	333 Hz 31.5 40 63 125 250 500 1 kHz 2 4 6.3 8 10 12.5 14 16 333 Hz	1 kHz 31.5 Hz 40 63 125 250 500 1 kHz 2 4 6.3 8 10 12.5 14 16 18 1 kHz			31.5 Hz 63 125 250 500 1 kHz 2 4 5 6.3 8 10 500 Hz	31.5 Hz 63 125 250 500 1 kHz 2 4 8 10 12.5 16 20 1 kHz		

#### 4.2.1.6 Preparatory steps

Set all code switches of the PERIPHERY CONTROLLER to the correct setting (refer to Section 4.2.9.2!) before starting with the calibration.

##### Line level:

Adjust required level:

OPERATING LEVEL	PEAK RECORDING LEVEL	JS 5	JS 6
0 dBm	6 dBm	0	0
4 dBm	10 dBm	1	0
8 dBm	14 dBm	0	1
10 dBm	16 dBm	1	1

If a different value is desired:

Select next value and calibrate the Line level with the level adjustments outlined below.

##### Checking the output level and the VU-meter:

Connect AF generator to the line input of channel 1 and feed in 1 kHz with operating level.

Connect AF millivoltmeter to line output channel 1 and load the output with 600  $\Omega$  (standard) or 200  $\Omega$  (minimum).

Switch recorder on and press the INP button of channel 1 and 2. Release all UNCAL buttons (calibrated level).

Adjust output level to operating level with the line amplifier trimmer accessible from the front.

Checking the VU-meter indication:

- VU indication: Operating level should result in a reading of 0 VU.
- PPM indication: Operating level should result in a reading of -6 (0 for reference level).

Correct the VU-meter reading with the trimmer potentiometer located on the back of the VU-meter amplifier.

On stereo recorders repeat the check for channel 2 in the same sequence.

#### Equalization:

Select the required equalization on the master panel (CCIR or NAB).

If the same calibration data (level, frequency response, bias) are desired for both types of equalization, proceed as follows:

- Select preferred equalization (master panel).
- Adjust and check all audio parameters according to the instructions.
- Set code switch 7: JS 7 = 1.
- Read out and reload all previously entered parameters. The same parameters are now stored for both equalizations.

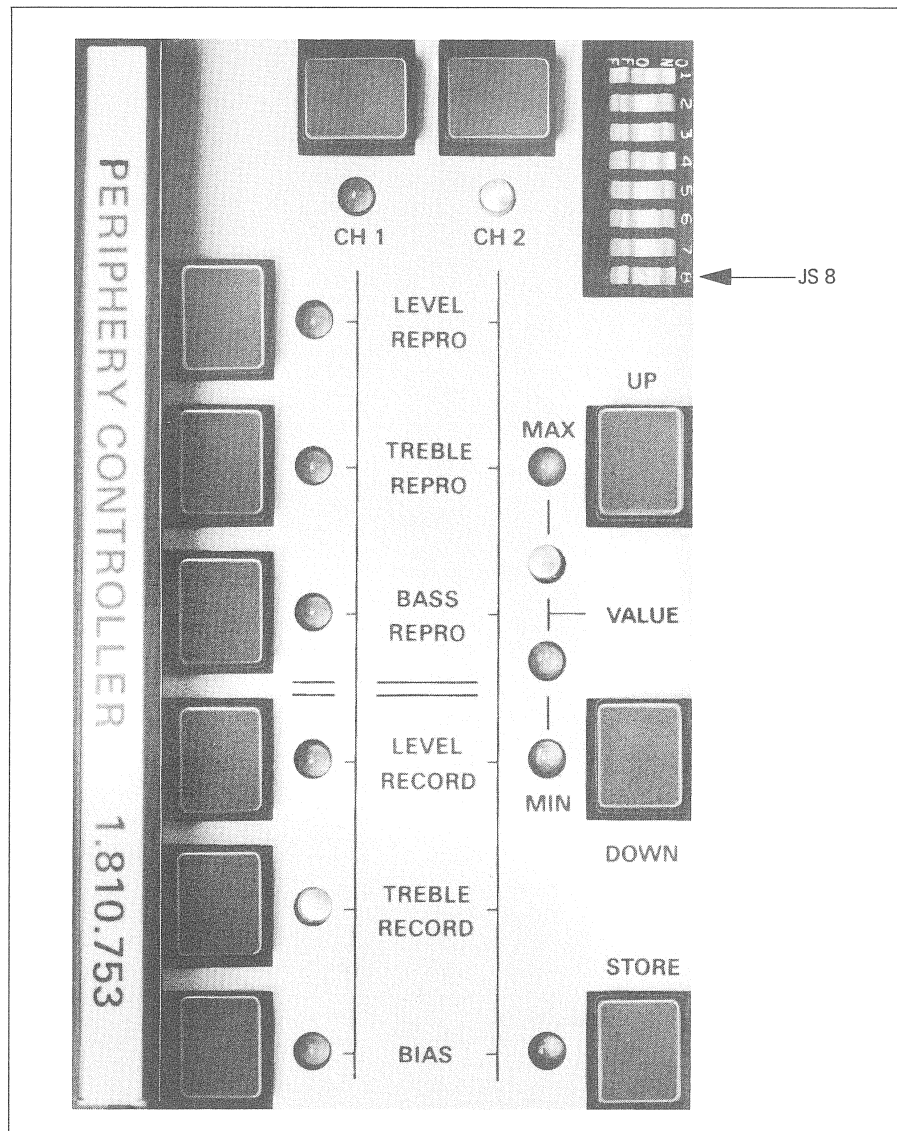
The equalization time constants can be changed selectively for special situations. In this case it is essential to set the code switch 7 to the off position (JS 7 = 0)!

#### Tape type

Set tape type selector to the desired position or program it according to 4.2.9.1.

NOTE: Repeat the reproduce and record adjustments step-by-step for the second tape formulation.

## 4.2.1.7 Input keyboard



Set code switch 8 on: JS 8 = 1.

If, for example, the reproduce level of channel 1 is to be adjusted, it is necessary to first press CH1 and then LEVEL REPRO. The corresponding pilot lamps turn on and the tape timer display indicates e.g. AA 83 (LCD version) or AAA83 (LED version).

- AA(A) for audio alignment
- 83 specifies in hexadecimal format the number of steps from the completely closed reproduce level controller (131 decimal).

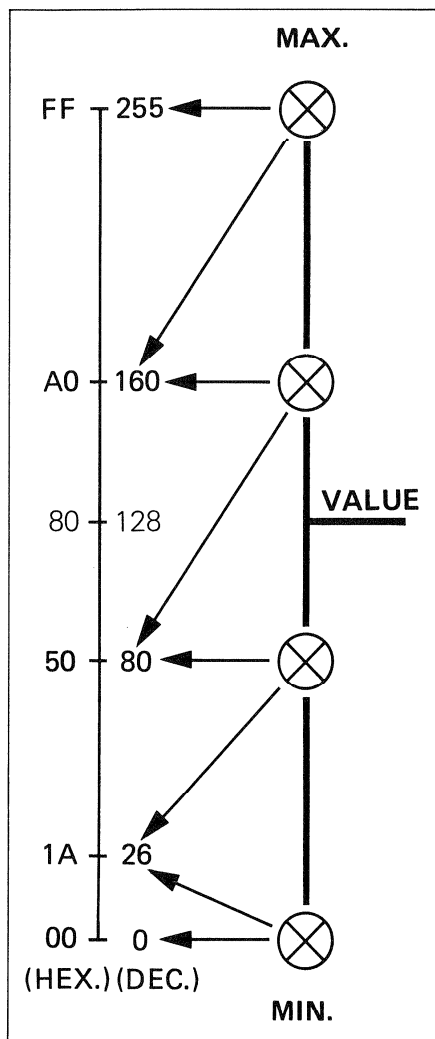
#### Readout of programmed value

The gain range of the various amplifiers can be adjusted in 255 steps between 0 and the maximum (corresponds to 256 discrete values). Compared with a potentiometer, these 256 values correspond to the range between the cw and ccw stops.

The programmed value is indicated on the tape timer display. To conserve space it is displayed in hexadecimal format (00 for 0 and FF for 255).

A coarse reading can be obtained from the 4 indicator lamps (VALUE) on the input section.





When the maximum value FF (255) is reached, the MAX lamp flashes, when 00 is reached, the MIN lamp flashes.

Examples of hexadecimal numbers:

DECIMAL	:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
HEXADECIMAL	:	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

HEXADECIMAL	DECIMAL	% of FF (or 255, resp.)
1A	26	10
33	51	20
4D	77	30
66	102	40
80	128	50
99	153	60
B3	179	70
CC	204	80
E6	230	90

#### IMPORTANT

The hexadecimal values displayed should indicate to the user the range in which the corresponding amplifier is operating. No voltages can be derived from these numbers!

Modifying the parameters

Each time the UP key is pressed, the gain increases by 1/256th. It is decreased by 1/256th by pressing the DOWN key.

The UP or DOWN keys have the same effect as turning a potentiometer clockwise or counterclockwise.

If the UP or DOWN key are pressed continuously, the gain is varied in consecutive steps.

Example:

Push	Display
	AA(A)3C
UP	AA(A)3D
UP	AA(A)3E
UP	AA(A)3F
UP	AA(A)40
UP	AA(A)41
DOWN	AA(A)40
DOWN	AA(A)3F

In contrast to the adjustment with potentiometers, the original value stored in RAM can be reproduced exactly at any time by simply pressing the corresponding parameter key (e.g. LEVEL REPRO).

Storing the parameters

When the desired value has been reached (e.g. operating level 10 dBm = 2.5 V) it can be stored in RAM.

Press STORE key: the STORE indicator lamp turns on briefly to acknowledge that the parameter has been stored.

The hexadecimal values representing the amplifier setting can be entered on a log for comparison purposes.

Example:

A810 No.: 5 EQUALIZATION: NAB		TAPE SPEED				REMARKS
		15. ips		7.5 ips		
		CH1	CH2	CH1	CH2	
REPRO	LEVEL	7E	70	80	7A	1) 6.3 kHz : - 1 dB 2) 125 Hz : + 1 dB
	TREBLE	A1 1)	9C	9F	9D	
	BASS	85	77 2)	79	7D	
	EQUAL.	44	44	87	87	
RECORD	LEVEL	8E	8C	90	7F	
	TREBLE	83	79	7A	7E	
	BASS	88	90	80	8B	
	EQUAL.	BA	BA	82	82	
SYNC	LEVEL	73	75	84	8A	
	TREBLE	A0	98	9C	9F	
	BASS	6B	6A	59	61	
	EQUAL.	44	44	87	87	

ERROR MESSAGE EE02 (LCD) or EEE02 (LED)

If the error message EE(E)02 appears during calibration, an error has probably occurred in the RAM or in its supply.

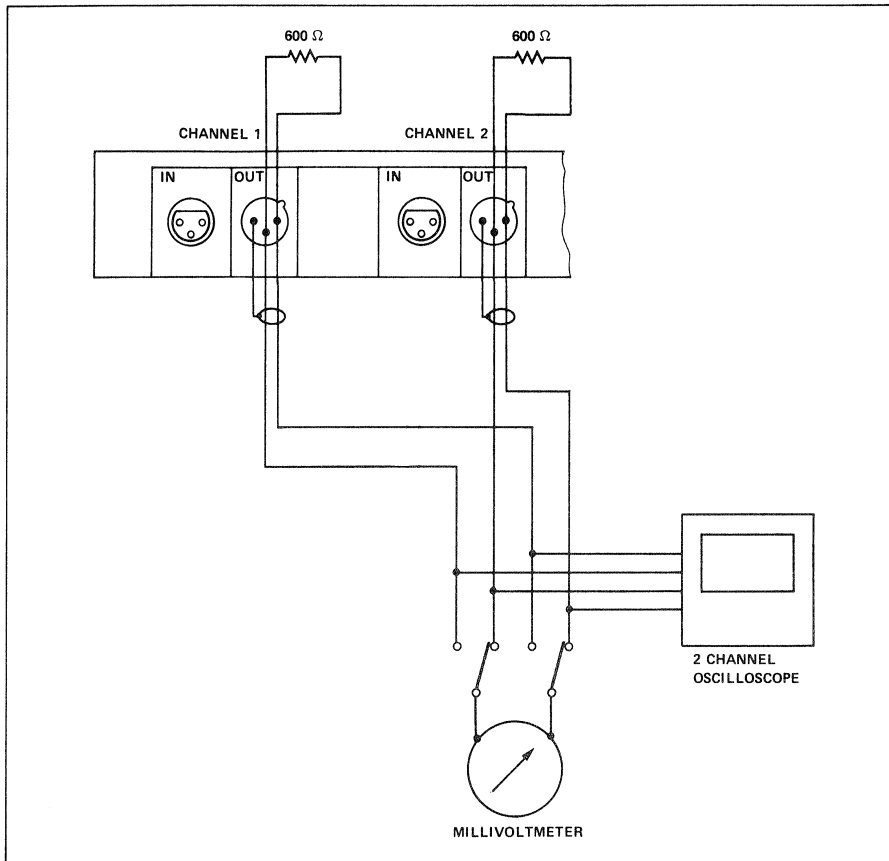
When the machine is switched off and on the next time, the parameters stored in PROM are automatically read.

"Degraded operation" is possible (refer to Section 2.7).

The recorder should be checked out by the nearest service agency as soon as possible.

#### 4.2.2 Reproduce adjustments

##### 4.2.2.1 Preparatory steps



Connect AF millivoltmeter to line output channel 1. Load the line outputs for all measurements with 600 Ω (or 200 Ω, resp.).  
Switch recorder on.  
Select high tape speed.  
Press SAFE and REP buttons of channels 1 and 2. Release all UNCAL buttons (calibrated level).  
Mount calibration tape of the corresponding equalization and speed, and spool forward to the "REFERENCE LEVEL" section.

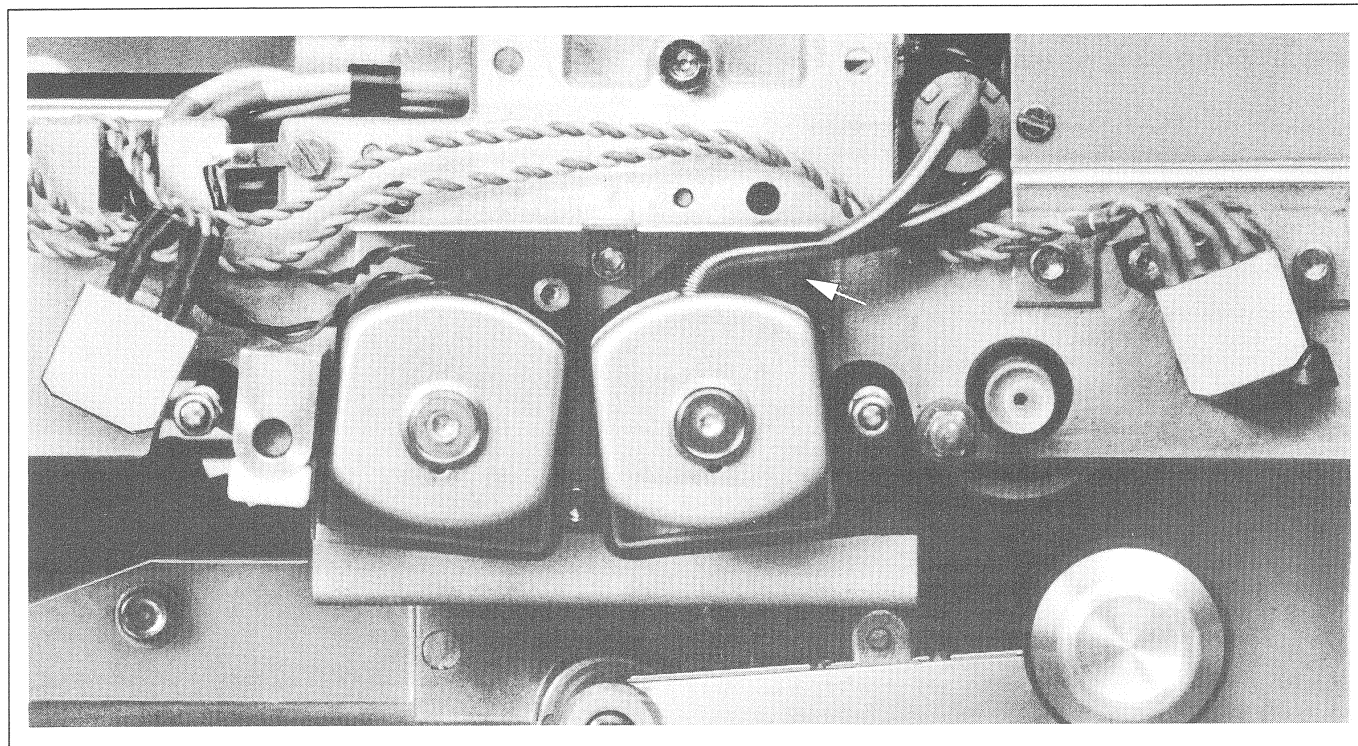
##### 4.2.2.2 Reproduce level adjustment

Press CH 1 and LEVEL REPRO on the input keyboard.  
Start recorder in play mode.  
Read out reproduce level and adjust it to the desired line level by pressing the UP or DOWN key.  
Press STORE.

On stereo recorders, connect the millivoltmeter to line output channel 2. Press CH2 and LEVEL REPRO. Adjust to the desired line level by pressing UP or DOWN.  
Press STORE.

#### 4.2.2.3 Azimuth alignment of the reproduce head

Spool calibration tape forward to the "AZIMUTH ALIGNMENT" section. The level of this section is approx. 10 dB below that of the reference level section. Connect millivoltmeter to line output channel 1. Start recorder in play mode.



The coarse adjustment is made during the reproduction of the reference frequency. The fine adjustment is made during the reproduction with 10 kHz (8 or 16 kHz). The alignment of the reproduce head is varied with the azimuth adjustment screw until the maximum output voltage and simultaneously the lowest level fluctuations are attained.

Stereo recorders are subsequently adjusted for minimum phase difference of the output signal, between channel 1 and 2 with the aid of an oscilloscope and by further correction with the azimuth adjustment screw of the reproduce head.

**Important:**

Always adjust to maximum level first and then to minimum phase difference!

**Checking the level:**

Rewind calibration tape to "REFERENCE LEVEL" section and start recorder in play mode. Check level of channels 1 and 2 and correct if necessary:

- CH1 (CH2), LEVEL REPRO
- UP or DOWN
- STORE.

#### 4.2.2.4 Frequency response adjustment

Spool calibration tape forward to "TREBLE FREQUENCY RESPONSE" test section (16 kHz for 30 ips, 14 kHz for 15 ips, 12.5 kHz for 7.5 ips). The level of this section is approx. 20 dB (CCIR) below that of the reference level section. Connect millivoltmeter to line output channel 1.

Press CH1 and TREBLE REPRO on input keyboard.  
Start recorder in play mode.  
Adjust to optimum frequency response with UP or DOWN.  
Press STORE.

On stereo recorders, connect the millivoltmeter to line output channel 2. Press CH2 and TREBLE REPRO. Adjust to optimum frequency response with UP or DOWN.  
Press STORE.

Rewind calibration tape to "FREQUENCY RESPONSE 63 Hz" test section. The level of this section is approx. 20 dB lower than that of the reference level section.  
Connect millivoltmeter to line output channel 1.

Press CH1 and BASS REPRO on input keyboard.  
Start recorder in play mode.  
Adjust for optimum frequency response with UP or DOWN.  
Press STORE.

On stereo recorders connect millivoltmeter to line output channel 2. Press CH2 and BASS REPRO. Adjust for optimum frequency response with UP or DOWN.  
Press STORE.

##### Note:

Strong fringing effects can occur at low frequencies if mono calibration tapes are used for the reproduce adjustment of stereo recorders. To ensure that a linear reproduce frequency response is attained, the reproduce adjustment of the bass frequencies must either be repeated with the record adjustment or if no record adjustments are planned, a calibration tape with correct track separation should be used!

The reproduce frequency response can be adjusted for special situations by slightly varying the time constant of the reproduce equalization.

This is accomplished as follows:

- Set program switch 7 off: JS7 = 0.
- Press CH1 (CH2).
- Hold down TRANS <REDUCED> continuously.
- Press TREBLE REPRO and release both keys. TREBLE REPRO status indicator lamp flashes.
- The time constant can be increased by pressing UP, i.e. the transition frequency is shifted toward the lower frequencies.
- The time constant can be decreased by pressing DOWN, i.e. the transition frequency is shifted toward the higher frequencies.
- Press STORE.

THEORETICAL EQUALIZATION ADJUSTMENTS		
TIME CONSTANT ( $\mu$ s)	TRANSITION FREQ. $\pm 3$ dB (kHz)	REPRODUCE HEX. VALUE
120	1.326	E5
90	1.768	A3
70	2.273	87
50	3.150	61
35	4.547	44
17.5	9.094	26

#### 4.2.2.5 Adjustments for other tape speeds

The instructions in 4.2.2.2 through 4.2.2.4 are basically applicable for adjusting the other tape speeds (SLOW):

- Select slower tape speed
- Changeover equalization and tape type, if necessary
- Mount corresponding calibration tape.

##### Exceptions:

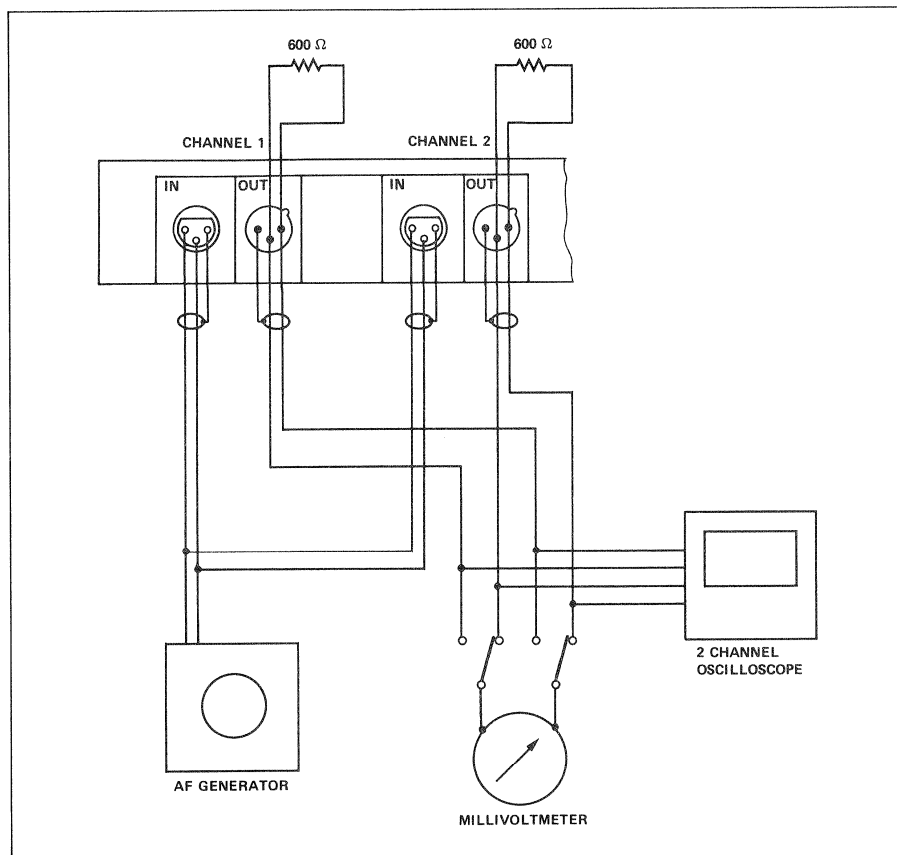
The reproduce frequency response is calibrated with different frequencies, depending on the tape speed:

ips	ADJUSTMENT FOR	
	TREBLE REPRO kHz	BASS REPRO Hz
3.75	8	63
7.5	12.5	63
15	14	63
30	16	63

#### 4.2.3 Record Adjustments

##### 4.2.3.1 Preparatory steps

Mount new (or practically new) unrecorded tape.



Connect AF generator with 1 kHz and line level to line input channel 1 (channels 1 + 2 on stereo models) and connect millivoltmeter to line output channel 1. A reference frequency of 700 Hz can be applied when aligning to NAB standards.

Switch recorder on and press READY and REP buttons of channels 1 and 2. Release all UNCAL buttons (calibrated line level). Select tape speed 7.5 ips or preferred studio speed.

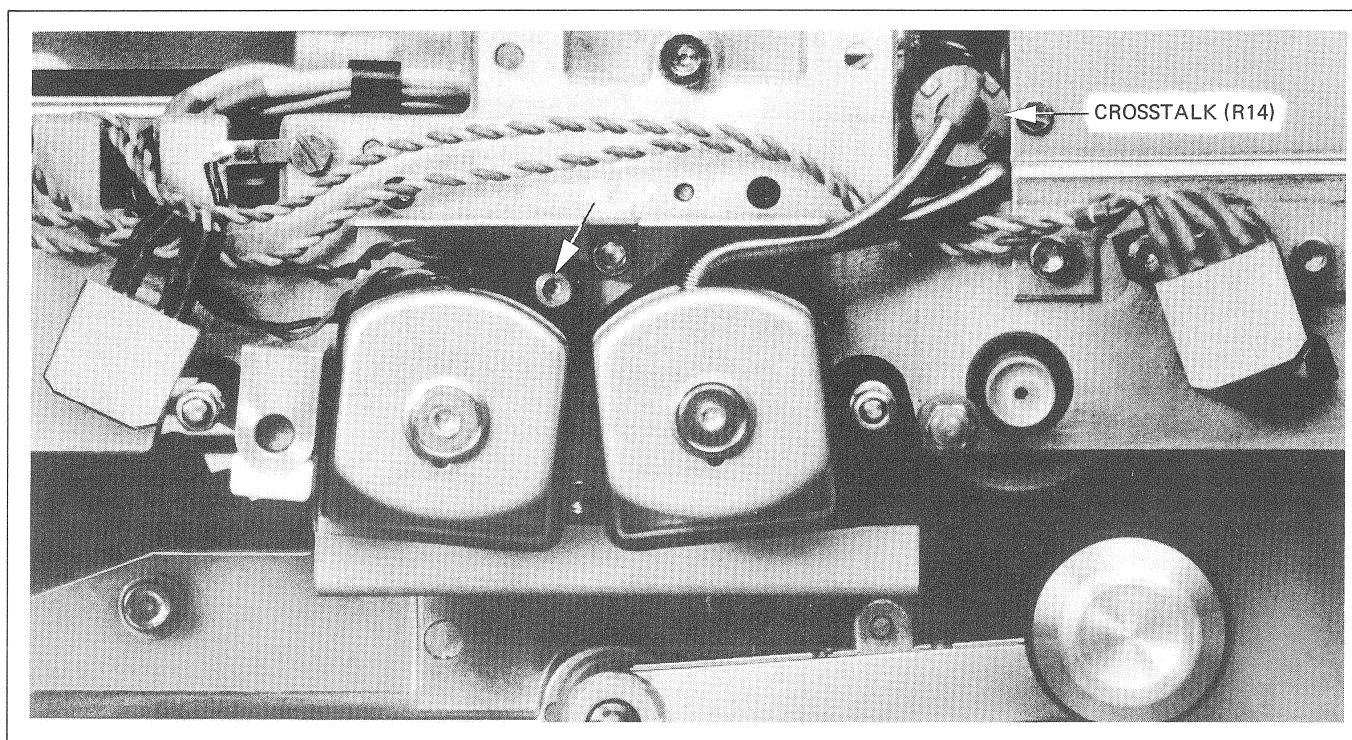
#### 4.2.3.2 Record level preadjustment

Press CH1 and LEVEL RECORD on input keyboard. Recall output level and press UP or DOWN key for adjusting to line level. Press STORE.

On stereo recorders connect millivoltmeter to line output channel 2. Press CH2 and LEVEL RECORD keys. Adjust output to line level by pressing UP or DOWN. Press STORE.

#### 4.2.3.3 Aligning the azimuth of the record head

Set AF generator to 10 kHz and decrease level by 20 dB. Connect millivoltmeter to line output channel 1. Start machine in record mode.

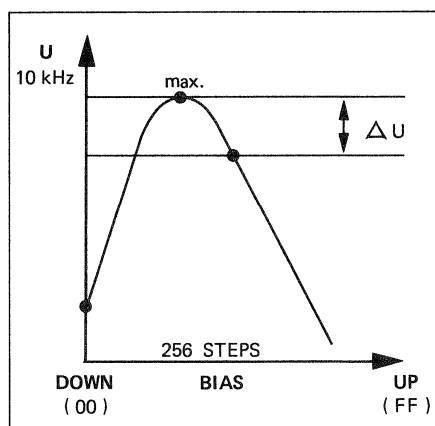


Correct the azimuth of the record head by turning the azimuth alignment screw until the highest output voltage and simultaneously the lowest level fluctuations are attained.

If significant correction of the azimuth alignment was necessary, repeat the record level preadjustment (Section 4.2.3.2)!

#### 4.2.3.4 Bias adjustment

Set AF generator to 10 kHz and the level 20 dB below line level.  
Connect millivoltmeter to line output channel 1.  
Press CH1 and BIAS on input keyboard.  
Start machine in record mode.  
Continue to press DOWN key until the MIN lamp flashes.  
Search the maximum output voltage with UP and write down this value.  
Continue with UP until the value  $\Delta U$  (dB) specified in the BIAS table is reached. This value depends on the tape formulation and the tape speed!



Refer to BIAS table at the end of this Section!  
Press STORE.

On stereo recorders connect the millivoltmeter to line output channel 2. Press CH2 and BIAS. Adjust bias in the same way as described for channel 1.  
Press STORE.

#### 4.2.3.5 Azimuth alignment STEREO

Stereo recorders are adjusted for minimum phase difference of the output signals on channels 1 and 2 by carefully turning the azimuth alignment screw of the record head.

#### 4.2.3.6 Record level adjustment

Set AF generator to 1 kHz (700 Hz) and operating level.  
Connect millivoltmeter to line output channel 1.  
Press CH1 and LEVEL RECORDED on input keyboard.  
Start machine in record mode.  
Adjust to line level by pressing UP or DOWN.  
Press STORE.

On stereo recorders connect the millivoltmeter to line output channel 2. Press CH2 and LEVEL RECORD. Adjust output level to line level with UP or DOWN.  
Press STORE.

#### 4.2.3.7 Frequency response adjustment

Set AF generator to line level -20 dB.  
Connect millivoltmeter to line output channel 1.  
Press CH1 and TREBLE RECORD on input keyboard.  
Start machine in record mode.  
Adjust to optimum frequency response (upward of 1 kHz) by pressing UP or DOWN.

Press BASS REPRO key and adjust to optimum frequency response (up to 1 kHz) by pressing UP or DOWN.  
Press STORE.



**Stereo recorders:**

Connect millivoltmeter to line output channel 2.

Press CH2 and TREBLE RECORD on input keyboard.

Start machine in record mode.

Adjust to optimum frequency response (upward of 1 kHz) by pressing UP or DOWN.

Press STORE.

Press BASS REPRO key and adjust to optimum frequency response (up to 1 kHz) by pressing UP or DOWN.

Press STORE.

In special situations it is possible to correct the over-all frequency response by slightly shifting the time constant of the record equalization.

This is accomplished as follows:

■ Set code switch 7 to off position: JS7 = 0.

■ Press CH1 (CH2).

■ Hold down TRANS <REDUCED>.

■ Press TREBLE RECORD and release both keys. The TREBLE RECORD lamp flashes.

■ The time constant can be decreased by pressing UP, i.e. the transition frequency is shifted toward the higher frequencies.

■ The time constant can be increased by pressing DOWN, i.e. the transition frequency is shifted toward the lower frequencies.

■ Press STORE.

THEORETICAL EQUALIZATION ADJUSTMENTS		
TIME CONSTANT ( $\mu$ S)	TRANSITION FREQ. $\pm 3$ dB (kHz)	RECORD HEX. VALUE
120	1.326	0E
90	1.768	4C
70	2.273	75
50	3.150	82
35	4.547	BA
17.5	9.094	DE

**4.2.3.8 Cross talk adjustment (2-channel and stereo models only)**

Connect AF generator (line level, 1 kHz) to line input channel 1 and connect millivoltmeter to line output channel 2. Switch both channels to READY and start machine in record mode.

Adjust to minimum cross talk with the aid of the CROSS TALK potentiometer (preamplifier on the headblock, R14, illustrated in Section 4.2.3.3).

Repeat the same measurement with interchanged channels. If pronounced differences occur, an optimum value has to be found for both channels.

#### 4.2.4 Sync adjustments

Because sync reproduction is not supported for 3.75 ips, all parameters should be left at 00 for this speed.

##### 4.2.4.1 Preparatory steps

Switch recorder off and wait 5 seconds.  
Set jumper on REPRODUCE AMPLIFIER to NARROW (or to WIDE if wider frequency response is desired). Also refer to 4.2.9.4.

Connect millivoltmeter to line output channel 1.  
Switch recorder on.  
Select tape speed, tape type, and equalization.  
Press SAFE and SYNC buttons of channels 1 and 2.  
Release all UNCAL buttons (calibrated level).  
Mount calibration tape of the corresponding speed and spool forward to the "REFERENCE LEVEL" section.

##### 4.2.4.2 Sync reproduce level adjustment

Press CH1 and LEVEL REPRO on the input keyboard.  
Start recorder in play mode.  
Read out sync reproduce level and adjust it to the desired line level by pressing the UP or DOWN key.  
Press STORE.

On stereo recorders, connect the millivoltmeter to line output channel 2.  
Press CH2 and LEVEL REPRO. Adjust to the desired line level by pressing the UP or DOWN key.  
Press STORE.

##### 4.2.4.3 Frequency response adjustment

Spool calibration tape forward to the "FREQUENCY RESPONSE" section. The level of this section is approx. 10 dB below that of the reference level section.  
Connect millivoltmeter to channel 1.

Press CH1 and TREBLE REPRO on input keyboard.  
Start recorder in play mode.

TAPE SPEED ips	TREBLE FREQ. RESP. (TREBLE SYNC)
7.5	8 kHz
15	12.5 kHz
30	12.5 kHz

Adjust for optimum frequency response by pressing UP or DOWN.  
Press STORE.

On stereo recorders, connect millivoltmeter to line output channel 2. Press CH2 and TREBLE REPRO. Adjust to optimum frequency response by pressing UP or DOWN.  
Press STORE.

Rewind calibration tape to test section "FREQUENCY RESPONSE 63 Hz". The level of this section is approx. 10 dB below that of the reference level section.  
Connect millivoltmeter to line output channel 1.

Press CH1 and BASS REPRO on input keyboard.  
Start recorder in play mode.  
Adjust to optimum frequency response by pressing UP or DOWN.  
Press STORE.

On stereo recorders connect the millivoltmeter to line output channel 2. Press CH2 and BASS REPRO. Adjust to optimum frequency response by pressing UP or DOWN.  
Press STORE.

**Note:**

Strong fringing effects can occur at low frequencies if mono calibration tapes are used for the sync reproduce adjustments of stereo recorders. To ensure that a linear sync reproduce frequency response is attained, a calibration tape with correct track separation should be used!

The sync reproduce frequency response can be adjusted for special situations by slightly varying the time constant of the sync reproduce equalization. This is accomplished as follows:

- Set program switch 7 off: JS7 = 0.
- Press CH1 (CH2).
- Hold down TRANS <REDUCED> continuously.
- Press TREBLE REPRO and release both keys. TREBLE REPRO status indicator lamp flashes.
- The time constant can be increased by pressing UP, i.e. the transition frequency is shifted toward the lower frequencies.
- The time constant can be decreased by pressing DOWN, i.e. the transition frequency is shifted toward the higher frequencies.
- Press STORE.

THEORETICAL EQUALIZATION ADJUSTMENTS		
TIME CONSTANT ( $\mu$ S)	TRANSITION FREQ. $\pm 3$ dB (kHz)	SYNC REPRO HEX. VALUE
120	1.326	E5
90	1.768	A3
70	2.273	87
50	3.150	61
35	4.547	44
17.5	9.094	26

**4.2.4.4 Adjustments for the other tape speeds**

The instructions in 4.2.4.2 through 4.2.4.3 are basically applicable for adjusting the other tape speeds (SLOW):

- Select corresponding tape speed
- Changeover equalization and tape type, if necessary
- Mount corresponding calibration tape.

#### 4.2.5 Time code reproduction

Basically no electrical alignments are necessary for time code reproduction.

The alignments are limited to the mechanical adjustment of the left-hand and right-hand code heads. These are only necessary if the code heads have been replaced. The TC head alignment gauge kit (part No. 10.010.001.28) should be available. Accurate alignment of the heads is absolutely essential because of the narrow width of the code track (0.38 mm).

##### 4.2.5.1 Preparatory steps

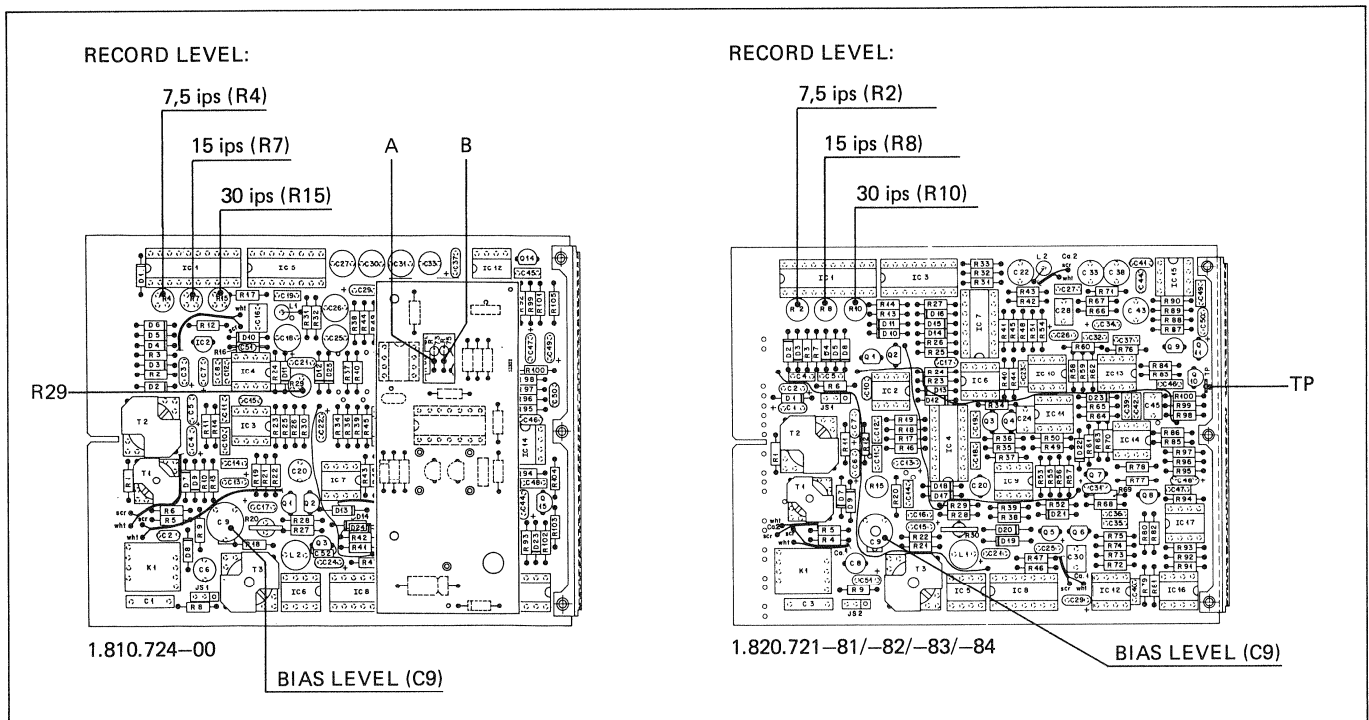
Check soundheads for contamination and clean them, if necessary. With the aid of a reference tape (in preparation) the height of the head can be adjusted in such a way that the maximum reproduce level is attained. For this purpose it is necessary to mount the CODE READ/WRITE amplifier on an extender board (part No. 1.820.799.00).

##### CAUTION

Switch recorder off and wait at least 5 seconds before unplugging or inserting any printed circuit boards!

Time code reproduction in spooling mode is not feasible as long as the CODE READ/WRITE UNIT is mounted on the extender board!

The reproduce signal is measured before the limiter on the test point (B for PCB 1.820.721-00 and 1.810.724-00, or TP for PCB 1.820-721.81/82/83/84), preferably with an oscilloscope; the ground lead of the oscilloscope probe is to be connected to terminal 21 of the extender board.



Mount time code reference tape, recording inhibited (SAFE).  
Start recorder in play mode.

#### 4.2.5.2 Checking the height of the heads

ONLY NECESSARY IF THE TIME CODE HEADS HAVE BEEN REPLACED!

First check the head height visually, then measure the voltage on test point B or TP.

On the left of the left-hand code head (audio erase head) alternately press with your finger slightly from the top and the bottom against the tape edge. The height is correct if the voltage decreases in both cases while the tape is being pressed.

Switch the recorder with TRANS <REDUCED> and < to the lowest tape speed and measure the voltage on test point B or TP. On the right of the right-hand code head (combination head) alternately press with your finger slightly from the top and the bottom against the tape edge. The height is correct if the voltage decreases in both cases while the tape is being pressed.

Should the measured voltage increase when the tape is pressed, it is necessary to correct the height of the head as follows:

at the left-hand code head with the aid of shims (0.1 mm, part No. 1.062.210.08),

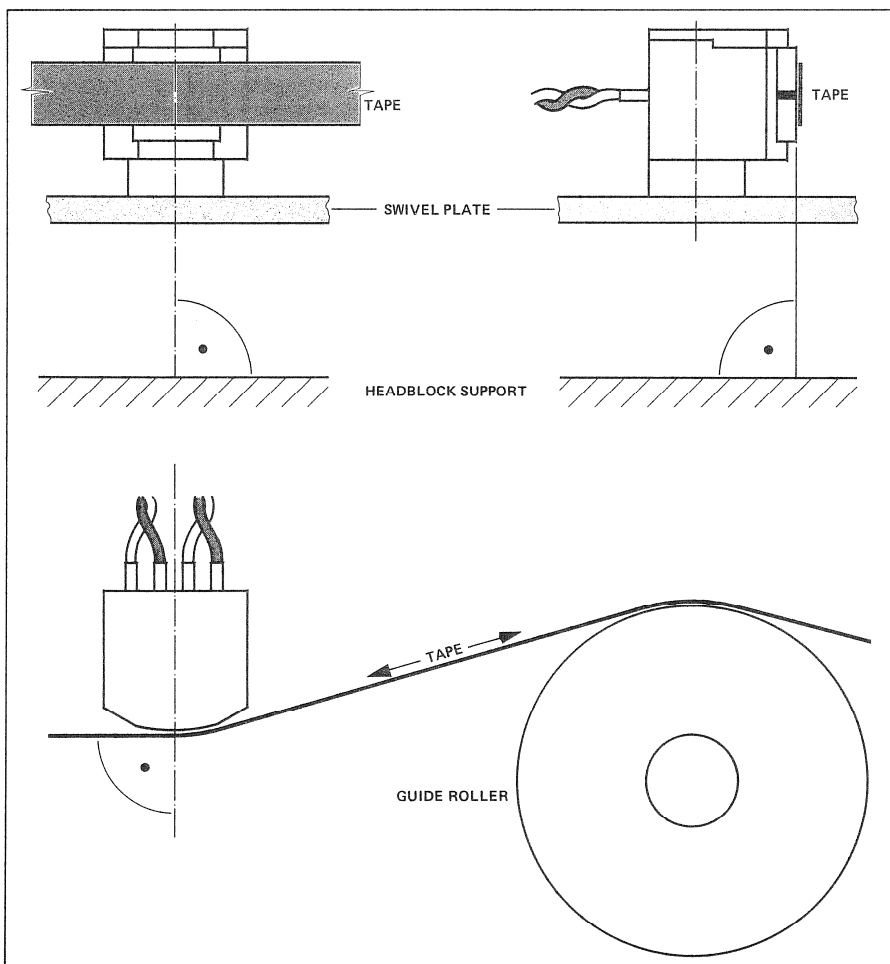
at the right-hand code head by shifting the swivel plate.

#### 4.2.5.3 Tape guidance

The right-hand time code head (combination head) must be positioned perpendicularly to the tape path. Lateral tilt or forward/backward inclination detected after the height alignment must be corrected by adjusting the swivel plate.

TC head alignment gauge kit, Part No. 10.010.001.28.

Recheck the height adjustment, if necessary!



#### 4.2.6 Time code recording

##### 4.2.6.1 Preparatory steps

The record alignments can be made either with a time code signal or a square-wave signal. The square-wave signal offers the advantage that the image on the oscilloscope is stationary. However, it also means that the CODE DELAY UNIT must be removed and the jumper JS2 on the CODE READ/WRITE UNIT be changed to the "BYPASS" position.  
Mount CODE READ/WRITE PCB on the extender board.

##### CAUTION

Switch recorder off and wait at least 5 seconds before unplugging or inserting any printed circuit boards! Time code reproduction in spooling mode is not feasible as long as the CODE READ/WRITE UNIT is mounted on the extender board!

##### Adjusting the input sensitivity

(only possible for 1.820.721.81/82/83/84)

Switch recorder on.

Set trigger level for time code line input:

- Connect square-wave generator (frequency 1 kHz) or time code generator to the time code line input. The output voltage of the generator should be the lowest voltage at which the line input and the code level pilot lamp should respond. (Factory setting: 0.5 Vpp, minimum input voltage approx. 150 mVpp).
- Turn trimmer potentiometer R15 on the CODE READ/WRITE UNIT clockwise until the CODE LEVEL lamp just turns on.

##### Setting the reference for the Limiter

(only possible for 1.810.724)

Switch recorder to STOP.

With a digital voltmeter adjust for a voltage of -7.0 V ( $\pm 0.5$  V) DC on test point TP A (R73 refer to drawing in 4.2.5.1) of the CODE READ/WRITE UNIT with the aid of potentiometer R29.

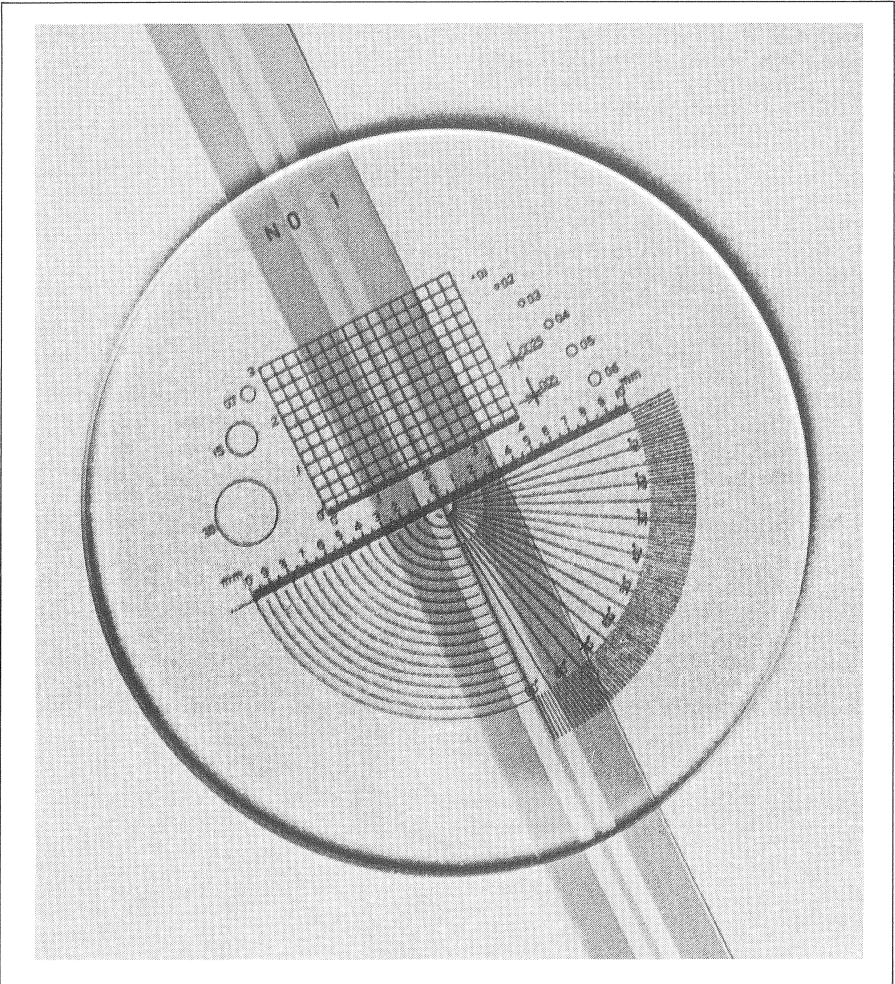
##### 4.2.6.2 Adjusting the height of the right-hand code head ( combination head)

- Mount practically new, unrecorded tape.
- Set bias trimmer C9 to its center position.
- Open record level trimmer clockwise by 1/3 of its travel (approx. 90°).

7.5 ips 19 cm/s	15 ips 38 cm/s	30 ips 76 cm/s	PCB
R4	R7	R15	1.820.721-00 1.810.724-00
R2	R8	R10	1.820.721-81 1.820.721-84

- Remove CODE DELAY UNIT, change jumper (JS1 for PCB 1.820.721-00 and 1.810.724-00, or JS2 for PCB 1.820-721-81/-82/-83/-84) on the CODE READ-WRITE UNIT to the "BYPASS" position (if not already done)
- Select tape speed 15 ips.
- Connect square-wave generator 2 Vpp, 1 kHz, to all three line inputs and produce and recording of approximately 10 to 20 seconds duration.
- Spray iron oxide (MAGNETIC IRON OXIDE made by AEROSOLS INTERNATIONAL LTD., Part No. 10.555.001.00) onto a few centimeters of the recorded tape, coated side facing up.
- After the tape has dried measure the symmetry of the tracks with the aid of a measuring magnifier (Part No. 10.258.006.00). Correct the azimuth of the head if the deviation exceeds  $\pm 0.05$  mm. Repeat recording and measurement until the specified symmetry is attained.

- To ensure the perpendicularity of the record head relative to the tape, the swivel plate may only be shifted symmetrically. Note the degree division of the hexagon-socket-screw key in the gauge set.
- The gauge 10.010.001.28 is absolutely essential for this alignment!



After the height alignment has been completed it is necessary to check the tape travel (4.2.5.3).

4.2.6.3 Preparatory steps

Press time code SAFE button (audio recording inhibited = SAFE).

Connect oscilloscope to test point B or TP. The ground lead of the oscilloscope probe is to be connected to terminal 21 of the extender board.

Mount time code reference tape (in preparation), wind forward to the 2nd part (time code, 729 nWb/m pp), switch recorder to PLAY, and measure the signal amplitude (peak-to-peak) with the oscilloscope on test point B or TP respectively.

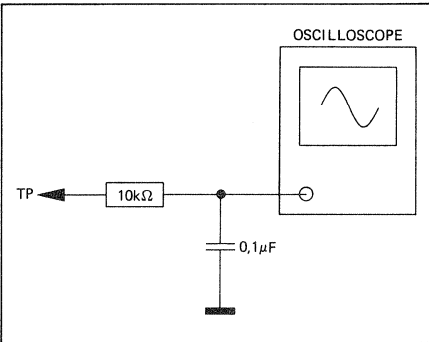
Write down the measurement result.

(For standard values see below):

Standard value	PCB
700 mVpp	1.820.721-00
250 mVpp	1.810.724-00
180 - 300 mVpp	1.820.721-81/-84

If no time code reference tape is available, this measurement can be made by way of expedient by using a full-track audio calibration tape. Proceed as follows:

- Connect oscilloscope via an RC element to test point B or TP as illustrated in the diagram below.



- Play level tone 1 kHz, measure signal amplitude (peak-to-peak), write down measured value.
- Multiply measured value with factor  
k = 1.3 if test tape with a flux of 200 nWb/m is used,  
k = 0.81 if test tape with a flux of 320 nWb/m is used  
in order to obtain the time code reproduce level (peak-to-peak) for a tape flux of 729 nWb/m.
- Write down computed value.

Mount practically new, unrecorded tape.  
Press time code READY button.

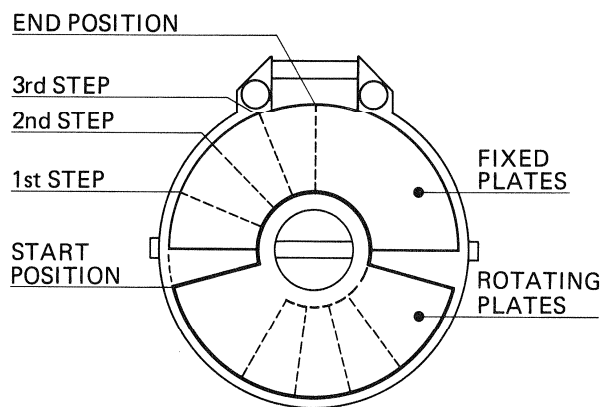
4.2.6.4 Bias adjustment

- Set bias trimmer C9 to minimum capacitance.
- Open the record trimmer clockwise by 1/3 of the travel (approximately 90°).

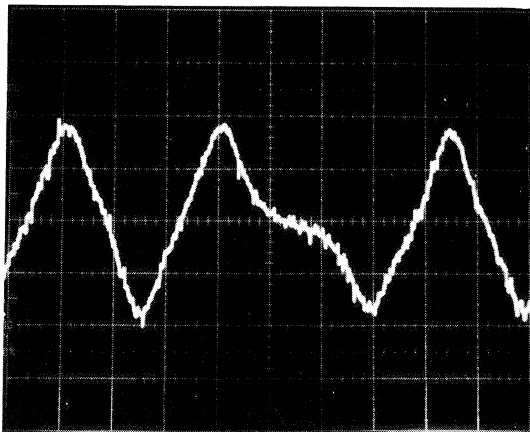
7.5 ips 19 cm/s	15 ips 38 cm/s	30 ips 76 cm/s	PCB
R4	R7	R15	1.820.721-00 1.810.724-00
R2	R8	R10	1.820.721-81 1.820.721-84

- Connect square-wave generator (frequency 1 kHz) or time code generator with approximately 2 Vpp to the time code line input; CODE DELAY UNIT removed. JS1 or JS2 on CODE READ/WRITE UNIT in "BYPASS" position.
- Start machine in record mode. During the recording gradually increase the capacitance of C9 in intervals of 10 seconds until the rotor is plunged in by approximately 90°. In this way a recording is produced with different bias values.

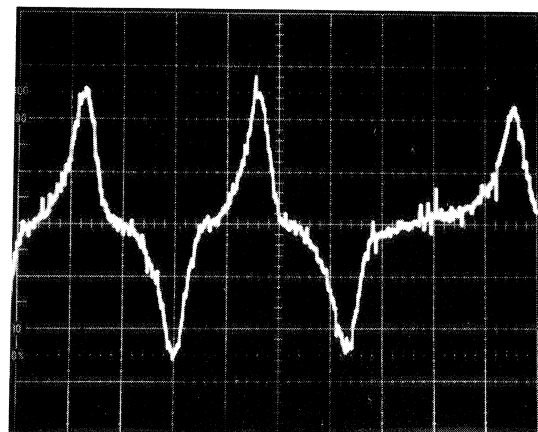




- Rewind to the beginning of the tape.
- Connect oscilloscope to test point B or TP, connect ground lead of the oscilloscope probe to terminal 21 of the extender board.
- Start recorder in PLAY mode.
- During the PLAY function check the position in which the greatest output amplitude is attained.
- Set C9 back to this position.
- Restart the recorder in PLAY mode, vary the setting of C9 in small steps near the previously found position.
- Determine the optimum setting of C9 i.e. the maximum amplitude and steepest signal edges by repeated experiments.



BAD



EXCELLENT

VERTICAL DEFLECTION : 0,2V/DIV.  
TIME BASE : 0,2ms/DIV.

#### 4.2.6.5 Record level adjustment

The record level is adjusted with the trimmer potentiometer for the corresponding speed in such a way that the reproduce level measured and noted in 4.2.6.3 is available on test point B and TP respectively.

7.5 ips 19 cm/s	15 ips 38 cm/s	30 ips 76 cm/s	PCB
R4	R7	R15	1.820.721-00 1.810.724-00
R2	R8	R10	1.820.721-81 1.820.721-84

#### PROCEDURE (for each tape speed):

- Mount new or practically new, unrecorded tape.
- Connect oscilloscope to test point B or TP respectively (ground to terminal 21 of the extender board).
- Start machine in RECORD mode, record during 20 seconds a square-wave signal with approx. 2 Vpp, 1 kHz (CODE DELAY UNIT removed, JS2 {JS1 for PCB 1.820.721-00 and 1.810.724-00} on the CODE READ/WRITE UNIT in "BYPASS" position, or record time code).
- Rewind to the start of the recording, start recorder in PLAY mode. The voltage on test point B and TP respectively should be the same as the value determined in 4.2.6.3.
- If this value is not attained, slightly vary the potentiometer setting of the corresponding speed.
- Repeat the foregoing procedure several times until this value is attained.

#### 4.2.6.6 Checking the head gap position, reproduce

- Reinstall the CODE DELAY UNIT. Set jumper JS1 or JS2 respectively of the CODE READ/WRITE UNIT to the "NORMAL" position.
- Set DIL switch 0 (below operator panel) to the "NO OFFSET" position.
- Set DIL switches 1 and 2 (below operator panel) in accordance with the desired time code standard.
- Connect time code line output and line output of one of the two audio channels to the MASTER input or SLAVE input respectively of a synchronizer STUDER TLS4000 (or a time code reader with offset indication possibility).
- Mount time code reference tape (in preparation), spool to the first section (full-track time code), and start recorder in PLAY mode, speed 15 ips.
- Measure the offset between the audio channel and the time code channel.
- The offset should not exceed 2 ms (for 30 ips), 4 ms (for 15 ips) or 8 ms (for 7.5 ips). Should these values be exceeded, the offset can be reduced by turning the left-hand combination head.
- After this adjustment it is necessary to check the erase attenuation of the audio channels! A compromise may possibly have to be made between maximum erase attenuation and minimum time code offset.

If no equipment is available for measuring the offset, it may be assumed that the offset is smaller than 2 ms (for 30 ips), 4 ms (for 15 ips), or 8 ms (for 7.5 ips) if the erase attenuation is adequate and the record and the reproduce head gaps are adjusted correctly.

#### 4.2.6.7 Checking the head gap position, via tape

- Connect time code generator in parallel to an audio channel and to the time code channel. Make a recording of about one minute duration.
- Rewind to the beginning of the recording and measure the offset between the audio channel and the time code channel with the same device as described in 4.2.6.6.
- The offset should not exceed 2 ms (30 ips), 4 ms (15 ips), or 8 ms (7.5 ips). If these values are exceeded, the offset can be reduced by turning the right-hand combination head.

**IMPORTANT:**

After a correction of the right-hand combination head (time code record head) it is necessary to make a new recording for checking the head gap position! The tape must touch the head face approximately symmetrically, it should not be drawn across one of the edges!

#### 4.2.6.8 Checking the time code reproduction in spooling mode

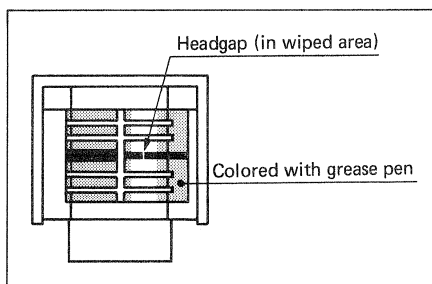
- Install CODE DELAY UNIT, set jumper JS1 or JS2 respectively to the "NORMAL" position. Set jumpers JS1 or JS2 to the "BYPASS" position if no code delay unit exists.
- Install CODE READ/WRITE UNIT without extender board.
- Connect time code generator to the TC line output.
- Select tape speed 7.5 ips
- Make a recording of about 10 minutes duration.
- Connect time code reader to TC line output
- Switch recorder to spooling. The recorded time code should be read correctly in both directions at maximum spooling speed!
- If the time code is not read correctly (too many drop-outs), the right-hand code head should be cleaned or possibly realigned. (The lifter may also have to be readjusted).

Cleaning the right-hand time code head:

- Remove the contamination in the grooves with the aid of a hard brush and clean the head with soundhead cleaner.

Checking the headface of the right-hand time code head

- Color the right-hand half of the right-hand time code head with a grease pen (Part No. 10.401.001.01).
  - Move out the tape lifter by hand and press one of the spooling keys. Check the headface after approximately 1 to 2 minutes. The headgap should be in the wiped area.
- Should this not be the case, check the lifter alignment according to 3.3.3 or possibly shift the time code head slightly at the expense of the delay unit (offset measurement).



**Important:**

In spooling mode the CODE DELAY UNIT is automatically bypassed, i.e. the spooling offset is inherently greater than the specified value (max. 8 ms at 7.5 ips), regardless of whether the delay unit is installed or not!

#### 4.2.7 External storage of the audio parameters

(Only possible with serial remote control 1.810.751.00)

The content of the RAM can be copied for back-up purpose to an external medium, e.g. an audio tape. The data can also be recorded on an audio tape on the machine of which the audio parameters are to be saved. A special command is available for comparing the data on tape with the RAM content in order to verify correct transmission.

In the following instructions we use the term SAVE for the process of copying the parameters from the RAM of the recorder to an external medium, the term VERIFY for the process of comparing the externally stored data with the content of the RAM in the recorder, and the term LOAD for the process of transferring the externally stored parameters into the RAM of the recorder.

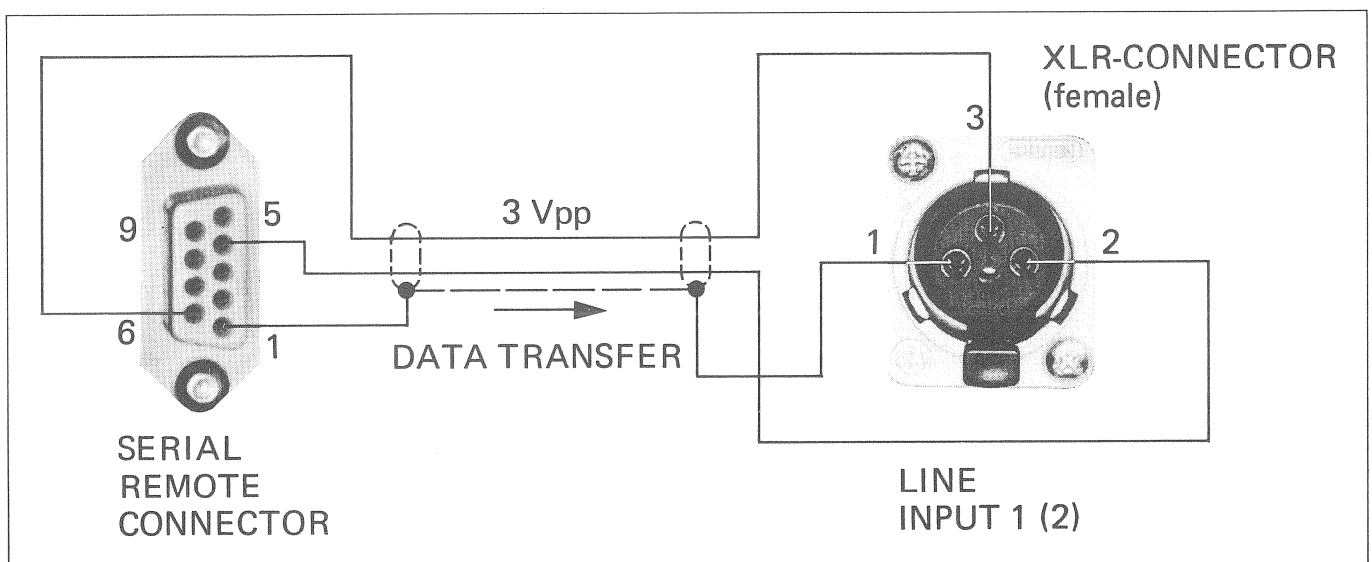
##### 4.2.7.1 Principle of saving the audio parameters

When the recorder receives the "SAVE" command, the microprocessor serially transmits all stored audio parameters to connector pins 4 and 6 of the 9-pin remote control connector. These terminals are balanced and floating. The level is approx. 3 V pp. A parallel load resistor can be connected between terminals 4 and 6 (50  $\Omega$  correspond to approx. 2 V pp) in order to match the output level.

For safety reasons, three complete copies of the data are transmitted (one correct copy is sufficient for reading in the data). The complete task takes approximately 30 seconds. During the SAVE process the message C0 C0 (LCD) or C0C0C (LED) appears on the tape timer display. The end of the task is indicated by the message CC CC (LCD) or CCCCC (LED) on the tape timer display.

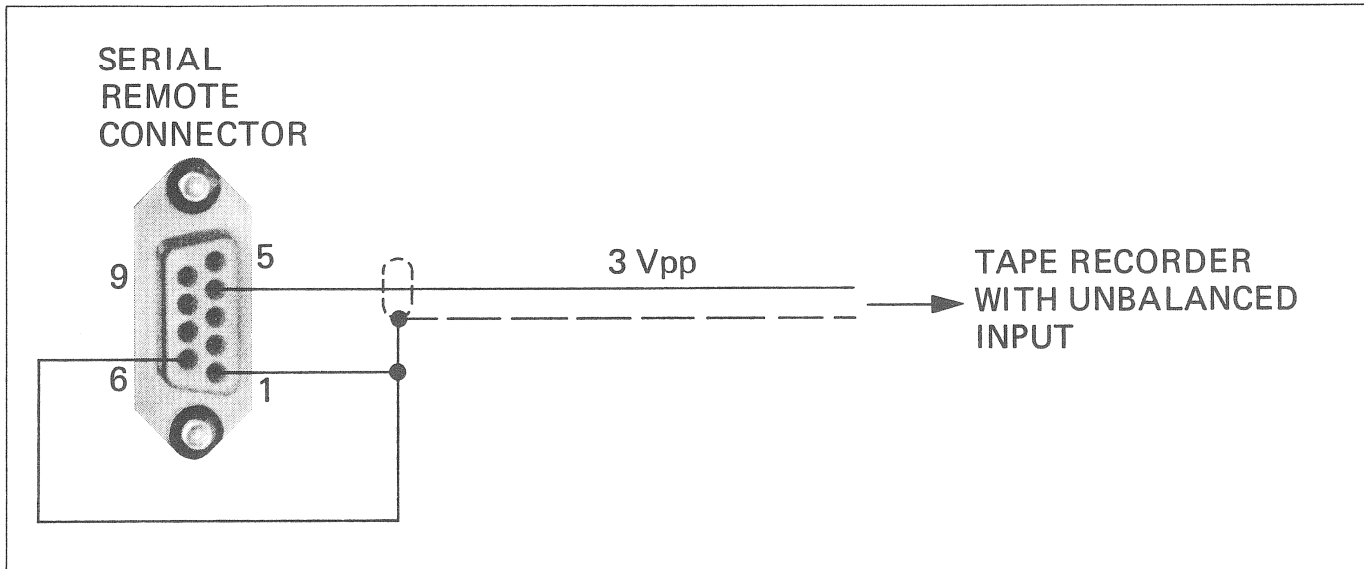
The integrity of the audio parameters saved on tape can be checked with the "VERIFY" command. During verification the message d0 d0 (LCD) or d0d0d (LED) appears on the tape timer display. If the data have been transmitted correctly, the message dd dd (LCD) or ddddd (LED) is displayed; in case of an error the message EE 08 (LCD) or EEE08 (LED) appears.

##### 4.2.7.2 Connecting the recorder to the remote control connector



Unbalanced connection:

Lines 1 and 6 of the 9-pin connector are to be interconnected.



#### 4.2.7.3 Preparatory steps

##### SAVE & VERIFY

The address board 1.810.739 (accessible from the back of the recorder) is to be programmed as follows:

- DIL switches 1 through 7 in "OFF" position
- DIL switch 8 in "ON" position
- Press MPU reset (on MP UNIT PCB 1.810.752/1.820.780) or switch recorder OFF and ON again.
- Select desired tape speed.
- Mount tape of the corresponding length (minimum recording time 30 seconds).
- Release UNCAL buttons (calibrated line level).
- Press READY button of the desired recording channel; even if the audio parameters are saved on a second recorder, a tape must nevertheless be mounted on the recorder whose parameters are to be saved, but the SAFE buttons are to be pressed.
- Plug data transmission cable into the serial remote connector and an audio input.

Note: Do not short-circuit the input and output of the same recorder via the data transmission cable.

#### 4.2.7.4 Saving the audio parameters

Start the second machine (if any) in record mode. Then start the recorder whose parameters are to be saved also in record mode (always press REC first, followed by PLAY, otherwise the machine starts in VERIFY or READ mode!)

- Display shows CC CC (LCD) or CCCC (LED) during the save process.
- After the data have been recorded (3 identical copies) the message CC CC (LCD) or CCCC (LED) appears on the display.

If the message EE 07 (LCD) or EEE07 (LED) appears during the save process, an internal error has occurred in the data transmission, possibly because of a transient power failure. The save process has to be repeated.

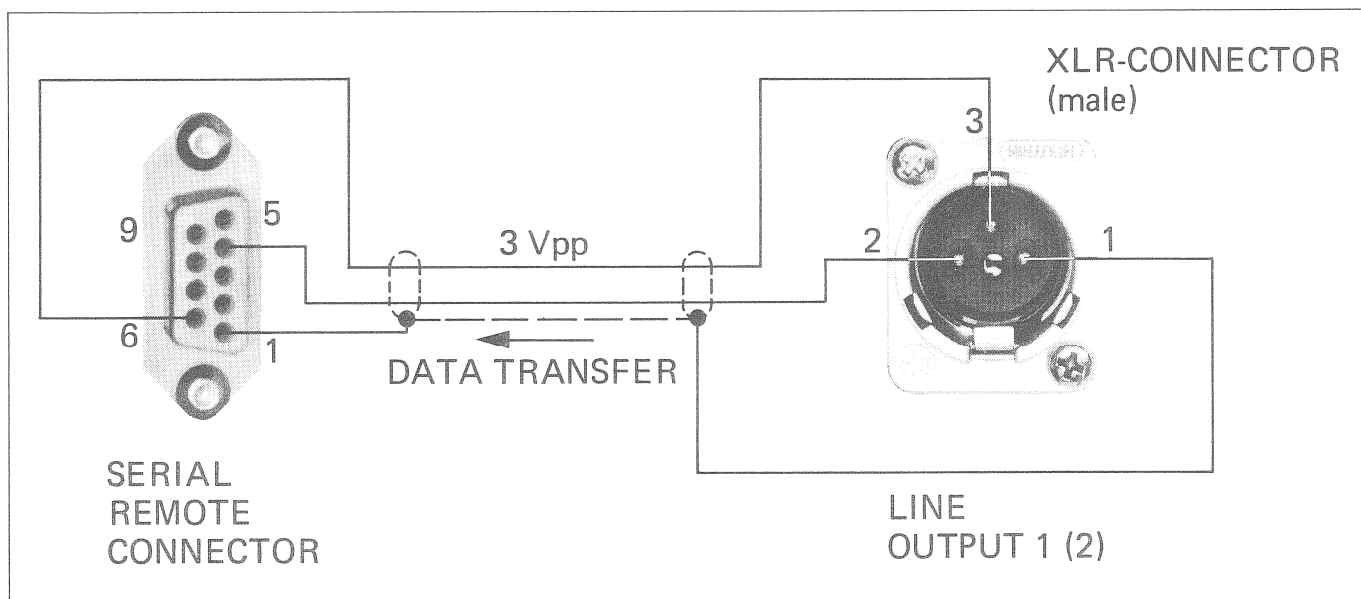
#### 4.2.7.5 Verification

The audio parameters saved on tape can be checked without influencing the RAM data:

- Switch settings on address board 1 810.739 as described in 4.2.7.3.
- Plug data transmission cable into the serial remote control connector and the LINE OUTPUT socket.

Note: If the other XLR connector of the data transmission cable is still in the LINE INPUT socket, it must first be unplugged.

Rewind tape with the saved audio parameters to the beginning.



- Press PLAY key and also start the second recorder (if any) in PLAY mode.
- The display indicated d0 d0 (LCD) or d0d0d (LED) during the verification process.

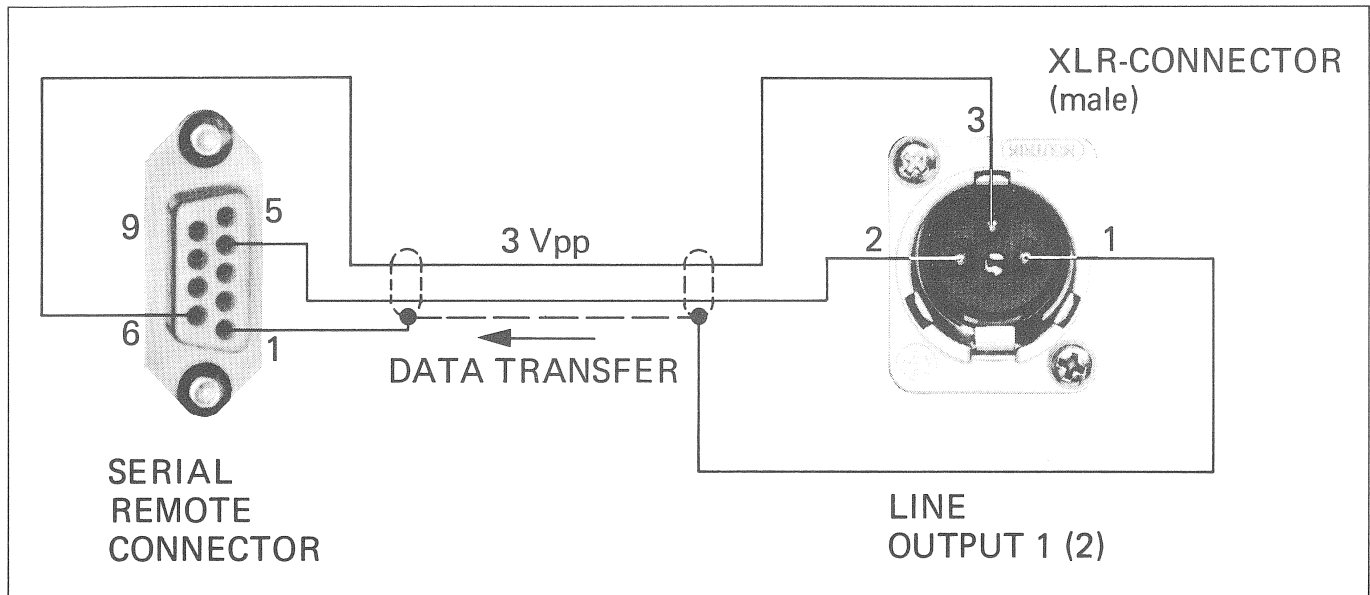
If EE(E)08 appears, the stored data are corrupted. Check the second and possibly the third copy.

Reasons for incorrect data recording or reproduction:

- Wiring error with hum injection;
- Strong wow and flutter;
- Missing treble reproduction (treble control closed);
- Error in software 13/83 with LED display;
- Tape with data belonging to another machine has been mounted.

#### 4.2.8 Reading in the audio parameters through the serial remote interface

##### 4.2.8.1 Connecting the recorder to the remote control connector



##### 4.2.8.2 Preparatory steps

The address board 1.810.739 (accessible on the rear of the recorder) is to be programmed as follows:

- DIL switches 1 through 6 in "ON" position
- DIL switch 7 in "OFF" position
- DIL switch 8 in "ON" position
- Press MPU reset (on MP-UNIT PCB 1.810.752/1.820.780).
- Select tape speed.

Mount tape with the saved audio parameters (even if a second recorder is used, a tape must be mounted on the recorder that is reading the data so that the PLAY function can be enabled).

##### Caution

It is also possible to record data with SAVE & LOAD by starting the machine in record mode. However, the data stored in RAM can be destroyed if the recorder is unintentionally started in play mode rather than record mode and if the microprocessor by coincidence detects a valid label.

#### 4.2.8.3 Loading the audio parameters

---

- Plug data transmission cable into the serial remote connector and into the LINE INPUT socket.

Caution: The other XLR connector must not be plugged into the LINE INPUT!

- Press PLAY key and start the second machine (if any) in PLAY mode.
- The display indicates b0 b0 (LCD) or b0b0b (LED) during the loading of the audio parameters.
- When the data are loaded correctly into the RAM (without drop-out) the message bb bb (LCD) or bbbbb (LED) appears on the tape timer display.

If the microprocessor detects incorrect data, the message EE(E)06 is displayed, and the standard audio parameters held in the PROM are automatically transferred into RAM. In this case it is necessary to repeat the loading process.

- Restore the DIL switches on the address board 1.810.739 to their normal position, otherwise the next PLAY command will clear the memory (the recorder expects new audio parameters from tape).
- Press MPU reset on MP UNIT PCB 1.810.752/1.820.780 or switch the recorder OFF and ON again.



#### 4.2.9 Programming the operating parameters

#### 4.2.9.1 Code switches of the COMMAND UNIT

A microprocessor RESET must be initiated after the operating parameters have been changed with the code switches. Press RESET key of the MP UNIT or turn the power switch off and on again.

The 20 code switches JS 0 ... JS 19 are accessible on the rear of the COMMAND UNIT (lower front panel open).

JS 0 ... JS 2: Time code mode

MODE	FRAMES/s	JS 1	JS 2	JS 0
FILM STANDARD	24	0	0	
TV EURO STANDARD	25	0	1	
TV US STANDARD B/W	30	1	1	
TV US STANDARD COLOR	29.97	1	0	
Coincident audio/TC recording and reproduction		X	X	0
M15A-TC compatible recording and reproduction {1.2" (30 mm) offset}		X	X	1

### JS 3: LIFTER button

JS 3 = 0 —> programmed as momentary button

JS 3 = 1  $\longrightarrow$  programmed as flip-flop button

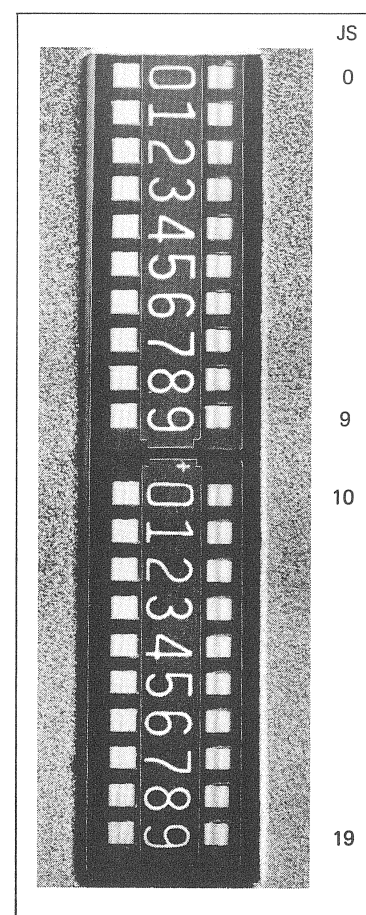
JS 4, JS 5: Drop-in / drop-out

The time offset of the drop-in can be disabled with JS 5 = 1 (erase and record head switch on concurrently).

The time offset of the drop-out can be disabled with JS 4 = 1 (erase and record head switch off concurrently).

## JS 6 ... JS 8: Tape type selection

The A810 recorder can be calibrated for two different tape formulations. The manner of changeover for tape type "A" or "B" can be selected with the three code switches JS 6, 7, and 8.



TAPE TYPE	TAPE SPEED	JS 6	JS 7	JS 8
"A"	SLOW (3.75 / 7.5 ips)	1	X	0
"B"	SLOW (3.75 / 7.5 ips)	1	X	1
"A"	FAST (15 / 30 ips)	1	0	X
"B"	FAST (15 / 30 ips)	1	1	X
If the tape recorder is not equipped with a mono/stereo switch, the pushbuttons on the master panel can be reprogrammed as a tape type selector:				
TAPE TYPE SELECTOR		0	NO EFFECT!	
MONO/STEREO SWITCH		1	X	X

#### JS 9 ... JS 11: Tape speed

LS version with 2-speed panel:

Two of three different tape speeds can be programmed:  
SLOW and FAST.

LS version with 3-speed panel:

The three lower speeds (3.75 – 7.5 – 15 ips) can be selected with the rotary switch on the master panel. The DIL switches JS9 through JS11 must be set to the "OFF" position.

HS versions:

All tape speeds can be selected with the rotary switch on the MASTER panel. JS9 through JS11 must be set to the "OFF" position!

The following tape speeds can be selected, depending on the capstan motor version:

3.75 7.5 15 30 ips  
9.53 19.05 38.1 76.2 cm/s

TAPE SPEED		JS 9	JS 10	JS 11	CAPSTAN (No. of poles)	REMARK
SLOW (ips)	FAST (ips)					
3.75	7.5	0	0	1	4	STANDARD special VERSIONS
3.75	15	0	1	0	4	
7.5	15	1	0	0	4	
15	30	1	1	1	2	
4 SPEED VERSION		0	0	0	2	STANDARD FOR HS VERSIONS
3 SPEED VERSION		0	0	0	4	STANDARD FOR LS VERSIONS

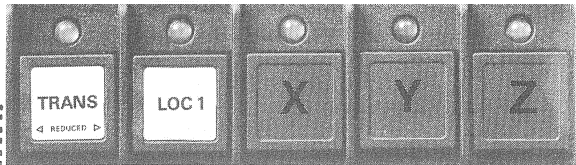
#### JS 12: Drop-in

JS 12 = 0 —> Drop-in with REC (provided recorder is already in PLAY mode).

JS 12 = 1 —> Drop-in with PLAY + REC.

JS 13 ... JS 19: Programmable keys

The three function keys on the right of TRANS and LOC1 can be programmed with the DIL switches JS13 through JS19. For explanations of the possible functions refer to Section 1.2.



CODE SWITCHES JS:

13 14 15 16 17 18 19

TRANS	LOC 1	LOC 2	LOC 3	LOC 4	0	0	0	0	0	0	0
TRANS	LOC 1	LOC 2	LOC 3	LOCST	0	1	0	0	0	0	1
TRANS	LOC 1	LOC 2	LCC 3	LIFTER	0	1	0	0	0	1	0
TRANS	LOC 1	LOC 2	LCC 3	FADER	0	1	0	0	0	1	1
TRANS	LOC 1	LOC 2	LOC 3	TAPDMP	0	1	0	0	1	0	0
TRANS	LOC 1	LOC 2	LOC 3	REMCTR	0	1	0	0	1	0	1
TRANS	LOC 1	LOC 2	LOC 3	CODREA	0	1	0	0	1	1	0
TRANS	LOC 1	LOC 2	LOCST	LIFTER	1	0	0	0	0	0	1
TRANS	LOC 1	LOC 2	LOCST	FADER	1	0	0	0	0	1	0
TRANS	LOC 1	LOC 2	LOCST	TAPDMP	1	0	0	0	0	1	1
TRANS	LOC 1	LOC 2	LOCST	REMCTR	1	0	0	0	1	0	0
TRANS	LOC 1	LOC 2	LOCST	CODREA	1	0	0	0	1	0	1
TRANS	LOC 1	LOC 2	LIFTER	FADER	1	0	0	0	1	1	0
TRANS	LOC 1	LOC 2	LIFTER	TAPDMP	1	0	0	0	1	1	1
TRANS	LOC 1	LOC 2	LIFTER	REMCTR	1	0	0	1	0	0	0
TRANS	LOC 1	LOC 2	LIFTER	CODREA	1	0	0	1	0	0	1
TRANS	LOC 1	LOC 2	FADER	TAPDMP	1	0	0	1	0	1	0
TRANS	LOC 1	LOC 2	FADER	REMCTR	1	0	0	1	0	1	1
TRANS	LOC 1	LOC 2	FADER	CODREA	1	0	0	1	1	0	0
TRANS	LOC 1	LOC 2	TAPDMP	REMCTR	1	0	0	1	1	0	1
TRANS	LOC 1	LOC 2	TAPDMP	CODREA	1	0	0	1	1	1	0
TRANS	LOC 1	LOC 2	REMCTR	CODREA	1	0	0	1	1	1	1
TRANS	LOC 1	LOCST	LIFTER	FADER	1	1	0	0	0	0	1
TRANS	LOC 1	LOCST	LIFTER	TAPDMP	1	1	0	0	0	1	0
TRANS	LOC 1	LOCST	LIFTER	REMCTR	1	1	0	0	0	1	1
TRANS	LOC 1	LOCST	LIFTER	CODREA	1	1	0	0	1	0	0
TRANS	LOC 1	LOCST	FADER	TAPDMP	1	1	0	0	1	0	1
TRANS	LOC 1	LOCST	FADER	REMCTR	1	1	0	0	1	1	0
TRANS	LOC 1	LOCST	FADER	CODREA	1	1	0	0	1	1	1
TRANS	LOC 1	LOCST	TAPDMP	REMCTR	1	1	0	1	0	0	0
TRANS	LOC 1	LOCST	TAPDMP	CODREA	1	1	0	1	0	0	1
TRANS	LOC 1	LOCST	REMCTR	CODREA	1	1	0	1	0	1	0
TRANS	LOC 1	LIFTER	FADER	TAPDMP	1	1	0	1	0	1	1
TRANS	LOC 1	LIFTER	FADER	REMCTR	1	1	0	1	1	0	0
TRANS	LOC 1	LIFTER	FADER	CODREA	1	1	0	1	1	0	1
TRANS	LOC 1	LIFTER	TAPDMP	REMCTR	1	1	0	1	1	1	0
TRANS	LOC 1	LIFTER	TAPDMP	CODREA	1	1	0	1	1	1	1
TRANS	LOC 1	LIFTER	REMCTR	CODREA	1	1	1	0	0	0	0
TRANS	LOC 1	FADER	TAPDMP	REMCTR	1	1	1	0	0	0	1
TRANS	LOC 1	FADER	TAPDMP	CODREA	1	1	1	0	0	1	0
TRANS	LOC 1	FADER	REMCTR	CODREA	1	1	1	0	0	1	1
TRANS	LOC 1	TAPDMP	REMCTR	CODREA	1	1	1	0	1	0	0

#### 4.2.9.2 Code switches PERIPHERY CONTROLLER

The code switch JS 8 must be in the "ON" position before data is entered with the code switches JS 1 ... 7!

##### JS 1, JS 2: Erase head

The type of erase head is programmed as follows:

ERASE HEAD	JS 1	JS 2
FULL TRACK	1	0
TWO TRACK	0	1
WITH TIME CODE TRACK	1	1
NO RECORD	0	0

##### JS 3: Channel control on 2-channel recorders:

The SAFE, READY, INP, SYNC, REC buttons can be programmed to control the channels individually or in parallel:

JS 3 = 0 —> INDIVIDUAL

JS 3 = 1 —> PARALLEL

##### JS 4: Automatic muting during spooling (AUTO MUTE):

When MUTE is activated, the output is muted for 0.5 s when the function is changed from STOP to PLAY or REC.

When the STOP command is given in PLAY or REC mode, the output is muted until the blocking of the tape tension sensors is in effect.

On recorders equipped with the MPU 1.810.752:

JS 4 = SPARE (not used)

On recorders with the MPU UNIT 1.820.780:

JS 4 = 0 —> AUTO MUTE off

JS 4 = 1 —> AUTO MUTE on

##### JS 5, JS 6: Line Level

The following line levels (operating level = peak level -6 dB) can be programmed for the inputs and outputs of the recorder:

LINE LEVEL	JS 5	JS 6
0 dBm	0	0
4 dBm	1	0
8 dBm	0	1
10 dBm	1	1

**JS 7: CCIR/NAB equalization**

JS 7 = 0 → Different audio parameters (bias, level, frequency response) for CCIR and NAB.

JS 7 = 1 → Identical audio parameters for CCIR and NAB.

This code switch must be set before the other audio parameters are programmed; it has no effect on previously stored parameters!

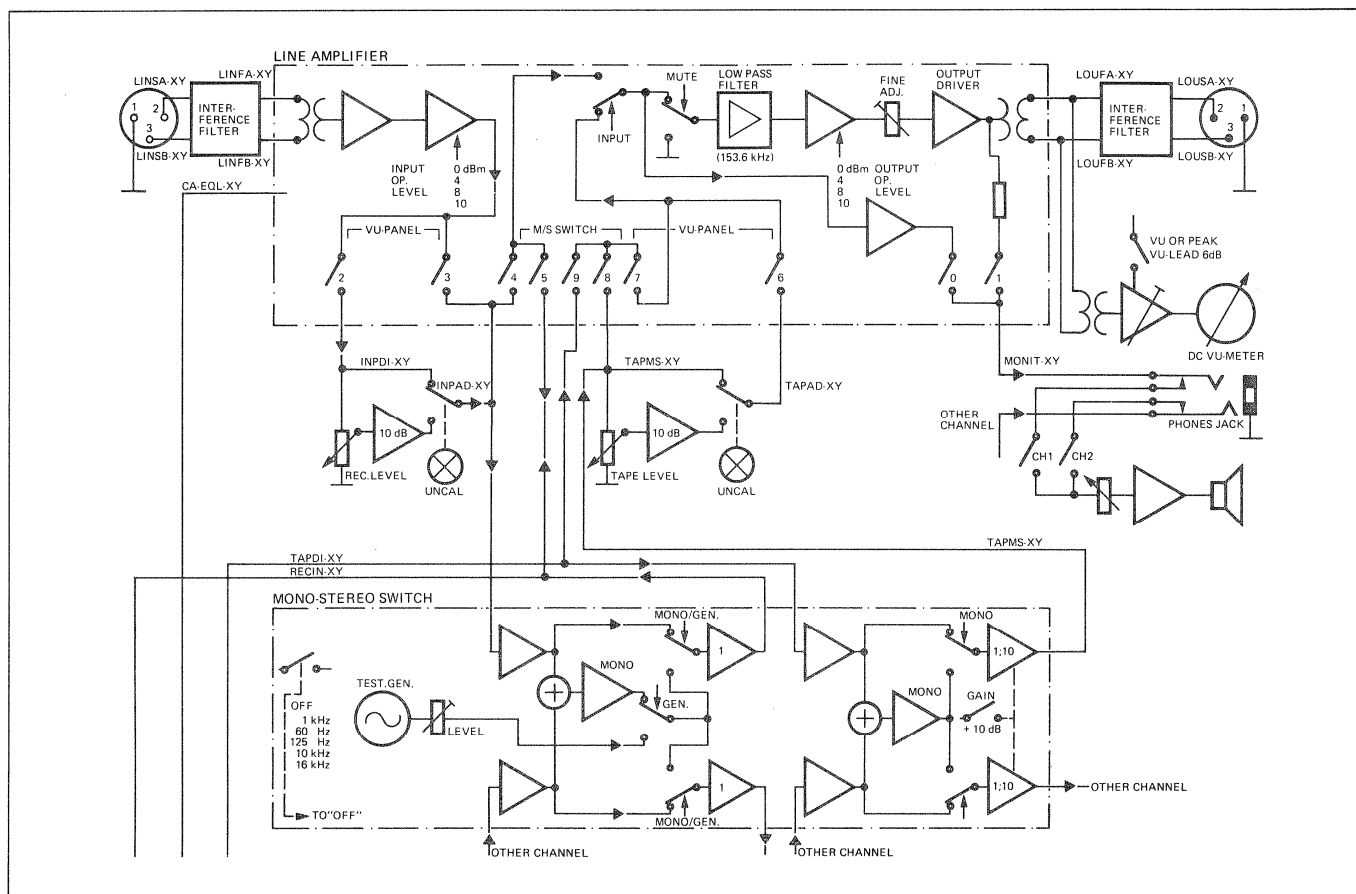
**Important:**

Because of the limited RAM capacity, only one equalization type can be stored for the two tape speeds 3.75 and 7.5 ips. Different levels, treble, bass, equalization, and bias for NAB and CCIR cannot be stored for these tape speeds.

**JS 8: input keyboard for audio parameters**

JS 8 = 0 → Keyboard off, no scanning of program switches JS 1 ... 7 and no adjustment of the audio parameters possible.

JS 8 = 1 → Keyboard on, scanning of program switches JS 1 ... 7

**4.2.9.3 Code switches LINE AMPLIFIER**

JS 0, JS 1: Connection of internal monitor and headphones output

Only possible for monitor speaker installed in recorder (below tape transport cover). Not applicable to VUK versions.

Connection to output amplifier:

JS 0 = 0

JS 1 = 1

Connection before muting:

JS 0 = 1

JS 1 = 0

Monitor and headphones disabled:

JS 0 = 0

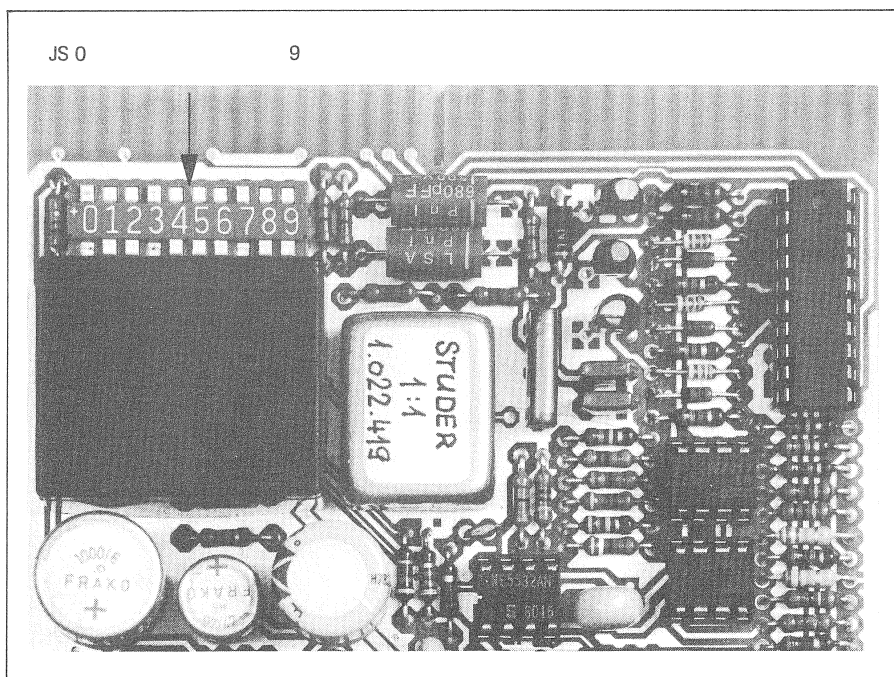
JS 1 = 0

JS 2 ... JS 9: VU-meter panel, mono/stereo switch:

The DIL switches JS2 through JS9 are to be set in accordance with the recorder configuration.

EQUIPMENT	CODE SWITCHES JS:							
	2	3	4	5	6	7	8	9
NO VU PANEL, NO M/S SWITCH	0	1	1	1	0	1	0	1
WITH VU PANEL, NO M/S SWITCH	1	0	1	1	1	0	1	1
NO VU PANEL, WITH M/S SWITCH	0	1	0*	1*	0	1	1	0
WITH VU PANEL, WITH M/S SWITCH	1	0	0*	1*	1	0	0	0

\* This switch position means that RECIN output of the mono/stereo switch can be heard when the output selector is in the INP position; if the input signal of the mono/stereo switch is to be tapped, set JS 4 = 1 and JS 5 = 0.

Note:

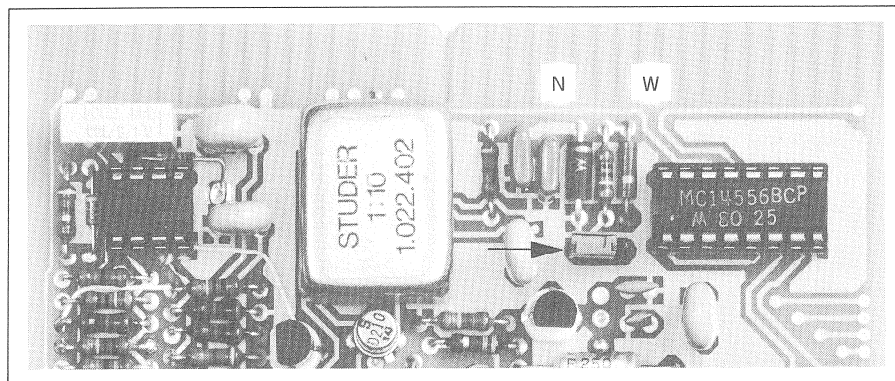
On recorders equipped with a mono/stereo switch, code switch 6 of the COMMAND UNIT must be JS 6 = 1!

#### 4.2.9.4 Jumper REPRODUCE AMPLIFIER

The sync reproduce frequency response can be switched over from 12 kHz to 20 kHz.

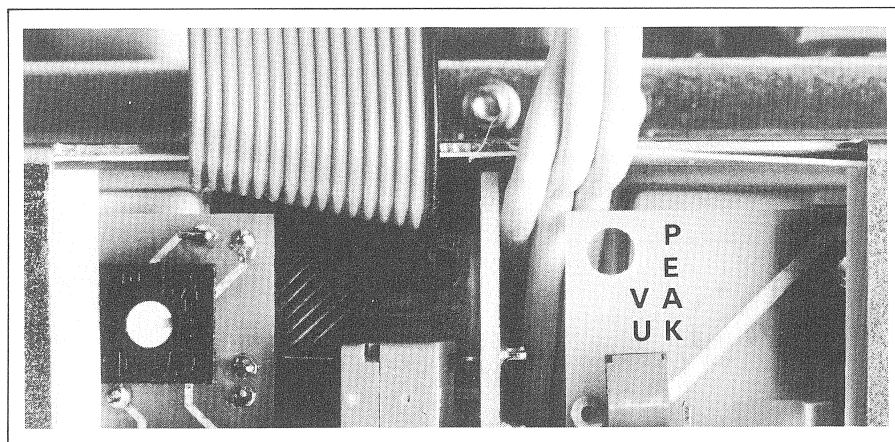
**Note:**

Strong cross talk between the record channel and the sync reproduce channel is to be expected above 12 kHz.



#### 4.2.9.5 Jumper VU-meter amplifier

The indication mode can be selected separately for each meter (VU or PPM) with the jumper on the back of the VU-meter panel.



VU-indication according to IEC recommendation 268, Part 10, Section 4.

Peak program (PPM) indication according to IEC recommendation 268, Part 10, Section 3 (except 24, 1, scale division).

On console versions it is necessary to remove the VU-meter by unfastening the 4 mounting screws (front).

#### 4.2.9.6 Jumper and code switches SERIAL REMOTE CONTROLLER

The jumper on the SERIAL REMOTE CONTROLLER must be in the "X" position on recorders equipped with the MP UNIT 1.810.752 or with the MP UNIT 1.820.780 and for software release date up to 13/83; for the MP UNIT 1.820.780, and software release date 40/85 or later, it must be in the "H" position.

JS 1 = 0 —> BUS DISPLAY off  
JS 1 = 1 —> BUS DISPLAY on

For MP UNIT 1.810.752 and for MP UNIT 1.820.780 with software release date up to 13/83:

JS 2 = 0 —> RS 232  
JS 2 = 1 —> saving data on tape

For MP UNIT 1.820.780 and software date 40/85 and later:

JS 2 = SPARE (not used, automatic switch-over)

JS 3 = SPARE (not used)

JS 4 = 0 —> BUS DISPLAY indicates WRITE signals  
JS 4 = 1 —> BUS DISPLAY indicates READ signals

The code switches JS 5 ... 8 select the assemblies of which the status is to be indicated on the BUS display.

JS 5 = 0 —> Status of COMMAND UNIT suppressed  
JS 5 = 1 —> Status of COMMAND UNIT on BUS DISPLAY

JS 6 = 0 —> Status of TAPE DECK CONTROLLER suppressed  
JS 6 = 1 —> Status of TAPE DECK CONTROLLER on BUS DISPLAY

JS 7 = 0 —> Status of PERIPHERY CONTROLLER suppressed  
JS 7 = 1 —> Status of PERIPHERY CONTROLLER on BUS DISPLAY

JS 8 = SPARE (not used)



#### 4.2.9.7 Code switches SERIAL INTERFACE

A microprocessor RESET must be initiated after the operating parameters are changed with the code switches of the SERIAL INTERFACE.  
Press RESET button of the MP UNIT or turn the power switch off and on again.

The code switches are accessible on the rear of the recorder (on the ADDRESS BOARD).

##### JS 1 ... JS 6:

- Operation with STUDIO bus (JS 7 = 1, JS 8 = 1; see below!):  
JS 1 ... JS 6 = any setting (device address)
- Operation with terminal (RS 232; JS 7 and JS 8 see below!):  
JS 1 ... JS 6 ≠ 100000: ECHO MODE = each character is transmitted back to the terminal  
JS 1 ... JS 6 = 100000: no ECHO MODE  
  
(≠ → not=)
- Saving data (JS 7 = 0, JS 8 = 1; see below!):  
JS 1 ... JS 6 = 000000: SAVE & VERIFY, data to be saved on tape and verified  
JS 1 ... JS 6 = 111111: SAVE & LOAD, data to be saved on tape and loaded

##### JS 7, JS 8: Baud rate

ADDR. BOARD SWITCH	1	2	3	4	5	6	7	8	
9600 Bd with ECHO	0	0	0	0	0	0	0	0	
9600 Bd without ECHO	1	0	0	0	0	0	0	0	
1200 Bd with ECHO	0	0	0	0	0	0	1	0	
1200 Bd without ECHO	1	0	0	0	0	0	1	0	
1200 Bd SAVE & VERIFY	0	0	0	0	0	0	0	1	data saving
1200 Bd SAVE & LOAD	1	1	1	1	1	1	0	1	data saving
300 Bd with ECHO *	1	1	0	0	0	0	0	1	
300 Bd without ECHO *	1	0	0	0	0	0	0	1	

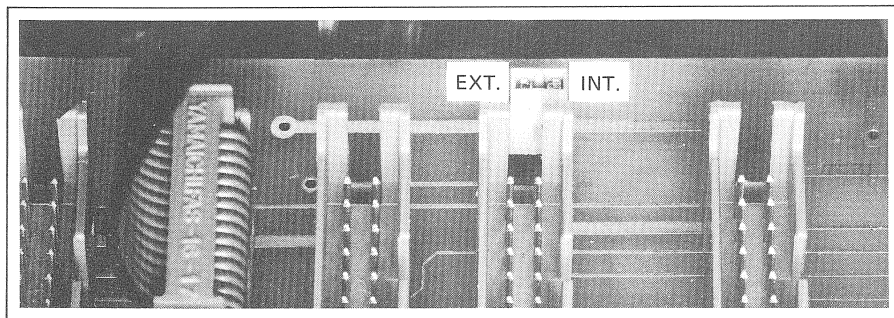
\*DIL 1 ... 6 must be neither 000000 nor 111111 !

#### 4.2.9.8 VU-meter panel internal or external

A jumper on the BUS CONNECTOR board defines whether an internal or external panel is used.

Access to this circuit board is gained by removing the rear panel of the recorder (disconnect power plug before removing the rear panel!).

The jumper must be in the INTERN position if neither a VU-meter panel nor a channel control unit is used!

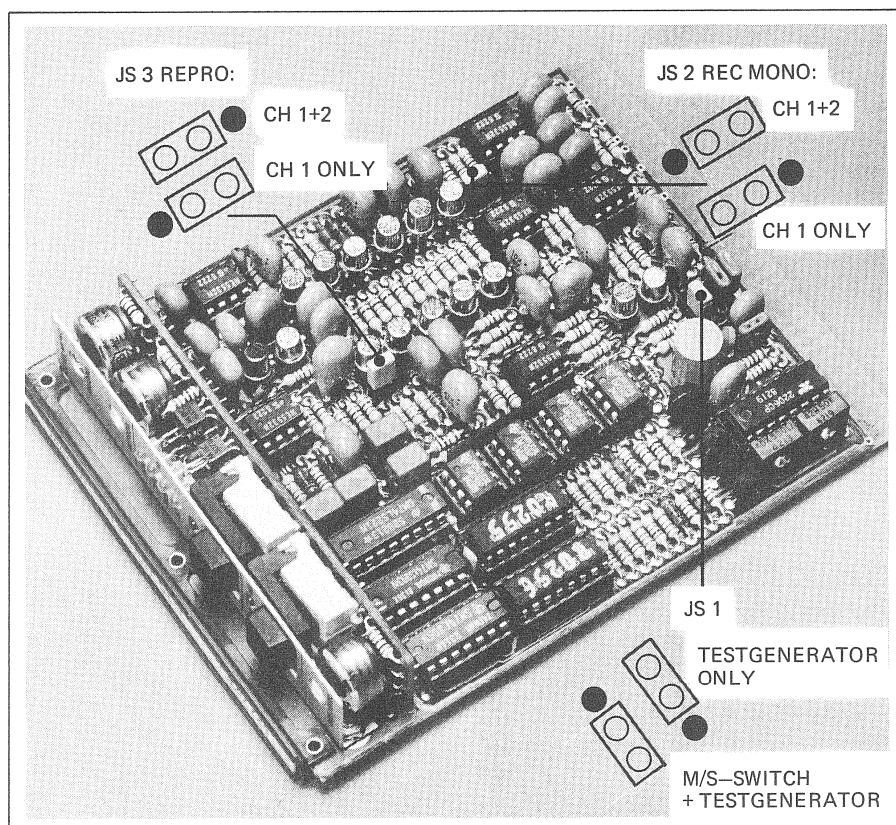


#### 4.2.9.9 Jumpers MONO/STEREO SWITCH and/or TEST GENERATOR

Recorders equipped with a test generator but without mono/stereo switch require the electronics of the mono/stereo switch. In this case the signal TA-ACTMO must be pulled to ground with jumper JS 1. Operation without mono/stereo switch is simulated to the microprocessor so that the mono/stereo switch will not be accessed.

The record mode is defined by jumper JS 2: mono signals are either from the input of channel 1 only or the sum of the inputs channel 1 + 2.

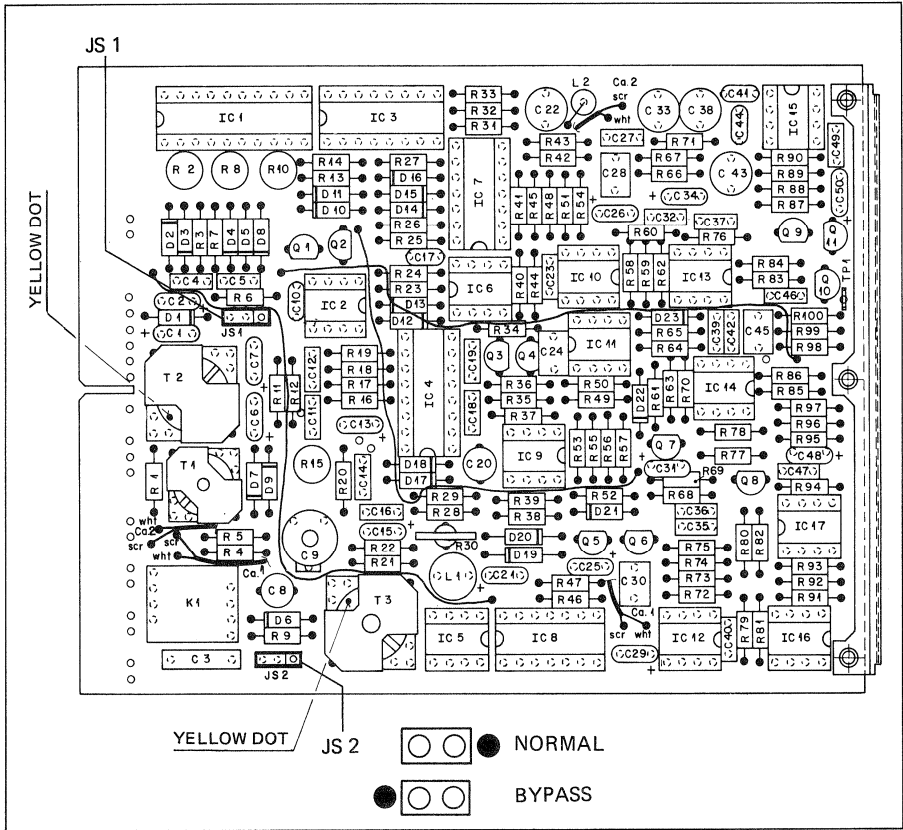
The reproduce mode is defined by jumper JS 3: The aggregate signal of channels 1 + 2 can either be placed on channel 1 or to channels 1 and 2.



4.2.9.10 Jumpers TIME CODE READ/WRITE UNIT

The CODE LEVEL LED can be disabled with jumper JS1.

If the code channel is operated without the CODE DELAY UNIT 1.820.722, the delay input and output must be interconnected. This can be done via the serial remote controller, if configured (2.8.3) or with the jumper JS2 on the CODE READ/WRITE amplifier. In the second case the CODE DELAY UNIT must not be installed!

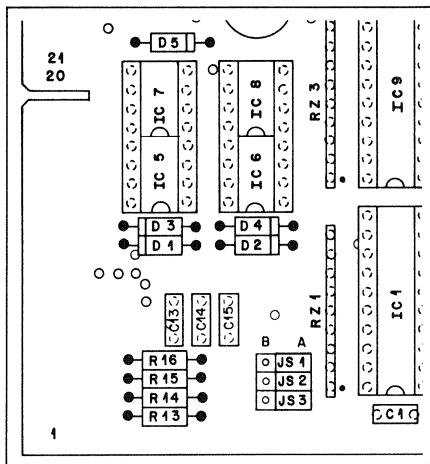


#### 4.2.9.11 Jumpers TAPE DECK CONTROLLER

The jumper JS 1 is not used (SPARE).

The microprocessor controls the display decoder differently, depending on whether a liquid crystal (LCD) or LED tape timer display is installed. This changeover is effected with jumper JS2 (JS2 inserted {position A}: LCD display, JS 2 removed {or in position B}: LED display).

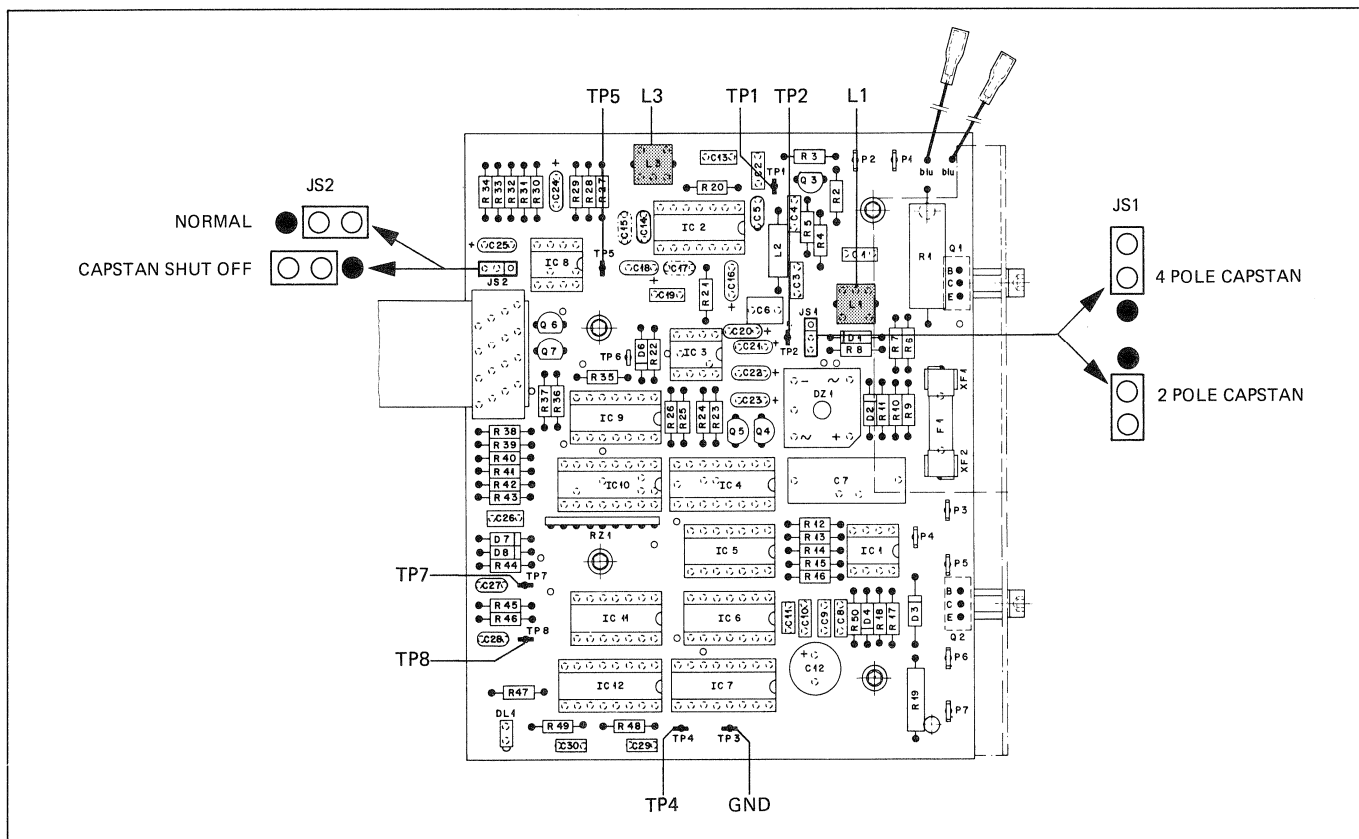
If jumper JS 3 is not inserted (or in position B), various tape transport monitoring functions are suppressed (necessary for mechanical transport adjustments according to Section 3.3).



## 4.2.9.12 Jumpers CAPSTAN MOTOR CONTROL

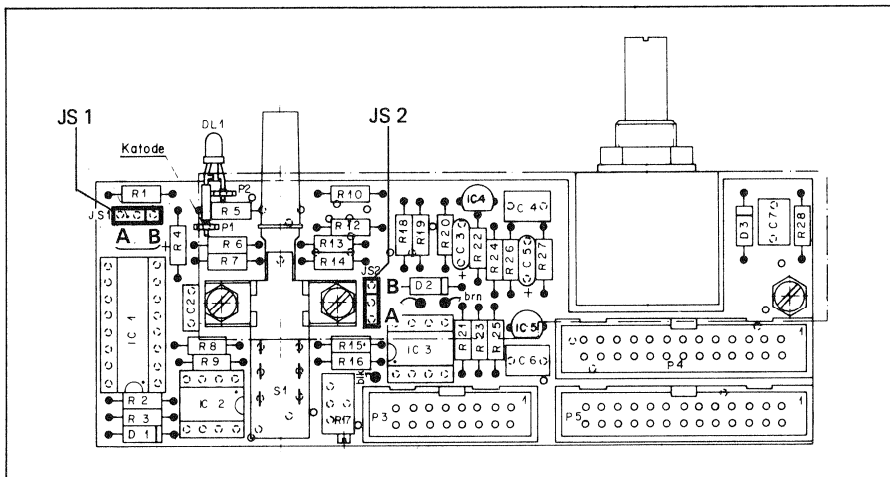
JS 1: This jumper matches the control time constant for the 2-pole or 4-pole capstan motor.

JS 2: This jumper programs the capstan motor to switch off after TAPE OUT (no tape threaded or tape torn) in order to protect the bearings from unnecessary wear.



#### 4.2.9.13 Jumpers VARISPEED CONTROL

- JS 1: Position A: for operation with B67 recorder  
Position B: for operation with A810/A812 recorder
- JS 2: Position A: DL1 turns on when switch S1 is in "ON" position.  
Position B: DL1 turns only on when the capstan speed corresponds to the selected nominal speed.  
(Not possible on A810 because no feedback available).



#### 4.2.9.14 Jumpers TAPE TRANSPORT REMOTE CONTROL

##### 1.328.200

##### Standard varispeed operation with external control frequency via BNC socket

Jumper positions:

1.328.201.00	1.328.201.81	Position
JS 3	JS 1	A
JS 1	JS 2	A
JS 2	JS 3	B

For varispeed mode press the varispeed key or the tape deck remote control: the yellow LED is on.

- The control frequency fed into the BNC socket varies the tape speed (9.6 kHz for nominal speed).
- When no control frequency is available on the BNC socket, the capstan motor slowly decelerates to a standstill when the varispeed button is pressed.

##### Varispeed operation in conjunction with integrated varispeed module

1.810.330.81 (option 20.810.871.00 or 20.810.872.00)

##### 1. Setting (standard)

Jumper positions:

1.328.201.00	1.328.201.81	Position
JS 3	JS 1	A
JS 1	JS 2	A
JS 2	JS 3	B

On the integrated varispeed module 1.810.330.81 the varispeed button must be pressed (red LED is on).

For varispeed operation press the varispeed key of the tape deck remote control, the yellow LED turns on and the speed preset on the integrated varispeed module 1.810.330.81 is implemented. If the varispeed button is pressed a second time, the capstan is reset to the nominal speed.

##### Note:

Also on the integrated varispeed module 1.810.330.81 it is possible to change over between varispeed mode and normal mode, regardless of the varispeed key position of the tape deck remote control!

- If the varispeed key on the integrated varispeed module is not pressed (red LED off), the capstan motor slowly decelerates to a standstill when the varispeed button of the tape deck remote control is pressed.

If a control frequency is also available on the BNC socket (9.6 kHz for nominal speed), the following functions are possible:

- 1) Integrated varispeed module 1.810.330.81 switched off (red LED off).  
The tape speed is determined by the external control frequency when the varispeed button of the tape deck remote control is pressed.
- 2) Varispeed key of the tape deck remote control not pressed (yellow LED off). When the varispeed key of the integrated varispeed module 1.810.330.81 is pressed (red LED on), the tape speed is determined by the potentiometer setting.

**Important:**

If both keys are activated simultaneously (on the varispeed module and on the remote control), the two signals are mixed which means that an illegal condition results!

## 2. setting (without external control frequency):

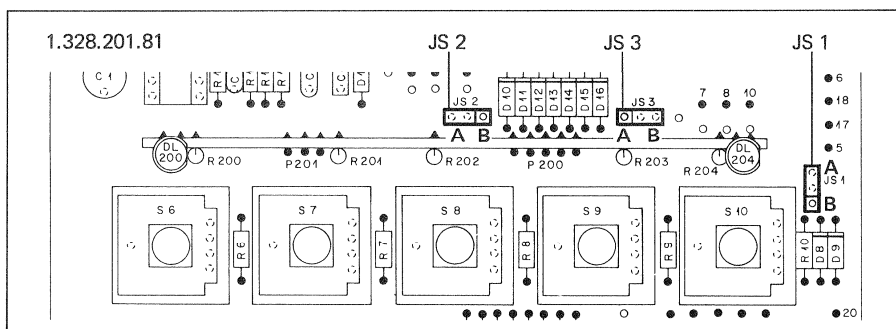
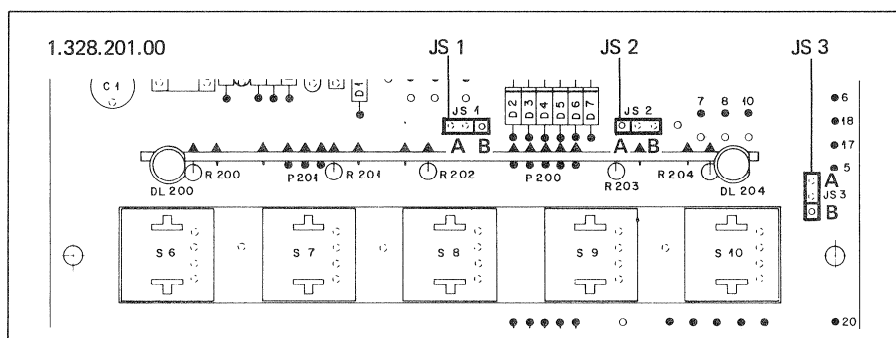
Jumper positions:

1.328.201.00	1.328.201.81	Position
JS 3	JS 1	B
JS 1	JS 2	B
JS 2	JS 3	A

When the varispeed button of the integrated module is pressed, the yellow varispeed LED of the integrated varispeed module turns on regardless of the own push button position. The LED indicates the availability of an external capstan frequency (from the integrated varispeed module 1.810.330.81). The recorder runs with the speed defined by the potentiometer setting. If the varispeed key of the remote control unit is pressed, the recorder switches back to the nominal speed.

From this moment the varispeed key of the tape deck remote control has the following function:

- When this key is held down, the recorder switches to the speed set with the integrated varispeed module
- When this key is released, the recorder switches back to the nominal speed.





**BIAS ADJUSTMENTS**

Type of tape	$\Delta U$ [dB]			
	9,5 cm/s 3.75 ips	19 cm/s 7.5 ips	38 cm/s 15 ips	76 cm/s 30 ips
Agfa PEM 468	6	6	3.5	1.5
Agfa PER 525	6	6	3	1
Agfa PER 528	6	6	3.5	1.5
Ampex 406	6	5	3	1.5
Ampex 456 GRAND MASTER	5	6.5	3.5	1.5
BASF LGR 30P	6	6	4	1.5
BASF LGR 50P	6	6	4	1.5
BASF SPR 50LH/50LHL	6	5.5	3.5	1.5
BASF STUDIO MASTER 910	5	6	4.5	1.5
EMI 816/817	6	6.5	4	1.5
PYRAL CJ90	6	6.5	3.5	1.5
SCOTCH (3M) 206	5.5	5.5	3	1.5
SCOTCH (3M) 226	6	6	3.5	1.5
SCOTCH (3M) 250	5	6	3.5	1
SCOTCH (3M) 256	6	6.5	3.5	1
SCOTCH (3M) 263	6	6	3	1

## SECTION 5 GENERAL DIAGRAMS (Power supply and control logic)

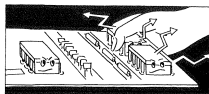
5.1	WIRING	5/1
5.1.1	Groups	5/1
5.1.2	Elements, connecting points	5/1
5.1.3	Main connection types	5/2
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5.1.5	Explanations to LOCATION PIN LIST	5/3
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5.2	SIGNAL NAMES	5/5
5.3	LOCATION PIN LIST, LOCATION SUMMARY	5/10
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5.5  
GENERAL DIAGRAMS

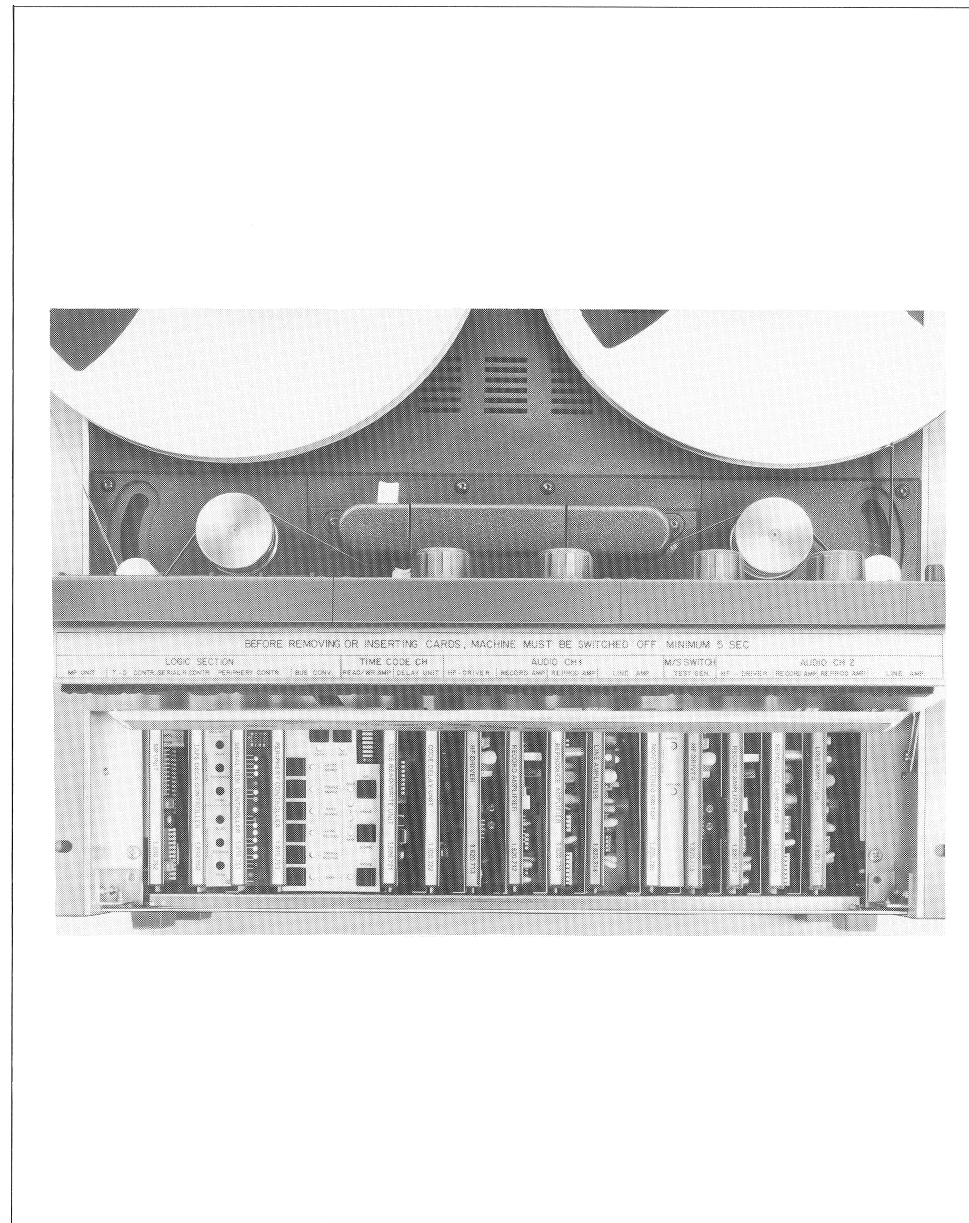
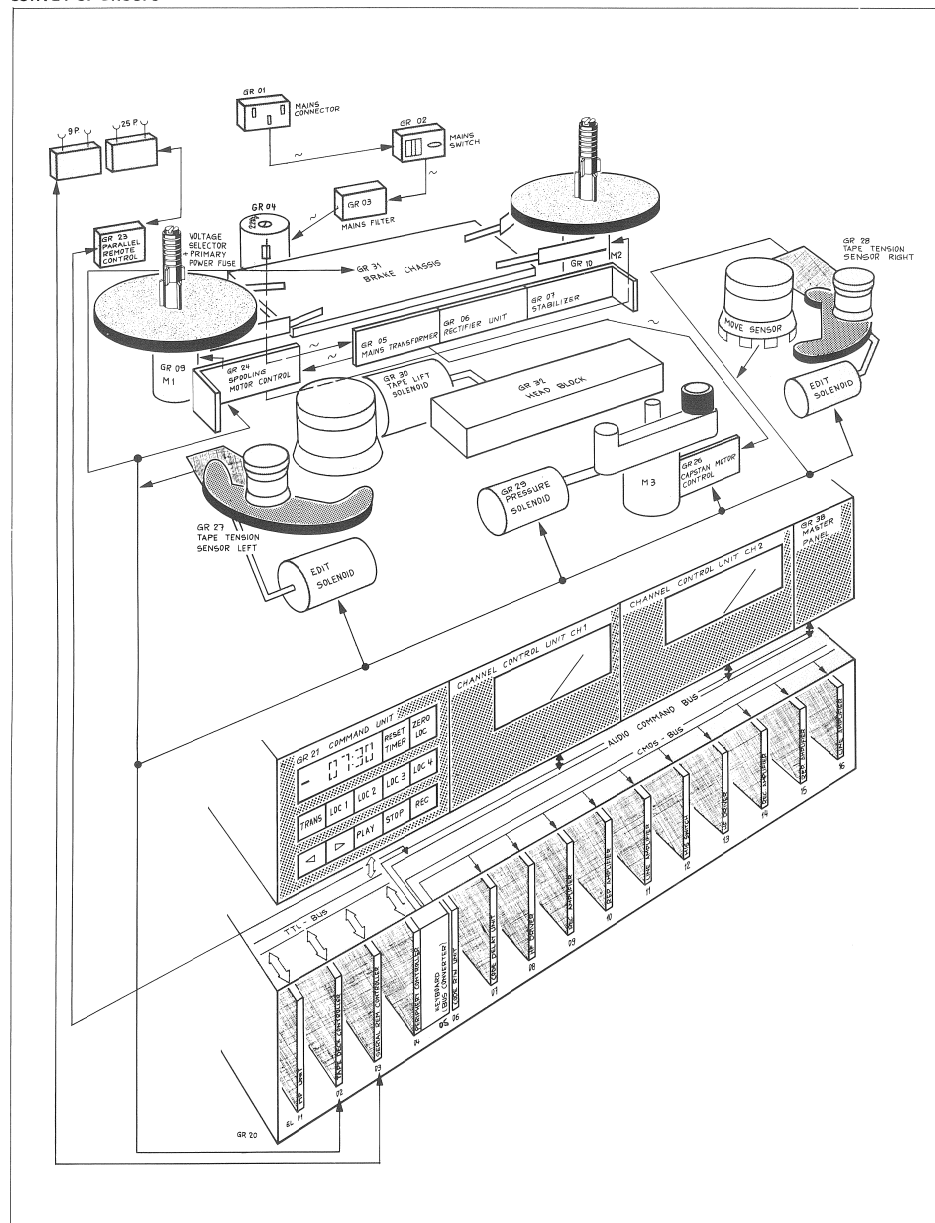
UNIT	PART NUMBER	GR/EL	PAGE
BLOCK DIAGRAM A810			5/33
SURVEY OF GROUPS			5/34
POWER SUPPLY	1.810.210-00	01...06	5/35
STABILIZER PCB	1.810.770-00	07	5/39
STABILIZER PCB	1.810.770-81	07	5/41
BASIS PCB	1.810.700-00/-81	20	5/43
BUS CONNECTOR PCB	1.810.701-00	25	5/45
MP UNIT A810 PCB	▲ 1.810.752-00	20/01	5/47
MP UNIT A810 PCB	▲ 1.820.780-00	20/01	5/49
- MP UNIT PCB	▲ 1.820.752-00		5/49
- SOFTWARE A810	▲ 1.100.521-00		5/50
MP UNIT A810 PCB	▲ 1.820.780-81	20	5/51
-MP UNIT PCB	▲ 1.820.752-81/-82		5/51
- SOFTWARE A810	▲ 1.100.521-00		5/52
TAPE DECK CONTROLLER PCB	1.810.750-00/-81	20/02	5/53
- TAPE TENSION ADJUST PCB	1.810.725-00		5/55
COMMAND UNIT PCB (LCD)	▲ 1.810.734-00	21	5/57
- DISPLAY PCB (LCD)	▲ 1.810.736-00	21/01	5/59
- LED DRIVER PCB (BASIC FUNCTIONS)	1.810.737-00		5/65
- LED DRIVER PCB (EXTENDED FUNCTIONS)	1.810.735-00		5/65
COMMAND UNIT PCB (LED OR LCD)	▲ 1.810.767-00	21	5/61
- DISPLAY PCB (LED)	▲ 1.810.768-00	21/01	5/63
- LED DRIVER PCB (BASIC FUNCTIONS)	1.810.737-00		5/65
- LED DRIVER PCB (EXTENDED FUNCTIONS)	1.810.735-00		5/65
PARALLEL REMOTE CONTROLLER PCB	1.810.738-00	23	5/67
- ADDRESS PCB	1.810.739-00		5/67
SERIAL REMOTE CONTROLLER PCB	1.810.751-00	20/03	5/69
- BUS DISPLAY PCB	1.810.757-00		5/69
PERIPHERY CONTROLLER	▲ 1.810.753-00	20/04	5/71
- PERIPHERY CONTROLLER PCB	▲ 1.810.756-00		5/71
- AUDIO ADJUSTMENT KEYBOARD PCB	1.810.755-00		5/71
BUS CONVERTER PCB	▲ 1.810.754-00	20/05	5/73
MASTER UNIT, 2 SPEEDS	1.810.310-81	38	5/75
OR			
MASTER & MONITOR CONTROL UNIT, 2 SP.	1.810.315-81	38	5/75
- MASTER SWITCHING PCB, 2 SPEEDS	1.810.732-00		5/75
- MASTER CONTROL PCB, 2 SPEEDS	1.810.733-00		5/75
MASTER UNIT, 3 SPEEDS	▲ 1.810.312-00	38	5/79
OR			
MASTER UNIT, 4 SPEEDS	▲ 1.810.305-00	38	5/79
OR			
MASTER & MON. CTRL. UNIT, 3 SP.	▲ 1.810.317-00	38	5/79
OR			
MASTER & MON. CTRL. UNIT, 4 SP.	▲ 1.810.307-00	38	5/79
- MASTER SWITCHING PCB, 3/4 SPEEDS	▲ 1.810.764-00		5/79
- MASTER CONTROL PCB, 3/4 SPEEDS	1.810.765-00		5/79
DISTRIBUTION PCB (EXT. VU PANEL)	1.810.720-00	90	5/83
NOISE REDUCTION SYSTEM CONTROL PCB	1.810.763-00/-81	90/02	5/84
PARALLEL REMOTE CONTROL PCB	1.328.201-00		5/85
PARALLEL REMOTE CONTROL PCB	1.328.201-81		5/87



ALL PCBs MARKED WITH THIS SIGN ▲  
CONTAIN COMPONENTS SENSITIVE TO  
STATIC CHARGES.  
PLEASE, REFER TO PREFACE BEFORE  
YOU REMOVE THESE BOARDS.



## SURVEY OF GROUPS



## 5.1

### WIRING

Wiring diagrams for equipment with complex electronic circuits are difficult to follow and can lead to misinterpretations. Our documentation is, therefore, based on computer wiring lists. They give complete information on each electrical connection within the equipment.

To make the documentation more understandable, the power supply, the controls, the tape transport control, and the audio section have been split into groups (GR) and the groups into elements (EL) and connecting points (PT).

The signals are referred to by names that have been constructed from various abbreviations and from which the corresponding function can be recognized.

#### 5.1.1

##### Groups

The electrical hardware of the A810 recorder is subdivided into 37 groups (GR). These groups are interconnected by cables and connectors that are identified with the corresponding group number. The group arrangement and the main interconnections are listed in the survey of groups (fold-out page on the left) and the block diagram (Section 5/33).

#### 5.1.2

##### Elements, connecting points

Groups that comprise multiple PCBs or other elements are subdivided into elements (EL). The connecting points (PT) are located on the elements.

## 5.1.3

## Main connection types

Type	Description	STUDER No.
A	Connector, D-type, crimp:	
AA	contact pin, for thin stranded wires	54.02.0451
B	contact pin, for heavy stranded wires	54.02.0455
BB	contact socket, for thin stranded wires	54.02.0450
	contact socket, for heavy stranded wires	54.02.0454
C	CIS connector:	
D	contact socket	54.01.0402
	contact pin	54.01.0401
F	MOLEX connector:	
FF	contact socket, for thin stranded wires	54.02.0412
	contact socket, for heavy stranded wires	54.02.0413
G	Solder hook	29.21.6002
H	Wire/stranded wire, tinned (6 mm)	--.---.----
I	Connector, D-type, crimp, contact pin	54.02.1112
JM	Flat connector AMP FASTON, crimp,	
J	0.8 * 6.3 mm:	
JJ	contact, female, for thin stranded wire	54.02.0337
	contact, female, for heavy stranded wire	54.02.0332
	contact, female, for very heavy stranded wire	54.02.0338
K	Wire/stranded wire, stripped 8mm, tinned 1mm	--.---.----
L	Wire/stranded wire, tinned 4mm	--.---.----
M	MOLEX contact pin, for thin stranded wire	54.02.0411
MM	MOLEX contact pin, for heavy stranded wire	54.02.0410
MY	AMP flat connector (blade)	54.02.0344
N	CIS connector, contact pin	54.01.0225
O	Contact spring to EURO card connector strip	54.01.0376
P	PCB contact strip:	
PP	contact strip, for thin stranded wire	54.06.4512
	contact spring, for heavy stranded wire	54.06.4510
Q	Socket strip, contact socket	54.01.0451
R	Connector, D-type, crimp, contact socket	54.02.1111
S	Wire/stranded wire, stripped 4mm and tinned	--.---.----
T	TERMI-POINT connector on WIRE WRAP post	--.---.----
U	Detent-spring solder contact, crimp	54.03.0201
UU	detent-spring solder contact, crimp	54.34.6002
V	Contact, female, for heavy stranded wire	54.02.0432
VV	contact, female, for thin stranded wire	54.02.0474
W	Wrapped	--.---.----
X	Flat connector AMP FASTON, crimp,	
XX	0.5 * 2.8 mm:	
	contact, female, for thin stranded wire	54.02.0325
	contact, female, for heavy stranded wire	54.02.0329
Y	Flat connector AMP FASTON, crimp,	
YY	0.8 * 2.8 mm:	
	contact, female, for thin stranded wire	54.02.0326
	contact, female, for heavy stranded wire	54.02.0327
Z	Not tinned	--.---.----

5.1.4

Wire labeling, color scheme

The most important leads of the wiring are labeled. Two numbers can be found on the end of each wire: these specify the element of the group and the corresponding connecting point.

Example:

Tape move sensor GR 28, EL 05. Conductor color: orange. This wire carries the identification 5 - 4. This means that the orange wire is connected to point 04 of element 05.

Color scheme

0	black	(blk)
1	brown	(brn)
2	red	(red)
3	orange	(org)
4	yellow	(yel)
5	green	(grn)
6	blue	(blu)
7	violet	(vio)
8	grey	(gry)
9	white	(wht)
-	uncolored	(unc)

5.1.5

Explanations to LOCATION PIN LIST

This list is arranged by group. If the group number or group designation is known, further information can be found by consulting this list.  
If only the signal name is known, consult the SIGNAL WIRE LIST (refer to 5.1.6 or 5.5).

The LOCATION PIN LIST is arranged by group number from GR 01 to GR 91.

Example: (refer to Section 5/17, LOCATION PIN LIST p. 17)

```

GR: 28      1.810.728.00                                <---  GROUP
TAPE TENSION UNIT RIGHT
*****
...
...
...

EL: 05  MOVE SENSOR                                WIRE FIELD  <---  ELEMENT
-----
TYPE PT  LV  SIG.NAME  COLOR F   X   Y
-----
U      01  0   + 0.0    0
U      02  0   + 5.6    2
U      03  0   T-CLK1   1
U      04  0   T-CLK2   3

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Group:  
GR 28, 1.810.728.00  
TAPE TENSION UNIT RIGHT

Element:  
EL 05 MOVE SENSOR

Wiring:  
In the wiring matrix (stranded wire is soldered directly to the board).

Type of connection:  
U (detent spring solder contact).

Connecting point:  
04

Signal name  
T-CLK2

Color  
3 (orange)

5.1.6  
Explanations to SIGNAL WIRE LIST

This list is arranged by signal name. If the signal name is known, further information can be obtained by consulting this list. If only the group designation or the group number are known, consult the LOCATION PIN LIST (refer to 5.1.5 or 5.4).

The SIGNAL WIRE LIST is arranged in alphabetic order by signal name (the signal names of the neutrals and the supply voltages are at the top of this list).

The signal names are listed in the first column which also specifies the color. The second and third columns specify the connecting point of the corresponding group and element on which the signal is available.

Example (refer to Section 5/29, SIGNAL WIRE LIST, p. 40)

SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT
...							
...							
...							
T-CLK2			20	02	02		CONN. TAPE DECK CONTROLLER J02
			20	20	16		CONN. SPOOLING MOTOR CONTR. P01
			24	01	16		FROM GR 20, EL 20
			24	03	14		CONN. TAPE TENS. UNIT, RIGHT J03
			28	01	14		FROM GR 24, EL 03 J01
	3	N	28	04	04		CONN. MOVE SENSOR J03
	3	U	28	05	04		MOVE SENSOR WIRE FIELD
...							
...							
...							

Signal name:  
T-CLK2

Color:  
3 (orange)

Connection type:  
U (detent spring solder contact), soldered directly into wiring matrix of  
MOVE SENSOR

## Signal path:

The signal is conducted from  
 MOVE SENSOR, wiring matrix, (GR 28, EL 05, PT 04)  
 with a C1S connector (connection type N) to  
 GR 28, EL 04, PT 04 (TAPE TENSION BOARD RIGHT), on this board to  
 GR 28, EL 01, PT 14 (solder terminal for flat cable)  
 through the flat cable to  
 GR 24, EL 03, PT 14 (SPOOLING MOTOR CONTROL, flat-cable connector)  
 etc.

## 5.2

## SIGNAL NAMES

-----

(T = TTL, C = CMOS)

```
+ 0.0      0
0.0 VCU    0
+ 5.6      0
+ 5V-LED    0
+110.0     0
+15.0      0
+24.0      0
-15.0      0
```

```
-----
ACA      0 AC supply voltage, pole A
ACAF     0 AC supply voltage after fuse
ACB      0 AC supply voltage, pole B
ACC      0 AC supply voltage, pole C (C=medium)
ACM      0 Motor AC voltage
AFCSW-XY 0 Audio frequency current switch,      1 @ record current on
AN-POT   0 DC Varispeed control
AN-RFTTL 0 Reference tape tension, left (analog)
AN-RFTTR 0 Reference tape tension, right (analog)
AN-TACHO 0 Tacho sensor capstan motor
AN-TTL   0 Tape tension, left (analog)
AN-TTR   0 Tape tension, right (analog)

B-BDY-XY 0 Control of Dolby NRS,                0 @ processor on input
B-CCIR   0 LED on master panel
B-CH1    0 LED on key board for audio alignment, 0 @ on
B-CH2    0 LED on key board for audio alignment, 0 @ on
B-FAD     0 LED on command unit
B-FAST    0 LED on master panel
B-FORW    0 LED on command unit
B-INP-XY 0 LED on channel control
B-LED0    0 LED on key board for audio alignment, 0 @ on
B-LED1    0 LED on key board for audio alignment, 0 @ on
B-LED2    0 LED on key board for audio alignment, 0 @ on
B-LED3    0 LED on key board for audio alignment, 0 @ on
B-LOC1    0 LED on command unit
B-MONO    0 LED on master panel,                0 @ on
B-NAB     0 LED on master panel,                0 @ on
B-PLAY    0 LED on command unit,                0 @ on
B-REA-XY  0 LED on channel control,             0 @ on
B-REC     0 LED on command unit,                0 @ on
B-REC-XY  0 LED on channel control,             0 @ on
B-REP-XY  0 LED on channel control,             0 @ on
B-REW     0 LED on command unit,                0 @ on
B-SAF-XY  0 LED on channel control,             0 @ on
B-SLOW    0 LED on master panel,                0 @ on
B-STEREO  0 LED on master panel,                0 @ on
B-STORE   0 LED on key board for audio alignment, 0 @ on
B-STOP    0 LED on command unit,                0 @ on
B-SYN-XY  0 LED on channel control,             0 @ on
B-TLC-XY  0 Control of Telcom NRS,              1 @ processor on input
B-TRANSF  0 LED on command unit
B-XKEY    0 LED on command unit
```



B-YKEY	0	LED on command unit	
B-ZKEY	0	LED on command unit	
BIASA-XY	0	Bias driver, HF-switch	
BIASB-XY	0	Supply voltage for bias driver	
BIASC-XY	0	Bias driver, HF-switch	
BR-FAD	0	Parallel remote control LED	
BR-FORW	0	Parallel remote control LED	
BR-PLAY	0	Parallel remote control LED	
BR-REC	0	Parallel remote control LED	
BR-REW	0	Parallel remote control LED	
BR-STOP	0	Parallel remote control LED	
BRC-BIA	0	LED on key board for audio alignment (rec. bias)	0 @ on
BRC-LVL	0	LED on key board for audio alignment (rec. level)	0 @ on
BRC-TRB	0	LED on key board for audio alignment (rec. treble)	0 @ on
BRP-BAS	0	LED on key board for audio alignment (repr. bass)	0 @ on
BRP-LVL	0	LED on key board for audio alignment (repr. level)	0 @ on
BRP-TRB	0	LED on key board for audio alignment (repr. treble)	0 @ on
CA-ADR-R	0	CMOS bus LSB address	
CA-ADR-S	0	"	
CA-ADR-T	0	"	
CA-ADR-U	0	CMOS bus MSB address	
CA-BADXY	0	Bias adjustment enable,	0 @ write
CA-BATXY	0		
CA-BIAXY	0	Bias soft switching,	1 @ bias soft switch on
CA-BIKXY	0	Bias switching,	1 @ bias switches on
CA-BPDTX	0	Bypass delay time code,	1 @ by pass
CA-CHSTC	0	Time-code	
CA-CHSXY	0	Channel select, CMOS bus	0 @ select on for write
CA-DATA0	0	Data line, CMOS bus	
CA-DATA1	0	Data line, CMOS bus	
CA-DATA2	0	Data line, CMOS bus	
CA-DATA3	0	Data line, CMOS bus	
CA-DATA4	0	Data line, CMOS bus	
CA-DATA5	0	Data line, CMOS bus	
CA-DATA6	0	Data line, CMOS bus	
CA-DATA7	0	Data line, CMOS bus	
CA-EQLXY	0	Switching equalization, low frequency,	
CA-EQLXY	1	0 @ 3180 us on, =NAB, 1=CCIR	
CA-EQRXY	0	Equalization record adjustment enable,	0 @ write
CA-EQTXY	0		
CA-ERAXY	0	Erase soft switching,	1 @ erase soft switch on
CA-ERKXY	0	Erase switching,	1 @ erase switch on
CA-ER1XY	0	Erase voltage	
CA-ER2XY	0	Erase voltage	
CA-ER3XY	0	Erase voltage	
CA-ER4XY	0	Erase voltage	
CA-INPXY	0	Input signal on output,	0 @ input on
CA-LERXY	0	Level record adjustment enable,	0 @ write
CA-LETXY	0	Level tape adjustment enable	0 @ write
CA-LLADB	0	Operating line level 10 dBm,	1 @ on
CA-LL0DB	0	Operating line level 0 dBm,	1 @ on
CA-LL4DB	0	Operating line level 4 dBm,	1 @ on
CA-LL8DB	0	Operating line level 8 dBm,	1 @ on
CA-LSBTC	0	Data load LSB time code,	1 @ load
CA-LSWXY	0	Line amplifier switching,	1 @ write
CA-MONO	0	Mono-stereo switch,	0 @ mono mode
CA-MSBTC	0	Data load MSB time code,	1 @ load
CA-MUTXY	0	Muting of line output,	1 @ mute
CA-RSWXY	0	Record switching enable,	1 @ write
CA-RS1TC	0	Read source time code	
CA-RS2TC	0	Read source time code	
CA-SAFE	0	Audio safe, reproduce mode,	1 @ safe
CA-SYNXY	0	Sync signal on output,	0 @ Sync on
CA-TRRXY	0	Treble record adjustment enable,	0 @ write
CA-TRTXY	0	Treble tape adjustment enable,	0 @ write
CA-WL0TC	0	Write level time code	
CA-WL1TC	0	Write level time code	
CA-WL2TC	0	Write level time code	
CA-WL3TC	0	Write level time code	
CA-WRTTC	0	Write time code,	1 @ write
CTS	0		

EQUAL-XY 0  
 ERACS-XY 0 Erase current off, 0 @ current off  
 ERAHH-TC 0 Erase head, high, time-code  
 ERAHH-XY 0 Erase head, high  
 ERAHL-TC 0 Erase head, low, time-code  
 ERAHL-XY 0 Erase head, low  
 ERAHM-XY 0 Erase head, medium  
 ERAHO-XY 0 Erase head, screen  
  
 FAD1 0 Fader start, 5 V to 30 V @ PLAY  
 FAD2 0 Fader start, 5 V to 30 V @ PLAY  
  
 GND 0 Ground  
  
 INPAD-XY 0 Input, adjusted  
 INPAU-XY 0 Input, uncalibrated  
 INPDI-XY 0 Input, direct  
  
 K-BRAKE 0 Brake solenoid  
 K-EDIT 0 Edit solenoids  
 K-LIFT 0 Lift solenoid  
 K-PRESS 0 Press solenoid  
 K-REC-XY 0 Record relay / sync muting, 0 @ record on / sync muting  
  
 LINE1 0 Power line  
 LINE2 0 Power line  
 LINFA-TC 0 Time code line input, amplifier (wire A)  
 LINFA-XY 0 Line input, amplifier (wire A)  
 LINFB-TC 0 Time code line input, amplifier (wire B)  
 LINFB-XY 0 Line input, amplifier (wire B)  
 LINSB-TC 0 Time code line input, machine (wire A)  
 LINSB-XY 0 Line input, machine (wire A)  
 LINSB-TC 0 Time code line input, machine (wire B)  
 LINSB-XY 0 Line input, machine (wire B)  
 LOUFA-TC 0 Time code line output, amplifier (wire A)  
 LOUFA-XY 0 Line output, amplifier (wire A)  
 LOUFB-TC 0 Time code line output, amplifier (wire B)  
 LOUFB-XY 0 Line output, amplifier (wire B)  
 LOUSA-TC 0 Time code line output, machine (wire A)  
 LOUSA-XY 0 Line output, machine (wire A)  
 LOUSB-TC 0 Time code line output, machine (wire B)  
 LOUSB-XY 0 Line output, machine (wire B)  
  
 MONIT-XY 0 Monitor signal  
 MONITAMP 0 Monitor signal, from volume control  
  
 PRIMW-1 0 Mains transformer, primary  
 PRIMW-2 0 Mains transformer, primary  
 PRIMW-3 0 Mains transformer, primary  
 PRIMW-4 0 Mains transformer, primary  
 PRIMW-5 0 Mains transformer, primary  
 PRIMW-6 0 Mains transformer, primary  
 PRIMW-7 0 Mains transformer, primary  
  
 RCCOMM 0  
 RCVDATA 0  
 RECHH-TC 0 Record head, high, time-code  
 RECHH-XY 0 Record head, high  
 RECHL-TC 0 Record head, low, time-code  
 RECHL-XY 0 Record head, low  
 RECIN-XY 0 Record amplifier, input  
 REPHH-TC 0 Reproduce head, high, time-code  
 REPHH-XY 0 Reproduce head, high  
 REPHL-TC 0 Reproduce head, low, time-code  
 REPHL-XY 0 Reproduce head, low  
 REPRE-XY 0  
 REPRO-XY 0  
 S-AKBENA 0 Audio parameter keyboard enabled @ 1  
 S-CADEQU 0 Common adjust for equalization (CCIR levels = NAB levels)  
 S-EHEAD1 0 Type of erase head {AB=10 @ full track, AB=11 @ time code  
 S-EHEAD2 0 {AB=01 @ two track, AB=00 @ record def.  
 S-EQUAL 0  
 S-FORW 0 0 @ FORWARD command  
 S-INP-XY 0 0 @ INPUT command  
 S-LINE1 0 Power line from mains switch  
 S-LINE2 0 Power line from mains switch

S-LINELA 0 Line operating level setting { AB=00 @ 0 dBm, AB=10 @ 4 dBm  
 S-LINELB 0 { AB=01 @ 8 dBm, AB=11 @10 dBm  
 S-LLLSDB 0 Line level LSB  
 S-LLMSDB 0 Line level MSB  
 S-LOC1 0 Key on command unit 0 @ LOC1 command  
 S-NABCCI 0 Audio parameter equal. for CCIR and NAB  
 S-PLAY 0 Key on command unit 0 @ PLAY command  
 S-PLCNTR 0 Parallel control of audio channels, 0 @ parallel  
 S-REA-XY 0 Key on channel control 0 @ READY command  
 S-REC 0 Key on command unit 0 @ RECORD command  
 S-RECAPT 0  
 S-REP-XY 0 Key on channel control 0 @ REPRODUCE command  
 S-RESET 0 Key on command unit 0 @ RESET command  
 S-REW 0 Key on command unit 0 @ REWIND command  
 S-SAF-XY 0 Key on channel control 0 @ SAFE command  
 S-SPEEDA 0 0 @ SLOW speed 0 @ on command  
 S-SPEEDB 0 0 @ FAST speed 0 @ on command  
 S-STOP 0 Key on command unit 0 @ STOP command  
 S-SYN-XY 0 Key on channel control 0 @ SYNC command  
 S-TRANSF 0 Key on command unit 0 @ TRANSFER command to LOC memory  
 S-OLOC 0 Key on command unit 0 @ OLOC command  
 S-XKEY 0 Key on command unit 0 @ on command  
 S-YKEY 0 Key on command unit 0 @ on command  
 S-ZKEY 0 Key on command unit 0 @ on command  
 SF-LINE1 0 Power line from mains filter  
 SF-LINE2 0 Power line from mains filter  
 SHIELD 0  
 SNCOMM 0  
 SNDATA 0  
 SR-FORW 0 0 @ FORWARD command from remote control  
 SR-LIFT 0 0 @ LIFTER command from remote control  
 SR-LOC1 0 0 @ LOC1 command from remote control  
 SR-PLAY 0 0 @ PLAY command from remote control  
 SR-REC 0 0 @ RECORD command from remote control  
 SR-REW 0 0 @ REWIND command from remote control  
 SR-STOP 0 0 @ STOP command from remote control  
 SR-TRANS 0 0 @ TRANSFER command from remote control  
 SR-VRSPD 0 0 @ VARISPEED command from remote control  
 STABIN-1 0 Stabilizer input  
 STABIN-3 0 Stabilizer input  
 STABIN-4 0 Stabilizer input  
 STABIN-5 0 Stabilizer input  
 STABIN-6 0 Stabilizer input  
 STUBUS1 0 STUDER bus line symmetrical  
 STUBUS2 0 STUDER bus line symmetrical  
 SYNHH-XY 0 Record head, high, sync mode  
 SYNHL-XY 0 Record head, low, sync mode  
 SYPRE-XY 0  
  
 T-ACSTR 0 Audio controller strobe  
 T-ADOPT1 0 Audio VU-panel int/ext 1 @ VU-panel external  
 T-ADRX 0 Address bus, microprocessor bus TTL  
 T-ADRY 0 Address bus, microprocessor bus TTL  
 T-ADRZ 0 Address bus, microprocessor bus TTL  
 T-BUSSW 0  
 T-CAPON 0 Capstan control on/off 0 @ on  
 T-CLK1 0 Clock 1 from tape move sensor  
 T-CLK2 0 Clock 2 from tape move sensor  
 T-CTS 0  
 T-CUSTR 0 Command unit strobe  
 T-DATA0 0 Data bus  
 T-DATA1 0 Data bus  
 T-DATA2 0 Data bus  
 T-DATA3 0 Data bus  
 T-DATA4 0 Data bus  
 T-DATA5 0 Data bus  
 T-DATA6 0 Data bus  
 T-DATA7 0 Data bus  
 T-DIR 0 Tape move direction 1 @ forward  
 T-DRVENB 0 Drivers ser. IF enable/disable 0 @ drivers enabled  
 T-DT-CH1 0 Data for channel 1, MUX bus  
 T-DT-CH2 0 Data for channel 2, MUX bus  
 T-DT-CH3 0 Data for channel 3, MUX bus  
 T-DT-MP 0 Data for master panel, MUX bus  
 T-DT-RES 0 Available data line  
 T-DT-RP1 0 Data for parallel remote panel, MUX bus  
 T-DT-RP2 0 Data for parallel remote panel, MUX bus

T-DT-SJM 0 Data for jumpers ser. IF mode control, MUX bus  
 T-ENB 0 Processor's clock (1.2288 MHz)  
 T-IRQ 0 Processor's interrupt line  
 T-LEDL 0 0 @ tape end  
 T-LEDR 0 0 @ tape end  
 T-MODSEL 0  
 T-MONMUT 0 Monitor muting for fader mode, 0 @ monitor muting  
 T-MRS-XY 0 Control of Dolby NRS, 0 @ processor on input  
 T-NMI 0  
 T-NOMSPD 0  
 T-PWRON 0 Power on 1 @ on  
 T-READSL 0 Select read mode, MUX bus  
 T-REFEXT 0 Capstan PLL, external reference (vari-speed)  
 T-REFINT 0 Internal reference for capstan (9.6 kHz)  
 T-REFSEL 0 Speed reference select 0 @ varispeed  
 T-RESET 0 System reset line  
 T-RTS 0  
 T-RVSTR 0  
 T-RW 0 Processor's read/write 1 @ read  
 T-RX 0 Serial IF read line  
 T-SADA 0 Address A, MUX bus  
 T-SADB 0 Address B, MUX bus  
 T-SADC 0 Address C, MUX bus  
 T-SLI 0  
 T-SPDSL 0 Capstan speed select IPS | 30 | 15 | 7.5 | 3.75 |  
 T-SPDSL1 1 Capstan speed select | 0 | 0 | 1 | 1 |  
 T-SPDSL2 0 Capstan speed select | 0 | 1 | 1 | 0 |  
 T-SUPVON 0 Supply voltages on 1 @ on  
 T-SYNCAP 0 Capstan synchronisation 0 @ sync  
 T-TCINDL 0 Time code input delay  
 T-TCOUDL 0 Time code output delay  
 T-TCPRES 0 Time code present  
 T-TDSTR 0 Tape deck controller strobe 0 @ selected  
 T-TENDL 0 Tape end sensor, left 0 @ tape end  
 T-TENDR 0 Tape end sensor, right 0 @ tape end  
 T-TNDL 0  
 T-TNDR 0  
 T-TPSPD1 0 Tape spooling speed  
 T-TPSPD2 0 Tape spooling speed  
 T-TX 0 Serial IF, send line  
 T-VARSPD 0 0 @ external reference for capstan motor control  
 T-WRTSL 0 Write select, MUX bus  
 TA-ACTMO 0 Mono-stereo switch stand by, 0 @ switch missing  
 TA-ACTTC 0 Time code channel record section stand by  
 TA-ACTTC 1 0 @ defect or missing  
 TA-ACTXY 0 Channel record section stand by, 0 @ defect or missing  
 TA-CLK 0 Audio clock (307.2 KHz)  
 TAPAD-XY 0 Tape signal, adjusted  
 TAPAU-XY 0 Tape signal, uncalibrated  
 TAPDI-XY 0 Tape direct  
 TAPLI-XY 0 Check point  
 TAPMS-XY 0 Tape signal, after mono-stereo switch  
 TD-CLK 0 Clock for spooling motor control (76.8 KHz)  
 TD-CLK 0 Tape move clock parallel remote  
 TD-DIR 0 Tape move direction parallel remote  
 TS-ADCH1 0 Audio adjust, channel 1  
 TS-ADCH2 0 Audio adjust, channel 2  
 TS-CH1 0 Key on board for audio alignment, 0 @ on command  
 TS-CH2 0 Key on board for audio alignment, 0 @ on command  
 TS-DOWN 0 Key on board for audio alignment, 0 @ on command  
 TS-STORE 0 Key on board for audio alignment, 0 @ on command  
 TS-UP 0 Key on board for audio alignment, 0 @ on command  
 TSRC-BIA 0 Key on board for audio alignment, 0 @ on command  
 TSRC-LVL 0 Key on board for audio alignment, 0 @ on command  
 TSRC-TRB 0 Key on board for audio alignment, 0 @ on command  
 TSRP-BAS 0 Key on board for audio alignment, 0 @ on command  
 TSRP-LVL 0 Key on board for audio alignment, 0 @ on command  
 TSRP-TRB 0 Key on board for audio alignment, 0 @ on command  
 VU-A-XY 0 VU Meter signal, wire A  
 VU-B-XY 0 VU Meter signal, wire B  
 O-TACHD 0 Tacho sensor capstan motor

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SECTION 5/10

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P A G E 1 O F 46

TITLE: TAPE TRANSPORT & AUDIO CIRCUITS \* STUDER A810 \* 1.810.090.00 INDEX: 0 DATE OF ORIGIN: 81/01/29  
\*\*\*\*\* DATE OF PROC.: 83/02/25

OPTIONS IN EFFECT: LOCLIS, SIGLIS, ALLCOL TOTAL GROUPS: 38  
TOTAL ELEMENTS: 153  
TOTAL PINS: 1980  
TOTAL UNUSED PINS: 213  
MULTIPLE PINS: 0

SIGNALS: TOTAL: 317 GROUP NODE = \*  
USED: 258 INTER GROUP NODE = #  
UNUSED: 59 DIRECT WIRE TO # = <  
WIRING NOT COMPUTED = @

DIAGNOSTICS GENERATED: N O N E

\*\*\*\*\*  
\* STUDER \* L O C A T I O N P I N L I S T \* 83/02/25 \* 08:28 \* P A G E 2 \*  
\*\*\*\*\*  
TAPE TRANSPORT & AUDIO CIRCUITS \* STUDER A810 \* 1.810.090.00 81/01/29

GR: 01 54.04.0109  
POWER INPUT  
\*\*\*\*\*

GR: 02 55.12.0001  
POWER SWITCH  
\*\*\*\*\*

GR: 03 89.01.0384  
MAINS FILTER  
\*\*\*\*\*

EL: 01 CONNECTOR POWER INPUT P01  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
01 0 LINE1 1  
02 0 LINE2 6  
03 0 GND 5/4

EL: 01 POWER SWITCH  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
J 01 0 LINE1 1  
J 02 0 LINE2 6  
J 03 0 S-LINE1 1  
J 04 0 S-LINE2 6

EL: 01 MAINS FILTER, INPUT  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
J 01 0 S-LINE1 1  
J 02 0 S-LINE2 6  
  
EL: 02 MAINS FILTER, OUTPUT  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
J 01 0 SF-LINE1 1  
J 02 0 SF-LINE2 6

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\* STUDER \* L O C A T I O N P I N L I S T \* 83/02/25 \* 08:28 \* P A G E 3 \*  
\*\*\*\*\*  
TAPE TRANSPORT & AUDIO CIRCUITS \* STUDER A810 \* 1.810.090.00 81/01/29

GR: 04 53.03.0130  
MAIN FUSE/VOLTAGE SELECTOR  
\*\*\*\*\*

GR: 05 1.810.200.00  
MAINS TRANSFORMER  
\*\*\*\*\*

GR: 06  
RECTIFIER UNIT  
\*\*\*\*\*

EL: 01 FUSE HOLDER  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
L 01 0 SF-LINE1 1  
  
EL: 02 VOLTAGE SELECTOR  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
L 01 0 SF-LINE2 6+8  
L 02 0 PRIMW-3 3  
L 03 0 PRIMW-7 7  
L 04A 0 PRIMW-4 4+4  
L 04B 0 PRIMW-6 6+4  
L 05 0 PRIMW-1 1  
L 06 0 PRIMW-5 5  
L 07 0 PRIMW-2 2

EL: 01 PRIMARY 1 P01  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
Y 01 0 PRIMW-1 1  
Y 02 0 PRIMW-2 2  
Y 03 0 PRIMW-3 3  
Y 04 0 PRIMW-4 4

EL: 01 FUSE, F 1  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
L 01 0 ACA-25.6 5  
L 02 0 STABIN-1 5

EL: 02 PRIMARY 2 P02  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
Y 05 0 PRIMW-5 5  
Y 06 0 PRIMW-6 6  
Y 07 0 PRIMW-7 7  
Y 08 0 SF-LINE2 8

EL: 02 FUSE, F 2  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
L 01 0 ACA-35.2 7  
L 02 0 ACAF35.2 7

EL: 03 SECONDARY 1 P03  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
09 0  
10 0  
L 11 0 ACC-35.2 4  
Y 12 0 ACA-35.2 7  
L 13 0 ACC-25.6 4  
Y 14 0 ACA-25.6 5  
Y 15 0 ACA-125 2  
L 16 0 ACA-10  
Y 17 0 ACA-10  
L 18 0 ACC-10 4  
Y 19 0 ACA-130 6  
L 20 0 ACC-130 4

EL: 03 SOLDER TERMINAL  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
L 01 0 STABIN-1 5  
L 02 0  
L 03 0 ACB-25.6 4

EL: 04 SECONDARY 2 P04  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
L 09 0 ACC-130 4  
Y 10 0 ACB-130 6  
L 11 0 ACC-10 4  
Y 12 0 ACB-10  
L 13 0 ACB-10  
Y 14 0 ACB-125 0  
Y 15 0 ACB-25.6 4  
L 16 0 ACC-25.6 4  
Y 17 0 ACB-35.2 2  
L 18 0 ACC-35.2 4  
19 0  
20 0

EL: 04 RECTIFIER, D 1  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
J 01 0 STABIN-1 5  
J 02 0 ACB-25.6 4  
J 03 0 STABIN-5 2  
J 04 0 STABIN-6 6

EL: 05 RECTIFIER, D 2  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
J 01 0 ACAF35.2 7  
J 02 0 ACB-35.2 2  
J 03 0 STABIN-4 3  
J 04 0 STABIN-3 1

EL: 06 CAPACITOR, C 2  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
L 01 0 STABIN-5 2  
L 02 0 STABIN-6 6

EL: 07 CAPACITOR, C 3  
-----  
TYPE PT LV SIG.NAME COLOR F X Y  
-----  
L 01 0 STABIN-5 2  
L 02 0 STABIN-6 6

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 \* STUDER \* L O C A T I O N P I N L I S T \* 83/02/25 \* 08:28 \* P A G E 4 \*  
 \*\*\*\*\*  
 TAPE TRANSPORT & AUDIO CIRCUITS \* STUDER A810 \* 1.810.090.00 81/01/29

SECTION 5/11

GR: 06 (CONTINUATION)  
 RECTIFIER UNIT

EL: 08 CAPACITOR, C 1

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01	0	STABIN-4	3			
L	02	0	STABIN-3	1			

GR: 07 1.810.770.00  
 STABILIZER

EL: 01 OUTPUT (TO GR 20, EL 31/32) P01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
F	01	0	+ 0.0	0			
F	02	0	+24.0	7			
F	03	0	+ 5.6	3			
F	04	0	+15.0	2			
F	05	0	+ 0.0	4			
F	06	0	+ 5.6	3			
F	07	0	+ 0.0	0			
F	08	0	+ 0.0	4			
F	09	0	+ 0.0	4			
F	10	0	-15.0	6			
F	11	0	T-PWRON	1			
F	12	0	T-SUPVON	5			

EL: 02 INPUT

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
Y	01	0	STABIN-1	5			
Y	02	0	ACB-25.6	4			
Y	03	0	STABIN-3	1			
Y	04	0	STABIN-4	3			
Y	05	0	STABIN-5	2			
Y	06	0	STABIN-6	6			

GR: 08  
 REAR PANEL

EL: 01 EARTH CONTACT

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	GND				

EL: 02 GROUND

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	GND	5/4			

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 \* STUDER \* L O C A T I O N P I N L I S T \* 83/02/25 \* 08:28 \* P A G E 5 \*  
 \*\*\*\*\*  
 TAPE TRANSPORT & AUDIO CIRCUITS \* STUDER A810 \* 1.810.090.00 81/01/29

GR: 09 1.810.726.00  
 CONNECTOR BOARD SPOOLING MOTOR, LEFT

EL: 01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
Y	01	0	ACML-H	1			
Y	02	0	ACML-H	5			
Y	03	0	ACML-O	4			
Y	04	0	ACML-C	6			
U	05	0	ACML-H	6			
U	06	0	ACML-O	0			
U	07	0	ACML-O	1			
U	08	0	ACML-C	3			

EL: 02 PHASE SHIFT CAPACITOR

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
J	01	0	ACML-O	1			
J	02	0	ACML-C	3			

GR: 10 1.810.727.00  
 CONNECTOR BOARD SPOOLING MOTOR, RIGHT

EL: 01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
Y	01	0	ACMR-H	1			
Y	02	0	ACMR-H	6			
Y	03	0	ACMR-O	4			
Y	04	0	ACMR-C	5			
U	05	0	ACMR-H	4			
U	06	0	ACMR-O	0			
U	07	0	ACMR-O	1			
U	08	0	ACMR-C	3			

EL: 02 PHASE SHIFT CAPACITOR

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
J	01	0	ACMR-O	1			
J	02	0	ACMR-C	3			

GR: 20 1.810.700.00  
 BASIS BOARD

EL: 01 CONNECTOR MPU UNIT J01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0					
	02	0					
	03	0					
	04	0					
	05	0					
	06	0					
	07	0					
	08	0	T-BUSSW				
	09	0	T-NMI				
	10	0	T-RX				
	11	0	T-TX				
	12	0	T-DRVENB				
	13	0	T-IRQ				
	14	0	T-PWRON				
	15	0	T-RVSTR				
	16	0	TD-CLK				
	17	0	T-REFINT				
	18	0	+15.0				
	19	0	KEY				
	20	0	+ 5.6				
	21	0	+ 0.0				
	22	0	TA-CLK				
	23	0	T-CUSTR				
	24	0	T-TDSTR				
	25	0	T-ACSTR				
	26	0	T-RESET				
	27	0	T-RW				
	28	0	T-EVB				
	29	0	T-ADRZ				
	30	0	T-ADRY				
	31	0	T-ADRX				
	32	0	T-DATA7				
	33	0	T-DATA6				
	34	0	T-DATA5				
	35	0	T-DATA4				
	36	0	T-DATA3				
	37	0	T-DATA2				
	38	0	T-DATA1				
	39	0	T-DATA0				

EL: 02 CONV. TAPE DECK CONTROLLER J02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	T-CLK1				
	02	0	T-CLK2				
	03	0	T-TENDL				
	04	0	T-TENDR				
	05	0	T-DIR				
	06	0	T-SUPVON				
	07	0	T-SYNCAP				

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GR: 20 (CONTINUATION)  
BASIS BOARD

EL: 02 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	08	0	T-TPSPD1				
	09	0	T-TPSPD2				
	10	0	T-SPDSL1				
	11	0	T-SPDSL2				
	12	0	T-REFSEL				
	13	0	AN-RFTTL				
	14	0	AN-RFTTR				
	15	0	K-BRAKE				
	16	0	K-LITAB				
	17	0	K-PRESS				
	18	0	+15.0				
	19	0	KEY				
	20	0	+ 5.6				
	21	0	+ 0.0				
	22	0	K-EDIT				
	23	0	T-CAPON				
	24	0	+ 0.0				
	25	0	T-TDSTR				
	26	0	T-RESET				
	27	0	T-RW				
	28	0	T-ENB				
	29	0	T-ADRZ				
	30	0	T-ADRY				
	31	0	T-ADRX				
	32	0	T-DATA7				
	33	0	T-DATA6				
	34	0	T-DATA5				
	35	0	T-DATA4				
	36	0	T-DATA3				
	37	0	T-DATA2				
	38	0	T-DATA1				
	39	0	T-DATA0				

EL: 03 CONN. SERIAL REM. CONTROLLER J03

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	SHIELD				
	02	0	STUBUS2				
	03	0	SNDATA				
	04	0	SNCOMM				
	05	0	RCCOMM				
	06	0	RCVDATA				
	07	0	STUBUS1				
	08	0	GND				
	09	0	SPARE				
	10	0	T-RX				
	11	0	T-TX				
	12	0	T-DRVENB				
	13	0	T-RTS				
	14	0	T-CTS				

GR: 20 (CONTINUATION)  
BASIS BOARD

EL: 03 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	15	0	T-BUSSW				
	16	0	T-RVSTR				
	17	0					
	18	0	+15.0				
	19	0	KEY				
	20	0	+ 5.6				
	21	0	+ 0.0				
	22	0	-15.0				
	23	0	T-CUSTR				
	24	0	T-TDSTR				
	25	0	T-ACSTR				
	26	0	T-RESET				
	27	0	T-RW				
	28	0	T-ENB				
	29	0	T-ADRZ				
	30	0	T-ADRY				
	31	0	T-ADRX				
	32	0	T-DATA7				
	33	0	T-DATA6				
	34	0	T-DATA5				
	35	0	T-DATA4				
	36	0	T-DATA3				
	37	0	T-DATA2				
	38	0	T-DATA1				
	39	0	T-DATA0				

EL: 04 CONN. PERIPHERY CONTROLLER J04

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	T-SADA				
	02	0	T-SADB				
	03	0	T-SADC				
	04	0	T-READSL				
	05	0	T-WRTSL				
	06	0	T-DT-CH1				
	07	0	T-DT-CH2				
	08	0	T-DT-CH3				
	09	0	T-DT-MP				
	10	0	T-DT-RP1				
	11	0	T-DT-RP2				
	12	0	T-DT-SJM				
	13	0	T-DT-RES				
	14	0					
	15	0					
	16	0					
	17	0					
	18	0	+15.0				
	19	0	KEY				
	20	0	+ 5.6				
	21	0	+ 0.0				

GR: 20 (CONTINUATION)  
BASIS BOARD

EL: 04 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	22	0	-15.0				
	23	0					
	24	0					
	25	0	T-ACSTR				
	26	0	T-RESET				
	27	0	T-RW				
	28	0	T-ENB				
	29	0	T-ADRZ				
	30	0	T-ADRY				
	31	0	T-ADRX				
	32	0	T-DATA7				
	33	0	T-DATA6				
	34	0	T-DATA5				
	35	0	T-DATA4				
	36	0	T-DATA3				
	37	0	T-DATA2				
	38	0	T-DATA1				
	39	0	T-DATA0				

EL: 05 CONNECTOR BUS CONVERTOR J05

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01A	0					
	01B	0					
	02A	0					
	02B	0					
	03A	0					
	03B	0					
	04A	0					
	04B	0					
	05A	0					
	05B	0					
	06A	0					
	06B	0	TA-ACTMD				
	07A	0					
	07B	0	TA-ACTO1				
	08A	0					
	08B	0	TA-ACTTC				
	09A	0					
	09B	0	TA-ACTO2				
	10A	0					
	10B	0					
	11A	0					
	11B	0	CA-CHSTC				
	12A	0					
	12B	0	CA-CHSO1				
	13A	0					
	13B	0	CA-MONO				
	14A	0	T-ACSTR				
	14B	0	CA-CHSO2				

GR: 20 (CONTINUATION)  
BASIS BOARD

EL: 05 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	15A	0	+15.0				
	15B	0	+15.0				
	16A	0	+ 0.0				
	16B	0	+ 0.0				
	17A	0	-15.0				
	17B	0	-15.0				
	18A	0	+ 5.6				
	18B	0	+ 5.6				
	19A	0	T-RESET				
	19B	0	TA-CLK				
	20A	0	T-RW				
	20B	0	CA-SAFE				
	21A	0	T-ENB				
	21B	0	CA-ADR-R				
	22A	0	T-ADRZ				
	22B	0	CA-ADR-S				
	23A	0	T-ADRY				
	23B	0	CA-ADR-T				
	24A	0	T-ADRX				
	24B	0	CA-ADR-U				
	25A	0	T-DATA7				
	25B	0	CA-DATA0				
	26A	0	T-DATA6				
	26B	0	CA-DATA1				
	27A	0	T-DATA5				
	27B	0	CA-DATA2				
	28A	0	T-DATA4				
	28B	0	CA-DATA3				
	29A	0	T-DATA3				
	29B	0	CA-DATA4				
	30A	0	T-DATA2				
	30B	0	CA-DATA5				
	31A	0	T-DATA1				
	31B	0	CA-DATA6				
	32A	0	T-DATA0				
	32B	0	CA-DATA7				

EL: 06 CONN. CODE WRITE/READ UNIT J06

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	T-TCINDL				
	02	0	T-TCOUDL				
	03	0					
	04	0	ERAHH-TC 0				
	05	0	ERAHL-TC 6				
	06	0					
	07	0	RECHH-TC 0				
	08	0	RECHL-TC 6				
	09	0					
	10	0	REPHH-TC 0				

GR: 20 (CONTINUATION)  
BASIS BOARD

EL: 06 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	11	0	REPHL-TC 6				
	12	0					
	13	0					
	14	0	T-TCPRES				
	15	0	LINF-A-TC 0				
	16	0	LINF-B-TC 6				
	17	0	LOUFA-TC 0				
	18	0	LOUFB-TC 6				
	19	0	KEY				
	20	0	TA-ACTTC				
	21	0	+ 0.0 S				
	22	0	+15.0				
	23	0	-15.0				
	24	0	+ 5.6				
	25	0	TA-CLK				
	26	0	CA-SAFE				
	27	0	CA-ADR-R				
	28	0	CA-ADR-S				
	29	0	CA-ADR-T				
	30	0	CA-ADR-U				
	31	0	CA-DATA0				
	32	0	CA-DATA1				
	33	0	CA-DATA2				
	34	0	CA-DATA3				
	35	0	CA-DATA4				
	36	0	CA-DATA5				
	37	0	CA-DATA6				
	38	0	CA-DATA7				
	39	0	CA-CHSTC				

EL: 07 CONNECTOR CODE DELAY UNIT J07

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	T-TCINDL				
	02	0	T-TCOUDL				
	03	0					
	04	0					
	05	0					
	06	0					
	07	0					
	08	0					
	09	0					
	10	0					
	11	0					
	12	0					
	13	0					
	14	0	T-TCPRES				
	15	0					
	16	0					
	17	0					

GR: 20 (CONTINUATION)  
BASIS BOARD

EL: 07 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	18	0					
	19	0	KEY				
	20	0	TA-ACTTC				
	21	0	+ 0.0				
	22	0	+15.0				
	23	0	-15.0				
	24	0	+ 5.6				
	25	0	TA-CLK				
	26	0	CA-SAFE				
	27	0	CA-ADR-R				
	28	0	CA-ADR-S				
	29	0	CA-ADR-T				
	30	0	CA-ADR-U				
	31	0	CA-DATA0				
	32	0	CA-DATA1				
	33	0	CA-DATA2				
	34	0	CA-DATA3				
	35	0	CA-DATA4				
	36	0	CA-DATA5				
	37	0	CA-DATA6				
	38	0	CA-DATA7				
	39	0	CA-CHSTC				

GR: 20 (CONTINUATION)  
 BASIS BOARD

EL: 08 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
25	0		TA-CLK				
26	0		CA-SAFE				
27	0		CA-ADR-R				
28	0		CA-ADR-S				
29	0		CA-ADR-T				
30	0		CA-ADR-U				
31	0		CA-DATA0				
32	0		CA-DATA1				
33	0		CA-DATA2				
34	0		CA-DATA3				
35	0		CA-DATA4				
36	0		CA-DATA5				
37	0		CA-DATA6				
38	0		CA-DATA7				
39	0		CA-CHS01				

EL: 09 CONN. RECORD AMPLIFIER, CH 1 J09

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0		RECIN-01				
02	0		EQUAL-01				
03	0						
04	0		K-REC-01				
05	0		+ 0.0				
06	0		BIASA-01				
07	0		BIASB-01				
08	0		BIASC-01				
09	0		RECHL-01 6				
10	0		RECHH-01 0				
11	0		+ 0.0 S				
12	0		SYNHL-01				
13	0		SYNHH-01				
14	0		+ 0.0				
15	0		AFCSW-01				
16	0		+ 0.0				
17	0		CA-BAD01				
18	0		CA-RSW01				
19	0		KEY				
20	0		TA-ACT01				
21	0		+ 0.0				
22	0		+15.0				
23	0		-15.0				
24	0		+ 5.6				
25	0		TA-CLK				
26	0		CA-SAFE				
27	0		CA-ADR-R				
28	0		CA-ADR-S				
29	0		CA-ADR-T				
30	0		CA-ADR-U				
31	0		CA-DATA0				

GR: 20 (CONTINUATION)  
 BASIS BOARD

EL: 09 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
32	0		CA-DATA1				
33	0		CA-DATA2				
34	0		CA-DATA3				
35	0		CA-DATA4				
36	0		CA-DATA5				
37	0		CA-DATA6				
38	0		CA-DATA7				
39	0		CA-CHS01				

EL: 10 CONN. REPRODUCE AMPL., CH 1 J10

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0		TAPLI-01				
02	0		EQUAL-01				
03	0		SYPRE-01				
04	0		K-REC-01				
05	0		+ 0.0 S				
06	0		REPRE-01 0				
07	0		REPRO-01 6				
08	0		+ 0.0				
09	0		+ 0.0				
10	0		TAPDI-01				
11	0		+ 0.0				
12	0		SYNHL-01				
13	0		SYNHH-01				
14	0		+ 0.0				
15	0		CA-EQL01				
16	0		CA-SYN01				
17	0		CA-LSW01				
18	0		+ 0.0				
19	0		KEY				
20	0		TA-ACT01				
21	0		+ 0.0				
22	0		+15.0				
23	0		-15.0				
24	0		+ 5.6				
25	0		TA-CLK				
26	0		CA-SAFE				
27	0		CA-ADR-R				
28	0		CA-ADR-S				
29	0		CA-ADR-T				
30	0		CA-ADR-U				
31	0		CA-DATA0				
32	0		CA-DATA1				
33	0		CA-DATA2				
34	0		CA-DATA3				
35	0		CA-DATA4				
36	0		CA-DATA5				
37	0		CA-DATA6				
38	0		CA-DATA7				

GR: 20 (CONTINUATION)  
 BASIS BOARD

EL: 10 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
39	0		CA-CHS01				

EL: 11 CONN. LINE AMPLIFIER, CH 1 J11

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0		MONIT-01				
02	0		+ 0.0 S				
03	0		LOUFA-01 0				
04	0		LOUFB-01 6				
05	0		+ 0.0				
06	0		INPDI-01				
07	0		INPAD-01				
08	0		RECIN-01				
09	0		+ 0.0				
10	0		TAPAD-01				
11	0		TAPMS-01				
12	0		TAPDI-01				
13	0		+ 0.0 S				
14	0		LINF A-01 0				
15	0		LINF B-01 6				
16	0		CA-EQL01				
17	0		CA-SYN01				
18	0		CA-LSW01				
19	0		KEY				
20	0		TA-ACT01				
21	0		+ 0.0				
22	0		+15.0				
23	0		-15.0				
24	0		+ 5.6				
25	0		TA-CLK				
26	0		CA-SAFE				
27	0		CA-ADR-R				
28	0		CA-ADR-S				
29	0		CA-ADR-T				
30	0		CA-ADR-U				
31	0		CA-DATA0				
32	0		CA-DATA1				
33	0		CA-DATA2				
34	0		CA-DATA3				
35	0		CA-DATA4				
36	0		CA-DATA5				
37	0		CA-DATA6				
38	0		CA-DATA7				
39	0		CA-CHS01				

GR: 20 (CONTINUATION)  
 BASIS BOARD

EL: 12 CONNECTOR MONO-STEREO-SWITCH J12

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0		INPAD-01				
02	0		+ 0.0				
03	0		INPAD-02				
04	0		+ 0.0				
05	0		TAPMS-02				
06	0		+ 0.0				
07	0		TAPMS-01				
08	0		+ 0.0				
09	0		TAPDI-01				
10	0		+ 0.0				
11	0		TAPDI-02				
12	0		+ 0.0				
13	0		RECIN-02				
14	0		+ 0.0				
15	0		RECIN-01				
16	0						
17	0						
18	0						
19	0		KEY				
20	0		TA-ACTM0				
21	0		+ 0.0				
22	0		+15.0				
23	0		-15.0				
24	0		+ 5.6				
25	0		TA-CLK				
26	0		CA-SAFE				
27	0		CA-ADR-R				
28	0		CA-ADR-S				
29	0		CA-ADR-T				
30	0		CA-ADR-U				
31	0		CA-DATA0				
32	0		CA-DATA1				
33	0		CA-DATA2				
34	0		CA-DATA3				
35	0		CA-DATA4				
36	0		CA-DATA5				
37	0		CA-DATA6				
38	0		CA-DATA7				
39	0		CA-MONO				

EL: 13 CONNECTOR HF-DRIVER, CH 2 J13

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0						
02	0		K-REC-02				
03	0		+ 0.0				
04	0		+ 0.0				
05	0		BIASA-02				
06	0		BIASB-02				
07	0		BIASC-02				

GR: 20 (CONTINUATION)  
 BASIS BOARD

EL: 13 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
08	0		ERACS-02 7				
09	0		AFCSW-02				
10	0		+ 0.0 S				
11	0		ERAIHL-02 6				
12	0		ERAIHM-02 0				
13	0		ERAIHH-02				
14	0		ERAIHO-02				
15	0		+ 0.0				
16	0		CA-BAD02				
17	0		CA-RSW02				
18	0		KEY				
19	0		TA-ACT02				
20	0		+ 0.0				
21	0		+15.0				
22	0		-15.0				
23	0		+ 5.6				
24	0		TA-CLK				
25	0		CA-SAFE				
26	0		CA-ADR-R				
27	0		CA-ADR-S				
28	0		CA-ADR-T				
29	0		CA-ADR-U				
30	0		CA-DATA0				
31	0		CA-DATA1				
32	0		CA-DATA2				
33	0		CA-DATA3				
34	0		CA-DATA4				
35	0		CA-DATA5				
36	0		CA-DATA6				
37	0		CA-DATA7				
38	0		CA-CHS02				

EL: 14 CONN. RECORD AMPLIFIER, CH 2 J14

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	RECIN-02				
	02	0	EQUAL-02				
	03	0					
	04	0	K-REC-02				
	05	0	+ 0.0				
	06	0	BIASA-02				
	07	0	BIASB-02				
	08	0	BIASC-02				
	09	0	RECHL-02	6			
	10	0	RECHH-02	0			
	11	0	+ 0.0	S			
	12	0	SYNHL-02				
	13	0	SYNHH-02				
	14	0	+ 0.0				



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GR: 20 (CONTINUATION)  
BASIS BOARD

EL: 15 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		22	0	+15.0			
		23	0	-15.0			
		24	0	+ 5.6			
		25	0	TA-CLK			
		26	0	CA-SAFE			
		27	0	CA-ADR-R			
		28	0	CA-ADR-S			
		29	0	CA-ADR-T			
		30	0	CA-ADR-U			
		31	0	CA-DATA0			
		32	0	CA-DATA1			
		33	0	CA-DATA2			
		34	0	CA-DATA3			
		35	0	CA-DATA4			
		36	0	CA-DATA5			
		37	0	CA-DATA6			
		38	0	CA-DATA7			
		39	0	CA-CHS02			

EL: 16 CONN. LINE AMPLIFIER, CH 2 J16

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	MONIT-02			
		02	0	+ 0.0	S		
		03	0	LOUFA-02	0		
		04	0	LOUFB-02	6		
		05	0	+ 0.0			
		06	0	INPDI-02			
		07	0	INPAD-02			
		08	0	RECIN-02			
		09	0	+ 0.0			
		10	0	TAPAD-02			
		11	0	TAPMS-02			
		12	0	TAPDI-02			
		13	0	+ 0.0	S		
		14	0	LINF A-02	0		
		15	0	LINF B-02	6		
		16	0	CA-EQL02			
		17	0	CA-SYN02			
		18	0	CA-LSW02			
		19	0	KEY			
		20	0	TA-ACT02			
		21	0	+ 0.0			
		22	0	+15.0			
		23	0	-15.0			
		24	0	+ 5.6			
		25	0	TA-CLK			
		26	0	CA-SAFE			
		27	0	CA-ADR-R			
		28	0	CA-ADR-S			

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GR: 20 (CONTINUATION)  
BASIS BOARD

EL: 23 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		30	0				
		31	0	0.0 VCU			
		32	0				
		33	0	0.0 VCU			
		34	0	T-CUSTR			
		35	0	0.0 VCU			
		36	0				
		37	0	+ 0.0			
		38	0	+ 5.6			
		39	0	+ 0.0			
		40	0	+ 5.6			

EL: 24 CONN. TO BUS CONNECTOR BOARD J17

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	T-REFEXT			
		02	0	T-DIR			
		03	0	T-CLK1			
		04	0				
		05	0				
		06	0	T-SADA			
		07	0	T-SADB			
		08	0	T-SADC			
		09	0	T-READSL			
		10	0	T-WRTSL			
		11	0	T-DT-CH1			
		12	0	T-DT-CH2			
		13	0	T-DT-CH3			
		14	0	T-DT-MP			
		15	0	T-DT-RP1			
		16	0	T-DT-RP2			
		17	0	T-DT-SJM			
		18	0	T-DT-RES			

EL: 25 CONN. TO BUS CONNECTOR BOARD J18

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0				
		02	0				
		03	0	+ 0.0			
		04	0	+ 0.0			
		05	0	+15.0			
		06	0	+15.0			
		07	0	-15.0			
		08	0	-15.0			
		09	0	+ 0.0			
		10	0	+ 0.0			
		11	0	+ 5.6			
		12	0	+ 5.6			

GR: 20 (CONTINUATION)  
BASIS BOARD

EL: 16 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		29	0	CA-ADR-T			
		30	0	CA-ADR-U			
		31	0	CA-DATA0			
		32	0	CA-DATA1			
		33	0	CA-DATA2			
		34	0	CA-DATA3			
		35	0	CA-DATA4			
		36	0	CA-DATA5			
		37	0	CA-DATA6			
		38	0	CA-DATA7			
		39	0	CA-CHS02			

EL: 20 CONN. SPOOLING MOTOR CONTR. P01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	+ 0.0			
		02	0	+ 0.0			
		03	0	+ 5.6			
		04	0	+ 5.6			
		05	0	+15.0			
		06	0	+15.0			
		07	0	-15.0			
		08	0	TD-CLK			
		09	0	T-TPSPD1			
		10	0	T-TPSPD2			
		11	0	AN-RFTTL			
		12	0	AN-RFTTL			
		13	0	T-TENDL			
		14	0	T-TENDR			
		15	0	T-CLK1			
		16	0	T-CLK2			

EL: 21 CONN. CAPSTAN CONTROL UNIT P02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	+ 0.0			
		02	0	+ 0.0			
		03	0	+ 5.6			
		04	0	+ 5.6			
		05	0	+15.0			
		06	0	+15.0			
		07	0	-15.0			
		08	0	-15.0			
		09	0	T-SPDSL1			
		10	0	T-SPDSL2			
		11	0	T-REFSEL			
		12	0	T-SYNCAP			
		13	0	T-CAPON			
		14	0				

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GR: 20 (CONTINUATION)  
BASIS BOARD

EL: 21 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		15	0	T-REFINT			
		16	0	T-REFEXT			

EL: 22 CONN. SERIAL REMOTE CONTROL P03

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	SHIELD			
		02	0	STUBUS2			
		03	0	SNDA1			
		04	0	SNCOMM			
		05	0	RCCOMM			
		06	0	PCVDA1			
		07	0	STUBUS1			
		08	0	GND			
		09	0	SPARE			
		10	0				

EL: 23 CONNECTOR COMMAND UNIT P04

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	0.0 VCU			
		02	0	T-DATA0			
		03	0	0.0 VCU			
		04	0	T-DATA1			
		05	0	0.0 VCU			
		06	0	T-DATA2			
		07	0	0.0 VCU			
		08	0	T-DATA3			
		09	0	0.0 VCU			
		10	0	T-DATA4			
		11	0	0.0 VCU			
		12	0	T-DATA5			
		13	0	0.0 VCU			
		14	0	T-DATA6			
		15	0	0.0 VCU			
		16	0	T-DATA7			
		17	0	0.0 VCU			
		18	0	T-ADRX			
		19	0	0.0 VCU			
		20	0	T-ADRY			
		21	0	0.0 VCU			
		22	0	T-ADRX			
		23	0	0.0 VCU			
		24	0				
		25	0	0.0 VCU			
		26	0	T-RW			
		27	0	0.0 VCU			
		28	0				
		29	0	0.0 VCU			

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GR: 20 (CONTINUATION)  
BASIS BOARD

EL: 23 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		30	0				
		31	0	0.0 VCU			
		32	0				
		33	0	0.0 VCU			
		34	0	T-CUSTR			
		35	0	0.0 VCU			
		36	0				
		37	0	+ 0.0			
		38	0	+ 5.6			
		39	0	+ 0.0			
		40	0	+ 5.6			

EL: 24 CONN. TO BUS CONNECTOR BOARD J17

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	T-REFEXT			
		02	0	T-DIR			
		03	0	T-CLK1			
		04	0				
		05	0				
		06	0	T-SADA			
		07	0	T-SADB			
		08	0	T-SADC			
		09	0	T-READSL			
		10	0	T-WRTSL			
		11	0	T-DT-CH1			
		12	0	T-DT-CH2			
		13	0	T-DT-CH3			
		14	0	T-DT-MP			
		15	0	T-DT-RP1			
		16	0	T-DT-RP2			
		17	0	T-DT-SJM			
		18	0	T-DT-RES			

EL: 25 CONN. TO BUS CONNECTOR BOARD J18

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0				
		02	0				
		03	0	+ 0.0			
		04	0	+ 0.0			
		05	0	+15.0			
		06	0	+15.0			
		07	0	-15.0			
		08	0	-15.0			
		09	0	+ 0.0			
		10	0	+ 0.0			
		11	0	+ 5.6			
		12	0	+ 5.6			

GR: 20 (CONTINUATION)  
BASIS BOARD

EL: 25 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	13	0	+ 0.0				
	14	0	+ 0.0				
	15	0					
	16	0					
	17	0	+ 0.0				
	18	0	+ 0.0				
	19	0	+24.0				
	20	0	+24.0				

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SECTION 5/15

GR: 20 (CONTINUATION)  
 BASIS BOARD

EL: 33 WIRE FIELD (HEAD BLOCK ASSEMBLY)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
U	01	0	+ 0.0	0			
U	02	0	+15.0	2			
U	03	0	-15.0	6			
U	04	0	+ 5.6	3			

GR: 21 1.810.300.00  
 COMMAND UNIT

EL: 01 CONNECTOR TO BASIS BOARD, EL 23

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	0.0 VCU				
	02	0	T-DATA0				
	03	0	0.0 VCU				
	04	0	T-DATA1				
	05	0	0.0 VCU				
	06	0	T-DATA2				
	07	0	0.0 VCU				
	08	0	T-DATA3				
	09	0	0.0 VCU				
	10	0	T-DATA4				
	11	0	0.0 VCU				
	12	0	T-DATA5				
	13	0	0.0 VCU				
	14	0	T-DATA6				
	15	0	0.0 VCU				
	16	0	T-DATA7				
	17	0	0.0 VCU				
	18	0	T-ADRX				
	19	0	0.0 VCU				
	20	0	T-ADRY				
	21	0	0.0 VCU				
	22	0	T-ADRZ				
	23	0	0.0 VCU				
	24	0					
	25	0	0.0 VCU				
	26	0	T-RW				
	27	0	0.0 VCU				
	28	0					
	29	0					
	30	0					
	31	0					
	32	0					
	33	0	0.0 VCU				
	34	0	T-CUSTR				
	35	0	0.0 VCU				
	36	0					
	37	0	+ 0.0				
	38	0	+ 5.6				
	39	0	+ 0.0				
	40	0	+ 5V-LED				

EL: 02 CONNECTOR TO DISPLAY BOARD

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	T-DATA0				
	02	0	T-DATA1				
	03	0	T-DATA2				
	04	0	T-DATA3				
	05	0	T-DATA4				
	06	0	T-DATA5				

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GR: 22  
 SERIAL REMOTE CONTROL

EL: 01 FROM GR 20, EL 22 J01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	SHIELD				
	02	0	SNDATA				
	03	0	RCCOMM				
	04	0	STUBUS1				
	05	0	SPARE				
	06	0	STUBUS2				
	07	0	SNCOMM				
	08	0	RCVDATA				
	09	0	GND				

GR: 23 1.810.738.00  
 PARALLEL REMOTE CONTROL

EL: 01 CONN. PARALLEL REMOTE CONTR. J01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
B	01	0	+ 0.0				
B	02	0	BR-REW				
B	03	0	BR-FORW				
B	04	0	KEY				
B	05	0	SR-VRSPD				
B	06	0	SR-TRANS				
B	07	0	TO-CLK				
B	08	0	BR-FAD				
B	09	0	BR-REC				
B	10	0	TO-DIR				
B	11	0	FAD1				
B	12	0	FAD2				
B	13	0	T-REFEXT				
B	14	0	+ 0.0				
B	15	0	BR-PLAY				
B	16	0	BR-STOP				
B	17	0	SR-LIFT				
B	18	0	SR-LOC1				
B	19	0	SR-REC				
B	20	0	SR-REW				
B	21	0	SR-FORW				
B	22	0	SR-PLAY				
B	23	0	SR-STOP				
B	24	0	KEY				
B	25	0	+24.0				

EL: 02 FROM GR 25, EL 02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	+ 0.0				
	02	0	+ 0.0				
	03	0	+ 5.6				
	04	0	+ 5.6				
	05	0	+15.0				
	06	0	-15.0				
	07	0	T-SADA				
	08	0	T-SADB				
	09	0	T-SADC				
	10	0	T-READSL				
	11	0	T-WRTSL				
	12	0	T-DT-RP1				
	13	0	T-DT-RP2				
	14	0	T-DT-SJM				
	15	0	T-REFEXT				
	16	0	T-DIR				
	17	0	T-CLK1				
	18	0					
	19	0					
	20	0	+ 0.0				
	21	0					

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GR: 21 (CONTINUATION)  
 COMMAND UNIT

EL: 02 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	07	0	T-DATA6				
	08	0	T-DATA7				
	09	0	T-ADRX				
	10	0	T-ADRY				
	11	0	T-CUSTR				
	12	0	T-SL1				
	13	0	T-ADRZ				
	14	0	+ 0.0				
	15	0	+ 5.6				

GR: 23 (CONTINUATION)  
 PARALLEL REMOTE CONTROL

EL: 02 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	22	0	+ 0.0				
	23	0					
	24	0	+24.0				
	25	0	+ 0.0				
	26	0	+ 0.0				

GR: 24 1.810.760.00  
 SPOOLING MOTOR CONTROL  
 \*\*\*\*\*

EL: 01 FROM GR 20, EL 20

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	+	15.0				
07	0	-	15.0				
08	0	T	-CLK				
09	0	T	-TPSPD1				
10	0	T	-TPSPD2				
11	0	AN	-RFTTL				
12	0	AN	-RFTTR				
13	0	T	-TENDL				
14	0	T	-TENDR				
15	0	T	-CLK1				
16	0	T	-CLK2				

EL: 02 CONN. TAPE TENS. UNIT, LEFT J02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	+	15.0				
07	0	-	15.0				
08	0	-	15.0				
09	0						
10	0						
11	0	AN	-TTL				
12	0	T	-TENDL				
13	0						
14	0						
15	0						
16	0						

EL: 03 CONN. TAPE TENS. UNIT, RIGHT J03

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	+	15.0				
07	0	-	15.0				
08	0	-	15.0				
09	0						

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GR: 24 (CONTINUATION)  
 SPOOLING MOTOR CONTROL  
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EL: 03 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
10	0						
11	0	AN	-TTR				
12	0	T	-TENDR				
13	0	T	-CLK1				
14	0	T	-CLK2				
15	0						
16	0						

EL: 04 TRANSFORMER FEED

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
U	01	0	ACA-125	2			
U	02	0	ACB-125	0			

EL: 05 CONN. BOARD SPOOLING MOTOR, LEFT

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
Y	01	0	ACML-H	6			
Y	02	0	ACML-0	0			

EL: 06 CONN. BOARD SPOOLING MOTOR, RIGHT

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
Y	01	0	ACMR-H	4			
Y	02	0	ACMR-0	0			

GR: 25 1.810.701.00  
 BUS CONNECTOR BOARD  
 \*\*\*\*\*

EL: 01 CONN. VU-METER PANEL EXT. P01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T	-SADA				
08	0	T	-SADB				
09	0	T	-SADC				
10	0	T	-READSL				
11	0	T	-WRTSL				
12	0	T	-DT-CH1				
13	0	T	-DT-CH2				
14	0	T	-DT-CH3				
15	0	T	-DT-MP				
16	0						
17	0						
18	0						
19	0						
20	0	+	0.0				
21	0	T	-VARSPD				
22	0	+	0.0				
23	0	T	-REFEXT				
24	0	+	24.0				
25	0	+	0.0				
26	0	+	0.0				

EL: 02 CONN. REMOTE CONTROL P02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T	-SADA				
08	0	T	-SADB				
09	0	T	-SADC				
10	0	T	-READSL				
11	0	T	-WRTSL				
12	0	T	-DT-RP1				
13	0	T	-DT-RP2				
14	0	T	-DT-SJM				
15	0	T	-REFEXT				
16	0	T	-DIR				
17	0	T	-CLK1				
18	0						
19	0						
20	0	+	0.0				

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GR: 25 (CONTINUATION)  
 BUS CONNECTOR BOARD  
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EL: 02 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
21	0						
22	0	+	0.0				
23	0						
24	0	+	24.0				
25	0	+	0.0				
26	0	+	0.0				

EL: 03 CONNECTOR COMMANDS CH1 P03

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T	-SADA				
08	0	T	-SADB				
09	0	T	-SADC				
10	0	T	-READSL				
11	0	T	-WRTSL				
12	0	T	-DT-CH1				
13	0						
14	0						
15	0						
16	0	+	24.0				

EL: 04 CONNECTOR COMMANDS CH2 P04

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T	-SADA				
08	0	T	-SADB				
09	0	T	-SADC				
10	0	T	-READSL				
11	0	T	-WRTSL				
12	0	T	-DT-CH2				
13	0						
14	0						
15	0						
16	0	+	24.0				

GR: 25 (CONTINUATION)  
 BUS CONNECTOR BOARD  
 \*\*\*\*\*

EL: 05 CONNECTOR COMMANDS CH3 P05

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T	-SADA				
08	0	T	-SADB				
09	0	T	-SADC				
10	0	T	-READSL				
11	0	T	-WRTSL				
12	0	T	-DT-CH3				
13	0						
14	0						
15	0						
16	0	+	24.0				

EL: 06 CONN. COMMANDS MASTER PANEL P06

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T	-SADA				
08	0	T	-SADB				
09	0	T	-SADC				
10	0	T	-READSL				
11	0	T	-WRTSL				
12	0	T	-DT-MP				
13	0	T	-REFEXT				
14	0	T	-ADAPT1				
15	0	T	-VARSPD				
16	0	+	24.0				

EL: 07 CONN. COMM. VARI SPEED PANEL P07

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T	-SADA				
08	0	T	-SADB				
09	0	T	-SADC				

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SECTION 5/17

GR: 26 1.810.761.00  
 CAPSTAN CONTROL UNIT  
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EL: 01 FROM GR 20, EL 21

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	+ 0.0				
	02	0	+ 0.0				
	03	0	+ 5.6				
	04	0	+ 5.6				
	05	0	+15.0				
	06	0	+15.0				
	07	0	-15.0				
	08	0	-15.0				
	09	0	T-SPDSL1				
	10	0	T-SPDSL2				
	11	0	T-REFSEL				
	12	0	T-SYNCAP				
	13	0	T-CAPON				
	14	0					
	15	0	T-REFINT				
	16	0	T-REFEXT				

EL: 02 TRANSFORMER FEED

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
U	01	0	ACA-130	6			
U	02	0	ACB-130	6			

EL: 03 CONNECTOR CAPSTAN MOTOR

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
Y	01	0	ACMC-A	8			
Y	02	0	ACMC-B	4			
Y	03	0	ACMC-C	5			
Y	04	0	AN-TACHD 2				
Y	05	0	0-TACHD 9				

EL: 04 CONN. PHASE SHIFT CAPACITOR

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
Y	01	0	ACMC-B	4			
Y	02	0	ACMC-C	5			

EL: 05 PHASE SHIFT CAPACITOR

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	ACMC-B	4			
	02	0	ACMC-C	5			

GR: 26 (CONTINUATION)  
 CAPSTAN CONTROL UNIT  
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EL: 06 CAPACITIVE SENSOR

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	04	0	AN-TACHD 2				
	05	0	0-TACHD 9				

GR: 27 1.810.730.81  
 TAPE TENSION UNIT LEFT  
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EL: 01 FROM GR 24, EL 02 J01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	+ 0.0				
	02	0	+ 0.0				
	03	0	+ 5.6				
	04	0	+ 5.6				
	05	0	+15.0				
	06	0	+15.0				
	07	0	-15.0				
	08	0	-15.0				
	09	0					
	10	0					
	11	0	AN-TTL				
	12	0	T-TENDL				
	13	0					
	14	0					
	15	0					
	16	0					

EL: 02 CONN. TAPE END SW LEFT J02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
N	01	0	T-LED	1			
N	02	0	+ 5.6	2			
N	03	0	T-TNDL	4			
	04	0	KEY				

EL: 03 EDIT SOLENOID, LEFT

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
X	01	0	+24.0	7			
X	02	0	K-EDIT	5			

EL: 04 TAPE END SW. LEFT WIRE FIELD

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
U	01	0	T-LED	1			
U	02	0	+ 5.6	2			
U	03	0	T-TNDL	4			

\*\*\*\*\*  
 \* STUDER \* L O C A T I O N P I N L I S T \* 83/02/25 \* 08:28 \* P A G E 17 \*  
 \*\*\*\*\*  
 TAPE TRANSPORT & AUDIO CIRCUITS \* STUDER A810 \* 1.810.090.00 81/01/29

GR: 28 1.810.728.81  
 TAPE TENSION UNIT RIGHT  
 \*\*\*\*\*

EL: 01 FROM GR 24, EL 03 J01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	+ 0.0				
	02	0	+ 0.0				
	03	0	+ 5.6				
	04	0	+ 5.6				
	05	0	+15.0				
	06	0	+15.0				
	07	0	-15.0				
	08	0	-15.0				
	09	0					
	10	0					
	11	0	AN-TTR				
	12	0	T-TENDR				
	13	0	T-CLK1				
	14	0	T-CLK2				
	15	0					
	16	0					

EL: 02 CONN. TAPE END SW RIGHT J02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
N	01	0	T-LED	1			
N	02	0	+ 5.6	2			
N	03	0	T-TNDR	4			
	04	0	KEY				

EL: 03 EDIT SOLENOID, RIGHT

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
X	01	0	+24.0	7			
X	02	0	K-EDIT	5			

EL: 04 CONN. MOVE SENSOR J03

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
N	01	0	+ 0.0	0			
N	02	0	+ 5.6	2			
N	03	0	T-CLK1	1			
N	04	0	T-CLK2	3			
	05	0	KEY				

EL: 05 MOVE SENSOR WIRE FIELD

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
U	01	0	+ 0.0	0			
U	02	0	+ 5.6	2			
U	03	0	T-CLK1	1			
U	04	0	T-CLK2	3			

GR: 28 (CONTINUATION)  
 TAPE TENSION UNIT RIGHT  
 \*\*\*\*\*

EL: 06 TAPE END SW. RIGHT WIRE FIELD

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
U	01	0	T-LED	1			
U	02	0	+ 5.6	2			
U	03	0	T-TNDR	4			

GR: 29  
 PRESS-SOLENOID  
 \*\*\*\*\*

EL: 01 PRESS SOLENOID

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
X	01	0	+24.0	7			
X	02	0	K-PRESS	8			

\*\*\*\*\*  
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\*\*\*\*\*  
TAPE TRANSPORT & AUDIO CIRCUITS \* STUDER A810 \* 1.810.090.00 81/01/29

SECTION 5/18

GR: 30  
LIFT SOLENOID  
\*\*\*\*\*

EL: 01 LIFT SOLENOID

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
X	01	0	+24.0	7			
X	02	0	K-LIFT	9			

GR: 31 1.810.165.00  
BRAKE CHASSIS  
\*\*\*\*\*

EL: 01 BRAKE SOLENOID

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
X	01	0	+24.0	7			
X	02	0	K-BRAKE	1			

EL: 02 EDIT-BRAKE SOLENOID

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
X	01	0	+24.0	7			
X	02	0	K-EDIT	5			

GR: 32  
HEAD BLOCK ASSEMBLY  
\*\*\*\*\*

EL: 01 CONN. HEAD BLOCK ASSEMBLY P01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
B	01	0	REPRE-01	0			
B	02	0	REPRO-01	6			
B	03	0	+15.0	2			
B	04	0					
B	05	0	RECHL-01	6			
B	06	0	RECHH-01	0			
B	07	0	+ 0.0	0			
B	08	0	+ 5.6	3			
B	09	0	REPHH-TC	0			
B	10	0	RECHH-TC	0			
B	11	0	ERAHH-TC	0			
B	12	0	ERAHL-01	6			
B	13	0	ERAHM-01	0			
B	14	0	REPRE-02	0			
B	15	0	REPRO-02	6			
B	16	0	-15.0	6			
B	17	0					
B	18	0	RECHL-02	6			
B	19	0	RECHH-02	0			
B	20	0	ERACS-02				
B	21	0	REPHL-TC	6			
B	22	0	RECHL-TC	6			
B	23	0	ERAHL-TC	6			
B	24	0	ERAHL-02	6			
B	25	0	ERAHM-02	0			

EL: 02 REPRODUCE PREAMPLIFIER

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01	0	+15.0	2			
L	02	0	REPRE-01	0			
L	03	0	REPRO-01	6			
L	04	0	+ 0.0	S			
L	05	0	+ 0.0	S			
L	06	0	REPRO-02	6			
L	07	0	REPRE-02	0			
L	08	0	-15.0	6			
L	09	0					
L	10	0					
L	11	0	REPHL-01	0			
L	12	0	REPHH-01	1			
L	13	0	REPHL-02	0			
L	14	0	REPHH-02	1			

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\*\*\*\*\*  
TAPE TRANSPORT & AUDIO CIRCUITS \* STUDER A810 \* 1.810.090.00 81/01/29

GR: 33  
CONNECTOR VU-METER PANEL, EXTERN  
\*\*\*\*\*

EL: 01 FROM GR 25, EL 01 J01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	+ 0.0				
	02	0	+ 5.6				
	03	0	+15.0				
	04	0	T-SADA				
	05	0	T-SADC				
	06	0	T-WRTSL				
	07	0	T-DT-CH2				
	08	0	T-DT-MP				
	09	0					
	10	0					
	11	0	T-VARSPD				
	12	0	T-REFEXT				
	13	0	+ 0.0				
	14	0	+ 0.0				
	15	0	+ 5.6				
	16	0	-15.0				
	17	0	T-SADB				
	18	0	T-READSL				
	19	0	T-DT-CH1				
	20	0	T-DT-CH3				
	21	0					
	22	0					
	23	0	+ 0.0				
	24	0	+ 0.0				
	25	0	+24.0				

GR: 34  
CONNECTOR VU-METER PANEL, EXTERN (AUDIO)  
\*\*\*\*\*

EL: 01 FROM GR 20, EL 26+27 P01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
A	01	0	TAPHS-01	0			
A	02	0	+ 0.0	S			
A	03	0	INPAD-01	6			
A	04	0					
A	05	0	LOUFA-01	0			
A	06	0					
A	07	0					
A	08	0	TAPHS-02	0			
A	09	0	+ 0.0	S			
A	10	0	INPAD-02	6			
A	11	0					
A	12	0	LOUFA-02	0			
A	13	0	GND	0			
A	14	0	TAPAD-01	6			
A	15	0	+ 0.0	S			
A	16	0	INPDI-01	0			
A	17	0	+ 0.0	S			
A	18	0	LOUFB-01	6			
A	19	0					
A	20	0					
A	21	0	TAPAD-02	6			
A	22	0	+ 0.0	S			
A	23	0	INPDI-02	0			
A	24	0	+ 0.0	S			
A	25	0	LOUFB-02	6			

EL: 02 GROUND CONN. TO GR34, EL01, PT13

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01	0	GND	0			

GR: 35 1.820.749.00  
INTERFERENCE FILTER, CH01  
\*\*\*\*\*

EL: 01 CONNECTOR XLR, INPUT J01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	GND				
	02	0	LINSA-01				
	03	0	LINSB-01				

EL: 02 CONNECTOR XLR, OUTPUT P01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	GND				
	02	0	LOUSA-01				
	03	0	LOUSB-01				

EL: 03 CONNECTOR LINE FILTER, INP. P01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
D	01	0	LINF8-01	6			
D	02	0	KEY				
D	03	0	+ 0.0	S			
D	04	0	LINF8-01	0			

EL: 04 CONNECTOR LINE FILTER, OUTP. P02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
D	01	0	LOUFB-01	6			
D	02	0	KEY				
D	03	0	+ 0.0	S			
D	04	0	LOUFA-01	0			

GR: 36 1.820.749.00  
 INTERFERENCE FILTER, CH02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	GND			
		02	0	LINSA-02			
		03	0	LINSB-02			

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	GND			
		02	0	LOUSA-02			
		03	0	LOUSB-02			

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
D	01	0	LINFB-02 6				
D	02	0	KEY				
D	03	0	+ 0.0 S				
D	04	0	LINFA-02 0				

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
D	01	0	LOUFB-02 6				
D	02	0	KEY				
D	03	0	+ 0.0 S				
D	04	0	LOUFA-02 0				

GR: 37 1.820.749.00  
 INTERFERENCE FILTER, CHTC

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	GND			
		02	0	LINSA-TC			
		03	0	LINSB-TC			

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	GND			
		02	0	LOUSA-TC			
		03	0	LOUSB-TC			

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
D	01	0	LINFB-TC 6				
D	02	0	KEY				
D	03	0	+ 0.0 S				
D	04	0	LINFA-TC 0				

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
D	01	0	LOUFB-TC 6				
D	02	0	KEY				
D	03	0	+ 0.0 S				
D	04	0	LOUFA-TC 0				

GR: 38 1.810.315.00  
 MASTER + MONITOR CONTROL UNIT

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01A	0	MONIT-01 6				
L	01B	0	MONIT-01 6				
L	02A	0	MONIT-02 0				
L	02B	0	MONIT-02 0				
L	03A	0	+ 0.0 S				

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	04A	0	+ 0.0 S				
L	05A	0	MONITAMP 9				
L	06A	0	MONITAMP 6				

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
U	01	0	MONIT-01 6				
U	02	0	MONIT-02 0				
U	03	0	MONITAMP 9				
U	04B	0	+ 0.0 4				
U	06B	0	MONITAMP 6				

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	+ 0.0			
		02	0	+ 0.0			
		03	0	+ 5.6			
		04	0	+ 5.6			
		05	0	+15.0			
		06	0	-15.0			
		07	0	T-SADA			
		08	0	T-SADB			
		09	0	T-SADC			
		10	0	T-READSL			
		11	0	T-WRTSL			
		12	0	T-DT-MP			
		13	0	T-REFEXT			
		14	0	T-ADOPT1			
		15	0	T-VARSPD			
		16	0	+24.0			

GR: 39 1.820.732.00  
 VU-METER PANEL, CH01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
U	01	0	+15.0 2				
U	02	0	+ 5.6 3				
U	03	0	+ 0.0 0				
U	04	0	-15.0 6				
U	05	0	INPDI-01 0				
U	06	0	INPDI-01 1				
U	07	0	INPAD-01 6				
U	08	0	INPAU-01 2				
U	09	0	LOUFA-01 0				
U	10	0	LOUFB-01 6				
U	11	0	+ 0.0 S				
U	12	0	+ 0.0 S				
U	13	0	+ 0.0 0				
U	14	0	TAPAD-01 6				
U	15	0	TAPMS-01 0				
U	16	0	TAPMS-01 1				
U	17	0	+ 0.0 S				
U	18	0	GND				
U	19	0	+ 0.0 0				
U	20	0	TAPAU-01 2				

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	+15.0			
		02	0	+ 5.6			
		03	0	+ 0.0			
		04	0	-15.0			
		05	0	+ 0.0			
		06	0	LOUFB-01			
		07	0	LOUFA-01			

EL: 03 POTENTIOMETER RECORD-LEVEL

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01	0	INPDI-01 1				
L	02	0	INPAU-01 2				
L	03	0	+ 0.0 0				

EL: 04 POTENTIOMETER REPRODUCE-LEVEL

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01	0	TAPMS-01 1				
L	02	0	TAPAU-01 2				
L	03	0	+ 0.0 0				

GR: 39 (CONTINUATION)  
 VU-METER PANEL, CH01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01	0	+15.0 2				
L	02	0	+ 5.6 3				
L	03	0	+ 0.0 0				
L	04	0	-15.0 6				

EL: 12 FROM GR 25, EL 03

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	+ 0.0			
		02	0	+ 0.0			
		03	0	+ 5.6			
		04	0	+ 5.6			
		05	0	+15.0			
		06	0	-15.0			
		07	0	T-SADA			
		08	0	T-SADB			
		09	0	T-SADC			
		10	0	T-READSL			
		11	0	T-WRTSL			
		12	0	T-DT-CH1			
		13	0				
		14	0				
		15	0				
		16	0	+24.0			

EL: 21 VU-METER AMPLIFIER BOARD

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01	0	VU-A-01 2				
L	02	0	VU-B-01 0				

GR: 40 1.820.732.00  
 VU-METER PANEL, CH02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
U	01	0	+15.0 2				
U	02	0	+ 5.6 3				
U	03	0	+ 0.0 0				
U	04	0	-15.0 6				
U	05	0	INPDI-02 0				
U	06	0	INPDI-02 1				
U	07	0	INPAD-02 6				
U	08	0	INPAU-02 2				
U	09	0	LOUFA-02 0				
U	10	0	LOUFB-02 6				
U	11	0	+ 0.0 S				
U	12	0	+ 0.0 S				
U	13	0	+ 0.0 0				
U	14	0	TAPAD-02 6				
U	15	0	TAPMS-02 0				
U	16	0	TAPMS-02 1				
U	17	0	+ 0.0 S				
U	18	0	GND				
U	19	0	+ 0.0 0				
U	20	0	TAPAU-02 2				

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
		01	0	+15.0			
		02	0	+ 5.6			
		03	0	+ 0.0			
		04	0	-15.0			
		05	0	+ 0.0			
		06	0	LOUFB-02			
		07	0	LOUFA-02			

EL: 03 POTENTIOMETER RECORD-LEVEL

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01	0	INPDI-02 1				
L	02	0	INPAU-02 2				
L	03	0	+ 0.0 0				

EL: 04 POTENTIOMETER REPRODUCE-LEVEL

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01	0	TAPMS-02 1				
L	02	0	TAPAU-02 2				
L	03	0	+ 0.0 0				

GR: 40 (CONTINUATION)  
VU-METER PANEL, CH02  
\*\*\*\*\*

EL: 11 CHANNEL CONTROL BOARD

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01	0	+15.0	2			
L	02	0	+ 5.6	3			
L	03	0	+ 0.0	0			
L	04	0	-15.0	6			

EL: 12 FROM GR 25, EL 04

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	+ 0.0				
	02	0	+ 0.0				
	03	0	+ 5.6				
	04	0	+ 5.6				
	05	0	+15.0				
	06	0	-15.0				
	07	0	T-SADA				
	08	0	T-SADB				
	09	0	T-SADC				
	10	0	T-READSL				
	11	0	T-WRTSL				
	12	0	T-DT-CH2				
	13	0					
	14	0					
	15	0					
	16	0	+24.0				

EL: 21 VU-METER AMPLIFIER BOARD

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01	0	VU-A-02	2			
L	02	0	VU-B-02	0			

GR: 41 1.810.722.81  
MONITOR AMPLIFIER  
\*\*\*\*\*

EL: 01 FROM GR 20, EL 28 WIRE FIELD

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
U	01	0					
U	02	0	+15.0	2			
U	03	0	-15.0	6			
U	04	0	+ 0.0	S			
U	05	0	MONITAMP	9			

GR: 42 1.810.330.00  
VARISPEED PANEL  
\*\*\*\*\*

EL: 01 FEED CONNECTOR FROM GR 25, EL 07

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	+ 0.0				
	02	0	+ 0.0				
	03	0	+ 5.6				
	04	0	+ 5.6				
	05	0	+15.0				
	06	0	-15.0				
	07	0	T-SADA				
	08	0	T-SADB				
	09	0	T-SADC				
	10	0	T-READSL				
	11	0	T-WRTSL				
	12	0	T-DT-MP				
	13	0	T-REFEXT				
	14	0	T-ADOPT1				
	15	0	T-VARSPD				
	16	0	+24.0				

EL: 02 WIRE FIELD

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	+ 0.0	0			
	02	0	AN-POT	1			

EL: 03 POTENTIOMETER

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	+ 0.0	0			
	02	0	AN-POT	1			

GR: 43 1.810.753.00  
PERIPHERY CONTROLLER  
\*\*\*\*\*

EL: 01 CONN. BASIS BOARD (EL 04) P01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	T-SADA				
	02	0	T-SADB				
	03	0	T-SADC				
	04	0	T-READSL				
	05	0	T-WRTSL				
	06	0	T-DT-CH1				
	07	0	T-DT-CH2				
	08	0	T-DT-CH3				
	09	0	T-DT-MP				
	10	0	T-DT-RP1				
	11	0	T-DT-RP2				
	12	0	T-DT-SJM				
	13	0	T-DT-RES				
	14	0					
	15	0					
	16	0					
	17	0					
	18	0	+15.0				
	19	0	KEY				
	20	0	+ 5.6				
	21	0	+ 0.0				
	22	0	-15.0				
	23	0					
	24	0					
	25	0	T-ACSTR				
	26	0	T-RESET				
	27	0	T-RW				
	28	0	T-ENB				
	29	0	T-ADRZ				
	30	0	T-ADRY				
	31	0	T-ADRX				
	32	0	T-DATA7				
	33	0	T-DATA6				
	34	0	T-DATA5				
	35	0	T-DATA4				
	36	0	T-DATA3				
	37	0	T-DATA2				
	38	0	T-DATA1				
	39	0	T-DATA0				

EL: 02 PERIPHERY CONTROLLER BOARD P02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	S-EHEAD1				
	02	0	S-EHEAD2				
	03	0	S-PLCNTR				
	04	0	RESERVE				
	05	0	S-LINELA				
	06	0	S-LINELB				
	07	0	S-NABCCI				

GR: 43 (CONTINUATION)  
PERIPHERY CONTROLLER  
\*\*\*\*\*

EL: 02 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	08	0	S-AKBENA				
	09	0	TS-CH1				
	10	0	TS-CH2				
	11	0	TS-UP				
	12	0	TS-DWN				
	13	0	TS-STO				
	14	0	TSRP-LVL				
	15	0	TSRP-TRB				
	16	0	TSRP-BAS				
	17	0	TSRC-LVL				
	18	0	TSRC-TRB				
	19	0	TSRC-BIA				
	20	0	BRP-LVL				
	21	0	BRP-TRB				
	22	0	BRP-BAS				
	23	0	BRC-LVL				
	24	0	BRC-TRB				
	25	0	BRC-BIA				
	26	0	B-LEDO				
	27	0	B-LED1				
	28	0	B-LED2				
	29	0	B-LED3				
	30	0	B-STO				
	31	0	B-CH1				
	32	0	B-CH2				
	33	0					
	34	0					
	35	0					
	36	0					
	37	0					
	38	0					
	39	0	+ 5.0				
	40	0	+ 0.0				

EL: 03 KEY BOARD

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	01	0	S-EHEAD1				
	02	0	S-EHEAD2				
	03	0	S-PLCNTR				
	04	0	RESERVE				
	05	0	S-LINELA				
	06	0	S-LINELB				
	07	0	S-NABCCI				
	08	0	S-AKBENA				
	09	0	TS-CH1				
	10	0	TS-CH2				
	11	0	TS-UP				
	12	0	TS-DWN				
	13	0	TS-STO				

GR: 43 (CONTINUATION)  
PERIPHERY CONTROLLER  
\*\*\*\*\*

EL: 03 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
	14	0	TSRP-LVL				
	15	0	TSRP-TRB				
	16	0	TSRP-BAS				
	17	0	TSRC-LVL				
	18	0	TSRC-TRB				
	19	0	TSRC-BIA				
	20	0	BRP-LVL				
	21	0	BRP-TRB				
	22	0	BRP-BAS				
	23	0	BRC-LVL				
	24	0	BRC-TRB				
	25	0	BRC-BIA				
	26	0	B-LEDO				
	27	0	B-LED1				
	28	0	B-LED2				
	29	0	B-LED3				
	30	0	B-STO				
	31	0	B-CH1				
	32	0	B-CH2				
	33	0					
	34	0					
	35	0					
	36	0					
	37	0					
	38	0					
	39	0	+ 5.0				
	40	0	+ 0.0				

GR: 44  
TIME CODE CONTROL UNIT  
\*\*\*\*\*

EL: 01 FROM GR 25, EL 05

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T-	SADA				
08	0	T-	SADB				
09	0	T-	SADC				
10	0	T-	READSL				
11	0	T-	WRTSL				
12	0	T-	DT-CH3				
13	0						
14	0						
15	0						
16	0	+	24.0				

GR: 45 1.810.763.00  
NOISE REDUCTION SYSTEM CONTROL BOARD  
\*\*\*\*\*

EL: 01 CONN. NOISE REDUCTION SYSTEM J01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	B-	BDY-01				
02	0	B-	BDY-02				
03	0						
04	0	KEY					
05	0						
06	0						
07	0						
08	0						
09	0						
10	0						
11	0	B-	TLC-01				
12	0	KEY					
13	0	B-	TLC-02				
14	0	+	24.0				
15	0	+	0.0				

EL: 02 FROM GR 25, EL 01 J02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T-	SADA				
08	0	T-	SADB				
09	0	T-	SADC				
10	0	T-	READSL				
11	0	T-	WRTSL				
12	0	T-	DT-CH1				
13	0	T-	DT-CH2				
14	0	T-	DT-CH3				
15	0	T-	DT-MP				
16	0						
17	0						
18	0						
19	0						
20	0	+	0.0				
21	0	T-	VARSPD				
22	0	+	0.0				
23	0	T-	REFEXT				
24	0	+	24.0				
25	0	+	0.0				
26	0	+	0.0				

GR: 90 1.810.720.00  
DISTRIBUTION BOARD  
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EL: 01 FROM GR 33, EL 01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T-	SADA				
08	0	T-	SADB				
09	0	T-	SADC				
10	0	T-	READSL				
11	0	T-	WRTSL				
12	0	T-	DT-CH1				
13	0	T-	DT-CH2				
14	0	T-	DT-CH3				
15	0	T-	DT-MP				
16	0						
17	0						
18	0						
19	0						
20	0	+	0.0				
21	0	T-	VARSPD				
22	0	+	0.0				
23	0	T-	REFEXT				
24	0	+	24.0				
25	0	+	0.0				
26	0	+	0.0				

EL: 02 CONNECTOR NOISE REDUCTION P01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T-	SADA				
08	0	T-	SADB				
09	0	T-	SADC				
10	0	T-	READSL				
11	0	T-	WRTSL				
12	0	T-	DT-CH1				
13	0	T-	DT-CH2				
14	0	T-	DT-CH3				
15	0	T-	DT-MP				
16	0						
17	0						
18	0						
19	0						
20	0	+	0.0				

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GR: 90 (CONTINUATION)  
DISTRIBUTION BOARD  
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EL: 02 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
21	0	T-	VARSPD				
22	0	+	0.0				
23	0	T-	REFEXT				
24	0	+	24.0				
25	0	+	0.0				
26	0	+	0.0				

EL: 03 RESERVE P02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T-	SADA				
08	0	T-	SADB				
09	0	T-	SADC				
10	0	T-	READSL				
11	0	T-	WRTSL				
12	0	T-	DT-CH1				
13	0	T-	DT-CH2				
14	0	T-	DT-CH3				
15	0	T-	DT-MP				
16	0						
17	0						
18	0						
19	0						
20	0	+	0.0				
21	0	T-	VARSPD				
22	0	+	0.0				
23	0	T-	REFEXT				
24	0	+	24.0				
25	0	+	0.0				
26	0	+	0.0				

EL: 04 CONN. COMMANDS VARI SPEED P03

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T-	SADA				
08	0	T-	SADB				
09	0	T-	SADC				

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GR: 90 (CONTINUATION)  
DISTRIBUTION BOARD  
\*\*\*\*\*

EL: 04 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
10	0	T-	READSL				
11	0	T-	WRTSL				
12	0	T-	DT-MP				
13	0	T-	REFEXT				
14	0						
15	0	T-	VARSPD				
16	0	+	24.0				

EL: 05 CONNECTOR COMMANDS CH 03 P04

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T-	SADA				
08	0	T-	SADB				
09	0	T-	SADC				
10	0	T-	READSL				
11	0	T-	WRTSL				
12	0	T-	DT-CH3				
13	0						
14	0						
15	0						
16	0	+	24.0				

EL: 06 CONNECTOR COMMANDS CH 01 P05

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T-	SADA				
08	0	T-	SADB				
09	0	T-	SADC				
10	0	T-	READSL				
11	0	T-	WRTSL				
12	0	T-	DT-CH1				
13	0						
14	0						
15	0						
16	0	+	24.0				

GR: 90 (CONTINUATION)  
DISTRIBUTION BOARD  
\*\*\*\*\*

EL: 07 CONNECTOR COMMANDS CH 02 P06

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
01	0	+	0.0				
02	0	+	0.0				
03	0	+	5.6				
04	0	+	5.6				
05	0	+	15.0				
06	0	-	15.0				
07	0	T-	SADA				
08	0	T-	SADB				
09	0	T-	SADC				
10	0	T-	READSL				
11	0	T-	WRTSL				
12	0	T-	DT-CH2				
13	0						
14	0						
15	0						
16	0	+	24.0				

EL: 08 GROUND CONNECTION

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
L	01	0	GND	0			

EL: 09 CONN. VU-METER CH 1, AUDIO J01

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
N	01	0	+	0.0	S		
N	02	0	LOUFA-01	0			
N	03	0	LOUFB-01	6			
N	04	0	+	0.0	S		
N	05	0	INPD1-01	0			
N	06	0	INPAD-01	6			
N	07	0	+	0.0	S		
N	08	0	TAPAD-01	6			
N	09	0	TAPMS-01	0			
N	10	0	KEY				

EL: 10 CONN. VU-METER CH 2, AUDIO J02

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
N	01	0	+ 0.0	S			
N	02	0	LOUFA-02	0			
N	03	0	LOUFB-02	6			
N	04	0	+ 0.0	S			
N	05	0	INPD1-02	0			
N	06	0	INPAD-02	6			
N	07	0	+ 0.0	S			
N	08	0	TAPAD-02	6			
N	09	0	TAPMS-02	0			



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 \* STUDER \* LOCATION PIN LIST \* 83/02/25 \* 08:28 \* PAGE 26 \*  
 \*\*\*\*\*  
 TAPE TRANSPORT & AUDIO CIRCUITS \* STUDER A810 \* 1.810.090.00 81/01/29 \*\*\*\*\*

SECTION 5/22

GR: 90 (CONTINUATION)  
 DISTRIBUTION BOARD

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EL: 10 (CONTINUATION)

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
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10	0	KEY					
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EL: 11 CONNECTOR MONITOR AMPLIFIER P07

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
------	----	----	----------	-------	---	---	---

01	0	+ 0.0					
02	0	+ 0.0					
03	0	+ 5.6					
04	0	+ 5.6					
05	0	+15.0					
06	0	-15.0					
07	0	TAPMS-02					
08	0	+ 0.0					
09	0	INPDI-02					
10	0	+ 0.0					
11	0	+ 0.0					
12	0	+ 0.0					
13	0	+ 0.0					
14	0	TAPMS-01					
15	0	+ 0.0					
16	0	INPDI-01					

GR: 91 1.810.721.81  
 MONITOR UNIT BOARD

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EL: 01 PHONES+LS CONNECTION WIRE FIELD

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
------	----	----	----------	-------	---	---	---

L	01	0				4	
L	02	0				3	
L	03	0				1	
L	04	0				8	
L	05	0				0	
L	06	0				0	

EL: 02 POTENTIOMETER CONN. WIRE FIELD

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
------	----	----	----------	-------	---	---	---

L	01	0				6	
L	02	0				0	
L	03	0				5	

EL: 03 FROM GR 90, EL 11

TYPE	PT	LV	SIG.NAME	COLOR	F	X	Y
------	----	----	----------	-------	---	---	---

01	0	+ 0.0					
02	0	+ 0.0					
03	0	+ 5.6					
04	0	+ 5.6					
05	0	+15.0					
06	0	-15.0					
07	0	TAPMS-02					
08	0	+ 0.0					
09	0	INPDI-02					
10	0	+ 0.0					
11	0	+ 0.0					
12	0	+ 0.0					
13	0	+ 0.0					
14	0	TAPMS-01					
15	0	+ 0.0					
16	0	INPDI-01					

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 \* STUDER \* LOCATION SUMMARY \* 83/02/25 \* 08:28 \* PAGE 27 \*  
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 TAPE TRANSPORT & AUDIO CIRCUITS \* STUDER A810 \* 1.810.090.00 81/01/29 \*\*\*\*\*

GR #	USED PINS	UNUSED PINS	TOTAL PINS	COD. KEYS	ELE-MNTS	DESCRIPTION OF GROUP	PART # OF GR
01	3	0	3	0	1	POWER INPUT	54.04.0109
02	4	0	4	0	1	POWER SWITCH	55.12.0001
03	4	0	4	0	2	MAINS FILTER	89.01.0384
04	9	0	9	0	2	MAINS FUSE/VOLTAGE SELECTOR	53.03.0130
05	28	4	32	0	4	MAINS TRANSFORMER	1.810.200.00
06	20	1	21	0	8	RECTIFIER UNIT	
07	18	0	18	0	2	STABILIZER	1.810.770.00
08	2	0	2	0	2	REAR PANEL	
09	10	0	10	0	2	CONNECTOR BOARD SPOOLING MOTOR, LEFT	1.810.726.00
10	10	0	10	0	2	CONNECTOR BOARD SPOOLING MOTOR, RIGHT	1.810.727.00
20	735	75	810	19	30	BASIS BOARD	1.810.700.00
21	48	7	55	0	2	COMMAND UNIT	1.810.300.00
22	9	0	9	0	1	SERIAL REMOTE CONTROL	
23	45	4	49	2	2	PARALLEL REMOTE CONTROL	1.810.738.00
24	44	10	54	0	6	SPOOLING MOTOR CONTROL	1.810.760.00
25	115	17	132	0	7	BUS CONNECTOR BOARD	1.810.701.00
26	28	1	29	0	6	CAPSTAN CONTROL UNIT	1.810.761.00
27	18	6	24	1	4	TAPE TENSION UNIT LEFT	1.810.730.81
28	28	4	32	2	6	TAPE TENSION UNIT RIGHT	1.810.728.81
29	2	0	2	0	1	PRESS-SOLENOID	
30	2	0	2	0	1	LIFT SOLENOID	
31	4	0	4	0	2	BRAKE CHASSIS	1.810.165.00
32	35	4	39	0	2	HEAD BLOCK ASSEMBLY	
33	21	4	25	0	1	CONNECTOR VU-METER PANEL, EXTERN	
34	20	6	26	0	2	CONNECTOR VU-METER PANEL, EXTERN (AUDIO)	
35	12	0	12	2	4	INTERFERENCE FILTER, CH01	1.820.749.00
36	12	0	12	2	4	INTERFERENCE FILTER, CH02	1.820.749.00
37	12	0	12	2	4	INTERFERENCE FILTER, CHTC	1.820.749.00
38	29	0	29	0	4	MASTER + MONITOR CONTROL UNIT	1.810.315.00
39	52	3	55	0	7	VU-METER PANEL, CH01	1.820.732.00
40	52	3	55	0	7	VU-METER PANEL, CH02	1.820.732.00
41	4	1	5	0	1	MONITOR AMPLIFIER	1.810.722.81
42	20	0	20	0	3	VARIASPEED PANEL	1.810.330.00
43	100	18	118	1	3	PERIPHERY CONTROLLER	1.810.753.00
44	13	3	16	0	1	TIME CODE CONTROL UNIT	
45	28	11	39	2	2	NOISE REDUCTION SYSTEM CONTROL BOARD	1.810.763.00
90	155	22	177	2	11	DISTRIBUTION BOARD	1.810.720.00
91	16	9	25	0	3	MONITOR UNIT BOARD	1.810.721.81
TOT.	1767	213	1980	35	153	DISTRIBUTED IN 38 GROUPS	

SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	
* 0.0	0	F	07	01	01		OUTPUT (TO GR 20, EL 31/32)	P01	(CONT.)		20	15	09		CONN. REPRODUCE AMPL., CH 2	J15
	4	F	07	01	05		OUTPUT (TO GR 20, EL 31/32)	P01			20	15	11		CONN. REPRODUCE AMPL., CH 2	J15
	0	F	07	01	07		OUTPUT (TO GR 20, EL 31/32)	P01			20	15	14		CONN. REPRODUCE AMPL., CH 2	J15
	4	F	07	01	08		OUTPUT (TO GR 20, EL 31/32)	P01			20	15	18		CONN. REPRODUCE AMPL., CH 2	J15
	4	F	07	01	09		OUTPUT (TO GR 20, EL 31/32)	P01			20	15	21		CONN. REPRODUCE AMPL., CH 2	J15
			20	01	21		CONNECTOR MPU UNIT	J01	S		20	16	02		CONN. LINE AMPLIFIER, CH 2	J16
			20	02	21		CONN. TAPE DECK CONTROLLER	J02			20	16	05		CONN. LINE AMPLIFIER, CH 2	J16
			20	02	24		CONN. TAPE DECK CONTROLLER	J02			20	16	09		CONN. LINE AMPLIFIER, CH 2	J16
			20	03	21		CONN. SERIAL REM. CONTROLLER	J03	S		20	16	13		CONN. LINE AMPLIFIER, CH 2	J16
			20	04	21		CONN. PERIPHERY CONTROLLER	J04			20	16	21		CONN. LINE AMPLIFIER, CH 2	J16
			20	05	16A		CONNECTOR BUS CONVERTOR	J05			20	20	01		CONN. SPOOLING MOTOR CONTR.	P01
			20	05	16B		CONNECTOR BUS CONVERTOR	J05			20	20	02		CONN. SPOOLING MOTOR CONTR.	P01
	S		20	06	21		CONN. CODE WRITE/READ UNIT	J06			20	21	01		CONN. CAPSTAN CONTROL UNIT	P02
			20	07	21		CONNECTOR CODE DELAY UNIT	J07			20	21	02		CONN. CAPSTAN CONTROL UNIT	P02
			20	08	03		CONNECTOR HF-DRIVER, CH 1	J08			20	23	37		CONNECTOR COMMAND UNIT	P04
			20	08	04		CONNECTOR HF-DRIVER, CH 1	J08			20	23	39		CONNECTOR COMMAND UNIT	P04
	S		20	08	11		CONNECTOR HF-DRIVER, CH 1	J08			20	25	03		CONN. TO BUS CONNECTOR BOARD	J18
			20	08	16		CONNECTOR HF-DRIVER, CH 1	J08			20	25	04		CONN. TO BUS CONNECTOR BOARD	J18
			20	08	21		CONNECTOR HF-DRIVER, CH 1	J08			20	25	09		CONN. TO BUS CONNECTOR BOARD	J18
			20	09	05		CONN. RECORD AMPLIFIER, CH 1	J09			20	25	10		CONN. TO BUS CONNECTOR BOARD	J18
	S		20	09	11		CONN. RECORD AMPLIFIER, CH 1	J09			20	25	13		CONN. TO BUS CONNECTOR BOARD	J18
			20	09	14		CONN. RECORD AMPLIFIER, CH 1	J09			20	25	14		CONN. TO BUS CONNECTOR BOARD	J18
			20	09	16		CONN. RECORD AMPLIFIER, CH 1	J09			20	25	17		CONN. TO BUS CONNECTOR BOARD	J18
			20	09	21		CONN. RECORD AMPLIFIER, CH 1	J09			20	25	18		CONN. TO BUS CONNECTOR BOARD	J18
	S		20	10	05		CONN. REPRODUCE AMPL., CH 1	J10	S	N	20	26	01		CONN. TO VU-METER PANEL, CH1	J19
			20	10	08		CONN. REPRODUCE AMPL., CH 1	J10	S	N	20	26	04		CONN. TO VU-METER PANEL, CH1	J19
			20	10	09		CONN. REPRODUCE AMPL., CH 1	J10	S	N	20	26	07		CONN. TO VU-METER PANEL, CH1	J19
			20	10	11		CONN. REPRODUCE AMPL., CH 1	J10	S	N	20	27	01		CONN. TO VU-METER PANEL, CH2	J20
			20	10	14		CONN. REPRODUCE AMPL., CH 1	J10	S	N	20	27	04		CONN. TO VU-METER PANEL, CH2	J20
			20	10	18		CONN. REPRODUCE AMPL., CH 1	J10	S	N	20	27	07		CONN. TO VU-METER PANEL, CH2	J20
			20	10	21		CONN. REPRODUCE AMPL., CH 1	J10	S	N	20	28	03		CONN. TO MONITOR AMPLIFIER	J21
	S		20	11	02		CONN. LINE AMPLIFIER, CH 1	J11	0	N	20	28	06		CONN. TO MONITOR AMPLIFIER	J21
			20	11	05		CONN. LINE AMPLIFIER, CH 1	J11	S	N	20	29	02		CONNECTOR TO MASTER PANEL	J22
			20	11	09		CONN. LINE AMPLIFIER, CH 1	J11	S	N	20	29	04		CONNECTOR TO MASTER PANEL	J22
	S		20	11	13		CONN. LINE AMPLIFIER, CH 1	J11	4	L	20	31	08		WIRE FIELD (POWER SUP. +SOLE.)	
			20	11	21		CONN. LINE AMPLIFIER, CH 1	J11	4	L	20	31	10		WIRE FIELD (POWER SUP. +SOLE.)	
			20	12	02		CONNECTOR MONO-STEREO-SWITCH	J12	4	L	20	31	11		WIRE FIELD (POWER SUP. +SOLE.)	
			20	12	04		CONNECTOR MONO-STEREO-SWITCH	J12	0	L	20	32	03		WIRE FIELD (POWER SUPPLY)	
			20	12	06		CONNECTOR MONO-STEREO-SWITCH	J12	0	L	20	32	04		WIRE FIELD (POWER SUPPLY)	
			20	12	08		CONNECTOR MONO-STEREO-SWITCH	J12	0	U	20	33	01		WIRE FIELD (HEAD BLOCK ASSEMBLY)	
			20	12	10		CONNECTOR MONO-STEREO-SWITCH	J12			21	01	37		CONNECTOR TO BASIS BOARD, EL 23	
			20	12	12		CONNECTOR MONO-STEREO-SWITCH	J12			21	01	39		CONNECTOR TO BASIS BOARD, EL 23	
			20	12	14		CONNECTOR MONO-STEREO-SWITCH	J12			21	02	14		CONNECTOR TO DISPLAY BOARD	
			20	12	21		CONNECTOR MONO-STEREO-SWITCH	J12		8	23	01	01		CONN. PARALLEL REMOTE CONTR.	J01
			20	13	03		CONNECTOR HF-DRIVER, CH 2	J13	8		23	01	14		CONN. PARALLEL REMOTE CONTR.	J01
			20	13	04		CONNECTOR HF-DRIVER, CH 2	J13			23	02	01		FROM GR 25, EL 02	
	S		20	13	11		CONNECTOR HF-DRIVER, CH 2	J13			23	02	02		FROM GR 25, EL 02	
			20	13	16		CONNECTOR HF-DRIVER, CH 2	J13			23	02	20		FROM GR 25, EL 02	
			20	13	21		CONNECTOR HF-DRIVER, CH 2	J13			23	02	22		FROM GR 25, EL 02	
			20	14	05		CONN. RECORD AMPLIFIER, CH 2	J14			23	02	25		FROM GR 25, EL 02	
	S		20	14	11		CONN. RECORD AMPLIFIER, CH 2	J14			23	02	26		FROM GR 25, EL 02	
			20	14	14		CONN. RECORD AMPLIFIER, CH 2	J14			24	01	01		FROM GR 20, EL 20	
			20	14	16		CONN. RECORD AMPLIFIER, CH 2	J14			24	01	02		FROM GR 20, EL 20	
			20	14	21		CONN. RECORD AMPLIFIER, CH 2	J14			24	02	01		CONN. TAPE TENS. UNIT, LEFT	J02
			20	15	05		CONN. REPRODUCE AMPL., CH 2	J15			24	02	02		CONN. TAPE TENS. UNIT, LEFT	J02
	S		20	15	08		CONN. REPRODUCE AMPL., CH 2	J15			24	03	01		CONN. TAPE TENS. UNIT, RIGHT	J03
							./.	./.								./.

SIG-NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG-NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT
(CONT.)			24	03	02		CONN. TAPE TENS. UNIT, RIGHT	J03	(CONT.)	0	U	39	01	03	CALIBRATION BOARD
			25	01	01		CONN. VU-METER PANEL EXT.	P01	S	U	39	01	11		CALIBRATION BOARD
			25	01	02		CONN. VU-METER PANEL EXT.	P01	S	U	39	01	12		CALIBRATION BOARD
			25	01	20		CONN. VU-METER PANEL EXT.	P01	0	U	39	01	13		CALIBRATION BOARD
			25	01	22		CONN. VU-METER PANEL EXT.	P01	S	U	39	01	17		CALIBRATION BOARD
			25	01	25		CONN. VU-METER PANEL EXT.	P01	0	U	39	01	19		CALIBRATION BOARD
			25	01	26		CONN. VU-METER PANEL EXT.	P01			39	02	03		CALIBRATION BOARD
			25	02	01		CONN. REMOTE CONTROL	P02			39	02	05		CALIBRATION BOARD
			25	02	02		CONN. REMOTE CONTROL	P02	0	L	39	03	03		POTENTIOMETER RECORD-LEVEL
			25	02	20		CONN. REMOTE CONTROL	P02	0	L	39	04	03		POTENTIOMETER REPRODUCE-LEVEL
			25	02	22		CONN. REMOTE CONTROL	P02	0	L	39	11	03		CHANNEL CONTROL BOARD
			25	02	25		CONN. REMOTE CONTROL	P02			39	12	01		FROM GR 25, EL 03
			25	02	26		CONN. REMOTE CONTROL	P02			39	12	02		FROM GR 25, EL 03
			25	03	01		CONNECTOR COMMANDS CH1	P03	0	U	40	01	03		CALIBRATION BOARD
			25	03	02		CONNECTOR COMMANDS CH1	P03	S	U	40	01	11		CALIBRATION BOARD
			25	04	01		CONNECTOR COMMANDS CH2	P04	S	U	40	01	12		CALIBRATION BOARD
			25	04	02		CONNECTOR COMMANDS CH2	P04	0	U	40	01	13		CALIBRATION BOARD
			25	05	01		CONNECTOR COMMANDS CH3	P05	S	U	40	01	17		CALIBRATION BOARD
			25	05	02		CONNECTOR COMMANDS CH3	P05	0	U	40	01	19		CALIBRATION BOARD
			25	06	01		CONN. COMMANDS MASTER PANEL	P06			40	02	03		CALIBRATION BOARD
			25	06	02		CONN. COMMANDS MASTER PANEL	P06			40	02	05		CALIBRATION BOARD
			25	07	01		CONN. COMM. VARI SPEED PANEL	P07	0	L	40	03	03		POTENTIOMETER RECORD-LEVEL
			25	07	02		CONN. COMM. VARI SPEED PANEL	P07	0	L	40	04	03		POTENTIOMETER REPRODUCE-LEVEL
			26	01	01		FROM GR 20, EL 21		0	L	40	11	03		CHANNEL CONTROL BOARD
			26	01	02		FROM GR 20, EL 21				40	12	01		FROM GR 25, EL 04
			27	01	01		FROM GR 24, EL 02	J01			40	12	02		FROM GR 25, EL 04
			27	01	02		FROM GR 24, EL 02	J01	S	J	41	01	04		FROM GR 20, EL 28
			28	01	01		FROM GR 24, EL 03	J01			42	01	01		FEED CONNECTOR FROM GR 25, EL 07
			28	01	02		FROM GR 24, EL 03	J01			42	01	02		FEED CONNECTOR FROM GR 25, EL 07
0			28	04	01		CONN. MOVE SENSOR	J03	0		42	02	01		WIRE FIELD
0	U		28	05	01		MOVE SENSOR		0		42	03	01		POTENTIOMETER
0	B		32	01	07		CONN. HEAD BLOCK ASSEMBLY	P01			43	01	21		CONN. BASIS BOARD (EL 04)
S	L		32	02	04		REPRODUCE PREAMPLIFIER				43	02	40		PERIPHERY CONTROLLER BOARD
S	L		32	02	05		REPRODUCE PREAMPLIFIER				43	03	40		KEY BOARD
			33	01	01		FROM GR 25, EL 01	J01			44	01	01		FROM GR 25, EL 05
			33	01	13		FROM GR 25, EL 01	J01			44	01	02		FROM GR 25, EL 05
			33	01	14		FROM GR 25, EL 01	J01			45	01	15		CONN. NOISE REDUCTION SYSTEM
			33	01	23		FROM GR 25, EL 01	J01			45	02	01		FROM GR 25, EL 01
			33	01	24		FROM GR 25, EL 01	J01			45	02	02		FROM GR 25, EL 01
S	A		34	01	02		FROM GR 20, EL 26+27	P01			45	02	20		FROM GR 25, EL 01
S	A		34	01	09		FROM GR 20, EL 26+27	P01			45	02	22		FROM GR 25, EL 01
S	A		34	01	15		FROM GR 20, EL 26+27	P01			45	02	25		FROM GR 25, EL 01
S	A		34	01	17		FROM GR 20, EL 26+27	P01			45	02	26		FROM GR 25, EL 01
S	A		34	01	22		FROM GR 20, EL 26+27	P01			90	01	01		FROM GR 33, EL 01
S	A		34	01	24		FROM GR 20, EL 26+27	P01			90	01	02		FROM GR 33, EL 01
S	D		35	03	03		CONNECTOR LINE FILTER, INP.	P01			90	01	20		FROM GR 33, EL 01
S	D		36	03	03		CONNECTOR LINE FILTER, OUTP.	P02			90	01	22		FROM GR 33, EL 01
S	D		36	03	03		CONNECTOR LINE FILTER, INP.	P01			90	01	25		FROM GR 33, EL 01
S	D		36	04	03		CONNECTOR LINE FILTER, OUTP.	P02			90	01	26		FROM GR 33, EL 01
S	D		37	03	03		CONNECTOR LINE FILTER, INP.	P01			90	02	01		CONNECTOR NOISE REDUCTION
S	D		37	04	03		CONNECTOR LINE FILTER, OUTP.	P02			90	02	02		CONNECTOR NOISE REDUCTION
S	L		38	01	03A		CONNECTOR, HEAD PHONES				90	02	20		CONNECTOR NOISE REDUCTION
S	L		38	02	04A		LEVEL POTENTIOMETER				90	02	22		CONNECTOR NOISE REDUCTION
4	U		38	03	04B		MASTER SWITCHING BOARD				90	02	25		CONNECTOR NOISE REDUCTION
			38	04	01		MASTER CONTROL BOARD				90	02	26		CONNECTOR NOISE REDUCTION
			38	04	02		MASTER CONTROL BOARD				90	03	01		RESERVE

SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT
(CONT.)			90	03	02		RESERVE	(CONT.)			20	15	24		CONN. REPRODUCE AMPL., CH 2
			90	03	20		RESERVE				20	16	24		CONN. LINE AMPLIFIER, CH 2
			90	03	22		RESERVE				20	20	03		CONN. SPOOLING MOTOR CONTR.
			90	03	25		RESERVE				20	20	04		CONN. SPOOLING MOTOR CONTR.
			90	03	26		RESERVE				20	21	03		CONN. CAPSTAN CONTROL UNIT
			90	04	01		CONN. COMMANDS VARI SPEED				20	21	04		CONN. CAPSTAN CONTROL UNIT
			90	04	02		CONN. COMMANDS VARI SPEED				20	23	38		CONNECTOR COMMAND UNIT
			90	05	01		CONNECTOR COMMANDS CH 03				20	23	40		CONNECTOR COMMAND UNIT
			90	05	02		CONNECTOR COMMANDS CH 03				20	25	11		CONN. TO BUS CONNECTOR BOARD
			90	06	01		CONNECTOR COMMANDS CH 01				20	25	12		CONN. TO BUS CONNECTOR BOARD
			90	06	02		CONNECTOR COMMANDS CH 01	3	L		20	32	01		WIRE FIELD (POWER SUPPLY)
			90	07	01		CONNECTOR COMMANDS CH 02	3	L		20	32	02		WIRE FIELD (POWER SUPPLY)
			90	07	02		CONNECTOR COMMANDS CH 02	3	U		20	33	04		WIRE FIELD (HEAD BLOCK ASSEMBLY)
S	N		90	09	01		CONN. VU-METER CH 1, AUDIO				21	01	38		CONNECTOR TO BASIS BOARD, EL 23
S	N		90	09	04		CONN. VU-METER CH 1, AUDIO				21	02	15		CONNECTOR TO DISPLAY BOARD
S	N		90	09	07		CONN. VU-METER CH 1, AUDIO				23	02	03		FROM GR 25, EL 02
S	N		90	10	01		CONN. VU-METER CH 2, AUDIO				23	02	04		FROM GR 25, EL 02
S	N		90	10	04		CONN. VU-METER CH 2, AUDIO				24	01	03		FROM GR 20, EL 20
S	N		90	10	07		CONN. VU-METER CH 2, AUDIO				24	01	04		FROM GR 20, EL 20
			90	11	01		CONNECTOR MONITOR AMPLIFIER				24	02	03		CONN. TAPE TENS. UNIT, LEFT
			90	11	02		CONNECTOR MONITOR AMPLIFIER				24	02	04		CONN. TAPE TENS. UNIT, LEFT
			90	11	08		CONNECTOR MONITOR AMPLIFIER				24	03	03		CONN. TAPE TENS. UNIT, RIGHT
			90	11	10		CONNECTOR MONITOR AMPLIFIER				24	03	04		CONN. TAPE TENS. UNIT, RIGHT
			90	11	11		CONNECTOR MONITOR AMPLIFIER				25	01	03		CONN. VU-METER PANEL EXT.
			90	11	12		CONNECTOR MONITOR AMPLIFIER				25	01	04		CONN. VU-METER PANEL EXT.
			90	11	13		CONNECTOR MONITOR AMPLIFIER				25	02	03		CONN. REMOTE CONTROL
			90	11	15		CONNECTOR MONITOR AMPLIFIER				25	02	04		CONN. REMOTE CONTROL
			91	03	01		FROM GR 90, EL 11				25	03	03		CONNECTOR COMMANDS CH1
			91	03	02		FROM GR 90, EL 11				25	03	04		CONNECTOR COMMANDS CH1
			91	03	08		FROM GR 90, EL 11				25	04	03		CONNECTOR COMMANDS CH2
			91	03	10		FROM GR 90, EL 11				25	04	04		CONNECTOR COMMANDS CH2
			91	03	11		FROM GR 90, EL 11				25	05	03		CONNECTOR COMMANDS CH3
			91	03	12		FROM GR 90, EL 11				25	05	04		CONNECTOR COMMANDS CH3
			91	03	13		FROM GR 90, EL 11				25	06	03		CONN. COMMANDS MASTER PANEL
			91	03	15		FROM GR 90, EL 11				25	06	04		CONN. COMMANDS MASTER PANEL
+ 5.0			43	02	39		PERIPHERY CONTROLLER BOARD	P02			25	07	03		CONN. COMM. VARI SPEED PANEL
			43	03	39		KEY BOARD				25	07	04		CONN. COMM. VARI SPEED PANEL
+ 5.6	3	F	07	01	03		OUTPUT (TO GR 20, EL 31/32)	P01			26	01	03		FROM GR 20, EL 21
	3	F	07	01	06		OUTPUT (TO GR 20, EL 31/32)	P01			27	01	03		FROM GR 24, EL 02
			20	01	20		CONNECTOR MPU UNIT	J01	2	N	27	01	04		FROM GR 24, EL 02
			20	02	20		CONN. TAPE DECK CONTROLLER	J02	2	U	27	02	02		CONN. TAPE END SW LEFT
			20	03	20		CONN. SERIAL REM. CONTROLLER	J03			28	01	03		TAPE END SW, LEFT
			20	04	20		CONN. PERIPHERY CONTROLLER	J04			28	01	04		FROM GR 24, EL 03
			20	05	18A		CONNECTOR BUS CONVERTOR	J05	2	N	28	02	02		CONN. TAPE END SW RIGHT
			20	05	18B		CONNECTOR BUS CONVERTOR	J05	2	N	28	04	02		CONN. MOVE SENSOR
			20	06	24		CONN. CODE WRITE/READ UNIT	J06	2	U	28	05	02		MOVE SENSOR
			20	07	24		CONNECTOR CODE DELAY UNIT	J07	2	U	28	06	02		TAPE END SW, RIGHT
			20	08	24		CONNECTOR HF-DRIVER, CH 1	J08	3	B	32	01	08		CONN. HEAD BLOCK ASSEMBLY
			20	09	24		CONN. RECORD AMPLIFIER, CH 1	J09			33	01	02		FROM GR 25, EL 01
			20	10	24		CONN. REPRODUCE AMPL., CH 1	J10			33	01	15		FROM GR 25, EL 01
			20	11	24		CONN. LINE AMPLIFIER, CH 1	J11			38	04	03		MASTER CONTROL BOARD
			20	12	24		CONNECTOR MONO-STEREO-SWITCH	J12			38	04	04		MASTER CONTROL BOARD
			20	13	24		CONNECTOR HF-DRIVER, CH 2	J13	3	U	39	01	02		CALIBRATION BOARD
			20	14	24		CONN. RECORD AMPLIFIER, CH 2	J14			39	02	02		CALIBRATION BOARD
							./.								J01
							./.								./.

SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	
(CONT.)	3	L	39	11	02		CHANNEL CONTROL BOARD	(CONT.)			20	21	05		CONN. CAPSTAN CONTROL UNIT	
			39	12	03		FROM GR 25, EL 03				20	21	06		CONN. CAPSTAN CONTROL UNIT	
			39	12	04		FROM GR 25, EL 03				20	25	05		CONN. TO BUS CONNECTOR BOARD	
	3	U	40	01	02		CALIBRATION BOARD				20	25	06		CONN. TO BUS CONNECTOR BOARD	
			40	02	02		CALIBRATION BOARD	J01	2	N	20	28	05		CONN. TO MONITOR AMPLIFIER	
	3	L	40	11	02		CHANNEL CONTROL BOARD		2	L	20	32	05		WIRE FIELD (POWER SUPPLY)	
			40	12	03		FROM GR 25, EL 04		2	U	20	33	02		WIRE FIELD (HEAD BLOCK ASSEMBLY)	
			40	12	04		FROM GR 25, EL 04				23	02	05		FROM GR 25, EL 02	
			42	01	03		FEED CONNECTOR FROM GR 25, EL 07				24	01	05		FROM GR 20, EL 20	
			42	01	04		FEED CONNECTOR FROM GR 25, EL 07				24	01	06		FROM GR 20, EL 20	
			43	01	20		CONN. BASIS BOARD (EL 04)	P01			24	02	05		CONN. TAPE TENS. UNIT, LEFT	
			44	01	03		FROM GR 25, EL 05				24	02	06		CONN. TAPE TENS. UNIT, LEFT	
			44	01	04		FROM GR 25, EL 05				24	03	05		CONN. TAPE TENS. UNIT, RIGHT	
			45	02	03		FROM GR 25, EL 01	J02			24	03	06		CONN. TAPE TENS. UNIT, RIGHT	
			45	02	04		FROM GR 25, EL 01	J02			25	01	05		CONN. VU-METER PANEL EXT.	
			90	01	03		FROM GR 33, EL 01				25	02	05		CONN. REMOTE CONTROL	
			90	01	04		FROM GR 33, EL 01				25	03	05		CONNECTOR COMMANDS CH1	
			90	02	03		CONNECTOR NOISE REDUCTION	P01			25	04	05		CONNECTOR COMMANDS CH2	
			90	02	04		CONNECTOR NOISE REDUCTION	P01			25	05	05		CONNECTOR COMMANDS CH3	
			90	03	03		RESERVE	P02			25	06	05		CONN. COMMANDS MASTER PANEL	
			90	03	04		RESERVE	P02			25	07	05		CONN. COMM. VARI SPEED PANEL	
			90	04	03		CONN. COMMANDS VARI SPEED	P03			26	01	05		FROM GR 20, EL 21	
			90	04	04		CONN. COMMANDS VARI SPEED	P03			26	01	06		FROM GR 20, EL 21	
			90	05	03		CONNECTOR COMMANDS CH 03	P04			27	01	05		FROM GR 24, EL 02	
			90	05	04		CONNECTOR COMMANDS CH 03	P04			27	01	06		FROM GR 24, EL 02	
			90	06	03		CONNECTOR COMMANDS CH 01	P05			28	01	05		FROM GR 24, EL 03	
			90	06	04		CONNECTOR COMMANDS CH 01	P05			28	01	06		FROM GR 24, EL 03	
			90	07	03		CONNECTOR COMMANDS CH 02	P06	2	B	32	01	03		CONN. HEAD BLOCK ASSEMBLY	
			90	07	04		CONNECTOR COMMANDS CH 02	P06	2	L	32	02	01		REPRODUCE PREAMPLIFIER	
			90	11	03		CONNECTOR MONITOR AMPLIFIER	P07			33	01	03		FROM GR 25, EL 01	
			90	11	04		CONNECTOR MONITOR AMPLIFIER	P07			38	04	05		MASTER CONTROL BOARD	
			91	03	03		FROM GR 90, EL 11		2	U	39	01	01		CALIBRATION BOARD	
			91	03	04		FROM GR 90, EL 11				39	02	01		CALIBRATION BOARD	
+ 5V-LED			21	01	40		CONNECTOR TO BASIS BOARD, EL 23		2	L	39	11	01		CHANNEL CONTROL BOARD	
															FROM GR 25, EL 03	
+15.0	2	F	07	01	04		OUTPUT (TO GR 20, EL 31/32)	P01	2	U	40	01	01		CALIBRATION BOARD	
			20	01	18		CONNECTOR MPU UNIT	J01			40	02	01		CALIBRATION BOARD	
			20	02	18		CONN. TAPE DECK CONTROLLER	J02	2	L	40	11	01		CHANNEL CONTROL BOARD	
			20	03	18		CONN. SERIAL REM. CONTROLLER	J03			40	12	05		FROM GR 25, EL 04	
			20	04	18		CONN. PERIPHERY CONTROLLER	J04			41	01	02		FEED CONNECTOR FROM GR 25, EL 07	
			20	05	15A		CONNECTOR BUS CONVERTOR	J05			43	01	18		CONN. BASIS BOARD (EL 04)	
			20	05	15B		CONNECTOR BUS CONVERTOR	J05			44	01	05		FROM GR 25, EL 05	
			20	06	22		CONN. CODE WRITE/READ UNIT	J06			45	02	05		FROM GR 25, EL 01	
			20	07	22		CONNECTOR CODE DELAY UNIT	J07			90	01	05		FROM GR 33, EL 01	
			20	08	22		CONNECTOR HF-DRIVER, CH 1	J08			90	02	05		CONNECTOR NOISE REDUCTION	
			20	09	22		CONN. RECORD AMPLIFIER, CH 1	J09			90	03	05		RESERVE	
			20	10	22		CONN. REPRODUCE AMPL., CH 1	J10			90	04	05		CONN. COMMANDS VARI SPEED	
			20	11	22		CONN. LINE AMPLIFIER, CH 1	J11			90	05	05		CONNECTOR COMMANDS CH 03	
			20	12	22		CONNECTOR MONO-STEREO-SWITCH	J12			90	06	05		CONNECTOR COMMANDS CH 01	
			20	13	22		CONNECTOR HF-DRIVER, CH 2	J13			90	07	05		CONNECTOR COMMANDS CH 02	
			20	14	22		CONN. RECORD AMPLIFIER, CH 2	J14			90	11	05		CONNECTOR MONITOR AMPLIFIER	
			20	15	22		CONN. REPRODUCE AMPL., CH 2	J15			91	03	05		FROM GR 90, EL 11	
			20	16	22		CONN. LINE AMPLIFIER, CH 2	J16								
			20	20	05		CONN. SPOOLING MOTOR CONTR.	P01	+24.0	7	F	07	01	02		OUTPUT (TO GR 20, EL 31/32)
			20	20	06		CONN. SPOOLING MOTOR CONTR.	P01				20	25	19		CONN. TO BUS CONNECTOR BOARD
							+15.0									

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\* STUDER \* S I G N A L W I R E L I S T \* 83/02/25 \* 08:28 \* P A G E 32 \*  
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TAPE TRANSPORT & AUDIO CIRCUITS \* STUDER A810 \* 1.810.090.00 81/01/29

SECTION 5/25

SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT
(CONT.)								(CONT.)							
			20	25	20		CONN. TO BUS CONNECTOR BOARD J18				20	21	07		CONN. CAPSTAN CONTROL UNIT P02
7	U		20	31	01		WIRE FIELD (POWER SUP. +SOLE.)				20	21	08		CONN. CAPSTAN CONTROL UNIT P02
7	U		20	31	02		WIRE FIELD (POWER SUP. +SOLE.)				20	25	07		CONN. TO BUS CONNECTOR BOARD J18
7	U		20	31	03		WIRE FIELD (POWER SUP. +SOLE.)				20	25	08		CONN. TO BUS CONNECTOR BOARD J18
7	U		20	31	04		WIRE FIELD (POWER SUP. +SOLE.)	6	N		20	28	04		CONN. TO MONITOR AMPLIFIER J21
7	U		20	31	05		WIRE FIELD (POWER SUP. +SOLE.)	6	L		20	32	06		WIRE FIELD (POWER SUPPLY)
7	U		20	31	06		WIRE FIELD (POWER SUP. +SOLE.)	6	U		20	33	03		WIRE FIELD (HEAD BLOCK ASSEMBLY)
7	L		20	31	07		WIRE FIELD (POWER SUP. +SOLE.)				23	02	06		FROM GR 25, EL 02
B			23	01	25		CONN. PARALLEL REMOTE CONTR. J01				24	01	07		FROM GR 20, EL 20
			23	02	24		FROM GR 25, EL 02				24	02	07		CONN. TAPE TENS. UNIT, LEFT J02
			25	01	24		CONN. VU-METER PANEL EXT. P01				24	02	08		CONN. TAPE TENS. UNIT, LEFT J02
			25	02	24		CONN. REMOTE CONTROL P02				24	03	07		CONN. TAPE TENS. UNIT, RIGHT J03
			25	03	16		CONNECTOR COMMANDS CH1 P03				24	03	08		CONN. TAPE TENS. UNIT, RIGHT J03
			25	04	16		CONNECTOR COMMANDS CH2 P04				25	01	06		CONN. VU-METER PANEL EXT. P01
			25	05	16		CONNECTOR COMMANDS CH3 P05				25	02	06		CONN. REMOTE CONTROL P02
			25	06	16		CONN. COMMANDS MASTER PANEL P06				25	03	06		CONNECTOR COMMANDS CH1 P03
			25	07	16		CONN. COMM. VARI SPEED PANEL P07				25	04	06		CONNECTOR COMMANDS CH2 P04
7	X		27	03	01		EDIT SOLENOID, LEFT				25	05	06		CONNECTOR COMMANDS CH3 P05
7	X		28	03	01		EDIT SOLENOID, RIGHT				25	06	06		CONN. COMMANDS MASTER PANEL P06
7	X		29	01	01		PRESS SOLENOID				25	07	06		CONN. COMM. VARI SPEED PANEL P07
7	X		30	01	01		LIFT SOLENOID				26	01	07		FROM GR 20, EL 21
7	X		31	01	01		BRAKE SOLENOID				26	01	08		FROM GR 20, EL 21
7	X		31	02	01		EDIT-BRAKE SOLENOID				27	01	07		FROM GR 24, FL 02 J01
			33	01	25		FROM GR 25, EL 01 J01				27	01	08		FROM GR 24, EL 02 J01
			38	04	16		MASTER CONTROL BOARD				28	01	07		FROM GR 24, EL 03 J01
			39	12	16		FROM GR 25, EL 03				28	01	08		FROM GR 24, EL 03 J01
			40	12	16		FROM GR 25, EL 04	6	B		32	01	16		CONN. HEAD BLOCK ASSEMBLY P01
			42	01	16		FEED CONNECTOR FROM GR 25, EL 07	6	L		32	02	08		REPRODUCE PREAMPLIFIER
			44	01	16		FROM GR 25, EL 05				33	01	16		FROM GR 25, EL 01 J01
			45	01	14		CONN. NOISE REDUCTION SYSTEM J01				38	04	06		MASTER CONTROL BOARD
			45	02	24		FROM GR 25, EL 01 J02	6	U		39	01	04		CALIBRATION BOARD
			90	01	24		FROM GR 33, EL 01				39	02	04		CALIBRATION BOARD J01
			90	02	24		CONNECTOR NOISE REDUCTION P01				39	11	04		CHANNEL CONTROL BOARD
			90	03	24		RESERVE P02	6	L		39	12	06		FROM GR 25, EL 03
			90	04	16		CONN. COMMANDS VARI SPEED P03				40	01	04		CALIBRATION BOARD
			90	05	16		CONNECTOR COMMANDS CH 03 P04	6	U		40	02	04		CALIBRATION BOARD J01
			90	06	16		CONNECTOR COMMANDS CH 01 P05				40	11	04		CHANNEL CONTROL BOARD
			90	07	16		CONNECTOR COMMANDS CH 02 P06	6	L		40	12	06		FROM GR 25, EL 04
											41	01	03		FROM GR 20, EL 28 WIRE FIELD
-15.0	6	F	07	01	10		OUTPUT (TO GR 20, EL 31/32) P01				42	01	06		FEED CONNECTOR FROM GR 25, EL 07
			20	03	22		CONN. SERIAL REM. CONTROLLER J03				43	01	22		CONN. BASIS BOARD (EL 04) P01
			20	04	22		CONN. PERIPHERY CONTROLLER J04				44	01	06		FROM GR 25, EL 05
			20	05	17A		CONNECTOR BUS CONVERTOR J05				45	02	06		FROM GR 25, EL 01 J02
			20	05	17B		CONNECTOR BUS CONVERTOR J05				90	01	06		FROM GR 33, EL 01
			20	06	23		CONN. CODE WRITE/READ UNIT J06				90	02	06		CONNECTOR NOISE REDUCTION P01
			20	07	23		CONNECTOR CODE DELAY UNIT J07				90	03	06		RESERVE P02
			20	08	23		CONNECTOR HF-DRIVER, CH 1 J08				90	04	06		CONN. COMMANDS VARI SPEED P03
			20	09	23		CONN. RECORD AMPLIFIER, CH 1 J09				90	05	06		CONNECTOR COMMANDS CH 03 P04
			20	10	23		CONN. REPRODUCE AMPL., CH 1 J10				90	06	06		CONNECTOR COMMANDS CH 01 P05
			20	11	23		CONN. LINE AMPLIFIER, CH 1 J11				90	07	06		CONNECTOR COMMANDS CH 02 P06
			20	12	23		CONNECTOR MONO-STEREO-SWITCH J12				90	11	06		CONNECTOR MONITOR AMPLIFIER P07
			20	13	23		CONNECTOR HF-DRIVER, CH 2 J13				91	03	06		FROM GR 90, EL 11
			20	14	23		CONN. RECORD AMPLIFIER, CH 2 J14								
			20	15	23		CONN. REPRODUCE AMPL., CH 2 J15	ACA-10	L		05	03	16		SECONDARY 1 P03
			20	16	23		CONN. LINE AMPLIFIER, CH 2 J16		Y		05	03	17		SECONDARY 1 P03
			20	20	07		CONN. SPOOLING MOTOR CONTR. P01								
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SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT
ACA-125	2	Y	05	03	15		SECONDARY 1 P03	(CONT.)	3	J	09	02	02		PHASE SHIFT CAPACITOR
	2	U	24	04	01		TRANSFORMER FEED								
ACA-130	6	Y	05	03	19		SECONDARY 1 P03	ACML-H	1	Y	09	01	01		
	6	U	26	02	01		TRANSFORMER FEED		5	Y	09	01	02		
									6	U	09	01	05		
ACA-25.6	5	Y	05	03	14		SECONDARY 1 P03		6	Y	24	05	01		CONN. BOARD SPOOLING MOTOR, LEFT
	5	L	06	01	01		FUSE, F 1	ACML-O	4	Y	09	01	03		
									0	U	09	01	06		
ACA-35.2	7	Y	05	03	12		SECONDARY 1 P03		1	U	09	01	07		
	7	L	06	02	01		FUSE, F 2		1	J	09	02	01		PHASE SHIFT CAPACITOR
									0	Y	24	05	02		CONN. BOARD SPOOLING MOTOR, LEFT
ACAF35.2	7	L	06	02	02		FUSE, F 2	ACMR-C	5	Y	10	01	04		
	7	J	06	05	01		RECTIFIER, D 2		3	U	10	01	08		
CB-10		Y	05	04	12		SECONDARY 2 P04		3	J	10	02	02		PHASE SHIFT CAPACITOR
	L		05	04	13		SECONDARY 2 P04								
CB-125	0	Y	05	04	14		SECONDARY 2 P04	ACMR-H	1	Y	10	01	01		
	0	U	24	04	02		TRANSFORMER FEED		6	Y	10	01	02		
									4	U	10	01	05		
CB-130	6	Y	05	04	10		SECONDARY 2 P04		4	Y	24	06	01		CONN. BOARD SPOOLING MOTOR, RIGH
	6	U	26	02	02		TRANSFORMER FEED	ACMR-O	4	Y	10	01	03		
									0	U	10	01	06		
CB-25.6	4	Y	05	04	15		SECONDARY 2 P04		1	U	10	01	07		
	4	L	06	03	03		SOLDER TERMINAL		1	J	10	02	01		PHASE SHIFT CAPACITOR
	4	J	06	04	02		RECTIFIER, D 1		0	Y	24	06	02		CONN. BOARD SPOOLING MOTOR, RIGH
	4	Y	07	02	02		INPUT								
CB-35.2	2	Y	05	04	17		SECONDARY 2 P04	AFCSW-01			20	08	10		CONNECTOR HF-DRIVER, CH 1 J08
	2	J	06	05	02		RECTIFIER, D 2				20	09	15		CONN. RECORD AMPLIFIER, CH 1 J09
CB-10	4	L	05	03	18		SECONDARY 1 P03	AFCSW-02			20	13	10		CONNECTOR HF-DRIVER, CH 2 J13
	4	L	05	04	11		SECONDARY 2 P04				20	14	15		CONN. RECORD AMPLIFIER, CH 2 J14
CB-130	4	L	05	03	20		SECONDARY 1 P03	AN-POT	1		42	02	02		WIRE FIELD
	4	L	05	04	09		SECONDARY 2 P04		1		42	03	02		POTENTIOMETER
CB-25.6	4	L	05	03	13		SECONDARY 1 P03	AN-RFTTL			20	02	13		CONN. TAPE DECK CONTROLLER J02
	4	L	05	04	16		SECONDARY 2 P04				20	20	11		CONN. SPOOLING MOTOR CONTR. P01
											24	01	11		FROM GR 20, EL 20
CB-35.2	4	L	05	03	11		SECONDARY 1 P03	AN-RFTTR			20	02	14		CONN. TAPE DECK CONTROLLER J02
	4	L	05	04	18		SECONDARY 2 P04				20	20	12		CONN. SPOOLING MOTOR CONTR. P01
											24	01	12		FROM GR 20, EL 20
CB-A	8	Y	26	03	01		CONNECTOR CAPSTAN MOTOR	AN-TACHD	2	Y	26	03	04		CONNECTOR CAPSTAN MOTOR
CB-B	4	Y	26	03	02		CONNECTOR CAPSTAN MOTOR		2		26	06	04		CAPACITIVE SENSOR
	4	Y	26	04	01		CONN. PHASE SHIFT CAPACITOR	AN-TTL			24	02	11		CONN. TAPE TENS. UNIT, LEFT J02
	4		26	05	01		PHASE SHIFT CAPACITOR				27	01	11		FROM GR 24, EL 02 J01
CB-C	5	Y	26	03	03		CONNECTOR CAPSTAN MOTOR	AN-TTR			24	03	11		CONN. TAPE TENS. UNIT, RIGHT J03
	5	Y	26	04	02		CONN. PHASE SHIFT CAPACITOR				28	01	11		FROM GR 24, EL 03 J01
	5		26	05	02		PHASE SHIFT CAPACITOR								
CB-L-C	6	Y	09	01	04			B-BDY-01			45	01	01		CONN. NOISE REDUCTION SYSTEM J01
	3	U	09	01	08										
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SECTION 5/26

SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT
B-BDY-02			45	01	02		CONN. NOISE REDUCTION SYSTEM J01	BRC-BIA			43	02	25		PERIPHERY CONTROLLER BOARD P02
B-CH1			43	02	31		PERIPHERY CONTROLLER BOARD P02				43	03	25		KEY BOARD
			43	03	31		KEY BOARD	BRC-LVL			43	02	23		PERIPHERY CONTROLLER BOARD P02
B-CH2			43	02	32		PERIPHERY CONTROLLER BOARD P02				43	03	23		KEY BOARD
			43	03	32		KEY BOARD	BRC-TRB			43	02	24		PERIPHERY CONTROLLER BOARD P02
B-LED0			43	02	26		PERIPHERY CONTROLLER BOARD P02				43	03	24		KEY BOARD
			43	03	26		KEY BOARD	BRP-BAS			43	02	22		PERIPHERY CONTROLLER BOARD P02
B-LED1			43	02	27		PERIPHERY CONTROLLER BOARD P02				43	03	22		KEY BOARD
			43	03	27		KEY BOARD	BRP-LVL			43	02	20		PERIPHERY CONTROLLER BOARD P02
B-LED2			43	02	28		PERIPHERY CONTROLLER BOARD P02				43	03	20		KEY BOARD
			43	03	28		KEY BOARD	BRP-TRB			43	02	21		PERIPHERY CONTROLLER BOARD P02
B-LED3			43	02	29		PERIPHERY CONTROLLER BOARD P02				43	03	21		KEY BOARD
			43	03	29		KEY BOARD	CA-ADR-R			20	05	21B		CONNECTOR BUS CONVERTOR J05
B-STO			43	02	30		PERIPHERY CONTROLLER BOARD P02				20	06	27		CONN. CODE WRITE/READ UNIT J06
			43	03	30		KEY BOARD				20	07	27		CONNECTOR CODE DELAY UNIT J07
B-TLC-01			45	01	11		CONN. NOISE REDUCTION SYSTEM J01				20	08	27		CONNECTOR HF-DRIVER, CH 1 J08
B-TLC-02			45	01	13		CONN. NOISE REDUCTION SYSTEM J01				20	09	27		CONN. RECORD AMPLIFIER, CH 1 J09
BIASA-01			20	08	05		CONNECTOR HF-DRIVER, CH 1 J08				20	10	27		CONN. REPRODUCE AMPL., CH 1 J10
			20	09	06		CONN. RECORD AMPLIFIER, CH 1 J09				20	11	27		CONN. LINE AMPLIFIER, CH 1 J11
BIASA-02			20	13	05		CONNECTOR HF-DRIVER, CH 2 J13				20	12	27		CONNECTOR MONO-STEREO-SWITCH J12
			20	14	06		CONN. RECORD AMPLIFIER, CH 2 J14				20	13	27		CONNECTOR HF-DRIVER, CH 2 J13
BIASB-01			20	08	06		CONNECTOR HF-DRIVER, CH 1 J08				20	14	27		CONN. RECORD AMPLIFIER, CH 2 J14
			20	09	07		CONN. RECORD AMPLIFIER, CH 1 J09				20	15	27		CONN. REPRODUCE AMPL., CH 2 J15
BIASB-02			20	13	06		CONNECTOR HF-DRIVER, CH 2 J13				20	16	27		CONN. LINE AMPLIFIER, CH 2 J16
			20	14	07		CONN. RECORD AMPLIFIER, CH 2 J14	CA-ADR-S			20	05	22B		CONNECTOR BUS CONVERTOR J05
BIASC-01			20	08	07		CONNECTOR HF-DRIVER, CH 1 J08				20	06	28		CONN. CODE WRITE/READ UNIT J06
			20	09	08		CONN. RECORD AMPLIFIER, CH 1 J09				20	07	28		CONNECTOR CODE DELAY UNIT J07
BIASC-02			20	13	07		CONNECTOR HF-DRIVER, CH 2 J13				20	08	28		CONNECTOR HF-DRIVER, CH 1 J08
			20	14	08		CONN. RECORD AMPLIFIER, CH 2 J14				20	09	28		CONN. RECORD AMPLIFIER, CH 1 J09
BR-FAD	B		23	01	08		CONN. PARALLEL REMOTE CONTR. J01				20	10	28		CONN. REPRODUCE AMPL., CH 1 J10
BR-FORM	B		23	01	03		CONN. PARALLEL REMOTE CONTR. J01				20	11	28		CONN. LINE AMPLIFIER, CH 1 J11
BR-PLAY	B		23	01	15		CONN. PARALLEL REMOTE CONTR. J01				20	12	28		CONNECTOR MONO-STEREO-SWITCH J12
BR-REC	B		23	01	09		CONN. PARALLEL REMOTE CONTR. J01				20	13	28		CONNECTOR HF-DRIVER, CH 2 J13
BR-REW	B		23	01	02		CONN. PARALLEL REMOTE CONTR. J01				20	14	28		CONN. RECORD AMPLIFIER, CH 2 J14
BR-STOP	B		23	01	16		CONN. PARALLEL REMOTE CONTR. J01				20	15	28		CONN. REPRODUCE AMPL., CH 2 J15
											20	16	28		CONN. LINE AMPLIFIER, CH 2 J16

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SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT
CA-ADR-U			20	05	24B		CONNECTOR BUS CONVERTOR J05	(CONT.)			20	13	32		CONNECTOR HF-DRIVER, CH 2 J13
			20	06	30		CONN. CODE WRITE/READ UNIT J06				20	14	32		CONN. RECORD AMPLIFIER, CH 2 J14
			20	07	30		CONNECTOR CODE DELAY UNIT J07				20	15	32		CONN. REPRODUCE AMPL., CH 2 J15
			20	08	30		CONNECTOR HF-DRIVER, CH 1 J08				20	16	32		CONN. LINE AMPLIFIER, CH 2 J16
			20	09	30		CONN. RECORD AMPLIFIER, CH 1 J09	CA-DATA2			20	05	27B		CONNECTOR BUS CONVERTOR J05
			20	10	30		CONN. REPRODUCE AMPL., CH 1 J10				20	06	33		CONN. CODE WRITE/READ UNIT J06
			20	11	30		CONN. LINE AMPLIFIER, CH 1 J11				20	07	33		CONNECTOR CODE DELAY UNIT J07
			20	12	30		CONNECTOR MONO-STEREO-SWITCH J12				20	08	33		CONNECTOR HF-DRIVER, CH 1 J08
			20	13	30		CONNECTOR HF-DRIVER, CH 2 J13				20	09	33		CONN. RECORD AMPLIFIER, CH 1 J09
			20	14	30		CONN. RECORD AMPLIFIER, CH 2 J14				20	10	33		CONN. REPRODUCE AMPL., CH 1 J10
			20	15	30		CONN. REPRODUCE AMPL., CH 2 J15				20	11	33		CONN. LINE AMPLIFIER, CH 1 J11
			20	16	30		CONN. LINE AMPLIFIER, CH 2 J16				20	12	33		CONNECTOR MONO-STEREO-SWITCH J12
CA-BAD01			20	08	17		CONNECTOR HF-DRIVER, CH 1 J08				20	13	33		CONNECTOR HF-DRIVER, CH 2 J13
			20	09	17		CONN. RECORD AMPLIFIER, CH 1 J09				20	14	33		CONN. RECORD AMPLIFIER, CH 2 J14
CA-BAD02			20	13	17		CONNECTOR HF-DRIVER, CH 2 J13				20	15	33		CONN. REPRODUCE AMPL., CH 2 J15
			20	14	17		CONN. RECORD AMPLIFIER, CH 2 J14				20	16	33		CONN. LINE AMPLIFIER, CH 2 J16
CA-CHSTC			20	05	11B		CONNECTOR BUS CONVERTOR J05	CA-DATA3			20	05	28B		CONNECTOR BUS CONVERTOR J05
			20	06	39		CONN. CODE WRITE/READ UNIT J06				20	06	34		CONN. CODE WRITE/READ UNIT J06
			20	07	39		CONNECTOR CODE DELAY UNIT J07				20	07	34		CONNECTOR CODE DELAY UNIT J07
CA-CHSO1			20	05	12B		CONNECTOR BUS CONVERTOR J05				20	08	34		CONNECTOR HF-DRIVER, CH 1 J08
			20	08	39		CONNECTOR HF-DRIVER, CH 1 J08				20	09	34		CONN. RECORD AMPLIFIER, CH 1 J09
			20	09	39		CONN. RECORD AMPLIFIER, CH 1 J09				20	10	34		CONN. REPRODUCE AMPL., CH 1 J10
			20	10	39		CONN. REPRODUCE AMPL., CH 1 J10				20	11	34		CONN. LINE AMPLIFIER, CH 1 J11
			20	11	39		CONN. LINE AMPLIFIER, CH 1 J11				20	12	34		CONNECTOR MONO-STEREO-SWITCH J12
CA-CHSO2			20	05	14B		CONNECTOR BUS CONVERTOR J05				20	13	34		CONNECTOR HF-DRIVER, CH 2 J13
			20	13	39		CONNECTOR HF-DRIVER, CH 2 J13				20	14	34		CONN. RECORD AMPLIFIER, CH 2 J14
			20	14	39		CONN. RECORD AMPLIFIER, CH 2 J14				20	15	34		CONN. REPRODUCE AMPL., CH 2 J15
			20	15	39		CONN. REPRODUCE AMPL., CH 2 J15				20	16	34		CONN. LINE AMPLIFIER, CH 2 J16
			20	16	39		CONN. LINE AMPLIFIER, CH 2 J16	CA-DATA4			20	05	29B		CONNECTOR BUS CONVERTOR J05
CA-DATA0			20	05	25B		CONNECTOR BUS CONVERTOR J05				20	06	35		CONN. CODE WRITE/READ UNIT J06
			20	06	31		CONN. CODE WRITE/READ UNIT J06				20	07	35		CONNECTOR CODE DELAY UNIT J07
			20	07	31		CONNECTOR CODE DELAY UNIT J07				20	08	35		CONNECTOR HF-DRIVER, CH 1 J08
			20	08	31		CONNECTOR HF-DRIVER, CH 1 J08				20	09	35		CONN. RECORD AMPLIFIER, CH 1 J09
			20	09	31		CONN. RECORD AMPLIFIER, CH 1 J09				20	10	35		CONN. REPRODUCE AMPL., CH 1 J10
			20	10	31		CONN. REPRODUCE AMPL., CH 1 J10				20	11	35		CONN. LINE AMPLIFIER, CH 1 J11
			20	11	31		CONN. LINE AMPLIFIER, CH 1 J11				20	12	35		CONNECTOR MONO-STEREO-SWITCH J12
			20	12	31		CONNECTOR MONO-STEREO-SWITCH J12				20	13	35		CONNECTOR HF-DRIVER, CH 2 J13
			20	13	31		CONNECTOR HF-DRIVER, CH 2 J13				20	14	35		CONN. RECORD AMPLIFIER, CH 2 J14
			20	14	31		CONN. RECORD AMPLIFIER, CH 2 J14				20	15	35		CONN. REPRODUCE AMPL., CH 2 J15
			20	15	31		CONN. REPRODUCE AMPL., CH 2 J15				20	16	35		CONN. LINE AMPLIFIER, CH 2 J16
			20	16	31		CONN. LINE AMPLIFIER, CH 2 J16	CA-DATA5			20	05	30B		CONNECTOR BUS CONVERTOR J05
CA-DATA1			20	05	26B		CONNECTOR BUS CONVERTOR J05				20	06	36		CONN. CODE WRITE/READ UNIT J06
			20	06	32		CONN. CODE WRITE/READ UNIT J06				20	07	36		CONNECTOR CODE DELAY UNIT J07
			20	07	32		CONNECTOR CODE DELAY UNIT J07				20	08	36		CONNECTOR HF-DRIVER, CH 1 J08
			20	08	32		CONNECTOR HF-DRIVER, CH 1 J08				20	09	36		CONN. RECORD AMPLIFIER, CH 1 J09
			20	09	32		CONN. RECORD AMPLIFIER, CH 1 J09				20	10	36		CONN. REPRODUCE AMPL., CH 1 J10
			20	10	32		CONN. REPRODUCE AMPL., CH 1 J10				20	11	36		CONN. LINE AMPLIFIER, CH 1 J11
			20	11	32		CONN. LINE AMPLIFIER, CH 1 J11				20	12	36		CONNECTOR MONO-STEREO-SWITCH J12
			20	12	32		CONNECTOR MONO-STEREO-SWITCH J12				20	13	36		CONNECTOR HF-DRIVER, CH 2 J13
											20	14	36		CONN. RECORD AMPLIFIER, CH 2 J14
											20	15	36		CONN. REPRODUCE AMPL., CH 2 J15
											20	16	36		CONN. LINE AMPLIFIER, CH 2 J16



SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT
LINSB-01			35	01	03		CONNECTOR XLR, INPUT J01	(CONT.)	6	L	38	01	01A		CONNECTOR, HEAD PHONES
LINSB-02			36	01	03		CONNECTOR XLR, INPUT J01		6	L	38	01	01B		CONNECTOR, HEAD PHONES
									6	U	38	03	01		MASTER SWITCHING BOARD
LOUFA-TC	0		20	06	17		CONN. CODE WRITE/READ UNIT J06	MONIT-02			20	16	01		CONN. LINE AMPLIFIER, CH 2 J16
	0	D	37	04	04		CONNECTOR LINE FILTER, OUTP. P02		0	N	20	29	01		CONNECTOR TO MASTER PANEL J22
LOUFA-01	0		20	11	03		CONN. LINE AMPLIFIER, CH 1 J11		0	L	38	01	02A		CONNECTOR, HEAD PHONES
	0	N	20	26	02		CONN. TO VU-METER PANEL, CH1 J19		0	L	38	01	02B		CONNECTOR, HEAD PHONES
	0	A	34	01	05		FROM GR 20, EL 26+27 P01		0	U	38	03	02		MASTER SWITCHING BOARD
	0	D	35	04	04		CONNECTOR LINE FILTER, OUTP. P02	MONITAMP	9	N	20	28	02		CONN. TO MONITOR AMPLIFIER J21
	0	U	39	01	09		CALIBRATION BOARD J01		9	N	20	29	05		CONNECTOR TO MASTER PANEL J22
	0		39	02	07		CALIBRATION BOARD J01		9	L	38	02	05A		LEVEL POTENTIOMETER
	0	N	90	09	02		CONN. VU-METER CH 1, AUDIO J01		6	L	38	02	06A		LEVEL POTENTIOMETER
LOUFA-02	0		20	16	03		CONN. LINE AMPLIFIER, CH 2 J16		9	U	38	03	03		MASTER SWITCHING BOARD
	0	N	20	27	02		CONN. TO VU-METER PANEL, CH2 J20		6	U	38	03	06B		MASTER SWITCHING BOARD
	0	A	34	01	12		FROM GR 20, EL 26+27 P01		9	U	41	01	05		FROM GR 20, EL 28 WIRE FIELD
	0	D	36	04	04		CONNECTOR LINE FILTER, OUTP. P02	PRIMW-1	1	L	04	02	05		VOLTAGE SELECTOR
	0	U	40	01	09		CALIBRATION BOARD J01		1	Y	05	01	01		PRIMARY 1 P01
	0		40	02	07		CALIBRATION BOARD J01	PRIMW-2	2	L	04	02	07		VOLTAGE SELECTOR
	0	N	90	10	02		CONN. VU-METER CH 2, AUDIO J02		2	Y	05	01	02		PRIMARY 1 P01
LOUFB-TC	6		20	06	18		CONN. CODE WRITE/READ UNIT J06	PRIMW-3	3	L	04	02	02		VOLTAGE SELECTOR
	6	D	37	04	01		CONNECTOR LINE FILTER, OUTP. P02		3	Y	05	01	03		PRIMARY 1 P01
LOUFB-01	6		20	11	04		CONN. LINE AMPLIFIER, CH 1 J11	PRIMW-4	4+4	L	04	02	04A		VOLTAGE SELECTOR
	6	N	20	26	03		CONN. TO VU-METER PANEL, CH1 J19		4	Y	05	01	04		PRIMARY 1 P01
	6	A	34	01	18		FROM GR 20, EL 26+27 P01	PRIMW-5	5	L	04	02	06		VOLTAGE SELECTOR
	6	D	35	04	01		CONNECTOR LINE FILTER, OUTP. P02		5	Y	05	02	05		PRIMARY 2 P02
	6	U	39	01	10		CALIBRATION BOARD J01	PRIMW-6	6+4	L	04	02	04B		VOLTAGE SELECTOR
	6		39	02	06		CALIBRATION BOARD J01		6	Y	05	02	06		PRIMARY 2 P02
	6	N	90	09	03		CONN. VU-METER CH 1, AUDIO J01	PRIMW-7	7	L	04	02	03		VOLTAGE SELECTOR
LOUFB-02	6		20	16	04		CONN. LINE AMPLIFIER, CH 2 J16		7	Y	05	02	07		PRIMARY 2 P02
	6	N	20	27	03		CONN. TO VU-METER PANEL, CH2 J20	RCCOMM			20	03	05		CONN. SERIAL REM. CONTROLLER J03
	6	A	34	01	25		FROM GR 20, EL 26+27 P01				20	22	05		CONN. SERIAL REMOTE CONTROL P03
	6	D	36	04	01		CONNECTOR LINE FILTER, OUTP. P02				22	01	03		FROM GR 20, EL 22 J01
	6	U	40	01	10		CALIBRATION BOARD J01	RCVDATA			20	03	06		CONN. SERIAL REM. CONTROLLER J03
	6		40	02	06		CALIBRATION BOARD J01				20	22	06		CONN. SERIAL REMOTE CONTROL P03
	6	N	90	10	03		CONN. VU-METER CH 2, AUDIO J02				22	01	08		FROM GR 20, EL 22 J01
LOUSA-TC			37	02	02		CONNECTOR XLR, OUTPUT P01	RECHH-TC	0		20	06	07		CONN. CODE WRITE/READ UNIT J06
LOUSA-01			35	02	02		CONNECTOR XLR, OUTPUT P01		0	B	32	01	10		CONV. HEAD BLOCK ASSEMBLY P01
LOUSA-02			36	02	02		CONNECTOR XLR, OUTPUT P01	RECHH-01	0		20	09	10		CONN. RECORD AMPLIFIER, CH 1 J09
LOUSB-TC			37	02	03		CONNECTOR XLR, OUTPUT P01		0	B	32	01	06		CONN. HEAD BLOCK ASSEMBLY P01
LOUSB-01			35	02	03		CONNECTOR XLR, OUTPUT P01	RECHH-02	0		20	14	10		CONN. RECORD AMPLIFIER, CH 2 J14
LOUSB-02			36	02	03		CONNECTOR XLR, OUTPUT P01		0	B	32	01	19		CONV. HEAD BLOCK ASSEMBLY P01
MONIT-01	6	N	20	11	01		CONN. LINE AMPLIFIER, CH 1 J11								
			20	29	03		CONNECTOR TO MASTER PANEL J22								
							./.								

SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT
RECHL-TC	6	B	20	06	08		CONN. CODE WRITE/READ UNIT J06	S-EHEAD2			43	02	02		PERIPHERY CONTROLLER BOARD P02
	6		32	01	22		CONN. HEAD BLOCK ASSEMBLY P01				43	03	02		KEY BOARD
RECHL-01	6		20	09	09		CONN. RECORD AMPLIFIER, CH 1 J09	S-LINELA			43	02	05		PERIPHERY CONTROLLER BOARD P02
	6	B	32	01	05		CONN. HEAD BLOCK ASSEMBLY P01				43	03	05		KEY BOARD
RECHL-02	6		20	14	09		CONN. RECORD AMPLIFIER, CH 2 J14	S-LINELB			43	02	06		PERIPHERY CONTROLLER BOARD P02
	6	B	32	01	18		CONN. HEAD BLOCK ASSEMBLY P01				43	03	06		KEY BOARD
RECIN-01			20	09	01		CONN. RECORD AMPLIFIER, CH 1 J09	S-LINE1	1	J	02	01	03		POWER SWITCH
			20	11	08		CONN. LINE AMPLIFIER, CH 1 J11		1	J	03	01	01		MAINS FILTER, INPUT
			20	12	15		CONNECTOR MONO-STEREO-SWITCH J12	S-LINE2	6	J	02	01	04		POWER SWITCH
RECIN-02			20	12	13		CONNECTOR MONO-STEREO-SWITCH J12		6	J	03	01	02		MAINS FILTER, INPUT
			20	14	01		CONN. RECORD AMPLIFIER, CH 2 J14	S-NABCCI			43	02	07		PERIPHERY CONTROLLER BOARD P02
			20	16	08		CONN. LINE AMPLIFIER, CH 2 J16				43	03	07		KEY BOARD
REPHH-TC	0		20	06	10		CONN. CODE WRITE/READ UNIT J06	S-PLCNTR			43	02	03		PERIPHERY CONTROLLER BOARD P02
	0	B	32	01	09		CONN. HEAD BLOCK ASSEMBLY P01				43	03	03		KEY BOARD
REPHH-01	1	L	32	02	12		REPRODUCE PREAMPLIFIER	SF-LINE1	1	J	03	02	01		MAINS FILTER, OUTPUT
REPHH-02	1	L	32	02	14		REPRODUCE PREAMPLIFIER		1	L	04	01	01		FUSE HOLDER
REPHL-TC	6		20	06	11		CONN. CODE WRITE/READ UNIT J06	SF-LINE2	6	J	03	02	02		MAINS FILTER, OUTPUT
	6	B	32	01	21		CONN. HEAD BLOCK ASSEMBLY P01		6+8	L	04	02	01		VOLTAGE SELECTOR
REPHL-01	0		32	02	11		REPRODUCE PREAMPLIFIER		8	Y	05	02	08		PRIMARY 2 P02
REPHL-02	0	L	32	02	13		REPRODUCE PREAMPLIFIER	SHIELD			20	03	01		CONN. SERIAL REM. CONTROLLER J03
REPRE-01	0		20	10	06		CONN. REPRODUCE AMPL., CH 1 J10				20	22	01		CONN. SERIAL REMOTE CONTROL P03
	0	B	32	01	01		CONN. HEAD BLOCK ASSEMBLY P01				22	01	01		FROM GR 20, EL 22 J01
	0	L	32	02	02		REPRODUCE PREAMPLIFIER	SNCOMM			20	03	04		CONN. SERIAL REM. CONTROLLER J03
REPRE-02	0		20	15	06		CONN. REPRODUCE AMPL., CH 2 J15				20	22	04		CONN. SERIAL REMOTE CONTROL P03
	0	B	32	01	14		CONN. HEAD BLOCK ASSEMBLY P01				22	01	07		FROM GR 20, EL 22 J01
	0	L	32	02	07		REPRODUCE PREAMPLIFIER	SNDATA			20	03	03		CONN. SERIAL REM. CONTROLLER J03
REPRO-01	6		20	10	07		CONN. REPRODUCE AMPL., CH 1 J10				20	22	03		CONN. SERIAL REMOTE CONTROL P03
	6	B	32	01	02		CONN. HEAD BLOCK ASSEMBLY P01				22	01	02		FROM GR 20, EL 22 J01
	6	L	32	02	03		REPRODUCE PREAMPLIFIER	SPARE			20	03	09		CONN. SERIAL REM. CONTROLLER J03
REPRO-02	6		20	15	07		CONN. REPRODUCE AMPL., CH 2 J15				20	22	09		CONN. SERIAL REMOTE CONTROL P03
	6	B	32	01	15		CONN. HEAD BLOCK ASSEMBLY P01				22	01	05		FROM GR 20, EL 22 J01
	6	L	32	02	06		REPRODUCE PREAMPLIFIER	SR-FORW		B	23	01	21		CONN. PARALLEL REMOTE CONTR. J01
RESERVE			43	02	04		PERIPHERY CONTROLLER BOARD P02	SR-LIFT		B	23	01	17		CONN. PARALLEL REMOTE CONTR. J01
			43	03	04		KEY BOARD	SR-LOC1		B	23	01	18		CONN. PARALLEL REMOTE CONTR. J01
S-AKBENA			43	02	08		PERIPHERY CONTROLLER BOARD P02	SR-PLAY		B	23	01	22		CONV. PARALLEL REMOTE CONTR. J01
			43	03	08		KEY BOARD	SR-REC		B	23	01	19		CONN. PARALLEL REMOTE CONTR. J01
S-EHEAD1			43	02	01		PERIPHERY CONTROLLER BOARD P02	SR-REW		B	23	01	20		CONN. PARALLEL REMOTE CONTR. J01
			43	03	01		KEY BOARD								





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SIG. NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG. NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	
(CONT.)			90	07	10		CONNECTOR COMMANDS CH 02	P06	(CONT.)		25	02	07		CONN. REMOTE CONTROL	P02
T-REFEXT			20	21	16		CONN. CAPSTAN CONTROL UNIT	P02			25	03	07		CONNECTOR COMMANDS CH1	P03
			20	24	01		CONN. TO BUS CONNECTOR BOARD	J17			25	04	07		CONNECTOR COMMANDS CH2	P04
	B		23	01	13		CONN. PARALLEL REMOTE CONTR.	J01			25	05	07		CONNECTOR COMMANDS CH3	P05
			23	02	15		FROM GR 25, EL 02				25	06	07		CONN. COMMANDS MASTER PANEL	P06
			25	01	23		CONN. VU-METER PANEL EXT.	P01			25	07	07		CONN. COMM. VARI SPEED PANEL	J01
			25	02	15		CONN. REMOTE CONTROL	P02			33	01	04		FROM GR 25, EL 01	
			25	06	13		CONN. COMMANDS MASTER PANEL	P06			38	04	07		MASTER CONTROL BOARD	
			25	07	13		CONN. COMM. VARI SPEED PANEL	P07			39	12	07		FROM GR 25, EL 03	
			26	01	16		FROM GR 20, EL 21				40	12	07		FROM GR 25, EL 04	
			33	01	12		FROM GR 25, EL 01	J01			42	01	07		FEED CONNECTOR FROM GR 25, EL 07	
			38	04	13		MASTER CONTROL BOARD				43	01	01		CONN. BASIS BOARD (EL 04)	P01
			42	01	13		FEED CONNECTOR FROM GR 25, EL 07				44	01	07		FROM GR 25, EL 05	
			45	02	23		FROM GR 25, EL 01	J02			45	02	07		FROM GR 25, EL 01	J02
			90	01	23		FROM GR 33, EL 01				90	01	07		FROM GR 33, EL 01	
			90	02	23		CONNECTOR NOISE REDUCTION	P01			90	02	07		CONNECTOR NOISE REDUCTION	P01
			90	03	23		RESERVE	P02			90	03	07		RESERVE	P02
			90	04	13		CONN. COMMANDS VARI SPEED	P03			90	04	07		CONN. COMMANDS VARI SPEED	P03
											90	05	07		CONNECTOR COMMANDS CH 03	P04
T-REFINT			20	01	17		CONNECTOR MPU UNIT	J01			90	06	07		CONNECTOR COMMANDS CH 01	P05
			20	21	15		CONN. CAPSTAN CONTROL UNIT	P02			90	07	07		CONNECTOR COMMANDS CH 02	P06
			26	01	15		FROM GR 20, EL 21		T-SADB		20	04	02		CONN. PERIPHERY CONTROLLER	J04
T-REFSEL			20	02	12		CONN. TAPE DECK CONTROLLER	J02			20	24	07		CONN. TO BUS CONNECTOR BOARD	J17
			20	21	11		CONN. CAPSTAN CONTROL UNIT	P02			23	02	08		FROM GR 25, EL 02	
			26	01	11		FROM GR 20, EL 21				25	01	08		CONN. VU-METER PANEL EXT.	P01
											25	02	08		CONN. REMOTE CONTROL	P02
T-RESET			20	01	26		CONNECTOR MPU UNIT	J01			25	03	08		CONNECTOR COMMANDS CH1	P03
			20	02	26		CONN. TAPE DECK CONTROLLER	J02			25	04	08		CONNECTOR COMMANDS CH2	P04
			20	03	26		CONN. SERIAL REM. CONTROLLER	J03			25	05	08		CONNECTOR COMMANDS CH3	P05
			20	04	26		CONN. PERIPHERY CONTROLLER	J04			25	06	08		CONN. COMMANDS MASTER PANEL	P06
			20	05	19A		CONNECTOR BUS CONVERTOR	J05			25	07	08		CONN. COMM. VARI SPEED PANEL	P07
			43	01	26		CONN. BASIS BOARD (EL 04)	P01			33	01	17		FROM GR 25, EL 01	J01
											38	04	08		MASTER CONTROL BOARD	
T-RTS			20	03	13		CONN. SERIAL REM. CONTROLLER	J03			39	12	08		FROM GR 25, EL 03	
											40	12	08		FROM GR 25, EL 04	
T-RVSTR			20	01	15		CONNECTOR MPU UNIT</									

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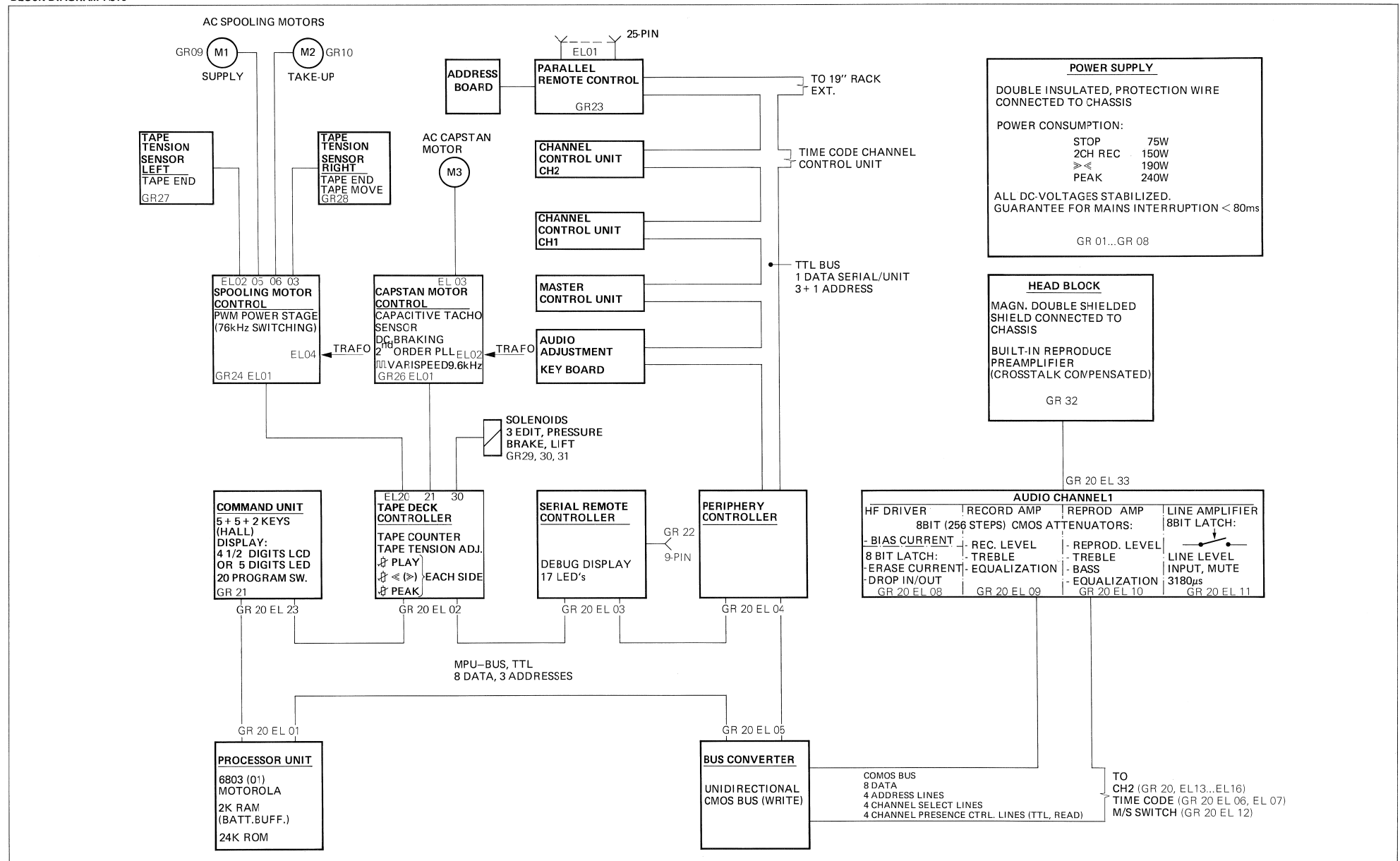
SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT
CONT.)			25	06	09		CONN. COMMANDS MASTER PANEL	(CONT.)			20	20	14		CONN. SPOOLING MOTOR CONTR.
			25	07	09		CONN. COMM. VARI SPEED PANEL				24	01	14		FROM GR 20, EL 20
			33	01	05		FROM GR 25, EL 01				24	03	12		CONN. TAPE TENS. UNIT, RIGHT
			38	04	09		MASTER CONTROL BOARD				28	01	12		FROM GR 24, EL 03
			39	12	09		FROM GR 25, EL 03	T-TNDL	4	N	27	02	03		CONN. TAPE END SW LEFT
			40	12	09		FROM GR 25, EL 04		4	U	27	04	03		TAPE END SW. LEFT WIRE FIELD
			42	01	09		FEED CONNECTOR FROM GR 25, EL 07	T-TNDR	4	N	28	02	03		CONN. TAPE END SW RIGHT
			43	01	03		CONN. BASIS BOARD (EL 04)		4	U	28	06	03		TAPE END SW. RIGHT WIRE FIELD
			44	01	09		FROM GR 25, EL 05	T-TPSPD1			20	02	08		CONN. TAPE DECK CONTROLLER
			45	02	09		FROM GR 25, EL 01				20	20	09		CONN. SPOOLING MOTOR CONTR.
			90	01	09		FROM GR 33, EL 01	T-TPSPD2			20	02	09		CONN. TAPE DECK CONTROLLER
			90	02	09		CONNECTOR NOISE REDUCTION				20	20	10		CONN. SPOOLING MOTOR CONTR.
			90	03	09		RESERVE				24	01	10		FROM GR 20, EL 20
			90	04	09		CONN. COMMANDS VARI SPEED								
		90	05	09		CONNECTOR COMMANDS CH 03									
		90	06	09		CONNECTOR COMMANDS CH 01									
		90	07	09		CONNECTOR COMMANDS CH 02									
T-SL1			21	02	12		CONNECTOR TO DISPLAY BOARD	T-TX			20	01	11		CONNECTOR MPU UNIT
T-SPDSL1			20	02	10		CONN. TAPE DECK CONTROLLER				20	03	11		CONN. SERIAL REM. CONTROLLER
			20	21	09		CONN. CAPSTAN CONTROL UNIT	T-VARSPD			25	01	21		CONN. VU-METER PANEL EXT.
			26	01	09		FROM GR 20, EL 21				25	06	15		CONN. COMMANDS MASTER PANEL
T-SPDSL2			20	02	11		CONN. TAPE DECK CONTROLLER				25	07	15		CONN. COMM. VARI SPEED PANEL
			20	21	10		CONN. CAPSTAN CONTROL UNIT				33	01	11		FROM GR 25, EL 01
			26	01	10		FROM GR 20, EL 21				38	04	15		MASTER CONTROL BOARD
T-SUPVON 5	F		07	01	12		OUTPUT (TO GR 20, EL 31/32)				42	01	15		FEED CONNECTOR FROM GR 25, EL 07
			20	02	06		CONN. TAPE DECK CONTROLLER				45	02	21		FROM GR 25, EL 01
	U		20	31	09		WIRE FIELD (POWER SUP. +SOLEN.)				90	01	21		FROM GR 33, EL 01
T-SYNCAP			20	02	07		CONN. TAPE DECK CONTROLLER				90	02	21		CONNECTOR NOISE REDUCTION
			20	21	12		CONN. CAPSTAN CONTROL UNIT				90	03	21		RESERVE
			26	01	12		FROM GR 20, EL 21				90	04	15		CONN. COMMANDS VARI SPEED
T-TCINDL			20	06	01		CONN. CODE WRITE/READ UNIT	T-WRTSL			20	04	05		CONN. PERIPHERY CONTROLLER
			20	07	01		CONNECTOR CODE DELAY UNIT				20	24	10		CONN. TO BUS CONNECTOR BOARD
T-TCOUDL			20	06	02		CONN. CODE WRITE/READ UNIT				23	02	11		FROM GR 25, EL 02
			20	07	02		CONNECTOR CODE DELAY UNIT				25	01	11		CONN. VU-METER PANEL EXT.
T-TCPRES			20	06	14		CONN. CODE WRITE/READ UNIT				25	02	11		CONN. REMOTE CONTROL
			20	07	14		CONNECTOR CODE DELAY UNIT				25	03	11		CONNECTOR COMMANDS CH1
T-TDSTR			20	01	24		CONNECTOR MPU UNIT				25	04	11		CONNECTOR COMMANDS CH2
			20	02	25		CONN. TAPE DECK CONTROLLER				25	05	11		CONNECTOR COMMANDS CH3
			20	03	24		CONN. SERIAL REM. CONTROLLER				25	06	11		CONN. COMMANDS MASTER PANEL
T-TENDL			20	02	03		CONN. TAPE DECK CONTROLLER				25	07	11		CONN. COMM. VARI SPEED PANEL
			20	20	13		CONN. SPOOLING MOTOR CONTR.				33	01	06		FROM GR 25, EL 01
			24	01	13		FROM GR 20, EL 20				38	04	11		MASTER CONTROL BOARD
			24	02	12		CONN. TAPE TENS. UNIT, LEFT				39	12	11		FROM GR 25, EL 03
			27	01	12		FROM GR 24, EL 02				40	12	11		FROM GR 25, EL 04
T-TENDR			20	02	04		CONN. TAPE DECK CONTROLLER				42	01	11		FEED CONNECTOR FROM GR 25, EL 07
							./.				43	01	05		CONN. BASIS BOARD (EL 04)
											44	01	11		FROM GR 25, EL 05
											45	02	11		FROM GR 25, EL 01
											90	01	11		FROM GR 33, EL 01

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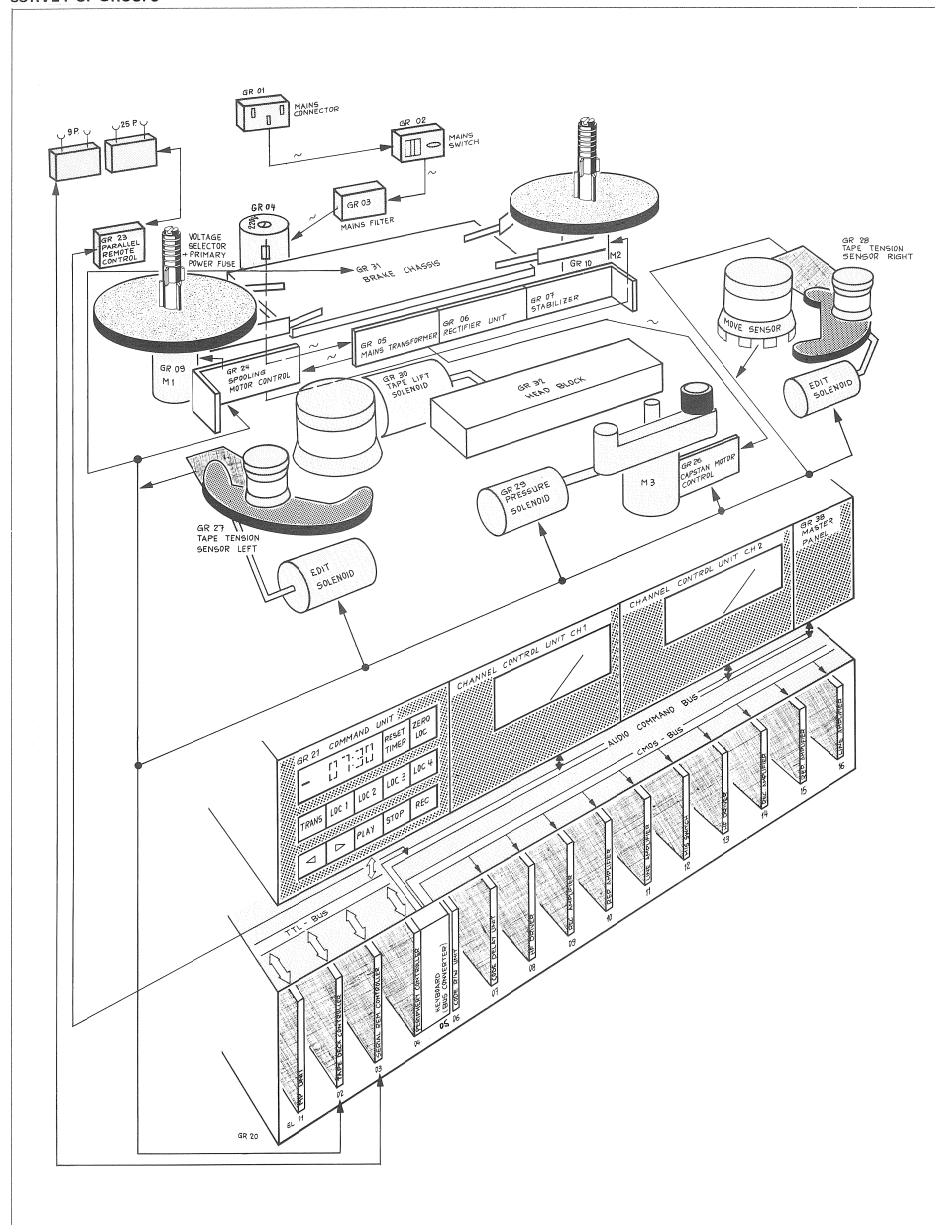
SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG.NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT
(CONT.)			90	05	11		CONNECTOR COMMANDS CH 03	(CONT.)			20	11	12		CONN. LINE AMPLIFIER, CH 1
			90	06	11		CONNECTOR COMMANDS CH 01				20	12	09		CONNECTOR MONO-STEREO-SWITCH
			90	07	11		CONNECTOR COMMANDS CH 02	TAPDI-02			20	12	11		CONNECTOR MONO-STEREO-SWITCH
TA-ACTMO			20	05	06B		CONNECTOR BUS CONVERTOR				20	15	10		CONN. REPRODUCE AMPL., CH 2
			20	12	20		CONNECTOR MONO-STEREO-SWITCH				20	16	12		CONN. LINE AMPLIFIER, CH 2
TA-ACTTC			20	05	08B		CONNECTOR BUS CONVERTOR	TAPLI-01			20	10	01		CONN. REPRODUCE AMPL., CH 1
			20	06	20		CONN. CODE WRITE/READ UNIT				20	15	01		CONN. REPRODUCE AMPL., CH 2
			20	07	20		CONNECTOR CODE DELAY UNIT	TAPMS-01			20	11	11		CONN. LINE AMPLIFIER, CH 1
TA-ACTO1			20	05	07B		CONNECTOR BUS CONVERTOR				20	12	07		CONNECTOR MONO-STEREO-SWITCH
			20	08	20		CONNECTOR HF-DRIVER, CH 1				20	26	09		CONN. TO VU-METER PANEL, CH1
			20	09	20		CONN. RECORD AMPLIFIER, CH 1		0	N	34	01	01		FROM GR 20, EL 26+27
			20	10	20		CONN. REPRODUCE AMPL., CH 1		0	A	39	01	15		CALIBRATION BOARD
			20	11	20		CONN. LINE AMPLIFIER, CH 1		1	U	39	01	16		CALIBRATION BOARD
TA-ACTO2			20	05	09B		CONNECTOR BUS CONVERTOR		1	L	39	04	01		POTENTIOMETER REPRODUCE-LEVEL
			20	13	20		CONNECTOR HF-DRIVER, CH 2		0	N	90	09	09		CONN. VU-METER CH 1, AUDIO
			20	14	20		CONN. RECORD AMPLIFIER, CH 2				90	11	14		CONNECTOR MONITOR AMPLIFIER
			20	15	20		CONN. REPRODUCE AMPL., CH 2				91	03	14		FROM GR 90, EL 11
			20	16	20		CONN. LINE AMPLIFIER, CH 2	TAPMS-02			20	12	05		CONNECTOR MONO-STEREO-SWITCH
TA-CLK			20	01	22		CONNECTOR MPU UNIT				20	16	11		CONN. LINE AMPLIFIER, CH 2
			20	05	19B		CONNECTOR BUS CONVERTOR		0	N	20	27	09		CONN. TO VU-METER PANEL, CH2
			20	06	25		CONN. CODE WRITE/READ UNIT		0	A	34	01	08		FROM GR 20, EL 26+27
			20	07	25		CONNECTOR CODE DELAY UNIT		0	U	40	01	15		CALIBRATION BOARD
			20	08	25		CONNECTOR HF-DRIVER, CH 1		1	U	40	01	16		CALIBRATION BOARD
			20	09	25		CONN. RECORD AMPLIFIER, CH 1		1	L	40	04	01		POTENTIOMETER REPRODUCE-LEVEL
			20	10	25		CONN. REPRODUCE AMPL., CH 1		0	N	90	10	09		CONN. VU-METER CH 2, AUDIO
			20	11	25		CONN. LINE AMPLIFIER, CH 1				90	11	07		CONNECTOR MONITOR AMPLIFIER
			20	12	25		CONNECTOR MONO-STEREO-SWITCH				91	03	07		FROM GR 90, EL 11
			20	13	25		CONNECTOR HF-DRIVER, CH 2	TD-CLK			20	01	16		CONNECTOR MPU UNIT
TAPAD-01			20	14	25		CONN. RECORD AMPLIFIER, CH 2				20	20	08		CONN. SPOOLING MOTOR CONTR.
			20	15	25		CONN. REPRODUCE AMPL., CH 2				24	01	08		FROM GR 20, EL 20
			20	16	25		CONN. LINE AMPLIFIER, CH 2	TO-CLK	8		23	01	07		CONN. PARALLEL REMOTE CONTR.
	6	N	20	11	10		CONN. LINE AMPLIFIER, CH 1				23	01	10		CONN. PARALLEL REMOTE CONTR.
	6	A	20	26	08		CONN. TO VU-METER PANEL, CH1	TS-CH1			43	02	09		PERIPHERY CONTROLLER BOARD
TAPAD-02	6	U	34	01	14		FROM GR 20, EL 26+27				43	03	09		KEY BOARD
	6	U	39	01	14		CALIBRATION BOARD	TS-CH2			43	02	10		PERIPHERY CONTROLLER BOARD
	6	N	90	09	08		CONN. VU-METER CH 1, AUDIO				43	03	10		KEY BOARD
	6	N	20	16	10		CONN. LINE AMPLIFIER, CH 2	TS-DWN			43	02	12		PERIPHERY CONTROLLER BOARD
	6	A	20	27	08		CONN. TO VU-METER PANEL, CH2				43	03	12		KEY BOARD
TAPAU-01	2	U	39	01	20		CALIBRATION BOARD	TS-STD			43	02	13		PERIPHERY CONTROLLER BOARD
	2	L	39	04	02		POTENTIOMETER REPRODUCE-LEVEL				43	03	13		KEY BOARD
TAPAU-02	2	U	40	01	20		CALIBRATION BOARD	TS-UP			43	02	11		PERIPHERY CONTROLLER BOARD
	2	L	40	04	02		POTENTIOMETER REPRODUCE-LEVEL				43	03	11		KEY BOARD
TAPDI-01			20	10	10		CONN. REPRODUCE AMPL., CH 1								./.

SIG-NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT	SIG-NAME	COLOR	TYPE	GR	EL	PT	S	DESCRIPTION OF ELEMENT
TSRC-BIA			43	02	19		PERIPHERY CONTROLLER BOARD P02	(CONT.)			21	01	25		CONNECTOR TO BASIS BOARD, EL 23
			43	03	19		KEY BOARD				21	01	27		CONNECTOR TO BASIS BOARD, EL 23
											21	01	33		CONNECTOR TO BASIS BOARD, EL 23
TSRC-LVL			43	02	17		PERIPHERY CONTROLLER BOARD P02				21	01	35		CONNECTOR TO BASIS BOARD, EL 23
			43	03	17		KEY BOARD								
TSRC-TRB			43	02	18		PERIPHERY CONTROLLER BOARD P02	0-TACHO	9	Y	26	03	05		CONNECTOR CAPSTAN MOTOR
			43	03	18		KEY BOARD		9		26	06	05		CAPACITIVE SENSOR
TSRP-BAS			43	02	16		PERIPHERY CONTROLLER BOARD P02								
			43	03	16		KEY BOARD								
TSRP-LVL			43	02	14		PERIPHERY CONTROLLER BOARD P02								
			43	03	14		KEY BOARD								
TSRP-TRB			43	02	15		PERIPHERY CONTROLLER BOARD P02								
			43	03	15		KEY BOARD								
VU-A-01	2	L	39	21	01		VU-METER AMPLIFIER BOARD								
VU-A-02	2	L	40	21	01		VU-METER AMPLIFIER BOARD								
VU-B-01	0	L	39	21	02		VU-METER AMPLIFIER BOARD								
VU-B-02	0	L	40	21	02		VU-METER AMPLIFIER BOARD								
0.0 VCU			20	23	01		CONNECTOR COMMAND UNIT P04								
			20	23	03		CONNECTOR COMMAND UNIT P04								
			20	23	05		CONNECTOR COMMAND UNIT P04								
			20	23	07		CONNECTOR COMMAND UNIT P04								
			20	23	09		CONNECTOR COMMAND UNIT P04								
			20	23	11		CONNECTOR COMMAND UNIT P04								
			20	23	13		CONNECTOR COMMAND UNIT P04								
			20	23	15		CONNECTOR COMMAND UNIT P04								
			20	23	17		CONNECTOR COMMAND UNIT P04								
			20	23	19		CONNECTOR COMMAND UNIT P04								
			20	23	21		CONNECTOR COMMAND UNIT P04								
			20	23	23		CONNECTOR COMMAND UNIT P04								
			20	23	25		CONNECTOR COMMAND UNIT P04								
			20	23	27		CONNECTOR COMMAND UNIT P04								
			20	23	29		CONNECTOR COMMAND UNIT P04								
			20	23	31		CONNECTOR COMMAND UNIT P04								
			20	23	33		CONNECTOR COMMAND UNIT P04								
			20	23	35		CONNECTOR COMMAND UNIT P04								
			21	01	01		CONNECTOR TO BASIS BOARD, EL 23								
			21	01	03		CONNECTOR TO BASIS BOARD, EL 23								
			21	01	05		CONNECTOR TO BASIS BOARD, EL 23								
			21	01	07		CONNECTOR TO BASIS BOARD, EL 23								
			21	01	09		CONNECTOR TO BASIS BOARD, EL 23								
			21	01	11		CONNECTOR TO BASIS BOARD, EL 23								
			21	01	13		CONNECTOR TO BASIS BOARD, EL 23								
			21	01	15		CONNECTOR TO BASIS BOARD, EL 23								
			21	01	17		CONNECTOR TO BASIS BOARD, EL 23								
			21	01	19		CONNECTOR TO BASIS BOARD, EL 23								
			21	01	21		CONNECTOR TO BASIS BOARD, EL 23								
			21	01	23		CONNECTOR TO BASIS BOARD, EL 23								
							./.								

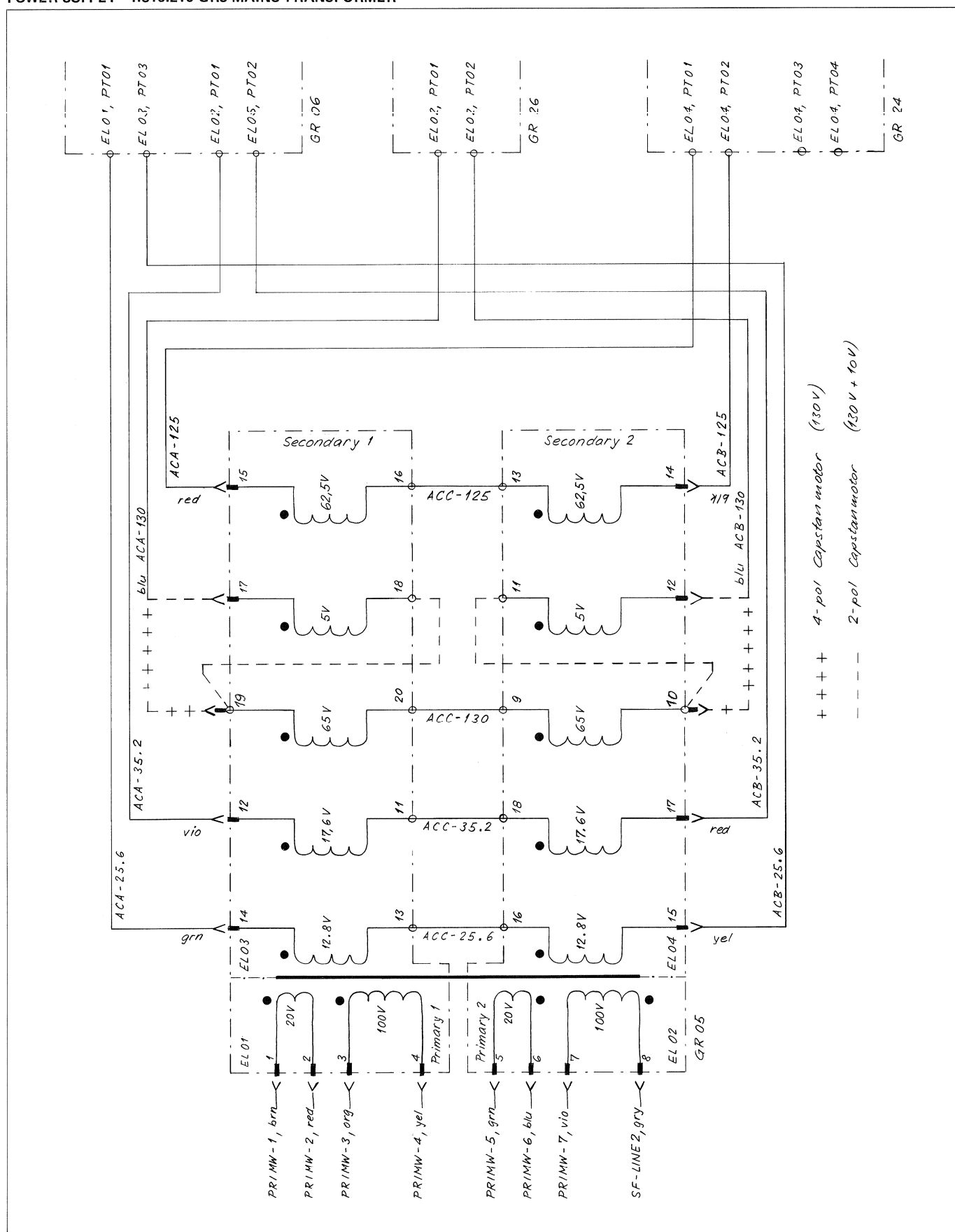
BLOCK DIAGRAM A810



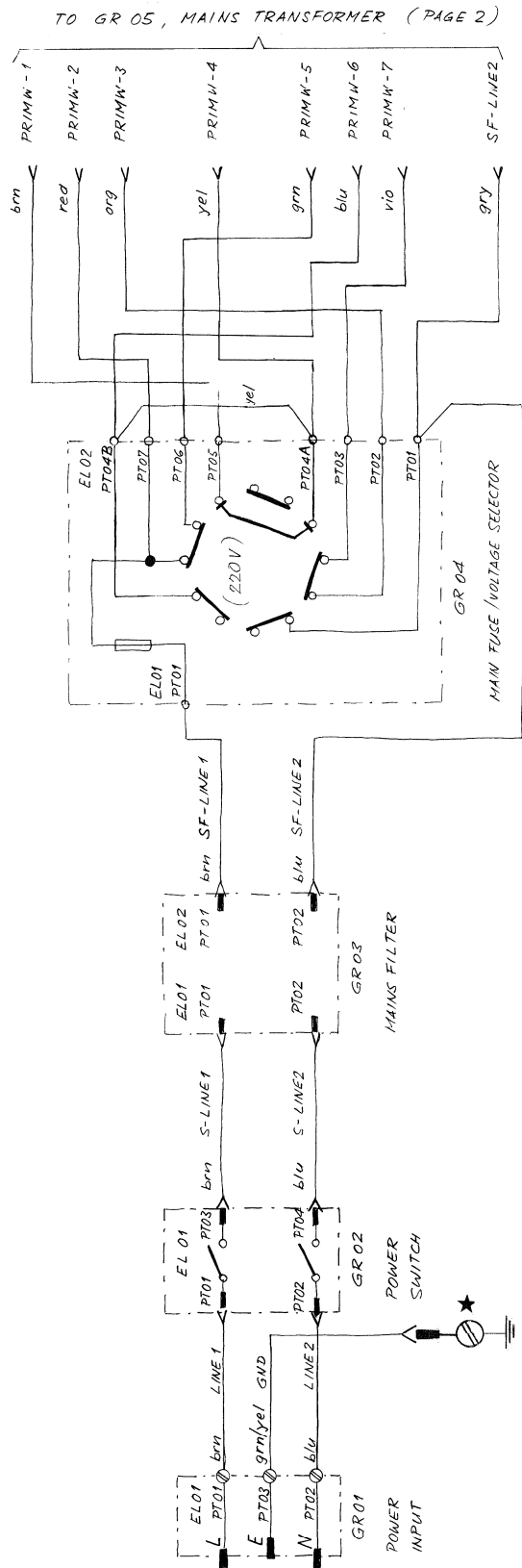
## SURVEY OF GROUPS



## POWER SUPPLY 1.810.210 GR5 MAINS TRANSFORMER

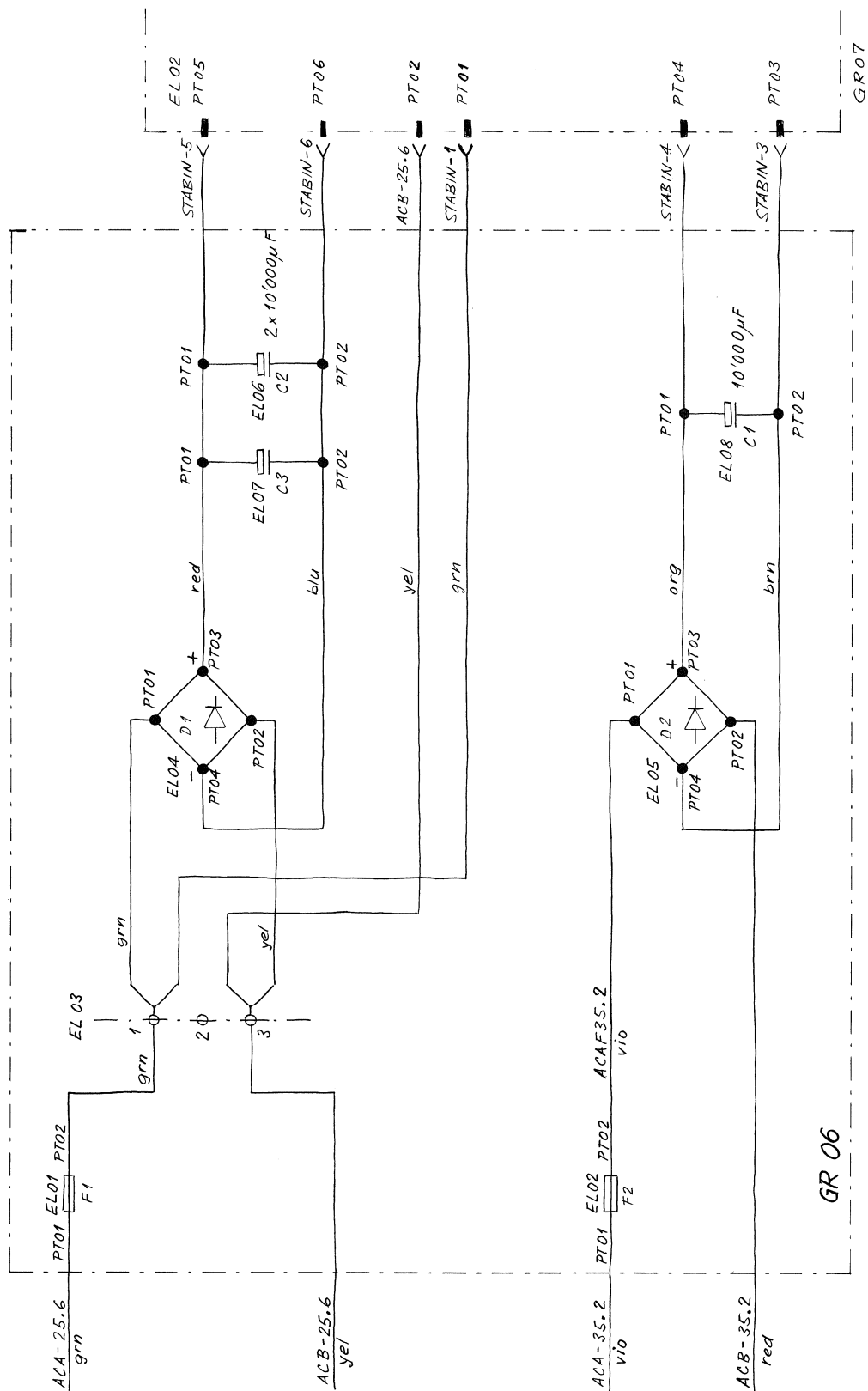


POWER SUPPLY 1.810.210 GR1...4 MAINS INPUT UNIT



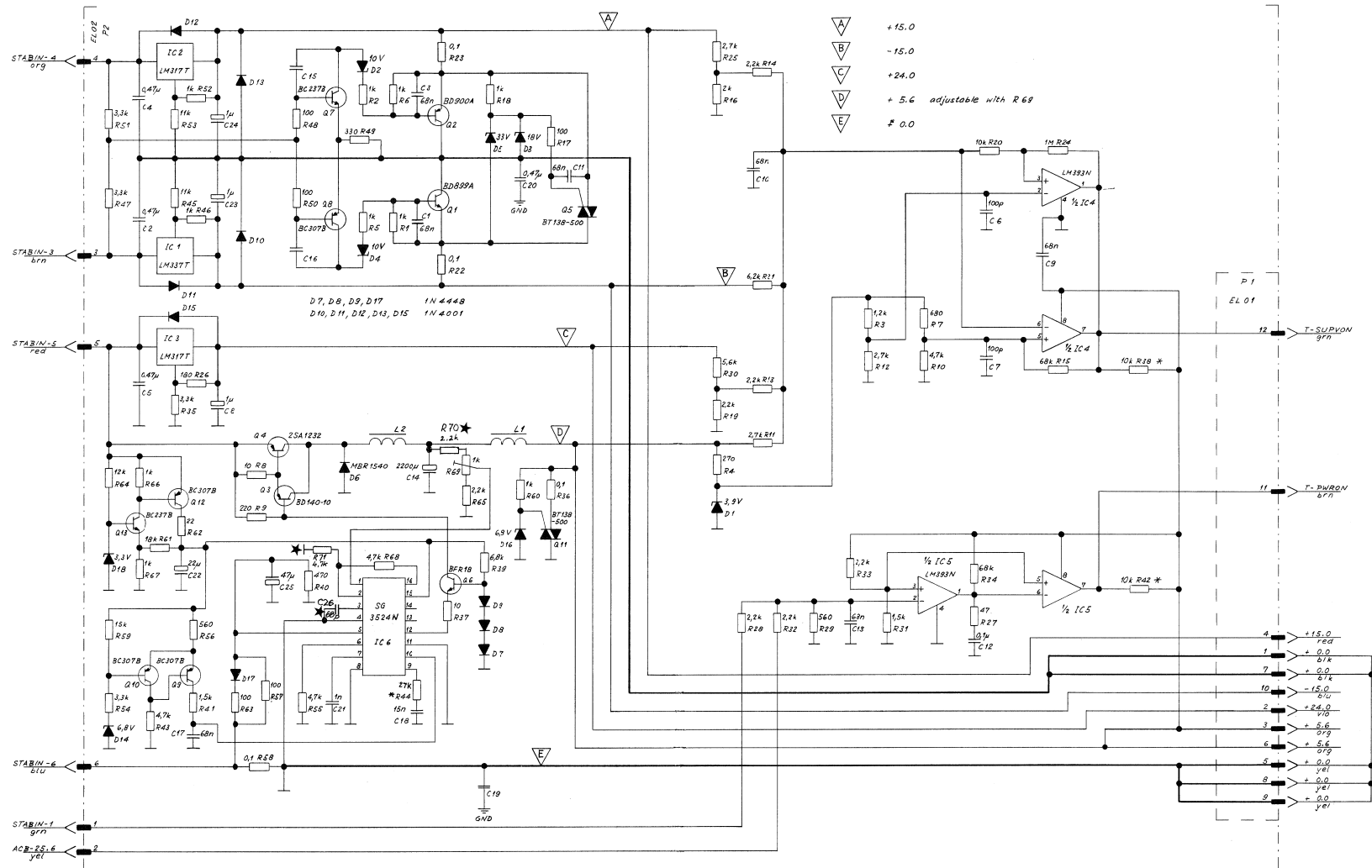
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## POWER SUPPLY 1.810.210-00 GR6 RECTIFIER UNIT

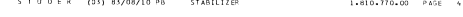
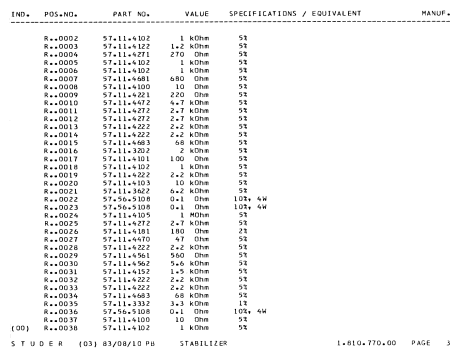




## STABILIZER PCB 1.810.770-00 GR7

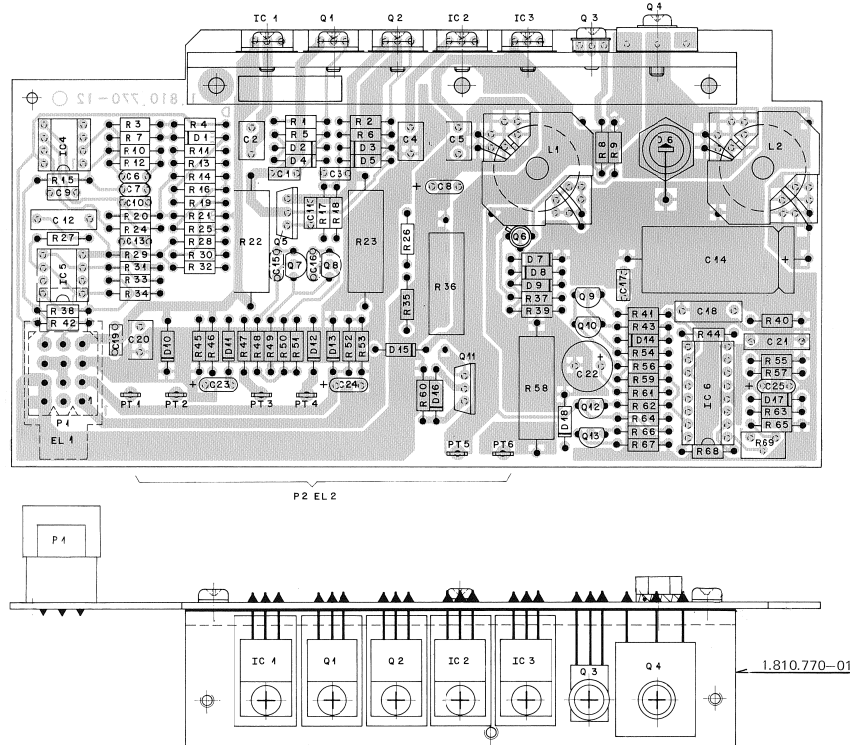


IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(01)	##0038	971111003	10 OHM	5%	
	##0039	971111002	5.6 OHM	5%	
	##0040	971111001	7.0 OHM	5%	
	##0041	971111002	5.6 OHM	5%	
	##0042	971111002	10 OHM	5%	
(01)	##0042	971111003	10 OHM	5%	
	##0043	971111003	10 OHM	5%	
	##0044	971111021	120 OHM	5%	
(02)	##0045	971111027	10 OHM	5%	
	##0045	971111013	11 OHM	5%	
	##0046	971111013	10 OHM	5%	
	##0047	971110332	3.3 OHM	5%	
	##0048	971111033	150 OHM	5%	
	##0049	971110331	130 OHM	5%	
	##0050	971111031	150 OHM	5%	
	##0051	971110332	3.3 OHM	5%	
	##0052	971111032	10 OHM	5%	
	##0053	971111033	11 OHM	5%	
	##0054	971111032	3.3 OHM	5%	
	##0055	971110747	4.7 OHM	5%	
	##0056	971110951	500 OHM	5%	
	##0057	971110951	500 OHM	5%	
	##0058	971061008	0.1 OHM	10%, 4W	
	##0059	971110951	500 OHM	5%	
	##0060	971111002	1 OHM	5%	
	##0061	971111002	1 OHM	5%	
	##0062	971110229	22 OHM	5%	
	##0063	971111031	100 OHM	5%	
	##0064	971110223	32 OHM	5%	
	##0065	971110222	2.2 OHM	5%	
	##0066	971111002	1 OHM	5%	
	##0067	971111002	1 OHM	5%	
	##0068	971110227	4.7 OHM	5%	
	##0069	970401170	10 OHM	10%, 0.25W, 5% note 2	
(03)	##0070	971110227	4.7 OHM	5%	
(03)	##0071	971110227	4.7 OHM	5%	

[illegible]



## STABILIZER PCB 1.810.770-81 GR7



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
L..0001	59.99.0205		68 nF		
L..0002	59.99.5474		0.47 uF	5%	Ce
L..0003	59.99.0205		68 nF		
L..0004	59.99.5474		0.47 uF	5%	Ce
L..0005	59.99.0205		68 nF		
L..0006	59.99.5474		0.47 uF	5%	Ce
L..0007	59.99.0205		68 nF		
L..0008	59.99.5474		0.47 uF	5%	Ce
L..0009	59.99.0205		68 nF		
L..0010	59.99.5474		0.47 uF	5%	Ce
L..0011	59.99.0205		68 nF		
L..0012	59.99.5474		0.47 uF	5%	Ce
L..0013	59.99.0205		68 nF		
L..0014	59.99.5474		0.47 uF	5%	Ce
L..0015	59.99.0205		68 nF		
L..0016	59.99.5474		0.47 uF	5%	Ce
L..0017	59.99.0205		68 nF		
L..0018	59.99.5474		0.47 uF	5%	Ce
L..0019	59.99.0205		68 nF		
L..0020	59.99.5474		0.47 uF	5%	Ce
L..0021	59.99.0205		68 nF		
L..0022	59.99.5474		0.47 uF	5%	Ce
L..0023	59.99.0205		68 nF		
L..0024	59.99.5474		0.47 uF	5%	Ce
L..0025	59.99.0205		68 nF		
D..0001	50.04.1101		3.9 V	2.2K3C 3.9V, 2.2K3SC 3.9V, ZPD 3.9V	ITT, Ses
D..0002	50.04.1101		10 V	2.2K3C 10V, 2.2K3SC 10V, ZPD 10V	ITT, Ses
D..0003	50.04.1101		18 V	2.2K3C 18V, 2.2K3SC 18V, ZPD 18V	ITT, Ses
D..0004	50.04.1101		10 V	2.2K3C 10V, 2.2K3SC 10V, ZPD 10V	ITT, Ses
D..0005	50.04.1101		33 V	2.2K3C 33V, 2.2K3SC 33V, ZPD 33V	ITT, Ses
D..0006	50.04.1101		100V	2.2K3C 100V, 2.2K3SC 100V, ZPD 100V	ITT, Ses
D..0007	50.04.1101		1N4448		ITT, Ph
D..0008	50.04.1101		1N4448		ITT, Ph
D..0009	50.04.1101		1N4448		ITT, Ph
D..0010	50.04.1101		1N4448		ITT, Ph
D..0011	50.04.1101		1N4448		ITT, Ph

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IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
D..0012	50.04.1101		1N4448	1N4002, 1N4003, 1N4004	ITT, Ph
D..0013	50.04.1101		1N4448	1N4002, 1N4003, 1N4004	ITT, Ph
D..0014	50.04.1101		1N4448	1N4002, 1N4003, 1N4004	ITT, Ph
D..0015	50.04.1101		1N4448	1N4002, 1N4003, 1N4004	ITT, Ph
D..0016	50.04.1101		1N4448	1N4002, 1N4003, 1N4004	ITT, Ph
D..0017	50.04.1101		1N4448	1N4002, 1N4003, 1N4004	ITT, Ph
D..0018	50.04.1101		1N4448	1N4002, 1N4003, 1N4004	ITT, Ph
IC..0001	50.10.1109		LM317	LM317 pos. Voltage Regulator	NS, TI
IC..0002	50.10.1109		LM317	LM317 pos. Voltage Regulator	NS, TI
IC..0003	50.10.1109		LM317	LM317 pos. Voltage Regulator	NS, TI
IC..0004	50.10.1109		LM317	LM317 pos. Voltage Regulator	NS, TI
IC..0005	50.10.1109		LM317	LM317 pos. Voltage Regulator	NS, TI
IC..0006	50.10.1109		LM317	LM317 pos. Voltage Regulator	NS, TI
L..0001	1.022.211.00		1.022.211.00	HF-Coil, 5A, RNS	St
L..0002	1.022.211.00		1.022.211.00	HF-Coil, 5A, RNS	St
P..0001	54.02.0406		12 cont.	connector, 12x02, 0406, see note 1	
P..0002	54.02.0406		6 cont.	Luglet Nr. E 184 / 8 LE	
Q..0001	50.03.0512		80899A	80899A	Mot, SGS
Q..0002	50.03.0512		80899A	80899A	Mot, SGS
Q..0003	50.03.0512		80899A	80899A	Mot, SGS
Q..0004	50.03.0512		80899A	80899A	Mot, SGS
Q..0005	50.03.0512		80899A	80899A	Mot, SGS
Q..0006	50.03.0512		80899A	80899A	Mot, SGS
Q..0007	50.03.0512		80899A	80899A	Mot, SGS
Q..0008	50.03.0512		80899A	80899A	Mot, SGS
Q..0009	50.03.0512		80899A	80899A	Mot, SGS
Q..0010	50.03.0512		80899A	80899A	Mot, SGS
Q..0011	50.03.0512		80899A	80899A	Mot, SGS
Q..0012	50.03.0512		80899A	80899A	Mot, SGS
Q..0013	50.03.0512		80899A	80899A	Mot, SGS
R..0001	57.11.4102		1 kOhm	5%	
R..0002	57.11.4102		1 kOhm	5%	

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IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R..0003	57.11.4122		1.2 kOhm	5%	
R..0004	57.11.4122		270 Ohm	5%	
R..0005	57.11.4122		1 kOhm	5%	
R..0006	57.11.4122		1 kOhm	5%	
R..0007	57.11.4122		980 Ohm	5%	
R..0008	57.11.4122		10 Ohm	5%	
R..0009	57.11.4122		270 Ohm	5%	
R..0010	57.11.4122		4.7 kOhm	5%	
R..0011	57.11.4122		2.7 kOhm	5%	
R..0012	57.11.4122		2.7 kOhm	5%	
R..0013	57.11.4122		2.7 kOhm	5%	
R..0014	57.11.4122		2.2 kOhm	5%	
R..0015	57.11.4122		48 kOhm	5%	
R..0016	57.11.4122		2 kOhm	5%	
R..0017	57.11.4122		100 Ohm	5%	
R..0018	57.11.4122		1 kOhm	5%	
R..0019	57.11.4122		2.2 kOhm	5%	
R..0020	57.11.4122		10 kOhm	5%	
R..0021	57.11.4122		6.2 kOhm	5%	
R..0022	57.11.4122		0.1 Ohm	10%, 4W	
R..0023	57.11.4122		0.1 Ohm	10%, 4W	
R..0024	57.11.4122		1 kOhm	5%	
R..0025	57.11.4122		1 kOhm	5%	
R..0026	57.11.4122		1 kOhm	5%	
R..0027	57.11.4122		1 kOhm	5%	
R..0028	57.11.4122		1 kOhm	5%	
R..0029	57.11.4122		1 kOhm	5%	
R..0030	57.11.4122		1 kOhm	5%	
R..0031	57.11.4122		1 kOhm	5%	
R..0032	57.11.4122		1 kOhm	5%	
R..0033	57.11.4122		1 kOhm	5%	
R..0034	57.11.4122		1 kOhm	5%	
R..0035	57.11.4122		1 kOhm	5%	
R..0036	57.11.4122		1 kOhm	5%	
R..0037	57.11.4122		1 kOhm	5%	
R..0038	57.11.4122		1 kOhm	5%	
R..0039	57.11.4122		1 kOhm	5%	

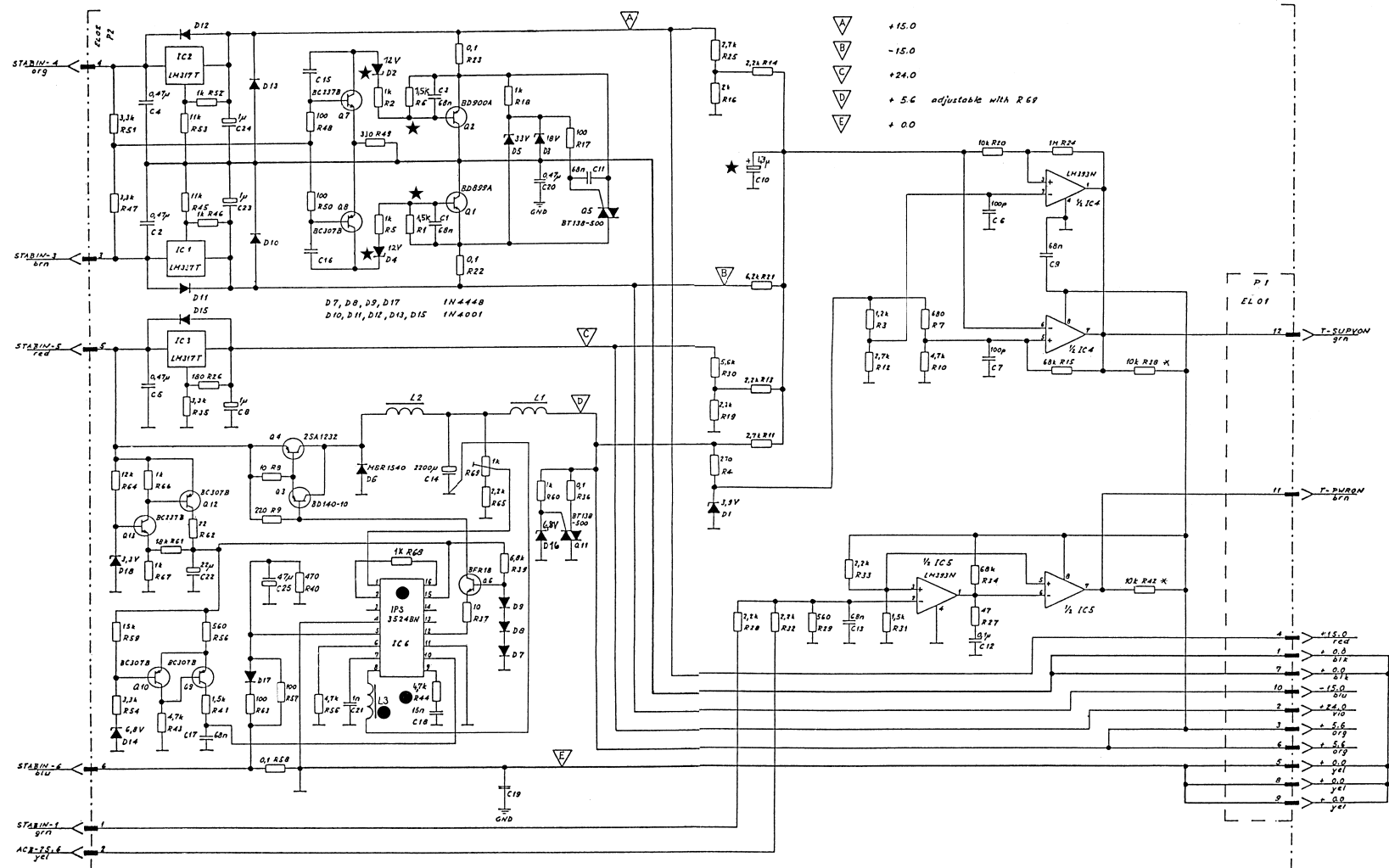
STUDER (00) 83/09/10 PB STABILIZER 1.810.770.81 PAGE 3

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R..0040	57.11.4122		470 Ohm	5%	
R..0041	57.11.4122		1.5 kOhm	5%	
R..0042	57.11.4122		10 kOhm	5%	
R..0043	57.11.4122		4.7 kOhm	5%	
R..0044	57.11.4122		27 kOhm	5%	
R..0045	57.11.4122		11 kOhm	5%	
R..0046	57.11.4122		1 kOhm	5%	
R..0047	57.11.4122		3.3 kOhm	5%	
R..0048	57.11.4122		100 Ohm	5%	
R..0049	57.11.4122		330 Ohm	5%	
R..0050	57.11.4122		100 Ohm	5%	
R..0051	57.11.4122		3.3 kOhm	5%	
R..0052	57.11.4122		1 kOhm	5%	
R..0053	57.11.4122		4.7 kOhm	5%	
R..0054	57.11.4122		3.3 kOhm	5%	
R..0055	57.11.4122		1 kOhm	5%	
R..0056	57.11.4122		1 kOhm	5%	
R..0057	57.11.4122		1 kOhm	5%	
R..0058	57.11.4122		1 kOhm	5%	
R..0059	57.11.4122		1 kOhm	5%	
R..0060	57.11.4122		1 kOhm	5%	
R..0061	57.11.4122		1 kOhm	5%	
R..0062	57.11.4122		1 kOhm	5%	
R..0063	57.11.4122		1 kOhm	5%	
R..0064	57.11.4122		1 kOhm	5%	
R..0065	57.11.4122		1 kOhm	5%	
R..0066	57.11.4122		1 kOhm	5%	
R..0067	57.11.4122		1 kOhm	5%	
R..0068	57.11.4122		1 kOhm	5%	
R..0069	57.11.4122		1 kOhm	5%	
R..0070	57.11.4122		1 kOhm	5%	
R..0071	57.11.4122		1 kOhm	5%	
R..0072	57.11.4122		1 kOhm	5%	
R..0073	57.11.4122		1 kOhm	5%	
R..0074	57.11.4122		1 kOhm	5%	
R..0075	57.11.4122		1 kOhm	5%	
R..0076	57.11.4122		1 kOhm	5%	
R..0077	57.11.4122		1 kOhm	5%	
R..0078	57.11.4122		1 kOhm	5%	
R..0079	57.11.4122		1 kOhm	5%	
R..0080	57.11.4122		1 kOhm	5%	
R..0081	57.11.4122		1 kOhm	5%	
R..0082	57.11.4122		1 kOhm	5%	
R..0083	57.11.4122		1 kOhm	5%	
R..0084	57.11.4122		1 kOhm	5%	
R..0085	57.11.4122		1 kOhm	5%	
R..0086	57.11.4122		1 kOhm	5%	
R..0087	57.11.4122		1 kOhm	5%	
R..0088	57.11.4122		1 kOhm	5%	
R..0089	57.11.4122		1 kOhm	5%	
R..0090	57.11.4122		1 kOhm	5%	
R..0091	57.11.4122		1 kOhm	5%	
R..0092	57.11.4122		1 kOhm	5%	
R..0093	57.11.4122		1 kOhm	5%	
R..0094	57.11.4122		1 kOhm	5%	
R..0095	57.11.4122		1 kOhm	5%	
R..0096	57.11.4122		1 kOhm	5%	
R..0097	57.11.4122		1 kOhm	5%	
R..0098	57.11.4122		1 kOhm	5%	
R..0099	57.11.4122		1 kOhm	5%	
R..0100	57.11.4122		1 kOhm	5%	

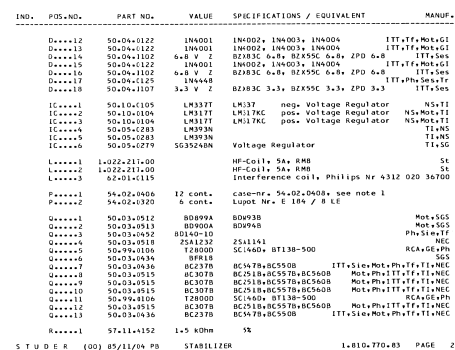
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IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1 = Connector		Molux Pin Nr.	02-06-R103		
		Molux Case Nr.	03-09-2121		
Note 2 = 1 kOhm Potentiometer		Bourns Nr.	3386 X-1-102		
		Vish Nr.	FD0-402 15		
		Spectrol Nr.	63 K 102 T010		
Ce=Ceramic, El=Electrolytic, S=Solid Aluminum					
Manufacturers: GE=General Electric, G=General Instruments, ITT=International, Mot=Motorola, NEC=Nippon Electric Corp., Phil=Philips, R=Radio Shack, RNS=Radio Shack, RCA=Radio Corporation of America, S=Siemens, SGS=Silicon General, SGS=SGS-Thomson, St=Stamington, Si=Siemens, St=Studer, T=Telefunken, Ti=Texas Instruments, Tr=Transtrons, Var=Varo					
DRIG 83/0910					
S T U D E R	(05)	83/0910 PB	STABILIZER	1.810.770-01	PAGE 5

## STABILIZER PCB 1.810.770-82/-83 GR7



IND.	PDS-Nb	PART N°	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
IND-000019	57111-0002	6-8 KdHm	5%		
IND-000020	57111-0001	0-70 Dm	5%		
IND-000021	57111-0025	1-5 KdHm	5%		
IND-000022	57111-0019	1-0 KdHm	5%		
IND-000023	57111-0072	4-7 KdHm	5%		
IND-000024	57111-0011	1 KdHm	5%		
IND-000025	57111-0102	1 KdHm	1%		
IND-000026	57111-0102	3-3 KdHm	5%		
IND-000027	57111-0101	1-00 Dm	5%		
IND-000028	57111-0101	3-30 Dm	5%		
IND-000029	57111-0101	1-00 Dm	5%		
IND-000030	57111-0101	3-3 KdHm	5%		
IND-000031	57111-0102	1 KdHm	1%		
IND-000032	57111-0113	11 KdHm	5%		
IND-000033	57111-0102	3-3 KdHm	5%		
IND-000034	57111-0072	4-7 KdHm	5%		
IND-000035	57111-0101	560 Dm	5%		
IND-000036	57111-0101	560 Dm	5%		
IND-000037	57111-0101	0-1 Dm	10% 4W		
IND-000038	57111-0101	0-1 Dm	5%		
IND-000039	57111-0101	1-00 Dm	5%		
IND-000040	57111-0102	1 KdHm	5%		
IND-000041	57111-0101	10 KdHm	5%		
IND-000042	57111-0101	1-00 Dm	5%		
IND-000043	57111-0101	4-00 Dm	5%		
IND-000044	57111-0101	1-00 Dm	5%		
IND-000045	57111-0102	2-2 KdHm	5%		
IND-000046	57111-0102	1 KdHm	5%		
IND-000047	57111-0102	1 KdHm	5%		
IND-000048	57111-0102	1 KdHm	5%		
IND-000049	58011-0102	1 KdHm	10% 0,25W, see note 2		



IND.	PDS-No.	PART No.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
<b>Note 1 - CONNECTOR:</b>					
		Males Pin Nr.	02-06-8103		
		Males Case Nr.	03-06-1121		
<b>Note 2 - 1 kOhm Potentiometer:</b>					
		Boards Nr.	3306 X-1-102		
		VAN Nr.	780-003 1k		
		Spectral Nr.	63 X 102 T010		
<b>Cer-Ceramics (E=Electrolytic, Sol=Solid Aluminum):</b>					
<b>Manufacturer:</b>					
		GE-General Electric	GI-General Instruments		
		ITT-International	Not-National	NEC-National Electric Corp.	
		NS-National Semiconductor	Phil-Philips		
		RC-Radiola Corporation of America	Sen-Sensicon		
		SG-Silicon General	SGS-SGS/Atos	Sh-Shindengen	
		Sie-Siemens	Sil-Siliconix	Tr-Transilux	
		Var-Vacuum	Var-Vacuum		
<b>DRIG 89/11/00</b>					
S.T.U.B.E.R.	(00)	85/11/04	PD	STABILIZER	1-810-6770-83 PAGE

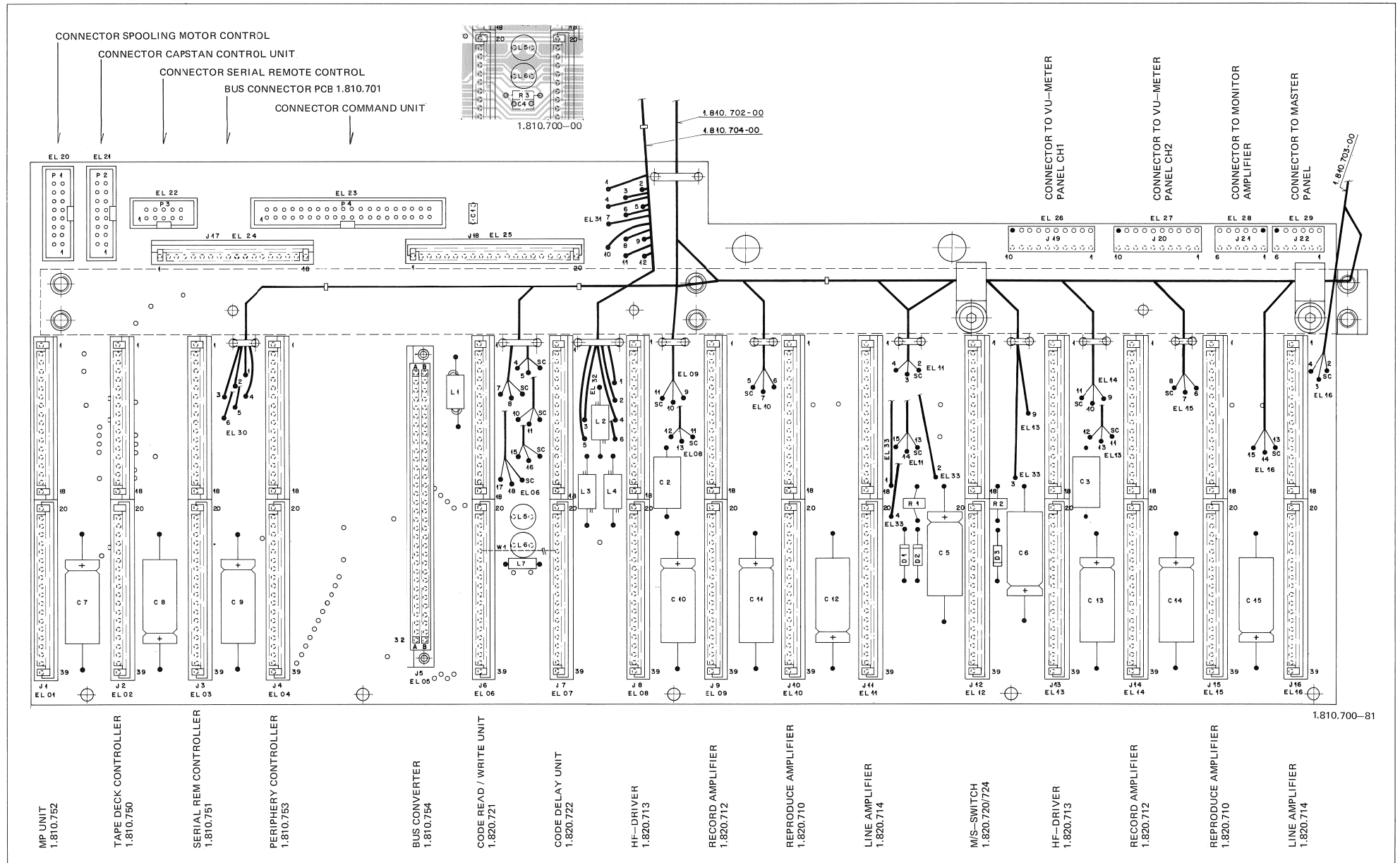
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PUBLISHED: 12/86

S T U D E R (DD) 86/09/83 MPh STABILIZER 1.810.770.84 PAGE 3



BASIS PCB 1.810.700-00/-81 GR20



BASIS PCB 1.810.700--00 GR20

BASIS PCB 1.810.700--81 GR20

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.04.0205	68 nF			Cw
C..0002	59.04.9472	4.7 nF	5% 630V	Ps	
C..0003	59.04.9472	4.7 nF	5% 630V	Ps	
C..0004		not used			
C..0005	59.25.3471	470 uF	20%, 16V	E1	
C..0006	59.25.3471	470 uF	20%, 16V	E1	
C..0007	59.25.1102	1000 uF	20%, 6.3V	E1	
C..0008	59.25.3471	470 uF	20%, 16V	E1	
C..0009	59.25.3471	470 uF	20%, 16V	E1	
C..0010	59.25.1102	1000 uF	20%, 6.3V	E1	
C..0011	59.25.3471	470 uF	20%, 16V	E1	
C..0012	59.25.3471	470 uF	20%, 16V	E1	
C..0013	59.25.1102	1000 uF	20%, 6.3V	E1	
C..0014	59.25.3471	470 uF	20%, 16V	E1	
C..0015	59.25.3471	470 uF	20%, 16V	E1	
D..0001	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Fc-Gl-Mot-101	
D..0002	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Fc-Gl-Mot-101	
D..0003	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Fc-Gl-Mot-101	
J..0001		18 + 20 contacts	see note 1		
J..0002		18 + 20 contacts	see note 1		
J..0003		18 + 20 contacts	see note 1		
J..0004	54.11.2005	18 + 20 contacts	see note 1		
J..0005		See note 2			
J..0006		18 + 20 contacts	see note 1		
J..0007		18 + 20 contacts	see note 1		
J..0008		18 + 20 contacts	see note 1		
J..0009		18 + 20 contacts	see note 1		
J..0010		18 + 20 contacts	see note 1		
J..0011		18 + 20 contacts	see note 1		
J..0012		18 + 20 contacts	see note 1		
J..0013		18 + 20 contacts	see note 1		
J..0014		18 + 20 contacts	see note 1		
J..0015		18 + 20 contacts	see note 1		
J..0016	54.10.2015	18 cont.	Burndy Nr. GCSB 18 50 19 V1 K9		
J..0017					
S T U D E R	R2/09/08 PB	BASIS BOARD		1.810.700.00	PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
J..0018	54.10.2026	20 cont.	Burndy Nr. GCSB 20 50 19 V1 K9		
J..0019	54.01.0290	10 cont.	AMP Nr. 163.680-B		
J..0020	54.01.0290	10 cont.	AMP Nr. 163.680-B		
J..0021	54.01.0216	6 cont.	AMP Nr. 163.680-A		
J..0022	54.01.0216	6 cont.	AMP Nr. 163.680-A		
L..0001	62.01.0115		Interference coil, Philips Nr 4312 020 36700		
L..0002	62.01.0115		Interference coil, Philips Nr 4312 020 36700		
L..0003	62.01.0115		Interference coil, Philips Nr 4312 020 36700		
L..0004	62.01.0115		Interference coil, Philips Nr 4312 020 36700		
L..0005	62.02.2122	1.2 mH	See note 3		
L..0006	62.02.2122	1.2 mH	See note 3		
P..0001	54.14.2002	16 cont.	Yamaichi Nr. FAP-16-0804		
P..0002	54.14.2002	16 cont.	Yamaichi Nr. FAP-16-0804		
P..0003	54.14.2001	10 cont.	Yamaichi Nr. FAP-10-0804		
P..0004	54.14.2004	40 cont.	Yamaichi Nr. FAP-40-0804		
R..0001	51.99.0211	40 Ohm	See note 4		
R..0002	51.99.0211	40 Ohm	See note 4		
R..0003			wire bridge		

S T U D E R R2/09/08 PB BASIS BOARD 1.810.700.00 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Cer=Ceramic, Ps=Polystyrol, El=Electrolytic					
Note 1 - 2 connectors: 18 contacts Studer 54.10.2015, Burndy GCSB 18 50 19 V1 K9 20 contacts Studer 54.10.2026, Burndy GCSB 20 50 19 V1 K9					
Note 2 - connector 2 + 32 contacts: Burndy Nr. JT 4x 8 20 R 00 J 00 Philips Nr. 2422 025 80297 Erni Nr. 0722-54.610 3TV-B64F 4mm					
Note 3 - TDK Nr. CSL 0812-122 J Draloric Nr. KGS0 5.5/9 R5 1200uH 5k					
Note 4 - PTC Resistor: Philips Nr. 2322 661 91003 Siemens Nr. C 63 100-P 390-13					

ORIG R2/09/08  
S T U D E R R2/09/08 PB BASIS BOARD 1.810.700.00 PAGE 3

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.04.0205	68 nF			Cw
C..0002	59.04.9472	4.7 nF	5% 630V	Ps	
C..0003	59.04.9472	4.7 nF	5% 630V	Ps	
C..0004		not used			
C..0005	59.25.3471	470 uF	20%, 16V	E1	
C..0006	59.25.3471	470 uF	20%, 16V	E1	
C..0007	59.25.1102	1000 uF	20%, 6.3V	E1	
C..0008	59.25.3471	470 uF	20%, 16V	E1	
C..0009	59.25.3471	470 uF	20%, 16V	E1	
C..0010	59.25.1102	1000 uF	20%, 6.3V	E1	
C..0011	59.25.3471	470 uF	20%, 16V	E1	
C..0012	59.25.3471	470 uF	20%, 16V	E1	
C..0013	59.25.1102	1000 uF	20%, 6.3V	E1	
C..0014	59.25.3471	470 uF	20%, 16V	E1	
C..0015	59.25.3471	470 uF	20%, 16V	E1	
D..0001	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Fc-Gl-Mot-101	
D..0002	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Fc-Gl-Mot-101	
D..0003	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Fc-Gl-Mot-101	
J..0001		18 + 20 contacts	see note 1		
J..0002		18 + 20 contacts	see note 1		
J..0003		18 + 20 contacts	see note 1		
J..0004		18 + 20 contacts	see note 1		
J..0005	54.11.2005	See note 2			
J..0006		18 + 20 contacts	see note 1		
J..0007		18 + 20 contacts	see note 1		
J..0008		18 + 20 contacts	see note 1		
J..0009		18 + 20 contacts	see note 1		
J..0010		18 + 20 contacts	see note 1		
J..0011		18 + 20 contacts	see note 1		
J..0012		18 + 20 contacts	see note 1		
J..0013		18 + 20 contacts	see note 1		
J..0014		18 + 20 contacts	see note 1		
J..0015		18 + 20 contacts	see note 1		
J..0016	54.10.2015	18 cont.	Burndy Nr. GCSB 18 50 19 V1 K9		
J..0017					
S T U D E R	(00) 84/07/26 GAE	BASIS BOARD		1.810.700.81	PAGE 1

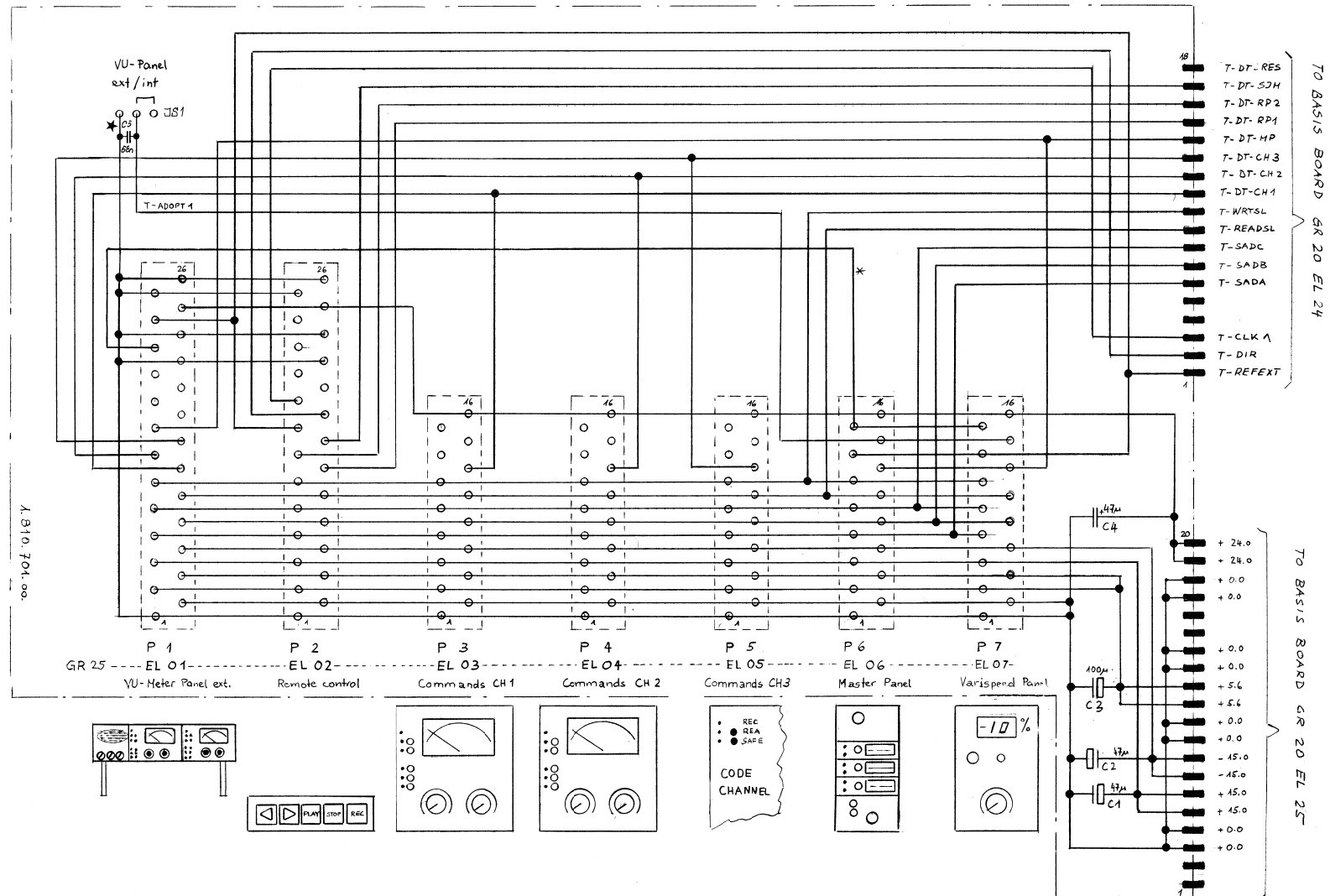
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
J..0018	54.10.2026	20 cont.	Burndy Nr. GCSB 20 50 19 V1 K9		
J..0019	54.01.0290	10 cont.	AMP Nr. 163.680-B		
J..0020	54.01.0290	10 cont.	AMP Nr. 163.680-B		
J..0021	54.01.0216	6 cont.	AMP Nr. 163.680-A		
J..0022	54.01.0216	6 cont.	AMP Nr. 163.680-A		
L..0001	62.01.0115		Interference coil, Philips Nr 4312 020 36700		
L..0002	62.01.0115		Interference coil, Philips Nr 4312 020 36700		
L..0003	62.01.0115		Interference coil, Philips Nr 4312 020 36700		
L..0004	62.01.0115		Interference coil, Philips Nr 4312 020 36700		
L..0005	62.02.2122	1.2 mH	See note 3		
L..0006	62.02.2122	1.2 mH	See note 3		
L..0007	62.01.0115		Interference coil, Philips Nr 4312 020 36700		
P..0001	54.14.2002	16 cont.	Yamaichi Nr. FAP-16-0804		
P..0002	54.14.2001	10 cont.	Yamaichi Nr. FAP-10-0804		
P..0003	54.14.2001	10 cont.	Yamaichi Nr. FAP-10-0804		
P..0004	54.14.2004	40 cont.	Yamaichi Nr. FAP-40-0804		
R..0001	51.99.0211	40 Ohm	See note 4		
R..0002	51.99.0211	40 Ohm	See note 4		
R..0003			not used		
R..0001	1.010.108.64		Wire bridge		

S T U D E R (00) 84/07/26 GAE BASIS BOARD 1.810.700.81 PAGE 2

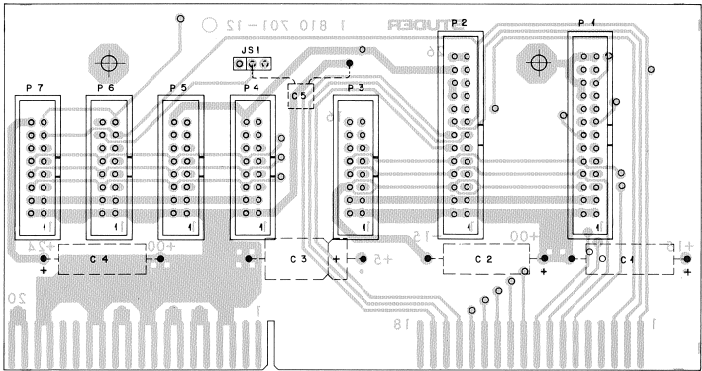
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Cer=Ceramic, Ps=Polystyrol, El=Electrolytic					
Note 1 - 2 connectors: 18 contacts Studer 54.10.2015, Burndy GCSB 18 50 19 V1 K9 20 contacts Studer 54.10.2026, Burndy GCSB 20 50 19 V1 K9					
Note 2 - connector 2 + 32 contacts: Burndy Nr. JT 4x 8 20 R 00 J 00 Philips Nr. 2422 025 80297 Erni Nr. 0722-54.610 3TV-B64F 4mm					
Note 3 - TDK Nr. CSL 0812-122 J Draloric Nr. KGS0 5.5/9 R5 1200uH 5k					
Note 4 - PTC Resistor: Philips Nr. 2322 661 91003 Siemens Nr. C 63 100-P 390-13					

ORIG 84/07/26  
S T U D E R (00) 84/07/26 GAE BASIS BOARD 1.810.700.81 PAGE 3

## BUS CONNECTOR PCB 1.810.701-00 GR25



BUS CONNECTOR PCB 1.810.701-00 GR25



PLUGGED INTO BASIS PCB 1.810.700-00

GR20 EL25

GR20 EL24

IND.	POS+NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
		C++0001	59+25+4470	47 uF	-10% 25V+ E1
		C++0002	59+25+4470	47 uF	-10% 25V+ E1
		C++0003	59+25+3101	100 uF	-10% 16V+ E1
		C++0004	59+25+4470	47 uF	-10% 25V+ E1
(01)		C++0005	59+99+0246	68 nF	Co
		J5+0001		See note 1	
		P++0001	5%1%+2003	26 cont.	Yamaichi Nr. FAP-26-0824
		P++0002	5%1%+2003	26 cont.	Yamaichi Nr. FAP-26-0824
		P++0003	5%1%+2002	16 cont.	Yamaichi Nr. FAP-16-0824
		P++0004	5%1%+2002	16 cont.	Yamaichi Nr. FAP-16-0824
		P++0005	5%1%+2002	16 cont.	Yamaichi Nr. FAP-16-0824
		P++0006	5%1%+2002	16 cont.	Yamaichi Nr. FAP-16-0824
		P++0007	5%1%+2002	16 cont.	Yamaichi Nr. FAP-16-0824

(01) 83/06/29 Rejection of crosstalk from wire T-REFEXT in jumper-position VU Panel internal.

Note 1 - Contact pint Studer 5%01+0020  
Phillips 2422 025 89303  
Berg 75 100-102-36  
Bridge: Studer 5%01+0021  
Phillips 2422 024 88001  
Berg 65 476-001

Co=Ceramic capacitor; E1=Electrolytic capacitor

ORIG 81/04/21 (01) 83/06/29

S T U D E R (01) 83/06/29 PB BUS CONNECTOR BOARD 1+810.701.00 PAGE 1



IND.	PDS.ND.	REF. NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUFACT.
IC	00014	50-06-0373	N74LS373N		Signif
00	00001	50-06-0508	PM52369	B5120	Not Ph
R	00001	51-11-1221	220 Ohm	2%	
R	00002	51-11-1013	10 Ohm		
R	00003	51-11-1013	10 Ohm		
R	00004	51-11-1013	100 Ohm		
R	00005	51-11-1013	1 KOhm		
R	00006	51-11-1012	1 KOhm		
RZ	00001	57-08-1332		See note 3	
RZ	00002	57-08-1332		See note 3	
RZ	00003	57-08-1332		See note 3	
S	00001	59-01-0122	switch	Impulse - Chicago Switch Nr. 3A-550-001	
8R	00001	89-01-0250		Waterbury, Keystone com. 4000	
8R	00002	89-01-0250		Battery holder. Optisol 2000	
Y	00001	89-01-0553		Quartz 4915 MHz -100 ppm	

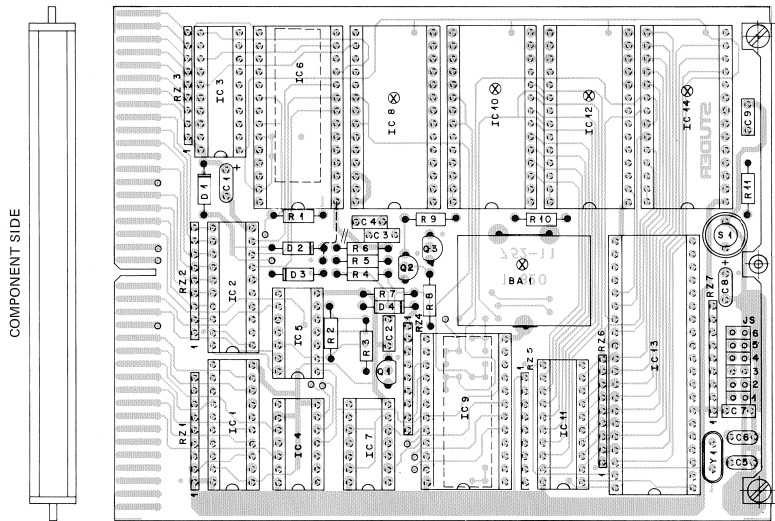
STUDER 1001 02/03/10 DSC MPU UNIT A810 L=810.752.00 PAGE 2

ORIG 02/03/10

S T U D E R {00} 02/03/10 DSC MPU UNIT A810 1.810.752.00 PAGE 3

★ HAS BEEN MODIFIED

MP UNIT A810 PCB 1.820.780-00 GR20 EL1 "ESE" (MP UNIT PCB WITHOUT SOFTWARE: 1.820.752-00)



// PRINTED CONDUCTOR INTERRUPTED

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
BA-0001	89-01-0174			See note 1	
C-0001	59-26-0170	47 uF	201+ 6-3V+ Sal		Ph
C-0002	59-99-0205	88 nF	-201+ Co		
C-0003	59-99-0205	88 nF	-201+ Co		
C-0004	59-99-0205	88 nF	-201+ Co		
C-0005	59-32-0100	10 pF	51+ Co		
C-0006	59-32-0100	10 pF	51+ Co		
C-0007	59-99-0205	88 nF	-201+ Co		Ph
C-0008	59-26-0170	47 uF	201+ 6-3V+ Sal		
C-0009	59-99-0205	88 nF	-201+ Co		
D-0001	50-04-0112	1N5818	1N5819		Not
D-0002	50-04-0125	1N4448		ITT+Ph+Sec+TI	
D-0003	50-04-0127	BA54002	BA745		Sec
(01) D-0003	50-04-0127	BA54002	BA745		Sec
D-0004	50-04-1101	3-9 V Z	BZK33C 3-9V BZX55C 3-9V ZPD 3-9V	ITT+Sec	
IC-0001	50-06-0141	74LS541PC	SN74LS541N		Fc+Mot+TI
IC-0002	50-06-0141	74LS541PC	SN74LS541N		Fc+Mot+TI
IC-0003	50-06-0445	SN74LS645N		TI+Mot	
IC-0004	50-06-0806	74LS 549C	SN74LS 04N+ N74LS 04N		Fc+Sig+TI
IC-0005	50-06-0193	SN74LS393N		TI	
IC-0006	50-14-0107	HM6116LP-H	HM6116LP-3+ MSMS128-128S		Hi+OR
IC-0007	50-06-0810	74LS 10PC	SN74LS 10N+ N74LS 10N		Fc+Sig+TI
IC-0008			See note 2		
IC-0009	50-12-0806	SN74159N			TI
IC-0010			See note 2		
IC-0011	50-06-1573	74LS573PC	SN74LS573AN		Fc+TI
IC-0012			See note 2		
IC-0013	50-16-0107	MC68036-1	HM6803P-1		Hi+Mot
IC-0014			See note 2		
JS-0001			See note 3		
JS-0002			See note 3		
JS-0003			See note 3		
JS-0004			See note 3		
S T U D E R (01) 86/01/11 AJ MP UNIT WITHOUT SOFTWARE 1-820.752-00 PAGE 1					

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
JS-0005				See note 3	
JS-0006				See note 3	
Q-0001	50-03-0508	MP52369			Not+Ph
Q-0002	50-03-0540	BC337-25			NEC+TI
Q-0003	50-03-0540	BC337-25			NEC+TI
R-0001	57-11-4103	10 kOhm	2%		
R-0002	57-11-4102	1 kOhm	2%		
R-0003	57-11-4561	560 Ohm	2%		
R-0004	57-11-4470	47 Ohm	2%		
R-0005	57-11-4470	47 Ohm	2%		
R-0006	57-11-4471	470 Ohm	2%		
R-0007	57-11-4101	100 Ohm	2%		
R-0008	57-11-4102	1 kOhm	2%		
R-0009	57-11-4223	22 kOhm	2%		
R-0010	57-11-4473	47 kOhm	2%		
R-0011	57-11-4102	1 kOhm	2%		
R2-0001	57-88-4332	3-3 kOhm	See note 4		
R2-0002	57-88-4332	3-3 kOhm	See note 4		
R2-0003	57-88-4332	3-3 kOhm	See note 4		
R2-0004	57-88-4332	3-3 kOhm	See note 4		
R2-0005	57-88-4332	3-3 kOhm	See note 4		
R2-0006	57-88-4332	3-3 kOhm	See note 4		
R2-0007	57-88-4332	3-3 kOhm	See note 4		
S-0001	55-03-0122	Switch	Impulse -> Chicago Switch Nr. 34-550-001		
V-0001	89-01-0553		Quartz 4-9152 MHz +/-100 ppm		

S T U D E R (01) 86/01/13 AJ MP UNIT WITHOUT SOFTWARE 1-820.752-00 PAGE 2

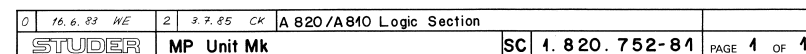
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(01) 86/01/13 Improved battery loading circuit: better overload protection: cathode D3 connected to cathode D2).					
Note 1 - NiCd Battery: Varta Nr. 53009 303 059 / 3-100 OKD 5-5LF +8+					
Note 2 - IC 8/10/12/14: Software see Position List of actual MP Unit with software					
Note 3 - Contact pin:					
		Studer	Nr. 56-01-0020		
		Berg	Nr. 75 340-102-16		
		Philips	Nr. 2422 025 89303		
		Studer	Nr. 56-01-0021		
		Berg	Nr. 65 414-001		
		Philips	Nr. 2422 024 88003		
Note 4 - Network:					
		8 ± 3-3 kOhm, 5%			
		3 covered Nr. 109 ± 3-3 k			
		Imbro Nr. R08 3-3 k 1%			
Co-Ceramic, Sal-Solid Aluminum					
MANUFACTURER: Fc=Fairchild, Hi=Hitachi, ITT=Intermetall, Not=Motorola, NEC=Nippon Electronic Corporation, DR=DKI, Ph=Philips, S=Seimens, Sig=Signetics, TI=Telefunken, TI=Texas Instruments.					

DRIG 82/09/16 (01) 86/01/13  
S T U D E R (01) 86/01/13 AJ MP UNIT WITHOUT SOFTWARE 1-820.752-00 PAGE 3

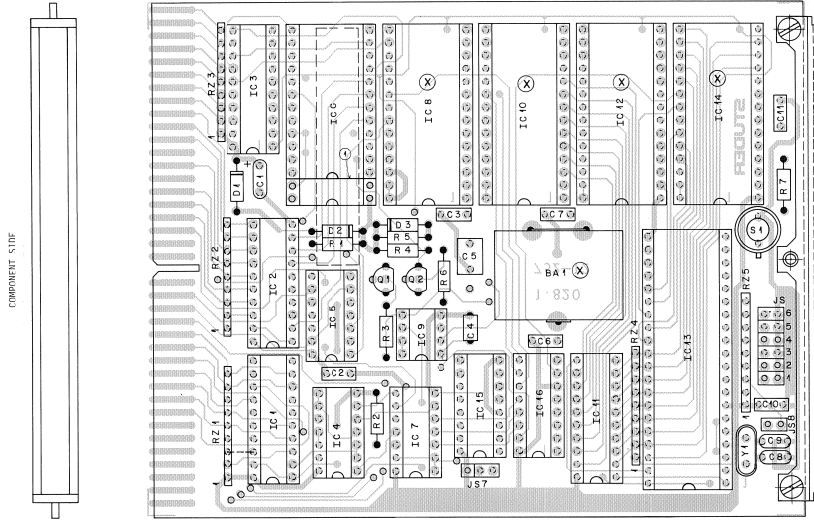


R	
C	

R \_\_\_\_\_  
C \_\_\_\_\_

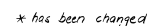


MP UNIT A810 PCB 1.820.780-81 GR 20 EL 1"ESE" (MP UNIT PCB WITHOUT SOFTWARE: 1.820.752-81/-82)



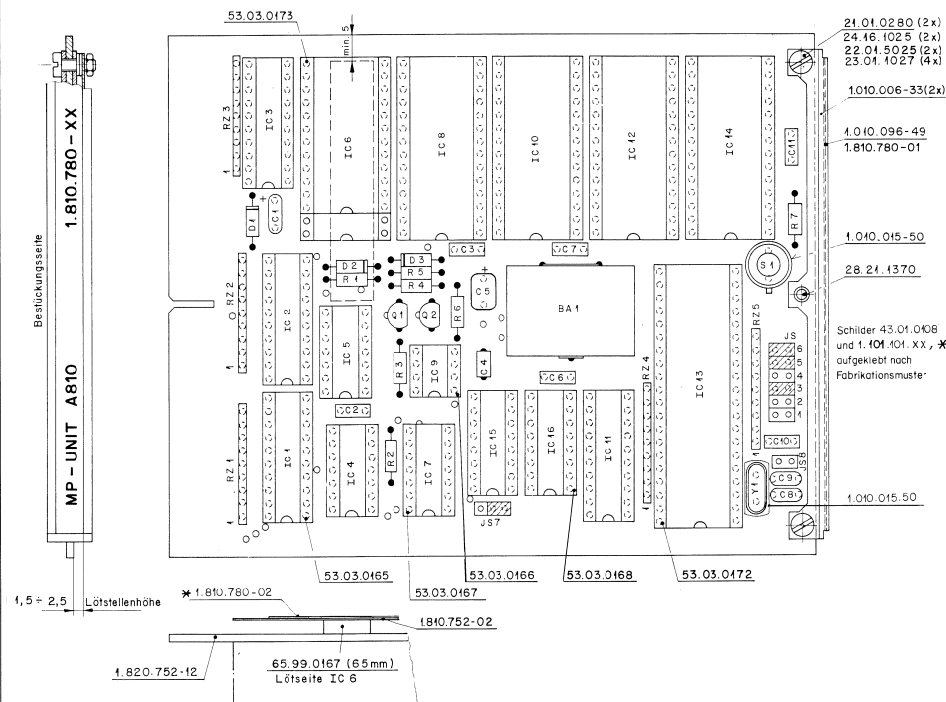
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
		BA-0001	89-01-0274	See note 1	
		C-00001	59-26-0470	47 uF 20%, 6-3V, Sal	Ph
		C-00002	59-99-0205	68 nF -20%, Co	
		C-00003	59-99-0205	68 nF -20%, Co	
		C-00004	59-00-0104	0.1 uF 10%, Co	
		C-00005	59-06-0474	0.47 uF 10%, Co	
		C-00006	59-99-0205	68 nF -20%, Co	
		C-00007	59-99-0205	68 nF -20%, Co	
		C-00008	59-34-1150	15 pF 1%, Co	
		C-00009	59-34-1150	15 pF 1%, Co	
		C-00010	59-99-0205	68 nF -20%, Co	
		C-00011	59-99-0205	68 nF -20%, Co	
		D-00001	50-04-0512	1N5818 1N5819	Not
		D-00002	50-04-0125	1N4648	ITT-Phy.Sem.TI
		D-00003	50-04-0127	BAS4002	Sie
		IC-00001	50-06-0541	74LS541PC 5N74LS541N	Fc+Mot+TI
		IC-00002	50-06-0541	74LS541PC 5N74LS541N	Fc+Mot+TI
		IC-00003	50-06-0645	5N74LS645N	TI+Mot
		IC-00004	50-06-0007	74LS 02PC 5N74LS 02N, N74LS 02N	Signi
		IC-00005	50-06-0393	5N74LS393N	Ph+Mot+NS+RCA
		IC-00006	50-17-1399	MC74HC393N	Ph+Mot+NS+RCA
		IC-00007	50-14-0107	HM6116LP-4	Hi+DK
		IC-00008	50-06-0011	74LS 11PC 5N74LS 11N, N74LS 11N	Signi
		IC-00009	50-11-0122	TL7705CP	TI
		IC-00010	50-11-0122	TL7705CP	TI
		IC-00011	50-06-1573	74LS573PC 5N74LS573N	Fc+TI
		IC-00012	50-17-1573	MC74HC573N	Ph+Mot+NS+RCA
		IC-00013	50-16-0107	MC6803G-1	Hi+Mot
		IC-00014	50-06-0138	74LS138PC 5N74LS138N	TI
		IC-00015	50-06-0138	74LS138PC 5N74LS138N	TI
		JS-00001	50-03-0508	MP52369	See note 3
		JS-00002	50-03-0508	MP52369	See note 3
		JS-00003	50-03-0508	MP52369	See note 3
		JS-00004	50-03-0508	MP52369	See note 3
		JS-00005	50-03-0508	MP52369	See note 3
		JS-00006	50-03-0508	MP52369	See note 3
		JS-00007	50-03-0508	MP52369	See note 3
		JS-00008	50-03-0508	MP52369	See note 3
		Q-00001	50-03-0508	MP52369	See note 3
		Q-00002	50-03-0508	MP52369	See note 3
		R-00001	57-11-0102	1 kOhm 2%	Not+Ph
		R-00002	57-11-0471	470 Ohm 2%	Not+Ph
		R-00003	57-11-0103	10 kOhm 2%	
		R-00004	57-11-0102	1 kOhm 2%	
		R-00005	57-11-0471	470 Ohm 2%	
		R-00006	57-11-0102	1 kOhm 2%	
		R-00007	57-11-0471	470 Ohm 2%	
		R-00008	57-11-0103	10 kOhm 2%	
		R-00009	57-11-0471	470 Ohm 2%	
		R-00010	57-11-0471	470 Ohm 2%	
		R-00011	57-11-0471	470 Ohm 2%	
		R-00012	57-11-0471	470 Ohm 2%	
		R-00013	57-11-0471	470 Ohm 2%	
		R-00014	57-11-0471	470 Ohm 2%	
		R-00015	57-11-0471	470 Ohm 2%	
		R-00016	57-11-0471	470 Ohm 2%	
		R-00017	57-11-0471	470 Ohm 2%	
		R-00018	57-11-0471	470 Ohm 2%	
		R-00019	57-11-0471	470 Ohm 2%	
		R-00020	57-11-0471	470 Ohm 2%	
		R-00021	57-11-0471	470 Ohm 2%	
		R-00022	57-11-0471	470 Ohm 2%	
		R-00023	57-11-0471	470 Ohm 2%	
		R-00024	57-11-0471	470 Ohm 2%	
		R-00025	57-11-0471	470 Ohm 2%	
		R-00026	57-11-0471	470 Ohm 2%	
		R-00027	57-11-0471	470 Ohm 2%	
		R-00028	57-11-0471	470 Ohm 2%	
		R-00029	57-11-0471	470 Ohm 2%	
		R-00030	57-11-0471	470 Ohm 2%	
		R-00031	57-11-0471	470 Ohm 2%	
		R-00032	57-11-0471	470 Ohm 2%	
		R-00033	57-11-0471	470 Ohm 2%	
		R-00034	57-11-0471	470 Ohm 2%	
		R-00035	57-11-0471	470 Ohm 2%	
		R-00036	57-11-0471	470 Ohm 2%	
		R-00037	57-11-0471	470 Ohm 2%	
		R-00038	57-11-0471	470 Ohm 2%	
		R-00039	57-11-0471	470 Ohm 2%	
		R-00040	57-11-0471	470 Ohm 2%	
		R-00041	57-11-0471	470 Ohm 2%	
		R-00042	57-11-0471	470 Ohm 2%	
		R-00043	57-11-0471	470 Ohm 2%	
		R-00044	57-11-0471	470 Ohm 2%	
		R-00045	57-11-0471	470 Ohm 2%	
		R-00046	57-11-0471	470 Ohm 2%	
		R-00047	57-11-0471	470 Ohm 2%	
		R-00048	57-11-0471	470 Ohm 2%	
		R-00049	57-11-0471	470 Ohm 2%	
		R-00050	57-11-0471	470 Ohm 2%	
		R-00051	57-11-0471	470 Ohm 2%	
		R-00052	57-11-0471	470 Ohm 2%	
		R-00053	57-11-0471	470 Ohm 2%	
		R-00054	57-11-0471	470 Ohm 2%	
		R-00055	57-11-0471	470 Ohm 2%	
		R-00056	57-11-0471	470 Ohm 2%	
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		R-00059	57-11-0471	470 Ohm 2%	
		R-00060	57-11-0471	470 Ohm 2%	
		R-00061	57-11-0471	470 Ohm 2%	
		R-00062	57-11-0471	470 Ohm 2%	
		R-00063	57-11-0471	470 Ohm 2%	
		R-00064	57-11-0471	470 Ohm 2%	
		R-00065	57-11-0471	470 Ohm 2%	
		R-00066	57-11-0471	470 Ohm 2%	
		R-00067	57-11-0471	470 Ohm 2%	
		R-00068	57-11-0471	470 Ohm 2%	
		R-00069	57-11-0471	470 Ohm 2%	
		R-00070	57-11-0471	470 Ohm 2%	
		R-00071	57-11-0471	470 Ohm 2%	
		R-00072	57-11-0471	470 Ohm 2%	
		R-00073	57-11-0471	470 Ohm 2%	
		R-00074	57-11-0471	470 Ohm 2%	
		R-00075	57-11-0471	470 Ohm 2%	
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		R-00078	57-11-0471	470 Ohm 2%	
		R-00079	57-11-0471	470 Ohm 2%	
		R-00080	57-11-0471	470 Ohm 2%	
		R-00081	57-11-0471	470 Ohm 2%	
		R-00082	57-11-0471	470 Ohm 2%	
		R-00083	57-11-0471	470 Ohm 2%	
		R-00084	57-11-0471	470 Ohm 2%	
		R-00085	57-11-0471	470 Ohm 2%	
		R-00086	57-11-0471	470 Ohm 2%	
		R-00087	57-11-0471	470 Ohm 2%	
		R-00088	57-11-0471	470 Ohm 2%	
		R-00089	57-11-0471	470 Ohm 2%	
		R-00090	57-11-0471	470 Ohm 2%	
		R-00091	57-11-0471	470 Ohm 2%	
		R-00092	57-11-0471	470 Ohm 2%	
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		R-00097	57-11-0471	470 Ohm 2%	
		R-00098	57-11-0471	470 Ohm 2%	
		R-00099	57-11-0471	470 Ohm 2%	
		R-00100	57-11-0471	470 Ohm 2%	
		R-00101	57-11-0471	470 Ohm 2%	
		R-00102	57-11-0471	470 Ohm 2%	
		R-00103	57-11-0471	470 Ohm 2%	
		R-00104	57-11-0471	470 Ohm 2%	
		R-00105	57-11-0471	470 Ohm 2%	
		R-00106	57-11-0471	470 Ohm 2%	
		R-00107	57-11-0471	470 Ohm 2%	
		R-00108	57-11-0471	470 Ohm 2%	
		R-00109	57-11-0471	470 Ohm 2%	
		R-00110	57-11-0471	470 Ohm 2%	
		R-00111	57-11-0471	470 Ohm 2%	
		R-00112	57-11-0471	470 Ohm 2%	
		R-00113	57-11-0471	470 Ohm 2%	
		R-00114	57-11-0471	470 Ohm 2%	
		R-00115	57-11-0471	470 Ohm 2%	
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		R-00117	57-11-0471	470 Ohm 2%	
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		R-00119	57-11-0471	470 Ohm 2%	
		R-00120	57-11-0471	470 Ohm 2%	
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		R-00125	57-11-0471	470 Ohm 2%	
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		R-00138	57-11-0471	470 Ohm 2%	
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		R-00141	57-11-0471	470 Ohm 2%	
		R-00142	57-11-0471	470 Ohm 2%	
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		R-00171	57-11-0471	470 Ohm 2%	
		R-00172	57-11-0471	470 Ohm 2%	
		R-00173	57-11-0471	470 Ohm 2%	
		R-00174	57-11-0471	470 Ohm 2%	
		R-00175	57-11-0471	470 Ohm 2%	
		R-00176	57-11-0471	470 Ohm 2%	
		R-00177</			

R	R
C	C



20	20.3.86	A 820 / A 840 Logic Section	
STUDER	MP Unit Mk	SC	1. 810. 780-22
			PAGE 1 OF 1

## MP UNIT MK 1.810.780.22



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(20)	BA....1	89.01.0274		See note 1	
(20)	C.....1	59.26.0470	47 uF	20K, 6.3V, Sal	Ph
(20)	C.....2	59.99.0205	68 nF	-20K, C	
(20)	C.....3	59.99.0205	68 nF	-20K, C	
(20)	C.....4	59.06.0104	0.1 uF	10K, 16V, Sal	
(20)	C.....5	59.99.0105	10 uF	20K, C	
(20)	C.....6	59.99.0205	68 nF	-20K, C	
(20)	C.....7	59.99.0205	68 nF	-20K, C	
(20)	C.....8	59.34.2330	33 pF	5K, C	
(20)	C.....9	59.34.2330	33 pF	5K, C	
(20)	C.....10	59.99.0205	68 nF	-20K, C	
(20)	C.....11	59.99.0205	68 nF	-20K, C	
(20)	D.....1	50.04.0512	1K5B18	1N5B19	Not
(20)	D.....2	50.04.0125	1B4448		ITT/Ph/Sig/TT
(20)	D.....3	50.04.0127	BA54002	BAT85	Sie
(20)	IC.....1	50.06.0541	74LS541PC	SN74LS541N	For/Not/TT
(20)	IC.....2	50.06.0541	74LS541PC	SN74LS541N	For/Not/TT
(20)	IC.....3	50.06.0545	SN74LS545N		TT/Not
(20)	IC.....4	50.06.0502	74LS 02PC	SN74LS 02N, 74LS 02M	Sig/TT
(20)	IC.....5	50.17.1393	MC74HC93B	PC74HC93B, MC74HC93B	Ph/Not/MS/BCA
(20)	IC.....6	50.14.0107	HM6161P-4	HM6161P-3, HM6161P-12B	Hi/OK
(20)	IC.....7	50.06.0011	74LS 11PC	SN74LS 11N, 74LS 11N	Sig/TT
(20)	IC.....8		not used		TT
(20)	IC.....9	50.13.0122	TL7002P		It/TT/SSS
(20)	IC.....10	50.14.0113	D 2764-3	TM2764-253L, M2764 F 1	
(20)	IC.....11	50.17.1579	MC74HC573N	PC74HC573P, MC74HC573N	Ph/Not/MS/BCA
(20)	IC.....12	50.14.0113	D 2764-3	TM2764-253L, M2764 F 1	It/TT/SSS
(21)	IC.....12			See note 2	
(22)	IC.....12			See note 2	
(22)	IC.....12			See note 2	
(20)	IC.....13	50.16.0107	MC68000-1	MC68000-1	Hi/Not

S T U D E R (22) 87/12/10 BD MP UNIT A 810 PL 1.810.780.00 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(00)	IC.....14	50.14.0113	D 2764-3	TM2764-253L, M2764 F 1	It/TT/SSS
(20)	IC.....14			See note 2	
(21)	IC.....14			See note 2	
(22)	IC.....14			See note 2	
(20)	IC.....15	50.06.0138	74LS138PC	SN74LS138N	TT
(20)	IC.....16	50.06.0138	74LS138PC	SN74LS138N	TT
(20)	JS.....1			See note 3	
(20)	JS.....2			See note 3	
(20)	JS.....3			See note 3	
(20)	JS.....4			See note 3	
(20)	JS.....5			See note 3	
(20)	JS.....6			See note 3	
(20)	JS.....7			See note 3	
(20)	JS.....8			See note 3	
(20)	D.....1	50.03.0508	NP52369	BSX20	Not/Ph
(20)	D.....2	50.03.0508	NP52369	BSX20	Not/Ph
(20)	R.....1	57.11.4102	1 kOhm	2K	
(20)	R.....2	57.11.4471	470 Ohm	2K	
(20)	R.....3	57.11.4103	10 kOhm	2K	
(20)	R.....4	57.11.4102	1 kOhm	2K	
(20)	R.....5	57.11.4471	470 Ohm	2K	
(20)	R.....6	57.11.4103	10 kOhm	2K	
(20)	R.....7	57.11.4471	470 Ohm	2K	
(20)	RZ.....1	57.08.4352	3.3 kOhm	See note 4	
(20)	RZ.....2	57.08.4352	3.3 kOhm	See note 4	
(20)	RZ.....3	57.08.4352	3.3 kOhm	See note 4	
(20)	RZ.....4	57.08.4352	3.3 kOhm	See note 4	
(20)	RZ.....5	57.08.4352	3.3 kOhm	See note 4	
(20)	S.....1	55.03.0122	Switch	Impulse ~ Chicago Switch Nr. 34-550-001	
(20)	Y.....1	89.01.0560		Quartz 4.915200 MHz, +/-100 ppm	

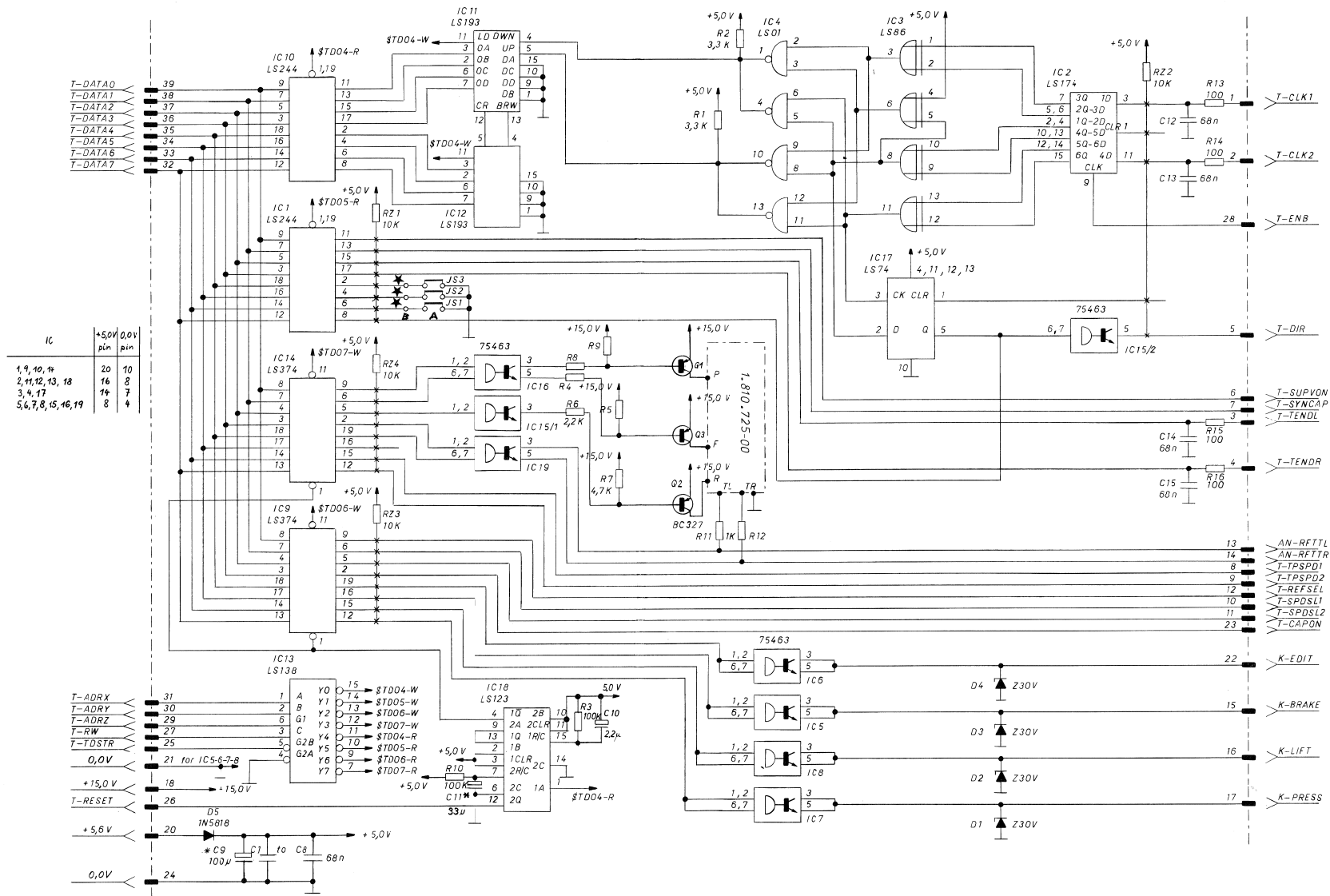
S T U D E R (22) 87/12/10 BD MP UNIT A 810 PL 1.810.780.00 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(20)	21.03.06	PCB lay-out	1.820.752-12		
(21)	18.06.86	Software	1.810.999.21		
(22)	10.12.87	Software	1.810.999.22		
Note 1	- NiCd Battery:	Varta Nr. 53009 303 059 / 3-100 BKO S.SLF +8+			
Note 2	- IC 10/12/14:	Software is delivered in a net only.			
(20)	Software 40/85:	Studer Nr. 1.810.999.20			
(21)	Software 25/86:	Studer Nr. 1.810.999.21			
(22)	Software 01/88:	Studer Nr. 1.810.999.22			
Note 3	- Contact pin:	Studer Nr. 54.01.0020			
		Reg Nr. 78 160-102-36			
		Philips Nr. 2422 028 88803			
	Bridge:	Studer Nr. 54.01.0021			
		Reg Nr. 65 474-001			
		Philips Nr. 2422 024 88803			
Note 4	- Network:	8 x 3.3 kOhm, 5K			
		Siliconix Nr. 029 x 3.3 k J			
		Intelco Nr. RBB 3.3 k 5K			
Cer/Ceramic, Sal=Solid Aluminum					
MANUFACTURER: Fo=Fairchild, Hi=Hitachi, ITT=Intertec, Not=Motorola, NEC=NEC Electronic Corp., NM=National Semiconductor, DE=DEI, Ph=Philips, RCA=Radio Corporation of America, Sem=Semiconductors, Sig=Signetics, TP=Telefunken, TI=Texas Instruments.					

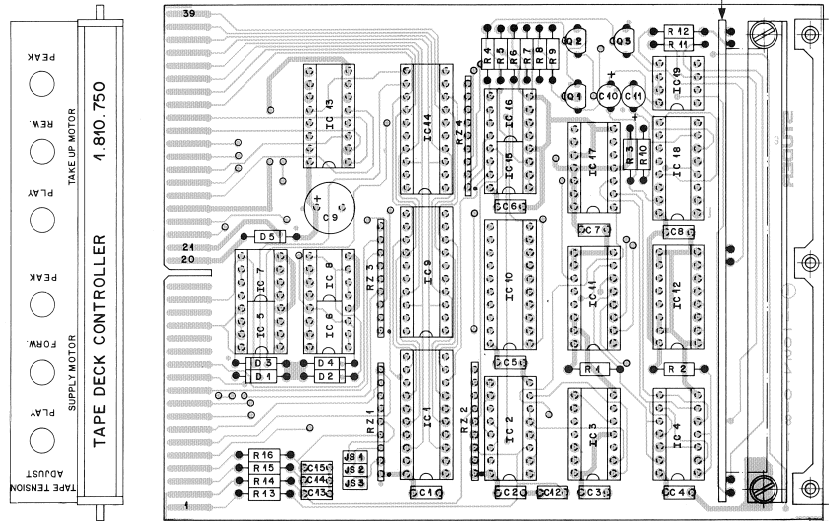
ORIG 86/03/21 (20) 86/03/21 (21) 86/06/18 (22) 87/12/10

S T U D E R (22) 87/12/10 BD MP UNIT A 810 PL 1.810.780.00 PAGE 3

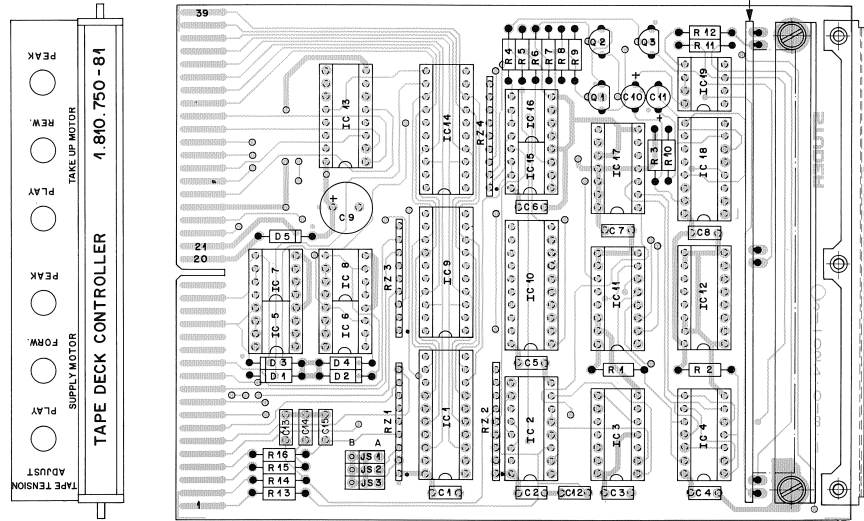
## TAPE DECK CONTROLLER PCB 1.810.750-00/-81 GR20 EL2



TAPE DECK CONTROLLER PCB 1.810.750-00 GR20 EL2

TAPE TENSION ADJUST  
PCB 1.810.725-00

TAPE DECK CONTROLLER PCB 1.810.750-81 GR20 EL2

TAPE TENSION ADJUST  
PCB 1.810.725-00

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C-0001	59.99.0205	68 nF	Ce		
C-0002	59.99.0205	68 nF	Ce		
C-0003	59.99.0205	68 nF	Ce		
C-0004	59.99.0205	68 nF	Ce		
C-0005	59.99.0205	68 nF	Ce		
C-0006	59.99.0205	68 nF	Ce		
C-0007	59.99.0205	68 nF	Ce		
C-0008	59.99.0205	68 nF	Ce		
(01)	C-0009	59.22.1101	100 uF	10%, 10V, E1	
(01)	C-0010	59.22.1101	100 uF	10%, 25V, E1	Ph
(01)	C-0011	59.26.1129	2.2 uF	20%, 25V, Sd	Ph
(02)	C-0012	59.26.1130	33 uF	20%, 10V, Sd	Ph
C-0013	59.99.0205	68 nF	Ce		
C-0014	59.99.0205	68 nF	Ce		
C-0015	59.99.0205	68 nF	Ce		
D-0001	50.04.1125	30 V Z	ZPD 30		ITT
D-0002	50.04.1125	30 V Z	ZPD 30		ITT
D-0003	50.04.1125	30 V Z	ZPD 30		ITT
D-0004	50.04.1125	30 V Z	ZPD 30		ITT
D-0005	50.04.0512	1N5818	1N5818		Mot
I-0001	50.06.0244	74LS244	SN74LS244N		AMI,MM,Mot,TT
I-0002	50.06.0174	74ALS174N	SN74ALS174N		Sign,TT
I-0003	50.06.0086	74ALS 86N	SN74ALS 86N		Sign,TT
I-0004	50.06.0006	74ALS 01N	SN74ALS 01N		Sign,TT
I-0005	50.05.0203	SN75463PS	N75463JG, SN5463JG, D53613N		NS,TT
I-0006	50.05.0203	SN75463PS	N75463JG, SN5463JG, D53613N		NS,TT
I-0007	50.05.0203	SN75463PS	N75463JG, SN5463JG, D53613N		NS,TT
I-0008	50.05.0203	SN75463PS	N75463JG, SN5463JG, D53613N		NS,TT
I-0009	50.06.0374	DM74LS374	SN74LS374N		NS,TT
I-0010	50.06.0244	74LS244	SN74LS244N		AMI,MM,Mot,TT
I-0011	50.06.0193	74ALS193N	SN74ALS193N		Sign,TT
I-0012	50.06.0193	74ALS193N	SN74ALS193N		Sign,TT
I-0013	50.06.0193	74ALS193N	SN74ALS193N		Sign,TT
I-0014	50.06.0193	74ALS193N	SN74ALS193N		Sign,TT
I-0015	50.06.0138	SN74ALS138N	SN74ALS138N		NS,TT

S T U D E R (02) 83/03/03 PB TAPE DECK CONTROLLER 1.810.750-00 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C-0001	59.99.0205	68 nF	Ce		
C-0002	59.99.0205	68 nF	Ce		
C-0003	59.99.0205	68 nF	Ce		
C-0004	59.99.0205	68 nF	Ce		
C-0005	59.99.0205	68 nF	Ce		
C-0006	59.99.0205	68 nF	Ce		
C-0007	59.99.0205	68 nF	Ce		
C-0008	59.99.0205	68 nF	Ce		
C-0009	59.22.1101	100 uF	10%, 25V, E1		Ph
C-0010	59.26.1129	2.2 uF	20%, 25V, Sd		Ph
C-0011	59.26.1130	33 uF	20%, 10V, Sd		Ph
C-0012	59.99.0205	68 nF	Ce		
C-0013	59.99.0205	68 nF	Ce		
C-0014	59.99.0205	68 nF	Ce		
C-0015	59.99.0205	68 nF	Ce		
D-0001	50.04.1125	30 V Z	ZPD 30		ITT
D-0002	50.04.1125	30 V Z	ZPD 30		ITT
D-0003	50.04.1125	30 V Z	ZPD 30		ITT
D-0004	50.04.1125	30 V Z	ZPD 30		ITT
D-0005	50.04.0512	1N5818	1N5818		Mot
I-0001	50.06.0244	74LS244	SN74LS244N		AMI,MM,Mot,TT
I-0002	50.06.0174	74ALS174N	SN74ALS174N		Sign,TT
I-0003	50.06.0086	74ALS 86N	SN74ALS 86N		Sign,TT
I-0004	50.06.0006	74ALS 01N	SN74ALS 01N		Sign,TT
I-0005	50.05.0203	SN75463PS	N75463JG, SN5463JG, D53613N		NS,TT
I-0006	50.05.0203	SN75463PS	N75463JG, SN5463JG, D53613N		NS,TT
I-0007	50.05.0203	SN75463PS	N75463JG, SN5463JG, D53613N		NS,TT
I-0008	50.05.0203	SN75463PS	N75463JG, SN5463JG, D53613N		NS,TT
I-0009	50.06.0374	DM74LS374	SN74LS374N		NS,TT
I-0010	50.06.0244	74LS244	SN74LS244N		AMI,MM,Mot,TT
I-0011	50.06.0193	74ALS193N	SN74ALS193N		Sign,TT
I-0012	50.06.0193	74ALS193N	SN74ALS193N		Sign,TT
I-0013	50.06.0193	74ALS193N	SN74ALS193N		Sign,TT
I-0014	50.06.0193	74ALS193N	SN74ALS193N		Sign,TT
I-0015	50.05.0203	SN75463PS	N75463JG, SN5463JG, D53613N		NS,TT

S T U D E R (00) 83/08/01 PB TAPE DECK CONTROLLER 1.810.750-81 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
I-0001	50.05.0203	SN75463PS	N75463JG, SN5463JG, D53613N		NS,TT
I-0002	50.06.0074	74ALS 74N	SN74ALS 74N		Sign,TT
I-0003	50.06.0123	SN74LS123N	SN74LS123N		TT
I-0004	50.05.0203	SN75463PS	N75463JG, SN5463JG, D53613N		NS,TT
J5-0001			See note 1		
J5-0002			See note 1		
J5-0003			See note 1		
Q-0001	50.03.0351	BC327-25			ITT+NEC+Ph+Sig+TT
Q-0002	50.03.0351	BC327-25			ITT+NEC+Ph+Sig+TT
Q-0003	50.03.0351	BC327-25			ITT+NEC+Ph+Sig+TT
R-0001	57.11.4332	3.3 kOhm			
R-0002	57.11.4332	3.3 kOhm			
R-0003	57.11.4104	100 kOhm			
R-0004	57.11.4222	2.2 kOhm			
R-0005	57.11.4222	2.2 kOhm			
R-0006	57.11.4222	2.2 kOhm			
R-0007	57.11.4222	2.2 kOhm			
R-0008	57.11.4222	2.2 kOhm			
R-0009	57.11.4222	2.2 kOhm			
R-0010	57.11.4104	100 kOhm			
R-0011	57.11.4102	1 kOhm			
R-0012	57.11.4102	1 kOhm			
R-0013	57.11.4101	100 Ohm			
R-0014	57.11.4101	100 Ohm			
R-0015	57.11.4101	100 Ohm			
R-0016	57.11.4101	100 Ohm			
R2-0001	1.010.014.57		Network 8 x 10 kOhm		
R2-0002	1.010.014.57		Network 8 x 10 kOhm		
R2-0003	1.010.014.57		Network 8 x 10 kOhm		
R2-0004	1.010.014.57		Network 8 x 10 kOhm		

S T U D E R (00) 83/08/01 PB TAPE DECK CONTROLLER 1.810.750-81 PAGE 2

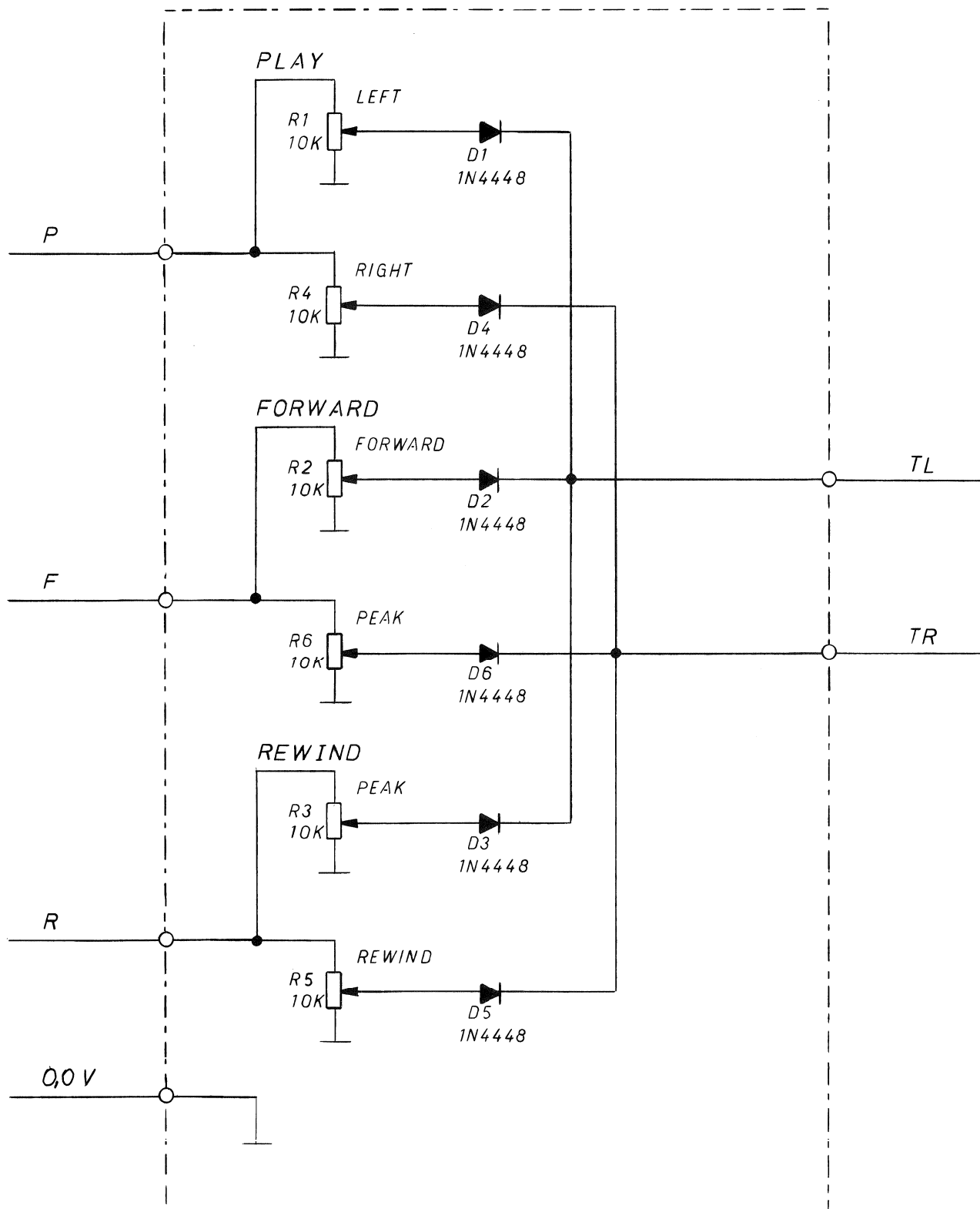
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(01)	R2/08/10			Improved reliability of C 9 (higher noise voltage)	
(02)	R3/03/03			prolongation of reset time.	
Note 1				Contact pins: Studer 54.01.0020x Berg 75 160-102-30 Bridge: Studer 54.01.0021x Philips 2422 024 88003	
				Co-Ceramics: El-Electrolytic, Sd-Solid aluminium	
				MANUFACTURER: AMI=American Microsystems Inc., ITT=International, MM=Monolithic Memories Inc., Mot=Motorola, NEC=Nippon Electric Corp., NS=National Semiconductors, Ph=Philips, Sig=Signetics, TT=Talukhann, TI=Texas Instruments	

DRIG 82/03/10 (01) 82/05/10 (02) 83/03/03  
S T U D E R (02) 83/03/03 PB TAPE DECK CONTROLLER 1.810.750-00 PAGE 3

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1				Contact pins: Studer 54.01.0020 Philips 2422 025 89303 Berg 75 160-102-30	
				Bridge: Studer 54.01.0021 Philips 2422 024 88003 Berg 75 160-102-30	
				Co-Ceramics: El-Electrolytic, Sd-Solid aluminium	
				MANUFACTURER: AMI=American Microsystems Inc., ITT=International, MM=Monolithic Memories Inc., Mot=Motorola, NEC=Nippon Electric Corp., NS=National Semiconductors, Ph=Philips, Sig=Signetics, TT=Talukhann, TI=Texas Instruments	

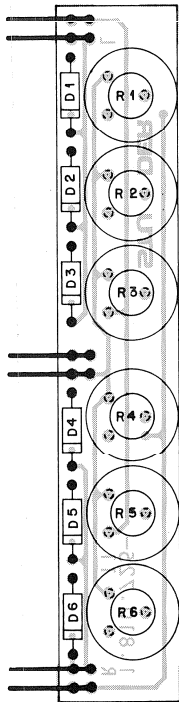
DRIG 83/08/10  
S T U D E R (00) 83/08/01 PB TAPE DECK CONTROLLER 1.810.750-81 PAGE 3

## TAPE TENSION ADJUST PCB 1.810.725-00



SOLDERED ONTO TAPE DECK CONTROLLER PCB 1.810.750-00

TAPE TENSION ADJUST PCB 1.810.725-00

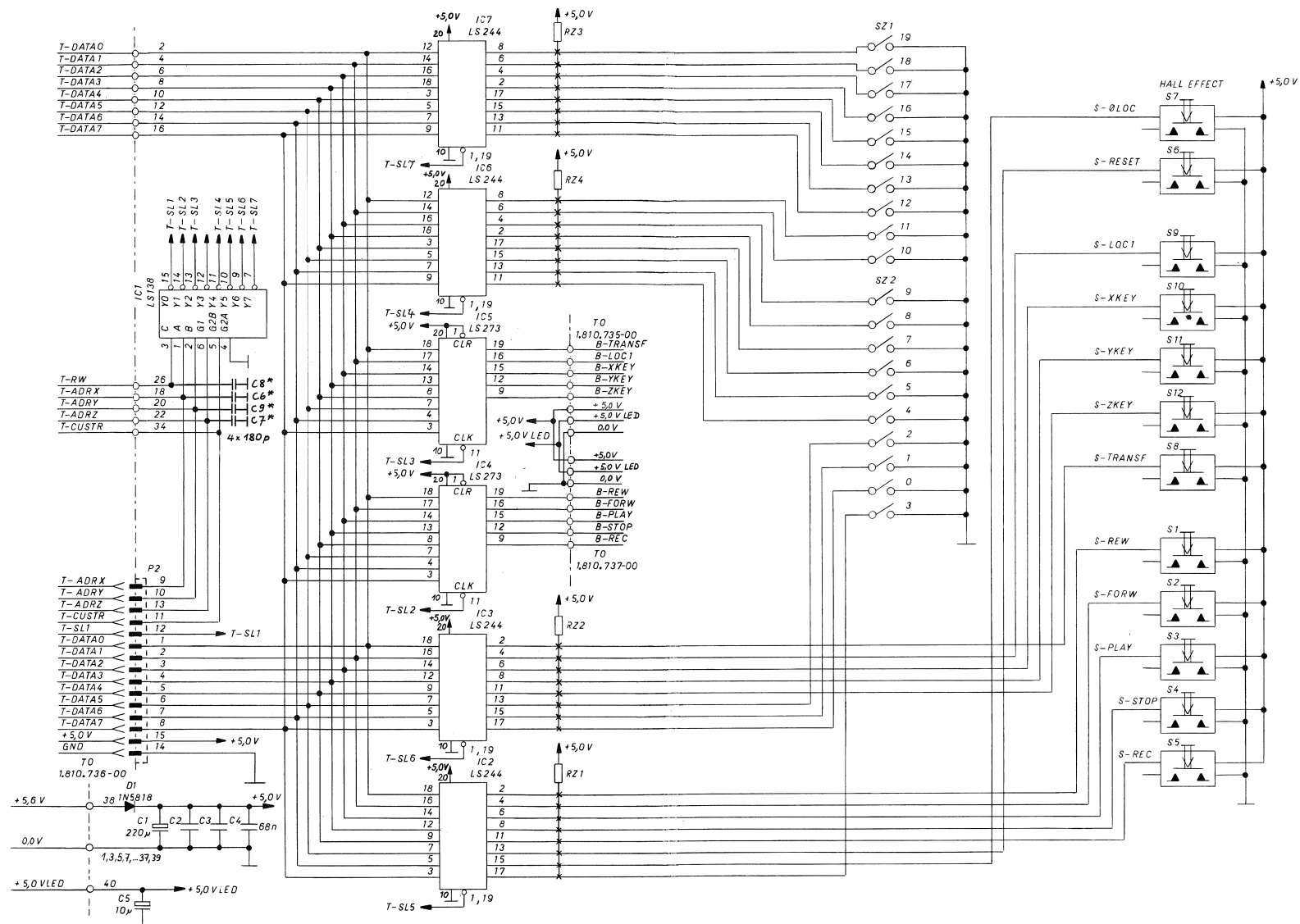


SOLDERED ONTO TAPE DECK CONTROLLER PCB 1.810.750-00

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	D..0001	50.04.0125	1N4448		ITT,Ph,Ses,TI
	D..0002	50.04.0125	1N4448		ITT,Ph,Ses,TI
	D..0003	50.04.0125	1N4448		ITT,Ph,Ses,TI
	D..0004	50.04.0125	1N4448		ITT,Ph,Ses,TI
	D..0005	50.04.0125	1N4448		ITT,Ph,Ses,TI
	D..0006	50.04.0125	1N4448		ITT,Ph,Ses,TI
	R..0001	58.01.5103	10 kOhm	Pot., lin., Allen Bradley Nr. VR 103 M	
	R..0002	58.01.5103	10 kOhm	Pot., lin., Allen Bradley Nr. VR 103 M	
	R..0003	58.01.5103	10 kOhm	Pot., lin., Allen Bradley Nr. VR 103 M	
	R..0004	58.01.5103	10 kOhm	Pot., lin., Allen Bradley Nr. VR 103 M	
	R..0005	58.01.5103	10 kOhm	Pot., lin., Allen Bradley Nr. VR 103 M	
	R..0006	58.01.5103	10 kOhm	Pot., lin., Allen Bradley Nr. VR 103 M	
	P..0001	54.01.0222	6 cont.	AMP Nr. 163.740-4	



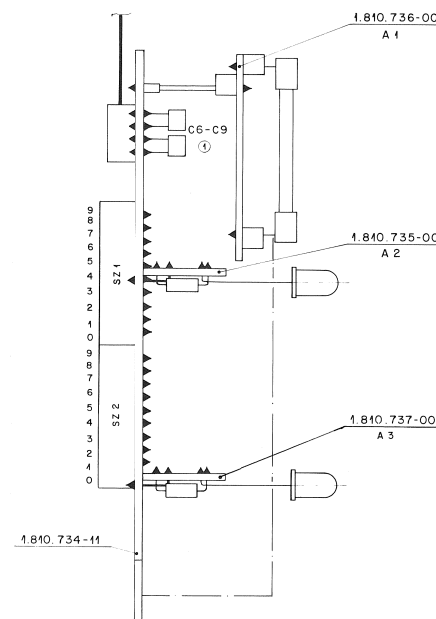
## COMMAND UNIT PCB 1.810.734-00 GR21 (LCD) "ESE"



TO BE USED ONLY TOGETHER WITH MPU A810 PCB 1.810.752-00

★ HAS BEEN MODIFIED

LED DRIVER PCB (BASIC FUNCTIONS) 1.810.737-00  
LED DRIVER PCB (EXTENDED FUNCTIONS) 1.810.735-00 SEE SECTION 5/61



IND.	POS. NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
S-00005	59-03-0260	SWITCH	Sigma Nr.	MCFH 2 T	
S-00006	59-03-0260	SWITCH	Sigma Nr.	MCFH 2 T	
S-00007	59-03-0260	SWITCH	Sigma Nr.	MCFH 2 T	
S-00008	59-03-0260	SWITCH	Sigma Nr.	MCFH 2 T	
S-00009	59-03-0260	SWITCH	Sigma Nr.	MCFH 2 T	
S-00010	59-03-0260	SWITCH	Sigma Nr.	MCFH 2 T	
S-00011	59-03-0260	SWITCH	Sigma Nr.	MCFH 2 T	
S-00012	59-03-0260	SWITCH	Sigma Nr.	MCFH 2 T	
SZ-00001	59-01-0170	SWITCH	Dual in 1 line	SAE Nr. 101-0692	
SZ-00002	59-01-0170	SWITCH	Dual in 1 line	SAE Nr. 101-0692	

[01] 83/03/02 improved suppression of interfeerency on address lines.

Note 1 - Yamachi Nr. FAS-40-17, Burndy Nr. FRS-40 8D-7P  
Conrection cable Studer Nr. 1.810.747.00

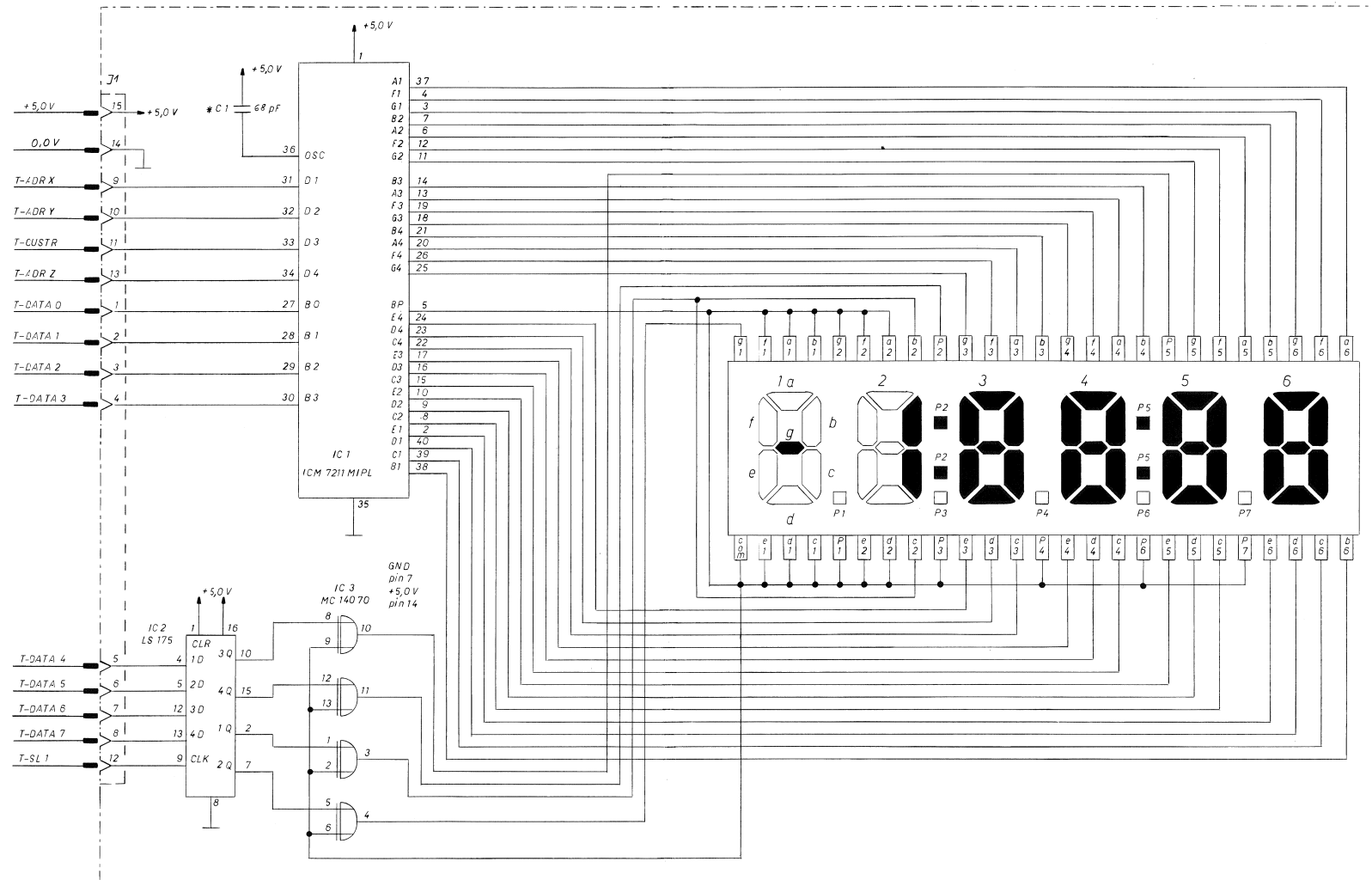
Ce=Ceramic, El=Electrolytic, Sal=Solid aluminium,

MANUFACTURER: AMI=American Microsystem Inc.,  
MM=Monolithic Memories Inc., Mot=Motorola, Ph=Philips,  
Sig=Signetics

ORIG 81/10/19 (01) 83/03/02

S T U D E R 83/03/02 PB COMMAND UNIT AB10 1.810.734.00 PAGE 2

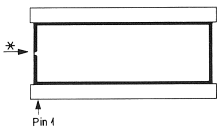
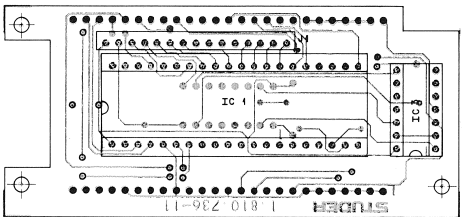
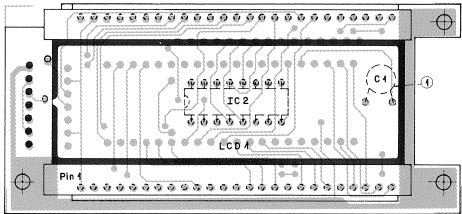
## DISPLAY PCB 1.810.736-00 GR21 EL2 (LCD) "ESE"



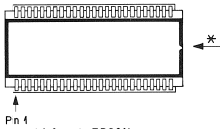
PLUGGED ONTO COMMAND UNIT PCB 1.810.734-00  
OR COMMAND UNIT PCB 1.810.767-00

★ HAS BEEN MODIFIED

DISPLAY PCB 1.810.736-00 GR21 EL2 (LCD) "ESE"



Lieferant BBC  
(auch mit freien  
Kontakten möglich)



Lieferant EPSON

\* Kerbe beachten

IND.	POS.ND.	PART ND.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(00)	C++0001	59-02-0100	10 pF	20%, Ce	
(01)	C++0001	59-09-0017	0.01 pF	20%, Ce	
	IC+0001	90-07-0005	C02210SE	IC#7211W1PL	Is+RCA
	IC+0002	90-06-0175	N74LS175N	SN74LS175N	Si+TI
	IC+0003	90-07-0070	MC14070BCP	4070BPC	Pc+Rot
	J++0001			See note 2	
	LC00001	73-01-0123		See note 1	

(01) 83/01/20 improved LCD display contrast by reducing the ac voltage frequency ( C 1 68 pF instead of 10 pF )

Note 1 - Liquid Crystal Display  
Videler (BSC) Nr. SC 703060-301 15/12  
Yoshida Nr. SC 2019A-32 P1  
Epson Nr. LC-01 7918 A2

Note 2 - 2 pieces Studer Nr. 93-05-0212, or  
2 pieces Precision Nr. P-115 R 01

Ce=Ceramic

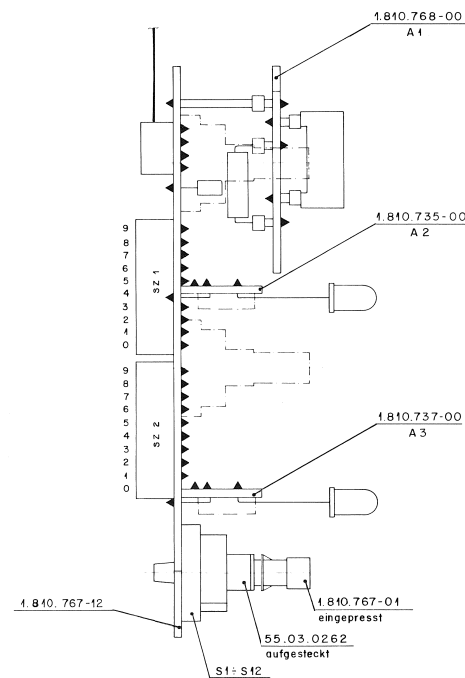
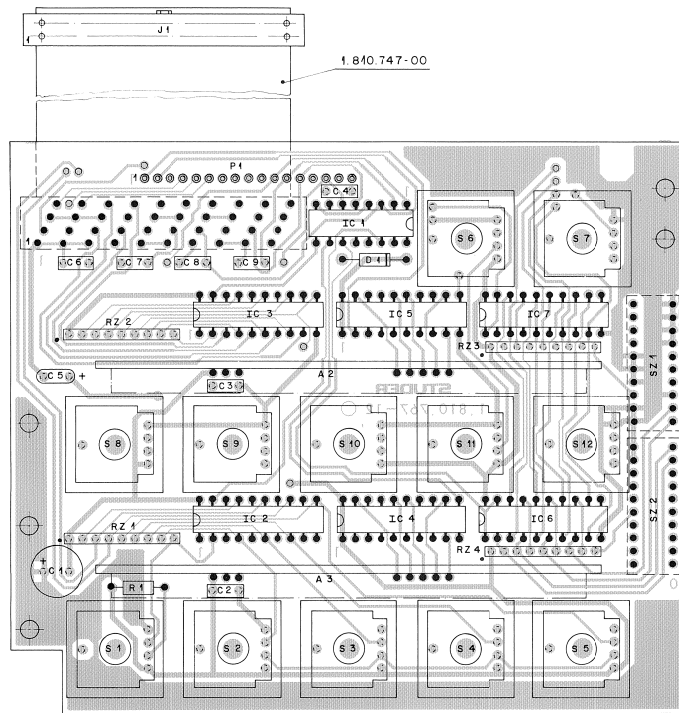
MANUFACTURER: Fc=Fairchild, Is=Intersil, Mo=Motorola  
RCA=Radio Corporation of America, Sig=Signetics,  
TI=Texas Instruments.

DR16 81/10/19 (01) 83/01/20

S T U D E R 83/01/20 PHM DISPLAY UNIT A810 1.810.736-00 PAGE 1

TO BE USED ONLY TOGETHER WITH MP UNIT A810 PCB 1.820.780-00

## COMMAND UNIT PCB 1.810.767-00 GR21 (LED/LCD) "ESE"



INT.	POS+NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
A..000	1.810.768-00			LED-DISPLAY UNIT A810	St
A..002	1.810.735-00			LED DRIVER (ext. fct.) A810	St
A..003	1.810.737-00			LED DRIVER (basic fct.) A810	St
C..000	59.22.2221		220 uF	-10%, 6.3V, EI	
C..002	59.99.0205		0.8 nF	Co	
C..003	59.99.0205		0.8 nF	Co	
C..004	59.99.0205		0.8 nF	Co	
C..005	59.26.2100		10 uF	-20%, 16V, Sol	Ph
C..006	59.18.2181		180 pF	10%, Co	
C..007	59.18.2181		180 pF	10%, Co	
C..008	59.18.2181		180 pF	10%, Co	
C..009	59.18.2181		180 pF	10%, Co	
D..000	50.04.0512		105818	155819	Not
IC.000	50.06.0138	SN74LS138N	DM74LS138N		SGTI
IC.002	50.06.0244	74LS244	SN74LS244N		Mil+Mot+TI
IC.003	50.06.0244	74LS244	SN74LS244N		Mil+Mot+TI
IC.004	50.06.0271	SN74LS273N	SN74LS273N, AP74LS273N		AMD Sign+TI
IC.005	50.06.0271	SN74LS273N	SN74LS273N, AP74LS273N		AMD Sign+TI
IC.006	50.06.0244	74LS244	SN74LS244N		Mil+Mot+TI
IC.007	50.06.0244	74LS244	SN74LS244N		Mil+Mot+TI
J..000	54.14.5023		40 cont.	See note 1	
P..000				17 pieces Studer Nr. 1.010.019.54	
R..000	57.11.4331		330 Ohm	5%	
RZ.000	1.010.014.57			Network 8 x 10 Kohm 10%	
RZ.002	1.010.014.57			Network 8 x 10 Kohm 10%	
RZ.003	1.010.014.57			Network 8 x 10 Kohm 10%	
RZ.004	1.010.014.57			Network 8 x 10 Kohm 10%	
S..000	55.03.0261			Momentary switch, Rafi Nr. 3-13001-110	
S..002	55.03.0261			Momentary switch, Rafi Nr. 3-13001-110	

INT.	POS+NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
S..000	55.03.0261			Momentary switch, Rafi Nr. 3-13001-110	
S..004	55.03.0261			Momentary switch, Rafi Nr. 3-13001-110	
S..005	55.03.0261			Momentary switch, Rafi Nr. 3-13001-110	
S..006	55.03.0261			Momentary switch, Rafi Nr. 3-13001-110	
S..007	55.03.0261			Momentary switch, Rafi Nr. 3-13001-110	
S..008	55.03.0261			Momentary switch, Rafi Nr. 3-13001-110	
S..009	55.03.0261			Momentary switch, Rafi Nr. 3-13001-110	
S..010	55.03.0261			Momentary switch, Rafi Nr. 3-13001-110	
S..011	55.03.0261			Momentary switch, Rafi Nr. 3-13001-110	
S..012	55.03.0261			Momentary switch, Rafi Nr. 3-13001-110	
SZ.000	55.01.0170		Switch	Dual in line, AMP Nr. 435 166-7	
SZ.002	55.01.0170		Switch	Dual in line, AMP Nr. 435 166-7	

Note 1 - Yamichi Nr. F45-40-174 Burndy Nr. F45-40 00-TP  
Connection cable Studer Nr. 1.810.747-00

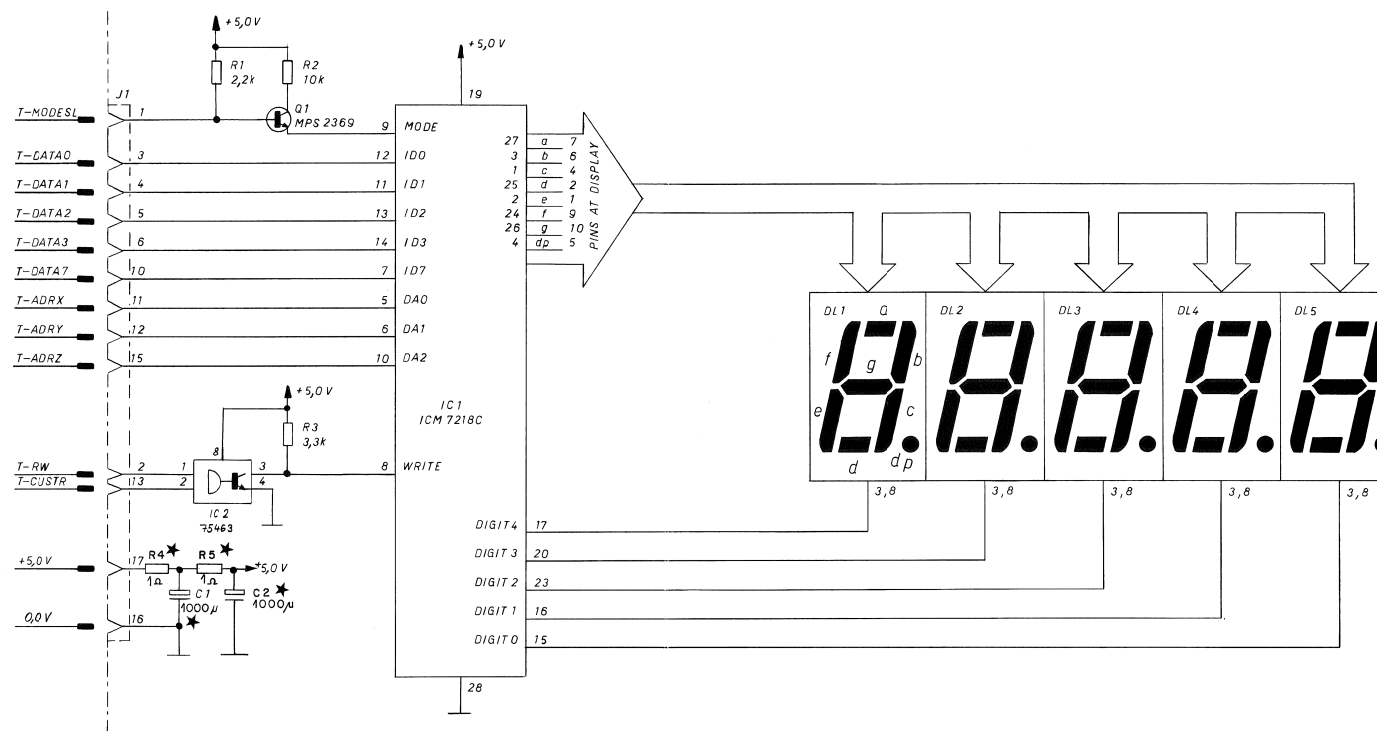
Co=Ceramic, El=Electrolytic, Sol=Solid aluminum

MANUFACTURER: AMD=Advanced Micro Devices, PH=Philips, SG=Signetics, ST=Studer  
M=Motorola, TI=Texas Instrument, S=Signetics, ST=Studer

DRG 83/04/22

STUDER 83/04/22 P1 COMMAND UNIT A810 1.810.767-00 PAGE 2

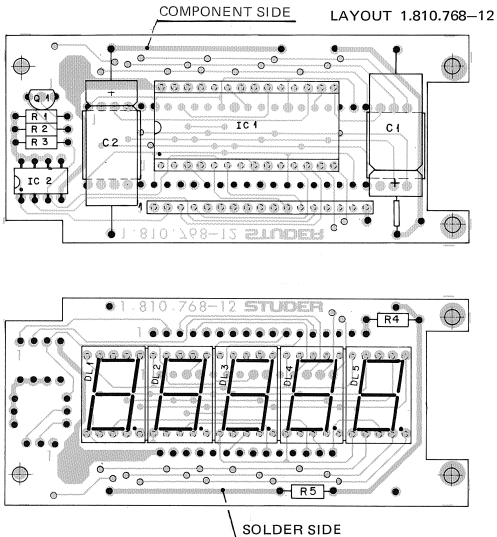
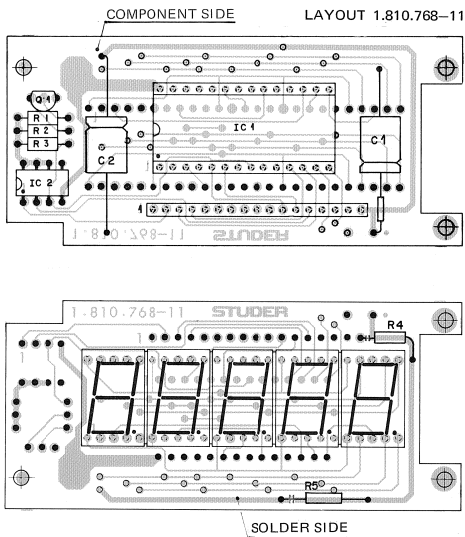
## DISPLAY PCB 1.810.768-00 (LED) GR21 EL2 "ESE"



★HAS BEEN MODIFIED

TO BE USED ONLY TOGETHER WITH AND  
PLUGGED ONTO COMMAND UNIT PCB 1.810.767-00 (LED)

DISPLAY PCB 1.810.768-00 (LED) GR21 EL2 "ESE"



IND.	POS. NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(00)	C.....1	59-26-0680	68 uF	+20% 6.3V Sol	
(01)	C.....1	59-25-1102	1000 uF	+20% 6.3V El	
(01)	C.....2	59-25-1102	1000 uF	+20% 6.3V El	
DL.....1	73-01-0124	MAN6660	LED orange		Ms
DL.....2	73-01-0124	MAN6660	LED orange		Ms
DL.....3	73-01-0124	MAN6660	LED orange		Ms
DL.....4	73-01-0124	MAN6660	LED orange		Ms
DL.....5	73-01-0124	MAN6660	LED orange		Ms
IC.....1	50-07-0001	ICM218C1J1	Driver		Is
IC.....2	50-05-0203	SN75463	Driver		TI
J.....1	53-03-0216		Connector 17 pins		
Q.....1	50-03-0508	MP52369	85X 20		Not Ph
R.....1	57-11-4222	2.2 kOhm	2% 0.250W	MF	
R.....2	57-11-4103	10 kOhm			
R.....3	57-11-4332	3.3 kOhm			
(01)	R.....4	57-11-4109	1 Ohm		
(01)	R.....5	57-11-4109	1 Ohm		

(01) 83-11-11 Improved multiplex noise suppression.

El=Electrolytic, MF=Metal Film

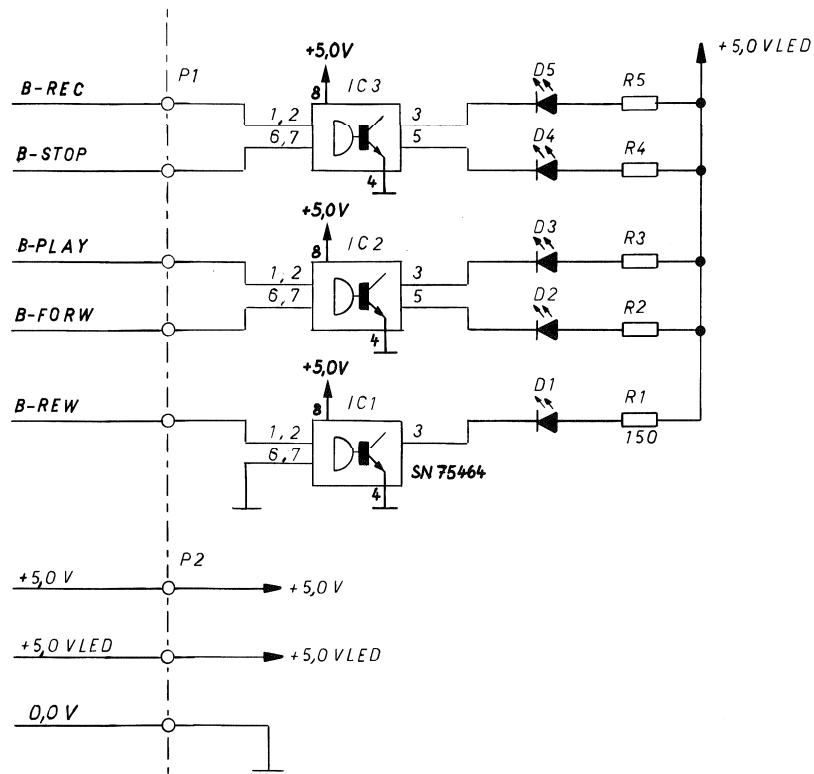
Manufacturer: Is=Intersil, TI=Texas Instruments, Mot=Motorola,  
Ns=National, Ph=Philips

ORIG 82/11/02 (01) 83/11/11

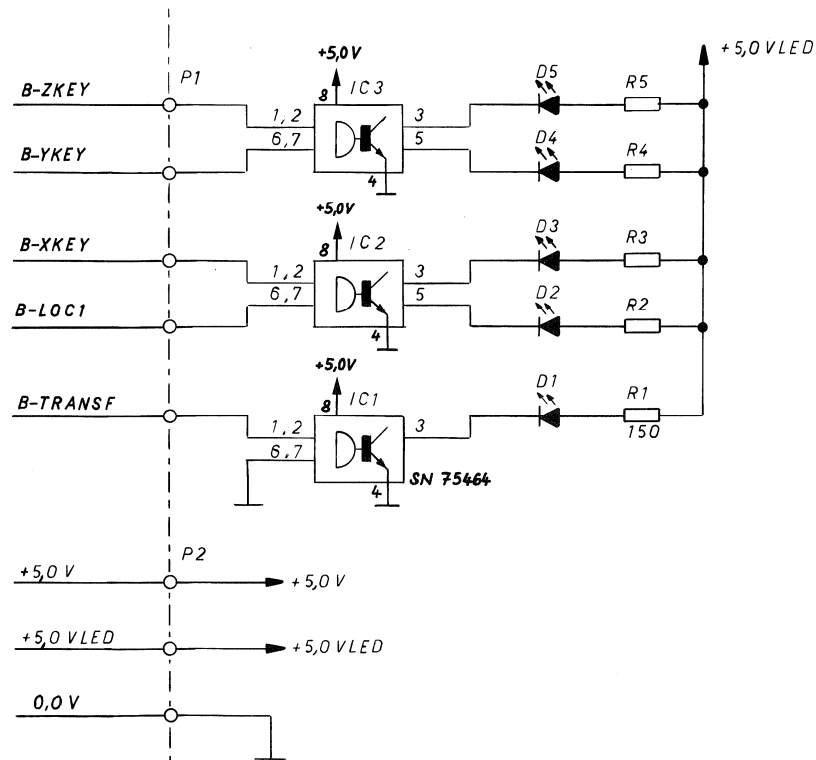
S T U D E R (01) 83/11/11 PB LED-Display Board 1-810.768-00 PAGE 1



LED DRIVER PCB BASIC FUNCTIONS 1.810.737-00  
LED DRIVER PCB EXTENDED FUNCTIONS 1.810.735-00



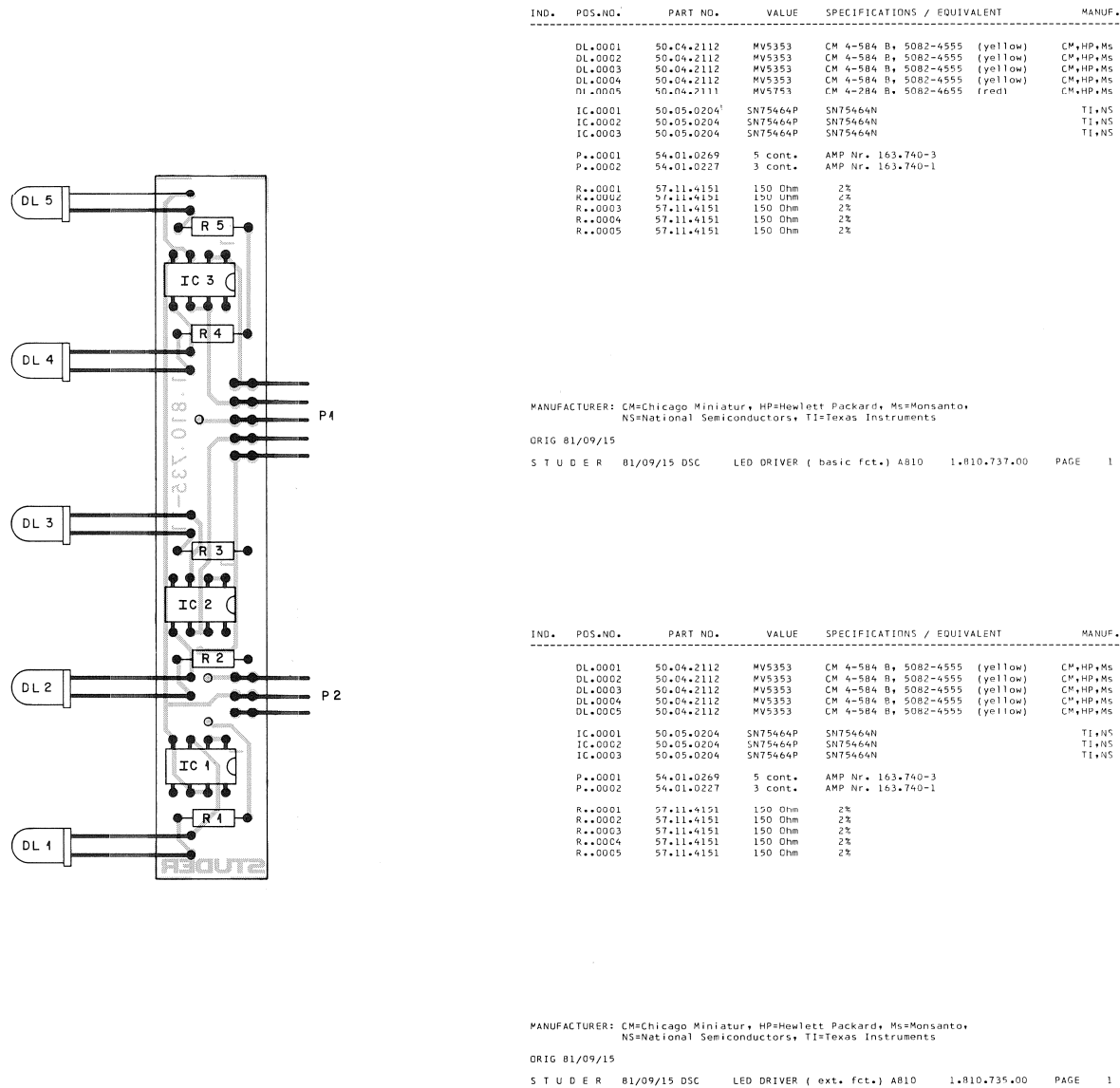
SOLDERED ONTO COMMAND UNIT PCB(LCD:1.810.734-00 OR LED:1.810.767-00)



SOLDERED ONTO COMMAND UNIT PCB(LCD:1.810.734-00 OR LED:1.810.767-00)

LED DRIVER PCB BASIC FUNCTIONS 1.810.737-00

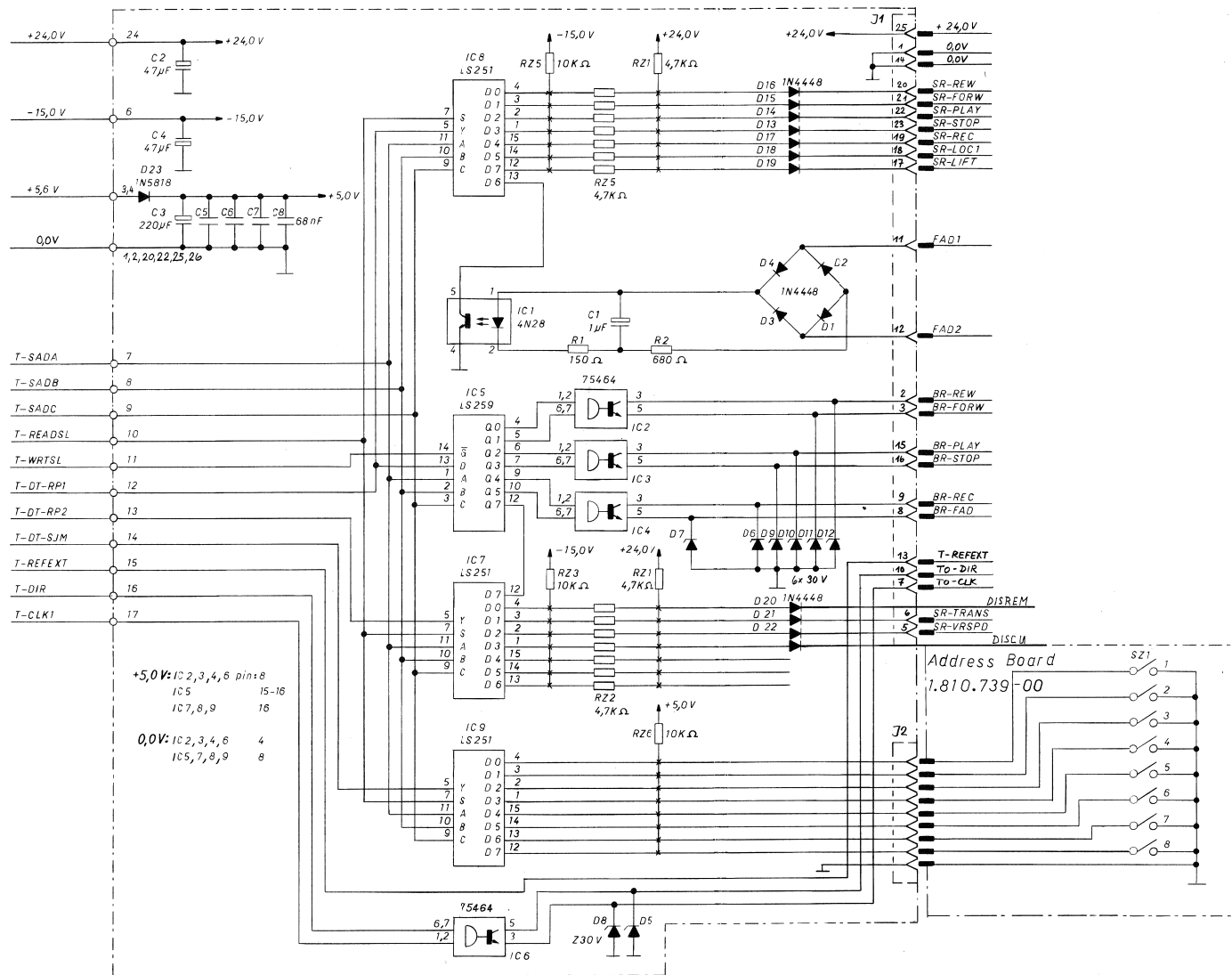
LED DRIVER PCB EXTENDED FUNCTIONS 1.810.735-00



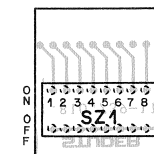
SOLDERED ONTO COMMAND UNIT PCB(LCD:1.810.734-00 OR LED:1.810.767-00)

PARALLEL REMOTE CONTROLLER PCB 1.810.738-00 GR23

ADDRESS PCB 1.810.739-00



ADDRESS PCB 1.810.739-00



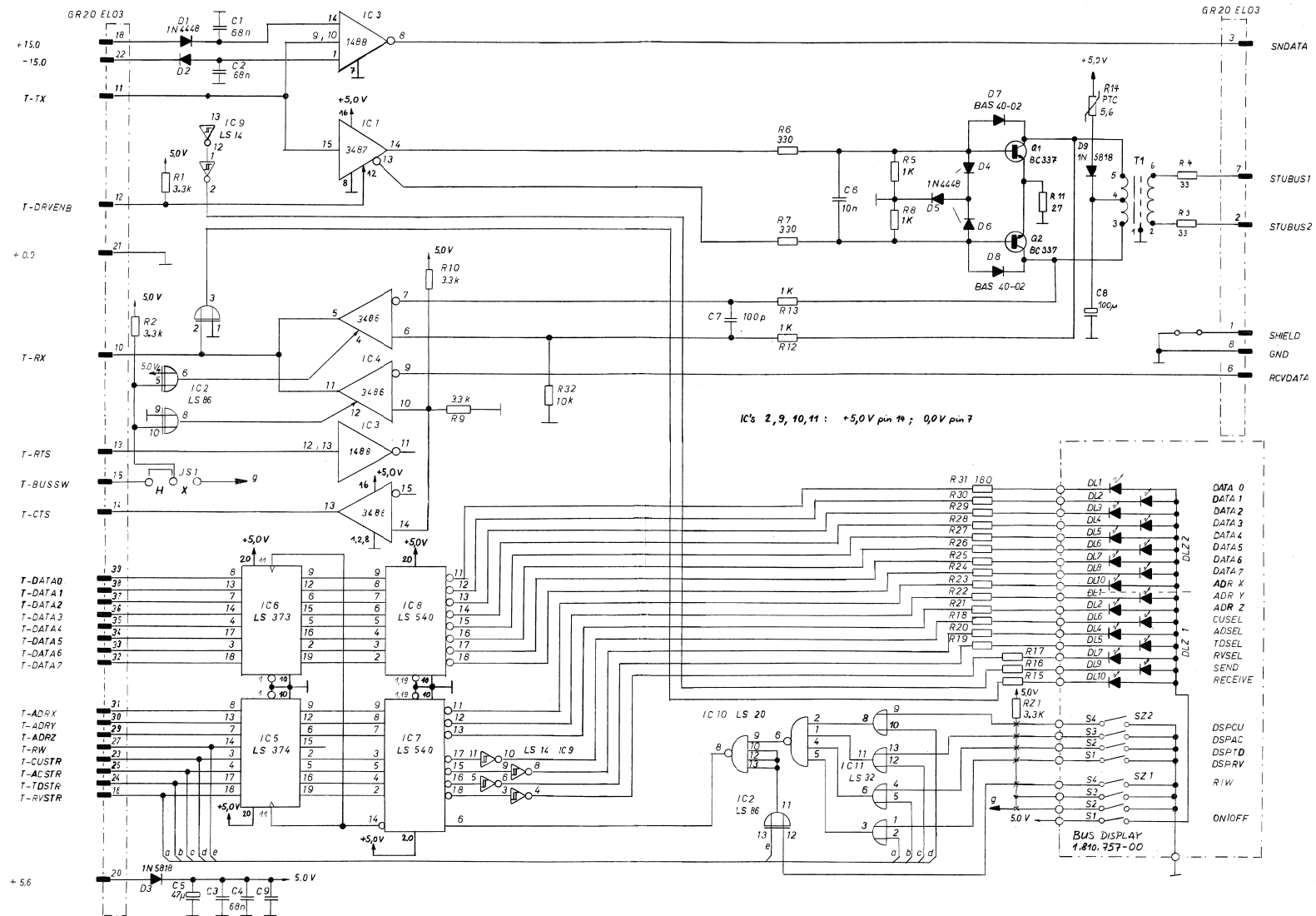
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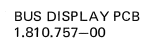
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SERIAL REMOTE CONTROLLER PCB 1.810.751-00 GR20 EL3, BUS DISPLAY PCB 1.810.757-00



**BUS DISPLAY PCB 1.810.757-00**



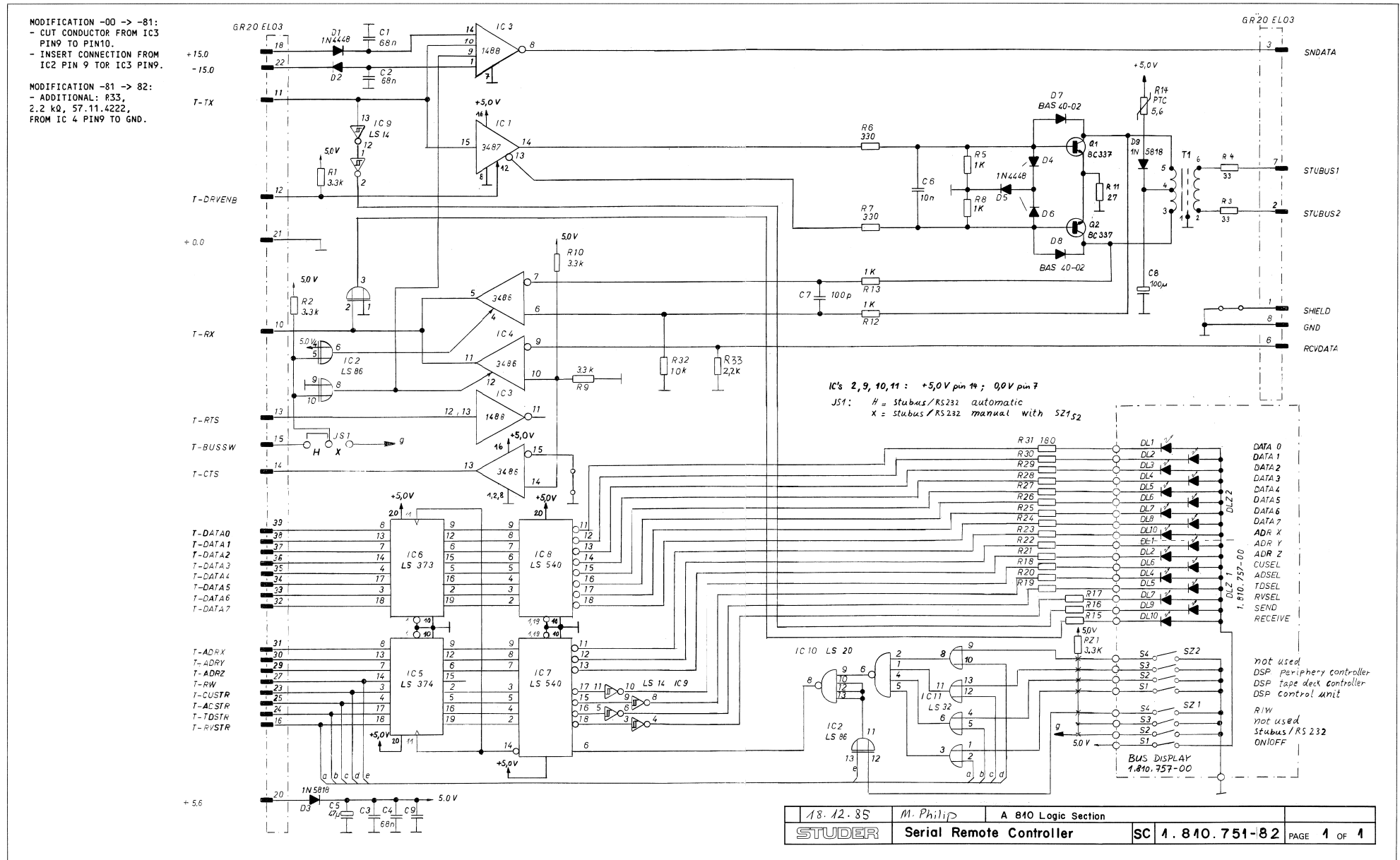
**BUS DISPLAY PCB 1.810.757-00 SOLDERED ONTO SERIAL  
REMOTE CONTROLLER PCB 1.810.751-00**

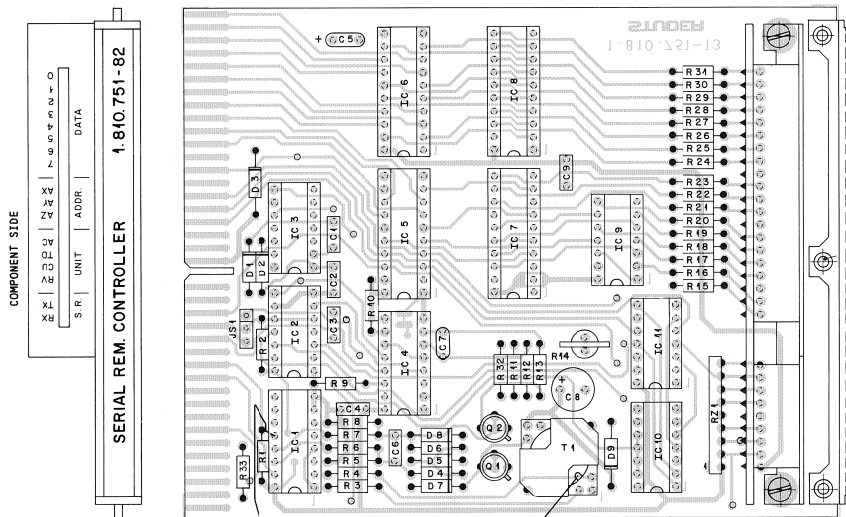
IND.	PDS NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	DL2-1	50-04-2134	MV57164F	MV5716AG	G1
	DL2-2	50-04-2134	MV57164F	MV5716AG	G1
	SZ-1	35-01-0104		Switch Array, AMP D-161 391-4, SAT 100A-B92	
	SZ-2	35-02-0104		Switch Array, AMP D-161 391-4, SAT 100A-B92	
	P-1A-1	54-01-0261	20 CONT.	AMP 1-163,740-9	
	P-1A-2	54-01-0220	5 CONT.	AMP 1-163,740-7	

Ce=Ceramic, El=Electrolytic, Sal=Solid aluminium, PETP=Polyester

STUDER 02/06/23 DSC BUS DISPLAY 1.810.757.00 PAGE 1

SERIAL REMOTE CONTROLLER 1.810.751-81/-82 GR20 EL3  
- BUS DISPLAY PCB 1.810.757-00



SERIAL REMOTE CONTROLLER 1.810.751-81/-82 GR20 EL3  
(BUS DISPLAY PCB 1.810.757-00: REFER TO SECTION 5/70)BRIDGE ON SOLDER SIDE (NOT  
USED FOR 1.810.751-13 (1))YELLOW  
DOT

IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
		1.810.757-00		Bus display board		[00]	R.....15	57-11-1800	180 Ohm	2%	
	C.....1	59-99-8205	68 nF	-28%	Ce	[01]	R.....25	57-11-1811	180 Ohm	2%	
	C.....2	59-99-8205	68 nF	-28%	Ce	[01]	R.....16	57-11-1800	180 Ohm	2%	
	C.....3	59-99-8205	68 nF	-28%	Ce	[01]	R.....26	57-11-1811	180 Ohm	2%	
	C.....4	59-99-8205	68 nF	-28%	Ce	[01]	R.....17	57-11-1800	180 Ohm	2%	
	C.....5	59-26-4410	47 uF	20%, 6.3 V, Sat		[01]	R.....27	57-11-1811	180 Ohm	2%	
	C.....6	59-06-8103	10 nF	18%	PETP	[01]	R.....18	57-11-1800	180 Ohm	2%	
[00]	R.....7	59-26-101	100 pF	2%	Ce	[01]	R.....28	57-11-1811	180 Ohm	2%	
[01]	R.....8	59-34-1101	100 pF	2%	Ce	[01]	R.....29	57-11-1811	180 Ohm	2%	
	C.....9	59-22-1101	100 nF	15%, 10 V, El		[01]	R.....30	57-11-1800	180 Ohm	2%	
	C.....0	59-99-8205	68 nF	-28%	Ce	[01]	R.....19	57-11-1800	180 Ohm	2%	
	D.....1	50-04-0125	INA448		ITT+Phy.Sens+TI	[01]	R.....20	57-11-1811	180 Ohm	2%	
	D.....2	50-04-0125	INA448		ITT+Phy.Sens+TI	[01]	R.....11	57-11-1800	180 Ohm	2%	
	D.....3	50-04-0512	IN5818		IN5819	[01]	R.....12	57-11-1811	180 Ohm	2%	
	D.....4	50-04-0125	INA448		ITT+Phy.Sens+TI	[01]	R.....13	57-11-1800	180 Ohm	2%	
	D.....5	50-04-0125	INA448		ITT+Phy.Sens+TI	[01]	R.....14	57-11-1811	180 Ohm	2%	
	D.....6	50-04-0125	INA448		ITT+Phy.Sens+TI	[01]	R.....15	57-11-1800	180 Ohm	2%	
	D.....7	50-04-0127	BA785	BA140-02	Phy.Sig						
	D.....8	50-04-0127	BA785	BA140-02	Phy.Sig						
	D.....9	50-04-0512	IN5818	IN5819	Not						
	I.....1	50-15-0105	MC3487	DS1487	Not+SOS						
	I.....2	50-06-8086	SN74LS 86N	DM74LS 86N, 74LS 86PC	Fc+N5+Sig+TI						
	I.....3	50-15-0106	MC1488		Not						
	I.....4	50-15-0104	MC1488P	DS1488	Not+MS						
	I.....5	50-06-8374	SN74LS374N	SN74LS374N, DM74LS374N	AND+MS+TI						
	I.....6	50-06-8373	SN74LS373N	74LS373N	Not+Sig+TI						
	I.....7	50-06-8540	SN74LS540N	74LS540PC	Fc+Not+TI						
	I.....8	50-06-8540	SN74LS540N	74LS540PC	Fc+Not+TI						
	I.....9	50-06-8016	SN74LS 15N	DM74LS 15N, 74LS 14PC	Fc+N5+Sig+TI						
	I.....10	50-06-8020	SN74LS 20N	DM74LS 20N, 74LS 20PC	Fc+N5+Sig+TI						
	I.....11	50-06-8032	SN74LS 32N	DM74LS 32N, 74LS 32PC	Fc+N5+Sig+TI						
	J5.....1			See note 1							

STUDER (01) 86/04/29 PB SERIAL REMOTE CONTROLLER 1.810.751-82 PAGE 1

STUDER (01) 86/04/29 PB SERIAL REMOTE CONTROLLER 1.810.751-82 PAGE 3

IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	Q.....1	50-03-0434	BFR18		SOS						
	Q.....2	50-03-0434	BFR18		SOS						
	R.....1	57-11-1332	3.3 kOhm	2%							
	R.....2	57-11-1332	3.3 kOhm	2%							
	R.....3	57-11-1330	33 Ohm	2%							
	R.....4	57-11-1330	33 Ohm	2%							
	R.....5	57-11-1302	1 kOhm	2%							
	R.....6	57-11-1331	330 Ohm	2%							
	R.....7	57-11-1331	330 Ohm	2%							
	R.....8	57-11-1302	1 kOhm	2%							
	R.....9	57-11-1332	3.3 kOhm	2%							
	R.....10	57-11-1332	3.3 kOhm	2%							
	R.....11	57-11-1370	27 Ohm	2%							
	R.....12	57-11-1302	1 kOhm	2%							
	R.....13	57-11-1302	1 kOhm	2%							
	R.....14	59-99-8209	5.6 Ohm		PT Resistor, Philips Nr. 2322 662 91005						
[00]	R.....15	57-11-1800	180 Ohm	2%							
[01]	R.....16	57-11-1801	180 Ohm	2%							
[01]	R.....17	57-11-1801	180 Ohm	2%							
[01]	R.....18	57-11-1801	180 Ohm	2%							
[01]	R.....19	57-11-1801	180 Ohm	2%							
[01]	R.....20	57-11-1801	180 Ohm	2%							
[01]	R.....21	57-11-1801	180 Ohm	2%							
[01]	R.....22	57-11-1801	180 Ohm	2%							
[01]	R.....23	57-11-1801	180 Ohm	2%							
[01]	R.....24	57-11-1801	180 Ohm	2%							
[01]	R.....25	57-11-1801	180 Ohm	2%							

STUDER (01) 86/04/29 PB SERIAL REMOTE CONTROLLER 1.810.751-82 PAGE 2

STUDER (01) 86/04/29 PB SERIAL REMOTE CONTROLLER 1.810.751-82 PAGE 4

Note 1 - Contact pin:  
Studer Nr. 94-11-0126  
Berg Nr. 75219-310-36  
Metroplast Nr. SL 1/25/36 Z  
Comet! Nr. BA 0356 L 36 440  
Studer Nr. 94-01-0021  
Comet! Nr. Z 030 946-8

Note 2 - Network:  
8 x 3.3 kOhm 5%  
Sickward Nr. C09 x 3.3 k J  
Ineltra Nr. R88 3.3 k 5%

Ce=Ceramic, El=Electrolytic, Sol=Solid aluminum, PETP=Polyester  
MANUFACTURER: AMD=Advanced Micro Devices, Fc=Fairchild,  
TI=Intermetall, Mos=Motorola,  
N=National Semiconductor, Ph=Philips, Soc=Soucon,  
SOS=SOS-Ates, Sig=Siemens, Sig=Signetics, St=Studer,  
TI=Texas Instruments



Periphery Controller  
1.810.756-00

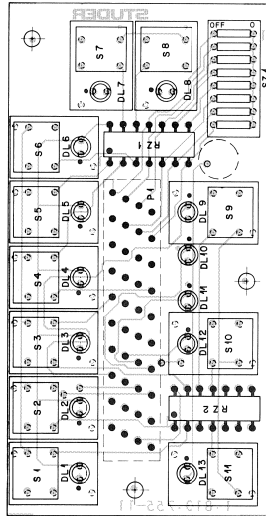
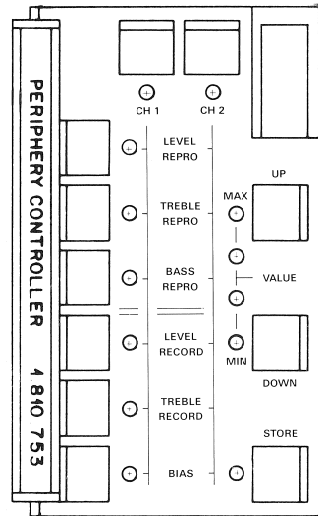
Key Board 1.810.755-00

VCC: IC1, pin: 13, 15, 17, 20  
IC2, 20  
IC3, 16  
IC4, 16  
IC5, 16  
IC7, 15-16  
IC8, 15-16

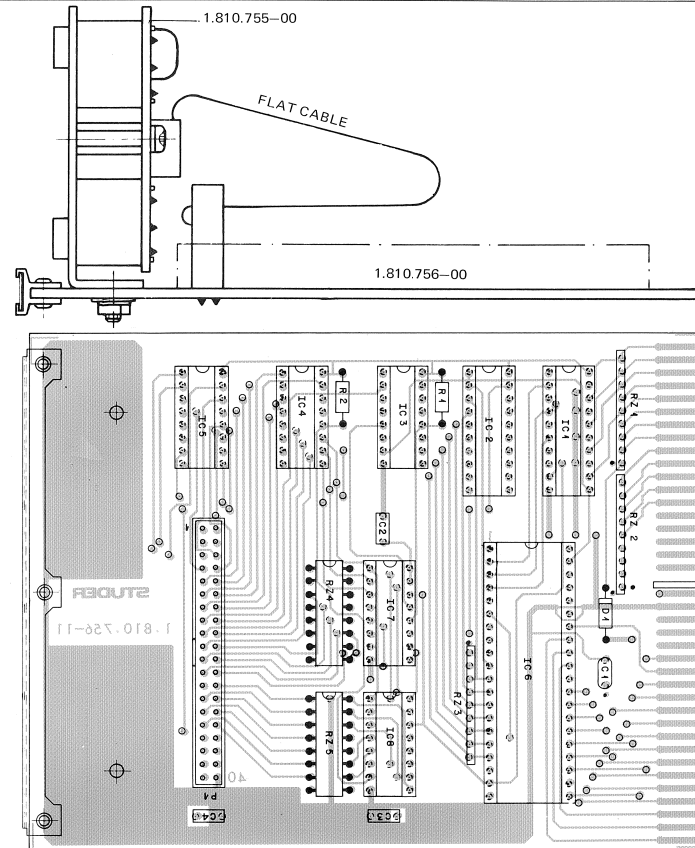
Gnd: IC1, 1, 10, 19  
IC2, 10  
IC3, 6  
IC4, 8  
IC5, 8  
IC7, 6  
IC8, 6

PERIPHERY CONTROLLER UNIT 1.810.753-00 GR20 EL4 "ESE"

PERIPHERY CONTROLLER PCB 1.810.756-00, AUDIO ADJUSTMENT KEYBOARD PCB 1.810.755-00



1.810.743-00

DL 4 bus ES  
Kathode = \*PERIPHERY CONTROLLER  
1.810.756

AUDIO ADJUSTMENT KEYBOARD PCB 1.810.755 FIXED AND PLUGGED (VIA FLAT CABLE CONNECTOR) INTO PERIPHERY CONTROLLER PCB 1.810.756-00

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
S+0001	55.15.0501	Switch	Series DIGITAST	Schadow/ITT	
S+0002	55.15.0501	Switch	Series DIGITAST	Schadow/ITT	
S+0003	55.15.0501	Switch	Series DIGITAST	Schadow/ITT	
S+0004	55.15.0501	Switch	Series DIGITAST	Schadow/ITT	
S+0005	55.15.0501	Switch	Series DIGITAST	Schadow/ITT	
S+0006	55.15.0501	Switch	Series DIGITAST	Schadow/ITT	
S+0007	55.15.0501	Switch	Series DIGITAST	Schadow/ITT	
S+0008	55.15.0501	Switch	Series DIGITAST	Schadow/ITT	
S+0009	55.15.0501	Switch	Series DIGITAST	Schadow/ITT	
S+0010	55.15.0501	Switch	Series DIGITAST	Schadow/ITT	
S+0011	55.15.0501	Switch	Series DIGITAST	Schadow/ITT	
DL0001	50.04.2130	COV 13-5	Q 62703-Q 575	Sie	
DL0002	50.04.2130	COV 13-5	Q 62703-Q 575	Sie	
DL0003	50.04.2130	COV 13-5	Q 62703-Q 575	Sie	
DL0004	50.04.2130	COV 13-5	Q 62703-Q 575	Sie	
DL0005	50.04.2130	COV 13-5	Q 62703-Q 575	Sie	
DL0006	50.04.2130	COV 13-5	Q 62703-Q 575	Sie	
DL0007	50.04.2130	COV 13-5	Q 62703-Q 575	Sie	
DL0008	50.04.2130	COV 13-5	Q 62703-Q 575	Sie	
DL0009	50.04.2130	COV 13-5	Q 62703-Q 575	Sie	
DL0010	50.04.2130	COV 13-5	Q 62703-Q 575	Sie	
DL0011	50.04.2130	COV 13-5	Q 62703-Q 575	Sie	
DL0012	50.04.2130	COV 13-5	Q 62703-Q 575	Sie	
DL0013	50.04.2129	COV 11-5	Q 62703-Q 571	Sie	
J+0001	94.14.0023	40 cont.	See note 1		
R2+0001	57.89.3332	3+5 kOhm	See note 2		
R2+0002	57.89.3332	3+5 kOhm	See note 2		
S2+0001	55.01.0168		See note 3		

STUDER 81/10/14 DSC KEY BOARD 1.810.755-00 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1 - Yamaichi Nr. F55-00-174 Durney Nr. F55-00 80-TP Connection cable Studer Nr. 1.810.743-00					
Note 2 - Network 13 5 3,3 kOhm Beckman Nr. 89-1-R 3,3k Allen Bradley Nr. 34 A 3325 National Nr. R4 13-3,3k4					
Note 3 - Switch array: 10P Nr. 435168-5 JAE Nr. 1208-692					
MANUFACTURER: SionSiemens					

ORIG 81/10/14

STUDER 81/10/14 DSC KEY BOARD 1.810.755-00 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C+0001	59.26.0470	47 uF	-20% 6-3V, Sal	PH	
C+0002	59.99.0205	68 nF	-20% Ce		
C+0003	59.99.0205	68 nF	-20% Ce		
C+0004	59.99.0205	68 nF	-20% Ce		
D+0001	50.04.0512	1N5818	IN5819	Mot	
IC+0001	50.06.0244	74LS244	SN74LS244N	AMI,MM,Mot,TT	
IC+0002	50.06.0245	SN74LS245	SN74LS245N	AMI,TT	
IC+0003	50.06.0251	SN74LS251N	AP74LS251N	AMI,TT	
IC+0004	50.06.0251	SN74LS251N	AP74LS251N	AMI,TT	
IC+0005	50.06.0251	SN74LS251N	AP74LS251N	AMI,TT	
IC+0006	50.16.0106	MC6821P	68821P, F8B21P	AMI,FC,Mot	
IC+0007	50.15.0102	NE590N	NE590N	SiG	
IC+0008	50.15.0102	NE590N	NE590N	SiG	
P+0001	94.14.0004	40 cont.	Yamaichi Nr. FAP-40-0804		
R+0001	57.11.4103	10 kOhm			
R+0002	57.11.4103	10 kOhm			
R2+0001	1.010.014.57		Network 8 # 10 kOhm 10%		
R2+0002	1.010.014.57		Network 8 # 10 kOhm 10%		
R2+0003	1.010.014.57		Network 8 # 10 kOhm 10%		
R2+0004	57.89.3351	150 Ohm	See note 1		
R2+0005	57.89.3351	150 Ohm	See note 1		

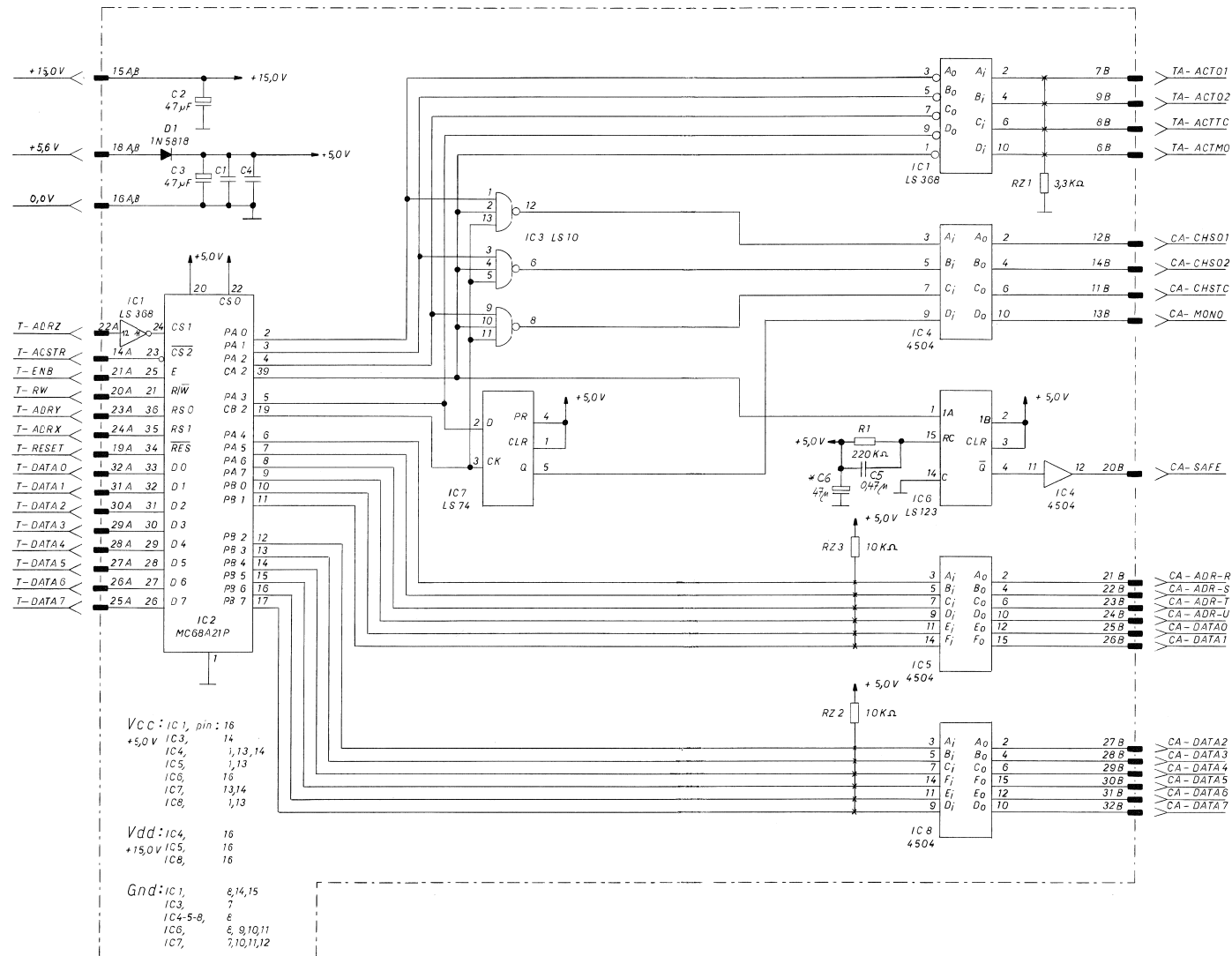
STUDER 81/10/14 DSC PERIPHERY CONTROLLER 1.810.756-00 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1 - Network 8 # 150 Ohm Allen Bradley Nr. 316 B 151 Beckman Nr. 89B-3-4 150 Epitex Nr. 1208-151 G					
CerCeramics, Sal-Solid aluminum					
MANUFACTURER: AMI-American Microsystems Inc., MM-Memulitic Memories Inc., Mot-Motorola, Phe-Philips, Sig-Signetics, TI-Texas Instruments					

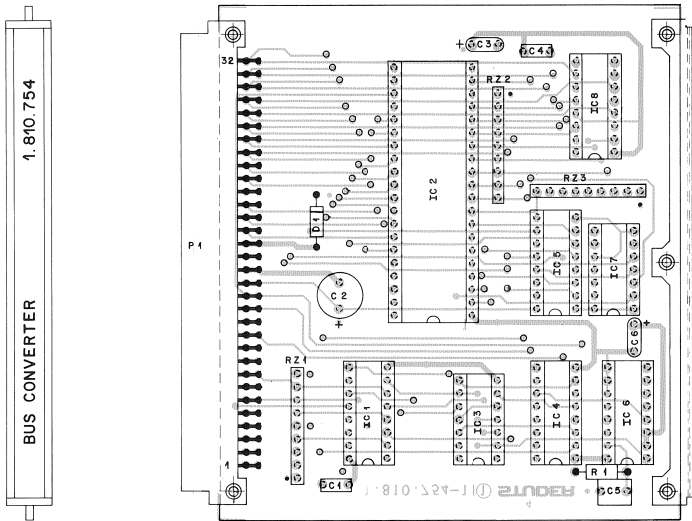
ORIG 81/10/14

STUDER 81/10/14 DSC PERIPHERY CONTROLLER 1.810.756-00 PAGE 2

## BUS CONVERTER PCB 1.810.754-00 GR20 EL5 "ESE"



BUS CONVERTER PCB 1.810.754-00 GR20 EL5 "ESE"



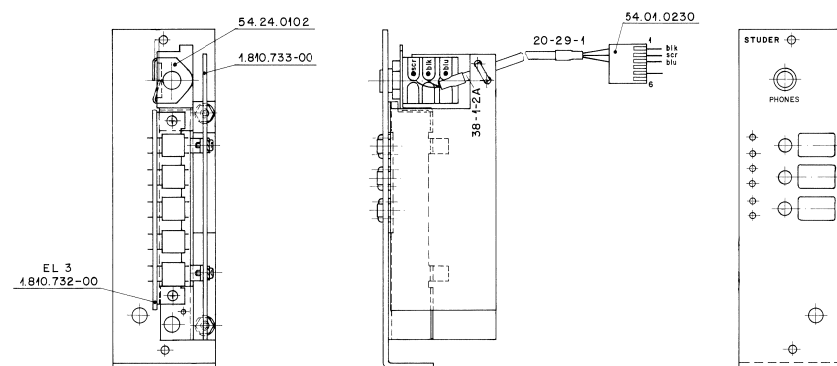
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	C****1	59-99-0205	68 nF	-20% C	
	C****2	59-22-9470	47 uF	-10% 25V E1	
	C****3	59-25-0470	47 uF	-20% 6.3V S&I	
	C****4	59-99-0205	68 nF	-20% C	
	C****5	59-05-0474	0.47 uF	10% 63V	
(00)	C****6	59-99-0205	68 nF	-20% C	
(01)	C****6	59-26-0470	47 uF	-20% 6.3V S&I	
D****1	50-04-0512	1N5818	1N5819		Mot
IC****1	50-06-0368	74LS368PC	SN74LS368AN		IC-TI
IC****2	50-16-0106	MC68A21P	68A21P, F88A21P		AMI-FC-Mot
IC****3	50-06-0010	N74LS 10N	SN74LS 10N		Sig-TI
IC****4	50-15-0103	MC1488P	MC14504B		Mot
IC****5	50-15-0103	MC1488P	MC14504B		Mot
IC****6	50-06-0123	SN74LS23N	SN74LS 74N		T1
IC****7	50-06-0074	N74LS 74AN	SN74LS 74N		Sig-TI
IC****8	50-15-0103	MC1488P	MC14504B		Mot
P****1	54-11-2004	2432 cont.	See note 1		
R****1	57-11-6224	220 kOhm	2%		
RZ****1	57-88-6332		See note 2		
RZ****2	1-010-014-57		Network B = 10 kOhm 10%		
RZ****3	1-010-014-57		Network B = 10 kOhm 10%		

S T U D E R 83/01/17 BBT BUS CONVERTER 1.810.754-00 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(01)	83/01/17			Improved stability of microlog time, reduction of supply voltage spikes by C 6	
Note 1		Burndy Nr. PI 64 B 20 P 00 G 00			
Erni Nr.		97-22-333-694 (563-191)			
Note 2		Network B = 10 kOhm			
Sigovend Nr.		C09 = 1x3k J			
Imetro Nr.		R8 3x3k 5%			
Ce=Ceramic, El=Electrolytic, Sal=Solid aluminium					
MANUFACTURER:		AMI=American Microsystems Inc., FC=Fairchild, Sig=Signetics, St=Studer, Ti=Texas Instruments			

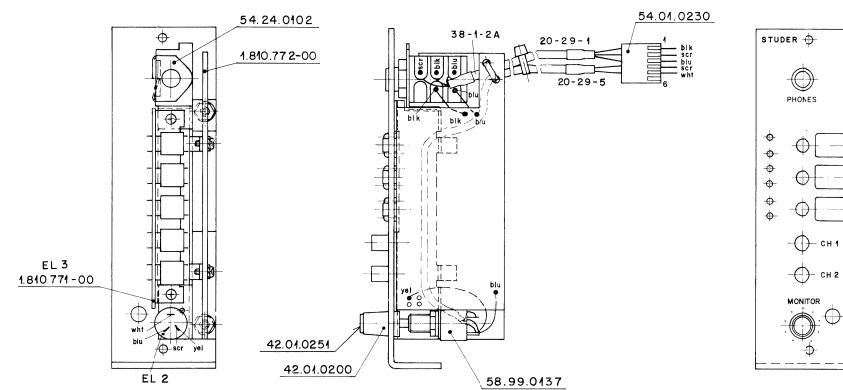
MASTER UNIT 1.810.310-81 GR38

MASTER SWITCHING PCB 1.810.732-00, MASTER CONTROL PCB 1.810.733-00

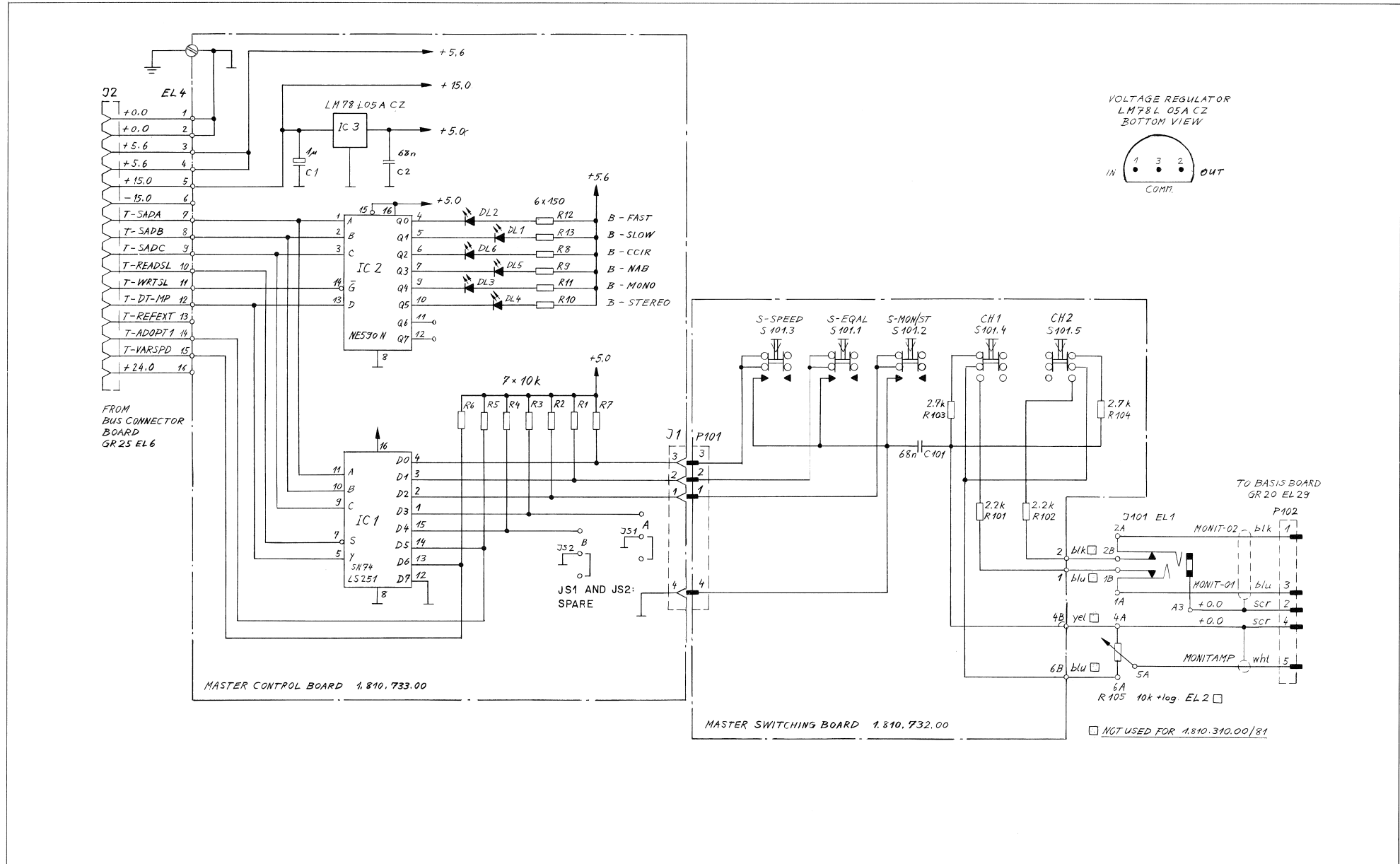


MASTER AND MONITOR CONTROL UNIT 1.810.315-81 GR38

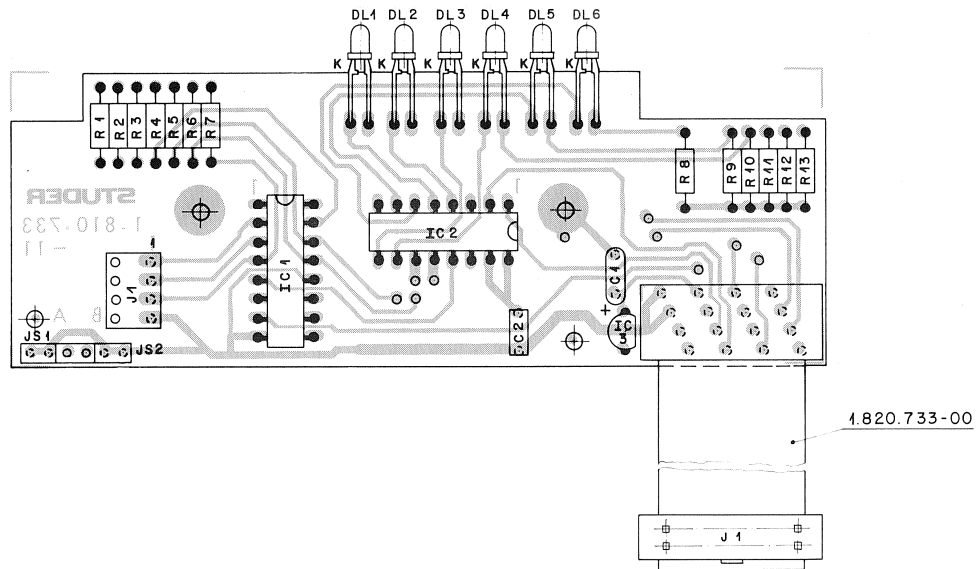
MASTER SWITCHING PCB 1.810.732-00, MASTER CONTROL PCB 1.810.733-00



MASTER UNIT 2 SPEEDS 1.810.310-81 / MASTER AND MONITOR CONTROL UNIT 2 SPEEDS 1.810.315-81  
 MASTER SWITCHING PCB 1.810.732-00, MASTER CONTROL PCB 1.810.733-00



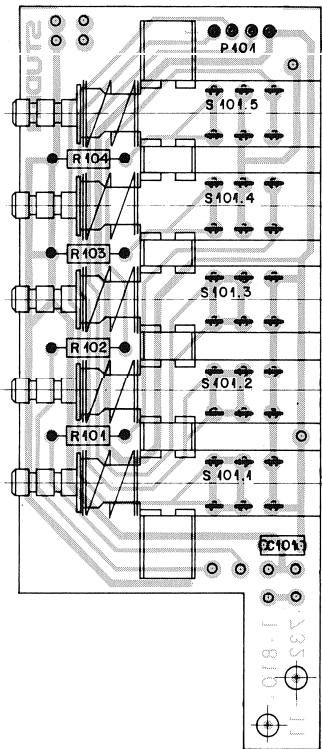
## MASTER CONTROL PCB 1.810.733-00



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C...	001	59.26.9109	1 uF	16V, Sal	Ph	<p>Note 1 - Yamaichi Nr. FAS-16-17, Burndy Nr. FRS-16 BD-4P Connection cable Studer Nr. 1.820.733.00</p> <p>Note 2 - Contact pin: Studer 54.01.0020, Berg 75 160-102-36 Bridge: Studer 54.01.0021, Philips 2422 024 88003</p> <p>Ce=Ceramic, Sal=Solid aluminium</p> <p>MANUFACTURER: AMI=American Microsystem Inc., Fc=Fairchild NS=National Semiconductors, Ph=Philips, Sie=Siemens, Sig=Signetics, TI=Texas Instruments</p>					
C...	002	99.99.0205	68 nF	Ce							
DL...	001	50.04.2130	COV 13-5	Q 62703-Q 575	Sie						
DL...	002	50.04.2130	COV 13-5	Q 62703-Q 575	Sie						
DL...	003	50.04.2130	COV 13-5	Q 62703-Q 575	Sie						
DL...	004	50.04.2130	COV 13-5	Q 62703-Q 575	Sie						
DL...	005	50.04.2130	COV 13-5	Q 62703-Q 575	Sie						
DL...	006	50.04.2130	COV 13-5	Q 62703-Q 575	Sie						
IC...	001	50.06.0251	SN74LS251N	AM74LS251N	AMI, TI						
IC...	002	50.15.0102	NE590N		Sig						
IC...	003	50.10.0107	LM78L05ACZ	UA78L05AHC	Fc, NS						
J...	001	54.01.0241	4 cont.	AMP Nr. 163.680-2							
J...	002	54.14.5021	16 cont.	See note 1							
JS...	001			See note 2							
JS...	002			See note 2							
R...	001	57.11.4103	10 kOhm								
R...	002	57.11.4103	10 kOhm								
R...	003	57.11.4103	10 kOhm								
R...	004	57.11.4103	10 kOhm								
R...	005	57.11.4103	10 kOhm								
R...	006	57.11.4103	10 kOhm								
R...	007	57.11.4103	10 kOhm								
R...	008	57.11.4151	150 Ohm								
R...	009	57.11.4151	150 Ohm								
R...	010	57.11.4151	150 Ohm								
R...	011	57.11.4151	150 Ohm								
R...	012	57.11.4151	150 Ohm								
R...	013	57.11.4151	150 Ohm								

ORIG 82/08/03

MASTER SWITCHING PCB 1.810.732-00

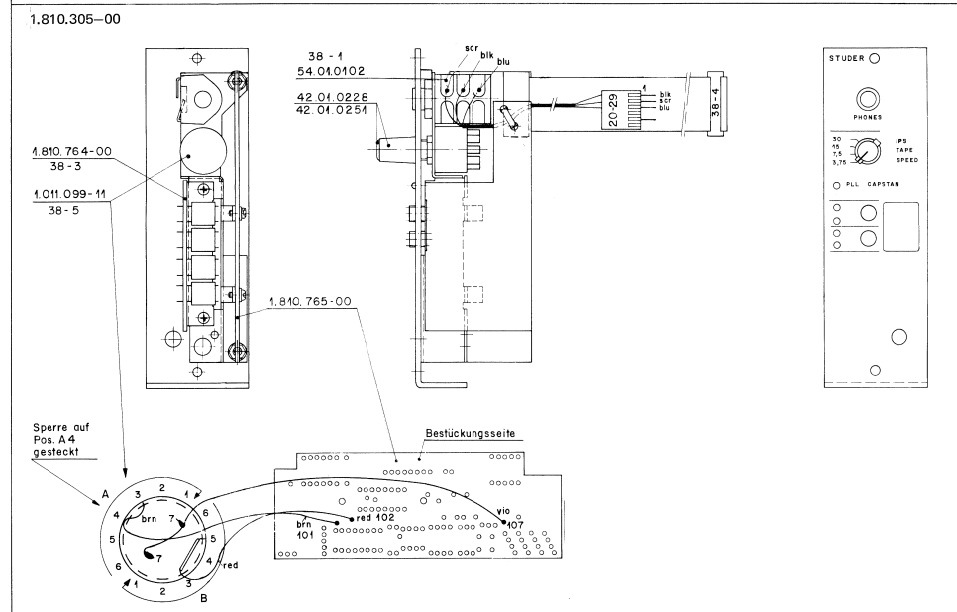
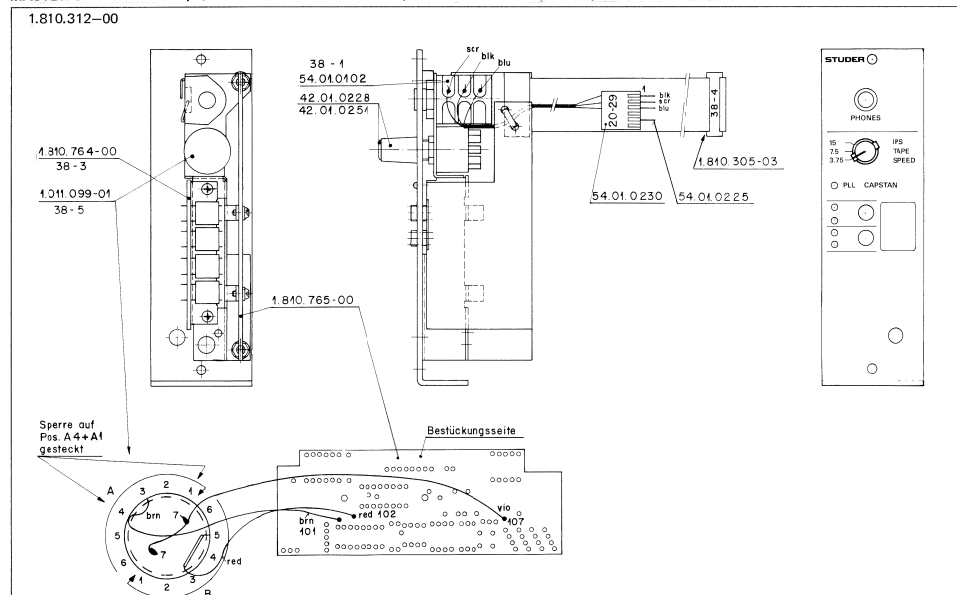


IND.	PDS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C...	101	59.99.0205	68 nF	Ce	
J...	101	54.24.0102		Cliff Nr. S2/BBB/hc	
P...	101			4 pieces Studer Nr. 1.010.017.54	
R...	101	57.11.4222	2.2 kOhm		
R...	102	57.11.4222	2.2 kOhm		
R...	103	57.11.4272	2.7 kOhm		
R...	104	57.11.4272	2.7 kOhm		
R...	105	58.99.0137	10 kOhm	log., Allen Bradley Nr. WA 1H 04B S 103 AA	
S...	101	1.810.732.01		5*2pole change over switch	St

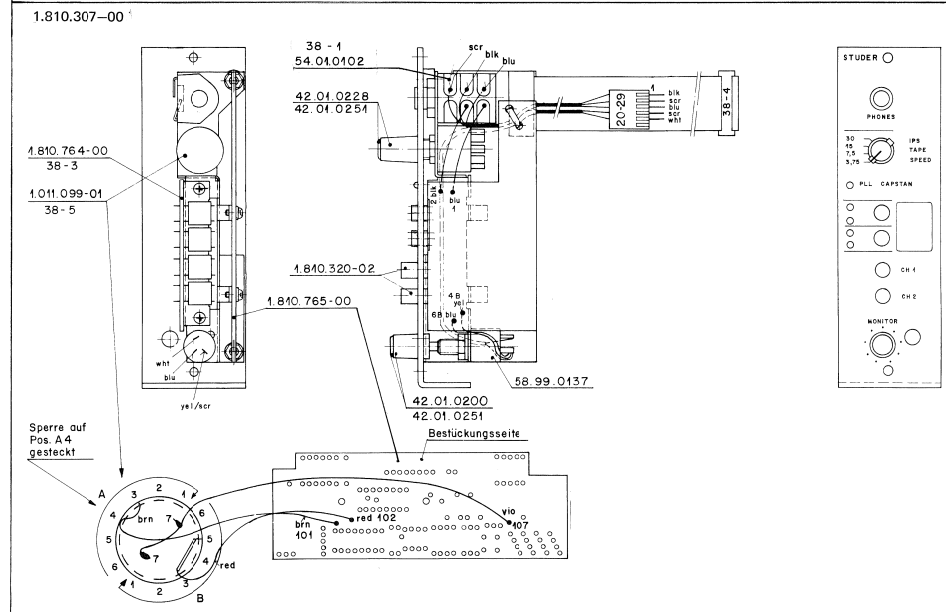
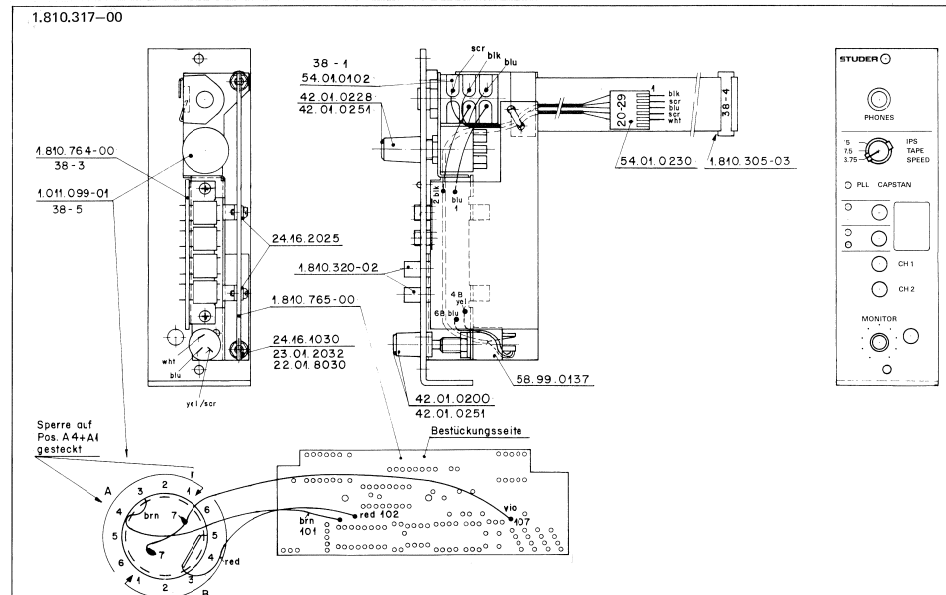
Ce=Ceramic,  
MANUFACTURER: St=Studer  
ORIG 82/08/03  
S T U D E R 82/08/03 GAE MASTER SWITCH. BOARD 1.810.732-00 PAGE 1



MASTER UNIT, 3 SPEEDS 1.810.312-00 / MASTER UNIT, 4 SPEEDS 1.810.305-00 GR38  
 MASTER SWITCHING PCB, 3/4 SPEEDS 1.810.764 "ESE" / MASTER CONTROL PCB 3/4 SPEEDS 1.810.765

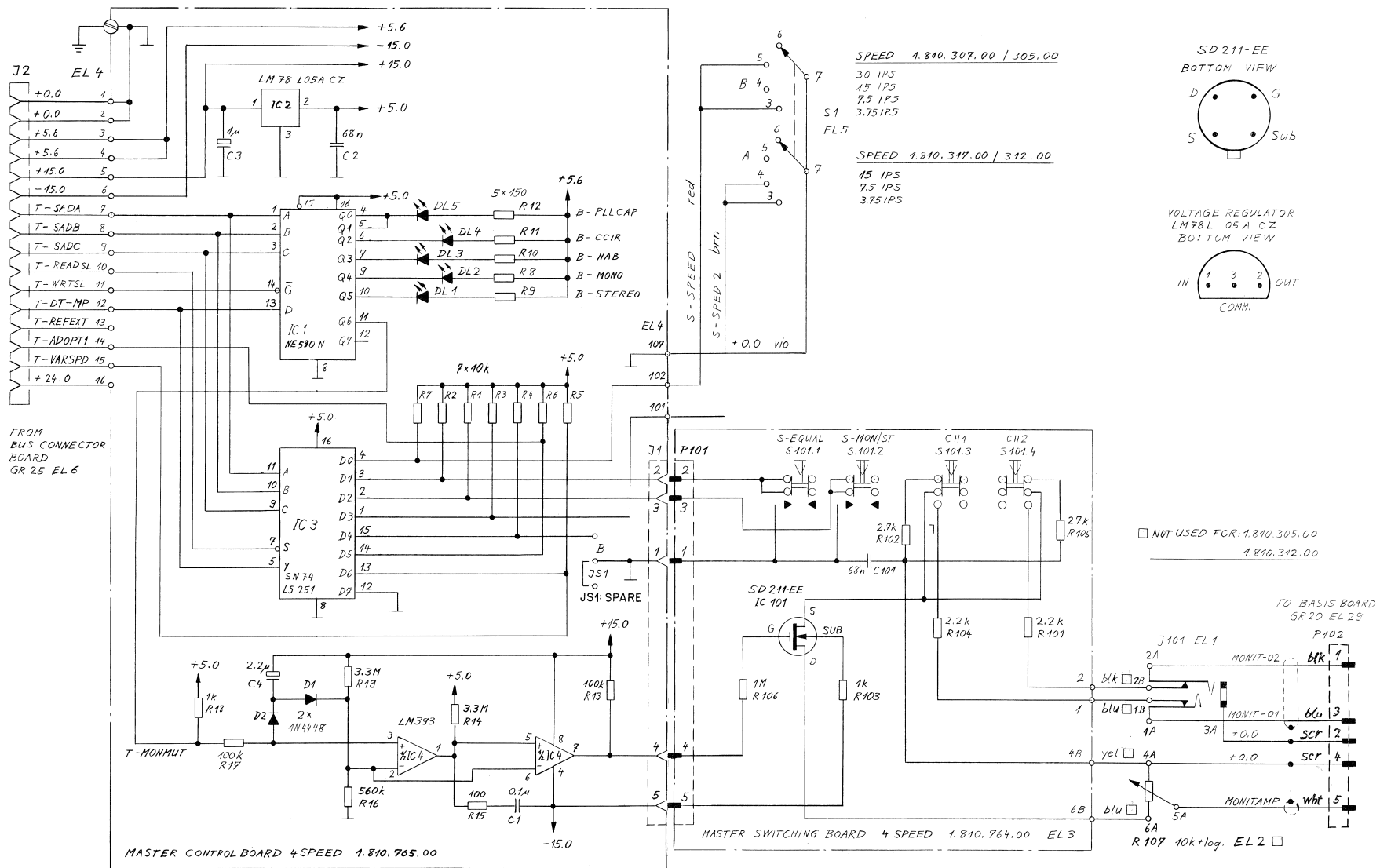


MASTER AND MONITOR CONTROL UNIT, 3 SPEEDS 1.810.317-00  
 MASTER AND MONITOR CONTROL UNIT 4 SPEEDS 1.810.307-00 GR38  
 MASTER SWITCHING PCB, 3/4 SPEEDS 1.810.764 "ESE" / MASTER CONTROL PCB 3/4 SPEEDS 1.810.765

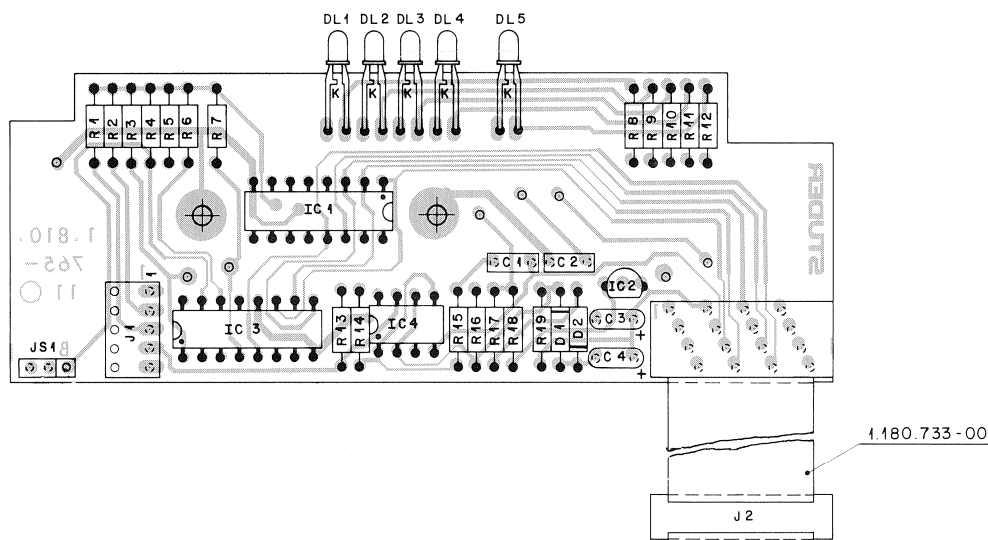


MASTER UNIT, 3 SPEEDS 1.810.312-00 / MASTER UNIT, 4 SPEEDS 1.810.305-00 GR38  
 MASTER SWITCHING PCB, 3/4 SPEEDS 1.810.764 "ESE" / MASTER CONTROL PCB 3/4 SPEEDS 1.810.765

MASTER AND MONITOR CONTROL UNIT, 3 SPEEDS 1.810.317-00  
 MASTER AND MONITOR CONTROL UNIT 4 SPEEDS 1.810.307-00 GR38  
 MASTER SWITCHING PCB, 3/4 SPEEDS 1.810.764 "ESE" / MASTER CONTROL PCB 3/4 SPEEDS 1.810.765



## MASTER CONTROL PCB 4 SPEED 1.810.765-00



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C...	001	59.06.5104	0.1 uF	PETP	ERD-EVOX	R...	014	57.11.6335	3.3 MOhm		
C...	002	59.99.0205	68 nF	Ce		R...	015	57.11.4101	100 Ohm		
C...	003	59.26.9109	1 uF	16V, Sal	Ph	R...	016	57.11.4564	560 kOhm		
C...	004	59.26.5229	2.2 uF	16V, Sal	Ph	R...	017	57.11.4104	100 kOhm		
D...	001	50.04.0125	1N4448			R...	018	57.11.4102	1 kOhm		
D...	002	50.04.0125	1N4448			R...	019	57.11.6335	3.3 MOhm		
DL...	001	50.04.2130	CQV 13-5	Q 62703-Q 575	Sie						
DL...	002	50.04.2130	CQV 13-5	Q 62703-Q 575	Sie						
DL...	003	50.04.2130	CQV 13-5	Q 62703-Q 575	Sie						
DL...	004	50.04.2130	CQV 13-5	Q 62703-Q 575	Sie						
DL...	005	50.04.2130	CQV 13-5	Q 62703-Q 575	Sie						
IC...	001	50.15.0102	NE590N		Sig						
IC...	002	50.10.0107	LM78L05ACZ	UA78L05AHC	Fc+NS						
IC...	003	50.06.0251	SN74LS251N	AM74LS251N	AMI+TI						
IC...	004	50.05.0283	LM393N	LM393D	NS+TI						
J...	001	54.01.0288	5 cont.	AMP Nr. 163.680-3							
J...	002	54.14.5021	16 cont.	See note 1							
JS...	001			See note 2							
R...	001	57.11.4103	10 kOhm								
R...	002	57.11.4103	10 kOhm								
R...	003	57.11.4103	10 kOhm								
R...	004	57.11.4103	10 kOhm								
R...	005	57.11.4103	10 kOhm								
R...	006	57.11.4103	10 kOhm								
R...	007	57.11.4103	10 kOhm								
R...	008	57.11.4151	150 Ohm								
R...	009	57.11.4151	150 Ohm								
R...	010	57.11.4151	150 Ohm								
R...	011	57.11.4151	150 Ohm								
R...	012	57.11.4151	150 Ohm								
R...	013	57.11.4104	100 kOhm								

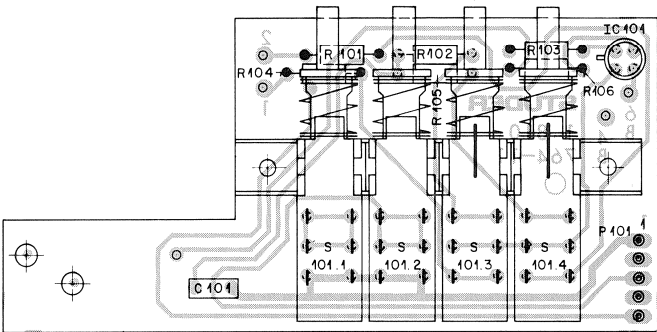
Note 1 - Yamaichi Nr. FAS-16-17, Burndy Nr. FRS-16 BD-4P  
Connection cable Studer Nr. 1.820.733.00  
Note 2 - Contact pin: Studer 54.01.0020, Berg 75 160-102-36  
Bridge: Studer 54.01.0021, Philips 2422 024 88003

Ce=Ceramic, PETP=Polyester, Sal=Solid aluminium

MANUFACTURER: AMI=American Microsystem Inc., Fc=Fairchild  
NS=National Semiconductors Corp., Ph=Philips, Sie=Siemens,  
Sig=Signetics, TI=Texas Instruments

URIG 82/10/27

MASTER SWITCHING PCB 4 SPEED 1.810.764-00 "ESE"



IND.	PCS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C...101	59.99.0205		68 nF	Ce	
IC...101	50.11.0106		SD 211-EE		Sig
J...101	54.24.0102			Cliff Nr. S2/BBB/hc	
P...101				5 pieces Studer Nr. 1.010.017.54	
R...101	57.11.4222		2.2 kOhm		
R...102	57.11.4272		2.7 kOhm		
R...103	57.11.4102		1 kOhm		
R...104	57.11.4222		2.2 kOhm		
R...105	57.11.4272		2.7 kOhm		
R...106	57.11.4105		1 MOhm		
R...107	58.99.0137		10 kOhm	See note 1	
S...101	1.810.764.01			4*2pole change over switch	St

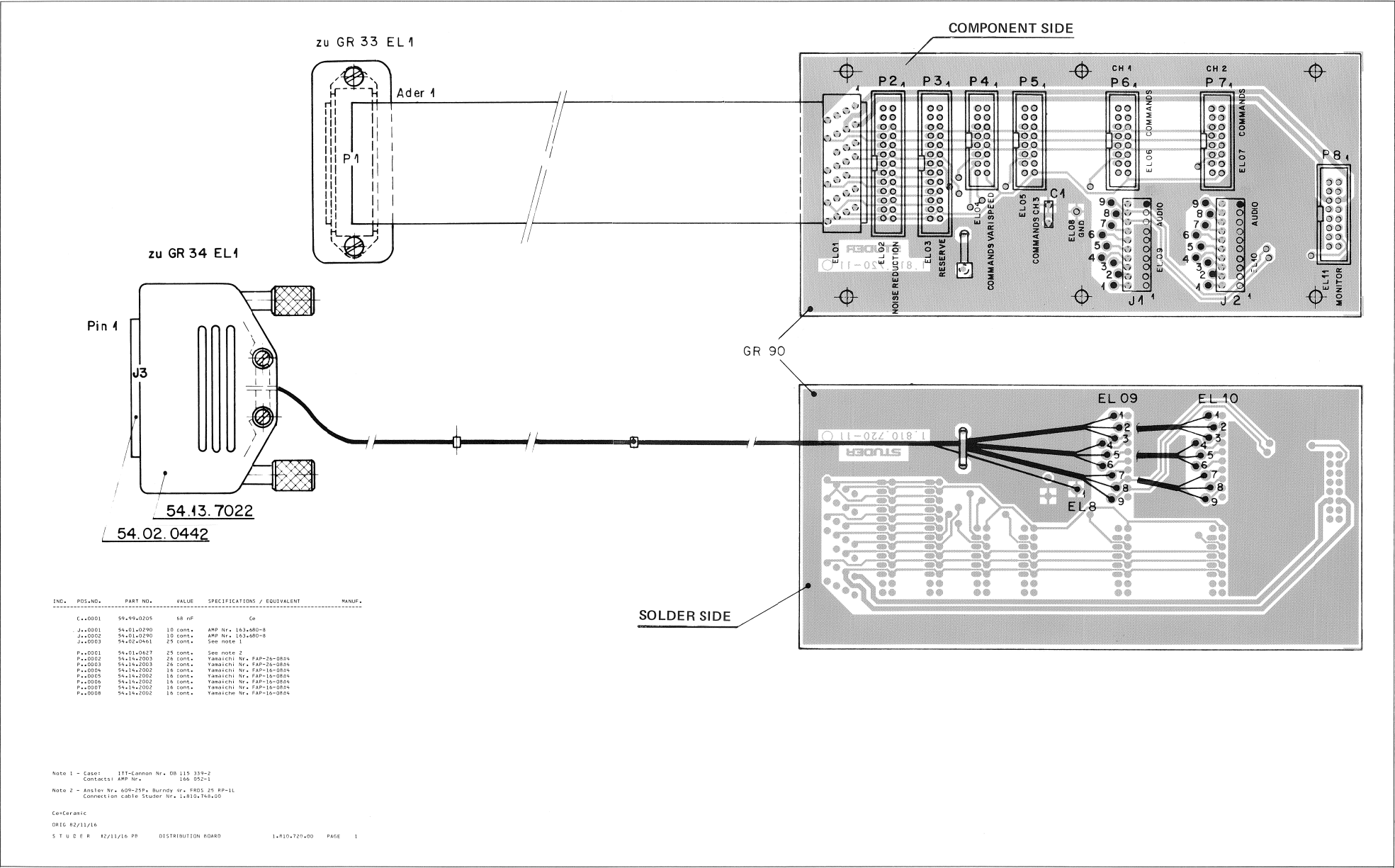
Note 1 - 10 kOhm Potentiometer \*log.  
Allen Bradley Nr. WA 1H 048 S103 AA

Ce=Ceramic

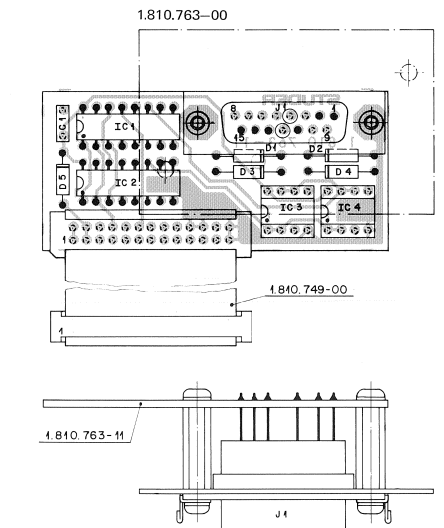
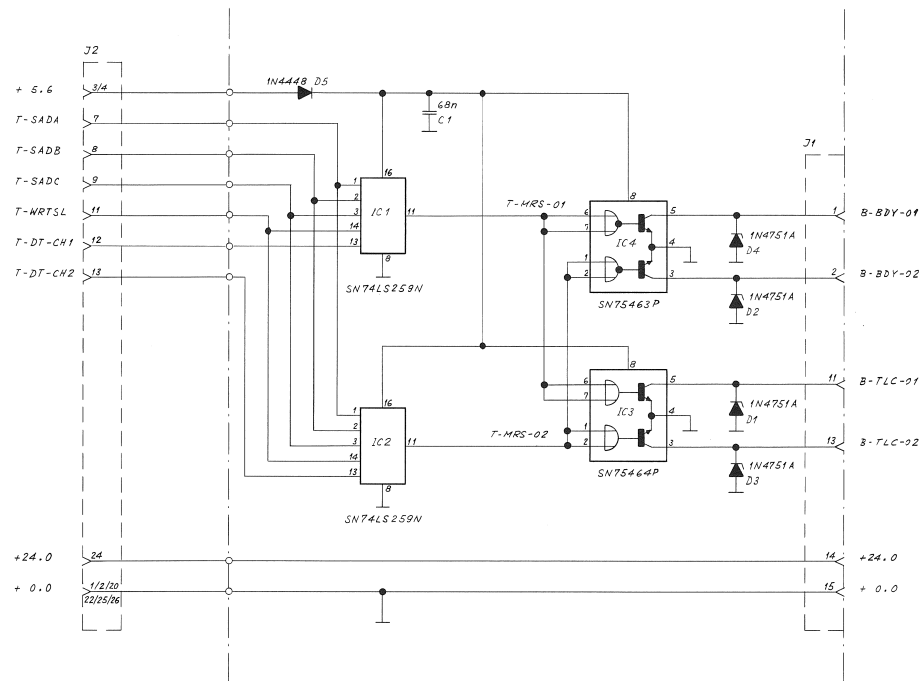
MANUFACTURER: Sig= Signetics, St=Studer

DRIG 82/10/27

DISTRIBUTION PCB (EXT. VU PANEL) 1.810.720-00 GR90



## NOISE REDUCTION SYSTEM CONTROL PCB 1.810.763-00/-81 GR90 EL2



IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.99.0205	68 nF	-20%	Ce	
D..0001	50.04.1506	30 V Z	B2661C30, B2V85C30, ZY30, 1N4751A	ITT-Mot-Ph	
D..0002	50.04.1506	30 V Z	B2661C30, B2V85C30, ZY30, 1N4751A	ITT-Mot-Ph	
D..0003	50.04.1506	30 V Z	B2661C30, B2V85C30, ZY30, 1N4751A	ITT-Mot-Ph	
D..0004	50.04.1506	30 V Z	B2661C30, B2V85C30, ZY30, 1N4751A	ITT-Mot-Ph	
D..0005	50.04.0125	1N4448		ITT-Ph+Sem-TI	
IC..0001	50.06.0259	SN74LS259N		Fc-Mot-TI	
IC..0002	50.06.0259	SN74LS259N		Fc-Mot-TI	
IC..0003	50.05.0204	SN75463P		NSC-TI	
IC..0004	50.05.0203	SN75463P		NSC-TI	
J..0001			See note 1		
J..0002	54.14.5022	26 cont.	See note 2		

Note 1 - Case: Studer Nr. 54.02.0441, AMP-Nr. 164 532-1  
Contacts: Studer Nr. 54.02.0472, AMP-Nr. 1-66492-8

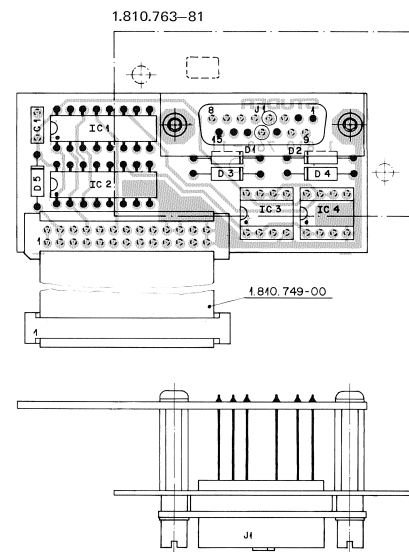
Note 2 - Yamaichi Nr. FAS-25-17, Burndy Nr. FRS-26 80-7P  
Connection cable Studer Nr. 1.810.749-00

Ce=Ceramic

MANUFACTURER: Fc=Fairchild, ITT=Intermetall, Mot=Motorola,  
NSC=National Semiconductor Corp., Ph=Philips,  
Sem=Semicon, TI=Texas Instruments

ORIG 82/08/14

S T U D E R 82/08/14 PB NRS CONTROL BOARD 1.810.763-00 PAGE 1



IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.99.0205	68 nF	-20%	Ce	
D..0001	50.04.1506	30 V Z	B2661C30, B2V85C30, ZY30, 1N4751A	ITT-Mot-Ph	
D..0002	50.04.1506	30 V Z	B2661C30, B2V85C30, ZY30, 1N4751A	ITT-Mot-Ph	
D..0003	50.04.1506	30 V Z	B2661C30, B2V85C30, ZY30, 1N4751A	ITT-Mot-Ph	
D..0004	50.04.1506	30 V Z	B2661C30, B2V85C30, ZY30, 1N4751A	ITT-Mot-Ph	
D..0005	50.04.0125	1N4448		ITT-Ph+Sem-TI	
IC..0001	50.06.0259	SN74LS259N		Fc-Mot-TI	
IC..0002	50.06.0259	SN74LS259N		Fc-Mot-TI	
IC..0003	50.05.0204	SN75463P		NSC-TI	
IC..0004	50.05.0203	SN75463P		NSC-TI	
J..0001	54.02.0183	15 cont.	See note 1		
J..0002	54.14.5022	26 cont.	See note 2		

Note 1 - Jack: TRW Nr. DA-15 5 (Cannon)

Note 2 - Jack: Yamaichi Nr. FAS-26-17  
Burndy Nr. FRS-26 80-7P  
Connection cable: Studer Nr. 1.810.749-00

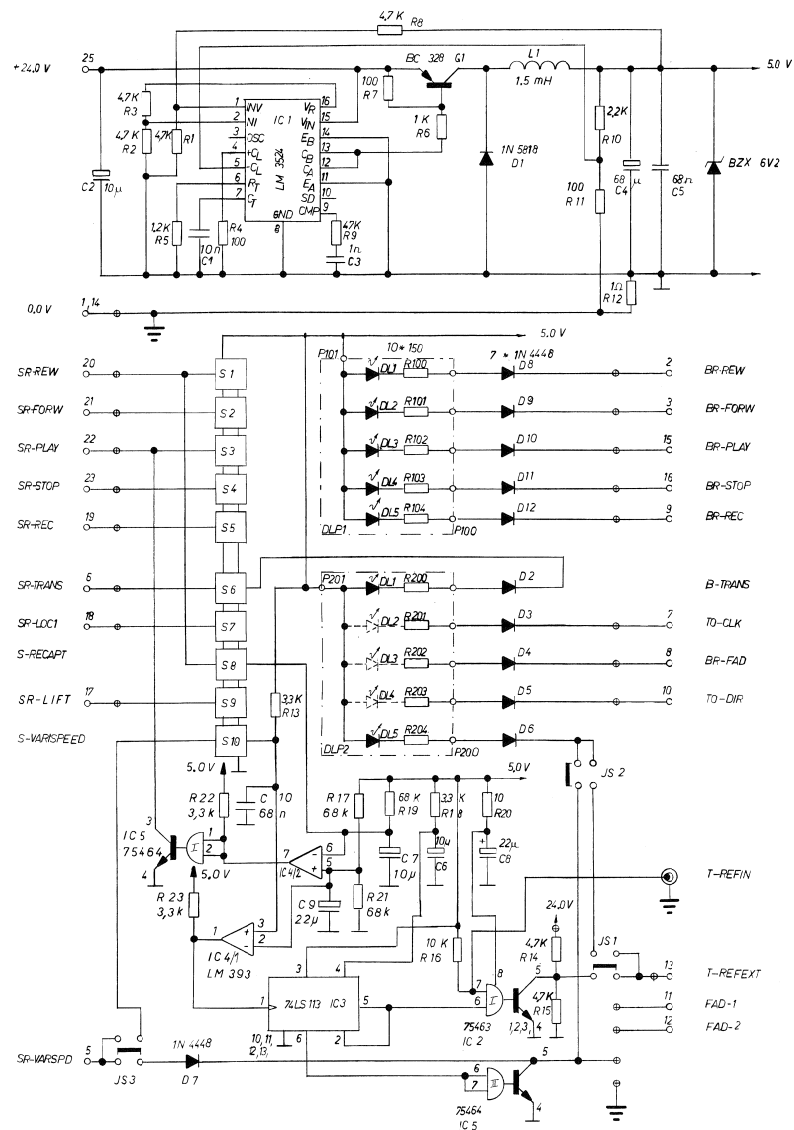
Ce=Ceramic

MANUFACTURER: Fc=Fairchild, ITT=Intermetall, Mot=Motorola,  
NSC=National Semiconductor Corp., Ph=Philips,  
Sem=Semicon, TI=Texas Instruments

ORIG 83/04/22

S T U D E R (00) 83/04/22 PB NRS CONTROL BOARD 1.810.763-81 PAGE 1

## PARALLEL REMOTE CONTROL PCB 1.328.201-00



**LAYOUT 1.328.201-11**

**LAYOUT 1.810.735-11**

**STUDER (00) 83/01/12 OSC REMOTE CONTROL BOARD**

IND.	PDS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	99.05.1103		10 nF	IT+ 63V Ph	
C..0002	99.22.0100		10 uF	-105+ 40V E1	
C..0003	99.12.1102		1 nF	105+ 400V Co	Ph
C..0004	99.20.0080		6.8 uF	205+ 63Vr Ssl	Ph
C..0005	99.99.0205		6.8 uF	205+ 100Vr Co	Ph
C..0006	99.20.0100		10 uF	205+ 10Vr Ssl	Ph
C..0007	99.20.0100		10 uF	205+ 10Vr Ssl	Ph
C..0008	99.20.0100		22 uF	205+ 10Vr Ssl	Ph
C..0009	99.06.1220		22 uF	205+ 10Vr Ssl	Ph
C..0010	99.99.0205		6.8 uF	205+ 100Vr Co	
D..0001	50.04.0512	IN5818			Mot
D..0002	50.04.0125	1N4448			ITT+PhSss+Tf
D..0003	50.04.0125	1N4448			ITT+PhSss+Tf
D..0004	50.04.0125	1N4448			ITT+PhSss+Tf
D..0005	50.04.0125	1N4448			ITT+PhSss+Tf
D..0006	50.04.0125	1N4448			ITT+PhSss+Tf
D..0007	50.04.0125	1N4448			ITT+PhSss+Tf
D..0008	50.04.0125	1N4448			ITT+PhSss+Tf
D..0009	50.04.0125	1N4448			ITT+PhSss+Tf
D..0010	50.04.0125	1N4448			ITT+PhSss+Tf
D..0011	50.04.0125	1N4448			ITT+PhSss+Tf
D..0012	50.04.0125	1N4448			ITT+PhSss+Tf
D..0013	50.04.1118	6x2 V		02X03C 6x2, B255C 6x2, ZPO 6x2	ITT+Lok
DL..0100	50.04.0212	M4535	C4=58k, 5082-4555	C4=HP+Ms	
DL..0101	50.04.0212	M4535	C4=58k, 5082-4555	C4=HP+Ms	
DL..0102	50.04.0212	M4535	C4=58k, 5082-4555	C4=HP+Ms	
DL..0103	50.04.0212	M4535	C4=58k, 5082-4555	C4=HP+Ms	
DL..0104	50.04.0212	M4535	C4=58k, 5082-4555	C4=HP+Ms	
DL..0200	50.04.0212	M4535	C4=58k, 5082-4555	C4=HP+Ms	
DL..020A	50.04.0212	M4535	C4=58k, 5082-4555	C4=HP+Ms	
[C..0001]	50.04.0279	SC32AN		SG-Tf	
[C..0002]	50.05.0203	SN7546JG	SN7546JG, D53613N	VSt-Tf	
[C..0003]	50.05.0113	SN74LS13M	SN74LS13M	SLip-Tf	
[C..0004]	50.05.0283	LM393N		Tl+MS	

**STUDER (00) 83/01/12 OSC REMOTE CONTROL BOARD**

IND.	PDS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
JC..0005	50.05.0204	SN7546AP	D53614N		VSt-Tf
J..0001	1.022.197.00		1.5 mH		St
P..0100	94.01.0209		5 Cont.	AMP Nr. 163-740-3	
P..0101	94.01.0227		3 Cont.	AMP Nr. 163-740-1	
P..0102	94.01.0209		5 Cont.	AMP Nr. 163-740-3	
P..0103	94.01.0227		3 Cont.	AMP Nr. 163-740-1	
Q..0001	50.03.0351	BC327-25		NEC-Sio+TT+Ph+Tf	
R..0001	57.11.4472		4.7 kOhm		
R..0002	57.11.4472		4.7 kOhm		
R..0003	57.11.4472		4.7 kOhm		
R..0004	57.11.4472		100 Ohm		
R..0005	57.11.4472		1.2 kOhm		
R..0006	57.11.4472		1.2 kOhm		
R..0007	57.11.4472		1.2 kOhm		
R..0008	57.11.4472		1.2 kOhm		



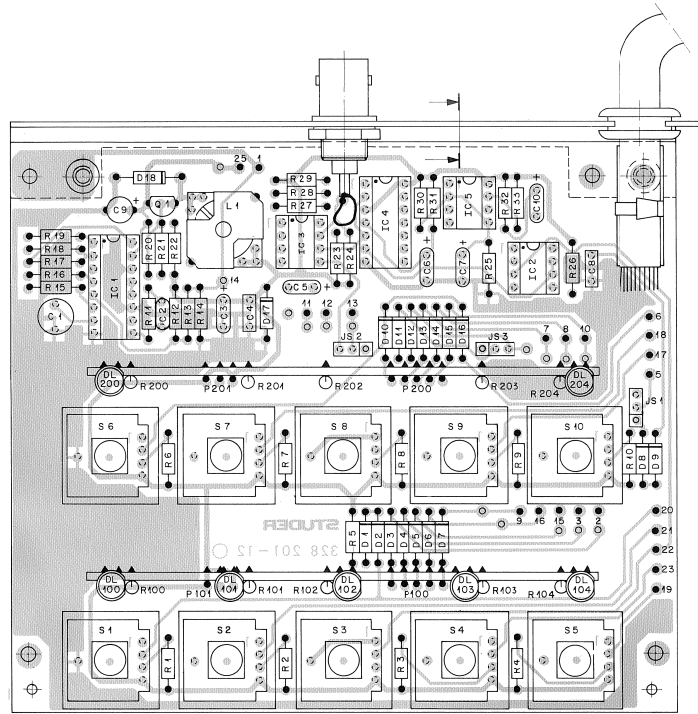
The diagram illustrates a portable cassette player circuit. Key components include:

- Power Supply:** Two 1.5V AA batteries (BAT65) connected to a 5.0V regulator (IC 1) and a 6V Zener diode (BZX D17).
- Pre-Amplifier:** A BC-327-25 transistor stage followed by a 1N 5819 diode.
- Buffer Amplifiers:** Ten S-series op-amp buffers (S1-S10) used for signal buffering.
- Comparators/Buffers:** A series of D-series comparators/buffers (D1-D11) for signal processing.
- Motor Driver Stage:** A 7546 IC driving a motor (T-REFIN) through a 7545 IC and a 7544 IC.
- Control Logic:** Includes a 7543 IC and a 7544 IC for timing and control.

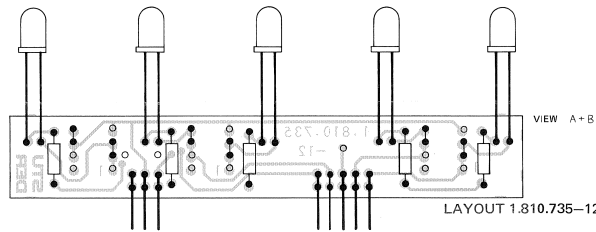
Component values and labels are provided throughout the schematic, such as resistors (R1-R24), capacitors (C1-C6), and integrated circuits (IC 1, IC 2, IC 3, IC 4).

\* has been modified

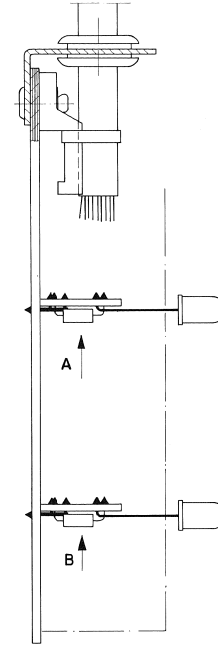
## PARALLEL REMOTE CONTROL PCB 1.328.201-81



LAYOUT 1.328.201-12



LAYOUT 1.810.735-12



IND.	POS.-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
DL++201			not used		
DL++202			not used		
DL++203			not used		
DL++204	50.04-2112	Mu5353		CM-5848, HLMF-3401	CM-GI-HP
IC++1	50.05-0279	SG35240N			SG
IC++2	50.05-0204	SN75444P		DS3614N	NS-IT
IC++3	50.05-0203	SN75443P		SN75463JG, SN75463JN	NS-IT
IC++4	50.05-0113	N74LS113N		SN74LS113N	Signifi
IC++5	50.05-0203	LM593N			NS-Thom
JS++1				See note 1	
JS++2				See note 1	
JS++3				See note 1	
L++1	1.022-197.00		1.5 OH		SS
P++100	54.01-0209		5 cont.	AMP Nr. 163.740-3	
P++101	54.01-0227		3 cont.	AMP Nr. 163.740-1	
P++102	54.01-0209		5 cont.	AMP Nr. 163.740-3	
P++201	54.01-0227		3 cont.	AMP Nr. 163.740-1	
Q++1	50.03-0351	BC327-25			ITT-Ph-Sio
R++1	57.11-4331		330 Ohm		
R++2	57.11-4331		330 Ohm		
R++3	57.11-4331		330 Ohm		
R++4	57.11-4331		330 Ohm		
R++5	57.11-4331		330 Ohm		
R++6	57.11-4331		330 Ohm		
R++7	57.11-4331		330 Ohm		
R++8	57.11-4331		330 Ohm		
R++9	57.11-4331		330 Ohm		
R++10	57.11-4331		330 Ohm		
R++11	57.11-4331		330 Ohm		
(00)	R++11		47 kOhm		
(01)	R++11		3.9 kOhm		
R++12	57.11-4332		2.2 kOhm		

S T U D E R (01) 85/03/07 PB REMOTE CONTROL BOARD 1.328.201-81 PAGE 2

IND.	POS.-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R++13	57.11-4101		100 Ohm		
R++14	57.11-4101		1 Ohm		
R++15	57.11-4122		1.2 kOhm		
R++16	57.11-4101		100 Ohm		
R++17	57.11-4472		4.7 kOhm		
R++18	57.11-4472		4.7 kOhm		
R++19	57.11-4472		4.7 kOhm		
R++20	57.11-4101		100 Ohm		
R++21	57.11-4102		1 kOhm		
R++22	57.11-4472		4.7 kOhm		
R++23	57.11-4100		10 Ohm		
R++24	57.11-4103		10 kOhm		
R++25	57.11-4053		68 kOhm		
R++26	57.11-4332		3.3 kOhm		
R++27	57.11-4472		4.7 kOhm		
R++28	57.11-4472		4.7 kOhm		
R++29	57.11-4332		3.3 kOhm		
R++30	57.11-4053		68 kOhm		
R++31	57.11-4332		3.3 kOhm		
R++32	57.11-4053		68 kOhm		
R++33	57.11-4332		3.3 kOhm		
R++34	57.11-4151		150 Ohm		
R++35	57.11-4151		150 Ohm		
R++36	57.11-4151		150 Ohm		
R++37	57.11-4151		150 Ohm		
R++38	57.11-4151		150 Ohm		
R++39	57.11-4151		150 Ohm		
R++40	57.11-4151		150 Ohm		
R++41	57.11-4151		150 Ohm		
R++42	57.11-4151		150 Ohm		
R++43	57.11-4151		150 Ohm		
R++44	57.11-4151		150 Ohm		
R++45	57.11-4151		150 Ohm		
S++1				See note 2	
S++2				See note 2	
S++3				See note 2	
S++4				See note 2	
S++5				See note 2	

S T U D E R (01) 85/03/07 PB REMOTE CONTROL BOARD 1.328.201-81 PAGE 3

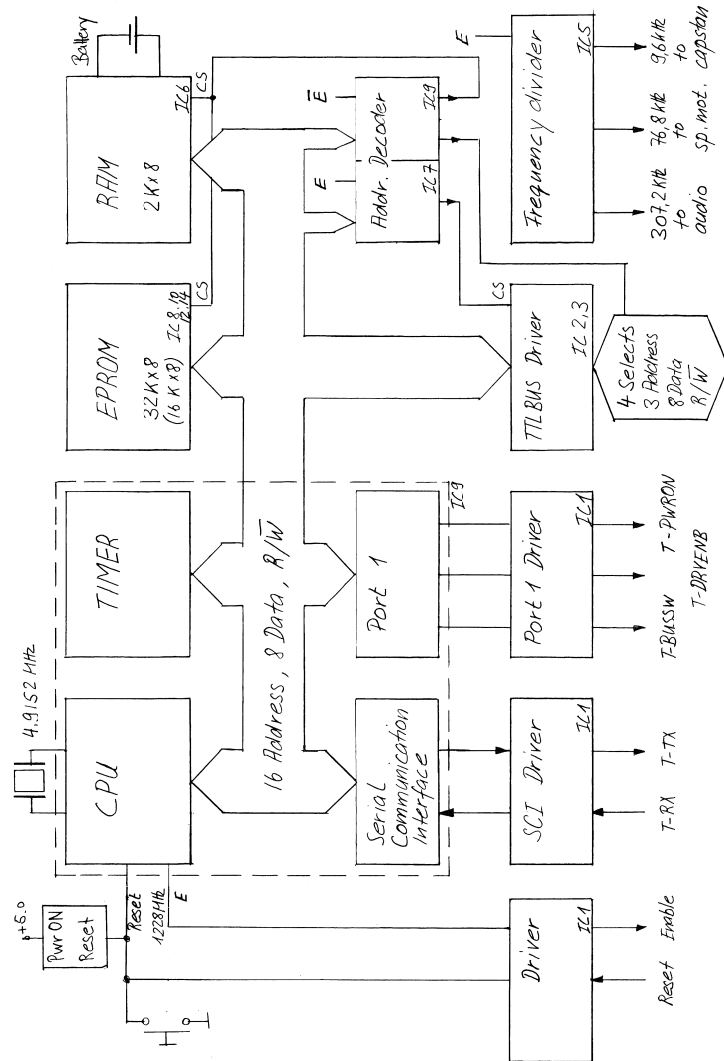
IND.	POS.-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(00)	C++1	59.05-1103	10 nF	1%, 63V, Pp	
(01)	C++2	59.32-1102	1 nF	10%, 400V, Ce	
C++3	59.06-0223	22 nF	10%, 100V, PETP		Ph
C++4	59.26-0680	68 nF	20%, 6.3V, Sal		Ph
C++5	59.06-0683	68 nF	20%, 100V, PETP		Ph
C++6	59.26-1220	22 uF	20%, 10V, Sal		Ph
C++7	59.26-1220	10 uF	20%, 10V, Sal		Ph
C++8	59.26-1220	22 uF	20%, 10V, Sal		Ph
C++9	59.06-0683	68 nF	20%, 100V, PETP		Ph
C++10	59.22-0100	10 uF	-10%, 40V, El		Ph
C++11	59.26-1220	10 uF	20%, 10V, Sal		Ph
D++1	50.04-2127	BAT 85	BAS 40-02		Ph-Sie
D++2	50.04-2127	BAT 85	BAS 40-02		Ph-Sie
D++3	50.04-2125	IN4448			Fc-ITT-Ph-Sie-Tf
D++4	50.04-2125	IN4448			Fc-ITT-Ph-Sie-Tf
D++5	50.04-2125	IN4448			Fc-ITT-Ph-Sie-Tf
D++6	50.04-2125	IN4448			Fc-ITT-Ph-Sie-Tf
D++7	50.04-2125	IN4448			Fc-ITT-Ph-Sie-Tf
D++8	50.04-2127	BAT 85	BAS 40-02		Ph-Sie
D++9	50.04-2127	BAT 85	BAS 40-02		Ph-Sie
D++10	50.04-2125	IN4448			Fc-ITT-Ph-Sie-Tf
D++11	50.04-2125	IN4448			Fc-ITT-Ph-Sie-Tf
D++12	50.04-2125	IN4448			Fc-ITT-Ph-Sie-Tf
D++13	50.04-2125	IN4448			Fc-ITT-Ph-Sie-Tf
D++14	50.04-2125	IN4448			Fc-ITT-Ph-Sie-Tf
D++15	50.04-2125	IN4448			Fc-ITT-Ph-Sie-Tf
D++16	50.04-2127	BAT 85	BAS 40-02		Ph-Sie
D++17	50.04-1110	6.2 9 2	B283C 6.2, B285C 6.2, 2P0 6.2		ITT-Sec
D++18	50.04-3512	IN5818	IN5819		Not
DL++100	50.04-1112	Mu5353	CM-5848, HLMF-3401		CM-GI-HP
DL++101	50.04-1112	Mu5353	CM-5848, HLMF-3401		CM-GI-HP
DL++102	50.04-1112	Mu5353	CM-5848, HLMF-3401		CM-GI-HP
DL++103	50.04-1112	Mu5353	CM-5848, HLMF-3401		CM-GI-HP
DL++104	50.04-1111	Mu5753	CM-2848, HLMF-3301		CM-GI-HP
DL++200	50.04-1112	Mu5353	CM-5848, HLMF-3401		CM-GI-HP

S T U D E R (01) 85/03/07 PB REMOTE CONTROL BOARD 1.328.201-81 PAGE 4

IND.	POS.-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
S++6				See note 2	
S++7				See note 2	
S++8				See note 2	
S++9				See note 2	
S++10				See note 2	
(01)	85/03/07			Improved compensation of error amplifier.	
Note 1	-	Contact pint	Studer 54.01-0209, Ref 75.100-102-36		
		Br idgel	Studer 54.01-0203, Philips 2422 02N 80003		
Note 2	-	Switch	Studer 55.03-0261, Rafi 3.13001.110		
		Extender	Studer 55.03-0262, Rafi 5.55101.690		
			Ce=Ceramic, El=Electrolytic, Sal=Solid aluminium, PETP=Polyesterfilm, Pnp=Polysilicon.		
MANUFACTURER:			CM=Chicom Miniature, Fc=Fairchild, ITT=ITT, Ph=Philips, HLM=Hewlett Packard, NS=National Semiconductor, Pnp=Philips, Sem=Semicon, Sig=Silicon General, Sie=Siemens, Sig=Signetics, Sit=Studer, Thom=Thomson, TI=Texas Instruments, Tf=Telefunken.		
DRG	84/10/17	(01) 85/03/07			

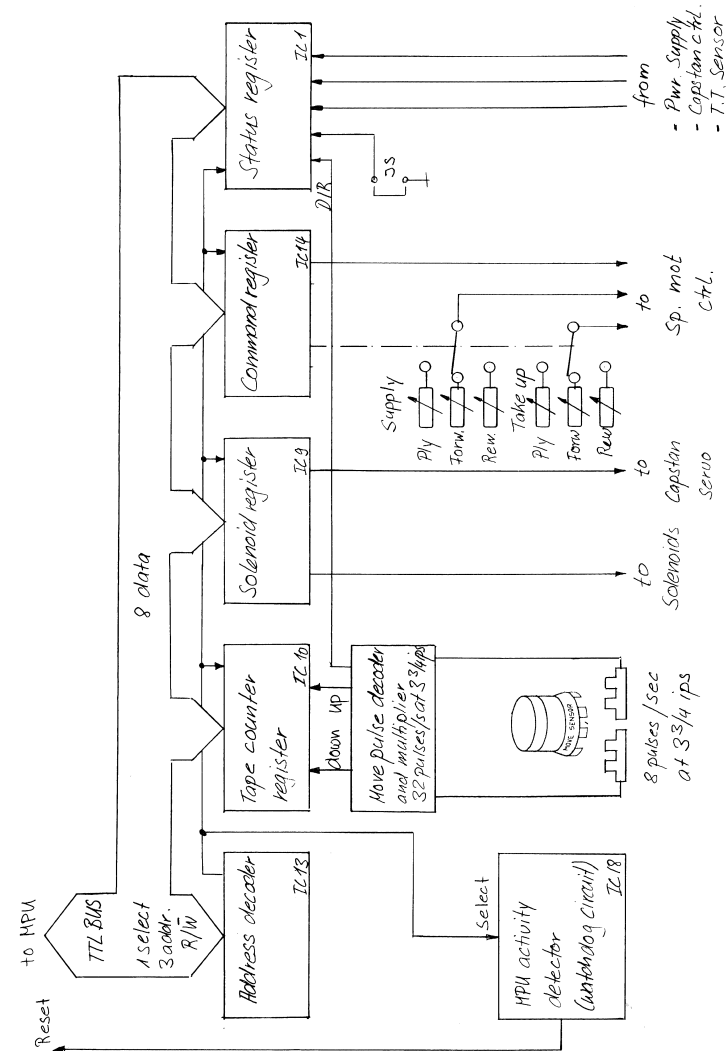
S T U D E R (01) 85/03/07 PB REMOTE CONTROL BOARD 1.328.201-81 PAGE 4

BLOCK DIAGRAM MP UNIT



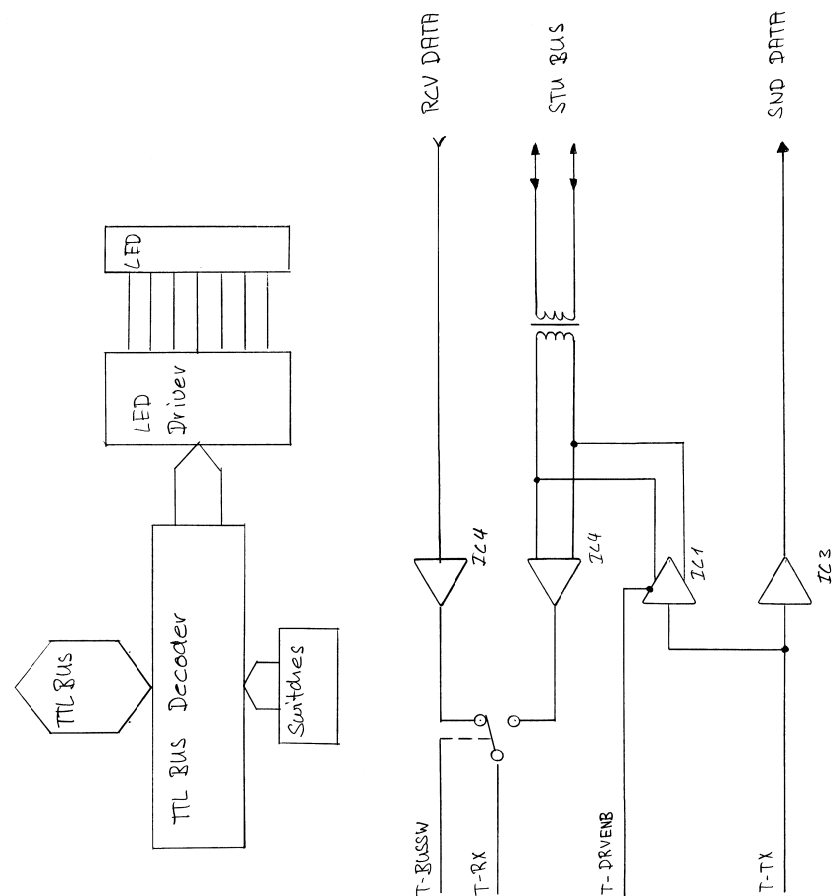
June 83 ke	A810	Block diagram		
STUDER	MP Unit		1.820.780.00	PAGE 1 OF 8

BLOCK DIAGRAM TAPE DECK CONTROLLER



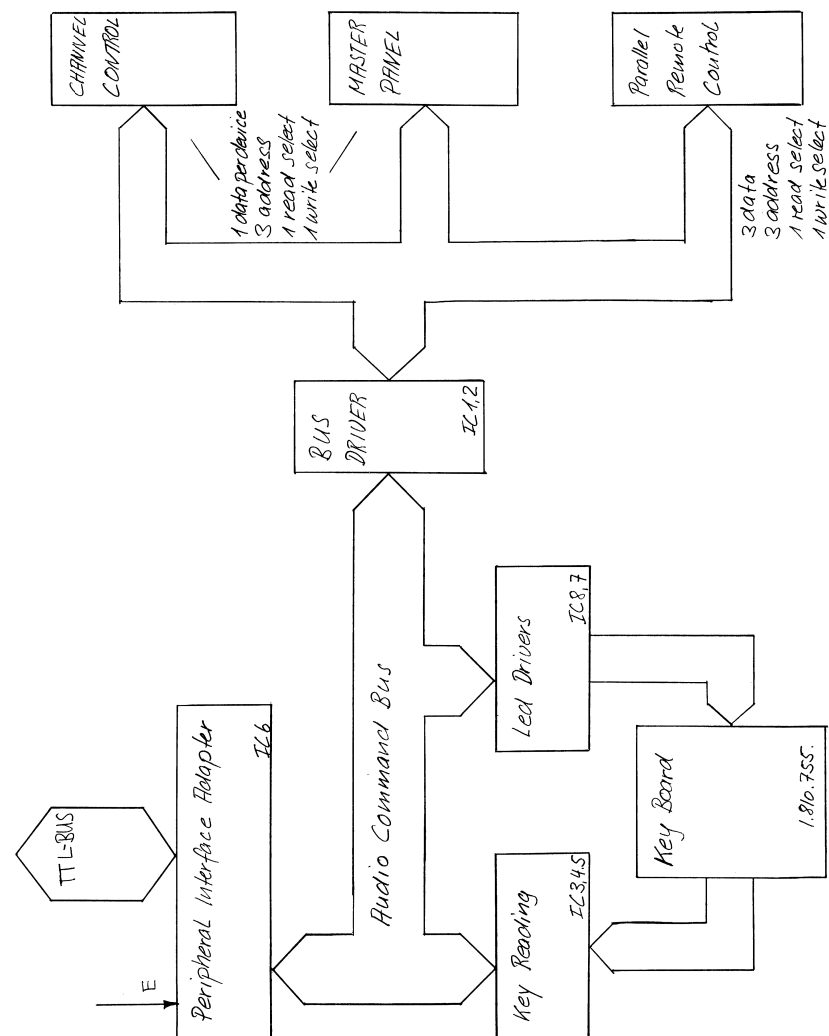
June 83 ke	A810	Block diagram		
STUDER	Tape Deck Controller		1.810.750.00	PAGE 1 OF 3

### BLOCK DIAGRAM SERIAL REMOTE CONTROLLER



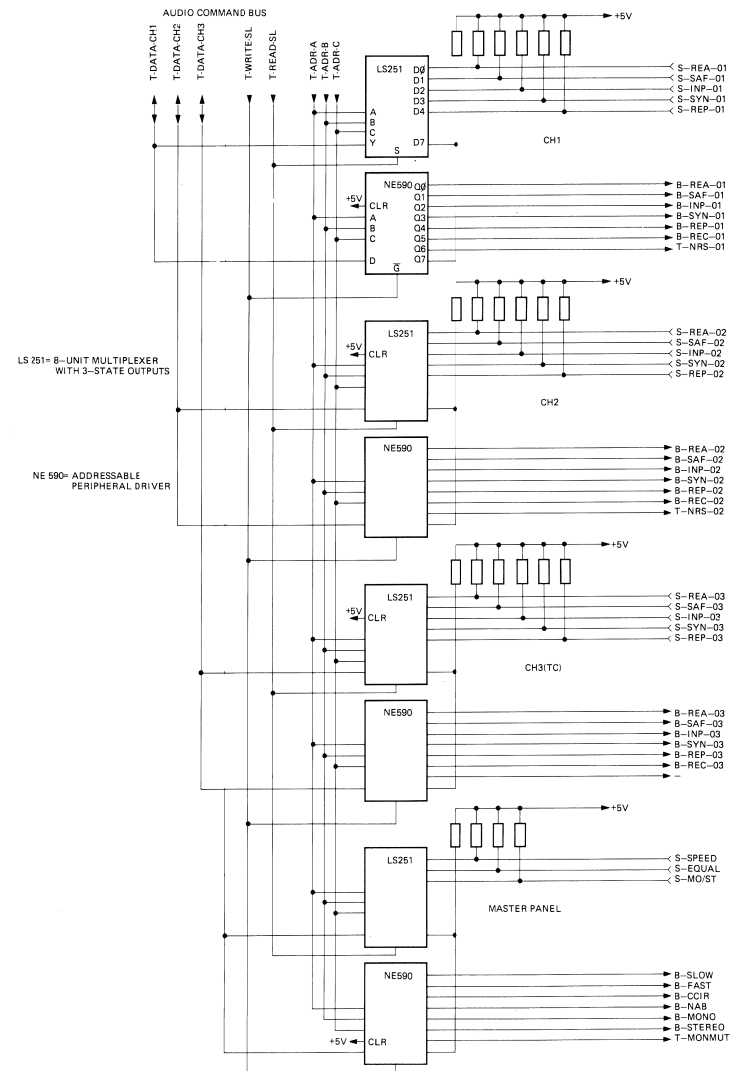
June 83 Ke	H810			
STUDER	SERIAL REMOTE CONTROLLER		181075100	PAGE 1 OF 5

### BLOCK DIAGRAM PERIPHERY CONTROLLER

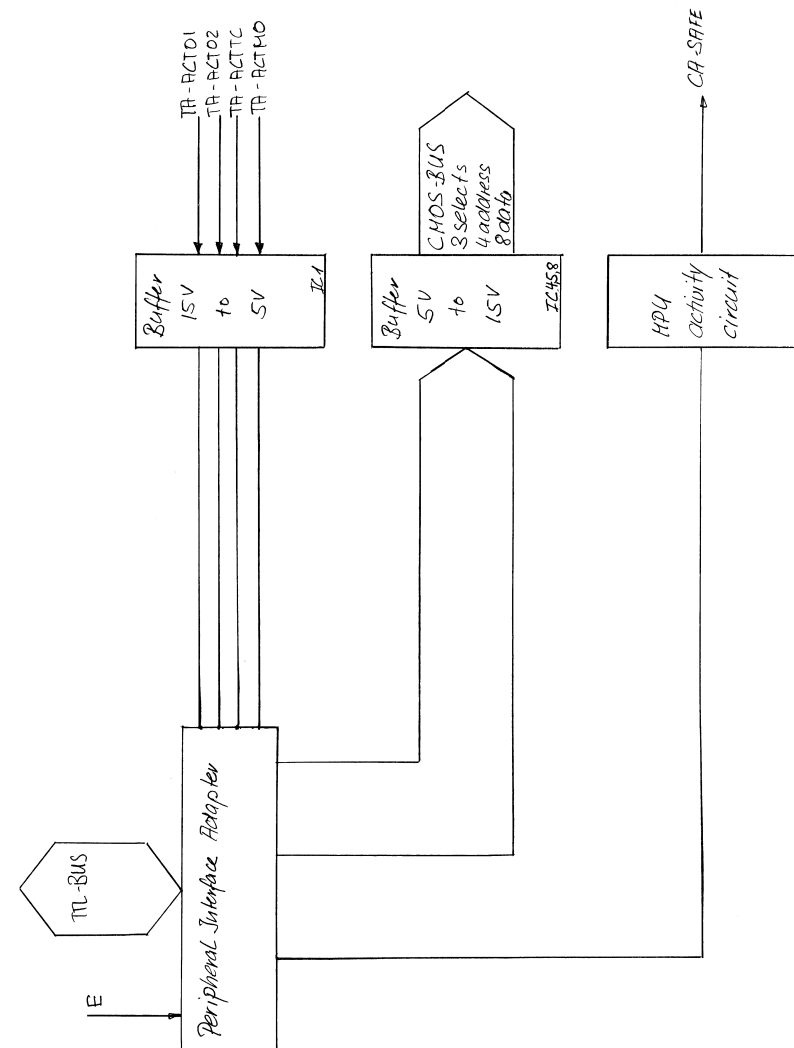


June 83	He	A810	Block diagram			
STUDER		Periphery Controller			1,810.753.00	PAGE 1 OF 3

BLOCK DIAGRAM CHANNEL CTRL. MASTER PANEL



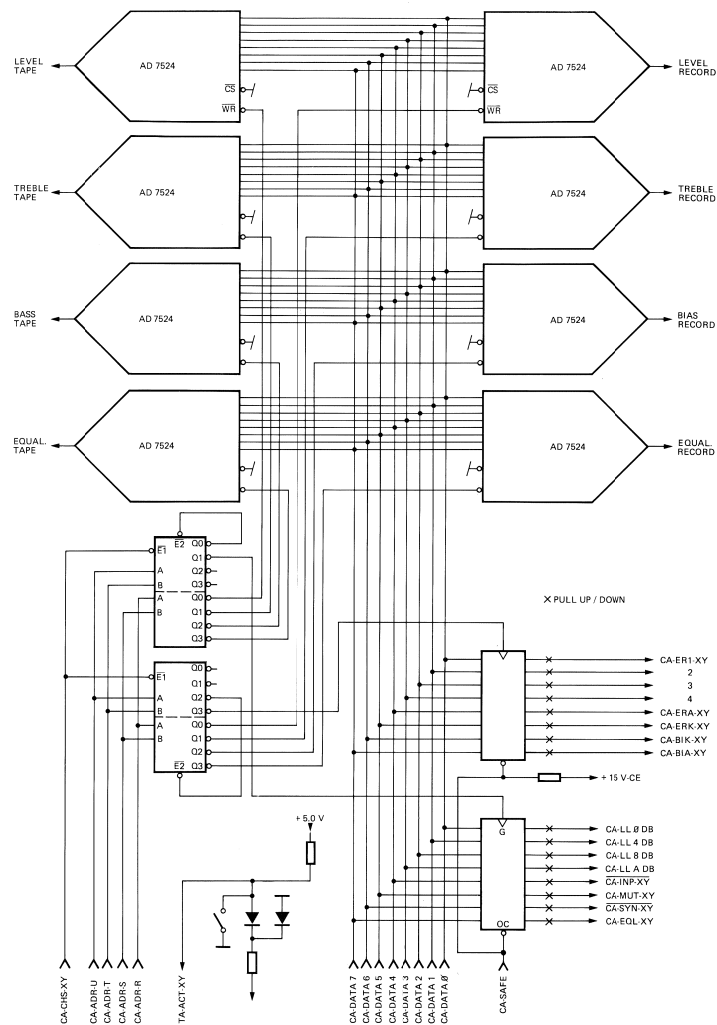
BLOCK DIAGRAM BUS CONVERTER



June 83 Ke	A 810	Blockdiagramm	
STUDER	CHANNEL CTRL. MASTER PANEL		PAGE OF

June 83 Ke	A810	Blockdiagram	
STUDER	BUS CONVERTER	1810754.00	PAGE 1 OF 2

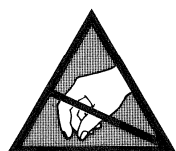
## BLOCK DIAGRAM BUS CONVERTER (PERIPHERY)



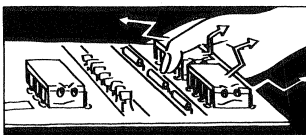
June 83 He	A 810	Blockdiagram	
STUDER	BUS CONVERTER (Periphery)		PAGE OF

## SECTION 6 TAPE TRANSPORT DIAGRAMS

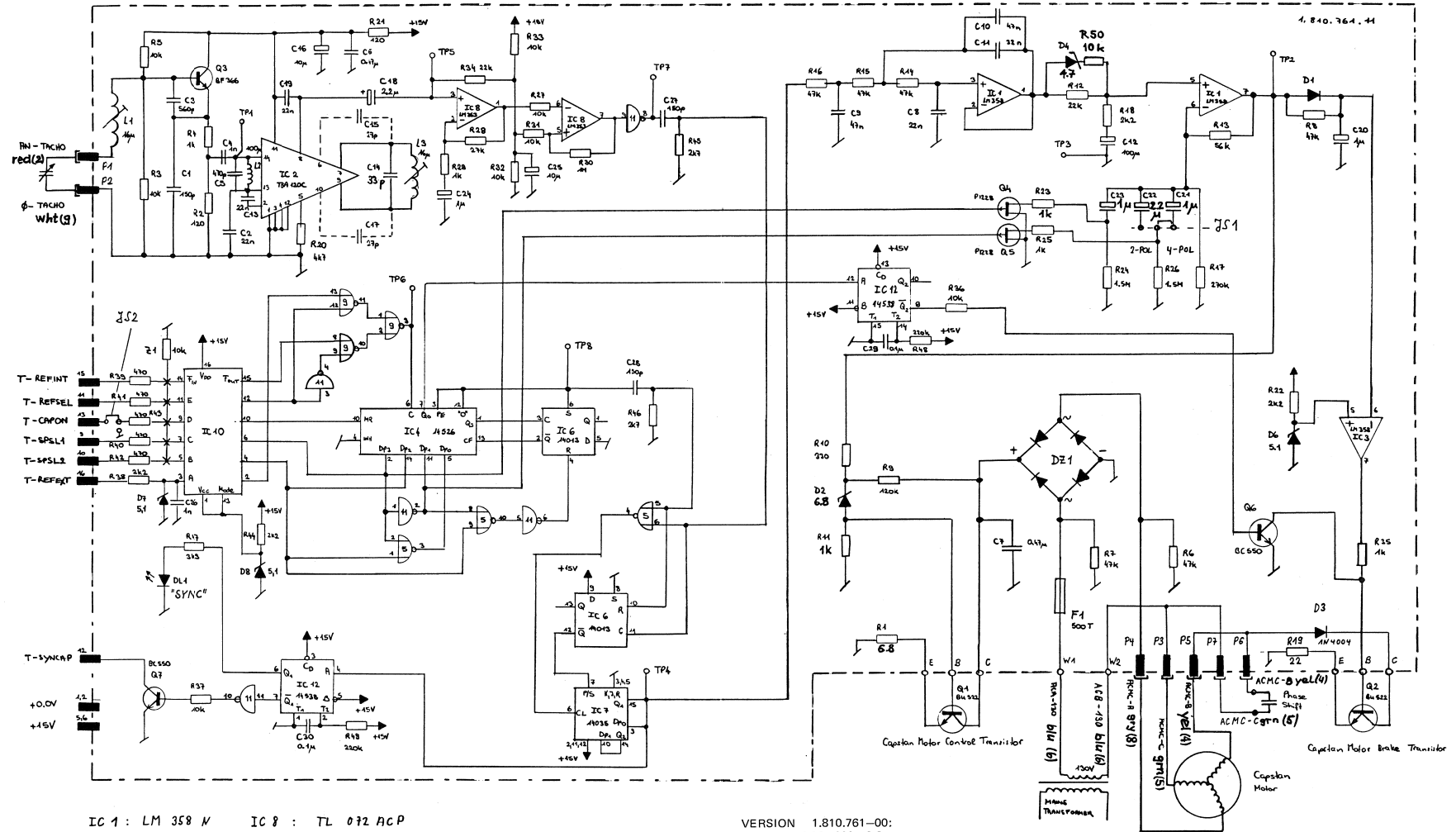
UNIT		PART NUMBER	GR/EL	PAGE
CAPSTAN MOTOR CONTROL PCB	▲	1.810.761-00	26	6/1
CAPSTAN MOTOR CONTROL PCB	▲	1.810.761-81	26	6/1
CAPSTAN MOTOR CONTROL PCB	▲	1.810.766-00	26	6/3
SPOOLING MOTOR CONTROL PCB	▲	1.810.760-00	24	6/5
- CONNECTION PCB LEFT		1.810.726-00	09	6/5
- CONNECTION PCB RIGHT		1.810.727-00	10	6/5
SPOOLING MOTOR CONTROL PCB	▲	1.810.760-81	24	6/7
- CONNECTION PCB LEFT		1.810.726-00	09	6/7
- CONNECTION PCB RIGHT		1.810.727-00	10	6/7
TAPE TENSION SENSOR PCB LEFT	▲	1.810.730-81/-82	27	6/9
- TAPE END SENSOR PCB		1.810.729-00	27/04	6/9
TAPE TENSION SENSOR PCB RIGHT	▲	1.810.728-81/-82	28	6/11
- TAPE END SENSOR PCB		1.810.729-00	28/06	6/11
TAPE MOVE SENSOR PCB		1.810.731-00	28/05	6/13
VARISPEED CONTROL PCB		1.810.762-00	42	6/15
VARISPEED CONTROL PCB		1.810.762-81	42	6/17
BLOCKDIAGRAM CAPSTAN MOTOR CONTROL				6/19



ALL PCBs MARKED WITH THIS SIGN ▲  
CONTAIN COMPONENTS SENSITIVE TO  
STATIC CHARGES.  
PLEASE, REFER TO PREFACE BEFORE  
YOU REMOVE THESE BOARDS.

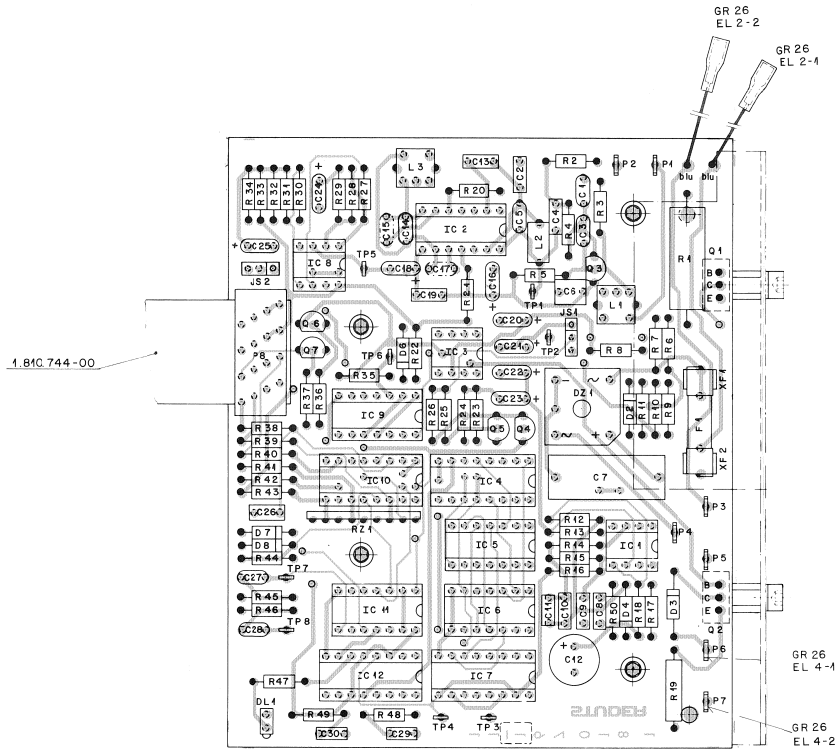


CAPSTAN MOTOR CONTROL PCB 1.810.761-00/-81 GR26 "ESE"





## CAPSTAN MOTOR CONTROL PCB 1.810.761-00/-81 GR26 "ESE"



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.34.4151	150 pF	5% 10V, Ce		
C..0002	59.04.0023	22 nF	10%, 16V		
C..0003	59.34.261	560 pF	5% 10V, Ce		
C..0004	59.04.0022	1 nF	10%, 16V		
C..0005	59.34.261	470 pF	5% 10V, Ce		
C..0006	59.04.0018	0.47 uF	10%, 16V		
C..0007	59.04.0020	0.47 uF	10%, 16V		
C..0008	59.04.0023	22 nF	10%, 16V		
C..0009	59.04.0013	47 nF	10%, 16V		
C..0010	59.04.0013	47 nF	10%, 16V		
C..0011	59.04.0013	33 nF	10%, 16V		
C..0012	59.22.5101	100 uF	10%, 16V, Et		
C..0013	59.04.0023	22 nF	10%, 16V		
C..0014	59.34.2330	33 pF	5% 10V, Ce		
C..0015	59.34.2210	10 uF	See note 1		
C..0016	59.26.2100	10 uF	-20%, 16V, Et		
C..0017	59.34.2210	10 uF	See note 1		
C..0018	59.26.5229	2.2 uF	-20%, 16V, Et		
C..0019	59.04.0023	22 nF	10%, 16V		
C..0020	59.26.9109	1.0 uF	-20%, 16V, Sal	PH	
C..0021	59.26.9109	1.0 uF	-20%, 16V, Sal	PH	
C..0022	59.26.5229	2.2 uF	-20%, 16V, Sal	PH	
C..0023	59.26.9109	1.0 uF	-20%, 16V, Sal	PH	
C..0024	59.26.9109	1.0 uF	-20%, 16V, Sal	PH	
C..0025	59.26.2100	10 uF	-20%, 16V, Sal	PH	
C..0026	59.04.0022	1 nF	10%, 16V		
C..0027	59.34.4151	150 pF	5% 10V, Ce		
C..0028	59.34.4151	150 pF	5% 10V, Ce		
C..0029	59.04.0024	0.1 uF	16V		
C..0030	59.04.0024	0.1 uF	16V		

D..0001	50.04.1102	not used	BZ883C 6-R, BZ855C 6-R, ZPD 6-R	ITT, Ses
D..0002	50.04.0105	1N4004	1N4005, 1N4006, 1N4007	Not
D..0004	50.04.1113	4.7 V Z	BZ883C 4-R, BZ855C 4-R, ZPD 4-R	ITT, Ses
D..0005	50.04.1112	not used	BZ883C 5-R, BZ855C 5-R, ZPD 5-R	ITT, Ses
D..0006	50.04.1112	5.1 V Z	BZ883C 5-R, BZ855C 5-R, ZPD 5-R	ITT, Ses

S T U D E R 82/12/21 CS CAPSTAN MOTOR CONTROL "ESE" 1.810.761-R1 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
D..0007	50.04.1112	5.1 V Z	BZ883C 5-R, BZ855C 5-R, ZPD 5-R	ITT, Ses	
D..0008	50.04.1112	5.1 V Z	BZ883C 5-R, BZ855C 5-R, ZPD 5-R	ITT, Ses	
DL0001	50.04.2107	LED, red	Dialco Nr. 555-200T		
DL0001	50.01.0028	Rectifier	150 W, 1 A, see note 2	GI, Vn	
F..0001	51.01.0114	0.5 A	Fuse, slow blow, 5 x 20 mm		
IC0001	50.04.0105	NE 5532N	NR 1532N	Mot, NS, TI	
IC0002	50.11.0107	TBA120C	TR1205, Q 67000-AA90	Mot, Si	
IC0003	50.07.0026	MC14288CP	MC14288	Mot, NS, TI	
IC0004	50.07.0026	MC14288CP	MC14288	Mot, NS, TI	
IC0005	50.07.0013	MC140138CP	MC140138	Mot, NS, TI	
IC0006	50.07.0013	MC140138CP	MC140138	Mot, NS, TI	
IC0007	50.07.0013	MC140138CP	MC140138	Mot, NS, TI	
IC0008	50.04.0101	LM723CP	LM723	Mot, NS, TI	
IC0009	50.04.0101	LM723CP	LM723	Mot, NS, TI	
IC0010	50.11.0103	MC3466P	MC3466	Mot, NS, TI	
IC0011	50.07.0013	MC140138CP	MC140138	Mot, NS, TI	
IC0012	50.07.0013	MC140138CP	MC140138	Mot, NS, TI	

J..0001	54.14.5021	16 cont.	See note 3		
J5.0001			See note 4		
J5.0002			See note 4		
L..0001	1.022.222.00	16 uH	TDK Nr. EL 0810 5K-101 X	St	
L..0002	62.02.4001	100 uH		St	
L..0003	1.022.222.00	16 uH		St	
P..0001	54.02.0320				
P..0002	54.02.0320				
P..0003	54.02.0320				
P..0004	54.02.0320				
P..0005	54.02.0320				
P..0006	54.02.0320				

S T U D E R 82/12/21 CS CAPSTAN MOTOR CONTROL "ESE" 1.810.761-R1 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
P..0007	54.02.0320				
Q..0001	50.03.0020	BU522		Mot	
Q..0002	50.03.0020	BU522		Mot	
Q..0003	50.03.0020	BU522		Mot	
Q..0004	50.03.0020	P1228E	WP146	TS, S4	
Q..0005	50.03.0020	P1228E	WP146	TS, S4	
Q..0006	50.03.0047	BC550E		Si	
Q..0007	50.03.0047	BC550E		Si	
R..0001	57.11.4189	6.8 Ohm	10%, 4 W		
R..0002	57.11.4189	120 Ohm	5%		
R..0003	57.11.4103	10 kOhm	5%		
R..0004	57.11.4103	10 kOhm	5%		
R..0005	57.11.4103	10 kOhm	5%		
R..0006	57.11.4173	47 kOhm	5%		
R..0007	57.11.4173	47 kOhm	5%		
R..0008	57.11.4173	47 kOhm	5%		
R..0009	57.11.4124	120 kOhm	5%		
R..0010	57.11.4124	330 Ohm	5%		
R..0011	57.11.4102	10 kOhm	5%		
R..0012	57.11.4123	22 Ohm	5%		
R..0013	57.11.4163	56 kOhm	2%		
R..0014	57.11.4173	47 kOhm	2%		
R..0015	57.11.4173	47 kOhm	2%		
R..0016	57.11.4173	47 kOhm	2%		
R..0017	57.11.4274	270 kOhm	2%		
R..0018	57.11.4222	2.2 kOhm	2%		
R..0019	57.13.4220	22 Ohm	5%, 0.3 W		
R..0020	57.11.4173	47 kOhm	5%		
R..0021	57.11.4123	120 Ohm	5%		
R..0022	57.11.4222	2.2 kOhm	5%		
R..0023	57.11.4102	10 kOhm	2%		
R..0024	57.11.4103	10 kOhm	5%		
R..0025	57.11.4102	10 kOhm	2%		
R..0026	57.11.4103	10 kOhm	5%		
R..0027	57.11.4103	10 kOhm	5%		

S T U D E R 82/12/21 CS CAPSTAN MOTOR CONTROL "ESE" 1.810.761-R1 PAGE 3

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R..0028	57.11.4273	27 kOhm	5%		
R..0029	57.11.4102	1 kOhm	5%		
R..0030	57.11.4103	10 kOhm	5%		
R..0031	57.11.4103	10 kOhm	5%		
R..0032	57.11.4103	10 kOhm	5%		
R..0033	57.11.4103	10 kOhm	5%		
R..0034	57.11.4223	22 kOhm	5%		
R..0035	57.11.4102	1 kOhm	5%		
R..0036	57.11.4103	10 kOhm	5%		
R..0037	57.11.4103	10 kOhm	5%		
R..0038	57.11.4222	2.2 kOhm	5%		
R..0039	57.11.4471	470 Ohm	5%		
R..0040	57.11.4471	470 Ohm	5%		
R..0041	57.11.4471	470 Ohm	5%		
R..0042	57.11.4471	470 Ohm	5%		
R..0043	57.11.4471	470 Ohm	5%		
R..0044	57.11.4222	2.2 kOhm	5%		
R..0045	57.11.4272	2.7 kOhm	5%		
R..0046	57.11.4272	2.7 kOhm	5%		
R..0047	57.11.4332	3.3 kOhm	5%		
R..0048	57.11.4224	220 kOhm	5%		
R..0049	57.11.4224	220 kOhm	5%		
R..0050	57.11.4103	10 kOhm	5%		
R2..0001	1.010.014+57		Network B * 10 kOhm, 10%		

S T U D E R 82/12/21 CS CAPSTAN MOTOR CONTROL "ESE" 1.810.761-R1 PAGE 4

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1	[13x17 (27p)]				
Note 2	Rectifier				
Note 3	General Instruments Nr. 88PC 104				
Note 4	Varo Nr. 45 448, 55447				
Note 5	Yamachi Nr. PAS-16-17, Burndy Nr. PAS-16 80-4P				
Note 6	Connection cable Studer Nr. 1.810.744-00				
Note 7	Contact point Studer 54.01.0024, Berq 3 140-102-36				
Note 8	Bridge: Studer 54.01.0021, Philips 2422 024 88D03				
Note 9	Centronics 110 Electrolytic, Sal+Solid Aluminium				
Note 10	MANUFACTURER: Fc=Fairchild, GI=General Instruments, ITT=Intermetall, Mot=Motorola, NS=National Semiconductors, Ph=Philips, PC=Radio Corp. of America, Ses=Siemens, Si=Siemens, TI=Texas Instruments, V=Varo, Vn=Vernier, W=Western Electric, Y=Yamachi				

S T U D E R 82/12/21 CS CAPSTAN MOTOR CONTROL "ESE" 1.810.761-R1 PAGE 5

IC 1 : LM 358 N IC 8 : TL 072 HCP  
IC 2 : TBA 120 C IC 9 : MC 14 001 CCP  
IC 3 : LM 358 N IC 10 : MC 14 504 B  
IC 4 : 4526 BPC IC 11 : 40 014 BCB 1 MC 14584 BCP  
IC 5 : MC 14 001 IC 12 : MC 14 538 BCP  
IC 6 : MC 14 013  
IC 7 : MC 14 035

4.810.744-00

GR 26 EL 2-2

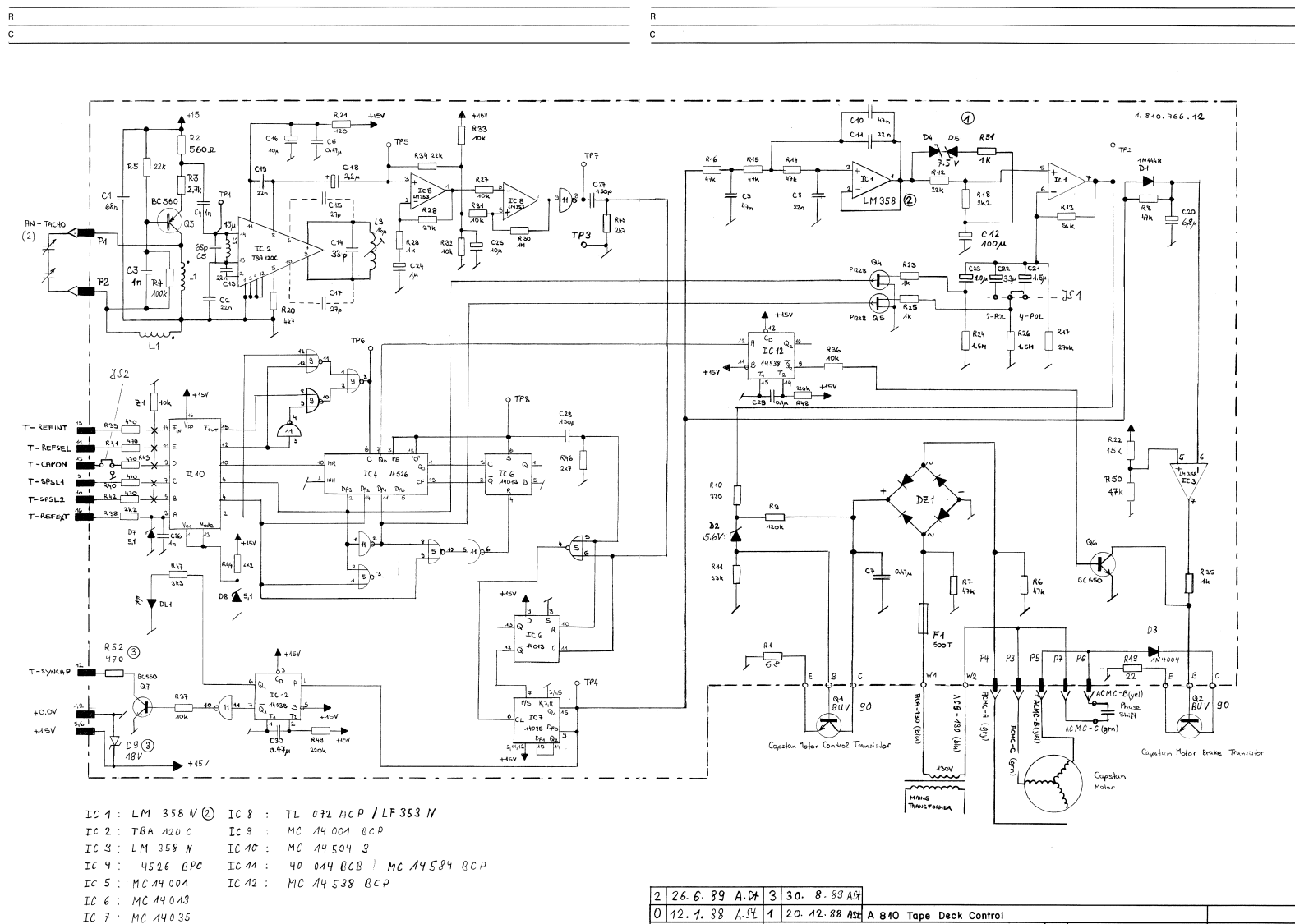
GR 26 EL 2-4

GR 26 EL 4-1

GR 26 EL 4-2

INT.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
L	0001	50.04.0005	50 nF	-20% 100V Co	
L	0002	50.04.0023	22 nF	100V	
L	0003	50.04.0002	1 nF		
L	0004	50.04.0002	1 nF		
L	0005	50.04.0007	60 pF	5% 100V Co	
L	0006	50.04.0076	4 nF	100V	
L	0007	50.04.0003	47 nF	100V	
L	0008	50.04.0023	22 nF	100V	
L	0009	50.04.0073	47 nF	100V	
L	0010	50.04.0073	47 nF	100V	
L	0011	50.04.0033	33 nF	100V	
L	0012	50.04.0031	100 nF	100V c1	
L	0013	50.04.0023	22 nF	100V	
L	0014	50.04.0020	10 pF	5% 100V Co	
L	0015	50.04.0020	10 pF	5% 100V Co	
L	0016	50.04.0020	10 pF	5% 100V Co	
L	0017	50.04.0020	10 pF	5% 100V Co	
L	0018	50.04.0020	10 pF	5% 100V Co	
L	0019	50.04.0020	10 pF	5% 100V Co	
L	0020	50.04.0020	10 pF	5% 100V Co	
L	0021	50.04.0020	10 pF	5% 100V Co	
L	0022	50.04.0020	10 pF	5% 100V Co	
L	0023	50.04.0020	10 pF	5% 100V Co	
L	0024	50.04.0020	10 pF	5% 100V Co	
L	0025	50.04.0020	10 pF	5% 100V Co	
L	0026	50.04.0020	10 pF	5% 100V Co	
L	0027	50.04.0020	10 pF	5% 100V Co	
L	0028	50.04.0020	10 pF	5% 100V Co	
L	0029	50.04.0020	10 pF	5% 100V Co	
L	0030	50.04.0020	10 pF	5% 100V Co	
D	0001	50.04.0025	1N4004		ITT+Phos+II
D	0002	50.04.0025	1N4004		ITT+Phos+II
D	0003	50.04.0025	1N4004		ITT+Phos+II
D	0004	50.04.0025	1N4004		ITT+Phos+II
ST U D E R	43/04/08 CS	CAPSTAN MOTOR CONTROL "E5E"	1.810.766.00	PAGE 1	

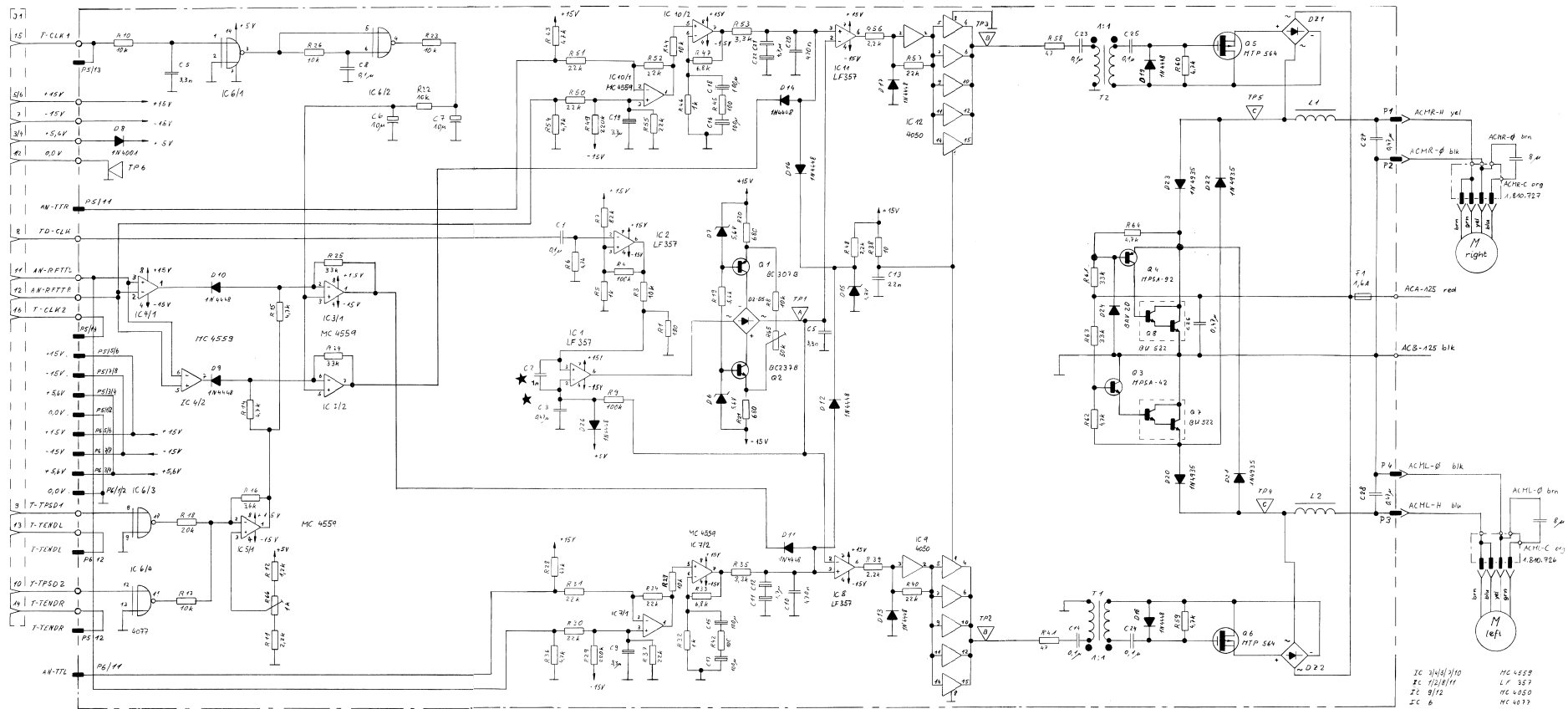
## CAPSTAN MOTOR CONTROL 1.810.766.81



## STUDER (03) 89/08/30 AST CAPSTAN MOTOR CONTROL "ESE" PL 1.810.766.81 PAGE 5

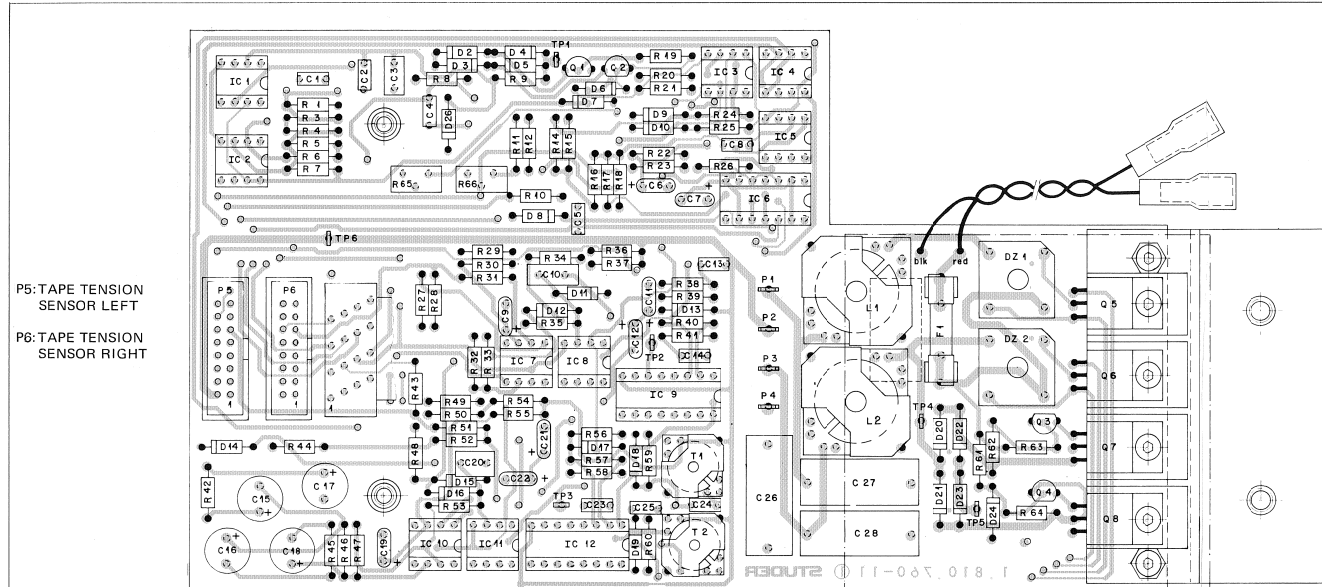
SPOOLING MOTOR CONTROL PCB 1.810.760-00 GR24 "ESE"

CONNECTION PCB LEFT 1.810.726-00 GR9, CONNECTION PCB RIGHT 1.810.727-00 GR10



★ HAS BEEN MODIFIED

## SPOOLING MOTOR CONTROL PCB 1.810.760-00 GR24 "ESE"



IND.	POS+NC	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R..0016		57.11.3362	3.6 kOhm	2%	
R..0017		57.11.4103	10 kOhm		
R..0018		57.11.3203	20 kOhm	2%	
R..0019		57.11.4562	5.6 kOhm		
R..0020		57.11.4681	680 Ohm		
R..0021		57.11.4681	680 Ohm		
R..0022		57.11.4103	10 kOhm		
R..0023		57.11.4333	33 kOhm		
R..0024		57.11.4333	33 kOhm		
R..0025		57.11.4103	10 kOhm		
R..0026		57.11.4103	10 kOhm		
R..0027		57.11.4103	10 kOhm		
R..0028		57.11.4473	4.7 kOhm		
R..0029		57.11.4223	22 kOhm		
R..0030		57.11.4223	22 kOhm		
R..0031		57.11.4482	1 kOhm		
R..0032		57.11.4223	22 kOhm		
R..0033		57.11.4223	22 kOhm		
R..0034		57.11.4223	22 kOhm		
R..0035		57.11.4223	22 kOhm		
R..0036		57.11.4472	4.7 kOhm		
R..0037		57.11.4223	22 kOhm		
R..0038		57.11.4100	10 Ohm		
R..0039		57.11.4223	22 kOhm		
R..0040		57.11.4223	22 kOhm		
R..0041		57.11.4470	4.7 Ohm		
R..0042		57.11.4101	100 Ohm		
R..0043		57.11.4473	4.7 kOhm		
R..0044		57.11.4103	10 Ohm		
R..0045		57.11.4101	100 Ohm		
R..0046		57.11.4102	1 Ohm		
R..0047		57.11.4081	6.8 kOhm		
R..0048		57.11.4222	2.2 kOhm		
R..0049		57.11.4224	220 kOhm		
R..0050		57.11.4223	22 kOhm		
R..0051		57.11.4221	22 kOhm		
R..0052		57.11.4223	22 kOhm		

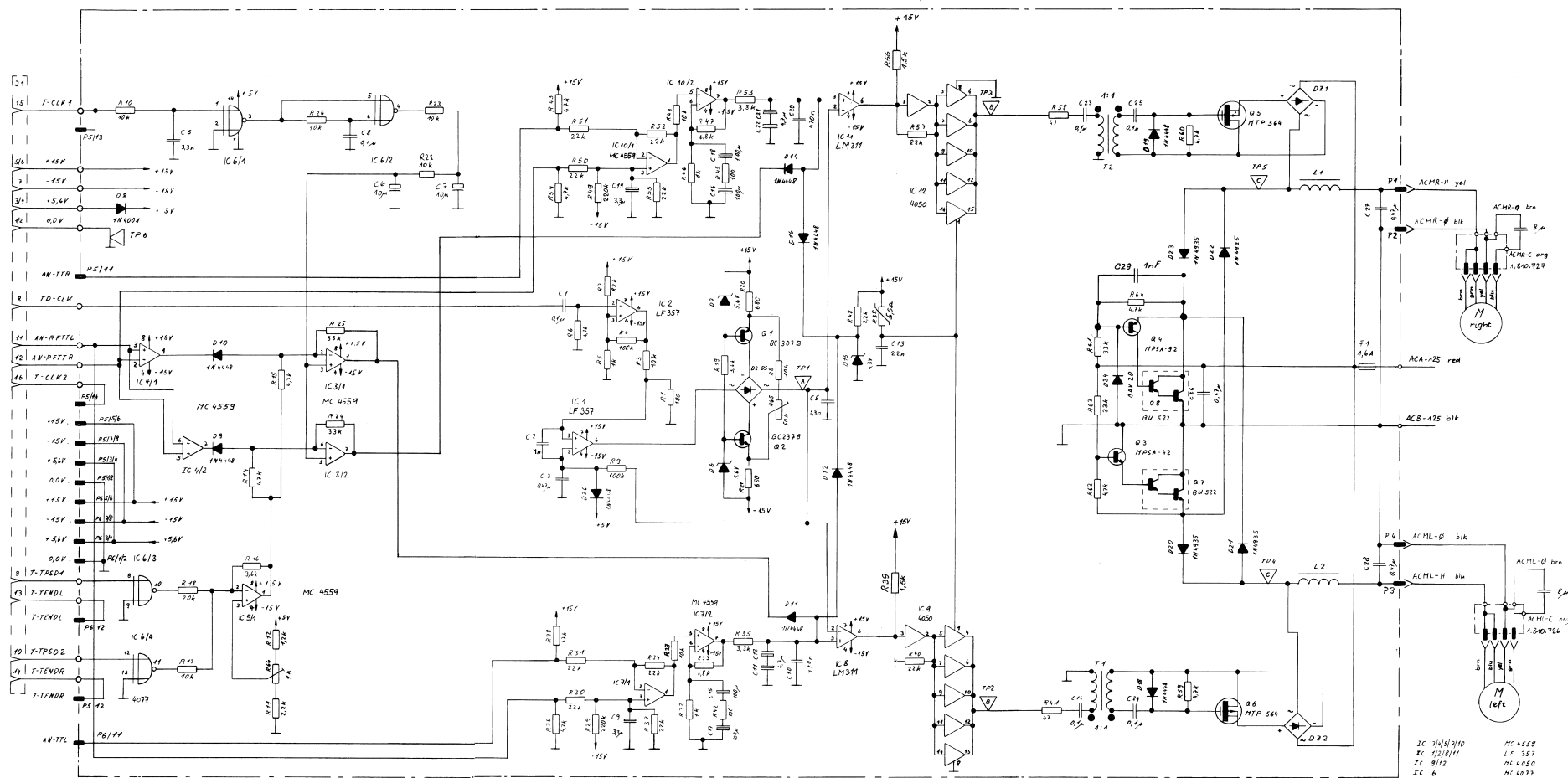
S T U D E R (02) 84/01/17 PB SPOOLING MOTOR CONTROL "ESE" 1.810.760.00 PAGE 4

IND.	POS+NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R..0053		57.11.4332	3.3 kOhm		
R..0054		57.11.4472	4.7 kOhm		
R..0055		57.11.4223	22 kOhm		
R..0056		57.11.4222	2.2 kOhm		
R..0057		57.11.4223	22 kOhm		
R..0058		57.11.4470	4.7 Ohm		
R..0059		57.11.4472	4.7 kOhm		
R..0060		57.11.4472	4.7 kOhm		
R..0061		57.11.4333	33 kOhm		
R..0062		57.11.4472	4.7 kOhm		
R..0063		57.11.4223	22 kOhm		
R..0064		57.11.4472	4.7 kOhm		
R..0065		56.01.7503	50 Ohm	See note 3	
R..0066		58.01.7102	1 kOhm	See note 4	
(01)	TP..0001	29.21.4002		Test Point	
(01)	TP..0001	29.21.4002		Test Point	
(01)	TP..0003	29.21.4002		Test Point	
(01)	TP..0004	29.21.4002		Test Point	
(01)	TP..0005	29.21.4002		Test Point	
(01)	TP..0006	29.21.4002		Test Point	
T..0001		1.022.220.00		Impulse Transformer	St
T..0002		1.022.220.00		Impulse Transformer	St

S T U D E R (02) 84/01/17 PB SPOOLING MOTOR CONTROL "ESE" 1.810.760.00 PAGE 5

IND.	POS+NC	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(00)	C..0001	59.06.0104	0.1 uF	105V, 63V	
(00)	C..0002	59.06.0332	3.3 uF	105V, 63V	
(02)	C..0002	59.06.0102	1 nF	105V, 63V	
C..0003		59.06.0474	0.47 uF	105V, 63V	
C..0004		59.06.0332	3.3 nF	105V, 63V	
C..0005		59.06.0332	3.3 nF	105V, 63V	
C..0006		59.26.2100	10 uF	>20%, 16V, Ssl	Ph
C..0007		59.26.2100	10 uF	>20%, 16V, Ssl	Ph
C..0008		59.06.0104	0.1 uF	105V, 63V	
C..0009		59.26.2339	3.3 uF	20%, 16V, Ssl	Ph
C..0010		59.06.0474	0.47 uF	105V, 63V	
C..0011		59.26.5479	4.7 uF	>20%, 25V, Ssl	Ph
C..0012		59.26.5479	4.7 uF	>20%, 25V, Ssl	Ph
C..0013		59.06.0223	22 nF	105V, 63V	
(00)	C..0014	59.06.0104	0.1 uF	105V, 63V	
C..0015		59.22.5101	100 uF	>10%, 25V, El	
C..0016		59.22.5101	100 uF	>10%, 25V, El	
C..0017		59.22.5101	100 uF	>10%, 25V, El	
C..0018		59.22.5101	100 uF	>10%, 25V, El	
C..0019		59.26.2339	3.3 uF	20%, 16V, Ssl	Ph
C..0020		59.06.0474	0.47 uF	105V, 63V	
C..0021		59.26.5479	4.7 uF	>20%, 25V, Ssl	Ph
C..0022		59.06.0104	0.1 uF	105V, 63V	
C..0023		59.06.0104	0.1 uF	105V, 63V	
C..0024		59.06.0104	0.1 uF	105V, 63V	
C..0025		59.06.0104	0.1 uF	105V, 63V	
C..0026		59.06.0104	0.1 uF	105V, 63V	
C..0027		59.06.0104	0.1 uF	105V, 63V	
C..0028		59.06.0104	0.1 uF	105V, 63V	
C..0029		59.06.0104	0.1 uF	105V, 63V	
C..0030		59.06.0104	0.1 uF	105V, 63V	
C..0031		59.06.0104	0.1 uF	105V, 63V	
C..0032		59.06.0104	0.1 uF	105V, 63V	
C..0033		59.06.0104	0.1 uF	105V, 63V	
C..0034		59.06.0104	0.1 uF	105V, 63V	
C..0035		59.06.0104	0.1 uF	105V, 63V	
C..0036		59.06.0104	0.1 uF	105V, 63V	
C..0037		59.06.0104	0.1 uF	105V, 63V	
C..0038		59.06.0104	0.1 uF	105V, 63V	
C..0039		59.06.0104	0.1 uF	105V, 63V	
C..0040		59.06.0104	0.1 uF	105V, 63V	
C..0041		59.06.0104	0.1 uF	105V, 63V	
C..0042		59.06.0104	0.1 uF	105V, 63V	
C..0043		59.06.0104	0.1 uF	105V, 63V	
C..0044		59.06.0104	0.1 uF	105V, 63V	
C..0045		59.06.0104	0.1 uF	105V, 63V	
C..0046		59.06.0104	0.1 uF	105V, 63V	
C..0047		59.06.0104	0.1 uF	105V, 63V	
C..0048		59.06.0104	0.1 uF	105V, 63V	
C..0049		59.06.0104	0.1 uF	105V, 63V	
C..0050		59.06.0104	0.1 uF	105V, 63V	
C..0051		59.06.0104	0.1 uF	105V, 63V	
C..0052		59.06.0104	0.1 uF	105V, 63V	
C..0053		59.06.0104	0.1 uF	105V, 63V	
C..0054		59.06.0104	0.1 uF	105V, 63V	
C..0055		59.06.0104	0.1 uF	105V, 63V	
C..0056		59.06.0104	0.1 uF	105V, 63V	
C..0057		59.06.0104	0.1 uF	105V, 63V	
C..0058		59.06.0104	0.1 uF	105V, 63V	
C..0059		59.06.0104	0.1 uF	105V, 63V	
C..0060		59.06.0104	0.1 uF	105V, 63V	
C..0061		59.06.0104	0.1 uF	105V, 63V	
C..0062		59.06.0104	0.1 uF	105V, 63V	
C..0063		59.06.0104	0.1 uF	105V, 63V	
C..0064		59.06.0104	0.1 uF	105V, 63V	
C..0065		59.06.0104	0.1 uF	105V, 63V	
C..0066		59.06.0104	0.1 uF	105V, 63V	
C..0067		59.06.0104	0.1 uF	105V, 63V	
C..0068		59.06.0104	0.1 uF	105V, 63V	
C..0069		59.06.0104	0.1 uF	105V, 63V	
C..0070		59.06.0104	0.1 uF	105V, 63V	
C..0071		59.06.0104	0.1 uF	105V, 63V	
C..0072		59.06.0104	0.1 uF	105V, 63V	
C..0073		59.06.0104	0.1 uF	105V, 63V	
C..0074		59.06.0104	0.1 uF	105V, 63V	
C..0075		59.06.0104	0.1 uF	105V, 63V	
C..0076		59.06.0104	0.1 uF	105V, 63V	
C..0077		59.06.0104	0.1 uF	105V, 63V	
C..0078		59.06.0104	0.1 uF	105V, 63V	
C..0079		59.06.0104	0.1 uF	105V, 63V	
C..0080		59.06.0104	0.1 uF	105V, 63V	
C..0081		59.06.0104	0.1 uF	105V, 63V	
C..0082		59.06.0104	0.1 uF	105V, 63V	
C..0083		59.06.0104	0.1 uF	105V, 63V	
C..0084		59.06.0104	0.1 uF	105V, 63V	
C..0085		59.06.0104	0.1 uF	105V, 63V	
C..0086		59.06.0104	0.1 uF	105V, 63V	
C..0087		59.06.0104	0.1 uF	105V, 63V	
C..0088		59.06.0104	0.1 uF	105V, 63V	
C..0089		59.06.0104	0.1 uF	105V, 63V	
C..0090		59.06.0104	0.1 uF	105V, 63V	
C..0091		59.06.0104	0.1 uF	105V, 63V	
C..0092		59.06.0104	0.1 uF	105V, 63V	
C..0093		59.06.0104	0.1 uF	105V, 63V	
C..0094		59.06.0104	0.1 uF	105V, 63V	
C..0095		59.06.0104	0.1 uF	105V, 63V	
C..0096		59.06.0104	0.1 uF	105V, 63V	
C..0097		59.06.0104	0.1 uF	105V, 63V	
C..0098		59.06.0104	0.1 uF	105V, 63V	
C..0099		59.06.0104	0.1 uF	105V, 63V	
C..0100		59.06.0104	0.1 uF	105V, 63V	
C..0101		59.06.0104	0.1 uF	105V, 63V	
C..0102		59.06.0104	0.1 uF	105V, 63V	
C..0103		59.06.0104	0.1 uF	105V, 63V	
C..0104		59.06.0104	0.1 uF	105V, 63V	
C..0105		59.06.0104	0.1 uF	105V, 63V	
C..0106		59.06.0104	0.1 uF	105V, 63V	
C..0107		59.06.0104	0.1 uF	105V, 63V	
C..0108		59.06.0104	0.1 uF	105V, 63V	
C..0109		59.06.0104	0.1 uF	105V, 63V	
C..0110		59.06.0104	0.1 uF	105V, 63V	
C..0111		59.06.0104	0.1 uF	105V, 63V	
C..0112		59.06.0104	0.1 uF	105V, 63V	
C..0113		59.06.0104	0.1 uF	105V, 63V	
C..0114		59.06.0104	0.1 uF	105V, 63V	
C..0115		59.06.0104	0.1 uF	105V, 63V	
C..0116		59.06.0104	0.1 uF	105V, 63V	
C..0117		59.06.0104	0.1 uF	105V, 63V	
C..0118		59.06.0104	0.1 uF	105V, 63V	
C..0119		59.06.0104	0.1 uF	105V, 63V	
C..0120		59.06.0104	0.1 uF	105V, 63V	
C..0121		59.06.0104	0.1 uF	105V, 63V	
C..0122		59.06.0104	0.1 uF	105V, 63V	
C..0123		59.06.0104	0.1 uF	105V, 63V	
C..0124		59.06.0104	0.1 uF	105V, 63V	
C..0125		59.06.0104	0.1 uF	105V, 63V	
C..0126		59.06.0104	0.1 uF	105V, 63V	
C..0127		59.06.0104	0.1 uF	105V, 63V	
C..0128		59.06.0104	0.1 uF	105V, 63V	
C..0129		59.06.0104	0.1 uF	105V, 63V	
C..0130		59.06.0104	0.1 uF	105V, 63V	
C..0131		59.06.0104	0.1 uF	105V, 63V	
C..0132		59.06.0104	0.1 uF	105V, 63V	
C..0133		59.06.0104	0.1 uF	105V, 63V	
C..0134		59.06.0104	0.1 uF	105V, 63V	
C..0135		59.06.0104	0.1 uF	105V, 63V	
C..0136		59.06.0104	0.1 uF	105V, 63V	
C..0137		59.06.0104	0.1 uF	105V, 63V	
C..0138		59.06.0104	0.1 uF	105V, 63V	
C..0139		59.06.0104	0.1 uF	105V, 63V	
C..0140		59.06.0104			

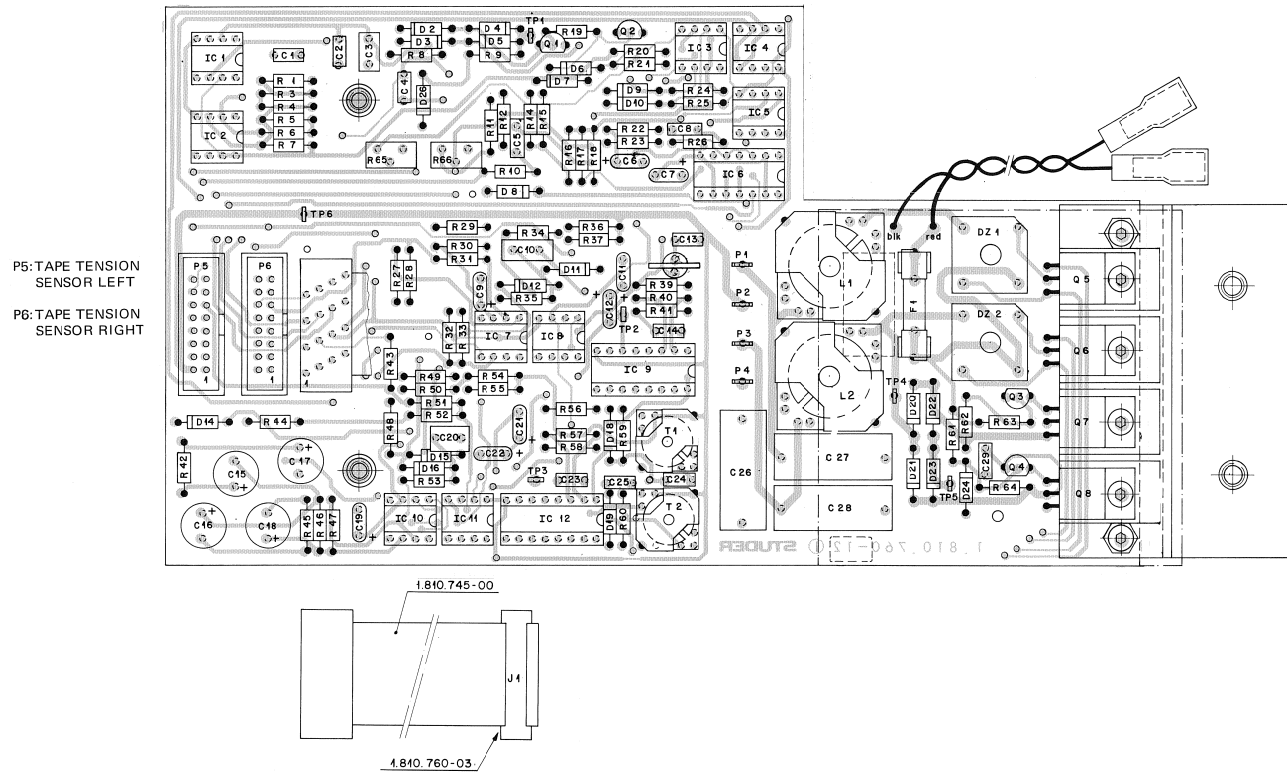
CONNECTION PCB LEFT 1.810.726—00 GR9, CONNECTION PCB RIGHT 1.810.727—00 GR10



★ HAS BEEN MODIFIED



## SPOOLING MOTOR CONTROL PCB 1.810.760-81 GR24 "ESE"



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R..0015	57.11.4472		4.7 kOhm		
R..0016	57.11.3362		3.6 kOhm		
R..0017	57.11.4103		10 kOhm		
R..0018	57.11.3201		20 kOhm		
R..0019	57.11.5562		5.6 kOhm		
R..0020	57.11.4681		680 Ohm		
R..0021	57.11.4681		680 Ohm		
R..0022	57.11.4103		10 kOhm		
R..0023	57.11.4103		10 kOhm		
R..0024	57.11.4333		33 kOhm		
R..0025	57.11.4333		33 kOhm		
R..0026	57.11.4103		10 kOhm		
R..0027	57.11.4103		10 kOhm		
R..0028	57.11.4472		4.7 kOhm		
R..0029	57.11.4224		220 kOhm		
R..0030	57.11.4223		22 kOhm		
R..0031	57.11.4223		22 kOhm		
R..0032	57.11.4102		1 kOhm		
R..0033	57.11.4682		6.8 kOhm		
R..0034	57.11.4223		22 kOhm		
R..0035	57.11.4332		3.3 kOhm		
R..0036	57.11.4472		4.7 kOhm		
R..0037	57.11.4223		22 kOhm		
R..0038	57.11.4223		22 kOhm		
R..0039	57.11.4102		1 kOhm		
R..0040	57.11.4223		22 kOhm		
R..0041	57.11.4101		100 Ohm		
R..0042	57.11.4101		100 Ohm		
R..0043	57.11.4673		47 kOhm		
R..0044	57.11.4103		10 kOhm		
R..0045	57.11.4101		100 Ohm		
R..0046	57.11.4102		1 kOhm		
R..0047	57.11.4682		6.8 kOhm		
R..0048	57.11.4222		2.2 kOhm		
R..0049	57.11.4224		220 kOhm		
R..0050	57.11.4223		22 kOhm		
R..0051	57.11.4223		22 kOhm		

STUDER (01) 84/01/17 PB SPOOLING MOTOR CONTROL "ESE" 1.810.760.81 PAGE 4

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R..0052	57.11.4223		22 kOhm		
R..0053	57.11.4332		3.3 kOhm		
R..0054	57.11.4472		4.7 kOhm		
R..0055	57.11.4223		22 kOhm		
R..0056	57.11.4102		1 kOhm		
R..0057	57.11.4223		22 kOhm		
R..0058	57.11.4470		47 kOhm		
R..0059	57.11.4472		4.7 kOhm		
R..0060	57.11.4333		33 kOhm		
R..0061	57.11.4333		33 kOhm		
R..0062	57.11.4472		4.7 kOhm		
R..0063	57.11.4333		33 kOhm		
R..0064	57.11.4472		4.7 kOhm		
R..0065	57.11.4103		10 kOhm		
R..0066	57.11.4102		1 kOhm		
TP..0001	29.21.6002			Test Point	
TP..0002	29.21.6002			Test Point	
TP..0003	29.21.6002			Test Point	
TP..0004	29.21.6002			Test Point	
TP..0005	29.21.6002			Test Point	
TP..0006	29.21.6002			Test Point	
T..0001	1.022.220.00			Impulse Transformer	St
T..0002	1.022.220.00			Impulse Transformer	St

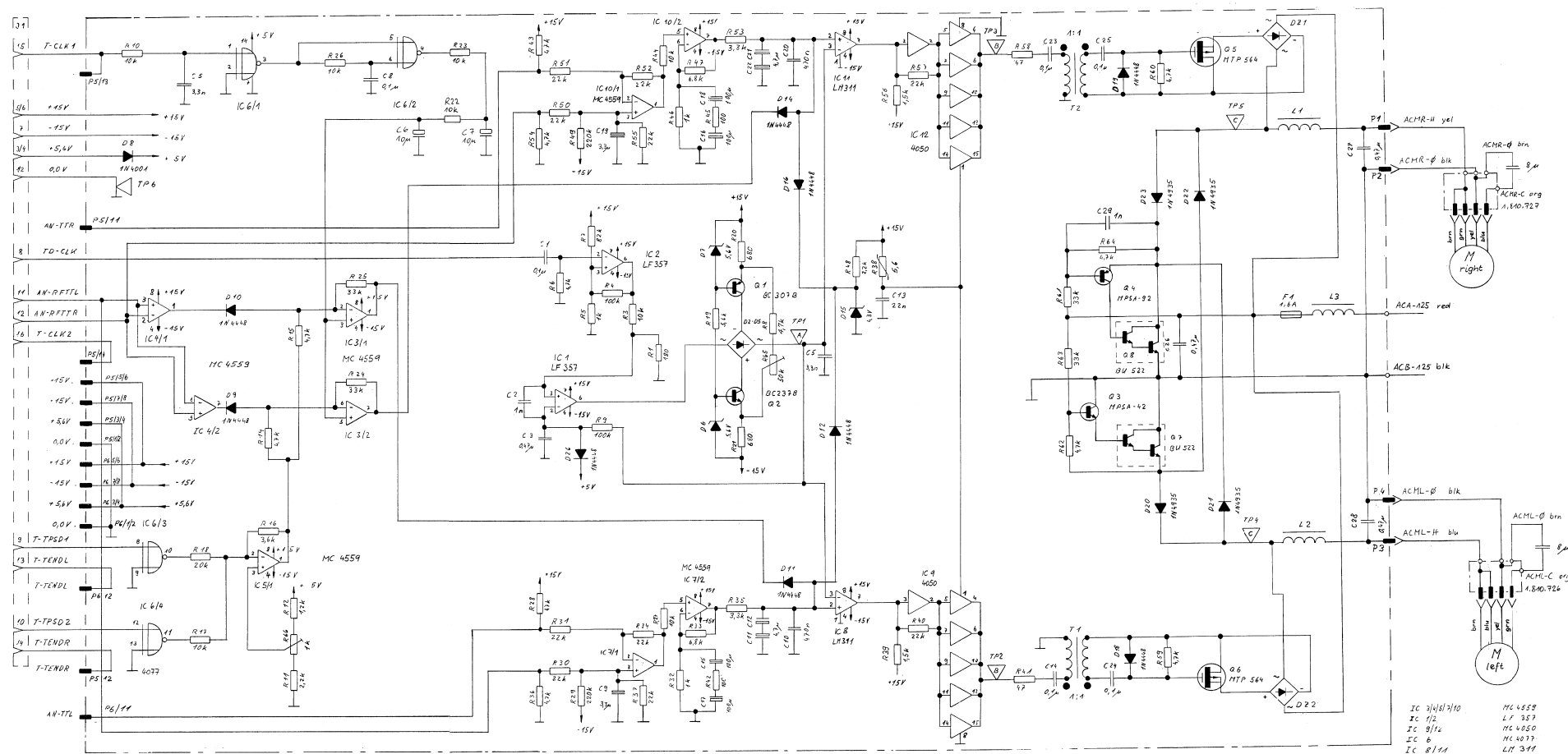
STUDER (01) 84/01/17 PB SPOOLING MOTOR CONTROL "ESE" 1.810.760.81 PAGE 5

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(00)	C..0001	59.06.0104	0.1 uF	10%, 63V		D..0006	50.04.1108	5.6 V Z	B2X83C 5.6V B2X85C 5.6V ZPD 5.6V	ITT+Sen		IC..0011	50.11.0114	LM311P	LM311N	Not+NS		(01)	84.01.17 C 2				
(01)	C..0002	59.06.0102	3.3 uF	10%, 63V		D..0007	50.04.1108	5.6 V Z	B2X83C 5.6V B2X85C 5.6V ZPD 5.6V	ITT+Sen		IC..0012	50.07.0350	MC14050	MC14050CP	Not+PC							
	C..0003	59.06.0102	1 uF	10%, 63V		D..0008	50.04.0122	1N4001	1N4002, 1N4001, 1N4004	RG+L, Not		J..0001	54.14.5321	16 CONT.	SEE NOTE 2								
	C..0004	59.06.0104	0.1 uF	10%, 63V		D..0009	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		L..0001	1.022.21.9.00	1 mH	Storage coil	St							
	C..0005	59.06.0104	0.1 uF	10%, 63V		D..0010	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		L..0002	1.022.21.9.00	1 mH	Storage coil	St							
	C..0006	59.26.0100	10 uF	-20%, 160V, Sal	Ph	D..0011	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		P..0001	54.14.2302	16 CONT.	Yamachi Nr. FAP-16-0804								
	C..0007	59.26.0100	10 uF	-20%, 160V, Sal	Ph	D..0012	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		P..0002	54.14.2302	16 CONT.	Yamachi Nr. FAP-16-0804								
	C..0008	59.06.0104	0.1 uF	10%, 63V		D..0013	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		P..0003	54.14.2302	16 CONT.	Yamachi Nr. FAP-16-0804								
	C..0009	59.26.0100	10 uF	-20%, 160V, Sal	Ph	D..0014	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		P..0004	54.14.2302	16 CONT.	Yamachi Nr. FAP-16-0804								
	C..0010	59.26.0100	10 uF	-20%, 160V, Sal	Ph	D..0015	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		P..0005	54.14.2302	16 CONT.	Yamachi Nr. FAP-16-0804								
	C..0011	59.26.0100	10 uF	-20%, 160V, Sal	Ph	D..0016	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		P..0006	54.14.2302	16 CONT.	Yamachi Nr. FAP-16-0804								
	C..0012	59.06.0104	0.1 uF	10%, 63V		D..0017	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0001	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0013	59.06.0104	0.1 uF	10%, 63V		D..0018	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0002	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0014	59.06.0104	0.1 uF	10%, 63V		D..0019	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0003	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0015	59.22.5101	100 uF	-10%, 250V, El		D..0020	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0004	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0016	59.22.5101	100 uF	-10%, 250V, El		D..0021	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0005	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0017	59.22.5101	100 uF	-10%, 250V, El		D..0022	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0006	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0018	59.22.5101	100 uF	-10%, 250V, El		D..0023	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0007	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0019	59.26.0100	10 uF	-20%, 160V, Sal	Ph	D..0024	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0008	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0020	59.06.0104	0.1 uF	10%, 63V		D..0025	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0009	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0021	59.26.0100	10 uF	-20%, 160V, Sal	Ph	D..0026	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0010	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0022	59.26.0100	10 uF	-20%, 160V, Sal	Ph	D..0027	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0011	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0023	59.06.0104	0.1 uF	10%, 63V		D..0028	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0012	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0024	59.06.0104	0.1 uF	10%, 63V		D..0029	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0013	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0025	59.06.0104	0.1 uF	10%, 63V		D..0030	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0014	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0026	59.06.0104	0.1 uF	10%, 63V		D..0031	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0015	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0027	59.06.0104	0.1 uF	10%, 63V		D..0032	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0016	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0028	59.06.0104	0.1 uF	10%, 63V		D..0033	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0017	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0029	59.06.0104	0.1 uF	10%, 63V		D..0034	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0018	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0030	59.06.0104	0.1 uF	10%, 63V		D..0035	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0019	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0031	59.06.0104	0.1 uF	10%, 63V		D..0036	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0020	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0032	59.06.0104	0.1 uF	10%, 63V		D..0037	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0021	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0033	59.06.0104	0.1 uF	10%, 63V		D..0038	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0022	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0034	59.06.0104	0.1 uF	10%, 63V		D..0039	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0023	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0035	59.06.0104	0.1 uF	10%, 63V		D..0040	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0024	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0036	59.06.0104	0.1 uF	10%, 63V		D..0041	50.04.0125	1N4001	1N4002, 1N4001, 1N4004	ITT+Ph+Sens+TI		Q..0025	50.03.0115	BC107B	BC210B, BC557B, BC560B	ITT+Ph+Ph+TI+TI							
	C..0037	59.06.0104																					

## SPOOLING MOTOR CONTROLLER 1.810.760-82 GR24 "ESE"

- CONNECTION PCB 1.810.726-00 GR9

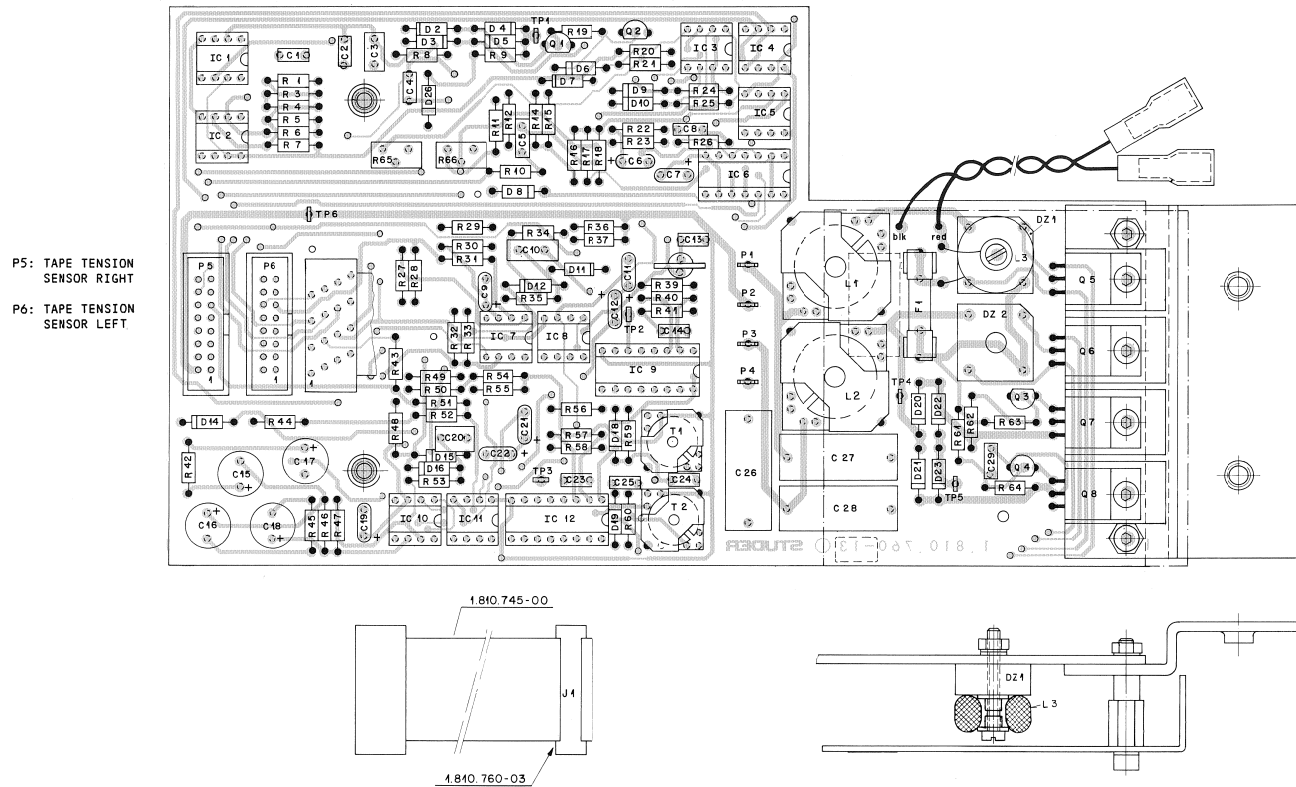
- CONNECTION PCB 1.810.727-00, GR10



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STUDER	Spooling Motor Control
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STUDER	Spooling Motor Control
SC 1.810.760-82	PAGE 4 OF 2

## SPOOLING MOTOR CONTROLLER 1.810.760-82 GR24 "ESE"



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R..0015	57.11.4472		4.7 kOhm		
R..0016	57.11.3362		3.6 kOhm	2%	
R..0017	57.11.4103		10 kOhm		
R..0018	57.11.3203		20 kOhm	2%	
R..0019	57.11.4562		2.4 kOhm		
R..0020	57.11.4681		680 Ohm		
R..0021	57.11.4681		680 Ohm		
R..0022	57.11.4103		10 kOhm		
R..0023	57.11.4103		10 kOhm		
R..0024	57.11.4333		33 kOhm		
R..0025	57.11.4333		33 kOhm		
R..0026	57.11.4103		10 kOhm		
R..0027	57.11.4103		10 kOhm		
R..0028	57.11.4473		4.7 kOhm		
R..0029	57.11.4224		220 kOhm		
R..0030	57.11.4223		22 kOhm		
R..0031	57.11.4223		22 kOhm		
R..0032	57.11.4102		1 kOhm		
R..0033	57.11.4682		6.8 kOhm		
R..0034	57.11.4223		22 kOhm		
R..0035	57.11.4332		3.3 kOhm		
R..0036	57.11.4472		4.7 kOhm		
R..0037	57.11.4223		22 kOhm		
R..0038	57.99.0209		5.6 Ohm	PTC-Resistor; Philips Nr. 2322 662 91005	
R..0039	57.11.4152		1.5 kOhm		
R..0040	57.11.4223		22 kOhm		
R..0041	57.11.4470		4.7 kOhm		
R..0042	57.11.4101		100 Ohm		
R..0043	57.11.4473		4.7 kOhm		
R..0044	57.11.4103		10 kOhm		
R..0045	57.11.4101		100 Ohm		
R..0046	57.11.4102		1 kOhm		
R..0047	57.11.4682		6.8 kOhm		
R..0048	57.11.4222		2.2 kOhm		
R..0049	57.11.4224		220 kOhm		
R..0050	57.11.4223		22 kOhm		
R..0051	57.11.4223		22 kOhm		

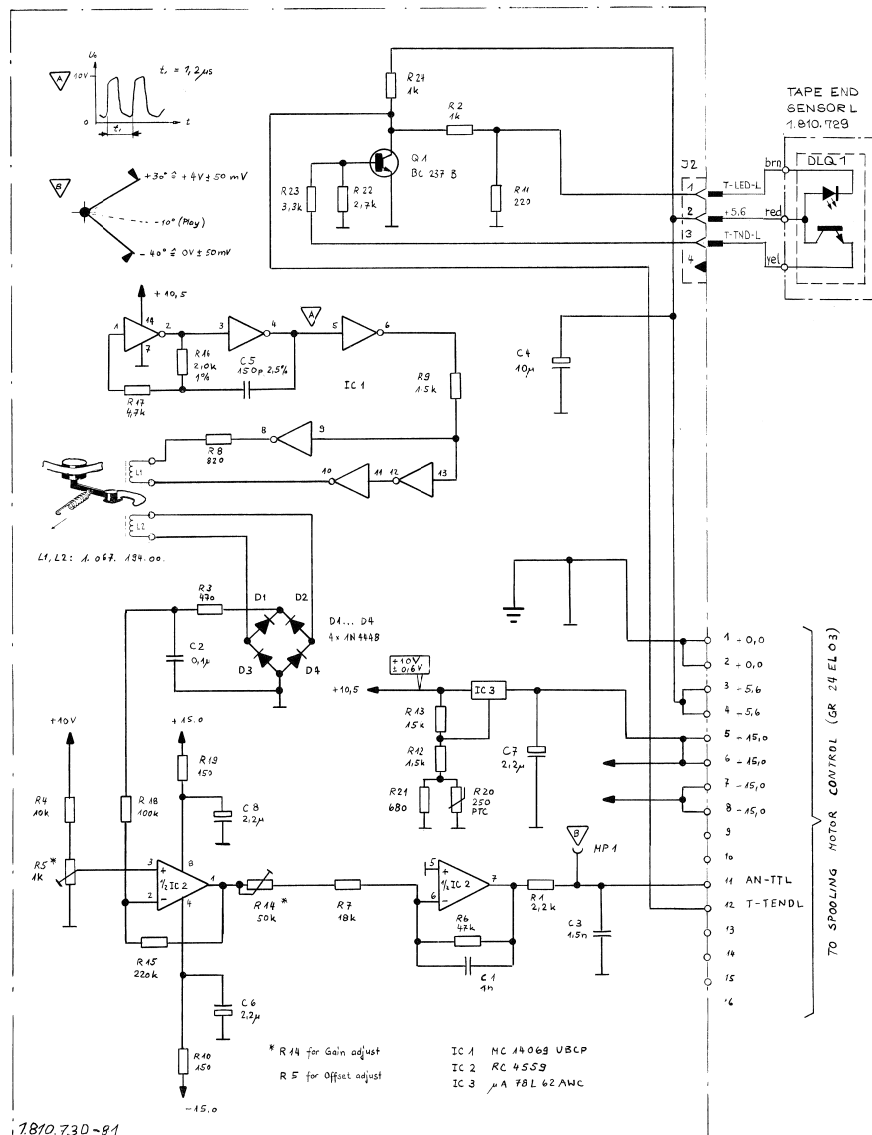
S T U D E R (00) 85/10/28 AST SPOOLING MOTOR CONTROL "ESE" 1.810.760-82 PAGE 4

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R..0051	57.11.4223		22 kOhm		
R..0052	57.11.4332		3.3 kOhm		
R..0053	57.11.4472		4.7 kOhm		
R..0054	57.11.4223		22 kOhm		
R..0055	57.11.4152		1.5 kOhm		
R..0056	57.11.4223		22 kOhm		
R..0057	57.11.4470		4.7 kOhm		
R..0058	57.11.4472		4.7 kOhm		
R..0059	57.11.4223		22 kOhm		
R..0060	57.11.4102		1 kOhm		
R..0061	57.11.4333		33 kOhm		
R..0062	57.11.4472		4.7 kOhm		
R..0063	57.11.4333		33 kOhm		
R..0064	57.11.4472		4.7 kOhm		
R..0065	58.01.9101		1 kOhm	See note 3	
R..0066	58.01.9102		1 kOhm	See note 4	
TP..0001	29.21.6002			Test Point	
TP..0002	29.21.6002			Test Point	
TP..0003	29.21.6002			Test Point	
TP..0004	29.21.6002			Test Point	
TP..0005	29.21.6002			Test Point	
TP..0006	29.21.6002			Test Point	
T..0001	1.022.270-00			Impulse Transformer	St
T..0002	1.022.270-00			Impulse Transformer	St

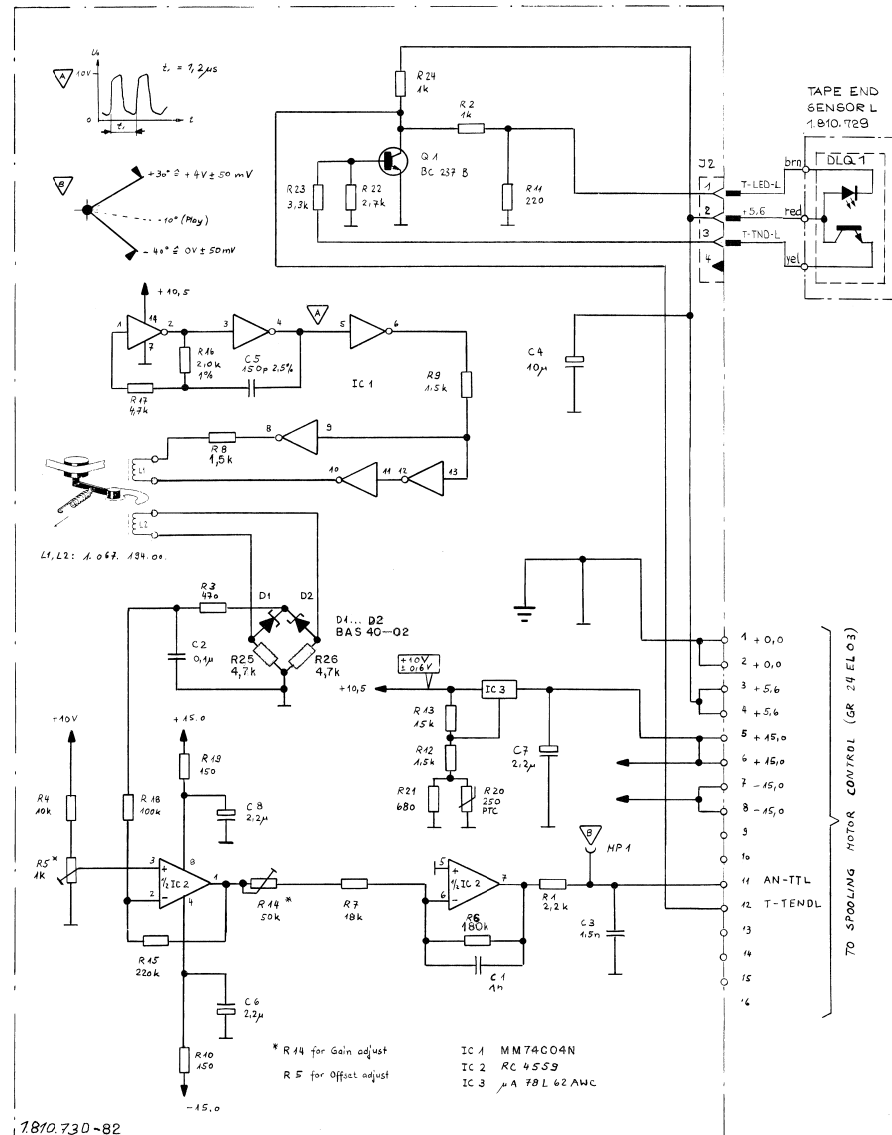
S T U D E R (00) 85/10/28 AST SPOOLING MOTOR CONTROL "ESE" 1.810.760-82 PAGE 5

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.06.0104	0.1 uF	10%, 63V		
C..0002	59.06.0102	0.1 uF	10%, 63V		
C..0003	59.06.0104	0.47 uF	10%, 63V		
C..0004	59.06.0332	3.3 nF	10%, 63V		
C..0005	59.06.0332	3.3 nF	10%, 63V		
C..0006	59.26.2100	10 uF	-20%, 16V, Sal		Ph
C..0007	59.26.2100	10 uF	-20%, 16V, Sal		Ph
C..0008	59.06.0104	0.1 uF	10%, 63V		
C..0009	59.26.2139	3.3 uF	-20%, 16V, Sal		Ph
C..0010	59.06.0474	0.47 uF	10%, 63V		
C..0011	59.26.5478	4.7 uF	10%, 63V		Ph
C..0012	59.26.5479	4.7 uF	-20%, 25V, Sal		Ph
C..0013	59.06.0223	22 nF	10%, 63V		
C..0014	59.06.0104	0.1 uF	10%, 63V		
C..0015	59.06.0104	0.1 uF	10%, 63V		
C..0016	59.22.5101	100 uF	-10%, 25V, El		
C..0017	59.22.5101	100 uF	-10%, 25V, El		
C..0018	59.22.5101	100 uF	-10%, 25V, El		
C..0019	59.26.2339	3.3 uF	20%, 16V, Sal		Ph
C..0020	59.06.0474	0.47 uF	10%, 63V		
C..0021	59.26.5479	4.7 uF	-20%, 25V, Sal		Ph
C..0022	59.26.5479	4.7 uF	-20%, 25V, Sal		Ph
C..0023	59.06.0104	0.1 uF	10%, 63V		
C..0024	59.06.0104	0.1 uF	10%, 63V		
C..0025	59.06.0104	0.1 uF	10%, 63V		
C..0026	59.99.0450	0.47 uF	10%, 150V, Mp		
C..0027	59.99.0450	0.47 uF	10%, 150V, Mp		
C..0028	59.99.0450	0.47 uF	10%, 150V, Mp		
C..0029	59.06.0102	1000 pF	10%, 63V, PETP		
C..0030	59.06.0102	1000 pF	10%, 63V, PETP		
D..0001	50.04.0125	not used		ITT+Ph+Sen+Ti	
D..0002	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0003	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0004	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0005	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0006	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0007	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0008	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0009	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0010	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0011	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0012	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0013	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0014	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0015	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0016	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0017	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0018	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0019	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0020	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0021	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0022	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0023	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0024	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0025	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0026	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0027	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0028	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0029	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0030	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0031	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0032	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0033	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0034	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0035	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0036	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0037	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0038	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0039	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0040	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0041	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0042	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0043	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0044	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0045	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0046	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0047	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0048	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0049	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0050	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0051	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0052	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0053	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0054	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0055	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0056	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0057	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0058	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0059	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0060	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0061	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0062	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0063	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0064	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0065	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0066	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0067	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0068	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0069	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0070	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0071	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0072	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0073	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0074	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0075	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0076	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0077	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0078	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0079	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0080	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0081	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0082	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0083	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0084	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0085	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0086	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0087	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0088	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0089	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0090	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0091	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0092	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0093	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0094	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0095	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0096	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0097	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0098	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0099	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0100	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0101	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0102	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0103	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0104	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0105	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
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D..0108	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0109	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0110	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0111	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0112	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D..0113	50.04.0125	IN4448		ITT+Ph+Sen+Ti	
D					

TAPE TENSION SENSOR PCB LEFT 1.810.730-81 GR27 "ESE"  
TAPE END SENSOR PCB 1.810.729-00 GR27 EL4



TAPE TENSION SENSOR PCB LEFT 1.810.730-82 GR27 "ESE"  
TAPE END SENSOR PCB 1.810.729-00 GR27 EL4



TAPE TENSION SENSOR PCB LEFT 1.810.730-81/-82 GR27 "ESE"

TAPE END SENSOR PCB 1.810.729-00 GR27 EL4

EL 01 GR 27

Ader 1

1.810.745-0C

EL02 GR 27

EL 01 GR 27

Ader 1

1.810.745-00

EL02 GR 27

IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C-----1	59-06-0102		1 nF	10%	
C-----2	59-12-2104		100 nF	5%	
C-----3	59-26-2192		1.5 nF	2.5%, 10%, PP	Ph
C-----4	59-26-2100		10 uF	20%, 10%, Sol	
C-----5	59-26-2151		150 uF	2.5%, PP	Ph
C-----6	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
C-----7	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
C-----8	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
D-----1	50-04-0125	1N4448		ITT*Ph*Sem*Ti	
D-----2	50-04-0125	1N4448		ITT*Ph*Sem*Ti	
D-----3	50-04-0125	1N4448		ITT*Ph*Sem*Ti	
D-----4	50-04-0125	1N4448		ITT*Ph*Sem*Ti	
IC-----1	50-07-1007	RC4599B		RC4599B/PC	Ph
IC-----2	50-09-0107	RC4599B		RC4599B	Ph
IC-----3	50-10-0101	uA78L02ZAC		uA78L02ZAC	Ph
J-----1	50-11-0304		4 cont.	AMP Nr. 163-083-2	
J-----2	50-11-0301		16 cont.	See note 1	
L-----1	1-067-194-00			Sensor coil	St
L-----2	1-067-194-00			Sensor coil	St
Q-----1	50-03-0436	BC237B		BC547B, BC950B	ITT*Ph*Ph*Sem*Ti
R-----1	57-11-4222		2.2 kOhm	2%	
R-----2	57-11-4102		1 kOhm	2%	
R-----3	57-11-4471		470 Ohm	2%	
R-----4	57-11-4103		10 kOhm	2%	
R-----5	58-01-8102		1 kOhm	See note 2	
R-----6	57-11-4184		180 kOhm	2%	
R-----7	57-11-4183		18 kOhm	2%	
R-----8	57-11-4152		1.5 kOhm	2%	
R-----9	57-11-4152		1.5 kOhm	2%	
R-----10	57-11-4151		150 Ohm	2%	
R-----11	57-11-4221		220 Ohm	2%	
R-----12	57-11-4153		15 kOhm	2%	

S T U D E R (00) 82/09/28 PST TAPE TENSION SENSOR LEFT 1.810.730-81 PAGE 1

IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R-----12	57-11-4152		1.5 kOhm	2%	
R-----13	57-11-4153		15 kOhm	2%	
R-----14	58-01-8503		50 kOhm	See note 3	
R-----15	57-11-4224		220 kOhm	2%	
R-----16	57-11-4225		220 kOhm	2%	
R-----17	57-11-4226		220 kOhm	2%	
R-----18	57-11-4227		220 kOhm	2%	
R-----19	57-11-4228		220 kOhm	2%	
R-----20	57-11-4229		220 kOhm	2%	
R-----21	57-11-4230		220 kOhm	2%	
R-----22	57-11-4231		220 kOhm	2%	
R-----23	57-11-4232		220 kOhm	2%	
R-----24	57-11-4233		220 kOhm	2%	

Nota 1 - YAMACHI Nr. PAS-10-17; Burndy Nr. FRS-16 BD-1P  
Connection cable Studer Nr. 1.810.745-0P

Nota 2 - Potentiometer, 1 kOhm  
Altim Bradley Nr. E 28 102  
Bourne Nr. 3380 F-1-102  
Spectrol Nr. 63 M 102 T010

Nota 3 - Potentiometer, 50 kOhm  
Altim Bradley Nr. E 28 103  
Bourne Nr. 3380 F-1-103  
Spectrol Nr. 63 M 103 T010

PPH:Polypropylene, Sol:solid aluminium

MANUFACTURERS: Ph=Philips, ITT=Intermetall, Mot=Motorola, Ph=Philips, RC=Resistor, RC=Resistor Corp. of America, Sig=Siemens, Sig=Siemens, Sig=Siemens, St=Studer, Tr=Telefunken, Tr=Texas Instruments

DRG 82/09/28

S T U D E R (00) 82/09/28 PST TAPE TENSION SENSOR LEFT 1.810.730-81 PAGE 2

IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C-----1	59-06-0102		1 nF	10%	
C-----2	59-12-2104		100 nF	5%	
C-----3	59-26-2192		1.5 nF	2.5%, 10%, PP	Ph
C-----4	59-26-2100		10 uF	20%, 10%, Sol	
C-----5	59-26-2151		150 uF	2.5%, PP	Ph
C-----6	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
C-----7	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
C-----8	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
D-----1	50-04-0127	8A5 40-02	BAT 85		St
D-----2	50-04-0127	8A5 40-02	BAT 85		St
IC-----1	50-49-0167	MM74C04N		MM74C04N/A	NS
IC-----2	50-49-0107	RC4599B		RC4599B	Ph
IC-----3	50-10-0101	uA78L02ZAC		uA78L02ZAC	Ph
J-----1	50-11-0304		4 cont.	AMP Nr. 163-083-2	
J-----2	50-11-0301		16 cont.	See note 1	
L-----1	1-067-194-00			Sensor coil	St
L-----2	1-067-194-00			Sensor coil	St
Q-----1	50-03-0436	BC237B		BC547B, BC950B	ITT*Ph*Ph*Sem*Ti
R-----1	57-11-4222		2.2 kOhm	2%	
R-----2	57-11-4102		1 kOhm	2%	
R-----3	57-11-4471		470 Ohm	2%	
R-----4	57-11-4103		10 kOhm	2%	
R-----5	58-01-8102		1 kOhm	See note 2	
R-----6	57-11-4184		180 kOhm	2%	
R-----7	57-11-4183		18 kOhm	2%	
R-----8	57-11-4152		1.5 kOhm	2%	
R-----9	57-11-4152		1.5 kOhm	2%	
R-----10	57-11-4151		150 Ohm	2%	
R-----11	57-11-4221		220 Ohm	2%	
R-----12	57-11-4153		15 kOhm	2%	

S T U D E R (00) 84/01/10 BBT TAPE TENSION SENSOR LEFT 1.810.730-82 PAGE 1

IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R-----14	58-01-8503		50 kOhm	See note 3	
R-----15	57-11-4224		220 kOhm	2%	
R-----16	57-11-4225		220 kOhm	2%	
R-----17	57-11-4226		220 kOhm	2%	
R-----18	57-11-4227		220 kOhm	2%	
R-----19	57-11-4228		220 kOhm	2%	
R-----20	57-11-4229		220 kOhm	2%	
R-----21	57-11-4230		220 kOhm	2%	
R-----22	57-11-4231		220 kOhm	2%	
R-----23	57-11-4232		220 kOhm	2%	
R-----24	57-11-4233		220 kOhm	2%	

Nota 1 - YAMACHI Nr. PAS-10-17; Burndy Nr. FRS-16 BD-1P  
Connection cable Studer Nr. 1.810.745-0P

Nota 2 - Potentiometer, 1 kOhm  
Altim Bradley Nr. E 28 102  
Bourne Nr. 3380 F-1-102  
Spectrol Nr. 63 M 102 T010

Nota 3 - Potentiometer, 50 kOhm  
Altim Bradley Nr. E 28 103  
Bourne Nr. 3380 F-1-103  
Spectrol Nr. 63 M 103 T010

PPH:Polypropylene, Sol:solid aluminium

MANUFACTURERS: Ph=Philips, ITT=Intermetall, Mot=Motorola, Ph=Philips, RC=Resistor, RC=Resistor Corp. of America, Sig=Siemens, Sig=Siemens, Sig=Siemens, St=Studer, Tr=Telefunken, Tr=Texas Instruments

DRG 84/01/10

S T U D E R (00) 84/01/10 BBT TAPE TENSION SENSOR LEFT 1.810.730-82 PAGE 2

EL 01 GR 27

Ader 1

1.810.745-0C

EL02 GR 27

EL 01 GR 27

Ader 1

1.810.745-00

EL02 GR 27

IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C-----1	59-06-0102		1 nF	10%	
C-----2	59-12-2104		100 nF	5%	
C-----3	59-26-2192		1.5 nF	2.5%, 10%, PP	Ph
C-----4	59-26-2100		10 uF	20%, 10%, Sol	
C-----5	59-26-2151		150 uF	2.5%, PP	Ph
C-----6	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
C-----7	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
C-----8	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
D-----1	50-04-0127	8A5 40-02	BAT 85		St
D-----2	50-04-0127	8A5 40-02	BAT 85		St
IC-----1	50-49-0167	MM74C04N		MM74C04N/A	NS
IC-----2	50-49-0107	RC4599B		RC4599B	Ph
IC-----3	50-10-0101	uA78L02ZAC		uA78L02ZAC	Ph
J-----1	50-11-0304		4 cont.	AMP Nr. 163-083-2	
J-----2	50-11-0301		16 cont.	See note 1	
L-----1	1-067-194-00			Sensor coil	St
L-----2	1-067-194-00			Sensor coil	St
Q-----1	50-03-0436	BC237B		BC547B, BC950B	ITT*Ph*Ph*Sem*Ti
R-----1	57-11-4222		2.2 kOhm	2%	
R-----2	57-11-4102		1 kOhm	2%	
R-----3	57-11-4471		470 Ohm	2%	
R-----4	57-11-4103		10 kOhm	2%	
R-----5	58-01-8102		1 kOhm	See note 2	
R-----6	57-11-4184		180 kOhm	2%	
R-----7	57-11-4183		18 kOhm	2%	
R-----8	57-11-4152		1.5 kOhm	2%	
R-----9	57-11-4152		1.5 kOhm	2%	
R-----10	57-11-4151		150 Ohm	2%	
R-----11	57-11-4221		220 Ohm	2%	
R-----12	57-11-4153		15 kOhm	2%	

S T U D E R (00) 82/09/28 PST TAPE TENSION SENSOR LEFT 1.810.730-81 PAGE 1

IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R-----12	57-11-4152		1.5 kOhm	2%	
R-----13	57-11-4153		15 kOhm	2%	
R-----14	58-01-8503		50 kOhm	See note 3	
R-----15	57-11-4224		220 kOhm	2%	
R-----16	57-11-4225		220 kOhm	2%	
R-----17	57-11-4226		220 kOhm	2%	
R-----18	57-11-4227		220 kOhm	2%	
R-----19	57-11-4228		220 kOhm	2%	
R-----20	57-11-4229		220 kOhm	2%	
R-----21	57-11-4230		220 kOhm	2%	
R-----22	57-11-4231		220 kOhm	2%	
R-----23	57-11-4232		220 kOhm	2%	
R-----24	57-11-4233		220 kOhm	2%	

Nota 1 - YAMACHI Nr. PAS-10-17; Burndy Nr. FRS-16 BD-1P  
Connection cable Studer Nr. 1.810.745-0P

Nota 2 - Potentiometer, 1 kOhm  
Altim Bradley Nr. E 28 102  
Bourne Nr. 3380 F-1-102  
Spectrol Nr. 63 M 102 T010

Nota 3 - Potentiometer, 50 kOhm  
Altim Bradley Nr. E 28 103  
Bourne Nr. 3380 F-1-103  
Spectrol Nr. 63 M 103 T010

PPH:Polypropylene, Sol:solid aluminium

MANUFACTURERS: Ph=Philips, ITT=Intermetall, Mot=Motorola, Ph=Philips, RC=Resistor, RC=Resistor Corp. of America, Sig=Siemens, Sig=Siemens, Sig=Siemens, St=Studer, Tr=Telefunken, Tr=Texas Instruments

DRG 82/09/28

S T U D E R (00) 82/09/28 PST TAPE TENSION SENSOR LEFT 1.810.730-81 PAGE 2

IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C-----1	59-06-0102		1 nF	10%	
C-----2	59-12-2104		100 nF	5%	
C-----3	59-26-2192		1.5 nF	2.5%, 10%, PP	Ph
C-----4	59-26-2100		10 uF	20%, 10%, Sol	
C-----5	59-26-2151		150 uF	2.5%, PP	Ph
C-----6	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
C-----7	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
C-----8	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
D-----1	50-04-0127	8A5 40-02	BAT 85		St
D-----2	50-04-0127	8A5 40-02	BAT 85		St
IC-----1	50-49-0167	MM74C04N		MM74C04N/A	NS
IC-----2	50-49-0107	RC4599B		RC4599B	Ph
IC-----3	50-10-0101	uA78L02ZAC		uA78L02ZAC	Ph
J-----1	50-11-0304		4 cont.	AMP Nr. 163-083-2	
J-----2	50-11-0301		16 cont.	See note 1	
L-----1	1-067-194-00			Sensor coil	St
L-----2	1-067-194-00			Sensor coil	St
Q-----1	50-03-0436	BC237B		BC547B, BC950B	ITT*Ph*Ph*Sem*Ti
R-----1	57-11-4222		2.2 kOhm	2%	
R-----2	57-11-4102		1 kOhm	2%	
R-----3	57-11-4471		470 Ohm	2%	
R-----4	57-11-4103		10 kOhm	2%	
R-----5	58-01-8102		1 kOhm	See note 2	
R-----6	57-11-4184		180 kOhm	2%	
R-----7	57-11-4183		18 kOhm	2%	
R-----8	57-11-4152		1.5 kOhm	2%	
R-----9	57-11-4152		1.5 kOhm	2%	
R-----10	57-11-4151		150 Ohm	2%	
R-----11	57-11-4221		220 Ohm	2%	
R-----12	57-11-4153		15 kOhm	2%	

S T U D E R (00) 84/01/10 BBT TAPE TENSION SENSOR LEFT 1.810.730-82 PAGE 1

IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R-----14	58-01-8503		50 kOhm	See note 3	
R-----15	57-11-4224		220 kOhm	2%	
R-----16	57-11-4225		220 kOhm	2%	
R-----17	57-11-4226		220 kOhm	2%	
R-----18	57-11-4227		220 kOhm	2%	
R-----19	57-11-4228		220 kOhm	2%	
R-----20	57-11-4229		220 kOhm	2%	
R-----21	57-11-4230		220 kOhm	2%	
R-----22	57-11-4231		220 kOhm	2%	
R-----23	57-11-4232		220 kOhm	2%	
R-----24	57-11-4233		220 kOhm	2%	

Nota 1 - YAMACHI Nr. PAS-10-17; Burndy Nr. FRS-16 BD-1P  
Connection cable Studer Nr. 1.810.745-0P

Nota 2 - Potentiometer, 1 kOhm  
Altim Bradley Nr. E 28 102  
Bourne Nr. 3380 F-1-102  
Spectrol Nr. 63 M 102 T010

Nota 3 - Potentiometer, 50 kOhm  
Altim Bradley Nr. E 28 103  
Bourne Nr. 3380 F-1-103  
Spectrol Nr. 63 M 103 T010

PPH:Polypropylene, Sol:solid aluminium

MANUFACTURERS: Ph=Philips, ITT=Intermetall, Mot=Motorola, Ph=Philips, RC=Resistor, RC=Resistor Corp. of America, Sig=Siemens, Sig=Siemens, Sig=Siemens, St=Studer, Tr=Telefunken, Tr=Texas Instruments

DRG 84/01/10

S T U D E R (00) 84/01/10 BBT TAPE TENSION SENSOR LEFT 1.810.730-82 PAGE 2

EL 01 GR 27

Ader 1

1.810.745-0C

EL02 GR 27

EL 01 GR 27

Ader 1

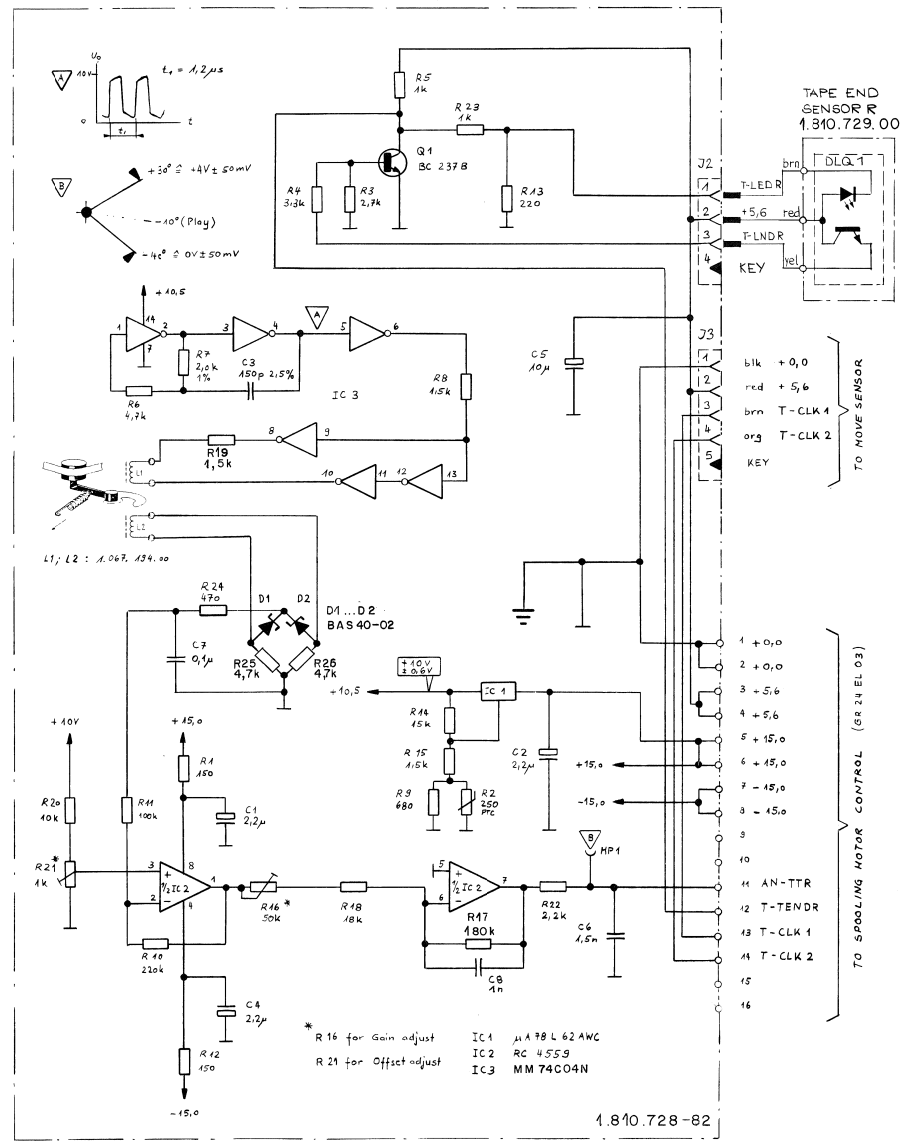
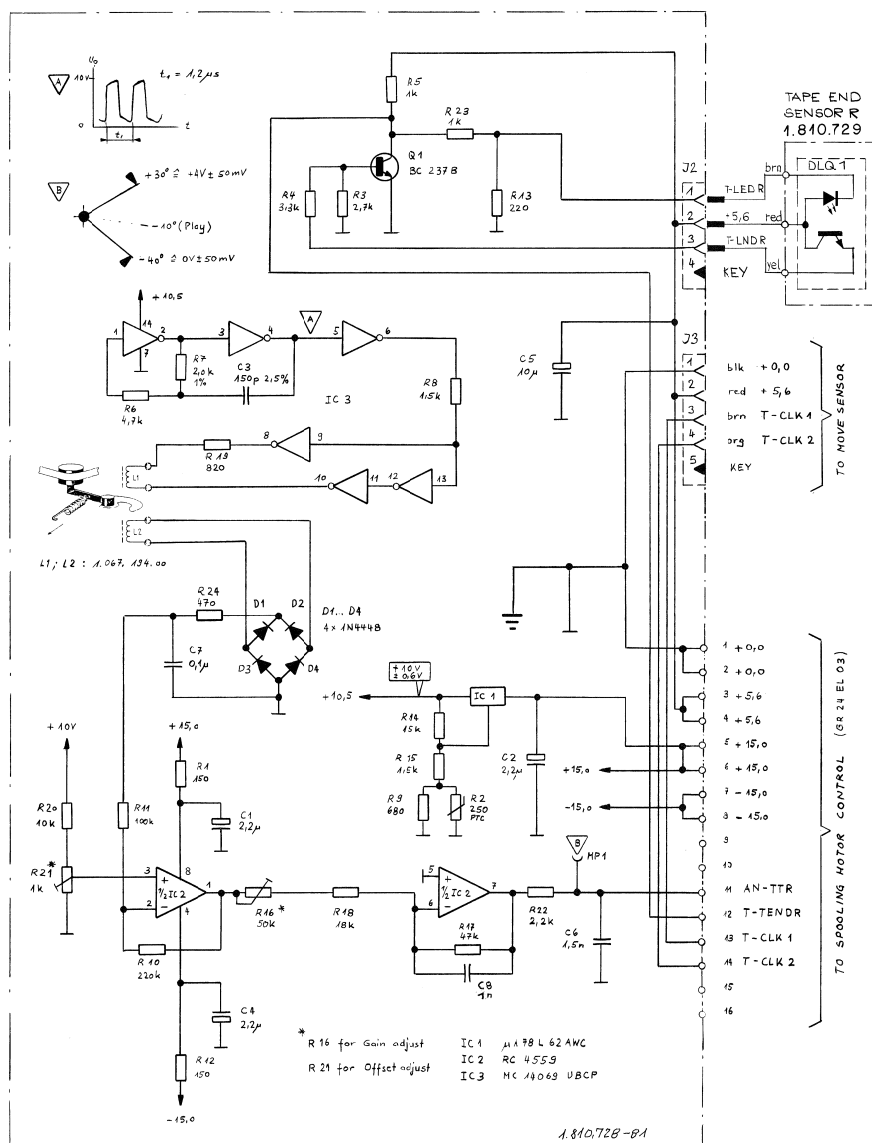
1.810.745-00

EL02 GR 27

IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C-----1	59-06-0102		1 nF	10%	
C-----2	59-12-2104		100 nF	5%	
C-----3	59-26-2192		1.5 nF	2.5%, 10%, PP	Ph
C-----4	59-26-2100		10 uF	20%, 10%, Sol	
C-----5	59-26-2151		150 uF	2.5%, PP	Ph
C-----6	59-26-5229		2.2 uF	20%, 25%, Sol	Ph
C-----7	59-26-5229				

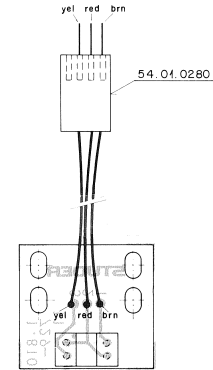
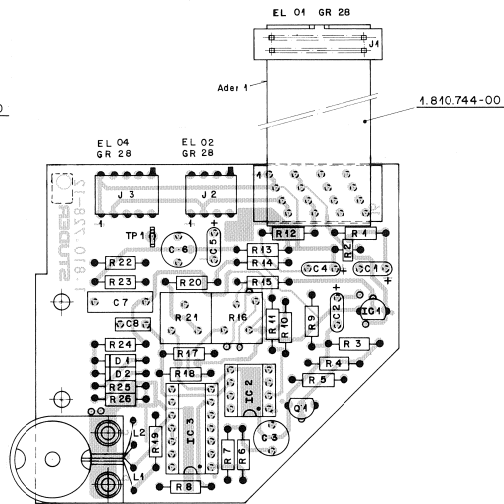
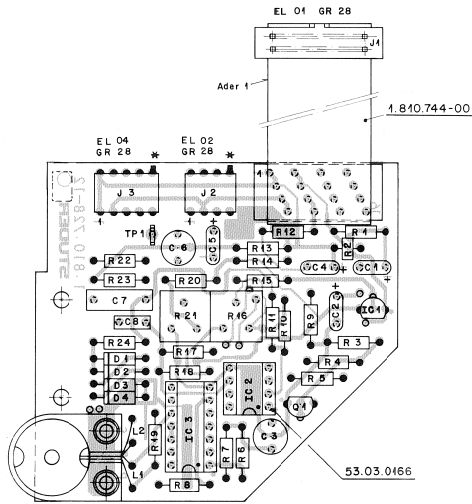
TAPE TENSION SENSOR PCB RIGHT 1.810.728-81 GR28 "ESE"  
TAPE END SENSOR PCB 1.810.729-00 GR28 EL6

TAPE TENSION SENSOR PCB RIGHT 1.810.728-82 GR28 "ESE"  
TAPE END SENSOR PCB 1.810.729-00 GR28 EL6

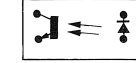


TAPE TENSION SENSOR PCB 1.810.728-81/-82 GR28 "ESE"

TAPE END SENSOR PCB 1.810.729-00 GR28 EL6



DLQ 1/2



TOP VIEW

IND.	POS.-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C+0001	59.26.5229	2.2 uF	20%, 25V, Sal		Ph
C+0002	59.26.5229	2.2 uF	20%, 25V, Sal		Ph
C+0003	59.05.2151	150 pF	2.5%, PP		Ph
C+0004	59.26.5229	2.2 uF	20%, 25V, Sal		Ph
C+0005	59.26.2100	10 uF	20%, 16V, Sal		Ph
C+0006	59.26.2100	10 uF	20%, 16V, Sal		Ph
C+0007	59.12.2104	100 nF	5%		Ph
C+0008	59.06.0102	1 nF	10%		Ph
D+0001	50.04.0125	N4448		ITT-Ph+Seu-TT	
D+0002	50.04.0125	N4448		ITT-Ph+Seu-TT	
D+0003	50.04.0125	N4448		ITT-Ph+Seu-TT	
D+0004	50.04.0125	N4448		ITT-Ph+Seu-TT	
IC+0001	50.10.0101	UA78L24AC	TLDAAC5	Fc+Sig	
IC+0002	50.09.0107	RL4599NB		Res+IT	
IC+0003	50.07.1009	486WBCF	HC1469WBCF, CD4069UBE	Fc+Mot+RCA	
J+0001	54.14.5021	14 cont.	See note 1		
J+0002	54.01.0304	4 cont.	AMP Nr. 163.683-2		
J+0003	54.01.0305	5 cont.	AMP Nr. 163.683-3		
L+0001	1.067.194.00		Sensor coil		St
L+0002	1.067.194.00		Sensor coil		St
Q+0001	50.03.0436	BC237B	BC547B, BC550B	ITT-Mot+Ph+Seu-TT	
R+0001	57.11.4251	150 Ohm	2%		
R+0002	57.99.0216	250 Ohm	1%	PTC Resistor, Philips Nr. 2322 650 91001	
R+0003	57.11.4272	2.7 kOhm	2%		
R+0004	57.11.4332	3.3 kOhm	2%		
R+0005	57.11.4102	1 kOhm	2%		
R+0006	57.11.4472	4.7 kOhm	2%		
R+0007	57.11.3202	2.0 kOhm	1%		
R+0008	57.11.4152	1.5 kOhm	2%		
R+0009	57.11.4481	680 Ohm	2%		
R+0010	57.11.4224	220 kOhm	2%		
R+0011	57.11.4104	100 kOhm	2%		
R+0012	57.11.4151	150 Ohm	2%		
R+0013	57.11.4221	220 Ohm	2%		
R+0014	57.11.4153	15 kOhm	2%		
R+0015	57.11.4152	1.5 kOhm	2%		
R+0016	58.01.0903	50 kOhm	See note 2		
R+0017	57.11.4184	180 kOhm	2%		
R+0018	57.11.4183	18 kOhm	2%		
R+0019	57.11.4152	1.5 kOhm	2%		
R+0020	57.11.4153	15 kOhm	2%		
R+0021	58.01.0102	1 kOhm	See note 3		
R+0022	57.11.4222	2.2 kOhm	2%		
R+0023	57.11.4102	1 kOhm	2%		
R+0024	57.11.4471	4.7 kOhm	2%		
R+0025	57.11.4472	4.7 kOhm	5%		
R+0026	57.11.4472	4.7 kOhm	5%		

IND.	POS.-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C+0001	59.26.5229	2.2 uF	20%, 25V, Sal		Ph
C+0002	59.26.5229	2.2 uF	20%, 25V, Sal		Ph
C+0003	59.05.2151	150 pF	2.5%, PP		Ph
C+0004	59.26.5229	2.2 uF	20%, 25V, Sal		Ph
C+0005	59.26.2100	10 uF	20%, 16V, Sal		Ph
C+0006	59.26.2100	10 uF	20%, 16V, Sal		Ph
C+0007	59.12.2104	100 nF	5%		Ph
C+0008	59.06.0102	1 nF	10%		Ph
D+0001	50.04.0127	8AS 40-02	1AT R5		Sim
D+0002	50.04.0127	8AS 40-02	1AT R5		Sim
IC+0001	50.10.0101	UA78L24AC	78L04AC5	Fc+Sig	
IC+0002	50.09.0107	RL4599NB		Res+IT	
IC+0003	50.07.1009	486WBCF	MT469WBCF, MT469WBCF		
J+0001	54.14.5021	14 cont.	See note 1		
J+0002	54.01.0304	4 cont.	AMP Nr. 163.683-2		
J+0003	54.01.0305	5 cont.	AMP Nr. 163.683-3		
L+0001	1.067.194.00		Sensor coil		St
L+0002	1.067.194.00		Sensor coil		St
Q+0001	50.03.0436	BC237B	BC547B, BC550B	ITT-Mot+Ph+Seu-TT	
R+0001	57.11.4251	150 Ohm	2%		
R+0002	57.99.0216	250 Ohm	1%	PTC Resistor, Philips Nr. 2322 650 91001	
R+0003	57.11.4272	2.7 kOhm	2%		
R+0004	57.11.4332	3.3 kOhm	2%		
R+0005	57.11.4102	1 kOhm	2%		
R+0006	57.11.4472	4.7 kOhm	2%		
R+0007	57.11.3202	2.0 kOhm	1%		
R+0008	57.11.4152	1.5 kOhm	2%		
R+0009	57.11.4481	680 Ohm	2%		
R+0010	57.11.4224	220 kOhm	2%		
R+0011	57.11.4104	100 kOhm	2%		
R+0012	57.11.4151	150 Ohm	2%		
R+0013	57.11.4221	220 Ohm	2%		
R+0014	57.11.4153	15 kOhm	2%		
R+0015	57.11.4152	1.5 kOhm	2%		
R+0016	58.01.0903	50 kOhm	See note 2		
R+0017	57.11.4184	180 kOhm	2%		
R+0018	57.11.4183	18 kOhm	2%		
R+0019	57.11.4152	1.5 kOhm	2%		
R+0020	57.11.4153	15 kOhm	2%		
R+0021	58.01.0102	1 kOhm	See note 3		
R+0022	57.11.4222	2.2 kOhm	2%		
R+0023	57.11.4102	1 kOhm	2%		
R+0024	57.11.4471	4.7 kOhm	2%		
R+0025	57.11.4472	4.7 kOhm	5%		
R+0026	57.11.4472	4.7 kOhm	5%		

Note 1 - Yamaichi Nr. FAS-10-17, Burndy Nr. FAS-10 BD-4P  
Connection Cable Studer Nr. 1.810.744-00  
Note 2 - Potentiometer, 50 kOhm  
Allen Bradley Nr. E 2B 501  
Bourns Nr. 3386 P-1-503  
Spectrol Nr. 63 M 501 T010  
Note 3 - Potentiometer, 1 kOhm  
Allen Bradley Nr. E 2B 101  
Bourns Nr. 3386 P-1-102  
Spectrol Nr. 63 M 102 T010

PP=Polypropylene, Sal=solid aluminium

MANUFACTURER: Fc=Fairchild, ITT=International, Mot=Motorola, Ph=Philips  
Ranneythor, RCA=Radio Corp. of America, Sep=Selecrom,  
Siemens, Sig=Signetics, St=Studer, Tr=Telefunken,  
Tis=Texas Instruments

ORIG 82/09/21

STUDER 82/09/28 PST TAPE TENSION SENSOR RIGHT 1.810.728-81 PAGE 2

Note 1 - Yamaichi Nr. FAS-10-17, Burndy Nr. FAS-10 BD-4P  
Connection Cable Studer Nr. 1.810.744-00  
Note 2 - Potentiometer, 50 kOhm  
Allen Bradley Nr. E 2B 503  
Bourns Nr. 3386 P-1-503  
Spectrol Nr. 63 M 503 T010  
Note 3 - Potentiometer, 1 kOhm  
Allen Bradley Nr. E 2B 102  
Bourns Nr. 3386 P-1-102  
Spectrol Nr. 63 M 102 T010

PP=Polypropylene, Sal=solid aluminium

MANUFACTURER: Fc=Fairchild, ITT=International, Mot=Motorola, Ph=Philips  
Ranneythor, RCA=Radio Corp. of America, Sep=Selecrom,  
Siemens, Sig=Signetics, St=Studer, Tr=Telefunken,  
Tis=Texas Instruments

ORIG 84/01/10

STUDER (00) 84/01/10 BBT TAPE TENSION SENSOR RIGHT 1.810.728-82 PAGE 2

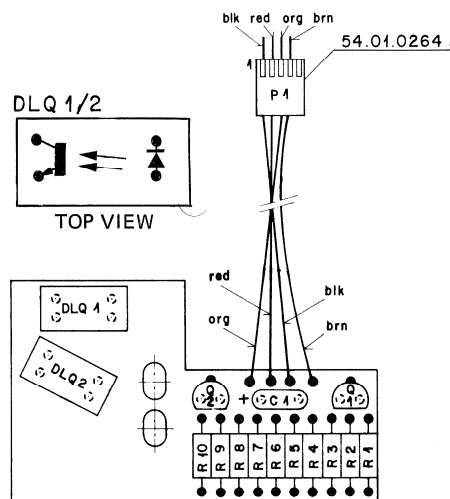
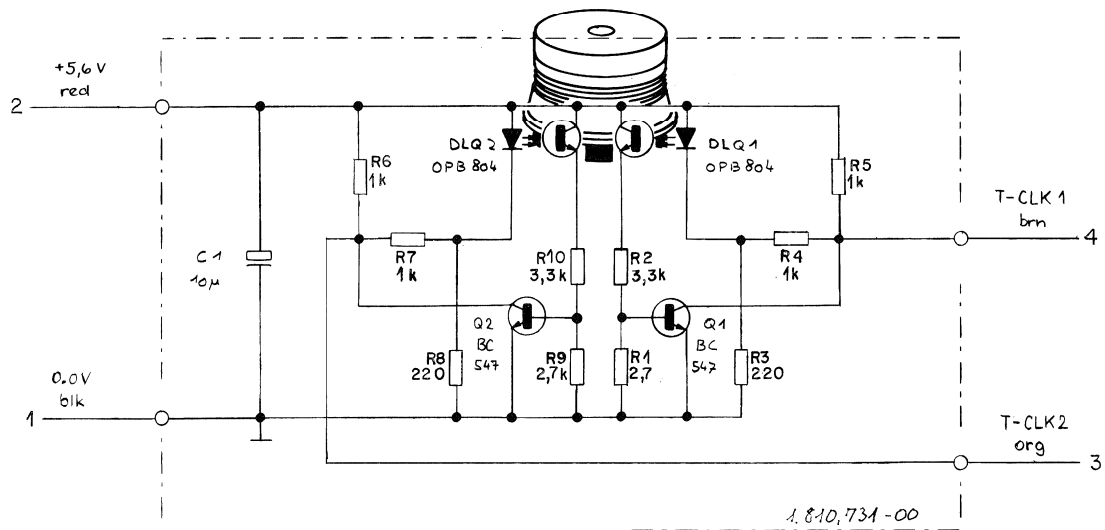
IND.	POS.-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
DLQ001	50.04.2128	OP804			Op

MANUFACTURER: Op=Optron

ORIG 81/10/14

STUDER 81/10/14 DSC TAPE END SENSOR BOARD A810 1.810.729-00 PAGE 1

## TAPE MOVE SENSOR PCB 1.810.731-00 GR28 EL5



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C.....1	59.26.2100		10 uF	20%, 16V, Sal	Ph
DLQ...1	50.04.2128	OPB804			Op
DLQ...2	50.04.2128	OPB804			Op
P.....1		5 cont.		See note 1	
Q.....1	50.03.0436	BC237B		BC547B, BC550B	ITT, Mot, Ph, Sie, Tf
Q.....2	50.03.0436	BC237B		BC547B, BC550B	ITT, Mot, Ph, Sie, Tf
R.....1	57.11.4272	2.7 kOhm			
R.....2	57.11.4332	3.3 kOhm			
R.....3	57.11.4221	220 Ohm			
R.....4	57.11.4102	1 kOhm			
R.....5	57.11.4102	1 kOhm			
R.....6	57.11.4102	1 kOhm			
R.....7	57.11.4102	1 kOhm			
R.....8	57.11.4221	220 Ohm			
R.....9	57.11.4272	2.7 kOhm			
R.....10	57.11.4332	3.3 kOhm			

Note 1 - Contact pin: Studer Nr. 54.01.0225, AMP Nr. 163.618-1  
Case: Studer Nr. 54.01.0264, AMP Nr. 163.690-3

Sal=Solid aluminium  
MANUFACTURER: ITT=Intermetall, Mot=Motorola, Op=Optron, Ph=Philips,  
Sie=Siemens, Tf=Telefunken

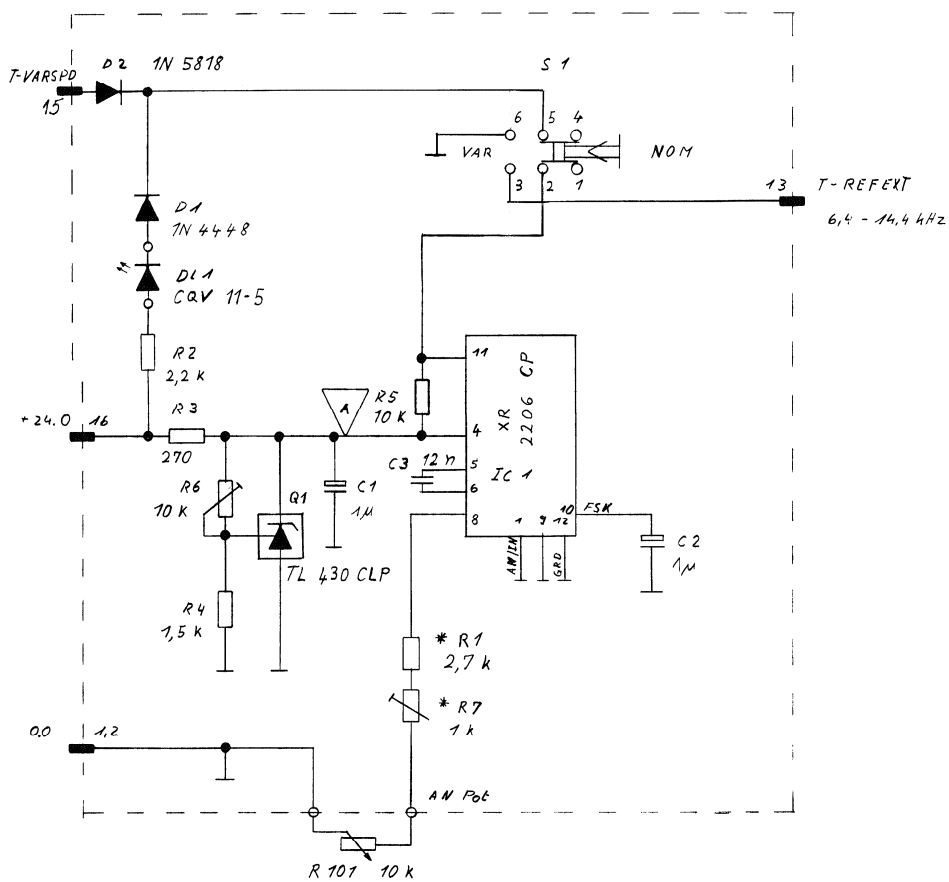
ORIG 82/02/23

S T U D E R 82/02/23 DSC MOVE SENSOR BOARD

1.810.731.00 PAGE 1



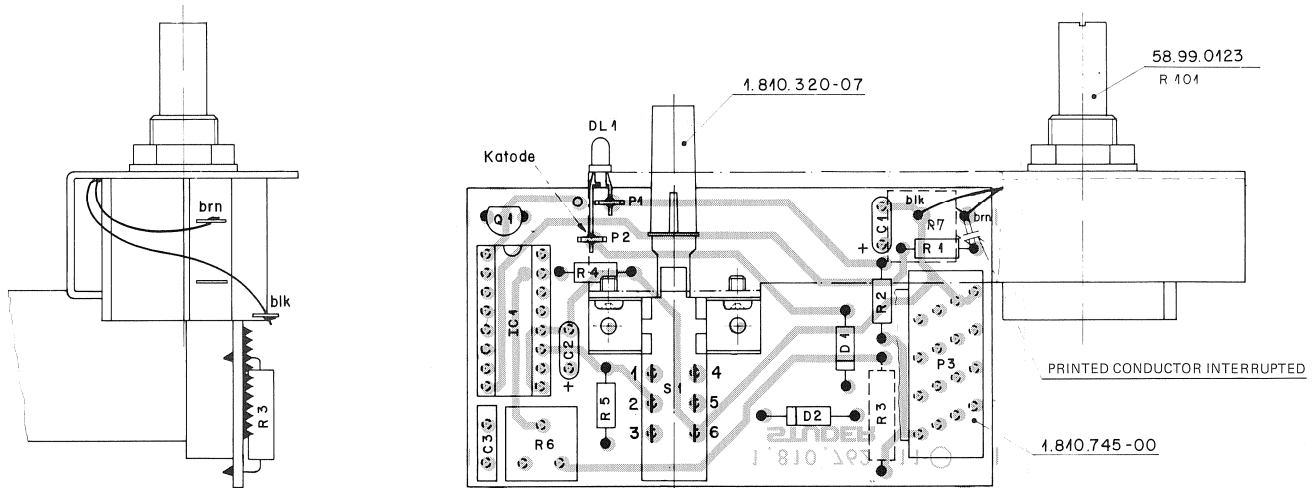
## VARISPEED CONTROL PCB 1.810.762-00 GR42



15V ± 0.2V ADJUSTED WITH R6

PIN 13: WITH R101 IN POS. 500 AND  
S1 IN POS. VAR, ADJUST OUTPUT  
WITH R7 TO 9.6 kHz.

## VARISPEED CONTROL PCB 1.810.762-00 GR42



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	C..0001	59.26.9109	1 uF	20%, 24V, Sal	Ph
	C..0002	59.26.9109	1 uF	20%, 24V, Sal	Ph
	C..0003	59.99.0220	12 nF	See note 1	
	D..0001	50.04.0125	1N4448		ITT*Ph*SeS*TI
	D..0002	50.04.0512	1N5818	1N5819	Mot
	DL.0001	50.04.2129	CQV11-5	Q62703-Q571	Sie
	IC.0001	50.11.0108	XR2206CP	SG2206	Ex*SG
	J..0001	54.14.5021		See note 2	
	Q..0001	50.10.0106	TL430CLP		TI
(01)	R..0001	57.11.4272	2.7 kOhm	5%	
	R..0002	57.11.4222	2.2 kOhm	5%	
	R..0003	57.13.4271	270 Ohm	5% 5 W	
	R..0004	57.11.4152	1.5 kOhm	5%	
	R..0005	57.11.4103	10 kOhm	5%	
	R..0006	58.01.8103	10 kOhm	See note 4	
(01)	R..0007	58.01.9102	1 kOhm	10%	
	R..0101	58.99.0123	10 kOhm	5% see note 5	
	S..0001	1.177.100.07	Switch	ITT/Schadow Nr. 1 x F 2u SI EE	

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	(01) 83/07/02			Improved frequency adjust circuit by inserting R 7 and reducing R 1	
	Note 1 -			Ceramic Capacitor, 5%, Temperature coefficient $\pm 30$ ppm Centralab Nr. CN 40 C 123 J Siemens Nr. B 37983-J 5123-J Kemet Nr. C 062 S 123 J 5G 5CA	
	Note 2 -			Yamaichi Nr. FAS-16-17, Burndy Nr. FRS-16 BD-4P Connection cable Studer Nr. 1.810.745.00	
	Note 3 -			For original version (00) of R 1 only : Metal-film resistor, 1%, 0.1 W, Temp. coefficient $\pm 25$ ppm Philips Nr. 2322 150 $\frac{1}{4}$ W Holco Nr. H 10 D 1% 5.11 kOhm	
	Note 4 -			Potentiometer Allen Bradley Nr. E 2B 103 Bourns Nr. 3386 F-1-103 Spectrol Nr. 63 M 103 T010	
	Note 5 -			Ten turns potentiometer mounted on the front panel	
				Ce=Ceramic, El Electrolytic, Sal=Solid aluminium	
				MANUFACTURER: Ex=Exar, ITI=Intermetall, Mot=Motorola, Ph=Philips, SeS=Sescosem, SG=Silicon General, Sie=Siemens, TI=Texas Instruments	

**Frequency Adjustment:**

- Mechanical Adjustment: Set scale to 000 @ left hand stop of potentiometer R29
- Nominal output frequency adjustment: Jumper JS1: 3200 Hz @ •  
9600 Hz @ -  
- Set potentiometer (R29) dial to "500"  
- Adjust nominal output frequency Y-REFEXT with R17  
(3200 Hz  $\pm$  1 Hz; 9600 Hz  $\pm$  3 Hz)

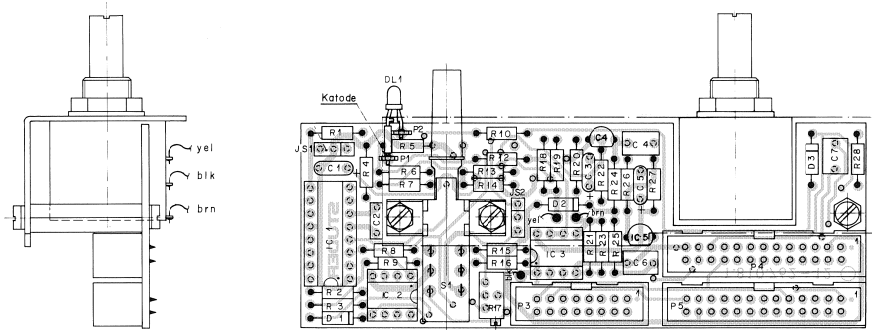
**Status Indicator DL1 Setting:**

Jumper JS2: Pos • : DL1 "on" @ Switch S1 "on" or BR-VRSPD "low" or B-SYNC "low"  
Pos - : DL1 "on" @ BR-VRSPD "low" or B-SYNC "low"

**ATTENTION!**

This 10-speed Control Unit may be connected to one machine only.

## VARISPEED CONTROL PCB 1.810.762-81 GR42



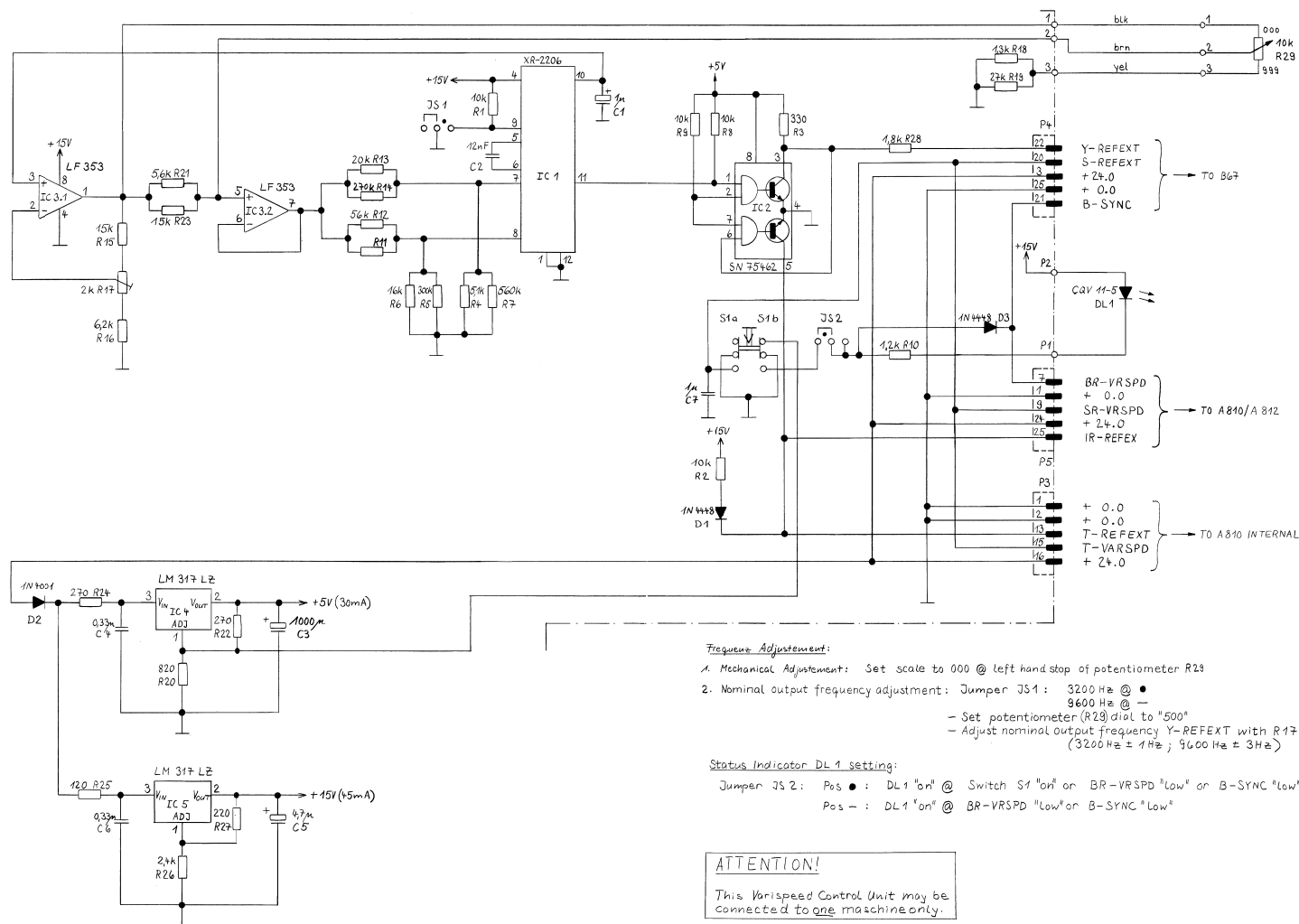
IND.	POS.NG.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NG.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.26.9109		1 uF	20%, 40V + Sol	Ph	R..0009	57.11.4103		10 kOhm	5%	
C..0002	59.99.0220		12 nF	5%, 50V + Cer	see note 1	R..0010	57.11.4122		1.2 kOhm	5%	
C..0003	59.26.1230		33 uF	20%, 10V + Sol	Ph	R..0011			not used		
C..0004	59.06.6334		0.33uF	10%, 63V + Petp	Ph	R..0012	57.11.3563		56 kOhm	1%	
C..0005	59.26.9479		6.7 uF	20%, 50V + Sol		R..0013	57.11.3025		20 kOhm	1%	
C..0006	59.06.6334		0.33uF	10%, 63V + Petp		R..0014	57.11.4274		270 kOhm	5%	
C..0007	59.06.5105		1uF	10%, 50V + Petp		R..0015	57.11.3153		15 kOhm	5%	
D..0001	50.04.0125		1N 4448	PhSes:ITT-Fc:TF		R..0016	57.11.3622		6.2 kOhm	5%	25 turns
D..0002	50.04.0122		1N 4001	Not v:Sol		R..0017	58.05.2202		2 kOhm		
D..0003	50.04.0125		1N 4448	PhSes:ITT-Fc:TF		R..0018	57.11.3132		1.3 kOhm	1%	
DL..0001	50.04.2124		COV11-T	Sio		R..0019	57.11.3273		27 kOhm	5%	
IC..0001	50.11.0108		XR204CP	SG 2206		R..0020	57.11.3821		820 Ohm	1%	
IC..0002	50.05.0227		SN79462P	TL 072CP		R..0021	57.11.3562		56 kOhm	1%	
IC..0003	50.09.0101		LF 353N	TL 072CP		R..0022	57.11.3271		270 Ohm	1%	
IC..0004	50.10.0108		LP317L2	Not:Mot		R..0023	57.11.3153		15 kOhm	1%	
IC..0005	50.10.0108		LP317L2	Not:Mot		R..0024	57.11.3271		270 Ohm	5%	
J5..0001	54.01.0020		Pin (3P)	54.01.0021 (ridge (1P) see note 2		R..0025	57.11.121		120 Ohm	5%	
J5..0002	54.01.0020		Pin (3P)	54.01.0021 (ridge (1P) see note 2		R..0026	57.11.3242		2.4 kOhm	1%	
P..0001	54.02.0320		2x880.8			R..0027	57.11.3221		220 Ohm	1%	
P..0002	54.02.0320		2x880.8			R..0028	57.11.4182		1.8 kOhm	5%	10 turns
P..0003	54.14.2002		16-contacts	see note 3		R..0029	58.79.0123		10 kOhm		
P..0004	54.14.2003		26-contacts	see note 4		S..0001	1.177.100-07		Switch		5%
P..0005	54.14.2003		26-contacts	see note 4							
R..0001	57.11.4103		10 kOhm	5%							
R..0002	57.11.4103		10 kOhm	5%							
R..0003	57.11.4301		330 Ohm	5%							
R..0004	57.11.3512		5.1 kOhm	1%							
R..0005	57.11.3304		300 kOhm	5%							
R..0006	57.11.3163		16 kOhm	1%							
R..0007	57.11.4566		560 kOhm	5%							
R..0008	57.11.4103		10 kOhm	5%							

S T U D E R (00) 84/03/05 LN VARISPEED CONTROL BOARD 1.810.762.81 PAGE 1 S T U D E R (00) 84/03/05 LN VARISPEED CONTROL BOARD 1.810.762.81 PAGE 2

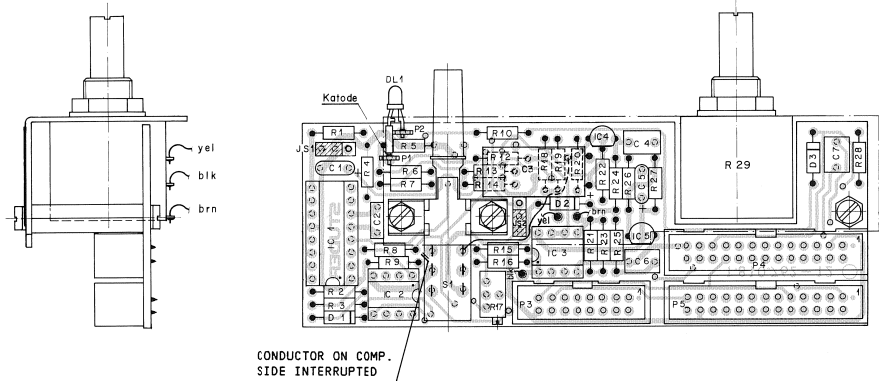
IND.	POS.NG.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1: 12nF50V: Centralab Nr. CN 40 C 123 J Siemens Nr. 0 37 953 - J - 5123 - J Kemet Nr. C 062 5 123 J 5 G 5 CA					
Note 2: Contact print: Berg Nr. 75160-102-36 Bridge: Philips Nr. 2422 025 89303 Berg Nr. 65474-001 AMP Nr. 141747-1 Philips Nr. 2422 024 88003					
Note 3: 16-contacts: Yamaichi Nr. FAP-16-08//A Burndy Nr. BPH 9 B 16 800 GS					
Note 4: 26-contacts: Yamaichi Nr. FAP-16-08//A Burndy Nr. BPH 9 B 26 800 GS					
Manufacturers: C=Compex, F=Fairchild, G=General Instruments ITT=Intertec, M=Motorola, N=National (Matsushita) NP=National Semiconductor, Ph=Philips Ses=Sensocon, Sies=Siemens, Sol=Solitron, St=Studer, TF=Telefunken, TI=Texas Instrument					

ORIG 84/03/05  
S T U D E R (00) 84/03/05 LN VARISPEED CONTROL BOARD 1.810.762.81 PAGE 3

## VARISPEED CONTROL PCB 1.810.762-82 GR42 "ESE"



VARISPEED CONTROL PCB 1.810.762-82 GR42 "ESE"



IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C++0001	59.26.9109	1 uF	20%, 40V + Sal	see note 1	Ph
C++0002	59.99.0203	12 uF	5%, 50V + Cer		
C++0003	59.99.1700	1000 uF	6.3V L < 21mm S < 10mm		Ph
C++0004	59.06.0336	0.33uF	10%, 63V + Petp		
C++0005	59.26.5479	4.7 uF	20%, 25V + Sal		
C++0006	59.06.0336	0.33uF	10%, 63V + Petp		
C++0007	59.06.5105	1uF	10%, 50V + Petp		
D++0001	50.04.0125	1N 4448			PhuSes, ITT, Fc, Tff
D++0002	50.04.0122	1N 4001			Mat, G1, Sol
D++0003	50.04.0125	1N 4448			PhuSes, ITT, Fc, Tff
DL+0001	50.04.2129	CDV11-7			Sie
IC+0001	50.11.0108	KR2204CP	5G 2206		Ex
IC+0002	50.09.0227	8079462P			TI
IC+0003	50.09.0101	LF 353N	TL 07ZCP		TI+NS+Mot
IC+0004	50.10.0108	LM317LZ			Nat+Mot
IC+0005	50.10.0108	LM317LZ			
JS+0001	54.01.0020	Pin (30)	54.01.0021 Bridge (1*)	see note 2	
JS+0002	54.01.0020	Pin (30)	54.01.0021 Bridge (1*)	see note 2	
P++0001	54.02.0320		2#P048		
P++0002	54.02.0320		2#P048		
P++0003	54.04.2002		16-contacts	see note 3	
P++0004	54.04.2003		26-contacts	see note 4	
P++0005	54.04.2003		26-contacts	see note 4	
R++0001	57.11.4103	10 kOhm	5%		
R++0002	57.11.4103	10 kOhm	5%		
R++0003	57.11.4331	330 Ohm	5%		
R++0004	57.11.3512	5.1 kOhm	1%		
R++0005	57.11.3304	300 kOhm	5%		
R++0006	57.11.4103	10 kOhm	5%		
R++0007	57.11.4568	560 kOhm	5%		
R++0008	57.11.4103	10 kOhm	5%		

S T U D E R {00} 85/07/09 LN VARISPEED CONTROL BOARD 1.810.762.82 PAGE 1

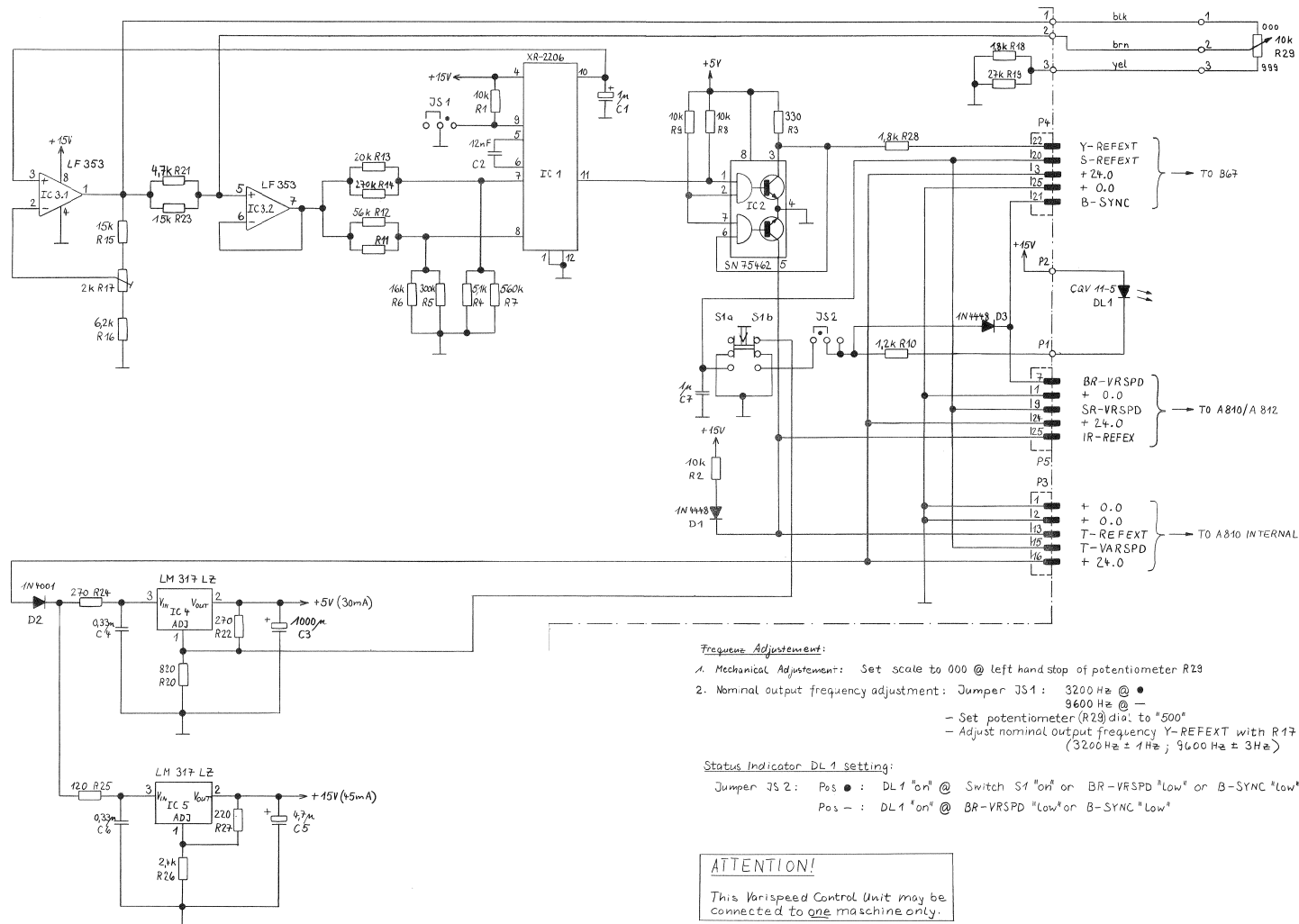
IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R++0009	57.11.4103	10 kOhm	5%		
R++0010	57.11.4322	1.2 kOhm	5%		
R++0011	57.11.3563	not used			
R++0012	57.11.3563	56 kOhm	1%		
R++0013	57.11.4203	20 kOhm	1%		
R++0014	57.11.4274	270 kOhm	5%		
R++0015	57.11.3153	15 kOhm	5%		
R++0016	57.11.3622	6.2 kOhm	5%		
R++0017	58.05.0202	2 kOhm		25 turns	
R++0018	57.11.3132	1.3 kOhm	1%		
R++0019	57.11.4273	27 kOhm	5%		
R++0020	57.11.3823	820 Ohm	1%		
R++0021	57.11.3562	5.6 kOhm	1%		
R++0022	57.11.3271	270 Ohm	1%		
R++0023	57.11.3153	15 kOhm	1%		
R++0024	57.11.3271	270 Ohm	5%		
R++0025	57.11.4121	120 Ohm	5%		
R++0026	57.11.3242	2.4 kOhm	1%		
R++0027	57.11.3221	220 Ohm	1%		
R++0028	57.11.4102	1.8 kOhm	5%		
R++0029	58.99.0123	10 kOhm		10 turns	
S++0001	1.177.100.07		Switch		St

S T U D E R {00} 85/07/09 LN VARISPEED CONTROL BOARD 1.810.762.82 PAGE 2

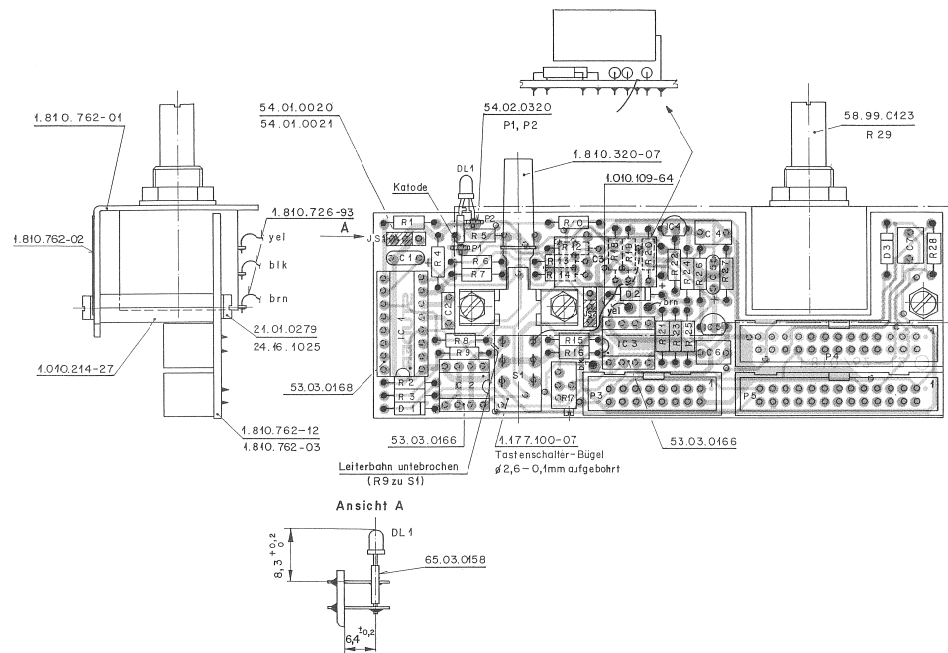
IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1:	12nF, 50V:	Generalab. Nr. CN 40 C 123 J Siemens Nr. B 37 863 - J - 5123 - J Kemet Nr. C 062 S 123 J 5 G 5 CA			
Note 2:	Contact pin:	Berg Nr. 75160-102-36 Philips Nr. 2422 020 89303			
	Bridge:	Berg Nr. 65476-001 AMP Nr. 141767-1 Philips Nr. 2422 024 88003			
Note 3:	16-contacts:	Yanachi Nr. FAP-16-08//4 Burdy Nr. BPM 9 B 16 800 GS			
Note 4:	26-contacts:	Yanachi Nr. FAP-26-08//4 Burdy Nr. BPM 9 B 26 800 GS			
Manufacturers: Ex=Exaro, Fc=Fairchild, G1=General Instruments, ITT=Intermetall, Mat=Motorola, Nat=National (Matsushita), NS=National Semiconductor, Ph=Philips, Ses=Siemens, Sie=Siemens, Sol=Solitron, St=Studer, Tff=Telefunken, TI=Texas Instrument					

ORIG 85/07/09  
S T U D E R {00} 85/07/09 LN VARISPEED CONTROL BOARD 1.810.762.82 PAGE 3

## VARISPEED CONTROL BOARD 1.810.762.83 GR42



## VARISPEED CONTROL BOARD 1.810.762.83



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C....1	59.26.9109	1 uF	20K, 40V, Sal	see note 1	Ph
C....2	59.99.0220	12 nF	5K, 50V, Car		
C....3	59.99.1700	1000 uF	6-3V, L < 3mm, p < 10mm		
C....4	59.06.0334	0.33uF	10K, 63V, Fatp		Ph
C....5	59.06.5479	4.7 uF	20K, 25V, Sal		
C....6	59.06.0334	0.33uF	10K, 63V, Fatp		
C....7	59.06.5105	1uF	10K, 50V, Fatp		
D....1	50.04.0125	18 4448			Ph;Saw;ITT;Fo;Tf
D....2	50.04.0122	18 4001			Met;Si;Sol
D....3	50.04.0128	18 4448			Ph;Saw;ITT;Fo;Tf
Me....1	50.04.2129	CDV11-7			Si
IC....1	50.11.0108	X82004CF	SG 2206		Ex
IC....2	50.05.0227	SN75462P			TI
IC....3	50.05.0191	LF 8338	TL 072CF		TI;MS;Met
IC....4	50.10.0108	LM317LZ			Met;Met
IC....5	50.10.0108	LM317LZ			Met;Met
JS....1	54.01.0020	Pin (3a)	54.01.0021 Bridge (1a) see note 2		
JS....2	54.01.0020	Pin (3a)	54.01.0021 Bridge (1a) see note 2		
P....1	54.02.0320		2.840.8		
P....2	54.02.0320		2.840.8		
P....3	54.14.2102		16-contacts	see note 3	
P....4	54.14.2003		26-contacts	see note 4	
P....5	54.14.2003		26-contacts	see note 4	
R....1	57.11.3103	10 kOhm	5K		
R....2	57.11.3103	10 kOhm	5K		
R....3	57.11.3331	330 Ohm	5K		
R....4	57.11.3512	5.1 kOhm	1K		
R....5	57.11.3304	300 kOhm	5K		
R....6	57.11.3163	14 kOhm	1K		
R....7	57.11.3564	560 kOhm	5K		
R....8	57.11.3103	10 kOhm	5K		

S T U D E R (00) 90/10/05 ZB VARISPEED CONTROL BOARD PL 1.810.762.83 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R....9	57.11.3103	10 kOhm	5K		
R....10	57.11.3122	1.2 kOhm	5K		
R....11	57.11.3863	not used			
R....12	57.11.3203	58 kOhm	1K		
R....13	57.11.3203	20 kOhm	1K		
R....14	57.11.3274	270 kOhm	5K		
R....15	57.11.3153	15 kOhm	5K		
R....16	57.11.3822	6.2 kOhm	5K		
R....17	58.08.0202	1.8 kOhm	25 turns		
R....18	57.11.3102	1.8 kOhm	5K		
R....19	57.11.3273	27 kOhm	5K		
R....20	57.11.3821	820 Ohm	1K		
R....21	57.11.3972	4.7 kOhm	1K		
R....22	57.11.3821	270 Ohm	1K		
R....23	57.11.3153	15 kOhm	5K		
R....24	57.11.3971	270 Ohm	5K		
R....25	57.11.3121	120 Ohm	5K		
R....26	57.11.3942	2.4 kOhm	1K		
R....27	57.11.3521	220 Ohm	1K		
R....28	57.11.3162	1.8 kOhm	5K		
R....29	58.99.0123	10 kOhm	10 turns		
S....1	1.177.100.07		Switch		St

S T U D E R (00) 90/10/05 ZB VARISPEED CONTROL BOARD PL 1.810.762.83 PAGE 2

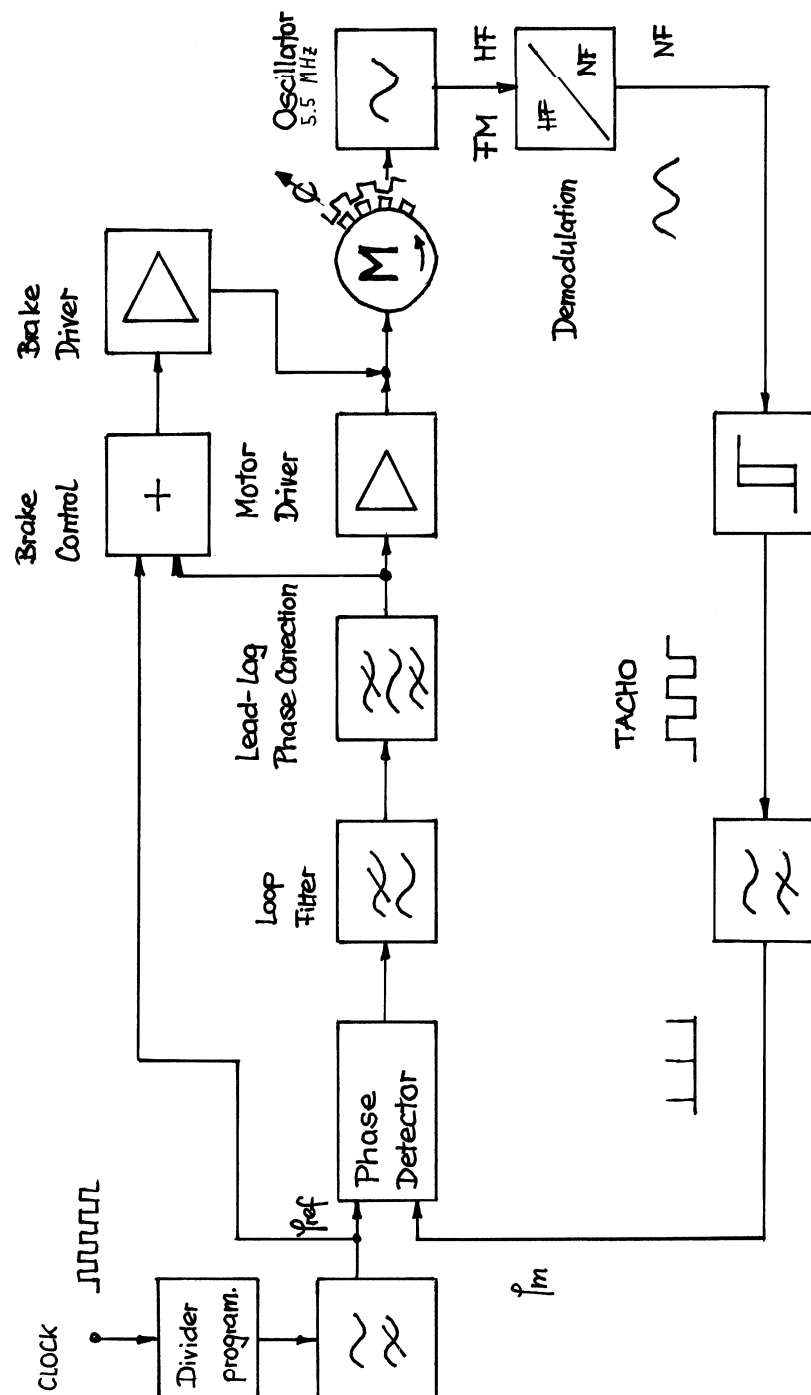
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1:	12nF,50V:	CentraLab Nr. CM 40 C 123 J			
		Sienens Nr. S 37 983 - J - 5123 - J			
		Exmet Nr. C 002 S 123 J S 0 S CA			
Note 2:	Contact pin: Berg Nr.	75160-102-36			
	Bridge:	Philips Nr. 2422 025 89303			
		Berg Nr. 65874-001			
		AMP Nr. 141767-1			
		Philips Nr. 2422 024 88003			
Note 3:	16-contacts:	Sienens Nr. V23535-A2700-A162			
		Thomas+Betta	501-1627 ES		
Note 4:	26-contacts:	Yanagichi Nr. YAP-26-08/74			
		Bundy Nr. BUN V B 26 300 05			
Manufacturers: Ex=Exmet, Fo=Fairchild, GI=General Instruments, ITT=ITT, Met=Metel, MS=Motorola, Ph=National (Datamatic), SI=Siemens, S=Siemens, Sal=Salisbury, St=Studer, TI=Telefunken, TI=Texas Instrument					

ORIG 90/10/05

S T U D E R (00) 90/10/05 ZB VARISPEED CONTROL BOARD PL 1.810.762.83 PAGE 3



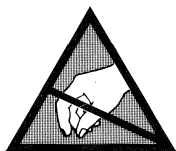
## BLOCK DIAGRAM CAPSTAN MOTOR CONTROL



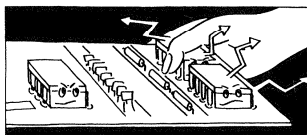
Dec. 82 CS	A 810	Blockdiagram	
STUDER	Capstan Motor Control		PAGE OF

## SECTION 7 AUDIO DIAGRAMS

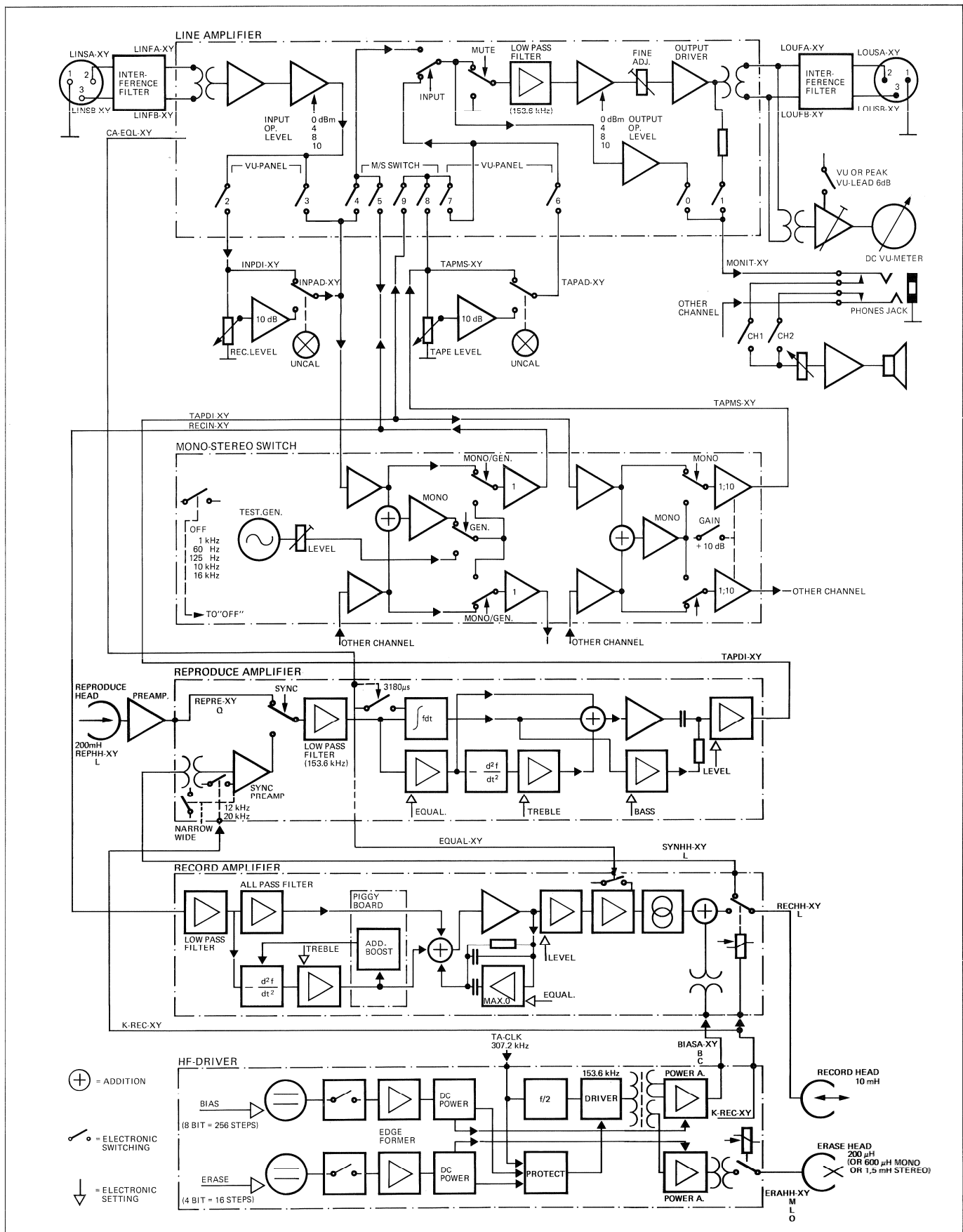
UNIT		PART NUMBER	GR/EL	PAGE
AUDIO BLOCK DIAGRAM				
LINE AMPLIFIER PCB WITH TRANSFORMER	▲	1.820.714-00/-81	20/11,16	7/1
INTERFERENCE FILTER PCB		1.820.749-00	35,36,37	7/4
REPRODUCE AMPLIFIER PCB	▲	1.820.710-00/-81	20/10,15	7/5
		/-82		
- REPRODUCE PREAMPLIFIER 1CH PCB		1.810.710-00	32/02	7/9
- REPRODUCE PREAMPLIFIER 2CH PCB		1.810.711-00	32/02	7/9
REPRODUCE PREAMPLIFIER 1CH PCB		1.810.710-81	32/02	7/11
- REPRODUCE PREAMPLIFIER 2CH PCB		1.810.711-81	32/02	7/11
RECORD AMPLIFIER PCB	▲	1.820.712-00/-81	20/09,14	7/13
- ADAPTATION PCB		1.820.740-00		7/13
HF DRIVER PCB	▲	1.820.713-00	20/08,13	7/17
MONO/STEREO SWITCH PCB	▲	1.820.720-00	20/12	7/19
- FRONT PANEL PCB		1.820.739-00		7/19
MONO/STEREO SWITCH W. TESTGEN. PCB	▲	1.820.724-00	20/12	7/21
- FRONT PANEL PCB		1.820.739-00		7/21
VU PANEL		1.810.320-81	39,40	7/23
- VU METER AMPLIFIER PCB		1.820.730-00		7/23
- VU METER AMPLIFIER PCB		1.820.730-81		7/23
VU PANEL		1.810.320-81		7/25
- CALIBRATION PCB		1.820.731-00		7/25
- CHANNEL CONTROL PCB		1.820.732-00		7/25
TC CHANNEL CONTROL PCB		1.820.735-00		7/27
MONITOR AMPLIFIER PCB		1.810.722-00	41	7/29
MONITOR AMPLIFIER PCB		1.810.722-81	41	7/29
MONITOR UNIT		1.810.345-81	91	7/31
- MONITOR UNIT PCB		1.810.721-00/-81		7/31
TIME CODE READ/WRITE UNIT PCB	▲	1.820.721-00	20/06	7/33
TIME CODE READ/WRITE UNIT PCB	▲	1.810.724-00	20/06	7/35
TIME CODE TRIGGER PCB		1.810.723-00		7/35
TIME CODE READ/WRITE UNIT PCB	▲	1.820.721-81	20/06	7/39
TIME CODE READ/WRITE UNIT PCB	▲	1.820.721-82	20/06	7/41
TIME CODE DELAY UNIT PCB	▲	1.820.722-00/-81	20/07	7/43



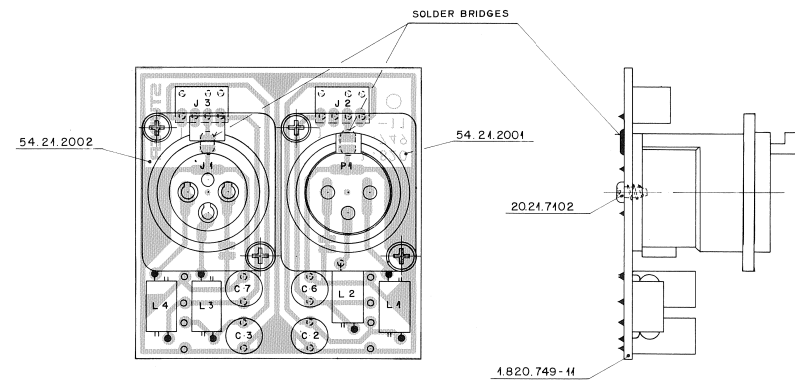
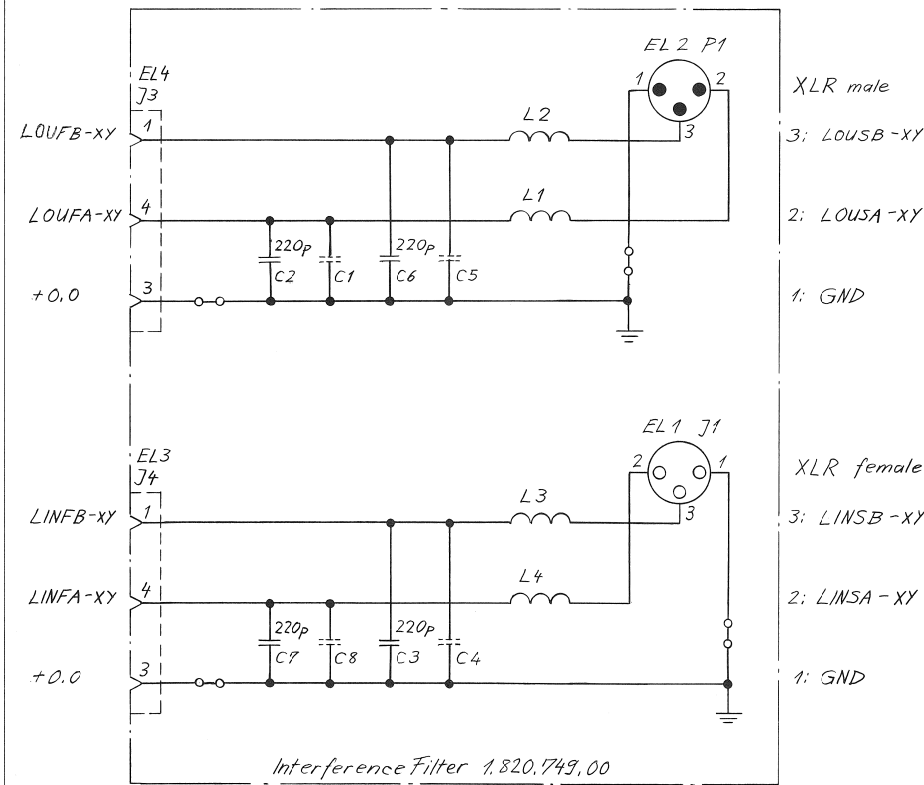
ALL PCBs MARKED WITH THIS SIGN ▲  
CONTAIN COMPONENTS SENSITIVE TO  
STATIC CHARGES.  
PLEASE, REFER TO PREFACE BEFORE  
YOU REMOVE THESE BOARDS.



## AUDIO BLOCK DIAGRAM



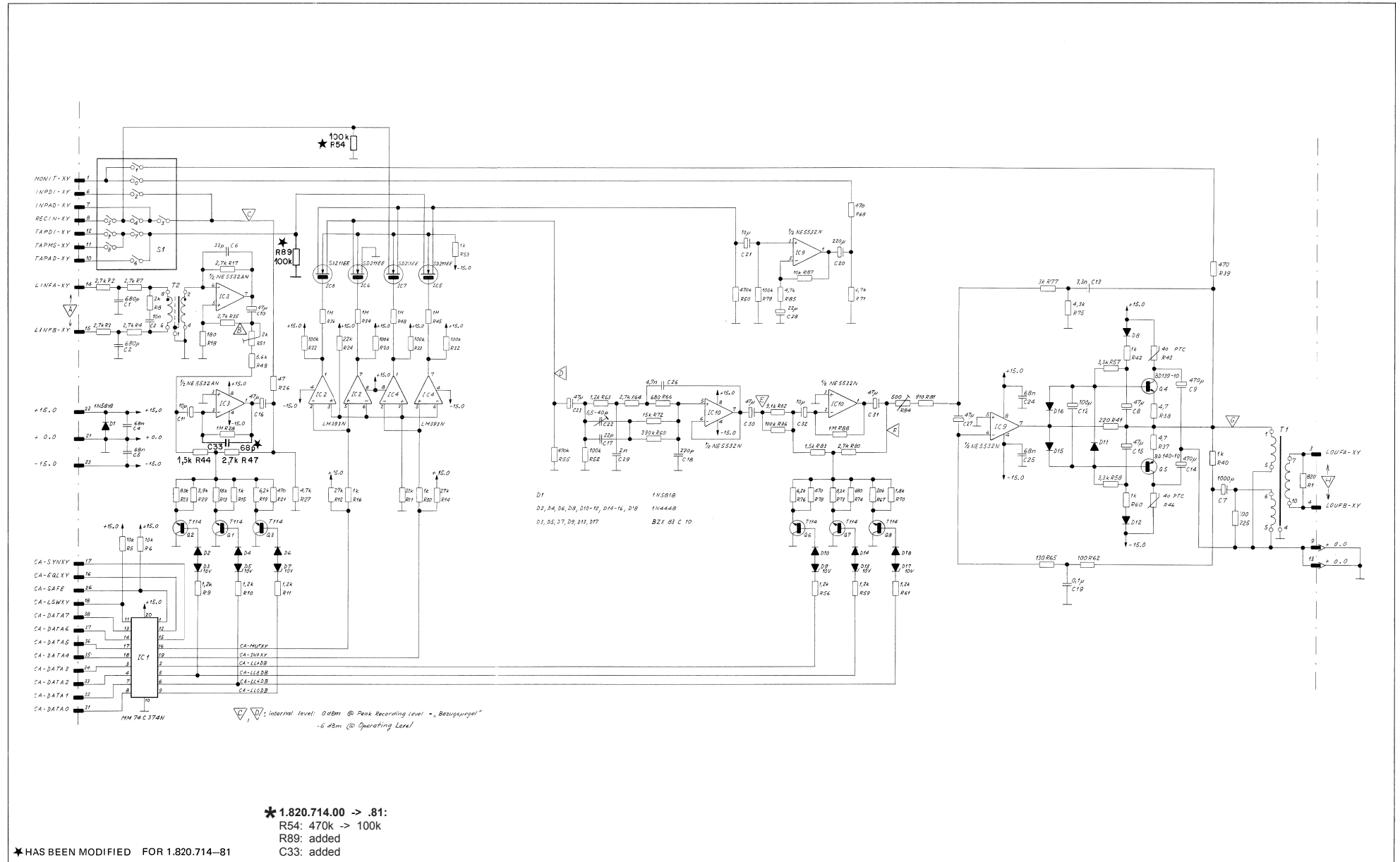
INTERFERENCE FILTER PCB 1.820.749-00 GR35/36/37



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C...	001		not used		
C...	002	59.05.1221	220 pF	630V PP	ERD,NSF
C...	003	59.05.1221	220 pF	630V PP	ERD,NSF
C...	004		not used		
C...	005		not used		
C...	006	59.05.1221	220 pF	630V PP	ERD,NSF
C...	007	59.05.1221	220 pF	630V PP	ERD,NSF
C...	008		not used		
J...	001	54.21.2002		XLR socket, Neutrik Nr. NC 3PD-V	
J...	003	54.01.0298	4 cont.	AMP Nr. 163x681-2	
J...	004	54.01.0298	4 cont.	AMP Nr. 163x681-2	
L...	001	62.01.0115		Interference-Coil, Philips Nr 4312 020 36700	
L...	002	62.01.0115		Interference-Coil, Philips Nr 4312 020 36700	
L...	003	62.01.0115		Interference-Coil, Philips Nr 4312 020 36700	
L...	004	62.01.0115		Interference-Coil, Philips Nr 4312 020 36700	
P...	001	54.21.2001		XLR plug, Neutrik Nr. NC 3MD-V	

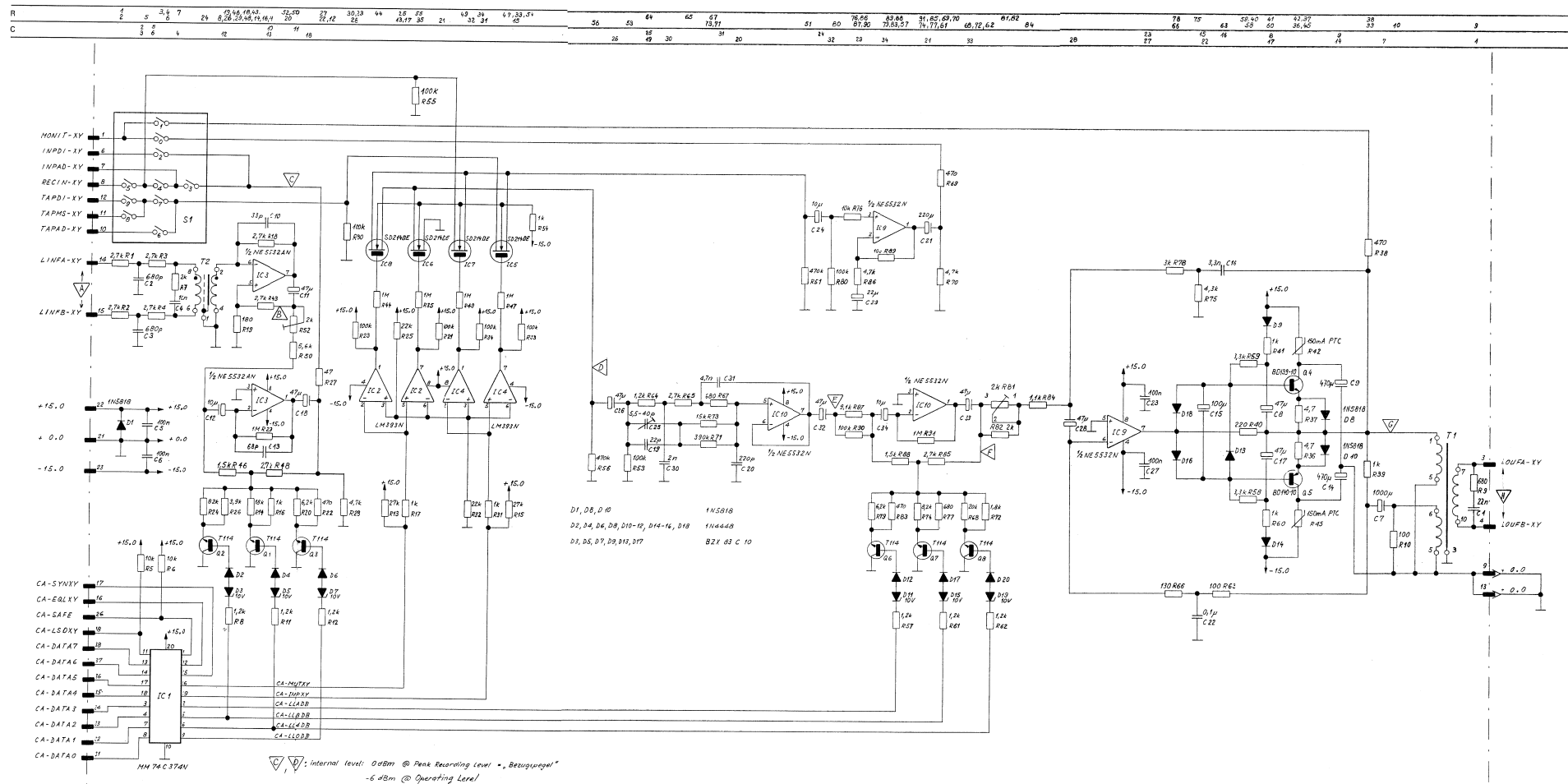
PP=Polypropylen  
MANUFACTURER: ERD=E. Roederstein, NSF=AEG-Telefunken-NSF,  
ORIG R2/08/03  
S T U D E R R 02/08/03 GAE INTERFERENCE FILTER 1.820.749,00 PAGE 1

## LINE AMPLIFIER PCB WITH TRANSFORMER 1.820.714-00/-81 GR20 EL11/16 "ESE"



IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C-0001	97-11-0481	680 Pf	1X			R-0039	97-11-1471	470 Ohm	5X		
C-0002	97-11-0481	68 Pf	1X			R-0040	97-11-1471	470 Ohm	5X		
C-0003	97-11-1103	10 nF	5X			R-0041	97-11-1471	220 Ohm	5X		
C-0004	97-11-0205	68 Pf	-20% 150V Co			R-0042	97-11-1471	1 kOhm	5X		
C-0005	97-11-0205	88 nF	-20% 150V Co			R-0043	97-11-0211	40 Ohm	See Note 2		
C-0006	97-11-0210	13 Pf	-20% 150V Co			R-0044	97-11-1471	1.5 kOhm	5X		
C-0007	97-11-0212	1050 uF	-10% 16V EI			R-0045	97-11-1471	1 MOhm	5X		
C-0008	97-11-0212	1050 uF	-10% 16V EI			R-0046	97-11-0211	40 Ohm	See Note 2		
C-0009	97-11-0212	470 uF	-10% 16V EI			R-0047	97-11-1471	2.7 kOhm	5X		
C-0010	97-11-0212	470 uF	-10% 16V EI			R-0048	97-11-1471	2.7 kOhm	5X		
C-0011	97-11-0212	100 uF	-10% 16V Sal			R-0049	97-11-1471	5.6 kOhm	5X		
C-0012	97-11-0212	100 uF	-10% 16V Sal			R-0050	97-11-1471	970 kOhm	5X		
C-0013	97-11-0212	3300 Pf	-10% 16V EI			R-0051	97-11-0212	2 kOhm	See Note 3		
C-0014	97-11-0212	470 uF	-10% 16V EI			R-0052	97-11-1471	100 kOhm	5X		
C-0015	97-11-0212	47 uF	-10% 16V EI			R-0053	97-11-1471	1 kOhm	5X		
C-0016	97-11-0212	220 Pf	-10% 16V EI			R-0054	97-11-1471	100 kOhm	5X		
C-0017	97-11-0212	22 Pf	5% 150V Co			R-0055	97-11-1471	470 kOhm	5X		
C-0018	97-11-0212	220 Pf	5% 150V Co			R-0056	97-11-1471	3.3 kOhm	5X		
C-0019	97-11-0212	6.1 uF	1X			R-0057	97-11-1471	3.3 kOhm	5X		
C-0020	97-11-0212	220 Pf	-20% 8V EI			R-0058	97-11-1471	1 kOhm	5X		
C-0021	97-11-0212	10 uF	20% 16V Sal			R-0059	97-11-1471	1.2 kOhm	5X		
C-0022	97-11-0212	10 uF	20% 16V Sal			R-0060	97-11-1471	1.2 kOhm	5X		
C-0023	97-11-0212	47 uF	20% 6.3V Sal			R-0061	97-11-1471	1.2 kOhm	5X		
C-0024	97-11-0212	88 nF	20% 6.3V Sal			R-0062	97-11-1471	100 Ohm	2X		
C-0025	97-11-0212	5.6 nF	-20% 6.3V Sal			R-0063	97-11-1471	1.2 kOhm	5X		
C-0026	97-11-0212	4.7 nF	-20% 6.3V Sal			R-0064	97-11-1471	2.7 kOhm	5X		
C-0027	97-11-0212	4.7 nF	-20% 6.3V Sal			R-0065	97-11-1471	100 Ohm	2X		
C-0028	97-11-0212	22 Pf	20% 16V Sal			R-0066	97-11-1471	100 Ohm	2X		
C-0029	97-11-0212	22 Pf	20% 16V Sal			R-0067	97-11-1471	20 Ohm	5X		
C-0030	97-11-0212	47 uF	20% 6.3V Sal			R-0068	97-11-1471	390 Ohm	5X		
C-0031	97-11-0212	47 uF	20% 6.3V Sal			R-0069	97-11-1471	1.8 kOhm	5X		
C-0032	97-11-0212	100 uF	20% 6.3V Sal			R-0070	97-11-1471	6.2 kOhm	5X		
C-0033	97-11-0212	100 uF	20% 6.3V Sal			R-0071	97-11-1471	6.2 kOhm	5X		
C-0034	97-11-0212	88 nF	5% 150V Co			R-0072	97-11-1471	970 kOhm	5X		
D-0001	50-04-0512	DS95B18	Not			R-0073	97-11-1471	970 kOhm			

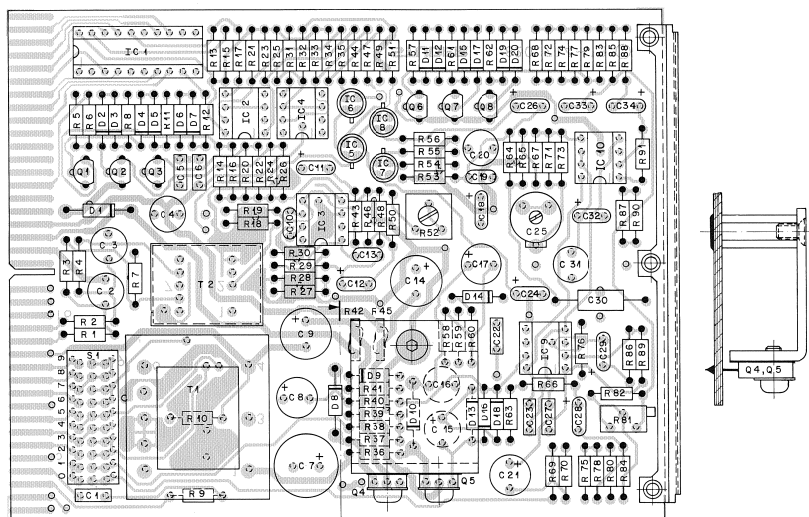
## LINE AMPLIFIER WITH TRANSFORMERS 1.820.714-82 GR20 EL11/16 "ESE"



18.01.85	B. Serru	A 820 / A 810 Audio Section	
STUDER	Line Amplifier	SC 1.820.714-82	PAGE 1 OF 2

18.01.85	B. Serru	A 820 / A 810 Audio Section	
STUDER	Line Amplifier	SC 1.820.714-82	PAGE 2 OF 2

COMPONENT SIDE	
LINE AMPLIFIER WITH TRAFO	1.820 714-82



IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Q-	0008	1-010-0374	Y 114 sel	See Note 1	See
	0001	9-11-0272	2-7 KOhm		
	0002	9-11-0272	2-7 KOhm		
	0003	9-11-0272	2-7 KOhm		
	0004	9-11-0272	2-7 KOhm		
	0005	9-11-0303	10 KOhm		
	0006	9-11-0303	10 KOhm		
	0007	9-11-0303	10 KOhm		
	0008	9-11-0322	1-2 KOhm		
	0009	9-11-0368	100 Ohm		
	0010	9-11-0301	100 Ohm		
	0011	9-11-0322	1-2 KOhm		
	0012	9-11-0322	1-2 KOhm		
	0013	9-11-0373	27 KOhm		
	0014	9-11-0383	18 KOhm		
	0015	9-11-0373	27 KOhm		
	0016	9-11-0302	1 KOhm		
	0017	9-11-0302	1 KOhm		
	0018	9-11-0272	2-7 KOhm		
	0019	9-11-0371	180 Ohm		
	0020	9-11-0302	6-2 KOhm		
	0021	9-11-0308	100 KOhm		
	0022	9-11-0371	70 Ohm		
	0023	9-11-0371	70 Ohm		
	0024	9-11-0323	82 KOhm		
	0025	9-11-0323	22 KOhm		
	0026	9-11-0392	3-9 KOhm		
	0027	9-11-0390	67 Ohm		
	0028	9-11-0472	4-7 KOhm		
	0029	9-11-0309	100 Ohm		
	0030	9-11-0304	100 KOhm		
	0031	9-11-0302	1 KOhm		
	0032	9-11-0323	22 KOhm		
	0033	9-11-0304	100 KOhm		
	0034	9-11-0304	100 KOhm		
	0035	9-11-0305	1 MOhm		

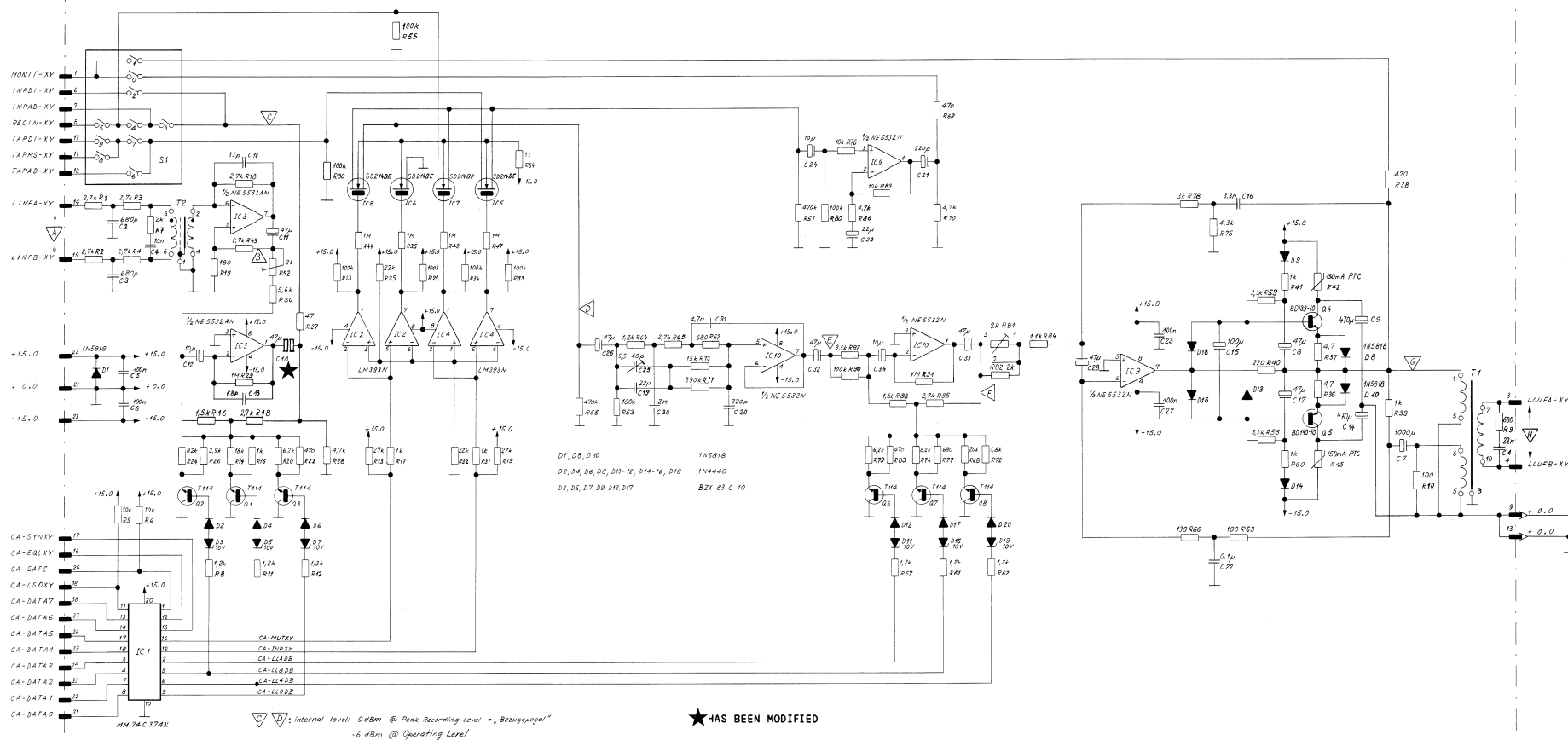
IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1 -	1 1k $\Omega$ sel. for inners mode (RBC = 3 M) VCE < 0.7 mV, IE 0 mA, VCE < 25 mV, IE 0 mA				
Note 2 -	150 mW PTC-resistor Philips Nr. 2322 6M 1511 PTC-resistor may be replaced by Fuse-Resistor ST1=0.050 Philips Nr. 2322 20W 1310H,				
Note 3 -	2 0hm Potentiometer 11m, 10% Bourrs Nr. 3384 P-1-202 Allen Bradley Nr. C 2 B 202 Spectrol Nr. 53 202 010				
Note 4 -	3 0hm Potentiometer 11m, 10% Bourrs Nr. 3294 Z - 1 - 202 Spectrol Nr. 6A Z 202 000 Murata Nr. PQT 3105 Z - 1 - 20Z Contelec Nr. 183 ZE 202				
CeCeramic:	Et-Electrolytic, Sal-Solid aluminum				
MANUFACTURER:	Ex=Exaro, IT=Intermetallic, Mo=Motolora, NS=National Semiconductor, Ph=Philips, Ray=Raytheon, Sen=Seimens, Sta=Stancor, Sig=Signetics, Sil=Siliconix, Stu=Studer, TF=Tefelunken, TI=Texas Instruments.				

ORIG 85/01/19



## LINE AMPLIFIER WITH TRANSFORMERS 1.820.714-83 GR20 EL11/16 "ESE"

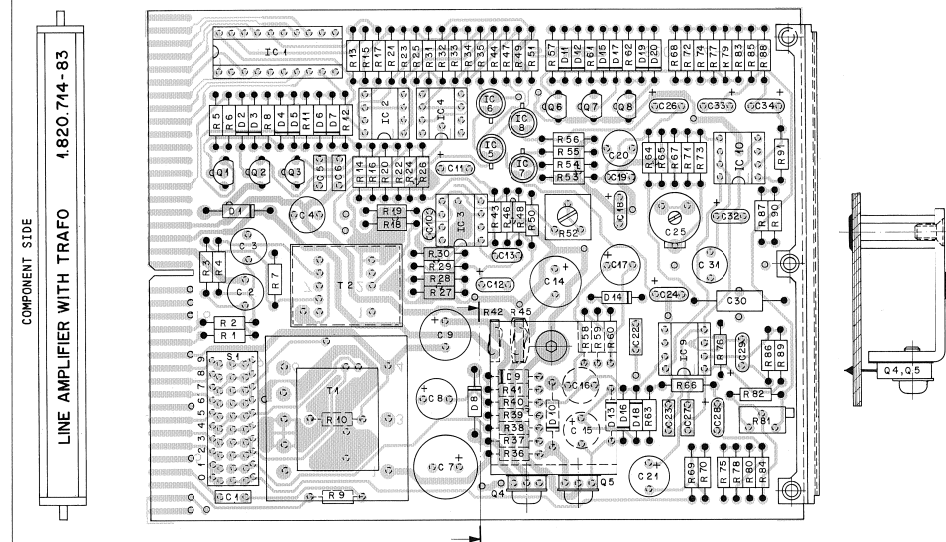
R	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											



18.01.85	B.Seml	A 820 / A 810 Audio Section	
STUDER	Line Amplifier	SC 1.820.714-83	PAGE 1 OF 2

18.01.85	B.Seml	A 820 / A 810 Audio Section	
STUDER	Line Amplifier	SC 1.820.714-83	PAGE 2 OF 2

## LINE AMPLIFIER WITH TRANSFORMERS 1.820.714-83 GR20 EL11/16 "ESE"



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
		C..0001	59-06-0223	22 nF	10%
		C..0002	59-05-0481	680 pF	1%
		C..0003	59-05-0481	680 pF	1%
		C..0004	59-05-0481	680 pF	1%
		C..0005	59-06-0104	100 nF	20%
		C..0006	59-06-0104	100 nF	20%
		C..0007	59-22-0102	1000 uF	-10% 6V E1
		C..0008	59-22-0470	47 uF	-10% 40V E1
		C..0009	59-22-0471	470 uF	-10% 16V E1
		C..0010	59-34-0330	33 uF	15% N150V Co
		C..0011	59-26-0470	47 uF	20% 6-3V Sa1
		C..0012	59-26-0100	10 uF	20% 10V Sa1
		C..0013	59-34-0680	68 pF	15% N150V Co
		C..0014	59-22-0471	470 uF	-10% 16V E1
		C..0015	59-22-0101	100 uF	-10% 10V E1
		C..0016	59-09-0132	3300 pF	1%
		C..0017	59-22-0470	47 uF	-10% 40V E1
		C..0018	59-26-0470	47 uF	20% 6-3V Sa1
		C..0019	59-34-0200	22 pF	15% N150V Co
		C..0020	59-05-0221	220 pF	1%
		C..0021	59-22-0221	220 uF	-10% 6V E1
		C..0022	59-06-0104	0.1 uF	1%
		C..0023	59-06-0104	100 nF	20%
		C..0024	59-26-0100	10 uF	20% 10V Sa1
		C..0025	59-18-0108	40 pF	Trimmer capacitor, Philips Nr 2222 80B 3240P
		C..0026	59-26-0470	47 uF	20% 6-3V Sa1
		C..0027	59-06-0104	100 nF	20%
		C..0028	59-26-0470	47 uF	20% 6-3V Sa1
		C..0029	59-26-0100	10 uF	20% 10V Sa1
		C..0030	59-12-0202	2 nF	1%
		C..0031	59-09-0132	47 uF	20% 6-3V Sa1
		C..0032	59-26-0470	47 uF	20% 6-3V Sa1
		C..0033	59-26-0100	10 uF	20% 10V Sa1
		C..0034	59-26-0100	10 uF	20% 10V Sa1
		D..0001	50-04-0512	1N5818	Not

S T U D E R (01) 85/11/21 GAE LINE AMPLIFIER 1-820.714-83 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
		D..0002	50-04-0125	1N4448	ITT-PhySes
		D..0003	50-04-0114	10V Z	ITT-PhySes
		D..0004	50-04-0105	1N4448	ITT-PhySes
		D..0005	50-04-0114	10V Z	ITT-PhySes
		D..0006	50-04-0105	1N4448	ITT-PhySes
		D..0007	50-04-0114	10V Z	ITT-PhySes
		D..0008	50-04-0125	1N4448	Not
		D..0009	50-04-0125	1N4448	ITT-PhySes
		D..0010	50-04-0125	1N4448	Not
		D..0011	50-04-0114	10V Z	ITT-PhySes
		D..0012	50-04-0125	1N4448	ITT-PhySes
		D..0013	50-04-0125	1N4448	ITT-PhySes
		D..0014	50-04-0125	1N4448	ITT-PhySes
		D..0015	50-04-0114	10V Z	ITT-PhySes
		D..0016	50-04-0125	1N4448	ITT-PhySes
		D..0017	50-04-0125	1N4448	ITT-PhySes
		D..0018	50-04-0125	1N4448	ITT-PhySes
		D..0019	50-04-0114	10V Z	ITT-PhySes
		D..0020	50-04-0125	1N4448	ITT-PhySes
		IL..0001	50-07-0303	HTF4C374N	NS
		IL..0002	50-05-0283	1N5939	TI-MS
		IL..0003	50-09-0006	NE5532AN	89532AN, 5532ANB
		IL..0004	50-05-0283	1N5939	TI-MS
		IL..0005	50-11-0106	50 214 DE	PhySis
		IL..0006	50-11-0106	50 214 DE	PhySis
		IL..0007	50-11-0106	50 214 DE	PhySis
		IL..0008	50-11-0106	50 214 DE	PhySis
		IL..0009	50-09-0005	NE5532N	89532N, 5532NB
		IL..0010	50-09-0005	NE5532N	89532N, 5532NB
		Q..0001	1-010-014-50	T 114 sel	See Note 1
		Q..0002	1-010-014-50	T 114 sel	See Note 1
		Q..0003	1-010-014-50	T 114 sel	See Note 1
		Q..0004	50-03-0151	80140-10	PNP
		Q..0005	50-03-0152	80140-10	PNP
		Q..0006	1-010-014-50	T 114 sel	See Note 1

S T U D E R (01) 85/11/21 GAE LINE AMPLIFIER 1-820.714-83 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
		Q..0007	1-010-014-50	T 114 sel	See Note 1
		Q..0008	1-010-014-50	T 114 sel	See Note 1
		R..0001	57-11-3272	2-7 kOhm	1%
		R..0002	57-11-3272	2-7 kOhm	1%
		R..0003	57-11-3272	2-7 kOhm	1%
		R..0004	57-11-3272	2-7 kOhm	1%
		R..0005	57-11-4103	10 kOhm	5%
		R..0006	57-11-4103	10 kOhm	5%
		R..0007	57-11-3202	2 kOhm	1%
		R..0008	57-11-4122	1-2 kOhm	5%
		R..0009	57-11-3081	680 Ohm	1%
		R..0010	57-11-4101	100 Ohm	5%
		R..0011	57-11-4122	1-2 kOhm	5%
		R..0012	57-11-4122	1-2 kOhm	5%
		R..0013	57-11-4273	27 kOhm	5%
		R..0014	57-11-4103	18 kOhm	5%
		R..0015	57-11-4273	27 kOhm	5%
		R..0016	57-11-4102	1 kOhm	5%
		R..0017	57-11-4102	1 kOhm	5%
		R..0018	57-11-4072	2-7 kOhm	5%
		R..0019	57-11-4181	180 Ohm	2%
		R..0020	57-11-3022	6-2 kOhm	5%
		R..0021	57-11-4104	100 kOhm	5%
		R..0022	57-11-4471	470 Ohm	5%
		R..0023	57-11-4104	100 kOhm	5%
		R..0024	57-11-4023	82 kOhm	5%
		R..0025	57-11-4203	22 kOhm	5%
		R..0026	57-11-4392	3-9 kOhm	5%
		R..0027	57-11-4470	47 Ohm	5%
		R..0028	57-11-4472	4-7 kOhm	5%
		R..0029	57-11-4105	1 kOhm	5%
		R..0030	57-11-4104	100 kOhm	5%
		R..0031	57-11-4102	1 kOhm	5%
		R..0032	57-11-4203	22 kOhm	5%
		R..0033	57-11-4104	100 kOhm	5%
		R..0034	57-11-4104	100 kOhm	5%

S T U D E R (01) 85/11/21 GAE LINE AMPLIFIER 1-820.714-83 PAGE 3

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
		R..0035	57-11-4105	1 kOhm	5%
		R..0036	57-11-4479	4-7 Ohm	5%
		R..0037	57-11-4479	4-7 Ohm	5%
		R..0038	57-11-4471	470 Ohm	5%
		R..0039	57-11-4102	1 kOhm	5%
		R..0040	57-11-4221	220 Ohm	5%
		R..0041	57-11-4102	1 kOhm	5%
		R..0042	57-92-1153	150 nA	See Note 2
		R..0043	57-11-4272	2-7 kOhm	2%
		R..0044	57-11-4105	1 kOhm	5%
		R..0045	57-92-1151	150 nA	See Note 2
		R..0046	57-11-4152	1-5 kOhm	5%
		R..0047	57-11-4105	1 kOhm	5%
		R..0048	57-11-4272	2-7 kOhm	2%
		R..0049	57-11-4105	1 kOhm	5%
		R..0050	57-11-4562	5-6 kOhm	5%
		R..0051	57-11-4476	470 kOhm	5%
		R..0052	58-01-0202	2 kOhm	See Note 3
		R..0053	57-11-4104	100 kOhm	5%
		R..0054	57-11-4102	1 kOhm	5%
		R..0055	57-11-4104	100 kOhm	5%
		R..0056	57-11-4476	470 kOhm	5%
		R..0057	57-11-4122	1-2 kOhm	5%
		R..0058	57-11-4332	3-3 kOhm	5%
		R..0059	57-11-4332	3-3 kOhm	5%
		R..0060	57-11-4102	1 kOhm	5%
		R..0061	57-11-4122	1-2 kOhm	5%
		R..0062	57-11-4122	1-2 kOhm	5%
		R..0063	57-11-4101	100 Ohm	2%
		R..0064	57-11-4122	1-2 kOhm	5%
		R..0065	57-11-4272	2-7 kOhm	2%
		R..0066	57-11-3131	130 Ohm	1%
		R..0067	57-11-4481	680 Ohm	2%
		R..0068	57-11-4103	10 kOhm	5%
		R..0069	57-11-4471	470 Ohm	5%
		R..0070	57-11-4472	4-7 kOhm	5%
		R..0071	57-11-4394	390 kOhm	5%

S T U D E R (01) 85/11/21 GAE LINE AMPLIFIER 1-820.714-83 PAGE 4

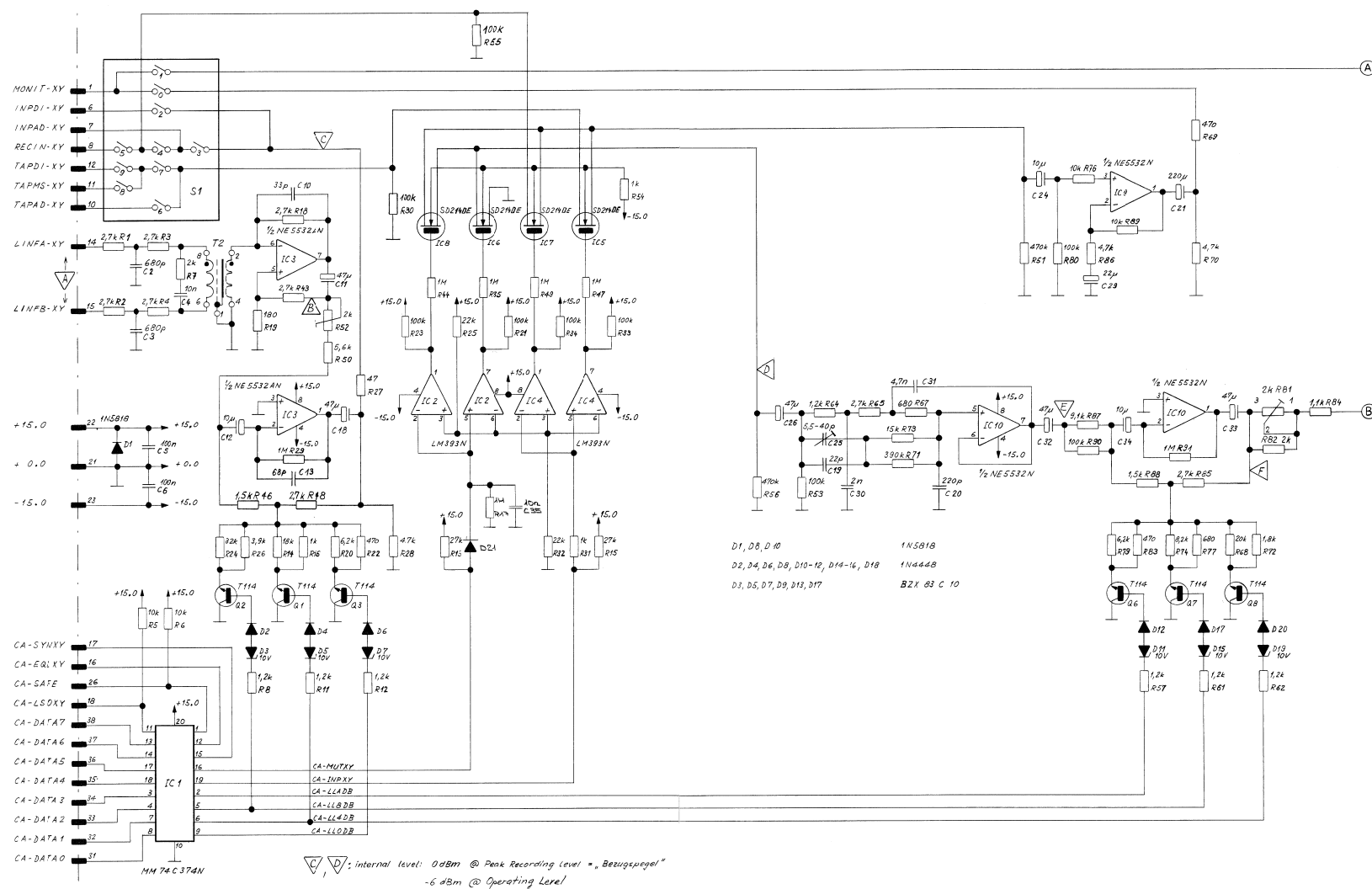
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
		R..0072	57-11-4125	1-8 kOhm	2%
		R..0073	57-11-3153	15 kOhm	1%
		R..0074	57-11-4022	8-2 kOhm	5%
		R..0075	57-11-4332	4-3 kOhm	1%
		R..0076	57-11-4103	10 kOhm	5%
		R..0077	57-11-3681	680 Ohm	1%
		R..0078	57-11-3022	3 kOhm	1%
		R..0079	57-11-3622	6-2 kOhm	5%
		R..0080	57-11-3022	3 kOhm	1%
		R..0081	58-05-0202	2 kOhm	See Note 4
		R..0082	57-11-3022	3 kOhm	1%
		R..0083	57-11-4471	470 Ohm	2%
		R..0084	57-11-3114	3-1 kOhm	5%
		R..0085	57-11-4272	2-7 kOhm	2%
		R..0086	57-11-4476	470 kOhm	5%
		R..0087	57-11-3912	9-1 kOhm	1%
		R..0088	57-11-4152	1-5 kOhm	2%
		R..0089	57-11-4103	10 kOhm	2%
		R..0090	57-11-4104	100 kOhm	5%
		R..0091	57-11-4105	1 kOhm	5%
		S..1-0-1	59-01-0170	SAE-Nr. 1010-692	
		T..0001	1-022-360-00	Output Transformer	1:1
		T..0002	1-022-415-00	Input Transformer	1:1

S T U D E R (01) 85/11/21 GAE LINE AMPLIFIER 1-820.714-83 PAGE 5

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
		(01) 85/11/21		Improved reliability.	
		Note 1	- T 114 sel. for inverts mode (IBC = 3 mA)		
			VCE < 0.7 mV, IE 0 mA, VCE < 25 mV, IE 4 mA		
		Note 2	- 150 nA PTC-Resistor		
			Philips Nr. 2322 661 11511		
			PTC-Resistor may be replaced by fuse-Resistor		
			57-11-4080 Philips Nr. 2322 255 13109.		
		Note 3	- 2 kOhm Potentiometer 1 mV, 10%		
			Bourn Nr. 3386 P-1-202		
			Allen Bradley Nr. E 2 B 202		
			Spectrol Nr. 63 M 202 T010		
		Note 4	- 2 kOhm Potentiometer 1 mV, 10%		
			Bourn Nr. 3206 C - 1 - 202		
			Spectrol Nr. 64 Z 202 T 000		
			Muratec Nr. P02 3105 Z - 1 - 202		
			Contec Nr. 183 X2 202		
			Ceramics: C=Electrolytic, Sa=Solid aluminium		
			MANUFACTURER: Ex=Exark, ITT=International, Mo=Motorola,		
			NS=National Semiconductor, PH=Philips, Ra=Raytheon,		
			Se=Seicon, Si=Siemens, Sig=Signetics, Si=Siliconix,		
			St=Studer, T=Telefunken, TI=Texas Instruments.		

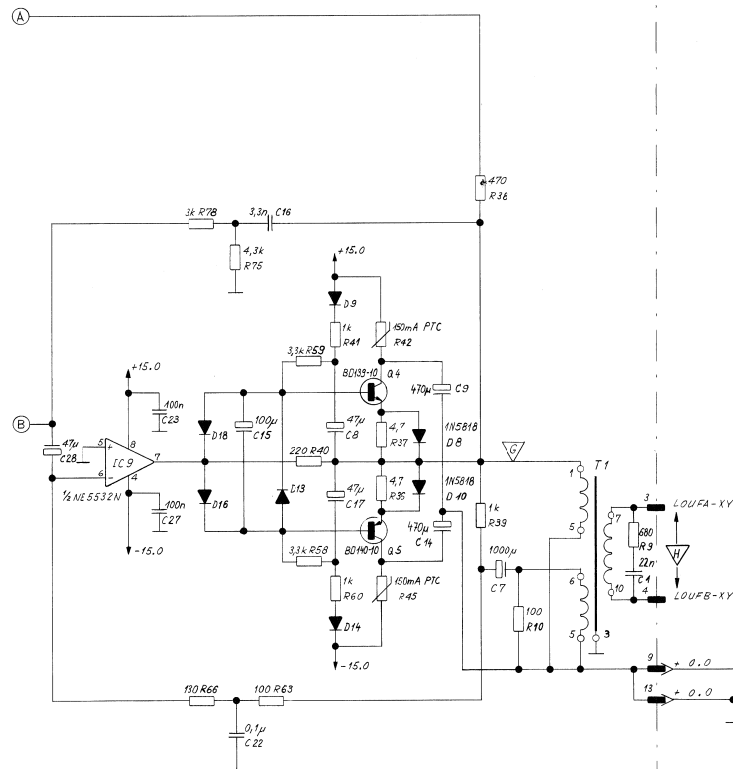
DRG 85/06/20 (01) 85/11/21 S T U D E R (01) 85/11/21 GAE LINE AMPLIFIER 1-820.714-83 PAGE 6

## LINE AMPLIFIER 1.820.714.84



D1, D8, D10 1N5018  
D2, D4, D6, D8, D10-12, D14-16, D18 1N4448B  
D3, D5, D7, D9, D13, D17 BZX 63 C 10

## LINE AMPLIFIER 1.820.714.84



20.06.85	B.Serv.	A 820 / A 840 Audio Section	
STUDER	Line Amplifier	SC 1.820.714-84	PAGE 2 OF 2

**LINE AMPLIFIER WITH TRAF0 1820.714-84**

Bezeichnungsskala

53.03.0165

1022.400-03

28.21.1370 (3x)

1.010.006-33 (2x)

53.03.0166 (5x)

1.010.011-33

1.820.714-01

1.010.046-22 gebördelt

21.53.2354

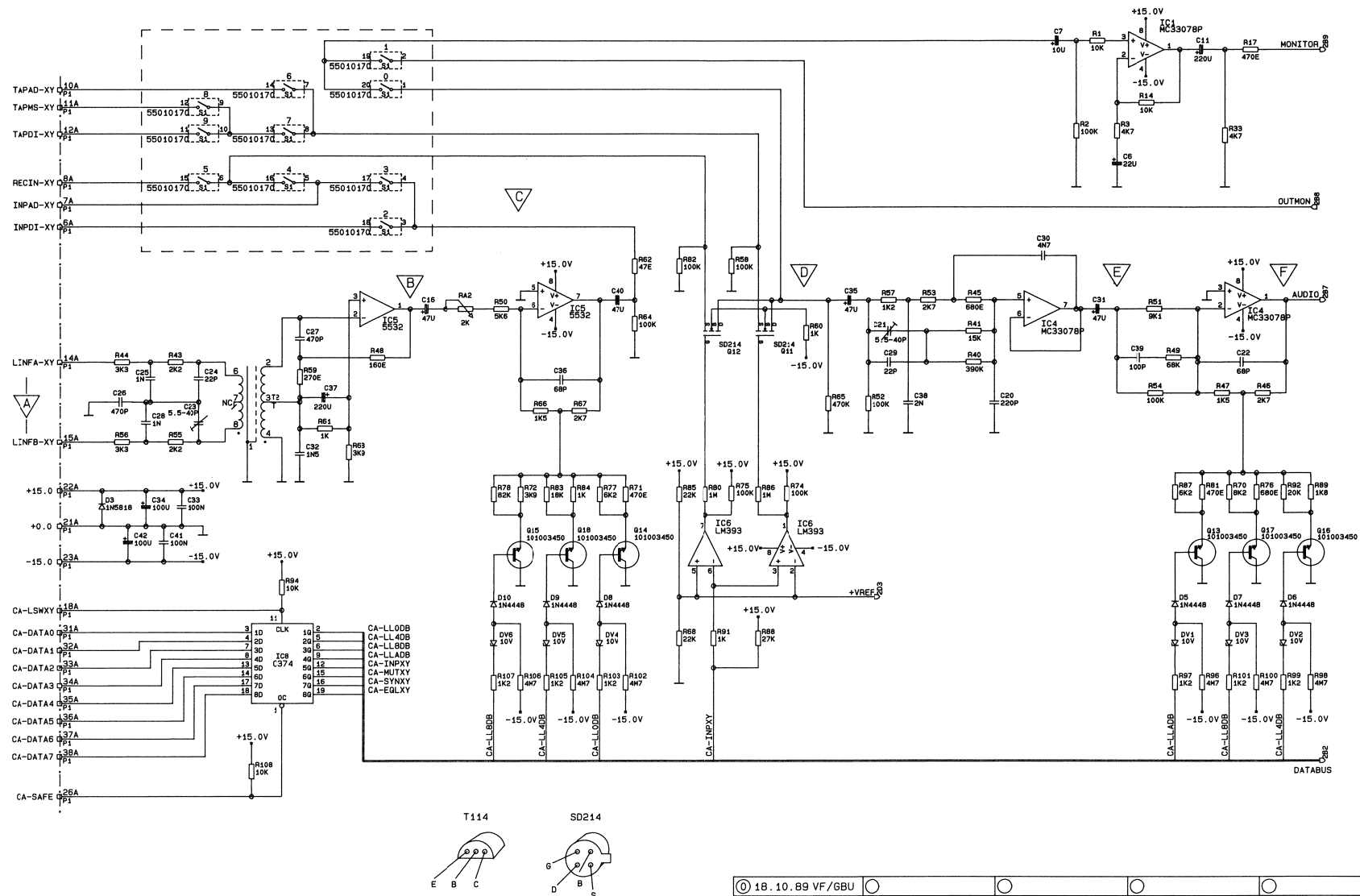
50.03.010(2x)

21.26.0354(2x)

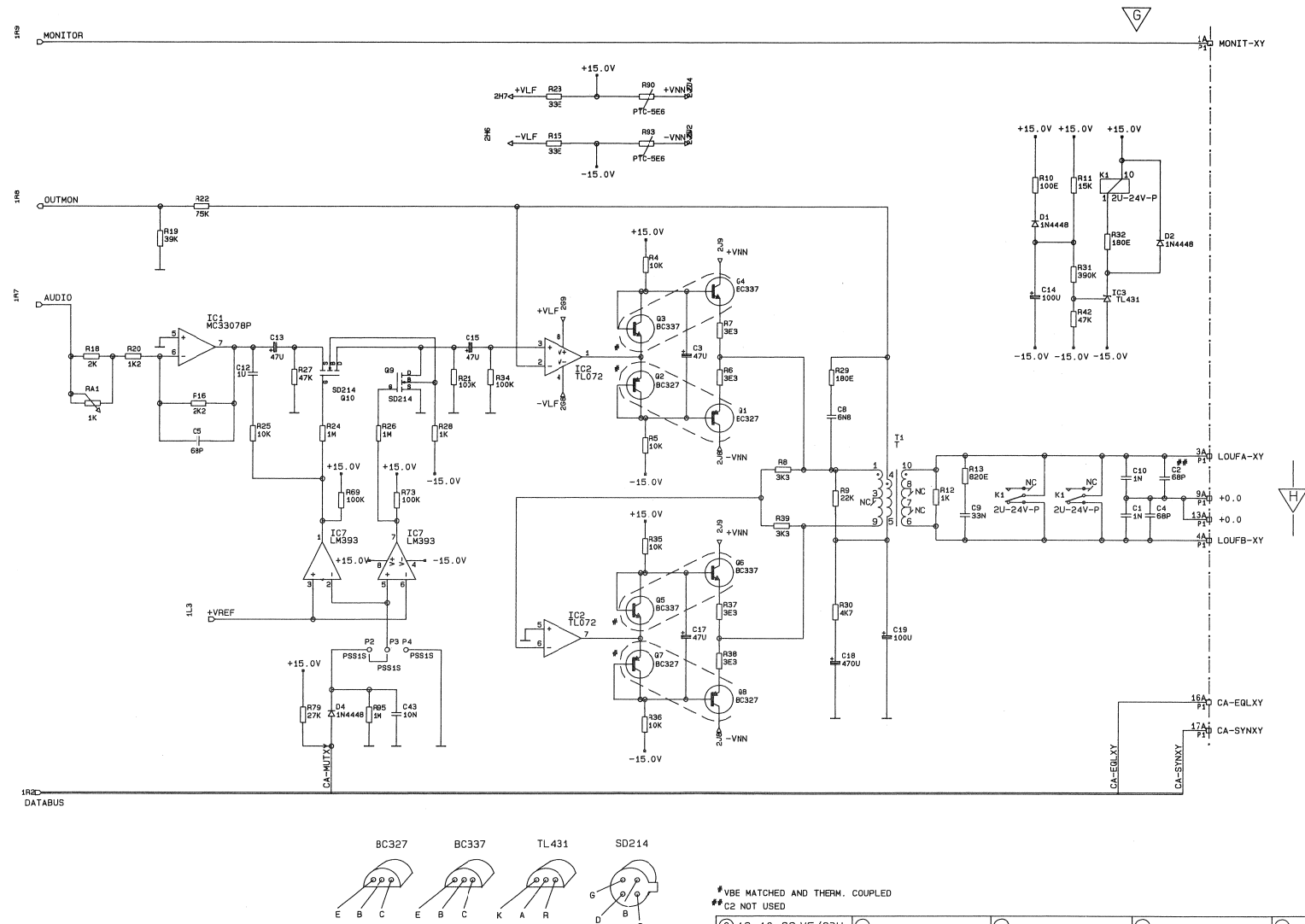
37.04.0104 (2x)

1820.714-14

## LINE AMPLIFIER WITH TRAFO 1.820.814.00 GR20 EL11/16



## LINE AMPLIFIER WITH TRAF0 1.820.814.00

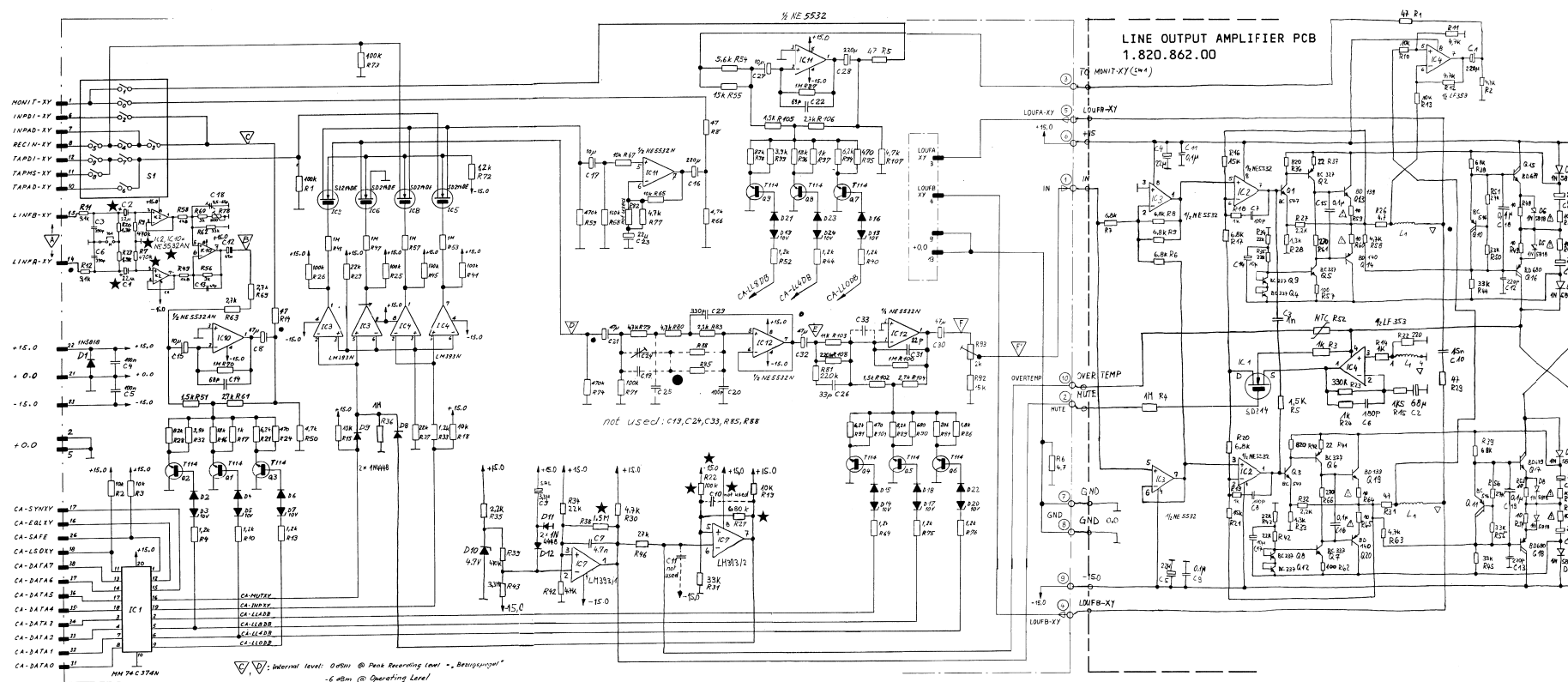


① 18.10.89 VF/G3U				
A810/B20 AUDIO SECTION				PAGE 2 OF 2
STUDER	LINE AMPLIFIER WITH TRAF0			SC1.820.814-00





LINE AMPLIFIER (TRANSFORMERLESS) 1.820.715-00/-81 GR20 EL11/16 "ESE"  
- LINE OUTPUT AMPLIFIER PCB 1.820.862-00 "ESE"



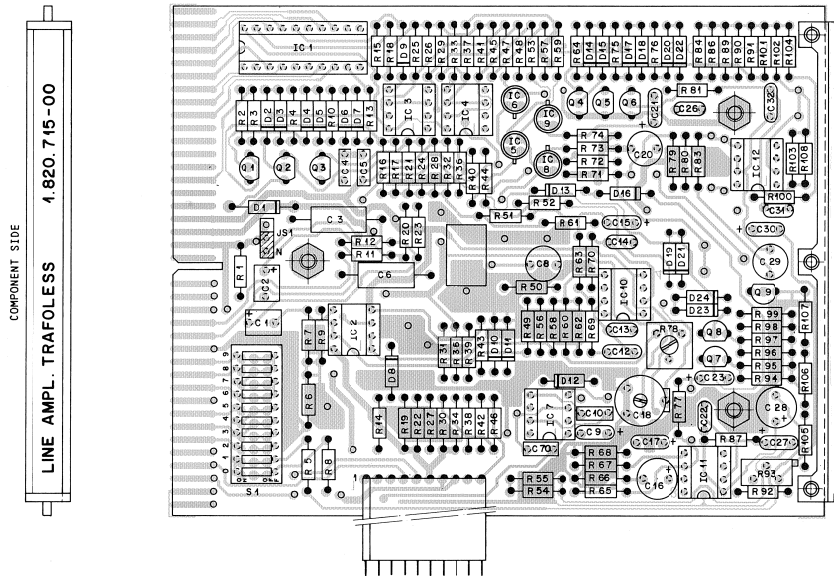
## ★ HAS BEEN MODIFIED:

	1.820.715.00	1.820.715.81
C10	10 nF (59.06.0102)	NOT USED
R22	33 kΩ (57.11.4333)	100 kΩ (57.11.4104)
R27	1 MΩ or 3.3 MΩ (57.11.4105 or 57.11.5335)	680 kΩ (57.11.4684)
R38	3.3 MΩ (57.11.5335)	1.5 MΩ (57.11.5155)

1 & 2P. 000 G6	A810/A812/A820
STUDER	LINE AMP. TRAFOLESS
1.820.715.81	PAGE OF

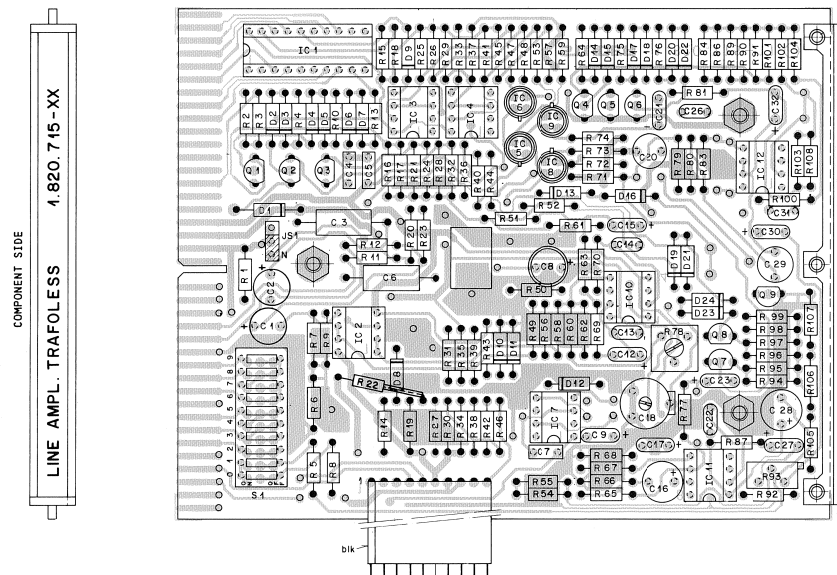
10. 9. 1985 G6	A810/A812/A820
STUDER	LINE AMP. TRAFOLESS 1.820.715.00/81
1.820.862.00	PAGE OF

## LINE AMPLIFIER (TRANSFORMERLESS) 1.820.715-00 GR20 EL11/16 "ESE"



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
A810-1.820.715-00 Line Output Amplifier											
(O1)	C1001	59.0x5105	1 uF	PETP	St	R1001	57.11x333	33 kOhm	5%		
(O1)	C1002	59.2x6220	22 uF	35V EL		R1002	57.11x333	1.3 kOhm	1%		
(O1)	C1003	59.0x5105	1 uF	PETP		R1003	57.11x333	470 Ohm	1%		
	C1004	59.2x6220	22 uF	1%		R1004	57.11x4104	100 kOhm	5%		
	C1005	59.1x1791	390 pF	1%		R1005	57.11x4104	100 kOhm	5%		
	C1006	59.0x10104	100 nF	20%		R1006	57.11x333	1.3 kOhm	5%		
	C1007	59.0x10104	100 nF	20%		R1007	57.11x4223	22 kOhm	5%		
	C1008	59.1x1391	390 pF	1%		R1008	57.11x4223	22 kOhm	5%		
	C1009	59.2x6220	22 uF	20%		R1009	57.11x333	33 kOhm	5%		
	C1010	59.0x2335	3.3 uF	20%		R1010	57.11x4223	22 kOhm	5%		
	C1011	59.0x10102	1 nF	PETP		R1011	57.11x4223	22 kOhm	5%		
	C1012	59.2x6220	22 uF	35V EL		R1012	57.11x4223	22 kOhm	5%		
	C1013	59.1x1791	390 pF	1%		R1013	57.11x4223	22 kOhm	5%		
	C1014	59.1x2680	68 pF	5% N150 Co		R1014	57.11x4223	22 kOhm	5%		
	C1015	59.2x6220	22 uF	20%		R1015	57.11x4223	22 kOhm	5%		
	C1016	59.2x2221	220 uF	-10% 6V EL		R1016	57.11x4223	22 kOhm	5%		
	C1017	59.2x6220	22 uF	20%		R1017	57.11x4223	22 kOhm	5%		
	C1018	59.1x10102	5.9-95pF			R1018	57.11x4223	22 kOhm	5%		
	C1019	not used				R1019	57.11x4223	22 kOhm	5%		
	C1020	59.0x1101	100 pF	1%		R1020	57.11x4223	22 kOhm	5%		
	C1021	59.2x6220	22 uF	20%		R1021	57.11x4223	22 kOhm	5%		
	C1022	59.1x2680	68 pF	5% N150 Co		R1022	57.11x4223	22 kOhm	5%		
	C1023	59.1x1220	22 uF	20%		R1023	57.11x4223	22 kOhm	5%		
	C1024	not used				R1024	57.11x4223	22 kOhm	5%		
	C1025	not used				R1025	57.11x4223	22 kOhm	5%		
	C1026	59.1x2335	33 pF	Co		R1026	57.11x4223	22 kOhm	5%		
	C1027	59.2x6220	22 uF	20%		R1027	57.11x4223	22 kOhm	5%		
	C1028	59.2x2221	220 uF	-10% 6V EL		R1028	57.11x4223	22 kOhm	5%		
	C1029	59.1x1391	390 pF	1%		R1029	57.11x4223	22 kOhm	5%		
	C1030	59.2x6220	22 uF	20%		R1030	57.11x4223	22 kOhm	5%		
	C1031	59.2x6220	22 uF	20%		R1031	57.11x4223	22 kOhm	5%		
	C1032	not used				R1032	57.11x4223	22 kOhm	5%		
S T U D E R (O1) 06/03/05 GAE LINE AMPLIFIER TRAFOLESS 1.820.715-00											
IND. <td>POS.NO.<td>PART NO.<td>VALUE<td>SPECIFICATIONS / EQUIVALENT<td>MANUF.<td>IND.<td>POS.NO.<td>PART NO.<td>VALUE<td>SPECIFICATIONS / EQUIVALENT<td>MANUF.</td></td></td></td></td></td></td></td></td></td></td>	POS.NO. <td>PART NO.<td>VALUE<td>SPECIFICATIONS / EQUIVALENT<td>MANUF.<td>IND.<td>POS.NO.<td>PART NO.<td>VALUE<td>SPECIFICATIONS / EQUIVALENT<td>MANUF.</td></td></td></td></td></td></td></td></td></td>	PART NO. <td>VALUE<td>SPECIFICATIONS / EQUIVALENT<td>MANUF.<td>IND.<td>POS.NO.<td>PART NO.<td>VALUE<td>SPECIFICATIONS / EQUIVALENT<td>MANUF.</td></td></td></td></td></td></td></td></td>	VALUE <td>SPECIFICATIONS / EQUIVALENT<td>MANUF.<td>IND.<td>POS.NO.<td>PART NO.<td>VALUE<td>SPECIFICATIONS / EQUIVALENT<td>MANUF.</td></td></td></td></td></td></td></td>	SPECIFICATIONS / EQUIVALENT <td>MANUF.<td>IND.<td>POS.NO.<td>PART NO.<td>VALUE<td>SPECIFICATIONS / EQUIVALENT<td>MANUF.</td></td></td></td></td></td></td>	MANUF. <td>IND.<td>POS.NO.<td>PART NO.<td>VALUE<td>SPECIFICATIONS / EQUIVALENT<td>MANUF.</td></td></td></td></td></td>	IND. <td>POS.NO.<td>PART NO.<td>VALUE<td>SPECIFICATIONS / EQUIVALENT<td>MANUF.</td></td></td></td></td>	POS.NO. <td>PART NO.<td>VALUE<td>SPECIFICATIONS / EQUIVALENT<td>MANUF.</td></td></td></td>	PART NO. <td>VALUE<td>SPECIFICATIONS / EQUIVALENT<td>MANUF.</td></td></td>	VALUE <td>SPECIFICATIONS / EQUIVALENT<td>MANUF.</td></td>	SPECIFICATIONS / EQUIVALENT <td>MANUF.</td>	MANUF.
D1001	50.0x0122	1N4048			not	R1001	57.11x333	33 kOhm	5%		
D1002	50.0x0125	1N4048			ITT-PhoSas	R1002	57.11x333	1.3 kOhm	1%		
D1003	50.0x1114	10V Z	5%		ITT-PhoSas	R1003	57.11x333	470 Ohm	1%		
D1004	50.0x0125	1N4048			ITT-PhoSas	R1004	57.11x4104	100 kOhm	5%		
D1005	50.0x1114	10V Z	5%		ITT-PhoSas	R1005	57.11x4104	100 kOhm	5%		
D1006	50.0x0125	1N4048			ITT-PhoSas	R1006	57.11x333	1.3 kOhm	5%		
D1007	50.0x1114	10V Z	5%		ITT-PhoSas	R1007	57.11x4223	22 kOhm	5%		
D1008	50.0x0125	1N4048			ITT-PhoSas	R1008	57.11x4223	22 kOhm	5%		
D1009	50.0x0125	1N4048			ITT-PhoSas	R1009	57.11x4223	22 kOhm	5%		
D1010	50.0x1114	10V Z	5%		ITT-PhoSas	R1010	57.11x4223	22 kOhm	5%		
D1011	50.0x0125	1N4048			ITT-PhoSas	R1011	57.11x4223	22 kOhm	5%		
D1012	50.0x0125	1N4048			ITT-PhoSas	R1012	57.11x4223	22 kOhm	5%		
D1013	50.0x1114	10V Z	5%		ITT-PhoSas	R1013	57.11x4223	22 kOhm	5%		
D1014	50.0x0125	1N4048			ITT-PhoSas	R1014	57.11x4223	22 kOhm	5%		
D1015	50.0x1114	10V Z	5%		ITT-PhoSas	R1015	57.11x4223	22 kOhm	5%		
D1016	50.0x0125	1N4048			ITT-PhoSas	R1016	57.11x4223	22 kOhm	5%		
D1017	50.0x1114	10V Z	5%		ITT-PhoSas	R1017	57.11x4223	22 kOhm	5%		
D1018	50.0x0125	1N4048			ITT-PhoSas	R1018	57.11x4223	22 kOhm	5%		
D1019	50.0x1114	10V Z	5%		ITT-PhoSas	R1019	57.11x4223	22 kOhm	5%		
D1020	50.0x0125	1N4048			ITT-PhoSas	R1020	57.11x4223	22 kOhm	5%		
D1021	50.0x0125	1N4048			ITT-PhoSas	R1021	57.11x4223	22 kOhm	5%		
D1022	50.0x1114	10V Z	5%		ITT-PhoSas	R1022	57.11x4223	22 kOhm	5%		
D1023	50.0x0125	1N4048			ITT-PhoSas	R1023	57.11x4223	22 kOhm	5%		
D1024	50.0x1114	10V Z	5%		ITT-PhoSas	R1024	57.11x4223	22 kOhm	5%		
D1025	50.0x0125	1N4048			ITT-PhoSas	R1025	57.11x4223	22 kOhm	5%		
D1026	50.0x0125	1N4048			ITT-PhoSas	R1026	57.11x4223	22 kOhm	5%		
D1027	50.0x1114	10V Z	5%		ITT-PhoSas	R1027	57.11x4223	22 kOhm	5%		
D1028	50.0x0125	1N4048			ITT-PhoSas	R1028	57.11x4223	22 kOhm	5%		
D1029	50.0x0125	1N4048			ITT-PhoSas	R1029	57.11x4223	22 kOhm	5%		
D1030	50.0x1114	10V Z	5%		ITT-PhoSas	R1030	57.11x4223	22 kOhm	5%		
D1031	50.0x0125	1N4048			ITT-PhoSas	R1031	57.11x4223	22 kOhm	5%		
D1032	50.0x0125	1N4048			ITT-PhoSas	R1032	57.11x4223	22 kOhm	5%		
D1033	50.0x1114	10V Z	5%		ITT-PhoSas	R1033	57.11x4223	22 kOhm	5%		
D1034	50.0x0125	1N4048			ITT-PhoSas	R1034	57.11x4223	22 kOhm	5%		
D1035	50.0x0125	1N4048			ITT-PhoSas	R1035	57.11x4223	22 kOhm	5%		
D1036	50.0x1114	10V Z	5%		ITT-PhoSas	R1036	57.11x4223	22 kOhm	5%		
D1037	50.0x0125	1N4048			ITT-PhoSas	R1037	57.11x4223	22 kOhm	5%		
D1038	50.0x0125	1N4048			ITT-PhoSas	R1038	57.11x4223	22 kOhm	5%		
D1039	50.0x1114	10V Z	5%		ITT-PhoSas	R1039	57.11x4223	22 kOhm	5%		
D1040	50.0x0125	1N4048			ITT-PhoSas	R1040	57.11x4223	22 kOhm	5%		
D1041	50.0x0125	1N4048			ITT-PhoSas	R1041	57.11x4223	22 kOhm	5%		
D1042	50.0x1114	10V Z	5%		ITT-PhoSas	R1042	57.11x4223	22 kOhm	5%		
D1043	50.0x0125	1N4048			ITT-PhoSas	R1043	57.11x4223	22 kOhm	5%		
D1044	50.0x0125	1N4048			ITT-PhoSas	R1044	57.11x4223	22 kOhm	5%		
D1045	50.0x1114	10V Z	5%		ITT-PhoSas	R1045	57.11x4223	22 kOhm	5%		
D1046	50.0x0125	1N4048			ITT-PhoSas	R1046	57.11x4223	22 kOhm	5%		
D1047	50.0x0125	1N4048			ITT-PhoSas	R1047	57.11x4223	22 kOhm	5%		
D1048	50.0x1114	10V Z	5%		ITT-PhoSas	R1048	57.11x4223	22 kOhm	5%		
D1049	50.0x0125	1N4048			ITT-PhoSas	R1049	57.11x4223	22 kOhm	5%		
D1050	50.0x0125	1N4048			ITT-PhoSas	R1050	57.11x4223	22 kOhm	5%		
D1051	50.0x1114	10V Z	5%		ITT-PhoSas	R1051	57.11x4223	22 kOhm	5%		
D1052	50.0x0125	1N4048			ITT-PhoSas	R1052	57.11x4223	22 kOhm	5%		
D1053	50.0x0125	1N4048			ITT-PhoSas	R1053	57.11x4223	22 kOhm	5%		
D1054	50.0x1114	10V Z	5%		ITT-PhoSas	R1054	57.11x4223	22 kOhm	5%		
D1055	50.0x0125	1N4048			ITT-PhoSas	R1055	57.11x4223	22 kOhm	5%		
D1056	50.0x0125	1N4048			ITT-PhoSas	R1056	57.11x4223	22 kOhm	5%		
D1057	50.0x1114	10V Z	5%		ITT-PhoSas	R1057	57.11x4223	22 kOhm	5%		
D1058	50.0x0125	1N4048			ITT-PhoSas	R1058	57.11x4223	22 kOhm	5%		
D1059	50.0x0125	1N4048			ITT-PhoSas	R1059	57.11x4223	22 kOhm	5%		
D1060	50.0x1114	10V Z	5%		ITT-PhoSas	R1060	57.11x4223	22 kOhm	5%		
D1061	50.0x0125	1N4048			ITT-PhoSas	R1061	57.11x4223	22 kOhm	5%		
D1062	50.0x0125	1N4048			ITT-PhoSas	R1062	57.11x4223	22 kOhm	5%		
D1063	50.0x1114	10V Z	5%		ITT-PhoSas	R1063	57.11x4223	22 kOhm	5%		
D1064	50.0x0125	1N4048			ITT-PhoSas	R1064	57.11x4223	22 kOhm	5%		
D1065	50.0x0125	1N4048			ITT-PhoSas	R1065	57.11x4223	22 kOhm	5%		
D1066	50.0x1114	10V Z	5%		ITT-PhoSas	R1066	57.11x4223	22 kOhm	5%		
D1067	50.0x0125	1N4048			ITT-PhoSas	R1067	57.11x4223	22 kOhm	5%		
D1068	50.0x0125	1N4048			ITT-PhoSas	R1068	57.11x4223	22 kOhm	5%		
D1069	50.0x1114	10V Z	5%		ITT-PhoSas	R1069	57.11x4223	22 kOhm	5%		
D1070	50.0x0125	1N4048			ITT-PhoSas	R1070	57.11x4223	22 kOhm	5%		
D1071	50.0x0125	1N4048			ITT-PhoSas	R1071	57.11x4223	22 kOhm	5%		
D1072	50.0x1114	10V Z	5%		ITT-PhoSas	R1072	57.11x4223	22 kOhm	5%		
D1073	50.0x0125	1N4048			ITT-PhoSas	R1073	57.11x4223	22 kOhm	5%		
D1074	50.0x0125	1N4048			ITT-PhoSas	R1074	57.11x4223	22 kOhm	5%		
D1075	50.0x1114	10V Z	5%		ITT-PhoSas	R1075	57.11x4223	22 kOhm	5%		
D1076	50.0x0125	1N4048			ITT-PhoSas	R1076	57.11x4223	22 kOhm	5%		
D1077	50.0x0125	1N4048			ITT-PhoSas	R1077	57.11x4223	22 kOhm	5%		
D1078	50.0x1114	10V Z	5%		ITT-PhoSas	R1078	57.11x4223	22 kOhm	5%		
D1079	50.0x0125	1N4048			ITT-PhoSas	R1079	57.11x4223	22 kOhm	5%		
D1080	50.0x0125	1N4048			ITT-PhoSas	R1080	57.11x4223	22 kOhm	5%		
D1081	50.0x1114	10V Z	5%		ITT-PhoSas	R1081	57.11x4223	22 kOhm	5%		
D1082	50.0x0125	1N4048			ITT-PhoSas	R1082	57.11x4223	22 kOhm	5%		
D1083	50.0x0125	1N4048			ITT-PhoSas	R1083	57.11x4223	22 kOhm	5%		
D1084	50.0x1114	10V Z	5%		ITT-PhoSas	R1084	57.				

## LINE AMPLIFIER (TRANSFORMERLESS) 1.820.715-81 GR20 EL11/16 "ESE"



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Line Output Amplifier					
A.....1	1.820.862+00				St
C.....1	99.22.2220	22 uF	35V, EL		
C.....2	99.22.2020	22 uF	35V, EL		
C.....3	99.12.7301	390 pF	15V, PS		
C.....4	99.06.0104	100 nF	20V, PETP		
C.....5	99.06.0104	100 nF	20V, PETP		
C.....6	99.12.7301	390 pF	15V, PS		
C.....7	99.06.0472	47 nF	20V, PETP		
C.....8	99.22.3470	47 uF	20V, 10V, EL		
C.....9	99.26.2339	33 uF	10 V, SAL		
C.....10		not used			
C.....11		not used			
C.....12	99.26.0470	47 uF			Ph
C.....13	99.34.2670	47 pF			
C.....14	99.34.2680	68 pF	50, N150, Co		
C.....15	99.26.2100	10 uF	20V, 10V, Sal		Ph
C.....16	99.22.2201	220 uF	100V, 6V, El		
C.....17	99.26.2100	10 uF	20V, 10V, Sal		
C.....18	99.18.0102	547 nF			
C.....19		not used			
C.....20	99.05.1101	100 p	15		
C.....21	99.26.0470	47 uF	20V, 6.3V, Sal		Ph
C.....22	99.34.0800	80 pF	50, N150, Co		
C.....23	99.26.1220	22 uF	20V, 10V, Sal		Ph
C.....24		not used			
C.....25		not used			
C.....26	99.34.2330	33 uF			
C.....27	99.26.2100	10 uF	20V, 10V, Sal		
C.....28	99.22.2221	220 uF	100V, 6V, El		
C.....29	99.05.1331	330 pF	15		Ph
C.....30	99.26.0470	47 uF	20V, 6.3V, Sal		
C.....31	99.34.2220	22 p			Ph
C.....32	99.26.0470	47 uF	20V, 6.3V, Sal		
C.....33		not used			
D.....1	50.04.0512	1N5818			Not

S T U D E R (08) 86/03/17 GAE LINE AMPLIFIER TRAFOLESS 1.820.715-81

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
D.....2	50.04.0125	1N4448			ITT-Ph-Ses
D.....3	50.04.1115	10W	5%		ITT-Ses
D.....4	50.04.0125	1N4448			ITT-Ph-Ses
D.....5	50.04.1114	10W	5%		ITT-Ses
D.....6	50.04.0125	1N4448			ITT-Ph-Ses
D.....7	50.04.1114	10W	5%		ITT-Ses
D.....8	50.04.0125	1N4448			ITT-Ph-Ses
D.....9	50.04.0125	1N4448			ITT-Ph-Ses
D.....10	50.04.1123	6.7V Z	2%		Not
D.....11	50.04.0125	1N4448			ITT-Ph-Ses
D.....12	50.04.0125	1N4448			ITT-Ph-Ses
D.....13	50.04.1114	10W	5%		ITT-Ses
D.....14	50.04.1114	10W	5%		ITT-Ses
D.....15	50.04.0125	1N4448			ITT-Ph-Ses
D.....16	50.04.0125	1N4448			ITT-Ph-Ses
D.....17	50.04.1114	10W	5%		ITT-Ses
D.....18	50.04.1114	10W	5%		ITT-Ses
D.....19	50.04.1114	10W	5%		ITT-Ses
D.....20	50.04.1114	10W	5%		ITT-Ses
D.....21	50.04.0125	1N4448			ITT-Ph-Ses
D.....22	50.04.0125	1N4448			ITT-Ph-Ses
D.....23	50.04.0125	1N4448			ITT-Ph-Ses
D.....24	50.04.1114	10W	5%		ITT-Ses
I.....1	50.07.0003	MM74C374N			NS
I.....2	50.04.0106	NE5532AN	KX5532AN, 5532AN		Sig-EleRa
I.....3	50.04.0283	LM938N			TI-MKS
I.....4	50.04.0283	LM938N			TI-MKS
I.....5	50.04.0106	50 214 DE	BS0 214		Phisix
I.....6	50.11.0106	50 214 DE	BS0 214		Phisix
I.....7	50.04.0283	LM938N			TI-MKS
I.....8	50.11.0106	50 214 DE	BS0 214		Phisix
I.....9	50.11.0106	50 214 DE	BS0 214		Phisix
I.....10	50.04.0106	50 214 DE	BS0 214		Phisix
I.....11	50.04.0106	NE5532AN	KX5532AN, 5532AN		Sig-EleRa
I.....12	50.04.0106	NE5532AN	KX5532AN, 5532AN		Sig-EleRa

S T U D E R (08) 86/03/17 GAE LINE AMPLIFIER TRAFOLESS 1.820.715-81

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
J.....1	54.01.0020	3 cont.		Philips Nr. 242 025 89303 See note 1	
Q.....1	1.010.034+50	T 114 sel		See Note 2	Sin
Q.....2	1.010.034+50	T 114 sel		See Note 2	Sin
Q.....3	1.010.034+50	T 114 sel		See Note 2	Sin
Q.....4	1.010.034+50	T 114 sel		See Note 2	Sin
Q.....5	1.010.034+50	T 114 sel		See Note 2	Sin
Q.....6	1.010.034+50	T 114 sel		See Note 2	Sin
Q.....7	1.010.034+50	T 114 sel		See Note 2	Sin
Q.....8	1.010.034+50	T 114 sel		See Note 2	Sin
Q.....9	1.010.034+50	T 114 sel		See Note 2	Sin
R.....1	57.11.4104	100 kOhm			
R.....2	57.11.4103	10 kOhm			
R.....3	57.11.4103	10 kOhm			
R.....4	57.11.4122	1k2 kOhm			
R.....5	57.11.4470	47 kOhm			
R.....6	57.11.4470	47 kOhm			
R.....7	57.11.4474	470 kOhm			
R.....8	57.11.4470	47 kOhm			
R.....9	57.11.4474	470 kOhm			
R.....10	57.11.4122	1k2 kOhm			
R.....11	57.11.3912	9.1 kOhm			
R.....12	57.11.3912	9.1 kOhm			
R.....13	57.11.4122	1k2 kOhm			
R.....14	57.11.4470	47 kOhm			
R.....15	57.11.4103	10 kOhm			
R.....16	57.11.4103	10 kOhm			
R.....17	57.11.3102	1 kOhm			
R.....18	57.11.4103	10 kOhm			
R.....19	57.11.4103	10 kOhm			
R.....20	57.11.3132	1.3 kOhm			
R.....21	57.11.3622	6.2 kOhm			
R.....22	57.11.4104	100 kOhm			
R.....23	57.11.3137	1.3 kOhm			
R.....24	57.11.3671	367 kOhm			
R.....25	57.11.4104	100 kOhm			

S T U D E R (08) 86/03/17 GAE LINE AMPLIFIER TRAFOLESS 1.820.715-81

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R.....26	57.11.4104	100 kOhm			
R.....27	57.11.4104	100 kOhm			
R.....28	57.11.4123	82 kOhm			
R.....29	57.11.4123	82 kOhm			
R.....30	57.11.4472	4.7 kOhm			
R.....31	57.11.4123	82 kOhm			
R.....32	57.11.3192	3.19 kOhm			
R.....33	57.11.4122	1.2 kOhm			
R.....34	57.11.4123	82 kOhm			
R.....35	57.11.4122	1.2 kOhm			
R.....36	57.11.4105	1 kOhm			
R.....37	57.11.4123	82 kOhm			
R.....38	57.11.4105	1.5 kOhm			
R.....39	57.11.4474	470 kOhm			
R.....40	57.11.4122	1k2 kOhm			
R.....41	57.11.4104	100 kOhm			
R.....42	57.11.4472	4.7 kOhm			
R.....43	57.11.3335	3.3 kOhm			
R.....44	57.11.4122	1k2 kOhm			
R.....45	57.11.4104	100 kOhm			
R.....46	57.11.4273	27 kOhm			
R.....47	57.11.4105	1 kOhm			
R.....48	57.11.4105	1 kOhm			
R.....49	57.11.3182	1.8 kOhm			
R.....50	57.11.4472	4.7 kOhm			
R.....51	57.11.3152	1.5 kOhm			
R.....52	57.11.4122	1k2 kOhm			
R.....53	57.11.4105	1 kOhm			
R.....54	57.11.3562	5.6 kOhm			
R.....55	57.11.4153	15 kOhm			
R.....56	57.11.3102	3 kOhm			
R.....57	57.11.4105	1 kOhm			
R.....58	57.11.3182	1.8 kOhm			
R.....59	57.11.4474	470 kOhm			
R.....60	57.11.3102	3 kOhm			
R.....61	57.11.3572	2.7 kOhm			
R.....62	57.11.4153	15 kOhm			
R.....63	57.11.4122	1k2 kOhm			
R.....64	57.11.4122	1k2 kOhm			
R.....65	57.11.4472	4.7 kOhm			
R.....66	57.11.4104	100 kOhm			
R.....67	57.11.4104	100 kOhm			
R.....68	57.11.4104	100 kOhm			
R.....69	57.11.4104	100 kOhm			
R.....70	57.11.4105	1 kOhm			
R.....71	57.11.4104	100 kOhm			
R.....72	57.11.4122	1k2 kOhm			
R.....73	57.11.4104	100 kOhm			
R.....74	57.11.4474	470 kOhm			
R.....75	57.11.4122	1k2 kOhm			
R.....76	57.11.4122	1k2 kOhm			
R.....77	57.11.4472	4.7 kOhm			
R.....78	57.11.4104	100 kOhm			
R.....79	57.11.4472	4.7 kOhm			
R.....80	57.11.4472	4.7 kOhm			
R.....81	57.11.4224	220 kOhm			
R.....82		not used			
R.....83	57.11.4222	2.2 kOhm			
R.....84	57.11.4003	40 kOhm			
R.....85		not used			
R.....86	57.11.3182	1.8 kOhm			
R.....87	57.11.4105	1 kOhm			
R.....88		not used			
R.....89	57.11.4822	8.2 kOhm			
R.....90	57.11.3081	308 kOhm			
R.....91	57.11.3622	6.2 kOhm			
R.....92	57.11.4153	15 kOhm			
R.....93	57.11.4122	1k2 kOhm			
R.....94	57.11.3622	6.2 kOhm			
R.....95	57.11.3671	367 kOhm			
R.....96	57.11.4103	10 kOhm			
R.....97	57.11.3102	3 kOhm			
R.....98	57.11.4122	1k2 kOhm			
R.....99	57.11.3192	3.19 kOhm			
R.....100	57.11.4105	1 kOhm			
R.....101	57.11.3471	347 kOhm			
R.....102	57.11.3192	3.19 kOhm			
R.....103	57.11.3113	31.1 kOhm			
R.....104	57.11.2272	2.27 kOhm			
R.....105	57.11.3192	3.19 kOhm			
R.....106	57.11.2272	2.27 kOhm			
R.....107	57.11.4472	4.7 kOhm			
R.....108	57.11.4124	220 kOhm			

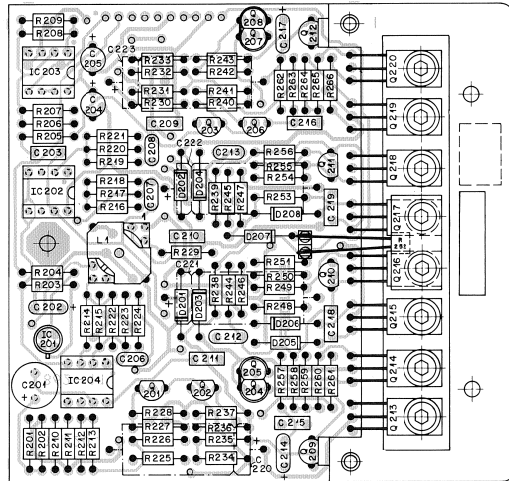
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IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1	Bridge Studer Nr. 54-01-0021				
Note 2	Philips Nr. 242 024 88003				
Note 3	T 114 sel. for inverts mode (IRE + 3 mA)				
Note 4	VCE < 0.7 mV @ 0 mA, VCE < 25 mV @ 4 mA				
Note 5	500 uOhm Potentiometer 10k, 10k				
Note 6	Allen Brady Nr. 128 501				
Note 7	3188 P-1, 501				
Note 8	63 M 501 T010				
Note 9	2 kOhm Potentiometer 10k, 10k				
Note 10	3296 Z - 1 - 202				
Note 11	Spectral Nr. 04 Z 202 T 000				
Note 12	POT 3105 Z - 1 - 202				
Note 13	Comatic Nr. 103 K 202				
Note 14	Capacitors: E=Electrolytic, PET=Polyester, PPS=Polypropylene				
Note 15	Sal=Solid aluminum				
Note 16	MANUFACTURER: Ex=Exara, ITT=Intertec, Mo=Motorola				
Note 17	NS=National Semiconductor, Phi=Philips, Ra=Raytheon				
Note 18	Ses=Siemens, Sig=Signetics, Sil=Siliconix				
Note 19	St=Studer, Tr=Telex Instruments				

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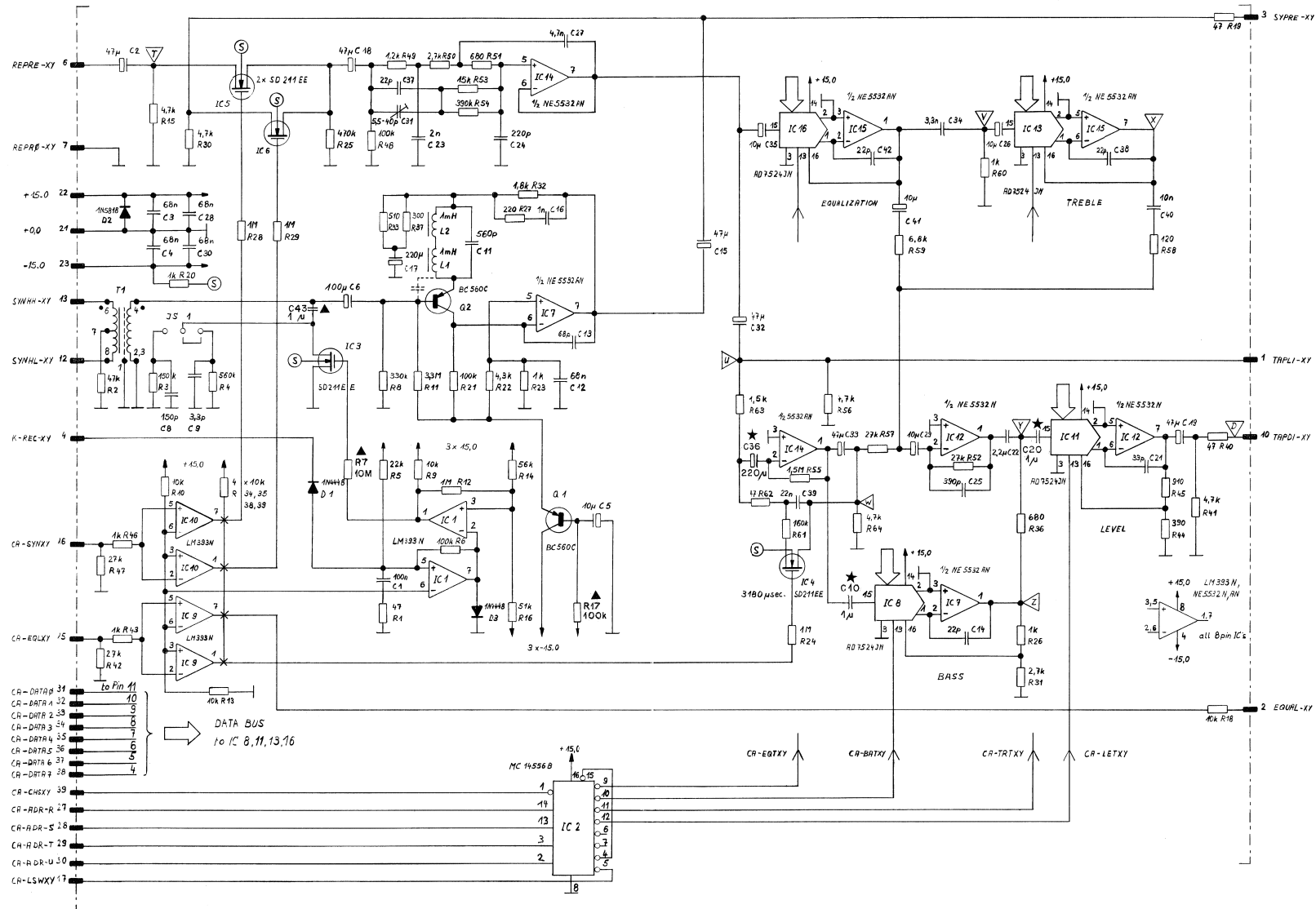
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## LINE OUTPUT AMPLIFIER PCB 1.820.862-00 "ESE"



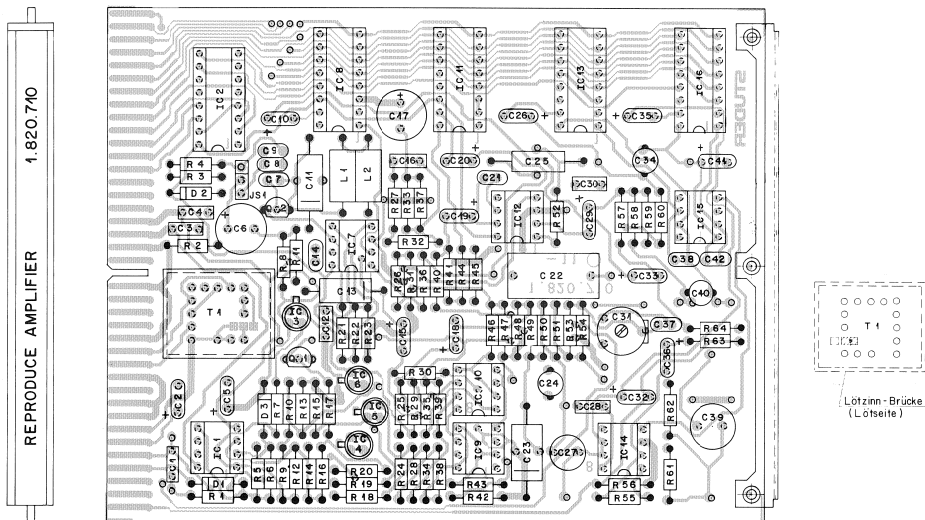
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C++0201	59-22-1221	220 uF	-27%, 10V	E1	Ph	R++0215	57-11-1152	1-5 kOhm	5%		
C++0202	59-22-0900	68 uF	-27%, 6.3V	Sat		R++0216	57-11-1153	15 kOhm	1%		
C++0203	59-08-0102	1 nF	17%, 6.3V	PETP		R++0217	57-11-1082	6-8 kOhm	1%		
C++0204	59-22-0220	22 uF	-27%, 35V	E1		R++0218	57-11-1102	1 kOhm	5%		
C++0205	59-34-1181	180 pF	1%, 6.3V	Cwr		R++0219	57-11-1102	1 kOhm	5%		
C++0206	59-34-1101	100 pF	1%, 6.3V	Cwr		R++0221	57-11-1133	15 kOhm	1%		
C++0207	59-34-1101	100 pF	1%, 6.3V	Cwr		R++0222	57-11-0221	270 Ohm	5%		
C++0208	59-08-0104	0-1 uF	17%, 6.3V	PETP		R++0223	57-11-1334	330 kOhm	5%		
C++0209	59-08-0103	15 nF	17%, 6.3V	PETP		R++0224	57-11-1102	1 kOhm	5%		
C++0210	59-08-0104	0-1 uF	17%, 6.3V	PETP		R++0225	57-11-0100	10 Ohm	5%	See Note 2	
C++0211	59-34-0221	220 pF	1%, 6.3V	Cwr	Ph	R++0226	57-11-0479	4-7 kOhm	5%		
C++0212	59-34-0221	220 pF	1%, 6.3V	Cwr		R++0227	57-11-1222	2-2 kOhm	1%		
C++0213	59-34-0221	220 pF	1%, 6.3V	Cwr		R++0228	57-11-1132	1-2 kOhm	1%		
C++0214	59-24-1100	10 u	-27%, 16V	Sat	Ph	R++0229	57-11-0100	10 Ohm	5%	See Note 2	
C++0215	59-08-0104	0-1 uF	17%, 6.3V	PETP		R++0230	57-11-0100	10 Ohm	5%		
C++0216	59-08-0104	0-1 uF	17%, 6.3V	PETP		R++0231	57-11-0479	4-7 kOhm	5%		
C++0217	59-24-1100	10 uF	-27%, 16V	Sat		R++0232	57-11-1222	2-2 kOhm	1%		
C++0218	59-08-0104	0-1 uF	17%, 6.3V	PETP		R++0233	57-11-1132	1-2 kOhm	1%		
C++0219	59-08-0104	0-1 uF	17%, 6.3V	PETP		R++0234	57-11-0223	22 kOhm	5%		
C++0220	59-24-1221	220 uF	-10%, 40V	E1		R++0235	57-11-0223	22 kOhm	5%		
C++0221	59-24-1221	220 uF	-10%, 40V	E1		R++0236	57-11-0221	820 Ohm	5%		
C++0222	59-24-1221	220 uF	-10%, 40V	E1		R++0237	57-11-0220	22 Ohm	5%		
C++0223	59-24-1221	220 uF	-10%, 40V	E1		R++0238	57-11-0683	68 kOhm	5%		
D++0201	50-04-3512	1N 5818	14 5819		Mot	R++0239	57-11-0683	68 kOhm	5%		
D++0202	50-04-3512	1N 5818	14 5819		Mot	R++0240	57-11-0621	820 Ohm	5%		
D++0203	50-04-3512	1N 5818	14 5819		Mot	R++0241	57-11-0220	22 Ohm	5%		
D++0204	50-04-3512	1N 5818	14 5819		Mot	R++0242	57-11-0223	22 kOhm	5%		
D++0205	50-04-3512	1N 5818	14 5819		Mot	R++0243	57-11-0223	22 kOhm	5%		
D++0206	50-04-3512	1N 5818	14 5819		Mot	R++0244	57-11-1333	33 kOhm	5%		
D++0207	50-04-3512	1N 5818	14 5819		Mot	R++0245	57-11-1333	33 kOhm	5%		
D++0208	50-04-3512	1N 5818	14 5819		Mot	R++0246	57-19-0100	10 Ohm	5%	See Note 2	
IC++0201	50-11-3106	50214-0E	80214		Sig+Ph	R++0247	57-19-0100	10 Ohm	5%	See Note 2	
IC++0202	50-09-3105	N5532 N	X1 5532 N, 5532 NB		Sig+Ex+Ra	R++0248	57-11-1100	10 Ohm	5%		
IC++0203	50-09-3105	N5532 N	X1 5532 N, 5532 NB		Sig+Ex+Ra	R++0249	57-11-1100	10 Ohm	5%		
IC++0204	50-09-3101	LF 353 N	TL 072 CP		Sig+Ex+Ra	R++0250	57-11-1333	33 kOhm	5%		
L++0201	1-022-275-00	3150 uH			NS+FI	R++0251	57-11-0273	270 Ohm	5%	See Note 3	
Q++0201	50-03-1436	8C 237 B	8C 547 B		Mot+Ph+Sig+St	R++0252	57-11-0220	11-2 kOhm	5%		
Q++0202	50-03-1436	8C 237-25	8C 547 B		Sig+Mot	R++0253	57-11-1100	10 Ohm	5%		
Q++0203	50-03-1436	8C 237 B	8C 547 B		Mot+Ph+Sig+St	R++0254	57-11-1100	10 Ohm	5%		
Q++0204	50-03-1516	8C 337		See Note 1	Sig	R++0255	57-11-1333	33 kOhm	5%		
Q++0205	50-03-1516	8C 337		See Note 1	Sig	R++0256	57-11-0273	27 kOhm	5%		
Q++0206	50-03-1516	8C 337-25		See Note 1	Sig+Mot	R++0257	57-11-1101	100 Ohm	5%		
Q++0207	50-03-1516	8C 337		See Note 1	Sig	R++0258	57-11-0479	4-7 kOhm	5%	See Note 2	
Q++0208	50-03-1516	8C 337		See Note 1	Sig	R++0259	57-11-0100	10 Ohm	5%	See Note 2	
Q++0209	50-03-1516	8C 337		See Note 1	Sig	R++0260	57-11-0100	10 Ohm	5%		
Q++0210	50-03-1436	8C 337		See Note 1	Sig+St	R++0261	57-11-0273	270 Ohm	5%		
Q++0211	50-03-1448	8C 516		See Note 1	Sig+St	R++0262	57-11-1101	100 Ohm	5%		
Q++0212	50-03-1516	8C 337		See Note 1	Sig	R++0263	57-11-0479	4-7 kOhm	5%	See Note 2	
Q++0213	50-03-1436	8C 139		See Note 1	Sig	R++0264	57-11-0100	10 Ohm	5%	See Note 2	
Q++0214	50-03-1448	8C 516		See Note 1	Sig	R++0265	57-11-0100	10 Ohm	5%		
Q++0215	50-03-1448	8C 516		See Note 1	Sig	R++0266	57-11-0271	270 Ohm	5%		
Q++0216	50-03-1448	8C 516		See Note 1	Sig						
Q++0217	50-03-1448	8C 516		See Note 1	Sig						
Q++0218	50-03-1448	8C 516		See Note 1	Sig						
Q++0219	50-03-1448	8C 516		See Note 1	Sig						
Q++0220	50-03-1448	8C 516		See Note 1	Sig						
Q++0221	50-03-1448	8C 516		See Note 1	Sig						
Q++0222	50-03-1448	8C 516		See Note 1	Sig						
Q++0223	50-03-1448	8C 516		See Note 1	Sig						
Q++0224	50-03-1448	8C 516		See Note 1	Sig						
Q++0225	50-03-1448	8C 516		See Note 1	Sig						
Q++0226	50-03-1448	8C 516		See Note 1	Sig						
Q++0227	50-03-1448	8C 516		See Note 1	Sig						
Q++0228	50-03-1448	8C 516		See Note 1	Sig						
Q++0229	50-03-1448	8C 516		See Note 1	Sig						
Q++0230	50-03-1448	8C 516		See Note 1	Sig						
Q++0231	50-03-1448	8C 516		See Note 1	Sig						
Q++0232	50-03-1448	8C 516		See Note 1	Sig						
Q++0233	50-03-1448	8C 516		See Note 1	Sig						
Q++0234	50-03-1448	8C 516		See Note 1	Sig						
Q++0235	50-03-1448	8C 516		See Note 1	Sig						
Q++0236	50-03-1448	8C 516		See Note 1	Sig						
Q++0237	50-03-1448	8C 516		See Note 1	Sig						
Q++0238	50-03-1448	8C 516		See Note 1	Sig						
Q++0239	50-03-1448	8C 516		See Note 1	Sig						
Q++0240	50-03-1448	8C 516		See Note 1	Sig						
Q++0241	50-03-1448	8C 516		See Note 1	Sig						
Q++0242	50-03-1448	8C 516		See Note 1	Sig						
Q++0243	50-03-1448	8C 516		See Note 1	Sig						
Q++0244	50-03-1448	8C 516		See Note 1	Sig						
Q++0245	50-03-1448	8C 516		See Note 1	Sig						
Q++0246	50-03-1448	8C 516		See Note 1	Sig						
Q++0247	50-03-1448	8C 516		See Note 1	Sig						
Q++0248	50-03-1448	8C 516		See Note 1	Sig						
Q++0249	50-03-1448	8C 516		See Note 1	Sig						
Q++0250	50-03-1448	8C 516		See Note 1	Sig						
Q++0251	50-03-1448	8C 516		See Note 1	Sig						
Q++0252	50-03-1448	8C 516		See Note 1	Sig						
Q++0253	50-03-1448	8C 516		See Note 1	Sig						
Q++0254	50-03-1448	8C 516		See Note 1	Sig						
Q++0255	50-03-1448	8C 516		See Note 1	Sig						
Q++0256	50-03-1448	8C 516		See Note 1	Sig						
Q++0257	50-03-1448	8C 516		See Note 1	Sig						
Q++0258	50-03-1448	8C 516		See Note 1	Sig						
Q++0259	50-03-1448	8C 516		See Note 1	Sig						
Q++0260	50-03-1448	8C 516		See Note 1	Sig						
Q++0261	50-03-1448	8C 516		See Note 1	Sig						
Q++0262	50-03-1448	8C 516		See Note 1	Sig						
Q++0263	50-03-1448	8C 516		See Note 1	Sig						
Q++0264	50-03-1448	8C 516		See Note 1	Sig						
Q++0265	50-03-1448	8C 516		See Note 1	Sig						
Q++0266	50-03-1448	8C 516		See Note 1	Sig						
Q++0267	50-03-1448	8C 516		See Note 1	Sig						
Q++0268	50-03-1448	8C 516		See Note 1	Sig						
Q++0269	50-03-1448	8C 516		See Note 1	Sig						
Q++0270	50-03-1448	8C 516		See Note 1	Sig						
Q++0271	50-03-1448	8C 516		See Note 1	Sig						
Q++0272	50-03-1448	8C 516		See Note 1	Sig						
Q++0273	50-03-1448	8C 516		See Note 1	Sig						
Q++0274	50-03-1448	8C 516		See Note 1	Sig						
Q++0275	50-03-1448	8C 516		See Note 1	Sig						
Q++0276	50-03-1448	8C 516		See Note 1	Sig						
Q++0277	50-03-1448	8C 516		See Note 1	Sig						
Q++0278	50-03-1448	8C 516		See Note 1	Sig						
Q++0279	50-03-1448	8C 516		See Note 1	Sig						
Q++0280	50-03-1448	8C 516		See Note 1	Sig						
Q++0281	50-03-1448	8C 516		See Note 1	Sig						
Q++0282	50-03-1448	8C 516		See Note 1	Sig						
Q++0283	50-03-1448	8C 516		See Note 1	Sig						
Q++0284	50-03-1448	8C 516		See Note 1	Sig						
Q++0285	50-03-1448	8C 516		See Note 1	Sig						
Q++0286	50-03-1448	8C 516		See Note 1	Sig						
Q++0287	50-03-1448										

## REPRODUCE AMPLIFIER PCB 1.820.710-00/-81/-82 GR20 EL 10/15 "ESE"



★ HAS BEEN MODIFIED FOR 1.820.710-81/-82  
 ▲ HAS BEEN MODIFIED FOR 1.820.710-82

## REPRODUCE AMPLIFIER PCB 1.820.710-00 GR20 EL10/15 "ESE"



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C++0001	59+06+5104	0.1 uF	51+ 63V + PETP		
C++0002	59+26+0470	47 uF	-201+ 6+3V + Sat	Ph	
C++0003	59+09+0205	68 nF	-201+ 63V + Cer		
C++0004	59+09+0205	68 nF	-201+ 63V + Cer		
C++0005	59+26+2100	10 uF	-201+ 16V + Sat		
C++0006	59+22+5101	100 uF	-201+ 25V + EL		
C++0007	59+34+2151	150 pF	21+ N150 + Cer		
C++0008	59+34+0139	3.3 uF	51+ N150 + Cer		
C++0010	59+26+2100	10 uF	-201+ 16V + Sat	Ph	
C++0011	59+12+1761	500 uF	11+ 63V + PS		
C++0012	59+09+0205	68 nF	-201+ 63V + Cer		
C++0013	59+06+0480	68 pF	51+ 63V + PP		
C++0014	59+34+2220	22 pF	51+ N150 + Cer	Ph	
C++0015	59+26+0470	47 uF	-201+ 6+3V + Sat		
C++0016	59+06+0102	1 nF	101+ 63V + PETP		
C++0017	59+22+2321	220 uF	101+ 60V + EL		
C++0018	59+26+0470	47 uF	-201+ 6+3V + Sat	Ph	
C++0019	59+26+0470	47 uF	-201+ 6+3V + Sat	Ph	
C++0020	59+26+2100	10 uF	-201+ 16V + Sat		
C++0021	59+34+2100	33 uF	51+ N150 + Cer		
C++0022	59+02+2225	2.2 uF	51+ 63V + PPC		
C++0023	59+12+7102	2 nF	11+ 63V + PP		
C++0024	59+05+1221	220 pF	11+ 63V + PP		
C++0025	59+12+7191	390 pF	11+ 63V + PP		
C++0026	59+26+2100	10 uF	-201+ 16V + Sat	Ph	
C++0027	59+05+1472	4.7 nF	11+ 63V + PP		
C++0028	59+09+0205	68 nF	-201+ 63V + Cer	Ph	
C++0029	59+26+2100	10 uF	-201+ 16V + Sat		
C++0030	59+09+0205	68 nF	-201+ 63V + Cer		
C++0031	59+18+0108	40 pF	101+ 63V + Sat	Ph	
C++0032	59+26+0470	47 uF	-201+ 6+3V + Sat		
C++0033	59+26+0470	47 uF	-201+ 6+3V + Sat		
C++0034	59+09+1132	3.3 nF	11+ 63V + PP	Ph	
C++0035	59+26+2100	10 uF	-201+ 16V + Sat	Ph	
C++0036	59+26+2100	10 uF	-201+ 16V + Sat	Ph	
C++0037	59+34+2120	22 pF	51+ N150 + Cer		

S T U D E R R2/02/25 BBT REPRODUCE AMPLIFIER 1.820.710.00 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C++0038	59+34+2120	22 pF	51+ N150 + Cer		
C++0039	59+05+1223	22 pF	11+ 63V + PP		
C++0040	59+05+1103	10 nF	11+ 63V + PP	Ph	
C++0041	59+26+2100	10 uF	-201+ 16V + Sat		
C++0042	59+34+2120	22 pF	51+ N150 + Cer		
D++0001	50+04+0.25	1N 4448	14+ 30 V		
D++0002	50+04+0.12	1N 5018			
D++0003	50+04+0.25	1N 4448			
IC++0001	50+05+0283	LM933N			
IC++0002	50+07+0802	AD7524JN	MC 14 5500+ 4550B	NS+T1	
IC++0003	50+11+0.06	SD211-EE	50 100-EE	RCX+MotaP	
IC++0004	50+11+0.06	SD211-EE	50 100-EE	Sig+Kra	
IC++0005	50+11+0.06	SD211-EE	50 100-EE	Sig+Kra	
IC++0006	50+11+0.06	SD211-EE	50 100-EE	Sig+Kra	
IC++0007	50+09+0.06	NE5532AN	AR 5532AN, 5532ANB	Sig+Kra	
IC++0008	50+07+0802	AD7524JN	MP 1524 JN	AD1+Mp5	
IC++0009	50+05+0283	LM933N		NS+T1	
IC++0010	50+09+2883	LM933N		NS+T1	
IC++0011	50+07+0802	AD7524JN	MP 1524 JN	AD1+Mp5	
IC++0012	50+09+2105	NE5532N	AR 5532 N, 5532 NB	Sig+Kra	
IC++0013	50+07+0802	AD7524JN	MP 1524 JN	AD1+Mp5	
IC++0014	50+09+2106	NE5532AN	AR 5532AN, 5532ANB	Sig+Kra	
IC++0015	50+09+2106	NE5532AN	AR 5532AN, 5532ANB	Sig+Kra	
IC++0016	50+07+0802	AD7524JN	MP 1524 JN	AD1+Mp5	
J5+0001					
L++0001	62+01+0128	1 mH	Gowanda Nr. 17-104+ Dalevan Nr. 1641-105		
L++0002	62+01+0128	1 mH	Gowanda Nr. 17-104+ Dalevan Nr. 1641-105		
Q++0001	50+03+0496	RC560		Sie+MotaPh+T	
Q++0002	50+03+0496	RC560		Sie+MotaPh+T	
R++0001	57+11+470	47 Ohm	51		
R++0002	57+11+4773	47 kOhm	51		

S T U D E R R2/02/25 BBT REPRODUCE AMPLIFIER 1.820.710.00 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R++0003	57+11+4114	150 kOhm	2%		
R++0004	57+11+4064	560 kOhm	2%		
R++0005	57+11+4233	22 kOhm	2%		
R++0006	57+11+4154	100 kOhm	5%		
R++0007	57+11+4105	1 kOhm	5%		
R++0008	57+11+4236	330 kOhm	2%		
R++0009	57+11+4103	10 kOhm	5%		
R++0010	57+11+4103	10 kOhm	5%		
R++0011	57+11+4135	3+3 kOhm	2%		
R++0012	57+11+4105	1 kOhm	5%		
R++0013	57+11+4103	10 kOhm	5%		
R++0014	57+11+4063	56 kOhm	2%		
R++0015	57+11+4472	4.7 kOhm	5%		
R++0016	57+11+3913	51 kOhm	1%		
R++0017	57+11+4103	10 kOhm	5%		
R++0018	57+11+4103	10 kOhm	5%		
R++0019	57+11+4470	47 Ohm	5%		
R++0020	57+11+4102	1 kOhm	5%		
R++0021	57+11+4104	100 kOhm	2%		
R++0022	57+11+3936	4+3 kOhm	1%		
R++0023	57+11+4102	1 kOhm	2%		
R++0024	57+11+4105	1 kOhm	5%		
R++0025	57+11+4476	470 kOhm	5%		
R++0026	57+11+4102	1 kOhm	2%		
R++0027	57+11+4221	220 Ohm	5%		
R++0028	57+11+4105	1 kOhm	5%		
R++0029	57+11+4105	1 kOhm	5%		
R++0030	57+11+4472	4.7 kOhm	5%		
R++0031	57+11+4272	2+7 kOhm	2%		
R++0032	57+11+4182	1+8 kOhm	2%		
R++0033	57+11+3911	510 Ohm	2%		
R++0034	57+11+4103	10 kOhm	5%		
R++0035	57+11+4103	10 kOhm	5%		
R++0036	57+11+4102	680 Ohm	2%		
R++0037	57+11+3301	300 Ohm	2%		
R++0038	57+11+4103	10 kOhm	5%		
R++0039	57+11+4103	10 kOhm	5%		

S T U D E R R2/02/25 BBT REPRODUCE AMPLIFIER 1.820.710.00 PAGE 3

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R++0040	57+11+4470	47 Ohm	5%		
R++0041	57+11+4472	4.7 kOhm	5%		
R++0042	57+11+4273	27 kOhm	5%		
R++0043	57+11+4102	1 kOhm	5%		
R++0044	57+11+3951	390 Ohm	2%		
R++0045	57+11+3911	910 Ohm	1%		
R++0046	57+11+4102	1 kOhm	5%		
R++0047	57+11+4273	27 kOhm	5%		
R++0048	57+11+4104	100 kOhm	5%		
R++0049	57+11+3122	1+2 kOhm	1%		
R++0050	57+11+3272	2+7 kOhm	1%		
R++0051	57+11+3681	680 Ohm	1%		
R++0052	57+11+3273	27 kOhm	2%		
R++0053	57+11+3153	15 kOhm	1%		
R++0054	57+11+3994	390 kOhm	5%		
R++0055	57+11+5155	1+5 kOhm	5%		
R++0056	57+11+4472	4.7 kOhm	5%		
R++0057	57+11+4273	27 kOhm	2%		
R++0058	57+11+4121	120 Ohm	2%		
R++0059	57+11+4482	6+8 kOhm	2%		
R++0060	57+11+4102	1 kOhm	5%		
R++0061	57+11+3364	160 kOhm	1%		
R++0062	57+11+4470	47 Ohm	5%		
R++0063	57+11+3152	1+5 kOhm	1%		
R++0064	57+11+4472	4.7 kOhm	5%		

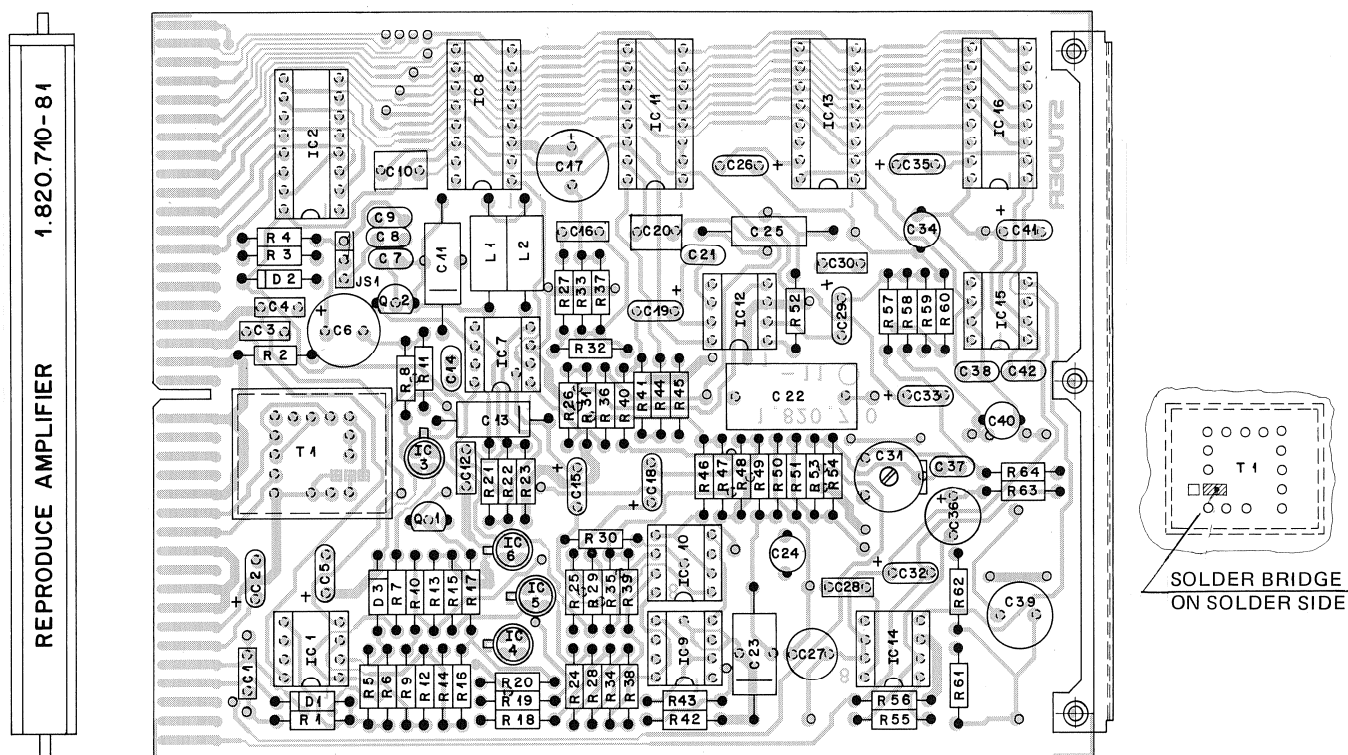
S T U D E R R2/02/25 BBT REPRODUCE AMPLIFIER 1.820.710.00 PAGE 4

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C++0038	59+34+2120	22 pF	51+ N150 + Cer		
C++0039	59+05+1223	22 pF	11+ 63V + PP		
C++0040	59+05+1103	10 nF	11+ 63V + PP	Ph	
C++0041	59+26+2100	10 uF	-201+ 16V + Sat		
C++0042	59+34+2120	22 pF	51+ N150 + Cer		
D++0001	50+04+0.25	1N 4448	14+ 30 V		
D++0002	50+04+0.12	1N 5018			
D++0003	50+04+0.25	1N 4448			
IC++0001	50+05+0283	LM933N			
IC++0002	50+07+0802	AD7524JN	MC 14 5500+ 4550B	NS+T1	
IC++0003	50+11+0.06	SD211-EE	50 100-EE	RCX+MotaP	
IC++0004	50+11+0.06	SD211-EE	50 100-EE	Sig+Kra	
IC++0005	50+11+0.06	SD211-EE	50 100-EE	Sig+Kra	
IC++0006	50+11+0.06	SD211-EE	50 100-EE	Sig+Kra	
IC++0007	50+09+0.06	NE5532AN	AR 5532AN, 5532ANB	Sig+Kra	
IC++0008	50+07+0802	AD7524JN	MP 1524 JN	AD1+Mp5	
IC++0009	50+05+0283	LM933N		NS+T1	
IC++0010	50+09+2883	LM933N		NS+T1	
IC++0011	50+07+0802	AD7524JN	MP 1524 JN	AD1+Mp5	
IC++0012	50+09+2105	NE5532N	AR 5532 N, 5532 NB	Sig+Kra	
IC++0013	50+07+0802	AD7524JN	MP 1524 JN	AD1+Mp5	
IC++0014	50+09+2106	NE5532AN	AR 5532AN, 5532ANB	Sig+Kra	
IC++0015	50+09+2106	NE5532AN	AR 5532AN, 5532ANB	Sig+Kra	
IC++0016	50+07+0802	AD7524JN	MP 1524 JN	AD1+Mp5	
J5+0001					
L++0001	62+01+0128	1 mH	Gowanda Nr. 17-104+ Dalevan Nr. 1641-105		
L++0002	62+01+0128	1 mH	Gowanda Nr. 17-104+ Dalevan Nr. 1641-105		
Q++0001	50+03+0496	RC560		Sie+MotaPh+T	
Q++0002	50+03+0496	RC560		Sie+MotaPh+T	
R++0001	57+11+470	47 Ohm	51		
R++0002	57+11+4773	47 kOhm	51		

S T U D E R R2/02/25 BBT REPRODUCE AMPLIFIER 1.820.710.00 PAGE 5

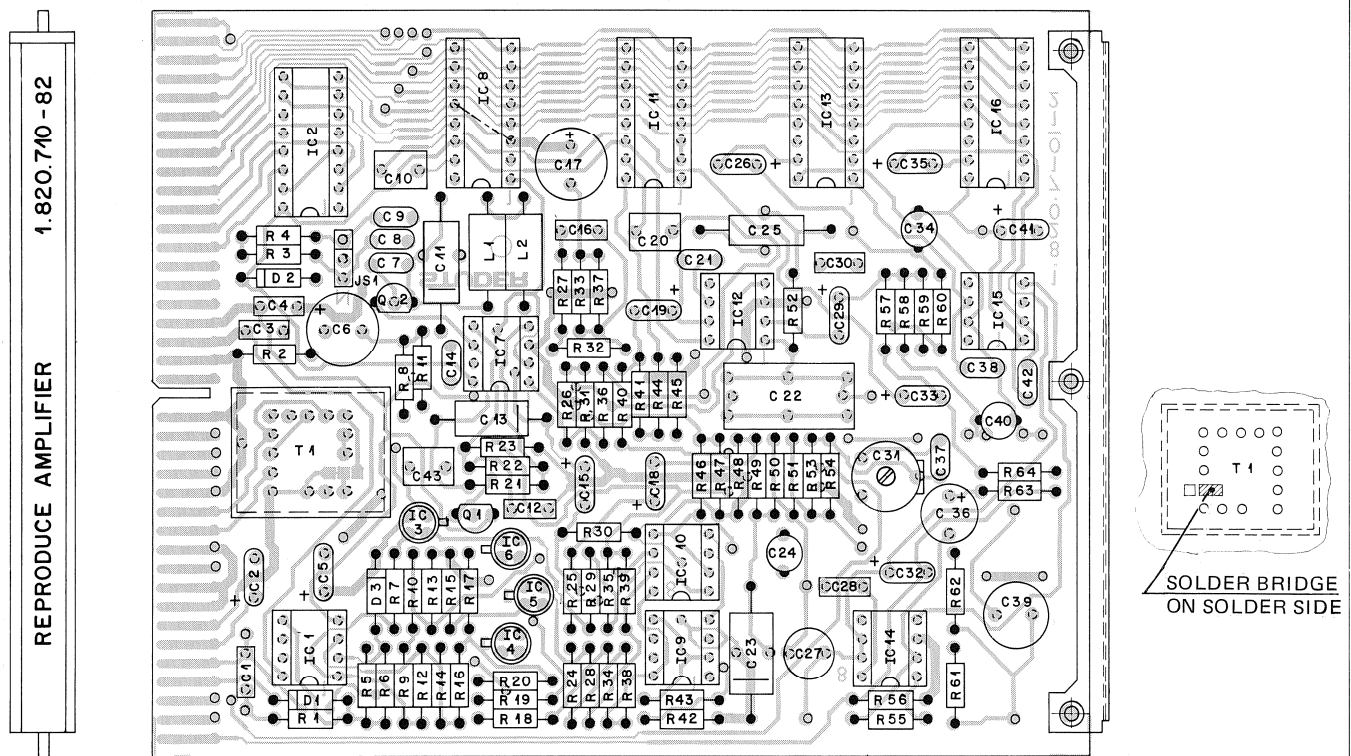
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R++0003	57+11+4114	150 kOhm	2%		
R++0004	57+11+4064	560 kOhm	2%		
R++0005	57+11+4233	22 kOhm	2%		
R++0006	57+11+4154	100 kOhm	5%		
R++0007	57+11+4105	1 kOhm	5%		
R++0008	57+11+4236	330 kOhm	2%		
R++0009	57+11+4103	10 kOhm	5%		
R++0010	57+11+4103	10 kOhm	5%		
R++0011	57+11+4135	3+3 kOhm	2%		
R++0012	57+11+4105	1 kOhm	5%		
R++0013	57+11+4103	10 kOhm	5%		
R++0014	57+11+4063	56 kOhm	2%		
R++0015	57+11+4472	4.7 kOhm	5%		
R++0016	57+11+3913	51 kOhm	1%		
R++0017	57+11+4103	10 kOhm	5%		
R++0018	57+11+4103	10 kOhm	5%		
R++0019	57+11+4470	47 Ohm	5%		
R++0020	57+11+4102	1 kOhm	5%		
R++0021	57+11+4104	100 kOhm	2%		
R++0022	57+11+3936	4+3 kOhm	1%		
R++0023	57+11+4102	1 kOhm	2%		
R++0024	57+11+4105	1 kOhm	5%		
R++0025	57+11+4476	470 kOhm	5%		
R++0026	57+11+4102	1 kOhm	2%		
R++0027	57+11+4221	220 Ohm	5%		
R++0028	57+11+4105	1 kOhm	5%		
R++0029	57+11+4105	1 kOhm	5%		
R++0030	57+11+4472	4.7 kOhm	5%		
R++0031	57+11+4272	2+7 kOhm	2%		
R++0032	57+11+4182	1+8 kOhm	2%		
R++0033	57+11+3911	510 Ohm	2%		
R++0034	57+11+4103	10 kOhm	5%		
R++0035	57+11+4103	10 kOhm	5%		
R++0036	57+11+4102	680 Ohm	5%		

## REPRODUCE AMPLIFIER PCB 1.820.710-81 GR20 EL10/15 "ESE"



IND.	POS. NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS. NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.76.5104	0.1 uF	5%	63V, PETP		R..0003	57.11.4154	150 kOhm	2%		
C..0002	59.26.0470	47 uF	-20%	6.3V, Sal	Ph	R..0004	57.11.4564	560 kOhm	2%		
C..0003	59.99.0205	68 nF	-20%	63V, Cer		R..0005	57.11.4223	22 kOhm	2%		
C..0004	59.99.0205	68 nF	-20%	63V, Cer		R..0006	57.11.4104	100 kOhm	5%		
C..0005	59.26.2100	10 uF	-20%	16V, Sal	Ph	R..0007	57.11.4105	1 MOhm	5%		
C..0006	59.22.5101	100 uF	-20%	25V, EL		R..0008	57.11.4334	330 kOhm	2%		
C..0007		not used				R..0009	57.11.4103	10 kOhm	5%		
C..0008	59.34.2151	150 pF	2%	N150, Cer		R..0010	57.11.4103	10 kOhm	5%		
C..0009	59.34.0359	3.3 pF	5%	N150, Cer		R..0011	57.11.4335	3.3 MOhm	2%		
C..0010	59.76.5105	1 uF	5%	PETP		R..0012	57.11.4105	1 MOhm	5%		
C..0011	59.12.7561	500 pF	1%	63V, PS		R..0013	57.11.4103	10 kOhm	5%		
C..0012	59.99.0205	68 nF	-20%	63V, Cer		R..0014	57.11.4563	56 kOhm	2%		
C..0013	59.06.9680	68 pF	5%	63V, PP		R..0015	57.11.4472	4.7 kOhm	5%		
C..0014	59.34.2220	22 pF	5%	N150, Cer		R..0016	57.11.3513	51 kOhm	1%		
C..0015	59.26.0470	47 uF	-20%	6.3V, Sal	Ph	R..0017	57.11.4103	10 kOhm	5%		
C..0016	59.06.0102	1 nF	-10%	6V, EL		R..0018	57.11.4103	10 kOhm	5%		
C..0017	59.22.2221	220 uF	-20%	6V, EL	Ph	R..0019	57.11.4470	47 Ohm	5%		
C..0018	59.26.0470	47 uF	-20%	6.3V, Sal	Ph	R..0020	57.11.4102	1 kOhm	5%		
C..0019	59.26.0470	47 uF	-20%	6.3V, Sal	Ph	R..0021	57.11.4104	100 kOhm	2%		
C..0020	59.06.5105	1 uF	5%	PETP		R..0022	57.11.3632	4.3 kOhm	1%		
C..0021	59.34.2330	33 pF	5%	N150, Cer		R..0023	57.11.4102	1 kOhm	2%		
C..0022	59.02.2225	2.2 uF	5%	63V, MPC		R..0024	57.11.4105	1 MOhm	5%		
C..0023	59.12.7202	2 nF	1%	63V, PS		R..0025	57.11.4474	470 kOhm	5%		
C..0024	59.05.1221	220 pF	1%	63V, PP		R..0026	57.11.4102	1 kOhm	2%		
C..0025	59.12.7391	390 pF	1%	63V, PS	Ph	R..0027	57.11.4221	220 Ohm	5%		
C..0026	59.26.2100	10 uF	-20%	16V, Sal		R..0028	57.11.4105	1 MOhm	5%		
C..0027	59.05.1472	4.7 nF	1%	63V, PP		R..0029	57.11.4105	1 MOhm	5%		
C..0028	59.99.0205	68 nF	-20%	63V, Cer		R..0030	57.11.4472	4.7 kOhm	5%		
C..0029	59.26.2100	10 uF	-20%	16V, Sal	Ph	R..0031	57.11.4272	2.7 kOhm	2%		
C..0030	59.99.0205	68 nF	-20%	63V, Cer		R..0032	57.11.4182	1.8 kOhm	2%		
C..0031	59.18.0108	60 pF		Trimmer capacitor, Philips Nr 2022.808.32409	Ph	R..0033	57.11.3511	510 Ohm	2%		
C..0032	59.26.0470	47 uF	-20%	6.3V, Sal	Ph	R..0034	57.11.4103	10 kOhm	5%		
C..0033	59.26.0470	47 uF	-20%	6.3V, Sal	Ph	R..0035	57.11.4103	10 kOhm	5%		
C..0034	59.05.1332	3.3 pF	1%	63V, PP		R..0036	57.11.4681	680 Ohm	2%		
C..0035	59.26.2100	10 uF	-20%	16V, Sal	Ph	R..0037	57.11.3301	300 Ohm	2%		
C..0036	59.22.3221	220 uF	-20%	10V, El		R..0038	57.11.4103	10 kOhm	5%		
C..0037	59.34.2220	22 pF	5%	N150, Cer		R..0039	57.11.4103	10 kOhm	5%		
C..0038	59.34.2220	22 pF	5%	N150, Cer		R..0040	57.11.4470	47 Ohm	5%		
C..0039	59.05.1223	22 nF	1%	63V, PP		R..0041	57.11.4472	4.7 kOhm	5%		
C..0040	59.05.1103	10 nF	1%	63V, PP	Ph	R..0042	57.11.4273	27 kOhm	5%		
C..0041	59.26.2100	10 uF	-20%	16V, Sal		R..0043	57.11.4102	1 kOhm	5%		
C..0042	59.34.2220	22 pF	5%	N150, Cer		R..0044	57.11.4391	390 Ohm	2%		
D..0001	50.04.0125	1N 4448				R..0045	57.11.3911	910 Ohm	1%		
D..0002	50.04.0512	1N 5818				R..0046	57.11.4102	1 kOhm	5%		
D..0003	50.04.0125	1N 4448		1A, 30 V		R..0047	57.11.4273	27 kOhm	5%		
IC..0001	50.05.0283	LM393N			NS+TI	R..0048	57.11.4104	100 kOhm	5%		
IC..0002	50.07.0004	CD4556B	MC 14 556B, 4556B		RCA, Mot, Fc	R..0049	57.11.3122	1.2 kOhm	1%		
IC..0003	50.11.0106	SD211-EE	SD 210-EE		Siq	R..0050	57.11.3272	2.7 kOhm	1%		
IC..0004	50.11.0106	SD211-EE	SD 210-EE		Siq	R..0051	57.11.3681	680 Ohm	1%		
IC..0005	50.11.0106	SD211-EE	SD 210-EE		Siq	R..0052	57.11.4273	27 kOhm	2%		
IC..0006	50.11.0106	SD211-EE	SD 210-EE		Siq	R..0053	57.11.3193	15 kOhm	1%		
IC..0007	50.09.0106	NE5532AN	XR5532AN, 5532ANB		Siq+Ex+Ra	R..0054	57.11.4394	390 kOhm	5%		
IC..0008	50.07.0002	AD7524JN	MP 7524 JN		ADI+Mps	R..0055	57.11.5155	1.5 MOhm	5%		
IC..0009	50.05.0283	LM393N			NS+TI	R..0056	57.11.4472	4.7 kOhm	5%		
IC..0010	50.05.0283	LM393N			NS+TI	R..0057	57.11.4273	27 kOhm	2%		
IC..0011	50.07.0002	AD7524JN	MP 7524 JN		ADI+Mps	R..0058	57.11.4121	120 Ohm	2%		
IC..0012	50.05.0105	NE5532N	XR 5532 N, 5532 NB		Siq+Ex+Ra	R..0059	57.11.4682	6.8 kOhm	2%		
IC..0013	50.07.0002	AD7524JN	MP 7524 JN		ADI+Mps	R..0060	57.11.4102	1 kOhm	5%		
IC..0014	50.09.0106	NE5532AN	XR 5532AN, 5532ANB		Siq+Ex+Ra	R..0061	57.11.3164	160 kOhm	1%		
IC..0015	50.09.0106	NE5532AN	XR 5532AN, 5532ANB		Siq+Ex+Ra	R..0062	57.11.4470	47 Ohm	5%		
IC..0016	50.07.0002	AD7524JN	MP 7524 JN		ADI+Mps	R..0063	57.11.3152	1.5 kOhm	1%		
JS..0001			See note 1			R..0064	57.11.4472	4.7 kOhm	5%		
L..0001	62.01.0128	1 mH	Gowanda Nr. 17-104, Delevan Nr. 1641-105		Siq+Mot+Ph+Tf						
L..0002	62.01.0128	1 mH	Gowanda Nr. 17-104, Delevan Nr. 1641-105		Siq+Mot+Ph+Tf						
Q..0001	50.03.0496	BC560			Siq+Ex+Ra						
Q..0002	50.03.0496	BC560			Siq+Ex+Ra						
R..0001	57.11.4470	47 Ohm	5%								
R..0002	57.11.4473	47 kOhm	5%								

## REPRODUCE AMPLIFIER PCB 1.820.710-82 GR20 EL10/15 "ESE"

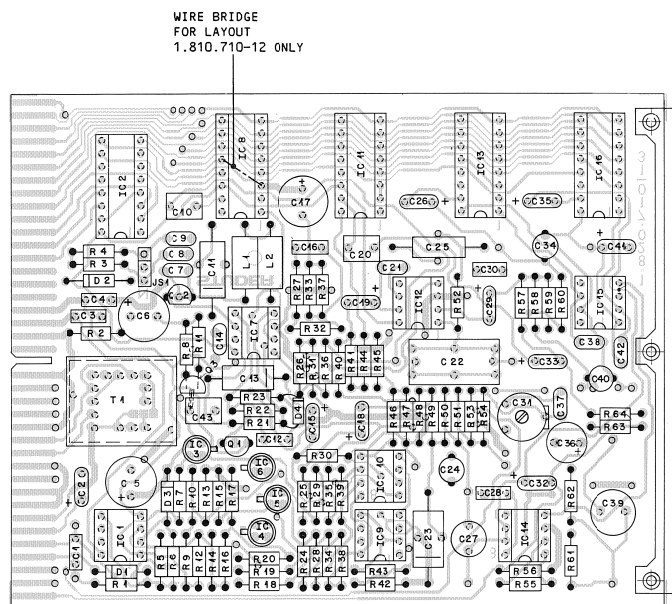


IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.06.5104	0.1 uF	5%, 63V	PETP		R..0002	57.11.4473	47 kOhm	5%		
C..0002	59.26.0470	47 uF	-20%, 6.3V	Sal	Ph	R..0003	57.11.4154	150 kOhm	2%		
C..0003	59.99.0205	68 nF	-20%, 63V	Cer		R..0004	57.11.4564	560 kOhm	2%		
C..0004	59.99.0205	68 nF	-20%, 63V	Cer		R..0005	57.11.4223	22 kOhm	2%		
C..0005	59.26.2100	10 uF	-20%, 16V	Sal	Ph	R..0006	57.11.4104	100 kOhm	5%		
C..0006	59.22.5101	100 uF	-20%, 25V	EL		R..0007	57.11.4106	10 MOhm	5%		
C..0007		not used				R..0008	57.11.4334	330 kOhm	2%		
C..0008	59.34.2151	150 pF	2%, N150	Cer		R..0009	57.11.4103	10 kOhm	5%		
C..0009	59.34.0339	3.3 pF	5%, N150	PETP		R..0010	57.11.4103	10 kOhm	5%		
C..0010	59.05.5105	1 uF	5%	PETP		R..0011	57.11.4335	3.3 MOhm	2%		
C..0011	59.12.7561	560 pF	1%, 63V	PS		R..0012	57.11.4105	1 MOhm	5%		
C..0012	59.99.0205	68 nF	-20%, 63V	Cer		R..0013	57.11.4103	10 kOhm	5%		
C..0013	59.04.9680	68 pF	5%, 63V	PP		R..0014	57.11.4563	56 kOhm	5%		
C..0014	59.34.2220	22 pF	5%, N150	Cer	Ph	R..0015	57.11.4472	4.7 kOhm	5%		
C..0015	59.26.0470	47 uF	-20%, 6.3V	Sal		R..0016	57.11.3513	51 kOhm	1%		
C..0016	59.06.0102	1 nF	10%, 63V	PETP		R..0017	57.11.4104	100 kOhm	5%		
C..0017	59.22.2221	220 uF	-10%, 6V	EL	Ph	R..0018	57.11.4103	10 kOhm	5%		
C..0018	59.26.0470	47 uF	-20%, 6.3V	Sal		R..0019	57.11.4470	47 Ohm	5%		
C..0019	59.26.0470	47 uF	-20%, 6.3V	Sal	Ph	R..0020	57.11.4102	1 kOhm	5%		
C..0020	59.06.5105	1 uF	5%	PETP		R..0021	57.11.4104	100 kOhm	2%		
C..0021	59.34.2330	33 pF	5%, N150	Cer		R..0022	57.11.3432	4.3 kOhm	1%		
C..0022	59.02.2225	2.2 uF	5%, 63V	MPC		R..0023	57.11.4102	1 kOhm	2%		
C..0023	59.12.7202	2 nF	1%, 63V	PS		R..0024	57.11.4105	1 MOhm	5%		
C..0024	59.05.1221	220 pF	1%, 63V	PP		R..0025	57.11.4474	470 kOhm	5%		
C..0025	59.12.7391	390 pF	1%, 63V	PS		R..0026	57.11.4102	1 kOhm	2%		
C..0026	59.26.2100	10 uF	-20%, 16V	Sal	Ph	R..0027	57.11.4221	220 Ohm	5%		
C..0027	59.05.1472	4.7 nF	1%, 63V	PP		R..0028	57.11.4105	1 MOhm	5%		
C..0028	59.99.0205	68 nF	-20%, 63V	Cer		R..0029	57.11.4105	1 MOhm	5%		
C..0029	59.26.2100	10 uF	-20%, 16V	Sal	Ph	R..0030	57.11.4472	4.7 kOhm	5%		
C..0030	59.99.0205	68 nF	-20%, 63V	Cer		R..0031	57.11.4272	2.7 kOhm	2%		
C..0031	59.18.0108	40 pF	Trimmer capacitor	Philips Nr 2222.808.32409		R..0032	57.11.4102	1 kOhm	2%		
C..0032	59.26.0470	47 uF	-20%, 6.3V	Sal	Ph	R..0033	57.11.3511	510 Ohm	2%		
C..0033	59.26.0470	47 uF	-20%, 6.3V	Sal	Ph	R..0034	57.11.4103	10 kOhm	5%		
C..0034	59.05.1332	3.3 nF	1%, 63V	PP		R..0035	57.11.4103	10 kOhm	5%		
C..0035	59.26.2100	10 uF	-20%, 16V	Sal	Ph	R..0036	57.11.4681	680 Ohm	2%		
C..0036	59.22.3221	220 uF	-20%, 10V	EI		R..0037	57.11.3301	300 Ohm	2%		
C..0037	59.34.2220	22 pF	5%, N150	Cer		R..0038	57.11.4103	10 kOhm	5%		
C..0038	59.34.2220	22 pF	5%, N150	Cer		R..0039	57.11.4103	10 kOhm	5%		
C..0039	59.05.1223	22 nF	1%, 63V	PP		R..0040	57.11.4470	47 Ohm	5%		
C..0040	59.05.1103	10 nF	1%, 63V	PP		R..0041	57.11.4472	4.7 kOhm	5%		
C..0041	59.26.2100	10 uF	-20%, 16V	Sal	Ph	R..0042	57.11.4273	27 kOhm	5%		
C..0042	59.34.2220	22 pF	5%, N150	Cer		R..0043	57.11.4102	1 kOhm	5%		
C..0043	59.06.5105	1 uF	5%	PETP		R..0044	57.11.4391	390 Ohm	2%		
D..0001	50.04.0125	1N 4448				R..0045	57.11.3911	910 Ohm	1%		
D..0002	50.04.0512	1N 5818	1A, 30 V			R..0046	57.11.4102	1 kOhm	5%		
D..0003	50.04.0125	1N 4448				R..0047	57.11.4273	27 kOhm	5%		
IC..0001	50.05.0283	LM393N			NS,TI	R..0048	57.11.4104	100 kOhm	5%		
IC..0002	50.07.0004	CD4556B	MC 14 556B, 4556B		RCA,Mot,Fc	R..0049	57.11.3122	1.2 kOhm	1%		
IC..0003	50.11.0106	SD 214 DE	B5D 214		Ph,Six	R..0050	57.11.3272	2.7 kOhm	1%		
IC..0004	50.11.0106	SD 214 DE	B5D 214		Ph,Six	R..0051	57.11.3681	680 Ohm	1%		
IC..0005	50.11.0106	SD 214 DE	B5D 214		Ph,Six	R..0052	57.11.4273	27 kOhm	2%		
IC..0006	50.11.0106	SD 214 DE	B5D 214		Ph,Six	R..0053	57.11.3123	15 kOhm	1%		
IC..0007	50.09.0106	NE5532AN	XR 5532AN, 5532ANB		Ph,Six	R..0054	57.11.4394	390 kOhm	5%		
IC..0008	50.07.0002	AD7524JN	MP 7524 JN		Sig,Ex,Ra	R..0055	57.11.5155	1.5 MOhm	5%		
IC..0009	50.05.0283	LM393N			NS,TI	R..0056	57.11.4472	4.7 kOhm	5%		
IC..0010	50.05.0283	LM393N			NS,TI	R..0057	57.11.4273	27 kOhm	2%		
IC..0011	50.07.0002	AD7524JN	MP 7524 JN		ADi,MpS	R..0058	57.11.4121	120 Ohm	2%		
IC..0012	50.09.0105	NE5532N	XR 5532 N, 5532 NB		ADi,MpS	R..0059	57.11.4682	6.8 kOhm	2%		
IC..0013	50.07.0002	AD7524JN	MP 7524 JN		ADi,MpS	R..0060	57.11.4102	1 kOhm	5%		
IC..0014	50.09.0106	NE5532AN	XR 5532AN, 5532ANB		Sig,Ex,Ra	R..0061	57.11.3164	160 kOhm	1%		
IC..0015	50.09.0106	NE5532AN	XR 5532AN, 5532ANB		Sig,Ex,Ra	R..0062	57.11.4470	47 Ohm	5%		
IC..0016	50.07.0002	AD7524JN	MP 7524 JN		ADi,MpS	R..0063	57.11.3152	1.5 kOhm	1%		
JS..0001		See note 1				R..0064	57.11.4472	4.7 kOhm	5%		
L..0001	62.01.0128	1 mH	Gowanda Nr. 17-104, Delevan Nr. 1641-105								
L..0002	62.01.0128	1 mH	Gowanda Nr. 17-104, Delevan Nr. 1641-105								
Q..0001	50.03.0496	BC560			Sie,Mot,Ph,Tf						
Q..0002	50.03.0496	BC560			Sie,Mot,Ph,Tf						
R..0001	57.11.4470	47 Ohm	5%								



▲ HAS BEEN MODIFIED FOR 1.820.710-83

COMPONENT SIDE



SOLDER BRIDGE  
ON SOLDER SIDE

NO.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	Q-000003	50-03-0216	J 1111		Six
	R-00001	57-11-4070	47 Ohm	5%	
	R-00002	57-11-4073	47 kOhm	5%	
	R-00003	57-11-4056	150 kOhm	2%	
	R-00004	57-11-4058	150 kOhm	2%	
	R-00005	57-11-4023	22 kOhm	5%	
	R-00006	57-11-4026	100 kOhm	5%	
	R-00007	57-11-4036	10 Mohm	5%	
	R-00008	57-11-4036	330 Ohm	2%	
	R-00009	57-11-4033	10 kOhm	5%	
	R-00010	57-11-4033	10 Ohm	5%	
	R-00011	57-11-4035	3-3 Mohm	2%	
	R-00012	57-11-4035	1 Mohm	5%	
	R-00013	57-11-4033	10 kOhm	5%	
	R-00014	57-11-4036	56 kOhm	5%	
	R-00015	57-11-4072	4-7 kOhm	5%	
	R-00016	57-11-4033	50 kOhm	5%	
	R-00017	57-11-4033	10 kOhm	5%	
	R-00018	57-11-4033	10 kOhm	5%	
	R-00019	57-11-4070	47 Ohm	5%	
	R-00020	57-11-4070	47 Ohm	5%	
	R-00021	57-11-4036	100 kOhm	2%	
	R-00022	57-11-4035	4-3 Mohm	1%	
	R-00023	57-11-4076	1 kOhm	2%	
	R-00024	57-11-4076	1 kOhm	2%	
	R-00025	57-11-4076	470 kOhm	5%	
	R-00026	57-11-4022	1 kOhm	2%	
	R-00027	57-11-4221	220 Ohm	5%	
	R-00028	57-11-4022	1 kOhm	2%	
	R-00029	57-11-4035	1 Mohm	5%	
	R-00030	57-11-4035	4-7 Mohm	5%	
	R-00031	57-11-4072	2-7 kOhm	2%	
	R-00032	57-11-4033	10 kOhm	2%	
	R-00033	57-11-4011	50 Ohm	2%	
	R-00034	57-11-4033	10 kOhm	2%	
	R-00035	57-11-4033	10 kOhm	2%	
S T A T U S	(004)	85V11/23	BBT	REPRODUCE AMPIFIER	1-802-710-03 PAGE

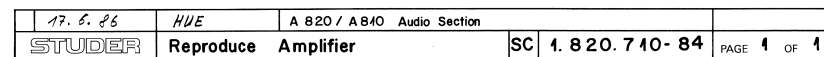
IND.	PDS NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MFG.
Note 1 =	Contact pinl Studer %401-0020, Berg 75 160-102-36 Bridge! Studer %401-0021, Phillips 2422 02A 80003				
	PCFPMaloxcel/Flyw. Salt-Solid-Ion/Lumina Cer/Ceramic %Polystyrol; %Polypropylene; Eth/Electrolytic MC-Metal Zinc Polycarbonate				
MANUFACTURER	ADI=Analog Devices Inc.; Rev/Ross; Fe-Fairchild; Nat-National; M%Micropower Semiconductor; KS-Kemet Semiconductors; PHN-Philips Radioglobe; RCA-Radio Corp. of America; Stee/Tiemens Sig-Signetics; Sil-Teliconix; TF=Tekamken Thos-CSP-Thomson Semiconductor; TI=Texas Instruments.				

Si=Siliconix, Tf=Telefunken, Tho-CSF=Thomson Semi  
Ti=Texas Instruments.

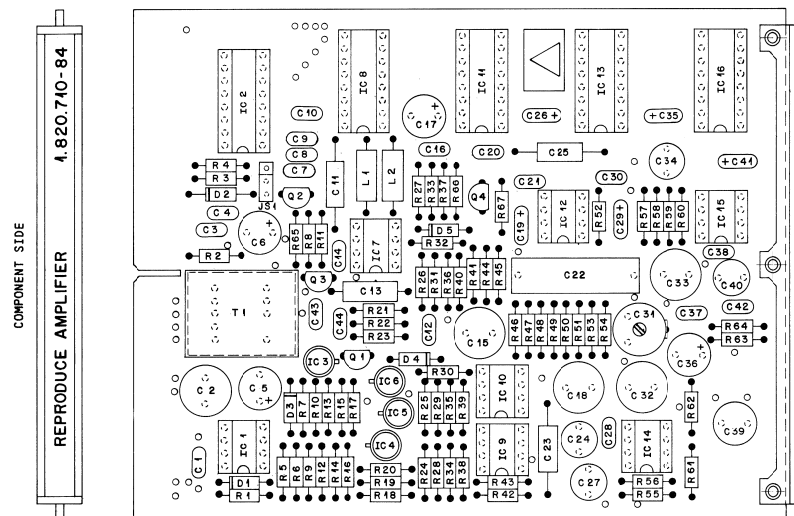
S T U D E R (00) 85/11/12 BBT REPRODUCE AMPLIFIER

S T U D E R (00) 85/11/12 BBT REPRODUCE AMPLIFIER 1.820.710.83 PAGE

R	63	62	61 <sup>85</sup> <sub>21</sub>	56	64	57	59	52	60	36 <sup>76</sup> <sub>26,31</sub>	58 <sup>45</sup> <sub>34</sub>	41	49 <sup>46</sup> <sub>48</sub>	
C	15	31,36,35	39	33,10	42	41,29	34	25 <sup>14</sup>	26	22	20	38	24,40	19



REPRODUCE AMPLIFIER PCB 1.820.710-84 GR20 EL10/15 "ESE"



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C++0001	59-06-1014	0.1 uF	1%, 63V, PETP		
C++0002	59-09-0601	47 uF	-20%, 16V, EI bipolar		
C++0003	59-06-0683	68 nF	10%, 63V, PETP		
C++0004	59-06-0683	68 nF	10%, 63V, PETP		
C++0005	59-22-1011	100 uF	-20%, 25V, EI		
C++0006	59-22-1011	100 uF	-20%, 25V, EI		
C++0007	59-22-1011	not used			
C++0008	59-22-1011	47 uF			
C++0009	59-22-1011	not used			
C++0010	59-06-1105	1 uF			
C++0011	59-12-1561	560 pF	1%, 63V, PS		
C++0012	59-06-1104	0.1 uF	1%, 63V, PETP		
C++0013	59-06-1080	68 pF	1%, 63V, PP		
C++0014	59-24-1220	22 pF	1%, 63V, PP		
C++0015	59-06-0601	47 uF	10%, 16V, EI bipolar		
C++0016	59-06-1012	100 uF	-20%, 16V, EI bipolar		
C++0017	59-22-1221	220 uF	-10%, 6V, EI		
C++0018	59-06-0601	47 uF	-20%, 16V, EI bipolar		
C++0019	59-26-0470	47 uF	-20%, 6.3V, Sal		
C++0020	59-06-1105	1 uF	1%, 50V, PETP		
C++0021	59-26-1330	33 pF	1%, N150, Cer		
C++0022	59-02-1225	2.2 uF	1%, 63V, MPC		
C++0023	59-12-1702	2 nF	1%, 63V, PS		
C++0024	59-05-1221	220 pF	1%, 63V, PP		
C++0025	59-12-1701	300 pF	1%, 63V, PS		
C++0026	59-26-1100	10 uF	-20%, 16V, Sal		
C++0027	59-05-1472	4.7 nF	1%, 63V, PP		
C++0028	59-06-0683	68 nF	10%, 63V, PETP		
C++0029	59-26-1100	10 uF	-20%, 16V, Sal		
C++0030	59-06-0683	68 nF	10%, 63V, PETP		
C++0031	59-18-0108	40 pF	Trimmer Capacitors, Philips Nr 2222-008-32409		
C++0032	59-06-0601	47 uF	-20%, 16V, EI bipolar		
C++0033	59-06-0601	47 uF	-20%, 16V, EI bipolar		
C++0034	59-05-1332	3.3 nF	1%, 63V, PP		
C++0035	59-26-1100	10 uF	-20%, 16V, Sal		
C++0036	59-22-1221	220 uF	-20%, 10V, EI		
C++0037	59-24-1220	22 pF	1%, N150, Cer		

STUDER (00) 86/06/17 HUE REPRODUCE AMPLIFIER 1.820.710.84 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C++0038	59-24-1220	22 pF	1%, N150, Cer		
C++0039	59-05-1223	22 nF	1%, 63V, PP		
C++0040	59-05-1103	10 nF	1%, 63V, PP		
C++0041	59-26-1100	10 uF	-20%, 16V, Sal		
C++0042	59-24-1220	22 pF	1%, N150, Cer		
C++0043	59-06-1019	1 uF	1%, 50V, PETP		
C++0044	59-06-1014	0.1 uF	1%, 63V, PETP		
D++0001	50-04-0125	1N 4448			Not
D++0002	50-04-0125	1N 5181			
D++0003	50-04-0125	1N 4448			
D++0004	50-04-0125	1N 4448			
D++0005	50-04-1121	24 V	5% G-W		
IC++0001	50-05-0283	LM393N			NSI
IC++0002	50-07-0004	CM5948	MC 14 556B, 4556B		RCAL
IC++0003	50-11-0106	50 214 DE	BS2 214		PhSiX
IC++0004	50-11-0106	50 214 DE	BS2 214		PhSiX
IC++0005	50-11-0106	50 214 DE	BS2 214		PhSiX
IC++0006	50-11-0106	50 214 DE	BS2 214		PhSiX
IC++0007	50-09-0106	NE532AN	K8532AN, 5532AN		SigneX
IC++0008	50-07-0002	AD725JN	MP 7524 JN		ADI
IC++0009	50-05-0283	LM393N			NSI
IC++0010	50-05-0283	LM393N			NSI
IC++0011	50-07-0002	AD725JN	MP 7524 JN		ADI
IC++0012	50-09-0106	NE532AN	K8 5532AN, 5532 AN		SigneX
IC++0013	50-07-0002	AD725JN	MP 7524 JN		ADI
IC++0014	50-09-0106	NE532AN	K8 5532AN, 5532AN		SigneX
IC++0015	50-09-0106	NE532AN	K8 5532AN, 5532AN		SigneX
IC++0016	50-07-0002	AD725JN	MP 7524 JN		ADI

STUDER (00) 86/06/17 HUE REPRODUCE AMPLIFIER 1.820.710.84 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C++0002	50-03-0516	RC337			See
C++0003	50-03-0516	7 111			See
C++0004	50-03-0407	RC550C			SeePH
R++0001	57-11-4470	47 Ohm	1%		
R++0002	57-11-4473	47 kOhm	1%		
R++0003	57-11-3134	130 kOhm	2%		
R++0004	57-11-1114	180 kOhm	1%		
R++0005	57-11-4223	22 kOhm	2%		
R++0006	57-11-4104	100 kOhm	1%		
R++0007	57-11-4106	10 kOhm	1%		
R++0008	57-11-4134	330 kOhm	1%		
R++0009	57-11-4103	10 kOhm	1%		
R++0010	57-11-4103	10 kOhm	1%		
R++0011	57-11-4335	3.3 kOhm	2%		
R++0012	57-11-4105	1 kOhm	1%		
R++0013	57-11-4103	10 kOhm	1%		
R++0014	57-11-4963	56 kOhm	1%		
R++0015	57-11-4472	4.7 kOhm	1%		
R++0016	57-11-2113	51 kOhm	1%		
R++0017	57-11-4103	10 kOhm	1%		
R++0018	57-11-4103	10 kOhm	1%		
R++0019	57-11-4470	47 Ohm	1%		
R++0020	57-11-4102	1 kOhm	1%		
R++0021	57-11-4104	100 kOhm	2%		
R++0022	57-11-2432	4.3 kOhm	2%		
R++0023	57-11-4102	1 kOhm	2%		
R++0024	57-11-4103	1 kOhm	2%		
R++0025	57-11-4474	470 kOhm	2%		
R++0026	57-11-4102	1 kOhm	2%		
R++0027	57-11-4221	220 Ohm	2%		
R++0028	57-11-4105	1 kOhm	2%		
R++0029	57-11-4105	1 kOhm	2%		
R++0030	57-11-4472	4.7 kOhm	2%		
R++0031	57-11-4472	4.7 kOhm	2%		
R++0032	57-11-4182	1.8 kOhm	2%		
R++0033	57-11-2111	510 Ohm	2%		

STUDER (00) 86/06/17 HUE REPRODUCE AMPLIFIER 1.820.710.84 PAGE 3

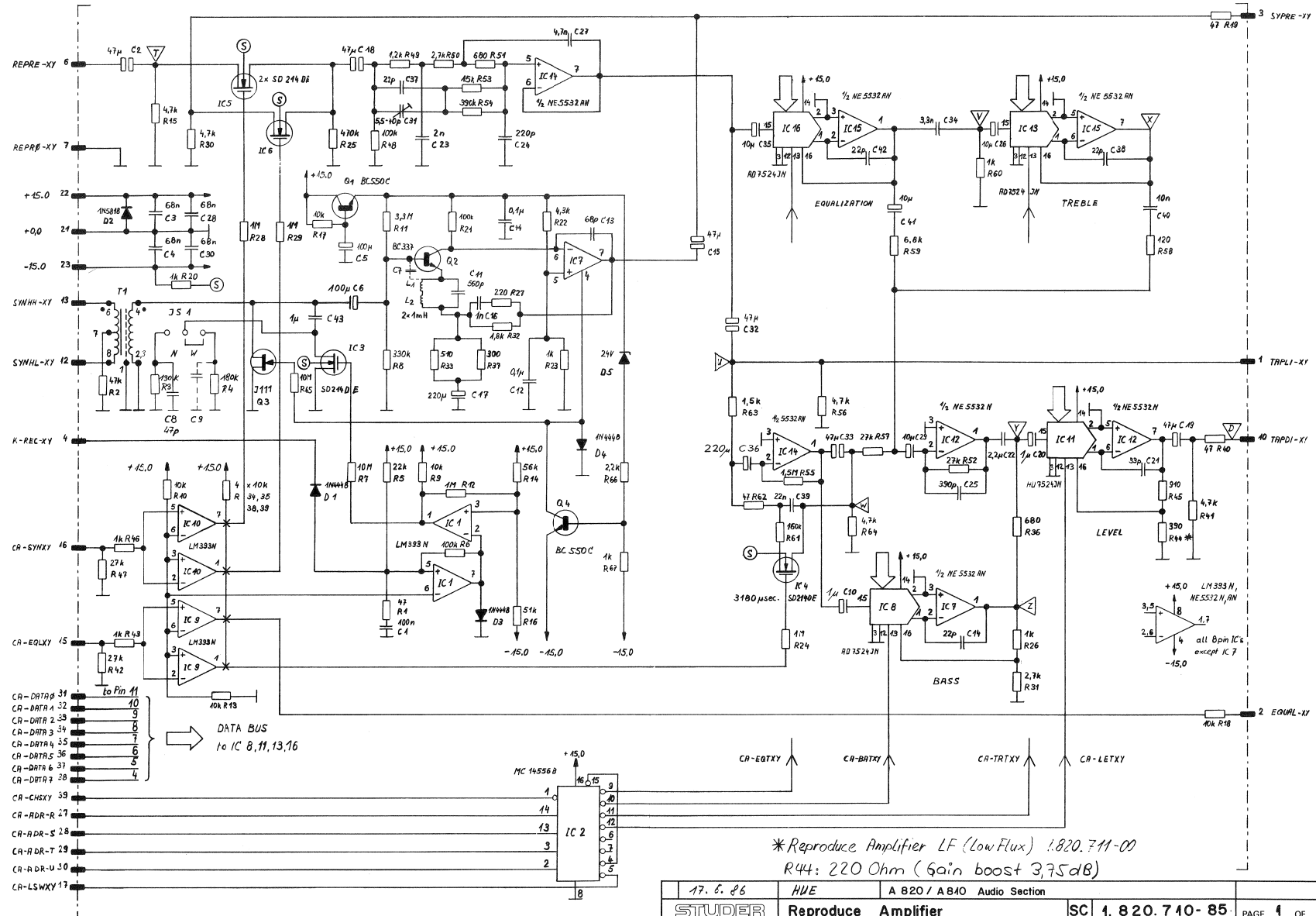
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R++0034	57-11-4103	10 kOhm	2%		
R++0035	57-11-4103	10 kOhm	2%		
R++0036	57-11-4481	680 Ohm	2%		
R++0037	57-11-3301	330 Ohm	2%		
R++0038	57-11-4103	10 kOhm	2%		
R++0039	57-11-4103	10 kOhm	2%		
R++0040	57-11-4470	47 Ohm	2%		
R++0041	57-11-4472	4.7 kOhm	2%		
R++0042	57-11-4273	27 kOhm	2%		
R++0043	57-11-3911	910 Ohm	1%		
R++0044	57-11-4391	390 Ohm	2%		
R++0045	57-11-3911	910 Ohm	1%		
R++0046	57-11-4102	1 kOhm	2%		
R++0047	57-11-3122	27 kOhm	1%		
R++0048	57-11-4104	100 kOhm	2%		
R++0049	57-11-3122	27 kOhm	1%		
R++0050	57-11-3272	2.7 kOhm	1%		
R++0051	57-11-3881	680 Ohm	1%		
R++0052	57-11-4273	27 kOhm	2%		
R++0053	57-11-3153	15 kOhm	1%		
R++0054	57-11-4394	390 kOhm	1%		
R++0055	57-11-3153	1.5 kOhm	2%		
R++0056	57-11-4472	4.7 kOhm	2%		
R++0057	57-11-4273	27 kOhm	2%		
R++0058	57-11-4121	120 Ohm	2%		
R++0059	57-11-4482	6.8 kOhm	2%		
R++0060	57-11-4102	1 kOhm	2%		
R++0061	57-11-3104	160 kOhm	1%		
R++0062	57-11-4470	47 Ohm	1%		
R++0063	57-11-3152	1.5 kOhm	1%		
R++0064	57-11-4472	4.7 kOhm	1%		
R++0065	57-11-5106	10 kOhm	1%		
R++0066	57-11-4222	2.2 kOhm	1%		
R++0067	57-11-4102	1.0 kOhm	1%		

STUDER (00) 86/06/17 HUE REPRODUCE AMPLIFIER 1.820.710.84 PAGE 4

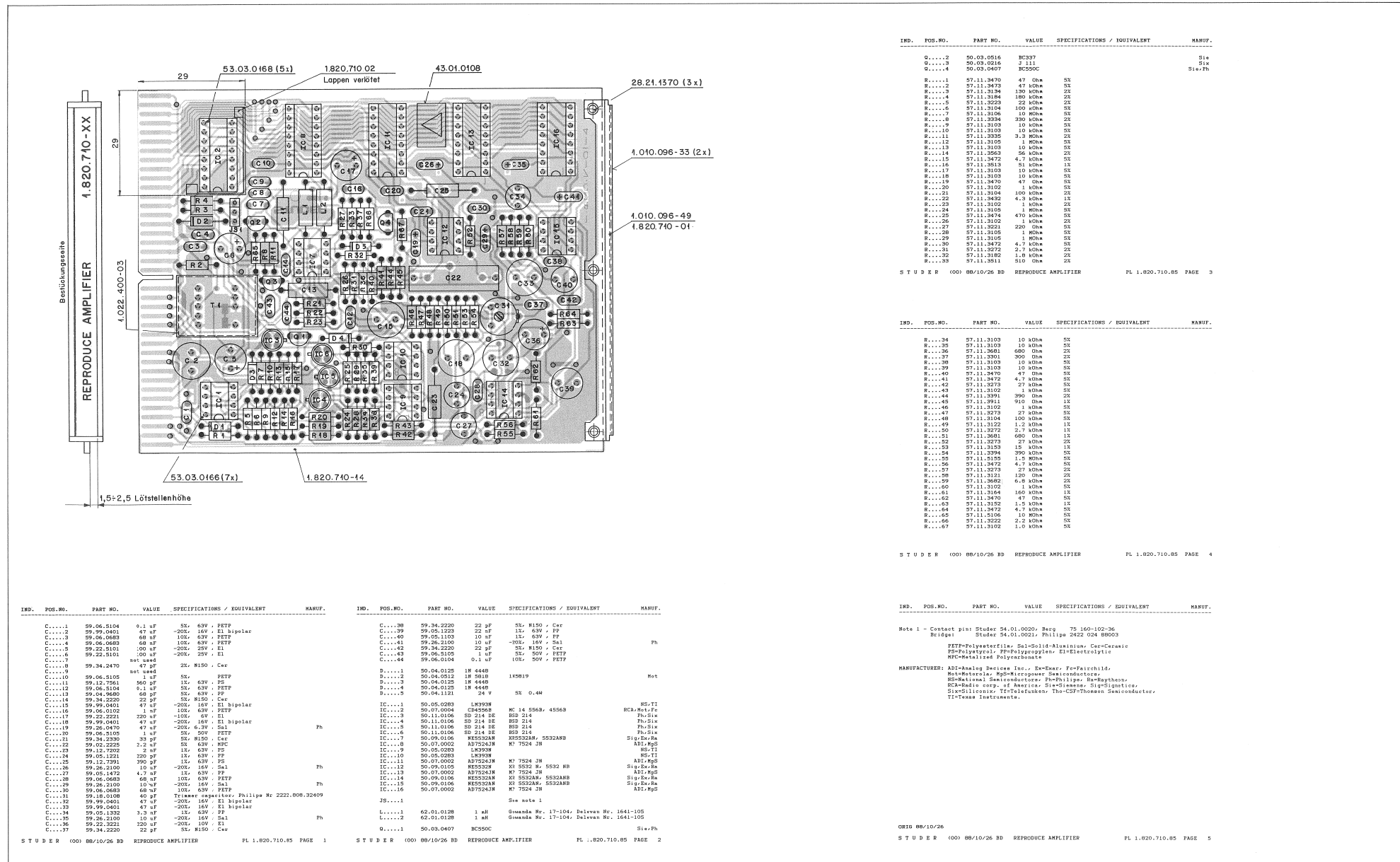
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C++0038	59-24-1220	22 pF	1%, N150, Cer		
C++0039	59-05-1223	22 nF	1%, 63V, PP		
C++0040	59-05-1103	10 nF	1%, 63V, PP		
C++0041	59-26-1100	10 uF	-20%, 16V, Sal		
C++0042	59-24-1220	22 pF	1%, N150, Cer		
C++0043	59-06-1019	1 uF	1%, 50V, PETP		
C++0044	59-06-1014	0.1 uF	1%, 63V, PETP		
D++0001	50-04-0125	1N 4448			Not
D++0002	50-04-0125	1N 5181			
D++0003	50-04-0125	1N 4448			
D++0004	50-04-0125	1N 4448			
D++0005	50-04-1121	24 V	5% G-W		
IC++0001	50-05-0283	LM393N			NSI
IC++0002	50-07-0004	CM5948	MC 14 556B, 4556B		RCAL
IC++0003	50-11-0106	50 214 DE	BS2 214		PhSiX
IC++0004	50-11-0106	50 214 DE	BS2 214		PhSiX
IC++0005	50-11-0106	50 214 DE	BS2 214		PhSiX
IC++0006	50-11-0106	50 214 DE	BS2 214		PhSiX
IC++0007	50-09-0106	NE532AN	K8532AN, 5532AN		SigneX
IC++0008	50-07-0002	AD725JN	MP 7524 JN		ADI
IC++0009	50-05-0283	LM393N			NSI
IC++0010	50-05-0283	LM393N			NSI
IC++0011	50-07-0002	AD725JN	MP 7524 JN		ADI
IC++0012	50-09-0106	NE532AN	K8 5532AN, 5532 AN		SigneX
IC++0013	50-07-0002	AD725JN	MP 7524 JN		ADI
IC++0014	50-09-0106	NE532AN	K8 5532AN, 5532AN		SigneX
IC++0015	50-09-0106	NE532AN	K8 5532AN, 5532AN		SigneX
IC++0016	50-07-0002	AD725JN	MP 7524 JN		ADI

STUDER (00) 86/06/17 HUE REPRODUCE AMPLIFIER 1.820.710.84 PAGE 5

## REPRODUCE AMPLIFIER 1.820.710.85 GR20 EL10/15

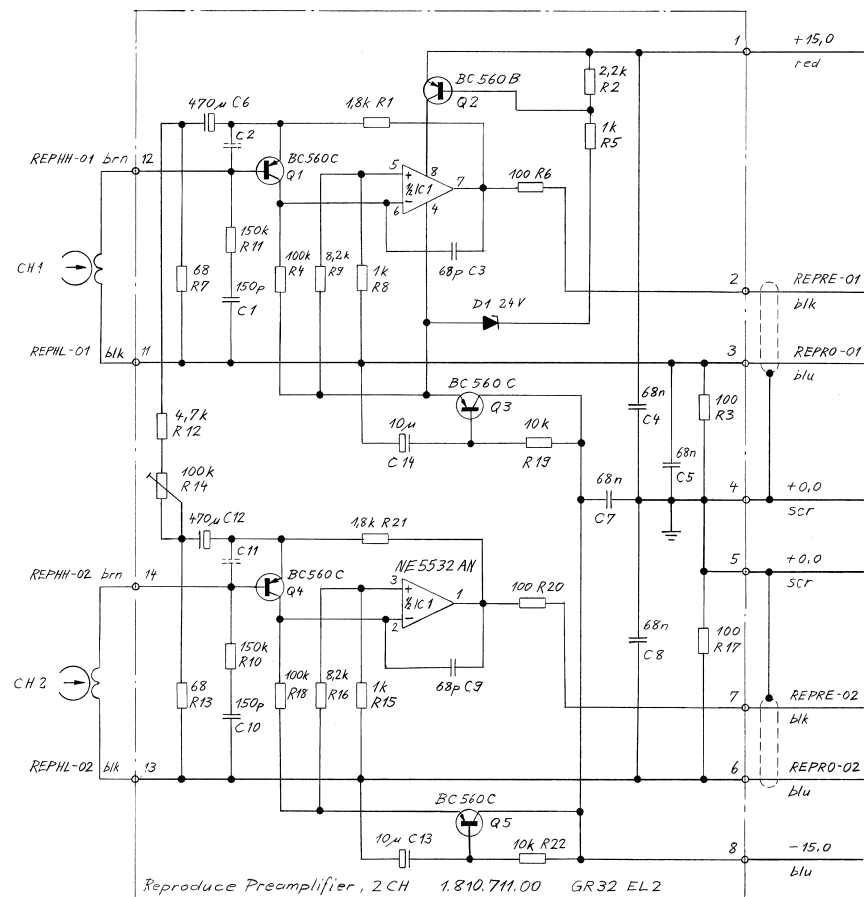
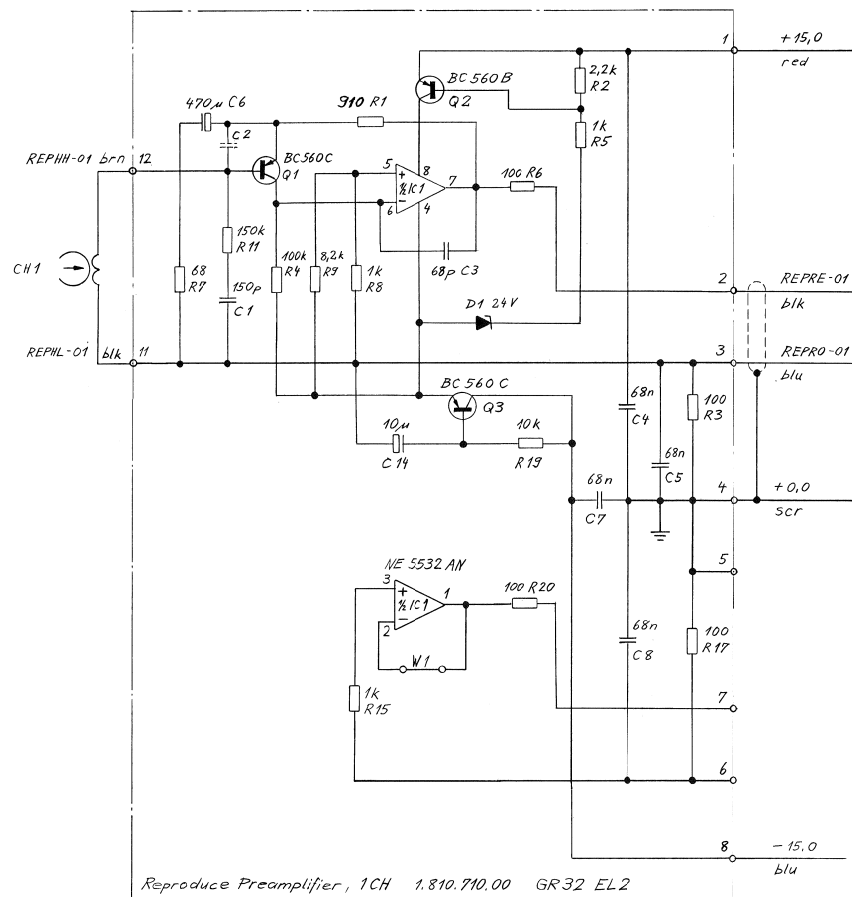


## REPRODUCE AMPLIFIER 1.820.710.85



REPRODUCE PREAMPLIFIER PCB 1 CHANNEL 1.810.710-00 GR32 EL2

REPRODUCE PREAMPLIFIER PCB 2 CHANNEL 1.810.711-00 GR32 EL2



IND.	PDS NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Following components are not used!					
C	0009,	0010, 0011, 0012, 0013.			
Q	0004, 0005.				
R	0010, 0012, 0013, 0014, 0016, 0018, 0021, 0022.				
Ce=Ceramic, El=Electrolytic, PP=Polypropylen, Sol=Solid aluminum					
MANUFACTURERS: B=Boehr, B=Boehrstein, Ex=Exar, ITT=Intermetall, M=McCulloch, M=Telefunken, M=Motorola, Ph=Philips, Ja=Raytheon, Sig=Sigecor, Si=Siemens, Sig=Signetics, T=Telefunken, TI=Texas Instruments					

IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	R-001A	57-LL-4480	6R 0 Ohm	See note 1	
	R-001A	58-LL-1104	100 KOhm		
	R-001B	57-LL-4102	1 KOhm		
	R-001B	57-LL-4022	8.2 KOhm		
	R-0017	57-LL-4101	100 Ohm		
	R-0018	57-LL-4104	100 Ohm		
	R-0019	57-LL-4103	10 KOhm		
	R-0020	57-LL-4101	100 Ohm		
	R-0021	57-LL-4182	1.8 KOhm		
	R-0022	57-LL-4103	10 KOhm		

Note 1 - 100 KOhm Potentiometer -10g, 10X  
 Allen Bradley No. VM 104 X

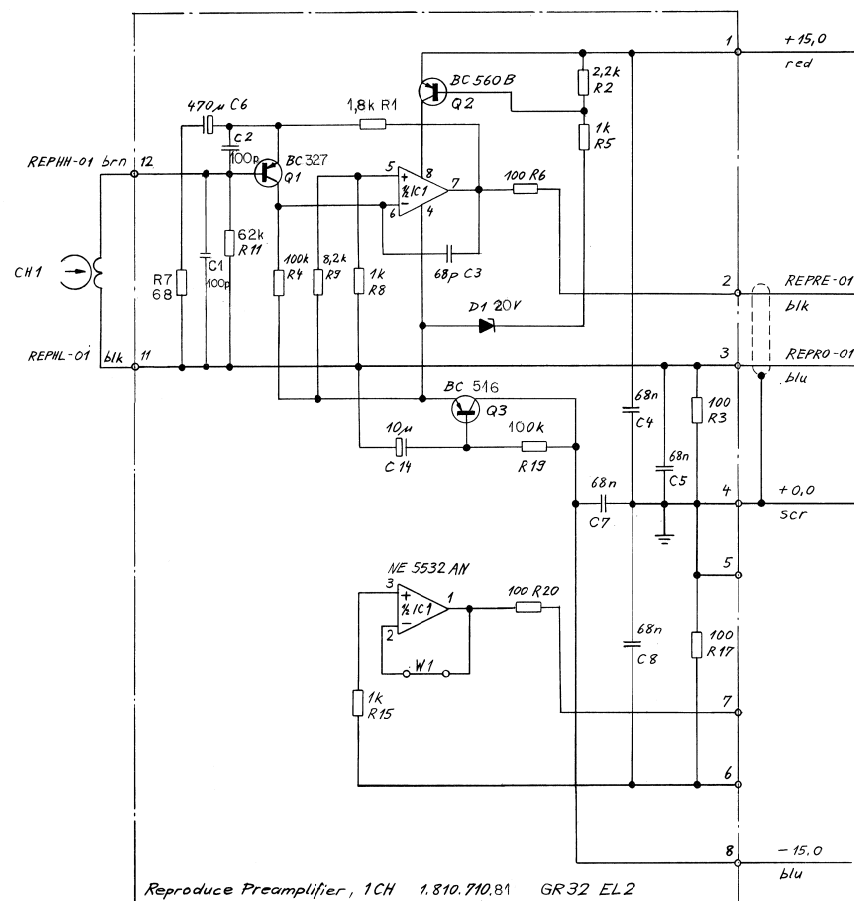
Cap/Material: El=Electrolytic; P=Polypropylene; Sol=Solid aluminum

MANUFACTURER: Ex=Ever; ITT=International; Mot=Motorola; Phn=Philips;  
 Ray=Raytheon; Sec=Secosum; Sig=Siemens; Sig=Signonics;  
 T=Telefunken; T=Texas Instruments

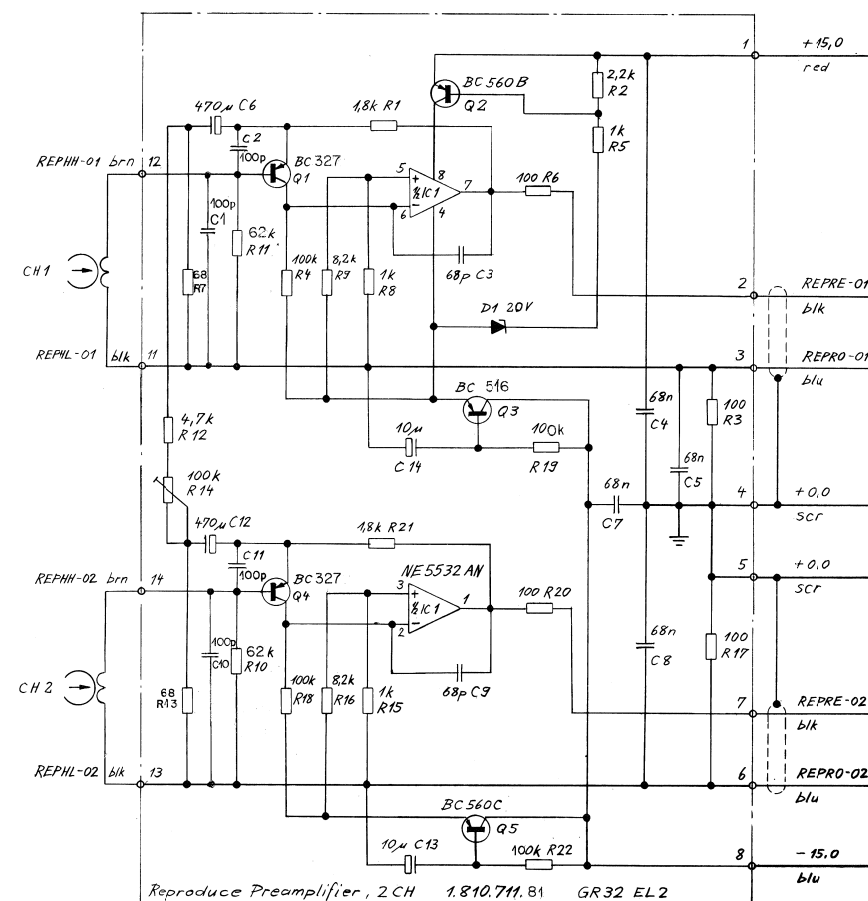
DRG R2/R2/02



REPRODUCE PREAMPLIFIER PCB 1 CHANNEL 1.810.710-81 GR32 EL2

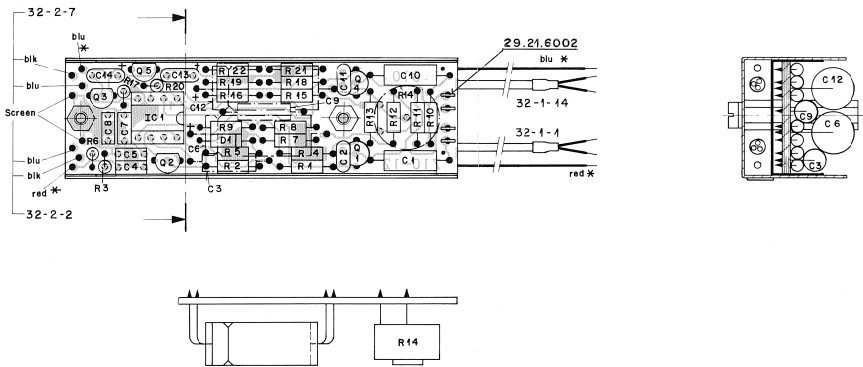
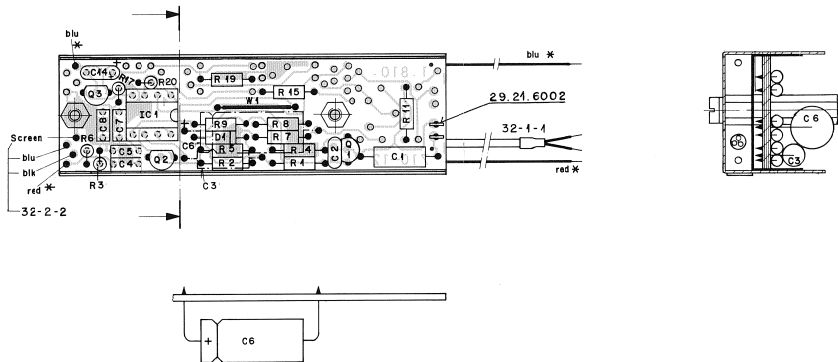


REPRODUCE PREAMPLIFIER PCB 2 CHANNEL 1.810.711-81 GR32 EL2



REPRODUCE PREAMPLIFIER PCB 1 CHANNEL 1.810.710-81 GR32 EL2

REPRODUCE PREAMPLIFIER PCB 2 CHANNEL 1.810.711-81 GR32 EL2



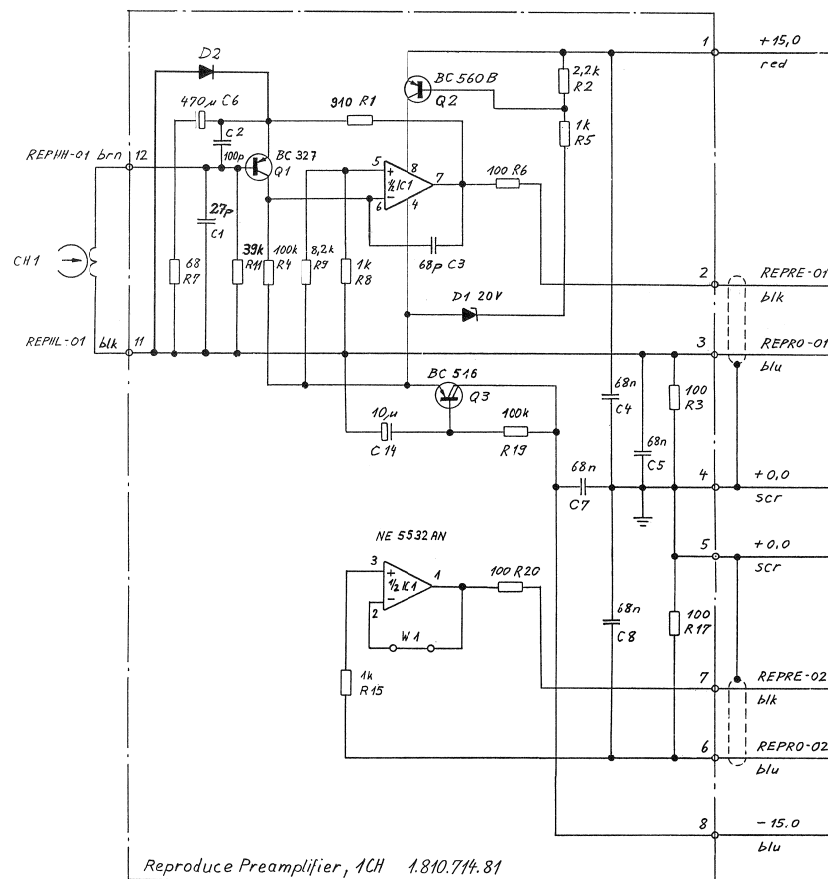
IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C+001	59-08-1101	100 pF	2,5%	PP	ERD+NSF+Sie
C+002	59-99-0622	100 pF		Co	ERD+NSF+Sie
C+003	59-04-0800	68 pF		PP	
C+004	59-99-0205	68 pF		Co	
C+005	59-99-0205	68 pF		Co	
C+006	59-25-1471	470 pF		6+3%, E1	
C+007	59-99-0205	68 pF		Co	
C+008	59-99-0205	68 pF		Co	
C+009	59-26-2100	10 uF		16V, Sal	PH
D+001	50-04-1109	20 V Z	BZK83C 20, BZX55C 20, ZPD 20		ITT+Sex
IC+001	50-04-0106	NE5532AN	XR5532AN, 5532ANB		Ex+R+Sig
Q+001	50-03-0625	BC327			Sex
Q+002	50-03-0915	BC307B	BC251B, BC557B, BC560B		ITT+Mot+Ph+Tf+Tl
Q+003	50-03-0448	BC516			Sex+Tl
R+001	57-11-3911	910 Ohm			
R+002	57-11-4222	2,2 kOhm			
R+003	57-11-4101	100 Ohm			
R+004	57-11-4104	100 kOhm			
R+005	57-11-4102	1 kOhm			
R+006	57-11-4101	100 Ohm			
R+007	57-11-4680	68 Ohm			
R+008	57-11-4102	1 kOhm			
R+009	57-11-4822	8,2 kOhm			
R+010	57-11-3623	62 kOhm			
R+011	57-11-4102	1 kOhm			
R+012	57-11-4101	100 Ohm			
R+013	57-11-4104	100 kOhm			
R+014	57-11-4101	100 Ohm			
W+001				Wire bridge	

IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Following components are not used:					
C 0009, 0010, 0011, 0012, 0013,					
Q 0004, 0005,					
R 0010, 0012, 0013, 0014, 0016, 0018, 0021, 0022,					
CerCeramic, El=Electrolytic, PP=Polypropylene, Sal=Solid aluminium					
MANUFACTURER: ERD=Er, Roderstein, Ex=Exar, ITT=Intermetall, NSP=NSC-Tetefonum, NS=Not-Motorola, PH=Philips, R=Raytheon, Sex=Secosens, Sie=Siemens, Sig=Signetics, Tl=Tetefonum, Tl+T=Texas Instruments					

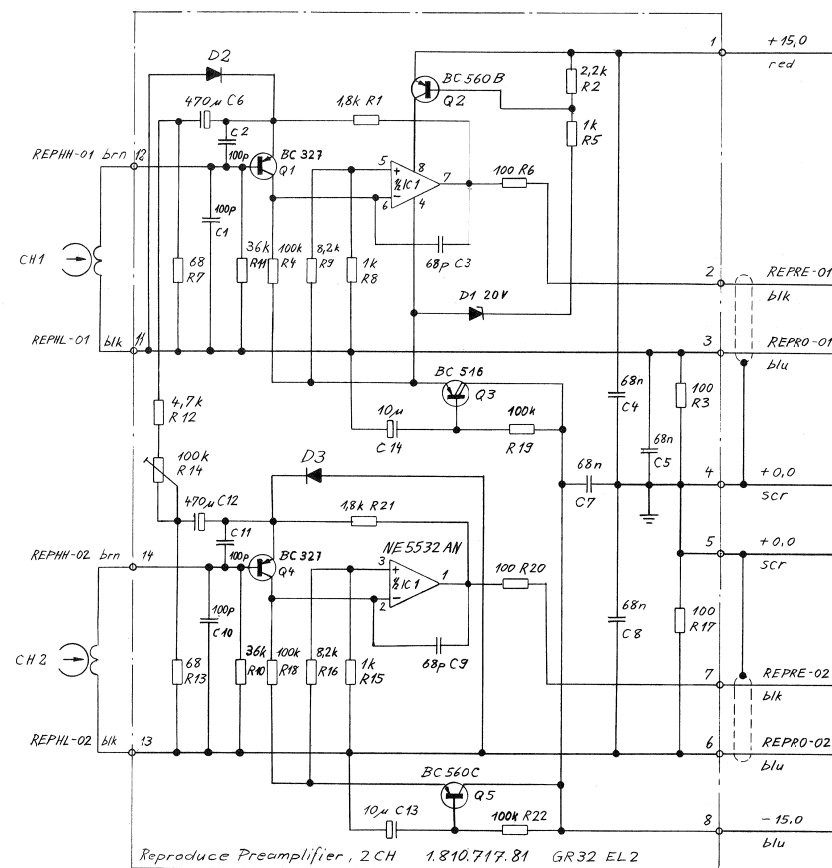
IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C+001	59-08-1101	100 pF	2,5%	PP	
C+002	59-99-0622	100 pF		Co	
C+003	59-04-0800	68 pF		PP	
C+004	59-99-0205	68 pF		Co	
C+005	59-99-0205	68 pF		Co	
C+006	59-25-1471	470 pF		6+3%, E1	
C+007	59-99-0205	68 pF		Co	
C+008	59-99-0205	68 pF		Co	
C+009	59-26-2100	10 uF		16V, Sal	PH
C+010	59-08-1101	100 pF	2,5%	PP	
C+011	59-99-0622	100 pF		Co	
C+012	59-25-1471	470 pF		6+3%, E1	
C+013	59-26-2100	10 uF		16V, Sal	PH
C+014	59-26-2100	10 uF		16V, Sal	PH
D+001	50-04-1109	20 V Z	BZK83C 20, BZX55C 20, ZPD 20		ITT+Sex
IC+001	50-04-0106	NE5532AN	XR5532AN, 5532ANB		Ex+R+Sig
Q+001	50-03-0625	BC327			Sex
Q+002	50-03-0915	BC307B	BC251B, BC557B, BC560B		ITT+Mot+Ph+Tf+Tl
Q+003	50-03-0448	BC516			Sex+Tl
Q+004	50-03-0625	BC327			Sex
Q+005	50-03-0496	BC560C			Sex+Tl
R+001	57-11-4102	1 kOhm			
R+002	57-11-4222	2,2 kOhm			
R+003	57-11-4101	100 Ohm			
R+004	57-11-4104	100 kOhm			
R+005	57-11-4102	1 kOhm			
R+006	57-11-4101	100 Ohm			
R+007	57-11-4680	68 Ohm			
R+008	57-11-4102	1 kOhm			
R+009	57-11-4822	8,2 kOhm			
R+010	57-11-3623	62 kOhm			
R+011	57-11-4102	1 kOhm			
R+012	57-11-4101	100 Ohm			

IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R+013	57-11-4680	68 Ohm			
R+014	58-01-4124	100 kOhm		See note 1	
R+015	57-11-4102	1 kOhm			
R+016	57-11-4822	8,2 kOhm			
R+017	57-11-4101	100 Ohm			
R+018	57-11-4104	100 kOhm			
R+019	57-11-4104	100 kOhm			
R+020	57-11-4101	100 Ohm			
R+021	57-11-4102	1 kOhm			
R+022	57-11-4104	100 kOhm			
Note 1 - 100 kOhm Potentiometer 10% 101					
Atten Braddy Mr. VR 104 A					
CerCeramic, El=Electrolytic, PP=Polypropylene, Sal=Solid aluminium					
MANUFACTURER: Ex=Exar, ITT=Intermetall, Mot=Motorola, PH=Philips, R=Raytheon, Sex=Secosens, Sie=Siemens, Sig=Signetics, Tl=Tetefonum, Tl+T=Texas Instruments					

REPRODUCE PREAMPLIFIER 1CH 1.810.714.81 GR32 EL02



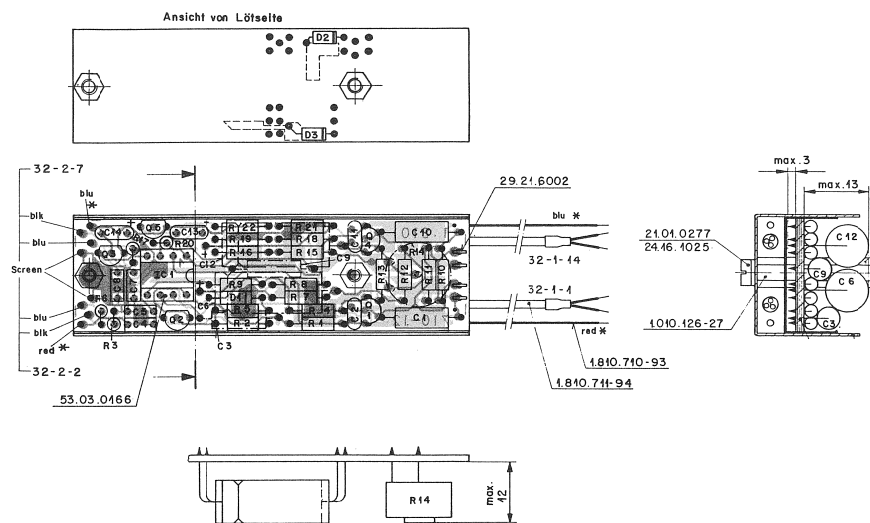
REPRODUCE PREAMPLIFIER 2CH 1.810.717.81 GR32 EL06



6.2.90	Gämpferle	Audio Section	
STUDER	Reproduce Preamplifier 1CH	SC	1.810.714-81
			PAGE 1 OF 1

8.2.90	Gämpferle	A 840 Audio Section	Part of GR 32
STUDER	Reproduce Preamplifier 2CH	SC	1.810.717-81
			PAGE 1 OF 1

## REPRODUCE PREAMPLIFIER 2CH 1.810.717.81



11D.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIV.MENT	MANUF.
Following components are not used:					
C	0009, 0010, 0011, 0012,	0013,			
Q	0004, 0005,				
R	0010, 0012, 0013, 0014, 0016, 0018, 0021, 0022,				
Ca=Ceramic, El=Electrolytic, PP=Polypropylen, Sa=Solid aluminum					
MANUFACTURER: EMD=E. Rodercastein, Ede=Ecar, TI=Intermetall;					
HFA=H. Telefunken-HF, H=Hutecor, P=Philips,					
Sa=Raytheon, Sae=Siemens, Sie=Siemens, Sig=Signetics,					
TI=Telefunken, TI=Texas Instruments					

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MARK
	R..0011	57.11.3363	36 kOhm	1Kz	
	R..0012	57.11.3472	4.7 kOhm		
	R..0013	57.11.3690	68 kOhm		
	R..0014	58.01.4104	100 kOhm	see note 1	
	R..0015	57.11.3102	1 kOhm		
	R..0016	57.11.3622	8.2 kOhm		
	R..0017	57.11.3101	100 kOhm		
	R..0018	57.11.3104	100 kOhm		
	R..0019	57.11.3104	100 kOhm		
	R..0020	57.11.3104	100 kOhm		
	R..0021	57.11.3182	1.8 kOhm		
	R..0022	57.11.3104	100 kOhm		

Note 1 - 100 kOhm Potentiometer - Lag. 10K  
 Allen Bradley Co. 75 104 B

Ca=Ceramic, El=Electretic, FF=Polypropylen, Sol=Solid aluminium

MANUFACTURER: Ex=Exar, ITT=International, Met=Metrolab, Ph=Philips,  
 De=Deussen, Sa=Saesonen, Si=Siemens, Sig=Signetics,  
 T=Telefunken, Tc=Teane Instruments

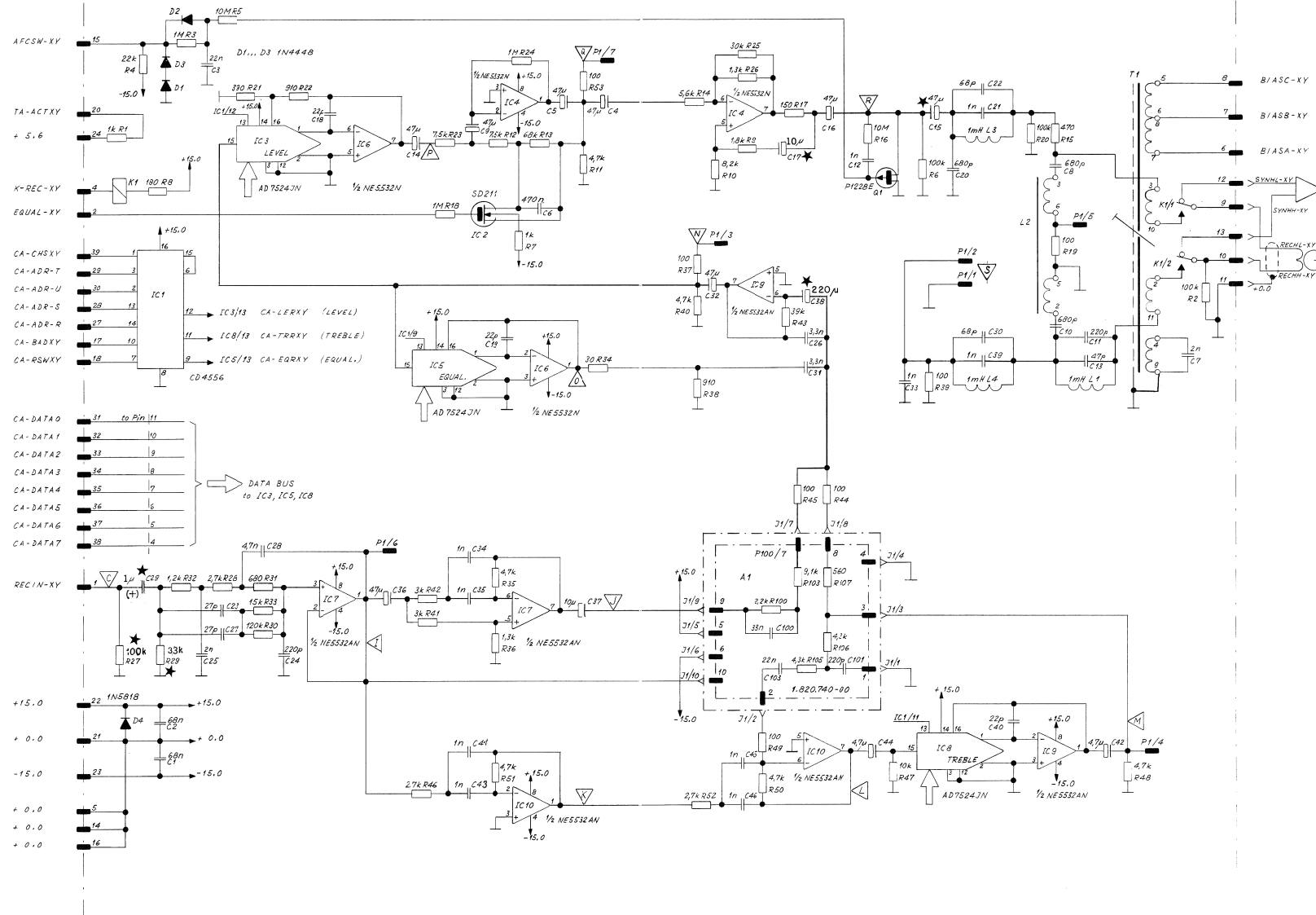
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MARK
	R..0011	57.11.3363	36 kOhm	1Z.	
	R..0012	57.11.3472	4.7 kOhm		
	R..0013	57.11.3690	68 kOhm		
	R..0014	58.01.4104	100 kOhm	see note 1	
	R..0015	57.11.3102	1 kOhm		
	R..0016	57.11.3622	8.2 kOhm		
	R..0017	57.11.3101	100 kOhm		
	R..0018	57.11.3104	100 kOhm		
	R..0019	57.11.3104	100 kOhm		
	R..0020	57.11.3104	100 kOhm		
	R..0021	57.11.3182	1.8 kOhm		
	R..0022	57.11.3104	100 kOhm		

Note 1 - 100 kOhm Potentiometer - Lag. 10Z  
 Allen Bradley Co. 75 104 B

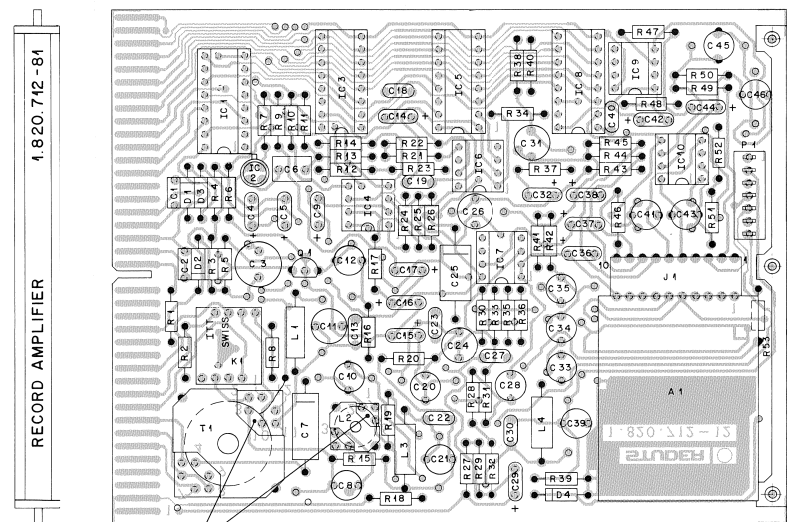
Ca=Ceramic, El=Electretic, FF=Polypropylen, Sol=Solid aluminium

MANUFACTURER: Ex=Exar, ITT=Internat'l, Met=Metrolab, Ph=Philips,  
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 T=Telefunken, Tc=Teane Instruments

RECORD AMPLIFIER PCB 1.820.712-00/-81 GR20 EL9/14 "ESE"  
ADAPTATION PCB 1.820.740-00

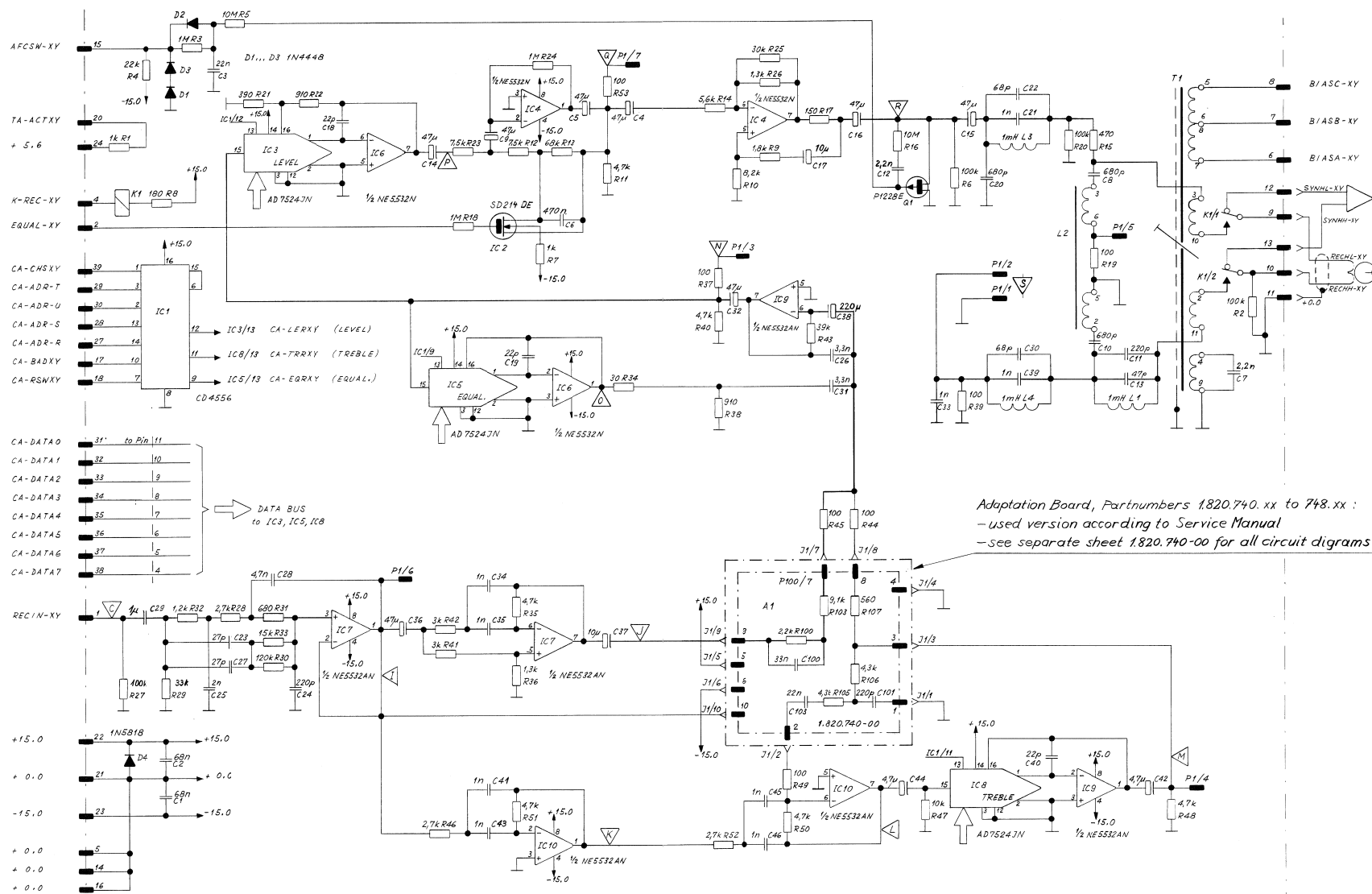


RECORD AMPLIFIER PCB 1.820.712-81 GR20 EL9/14 "ESE"

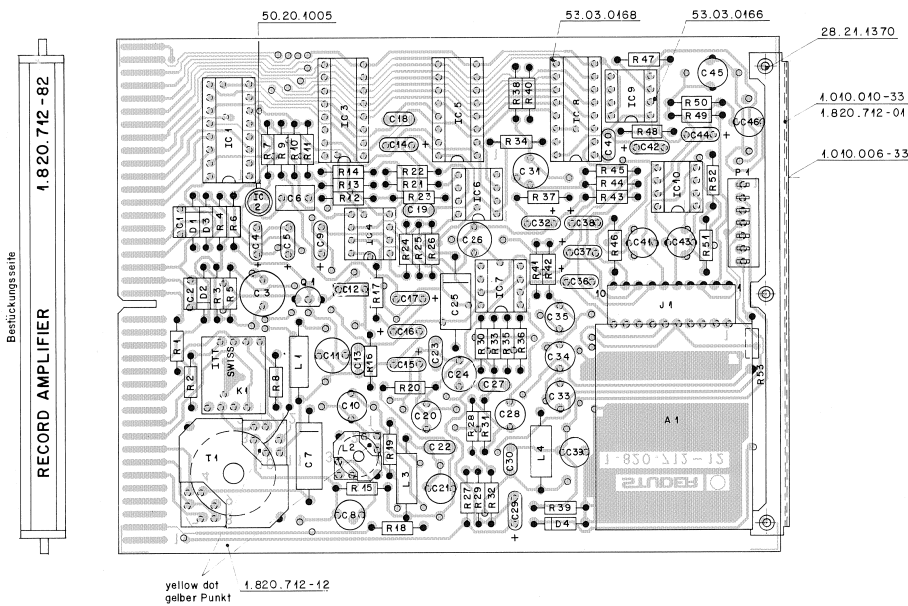


IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
A	0001	1-820-74C.00		Adaptation Board	SE	P	0001	54-12-007	7 cont.	AMP Mini Match System Nr. 164 713-7	
C	0001	59-94-0205	88 PF	40Vr Ce		U	0001	50-03-0329	P12ZE	AMP16	5ixx15
C	0002	59-94-0205	68 PF	40Vr Ce							
C	0003	59-94-1223	22 PF	1kV 40Vr PP		R	0001	57-11-1102	1 kOhm 2%		
C	0004	59-94-0210	100k	1% Sal	Ph	R	0002	57-11-1104	100 kOhm 2%		
C	0005	59-26-0470	47 uF	Sal		R	0003	57-11-1105	1 kOhm 2%		
C	0006	59-94-0210	100k	1% PETP		R	0004	57-11-1223	22 kOhm 2%		
C	0007	59-12-5022	2.2 PF	1kV 500Vr PS		R	0005	57-02-1106	10 kOhm 1%		
C	0008	59-04-0801	180 PF	1% PP		R	0006	57-11-1104	400 kOhm 2%		
C	0009	59-26-0470	47 uF	6.3Vr Sal	Ph	R	0007	57-11-1102	1 kOhm 2%		
C	0010	59-04-0801	180 PF	1% PP		R	0008	57-11-1181	180 kOhm 2%		
C	0011	59-05-1221	220 PF	1% PP		R	0009	57-11-1182	1.8 kOhm 2%		
C	0012	59-05-1221	1 PF	1% PP		R	0010	57-11-1822	18 kOhm 2%		
C	0013	59-26-0470	47 uF	6.3Vr Sal		R	0011	57-11-4472	4.7 kOhm 2%		
C	0014	59-26-0470	47 uF	6.3Vr Sal		R	0012	57-11-3752	3.75 kOhm 1%		
C	0015	59-26-0470	47 uF	6.3Vr Sal	Ph	R	0013	57-11-4683	88 kOhm 2%		
C	0016	59-26-0470	47 uF	6.3Vr Sal		R	0014	57-11-5662	4 kOhm 1%		
C	0017	59-26-0470	47 uF	6.3Vr Sal	Ph	R	0015	57-11-4471	470 kOhm 2%		
C	0018	59-13-0100	22 PF	1% Ce		R	0016	57-02-1106	10 kOhm 1%		
C	0019	59-13-0100	22 PF	1% Ce		R	0017	57-11-4151	150 kOhm 2%		
C	0020	59-04-0801	180 PF	1% PP		R	0018	57-11-1105	1 kOhm 2%		
C	0021	59-05-1102	1 PF	1% PP		R	0019	57-11-1101	100 Ohm 2%		
C	0022	59-13-0100	68 PF	1% Ce		R	0020	57-11-1104	100 kOhm 2%		
C	0023	59-26-0470	27 PF	1% Ce		R	0021	57-11-3911	390 kOhm 2%		
C	0024	59-05-1102	220 PF	1% PP		R	0022	57-11-3911	390 kOhm 1%		
C	0025	59-12-7362	2 PF	1% PS		R	0023	57-11-3752	3.75 kOhm 1%		
C	0026	59-05-1332	3.3 PF	1% PP		R	0024	57-11-1105	1 kOhm 2%		
C	0027	59-26-0470	27 PF	1% Ce		R	0025	57-11-3303	30 kOhm 2%		
C	0028	59-05-1102	4.7 PF	1% PP		R	0026	57-11-3132	31 kOhm 2%		
C	0029	59-05-1105	1 PF	1% PETP		R	0027	57-11-1104	100 kOhm 2%		
C	0030	59-13-0880	68 PF	1% Ce		R	0028	57-11-3752	3.75 kOhm 2%		
C	0031	59-05-1332	3.3 PF	1% PP		R	0029	57-11-3333	33 kOhm 2%		
C	0032	59-26-0470	47 uF	6.3Vr Sal		R	0030	57-11-1126	112 kOhm 2%		
C	0033	59-05-1102	1 PF	1% PP		R	0031	57-11-4481	440 kOhm 2%		
C	0034	59-05-1102	1 PF	1% PP		R	0032	57-11-1122	112 kOhm 2%		
C	0035	59-05-1102	1 PF	1% PP	Ph	R	0033	57-11-1153	15 kOhm 2%		
C	0036	59-26-0470	47 uF	6.3Vr Sal		R	0034	57-11-3300	30 kOhm 1%		
C	0037	59-26-1100	10 uF	16Vr Sal		R	0035	57-11-4472	4.7 kOhm 2%		
C	0038	59-22-1221	220 PF	10Vr EI		R	0036	57-11-332	33 kOhm 2%		
C	0039	59-05-1102	1 PF	1% PP		R	0037	57-11-4101	100 kOhm 2%		
C	0040	59-13-0100	22 PF	10Vr EI		R	0038	57-11-3911	100 kOhm 1%		
C	0041	59-05-1102	1 PF	1% PP		R	0039	57-11-4101	100 kOhm 2%		
C	0042	59-26-0470	47 uF	Sal	Ph	R	0040	57-11-4472	4.7 kOhm 2%		
C	0043	59-05-1102	1 PF	1% PP		R	0041	57-11-3302	33 kOhm 2%		
C	0044	59-26-0470	47 uF	Sal		R	0042	57-11-3302	33 kOhm 2%		
C	0045	59-05-1102	1 PF	1% PP		R	0043	57-11-3393	39 kOhm 1%		
C	0046	59-05-1102	1 PF	1% PP		R	0044	57-11-1101	100 kOhm 2%		
D	0001	50-04-1125	1N4448	ITT-PbSx-Ti		R	0045	57-11-4101	100 kOhm 2%		
D	0002	50-04-1125	1N4448	ITT-PbSx-Ti		R	0046	57-11-4472	4.7 kOhm 2%		
D	0003	50-04-1125	1N4448	ITT-PbSx-Ti		R	0047	57-11-4103	10 kOhm 2%		
D	0004	50-04-1125	1N4448	ITT-PbSx-Ti		R	0048	57-11-4472	4.7 kOhm 2%		
D	0005	50-04-1125	1N4448	ITT-PbSx-Ti		R	0049	57-11-4101	100 kOhm 2%		
D	0006	50-04-1125	1N4448	ITT-PbSx-Ti		R	0050	57-11-4472	4.7 kOhm 2%		
D	0007	50-04-1125	1N4448	ITT-PbSx-Ti		R	0051	57-11-4472	4.7 kOhm 2%		
D	0008	50-04-1125	1N4448	ITT-PbSx-Ti		R	0052	57-11-4472	4.7 kOhm 2%		
D	0009	50-04-1125	1N4448	ITT-PbSx-Ti		R	0053	57-11-4101	100 kOhm 2%		
D	0010	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0011	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0012	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0013	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0014	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0015	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0016	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0017	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0018	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0019	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0020	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0021	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0022	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0023	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0024	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0025	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0026	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0027	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0028	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0029	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0030	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0031	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0032	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0033	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0034	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0035	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0036	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0037	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0038	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0039	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0040	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0041	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0042	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0043	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0044	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0045	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0046	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0047	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0048	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0049	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0050	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0051	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0052	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0053	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0054	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0055	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0056	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0057	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0058	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0059	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0060	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0061	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0062	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0063	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0064	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0065	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0066	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0067	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0068	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0069	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0070	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0071	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0072	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0073	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0074	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0075	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0076	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0077	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0078	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0079	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0080	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0081	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0082	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0083	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0084	50-04-1125	1N4448	ITT-PbSx-Ti		R					
D	0085	50-04-1125	1N4448	ITT-PbS							

## RECORD AMPLIFIER 1.820.712.82



RECORD AMPLIFIER 1.820.712.82



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
A..0001		*** note 1		Adaptation Board	St
C..0001	59.99.0205	68 nF		40V, Ce	
C..0002	59.99.0205	68 nF		40V, Ce	
C..0003	59.05.1223	22 nF		1%, 40V, PF	Ph
C..0004	59.26.0470	47 uF		Sal	Ph
C..0005	59.26.0470	47 uF		Sal	Ph
C..0006	59.06.2474	470 nF		5%, PETP	
C..0007	59.12.9222	2.2 nF		1%, 500V, PS	
C..0008	59.05.1681	680 pF		1%, PF	Ph
C..0009	59.26.0470	47 uF		6.3V, Sal	Ph
C..0010	59.05.1681	680 pF		1%, PF	Ph
C..0011	59.05.1221	220 pF		1%, PF	
C..0012	59.06.0222	2.2 nF		10%, PETP	
C..0013	59.34.2470	47 pF		5%, Ce	Ph
C..0014	59.26.0470	47 uF		6.3V, Sal	Ph
C..0015	59.26.0470	47 uF		6.3V, Sal	Ph
C..0016	59.26.0470	47 uF		6.3V, Sal	Ph
C..0017	59.26.2100	10 uF		16V, Ca	Ph
C..0018	59.34.2220	22 pF		5%, Ce	
C..0019	59.34.2220	22 pF		5%, Ce	
C..0020	59.05.1681	680 pF		1%, PF	
C..0021	59.05.1102	1 nF		1%, PF	
C..0022	59.34.6080	608 pF		5%, Ca	
C..0023	59.34.2270	27 pF		5%, Ce	
C..0024	59.05.1221	220 pF		1%, PF	
C..0025	59.12.1202	2 nF		1%, PS	
C..0026	59.05.1332	3.3 nF		1%, PF	
C..0027	59.34.2270	27 pF		5%, Ce	
C..0028	59.05.1472	4.7 nF		1%, PF	
C..0029	59.06.1105	1 uF		5%, PETP	
C..0030	59.34.6080	608 pF		5%, Ca	
C..0031	59.05.1332	3.3 nF		1%, 6.3V	Ph
C..0032	59.26.0470	47 uF		Sal	
C..0033	59.05.1102	1 nF		1%, PF	
C..0034	59.05.1102	1 nF		1%, PF	
C..0035	59.05.1102	1 nF		1%, PF	

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IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0036	59.26.0470	47 uF		6.3V, Sal	Ph
C..0037	59.26.2100	10 uF		16V, Sal	Ph
C..0038	59.22.1221	220 nF		10%, EI	
C..0039	59.05.1102	1 nF		1%, PF	
C..0040	59.34.2220	22 pF		5%, Ca	
C..0041	59.05.1102	1 nF		1%, PF	Ph
C..0042	59.26.0470	4.7 uF		Sal	Ph
C..0043	59.05.1102	1 nF		1%, PF	Ph
C..0044	59.26.0470	4.7 uF		Sal	
C..0045	59.05.1102	1 nF		1%, PF	
C..0046	59.05.1102	1 nF		1%, PF	
D..0001	50.04.0125	184448			ITT/Ph/Ses/TT
D..0002	50.04.0125	184448			ITT/Ph/Ses/TT
D..0003	50.04.0125	184448			ITT/Ph/Ses/TT
D..0004	50.04.0512	185819			Not
IC..0001	50.07.0004	MC1458BCP		CM4558BE, 4558B FC	Not/RCA/Fo
IC..0002	50.11.0106	SR 214 DS		SR0214	Si/Ph/Ph
IC..0003	50.07.0002	AD7524JN		MP7524JN	ADI/RS
IC..0004	50.09.0105	WE5524N		MP7524JN	Si/Ph/Ph
IC..0005	50.07.0002	AD7524JN		MP7524JN	Si/Ph/Ph
IC..0006	50.09.0105	WE5524N		MP7524JN	Si/Ph/Ph
IC..0007	50.09.0106	WE5524N		MP7524JN	Si/Ph/Ph
IC..0008	50.07.0002	AD7524JN		MP7524JN	Si/Ph/Ph
IC..0009	50.09.0106	WE5524N		MP7524JN	Si/Ph/Ph
IC..0010	50.09.0106	WE5524N		MP7524JN	Si/Ph/Ph
J..0001	56.01.0307	10 cent.		AMP Sc. 163.683-B	
K..0001	56.04.0171	SK D1012			ITT
L..0001	62.01.0128	1 nH		Gewenda 16-104 or Delevan 2307-105	St
L..0002	1.022.214.00			Filter coil, 150 mH	
L..0003	62.01.0128	1 nH		Gewenda 16-104 or Delevan 2307-105	
L..0004	62.01.0128	1 nH		Gewenda 16-104 or Delevan 2307-105	

STUDER (00) 87/08/28 BD RECORD AMPLIFIER PL 1.820.712.82 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
P..0001	54.12.0007	7 cent.		AMP Mini Match System, No. 164 713-7	
Q..0001	50.03.0329	P122BE		WPL46	Si/Ph/TS
R..0001	57.11.4102	1 kOhm		2%	
R..0002	57.11.4104	100 kOhm		2%	
R..0003	57.11.4104	1 kOhm		2%	
R..0004	57.11.4523	22 kOhm		2%	
R..0005	57.11.5106	10 kOhm		2%	
R..0006	57.11.4104	100 kOhm		2%	
R..0007	57.11.4102	1 kOhm		2%	
R..0008	57.11.4181	180 Ohm		2%	
R..0009	57.11.4182	1.8 kOhm		2%	
R..0010	57.11.4522	8.2 kOhm		2%	
R..0011	57.11.4472	4.7 kOhm		2%	
R..0012	57.11.3752	7.5 kOhm		1%	
R..0013	57.11.4685	68 kOhm		2%	
R..0014	57.11.4552	5.6 kOhm		2%	
R..0015	57.11.4171	410 Ohm		2%	
R..0016	57.11.5106	10 kOhm		2%	
R..0017	57.11.4151	410 Ohm		2%	
R..0018	57.11.4105	1 kOhm		2%	
R..0019	57.11.4101	100 Ohm		2%	
R..0020	57.11.4104	100 kOhm		2%	
R..0021	57.11.4991	390 Ohm		2%	
R..0022	57.11.3911	910 Ohm		1%	
R..0023	57.11.3752	7.5 kOhm		1%	
R..0024	57.11.4105	1 kOhm		2%	
R..0025	57.11.3803	30 kOhm		2%	
R..0026	57.11.3132	1.3 kOhm		1%	
R..0027	57.11.4104	100 kOhm		2%	
R..0028	57.11.4472	2.7 kOhm		2%	
R..0029	57.11.4333	33 kOhm		2%	
R..0030	57.11.4104	100 kOhm		2%	
R..0031	57.11.4681	680 Ohm		2%	
R..0032	57.11.4122	1.2 kOhm		2%	
R..0033	57.11.4153	15 kOhm		2%	

STUDER (00) 87/08/28 BD RECORD AMPLIFIER PL 1.820.712.82 PAGE 3

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R..0034	57.11.3300	30 Ohm		2%	
R..0035	57.11.4472	4.7 kOhm		2%	
R..0036	57.11.3132	1.3 kOhm		1%	
R..0037	57.11.4101	100 Ohm		2%	
R..0038	57.11.3911	910 Ohm		1%	
R..0039	57.11.4101	100 Ohm		2%	
R..0040	57.11.4472	4.7 kOhm		2%	
R..0041	57.11.3802	38 kOhm		1%	
R..0042	57.11.3302	33 kOhm		1%	
R..0043	57.11.4393	39 kOhm		2%	
R..0044	57.11.4101	100 Ohm		2%	
R..0045	57.11.4101	100 Ohm		2%	
R..0046	57.11.4272	2.7 kOhm		2%	
R..0047	57.11.4103	10 kOhm		2%	
R..0048	57.11.4472	4.7 kOhm		2%	
R..0049	57.11.4101	100 Ohm		2%	
R..0050	57.11.4472	4.7 kOhm		2%	
R..0051	57.11.4472	4.7 kOhm		2%	
R..0052	57.11.4272	2.7 kOhm		2%	
R..0053	57.11.4101	100 Ohm		2%	

T..0001 1.022.213.00 Bias Transformer, 150 kHz St

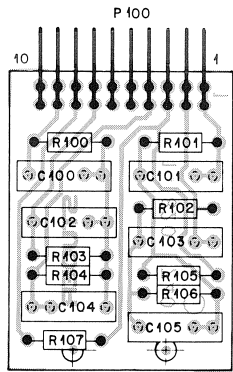
STUDER (00) 87/08/28 BD RECORD AMPLIFIER PL 1.820.712.82 PAGE 4

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1: Actual use of Adaptation Board (Studer nr. 1.820.740.00 up to 1.820.748.00) according to Service Manual.					
Ca=Ceramic, PETP=Polyester, PP=Polypropylene, PS=Polystyrol, Sal=Solid electrolyte					
MANUFACTURER: ADI=Analog Devices Inc., Em=Emar, Fo=Fairchild, ITT=International, Met=Motorola, Mgr=Microcomputer, Sem=Semiconductor, Ph=Philips, Ra=Raytheon, RCA=Radio Corp. of America, Spa=Spacocom, Sig=Signetics, Si=Siemens, Sil=Siliconix, TS=Telefunken Semiconductor, TI=Texas Instruments.					

ORIG 87/08/28 STUDER (00) 87/08/28 BD RECORD AMPLIFIER PL 1.820.712.82 PAGE 5



ADAPTATION PCB 1.820.740-00



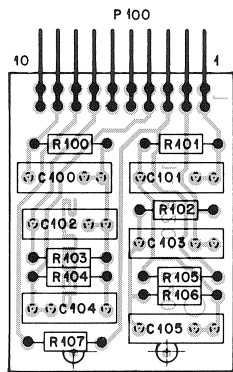
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	C..0100	59.12.2223	22 nF	5%	
	C..0101	59.11.6221	220 pF	5%	
	C..0102		not used		
	C..0103	59.02.5333	33 nF	5%	
	C..0104		not used		
	C..0105		not used		
	P..0100	54.01.0271	10 cont.	AMP-Nr. 163.740-8	
	R..0100	57.11.4222	2.2 kOhm	2%	
	R..0101		not used		
	R..0102		not used		
	R..0103	57.11.3912	9.1 kOhm	2%	
	R..0104		not used		
	R..0105	57.11.3432	4.3 kOhm	1%	
	R..0106	57.11.3432	4.3 kOhm	1%	
	R..0107	57.11.4561	560 Ohm	2%	

ORIG 82/06/28

S T U D E R 82/06/28 PB ADAPTATION BOARD

1.820.740.00 PAGE 1

ADAPTION BOARD 1.820.740.00/81 FOR 1.317....HEADS



IND.	POS.-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	C..0100	59.12.2223	22 nF	5%	
	C..0101	59.11.6221	220 pF	5%	
	C..0102		not used		
	C..0103	59.02.5333	33 nF	5%	
	C..0104		not used		
	C..0105		not used		
	P..0100	54.01.0271	10 cont.	AMP-Nr. 163.740-8	
	R..0100	57.11.4222	2.2 kOhm	2%	
	R..0101		not used		
	R..0102		not used		
	R..0103	57.11.3912	9.1 kOhm	2%	
	R..0104		not used		
	R..0105	57.11.3432	4.3 kOhm	1%	
	R..0106	57.11.3432	4.3 kOhm	1%	
	R..0107	57.11.4561	560 Ohm	2%	

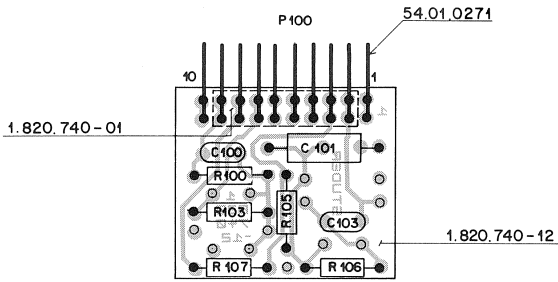
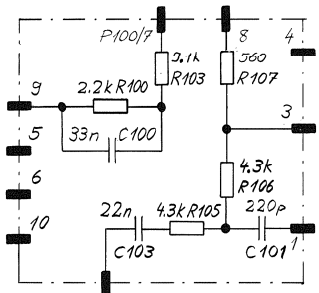
ORIG 82/06/28

S T U D E R (00) 82/06/28 PB

ADAPTATION BOARD

1.820.740.00 PAGE 1

1.820.740.00  
1.820.740.81



IND.	POS.-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(03)	C..0100	59.06.5223	22 nF	5%	
(01)	C..0100	59.06.5333	33 nF	5%	
	C..0101	59.04.6221	220 pF	5%	
	C..0102		not used		
(00)	C..0103	59.05.5333	33 nF	5%	
(01)	C..0103	59.05.5223	22 nF	5%	
	C..0104		not used		
	C..0105		not used		
	P..0100	54.01.0271	10 cont.	AMP-Nr. 163.740-8	
	R..0100	57.11.4222	2.2 kOhm	2%	
	R..0101		not used		
	R..0102		not used		
	R..0103	57.11.3912	9.1 kOhm	2%	
	R..0104		not used		
	R..0105	57.11.3432	4.3 kOhm	1%	
	R..0106	57.11.3432	4.3 kOhm	1%	
	R..0107	57.11.4561	560 Ohm	2%	

(01) 85/12/03 Correction of error: C100 and C103 exchanged.

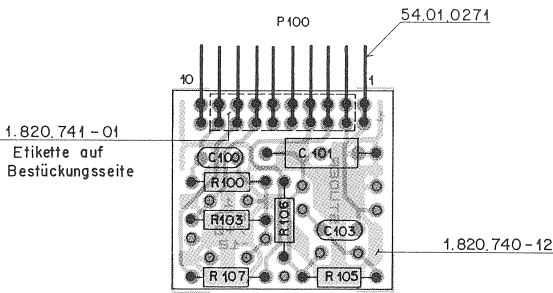
ORIG 85/09/25 (01) 85/12/03

S T U D E R (01) 86/12/03 SD

ADAPTATION BOARD

PL 1.820.740.81 PAGE 1

ADAPTATION BOARD 1.820.741.00



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	C..0100	59.06.5682	6.8 nF	5%	
	C..0101	59.04.8221	220 pF	5%	
	C..0102		not used		
	C..0103	59.06.5223	22 nF	5%	
	C..0104		not used		
	C..0105		not used		
	P..0100	54.01.0271	10 cent.	AMP-Nr. 163.740-B	
	R..0100	57.11.4472	4.7 kOhm	2%	
	R..0101		not used		
	R..0102		not used		
	R..0103	57.11.4682	6.8 kOhm	2%	
	R..0104		not used		
	R..0105	57.11.3432	4.3 kOhm	1%	
	R..0106	57.11.3432	4.3 kOhm	1%	
	R..0107	57.11.4102	1.0 kOhm	2%	

★ HAS BEEN MODIFIED

## LAYOUT 1.820.713-12

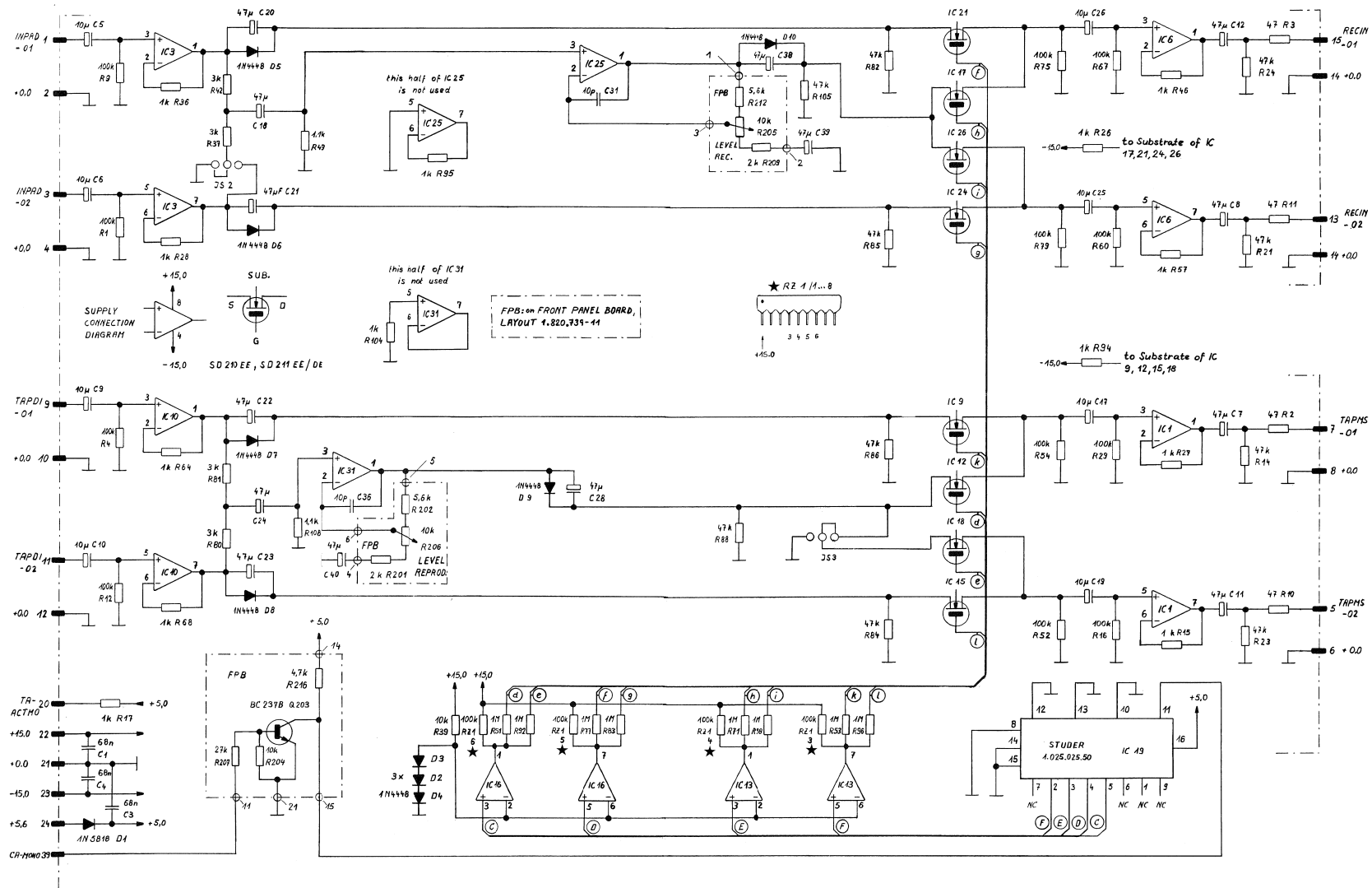
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..L0001	62-03-0128	1 wh		Grounds 16-104 or Delvaco 2307-105		..C01	82/26/25	Use of standard potentiometer. Testpoint added (TP 1).			
..L0002	1-022-197-10	1-5 mm			5t	..C02	82/26/25	Construction of breadboard of clock/resetting circuit.			
..L0003	1-022-197-0	1-5 mm			5t						
..P-0001	54-1-2005	9 cont.		AMP Mini-Ratch Switch, Pcs. 164 713-5				Not a - Potentiometer. Burns-Nor.	330K 1/4-203		
..C001	50-03-0101	P1228	wh16		T155			VR	780 400 20K		
..C002	50-03-0102	P1228	wh16		T155			General-R	68 X 203 1010		
..C003	50-03-0103	P1228	wh16		T155						
..C004	50-03-0104	P1228	wh16		T155						
..C005	50-03-0105	P1228	wh16		T155						
..C006	50-03-0106	P1228	wh16		T155						
..C007	50-03-0107	P1228	wh16		T155						
..C008	50-03-0108	P1228	wh16		T155						
..C009	50-03-0109	P1228	wh16		T155						
..C010	50-03-0110	P1228	wh16		T155						
..C011	50-03-0111	P1228	wh16		T155						
..C012	50-03-0112	P1228	wh16		T155						
..C013	50-03-0113	P1228	wh16		T155						
..C014	50-03-0114	P1228	wh16		T155						
..C015	50-03-0115	P1228	wh16		T155						
..C016	50-03-0116	P1228	wh16		T155						
..C017	50-03-0117	P1228	wh16		T155						
..C018	50-03-0118	P1228	wh16		T155						
..C019	50-03-0119	P1228	wh16		T155						
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..C021	50-03-0121	P1228	wh16		T155						
..C022	50-03-0122	P1228	wh16		T155						
..C023	50-03-0123	P1228	wh16		T155						
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..C036	50-03-0136	P1228	wh16		T155						
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..C001	50-03-0101	P1228	wh16		T155						
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..C004	50-03-0104	P1228	wh16		T155						
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..C008	50-03-0108	P1228	wh16		T155						
..C009	50-03-0109	P1228	wh16		T155						
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..C016	50-03-0116	P1228	wh16		T155						
..C017	50-03-0117	P1228	wh16		T155						
..C018	50-03-0118	P1228	wh16		T155						
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..C038	50-03-0138	P1228	wh16		T155						
..C039	50-03-0139	P1228	wh16		T155						
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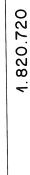
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..C018	50-03-0118	P1228	wh16		T155						
..C019											

MONO/STEREO SWITCH PCB 1.820.720-00 GR20 EL12 "ESE"  
FRONT PANEL PCB (LAYOUT 1.820.739-11)

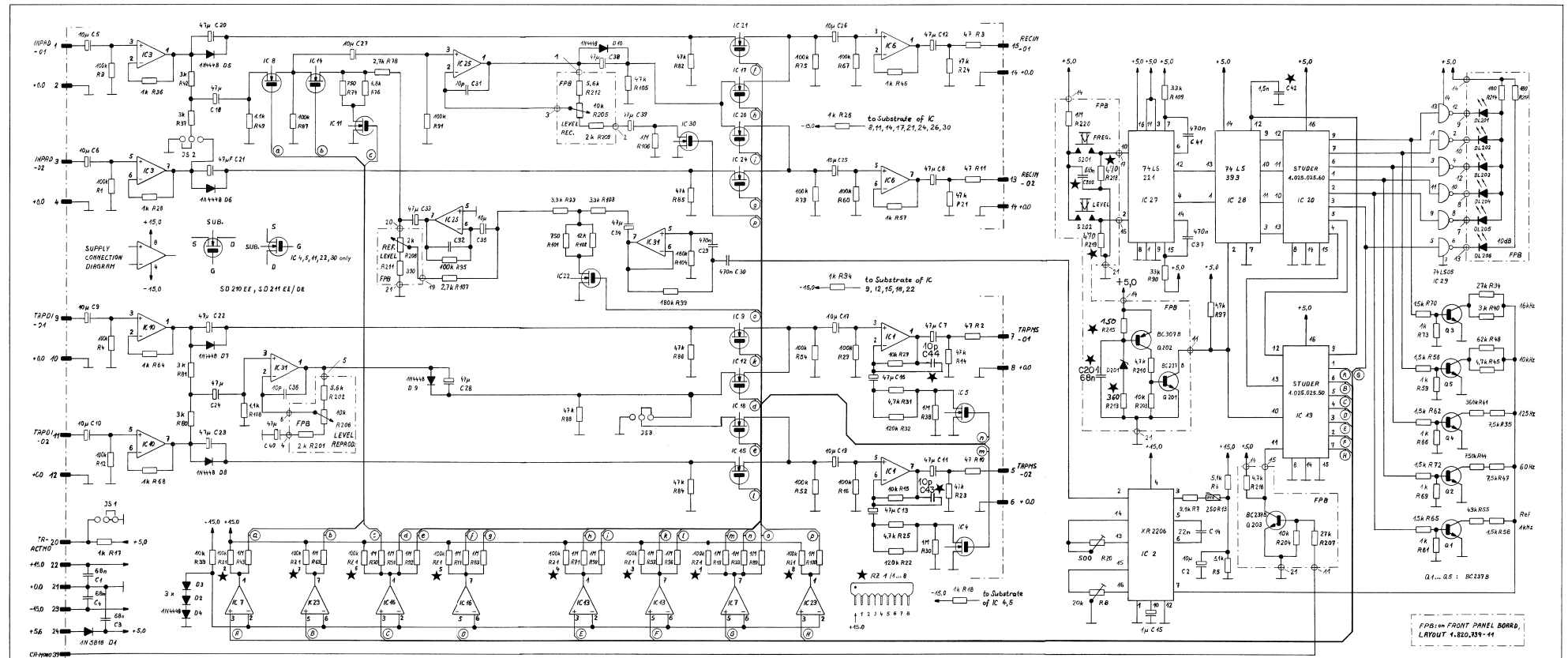


MONO/STEREO SWITCH PCB 1.820.720-00 GR20 EL12 "ESE"  
FRONT PANEL PCB (LAYOUT 1.820.739-11)



S T C D E R R3/03/22 BHT R-S SWITCH L:R20.720.00 PAGE 3

MONO/STEREO SWITCH PCB WITH TEST GENERATOR 1.820.724-00 GR20 EL12 "ESE"  
FRONT PANEL PCB (LAYOUT 1.820.739-11)



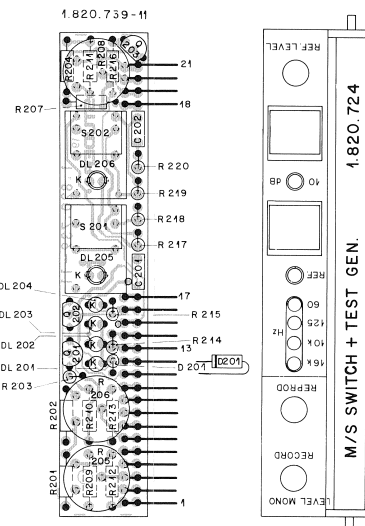
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C-0001	59-26-0205	0 8 pf	-20%	63V, Ca		C-0001	59-26-0470	47 uf	-20%	6.3V, 5at		I-0007	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0002	59-26-2100	10 uf	-20%	16V, 5at		C-0002	59-26-0470	47 uf	-20%	6.3V, 5at		I-0008	59-26-2100	10 uf	-20%	16V, 5at	
C-0003	59-26-0205	0 8 pf	-20%	63V, Ca		C-0004	59-26-0470	47 uf	-20%	6.3V, 5at		I-0009	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0004	59-26-0205	0 8 pf	-20%	63V, Ca		C-0004	59-26-0470	47 uf	-20%	6.3V, 5at		I-0010	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0005	59-26-0205	0 8 pf	-20%	63V, Ca		C-0005	59-26-0470	47 uf	-20%	6.3V, 5at		I-0011	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0006	59-26-2100	10 uf	-20%	16V, 5at		C-0006	59-26-0470	47 uf	-20%	6.3V, 5at		I-0012	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0007	59-26-0470	10 uf	-20%	16V, 5at		C-0007	59-26-0470	47 uf	-20%	6.3V, 5at		I-0013	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0008	59-26-0470	10 uf	-20%	16V, 5at		C-0008	59-26-0470	47 uf	-20%	6.3V, 5at		I-0014	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0009	59-26-2100	10 uf	-20%	16V, 5at		C-0009	59-26-0470	47 uf	-20%	6.3V, 5at		I-0015	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0010	59-26-0470	47 uf	-20%	6.3V, 5at		C-0010	59-26-0470	47 uf	-20%	6.3V, 5at		I-0016	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0011	59-26-0470	47 uf	-20%	6.3V, 5at		C-0011	59-26-0470	47 uf	-20%	6.3V, 5at		I-0017	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0012	59-26-0470	47 uf	-20%	6.3V, 5at		C-0012	59-26-0470	47 uf	-20%	6.3V, 5at		I-0018	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0013	59-26-0470	47 uf	-20%	6.3V, 5at		C-0013	59-26-0470	47 uf	-20%	6.3V, 5at		I-0019	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0014	59-26-0470	47 uf	-20%	6.3V, 5at		C-0014	59-26-0470	47 uf	-20%	6.3V, 5at		I-0020	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0015	59-26-0470	47 uf	-20%	6.3V, 5at		C-0015	59-26-0470	47 uf	-20%	6.3V, 5at		I-0021	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0016	59-26-0470	47 uf	-20%	6.3V, 5at		C-0016	59-26-0470	47 uf	-20%	6.3V, 5at		I-0022	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0017	59-26-0470	47 uf	-20%	6.3V, 5at		C-0017	59-26-0470	47 uf	-20%	6.3V, 5at		I-0023	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0018	59-26-0470	47 uf	-20%	6.3V, 5at		C-0018	59-26-0470	47 uf	-20%	6.3V, 5at		I-0024	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0019	59-26-0470	47 uf	-20%	6.3V, 5at		C-0019	59-26-0470	47 uf	-20%	6.3V, 5at		I-0025	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0020	59-26-0470	47 uf	-20%	6.3V, 5at		C-0020	59-26-0470	47 uf	-20%	6.3V, 5at		I-0026	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0021	59-26-0470	47 uf	-20%	6.3V, 5at		C-0021	59-26-0470	47 uf	-20%	6.3V, 5at		I-0027	59-26-0205	0 8 pf	-20%	63V, Ca	
C-0022	59-26-0470	47 uf	-20%	6.3V, 5at		C-0022	59-26-0470	47 uf	-20%	6.3V, 5at		I-0028	59-26-0205	0 8 pf	-20%	63V, Ca	
C-						C-					C-						
C-						C-					C-						
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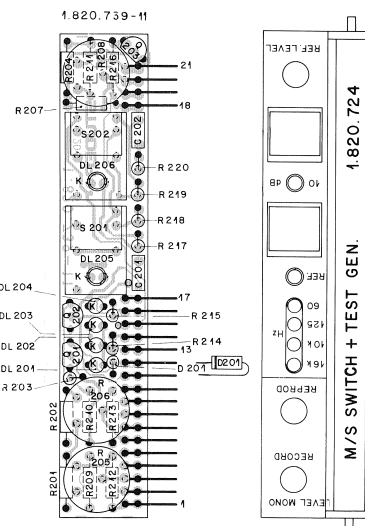
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LAYOUT 1.820.720-11

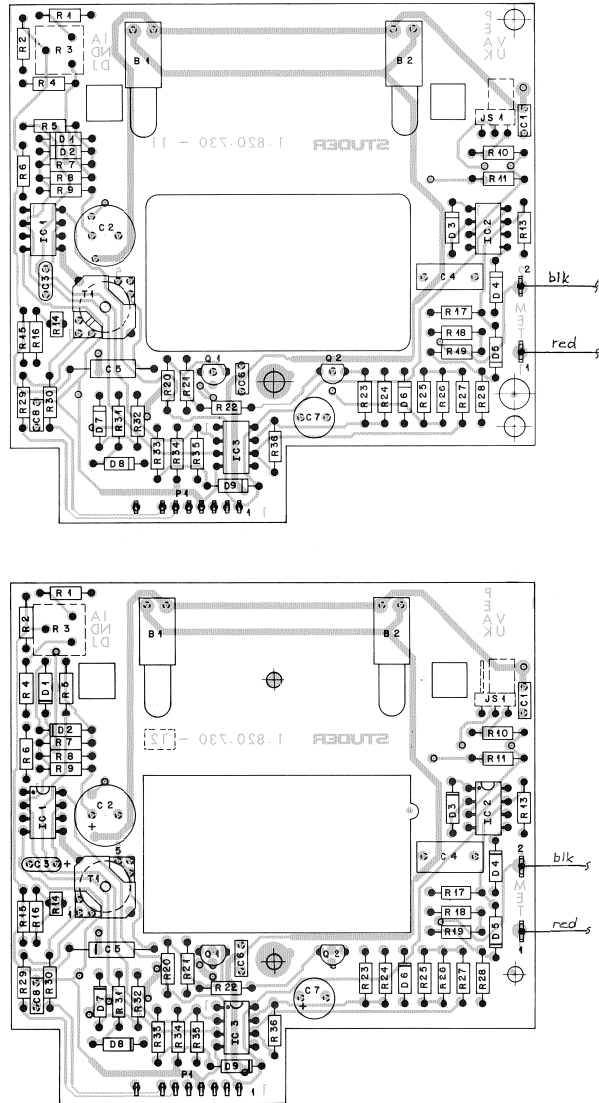


LAYOUT 1.820.720.12

ITEM	POS.=NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	R=0036	57-11-1402	1 KOhm	5%	
	R=0037	57-11-1302	3-0 KOhm	5%	
	R=0038	57-11-1405	1 Mohm	2%	
	R=0039	57-11-1403	1 Mohm	2%	
	R=0040	57-11-1302	3-0 KOhm	1%	
	R=0041	57-11-1304	300 KOhm	1%	
	R=0042	57-11-1302	3-0 KOhm	1%	
	R=0043	57-11-1405	1 Mohm	2%	
	R=0044	57-11-1375	750 KOhm	1%	
	R=0045	57-11-1302	3-0 KOhm	1%	
	R=0046	57-11-1407	1 KOhm	9%	
	R=0047	57-11-1302	3-0 KOhm	1%	
	R=0048	57-11-1303	62 KOhm	2%	
	R=0049	57-11-1312	1-4 KOhm	1%	
	R=0050	57-11-1405	1 Mohm	2%	
	R=0051	57-11-1405	1 Mohm	2%	
	R=0052	57-11-1404	100 KOhm	5%	
	R=0053	57-11-1405	1 Mohm	2%	
	R=0054	57-11-1406	100 KOhm	5%	
	R=0055	57-11-1303	62 KOhm	9%	
	R=0056	57-11-1402	1 KOhm	2%	
	R=0057	57-11-1302	3-0 KOhm	1%	
	R=0058	57-11-1402	1 KOhm	2%	
	R=0059	57-11-1402	1 KOhm	2%	
	R=0060	57-11-1404	100 KOhm	5%	
	R=0061	57-11-1405	1 Mohm	2%	
	R=0062	57-11-1402	1 KOhm	2%	
	R=0063	57-11-1405	1 Mohm	2%	
	R=0064	57-11-1402	1 KOhm	5%	
	R=0065	57-11-1402	1 KOhm	5%	
	R=0066	57-11-1402	1 KOhm	5%	
	R=0067	57-11-1402	1 KOhm	5%	
	R=0068	57-11-1402	1 KOhm	5%	
	R=0069	57-11-1402	1 KOhm	5%	
	R=0070	57-11-1402	1 KOhm	5%	
	R=0071	57-11-1405	1 Mohm	2%	
	R=0072	57-11-1402	1 KOhm	2%	
	R=0073	57-11-1302	3-0 KOhm	1%	
	R=0074	57-11-1375	750 KOhm	1%	
	R=0075	57-11-1405	1 Mohm	2%	
	R=0076	57-11-1405	6 Mohm	5%	
	R=0077	57-11-1405	1 Mohm	6%	
	R=0078	57-11-1407	2-7 KOhm	2%	
	R=0079	57-11-1406	100 KOhm	5%	
	R=0080	57-11-1302	3-0 KOhm	1%	
	R=0081	57-11-1302	3-0 KOhm	1%	
	R=0082	57-11-1403	97 KOhm	1%	
	R=0083	57-11-1405	1 Mohm	2%	
	R=0084	57-11-1403	97 KOhm	5%	
	R=0085	57-11-1403	97 KOhm	5%	
	R=0086	57-11-1403	97 KOhm	5%	
	R=0087	57-11-1403	97 KOhm	5%	
	R=0088	57-11-1403	97 KOhm	5%	
	R=0089	57-11-1405	1 Mohm	2%	
	R=0090	57-11-1403	33 KOhm	5%	
	R=0091	57-11-1406	100 KOhm	5%	
	R=0092	57-11-1405	1 Mohm	2%	
	R=0093	57-11-1312	1-4 KOhm	1%	
	R=0094	57-11-1402	1 KOhm	2%	
	R=0095	57-11-1402	1 KOhm	2%	
	R=0096	57-11-1405	1 Mohm	2%	
	R=0097	57-11-1402	6-7 KOhm	5%	
	R=0098	57-11-1405	1 Mohm	2%	
	R=0099	57-11-1405	1 Mohm	2%	
	R=0100	57-11-1405	1 Mohm	2%	
	R=0101	57-11-1405	1 Mohm	2%	
	R=0102	57-11-1423	12 KOhm	1%	
	R=0103	57-11-1332	3-3 KOhm	1%	
	R=0104	57-11-1406	100 KOhm	2%	
	R=0105	57-11-1403	97 KOhm	5%	
	R=0106	57-11-1405	1 Mohm	2%	
	R=0107	57-11-1402	2-7 KOhm	1%	
	R=0108	57-11-1312	1-4 KOhm	1%	
	R=0109	57-11-1333	33 KOhm	2%	
	R=0201	57-11-1302	2 KOhm	1%	
	R=0202	57-11-1402	5 KOhm	5%	
	R=0203	57-11-1403	10 KOhm	5%	

The image contains two circuit diagrams for a radio receiver, labeled A.820.730-00 and A.820.730-01. Both diagrams show a similar layout with a transformer, various resistors, capacitors, and integrated circuits. The top diagram (A.820.730-00) includes a note about resistors R10 and R11 being selected for a specific operating level. The bottom diagram (A.820.730-01) is a modified version of the top one, with some component values changed. Both diagrams show a power supply section with a transformer and a rectifier circuit. The output is connected to a speaker and a volume control potentiometer.

VU PANEL 1.810.320-81 GR39/40  
VU METER AMPLIFIER PCB 1.820.730-00/-81



PLUGGED INTO CALIBRATION PCB 1.820.731-00

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(00)	B.....1	51-02-0144	Lamp	See note 1	
(01)	B.....2	51-02-0144	Lamp	See note 1	
(01)	B.....2	51-02-0144	Lamp	See note 1	
C.....1	59-99-0205	68 nF			Ph
C.....2	59-22-2471	470 uF	0V, E1		
C.....3	59-22-0410	47 uF	0V, Sal		
C.....4	59-02-0884	680 nF	5%, 63V, MPC		
C.....5	59-22-1203	200 uF	1%, 63V, PS		
C.....6	59-99-0205	68 nF			
C.....7	59-22-5101	100 uF	25V, E1		
C.....8	59-99-0205	68 nF			
D.....1	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....2	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....3	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....4	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....5	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....6	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....7	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....8	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....9	50-04-1109	20 V Z		ITT,Ph,Sex,TI	
IC.....1	50-09-0101	LF353N	TLO72ACP	NS,TI	
IC.....2	50-09-0101	LF353N	TLO72ACP	NS,TI	
IC.....3	50-09-0101	LF353N	TLO72ACP	NS,TI	
JS.....1				See note 2	
ME.....1	1.810.320-22		VU-Meter	St	
P.....1	54-01-0319	9 cont.	AMP Nr. 163.749-7		
Q.....1	50-03-0436	BC237B		ITT,Ph,Sex	
Q.....2	50-03-0331	2N939		Max,Se	
R.....1	57-11-4151	150 Ohm			
R.....2	57-11-4822	8-2 kOhm		See note 3	
R.....3	58-01-4802	5 kOhm			

STUDER 82/11/19 BBT VU-METER AMPLIFIER 1.820.730-00 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R.....2	57-11-4822	8-2 kOhm		See note 3	
R.....3	58-01-4802	5 kOhm		1%	
R.....4	57-11-4103	20 kOhm			
R.....5	57-11-4103	10 kOhm			
R.....6	57-11-4103	10 kOhm			
R.....7	57-11-4103	20 kOhm			
R.....8	57-11-4103	20 kOhm			
R.....9	57-11-4104	100 kOhm			
R.....10	57-11-4192	3-9 kOhm			
R.....11	57-11-4192	1-8 kOhm			
R.....12	57-11-4472	not used			
R.....13	57-11-4472	4-7 kOhm			
R.....14	57-09-0216	250 Ohm		PTC Resistor, Philips Nr. 2322 660 91001	
R.....15	57-11-4472	4-7 kOhm			
R.....16	57-11-4271	270 Ohm			
R.....17	57-11-4472	4-7 kOhm			
R.....18	57-11-3162	1-6 kOhm		1%	
R.....19	57-11-4224	2-2 kOhm			
R.....20	57-11-4224	220 kOhm			
R.....21	57-11-4224	2-2 kOhm			
R.....22	57-11-4106	10 kOhm			
R.....23	57-11-3632	4-3 kOhm		1%	
R.....24	57-11-3632	4-3 kOhm		1%	
R.....25	57-11-3632	4-3 kOhm		1%	
R.....26	57-11-3632	4-3 kOhm		1%	
R.....27	57-11-3632	20 kOhm		1%	
R.....28	57-11-4103	10 kOhm			
R.....29	57-11-4562	5-6 kOhm			
R.....30	57-11-4562	5-6 kOhm			
R.....31	57-11-4101	100 Ohm			
R.....32	57-11-4173	67 kOhm			
R.....33	57-11-4688	68 kOhm			
R.....34	57-11-4822	8-2 kOhm			
R.....35	57-11-4203	20 kOhm		1%	
R.....36	57-11-4203	20 kOhm		1%	
T.....1	1-022-219-00		Inputtransformer 1 : 1		St

STUDER 82/11/19 BBT VU-METER AMPLIFIER 1.820.730-00 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(01)	19-11-82	Lamp 6V 1W		replaced by Lamp 6V 0-034 (to high intensity)	
Note 1	Lamp 6 V-0-034				
Over Nr.	2306				
ITT Nr.	52373				
Socket Studer Nr.	54-04-0107, Alps Nr. 4050 021				
Note 2	Contact pin: Studer 54-01-0125, Berg 75169-301-36				
Bridge: Studer 54-01-0021, Philips 2422 024 88003					
Note 3	5 kOhm Potentiometer				
Allen Bradley Nr. E 28 502					
Bourrs Nr.	3386 P-1-502				
Spectrol Nr.	63M 502 T010				
Ceramics:	ET=Electrolytic, MPC=Polystyrol, PS=Polystyrol				
Sal=Solid aluminum.					
MANUFACTURER:	ITT=Intermetal, Mot=Motorola, NS=National Semiconductors				
Ph=Philips, Sex=Secoscon, Sier=Siemens, St=Studer,					
Se=Siliconix, TI=Texas Instruments					

ORIG 82/08/09 (01) 82/11/19

STUDER 82/11/19 BBT VU-METER AMPLIFIER 1.820.730-00 PAGE 3

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
B.....1	51-02-0144	Lamp	See note 1		
B.....2	51-02-0144	Lamp	See note 1		
C.....1	59-99-0205	68 nF			Ph
C.....2	59-22-2471	470 uF	0V, E1		
C.....3	59-22-0410	47 uF	0V, Sal		
C.....4	59-02-0884	680 nF	5%, 63V, MPC		
C.....5	59-22-1203	200 uF	1%, 63V, PS		
C.....6	59-99-0205	68 nF			
C.....7	59-22-5101	100 uF	25V, E1		
C.....8	59-99-0205	68 nF			
D.....1	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....2	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....3	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....4	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....5	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....6	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....7	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....8	50-04-0125	1N4448		ITT,Ph,Sex,TI	
D.....9	50-04-1109	20 V Z		ITT,Ph,Sex,TI	
IC.....1	50-09-0101	LF353N	TLO72ACP	NS,TI	
IC.....2	50-09-0101	LF353N	TLO72ACP	NS,TI	
IC.....3	50-09-0101	LF353N	TLO72ACP	NS,TI	
JS.....1				See note 2	
ME.....1	1.810.320-22		VU-Meter	St	
P.....1	54-01-0319	9 cont.	AMP Nr. 163.749-7		
Q.....1	50-03-0436	BC237B		ITT,Ph,Sex	
Q.....2	50-03-0331	2N939		Max,Se	
R.....1	57-11-4151	150 Ohm			
R.....2	57-11-4822	8-2 kOhm		See note 3	
R.....3	58-01-4802	5 kOhm			

STUDER 83/02/22 BBT VU-METER AMPLIFIER 1.820.730-81 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R.....4	57-11-3203	20 kOhm		1%	
R.....5	57-11-4103	10 kOhm			
R.....6	57-11-4103	10 kOhm			
R.....7	57-11-3203	20 kOhm			
R.....8	57-11-3203	20 kOhm			
R.....9	57-11-4104	100 kOhm			
R.....10	57-11-4192	3-9 kOhm			
R.....11	57-11-4192	1-8 kOhm			
R.....12	57-11-4472	not used			
R.....13	57-11-4472	4-7 kOhm			
R.....14	57-09-0216	250 Ohm		PTC Resistor, Philips Nr. 2322 660 91001	
R.....15	57-11-4472	4-7 kOhm			
R.....16	57-11-4271	270 Ohm			
R.....17	57-11-4472	4-7 kOhm			
R.....18	57-11-3162	1-6 kOhm		1%	
R.....19	57-11-4224	2-2 kOhm			
R.....20	57-11-4224	220 kOhm			
R.....21	57-11-4224	2-2 kOhm			
R.....22	57-11-4106	10 kOhm			
R.....23	57-11-3632	4-3 kOhm		1%	
R.....24	57-11-3632	4-3 kOhm		1%	
R.....25	57-11-3632	4-3 kOhm		1%	
R.....26	57-11-3632	4-3 kOhm		1%	
R.....27	57-11-3632	20 kOhm		1%	
R.....28	57-11-4103	10 kOhm			
R.....29	57-11-4562	5-6 kOhm			
R.....30	57-11-4562	5-6 kOhm			
R.....31	57-11-4101	100 Ohm			
R.....32	57-11-4173	67 kOhm			
R.....33	57-11-4173	150 kOhm			
R.....34	57-11-4102	1 kOhm			
R.....35	57-11-3203	20 kOhm		1%	
R.....36	57-11-3203	20 kOhm		1%	
T.....1	1-022-219-00		Inputtransformer 1 : 1		St

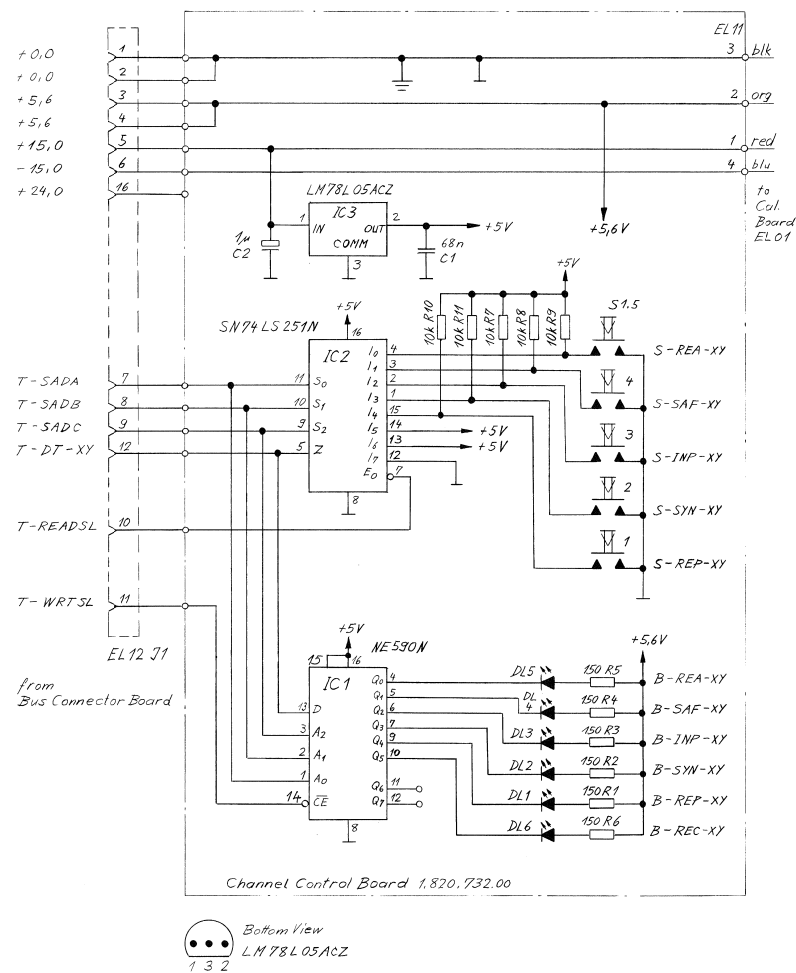
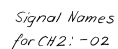
STUDER 83/02/22 BBT VU-METER AMPLIFIER 1.820.730-81 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1	Lamp 6 V-0-034				
Over Nr.	2306				
ITT Nr.	52373				
Socket Studer Nr.	54-04-0107, Alps Nr. 4050 021				
Note 2	Contact pin: Studer 54-01-0125, Berg 75169-301-36				
Bridge: Studer 54-01-0021, Philips 2422 024 88003					
Note 3	5 kOhm Potentiometer				
Allen Bradley Nr. E 28 502					
Bourrs Nr.	3386 P-1-502				
Spectrol Nr.	63M 502 T010				
Ceramics:	ET=Electrolytic, MPC=Polystyrol, PS=Polystyrol				
Sal=Solid aluminum.					
MANUFACTURER:	ITT=Intermetal, Mot=Motorola, NS=National Semiconductors				
Ph=Philips, Sex=Secoscon, Sier=Siemens, St=Studer,					
Se=Siliconix, TI=Texas Instruments					

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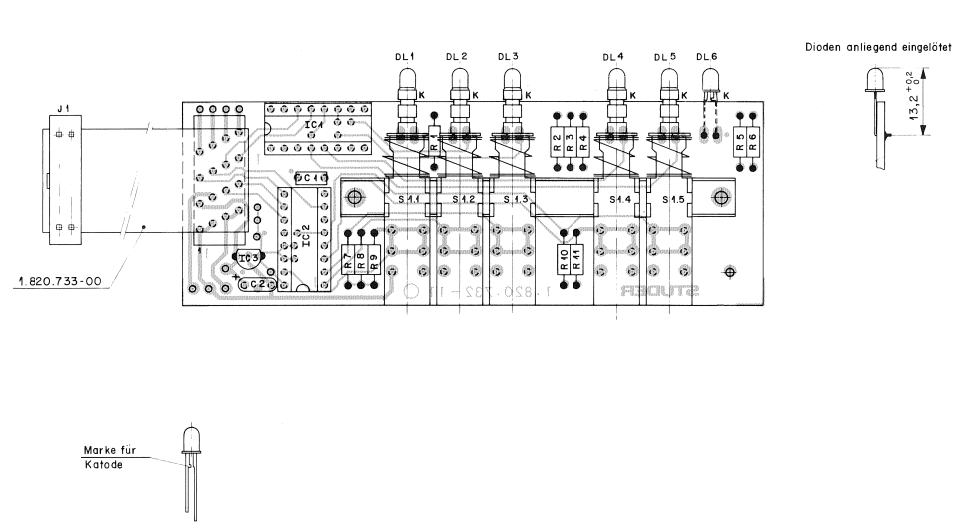
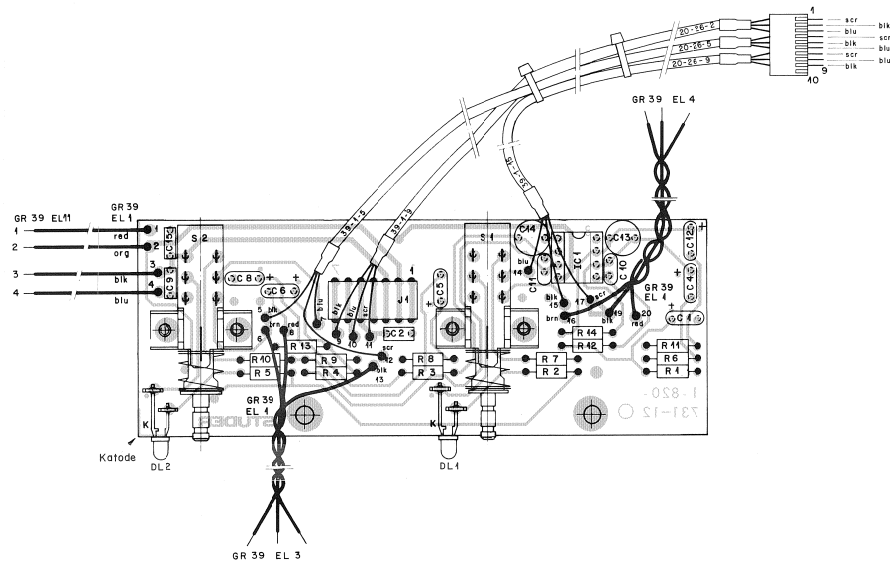
STUDER 83/02/22 BBT VU-METER AMPLIFIER 1.820.730-81 PAGE 3

CHANNEL CONTROL PCB 1.820.732-00



VU PANEL 1.810.320-81 GR39/40  
CALIBRATION PCB 1.820.731-00

## CHANNEL CONTROL PCB 1.820.732-00



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C...	001	59.26.2100	10 uF	16V, Sal	Ph
C...	002	59.99.0205	68 nF	Ce	
C...	003		not used		
C...	004	59.26.0470	47 uF	6V, Sal	Ph
C...	005	59.26.0470	47 uF	6V, Sal	Ph
C...	006	59.26.2100	10 uF	16V, Sal	Ph
C...	007		not used		
C...	008	59.26.0470	47 uF	6V, Sal	Ph
C...	009	59.99.0205	68 nF	Ce	
C...	010	59.34.0339	3.3 pF	Ce	
C...	011	59.34.0339	3.3 pF	Ce	
C...	012	59.26.0470	47 uF	6V, Sal	Ph
C...	013	59.05.2331	330 pF	PP	
C...	014	59.05.2331	330 pF	PP	
C...	015	59.99.0205	68 nF	Ce	
DL...	001	50.04.2230	CV 13-5	Q 62703-Q 575	Sie
DL...	002	50.04.2230	CV 13-5	Q 62703-Q 575	Sie
IC...	001	50.09.0105	NE5532N	85532N, 652NR	Sig,Ex+Ra
J...	001	54.01.0244	1 cont.	AMP Nr. 163.683-5	
R...	001	57.11.4104	100 kOhm		
R...	002	57.11.4151	150 Ohm		
R...	003	57.11.4102	1 kOhm		
R...	004	57.11.4101	100 Ohm		
R...	005	57.11.4151	150 Ohm		
R...	006	57.11.4102	1 kOhm		
R...	007	57.11.4470	47 Ohm		
R...	008	57.11.4222	2.2 kOhm		
R...	009	57.11.4473	47 Ohm		
R...	010	57.11.4470	47 Ohm		
R...	011	57.11.4473	47 Ohm		
R...	012	57.11.4101	100 Ohm		
R...	013	57.11.4104	100 kOhm		
R...	014	57.11.4222	2.2 kOhm		

S T U D E R 82/08/04 GAE CALIBRATION BOARD

1.820.731-00 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R...	101	58.10.9006	10 kOhm	log., Allen Bradley Nr. JA 1 N 072 S 103 AA	
R...	102	58.10.9006	10 kOhm	log., Allen Bradley Nr. JA 1 N 072 S 103 AA	
S...	001	1.820.731.01		2pole change over switch	St
S...	002	1.820.731.01		2pole change over switch	St
DL...	001	50.04.2130	CV 13-5	Q 62703-Q 575	Sie
DL...	002	50.04.2130	CV 13-5	Q 62703-Q 575	Sie
DL...	003	50.04.2130	CV 13-5	Q 62703-Q 575	Sie
DL...	004	50.04.2130	CV 13-5	Q 62703-Q 575	Sie
DL...	005	50.04.2131	CV 13-5	Q 62703-Q 585	Sie
DL...	006	50.04.2129	CV 11-5	Q 62703-Q 571	Sie
IC...	001	50.15.1102	NE5501N		Sig
IC...	002	50.04.0201	SN74LS13N	AMT4LS251N	AMT4T
IC...	003	50.10.0107	LM78L05ACZ	uAT8L05AMC	Fc+N5
J...	001	54.14.1001	16 cont.	See note 1	
R...	001	57.11.4151	150 Ohm		
R...	002	57.11.4151	150 Ohm		
R...	003	57.11.4151	150 Ohm		
R...	004	57.11.4151	150 Ohm		
R...	005	57.11.4151	150 Ohm		
R...	006	57.11.4151	150 Ohm		
R...	007	57.11.4103	10 kOhm		
R...	008	57.11.4103	10 kOhm		
R...	009	57.11.4103	10 kOhm		
R...	010	57.11.4103	10 kOhm		
R...	011	57.11.4103	10 kOhm		
S...	001	1.820.731.01		5pole change over switch	St

S T U D E R 82/08/04 GAE CALIBRATION BOARD

1.820.731-00 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C...	001	59.99.0205	68 nF	Ce	Ph
C...	002	59.26.1109	1 uF	16V, Sal	
DL...	001	50.04.2130	CV 13-5	Q 62703-Q 575	Sie
DL...	002	50.04.2130	CV 13-5	Q 62703-Q 575	Sie
DL...	003	50.04.2130	CV 13-5	Q 62703-Q 575	Sie
DL...	004	50.04.2130	CV 13-5	Q 62703-Q 575	Sie
DL...	005	50.04.2131	CV 13-5	Q 62703-Q 585	Sie
DL...	006	50.04.2129	CV 11-5	Q 62703-Q 571	Sie
IC...	001	50.15.1102	NE5501N		Sig
IC...	002	50.04.0201	SN74LS13N	AMT4LS251N	AMT4T
IC...	003	50.10.0107	LM78L05ACZ	uAT8L05AMC	Fc+N5
J...	001	54.14.1001	16 cont.	See note 1	
R...	001	57.11.4151	150 Ohm		
R...	002	57.11.4151	150 Ohm		
R...	003	57.11.4151	150 Ohm		
R...	004	57.11.4151	150 Ohm		
R...	005	57.11.4151	150 Ohm		
R...	006	57.11.4151	150 Ohm		
R...	007	57.11.4103	10 kOhm		
R...	008	57.11.4103	10 kOhm		
R...	009	57.11.4103	10 kOhm		
R...	010	57.11.4103	10 kOhm		
R...	011	57.11.4103	10 kOhm		
S...	001	1.820.731.01		5pole change over switch	St

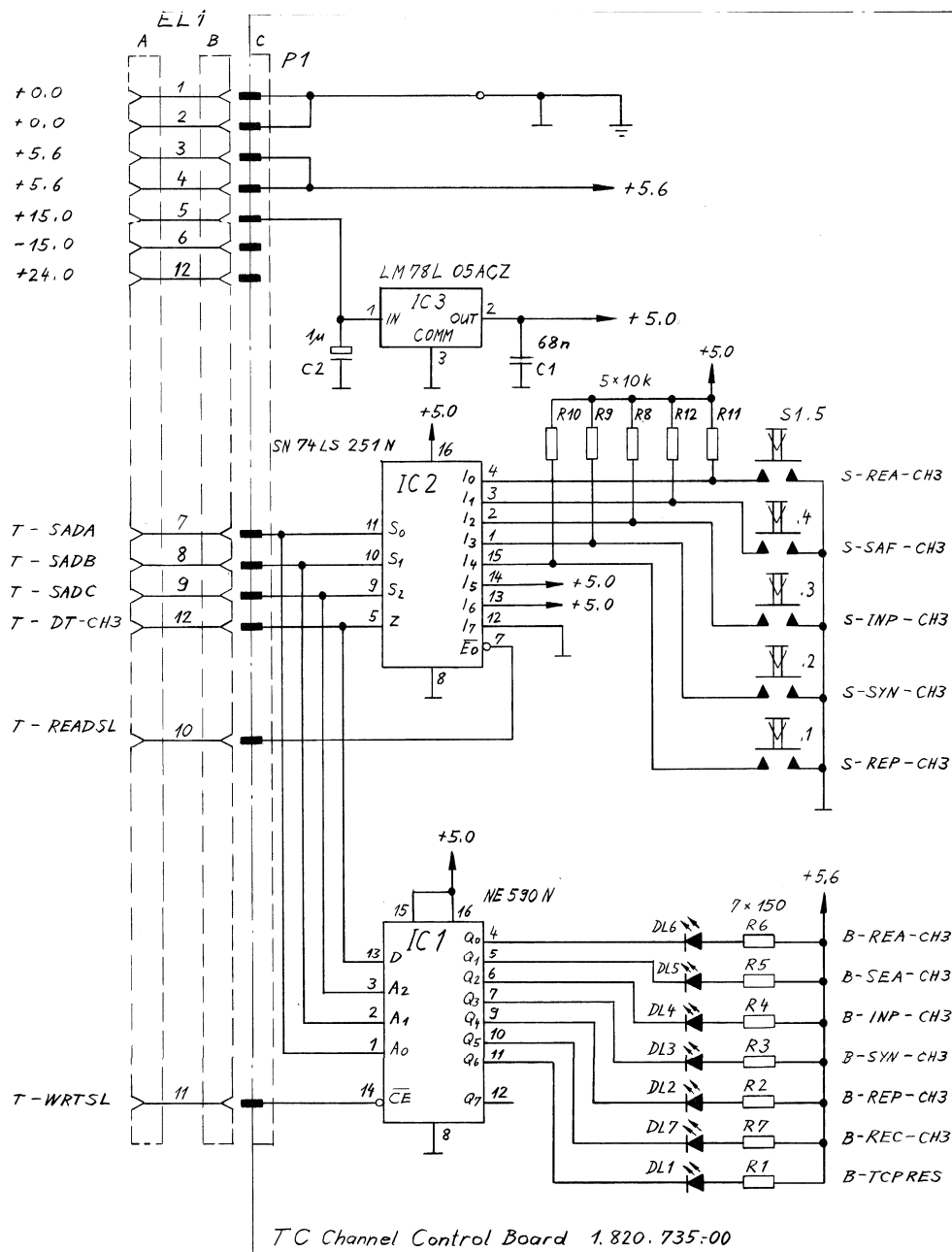
S T U D E R 82/08/04 GAE CHANNEL CONTR. BOARD

1.820.732-00 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1 - Yamaichi Nr. PA5-16-17, Burndy Nr. PR5-16 BD-AP Connection cable Nr. 1.820.733-00					
Ce=Ceramic, Sal=Solid aluminium					
MANUFACTURER: AMI=American Microsystem Inc., Fc=Fairchild, NS=National Semiconductor, Ph=Philips, Sie=Siemens, Sig=Signetics, St=Studer, T=Texas Instruments.					
ORIG 82/08/01					
S T U D E P 82/08/04 GAE CHANNEL CONTR. BOARD					
1.820.732-00 PAGE 2					

## TC CHANNEL CONTROL PCB 1.820.735-00

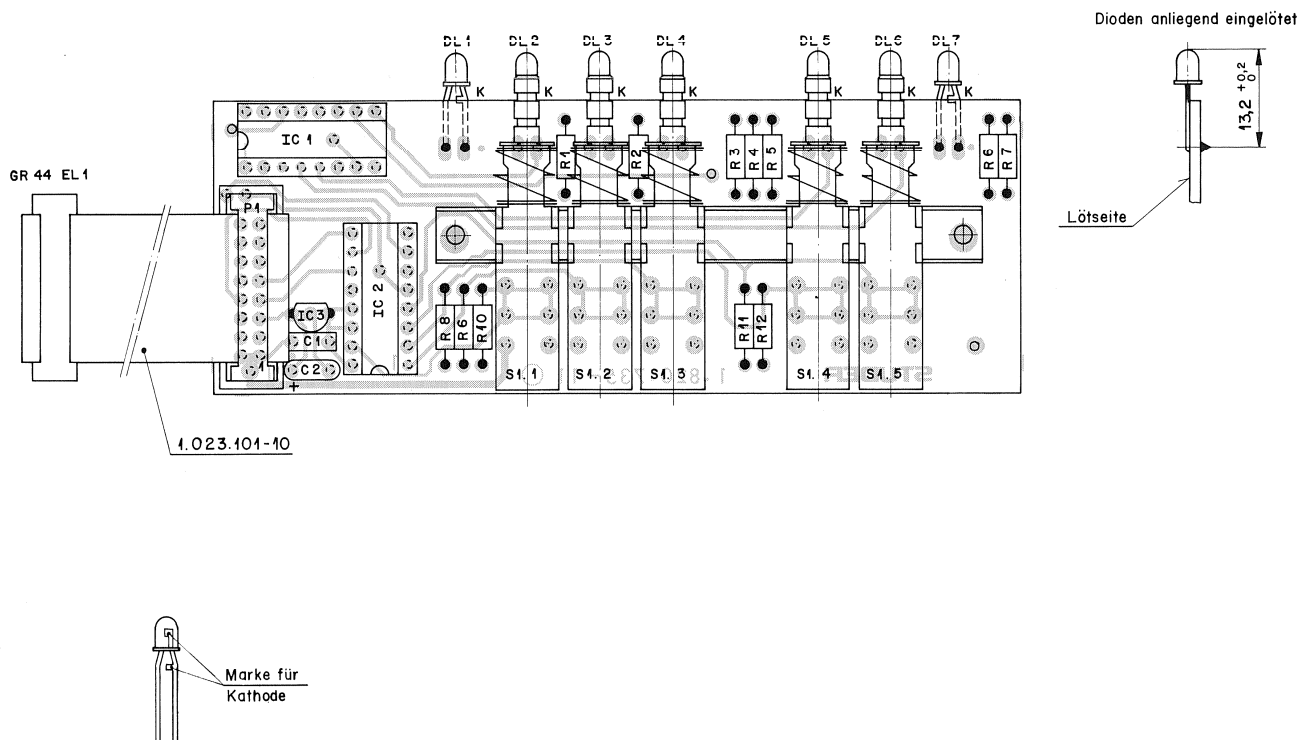
from Bus Connector Board



Bottom View  
LM78L05ACZ  
1 3 2

26.5.83	Gämpferle L511	A810 Audio Section	GR 44
STUDER	TC Channel Control Board	SC 1.820.735-00	PAGE 1 OF 1

## TC CHANNEL CONTROL PCB 1.820.735-00



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C...	001	59.99.0205	68 nF	Ce	
C...	002	59.26.9109	1 uF	16V, Sal	Ph
DL...	001	50.04.2131	CQV 15-5	Q 62703-Q 585	Sie
DL...	002	50.04.2130	CQV 13-5	Q 62703-Q 575	Sie
DL...	003	50.04.2130	CQV 13-5	Q 62703-Q 575	Sie
DL...	004	50.04.2130	CQV 13-5	Q 62703-Q 575	Sie
DL...	005	50.04.2130	CQV 13-5	Q 62703-Q 575	Sie
DL...	006	50.04.2131	CQV 15-5	Q 62703-Q 585	Sie
DL...	007	50.04.2129	CQV 11-5	Q 62703-Q 571	Sie
IC...	001	50.15.0102	NE590N		Sig
IC...	002	50.06.0251	SN74LS251N	AM74LS251N	AMI+TI
IC...	003	50.10.0107	LM78L05ACZ	uA78L05AWC	Fc+NS
P...	001	54.14.2002	16 cont.	See note 1	
R...	001	57.11.4151	150 Ohm		
R...	002	57.11.4151	150 Ohm		
R...	003	57.11.4151	150 Ohm		
R...	004	57.11.4151	150 Ohm		
R...	005	57.11.4151	150 Ohm		
R...	006	57.11.4151	150 Ohm		
R...	007	57.11.4151	150 Ohm		
R...	008	57.11.4103	10 kOhm		
R...	009	57.11.4103	10 kOhm		
R...	010	57.11.4103	10 kOhm		
R...	011	57.11.4103	10 kOhm		
R...	012	57.11.4103	10 kOhm		
S...	001	1.820.732-01		5*2pole change over switch	St

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Note 1 - Yamaichi Nr. FAP-16-08/4 Burndy Nr. BPH 9 B 16 B00 TN Connection cable Studer Nr. 1.023.101-10					
Ce=Ceramic, Sal=Solid aluminium					
MANUFACTURER: AMI=American Microsystem Inc., Fc=Fairchild, NS=National Semiconductors, Ph=Philips, Sie=Siemens, Sig=Signetics, St=Studer, TI=Texas Instruments.					

JRG 83/07/06

(00) 83/07/06 GAE

TC CHANNEL CONTR. BOARD

1.820.735-00 PAGE 1

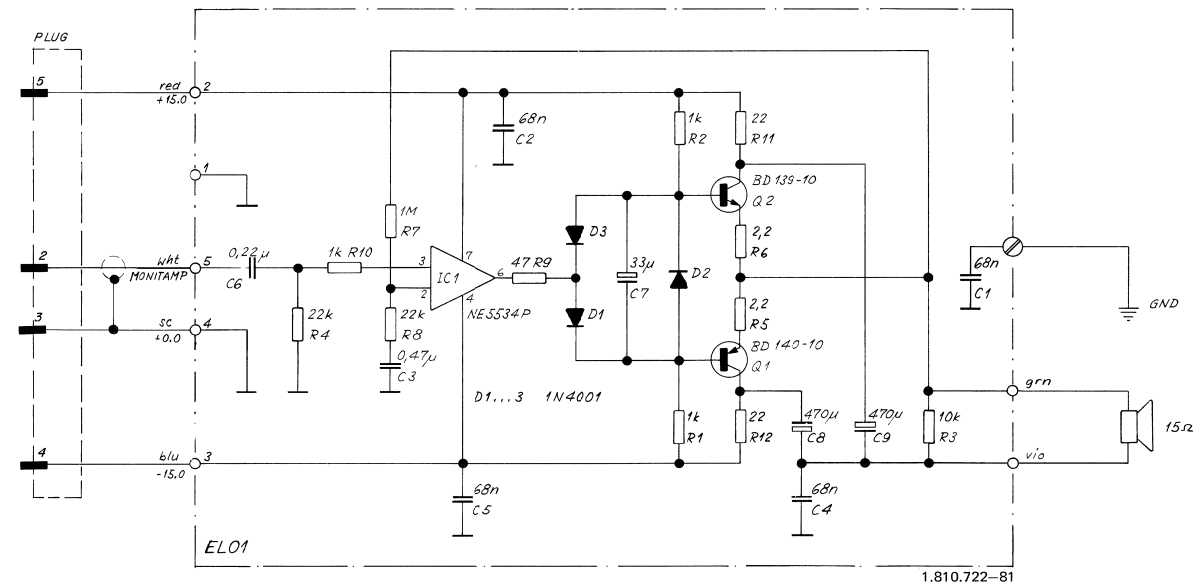
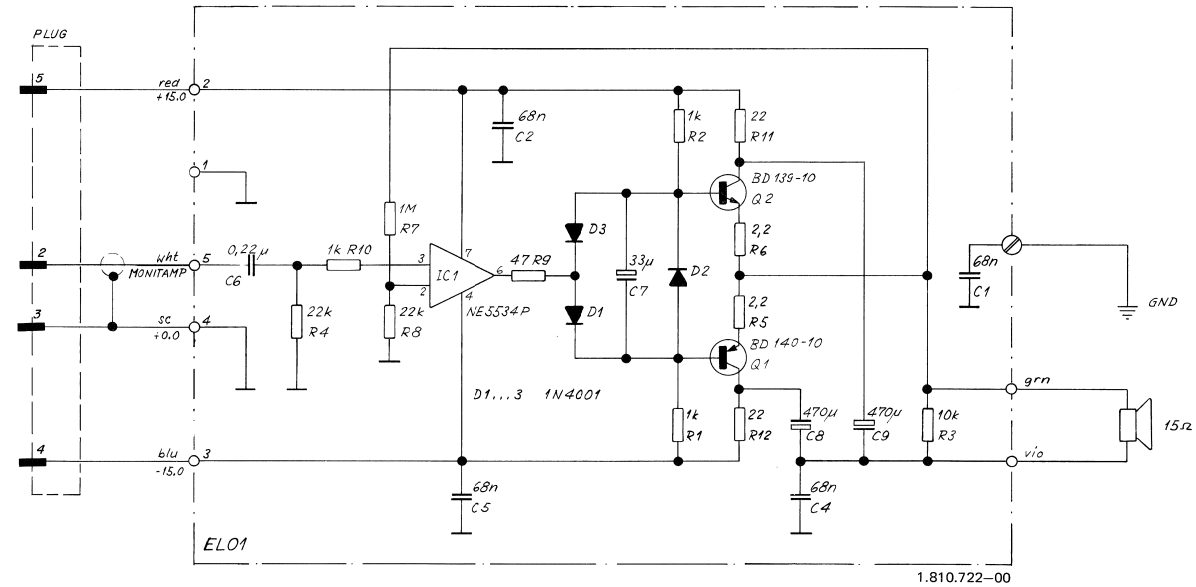
S T U D E R

(00) 83/07/06 GAE

TC CHANNEL CONTR. BOARD

1.820.735-00 PAGE 2

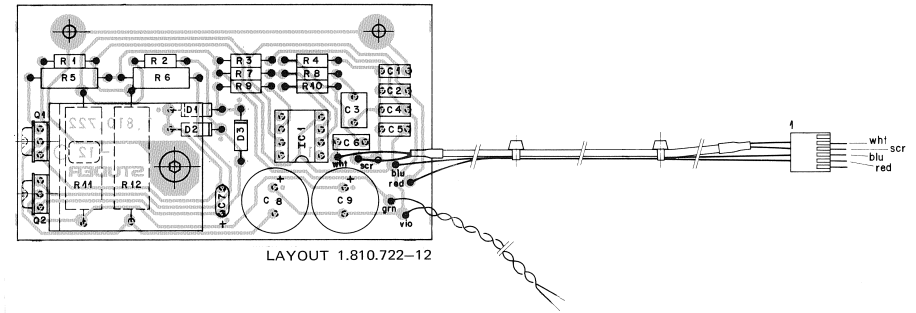
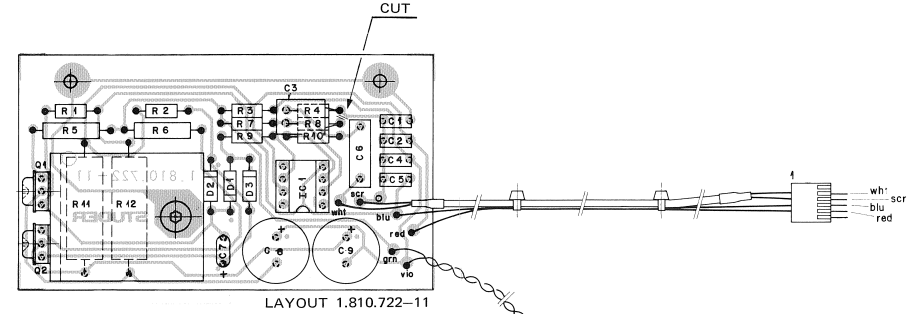
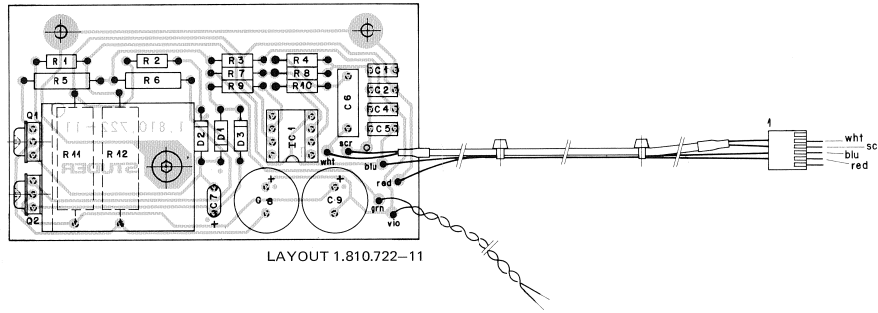
MONITOR AMPLIFIER PCB 1.810.722-00 GR41  
MONITOR AMPLIFIER PCB 1.810.722-81 GR41





## MONITOR AMPLIFIER PCB 1.810.722-00 GR41

## MONITOR AMPLIFIER PCB 1.810.722-81 GR41



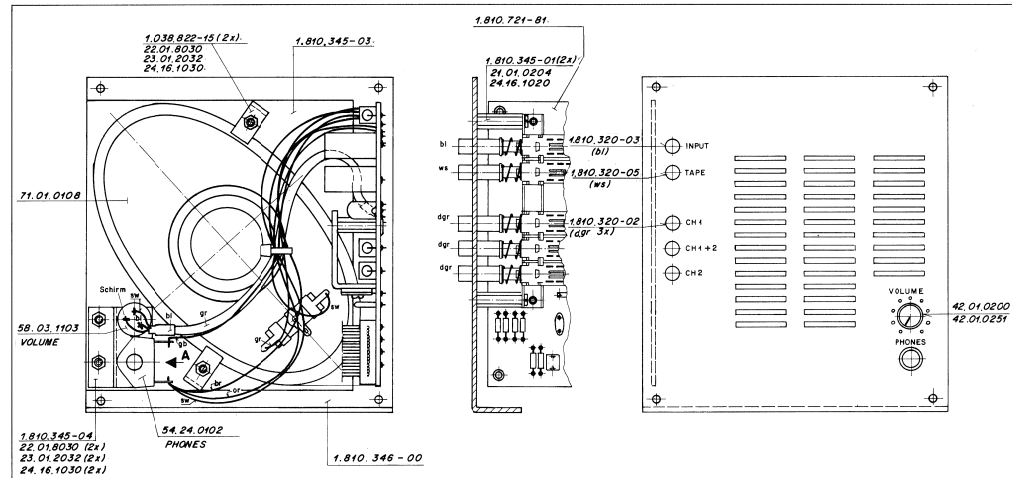
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.99.0205	68 nF	-20%	Ce	
C..0002	59.99.0205	68 nF	-20%	Ce	
C..0004	59.99.0205	68 nF	-20%	Ce	
C..0005	59.99.0205	68 nF	-20%	Ce	
C..0006	59.06.9224	C 22 uF	10%		
C..0007	59.06.1330	33 uF	20%	Sal	Ph
C..0008	59.22.4471	470 uF	20%	10V, EI	
C..0009	59.22.4471	470 uF	20%	10V, EI	
D..0001	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Fc:GI*Mot*Sol	
D..0002	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Fc:GI*Mot*Sol	
D..0003	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Fc:GI*Mot*Sol	
IC..0001	50.05.0243	NE5534N	NE5534P	SigniT	
Q..0001	50.03.0492	BC149-10	2SC496-0	Ph:SiexTfTo	
Q..0002	50.03.0451	BC139-10	2SC496-0	Ph:SiexTfTo	
R..0001	57.11.4102	1 kOhm	5%		
R..0002	57.11.4102	1 kOhm	5%		
R..0003	57.11.4103	10 kOhm	5%		
R..0004	57.11.4223	22 kOhm	5%		
R..0005	57.13.4229	2.2 kOhm	5%, 0.3W		
R..0006	57.13.4229	2.2 kOhm	5%, 0.3W		
R..0007	57.11.4105	1 kOhm	5%		
R..0008	57.11.4223	22 kOhm	5%		
R..0009	57.11.4470	47 kOhm	5%		
R..0010	57.11.4102	1 kOhm	5%		
R..0011	57.06.9220	22 Ohm	10%, 4W		
R..0012	57.06.9220	22 Ohm	10%, 4W		

ORIG 81/09/97

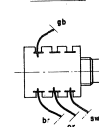
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.99.0205	68 nF	-20%	Ce	
C..0002	59.99.0205	68 nF	-20%	Ce	
C..0003	59.06.0476	0.47 uF	10%	Ce	
C..0004	59.99.0205	68 nF	-20%	Ce	
C..0005	59.06.9224	C 22 uF	10%		
C..0007	59.22.4471	470 uF	20%	10V, EI	
C..0008	59.22.4471	470 uF	20%	10V, EI	
C..0009	59.22.4471	470 uF	20%	10V, EI	
D..0001	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Fc:GI*Mot*Sol	
D..0002	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Fc:GI*Mot*Sol	
D..0003	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Fc:GI*Mot*Sol	
IC..0001	50.05.0243	NE5534N	NE5534P	SigniT	
Q..0001	50.03.0492	BD149-10	2SC496-0	Ph:SiexTfTo	
Q..0002	50.03.0451	BD139-10	2SC496-0	Ph:SiexTfTo	
R..0001	57.11.4102	1 kOhm	5%		
R..0002	57.11.4102	1 kOhm	5%		
R..0003	57.11.4103	10 kOhm	5%		
R..0004	57.11.4103	22 kOhm	5%		
R..0005	57.13.4229	2.2 kOhm	5%, 0.3W		
R..0006	57.13.4229	2.2 kOhm	5%, 0.3W		
R..0007	57.11.4105	1 kOhm	5%		
R..0008	57.11.4223	22 kOhm	5%		
R..0009	57.11.4470	47 kOhm	5%		
R..0010	57.11.4102	1 kOhm	5%		
R..0011	57.06.9220	22 Ohm	10%, 4W		
R..0012	57.06.9220	22 Ohm	10%, 4W		

ORIG 82/07/92

MONITOR UNIT 1.810.345-81 GR91  
MONITOR UNIT PCB 1.810.721-00/81



Siehe A



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
A++0001		1.810.721-81		Monitor Unit Board	Studer
J++0101		54.24.0102	Jack	see note 1	
LS+0101		71.01.0108		see note 2	
R++0101		58.03.1103	10 kOhm	see note 3	

Note 1 - Jacks  
52/888/rev opens reduced thread ni/ag contacts  
Manufacturer: Cliff Electronic Components Limited

Note 2 - Loudspeakers  
A0 3595 / K15 (15 Ohm, 2 W)  
Philips Nr.: 2422 256 30333

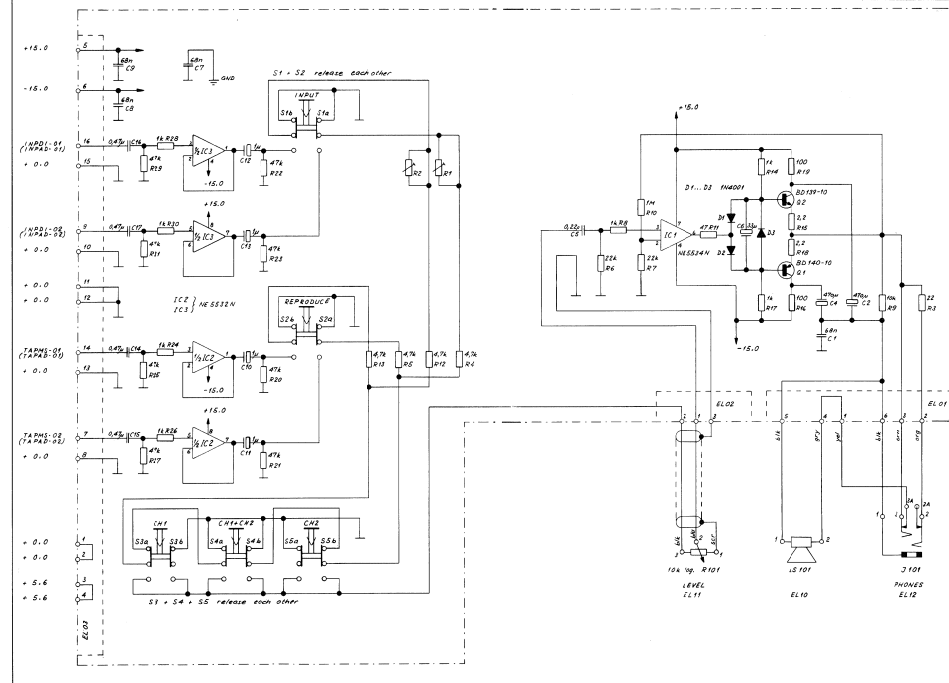
Note 3 - Potentiometers  
10 kOhm 10kx D+5W +10g  
Allen Bradley Nr.: MA 1G 028 S 103 AA

DREG 83/05/18

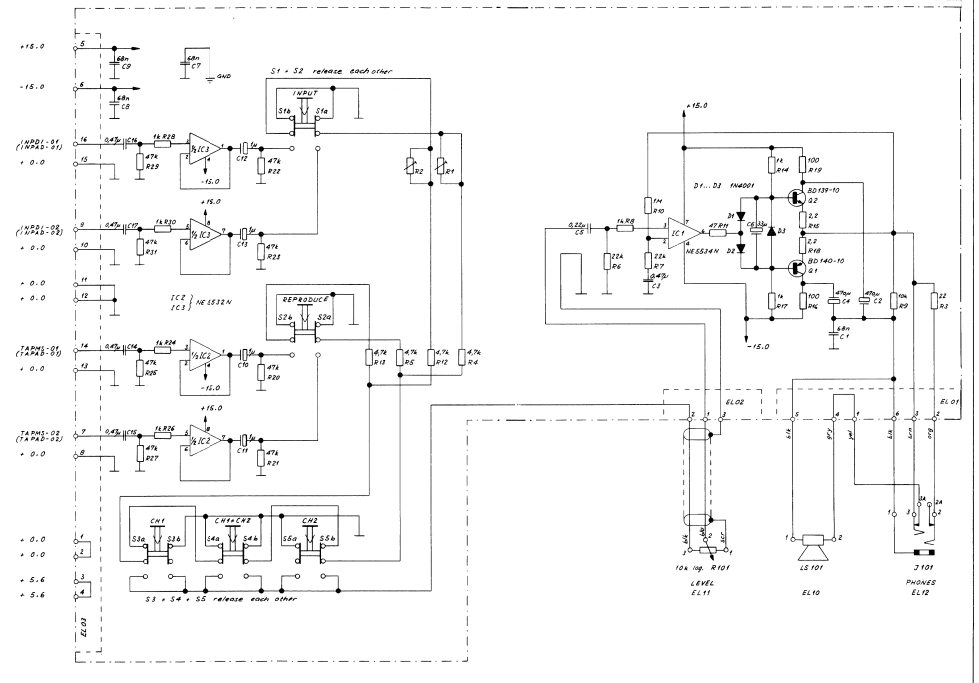
S T U D E R 83/05/18 PA MONITOR UNIT

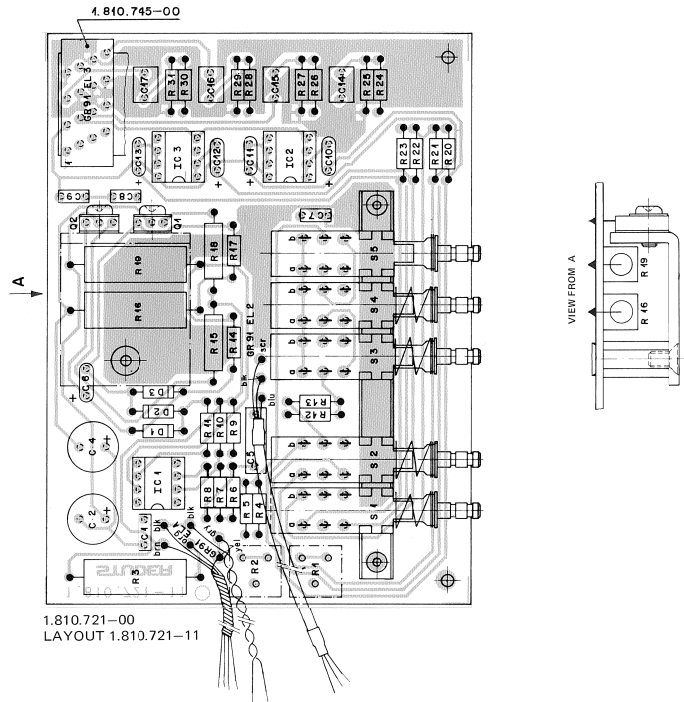
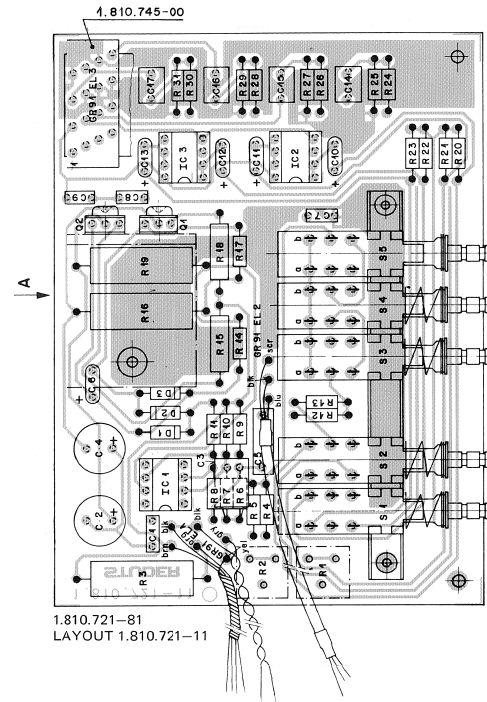
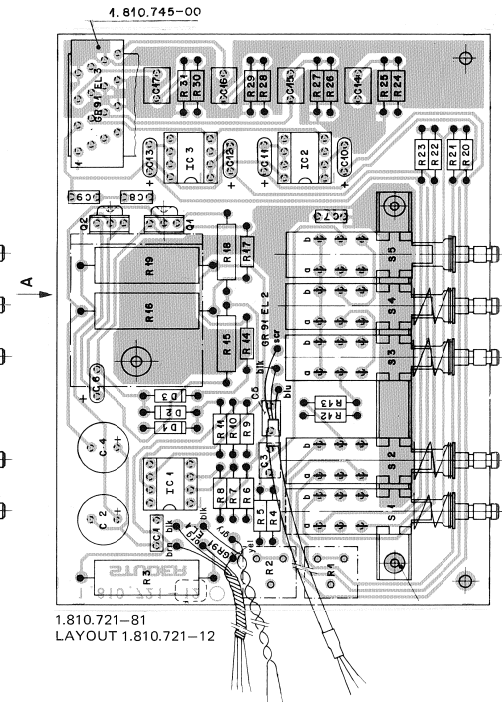
1.810.345-81 PAGE 1

1.810.721-00



1.810.721-81



MONITOR UNIT 1.810.345-81 GR91  
MONITOR UNIT PCB 1.810.721-00MONITOR UNIT 1.810.345-81 GR91  
MONITOR UNIT PCB 1.810.721-811.810.721-00  
LAYOUT 1.810.721-111.810.721-81  
LAYOUT 1.810.721-111.810.721-81  
LAYOUT 1.810.721-12

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.99.0205	68 nF	20%		
C..0002	59.22.4471	470 uF	20%	16V, E1	
C..0004	59.22.4471	470 uF	20%	16V, E1	
C..0005	59.06.5224	2.2 uF	5%		
C..0006	59.26.1330	33 uF	20%	sal	Ph
C..0007	59.99.0205	68 nF	20%		
C..0008	59.99.0205	68 nF	20%		
C..0009	59.99.0205	68 nF	20%		
C..0010	59.26.1330	33 uF	20%	sal	Ph
C..0011	59.26.1330	33 uF	20%	sal	Ph
C..0012	59.26.1330	33 uF	20%	sal	Ph
C..0013	59.26.1330	33 uF	20%	sal	Ph
C..0014	59.06.5474	2.47 uF	5%		
C..0015	59.06.5474	2.47 uF	5%		
C..0016	59.06.5474	2.47 uF	5%		
C..0017	59.06.5474	2.47 uF	5%		
D..0001	50.04.0122	1N4001	1N4002+ 1N4003+ 1N4004		FcG1Mot+Sol
D..0002	50.04.0122	1N4001	1N4002+ 1N4003+ 1N4004		FcG1Mot+Sol
D..0003	50.04.0122	1N4001	1N4002+ 1N4003+ 1N4004		FcG1Mot+Sol
IC..0001	50.05.0243	NE5534N	NE5534P+ 5554NB		Ra+Sig+Ti
IC..0002	50.09.0105	NE5532N	NE5532P+ 5552NB		Ex+Ra+Sig
IC..0003	50.09.0105	NE5532N	NE5532P+ 5552NB		Ex+Ra+Sig
J..0001	54.14.5021	15 cont.	see note 1		
Q..0001	50.03.0452	BD140-10	25A96-0		Ph+Sig+Tr+To
Q..0002	50.03.0451	BD139-10	25C96-0		Ph+Sig+Tr+To
R..0001	not used				
R..0002	not used				
R..0003	57.56.5220	12 Ohm	10%, 4W		
R..0004	57.11.3472	4.7 kOhm	5%		
R..0005	57.11.3472	4.7 kOhm	5%		
R..0006	57.11.4223	12 kOhm	5%		

S T U D E R 83/04/07 PB MONITOR UNIT BOARD 1.810.721-00 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R..0007	57.11.4223	22 kOhm	5%		
R..0008	57.11.4302	1 kOhm	5%		
R..0009	57.11.4303	10 kOhm	5%		
R..0010	57.11.4305	1 kOhm	5%		
R..0011	57.11.4470	47 Ohm	5%		
R..0012	57.11.3472	4.7 kOhm	1%		
R..0013	57.11.3472	4.7 kOhm	1%		
R..0014	57.11.4302	1 kOhm	5%		
R..0015	57.11.4229	2.2 Ohm	5%		
R..0016	57.56.5101	100 Ohm	10%, 4W		
R..0017	57.11.4102	1 kOhm	5%		
R..0018	57.11.4229	2.2 Ohm	5%		
R..0019	57.56.5101	100 Ohm	10%, 4W		
R..0020	57.11.4473	47 kOhm	5%		
R..0021	57.11.4473	47 kOhm	5%		
R..0022	57.11.4473	47 kOhm	5%		
R..0023	57.11.4473	47 kOhm	5%		
R..0024	57.11.4302	1 kOhm	5%		
R..0025	57.11.4473	47 kOhm	5%		
R..0026	57.11.4302	1 kOhm	5%		
R..0027	57.11.4473	47 kOhm	5%		
R..0028	57.11.4302	1 kOhm	5%		
R..0029	57.11.4473	47 kOhm	5%		
R..0030	57.11.4302	1 kOhm	5%		
R..0031	57.11.4473	47 kOhm	5%		
PC-Board	1.810.721-01	see note 2			
Note 1	Yamaichi Nr. P45-10-17, Burndy Nr. P85-16 BD-4P				
Note 2	Pushbutton switches:				
	Latching, release each other (51-52)(53+54+55)				
	Manufacturer: Schaefer (ITT) serie P5				
Capacitors:	El=Electrolytic, Sol=Solid aluminum				
MANUFACTURERS:	Ex=Exar, Fc=Fairchild, G=General Instruments, Mo=Motorola, Ph=Philips, Ra=Radiomont, Si=Siemens, Sig=Signetics, Sol=Soliton, Tr=Telefunken, Ti=Texas Instruments, To= Toshiba				
ORIG 83/04/07					

S T U D E R 83/04/07 PB MONITOR UNIT BOARD 1.810.721-00 PAGE 3

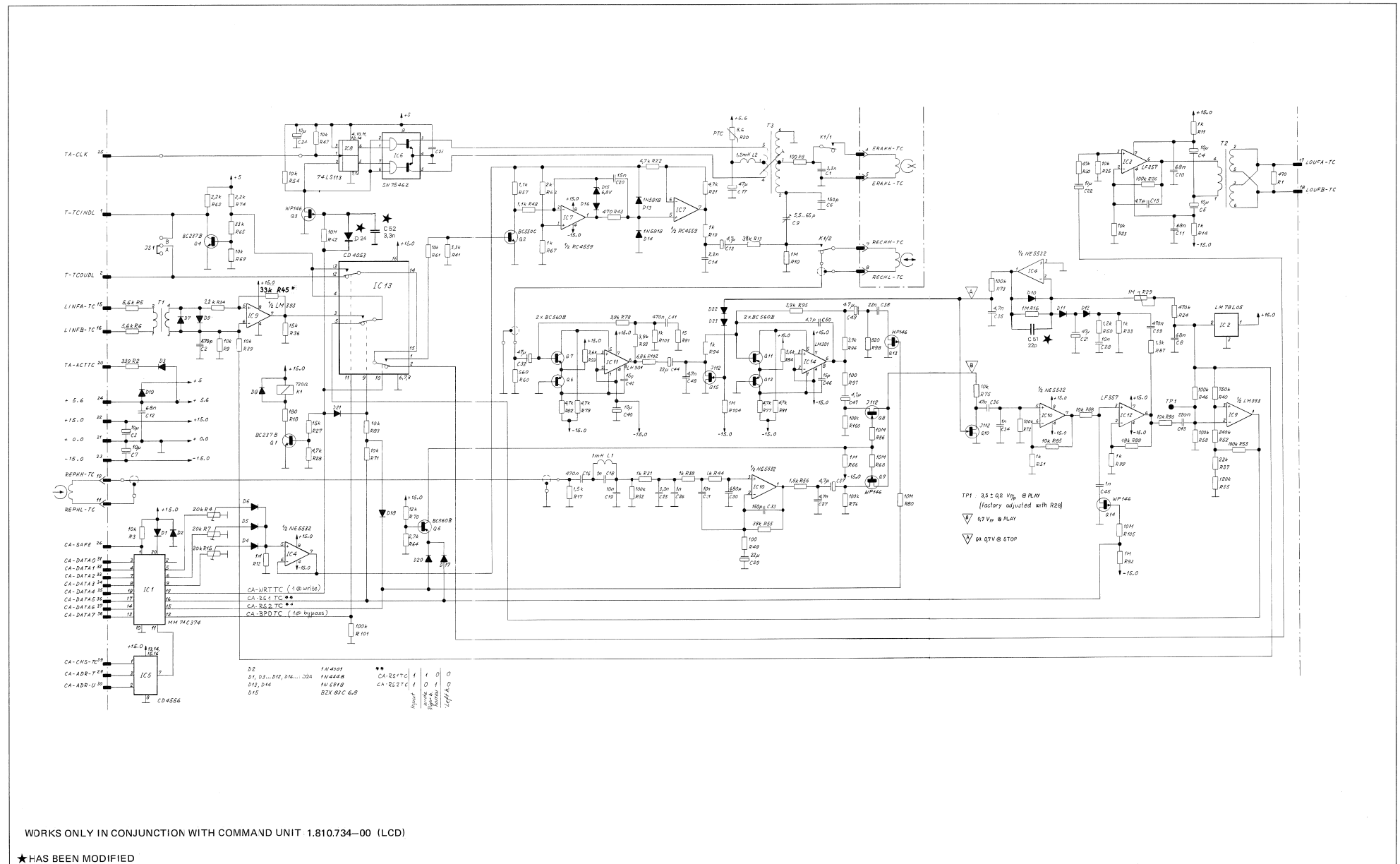
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C..0001	59.99.0205	68 nF	20%		
C..0002	59.22.4471	470 uF	20%	16V, E1	
C..0004	59.22.4471	470 uF	20%	16V, E1	
C..0005	59.06.5224	2.2 uF	5%		
C..0006	59.26.1330	33 uF	20%	sal	Ph
C..0007	59.99.0205	68 nF	20%		
C..0008	59.99.0205	68 nF	20%		
C..0009	59.99.0205	68 nF	20%		
C..0010	59.26.1330	33 uF	20%	sal	Ph
C..0011	59.26.1330	33 uF	20%	sal	Ph
C..0012	59.26.1330	33 uF	20%	sal	Ph
C..0013	59.26.1330	33 uF	20%	sal	Ph
C..0014	59.06.5474	2.47 uF	5%		
C..0015	59.06.5474	2.47 uF	5%		
C..0016	59.06.5474	2.47 uF	5%		
C..0017	59.06.5474	2.47 uF	5%		
D..0001	50.04.0122	1N4001	1N4002+ 1N4003+ 1N4004		FcG1Mot+Sol
D..0002	50.04.0122	1N4001	1N4002+ 1N4003+ 1N4004		FcG1Mot+Sol
D..0003	50.04.0122	1N4001	1N4002+ 1N4003+ 1N4004		FcG1Mot+Sol
IC..0001	50.05.0243	NE5534N	NE5534P+ 5534NB		Ra+Sig+Ti
IC..0002	50.09.0105	NE5532N	NE5532P+ 5532NB		Ex+Ra+Sig
IC..0003	50.09.0105	NE5532N	NE5532P+ 5532NB		Ex+Ra+Sig
J..0001	54.14.5021	16 cont.	see note 1		
Q..0001	50.03.0452	BD140-10	25A96-0		Ph+Sig+Tr+To
Q..0002	50.03.0451	BD139-10	25C96-0		Ph+Sig+Tr+To
R..0001	not used				
R..0002	not used				
R..0003	57.56.5220	12 Ohm	10%, 4W		
R..0004	57.11.3472	4.7 kOhm	5%		
R..0005	57.11.3472	4.7 kOhm	5%		
R..0006	57.11.4223	12 kOhm	5%		

S T U D E R 83/04/07 PB MONITOR UNIT BOARD 1.810.721-81 PAGE 1

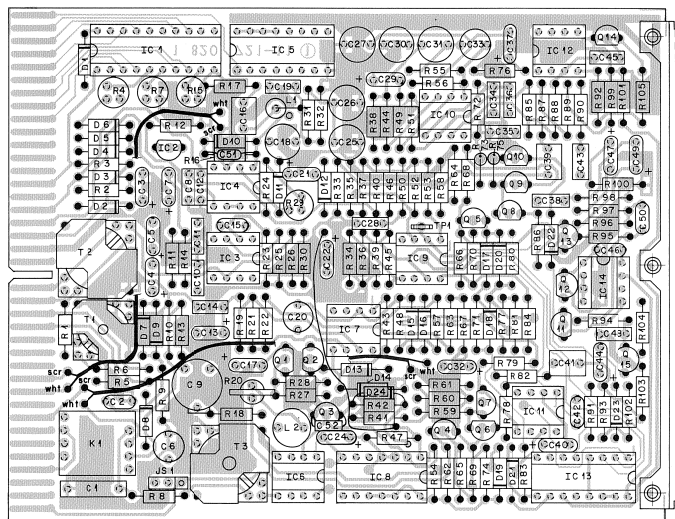
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R..0007	57.11.4223	22 kOhm	5%		
R..0008	57.11.4302	1 kOhm	5%		
R..0009	57.11.4303	10 kOhm	5%		
R..0010	57.11.4305	1 kOhm	5%		
R..0011	57.11.4470	47 Ohm	5%		
R..0012	57.11.3472	4.7 kOhm	1%		
R..0013	57.11.3472	4.7 kOhm	1%		
R..0014	57.11.4302	1 kOhm	5%		
R..0015	57.11.4229	2.2 Ohm	5%		
R..0016	57.56.5101	100 Ohm	10%, 4W		
R..0017	57.11.4102	1 kOhm	5%		
R..0018	57.11.4229	2.2 Ohm	5%		
R..0019	57.56.5101	100 Ohm	10%, 4W		
R..0020	57.11.4473	47 kOhm	5%		
R..0021	57.11.4473	47 kOhm	5%		
R..0022	57.11.4473	47 kOhm	5%		
R..0023	57.11.4473	47 kOhm	5%		
R..0024	57.11.4302	1 kOhm	5%		
R..0025	57.11.4473	47 kOhm	5%		
R..0026	57.11.4302	1 kOhm	5%		
R..0027	57.11.4473	47 kOhm	5%		
R..0028	57.11.4302	1 kOhm	5%		
R..0029	57.11.4473	47 kOhm	5%		
R..0030	57.11.4302	1 kOhm	5%		
R..0031	57.11.4473	47 kOhm	5%		
PC-Board	1.810.721-12	see note 2			
Note 1	Yamaichi Nr. P45-10-17, Burndy Nr. P85-16 BD-4P				
Note 2	Pushbutton switches:				
	Latching, release each other (51-52)(53+54+55)				
	Manufacturer: Schaefer (ITT) serie P5				
Capacitors:	El=Electrolytic, Sol=Solid aluminum				
MANUFACTURERS:	Ex=Exar, Fc=Fairchild, G=General Instruments, Mo=Motorola, Ph=Philips, Ra=Radiomont, Si=Siemens, Sig=Signetics, Sol=Soliton, Tr=Telefunken, Ti=Texas Instruments, To= Toshiba				
ORIG 83/04/07					

S T U D E R 83/04/07 PB MONITOR UNIT BOARD 1.810.721-81 PAGE 3

## TIME CODE READ/WRITE UNIT PCB 1.820.721-00 GR20 EL6 "ESE"

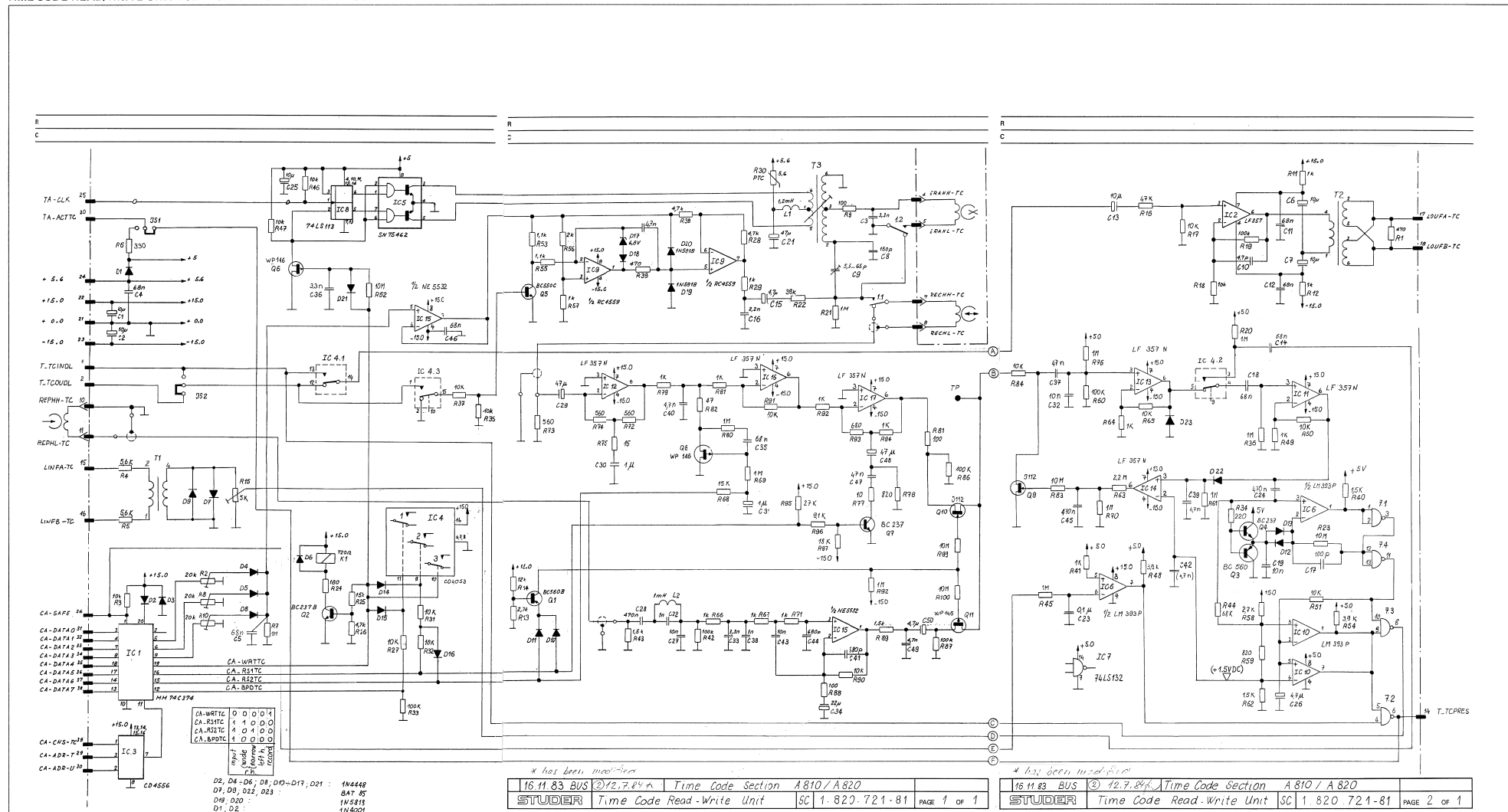


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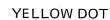


IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	00038	59.00a.0203	22 pf	10K			00033	57.11a.1022	1 kOhm	21	
	00039	59.00a.0076	470 pf	10K			00039	57.11a.1022	22 kOhm	21	
	00040	10.00a.0120	10	-20%, 10W, Sal	Ph		00035	57.11a.1024	120 kOhm	21	
	00041	59.00a.0076	470 pf	10K			00041	57.11a.1023	15 kOhm	21	
	00042	59.13a.1130	15 pf	20%, Co			00037	57.11a.1023	22 kOhm	21	
	00043	59.00a.0204	22 pf	10K			00043	57.11a.1023	15 kOhm	21	
	00044	59.00a.0202	22 pf	-20%, 10W, Sal	Ph		00039	57.11a.1013	10 kOhm	21	
	00045	59.00a.0202	22 pf	10K			00040	57.11a.1024	150 kOhm	21	
	00046	59.13a.1130	15 pf	20%, Co			00041	57.11a.1032	3 kOhm	21	
	00047	59.00a.0079	4.7 pf	10K, 25W, Sal			00042	57.11a.1022	15 kOhm	21	
	00048	59.00a.0072	4.7 pf	10K			00043	57.11a.1071	470 Ohm	21	
	00049	59.13a.1130	15 pf	20%, Co			00044	57.11a.1027	1 kOhm	21	
	00050	59.13a.1079	47 pf	-20%, 6.3W, Sal	Ph		00045	57.11a.1024	100 kOhm	21	
(02)	00051	59.00a.0079	4.7 pf	10K		(00)	00045	57.11a.1024	100 kOhm	21	
	00052	59.00a.0332	3.3 pf	10K		(01)	00046	57.11a.1024	100 kOhm	21	
	00053	59.00a.0332	3.3 pf	10K			00047	57.11a.1033	10 kOhm	21	
	00054	59.00a.0332	3.3 pf	10K			00048	57.11a.1032	1 kOhm	21	
	00055	59.00a.0332	3.3 pf	10K			00049	57.11a.1032	1 kOhm	21	
	00056	59.00a.0332	3.3 pf	10K			00050	57.11a.1022	1 kOhm	21	
	00057	59.00a.0332	3.3 pf	10K			00051	57.11a.1024	240 kOhm	21	
	00058	59.00a.0332	3.3 pf	10K			00052	57.11a.1024	240 kOhm	21	
	00059	59.00a.0332	3.3 pf	10K			00053	57.11a.1024	100 kOhm	21	
	00060	59.00a.0332	3.3 pf	10K			00054	57.11a.1033	10 kOhm	21	
	00061	59.00a.0332	3.3 pf	10K			00055	57.11a.1033	39 kOhm	21	
	00062	59.00a.0332	3.3 pf	10K			00056	57.11a.1032	1 kOhm	21	
	00063	59.00a.0332	3.3 pf	10K			00057	57.11a.1032	1 kOhm	21	
	00064	59.00a.0332	3.3 pf	10K			00058	57.11a.1024	100 kOhm	21	
	00065	59.00a.0332	3.3 pf	10K			00059	57.11a.1032	3 kOhm	21	
	00066	59.00a.0332	3.3 pf	10K			00060	57.11a.1032	3 kOhm	21	
	00067	59.00a.0332	3.3 pf	10K			00061	57.11a.1033	10 kOhm	21	
	00068	59.00a.0332	3.3 pf	10K			00062	57.11a.1032	1 kOhm	21	
	00069	59.00a.0332	3.3 pf	10K			00063	57.11a.1032	2 kOhm	21	
	00070	59.00a.0332	3.3 pf	10K			00064	57.11a.1032	3 kOhm	21	
	00071	59.00a.0332	3.3 pf	10K			00065	57.11a.1033	33 kOhm	21	
	00072	59.00a.0332	3.3 pf	10K			00066	57.11a.1035	1 kOhm	21	
	00073	59.00a.0332	3.3 pf	10K			00067	57.11a.1032	1 kOhm	21	
	00074	59.00a.0332	3.3 pf	10K			00068</				

## TIME CODE READ/WRITE UNIT PCB 1.820.721-81 GR20 EL6 "ESE"



CODE READ/WRITE UNIT	1.820 721-81
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S U O E R (02) 84/07/12 LN CODE READ/WRITE UNIT 1.820.721.81 PAGE

S T U D E R (02) 84/07/12 LN CODE READ/WRITE UNIT 1-820-721-81 PAGE 2

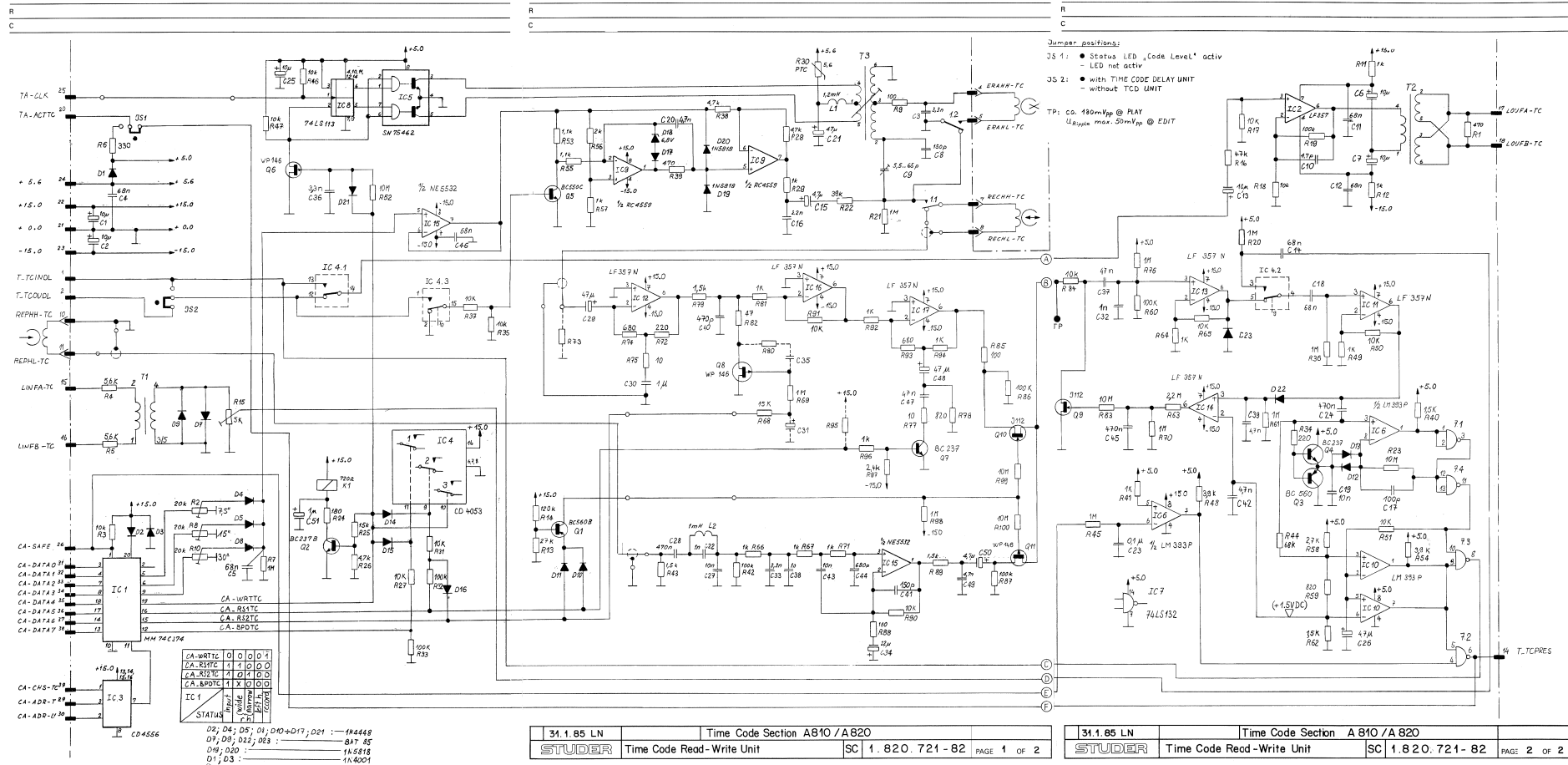
S T U D E N T (02) 84/07/12 LN CODE READ/WRITE UNIT 1.820.721.81 PAGE 3S T U D E R (02) 84/07/12 LN CODE READ/WRITE UNIT 1.620.721.81 PAGE 4

S T U D E R (02) 84/07/12 LN CODE READ/WRITE UNIT 1.820.721.81 PAGE 5

STUDER (02) 84/07/12 LN CODE READ/WRITE UNIT 1.820.721.81 PAGE 6

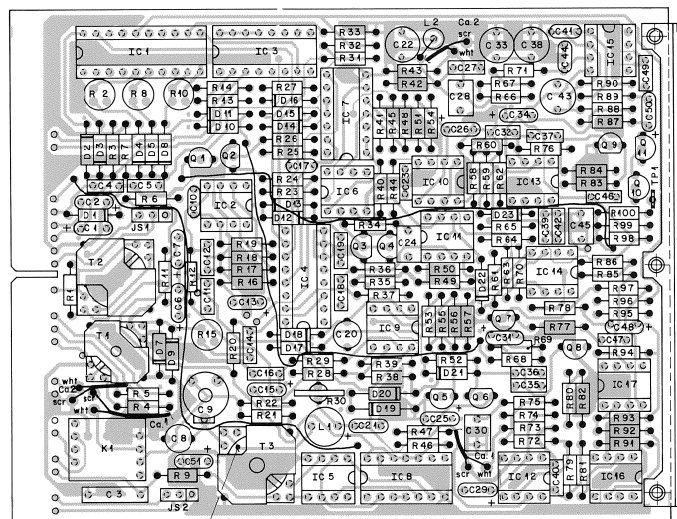
S T U D E R (02) 84/07/12 LN CODE READ/WRITE UNIT 1.820.721.81 PAGE 1

## TIME CODE READ/WRITE UNIT PCB 1.820.721-82 GR20 EL6 "ESE"





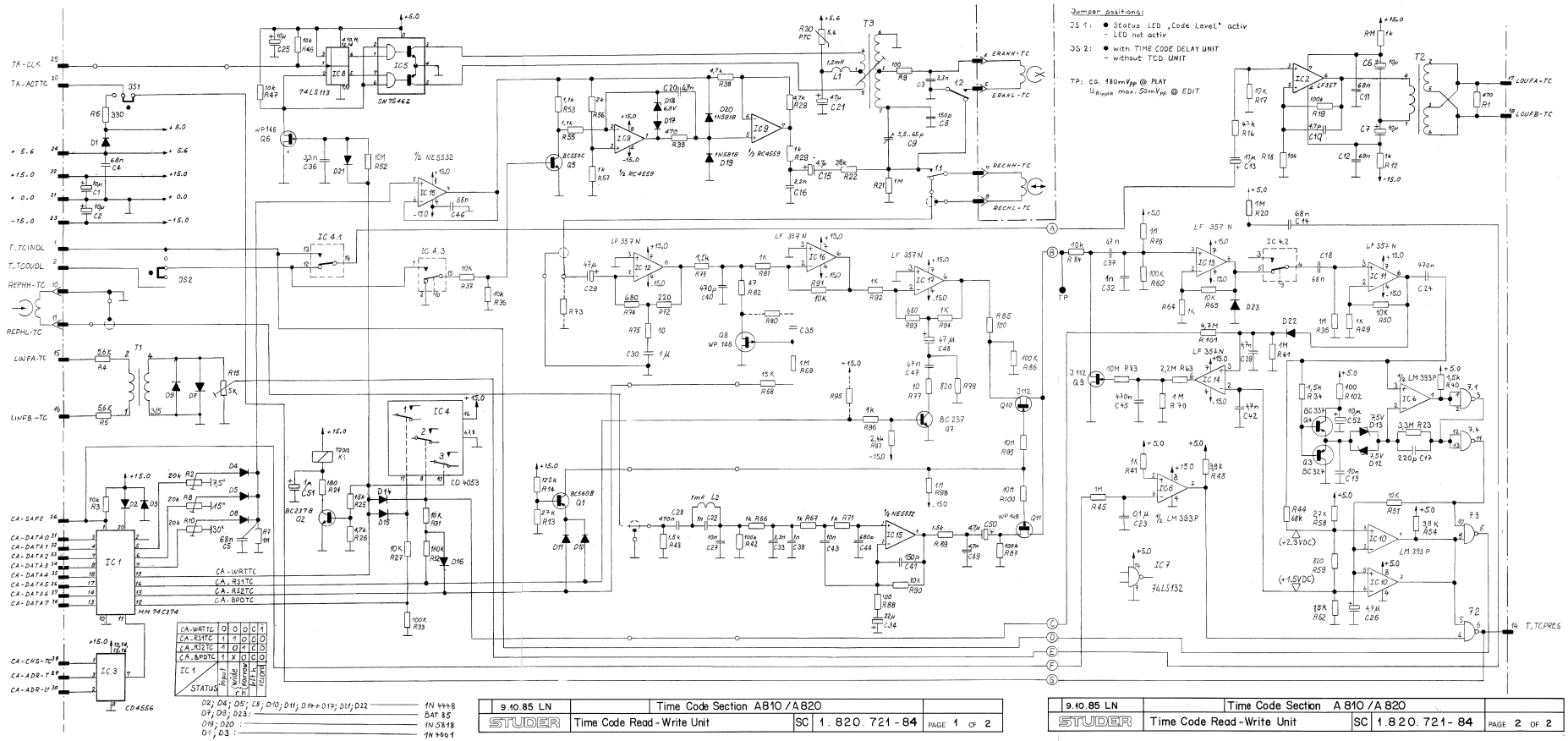
CONFIDENTIAL	2106
CODE READ/WRITE UNIT	1.820.724-82



YELLOW DOT

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Cxxxxx1	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx1	50x03x0350	J112P	J112P	IMD0062	Scs/Mst	
Cxxxxx2	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx2	50x03x0350	Ph 146				
Cxxxxx3	59x14x332	3+3 uF	-20% 10V, Sal	Ph	Dxxxxx3	59x11x471	470 Ohm	23			
Cxxxxx4	59x26x100	68 uF	-20% 10V, Sal	Ph	Dxxxxx4	59x11x203	20 KOhm	See Note 2			
Cxxxxx5	59x9x105	68 uF	-20% 10V, Sal	Ph	Dxxxxx5	59x11x103	10 KOhm	23			
Cxxxxx6	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx6	59x11x562	56 KOhm	23			
Cxxxxx7	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx7	59x11x103	10 KOhm	23			
Cxxxxx8	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx8	59x11x331	330 Ohm	23			
Cxxxxx9	59x11x102	55 pF	Trimmer Capacitor, Philips Nr 2222 808 0101		Dxxxxx9	59x11x102	10 KOhm	23			
Cxxxxx10	59x11x479	4.7 uF	20% 10V, Sal	Ph	Dxxxxx10	59x11x203	20 KOhm	See Note 2			
Cxxxxx11	59x9x105	68 uF	-20% 10V, Sal	Ph	Dxxxxx11	59x11x102	1 KOhm	23			
Cxxxxx12	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx12	59x11x203	20 KOhm	See Note 2			
Cxxxxx13	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx13	59x11x102	1 KOhm	23			
Cxxxxx14	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx14	59x11x102	1 KOhm	23			
Cxxxxx15	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx15	59x11x102	1 KOhm	23			
Cxxxxx16	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx16	59x11x102	1 KOhm	23			
Cxxxxx17	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx17	59x11x102	1 KOhm	23			
Cxxxxx18	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx18	59x11x102	1 KOhm	23			
Cxxxxx19	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx19	59x11x102	1 KOhm	23			
Cxxxxx20	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx20	59x11x102	1 KOhm	23			
Cxxxxx21	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx21	59x11x102	1 KOhm	23			
Cxxxxx22	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx22	59x11x102	1 KOhm	23			
Cxxxxx23	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx23	59x11x102	1 KOhm	23			
Cxxxxx24	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx24	59x11x102	1 KOhm	23			
Cxxxxx25	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx25	59x11x102	1 KOhm	23			
Cxxxxx26	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx26	59x11x102	1 KOhm	23			
Cxxxxx27	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx27	59x11x102	1 KOhm	23			
Cxxxxx28	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx28	59x11x102	1 KOhm	23			
Cxxxxx29	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx29	59x11x102	1 KOhm	23			
Cxxxxx30	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx30	59x11x102	1 KOhm	23			
Cxxxxx31	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx31	59x11x102	1 KOhm	23			
Cxxxxx32	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx32	59x11x102	1 KOhm	23			
Cxxxxx33	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx33	59x11x102	1 KOhm	23			
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Cxxxxx35	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx35	59x11x102	1 KOhm	23			
Cxxxxx36	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx36	59x11x102	1 KOhm	23			
Cxxxxx37	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx37	59x11x102	1 KOhm	23			
Cxxxxx38	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx38	59x11x102	1 KOhm	23			
Cxxxxx39	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx39	59x11x102	1 KOhm	23			
Cxxxxx40	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx40	59x11x102	1 KOhm	23			
Cxxxxx41	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx41	59x11x102	1 KOhm	23			
Cxxxxx42	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx42	59x11x102	1 KOhm	23			
Cxxxxx43	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx43	59x11x102	1 KOhm	23			
Cxxxxx44	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx44	59x11x102	1 KOhm	23			
Cxxxxx45	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx45	59x11x102	1 KOhm	23			
Cxxxxx46	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx46	59x11x102	1 KOhm	23			
Cxxxxx47	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx47	59x11x102	1 KOhm	23			
Cxxxxx48	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx48	59x11x102	1 KOhm	23			
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Cxxxxx58	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx58	59x11x102	1 KOhm	23			
Cxxxxx59	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx59	59x11x102	1 KOhm	23			
Cxxxxx60	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx60	59x11x102	1 KOhm	23			
Cxxxxx61	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx61	59x11x102	1 KOhm	23			
Cxxxxx62	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx62	59x11x102	1 KOhm	23			
Cxxxxx63	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx63	59x11x102	1 KOhm	23			
Cxxxxx64	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx64	59x11x102	1 KOhm	23			
Cxxxxx65	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx65	59x11x102	1 KOhm	23			
Cxxxxx66	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx66	59x11x102	1 KOhm	23			
Cxxxxx67	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx67	59x11x102	1 KOhm	23			
Cxxxxx68	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx68	59x11x102	1 KOhm	23			
Cxxxxx69	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx69	59x11x102	1 KOhm	23			
Cxxxxx70	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx70	59x11x102	1 KOhm	23			
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Cxxxxx72	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx72	59x11x102	1 KOhm	23			
Cxxxxx73	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx73	59x11x102	1 KOhm	23			
Cxxxxx74	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx74	59x11x102	1 KOhm	23			
Cxxxxx75	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx75	59x11x102	1 KOhm	23			
Cxxxxx76	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx76	59x11x102	1 KOhm	23			
Cxxxxx77	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx77	59x11x102	1 KOhm	23			
Cxxxxx78	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx78	59x11x102	1 KOhm	23			
Cxxxxx79	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx79	59x11x102	1 KOhm	23			
Cxxxxx80	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx80	59x11x102	1 KOhm	23			
Cxxxxx81	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx81	59x11x102	1 KOhm	23			
Cxxxxx82	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx82	59x11x102	1 KOhm	23			
Cxxxxx83	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx83	59x11x102	1 KOhm	23			
Cxxxxx84	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx84	59x11x102	1 KOhm	23			
Cxxxxx85	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx85	59x11x102	1 KOhm	23			
Cxxxxx86	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx86	59x11x102	1 KOhm	23			
Cxxxxx87	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx87	59x11x102	1 KOhm	23			
Cxxxxx88	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx88	59x11x102	1 KOhm	23			
Cxxxxx89	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx89	59x11x102	1 KOhm	23			
Cxxxxx90	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx90	59x11x102	1 KOhm	23			
Cxxxxx91	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx91	59x11x102	1 KOhm	23			
Cxxxxx92	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx92	59x11x102	1 KOhm	23			
Cxxxxx93	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx93	59x11x102	1 KOhm	23			
Cxxxxx94	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx94	59x11x102	1 KOhm	23			
Cxxxxx95	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx95	59x11x102	1 KOhm	23			
Cxxxxx96	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx96	59x11x102	1 KOhm	23			
Cxxxxx97	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx97	59x11x102	1 KOhm	23			
Cxxxxx98	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx98	59x11x102	1 KOhm	23			
Cxxxxx99	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx99	59x11x102	1 KOhm	23			
Cxxxxx100	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx100	59x11x102	1 KOhm	23			
Cxxxxx101	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx101	59x11x102	1 KOhm	23			
Cxxxxx102	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx102	59x11x102	1 KOhm	23			
Cxxxxx103	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx103	59x11x102	1 KOhm	23			
Cxxxxx104	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx104	59x11x102	1 KOhm	23			
Cxxxxx105	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx105	59x11x102	1 KOhm	23			
Cxxxxx106	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx106	59x11x102	1 KOhm	23			
Cxxxxx107	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx107	59x11x102	1 KOhm	23			
Cxxxxx108	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx108	59x11x102	1 KOhm	23			
Cxxxxx109	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx109	59x11x102	1 KOhm	23			
Cxxxxx110	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx110	59x11x102	1 KOhm	23			
Cxxxxx111	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx111	59x11x102	1 KOhm	23			
Cxxxxx112	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx112	59x11x102	1 KOhm	23			
Cxxxxx113	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx113	59x11x102	1 KOhm	23			
Cxxxxx114	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx114	59x11x102	1 KOhm	23			
Cxxxxx115	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx115	59x11x102	1 KOhm	23			
Cxxxxx116	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx116	59x11x102	1 KOhm	23			
Cxxxxx117	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx117	59x11x102	1 KOhm	23			
Cxxxxx118	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx118	59x11x102	1 KOhm	23			
Cxxxxx119	59x26x100	10 uF	20% 10V, Sal	Ph	Dxxxxx119	59x11x10					

## TIME CODE READ/WRITE UNIT PCB 1.820.721.83/84 GR 20 EL 06 "ESE"



FOR 1.820.721.83:

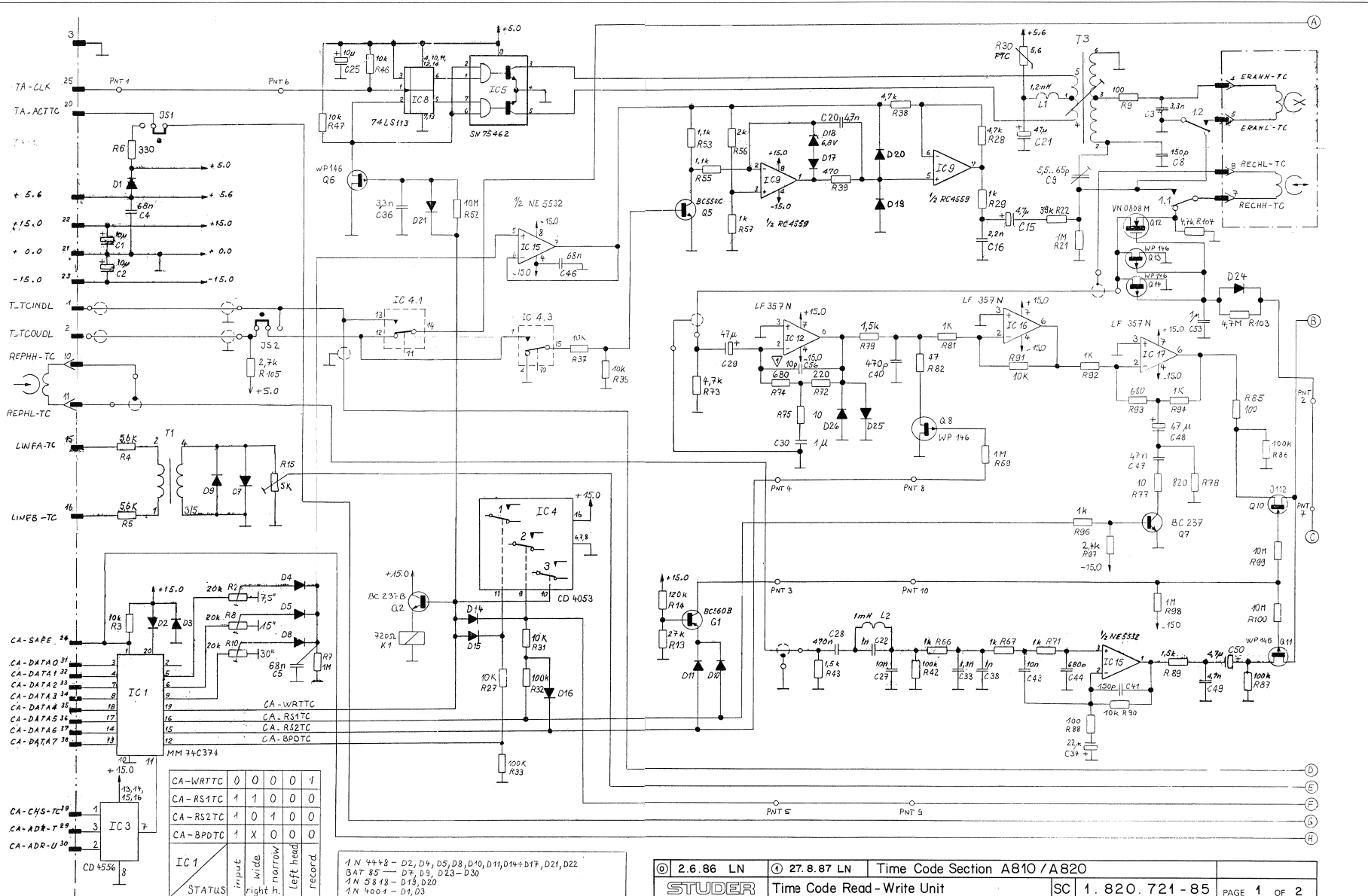
R34 57.11.4221 220 Ohm Q3 50.03.0496 BC 237  
 R23 57.11.5106 10 MOhm Q4 50.03.0436 BC 237  
 C17 59.34.4101 100 pF 5 % C52 NOT USED  
 D12 50.04.0125 1N4448 R102 NOT USED  
 D13 50.04.0125 1N4448

[illegible]

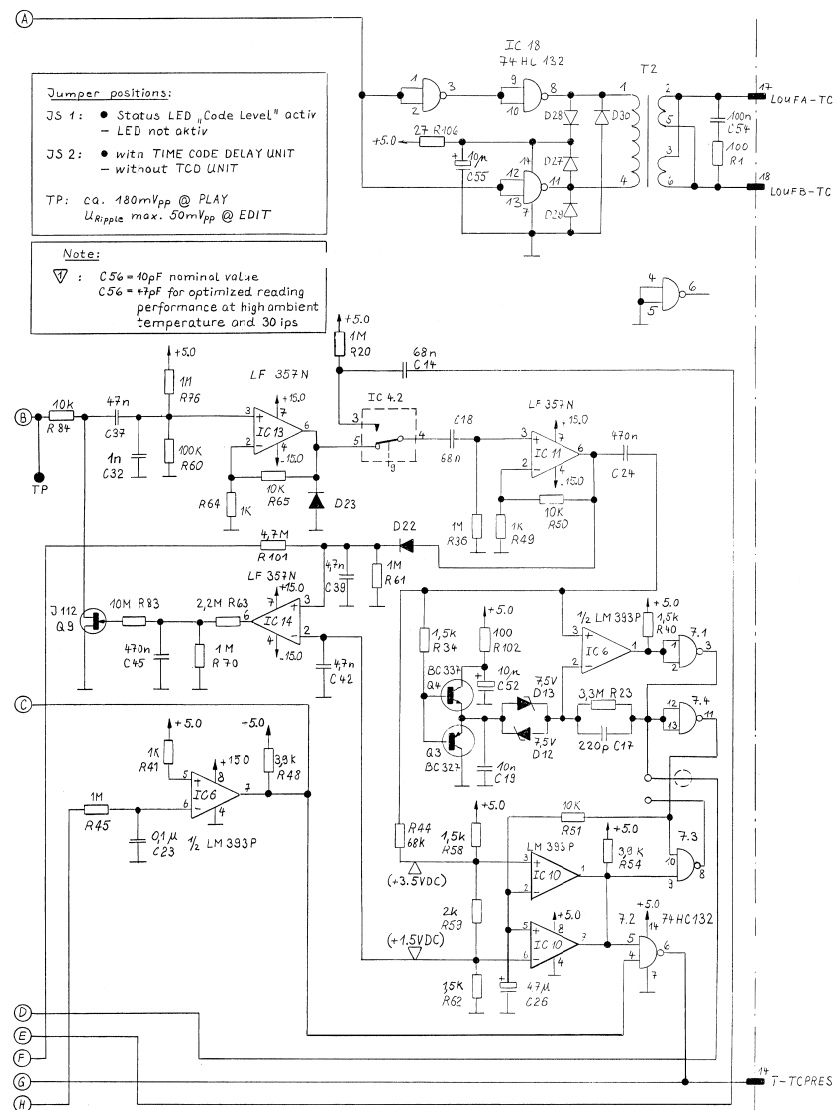
IND.	POS. NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R-----	571-11-403		10 kOhm	Z1	
R-----	571-11-405		1 mOhm	Z1	
R-----	571-11-407		1 mOhm	Z1	
R-----	571-11-409		7 kOhm	Z1	
R-----	571-11-411		470 Ohm	Z1	
R-----	571-11-413		10 kOhm	Z1	
R-----	571-11-415		10 kOhm	Z1	
R-----	571-11-417		10 kOhm	Z1	
R-----	571-11-419		100 Ohm	Z1	
R-----	571-11-421		100 Ohm	Z1	
R-----	571-11-423		100 Ohm	Z1	
R-----	571-11-425		100 Ohm	Z1	
R-----	571-11-427		100 Ohm	Z1	
R-----	571-11-429		100 Ohm	Z1	
R-----	571-11-431		100 Ohm	Z1	
R-----	571-11-433		100 Ohm	Z1	
R-----	571-11-435		100 Ohm	Z1	
R-----	571-11-437		100 Ohm	Z1	
R-----	571-11-439		100 Ohm	Z1	
R-----	571-11-441		100 Ohm	Z1	
R-----	571-11-443		100 Ohm	Z1	
R-----	571-11-445		100 Ohm	Z1	
R-----	571-11-447		100 Ohm	Z1	
R-----	571-11-449		100 Ohm	Z1	
R-----	571-11-451		100 Ohm	Z1	
R-----	571-11-453		100 Ohm	Z1	
R-----	571-11-455		100 Ohm	Z1	
R-----	571-11-457		100 Ohm	Z1	
R-----	571-11-459		100 Ohm	Z1	
R-----	571-11-461		100 Ohm	Z1	
R-----	571-11-463		100 Ohm	Z1	
R-----	571-11-465		100 Ohm	Z1	
R-----	571-11-467		100 Ohm	Z1	
R-----	571-11-469		100 Ohm	Z1	
R-----	571-11-471		100 Ohm	Z1	
R-----	571-11-473		100 Ohm	Z1	
R-----	571-11-475		100 Ohm	Z1	
R-----	571-11-477		100 Ohm	Z1	
R-----	571-11-479		100 Ohm	Z1	
R-----	571-11-481		100 Ohm	Z1	
R-----	571-11-483		100 Ohm	Z1	
R-----	571-11-485		100 Ohm	Z1	
R-----	571-11-487		100 Ohm	Z1	
R-----	571-11-489		100 Ohm	Z1	
R-----	571-11-491		100 Ohm	Z1	
R-----	571-11-493		100 Ohm	Z1	
R-----	571-11-495		100 Ohm	Z1	
R-----	571-11-497		100 Ohm	Z1	
R-----	571-11-499		100 Ohm	Z1	
R-----	571-11-501		100 Ohm	Z1	
R-----	571-11-503		100 Ohm	Z1	
R-----	571-11-505		100 Ohm	Z1	
R-----	571-11-507		100 Ohm	Z1	
R-----	571-11-509		100 Ohm	Z1	
R-----	571-11-511		100 Ohm	Z1	
R-----	571-11-513		100 Ohm	Z1	
R-----	571-11-515		100 Ohm	Z1	
R-----	571-11-517		100 Ohm	Z1	
R-----	571-11-519		100 Ohm	Z1	
R-----	571-11-521		100 Ohm	Z1	
R-----	571-11-523		100 Ohm	Z1	
R-----	571-11-525		100 Ohm	Z1	
R-----	571-11-527		100 Ohm	Z1	
R-----	571-11-529		100 Ohm	Z1	
R-----	571-11-531		100 Ohm	Z1	
R-----	571-11-533		100 Ohm	Z1	
R-----	571-11-535		100 Ohm	Z1	
R-----	571-11-537		100 Ohm	Z1	
R-----	571-11-539		100 Ohm	Z1	
R-----	571-11-541		100 Ohm	Z1	
R-----	571-11-543		100 Ohm	Z1	
R-----	571-11-545		100 Ohm	Z1	
R-----	571-11-547		100 Ohm	Z1	
R-----	571-11-549		100 Ohm	Z1	
R-----	571-11-551		100 Ohm	Z1	
R-----	571-11-553		100 Ohm	Z1	
R-----	571-11-555		100 Ohm	Z1	
R-----	571-11-557		100 Ohm	Z1	
R-----	571-11-559		100 Ohm	Z1	



## TIME CODE READ-WRITE UNIT 1.820.721.85

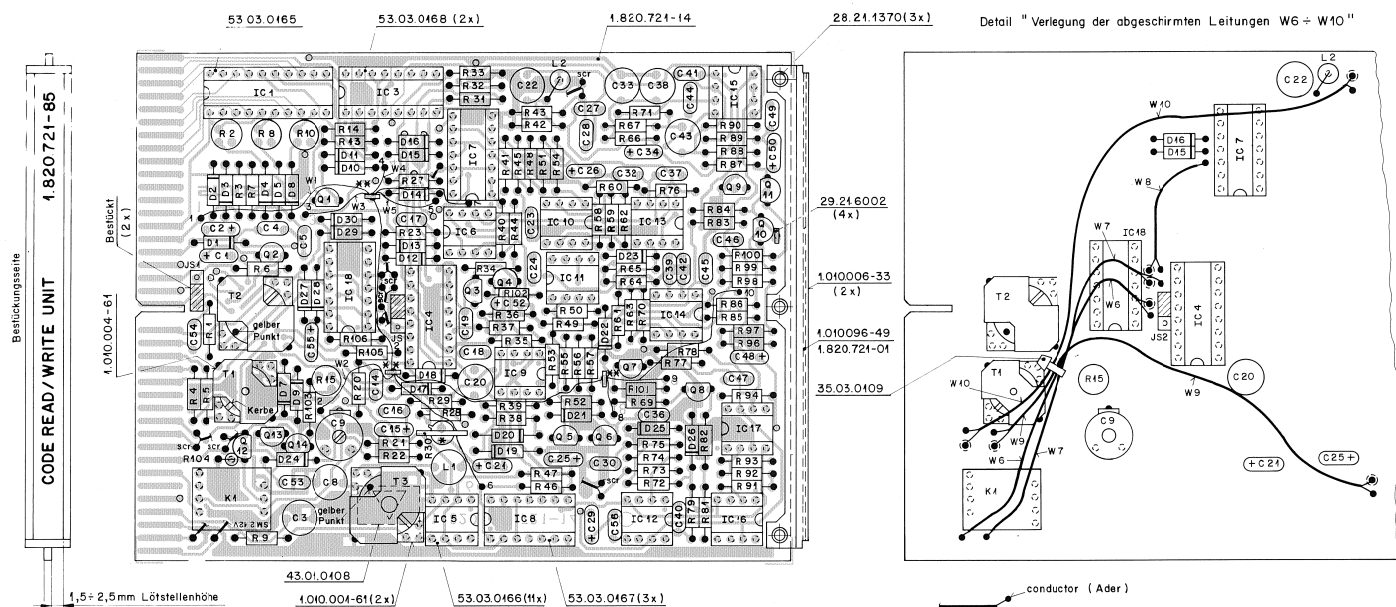


## TIME CODE READ-WRITE UNIT 1.820.721.85



© 2.6.86 LN	© 27.8.87 LN	Time Code Section A 810 / A 820	
STUDER	Time Code Read-Write Unit	SC 1.820.721-85	PAGE 2 OF 2

## TIME CODE READ-WRITE UNIT 1.820.721.85



\* 50 03.9944

\*\* W1 ÷ W5 durch Lötlösen 29.21.6002 hindurchgeführt

## Drahtverbindungen

Nr.	Punkt → Punkt	Norm Nr.	Verarbeitung	
			Abschneidelänge	Abisolierung
W 1	1 → 6	1.010.115-64		
W 2	2 → 7	1.010.113-64		
W 3	3 → 10	1.010.118-64		
W 4	4 → 8	1.010.115-64		
W 5	5 → 9	1.010.116-64		
W 6		64.03.0186	95 mm	Bild 1
W 7		64.03.0186	90 mm	Bild 1
W 8		64.03.0186	40 mm	Bild 1
W 9		64.03.0186	115 mm	Bild 2
W 10		64.03.0186	130 mm	Bild 2

Schirm bündig mit Mantel

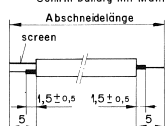


Bild 1

Toleranzen ± 1,0

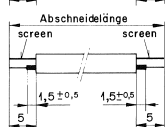


Bild 2

## TIME CODE READ-WRITE UNIT 1.820.721.85

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C....1	59.26.2100	10 uF	20%	16V, Sal	Ph.Ri
C....2	59.26.2100	10 uF	20%	16V, Sal	Ph.Ri
C....3	59.05.1352	5.3 nF	2.5%		
C....4	59.06.0683	68 nF	10%		
C....5	59.06.0683	68 nF	10%		
C....6		not used			
C....7		not used			
C....8	59.05.2151	150 pF	2.5%		
C....9	59.18.0102	68 pF			
C....10		not used			
C....11		not used			
C....12		not used			
C....13		not used			
C....14	59.06.0683	68 nF	10%		
C....15	59.26.2679	4.7 uF	20%	25V, Sal	Ph.Ri
C....16	59.06.0222	2.2 uF	10%		
C....17	59.34.4221	220 pF	10%		
C....18	59.06.0683	68 nF	10%		
C....19	59.06.0103	10 nF	10%		
C....20	59.03.2472	4.7 nF	2.5%		
C....21	59.26.0470	47 uF	20%	6.3V, Sal	Ph.Ri
C....22	59.05.1102	1 nF	1%		
C....23	59.26.2100	10 uF	20%	16V, Sal	Ph.Ri
C....24	59.06.0474	470 nF	10%		
C....25	59.26.2679	4.7 uF	20%	25V, Sal	Ph.Ri
C....26	59.06.0103	10 nF	10%		
C....27	59.06.0474	470 nF	10%		
C....28	59.26.0470	47 uF	20%	6.3V, Sal	Ph.Ri
C....29	59.06.0474	470 nF	10%		
C....30	59.06.5105	1 uF	5%		
C....31		not used			
C....32	59.06.5102	1 uF	10%		
C....33	59.05.1352	5.3 nF			
C....34	59.26.1220	22 uF	20%	10V, Sal	Ph.Ri
C....35		not used			
C....36	59.06.0332	3.3 uF	10%		
C....37	59.06.0473	47 nF	10%		

S T U D E R (01) 86/11/27 BD CODE READ/WRITE UNIT PL 1.820.721.85 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
IC....18	50.17.1132	NCT4HC132	NCT4HC132 NM74HC132		Not Ph.RS
JS....1		See Note 1			
JS....2		See Note 1			
K....1	56.04.0171	SM D1012			ITT
L....1	62.02.2122	1.2 uH			
L....2	62.01.0128	1.2 uH			
Q....1	50.03.0496	BC5605			Si
Q....2	50.03.0436	BC287B	BC547B, BC550B		ITT,Ph.RS
Q....3	50.03.0351	BC287B			ITT,Ph.RS
Q....4	50.03.0340	BC287-25			ITT,RS,Ph.Sie
Q....5	50.03.0487	BC5505			Si
Q....6	50.03.0329	NP 146			Si
Q....7	50.03.0350	BC287B	BC547B, BC550B		Si
Q....8	50.03.0329	NP 146			ITT,Ph.RS,Ph.Sie
Q....9	50.03.0350	11J27	J.12, TMO002		Se,RS,Ph
Q....10	50.03.0350	11J27	J.12, TMO002		Se,RS,Ph
Q....11	50.03.0329	NP 146			Si
Q....12	50.03.1505	W8 0808M	ZW 0108A		Fw,Si
Q....13	50.03.0329	NP 146			Si
Q....14	50.03.0329	NP 146			Si
R....1	57.11.4101	100 Ohm	5%		
R....2	58.11.6203	20 kOhm	See Note 2		
R....3	57.11.4103	10 kOhm	2%		
R....4	57.11.4562	5.6 kOhm	2%		
R....5	57.11.4562	5.6 kOhm	2%		
R....6	57.11.4331	330 Ohm	2%		
R....7	57.11.4105	1 MOhm	See Note 2		
R....8	58.11.6203	20 kOhm	See Note 2		
R....9	57.11.4101	100 Ohm	2%		
R....10	58.11.6203	20 kOhm	See Note 2		
R....11		not used			
R....12		not used			

S T U D E R (01) 86/11/27 BD CODE READ/WRITE UNIT PL 1.820.721.85 PAGE 4

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R....87	57.11.4104	100 kOhm	2%		
R....88	57.11.4101	100 Ohm	2%		
R....89	57.11.4102	1.5 kOhm	2%		
R....90	57.11.4103	10 kOhm	2%		
R....91	57.11.4103	10 kOhm	2%		
R....92	57.11.4102	1 kOhm	2%		
R....93	57.11.4601	680 Ohm	2%		
R....94	57.11.4102	1 kOhm	2%		
R....95		not used			
R....96	57.11.4102	1 kOhm	5%		
R....97	57.11.5262	2.4 kOhm	5%		
R....98	57.11.4105	1 MOhm	2%		
R....99	57.11.5106	10 kOhm	5%		
R....100	57.11.5106	10 kOhm	5%		
R....101	57.11.5675	4.7 kOhm	5%		
R....102	57.11.4101	100 Ohm	5%		
R....103	57.11.5675	4.7 kOhm	5%		
R....104	57.11.4672	4.7 kOhm	5%		
R....105	57.11.4672	2.7 kOhm	5%		
R....106	57.11.4270	27 Ohm	5%		
Y....1	1.022.218.00		Input Transformer 1:1		St
Y....2	1.022.215.00		Time Code Output Transformer		St
Y....3	1.022.221.00		Time Code HF Transformer		St

S T U D E R (01) 86/11/27 BD CODE READ/WRITE UNIT PL 1.820.721.85 PAGE 7

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C....38	59.05.1102	1 uF	1%		
C....39	59.06.0472	4.7 nF	10%		
C....40	59.32.2671	470 pF	10%		
C....41	59.34.4151	150 pF	5%		
C....42	59.06.0472	4.7 nF	10%		
C....43	59.05.1103	10 nF	1%		
C....44	59.32.2681	680 pF	10%		
C....45	59.06.0474	470 nF	10%		
C....46	59.06.0683	68 nF	10%		
C....47	59.06.0473	47 nF	10%		
C....48	59.26.0470	47 uF	20%	6.3V, Sal	Ph.Ri
C....49	59.06.0472	4.7 nF	10%		
C....50	59.26.2679	4.7 uF	20%	25V, Sal	Ph.Ri
C....51		not used			
C....52	59.26.1100	not used			
C....53	59.06.5105	1 uF	5%		
C....54	59.06.0109	100 nF	10%		
C....55	59.26.1100	10 uF	20%	10V, Sal	Ph.Ri
C....56	59.24.1100	10 pF			
D....11	50.04.0128	184400	184002, 184003, 184004		Met,Gl,Sal
D....12	50.04.0128	184440			Fe,ITT,Ph,Se
D....13	50.04.0128	184440	184002, 184003, 184004		Met,Gl,Sal
D....14	50.04.0128	184440			Fe,ITT,Ph,Se
D....15	50.04.0128	184440			Fe,ITT,Ph,Se
D....16		not used			
D....17	50.04.0127	not used			
D....18	50.04.0128	184440	8AS 40-02		Ph,Se
D....19	50.04.0127	8AT 85	8AS 40-02		Fe,ITT,Ph,Se
D....20	50.04.0128	184440			Ph,Se
D....21	50.04.0128	184440			Fe,ITT,Ph,Se
D....22	50.04.0128	184440			Fe,ITT,Ph,Se
D....23	50.04.1103	7.5 V Z	BZX83C 7V5, BZX85C 7V5, ZPD 7.5		See,ITT
D....24	50.04.0128	184440			Fe,ITT,Ph,Se
D....25	50.04.0128	184440			Fe,ITT,Ph,Se
D....26	50.04.0128	184440			Fe,ITT,Ph,Se
D....27	50.04.0128	184440			Fe,ITT,Ph,Se

S T U D E R (01) 86/11/27 BD CODE READ/WRITE UNIT PL 1.820.721.85 PAGE 2

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R....13	57.11.4273	27 kOhm	5%		
R....14	57.11.4124	120 kOhm	5%		
R....15	58.11.6502	5 kOhm	See Note 3		
R....16		not used			
R....17		not used			
R....18		not used			
R....19		not used			
R....20	57.11.4105	1 MOhm	2%		
R....21	57.11.4105	1 MOhm	2%		
R....22	57.11.4390	39 kOhm	2%		
R....23	57.11.5335	53.3 kOhm	2%		
R....24		not used			
R....25		not used			
R....26		not used			
R....27	57.11.4103	10 kOhm	2%		
R....28	57.11.3472	4.7 kOhm	1%		
R....29	57.11.3472	4.7 kOhm	1%		
R....30	57.99.0209	5.6 Ohm	PC Resistor, Philips R. 2322 662 91005		
R....31	57.11.4103	10 kOhm	2%		
R....32	57.11.4104	100 kOhm	5%		
R....33	57.11.4104	100 kOhm	2%		
R....34	57.11.4152	1.5 kOhm	2%		
R....35	57.11.4105	10 kOhm	2%		
R....36	57.11.4105	1 MOhm	2%		
R....37	57.11.4103	10 kOhm	2%		
R....38	57.11.3472	4.7 kOhm	1%		
R....39	57.11.4471	470 Ohm	2%		
R....40	57.11.4152	1.5 kOhm	2%		
R....41	57.11.4102	1 kOhm	2%		
R....42	57.11.4104	100 kOhm	2%		
R....43	57.11.4152	1.5 kOhm	2%		
R....44	57.11.4682	68 kOhm	2%		
R....45	57.11.4105	1 MOhm	2%		
R....46	57.11.4103	10 kOhm	2%		
R....47	57.11.4103	10 kOhm	2%		
R....48	57.11.4392	3.9 kOhm	2%		
R....49	57.11.4102	1 kOhm	2%		

S T U D E R (01) 86/11/27 BD CODE READ/WRITE UNIT PL 1.820.721.85 PAGE 5

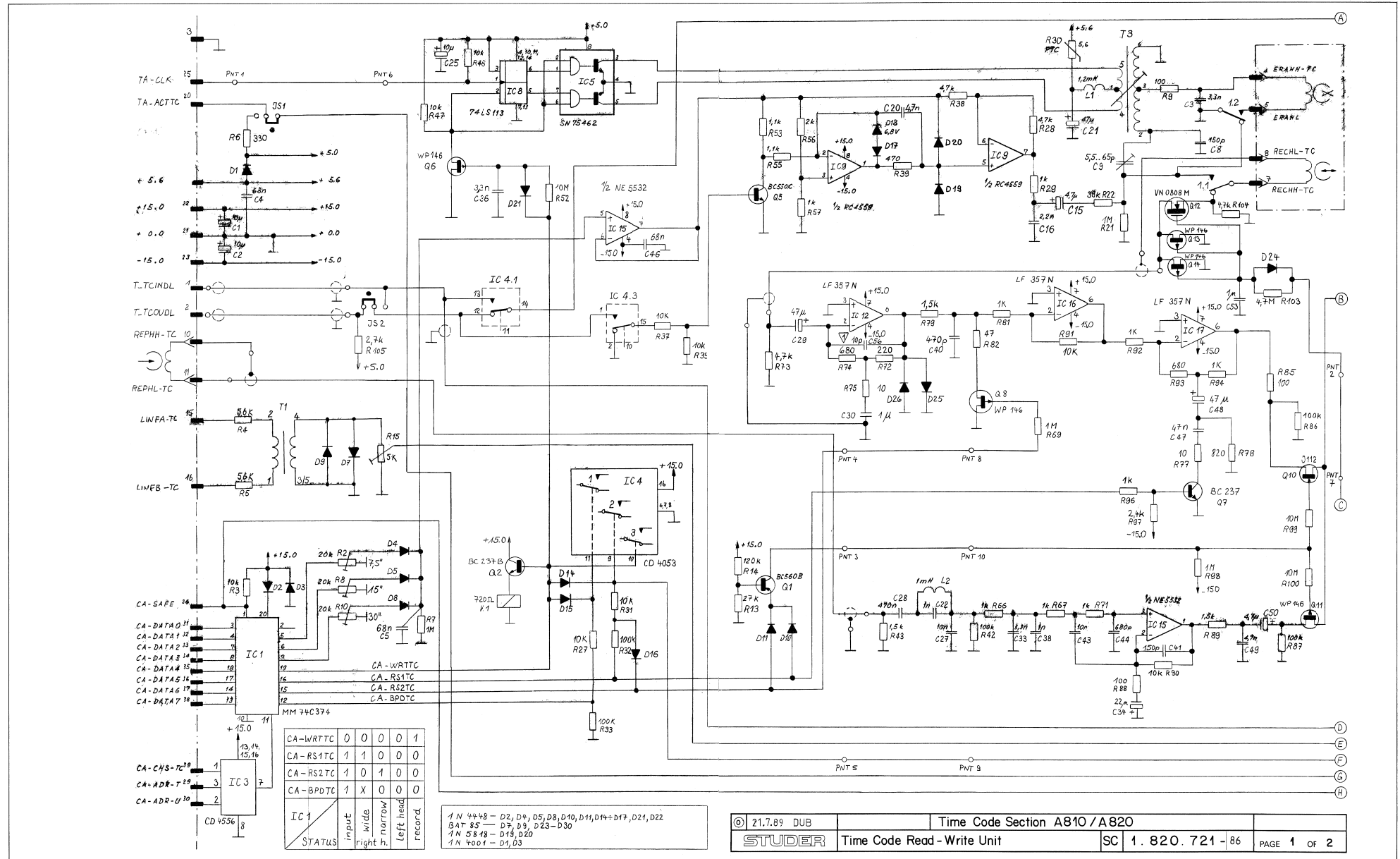
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
(01) 86/11/27 IC 11 to 14, 16 and 17: slow rate			40V/1uS		
Note 1: Contact pin:		Studec Nr.	54.01.0020		
		Berg Nr.	75 160-102-36		
		Philips Nr.	2452 025 89303		
		Studec Nr.	54.01.0021		
		Conrad Nr.	519.1365-000 408		
		Philips Nr.	2422 024 88003		
Note 2: Potentiometer, linear,		Source Nr. 3529 H - 1 - 203			
		VBR Nr. 170 - 20k			
		Leas Nr. 170 - 20k			
Note 3: Potentiometer, linear,		Source Nr. 3529 H - 1 - 502			
		VBR Nr. 170 - 5k			
		Leas Nr. 170 - 5k			
Ce: Ceramic, Sal-Solid Aluminum					
MANUFACTURERS:		See: Data, Fairchild, Fe/Ferranti,			
		GI: General Instruments, ITT: International,			
		Met: Motorola, RS: National, S: Sanyo, S: Sanyo,			
		Ph: Philips, S: Sanyo, S: Sanyo, S: Sanyo, S: Sanyo,			
		Se: Siemens, Si: Siemens, Si: Siemens, Si: Siemens,			
		Si: Siliconix, T: Telefunken, T: Telefunken,			
		TI: Texas Instruments			
ORIG 86/06/02	(01) 86/11/27				

S T U D E R (01) 86/11/27 BD CODE READ/WRITE UNIT PL 1.820.721.85 PAGE 8

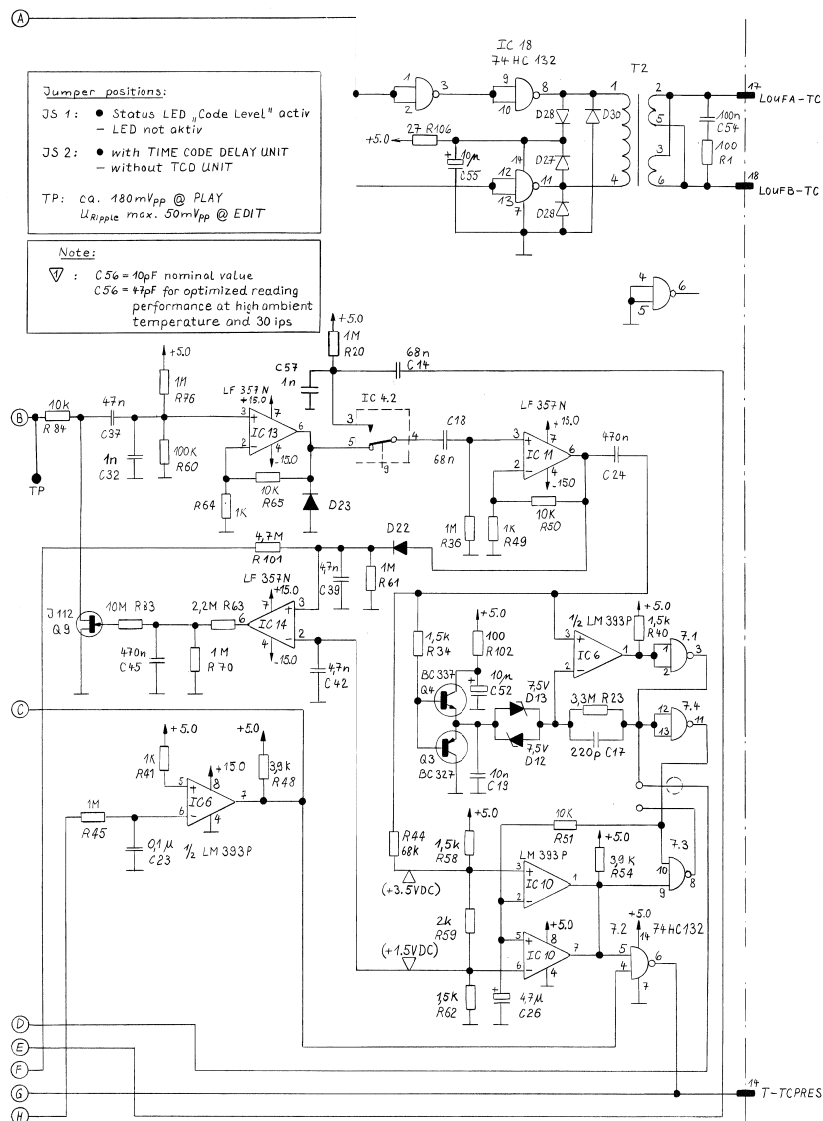
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
D....18	50.04.1102	4.8 V Z	BZX83C 5V8, BZX85C 5V8, ZPD 6.8		See,ITT
D....19	50.04.0512	185818	185819		Met
D....20	50.04.0512	185818	185819		Met
D....21	50.04.0128	184440			Fe,ITT,Ph,Se
D....22	50.04.0128	184440			Fe,ITT,Ph,Se
D....23	50.04.0127	8AT 85	8AS 40-02		Ph,Se
D....24	50.04.0127	8AT 85	8AS 40-02		Ph,Se
D....25	50.04.0127	8AT 85	8AS 40-02		Ph,Se
D....26	50.04.0127	8AT 85	8AS 40-02		Ph,Se
D....27	50.04.0127	8AT 85	8AS 40-02		Ph,Se
D....28	50.04.0127	8AT 85	8AS 40-02		Ph,Se
D....29	50.04.0127	8AT 85	8AS 40-02		Ph,Se
D....30	50.04.0127	8AT 85	8AS 40-02		Ph,Se
IC....1	50.07.0003	NM74C37AN			NSC
IC....2		not used			
IC....3	50.07.0004	CD4058BC	CD4058BC, 4058BC		Met,RS,Ph
IC....4	50.07.0015	NC14053B	CD4053BC		Met,RS,Ph
IC....5	50.07.0015	NC14053B	CD4053BC		Met,RS,Ph
IC....6	50.05.0283	LM939N	LM939		RS,TT
IC....7	50.11.4152	NCT4HC132	NCT4HC132 NM74HC132		RS,TT
IC....8	50.04.0113	8M74LS13N	N74LS13N, DM74LS13N		TT,Si,Ph,RS
IC....9	50.09.0107	IC4559M			RS
IC....10	50.05.0283	LM939			NSC,TT
IC....11	50.09.0110	LF3578N	Slow rate 300V/1uS		NSC
IC....12	50.09.0110	LF3577 A	Slow rate 340V/1uS		RS
IC....13	50.09.0110	LF3578N	Slow rate 330V/1uS		NSC
IC....14	50.09.0110	LF3577 A	Slow rate 340V/1uS		RS
IC....15	50.09.0110	LF3578N	Slow rate 330V/1uS		NSC
IC....1					



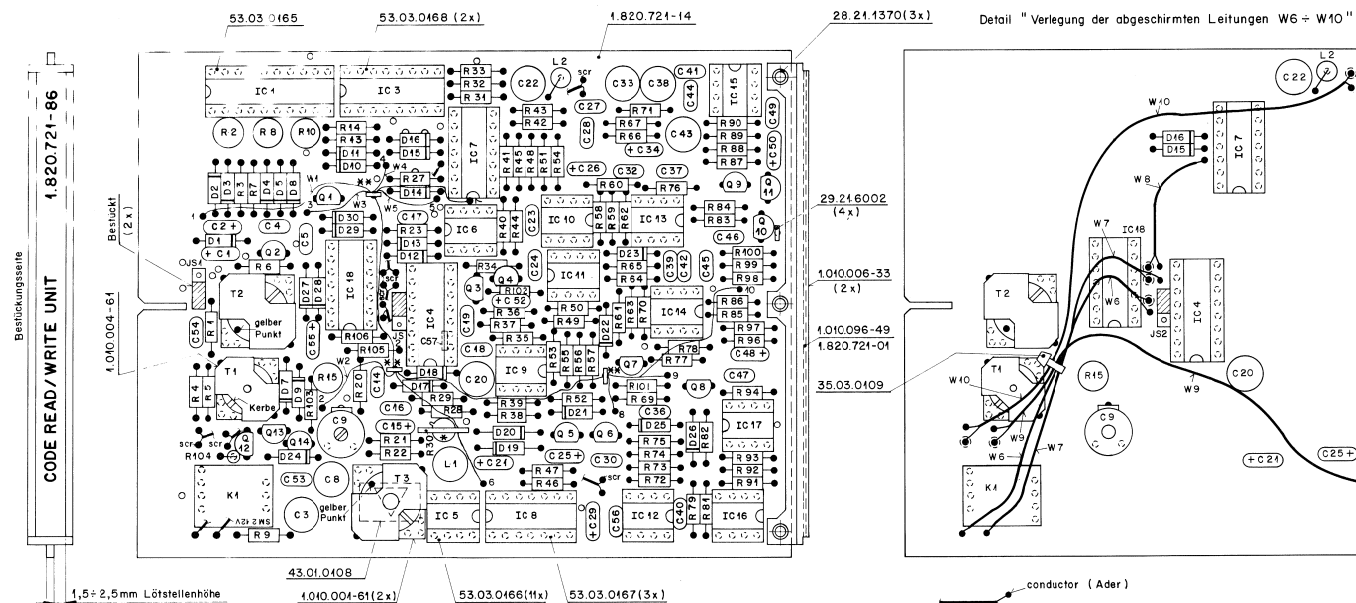
## TIME CODE READ-WRITE UNIT 1.820.721.86



## TIME CODE READ-WRITE UNIT 1.820.721.86



## TIME CODE READ-WRITE UNIT 1.820.721.86



\* 5C.03.9944

\*\* W4 ÷ W5 durch Lötlösen 29.21.6002 hindurchgeführt

## Drahtverbindungen

Nr.	Punkt → Punkt	Norm Nr.	Verarbeitung	
			Abschneidlänge	Abisolierung
W 1	1 → 6	1.010.115-64		
W 2	2 → 7	1.010.113-64		
W 3	3 → 10	1.010.118-64		
W 4	4 → 8	1.010.115-64		
W 5	5 → 9	1.010.116-64		
W 6		64.03.0186	95 mm	Bild 1
W 7		64.03.0186	90 mm	Bild 1
W 8		64.03.0186	40 mm	Bild 1
W 9		64.03.0186	115 mm	Bild 2
W 10		64.03.0186	130 mm	Bild 2

Schirm bündig mit Mantel

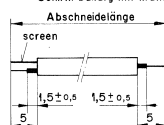


Bild 1

Toleranzen: ± 1,0

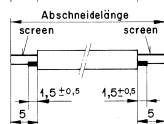


Bild 2

## TIME CODE READ-WRITE UNIT 1.820.721.86

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C...1	59.26.2100	10 uF	20%	16V, Sal	Ph/Ri	K.....	56.04.0171	5M D1012			ITT	R....92	57.11.4102	1 kOhm	2%		
C...2	59.26.2100	10 uF	20%	16V, Sal	Ph/Ri	L.....1	62.02.2122	1.2 uH	TDK Nr. CSL 0812-122 J			R....93	57.11.4081	680 Ohm	2%		
C...3	59.05.1102	3 uF	2.5%			L.....2	62.01.0128		Gowanda Nr. 17-104, Dalevan Nr. 1641-105			R....94	57.11.4102	1 kOhm	2%		
C...4	59.06.0683	68 nF	10%			Q.....1	50.03.0496	RC5602	RC547B, RC5608	ITT/Mot/Ph/Sie		R....95	57.11.4102	net used			
C...5	59.06.0683	68 nF	10%			Q.....2	50.03.0496	RC2378				R....97	57.11.2262	2.4 kOhm	2%		
C...6	not used					Q.....3	50.03.0381	RC327-23		ITT/Ph/Sie		R....99	57.11.2106	10 kOhm	2%		
C...7	not used					Q.....4	50.03.0440	RC327-25		ITT/MS/Ph/Sie		R....100	57.11.5106	10 kOhm	2%		
C...8	59.05.2151	150 pF	2.5%			Q.....5	50.03.0497	RC5602				R....101	57.11.2475	4.7 kOhm	2%		
C...9	59.18.0102	65 pF		Telexmac Capacitor, Philips Nr. 2222 808 01001		Q.....6	50.03.0329	NP 146				R....102	57.11.4101	100 Ohm	2%		
C...10	not used					Q.....7	50.03.0436	RC2378	RC547B, RC5608	ITT/Mot/Ph/Sie		R....103	57.11.2475	4.7 kOhm	2%		
C...11	not used					Q.....8	50.03.0329	NP 146				R....104	57.11.4272	4.7 kOhm	2%		
C...12	not used					Q.....9	50.03.0380	J112F	J112, TMO0662	Se/RS/Mot		R....105	57.11.4272	2.7 kOhm	2%		
C...13	not used					Q.....10	50.03.0380	J112F	J112, TMO0662	Se/RS/Mot		R....106	57.11.4270	27 Ohm	2%		
C...14	59.06.0683	68 nF	10%			Q.....11	50.03.0329	NP 146				T....1	1.022.215.00			Input Transformer 1:1	St
C...15	59.26.2479	4.7 uF	20%	25V, Sal	Ph/Ri	Q.....12	50.03.1805	W8 0908W	ZWR 0108A	Fe/Sie		T....2	1.022.215.00			Time Code Output Transformer	St
C...16	59.06.0222	2.2 uF	10%			Q.....13	50.03.0329	NP 146		Six		T....3	1.022.221.00			Time Code RF Transformer	St
C...17	59.34.4221	220 pF	5%	Cer		Q.....14	50.03.0329	NP 146									
C...18	59.06.0683	68 nF	10%			R.....1	57.11.4101	100 Ohm	2%								
C...19	59.06.0103	10 uF	10%			R.....2	57.11.4101	20 kOhm	2%								
C...20	59.05.2472	4.7 uF	2.5%			R.....3	57.11.4103	10 kOhm	2%								
C...21	59.26.0470	47 uF	20%	6.3V, Sal	Ph/Ri	R.....4	57.11.4082	5.6 kOhm	2%								
C...22	59.05.1102	nF	1%			R.....5	57.11.4562	5.6 kOhm	2%								
C...23	59.06.0104	100 nF	10%			R.....6	57.11.4331	330 Ohm	2%								
C...24	59.06.0474	470 nF	10%			R.....7	57.11.4105	1 kOhm	2%								
C...25	59.26.2100	10 uF	20%	16V, Sal	Ph/Ri	R.....8	58.11.6203	20 kOhm	See Note 2								
C...26	59.26.2479	4.7 uF	20%	25V, Sal	Ph/Ri	R.....9	57.11.4101	100 Ohm	2%								
C...27	59.06.0103	10 nF	10%			R.....10	58.11.6203	20 kOhm	See Note 2								
C...28	59.06.0474	470 nF	10%			R.....11	57.11.4101	100 Ohm	2%								
C...29	59.26.0470	47 uF	20%	6.3V, Sal	Ph/Ri	R.....12	57.11.4273	27 kOhm	5%								
C...30	59.06.3105	1 uF	1%			R.....13	57.11.4124	120 kOhm	5%								
C...31	59.06.5102	1 nF	10%			R.....14	58.11.6202	5 kOhm	See Note 3								
C...32	59.05.1332	3.3 nF	1%			R.....15	58.11.6202	5 kOhm	See Note 3								
C...33	59.05.1332	3.3 nF	1%			R.....16	not used										
C...34	59.26.1220	22 uF	20%	10V, Sal	Ph/Ri	R.....17	not used										
C...35	not used																
C...36	59.06.0332	3.3 nF	10%														
C...37	59.06.0473	47 nF	10%														

S T U D E R (00) 89/07/21 DUB CODE READ/WRITE UNIT PL 1.820.721.86 PAGE 1

S T U D E R (00) 89/07/21 DUB CODE READ/WRITE UNIT PL 1.820.721.86 PAGE 4

S T U D E R (00) 89/07/21 DUB CODE READ/WRITE UNIT PL 1.820.721.86 PAGE 7

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C...38	59.05.1102	1 nF	1%			R....18	not used					Not 1: Contact pin: Studer Nr.	54.01.0020				
C...39	59.06.0472	4 nF	10%			R....19	not used					Bridge: Regis Nr.	75.50-102-36				
C...40	59.32.2471	470 pF	10%			R....20	57.11.4108	1 kOhm	2%			Philips Nr.	2422 025 89303				
C...41	59.34.4121	120 pF	5%	Cer		R....21	57.11.4108	1 kOhm	2%			Studer Nr.	54.01.0021				
C...42	59.06.0472	4 nF	10%			R....22	57.11.4339	3.3 kOhm	5%			Cometel Nr.	313.1365.000 408				
C...43	59.05.1103	10 nF	1%			R....23	57.11.2078	3.3 kOhm	5%			Philips Nr.	2422 024 88003				
C...44	59.32.2681	680 pF	10%	Cer		R....24	not used										
C...45	59.06.0474	470 nF	10%			R....25	not used					Not 2: Potentiometer, linear, Bourne Nr. 3229 W - 1 - 203					
C...46	59.06.0683	68 nF	10%			R....26	not used					VBS Nr.	170 - 204				
C...47	59.26.0470	47 uF	20%	6.3V, Sal	Ph/Ri	R....27	57.11.3102	1 kOhm	2%			Less Nr.	170 - 206				
C...48	59.06.0472	4 nF	10%			R....28	57.11.3472	4.7 kOhm	1%								
C...49	59.26.2479	4.7 uF	20%	25V, Sal	Ph/Ri	R....29	57.11.3102	1 kOhm	2%			Not 3: Potentiometer, linear, Bourne Nr. 3229 W - 1 - 502					
C...50	59.26.2479	4.7 uF	20%	25V, Sal	Ph/Ri	R....30	57.09.0209	5.6 Ohm	PTC Resistor, Philips Nr. 2322 662 91005			VBS Nr.	170 - 54				
C...51	not used					R....31	57.11.4109	100 kOhm	2%			Less Nr.	170 - 54				
C...52	59.26.1100	10 uF	20%	10V, Sal	Ph/Ri	R....32	57.11.4104	100 kOhm	5%								
C...53	59.06.3105	1 uF	1%			R....33	57.11.4104	100 kOhm	5%								
C...54	59.06.0104	100 nF	10%			R....34	57.11.4152	1.5 kOhm	2%								
C...55	59.26.1100	10 uF	20%	10V, Sal	Ph/Ri	R....35	57.11.4103	10 kOhm	2%								
C...56	59.34.1100	10 pF	5%	Cer		R....36	57.11.4105	1 kOhm	2%								
C...57	59.60.0102	1 nF	5%	Cer Chip		R....37	57.11.4103	10 kOhm	2%								
D...1	50.04.0122	184601		184002, 184003, 184004	Mot/G1/Sol	R....38	57.11.3472	4.7 kOhm	1%			MANUFACTURER: EneXear, Fe/Fairchild, FawFerrant,					
D...2	50.04.0125	184648			Fe/ITT/Ph/Ses	R....39	57.11.4471	470 Ohm	2%			General Instruments, ITT-Intermetall,					
D...3	50.04.0122	184601		184002, 184003, 184004	Mot/G1/Sol	R....40	57.11.4152	1.5 kOhm	2%			Met-Metrolite, RCA-National Semiconductor,					
D...4	50.04.0125	184648			Fe/ITT/Ph/Ses	R....41	57.11.4104	100 kOhm	2%			Ph-Philips, RadKeythron, RCA-Radi. Corp. of America,					
D...5	50.04.0125	184648			Fe/ITT/Ph/Ses	R....42	57.11.4152	1.5 kOhm	2%			See-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					
D...6	50.04.0127	not used			Ph/Sie	R....43	57.11.4683	68 kOhm	2%			Sine-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					
D...7	50.04.0127	BAT 85		BAS 40-02	BAT 85	R....44	57.11.4105	1 kOhm	2%			Sine-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					
D...8	50.04.0125	184648			Fe/ITT/Ph/Ses	R....45	57.11.4103	10 kOhm	2%			Sine-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					
D...9	50.04.0127	BAT 85		BAS 40-02	Ph/Sie	R....46	57.11.4103	10 kOhm	2%			Sine-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					
D...10	50.04.0125	184648			Fe/ITT/Ph/Ses	R....47	57.11.4103	10 kOhm	2%			Sine-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					
D...11	50.04.0125	184648			Fe/ITT/Ph/Ses	R....48	57.11.4392	3.9 kOhm	2%			Sine-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					
D...12	50.04.1103	7.5 V ±		RZX83C 7V5, RZX83C 7V5, ZPD 7.5	See:ITT	R....49	57.11.4102	1 kOhm	2%			Sine-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					
D...13	50.04.1103	7.5 V ±		RZX83C 7V5, RZX83C 7V5, ZPD 7.5	See:ITT	R....50	57.11.4103	10 kOhm	2%			Sine-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					
D...14	50.04.0125	184648			Fe/ITT/Ph/Ses	R....51	57.11.5106	10 kOhm	5%			Sine-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					
D...15	50.04.0125	184648			Fe/ITT/Ph/Ses	R....52	57.11.3112	1.1 kOhm	1%			Sine-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					
D...16	50.04.0125	184648			Fe/ITT/Ph/Ses	R....53	57.11.4392	3.9 kOhm	2%			Sine-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					
D...17	50.04.0125	184648			Fe/ITT/Ph/Ses	R....54	57.11.4392	3.9 kOhm	2%			Sine-Seecon, Sine-Seecon, Sig-Sigilite, St-Studer,					

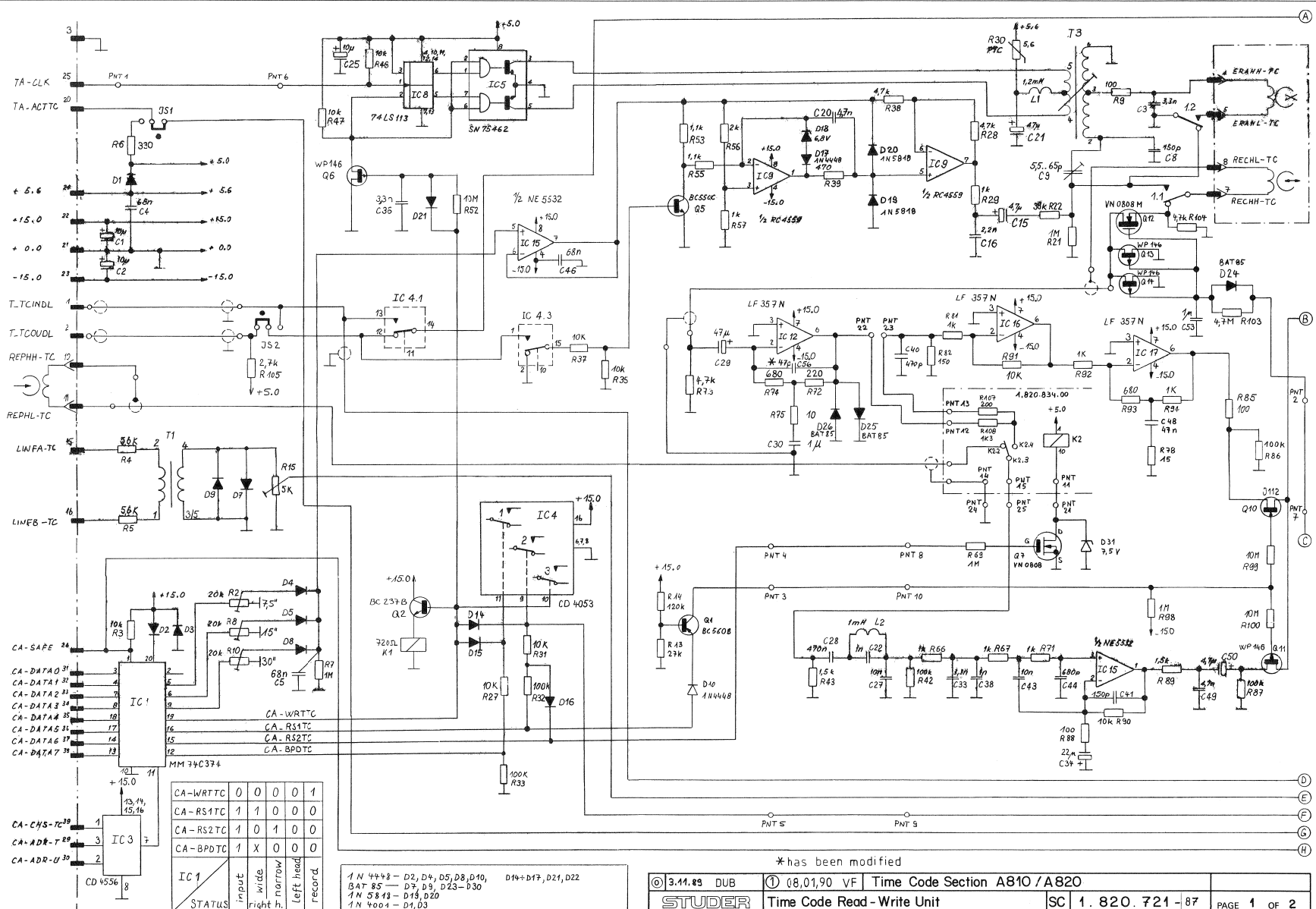
S T U D E R (00) 89/07/21 DUB CODE READ/WRITE UNIT PL 1.820.721.86 PAGE 2

S T U D E R (00) 89/07/21 DUB CODE READ/WRITE UNIT PL 1.820.721.86 PAGE 5

S T U D E R (00) 89/07/21 DUB CODE READ/WRITE UNIT PL 1.820.721.86 PAGE 8

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
D...17	50.04.0125	184648			Fe/ITT/Ph/Ses	R....55	57.11.3112	1.1 kOhm	1%		
D...18	50.04.1102	6.8 V ±	RZX83C 6V8, RZX83C 6V8, ZPD 6.8		See:ITT	R....56	57.11.3202	2 kOhm	1%		
D...19	50.04.0819	185819			Not	R....57	57.11.3102	1 kOhm	1%		
D...20	50.04.0512	185819			Not	R....58	57.11.3152	1.5 kOhm	1%		
D...21	50.04.0125	184648			Fe/ITT/Ph/Ses	R....59	57.11.3202	2 kOhm	1%		
D...22	50.04.0125	184648			Fe/ITT/Ph/Ses	R....60	57.11.4104	100 kOhm	2%		
D...23	50.04.0127	BAT 85	BAS 40-02		Ph/Sie	R....61	57.11.4105	1 kOhm	2%		
D...24	50.04.0127	BAT 85	BAS 40-02		Ph/Sie	R....62	57.11.3152	1.5 kOhm	1%		
D...25	50.04.0127	BAT 85	BAS 40-02		Ph/Sie	R....63	57.11.3202	2 kOhm	1%		
D...26	50.04.0127	BAT 85	BAS 40-02		Ph/Sie	R....64	57.11.4102	1 kOhm	1%		
D...27	50.04.0127	BAT 85	BAS 40-02		Ph/Sie	R....65	57.11.4103	10 kOhm	2%		
D...28	50.04.0127	BAT 85	BAS 40-02		Ph/Sie	R....66	57.11.3102	1 kOhm	1%		
D...29	50.04.0127	BAT 85	BAS 40-02		Ph/Sie	R....67	57.11.3102	1 kOhm	1%		
D...30	50.04.0127	BAT 85	BAS 40-02		Ph/Sie	R....68		Not used			
						R....69	57.11.4105	1 kOhm	2%		
						R....70	57.11.4105	1 kOhm	2%		
						R....71	57.11.4102	1 kOhm	2%		
						R....72	57.11.4221	220 Ohm	2%		
						R....73	57.11.4472	1.5 kOhm	2%		
						R....74	57.11.4681	680 Ohm	2%		
						R....75	57.11.4100	10 Ohm	2%		
						R....76	57.11.4105	1 kOhm	2%		
						R....77		Not used			
						R....78	57.11.4621	820 Ohm	2%		
						R....79	57.11.4152	1.5 kOhm	2%		
						R....80		Not used			
						R....81	57.11.4102	1 kOhm	2%		
						R....82	57.11.4447	47 Ohm	2%		
						R....83	57.11.5106	10 kOhm	2%		
						R....84	57.11.4105	1 kOhm	2%		
						R....85	57.11.4101	100 Ohm	2%		
						R....86	57.11.4105	1 kOhm	2%		
						R....87	57.11.4104	100 kOhm	2%		
						R....88		Not used			
						R....89	57.11.4152	1.5 kOhm	2%		
						R....90	57.11.4103	10 kOhm	2%		
						R....91	57.11.4103	10 kOhm	2%		
JS...11			See Note :								
JS...12			See Note :								

## TIME CODE READ-WRITE UNIT 1.820.721.87 GR20 EL06



**Jumper positions:**

JS 1: • Status LED „Code Level“ aktiv  
- LED not aktiv

JS 2: • with TIME CODE DELAY UNIT  
- without TCD UNIT

TP: ca. 180mV<sub>pp</sub> @ PLAY  
U<sub>Ripple</sub> max. 50mV<sub>pp</sub> @ EDIT

IC 18  
74HC132

T2

LOWFA-TC

LOWFB-TC

TP

TP-TCPRES

© 3.11.83 DUB	① 08.01.90 VF	Time Code Section	A 810 / A 820
STUDER		Time Code Read-Write Unit	SC 1.820.721-87
		PAGE 2	OF 2

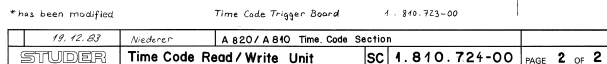
[illegible]

TIME CODE READ-WRITE UNIT 1.820.721.87

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
K....1	56.04.0171	SW D1012			ITT	R....94	57.11.3102	1 kOhm	2X		
K....2	56.04.0185	T02				R....95		not used			
L....1	62.02.2122	1.2 kH	TDK Nr. C51 0812-122 J			R....98	57.11.3105	1 MOhm	2X		
L....2	62.01.0128	1 kH	Devanda Nr. 17-104, Delavan Nr. 1641-105			R....99	57.11.3106	10 MOhm	5X		
Q....1	50.03.0496	BC360E				R....100	57.11.3106	10 MOhm	5X		
Q....2	50.03.0496	BC237B	BC547B, BC550B		ITT/Met./Ph./Sil	R....101	57.11.3475	4.7 MOhm	5X		
Q....3	50.03.0351	BC327-25			ITT/Ph./Sil	R....102	57.11.3101	100 Ohm	5X		
Q....4	50.03.0340	BC337-25			ITT/MS/Ph./Sil	R....103	57.11.3475	4.7 MOhm	5X		
Q....5	50.03.0497	BC350E			Sil	R....104	57.11.3472	4.7 MOhm	5X		
Q....6	50.03.0329	MF 146			Sil	R....105	57.11.3212	2.7 MOhm	5X		
Q....7	50.03.1505	VH 0808H	ZVH 0108A		Sil	R....106	57.11.3270	27 Ohm	5X		
Q....9	50.03.0350	J112F	J112, TMO0062		R....107	57.11.3201	200 Ohm	2X			
Q....10	50.03.0350	J112F	J112, TMO0062		R....108	57.11.3132	1.3 kOhm	2X			
Q....11	50.03.0329	MF 146			Se/MS/Met	T....1	1.022.218.00	Input Transformer 1:1		St	
Q....12	50.03.1505	VH 0808H	ZVH 0108A		Fe/Sil	T....2	1.022.215.00	Time Code Output Transformer		St	
Q....13	50.03.0329	MF 146			Sil	T....3	1.022.221.00	Time Code HF Transformer		St	
Q....14	50.03.0329	MF 146			Sil						
R....1	57.11.3101	100 Ohm	5X								
R....2	58.11.6203	20 kOhm	See Note 2								
R....3	57.11.3103	10 kOhm	2X								
R....4	57.11.3562	5.6 kOhm	2X								
R....5	57.11.3562	5.6 kOhm	2X								
R....6	57.11.3531	350 Ohm	2X								
R....7	57.11.3105	1 MOhm	2X								
R....8	58.11.6203	20 kOhm	See Note 2								
R....9	57.11.3101	100 Ohm	2X								
R....10	58.11.6203	20 kOhm	See Note 2								
R....11		not used									
R....12		not used									
R....13	57.11.3279	27 kOhm	5X								
R....14	57.11.3124	120 kOhm	5X								
R....15	58.11.6502	5 kOhm	See Note 3								
R....16		not used									
R....17		not used									
S T U D E R (01) 90/01/08 DUB CODE READ/WRITE UNIT PL 1.820.721.87 PAGE 4						S T U D E R (01) 90/01/08 DUB CODE READ/WRITE UNIT PL 1.820.721.87 PAGE 7					
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R....18		not used				(01) 08.01.90 Optimised reading at high ambient temperature.					
R....19		not used				Note 1: Contact pin:	Studec Nr.	54.01.0020			
R....20	57.11.3105	1 MOhm	2X			Berg Nr.	15 160-102-36				
R....21	57.11.3105	1 MOhm	2X			Philips Nr.	2425 025 89303				
R....22	57.11.2993	39 kOhm	2X			Studec Nr.	54.01.0021				
R....23	57.11.5235	3.3 MOhm	5X		Bridge:	Consteel Nr.	313.1365.000 408				
R....24		not used				Philips Nr.	2422 024 88003				
R....25		not used				Note 2: Potentiometer, linear:	Bourne Nr. 3329 W 1 - 203				
R....26		not used					VSM Nr. 170 - 20k				
R....27	57.11.3103	10 kOhm	2X				Leas Nr. 170 - 20k				
R....28	57.11.3472	4.7 MOhm	1X			Note 3: Potentiometer, linear:	Bourne Nr. 3329 W 1 - 502				
R....29	57.11.3102	1 MOhm	1X				VSM Nr. 170 - 5k				
R....30	57.99.0009	5.6 Ohm	2X				Leas Nr. 170 - 5k				
R....31	57.11.3103	10 kOhm	2X			Ca=Ceramic; Sal=Solid Aluminum					
R....32	57.11.3104	100 kOhm	2X			MANUFACTURER: Se=Seac; Fo=Fairchild; Fe=Ferranti;					
R....33	57.11.3104	100 kOhm	2X			Si=General Instruments; ITT=International;					
R....34	57.11.3152	1.5 kOhm	2X			Met=Motorola; RS=National Semiconductor;					
R....35	57.11.3103	10 kOhm	2X			Ph=Philips; Ra=Raytheon; RCA=Radio Corp. of America;					
R....36	57.11.3103	10 kOhm	2X			Sae=Seacometer; Sig=Signetics; Sig=Signetics; St=Studer;					
R....37	57.11.3103	10 kOhm	2X			Siv=Siliconix; TD=Teletype Semiconductor;					
R....38	57.11.3103	10 kOhm	2X			T=Telefunken; TI=Texas Instruments					
R....39	57.11.3471	470 Ohm	2X								
R....40	57.11.3102	1 MOhm	2X								
R....41	57.11.3102	1 MOhm	2X								
R....42	57.11.3102	1 MOhm	2X								
R....43	57.11.3152	1.5 kOhm	2X								
R....44	57.11.3105	1 MOhm	2X								
R....45	57.11.3105	1 MOhm	2X								
R....46	57.11.3105	1 MOhm	2X								
R....47	57.11.3103	10 kOhm	2X								
R....48	57.11.3103	10 kOhm	2X								
R....49	57.11.3102	1 MOhm	2X								
R....50	57.11.3103	10 kOhm	2X								
R....51	57.11.3103	10 kOhm	2X								
R....52	57.11.3104	10 MOhm	5X								
R....53	57.11.3112	1.1 kOhm	1X								
R....54	57.11.3392	3.9 kOhm	2X								
S T U D E R (01) 90/01/08 DUB CODE READ/WRITE UNIT PL 1.820.721.87 PAGE 5						S T U D E R (01) 90/01/08 DUB CODE READ/WRITE UNIT PL 1.820.721.87 PAGE 8					
IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.	IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
R....55	57.11.3112	1.1 kOhm	1X								
R....56	57.11.3202	2 kOhm	1X								
R....57	57.11.3102	1 MOhm	1X								
R....58	57.11.3152	1.5 kOhm	1X								
R....59	57.11.3202	2 kOhm	1X								
R....60	57.11.3104	100 kOhm	2X								
R....61	57.11.3105	1 MOhm	2X								
R....62	57.11.3152	1.5 kOhm	1X								
R....63	57.11.0225	2.2 MOhm	5X								
R....64	57.11.3102	1 MOhm	2X								
R....65	57.11.3103	10 kOhm	2X								
R....66	57.11.3102	1 MOhm	1X								
R....67	57.11.3102	1 MOhm	1X								
R....68		not used									
R....69	57.11.3105	1 MOhm	2X								
R....70	57.11.3105	1 MOhm	2X								
R....71	57.11.3102	1 MOhm	2X								
R....72	57.11.3221	220 Ohm	2X								
R....73	57.11.3472	4.7 MOhm	5X								
R....74	57.11.3681	680 Ohm	2X								
R....75	57.11.3100	10 Ohm	2X								
R....76	57.11.3105	1 MOhm	2X								
R....78	57.11.3150	1.5 Ohm	2X								
R....80		not used									
R....81	57.11.3102	1 MOhm	2X								
R....82	57.11.3151	150 Ohm	2X								
R....83	57.11.3106	10 MOhm	5X								
R....84	57.11.3103	10 kOhm	2X								
R....85	57.11.3101	100 Ohm	2X								
R....86	57.11.3104	100 kOhm	2X								
R....87	57.11.3104	100 kOhm	2X								
R....88	57.11.3101	100 Ohm	2X								
R....89	57.11.3152	1.5 kOhm	2X								
R....90	57.11.3103	10 kOhm	2X								
R....91	57.11.3103	10 kOhm	2X								
R....92	57.11.3102	1 MOhm	2X								
R....93	57.11.3681	680 Ohm	2X								
S T U D E R (01) 90/01/08 DUB CODE READ/WRITE UNIT PL 1.820.721.87 PAGE 6											

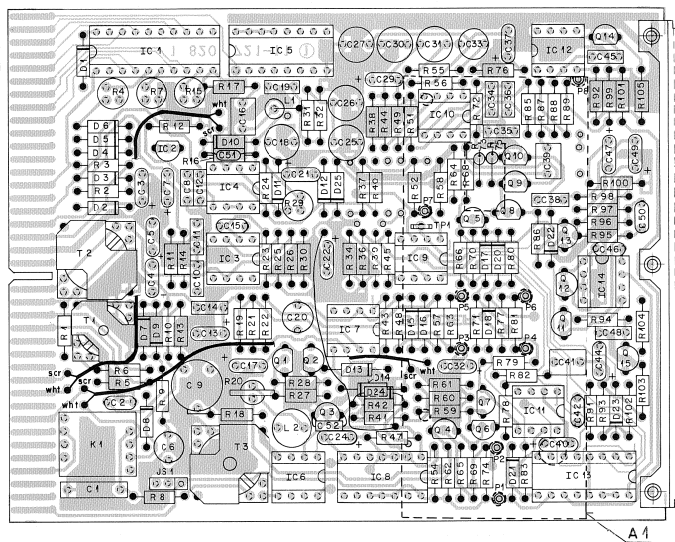


R	15	72	45	20	25	23	32	26	90	24	11	46	40	17	53	1
		51		89	50	99	105	89	29	87		14	58	52	35	
C	16	34		21	45			16	10	8	4					
				22	48			39	11	43	5					



WORKS ONLY IN CONJUNCTION  
WITH COMMAND UNIT 1.810.734-00 (LCD)

CODE READ/WRITE UNIT 4.810.724

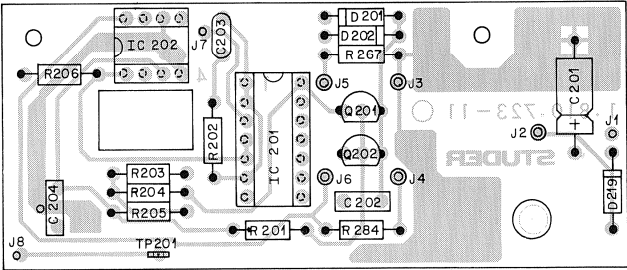


ITEM	POS.NUM	PART NUM	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF
0.00022	57-11-13672	4 x 7 1/8mm	1x		
0.00023	57-11-13671	4 x 7mm	1x		
0.00024	57-11-13674	4 x 7mm	2x		
0.00025	57-11-13675	4 x 7mm	2x		
0.00026	57-11-13676	4 x 7mm	2x		
0.00027	57-11-13677	4 x 7mm	2x		
0.00028	57-11-13672	4 x 7 1/8mm	1x		
0.00029	57-11-13672	1 1/2mm	1x		
0.00030	57-11-13673	4 x 7mm	2x		
0.00031	57-11-13672	1 1/2mm	1x		
0.00032	57-11-13674	100 1/8mm	2x		
0.00033	57-11-13672	2 x 2 1/2mm	1x		
0.00034	57-11-13672	2 x 2 1/2mm	1x		
0.00035	57-11-13673	15 1/8mm	2x		
0.00037	57-11-13672	22 1/8mm	1x		
0.00038	57-11-13672	1 1/2mm	1x		
0.00039	57-11-13673	10 1/8mm	1x		
0.00040	57-11-13705	750 1/8mm	1x		
0.00041	57-11-13707	4 x 1 1/2mm	1x		
0.00042	57-11-13676	10 1/8mm	1x		
0.00043	57-11-13672	4 x 7mm	4x		
0.00044	57-11-13672	1 1/2mm	1x		
0.00045	57-11-13673	33 1/8mm	1x		
0.00046	57-11-13673	not used	1x		
0.00047	57-11-13673	10 1/8mm	1x		
0.00048	57-11-13672	1 1/2mm	1x		
0.00049	57-11-13673	100 1/8mm	1x		
0.00050	57-11-13673	10 1/8mm	1x		
0.00051	57-11-13672	1 1/2mm	1x		
0.00052	57-11-13673	not used	1x		
0.00053	57-11-13673	10 1/8mm	1x		
0.00054	57-11-13673	10 1/8mm	1x		
0.00055	57-11-13672	1 x 5 1/8mm	1x		
0.00056	57-11-13672	1 x 5 1/8mm	1x		
0.00057	57-11-13672	1 1/2mm	1x		
0.00058	57-11-13676	100 1/8mm	1x		

ITEM NO.	PNOS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUFACTURER
Note 1	Contact pin	Stuffer Nr.	75 160-0020		
		Derp Nr.	75 160-102-36		
		Philips Nr.	62 925 89003		
Bridge:		Stuffer Nr.	75 160-0021		
		Derp Nr.	62 925-001		
		AMP Nr.	141 167-1		
		Philips Nr.	2422 028 40003		
Note 2	Potentiometer, linear	Bouras Nr.	3329 H - 1 - 203		
		98N Nr.	170 - 20K		
Note 3	Potentiometer, linear	Bouras Nr.	3329 H - 1 - 105		
		98N Nr.	170 - 1K		
Co=Ceramic, Sol=Solid Aluminum					
*MANUFACTURER: Ex=Exar, Fc=Fairchild, Gi=General Instruments, IIT=Intertecall, Mot=Motorola, NS=National Semiconductor, Phil=Philips, Rad=Radomex, RCA=Radio Corp. of America, Sov=Sovcomex, Lin=Lincomex, Sig=Signetics, SS=Studer, Ss=Siliconix, T=Telephony Semiconductor, Te=Telefunken, Ti=Texas Instruments					

ORIG 6312/17

TIME CODE TRIGGER PCB 1.810.723-00



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
C...	201	59.25.4100	10 uF	20%, 6.3V, E1	
C...	202	59.06.0103	10 nF	10%	
C...	203	59.34.4101	100 pF	5%, Ce	
C...	204	59.06.0474	0.47 uF	10%	
D...	201	50.04.0125	1N4448		Fc, ITT, Ph, Ses
D...	202	50.04.0125	1N4448		Fc, ITT, Ph, Ses
D...	219	50.04.0122	1N4001	1N4002, 1N4003, 1N4004	Mot, GI, Sol
IC...	201	50.06.0132	SN74LS132N	N74LS132N	TI, Sig
IC...	202	50.05.0283	LM393N	LM393P	NS, TI
J...	002	1.010.008.54		Contact jack	St
J...	003	1.010.008.54		Contact jack	St
J...	004	1.010.008.54		Contact jack	St
J...	005	1.010.008.54		Contact jack	St
J...	006	1.010.008.54		Contact jack	St
Q...	201	50.03.0436	BC237B	BC547B, BC550B	ITT, Mot, Ph, Sie
Q...	202	50.03.0496	BC540		Sie
R...	201	57.11.4221	220 Ohm	5%	
R...	202	57.11.5106	10 MOhm	5%	
R...	203	57.11.3362	2.4 kOhm	2%	
R...	204	57.11.4272	2.7 kOhm	2%	
R...	205	57.11.4683	68 kOhm	2%	
R...	206	57.11.4152	1.5 kOhm	5%	
R...	267	57.11.4102	1 kOhm	2%	
R...	284	57.11.3362	3.6 kOhm	2%	

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
Ce=Ceramic, E1=Electrolytic					
MANUFACTURER: Fc=Fairchild, GI=General Instruments, ITT=Intermetally, Mot=Motorola, NS=National Semiconductors, Ph=Philips, Ses=Sescomme, Sie=Siemens, Sig=Signetics, Sol=Solitron, St=Studer, TI=Texas Instruments					

ORIG 83/12/20



IND.	POS.ND.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	C...+01	59-94-00009	68 nF	Ce	
	C...+02	59-94-00100	100 uF	20%, 6V, 61	
	C...+03	59-94-00101	100 uF	20%, 6V, 61	
	C...+04	59-94-04971	470 pF	Ce	Oh
	C...+05	59-94-04972	470 pF	Ce	
	C...+06	59-94-2220	22 pF	Ce	
	C...+07	59-94-1212	470 pF	Ce	
	C...+08	59-94-0105	68 nF	Ce	
	C...+09	59-94-1001	100 uF	Ce	
	C...+10	59-94-00025	68 nF	Ce	
	C...+11	59-94-00025	68 nF	Ce	
	D...+01	59-04-0512	1N5818	1N5819	MoT
	D...+02	59-04-0122	1N4001	1N4002, 1N4003, 1N4004	Fe/LiMoT, MoT
	D...+03	59-04-0122	1N4001	1N4003, 1N4004	Fe/LiMoT, MoT
	I...+01	59-06-0183	5N74L153N	74L5153N	SigT
	I...+02	59-06-0183	5N74L153N	74L5153N	MoT
	I...+03	59-06-0183	5N74L153N	74L5153N	MoT
	I...+04	59-06-0183	5N74L153N	74L5153N	MoT
	I...+05	59-06-0183	5N74L153N	74L5153N	MoT
	I...+06	59-06-0183	5N74L153N	74L5153N	MoT
	I...+07	59-06-0183	5N74L153N	74L5153N	MoT
	I...+08	59-06-0183	5N74L153N	74L5153N	MoT
	I...+09	59-06-0183	5N74L153N	74L5153N	MoT
	I...+10	59-06-0183	5N74L153N	74L5153N	MoT
	I...+11	59-06-0183	5N74L153N	74L5153N	MoT
	I...+12	59-06-0183	5N74L153N	74L5153N	MoT
	I...+13	59-06-0183	5N74L153N	74L5153N	MoT
	I...+14	59-06-0183	5N74L153N	74L5153N	MoT
	I...+15	59-06-0183	5N74L153N	74L5153N	MoT
	I...+16	59-06-0183	5N74L153N	74L5153N	MoT
	I...+17	59-06-0183	5N74L153N	74L5153N	MoT
	I...+18	59-06-0183	5N74L153N	74L5153N	MoT
	I...+19	59-06-0183	5N74L153N	74L5153N	MoT
	I...+20	59-06-0183	5N74L153N	74L5153N	MoT
	I...+21	59-06-0183	5N74L153N	74L5153N	MoT
	I...+22	59-06-0183	5N74L153N	74L5153N	MoT
	I...+23	59-06-0183	5N74L153N	74L5153N	MoT
	I...+24	59-06-0183	5N74L153N	74L5153N	MoT
	I...+25	59-06-0183	5N74L153N	74L5153N	MoT
	I...+26	59-06-0183	5N74L153N	74L5153N	MoT
	I...+27	59-06-0183	5N74L153N	74L5153N	MoT
	I...+28	59-06-0183	5N74L153N	74L5153N	MoT
	I...+29	59-06-0183	5N74L153N	74L5153N	MoT
	I...+30	59-06-0183	5N74L153N	74L5153N	MoT
	I...+31	59-06-0183	5N74L153N	74L5153N	MoT
	I...+32	59-06-0183	5N74L153N	74L5153N	MoT
	I...+33	59-06-0183	5N74L153N	74L5153N	MoT
	I...+34	59-06-0183	5N74L153N	74L5153N	MoT
	I...+35	59-06-0183	5N74L153N	74L5153N	MoT
	I...+36	59-06-0183	5N74L153N	74L5153N	MoT
	I...+37	59-06-0183	5N74L153N	74L5153N	MoT
	I...+38	59-06-0183	5N74L153N	74L5153N	MoT
	I...+39	59-06-0183	5N74L153N	74L5153N	MoT
	I...+40	59-06-0183	5N74L153N	74L5153N	MoT
	I...+41	59-06-0183	5N74L153N	74L5153N	MoT
	I...+42	59-06-0183	5N74L153N	74L5153N	MoT
	I...+43	59-06-0183	5N74L153N	74L5153N	MoT
	I...+44	59-06-0183	5N74L153N	74L5153N	MoT
	I...+45	59-06-0183	5N74L153N	74L5153N	MoT
	I...+46	59-06-0183	5N74L153N	74L5153N	MoT
	I...+47	59-06-0183	5N74L153N	74L5153N	MoT
	I...+48	59-06-0183	5N74L153N	74L5153N	MoT
	I...+49	59-06-0183	5N74L153N	74L5153N	MoT
	I...+50	59-06-0183	5N74L153N	74L5153N	MoT
	I...+51	59-06-0183	5N74L153N	74L5153N	MoT
	I...+52	59-06-0183	5N74L153N	74L5153N	MoT
	I...+53	59-06-0183	5N74L153N	74L5153N	MoT
	I...+54	59-06-0183	5N74L153N	74L5153N	MoT
	I...+55	59-06-0183	5N74L153N	74L5153N	MoT
	I...+56	59-06-0183	5N74L153N	74L5153N	MoT
	I...+57	59-06-0183	5N74L153N	74L5153N	MoT
	I...+58	59-06-0183	5N74L153N	74L5153N	MoT
	I...+59	59-06-0183	5N74L153N	74L5153N	MoT
	I...+60	59-06-0183	5N74L153N	74L5153N	MoT
	I...+61	59-06-0183	5N74L153N	74L5153N	MoT
	I...+62	59-06-0183	5N74L153N	74L5153N	MoT
	I...+63	59-06-0183	5N74L153N	74L5153N	MoT
	I...+64	59-06-0183	5N74L153N	74L5153N	MoT
	I...+65	59-06-0183	5N74L153N	74L5153N	MoT
	I...+66	59-06-0183	5N74L153N	74L5153N	MoT
	I...+67	59-06-0183	5N74L153N	74L5153N	MoT
	I...+68	59-06-0183	5N74L153N	74L5153N	MoT
	I...+69	59-06-0183	5N74L153N	74L5153N	MoT
	I...+70	59-06-0183	5N74L153N	74L5153N	MoT
	I...+71	59-06-0183	5N74L153N	74L5153N	MoT
	I...+72	59-06-0183	5N74L153N	74L5153N	MoT
	I...+73	59-06-0183	5N74L153N	74L5153N	MoT
	I...+74	59-06-0183	5N74L153N	74L5153N	MoT
	I...+75	59-06-0183	5N74L153N	74L5153N	MoT
	I...+76	59-06-0183	5N74L153N	74L5153N	MoT
	I...+77	59-06-0183	5N74L153N	74L5153N	MoT
	I...+78	59-06-0183	5N74L153N	74L5153N	MoT
	I...+79	59-06-0183	5N74L153N	74L5153N	MoT
	I...+80	59-06-0183	5N74L153N	74L5153N	MoT
	I...+81	59-06-0183	5N74L153N	74L5153N	MoT
	I...+82	59-06-0183	5N74L153N	74L5153N	MoT
	I...+83	59-06-0183	5N74L153N	74L5153N	MoT
	I...+84	59-06-0183	5N74L153N	74L5153N	MoT
	I...+85	59-06-0183	5N74L153N	74L5153N	MoT
	I...+86	59-06-0183	5N74L153N	74L5153N	MoT
	I...+87	59-06-0183	5N74L153N	74L5153N	MoT
	I...+88	59-06-0183	5N74L153N	74L5153N	MoT
	I...+89	59-06-0183	5N74L153N	74L5153N	MoT
	I...+90	59-06-0183	5N74L153N	74L5153N	MoT
	I...+91	59-06-0183	5N74L153N	74L5153N	MoT
	I...+92	59-06-0183	5N74L153N	74L5153N	MoT
	I...+93	59-06-0183	5N74L153N	74L5153N	MoT
	I...+94	59-06-0183	5N74L153N	74L5153N	MoT
	I...+95	59-06-0183	5N74L153N	74L5153N	MoT
	I...+96	59-06-0183	5N74L153N	74L5153N	MoT
	I...+97	59-06-0183	5N74L153N	74L5153N	MoT
	I...+98	59-06-0183	5N74L153N	74L5153N	MoT
	I...+99	59-06-0183	5N74L153N	74L5153N	MoT
	I...+100	59-06-0183	5N74L153N	74L5153N	MoT
	I...+101	59-06-0183	5N74L153N	74L5153N	MoT
	I...+102	59-06-0183	5N74L153N	74L5153N	MoT
	I...+103	59-06-0183	5N74L153N	74L5153N	MoT
	I...+104	59-06-0183	5N74L153N	74L5153N	MoT
	I...+105	59-06-0183	5N74L153N	74L5153N	MoT
	I...+106	59-06-0183	5N74L153N	74L5153N	MoT
	I...+107	59-06-0183	5N74L153N	74L5153N	MoT
	I...+108	59-06-0183	5N74L153N	74L5153N	MoT
	I...+109	59-06-0183	5N74L153N	74L5153N	MoT
	I...+110	59-06-0183	5N74L153N	74L5153N	MoT
	I...+111	59-06-0183	5N74L153N	74L5153N	MoT
	I...+112	59-06-0183	5N74L153N	74L5153N	MoT
	I...+113	59-06-0183	5N74L153N	74L5153N	MoT
	I...+114	59-06-0183	5N74L153N	74L5153N	MoT
	I...+115	59-06-0183	5N74L153N	74L5153N	MoT
	I...+116	59-06-0183	5N74L153N	74L5153N	MoT
	I...+117	59-06-0183	5N74L153N	74L5153N	MoT
	I...+118	59-06-0183	5N74L153N	74L5153N	MoT
	I...+119	59-06-0183	5N74L153N	74L5153N	MoT
	I...+120	59-06-0183	5N74L153N	74L5153N	MoT
	I...+121	59-06-0183	5N74L153N	74L5153N	MoT
	I...+122	59-06-0183	5N74L153N	74L5153N	MoT
	I...+123	59-06-0183	5N74L153N	74L5153N	MoT
	I...+124	59-06-0183	5N74L153N	74L5153N	MoT
	I...+125	59-06-0183	5N74L153N	74L5153N	MoT
	I...+126	59-06-0183	5N74L153N	74L5153N	MoT
	I...+127	59-06-0183	5N74L153N	74L5153N	MoT
	I...+128	59-06-0183	5N74L153N	74L5153N	MoT
	I...+129	59-06-0183	5N74L153N	74L5153N	MoT
	I...+130	59-06-0183	5N74L153N	74L5153N	MoT
	I...+131	59-06-0183	5N74L153N	74L5153N	MoT
	I...+132	59-06-0183	5N74L153N	74L5153N	MoT
	I...+133	59-06-0183	5N74L153N	74L5153N	MoT
	I...+134	59-06-0183	5N74L153N	74L5153N	MoT
	I...+135	59-06-0183	5N74L153N	74L5153N	MoT
	I...+136	59-06-0183	5N74L153N	74L5153N	MoT
	I...+137	59-06-0183	5N74L153N	74L5153N	MoT
	I...+138	59-06-0183	5N74L153N	74L5153N	MoT
	I...+139	59-06-0183	5N74L153N	74L5153N	MoT
	I...+140	59-06-0183	5N74L153N	74L5153N	MoT
	I...+141	59-06-0183	5N74L153N	74L5153N	MoT
	I...+142	59-06-0183	5N74L153N	74L5153N	MoT
	I...+143	59-06-0183	5N74L153N	74L5153N	MoT
	I...+144	59-06-0183	5N74L153N	74L5153N	MoT
	I...+145	59-06-0183	5N74L153N	74L5153N	MoT
	I...+146	59-06-0183	5N74L153N	74L5153N	MoT
	I...+147	59-06-0183	5N74L153N	74L5153N	MoT
	I...+148	59-06-0183	5N74L153N	74L5153N	MoT
	I...+149	59-06-0183	5N74L153N	74L5153N	MoT
	I...+150	59-06-0183	5N74L153N	74L5153N	MoT
	I...+151	59-06-0183	5N74L153N	74L5153N	MoT
	I...+152	59-06-0183	5N74L153N	74L5153N	MoT
	I...+153	59-06-0183	5N74L153N	74L5153N	MoT
	I...+154	59-06-0183	5N74L153N	74L5153N	MoT
	I...+155	59-06-0183	5N74L153N	74L5153N	MoT
	I...+156	59-06-0183	5N74L153N	74L5153N	MoT
	I...+157	59-06-0183	5N74L153N	74L5153N	MoT
	I...+158	59-06-0183	5N74L153N	74L5153N	MoT
	I...+159	59-06-0183	5N74L153N	74L5153N	MoT
	I...+160	59-06-0183	5N74L153N	74L5153N	MoT
	I...+161	59-06-0183	5N74L153N	74L5153N	MoT
	I...+162	59-06-0183	5N74L153N	74L5153N	MoT
	I...+163	59-06-0183	5N74L153N	74L5153N	MoT
	I...+164	59-06-0183	5N74L153N	74L5153N	MoT
	I...+165	59-06-0183	5N74L153N	74L5153N	MoT
	I...+166	59-06-0183	5N74L153N	74L5153N	MoT
	I...+167	59-06-0183	5N74L153N	74L5153N	MoT
	I...+168	59-06-0183	5N74L153N	74L5153N	MoT
	I...+169	59-06-0183	5N74L153N	74L5153N	MoT
	I...+170	59-06-0183	5N74L153N	74L5153N	MoT
	I...+171	59-06-0183	5N74L153N	74L5153N	MoT
	I...+172	59-06-0183	5N74L153N	74L5153N	MoT
	I...+173	59-06-0183	5N74L153N	74L5153N	MoT
	I...+174	59-06-018			

IND.	PDS-NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
L.....01		62-01-0115		Interference coil, Philips Nr 4312 320 36900	
.....02		57-11-1013	10 kOhm	%	
.....03		57-11-1013	10 kOhm	%	
.....04		57-11-1013	10 kOhm	%	
.....05		57-11-1013	10 kOhm	%	
.....06		57-11-1013	10 kOhm	%	
.....07		57-11-1013	10 kOhm	%	
.....08		57-11-1013	10 kOhm	%	
.....09		57-11-1013	10 kOhm	%	
.....10		57-11-1013	10 kOhm	%	
.....11		57-11-1013	10 kOhm	%	
.....12		57-11-1013	10 kOhm	%	
.....13		57-11-1013	10 kOhm	%	
.....14		57-11-1013	10 kOhm	%	
.....15		57-11-1013	10 kOhm	%	
.....16		57-11-1013	10 kOhm	%	
.....17		57-11-1013	10 kOhm	%	
.....18		57-11-1013	10 kOhm	%	
.....19		57-11-1013	10 kOhm	%	
.....20		57-11-1013	10 kOhm	%	
.....21		57-11-1013	10 kOhm	%	
.....22		57-11-1013	10 kOhm	%	
.....23		57-11-1013	10 kOhm	%	
.....24		57-11-1013	10 kOhm	%	
.....25		57-11-1013	10 kOhm	%	
.....26		57-11-1013	10 kOhm	%	
.....27		57-11-1013	10 kOhm	%	
.....28		57-11-1013	10 kOhm	%	
.....29		57-11-1013	10 kOhm	%	
.....30		57-11-1013	10 kOhm	%	
.....31		57-11-1013	10 kOhm	%	
.....32		57-11-1013	10 kOhm	%	
.....33		57-11-1013	10 kOhm	%	
.....34		57-11-1013	10 kOhm	%	
.....35		57-11-1013	10 kOhm	%	
.....36		57-11-1013	10 kOhm	%	
.....37		57-11-1013	10 kOhm	%	
.....38		57-11-1013	10 kOhm	%	
.....39		57-11-1013	10 kOhm	%	
.....40		57-11-1013	10 kOhm	%	
.....41		57-11-1013	10 kOhm	%	
.....42		57-11-1013	10 kOhm	%	
.....43		57-11-1013	10 kOhm	%	
.....44		57-11-1013	10 kOhm	%	
.....45		57-11-1013	10 kOhm	%	
.....46		57-11-1013	10 kOhm	%	
.....47		57-11-1013	10 kOhm	%	
.....48		57-11-1013	10 kOhm	%	
.....49		57-11-1013	10 kOhm	%	
.....50		57-11-1013	10 kOhm	%	
.....51		57-11-1013	10 kOhm	%	
.....52		57-11-1013	10 kOhm	%	
.....53		57-11-1013	10 kOhm	%	
.....54		57-11-1013	10 kOhm	%	
.....55		57-11-1013	10 kOhm	%	
.....56		57-11-1013	10 kOhm	%	
.....57		57-11-1013	10 kOhm	%	
.....58		57-11-1013	10 kOhm	%	
.....59		57-11-1013	10 kOhm	%	
.....60		57-11-1013	10 kOhm	%	
.....61		57-11-1013	10 kOhm	%	
.....62		57-11-1013	10 kOhm	%	
.....63		57-11-1013	10 kOhm	%	
.....64		57-11-1013	10 kOhm	%	
.....65		57-11-1013	10 kOhm	%	
.....66		57-11-1013	10 kOhm	%	
.....67		57-11-1013	10 kOhm	%	
.....68		57-11-1013	10 kOhm	%	

**SECTION 8 ERSATZTEILE/SPARE PARTS**  
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**WARNUNG**

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Netzteil und Teile des Laufwerkes fuehren gefaehrliche Spannungen. Trotz des vorhandenen Beruehrungsschutzes innerhalb des Geraetes wird nach Entfernen der Geraeteverschalungen vorsichtiges Hantieren empfohlen. Vor dem Ausbau von Baugruppen ist der Netzstecker zu ziehen.

Um eine unzuellaessige Magnetisierung der Tonkoepfe zu vermeiden, muss das Geraet vor dem Entfernen des Kopftraegers ausgeschaltet werden!

Das Geraet muss mindestens 5 Sekunden ausgeschaltet sein, bevor Printplatten ausgezogen oder eingesteckt werden!

**Hinweis**

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Die Ausbauanleitungen beziehen sich auf das **stehende** Geraet.

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**CAUTION**

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Power supply and parts of the tape transport carry dangerous voltages. In spite of protections against contact inside the tape recorder, careful handling is recommended after having removed the covers. Before removing any subassembly, disconnect the mains plug.

To avoid inadmissible magnetisation of the sound heads, switch the recorder off before removing the head block.

The recorder has to be switched off for at least 5 seconds before any printed circuit boards are removed or inserted!

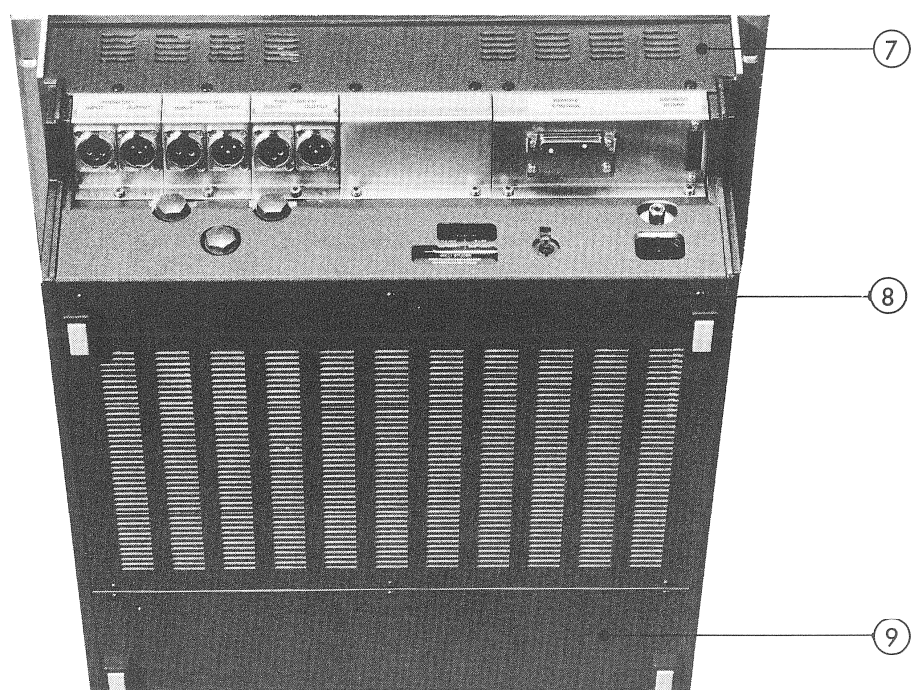
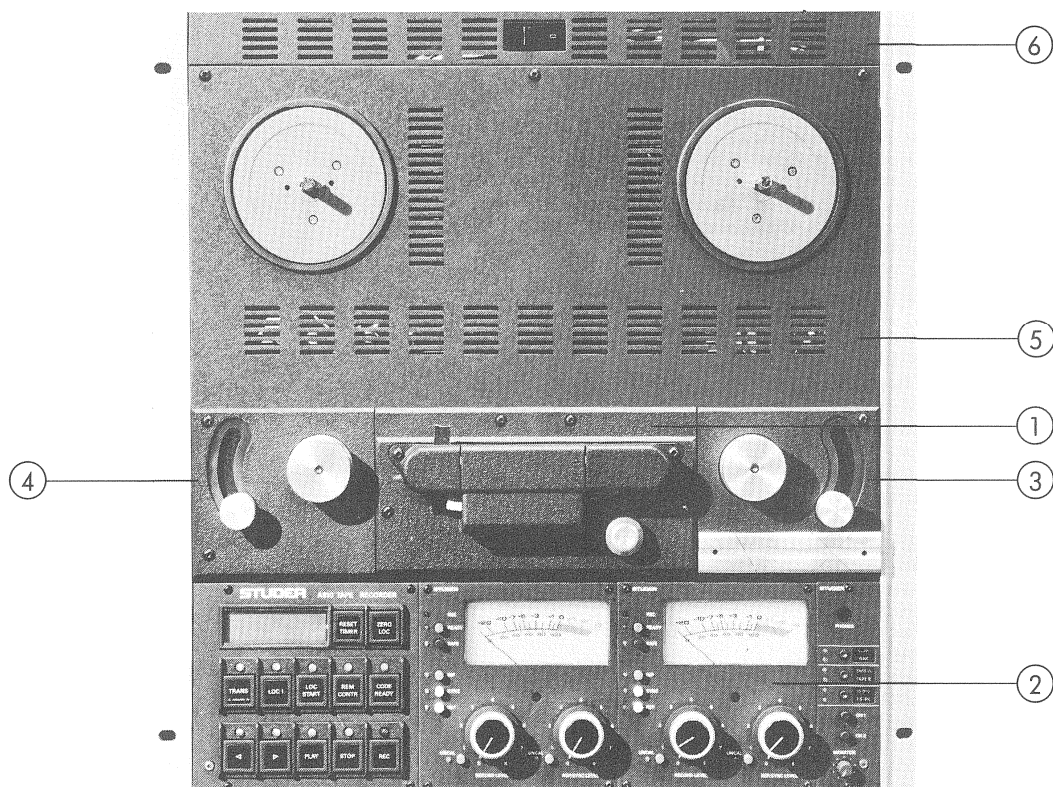
**Note**

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The disassembly instructions are referred to with the recorder in **upright** position.

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## 8.1

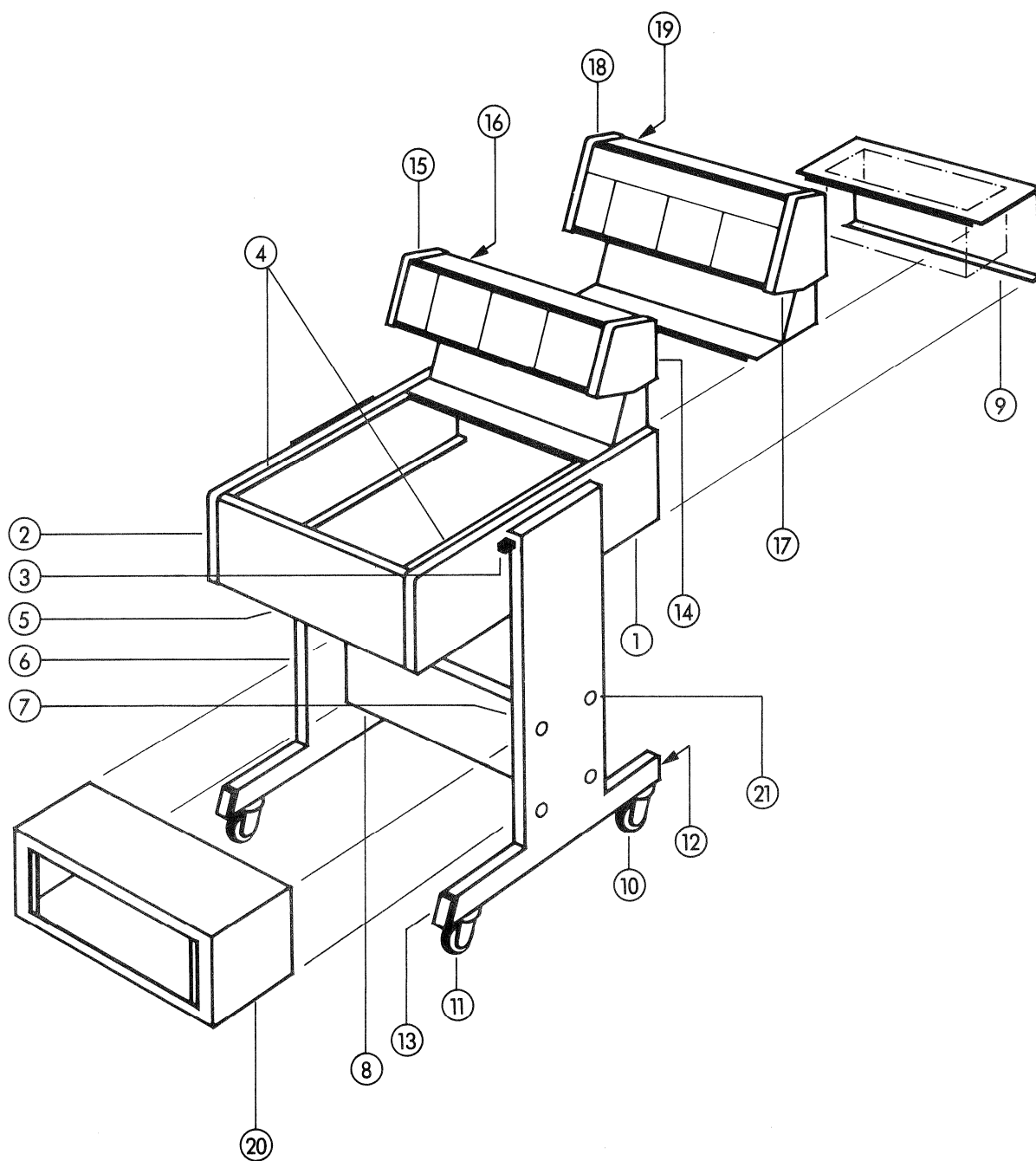
VERKLEIDUNGEN UND ZUBEHOER  
COVERING AND ACCESSORIES



# 8.1 VERKLEIDUNGEN UND ZUBEHOER COVERING AND ACCESSORIES

POS	QTY	ORDER NUMBER	BEZEICHNUNG / PART NAME
01	1	1.810.186.00	Kopftraegerabdeckung kompl. Headblock cover compl. Screw S IS M3x5
02			Panels, siehe 8.12 Panels, see 8.12
03	1	1.810.090.32	Abdeckung fuer Bandzugwaage rechts Cover to right-hand tape tension sensor
04	1	1.810.090.33	Abdeckung fuer Bandzugwaage links Cover to left-hand tape tension sensor zu 03, 04: to 03, 04:
	4	1.010.007.21	Schraube LIN IS M4x8 Screw LIN IS M4x8 zu 03: to 03:
	1	1.810.090.51	Klebeschiene Splicing block
	2	22.01.8030	Sechskantmutter M3 Hex. nut M3
	2	23.01.2032	Unterlagscheibe D 3,2/7 Washer D 3.2/7
	2	24.16.1030	Sicherungsscheibe D 3,2/5,5 Lock Washer D 3.2/5.5
05	1	1.810.090.30	Laufwerkabdeckung kompl. Tape transport cover compl.
	2	1.810.090.29	Schutzring Protection ring
	3	1.010.007.21	Schraube LIN IS M4x8 Screw LIN IS M4x8
06	1	1.810.090.08	Abdeckleiste Cover bracket
	4	21.53.0455	Schraube Z IS M4x8 Screw Z IS M4x8
	4	23.01.1043	Unterlagscheibe D 4,3/8 Washer D 4.3/8
07	1	1.810.090.31	Abdeckung oben Top cover
	7	1.010.007.21	Schraube LIN IS M4x8 Screw LIN IS M4x8
08	1	1.810.251.00	Rueckwand, oben; kompl. mit Fuessen Rear cover, upper; compl. with feet
	6	1.010.007.21	Schraube LIN IS M4x8 Screw LIN IS M4x8
	2	1.177.930.08	Fuss Foot
	2	1.067.010.08	Fusseinlage Foot insertion
09	1	1.810.250.00	Rueckwand, unten; kompl. m. Isolation, mit Fuessen Rear cover, lower; compl. w. insulation, w. feet
	5	1.010.007.21	Schraube LIN IS M4x8 Screw LIN IS M4x8
	6	1.177.930.08	Fuss Foot
	6	1.067.010.08	Fusseinlage Foot insertion
	2	1.810.075.00	Griffset kompl. (fuer Konsolenversion) Set of handles (console version)
	2	21.53.2507	Schraube S IS M5x12 Screw S IS M5x12
	2	21.53.2512	Schraube S IS M5x25 Screw S IS M5x25
	2	1.810.075.01	Griffunterlage Handle support
	1	1.810.077.00	Seitenabdeckung, Set; Holz, kompl. Set of wooden side panels, compl.
	4	21.53.0510	Schraube Z IS M5x20 Screw Z IS M5x20
	4	21.53.0535	Schraube Z IS M5x35 Screw Z IS M5x35
	8	21.51.8460	Schraube LIN IS M4x20 Screw LIN IS M4x20
	2	1.810.077.04	Klappgriff, kompl. Hinged handle, compl.
	1	1.810.078.00	Deckel fuer portable Ausfuehrung Cover for portable version

8.2  
Konsole  
Console



## 8.2

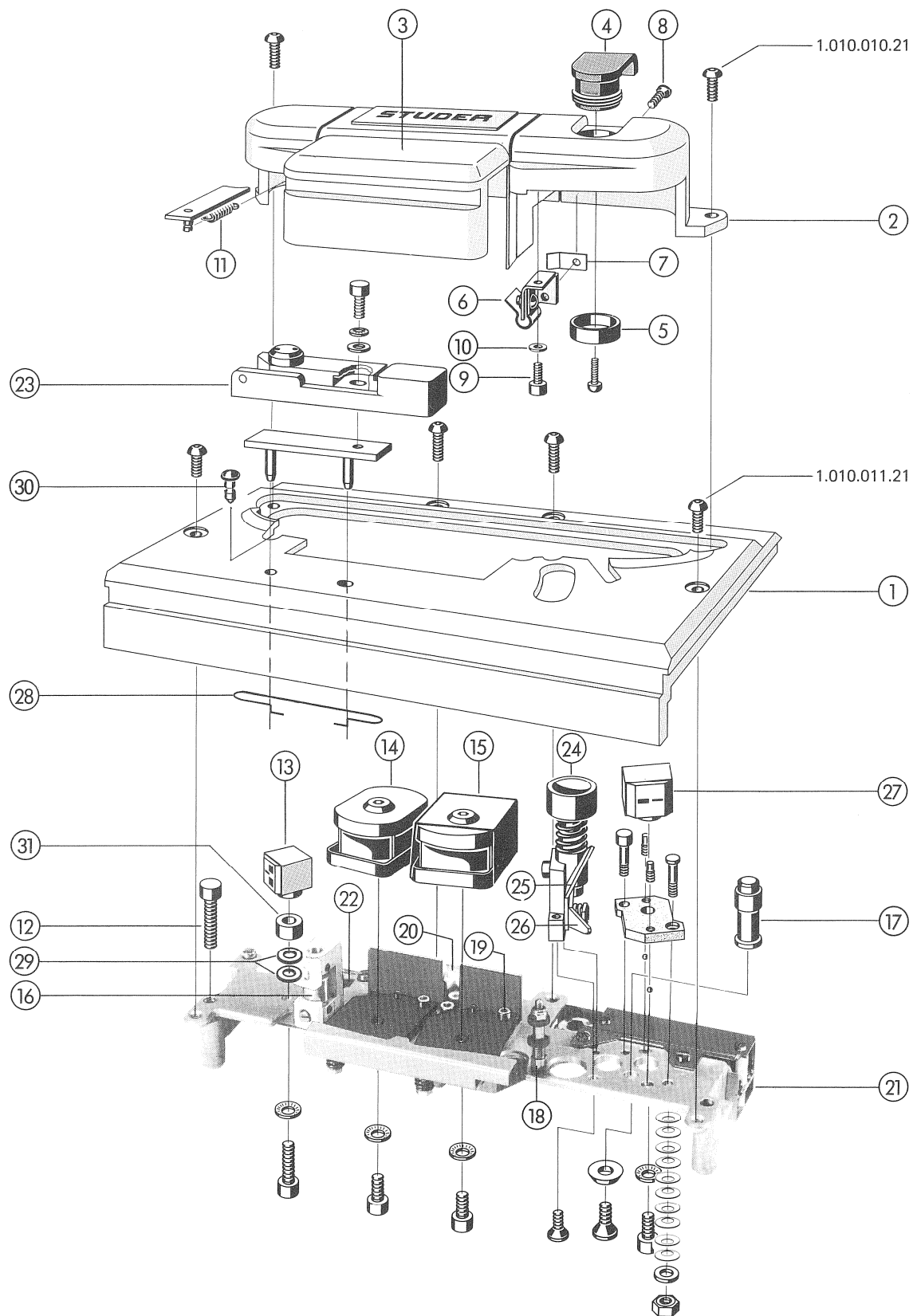
Konsole  
Console

POS	QTY	ORDER NUMBER	BEZEICHNUNG / PART NAME
1		1.038.880.00	Konsole Console
4		21.99.0167	Schraube M6x16 Screw M6x16
4		23.99.0121	U-Scheibe Flat washer
01	1	1.038.880.03	Seitenwand Holz, rechts Side board wood, right
6		21.53.0454	Schraube Z IS M4x6 Screw Z IS M4x6
02	1	1.038.880.04	Seitenwand Holz, links Side board wood, left
6		21.53.0454	Schraube Z IS M4x6 Screw Z IS M 4x6
03	2	1.038.880.05	Taste Push button
04	2	1.038.880.21	Leiste Mounting angle
6		21.26.2353	Schraube S KS M3x5 Screw S KS M3x5
05	1	1.038.880.10	Frontblech Front cover, console
4		21.51.8455	Schraube LIN M4x8 Screw LIN M4x8
06	1	1.038.881.81	Bein, links Leg, left
1		1.038.880.07	Abdeckung, links Side cover console, left
1		1.038.880.36	Abdeckblech Side cover, inside
8		21.51.8354	Schraube LIN M3x6 Screw LIN M3x6
07	1	1.038.882.81	Bein, rechts Leg, rechts
1		1.038.880.07	Abdeckung, rechts Side cover console, right
1		1.038.880.36	Abdeckblech Side cover, inside
8		21.51.8354	Schraube LIN M3x6 Screw LIN M3x6
08	1	1.038.883.00	Traverse Traverse
09	1	1.038.885.00	Abdeckblech hinten kpl. Rear cover back cpl.
or	1	1.038.884.00	Abdeckung mit Ablagewanne Rear cover with storage bin
		33.02.0110	Verschlusszapfen Spec. lock
10	2	33.04.0202	Lenkrolle Castor
	2	21.59.5571	Gewindestift IS M6x14 Set screw IS M6x14
11	2	33.04.0203	Lenkrolle mit Bremse Castor with break
	2	21.59.5571	Gewindestift IS M6x14 Set screw IS M6x14
12	2	1.038.880.01	Abschlusspfropfen Plastic plug
13	2	1.038.880.02	Abschlusspfropfen Plastic plug
		1.038.886.00	VU-Panel VU-Panel
	4	21.99.0167	Schraube M6x16 Screw M6x16
	4	23.99.0121	U-Scheibe Flat washer
14	1	1.038.886.01	Blende Holz, rechts Side panel penthouse wood, right
	4	21.53.0454	Schraube Z IS M4x6 Screw Z IS M4x6
15	1	1.038.886.02	Blende Holz, links Side panel penthouse wood, left

POS QTY ORDER NUMBER BEZEICHNUNG / PART NAME

	4	21.53.0454	Schraube Z IS M4x6 Screw Z IS M4x6
16	1	1.038.886.08	Rueckwand Rear panel, penthouse
	4	33.02.0110	Verschlusszapfen Spec. lock
	1	1.038.888.00	Synchronizer + VU-Panel Synchronizer + VU-Panel
	4	21.99.0167	Schraube M6x16 Screw M6x16
	4	23.99.0121	U-Scheibe Flat washer
		21.812.171.81	Blindabdeckung grau Filler panel grey
17	1	1.038.888.01	Blende Holz, rechts Side panel penthouse wood, right
	4	21.53.0454	Schraube Z IS M4x6 Screw Z IS M4x6
18	1	1.038.888.02	Blende Holz, links Side panel penthouse wood, left
	4	21.53.0454	Schraube Z IS M4x6 Screw Z IS M4x6
19	1	1.038.888.08	Rueckwand rear panel, penthouse
	4	33.02.0110	Verschlusszapfen Spec. lock
20	1	1.038.890.00	Rackunterbau Pedestal rack
	8	21.53.0556	Schraub Z IS M6x10 Screw Z IS M6x10
	12	21.99.0167	Schraube M6x16 Screw M6x16
	12	23.99.0121	U-Scheibe Flat washer
		1.918.001.00	Blindabdeckung weiss (Alu) 1unit Filler panel white (alu) 1unit
		1.918.002.00	Blindabdeckung weiss (Alu) 2unit Filler panel white (alu) 2unit
		1.918.003.00	Blindabdeckung weiss (Alu) 3unit Filler panel white (alu) 3unit
21	8	31.03.0106	Abdeckkappe D18.5/15.9mm Cover cap D18.5/15.9mm

**8.3**  
**KOPFTRAEGER**  
**HEAD BLOCK ASSEMBLY**



## 8.3

## Kopfträger

## Head Block Assembly

Index	Qty.	Order No.	Part Name	Specification
1	1	1.810.186.01	Kopfträger-Abdeckung	} kompl./compl. 1.810.186.00
2	1	1.810.171.00	Headblock cover plate	
	1	1.810.172.01	Kopfbedeckung	
			Head cover	
			Zusatzabschirmung	
3		1.810.176.00	Additional screening	
			Abschirmklappe	
4	1	1.810.185.02	Screening flap	
			Abdeckkappe	
5	1	1.810.185.03	Cover Cap	
			Kappe	
	1	20.25.0105	Cap	
			Schraube Z-Kerb	
			Screw Z, self-tapping	
6	1	1.810.178.00	Halterung rechts, genietet	
			Right-hand holder, riveted	
7	1	1.810.180.08	Erdfeder	
			Grounding spring	
8	1	21.51.2354	Schraube S IS	M3x6
			Screw S IS	M3x6
9	1	21.53.0353	Schraube Z IS	M3x5
			Screw Z IS	M3x5
10	1	24.16.1030	Sicherungsscheibe	D3,2 / 5,5
			Lock washer	D3.2 / 5.5
11	1	1.080.230.04	Zugfeder	
			Tension spring	
12	3	21.53.0465	Schraube Z IS	M4x35
			Screw Z IS	M4x35
		1.020.880.00	Kopfträger kompl. MONO	
			Head block compl. MONO	
13	1	1.116.097.81	Löschkopf MONO	
			Erase head MONO	
	1	21.53.0455	Schraube Z IS	M4x8
			Screw Z IS	M4x8
	1	24.16.1040	Sicherungsscheibe	D4,3 / 7
			Lock washer	D4.3 / 7
14	1	1.317.610.00	Aufnahmekopf MONO	
			Record head MONO	
	1	21.53.0455	Schraube Z IS	M4x8
			Screw Z IS	M4x8
	1	24.16.1040	Sicherungsscheibe	D4,3 / 7
			Lock washer	D4.3 / 7
15	1	1.317.616.00	Wiedergabekopf MONO	
			Reproduce head MONO	
	1	21.53.0455	Schraube Z IS	M4x8
			Screw Z IS	M4x8
	1	24.16.1040	Sicherungsscheibe	D4,3 / 7
			Lock washer	D4.3 / 7
	1	1.020.880.24	Zusatzabschirmung	
			Additional screening	
16	1	1.020.892.00	Beruhigungsrolle kompl.	
			Anti-scrape flutter roller compl.	
	2	21.53.0355	Schraube Z IS	M3x8
			Screw Z IS	M3x8
17	1	1.020.850.24	Umlenkbolzen rechts	
			Right-hand tape guide pin	
	1	1.010.002.23	Spez. U-Scheibe, massiv	
			Spec. washer, massive	
	1	21.51.2354	Schraube S IS	M3x6
			Screw S IS	M3x6
18	1	1.020.859.00	Bandführung kompl.	
			Tape guide compl.	
19	2	1.020.710.05	Taumelschraube (Z IS)	
			Swivel screw (Z IS)	
20	1	1.020.880.05	Erdfeder	
			Grounding spring	

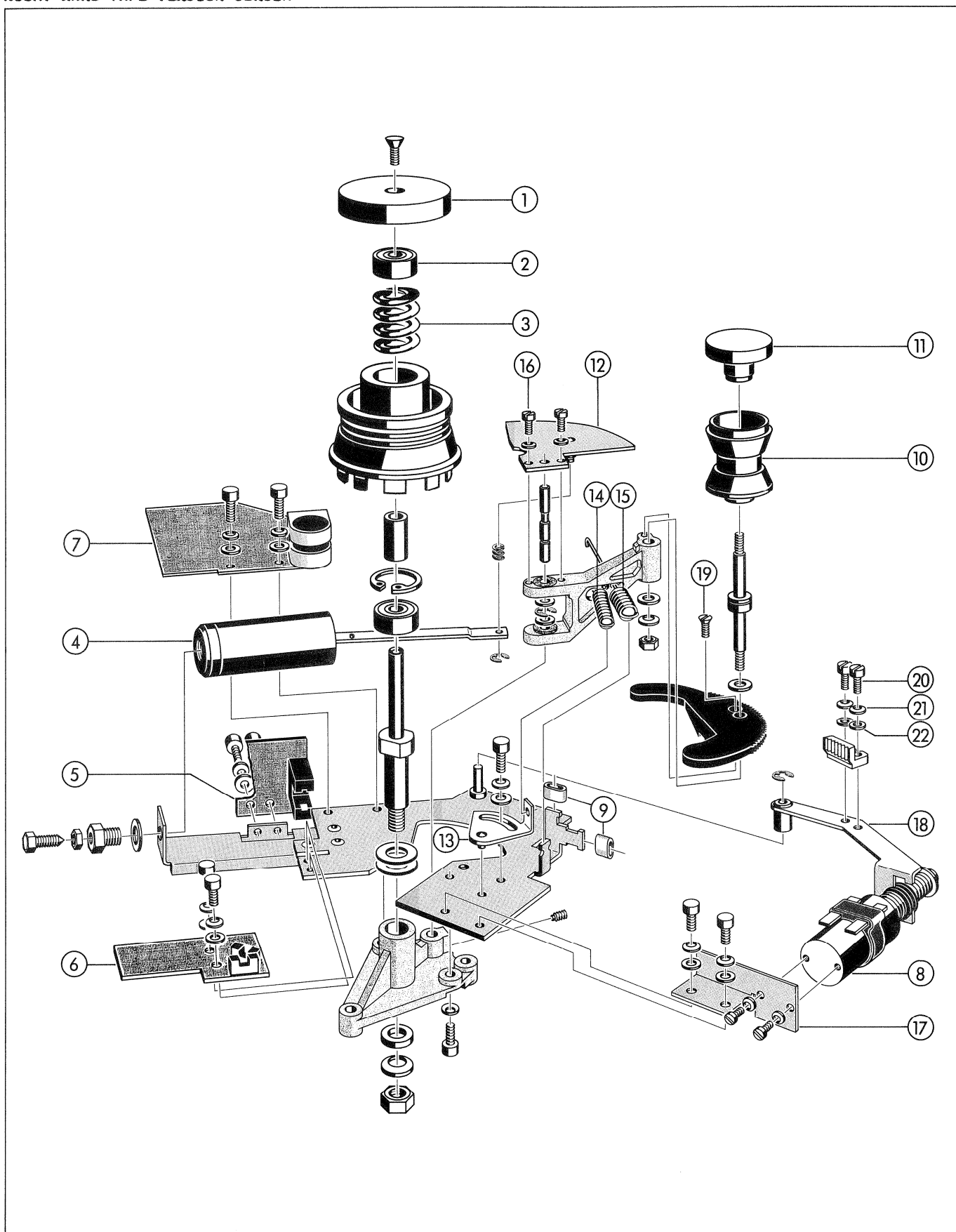
Index	Qty.	Order No.	Part Name	Specification
21	1	1.810.710.81	Vorverstärker MONO	
	2	21.01.0277	Preamplifier MONO	
	2	24.16.1025	Schraube Z	M2,5x4
			Screw Z	M2,5x4
			Sicherungsscheibe	D2,7 / 5
			Lock washer	D2,7 / 5
22	1	54.13.1003	Stecker, Typ D, 25 polig, Lötanschlüsse	
			Connector, D type, 25 pin, solder contacts	
23	1	1.810.402.81	Markiervorrichtung kompl.	
			Tape marker compl.	
or	2	1.810.186.02	Abdeckzapfen	
			Cover peg	
24	1	1.020.888.83	Bandschere kompl.	
			Tape cutting scissors compl.	
		21.51.2354	Schraube S IS	M3x6
			Screw S IS	M3x6
25	1	1.020.888.10	Feste Klinge	
			Fixed blade	
26	1	1.020.888.11	Bewegliche Klinge	
			Moving blade	
28	1	1.810.400.05	Spannklammer	
			Clamping spring	
29	4	1.010.070.23	Distanz Scheibe	
			Washer	
30	2	1.810.186.02	Abdeckstopfen	
			Stopper	
31	1	1.116.810.21	TC-Kopf distanzring	
			TC head spacing ring	
		1.020.881.00	Kopfträger kompl. 2CH, 2mm	
			Head block compl. 2CH, 2mm	
			wie 1.020.880.00 ausgenommen:	
			like 1.020.880.00 except:	
13	1	1.116.092.81	Löschkopf 2CH	
			Erase head 2CH	
14	1	1.317.620.00	Aufnahmekopf 2CH, 2mm	
			Record head 2CH, 2mm	
15	1	1.317.626.00	Wiedergabekopf 2CH, 2mm	
			Reproduce head 2CH, 2mm	
21	1	1.810.711.81	Vorverstärker 2CH	
			Preamplifier 2CH	
		1.020.882.00	Kopfträger kompl. 2CH, 0,75mm	
			Head block compl. 2CH, 0,75mm	
			wie 1.020.880.00 ausgenommen:	
			like 1.020.880.00 except:	
13	1	1.116.092.81	Löschkopf 2CH	
			Erase head 2CH	
14	1	1.317.630.00	Aufnahmekopf 2CH, 0,75mm	
			Record head 2CH, 0,75mm	
15	1	1.317.636.00	Wiedergabekopf 2CH, 0,75mm	
			Reproduce head 2CH, 0,75mm	
21	1	1.810.711.81	Vorverstärker 2CH	
			Preamplifier 2CH	
		1.020.883.00	Kopfträger 2CH, 2mm, Time-Code	
			Head block 2CH, 2mm, time code	
			wie 1.020.880.00 ausgenommen:	
			like 1.020.880.00 except:	
13	1	1.116.810.01	Löschkopf 2CH TC	
			Erase head 2CH TC	
	1	1.116.810.21	Distanzhülse	
			Spacer bush	
	x	1.062.210.08	Distanzscheibe 0,1mm (x = 0, 1 oder 2)	
			Spacer shim 0.1mm (x = 0, 1 or 2)	
	1	21.53.0471	Schraube Z IS	M4x14
			Screw Z IS	M4x14
	1	24.16.1040	Sicherungsscheibe	D 4,3 / 7
			Lock washer	D 4,3 / 7
14	1	1.317.620.00	Aufnahmekopf 2CH, 2mm	
			Record head 2CH, 2mm	
15	1	1.317.626.00	Wiedergabekopf 2CH, 2mm	
			Reproduce head 2CH, 2mm	

Index	Qty.	Order No.	Part Name	Specification
27	1	1.116.810.02	Kombikopf Time-Code	
	1	21.53.0455	Combi-head time code	
	1	24.16.1040	Schraube Z IS	M4x8
	1		Screw Z IS	M4x8
	1		Sicherungsscheibe	D 4,3 / 7
	1		Lock washer	D 4.3 / 7
21	1	1.810.711.81	Vorverstärker 2CH	
		1.020.884.00	Preamplifier 2CH	
			Kopfträger kompl. 2CH, 0.75mm	
			Head block compl. 2CH, 0.75mm	
			wie 1.020.882.00 ausgenommen:	
			like 1.020.882.00 except:	
13	1	1.116.097.81	Löschkopf MONO	
		1.020.885.00	Erase head MONO	
			Kopfträger kompl. 2CH, 2mm	
			Head block compl. 2CH, 2mm	
			wie 1.020.881.00 ausgenommen:	
			like 1.020.881.00 except:	
13	1	1.116.814.00	Löschkopf 2mm (ohne time code-Löschung)	
			Erase head 2mm (without time code erasure)	



Index	Qty.	Order No.	Part Name	Specification
		1.020.880.81	Kopfträger kompl. MONO	
			Head block compl. MONO	
			wie 1.020.880.00 ausgenommen:	
			like 1.020.880.00 except:	
14	1	1.318.610.00	Aufnahmekopf MONO	
15	1	1.318.616.00	Record head MONO	
21	1	1.810.714.81	Wiedergabekopf MONO	
			Reproduce head MONO	
			Vorverstärker MONO	
			Preamplifier MONO	
		1.020.881.81	Kopfträger kompl. 2CH, 2mm	
			Head block compl. 2CH, 2mm	
			wie 1.020.881.00 ausgenommen:	
			like 1.020.881.00 except:	
14	1	1.318.620.00	Aufnahmekopf 2CH, 2mm	
15	1	1.318.626.00	Record head 2CH, 2mm	
21	1	1.810.717.81	Wiedergabekopf 2CH, 2mm	
			Reproduce head 2CH, 2mm	
			Vorverstärker 2CH	
			Preamplifier 2CH	
		1.020.882.81	Kopfträger kompl. 2CH, 0.75mm	
			Head block compl. 2CH, 0.75mm	
			wie 1.020.882.00 ausgenommen:	
			like 1.020.882.00 except:	
14	1	1.318.630.00	Aufnahmekopf 2CH, 0.75mm	
15	1	1.318.636.00	Record head 2CH, 0.75mm	
21	1	1.810.717.81	Wiedergabekopf 2CH, 0.75mm	
			Reproduce head 2CH, 0.75mm	
			Vorverstärker 2CH	
			Preamplifier 2CH	
		1.020.883.81	Kopfträger kompl. 2CH, 2mm, Time-code	
			Head block compl. 2CH, 2mm, time code	
			wie 1.020.880.00 ausgenommen:	
			like 1.020.880.00 except:	
14	1	1.318.620.00	Aufnahmekopf 2CH, 2mm	
15	1	1.318.626.00	Record head 2CH, 2mm	
21	1	1.810.717.81	Wiedergabekopf 2CH, 2mm	
			Reproduce head 2CH, 2mm	
			Vorverstärker 2CH	
			Preamplifier 2CH	
		1.020.884.81	Kopfträger kompl. 2CH, 0.75mm	
			Head block compl. 2CH, 0.75mm	
			wie 1.020.882.81 ausgenommen:	
			like 1.020.882.81 except:	
13	1	1.116.097.81	Löschkopf MONO	
			Erase head MONO	
		1.020.885.81	Kopfträger kompl. 2CH, 2mm	
			Head block compl. 2CH, 2mm	
			wie 1.020.881.81 ausgenommen:	
			like 1.020.881.81 except:	
13	1	1.116.814.00	Löschkopf 2mm (ohne time code-Löschung)	
			Erase head 2mm (without time code erasure)	

**8-4**  
**BANDZUGWAAGE RECHTS**  
**RIGHT-HAND TAPE TENSION SENSOR**



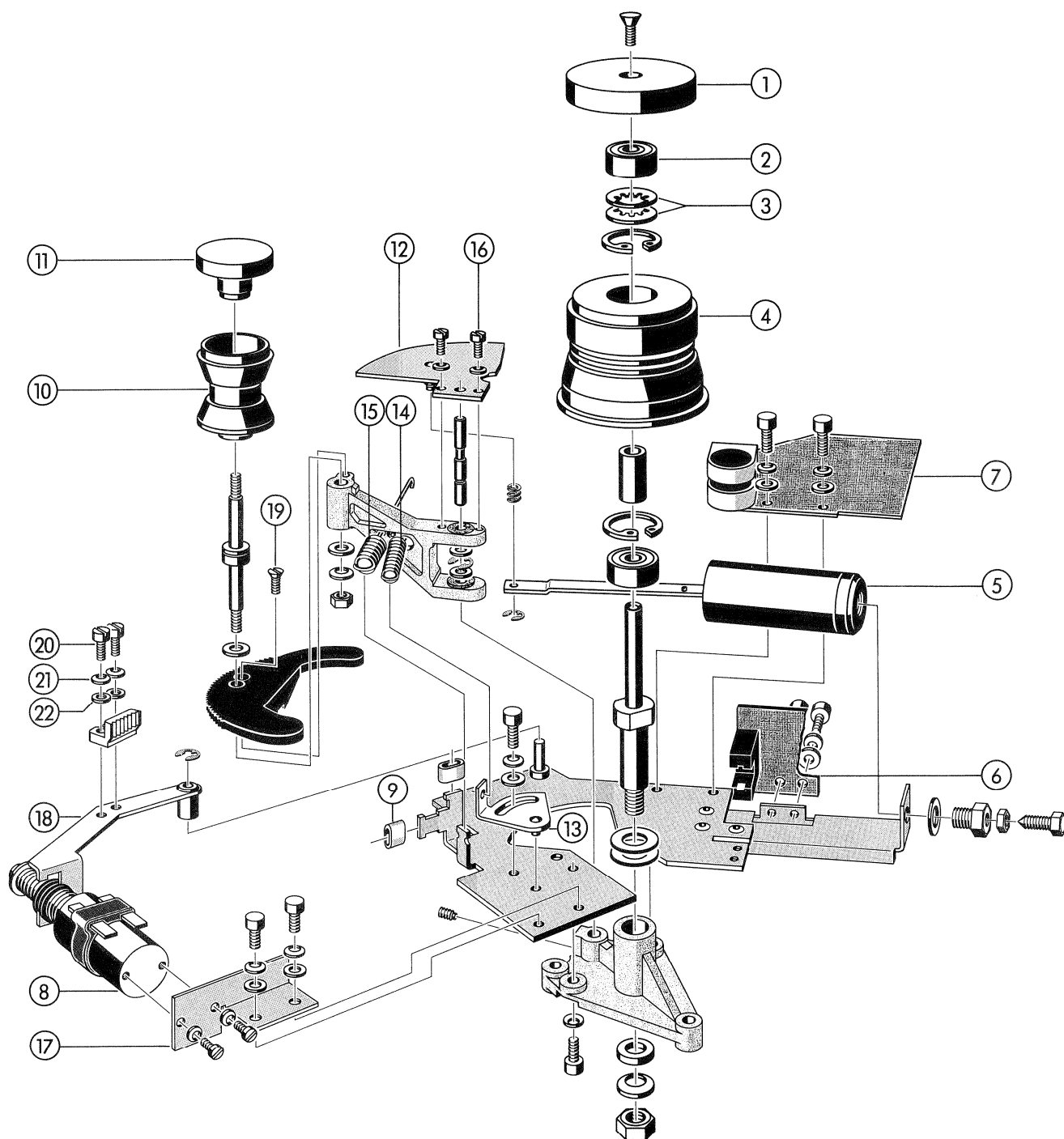
## 8.4

## BANDZUGWAAGE RECHTS

## RIGHT-HAND TAPE TENSION SENSOR

POS	QTY	ORDER NUMBER	BEZEICHNUNG / PART NAME
3		21.53.0357	Schraube Z IS M3x12 Screw Z IS M3x12
3		23.01.1032	Unterlagscheibe D 3,2/6 Washer D 3.2/6
3		24.16.1030	Sicherungsscheibe D 3,2/5,5 Lock washer D 3.2/5.5
		1.810.120.00	Bandzugwaage rechts Right-hand tape tension sensor
1		1.810.150.00	Umlenkrolle rechts kompl. Right-hand guide roller compl. bestehend aus: comprising:
01	1	1.810.150.03	Deckel Cover
	1	21.51.2356	Schraube S IS M3x10 Screw S IS M3x10
02	2	41.99.0106	Kugellager Ball bearing
03	2	1.010.091.37	Druckfeder D15,6 Pressure spring D15.6
04	1	1.810.116.00	Daempfungspumpe rechts kompl. (Daempfung im Herstellerwerk eingestellt!)
			Dashpot rechts kompl. (damping factory adjusted!)
05	1	1.810.729.00	Bandendsensorprint kompl. Tape end sensor board compl.
		21.53.0353	Schraube Z IS M3x5 Screw Z IS M3x5
06	1	1.810.731.00	Abtasterprint kompl. Move sensor board compl.
07	1	1.810.728.81	Bandzugprint rechts kompl. (ESE!)
			Right-hand tape tension sensor board compl. (ESE!)
	2	21.53.0353	Schraube Z IS M3x5 Screw Z IS M3x5
08	1	1.810.117.00	EDIT-Magnet kompl. EDIT solenoid compl. {+ = vio, - = grn}
09	2	1.067.170.14	Gummidampfung Rubber damping
10	1	1.810.145.00	Fuehrungsrolle kompl. Guide roller compl.
11	1	1.167.831.00	Kappe kompl. Cap compl.
12	1	1.810.122.00	Blende rechts kompl. Right-hand mask compl.
13	1	1.810.124.00	Spanner rechts kompl. Right-hand stretcher
14	1	1.010.032.37	Zugfeder Tension spring
15	1	1.010.105.37	Zugfeder Tension spring
16	2	21.01.0203	Schraube Z M2x5 Screw Z M2x5
17	1	1.810.120.01	Magnethalter rechts Right-hand solenoid mounting
18	1	1.810.123.00	Hebel rechts Right-hand lever
19	1	21.01.2278	Schraube S M2,5x5 {zu Zahnscheibe} Screw S M2.5x5 {to toothed disk}
			zu Zahnsegment: to toothed segment:
20	2	21.01.0279	Schraube Z M2,5x6 Screw Z M2.5x6
21	2	24.16.1025	Sicherungsscheibe D 2,7/4,8 Lock washer D 2.7/4.8
22	2	23.01.1027	Unterlagscheibe D 2,7/5 Washer D 2.7/5

**8.5**  
**BANDZUGWAAGE LINKS**  
**LEFT-HAND TAPE TENSION SENSOR**



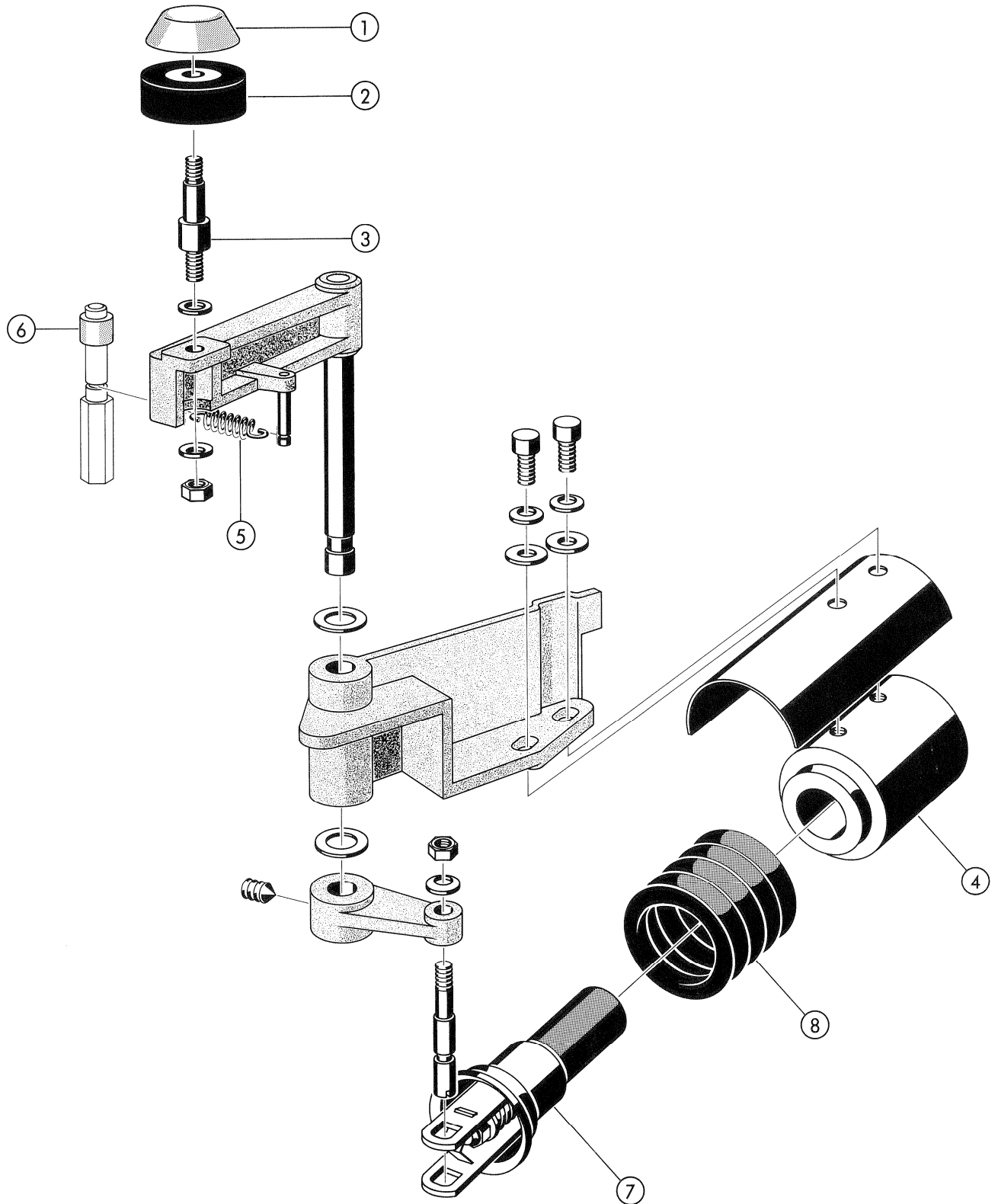
## 8.5

## BANDZUGWAAGE LINKS

## LEFT-HAND TAPE TENSION SENSOR

POS	QTY	ORDER NUMBER	BEZEICHNUNG / PART NAME
3		21.53.0357	Schraube Z IS M3x12 Screw Z IS M3x12
3		23.01.1032	Unterlagscheibe D 3.2/6 Washer D 3.2/6
3		24.16.1030	Sicherungsscheibe D 3.2/5.5 Lock washer D 3.2/5.5
		<b>1.810.110.00</b>	<b>Bandzugwaage links</b>
			<b>Left-hand tape tension sensor</b>
1		<b>1.167.837.00</b>	<b>Umlenkrolle links kompl.</b> <b>Left-hand guide roller compl.</b> bestehend aus: comprising:
01	1	1.167.837.02	Deckel Cover
	1	21.51.2356	Schraube S IS M3x10 Screw S IS M3x10
02	2	41.99.0105	Kugellager Ball bearing
03	2	37.02.0203	Tellerfeder Spacer sleeve
04	1	1.167.837.01	Umlenkrolle links Left-hand guide roller
05	1	1.810.115.00	Daempfungspumpe links kompl. (Daempfung im Herstellerwerk eingestellt!) Dashpot left compl. (damping factory adjusted!)
06	1	1.810.729.00	Bandendsensorprint kompl. Tape end sensor board compl.
07	1	1.810.730.81	Bandzugprint links kompl. (ESE!) Left-hand tape tension sensor board compl. (ESE!)
	2	21.53.0353	Schraube Z IS M3x5 Screw Z IS M3x5
08	1	1.810.117.00	EDIT-Magnet kompl. EDIT solenoid compl. {+ = vio, - = grn}
09	2	1.067.170.14	Gummi-daempfung Rubber damping
10	1	1.810.145.00	Fuehrungsrolle kompl. Guide roller compl.
11	1	1.167.831.00	Kappe Cap
12	1	1.810.112.00	Blende links kompl. Left-hand mask compl.
13	1	1.810.114.00	Spanner links kompl. Left-hand stretcher compl.
14	1	1.010.032.37	Zugfeder Tension spring
15	1	1.010.105.37	Zugfeder Tension spring
16	2	21.01.0203	Schraube Z M2x5 Screw Z M2x5
17	1	1.810.110.03	Magnethalter links Left-hand solenoid mounting
17	1	1.810.113.00	Hebel links Left-hand lever
19	1	21.01.2278	Schraube S M2.5x5 {zu Zahnscheibe} Screw S M2.5x5 {to toothed disk}
			zu Zahnsegment: to toothed segment:
20	2	21.01.0279	Schraube Z M2.5x6 Screw Z M2.5x6
21	2	24.16.1025	Sicherungsscheibe D 2.7/4.8 Lock washer D 2.7/4.8
22	2	23.01.1027	Unterlagscheibe D 2.7/5 Washer D 2.7/5

**8.6**  
**ANDRUCKAGGREGAT**  
**PRESSURE ROLLER ASSEMBLY**



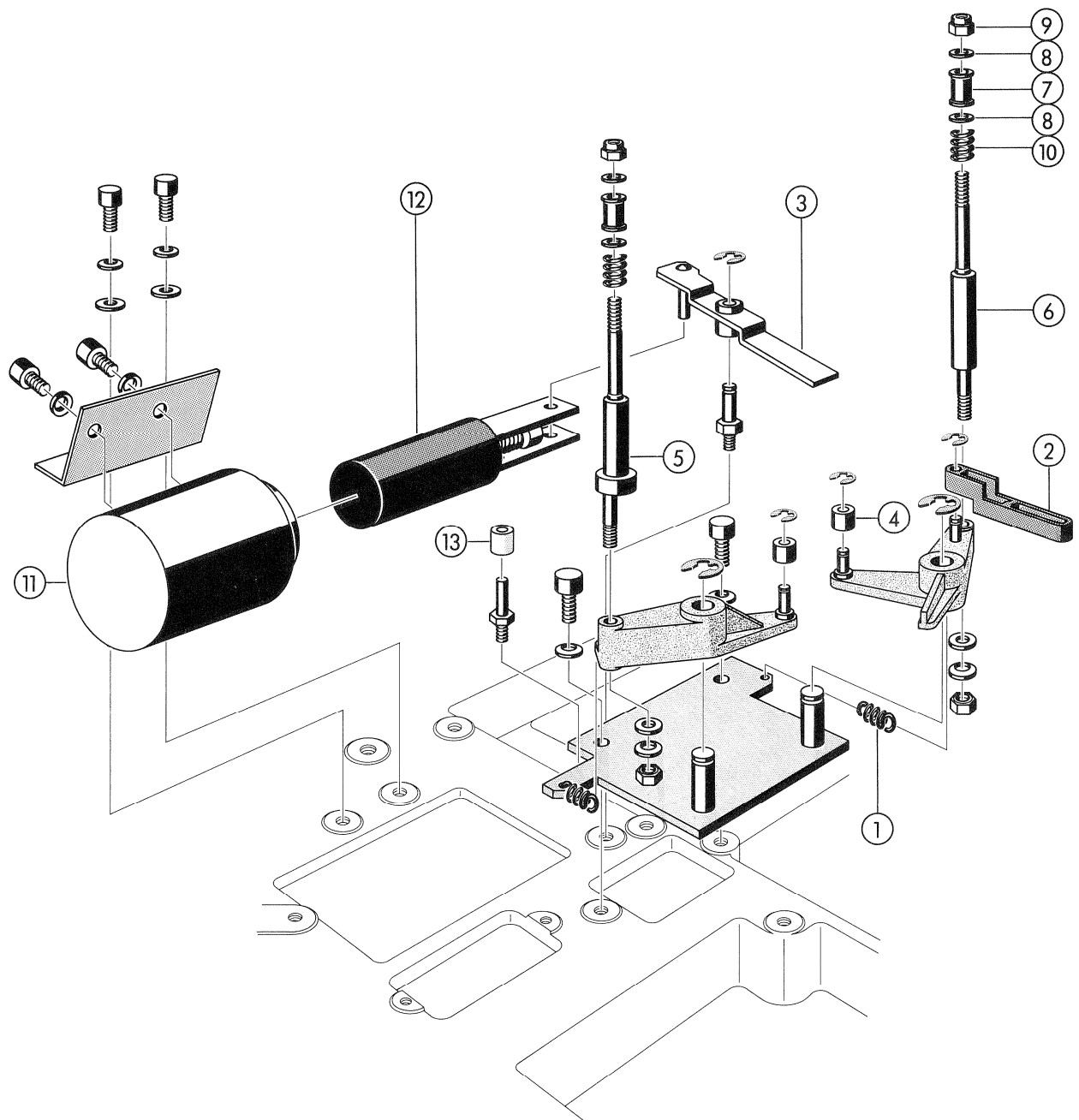
## 8.6

## ANDRUCKAGGREGAT

## PRESSURE ROLLER ASSEMBLY

POS	QTY	ORDER NUMBER	BEZEICHNUNG / PART NAME
	3	21.53.0457	Schraube Z IS M4x12 Screw Z IS M4x12
		1.810.100.81	Andruckaggregat Pressure roller assembly
01	1	1.810.106.00	Deckel (Kappe) Cover (cap)
02	1	1.167.178.00	Andruckrolle Pressure roller
03	1	1.167.170.10	Achse Axle
		1.062.210.08	Distanzscheibe 0,1 mm Spacer shim 0.1 mm
		1.062.210.09	Distanzscheibe 0,2 mm Spacer shim 0.2 mm
	1	24.16.1040	Sicherungsscheibe D 4,3/8 Lock washer D 4.3/8
	1	22.01.5040	Mutter M4 Hex nut M4
04	1	1.014.718.00	Andruckmagnet Pressure solenoid (* = vio, - = gry)
	2	21.53.0455	Schraube Z IS M4x8 Screw Z IS M4x8
	2	23.01.2043	Unterlagscheibe D 4,3/8 Washer D 4.3/8
	2	24.16.1040	Sicherungsscheibe D 4,3/7 Lock washer D 4.3/7
05	1	1.010.107.37	Zugfeder Tension spring
06	1	1.067.170.14	Gummi-Anschlagschlauch Rubber damping hose
07	1	1.810.101.00	Anker kompl. mit Buegel Plunger compl. with stirrup
08	1	1.810.100.08	Gummibalg Rubber bellows

**8.7**  
**BANDABHEBUNG**  
**TAPE LIFT ASSEMBLY**





## 8.7

## BANDABHEBUNG

## TAPE LIFT ASSEMBLY

POS	QTY	ORDER NUMBER	BEZEICHNUNG / PART NAME
	2	21.53.0353	Schraube Z IS M3x5 Screw Z IS M3x5
	2	24.16.1030	Sicherungsscheibe D 3,2/5,5 Lock washer D 3.2/5.5
		1.810.130.00	Bandabhebung Tape lift assembly
01	2	1.020.256.07	Zugfeder Tension spring
02	1	1.810.130.12	Kunststoff-Lasche Plastic shin
	1	24.16.3019	Wellensicherung 1,9 Circlip 1.9
03	1	1.810.135.00	Hebel Lever
	1	24.16.3040	Wellensicherung 4,0 Circlip 4.0
04	2	1.810.130.03	Lagerbuchse Bearing bush
	1	24.16.3019	Wellensicherung 1,9 Circlip 1.9
05	1	1.810.130.14	Abhebebolzen links Tape lift bolt left
06	1	1.810.130.10	Abhebebolzen rechts Tape lift bolt right
07	1	1.810.130.09	Fuehrungshuelse Guide bush
08	2	1.810.130.13	Fuehrungsscheibe Guide washer
09	1	22.99.0112	Mutter M3, selbstsichernd Hex nut M3, self locking
10	1	1.020.820.12	Druckfeder Pressure spring
11	1	1.014.718.00	Magnet Solenoid
	4	21.53.0454	Schraube Z IS M4x6 Schrew Z IS M4x6
	2	23.01.1043	Unterlagscheibe D 4,3/8 Washer D 4.3/8
	4	24.16.1040	Sicherungsscheibe D 4,3/7 Lock washer D 4.3/7
12	1	1.810.136.00	Anker kompl. Plunger compl.
13	1	1.067.170.14	Daempfungsgummi Damping rubber

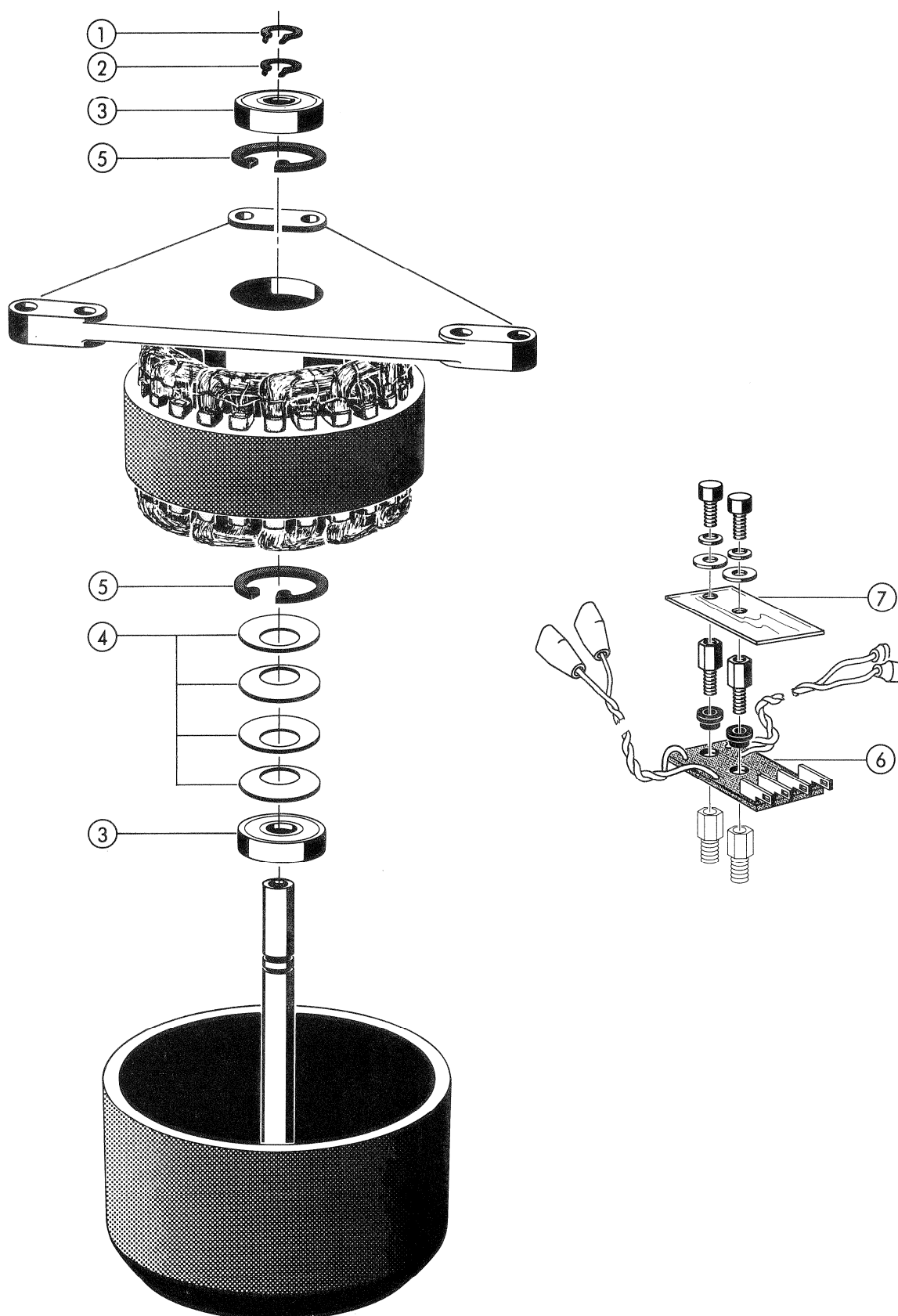


**8.8**  
**BANDBREMSEN**  
**TAPE BRAKES**  
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POS QTY ORDER NUMBER BEZEICHNUNG / PART NAME

	3	21.53.0354	Schraube Z IS M3x6 Screw Z IS M3x6
	3	23.01.2032	Unterlagscheibe D 3,2/7 Washer D 3,2/7
	3	24.16.1030	Sicherungsscheibe D 3,2/5.5 Lock washer D 3,2/5.5
	1	1.810.165.00	Bandbremse kompl. Tape brakes compl.
01	1	1.810.166.00	Bremschassis kompl. Brake chassis compl.
02	4	1.077.100.13	Bremszugfeder Brake tension spring
03	1	1.010.101.37	Zugfeder Tension spring
04	1	1.067.100.36	Daempfungsgummi Damping rubber
05	2	1.014.806.00	Bremsmagnet Brake solenoid
06	2	1.014.808.00	Anker kompl. Solenoid armature compl.
07	2	1.167.866.00	Bremsband kompl. Brake band kompl.
08	4	65.99.0144	Bleiband, selbstklebend Lead band, self-adhesive
09	2	1.067.242.00	Bremsrolle kompl. Brake drum compl.
10	2	21.01.4455	6kt.-Schraube M4x8 Hex. screw M4x8
11	2	24.16.1040	Sicherungsscheibe D 4,3/7 Lock washer D 4,3/7
12	2	23.01.3043	Unterlagscheibe D 4,3/8 Washer D 4,3/8
13	2	1.067.100.27	Mitnehmerscheibe Driver plate
	2	1.067.688.00	Wickelteller kompl. Reel support compl.
	1	21.53.0454	Schraube Z IS M4x6 Screw Z IS M4x6
	1	24.16.2040	Faecherscheibe D 4,3/8 Starwasher D 4,3/8
14	6	21.38.0355	Schraube Z KS M3x8 Screw Z KS M3x8
15	2	1.067.688.01	3-Zack-Huelse Three-pronged bush
16	2	1.067.688.02	Druckfeder Pressure spring
17	2	1.062.390.02	Schaftschraube Shank screw

8-9  
WICKELMOTOR  
SPOOLING MOTOR



## 8.9

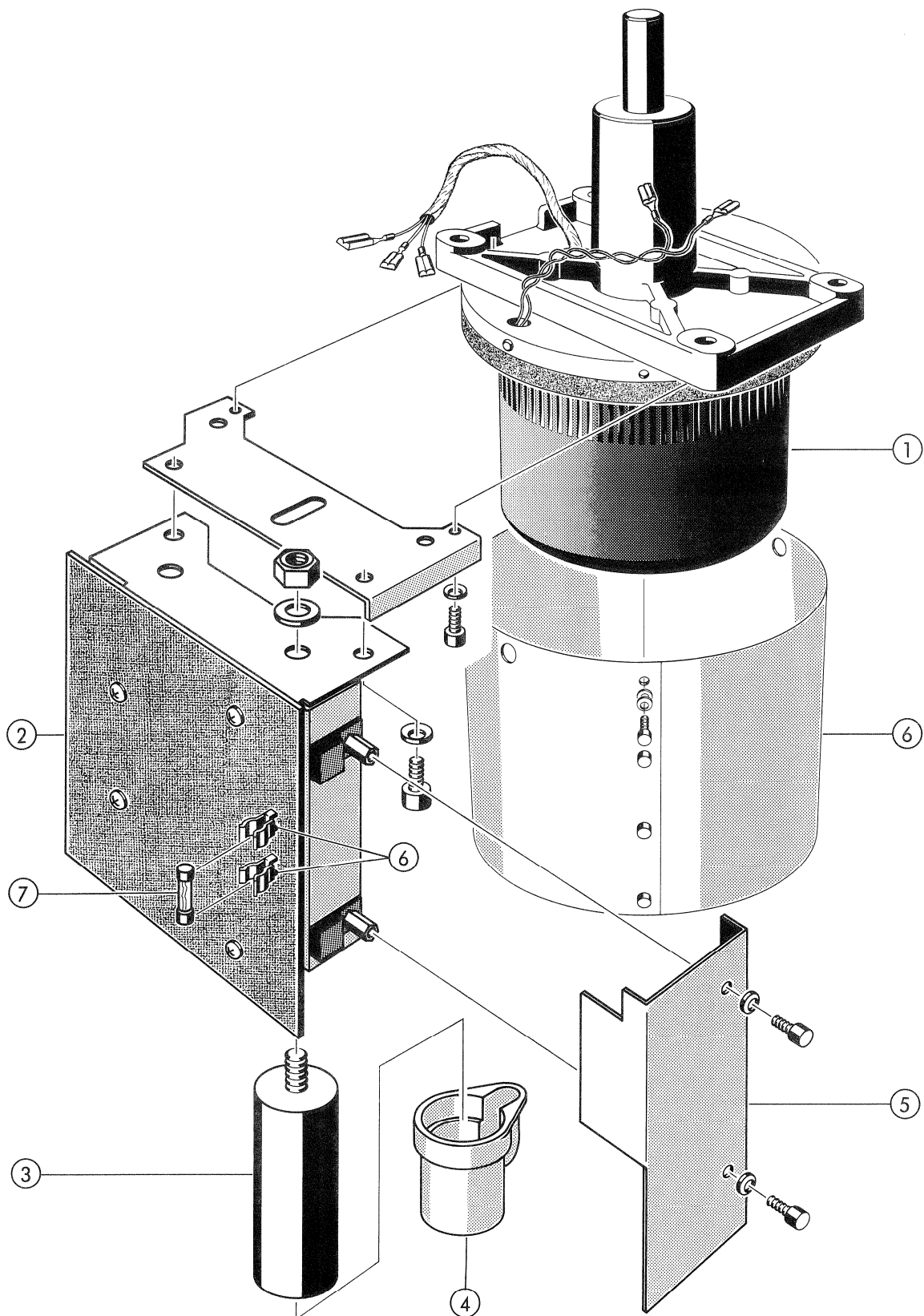
## WICKELMOTOR

## SPOOLING MOTOR

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POS QTY ORDER NUMBER BEZEICHNUNG / PART NAME

	3	21.53.0457	Schraube Z IS M4x12 Screw Z IS M4x12
	3	24.16.1040	Sicherungsscheibe D 4.3/7 Lock washer D 4.3/7
	2	1.021.255.00	Wickelmotor kompl. Spooling motor compl.
01	1	1.021.256.04	Aussensicherung geschliffen Circlip, surface polished
02	1	24.16.5080	Aussensicherung D 8 Circlip D 8
03	2	41.99.0105	Kugellager Ball bearing
04	4	37.02.0206	Tellerfeder Spring washer
05	2	24.16.4220	Innensicherung Circlip
06	1	1.810.726.00	Anschlussprint links Left-hand connection board
06	1	1.810.727.00	Anschlussprint rechts Right-hand connection board
	4	50.20.0404	Isolierdurchfuehrung Duct edge shield
	4	1.010.123.27	Gewindebolzen M3x6.5 Nut bolt M3x6.5
07	2	1.810.090.43	Beruehrungsschutz Protective cover
	4	21.53.0353	Schraube Z IS M3x5 Screw Z IS M3x5
	4	24.16.1030	Sicherungsscheibe D 3.2/5.5 Lock washer D 3.2/5.5
	4	23.01.3032	Unterlagscheibe D 3.2/9 Washer D 3.2/9

**8.10**  
**TONMOTOR**  
**CAPSTAN MOTOR**



# 8.10 TONMOTOR CAPSTAN MOTOR -----

## ACHTUNG -----

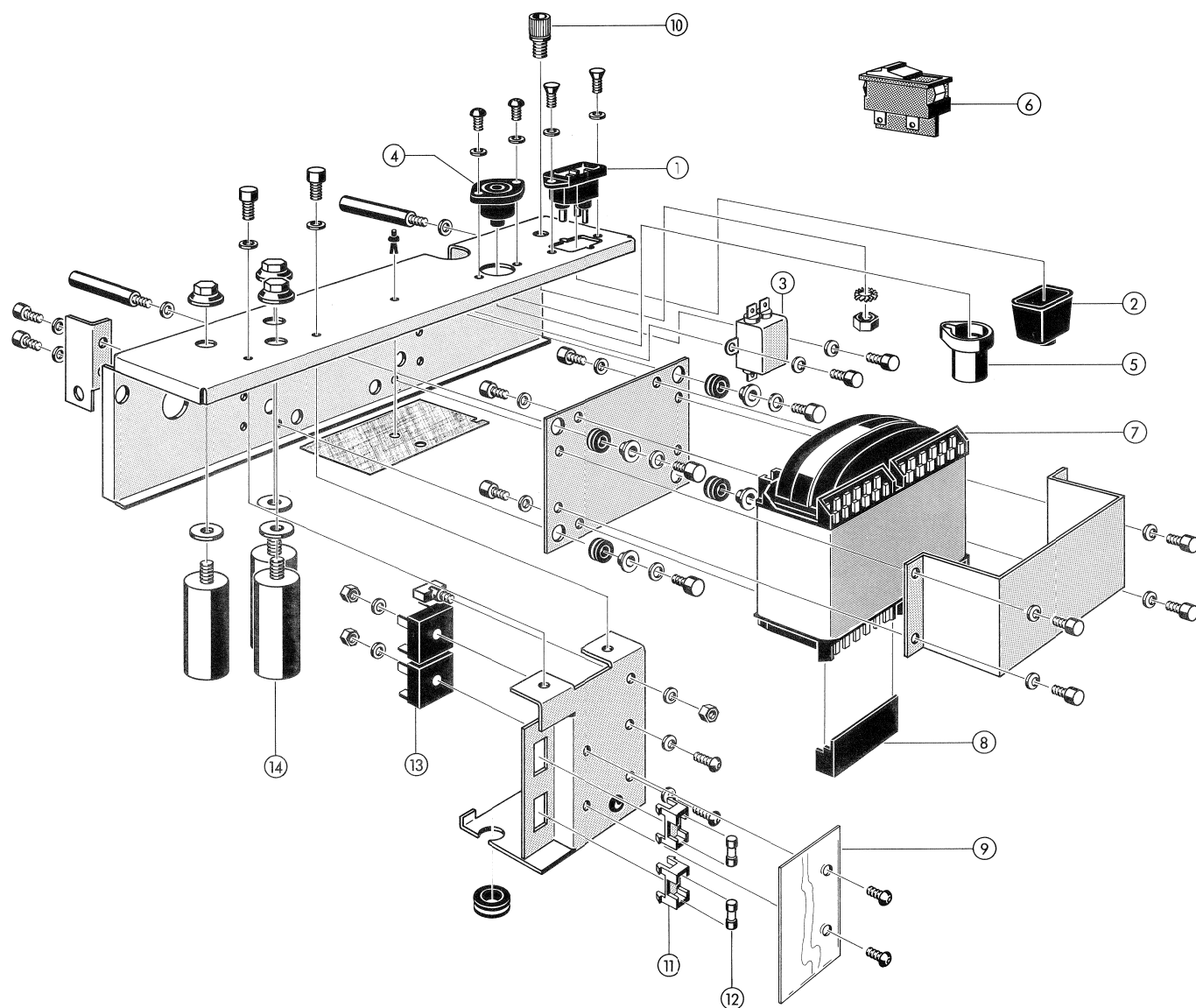
Nach dem Wechsel von Tonmotor oder Tonmotorsteuerung muss die Tonmotor-Steuerung abgeglichen werden! Siehe Kapitel 3.4.6 .

## CAUTION -----

When the capstan motor or the capstan motor control have been replaced, the capstan motor control has to be aligned! See section 3.4.6 .

POS	QTY	ORDER NUMBER	BEZEICHNUNG / PART NAME
2		21.53.0467	Schraube Z IS M4x45 Screw Z IS M4x45
2		1.010.093.27	Distanzhülse D 4,2/8x25 Spacer bush D 4.2/8X25
2		21.53.0459	Schraube Z IS M4x18 Screw Z IS M4x18
4		24.16.1040	Sicherungsscheibe D 4,3/7 Lock washer D 4.3/7
		1.810.061.81	Tonmotor 2-polig, komplett mit Tonmotor-Steuerung (19/38/76 cm/s) Capstan motor 2 poles, compl. with capstan motor control (7.5/15/30 ips)
or		1.810.060.81	Tonmotor 4-polig, komplett mit Tonmotor-Steuerung (9,5/19/38 cm/s) Capstan motor 4 poles, compl. with capstan motor control (3.75/7.5/15 ips)
01		1.021.365.81	Tonmotor 2-polig Capstan motor 2 poles
or		1.021.366.81	Tonmotor 4-polig Capstan motor 4 poles
02	1	1.810.766.00	Tonmotorsteuerung kompl. (ESE!)
			Capstan motor control compl. (ESE!)
	2	21.53.0454	Schraube Z IS M4x6 Screw Z IS M4x6
03	1	59.14.6809	MP-Kondensator 8 uF/240 V (2-poliger Motor) MP capacitor 8 uF/240 V (2 pole motor)
or		59.99.0452	MP-Kondensator 4,3 uF/160 V (4-poliger Motor) MP capacitor 4.3 uF/160 V (4 pole motor)
04	1	59.20.0124	Schutzkappe zu Kondensator 8 uF (d=30 mm) Protective cover to capacitor 8 uF (30 mm dia.)
or		59.20.0122	Schutzkappe zu Kondensator 4,3 uF (d=25 mm) Protective cover to capacitor 4.3 uF (25 mm dia.)
05	1	1.810.761.02	Berührungsschutz Protective cover
06	1	1.021.320.11	Tonmotor-Abschirmung (nur 2-poliger Motor) Capstan motor shield (2 pole motor only)
	1	1.021.310.12	Tonmotor-Abschirmung (2- und 4-poliger Motor) Capstan motor shield (2 and 4 pole motors)
	1	1.810.001.05	Abschirmblech (Tonmotor/Audio) (wird nur benötigt bei Ersatz eines 4-poligen durch einen 2-poligen Tonmotor) Screening sheet metal (capstan/audio) (only needed when replacing a 4 pole motor by a 2 pole motor)
	4	21.53.0354	Schraube Z IS M3x6 Screw Z IS M3x6
	4	24.16.1030	Sicherungsscheibe D 3,2/5,5 Lock washer D 3.2/5.5
06	1	53.03.0142	Sicherungshalter Fuse holder
07	1	51.01.0114	Sicherung T 500 mA Fuse T 500 mA (slow blow)

8-11  
NETZTEIL  
POWER SUPPLY





**8.11  
NETZTEIL  
POWER SUPPLY**

POS QTY ORDER NUMBER BEZEICHNUNG / PART NAME

<b>1.810.210.00 Netzteil kompl. Power supply compl.</b>			
01	1	54.04.0109	Netzstecker Mains socket
	2	21.53.2354	Schraube S IS M3x6 Screw S IS M3x6
02	1	54.04.0119	Isolierhaube Insulation cap
	1	1.810.210.16	Haltewinkel Bracket
03	1	89.01.0384	Netzfilter Mains filter
	2	21.53.0353	Schraube Z IS M3x5 Screw Z IS M3x5
	1	1.810.210.14	Isolationsfolie (fuer Netzfilter-Anschlusse) Insulation film (for mains filter connectors)
04	1	53.03.0130	Netzspannungswaehler Mains voltage selector
	2	21.51.8355	Schraube LIN IS M3x8 Screw LIN IS M3x8
	2	24.16.1030	Sicherungsscheibe D 3,2/5,5 Lock washer D 3,2/5,5
	1	51.01.0119	Sicherung T 1,6 A; 5x20 mm (220 V) Fuse T 1,6 A; 5x20 mm (slow blow) (220 V)
	1	51.01.0122	Sicherung T 3,15 A; 5x20 mm (110 V) Fuse T 3,15 A; 5x20 mm (slow blow) (110 V)
05	1	1.810.210.09	Isolierhaube Insulation cap
06	1	55.12.0001	Netzschalter Mains switch
07	1	1.810.200.00	Netztransformator Mains transformer
	4	29.99.0117	Vierkantmutter M5 Square nut M5
	8	24.16.1050	Sicherungsscheibe D5,3/9 Lock washer D5,3/9
	8	21.53.0506	Schraube Z IS M5x10 Screw Z IS M5x10
	1	1.810.210.08	Trafoplatte Transformer platform
	4	1.780.110.01	Gummituelle Rubber grommet
	4	1.780.110.02	Distanzbuechse Spacer bush
		1.810.210.15	Isolationsfolie (fuer Transformer-Anschlusse) Insulation film (for transformer connectors)
			Transformator-Abschirmung (nicht Ersatzteil) Mains transformer shield (not spare part)
	4	21.53.0353	Schraube Z IS M3x5 Screw Z IS M3x5
08	4	1.010.044.63	Beruehrungsschutz fuer Trafoanschluesse Protective cover for transformer connections
09	1	1.810.210.06	Beruehrungsschutz (Sicherungen) Protective cover (fuses)
	2	21.53.0454	Schraube Z IS M4x6 Screw Z IS M4x6
	2	24.16.1040	Sicherungsscheibe D 4,3/7 Lock washer D 4,3/7
10	1	1.010.001.53	Erdstuetzpunkt Ground connection
11	2	53.03.0144	Sicherungshalter Fuse holder
12	2	51.01.0124	Sicherung T 5 A; 5x20 mm Fuse T 5 A; 5x20 mm (slow blow)

POS QTY ORDER NUMBER BEZEICHNUNG / PART NAME

13	2	70.01.0231	Gleichrichter 100 V/35 A Rectifier 100 V/35 A
	2	21.53.0471	Schraube Z IS M4x15 Screw Z IS M4x15
	2	24.16.1040	Sicherungsscheibe D 4,3/7 Lock washer D 4,3/7
	2	22.01.5040	Mutter M4 Nut M4
			Gleichrichter-Grundplatte (nicht Ersatzteil) Rectifier mounting base (not spare part)
	2	21.53.0454	Schraube Z IS M4x6 Screw Z IS M4x6
	2	24.16.1040	Sicherungsscheibe D 4,3/7 Lock washer D 4,3/7
14	3	59.26.7103	Elektrolyt-Kondensator 10 mF/63 V (10*000 uF) Electrolytic capacitor 10 mF/63 V (10,000 uF)
	3	59.20.0109	Isolierhutmutter Insulating cap nut
	3	59.20.0107	Isolierscheibe Insulating washer
	3	59.20.0108	Isolierscheibe Insulating washer

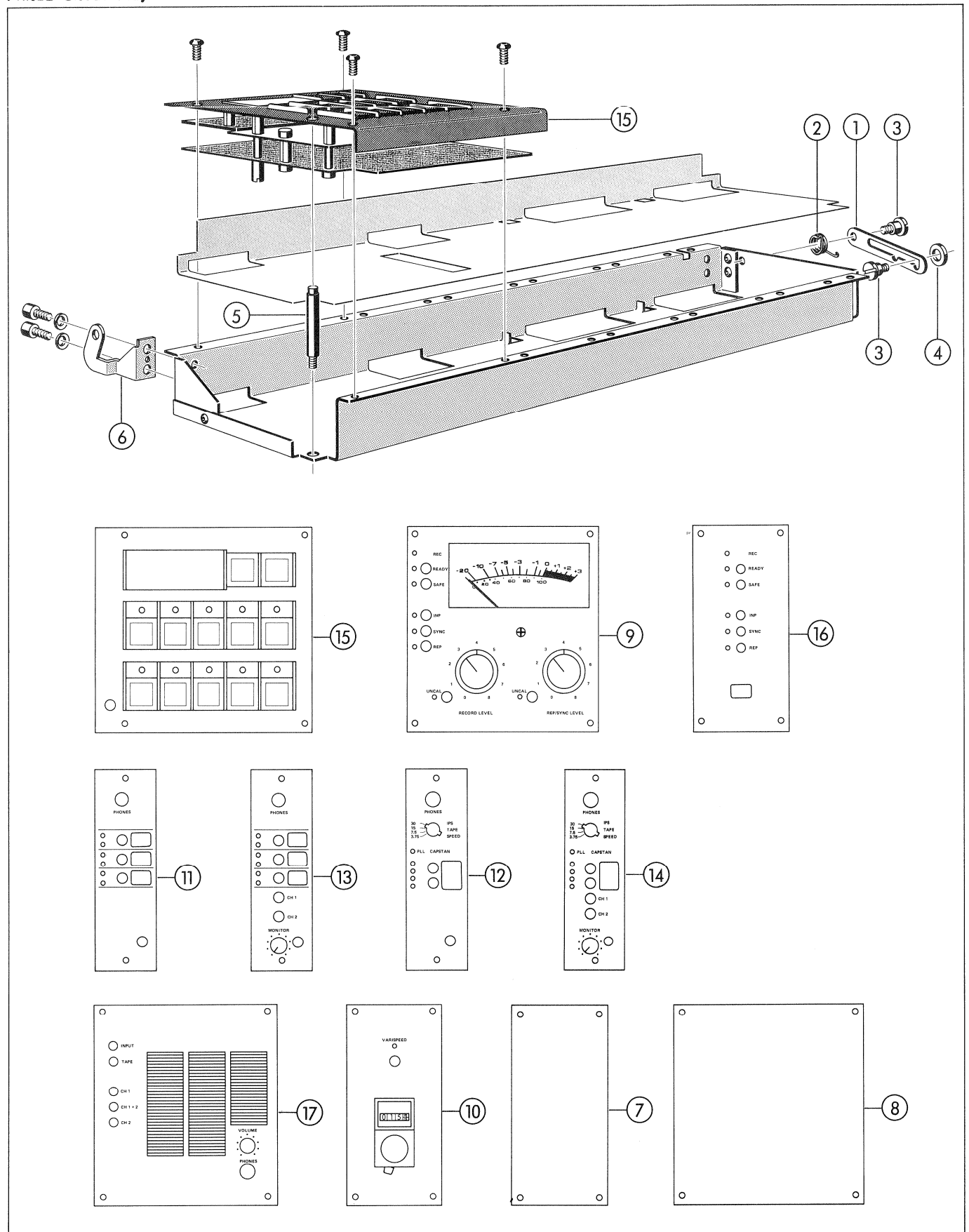
# 8.12 ANSCHLUESSE CONNECTOR PANELS

POS	QTY	ORDER NUMBER	BEZEICHNUNG / PART NAME
1	1.810.001.01	Blindplatte "AUDIO/TC" (1 Einheit) Dummy plate "AUDIO/TC" (1 unit)	
2	1.010.007.21	Schraube LIN IS M4x8 Screw LIN IS M4x8	
1	1.810.001.03	Blindplatte "CONSOLE" (2 Einheiten) Dummy plate "CONSOLE" (2 units)	
4	1.010.007.21	Schraube LIN IS M4x8 Screw LIN IS M4x8	
3	1.810.195.00	Audio/TC-Anschlussplatte "XLR" kompl. ohne Etikette Audio/TC connector plate "XLR" compl. without label	
6	1.010.007.21	Schraube LIN IS M4x8 Screw LIN IS M4x8	
3	1.820.749.00	Anschlussprint Connector board	
3	20.25.0103	Kerbschraube KS 2,2x6,5 Screw KS 2.2x6.5, self-tapping	
3	54.21.2001	XLR-Stecker J, 3 polig XLR connector J, 3 pin	
3	54.21.2002	XLR-Stecker P, 3 polig XLR connector P, 3 pin	
12	21.27.3354	Schraube LS KS M3x5 Screw LS KS M3x5	
3	1.810.196.00	Audio/TC-Anschlussplatte "LEMO" kompl. ohne Etikette Audio/TC connector plate "LEMO" compl. without label	
6	1.010.007.21	Schraube LIN IS M4x8 Screw LIN IS M4x8	
1	1.810.190.00	Anschlussplatte "CONSOLE/VU-PANEL" kompl. mit Kabelbaum intern fuer VU-Panel und Etikette Connector plate "CONSOLE/VU-PANEL" kompl. with internal rack-box wiring and label	
4	1.010.007.21	Schraube LIN IS M4x8 Screw LIN IS M4x8	
1	1.810.741.00	Kabelbund "CONSOLE/VU-PANEL" (Digital) Wire harness "CONSOLE/VU-PANEL" (digital)	
1	1.810.742.00	Kabelbund "CONSOLE/VU-PANEL" (Audio) Wire harness "CONSOLE/VU-PANEL" (audio)	
1	1.810.738.00	Anschlussplatte "REMOTE" (parallel) kompl. Connector plate "REMOTE" (parallel) compl.	
4	1.010.007.21	Schraube LIN IS M4x8 Screw LIN IS M4x8	
1	54.02.0442	D-Stecker J, 25 polig Connector, D-type, 25 pin	
1	1.810.001.04	Anschlussleiste (Fernsteuerung) Contact strip (remote control)	
1	1.810.070.00	Serielle Fernsteuerung kompl. (Option) Serial remote control compl. (optional)	
1	1.810.740.00	Kabelbund (Flachkabel) zu serieller Fernsteuerung Wire harness (flat cable) to serial remote control	
1	54.13.5002	D-Stecker J, 9 polig Connector D-type, 9 pin	
1	1.810.739.00	Adressprint oder Address board or	
1	1.810.140.00	Monitor kompl. (intern) Monitor compl. (internal)	
2	21.53.2354	Schraube S IS M3X6 Screw S IS M3X6	
1	71.01.0108	Lautsprecher 15 Ohm / 2 W Loudspeaker 15 ohms / 2 W	
1	1.810.722.81	Monitor-Verstaerker Monitor amplifier	
2	21.53.0354	Schraube Z IS M3X6 Screw Z IS M3X6	

## 8.13

## PANEL INTERN/EXTERN

## PANEL INTERNAL/EXTERNAL



## 8.13

## PANEL INTERN/EXTERN

## PANEL INTERNAL/EXTERNAL

POS	QTY	ORDER NUMBER	BEZEICHNUNG / PART NAME
01	1	1.810.090.34	Stuetze Support
02	1	1.810.090.36	Drehfeder Turn-spring
03	3	1.010.019.21	Ansatzschraube M3x9 Spec. screw M3x9
04	2	1.810.090.35	Unterlagscheibe spez., D 4,3/8/2 Washer special, D 4,3/8/2
05	2	1.810.090.35	Spezialschraube IS Special screw IS
06	1	1.810.090.19	Scharnier links Left-hand hinge
	1	1.810.090.20	Scharnier rechts right-hand hinge
07		1.810.002.04	Blindplatte, 1 Modul Dummy plate, 1 module
	2	1.010.025.21	Schraube LIN IS M3x6 Screw LIN IS M3x6
08		1.810.002.03	Blindplatte, 2 Module Dummy plate, 2 modules
	4	1.010.025.21	Schraube LIN IS M3x6 Screw LIN IS M3x6
09		1.810.320.81	VU-Panel VU panel
	4	1.010.025.21	Schraube LIN IS M3x6 Screw LIN IS M3x6
	1	1.810.321.81	Frontplatte VU-Panel Front cover VU panel
	2	42.01.0150	Drehknopf Alu. D6,35 Knob alu. D6,35
	2	42.01.0151	Abschlussdeckel Knob cover
	2	1.810.320.09	Anzeigescheibe Indicator ring
	2	1.810.320.08	Bremsring Retaining ring
	2	37.02.0210	Tellerfeder Spring washer
	1	1.810.320.02	Druckknopf, lang, dunkelgrau Push button, long, dark grey
	1	1.810.320.03	Druckknopf, lang, blau Push button, long, blue
	1	1.810.320.04	Druckknopf, lang, gelb Push button, long, yellow
	1	1.810.320.05	Druckknopf, lang, weiss Push button, long, white
	1	1.810.320.06	Druckknopf, lang, gruen Push button, long, green
	1	1.810.320.07	Druckknopf, lang, rot Push button, long, red
	1	1.810.320.22	VU-Meter VU-meter
		10.302.001.06	Ersatzglas fuer VU-Meter Replacement glass for VU-meter
	1	1.820.730.81	VU-Meter-Verstaerker VU-meter amplifier
	1	51.02.0144	Lampe 6 V / 30 mA zu VU-Meter Bulb 6 V / 30 mA to VU-meter
	1	1.820.731.00	Einstell-Print Calibration board
	2	1.820.731.01	Tastenschalter Push button switch
		1.820.732.00	Kanalsteuerung Channel control board
	1	1.820.732.01	Tastenschalter(Kanalselector) Push button switch(Channel selector)

POS	QTY	ORDER NUMBER	BEZEICHNUNG / PART NAME
<b>10</b>		<b>1.810.330.82</b>	<b>Vari-Speed-Panel</b>
			<b>Vari-speed panel</b>
	2	1.010.025.21	Schraube LIN IS M3x6 Screw LIN IS M3x6
	1	1.810.331.81	Frontplatte Vari-Speed Front panel Vari-speed
	1	1.810.762.00	Vari-Speed Steuer-Print Vari-speed control board
	1	58.99.0116	Feintrieb mit Ableseskala Fine drive with reading scale
<b>11</b>		<b>1.810.310.81</b>	<b>Master-Panel, 2 Geschw. (fuer Konsolenversionen)</b>
			<b>Master panel, 2 speeds (for console versions)</b>
	2	1.010.025.21	Schraube LIN IS M3x6 Screw LIN IS M3x6
	1	1.810.311.81	Frontplatte Master-Panel, 2 Geschwindigkeiten Front cover master panel, 2 speeds
	1	1.810.732.00	Schalter-Print, 2 Geschwindigkeiten Master switching board, 2 speeds
	1	1.810.733.00	Steuer-Print, 2 Geschwindigkeiten Master control board, 2 speeds
	3	1.810.310.03	Druckknopf, kurz, dunkelgrau Push button, short, dark grey
<b>12</b>		<b>1.810.312.00</b>	<b>Master-Panel, 3 Geschwindigkeiten (fuer Konsolenversionen)</b>
			<b>Master panel, 3 speeds (for console versions)</b>
			wie 1.810.310.81 ausser like 1.810.310.81 except
	1	1.810.313.00	Frontplatte Master-Panel, 3 Geschwindigkeiten Front cover master panel, 3 speeds
	1	1.810.764.00	Schalter-Print, 3/4 Geschwindigkeiten Master switching board, 3/4 speeds
	1	1.810.765.00	Steuer-Print, 3/4 Geschwindigkeiten Master control board, 3/4 speeds
	1	42.01.0228	Knebelknopf, grau Wing knob, grey
	1	42.01.0251	Deckel, grau, zu Drehknopf grau Cover, grey, to grey knob
	1	1.011.099.01	Drehschalter, auf 3 Positionen begrenzt Rotary switch, limited to 3 positions
<b>12</b>		<b>1.810.305.00</b>	<b>Master-Panel, 4 Geschwindigkeiten (fuer Konsolenversionen)</b>
			<b>Master panel, 4 speeds (for console versions)</b>
			wie 1.810.312.00 ausser like 1.810.312.00 except
	1	1.810.306.00	Frontplatte Master-Panel, 4 Geschwindigkeiten Front cover master panel, 4 speeds
	1	1.011.099.01	Drehschalter, auf 4 Positionen begrenzt Rotary switch, limited to 4 positions
<b>13</b>		<b>1.810.315.81</b>	<b>Master- &amp; Monitor-Panel, 2 Geschwindigkeiten (fuer Chassis- und portable Versionen)</b>
			<b>Master &amp; monitor panel, 2 speeds (for chassis and portable versions)</b>
			wie 1.810.310.81 ausser like 1.810.310.81 except
	1	1.810.316.81	Frontplatte Master- & Monitor-Panel, 2 Geschw. Front cover master & monitor panel, 2 speeds
	1	58.99.0137	Potentiometer Potentiometer
	1	42.01.0200	Drehknopf, grau Knob, grey
	1	42.01.0251	Deckel, grau, zu Drehknopf grau Cover, grey, to grey knob
	2	1.810.320.02	Druckknopf, lang, dunkelgrau Push button, long, dark grey

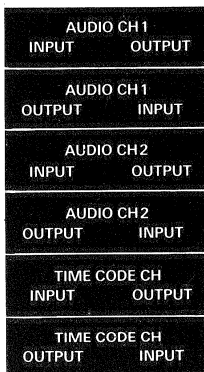
POS QTY ORDER NUMBER BEZEICHNUNG / PART NAME

14	1.810.317.00	Master- & Monitor-Panel, 3 Geschwindigkeiten (fuer Chassis- und portable Versionen) Master & monitor panel, 3 speeds (for chassis and portable versions) wie 1.810.312.00 ausser like 1.810.312.00 except
1	1.810.318.00	Frontplatte Master- & Monitor-Panel, 3 Geschw. Front cover master & monitor panel, 3 speeds
1	58.99.0137	Potentiometer Potentiometer
1	42.01.0200	Drehknopf, grau Knob, grey
2	42.01.0251	Deckel, grau, zu Drehknopf grau Cover, grey, to grey knob
2	1.810.320.02	Druckknopf, lang, dunkelgrau Push button, long, dark grey
14	1.810.307.00	Master- & Monitor-Panel, 4 Geschwindigkeiten (fuer Chassis- und portable Versionen) Master & monitor panel, 4 speeds (for chassis and portable versions) wie 1.810.305.00 ausser like 1.810.305.00 except
1	1.810.308.00	Frontplatte Master- & Monitor-Panel, 4 Geschw. Front cover master & monitor panel, 4 speeds
1	58.99.0137	Potentiometer Potentiometer
1	42.01.0200	Drehknopf, grau Knob, grey
2	42.01.0251	Deckel, grau, zu Drehknopf grau Cover, grey, to grey knob
2	1.810.320.02	Druckknopf, lang, dunkelgrau Push button, long, dark grey
15	1.810.300.00	Steuer-Einheit (LCD) Command unit (LCD)
	1.810.303.00	Steuer-Einheit (LED) Command unit (LED)
4	1.010.025.21	Schraube LIN IS M3x6 Screw LIN IS M3x6
1	1.810.301.81	Frontplatte Steuer-Einheit Front cover command unit
2	1.810.302.00	5er-Tasten-Gehaeuse, kompl. Fivefold push button housing, compl.
1	1.810.252.00	Display- und 2er-Tasten-Gehaeuse, kompl. (LCD) Display and twofold push b. housing, compl. (LCD)
1	1.810.253.00	Display- und 2er-Tasten-Gehaeuse, kompl. (LED) Display and twofold push b. housing, compl. (LED)
1	1.810.300.02	Anzeigefenster klar, fuer LCD-Anzeige Display window clear, for LCD-Display
1	1.810.303.02	Filterscheibe rot, fuer LED-Anzeige Filter screen red, for LED-Display
1	1.810.768.00	Anzeigeeinheit (LED) (ESE!) Display board (LED) (ESE!)
1	1.810.736.00	Anzeigeeinheit (LCD) (ESE!) Display board (LCD) (ESE!)
1	1.810.767.00	Steuer-Print kompl. (LED oder LCD) (ESE!) Command board compl. (LED or LCD) (ESE!)
1	1.810.735.00	LED-Treiber (programmierbare Funktionen) LED driver (extended functions)
1	1.810.737.00	LED-Treiber (Grundfunktionen) LED driver (basic functions)
12	55.03.0260	Impulstaste (Hall-Effekt,LCD) Command key (Hall effect,LCD)
12	55.03.0261	Impulstaste (Hall-Effekt,LED) Command key (Hall effect,LED)
12	55.03.0262	Zwischenstueck (zu Impulstaste,LED) Adapter piece (to command key,LED)
2	1.810.300.07	Mutterbolzen spez. 31 mm Nut bolt spec. 31 mm

POS QTY ORDER NUMBER BEZEICHNUNG / PART NAME

<b>16</b>		<b>1.810.335.81</b>	<b>Kanalsteuerung ohne Schilder</b> <b>Channel control without designation plates</b>
2		1.010.025.21	Schraube LIN IS M3x6 Screw LIN IS M3x6
1		1.810.336.81	Frontplatte Kanalsteuerung Front cover channel control
1		1.810.320.02	Druckknopf, lang, dunkelgrau Push button, long, dark grey
1		1.810.320.03	Druckknopf, lang, blau Push button, long, blue
1		1.810.320.04	Druckknopf, lang, gelb Push button, long, yellow
1		1.810.320.05	Druckknopf, lang, weiss Push button, long, white
1		1.810.320.06	Druckknopf, lang, gruen Push button, long, green
<b>17</b>		<b>1.810.345.81</b>	<b>Monitoreinheit, extern</b> <b>Monitor unit, external</b>
4		1.010.025.21	Schraube LIN IS M3x6 Screw LIN IS M3x6
1		1.810.346.81	Frontplatte Monitoreinheit extern Front cover external monitor unit
1		58.03.1103	Potentiometer Potentiometer
		42.01.0200	Drehknopf, grau Knob, grey
		42.01.0251	Deckel, grau, zu Drehknopf grau Cover, grey, to grey knob
1		54.24.0102	Kopfhoeererbuchse (6,3 mm Jack) Phones socket (Jack 6.3 mm)
3		1.810.320.02	Druckknopf, lang, dunkelgrau Push button, long, dark grey
1		1.810.320.03	Druckknopf, lang, blau Push button, long, blue
1		1.810.320.05	Druckknopf, lang, weiss Push button, long, white
1		1.810.721.82	Monitor-Print Monitor unit board
		<b>1.810.763.00</b>	<b>Steuereinheit fuer Geraeuschvermindungssystem</b> <b>Noise reduction system control (NRS)</b>
		<b>1.810.720.00</b>	<b>Verteilprint fuer 19" Rack</b> <b>Distribution board for 19" rack box</b>
		<b>1.810.390.00</b>	<b>19" Rack-Gehaeuse</b> <b>19" rack box</b>
		42.01.0111	Abschlussdeckel zur Abdeckung des Lochs der Kanal- steuer-Tasten oder Masterpanel-Tasten bei Nichtge- brauch einer Taste. Cover cap to cover hole of Channel selector or Master panel, if a push button is not used.
		42.01.0115	Abschlussdeckel, schwarz Cover cap, black
		42.01.0116	Abschlussdeckel, rot Cover cap, red
		42.01.0117	Abschlussdeckel, gelb Cover cap, yellow
		42.01.0118	Abschlussdeckel, blau Cover cap, blue
		42.01.0119	Abschlussdeckel, gruen Cover cap, green

## 8.14 SCHILDER DESIGNATION PLATES



1.810.090.47

Anschlussaufkleber  
Connection designation plates, self-adhesive



1.810.190.01

Anschlussaufkleber  
Connection designation plate, self-adhesive



1.810.738.02

Anschlussaufkleber  
Connection designation plate, self-adhesive



1.810.763.02

Anschlussaufkleber  
Connection designation plate, self-adhesive



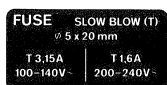
1.010.023.43

Schild "Schutzerdung"  
Designation plate "protective ground"



1.810.210.11

Sicherungsschild, Netzteil  
Fuse designation plate, power supply



1.810.210.13

Sicherungsschild, Spannungswaehler  
Fuse designation plate, line voltage selector



1.810.310.02

Schildersatz, Master Modul  
Set of designation plates, master module



1.810.310.04

Schildersatz, Master Modul spez. Geschwindigkeiten  
Set of designation plates, master module spec. speed



1.810.335.01

Schildersatz, Kanalsteuerung  
Set of designation plates, channel control



1.011.210.02

Schild, Steuer-Einheit (<)/(>){Umspulen}  
Designation plate, command unit (<)/(>){Fast wind}



1.011.210.03

Schild, Steuer-Einheit (PLAY)  
Designation plate, command unit (PLAY)



1.011.210.04

Schild, Steuer-Einheit (STOP)  
Designation plate, command unit (STOP)



1.011.210.05

Schild, Steuer-Einheit (REC)  
Designation plate, command unit (REC)



**RECAP**

1.011.210.06

Schild, Steuer-Einheit (RECAP)  
Designation plate, command unit (RECAP)**LIFTER**

1.011.210.07

Schild, Steuer-Einheit (LIFTER)  
Designation plate, command unit (LIFTER)**LOC  
START**

1.011.210.08

Schild, Steuer-Einheit (LOC START)  
Designation plate, command unit (LOC START)**FADER**

1.011.210.09

Schild, Steuer-Einheit (FADER)  
Designation plate, command unit (FADER)**VARI  
SPEED**

1.011.210.10

Schild, Steuer-Einheit (VARISPEED)  
Designation plate, command unit (VARISPEED)**REM  
CONTR**

1.011.210.11

Schild, Steuer-Einheit (REM. CONTR.)  
Designation plate, command unit (REM. CONTR.)**CODE  
READY**

1.011.210.12

Schild, Steuer-Einheit (CODE READY)  
Designation plate, command unit (CODE READY)**TAPE  
DUMP**

1.011.210.13

Schild, Steuer-Einheit (TAPE DUMP)  
Designation plate, command unit (TAPE DUMP)**RESET  
TIMER**

1.011.210.14

Schild, Steuer-Einheit (RESET TIMER)  
Designation plate, command unit (RESET TIMER)**ZERO  
LOC**

1.011.210.15

Schild, Steuer-Einheit (ZERO LOC)  
Designation plate, command unit (ZERO LOC)**TRANS**

1.011.210.16

Schild, Steuer-Einheit (TRANS/REDUCED)  
Designation plate, command unit (TRANS/REDUCED)**LOC1**

1.011.210.17

Schild, Steuer-Einheit (LOC 1)  
Designation plate, command unit (LOC 1)**LOC2**

1.011.210.18

Schild, Steuer-Einheit (LOC 2)  
Designation plate, command unit (LOC 2)**LOC3**

1.011.210.19

Schild, Steuer-Einheit (LOC 3)  
Designation plate, command unit (LOC 3)**LOC4**

1.011.210.20

Schild, Steuer-Einheit (LOC 4)  
Designation plate, command unit (LOC 4)1.810.090.48 Programmtabelle (links)  
Programming table (left hand side)  
1.810.090.59 Programmtabelle (rechts)  
Programming table (right hand side)

BEFORE REMOVING OR INSERTING CARDS, MACHINE MUST BE SWITCHED OFF MINIMUM 5 SEC

LOGIC SECTION				TIME CODE CH				AUDIO CH 1				M/S SWITCH	AUDIO CH 2			
MP UNIT	TO CONTR	SERIAL R CONTR	PERIPHERY CONTR	BUS CONV	READ WR AMP	DELAY UNIT	HF	DRIVER	RECORD AMP	REPROD AMP	LINE AMP	TEST GEN	HF - DRIVER	RECORD AMP	REPROD AMP	LINE AMP

1.810.090.46

Beschriftung zu Verstaerkerkorb  
Designation plate for amplifier rack

8.15  
KABELBUENDE  
WIRE HARNESSSES  
-----

POS QTY ORDER NUMBER BEZEICHNUNG / PART NAME  
-----

1.810.702.00	Kabelbund Kopftraeger-Anschluss Wire harness headblock connection
1.810.703.00	Kabelbund Linien-Anschluss Wire harness line connection
1.810.704.00	Kabelbund Laufwerk Wire harness tape transport
1.820.734.00	Kabelbund VU-Meter-Panel Wire harness VU meter panel
1.810.743.00	Flachkabel 40 polig, 100 mm (Eingabeteil fuer Audio- parameter) Flat cable 40 wires, 100 mm (Audio parameter key- board)
1.810.744.00	Flachkabel 16 polig, 800 mm (Tonmotorsteuerung, Bandzugwaage rechts) Flat cable 16 wires, 800 mm (Capstan control, right hand tape tension sensor)
1.810.745.00	Flachkabel 16 polig, 400 mm (Wickelmotorsteuerung, Bandzugw. links, Vari-Speed-Panel, ext. Monitor) Flat cable 16 wires, 400 mm (Spooling motor control, left hand tape tension sensor, vari-speed panel, external monitor panel)
1.810.746.00	Flachkabel 26 polig, 800 mm (Parallele Fernst.) Flat cable 26 wires, 800 mm (Par. remote control)
1.810.747.00	Flachkabel 40 polig, 400 mm (Steuereinheit) Flat cable 40 wires, 400 mm (Command unit)
1.820.733.00	Flachkabel 16 polig, 1000 mm (Kanalsteuerung, Master Panel 2/3/4 Geschw., VU-Meter-Panel) Flat cable 16 wires, 1000 mm (Channel control, master panel 2/3/4 speeds, VU meter panel)

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**9. ANHANG / APPENDIX / ANNEXE**

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<b>SI</b> (Service Information) No. 95/86	(A810 Software Version 40/85)
<b>SI</b> (Service Information) No. 99/86	(A810 Software Version 25/86)
<b>SI</b> (Service Information) No. 116/88	(A810 Software Version 01/88)

SI 95 / 86 D/E  
A810 Software 4085

### Einleitung

Die Software 40/85 für die A810 ist erhältlich.  
Diese neue Software bietet einen erweiterten Bedienungskomfort, ebenso wurden einige Mängel der Software 13/83 behoben.

#### Wichtig. für TLS 4000 Benützer

Wird die A810 mit der neuen Software 4085 in einem Synchronisationskomplex mit dem STUDER Synchronisator TLS 4000 betrieben, so muss auch auf dem Interface Print 1.812.120 die Software (alt R5491-2) durch R5491-3 ersetzt werden.

#### Achtung:

Bei Pilot-Ausführung der A810 funktioniert die automatische Umschaltung Bandsorte A / Bandsorte B beim Kopfträgeraustausch mit der Software 40/85 nicht mehr.  
Es wird eine neue spezielle Software für die A810 Pilotversion erhältlich sein.

### Wichtig:

Alle A810 Tonbandgeräte, die mit der Mikroprozessor-Karte 1.820.780 bestückt sind, können mit dieser Software bestückt werden. Hardware Änderungen müssen keine ausgeführt werden, es genügt, wenn die drei EPROMS ersetzt werden.

### Umrüstarbeiten:

Es müssen nur die EPROM's ersetzt werden. Dadurch erhält die MPU Karte eine neue Bezeichnung: 1.810.780.20 (Hardware -20). EPROM R5212-0 wird ersetzt durch R5212-1.  
EPROM R5213-0 wird ersetzt durch R5213-1.  
EPROM R5214-0 wird ersetzt durch R5214-1.

### Introduction:

The software 40/85 is now available. This software offers an improved operating comfort. Some shortcomings of the software 13/83 are also removed.

#### Important. for users of the TLS 4000

When using the A810 with the new Software 4085 in a synchronizer system together with the STUDER synchronizer TLS 4000, the old software (R5491-2) of the interface PCB 1.812.120 must be replaced by R5491-3.

#### Please note:

The automatic changeover from tape sort A to tape sort B by exchanging the headblock of the A810 pilot versions, does not function anymore with software 40/85.  
A new special software for all A810 pilot versions will be released.

### Important:

All A810 tape recorders equipped with the microprocessor PCB 1.820.780 allow the use of the new software. There are no hardware modifications necessary - just replace the three EPROM's only.

### Modification instructions:

Replace the three EPROM's. With this change, the MPU-PCB receives a new designation: 1.810.780.20 (Hardware - 20). Replace EPROM R5212-0 by R5212-1.  
Replace EPROM R5213-0 by R5213-1.  
Replace EPROM R5214-0 by R5214-1.

Wichtig:

Beim Austausch können die Audio-Daten verloren gehen. Daher nach Möglichkeit Daten auf Band abspeichern. Ebenso kann der RAM-interne Betriebsstundenzähler rückgesetzt werden.

Softwarebereinigung:

Unter anderem wurden folgende Mängel der Software 1383 behoben:

- Während der Faderstart Funktion wird die A810 beim Bandausfädeln nicht mehr blockiert.
- Bei Geräten mit LED Display können die auf Band abgespeicherten Audioparameter wieder mit dem RAM-Inhalt verglichen werden.
- Verschiedene unzulängliche Mute-Funktionen wurden bereinigt.
- Drop-in / Drop-out Zeiten wurden korrigiert.

Bedienungsänderungen und neue Funktionen der Software 4085 :

1. Falls beim Einschalten des Gerätes kein Band aufgelegt ist, blinkt die LED der Stop-Taste für ca. 10 Sekunden, nachher erlischt sie. Beim Drücken der STOP-Taste beginnt die LED erneut für ca. 10 Sekunden zu blinken.

LED für Stop:

dunkel oder blinkt                      = Kein Band eingelegt oder Bandende

permanent hell            = Band eingelegt ohne Schlaufe

Important:

Care must be taken that the Audio - parameters do not get lost when exchanging the EPROM's. Therefore, store the parameters on tape. The RAM-internal elapsed time counter may also get reset to zero.

Software modifications:

The following shortcomings of the software 1383 have been removed:

- If the tape runs out during faderstart operation, the tape transport does not block anymore.
- On tape recorders equipped with LED-Display it is possible to verify the audio parameters stored on tape with the contents of the RAM again.
- Various mute functions have been corrected.
- Drop in / Drop out times have been corrected.

Operating changes and new functions of the software 4085:

1. If in power on mode no tape is loaded, the LED of the STOP button flashes for approx. 10 seconds, afterwards it extinguishes. When pressing the STOP button, the LED flashes again for approx. 10 sec.

LED for STOP:

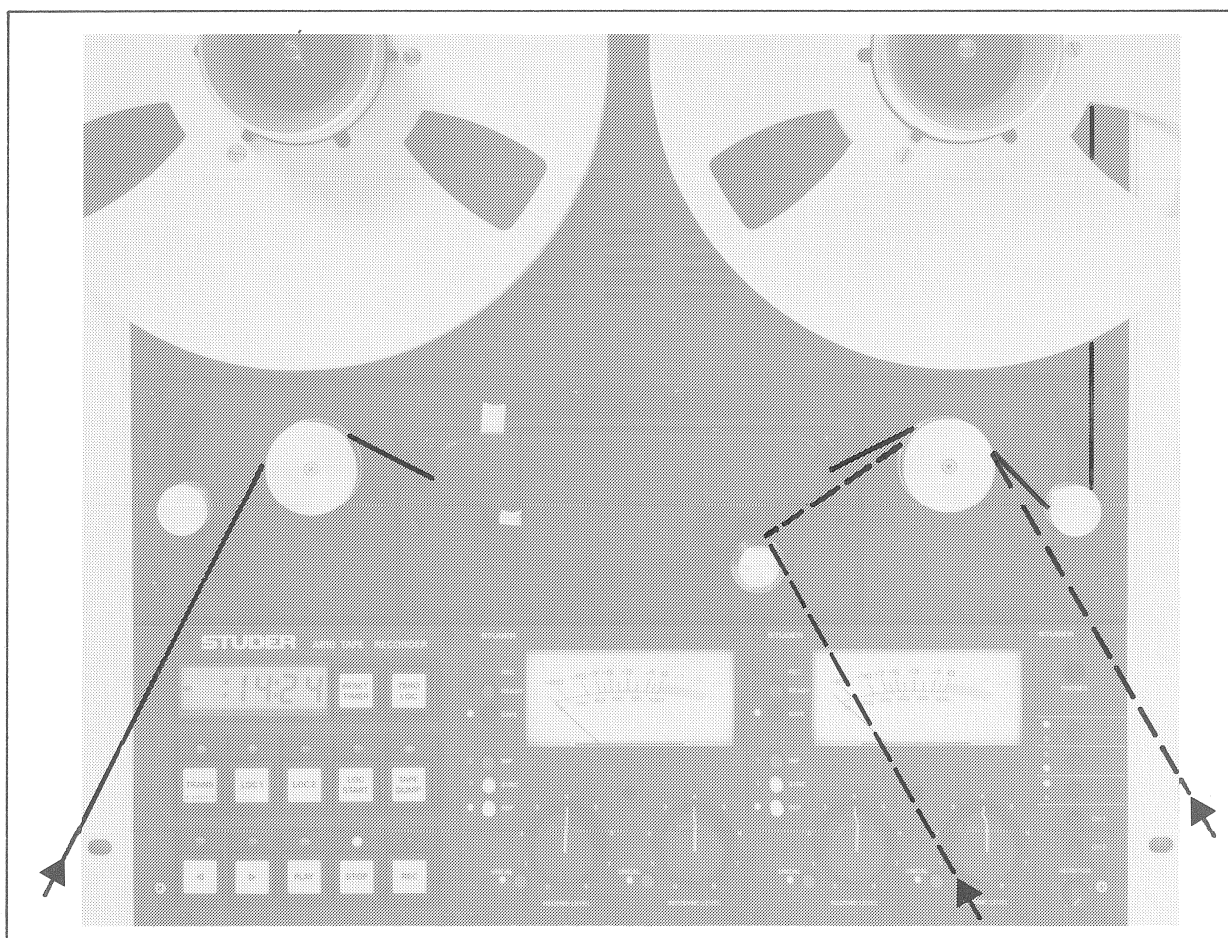
extinguished  
or flashing                = tape out or tape end

permanently  
turned on                = tape threaded and tension arms in operating position.

- |   |  |
|---|--|
| <p>2. Der Aufnahme Befehl wird vom Laufwerk nicht akzeptiert, wenn alle safe / ready Schalter auf Position SAFE stehen. (Die rote LED über der Laufwerkfunktionstaste REC leuchtet nicht, analog zu A820).</p> <p>3. Umschalten der Bandgeschwindigkeit während der Aufnahme setzt die A810 in STOP und der Kanal-selektor bleibt auf READY Position.</p> <p>4. Während der Parkierphase des Zero- oder Adresslocators, kann der Aufnahmebefehl vorgewählt werden. Falls kein Kanal-selektor auf READY steht, wird nach der Parkierphase der Record Befehl aufgehoben und das Laufwerk startet in Wiedergabe.</p> <p>5. Die Funktionstasten am Master-panel (CCIR/NAB, TAPE A / TAPE B oder MONO/STEREO-Umschaltung) sind gegen unbeabsichtigtes Betätigen gesichert worden.</p> <p>Die Umschaltung erfolgt nur durch Drücken der STOP-Taste und gleichzeitiges Betätigen der entsprechenden Umschalttaste am Masterpanel.</p> <p>6. Im reduzierten Wickelgeschwindigkeitsmodus sind die LOC-Tasten für die Locate Funktion gesperrt. Beim Drücken der LOC-Tasten wird lediglich der Zählerstand abgespeichert.</p> <p>7. Band einziehen nach dem Schneiden:</p> <p>Sind beide Bandsensoren in Ruheposition, kann das Band durch Drücken der Tasten &gt; oder &lt; auf den entsprechenden Spulenteller eingezogen werden.</p> | <p>2. The tape transport does not accept the record command anymore when all safe / ready switches are in position SAFE. (The red LED above the REC-button of the command unit does not light up anymore, similar to A820).</p> <p>3. While the A810 is in record mode, a speed change causes the machine to STOP and the channel selector remains in ready mode.</p> <p>4. During the parking mode of the zero- or address locator, it is possible to preselect the record command. If none of the channel selectors is in ready mode, the record command gets cancelled as soon as the tape transport has reached the parking point and the machine starts in play mode.</p> <p>5. The push button of the master-panel (CCIR/NAB, TAPE A / TAPE B or MONO/STEREO-switches) have been protected against unintentional operation.</p> <p>Any changeover occurs only when pressing the STOP button and pressing additionally the required push button of the master panel.</p> <p>6. The LOC-push buttons are disabled for the locate function during the reduced wind mode. When pressing any address LOC push button, only the counter position will be stored.</p> <p>7. Pull up the tape after cutting:</p> <p>It is possible to pull up (wind) the tape on to the corresponding tape reel when pressing the push button &gt; or &lt; if both tape tension sensors are in restposition.</p> |
|---|--|

Band über die linke oder rechte Umlenkrolle führen (je nach Einzugrichtung), sodass Kopfkontakt besteht. (Siehe Bild.)  
Die Einzugsgeschwindigkeit kann durch den Fingerdruck auf das Band kontrolliert werden.

Guide the tape over the left or right hand guide roller (depending on the pull up direction) so that it remains in contact with the heads. (See drawing).  
The speed of the pull up mode can be controlled by finger pressure on the tape.



#### 8. Bei Zeitcode Geräten:

Beim Umschalten von einer beliebigen Geschwindigkeit auf  $3 \frac{3}{4}$  ips wird der Zeitcode-Kanal automatisch auf SAFE und auf INPUT umgeschaltet.  
Beim Zurückschalten auf eine beliebige andere Geschwindigkeit wird der Zeitcode-Kanal auf SAFE belassen und nimmt den zuvor angewählten Status: REP, SYNC oder INPUT wieder an.

#### 8. Time code tape recorders:

When changing from any speed to  $3 \frac{3}{4}$  ips, the time code channel changes automatically to SAFE and INPUT mode.

When changing back to any other speed, the time code channel remains in SAFE mode and the previous status returns: REP, SYNC or INPUT.



### 9. Zeitcode lesen:

Im Schnellwickel Modus wird der Zeitcode jetzt immer vom rechten Kopf gelesen und die Delay unit wird überbrückt, (by pass) unabhängig von der Wickelgeschwindigkeit.

Dadurch werden die Lifter beim Umtasten der Schnellwickelrichtung nicht mehr aktiviert.

10. Auf der Laufwerkfernsteuerung 1.328.200 kann die LOC 1 Taste als LOC-START-Taste oder zurück als LOC 1 Taste umprogrammiert werden.

Umprogrammieren der LOC 1 Taste auf LOC-START:

TRANS und LOC 1 Taste drücken und gleichzeitig noch die PLAY Taste drücken. Die LOC 1 Taste der Laufwerksteuerung ist somit LOC-START-Taste. Wird die Taste aktiviert, leuchtet auf der geräteinternen Bedieneinheit die LOC-START LED. (Funktion wird im RAM eingelesen somit bleibt sie auch nach dem Ausschalten des Gerätes erhalten.

Umprogrammieren von LOC-START zurück auf LOC 1:

TRANS und LOC-START-Tasten drücken und gleichzeitig STOP-Taste drücken. Somit ist die LOC-START Taste wieder LOC 1-Taste. Beim Aktivieren der LOC 1 Taste leuchtet auf der maschineninternen Bedieneinheit die LOC 1 LED.

11. Der Brückenstecker JS 1 auf dem Tape deck controller PCB 1.810.750 hat neu folgende Funktion:

Brückenstecker JS 1 eingesetzt oder in POS. A:

Falls eine Laufwerkstaste auf TAPE DUMP (Papierkorbbetrieb) programmiert ist, wird beim Drücken der Taste TAPE DUMP sofort der Papierkorbbetrieb aktiviert.

### 9. Time code reading:

The time code reading in fast wind is no longer depending on the wind speed, i.e the time code will always be read by the right hand TC-head and the delay unit is by-passed.

For this reason the tape lifters are not moved anymore when changing wind direction.

10. On the tape transport remote control 1.328.200, the LOC 1 push button function can be changed into LOC-START and vice versa.

Programming of the LOC 1 push button to LOC-START:

Press TRANS and LOC 1 push buttons together and at the same time the PLAY-key. Now the LOC 1 push button activates the LOC-START function. When pressing this push button, the LOC-START LED of the internal command unit lights up. (The function is stored in the RAM, therefore, the function remains stored even after power off.

Programming the LOC-START function back to LOC 1:

Press TRANS and LOC-START push button together and in addition the STOP-push button. Now the LOC-START push button is again LOC 1. When pressing this push button the LOC 1 LED of the internal command unit lights up.

11. The jumper JS 1 on the tape deck controller PCB 1.810.750 has the following new function:

Jumper JS 1 inserted or in POS.A:

If one of the tape transport push buttons is programmed to TAPE DUMP, the tape dump function will be activated when pressing the TAPE DUMP key.

Brückenstecker JS 1 entfernt oder in POS. B:

Falls eine Laufwerktaaste auf TAPE DUMP (Papierkorbbetrieb) programmiert ist, wird das Laufwerk für den Papierkorbbetrieb vorbereitet. Durch Drücken der Taste PLAY wird die Funktion Papierkorbbetrieb ausgeführt.

Jumper JS 1 removed or in POS. B:

If one of the tape transport push buttons is programmed to TAPE DUMP, the tape dump function will be preselected when pressing the TAPE DUMP key. When pressing the PLAY push button the tape dump function is on.

12. Der Brückenstecker JS 5 auf der Mikro-Prozessor PCB 1.820.780 erhält folgende Funktion.

Brückenstecker JS 5 eingesetzt:

Normal Betrieb

Brückenstecker JS 5 entfernt:

Das Audio Eingangssignal wird direkt auf den Ausgang geschaltet

Diese Funktion wird nur benötigt, um das Potentiometer auf dem Linienverstärker 1.820.714 oder 1.820.715 abzugleichen, wenn keine Kanalselektoren in der A810 eingebaut sind.

12. The jumper JS 5 on the micro processor PCB 1.820.780 has the following new function:

Jumper JS 5 inserted:

Normal operation

Jumper JS 5 removed:

The audio input signal switches directly to the output

This function is just used to align the pot. meter on the line amplifier PCB 1.820.714 or 1.820.715 if no channel selectors are installed in the A810.

13. Brückenstecker JS 1 auf der seriellen Schnittstelle 1.810.752.00:

Der Brückenstecker JS 1 kann jetzt auf Position "H" umgesteckt werden. Dadurch verliert der DIL-Schalter 2 auf der oberen DIL-Schalter Reihe seine Funktion.

Das Gerät erkennt somit selbstständig, ob die RS 232 Schnittstelle aktiviert werden soll, oder ob die Audioparameter auf Band abgespeichert werden sollen. Die Erkennung erfolgt softwaremässig anhand der gesetzten DIL-Schalterposition des Adressprints 1.810.739 und wird über das Busswitch-Signal (T-BUSSW) umgeschaltet.

13. Jumper JS 1 on the serial remote control PCB 1.810.752.00:

Now the jumper JS 1 can be put into POS. "H". Thereby, the DIL-switch 2 on the upper row becomes inactive.

The tape recorder recognizes independently whether the RS 232 port has to be enabled or if the audio parameter has to be stored on the tape. The recognition is activated by software according to the DIL-switch positions of the addressboard 1.810.739 and is switched with the busswitch signal (T-BUSSW).

14. Folgende neue Befehle sind über die RS 232 implementiert worden:

14. Following new RS 232 commands have been implemented:

SMA \_xxxxxx- Setzen der Ma-  
schinenadresse via  
RS 232 auf (xxxxxx)  
(6 Nummern HEX)

MA? = Abfragen der Ma-  
schinenadresse, wel-  
che oben gesetzt  
wurde.

MAN = Beide Kanäle stumm  
(mute) geschaltet.

MAF = Entriegelung der  
Stummschaltung  
(mute) beider Audio-  
kanäle.

SMA \_xxxxxx- Set machine address  
to (xxxxxx) (6  
digit HEX) via RS  
232

MA? = Request for the  
above set machine  
address

MAN = Mute for both  
channels

MAF = Mute off for both  
channels

SI 99/86 D/E

A810 Software 25/86

Completion to Software 40/85

SI 95/86 D/E

### Einleitung

Die Software 25/86 wurde ab Serie Nr.5001 eingesetzt und löst die Software 40/85 sowie 13/83 ab.

Die neue Software 25/86 wurde notwendig, da mit der Software 40/85 die automatische Umschaltung Bandsorte A / Bandsorte B bei der A810 Spezial-Ausführung "Pilotton" beim Kopfträger-Austausch nicht mehr funktionierte. Ebenso konnten einige Mängel der Software 40/85 behoben werden.

### Wichtig für TLS 4000 Benutzer:

Wird die A810 mit der neuen Software 25/86 in einem Synchronisationskomplex mit dem STUDER Synchronisator TLS 4000 betrieben, so muss auch auf dem Interface Print 1.812.120 die Software (alt R5491-2 oder R5491-3) durch R5491-4 ersetzt werden.

Im Hinblick auf die Betriebssicherheit des Synchronisations-Systems, empfehlen wir allen TLS 4000 - Benutzern die neue A810 - Maschinen-Software (25/86) zu verwenden.

Siehe auch Software-Kombinationstabelle.

### Wichtig:

Alle A810 Tonbandgeräte, die mit der Mikroprozessor-Karte 1.820.780 oder 1.810.780.20 bestückt sind, können mit dieser Software bestückt werden.

Um bei dem Mikroprozessor-Print 1.820.780.81 oder 1.820.780.82 (MPU-Karte 1.820.780.12) sicher zu sein, dass der Mikroprozessor in allen Fällen richtig aufstartet, muss die MPU-reset Zeit auf 100ms verlängert werden.

Dazu muss der Kondensator C5(0,47µF) auf der Mikroprozessor-Karte 1.820.780.12 auf 10µF (59.26.2100) geändert werden (siehe Belegungsplan).

### Introduction:

Software 25/86 is factory installed from serial no. 5001 onwards and replaces the software 40/85 as well as 13/83.

The new software became necessary because with software 40/85 the automatic changeover between Tape sort A and Tape sort B of the A810 Special Pilot-Version was not effective anymore when exchanging the headblock. Some shortcomings of the software 40/85 have also been eliminated.

### Important for users of TLS 4000

When using the A810 with the new software 25/86 in a synchronizer system together with the STUDER synchronizer TLS 4000, the old software (R5491-2 or R5491-3) of the interface PCB 1.812.120 must be replaced by R5491-4.

To ensure reliable operation of the synchronizer-system we recommend to all TLS 4000 users to up-grade A810 Software to 25/86.

See also Software-Combination table.

### Important:

All A810 tape recorders equipped with the microprocessor PCB 1.820.780 or 1.810.780.20 allow the use of the new software.

To make sure that the microprocessor with the MPU PCB 1.820.780.81 and 1.820.780.82 (Layout 1.820.780.12) starts up smoothly in all cases, the MPU reset time must be lengthened to 100ms.

Therefore, capacitor C5 (0,47 µF) of the microprocessor board layout 1.820.780.12 has to be changed to 10 µF 59.26.2100 (see layout).

MPU-Prints mit der Bezeichnung 1.820.780.00 und 1.810.780.20 sind von dieser Aenderung nicht betroffen.

Sonst müssen keine Hardware Aenderungen ausgeführt werden, es genügt, wenn die drei EPROMS ersetzt werden.

#### Umrüstarbeiten:

Es müssen nur die EPROM's ersetzt werden. Dadurch erhält die MPU Karte eine neue Bezeichnung: 1.810.780.21 (Hardware -20).

EPROM R 5212-0 (13/83) oder IC 10 (40/85) 1.810.999.20 wird ersetzt durch IC 10 (25/86) 1.810.999.21.

EPROM R 5213-0 (13/83) oder IC 12 (40/85) 1.810.999.20 wird ersetzt durch IC 12 (25/86) 1.810.999.21.

EPROM R 5214-0 (13/83) oder IC 14 (40/85) 1.810.999.20 wird ersetzt durch IC 14 (25/86) 1.810.999.21.

#### Wichtig:

Beim Austausch können die Audio-Daten verloren gehen. Daher nach Möglichkeit Daten auf Band abspeichern. Ebenso kann der RAM-interne Betriebsstundenzähler rückgesetzt werden.

#### Softwarebereinigung:

Unter anderem wurden folgende Mängel der Software 40/85 behoben:

- Der (Software) Betriebsstundenzähler ist nicht mehr flüchtig.
- Wird der Aufnahmebefehl während dem Bandauslauf permanent gedrückt, so bleiben die Audiokanäle in Stop nicht mehr auf Ready-Record hängen.

This change is not required on MPU PCB's labelled 1.820.780.00 and 1.810.780.20.

No other hardware modifications are necessary - it is sufficient to replace the three EPROM's only.

#### Modification instructions:

Replace the three EPROM's. With this change, the MPU-PCB receives a new designation: 1.810.780.21 (Hardware - 20).

Replace EPROM R 5212-0 (13/83) or IC 10 (40/85) 1.810.999.20 by IC 10 (25/86) 1.810.999.21.

Replace EPROM R 5213-0 (13/83) or IC 12 (40/85) 1.810.999.20 by IC 12 (25/86) 1.810.999.21.

Replace EPROM R 5214-0 (13/83) or IC 14 (40/85) 1.810.999.20 by IC 14 (25/86) 1.810.999.21.

#### Important:

Care must be taken that the Audio-parameters do not get lost when exchanging the EPROM's. Therefore, store the parameters on tape. The RAM-internal elapsed time counter may also be reset to zero.

#### Software modifications:

The following shortcomings of the software 40/85 have been eliminated:

- The (software) elapsed counter content does not disappear anymore.
- If the record command is permanently pressed, even in the moment when the tape is running out of the tape transport, the audio channels do not remain in Ready-Record mode anymore after stop mode has been achieved.

### Bedienungsänderungen und neue Funktionen der Software 25/86

Die Software 25/86 offeriert dieselben neuen Funktionen die bereits in der Software 40/85 implementiert sind.  
Deshalb können die Bedienungsänderungen und die neuen Funktionen vollumfänglich der SI 95/86 entnommen werden.

Abweichend von SI 95/86 sind nur folgende zwei Punkte:

#### 1) Seite 1 Mitte:

Achtung:

Bei Pilot-Ausführung der A810 funktioniert die automatische Umschaltung Bandsorte A / Bandsorte B beim Kopfträgeraustausch mit der Software 40/85 nicht mehr.  
Es wird eine neue spezielle Software für die A810 Pilotversion erhältlich sein.

Dieser Abschnitt ist nicht mehr gültig.

#### 2) Seite 3 § 5:

5. Die Funktionstasten am Masterpanel (CCIR/NAB, TAPE A / TAPE B oder MONO/STEREO-Umschaltung) sind gegen unbeabsichtigtes Betätigen gesichert worden.

Die Umschaltung erfolgt nur durch Drücken der STOP-Taste und gleichzeitiges Betätigen der entsprechenden Umschalttaste am Masterpanel.

Diese Funktion ist jetzt mit einem Jumper auf dem Masterpanel anwählbar.

### Operating changes and new functions of software 25/86

Software 25/86 offers the same new features which are already implemented in software 40/85.  
Therefore, all the operating changes and new function can be read in SI 95/86.

Differing from SI 95/86 are only the following two paragraphs:

#### 1) Page 1 center:

Please note:

The automatic changeover from tape sort A to tape sort B by exchanging the headblock of the A810 pilot versions, does not function anymore with software 40/85.  
A new special software for all A810 pilot versions will be released.

This paragraph is no longer valid.

#### 2) Page 3 § 5:

5. The push button of the masterpanel CCIR/NAB, TAPE A / TAPE B or MONO/STEREO-switches) have been protected against unintentional operation.

Changeover occurs only when pressing the STOP button while pressing simultaneously the required push button of the master panel.

This function is now selectable by a jumper on the Masterpanel.

a) Masterpanel 1.810.310.00/81  
(2 Geschwindigkeits-Version)

Der Jumper JS2 auf dem Master-Control PCB 1.810.733.00 hat neu folgende Funktion:

JS2 in POS A = Funktionstasten  
verriegelt mit  
Stop-Taste

JS2 in POS B = Funktionstasten  
direkt schaltbar

a) Masterpanel 1.810.310.00/81  
(2 Speed-Version)

The jumper JS2 on the Master-Control PCB 1.810.733.00 has the following new function:

JS2 in POS A = Function change-  
over locked with  
Stop-Key

JS2 in POS B = Function change-  
over directly  
switchable

b) Masterpanel 1.810.312.00  
(3 Speed)  
Masterpanel 1.810.305.00  
(4 Speed)

Der Jumper JS1 auf dem Master-Control PCB 1.810.765.00 hat neu folgende Funktion:

JS1 in POS A = Funktionstasten  
verriegelt mit  
Stop-Taste

JS1 in POS B = Funktionstasten  
direkt schaltbar

b) Masterpanel 1.810.312.00  
(3 Speed)  
Masterpanel 1.810.305.00  
(4 Speed)

The jumper JS1 on the Master-control PCB 1.810.765.00 has now the following function:

JS1 in POS A = Function change-  
over locked with  
Stop-Key

JS1 in POS B = Function change-  
over direct  
switchable.

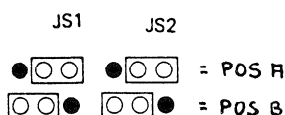
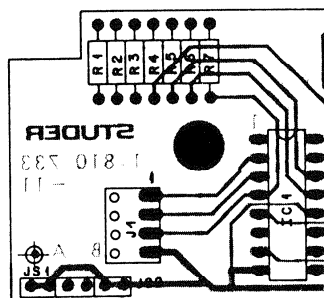
Wichtig:

Damit bei der A810 Pilot-Ausführung die automatische Umschaltung Tape A / Tape B möglich ist, muss der Jumper in Position B stehen.

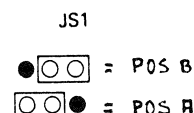
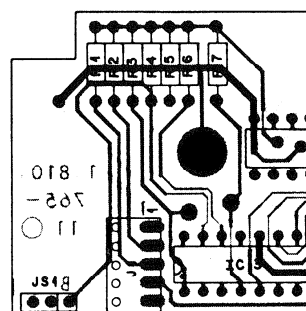
Important:

In order to make possible an automatic changeover from Tape A to Tape B in the A810 Pilot version (or vice versa) the jumper must be in position B.

MASTER CONTROL PCB 1.810.733-00



MASTER CONTROL PCB 4 SPEED 1.810.765-00





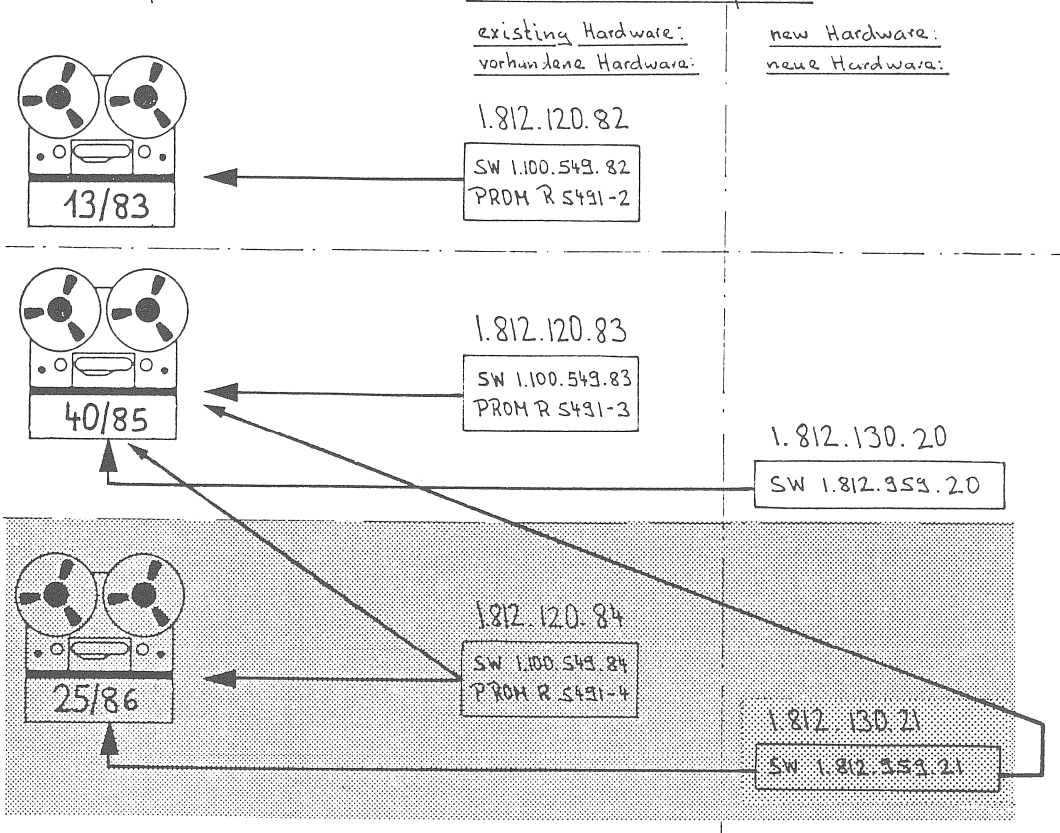
# A810 Software $\left\{ \begin{array}{l} \text{matched to} \\ \text{Anpassung an} \end{array} \right\}$ TLS 4000

The different Software - conditions of the A810 require also different Software (SW) for the TLS 4000 Interface.

Mit den verschiedenen Software - Ständen der A810 werden auch verschiedene TLS 4000 Interface - Software (SW) notwendig.

## A810 Software:

## TLS 4000 - Interface:



## Legend:

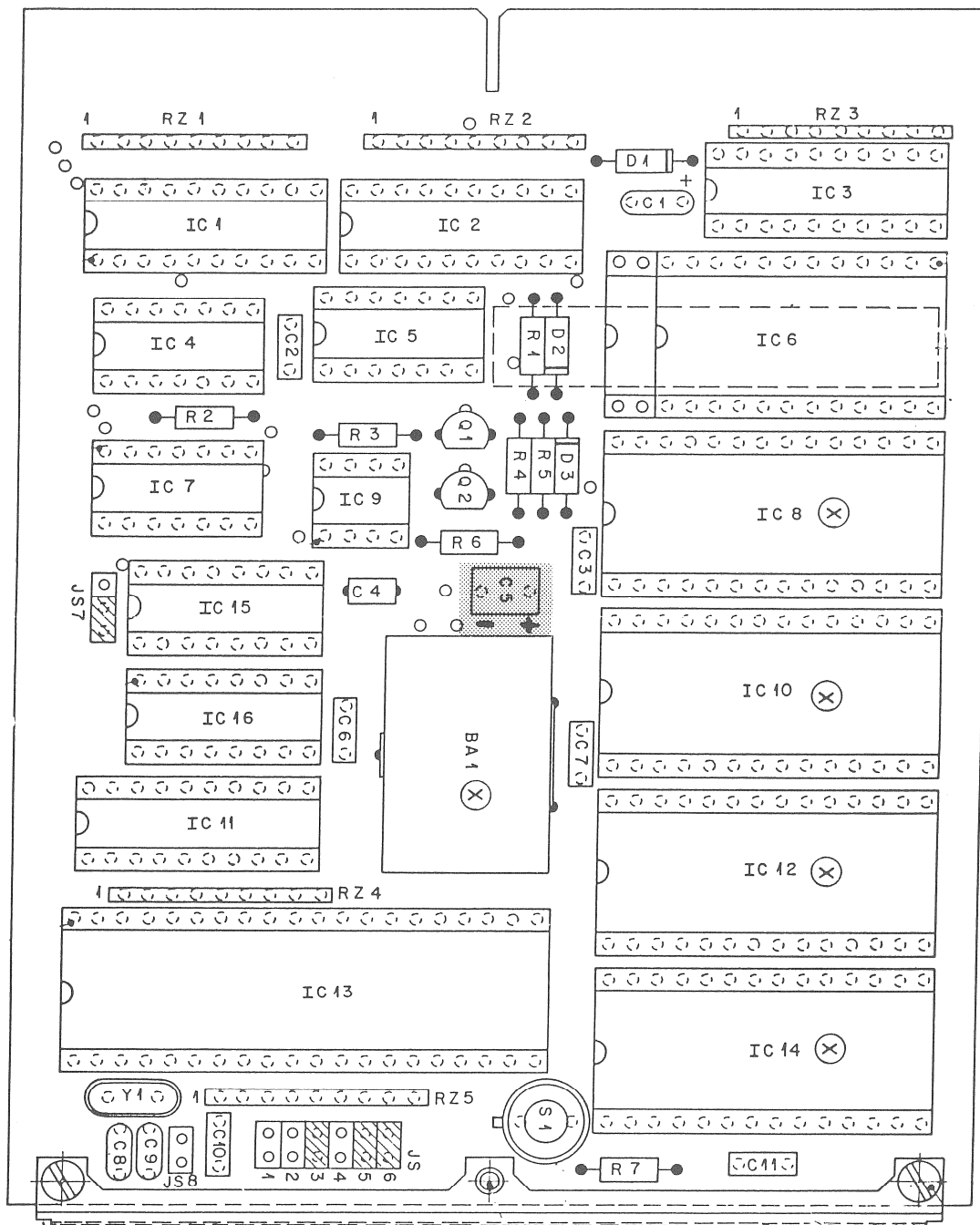
— allowed Combination

▨ latest Combination

## Legende:

— mögliche Kombination

▨ aktuelle Kombination



Layout 1.820.780.12  
Bestückungsplan 1.820.780.12

<b>STUDER</b> REGENSDORF ZÜRICH	Benennung: <b>MP UNIT WITH SOFTWARE</b>	Nummer: <b>1.820.780.-82</b>
---------------------------------------	---	------------------------------

Software A810 01/88

Bestellnummer 20.100.810.01

Order number 20.100.810.01

SI 116/88

D/E

Einleitung

- Die neue Software 01/88 ermöglicht Zeitcode Aufnahme- und Wiedergabe bei 3 3/4 ips (9,5 cm/s).
- Das Drop-in, drop-out timing wurde ebenfalls optimiert, um im Synchronisationsbetrieb (mit TLS 4000) ein nahtloses, unhörbares Aneinanderfügen der Aufnahmesequenzen zu garantieren.
- Es wurden gleichzeitig Aufkleber erstellt, welche die Funktion der Jumpers (Brückenstecker) erklärt.
- Die Software 01/88 sorgt auch für eine optimale Anpassung an die beiden neuen OPTIONEN parallele Kanalfernsteuerungs-Interface für VUK- (20.810.900.00) und NICHT VUK (20.810.901.00) Versionen.
- Einige kleine Mängel der vorgängigen Software 25/86 konnten behoben werden.

WICHTIG FÜR TLS 4000 BENUTZER

Aus der Software-Kombinationstabelle auf der letzten Seite dieser SI sind die aktuellen Software-Kombinationen ersichtlich.

Der Software-Umrüstsatz  
20.100.810.01 enthält

1 x Software 01/88	1.810.999.22
1 x Schild Index 22	1.810.780.01
1 x Schild für MPU	1.810.780.02
1 x Schild für Master-panel	1.810.090.63
1 x Schild für progr. Tabelle	1.810.090.64
1 x SI 116/88	10.85.6010

Die Software 01/88 wurde bei allen A810 Tonbandgeräten ab Tonbandgeräten Serienr. 6885 serienmässig eingebaut.

Introduction

- The new software 01/88 makes time code recording and reproduction at 3 3/4 ips (9,5 cm/s) possible as well.
- The drop-in and drop-out timing has been optimized to ensure gapless inaudible insertions when working with a synchronizer system such as the TLS 4000.
- Labels to explain the jumper-functions are also provided.
- The software 01/88 offers optimal matching to the two new OPTIONS Parallel channel control interface for VUK- (20.810.901.00) and NON VUK 20.810.900.00 versions.
- Some minor shortcomings of the software 25/86 are also eliminated.

IMPORTANT FOR USERS OF THE TLS 4000

For the latest software combinations refer to the software combination table on the last page of this SI.

The software up-date kit  
20.100.810.01 contains

1 x Software 01/88	1.810.999.22
1 x Label Index 22	1.810.780.01
1 x Label for MPU PCB	1.810.780.02
1 x Label for Master-panel	1.810.090.63
1 x Label for progr. table	1.810.090.64
1 x SI 116/88	10.85.6010

The software 01/88 is factory installed in all A810 tape recorders from serial no. 6885 onwards.

Anwendung

Alle A810 Tonbandgeräte bestückt mit den unten aufgelisteten Printplatten oder Softwareanzeigen können ohne Hardware-Änderungen auf den neuesten Softwarestand aufgerüstet werden.

Software	Printplatte
13/83	1.820.780.00 1.820.780.81 1.820.780.82
40/85	1.810.780.20
25/86	1.810.780.21

Application

The new software is suitable for all A810 tape recorders equipped with the below listed printed circuit boards or software status displays. A hardware modification is not required.

Software	PC-Boards
13/83	1.820.780.00 1.820.780.81 1.820.780.82
40/85	1.810.780.20
25/86	1.810.780.21

Bitte beachten

Geräte mit Software 07/83 (MPU Print 1.810.752.00) können nur durch Ersetzen der MPU-Karte auf die Software 01/88 aufgerüstet werden.

Bestellnummer für MPU-Karte mit Software 01/88: 1.810.780.22.

Please note

For tape recorders still equipped with software 07/83 (MPU PCB 1.810.752.00) the MPU-PCB needs to be exchanged.

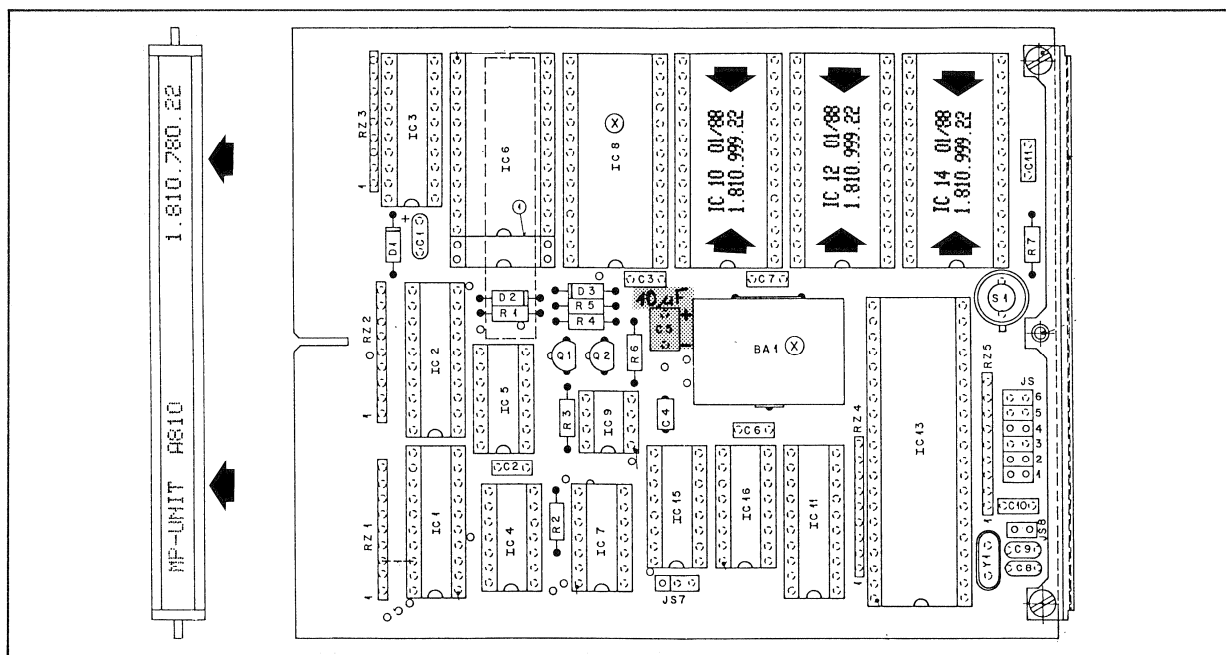
Order number for MPU PCB with software 01/88: 1.810.780.22.

Umrüstarbeiten

Es müssen nur die drei EPROM's und der Bezeichnungsstreifen 1.810.780.22 auf der der MPU-Karte ersetzt werden. Siehe Bestückungsplan unten.

Modification instructions

Only the three EPROM's and the designation label 1.810.780.22 on the MPU PCB need to be replaced. See layout below.

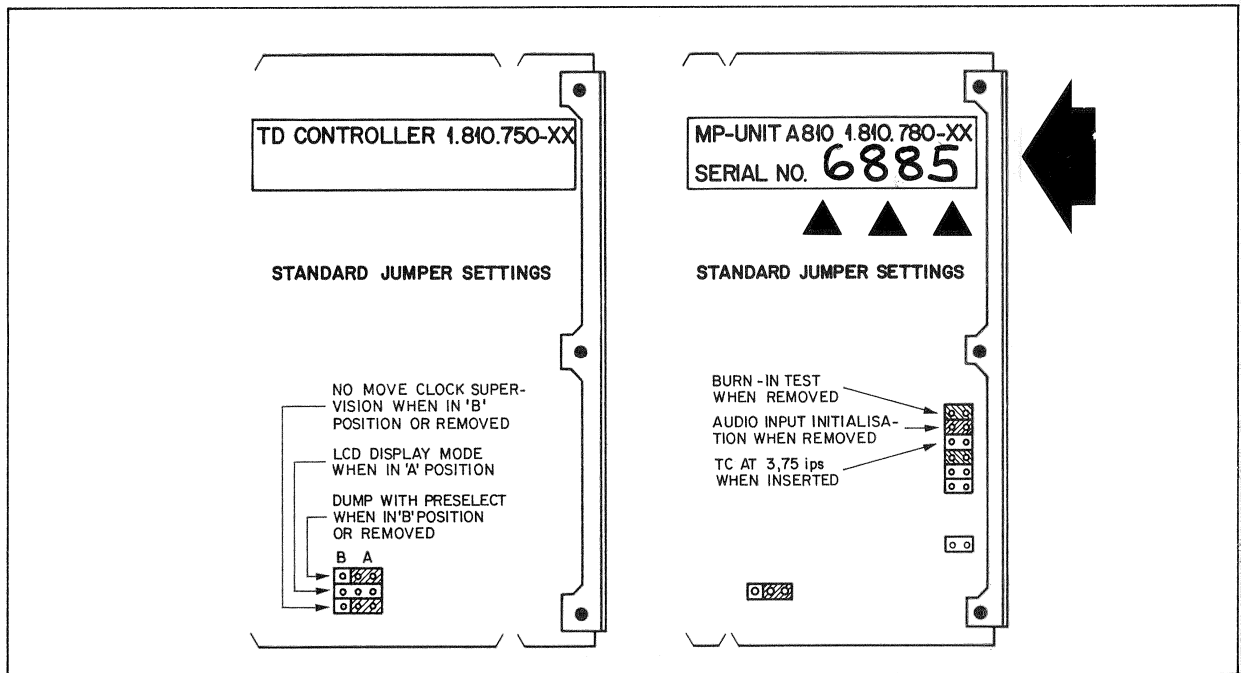


Auf diesem MPU Bestückungsplan muss C5 10  $\mu$ F (59.26.2100) betragen.

Anschliessend die Seriennummer der A810 auf dem Brückenstecker-Bezeichnungsschild 1.810.780.02 eintragen und Kleber an der Rückseite der MPU-Karte aufkleben.  
Siehe Aufkleber Beispiel unten:

Check that C5 on this MPU-layout is 10  $\mu$ F (59.26.2100).

Write the serial number of the A810 on to the jumper setting label 1.810.780.02 and stick it to the rear side of the MPU PCB.  
See label example below:



### Wichtig

Beim Austausch der EPROM's können die Audio Daten verloren gehen. Daher nach Möglichkeit Daten auf Band abspeichern. Ebenso kann der RAM-interne Betriebsstundenzähler rückgesetzt werden.

Sollten nach dem Software-Wechsel unerwartete Zustände auftreten, (wie z.B. Aussteigen aus der Aufnahme nach einigen Minuten Betrieb mit Anzeige EEEEC1 oder EEEEC2), so ist das RAM auf der MPU Karte zu löschen. Dazu RAM (IC 6) herausnehmen und die beiden Anschlussreihen mit einem Schraubenzieher kurzschliessen.

Dabei ist es unerlässlich, dass die Audioparameter vorher ausgelesen werden, ansonsten die Maschine neu eingemessen werden muss.

### Important

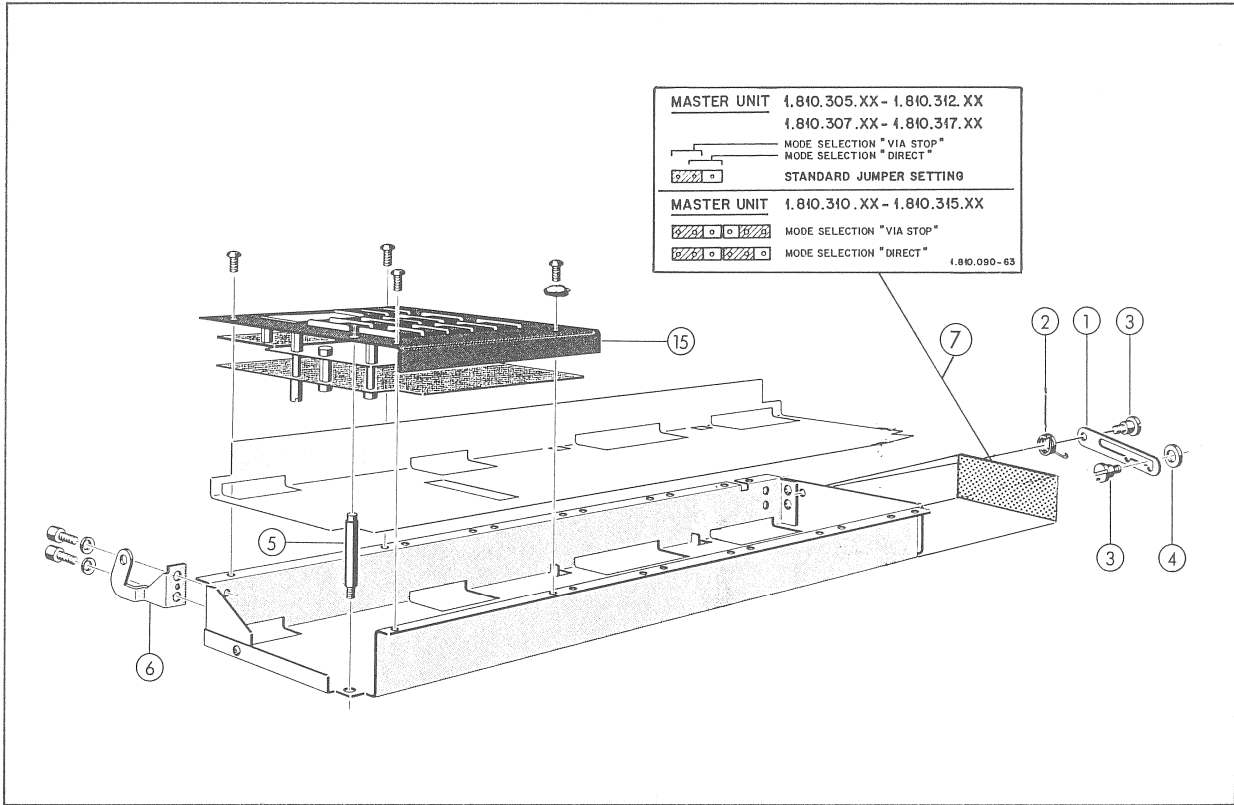
Care must be taken to make sure the Audioparameters do not get lost when exchanging the EPROM's. Therefore, store the parameters on tape. The RAM-internal elapsed time counter may also become reset to zero.

If the tape recorder shows unexpected conditions after the software change (as i.e. drop out of record mode after a few minutes in operation and the display indicates EEEEC1 or EEEEC2) erase the RAM on the MPU PCB. For this remove the RAM (IC 6) and short circuit both rows of connection pins with a screwdriver.

Before doing this it is necessary that the audioparameters are saved on tape, otherwise the tape recorder will have to be realigned.

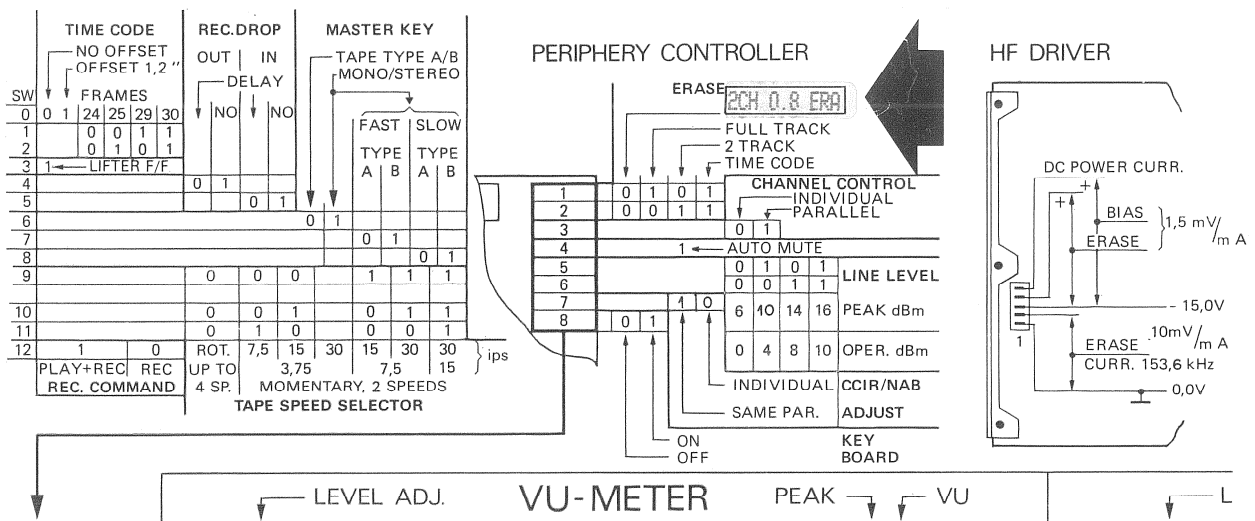
Bedienpanel aufklappen und Kleber ⑦ (1.810.090.63) für die Brückensteckerpositionen auf dem Masterpanel auf der rechten Seite vom Bedienpanel aufkleben.

Open command unit panel and stick the label ⑦ (1.810.090.63) for the jumper settings of the master-panel onto the right hand side of the command unit panel.



Zusatzkleber 1.810.090.64 für die DIL-Schalter auf dem PERIPHERY CONTROLLER auf die grosse Programmier-tabelle aufkleben.

Attach the additional label 1.810.090.64 for the DIL-switch settings of the PERIPHERY-CONTROLLER onto the large programming table.



### Software Aenderungen

#### 1. Zeitcode Aufnahme-Wiedergabe bei 3 3/4 ips

Um die Zeitcode Aufnahme/Wiedergabe bei 3 3/4 ips zu aktivieren, muss der Brückenstecker JS 4 auf der MPU-Karte 1.810.780.22 eingesteckt werden.

Dabei ist zu beachten, dass das Potentiometer R2 auf dem Zeitcode-Print 1.820.721.XX für die Zeitcode-Aufnahmepegel-einstellung bei 7 1/2 ips dadurch auch für 3 3/4 ips eingesetzt wird. Eine individuelle Pegel-einstellung für 3 3/4 ips und 7 1/2 ips ist daher nicht möglich. Eventuell muss der Pegel für 3 3/4 ips TC-Aufzeichnung leicht optimiert werden. (Einstellung siehe Serviceanleitung Sektion 4/27).

#### 2. Verbessertes Drop-in, Drop-out timing

Verbesserung der Verzögerungszeiten für den Aufnahme-Ein- und Ausstieg (Drop-in, Drop-out), um ein nahtloses, unhörbares Aneinanderfügen einzelner Aufnahme-sequenzen zu gewährleisten.

#### 3. Ergänzung der Löschkopf Varianten

Wird bei A810 NICHT ZEITCODE Geräten beim Löschvorgang keine Zeitcode-Löschung gewünscht, so muss der 2 Kanal Löschkopf mit 0,8 mm Spurtrennung 1.116.814.00 eingesetzt werden.

Für die entsprechende Löschstrom-vorgabe und das korrekte drop-in drop-out timing für diese Löschkopfvariante, musste die Software angepasst werden. Beide DIL-Schalter 1 und 2 auf dem Periphery Controller müssen dafür auf Null stehen.

### Software modifications

#### 1. Time code recording and playback at 3 3/4 ips

To activate time code recording and playback at 3 3/4 ips, insert the jumper JS 4 on the MPU PCB 1.810.780.22.

Please note that the potentiometer R2 on the time code read/write unit 1.820.721.XX for aligning the time code record level at 7 1/2 ips is used to set the TC-level at 3 3/4 ips as well.

An individual level setting for 3 3/4 ips and 7 1/2 ips is not possible therefore.

Most probably the TC recording level for 3 3/4 ips needs to be optimized. (For readjustment refer to Service manual section 4/27).

#### 2. Improved drop-in, drop-out timing

Improved drop-in, drop-out timing to ensure gapless, inaudible inserts.

#### 3. Supplementary Info for erasehead versions

To avoid time code erasure on A810 NON-TIME CODE versions, a special 2 track erase head with 0,8 mm track spacing 1.116.814.00 is required.

For correct erase current and correct drop-in, drop-out timing the software has to be matched to this erasehead configuration.

Set the two DIL-switches 1 and 2 of the periphery controller to zero for this erasehead configuration.



### Bitte beachten

Mit der Software 01/88 entfällt somit die Position NO RECORD. Für "Master safe" müssen daher entweder beide Aufnahmeverstärker oder beide HF-Treiber ausgesteckt werden.

#### 4. Blinkende LED's in Rehearse

Bei der Schnittprobe-Funktion "Rehearse" (Befehl SRH der seriellen Schnittstelle) blinkt die PLAY LED (bzw. PLAY und REC).

#### 5. Neue LOC-START Philosophie

Es werden nur noch definierte PLAY- (bzw. RECORD) Uebergänge im Loc-start-Speicher eingelesen, d.h. nur Wiedergabe und Aufnahme-starts aus Bandstillstand (Stop) werden abgespeichert.

#### 6. FADER Bereitschaftsanzeige

Das Signal BR-FAD am Anschluss 8 des parallelen Fernsteueranschlusses zeigt mit der Software 01/88 die Faderstart Bereitschaft an, d.h. wenn ein Faderstart möglich ist, ist dieses Signal Low (OV) und kann somit mittels einer Lampe oder LED anzeigen, dass die A810 den Wiedergabe-Startbefehl beim Öffnen des Faders annimmt.

#### 7. Bedieneinheit ausschalten

Vom Print Parallel Remote Controller 1.810.738.00 aus kann wahlweise die Bedieneinheit oder die externe Fernsteuerung abgeschaltet werden.

Durch Anlegen von 0 V an die Kathode von D20 auf dem Parallel Remote Controller Print 1.810.738 wird die Befehlseingabe der externen Fernsteuerung verhindert.

### Please note

With the software 01/88 the position NO RECORD is inapplicable. For Master-safe remove either both record amplifier PCB or both HF-Driver PCB.

#### 4. Flashing LED's in rehearse mode

In rehearse mode (command SRH of the serial remote control) the PLAY-LED (resp. PLAY and REC) flashes.

#### 5. New LOC-START philosophy

Only "genuine" start positions will be stored in the Loc-start memory, i.e. only when the PLAY (resp. RECORD) start happens out of tape stand still (stop).

#### 6. Indication of FADER READY

With software 01/88 the signal BR-FAD on pin 8 of the parallel remote control socket indicates the fader ready mode, i.e. when faderstart mode is possible the signal BR-FAD is low (OV). Thus a bulb or LED connected to this signal indicates that the A810 will accept the Play command when opening the fader.

#### 7. Disabling the command unit

From the parallel remote controller PCB 1.810.738.00 it is possible to disable the internal command unit or the external remote control alternatively.

To disable the commands from the external remote control, apply 0V to the cathode of D20 on the parallel remote controller PCB 1.810.738.

D24 an Widerstandsnetzwerk RZ1/RZ2 anschliessen. Durch Anlegen von 0 V an die Kathode von D24 wird die Befehlseingabe der Geräteinternen Bedieneinheit verhindert.  
Siehe Schema unten.

### Bitte beachten

Diese Signale sind nicht auf den parallelen Fernsteueranschluss gelegt.  
Soll zum Beispiel die Abschaltung der Bedieneinheit Geräte extern erfolgen, so muss ein zusätzlicher Draht verwendet werden.

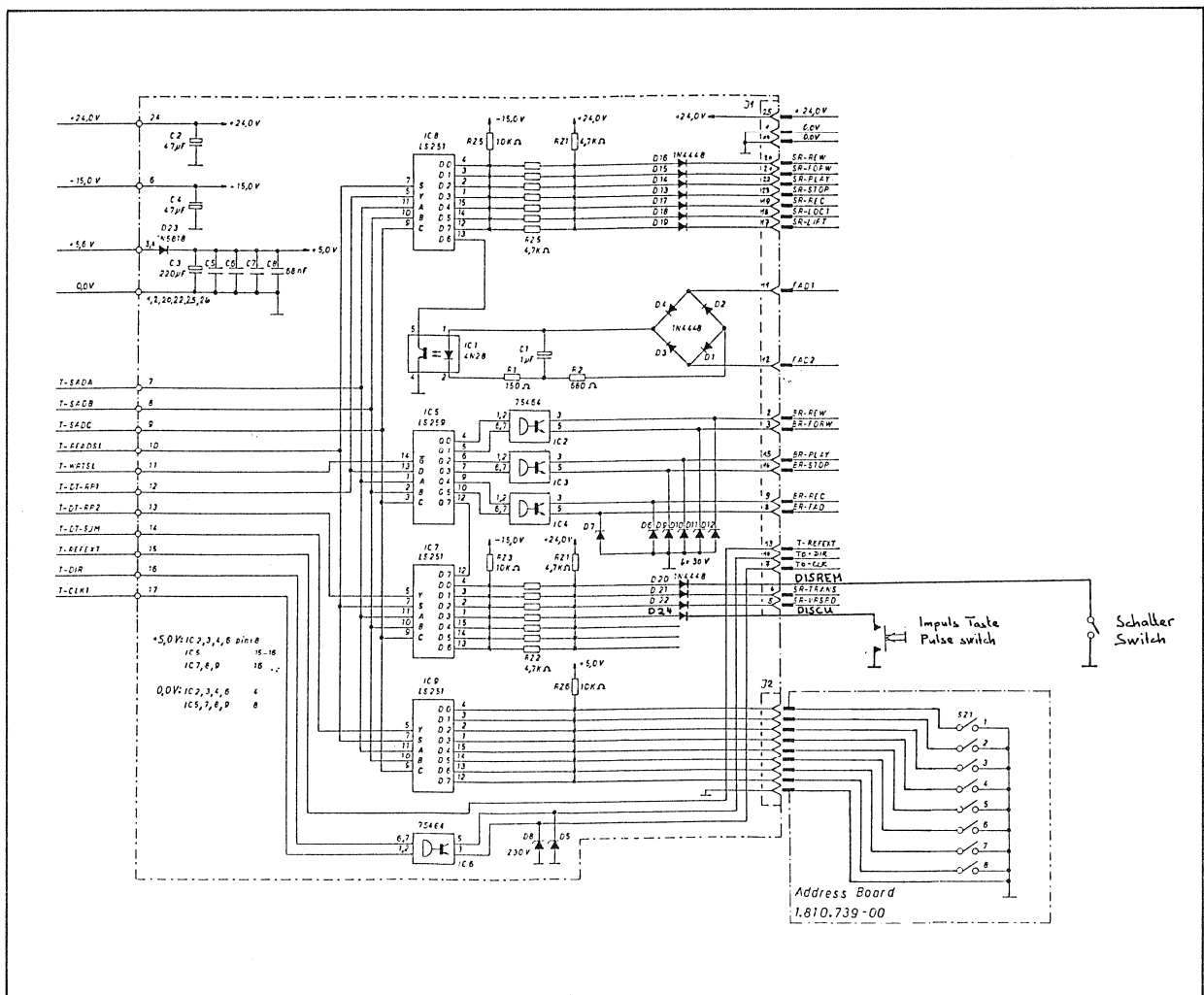
To disable the commands of the internal command unit, connect a diode D24 to the resistor network RZ1 / RZ2 and apply 0V to cathode of this diode.  
See circuit diagram below.

### Please note

These signals are not available on the parallel remote control socket.  
For example: To disable the command unit from an external device an additional wire will be required.

PARALLEL REMOTE CONTROLLER PCB 1.810.738-00 GR23

ADDRESS PCB 1.810.739-00



8. Anpassung an die Kanalfernsteuerung

Die Software musste den Optionen "Parallele Fernsteuerungs-Interface für VUK- (20.810.901.00) und NICHT VUK-Versionen (20.810.900.00)" insofern angepasst werden, damit bei eingeschalteter Kanalfernsteuerung (21.328.260.00) der angewählte Funktionsstatus beim Einschalten der A810 eingelesen wird.

9. Anpassung der Standard Entzerrungsparametern

Die Parameters für die Zeitkonstanten der Entzerrung und der Einstellung der Höhen wurde in der Software dem aktuellen Stand angeglichen.

CCIR

Wiedergabeentzerrung  
3 3/4 ips: AB

Aufnahmehöhen 3 3/4 ips: 90

NAB

Aufnahmehöhen 15 ips: 39

Sync Höhen 15 ips: A0

Aufnahmehöhen 7 1/2 ips: 39

Sync Höhen 7 1/2 ips: A0

Wiedergabeentzerrung

7 1/2 ips: 6D

Aufnahmehöhen 3 3/4 ips: 90

Wiedergabeentzerrung

3 3/4 ips: AB

10. Neue Statusanzeige

Wird bei einem LOCATE-Befehl mit Aufnahmewahl über die RS 232 der Status-(ST?) während der Lockierphase abgefragt, so erscheint als Rückmeldung nicht mehr 12 (Locate + Play), sondern 13 = LOCATE + RECORD. Ebenso erscheint bei der Dauer-Status-Abfrage (DST) die Rückmeldung LOC + REC.

8. Matching to the channel remote control

The software had to be matched to the options "parallel remote control interface for VUK- (20.810.901.00) and NON VUK-versions (20.810.900.00)" for correct initialization of the push-button selected functional status of the channel remote controller (21.328.260.00) when powering the A810 tape recorder while the channel remote controller is switched on.

9. Matching of the standard equalization parameters

With the new software, the parameters of the time constants for equalization and the treble adjustment are matched to the newest status.

CCIR

Reproduce equalization  
3 3/4 ips: AB

Record treble 3 3/4 ips: 90

NAB

Record treble 15 ips: 39

Sync treble 15 ips: A0

Record treble 7 1/2 ips: 39

Sync treble 7 1/2 ips: A0

Reproduce equalization

7 1/2 ips: 6D

Record treble 3 3/4 ips: 90

Reproduce equalization

3 3/4 ips: AB

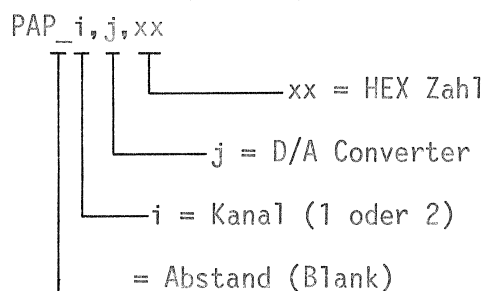
10. New status information

The status information request (ST?) via RS 232 during the search mode of a LOCATE command with record preselected, changed from 12 (locate + play) to 13 = LOCATE + RECORD. Furthermore the status information LOC + REC is displayed also with permanent status request DST.

11. Direkter Zugriff zu den DAC's ohne Abspeicherung.

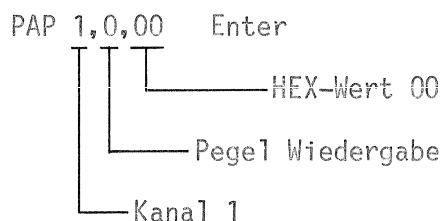
Mit dem Befehl PAP über die RS 232 können für den aktuellen Betriebszustand Daten direkt in die digital / analog Converter (C-MOS Attenuators) eingeschrieben werden, ohne die im RAM abgespeicherten Daten zu verändern.

Befehlseingabe



- j: 0 = Pegel Repro / Sync  
1 = Höhen Repro / Sync  
2 = Bass Repro / Sync  
3 = Entzerrung Repro / Sync  
4 = Pegel Aufnahme  
5 = Höhen Aufnahme  
6 = Vormagnetisierung  
7 = Entzerrung Aufnahme

Beispiel einer Befehlseingabe

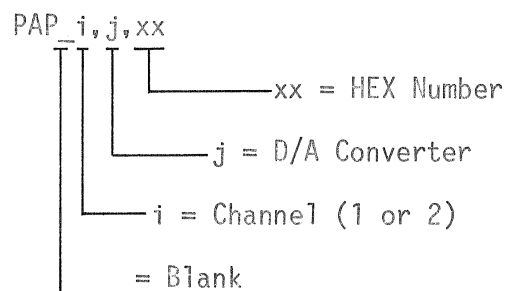


Steht das Gerät auf REPRO, so wird dadurch der Wiedergabepegel von Kanal 1 auf 00 (Null) gesetzt. Kanal 1 ist somit stumm.

11. Direct access to the DAC's without store

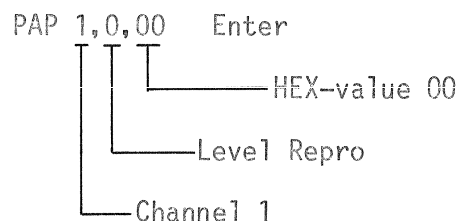
The command PAP via RS 232 permits to enter Data direct into the digital / analog converters (C-MOS attenuators) without influencing the Data stored in the RAM, for the selected operational status.

Command input



- j: 0 = Level Repro / Sync  
1 = Treble Repro / Sync  
2 = Bass Repro / Sync  
3 = Equalization Repro / Sync  
4 = Level Record  
5 = Treble Record  
6 = Bias  
7 = Equalization Record

Example for a command input



Is the tape recorder switched to REPRO, the reproduce level of channel 1 will be set to 00 (zero), therefore, channel 1 is muted.

## 12. Software-Bereinigungen

- Fehler Rückmeldungen auf der LED-Anzeige werden jetzt immer mit EEE .... angezeigt, PPP Informationen sind somit nicht mehr möglich.
- Keine Aufhebung mehr von der Funktion "Auto mute" (Stumm-schaltung), wenn während dem Wickeln die Geschwindigkeit umgeschaltet wird.

## 13. Aufnahmeschleife

Mit dem Jumper JS6 auf der MPU-Karte (Burn-in mode) kann ein Aufnahmeschleifenbetrieb für Dauerlauf- und Testzwecke gesetzt werden.

Jumper JS6 eingesetzt: Normaler Betrieb der Maschine.

Jumper JS6 entfernt:  
Maschine verhält sich wie folgt:

Beim Einschalten des Gerätes wird der Bandzähler auf 00:00:00 gesetzt und das Display zeigt EEEbb zur Information, dass der Aufnahmeschleifenbetrieb aktiviert wurde und das Gerät geht bis zur Zieladresse in den Aufnahmebetrieb. Dann wird auf 00:00:00 zurückgespult und der Aufnahmeprozess wiederholt sich unendlich (Zieladressen siehe unten).

Soll anstelle der Daueranzeige EEEbb, der Zählerstand sichtbar werden, so muss die Taste TRANS und gleichzeitig die Taste STOP gedrückt werden. Da dadurch das Laufwerk in Stop geht, muss anschliessend eine Laufwerkfunktionstaste (<, >, Play oder Rec) gedrückt werden, um den Schleifenbetrieb wieder zu aktivieren.

Die Schleifenlängen sind fest in der Software eingegeben und können extern nicht verändert werden.

## 12. Software corrections

- Fault indications on the LED-Display are now always shown with EEE ..., PPP-indications are no longer possible.
- No longer a disabling of the function "auto mute" by changing the speed during a fast wind mode.

## 13. Record Loop

The jumper JS6 on the MPU-PCB (Burn-in mode) enables a record-loop for endurance test-mode (soak testing).

For normal operation the jumper JS6 must be inserted.

If the jumper JS6 is removed the tape recorder reacts as follows:

When switching the tape recorder on, the tape counter resets to 00:00:00 and the display shows EEEbb to indicate that the record loop is activated. Afterwards the tape recorder starts in the record mode up to the target address, then the recorder rewinds to counter position 00:00:00. Now the recording mode will be repeated endlessly. (Target addresses see below).

To display the counter position instead of the permanent display EEEbb, press push button TRANS and STOP simultaneously. Because this causes the tape transport to enter the stop mode, an operating mode (i.e. <, >, Play or Rec) has to be selected to reactivate the loop mode.

The length of the loops have been defined in the software and therefore, cannot be changed by the user.

Die Schlaufenlängen betragen:

ca. 8 Minuten bei 9,5 cm/s  
ca. 4 Minuten bei 19 cm/s  
ca. 2 Minuten bei 38 cm/s  
ca. 1 Minute bei 76 cm/s

Achtung wichtig:

Die Schlaufe erfolgt immer in Aufnahme d.h. der Löschvorgang ist immer aktiviert, selbst wenn die Safe-Ready-Schalter auf safe stehen, oder gar wenn das externe VU-Meter-Panel nicht angeschlossen ist.

14. A810 Software Anpassungstabelle an das TLS 4000

Siehe nächste Seite.

The length of the loops are:

approx. 8 minutes for 3 3/4 ips  
approx. 4 minutes for 7 1/2 ips  
approx. 2 minutes for 15 ips  
approx. 1 minute for 30 ips

Attention important:

The loop-mode is always in Record i.e. the erase mode is always activated, even if the ready-safe switches are in position safe or even if the external VU-meter panel is not connected.

14. A810 Software-matching table to the TLS 4000

See next page.

Achtung

Auf der Laufwerkfernsteuerung kann durch den Softwarewechsel die Funktion der LOC-Taste geändert haben. Zuordnung der gewünschten Funktion durch folgende Programmierung:

Auf der Laufwerkfernsteuerung kann die LOC 1 Taste als LOC-START-Taste oder zurück als LOC 1 Taste umprogrammiert werden.

Umprogrammieren der LOC 1 Taste auf LOC-START:

TRANS und LOC 1 Taste drücken und gleichzeitig noch die PLAY Taste drücken. Die LOC 1 Taste der Laufwerksteuerung ist somit LOC-START-Taste. Wird die Taste aktiviert, leuchtet auf der geräteinternen Bedieneinheit die LOC-START LED. (Funktion wird im RAM eingelesen somit bleibt sie auch nach dem Ausschalten des Gerätes enthalten).

Umprogrammieren von LOC-START zurück auf LOC 1:

TRANS und LOC-START-Tasten drücken und gleichzeitig STOP-Taste drücken. Somit ist die LOC-START Taste wieder LOC 1-Taste. Beim Aktivieren der LOC 1 Taste leuchtet auf der maschineninternen Bedieneinheit die LOC 1 LED.

Please note

In case the LOC-key on the tape transport remote control has changed its function due the software change reprogram the required function according to the following instructions:

On the tape transport remote control the LOC 1 push button function can be changed into LOC-START and vice versa.

Programming of the LOC 1 push button to LOC-START:

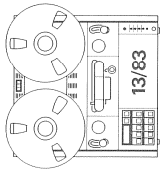
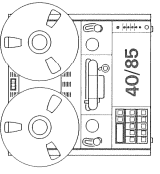

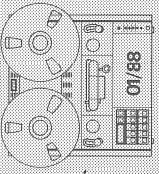
Press TRANS and LOC 1 push buttons together and at the same time the PLAY-key. Now the LOC 1 push button activates the LOC-START function. When pressing this push button, the LOC-START LED of the internal command unit lights up. (The function is stored in the RAM, therefore, the function remains stored even after power off).

Programming the LOC-START function back to LOC 1:

Press TRANS and LOC-START push buttons together and in addition the STOP-push button. Now the LOC-START push button is again LOC 1. When pressing this push button the LOC 1 LED of the internal command unit lights up.



The different Software conditions of the A810 requires also different Software (SW) for the TLS 4000 Interfaces.  
 Mit den verschiedenen Software-Ständen der A810 werden auch verschiedene TLS 4000 Interfaces Software (SW) notwendig.

A810 SOFTWARE	TLS 4000 MK I 1.812.101.XX			TLS 4000 MK II	
	Interface 1.812.120.XX	Interface 1.812.130.XX	Synchronizer PCB 1.812.106.XX	Interface 1.812.400.XX	Synchronizer PCB 1.812.320.XX
 MPU 1.820.780.00 1.820.780.81 1.820.780.82	1.812.120.82 SW 1.100.549.82 PROM R 5491-2		1.812.106.84 SW 1.100.548.84		
 MPU 1.810.780.20	1.812.120.83 SW 1.100.549.83 PROM R 5491-3	1.812.130 SW 1.812.959.20	1.812.106.23 SW 1.812.910.23		
 MPU 1.810.780.21	1.812.120.84 SW 1.100.549.84 PROM R 5491-4	1.812.130.21/22/23 SW 1.812.959.21/22/23	1.812.106.23 SW 1.812.910.23		
 ab Seriennummer 6885 MPU 1.810.780.22	1.812.120.84 SW 1.100.549.84 PROM R 5491-4	1.812.130.23 SW 1.812.959.23	1.812.106.23 SW 1.812.910.23	1.812.400.20 SW 1.812.950.20	1.812.320.21 SW 1.812.900.21 1.812.901.21 1.812.902.21

LEGENDE

 Mögliche Kombination  
 Aktuelle Kombination

LEGENDE

 Allowed combination  
 Latest combination