STUDER

PROFESSIONAL AUDIO EQUIPMENT

Service Information

Hardware Modification Kit
40/88 for A820 MCH

2" 20.050.820.60
1" 20.050.820.30

SI 120b/88 E

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1. Application

The hardware modifications described hereunder must be performed on all A820 multi-track tape recorders 1" and 2" version with delivery from STI up to 14th June 1988.

Information about the currently effective software for the A820 MCH can be obtained with STUDER INTERNATIONAL AG. The software is contained in a separate software update kit.

Please note:

- Machines that are delivered after September 1988 are modified as per SI 120b/88. These machines are also equipped with 2 gas springs to hold back the chassis in tilt-up position, each gas spring having a pressure force of 250 N.

- When a STUDER TLS 4000 Synchronizer is used together with the A820 Multitrack, the A820 MCH Interface of the TLS 4000 has to be equipped with the software 1.812.968.22.

- 8 Channel Machines (1" transports): These machines must be equipped with the tape tension sensors 1.820.385.00 (left) and 1.820.386.00 (right).

2. Summary of hardware changes

- New move roller with extremely low tape slippage for precise tape counting/locating and more accurate reel size inertia detection.
- New tape lifter with high wear-resistent tape guiding surface.
- Enlarged clearance between pinch roller and capstan shaft prevents tape slippage in play-mode.
- New tacho-roller sensing concept gives more reliability in case of tacho sensor failure during operation.
- New stop-position, left-hand roller retracted and mechanical brakes activated, no tape-head contact.
- New edit-position, left-hand roller engaged and mechanical brakes inactive, tape-head contact.

3. Contents of the modification kits

Update kit for 2" transports order no. 20.050.820.60:

- 1 SI 120b/88 3rd Edition	10.85.6062
- 1 Move Roller	1.820.450.08
- 1 Lifter Pin 2"	1.820.129.00
- 1 Resistor 680 Ohm	57.11.4681
- 2 Common Suppression Adjust kit	1.820.878.00
- 3 label index .81	1.010.081.43

Update kit for 1" transports order no. 20.050.820.30:

- 1 SI 120b/88 3rd Edition	10.85.6062
- 1 Move Roller	1.820.440.08
- 1 Lifter Pin 1"	1.820.128.00
- 1 Resistor 680 Ohm	57.11.4681
- 2 Common Suppression Adjust kit	1.820.878.00
- 3 label index .81	1.010.081.43

4. Modification instructions

4.1 Spooling Motor Drive Amplifier 1.820.875.00

Modification:

1. Remove resistor R7
2. Install Common Suppression Adjust Kit 1.820.878.00 :
   (see Schematics and Layout)
   2.1. Remove screw and mount the 12 mm - bolt.
   2.2. Solder the two pieces of wire into the holes on the additional print 1.820.878.00.
   2.3. Screw the additional print 1.820.878.00 onto the previously mounted bolt.
   2.4. Solder the two pieces of wire into the holes of R7. Check for good connection.
3. Attach label index .81 (1.010.081.43).

Common Mode Adjustment:

1. Connect only flat cable connector P1 to Spooling Motor Drive Amplifier. (All other connectors are unplugged.)
2. Switch tape recorder ON.
3. Measure offset voltage at TP2 (TP1 = ground) and write down offset voltage (voltage is between +/- 60 mV.)
4. Switch tape recorder OFF.
5. Apply a DC-voltage of +26 Volt to J1, Pin 1 with reference to TP1 (ground).
   Use for this purpose the +26 Volt on TP7 (TP3 = ground) of the Fuse/Supply Failure Detector 1.820.866.00.
   Make therefore the cable connections indicated in Fig. 4.1 .
6. Switch tape recorder ON.
7. Measure offset voltage at TP2 (TP1 = ground).
   Adjust with potentiometer R101 (10kohm) to the same offset voltage as measured under step 3 (tolerance +/- 10mV).
8. Switch tape recorder OFF.
9. Secure potentiometer with locking-paint.
10. Repeat steps 1 - 9 for the second Spooling Motor Drive Amplifier.

4.2 Power Fail Sense Board 1.820.869.00

Due to a production error, resistor R4 is not inserted in the power fail sense board. (see attached schematics)

Modification:

The resistor R4 must be inserted in all power fail sense boards in the existing A820 multi-track machines. The power fail sense board is located between the two spooling motors.

1. Tilt up the tape deck section for easy access.
2. Take out the Power Fail Sense Board 1.820.869.00. (Layout 1.820.869.11)
3. Insert R4 680 Ohm (57.11.4681).
4. Put the Power Fail Sense Board back.

Component:

1 Resistor 680 Ohm (57.11.4681)

4.3 Motor Assembly Right 1.820.141.00

Insufficient stroke length of the pinch roller assembly may result in tape slippage.

Modification:

The clearance of the pressure spring has to be increased to 0.5 ... 1mm.

1. Tilt up tape transport and remove right-hand Motor Assembly 1.820.141.00.
2. With a diagonal cutter or other suitable tool, shorten the right hand side control cam 1.820.141.06 by 3mm at the point indicated on the attached drawing. (Fig. X.X)
3. Motor assembly right 1.820.141.00 changes to 1.820.141.81. Attach index label .81 (1.010.081.43).

Adjustment:

The modification necessitates a readjustment of the distance between the pinchroller shaft and the headblock plate.

Adjusting the distance between pinchroller shaft and headblock plate: (see Fig. 4.3)

1. Switch tape recorder OFF.
2. Remove pinch roller.
3. Insert allen key (3mm) into the hole [1] and turn the pinch roller assembly clockwise to the end stop (Play - Position).
4. Loosen locknut (opening between flats 7mm) [2] on the tie rod at the pinch unit and turn tie rod [3] until a distance of ca.0.1mm between pinchroller shaft and headblock plate is obtained.
5. Retighten locknut and secure with locking paint.
6. Install pinch roller.

Checking the pinch roller force:

1. Switch tape recorder ON.
2. Press EDIT then PLAY (Pinch roller is now in PLAY - Position).
3. Unscrew fixing screw by a few turns [4].
4. Hook spring dynometer 0 - 20N to the screw, and pull in the direction of the connecting line between the centers of the capstan shaft and the pinch roller. While pulling, lightly brake the pinch roller with your finger.
5. The spring dynometer should indicate 1.2 - 1.3kp at the point where the pinch roller just lifts off the tape (and consequently stops).

Adjusting the pinching force:

If the above value is not attained, the pinch roller spring has to be readjusted.

1. Tilt recorder to service position.
2. Switch recorder to EDIT then PLAY.
3. The adjusting nut [5] (prevailing torque type nut, opening across flats 7mm) of the pinch unit is accessible through a hole in the cast chassis. Adjust until the requested value is attained.
4. Reinstall pinch roller cover after the adjustment.

Important Note:

For machines that are delivered after September 1988 and are equipped with a 4-section pinch roller, the following holds:

- These machines have a straight pinch roller shaft.
- The pinch roller pressure force is 0.9 - 1 kg.
- The distance between the pinch roller shaft and the capstan shaft should be 13.5 - 13.8 mm —> It is factory adjusted !

4.4 Lifter Pin 1.820.124.00 2"/ 1.820.123.00 1"

1. Remove headblock cover and old lifter pin.
2. Replace old lifter pin by the new lifter pin 1.820.129.00 (2") or 1.820.128.00 (1").

Adjusting the lifter pin:

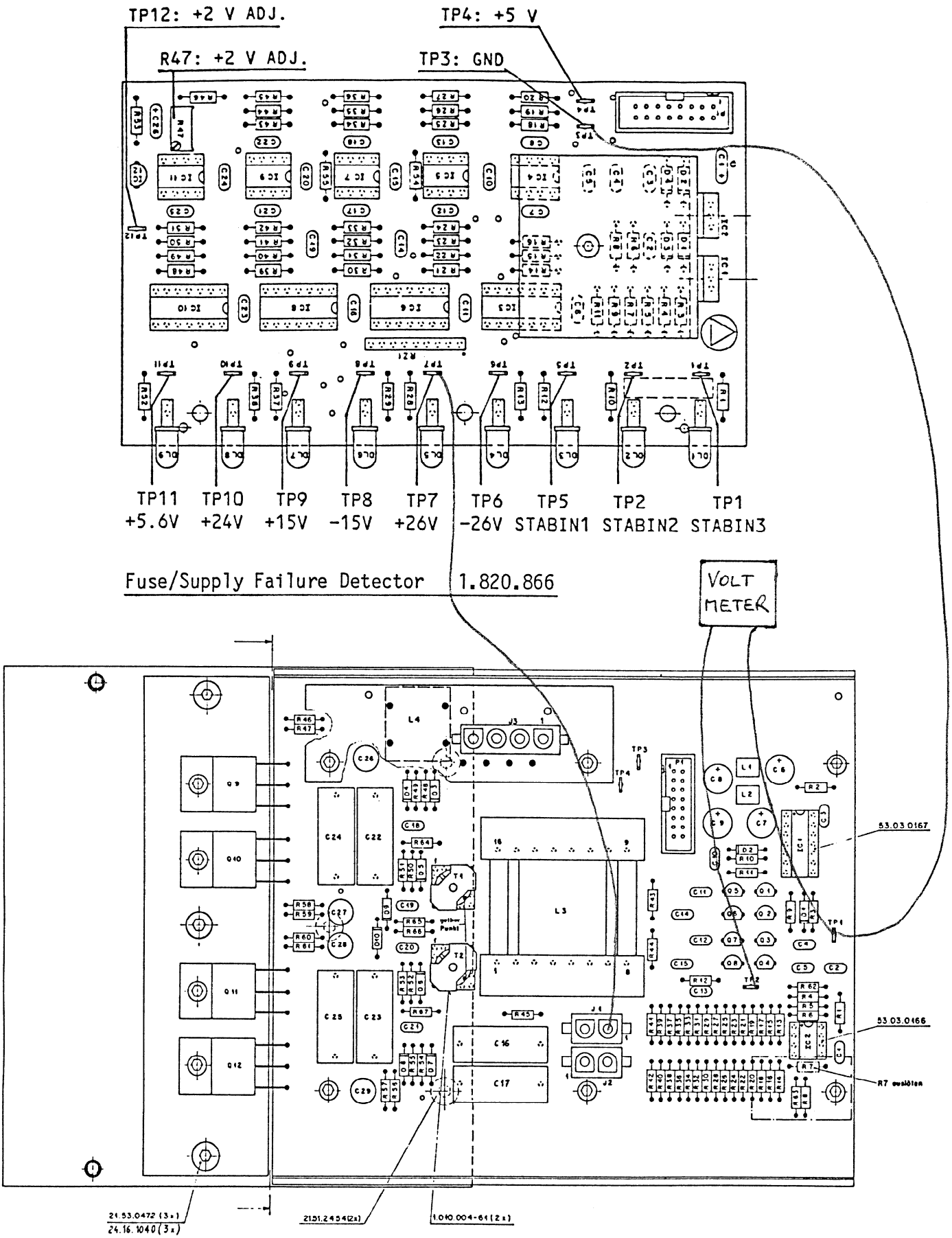
1. Load a tape.
2. Remove the headblock cover.
3. Switch recorder to EDIT. The tape must be separated from the capstan shaft by a few tenths of a millimeter. (the tape just does not touch the capstan shaft).
4. Should this not be the case, loosen the locknut (opening across flats 5,5 mm) and adjust screw (opening across flats 7 mm) to such a point where the tape just does not touch the capstan shaft in EDIT mode.
5. Retighten locknut.
6. Reinstall headblock cover.

4.5 Move Roller 1.820.450.04 2"/ 1.820.440.04 1"

1. Remove old move roller.
2. Replace old move roller by new move roller 1.820.450.08 (2") or 1.820.440.08 (1").
3. Check the tape transport and readjust if necessary. (see Service Information SI 110/87 or 115/88 or Manual 10.27.0663 section 3.3.15)

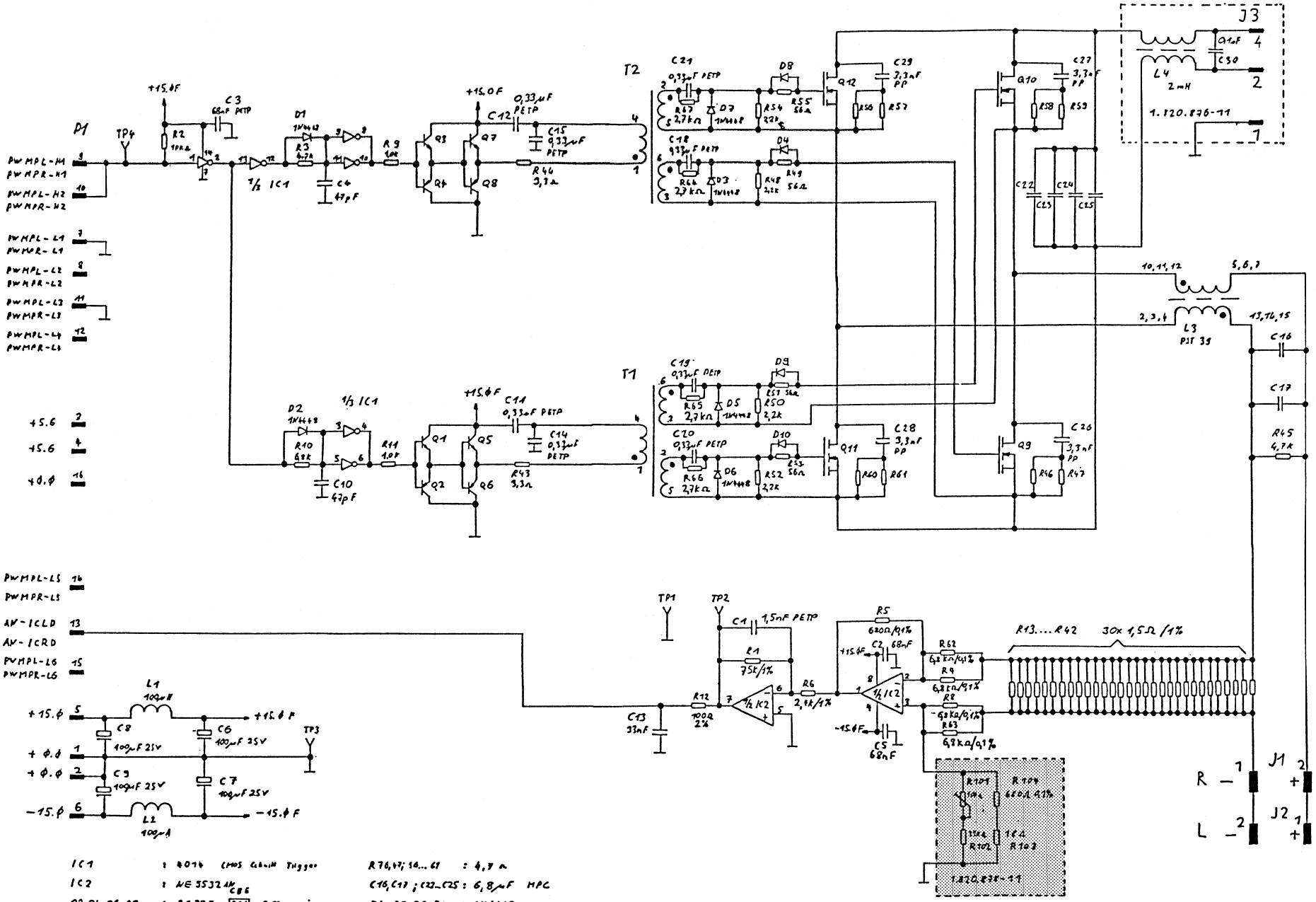
4.6 MPU Audio 1.820.782.xx

Insert Jumper in position 9 instead of position 8.
(see attached Lay-out)

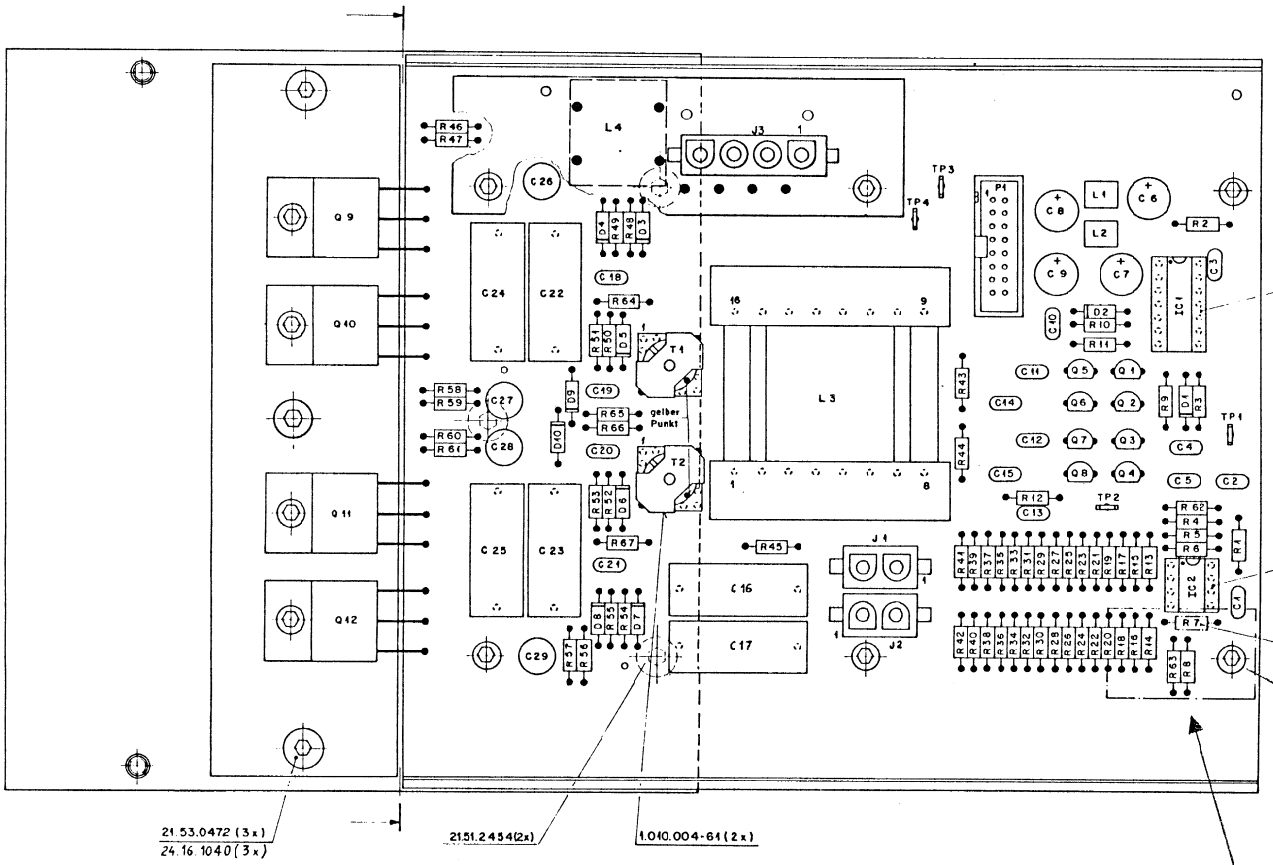


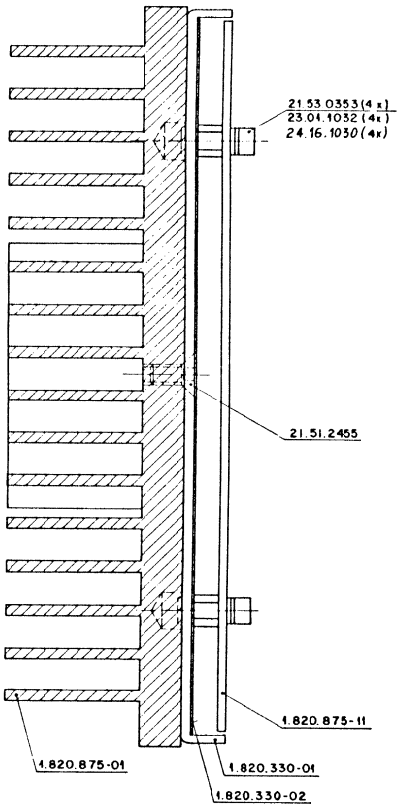
Spooling Motor Drive Amplifier 1.820.875.81

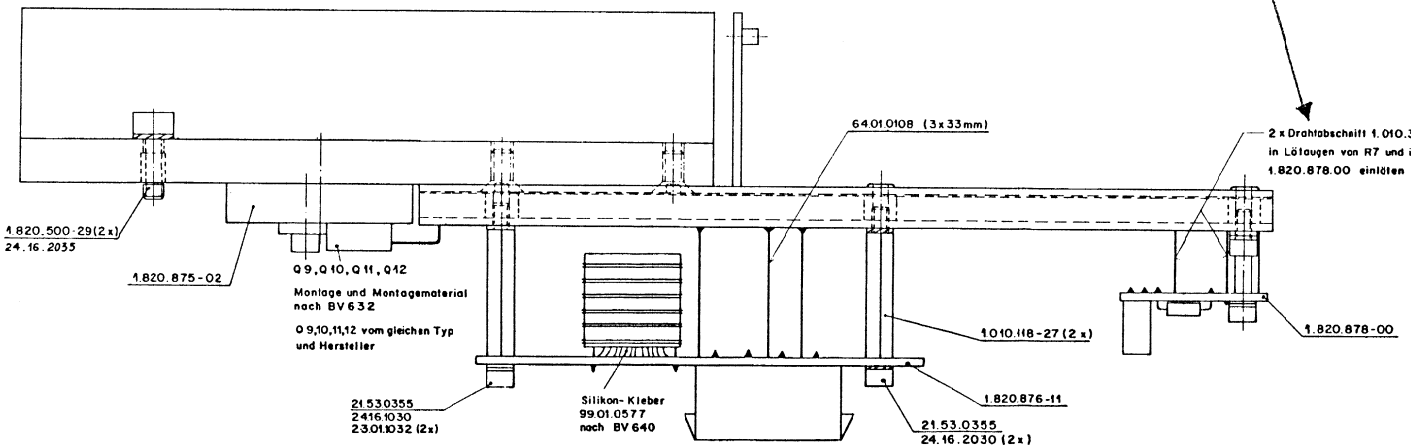
Fig. 4.1. Common Mode Adjustment



0 28.3.88 VA			
	A820 TAPE TRANSPORT SECTION		PAGE 1 OF 1
STUDER	SPOOLING MOTOR DRIVE AMPLIFIER	SC	1.820.875.87





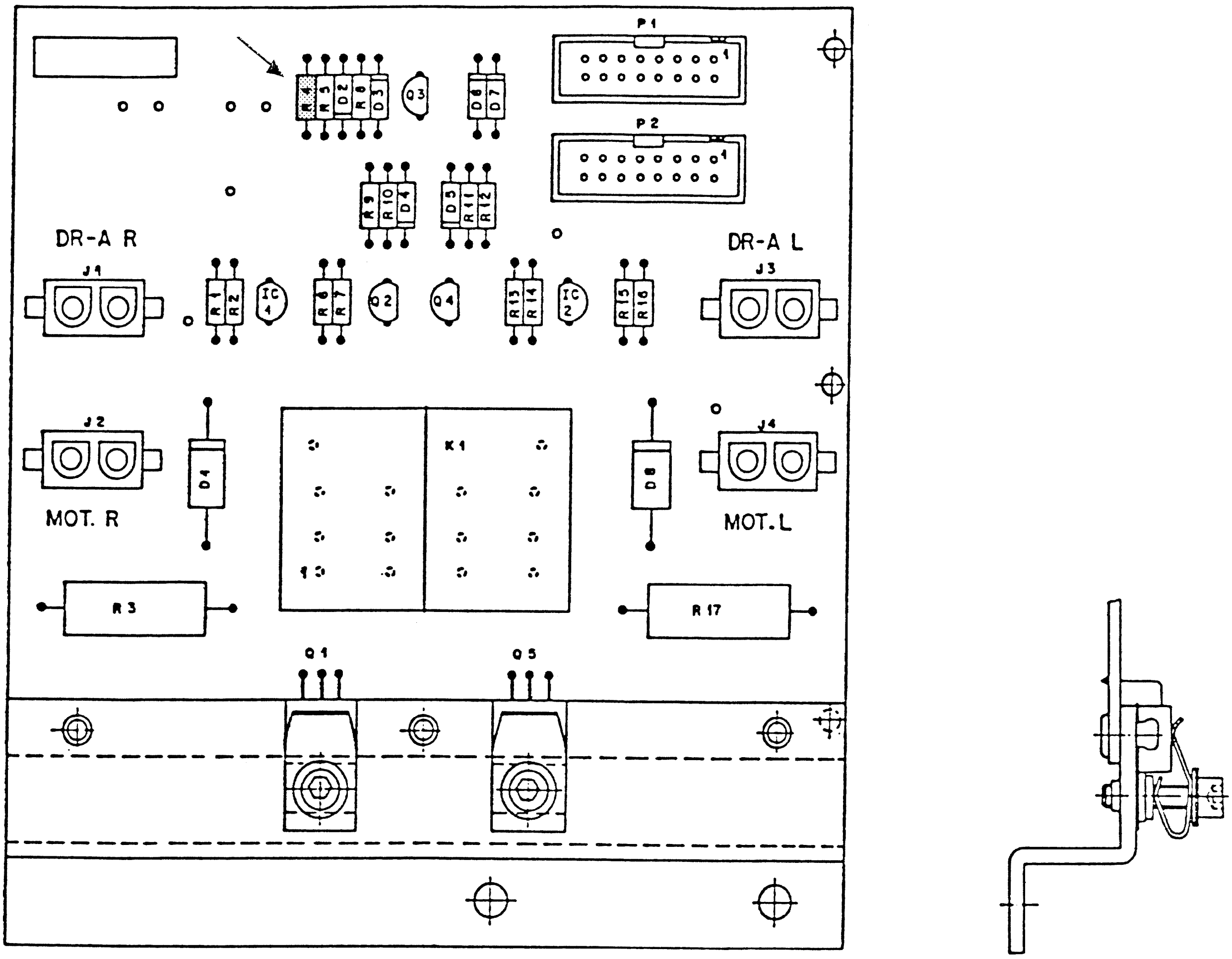


Schilder 1.820.875-04 / 43.01.0108
aufgeklebt nach Fabrikationsmuster.

Werkstoff: Norm Nr. / DIN Bez. / Abmessung	Oberfläche: Güte / Behandlung			Änderung: (1) (2) (3) (4)	
Zugehörige Unterlagen: BV640 PL, BV632, BV652	Freimassstoleranz	Massstab: 2:1	Ausgabe: 6.5.88	Datum	Gez.	Gepr.	Gen.	Index
Ersatz für:	Ersetzt durch:		Kopie für:					
STUDER REGENSDORF ZÜRICH	Benennung: SPOOLING MOTOR DRIVE AMPL. ESE		Nummer: 1.820.875-81					

SI 120/88

POWER FAIL SENSE PCB 1.820.869.00



IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	D.....1	50.04.0507	1N 5402	1N 5403, MR 502RL	GI,Mot
	D.....2	50.04.1109	20 V Z	BZX 55-C20	ITT,Mot,Ph,Tho,Tf
	D.....3	50.04.1110	6.2 V Z	BZX 55-C6V2	ITT,Mot,Ph,Tho,Tf
	D.....4	50.04.1114	10 V Z	BZX 55-C10	ITT,Mot,Ph,Tho,Tf
	D.....5	50.04.1114	10 V Z	BZX 55-C10	ITT,Mot,Ph,Tho,Tf
	D.....6	50.04.0125	1N 4448		Fc,ITT,Ph,Ses,Tf
	D.....7	50.04.1119	15 V Z	BZX 55-C15	ITT,Mot,Ph,Tho,Tf
	D.....8	50.04.0507	1N 5402	1N 5403, MR 502RL	GI,Mot
	IC....1	50.10.0108	LM 317 LZ		Mot,Nat
	IC....2	50.10.0108	LM 317 LZ		Mot,Nat
	J.....1	54.25.0002		see note 1	
	J.....2	54.25.0002		see note 1	
	J.....3	54.25.0002		see note 1	
	J.....4	54.25.0002		see note 1	
	K.....1	56.02.0108	24 V DC	Ly 4	Omron
	P.....1	54.14.2002		see note 2	
	P.....2	54.14.2002		see note 2	
	Q.....1	50.03.0512	BD 899 A	BDW 93 B	Mot,SGS
	Q.....2	50.03.0340	BC 337-25		ITT,NS,Ph,Sie
	Q.....3	50.03.0340	BC 337-25		ITT,NS,Ph,Sie
	Q.....4	50.03.0340	BC 337-25		ITT,NS,Ph,Sie
	Q.....5	50.03.0512	BD 899 A	BDW 93 B	Mot,SGS
	R.....1	57.11.4680	68 Ohm	5%	
	R.....2	57.11.4331	330 Ohm	5%	
	R.....3	57.56.5470	0.47 Ohm	10%, 4 Watt	
	R.....4	57.11.4681	680 Ohm	5%	
	R.....5	57.11.4271	270 Ohm	5%	
	R.....6	57.11.4471	470 Ohm	5%	
	R.....7	57.11.4271	270 Ohm	5%	
	R.....8	57.11.4152	1.5 kOhm	5%	
	R.....9	57.11.4562	5.6 kOhm	5%	

S T U D E R (00) 87/04/02 BD POWER FAIL SENSE BOARD 1.820.869.00 PAGE 1

IND.	POS.NO.	PART NO.	VALUE	SPECIFICATIONS / EQUIVALENT	MANUF.
	R....10	57.11.4103	10 kOhm	5%	
	R....11	57.11.4103	10 kOhm	5%	
	R....12	57.11.4562	5.6 kOhm	5%	
	R....13	57.11.4271	270 Ohm	5%	
	R....14	57.11.4471	470 Ohm	5%	
	R....15	57.11.4331	330 Ohm	5%	
	R....16	57.11.4680	68 Ohm	5%	
	R....17	57.56.5470	0.47 Ohm	10%, 4 Watt	

Note 1 - Connector, 2 contacts: AMP Nr. 826846-3

Note 2 - Connector,20 contacts: Yamaichi Nr. FAP-16-08-4055
Burndy Nr. BPH 9 B16 B00 G5
3M Nr. 7616-6002 YZ

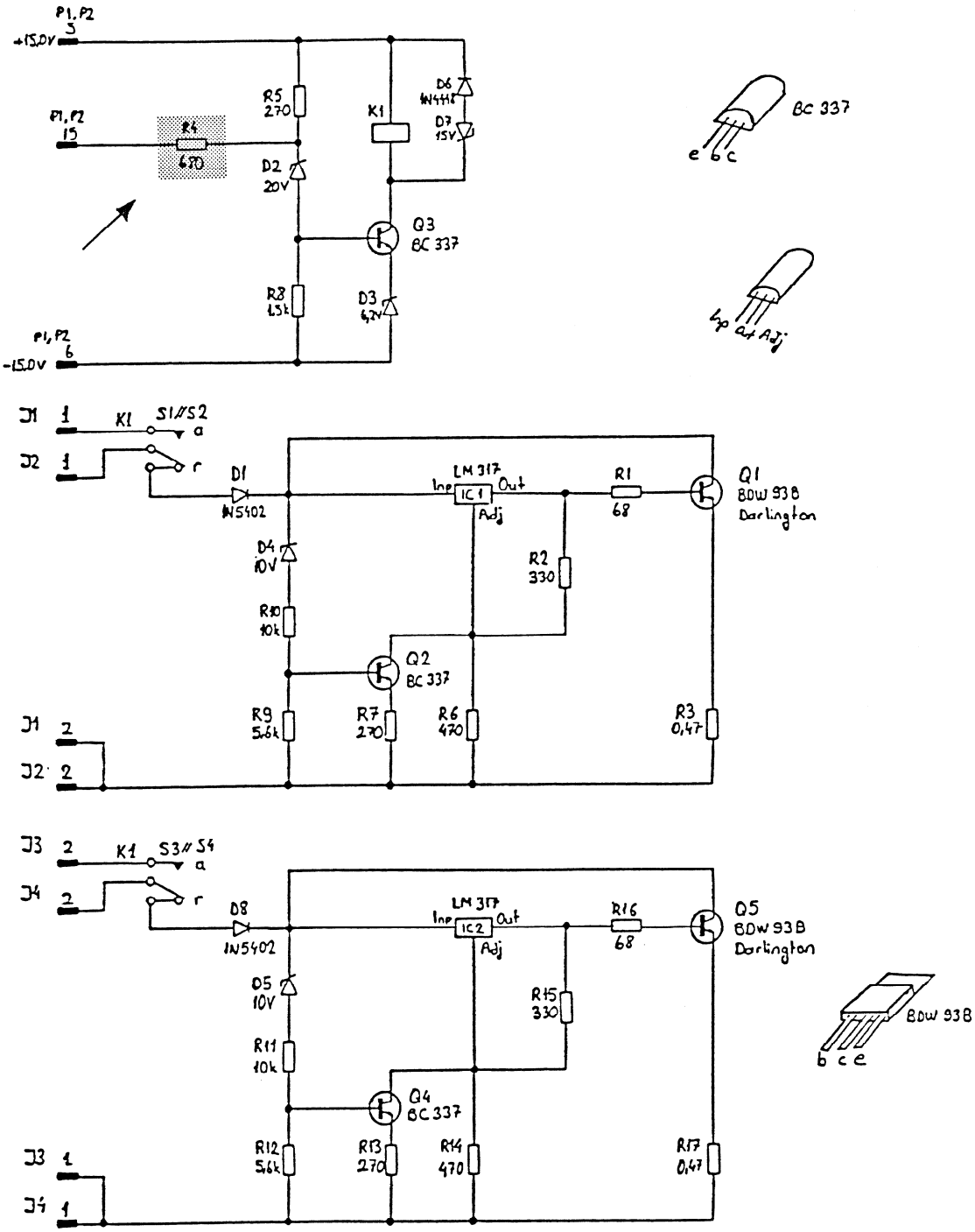
MANUFACTURER: Fc=Fairchild, GI=General Instruments, ITT=Intermetall,
Mot=Motorola, Nat=National, NS=National Semiconductors,
Ph=Philips, Ses=Sescosem, SGS=SGS\Ates, Sie=Siemens,
Tf=Telefunken, Tho=Thomson

ORIG 87/04/02

S T U D E R (00) 87/04/02 BD POWER FAIL SENSE BOARD 1.820.869.00 PAGE 2

PUBLISHED: 06/87

POWER FAIL SENSE PCB 1.820.869.00



12.2.87 ND				
STUDER	POWER FAIL SENSE BOARD		1.820.869-00	PAGE 1 OF 1

PUBLISHED: 06/87

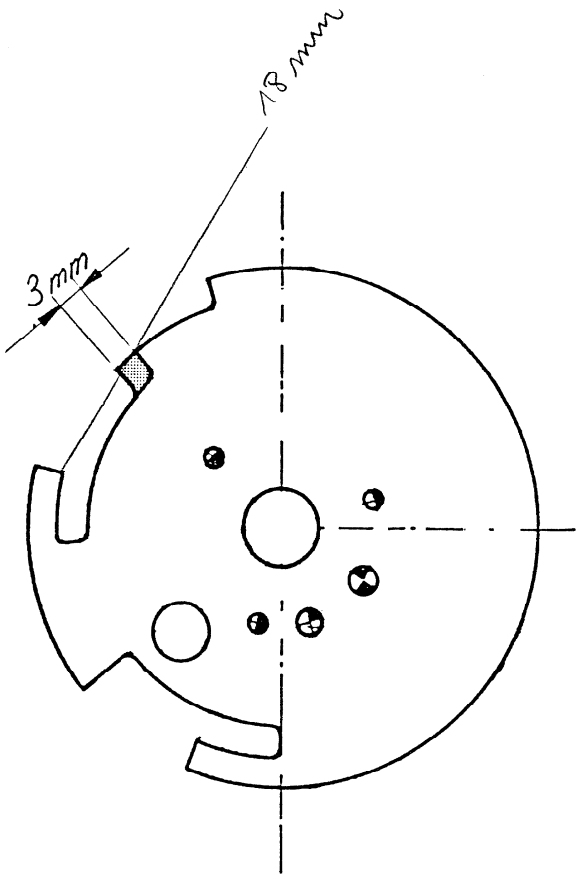
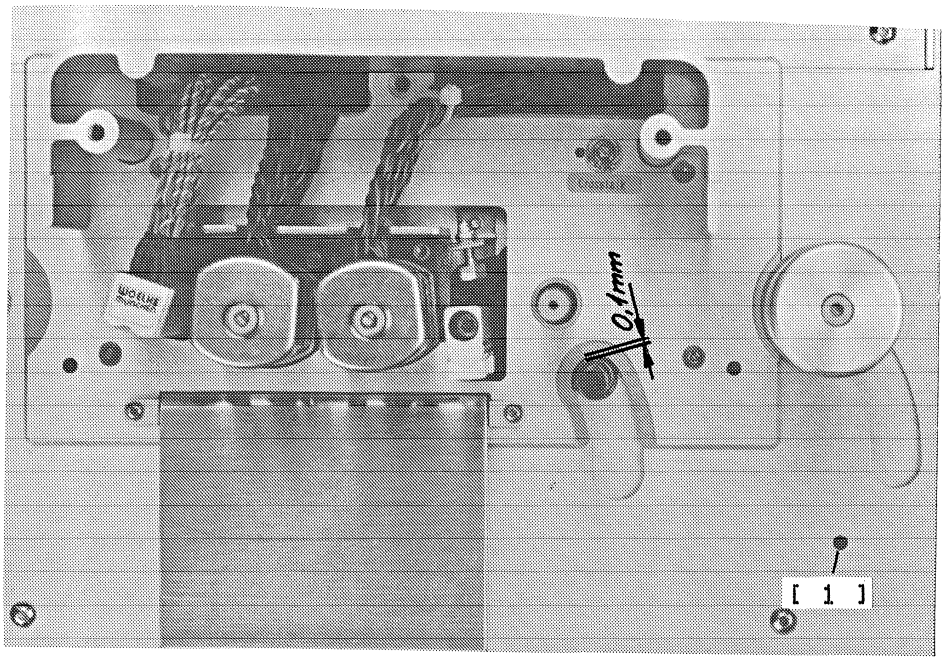
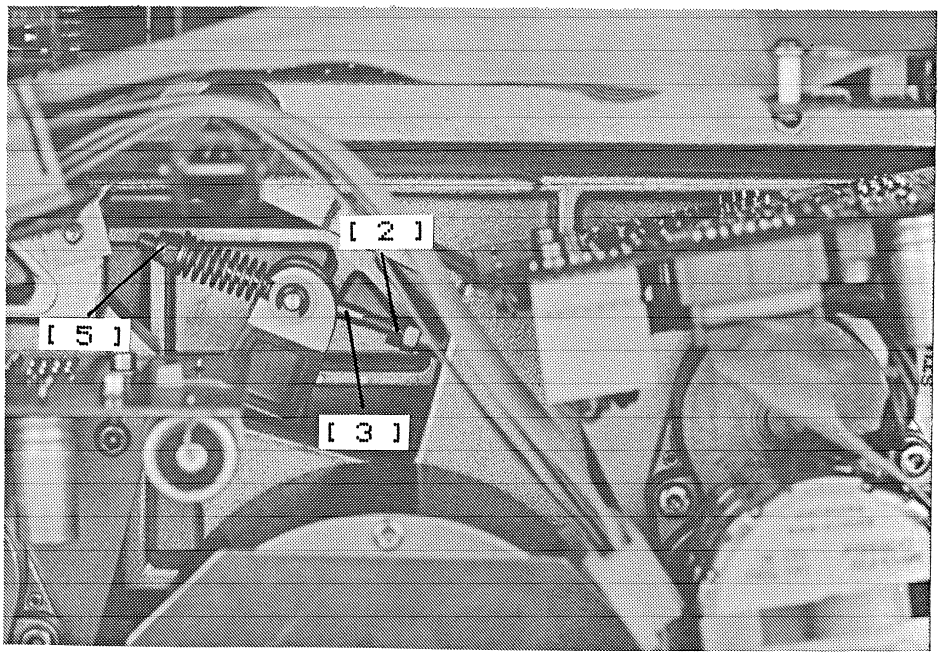


Fig. 4.2.

Werkstoff	Norm-Nr.: 14.04.0207	Oberfläche	Güte:	Änderung					③
	DIN-Bez.: AlMgSi 1 F32		Beh.:		8.3.88	DH	Sly.	Sly.	②
	Abmessung: 0,6 mm				9.4.85	FH	FH	FH	①
Zugehörige Unterlagen:		Freimasstoleranz: ± 0,1	Maßstab: 1:1	Ausgabe	14.3.84	FH	FH	FH	⓪
					Datum	Gez.	Gepr.	Ges.	Index
Ersatz für: 5589–61		Ersetzt durch:		Kopie für:					
STUDER REGENSDORF ZÜRICH	Benennung: Steuerscheibe rechts			Nummer: 1.820.141-06					





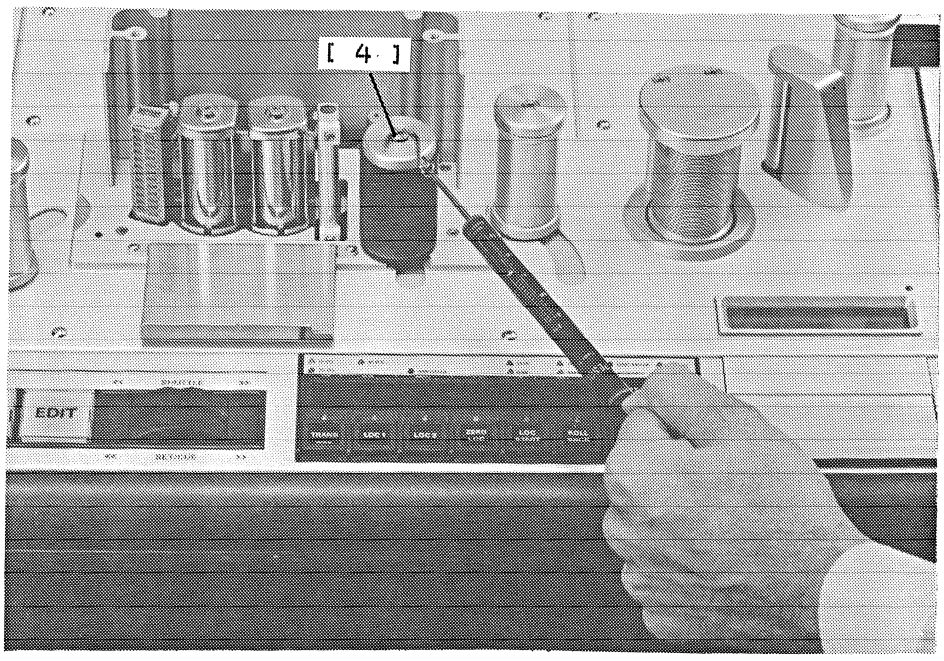
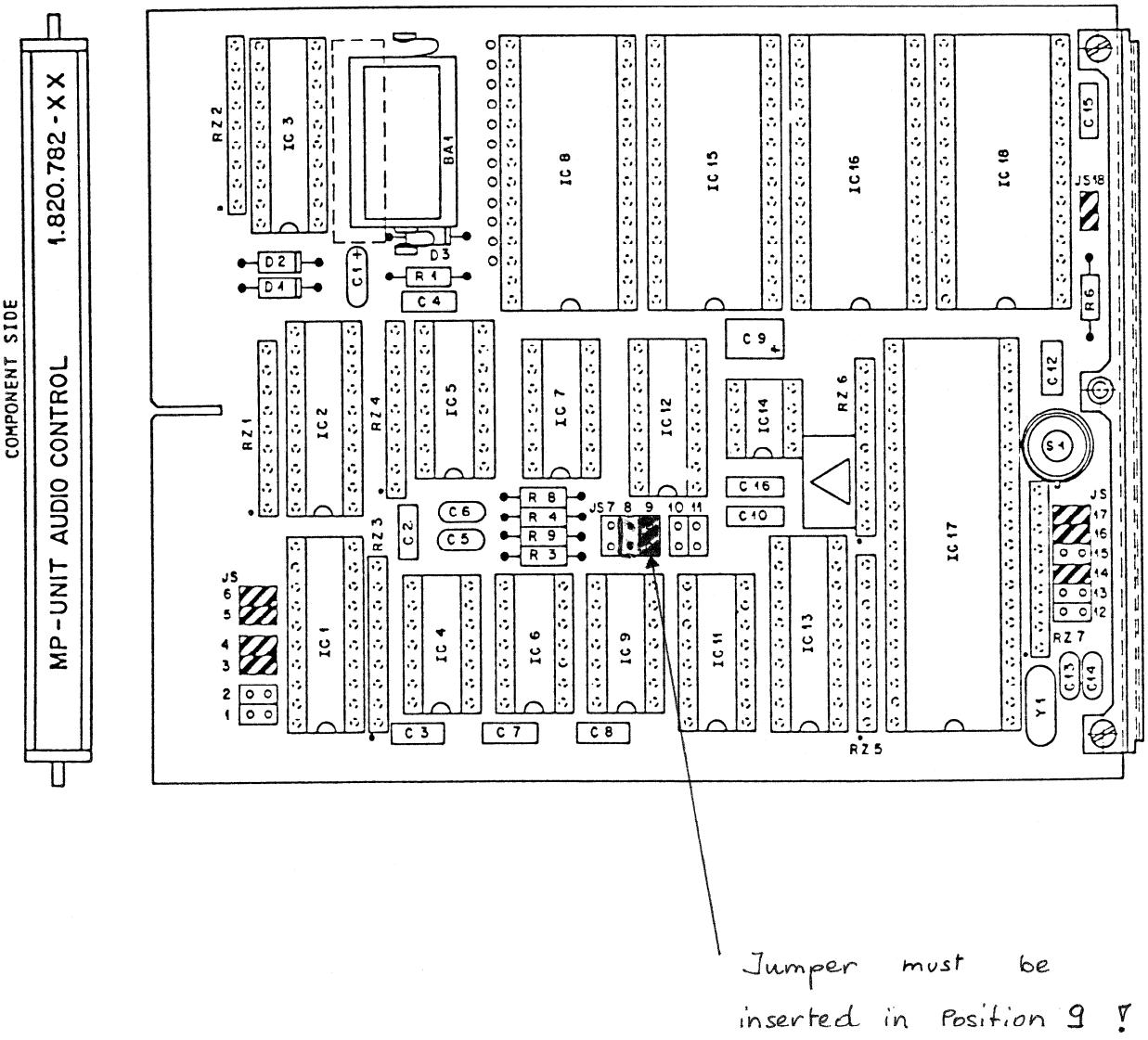


Fig. 4.3.

MP UNIT AUDIO CONTROL PCB 1.820.782.20 ASY 1, GRP 21 ELM 21



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