

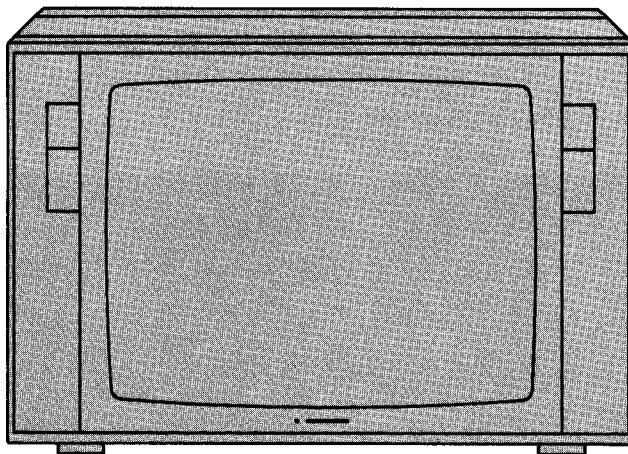
IS 63-49 VT 7 669 520
IS 70-49 VT 7 669 820

Farbfernseher
Colour TV
Televisore a colori

Ergänzung zur Kundendienstschrift	6 D89 464 011 (Chassis FM 500-40)
Supplement for Service Manual	6 D89 464 011 (Chassis FM 500-40)
Supplementare nelle Istruzioni di assistenza	6 D89 464 011 (Chassis FM 500-40)

Ⓛ Btx * 30 39 68 #

MC1/VKD 6 D89 464 022
(947)



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Wichtiger Hinweis!
Nach allen Servicearbeiten ist das Gerät gemäß VDE 0701/Teil 200 zu prüfen!

Important notice!
After any service work the set has to be checked according to VDE 0701/part 200!

Importante
Dopo qualsiasi intervento l'apparecchio deve essere controllato secondo le norme VDE 0701 / parte 200.

Ansetzen der Rückwand

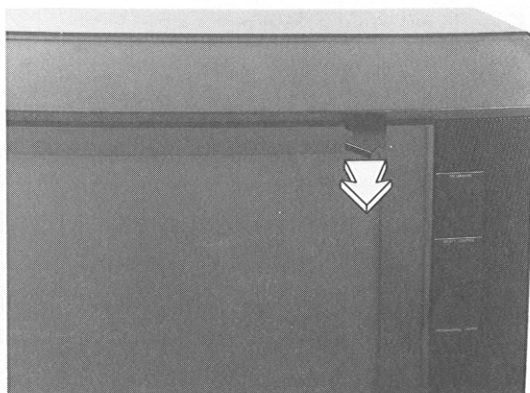
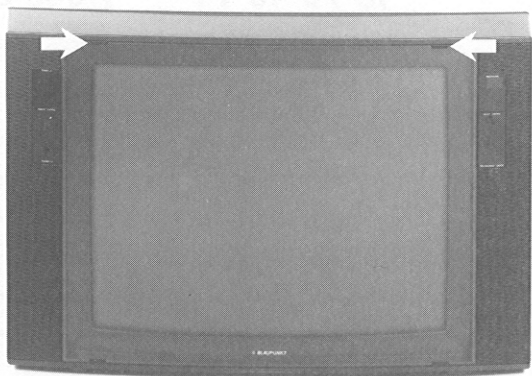
Wir empfehlen, den Fernseher dazu auf den Bildschirm zu legen. Kontrastfilterscheibe vorher abnehmen.

Mounting of the rear cover

It is advisable to place the TV-set onto the front of the picture tube. The contrast screen should be removed first.

Montaggio dello schienale

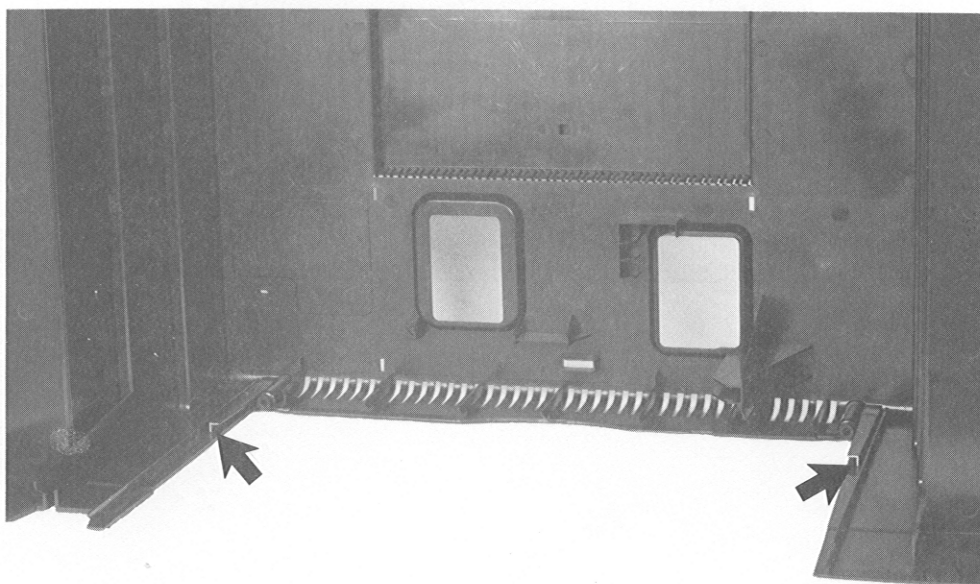
Si consiglia di appoggiare il televisore sulla parte dello schermo, dopo aver tolto il vetro di protezione.

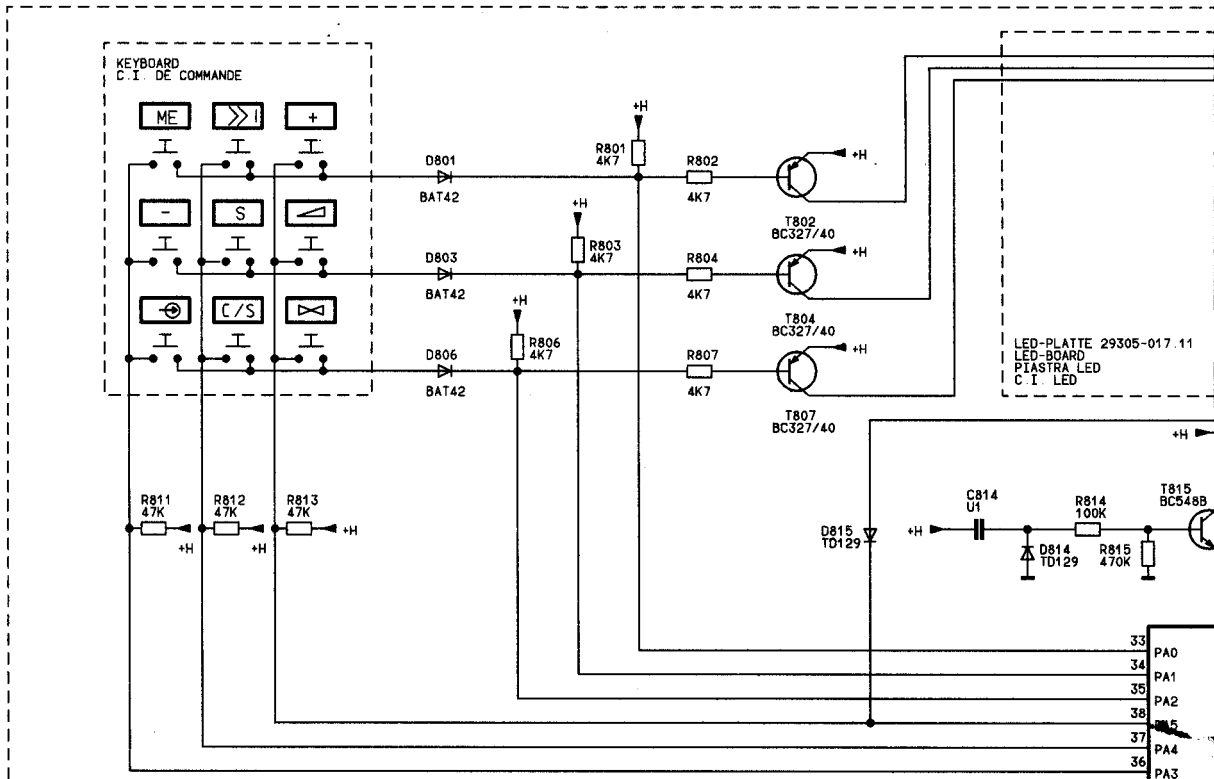


Bitte achten Sie darauf, daß sich die Führungen in der Rückwand, siehe Abbildung, über die Kanten des Gehäusebodens schieben.

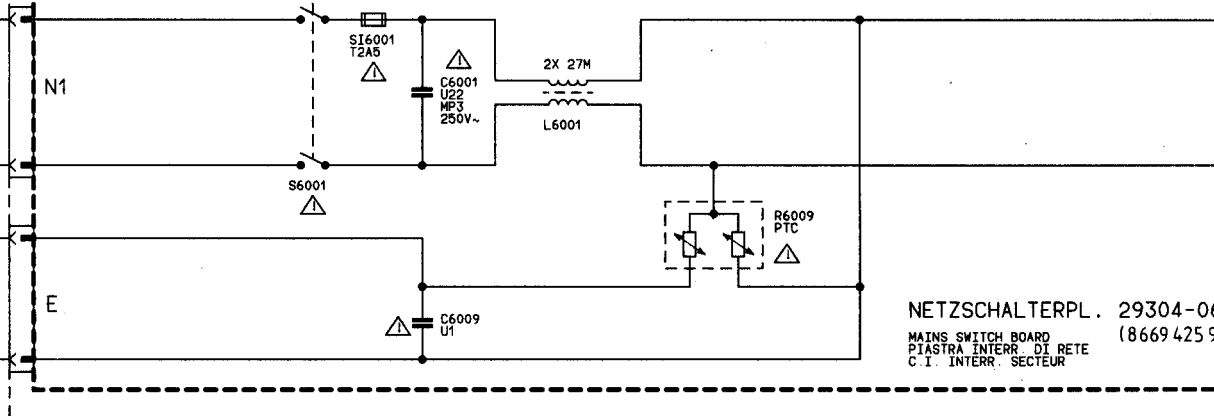
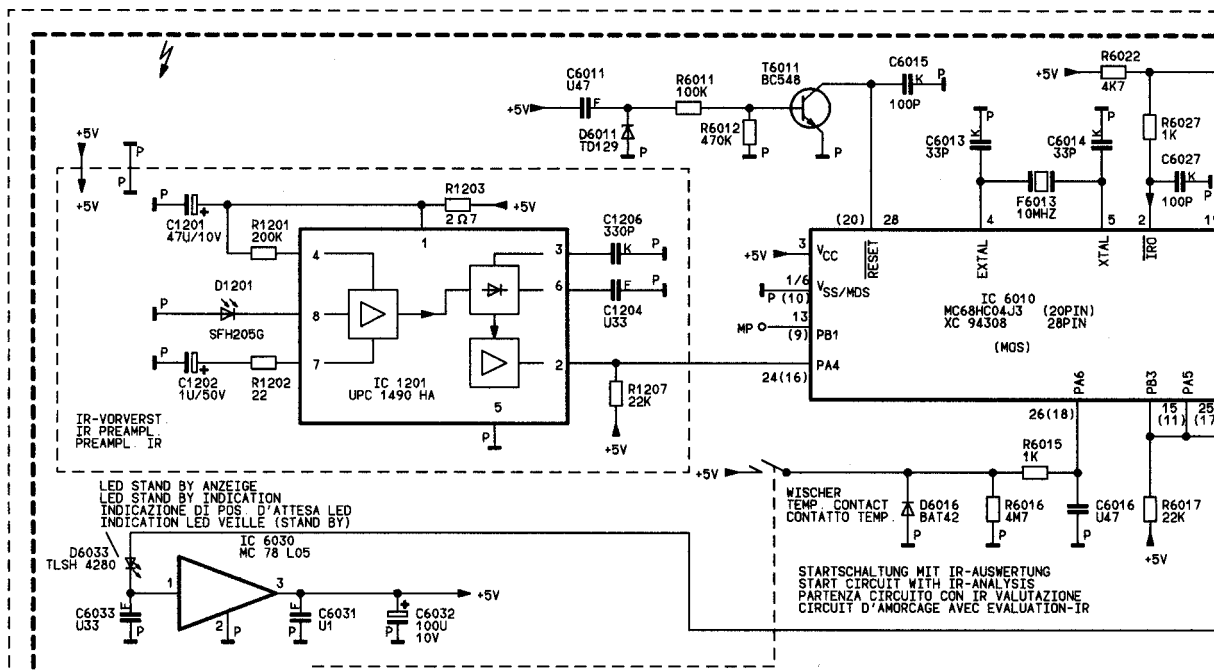
Please pay attention that the guide strips on the rear cover glide over the inside edges of the cabinet bottom.

Fare attenzione che la guida dello schienale (vedi figura) si inserisca nelle scanalature della base dell'apparecchio.



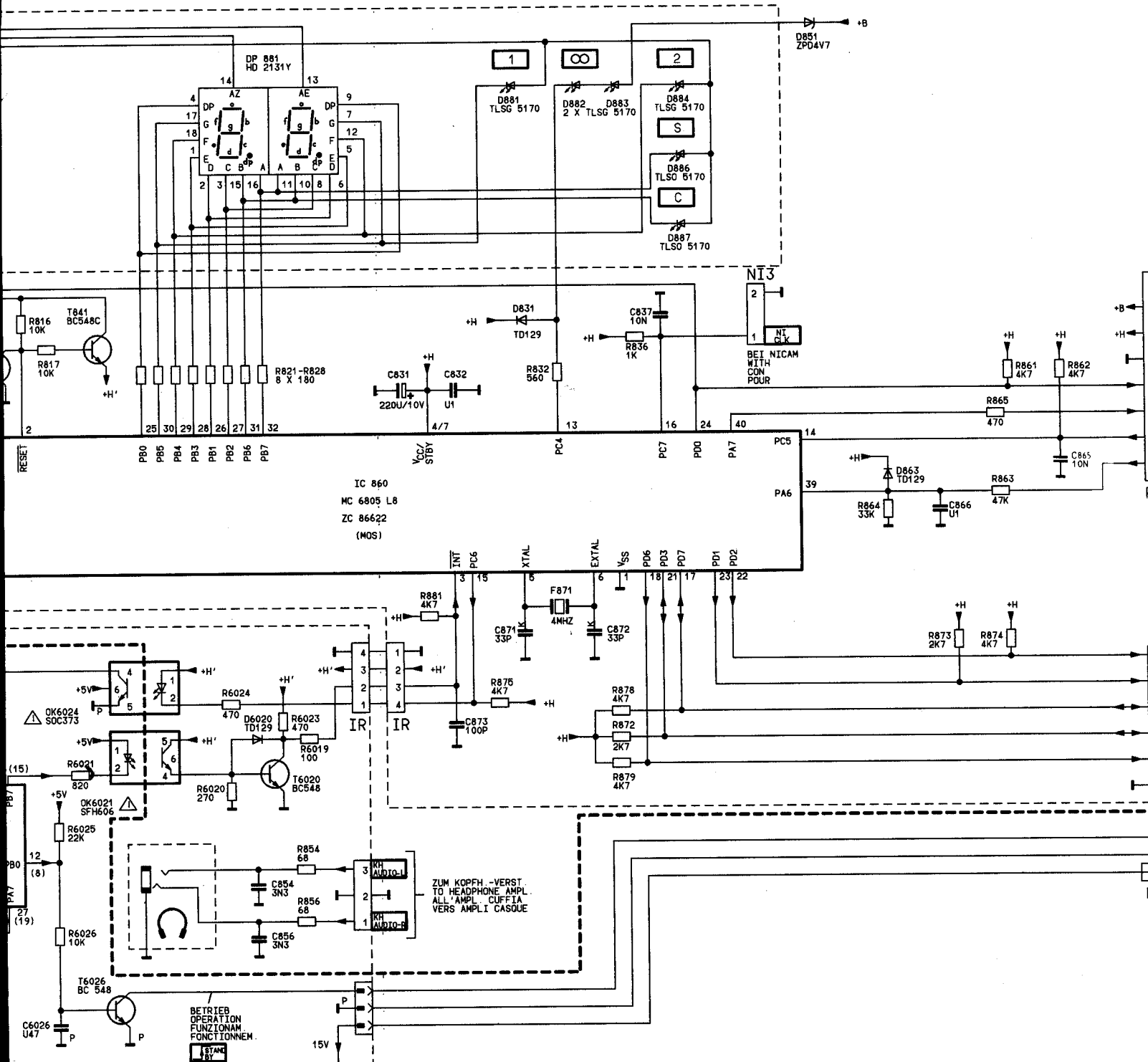


BED.-EINHEIT 29501-074.11
 CONTROL UNIT -074.14 NICAM
 UNITA DI COMANDO -074.19 (8669 425 921)
 UNITE DE COMMANDE



G181

NETZSCHALTERPL. 29304-00
 MAINS SWITCH BOARD (8669 425 921)
 PIASTRA INTERRU. DI RETE
 C.I. INTERRU. SECTEUR



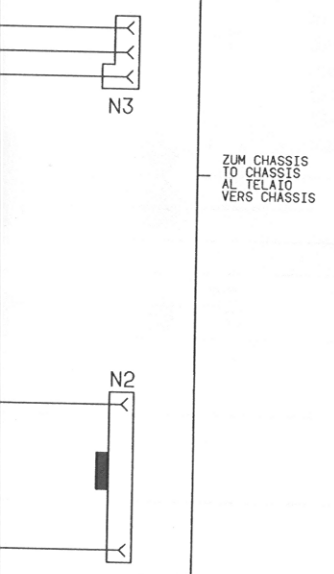
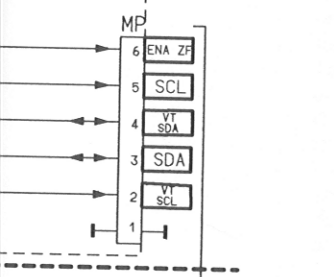
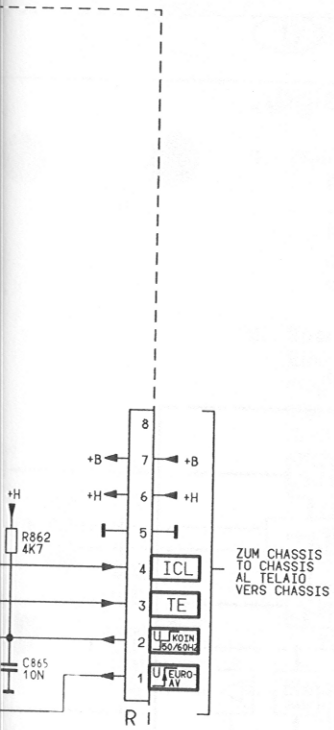
PRIMAERMASSE ACHTUNG: NICHT NETZGETRENNT
 PRIMARY CHASSIS NOTE: NOT MAINS ISOLATED
 MASSE PRIMAIRE ATTENTION: NON ISOLE DU SECTEUR
 MASSA PRIMARIO, ATTENZ.: NON SEPAR. DALLA RETE

5.61
 03) NICHT NETZGETRENNTES SCHALTUNGSTEIL
 CIRCUIT NOT MAINS - ISOLATED
 CIRCUIT NON ISOLE DU SECTEUR
 CIRCUITO NON SEPARATO DALLA RETE

Bedieneinheit 8 669 425 921

Control Unit

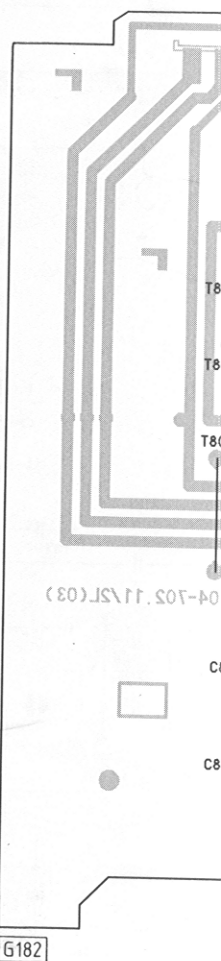
Unità di Comando



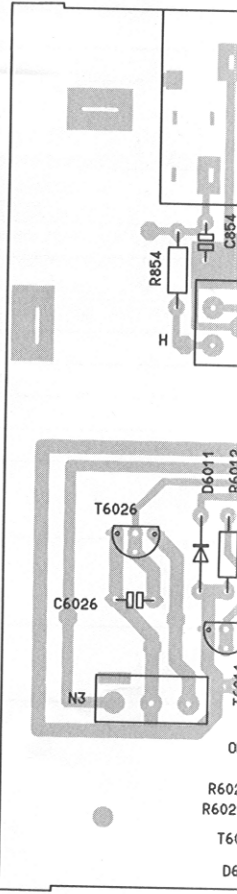
Netzschalter-Platte 8 669 425 903

Mains Switch Board

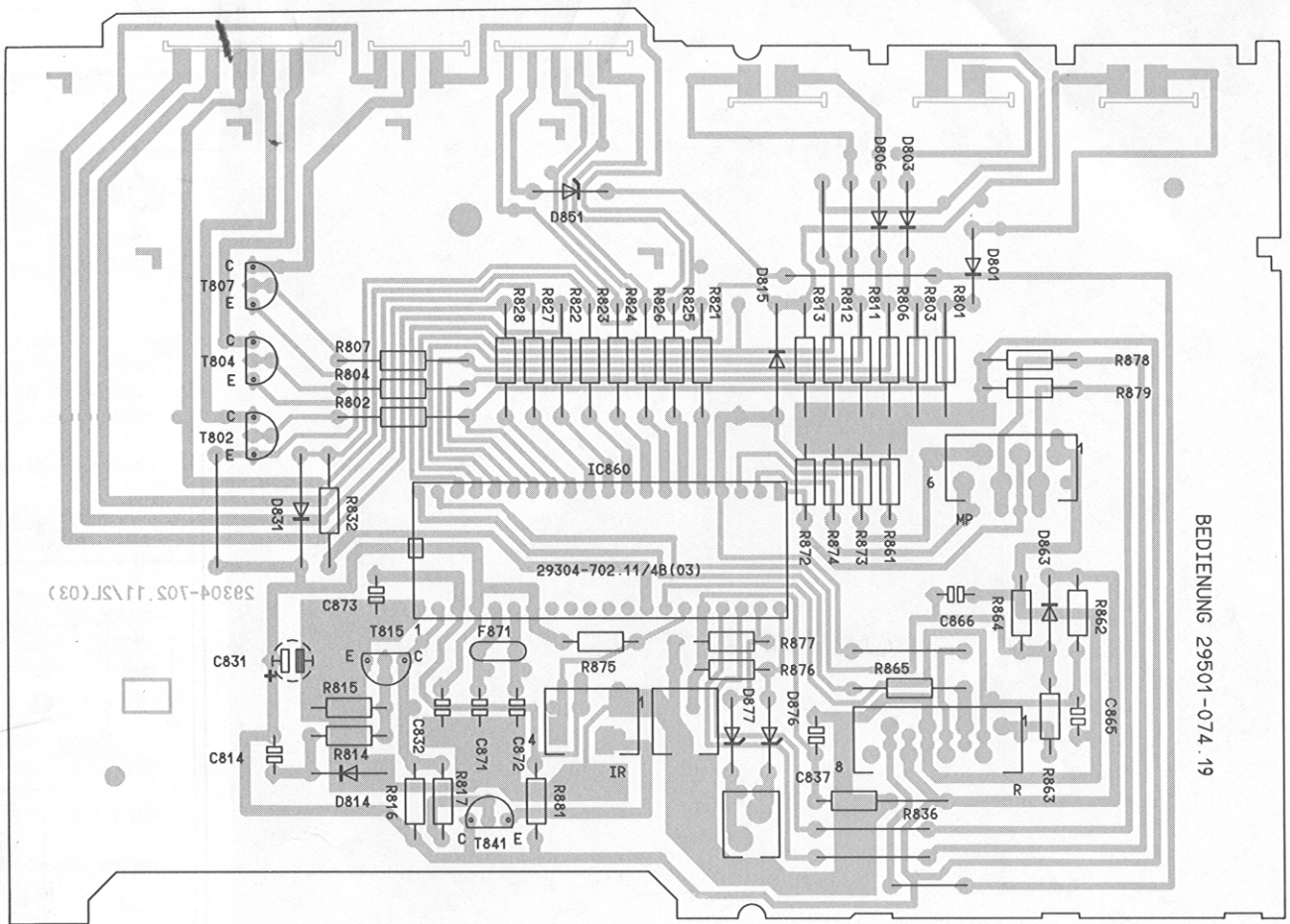
Piastra Interruto



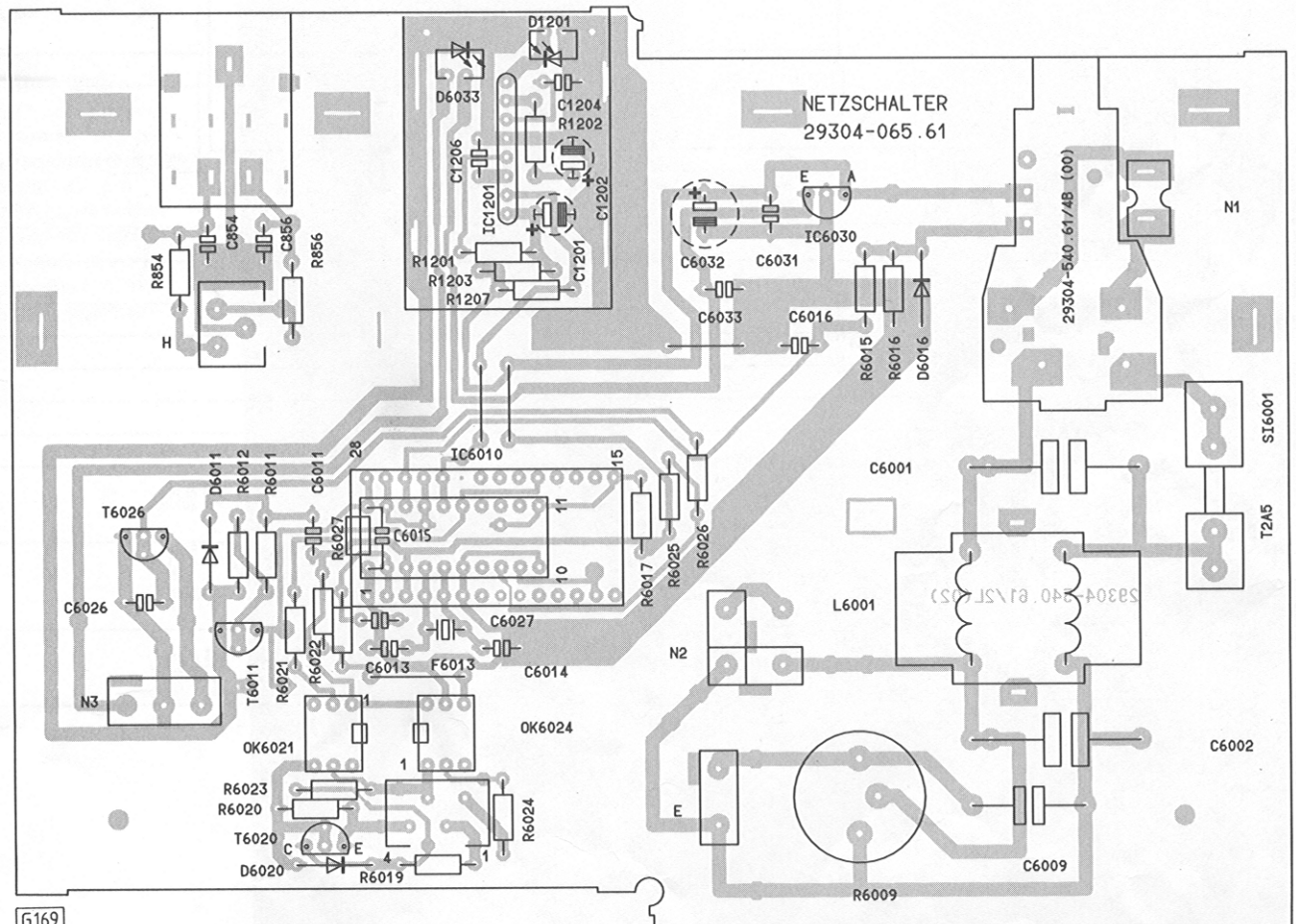
G182



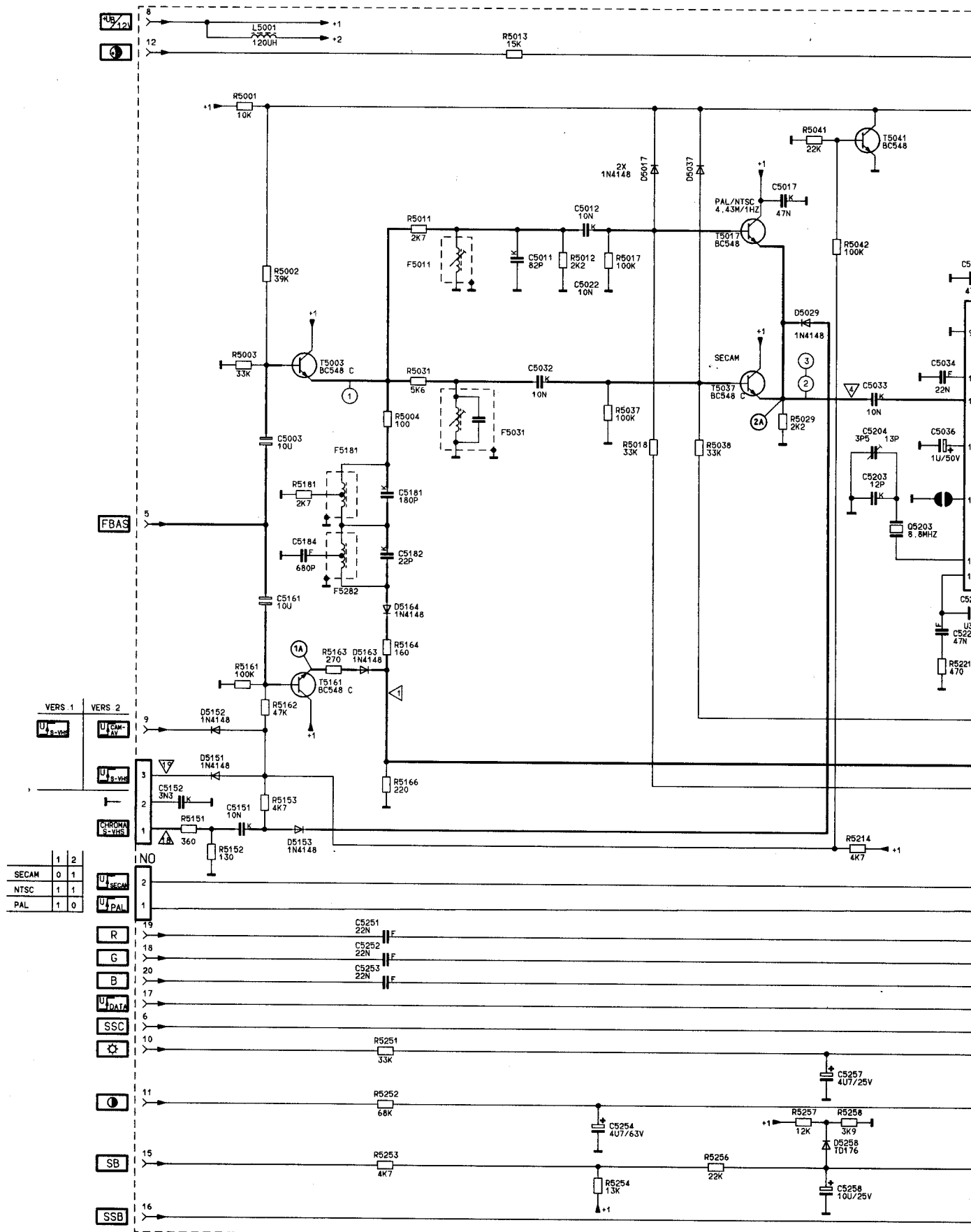
G169



G182



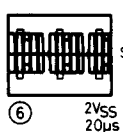
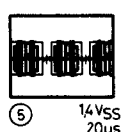
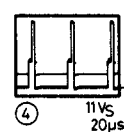
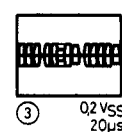
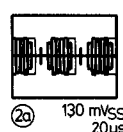
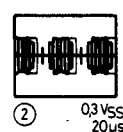
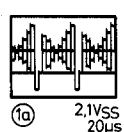
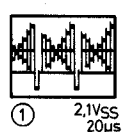
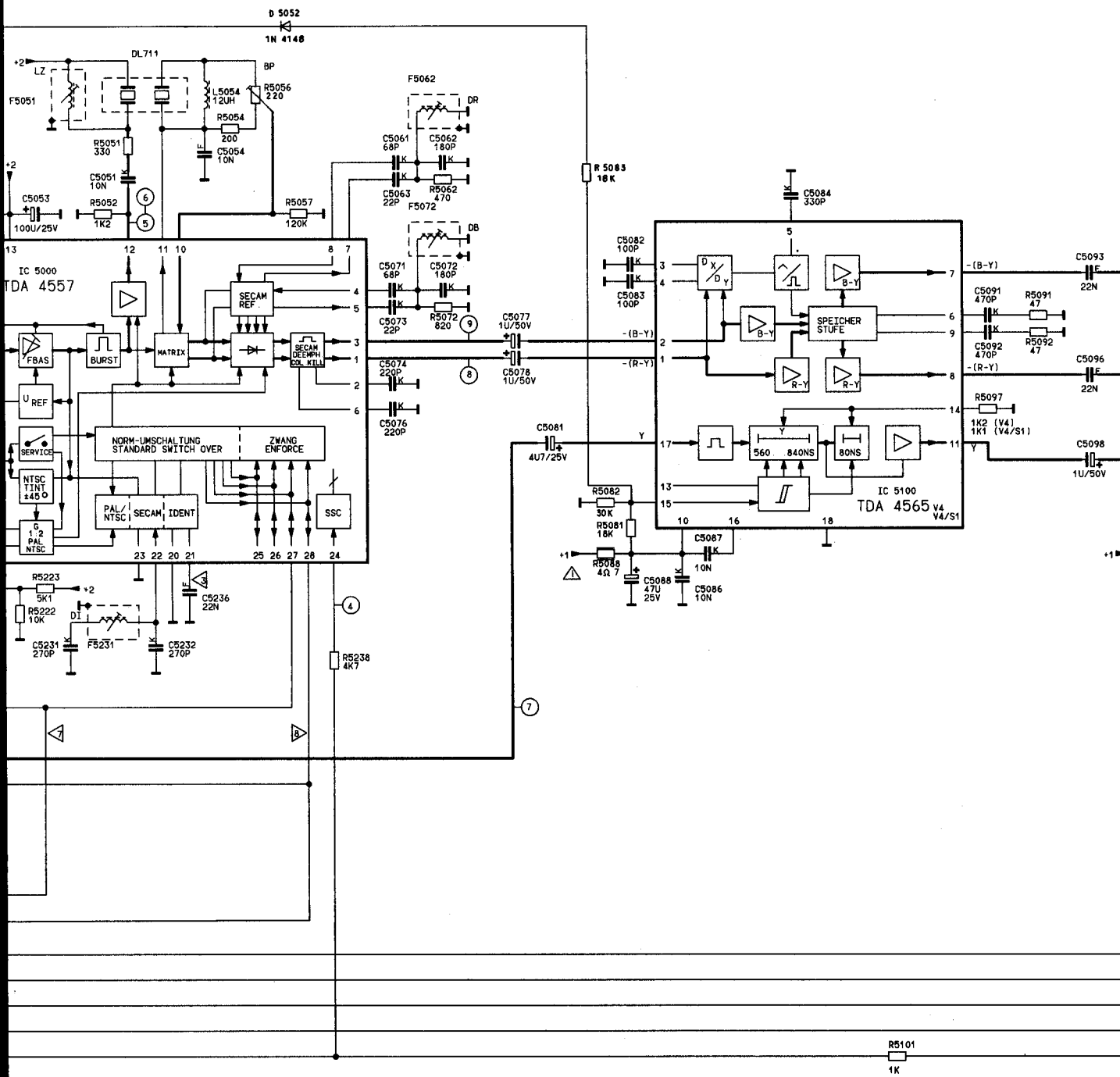
G169



VERS. 1	VERS. 2
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<input type="checkbox"/> U ₁ s-VHS	<input type="checkbox"/> U ₁ s-VHS
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<input type="checkbox"/> NO	<input type="checkbox"/> NO
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<input type="checkbox"/> NTSC	<input type="checkbox"/> NTSC
<input type="checkbox"/> PAL	<input type="checkbox"/> PAL

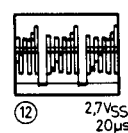
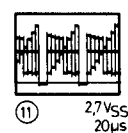
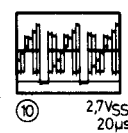
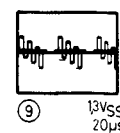
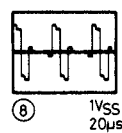
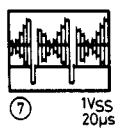
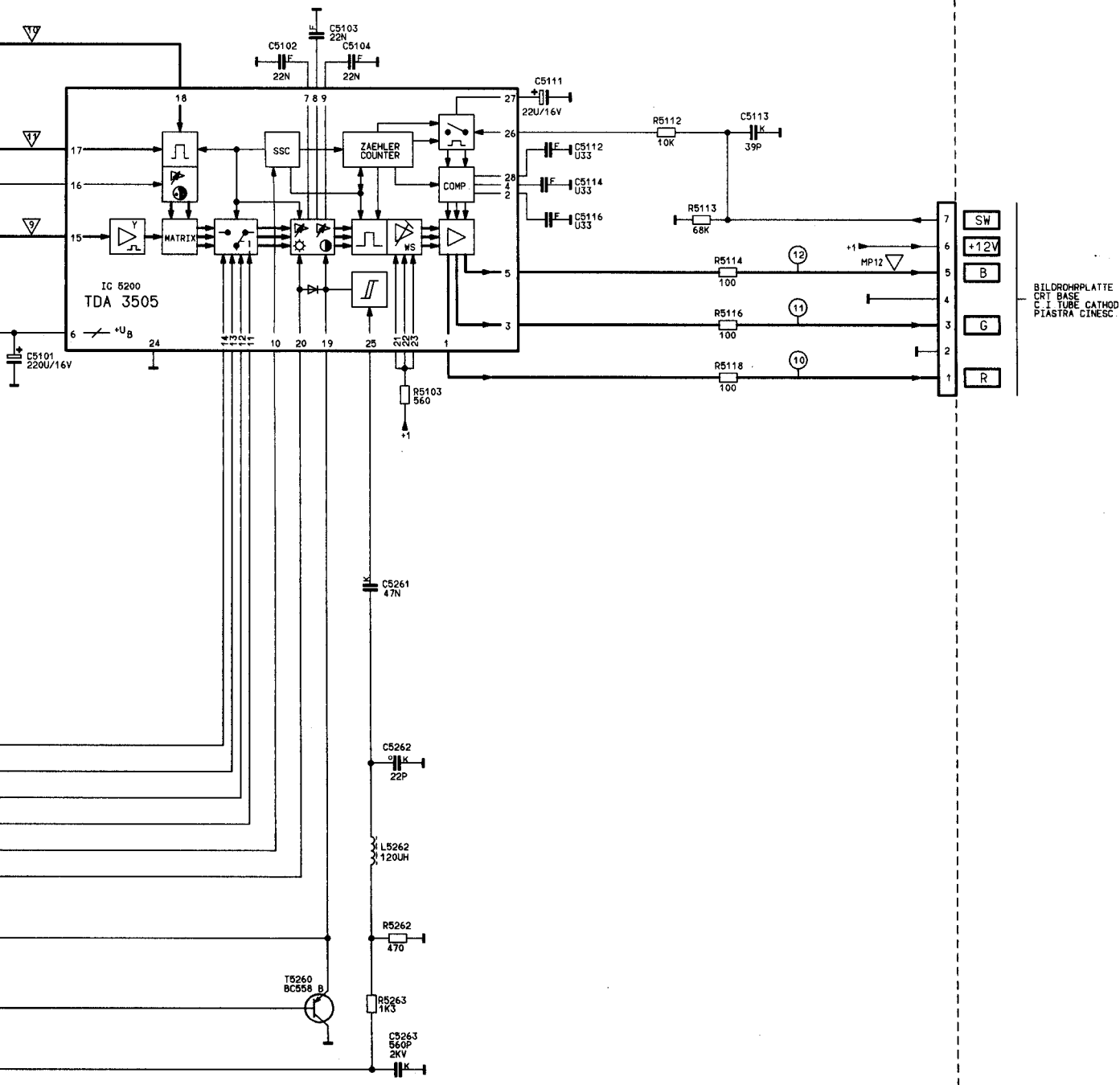
1	2
SECAM	0 1
NTSC	1 1
PAL	1 0

G185



C5094
4U7/25V

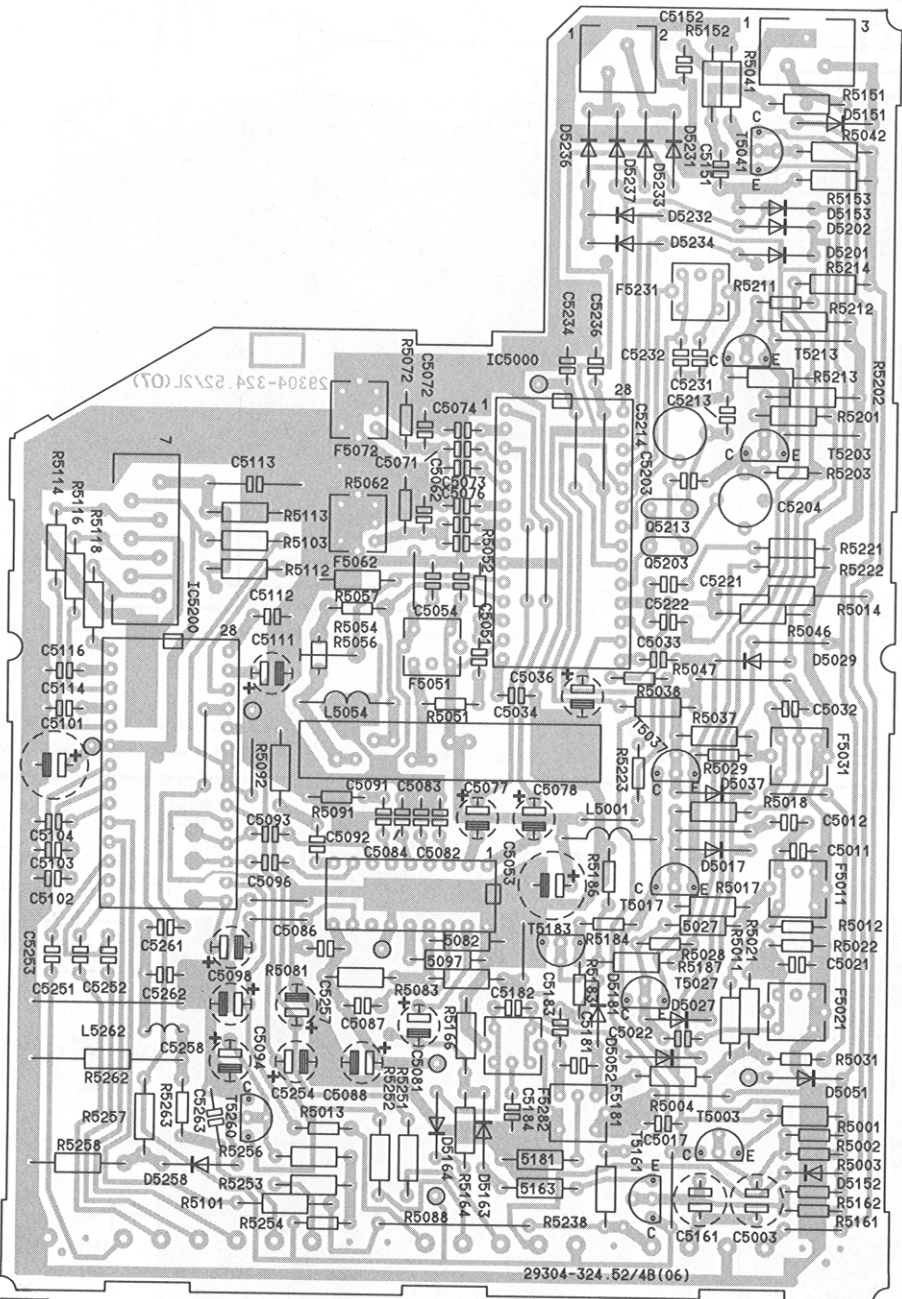
FARB / RGB 29504-105.31 (8669425924)
 COLOUR / RGB
 COULEUR / RVB
 COLORE / RVB



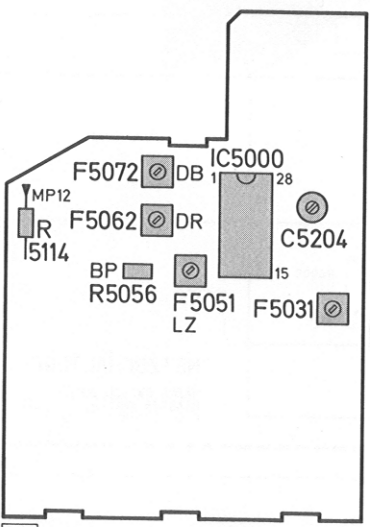
Farb/RGB-Modul 8 669 425 924

Chroma/RGB Module

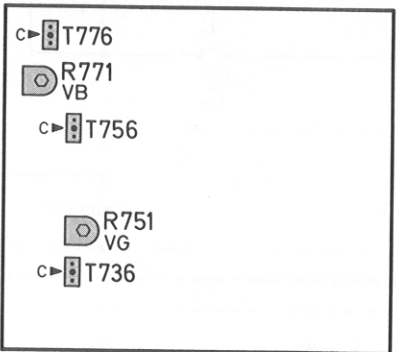
Modulo Colore/RVB



G186



G187



G151

Color RGB alignment

1. White level adjustment

- Display colour bar test pattern.
- Set ① to min., ② to nom., ③ to max.
- Adjust presets VG and VB (CTR socket board) so that the picture does not show any colouration.

2. Adjustment of cut-off point

Manual adjustment is not possible, as the circuit board employs an automatic dark current control circuit.

To check cut-off point (oscilloscope required), proceed as follows:

- Display colour bar test pattern.
- Set ① to min., ② to nom., ③ to min
- Connect test probe to collectors of T 736, T 756, T 776 (CRT socket board). The black levels of the three cathode signals should be 140 - 150V.

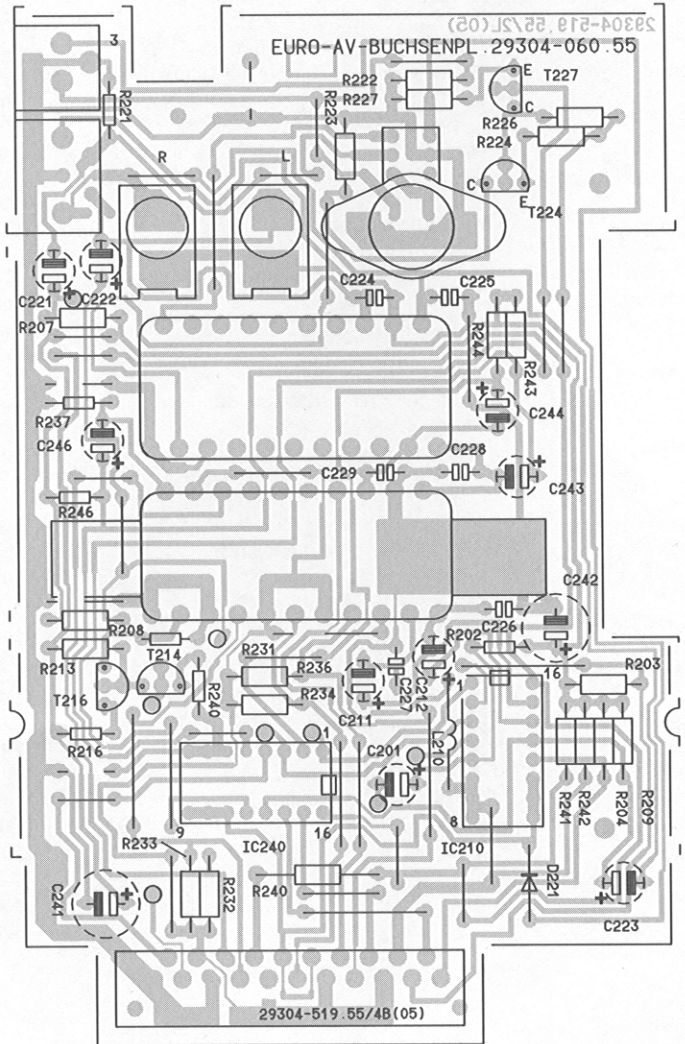
3. Adjustments in chroma channel

- Display PAL test pattern.
- Set ① to nom., ② to nom., ③ to max.
- Connect pin 28 of IC TDA 4557 to +12V supply.
- Connect pin 17 of IC TDA 4557 to chassis.
- Adjust trimmer C 5204 for stationary pattern in colour bars.
- Remove wire links.
- Connect test probe to test point MP 12. Bring the double image produced by the B-signal to coincidence by adjusting the preset BP and the coil LZ.
- Display SECAM test pattern.
- Connect test probe to pin 1 of IC TDA 4557.
- Use coil DR to align zero level of the (R-Y) signal with the line black level.
- Connect test probe to pin 3 of IC TDA 4557.
- Use coil DB to align zero level of the (B-Y) signal with the line black level.
- Adjust coil F 5031 so that the (B-Y) signal is free of overshooting.

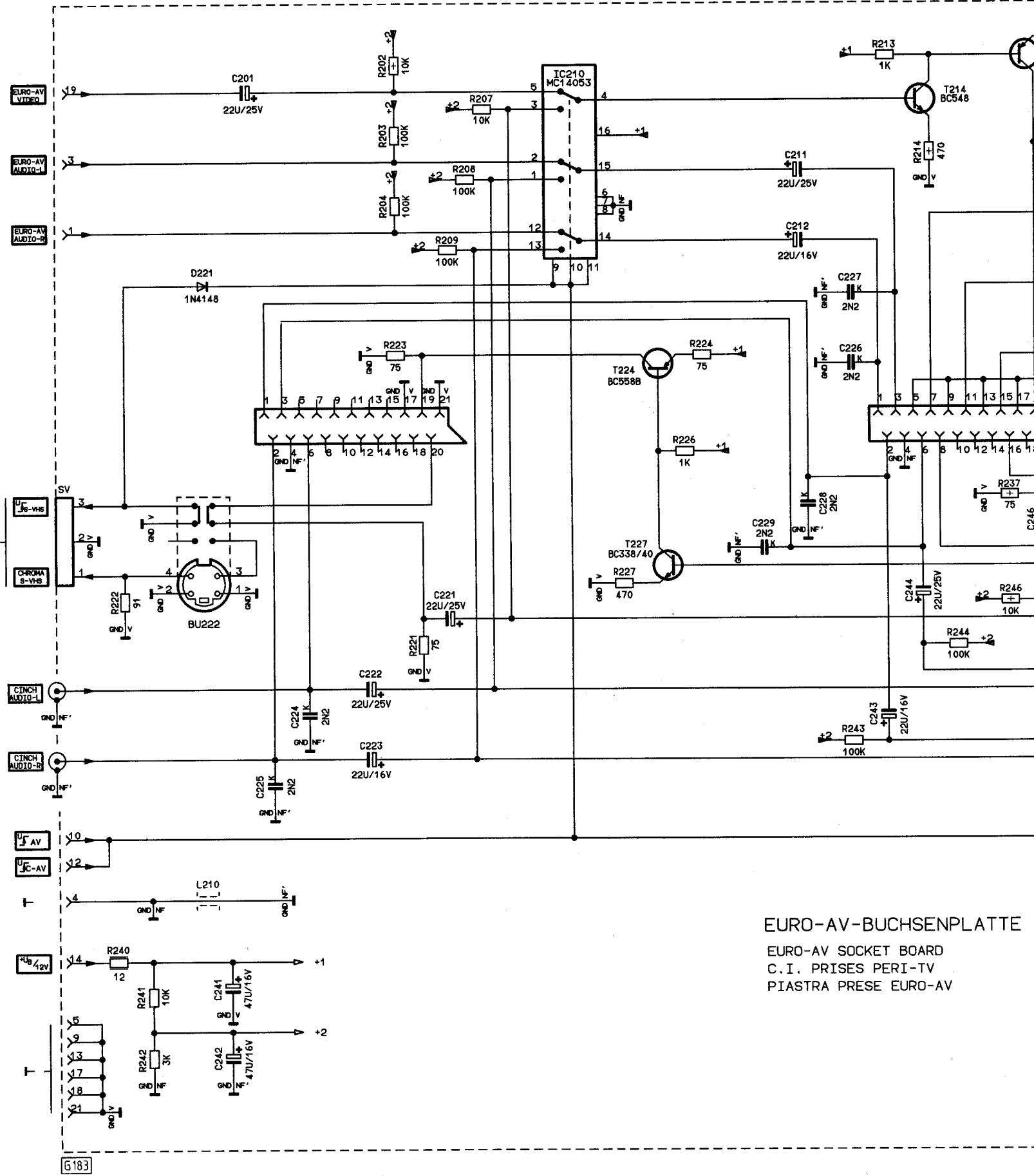
Euro-AV-Buchsenplatte 8 669 425 925

Euro-AV Socket Board

Piastra Prese Euro-AV

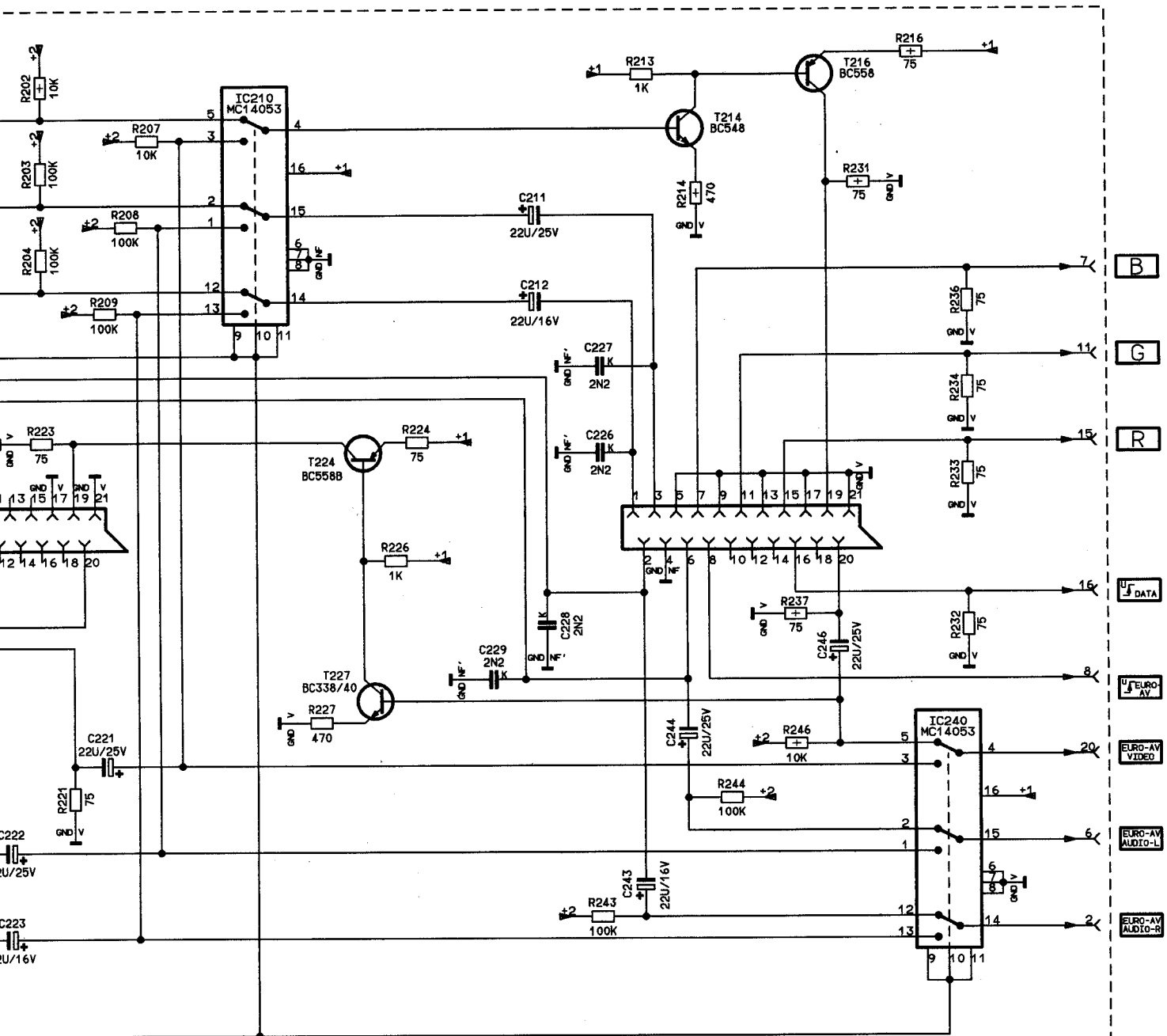


G184



EURO-AV-BUCHSENPLATTE
 EURO-AV SOCKET BOARD
 C.I. PRISES PERI-TV
 PIASTRA PRESE EURO-AV

Kein Anpassungsabgleich bei Austausch der Steckkarte notwendig
 When replacing the plug-in board, no alignment is necessary
 Non è necessaria nessuna taratura di adattamento dopo la
 sostituzione di una scheda ad innesto



EURO-AV-BUCHSENPLATTE 29304-060.62
 EURO-AV SOCKET BOARD (8669 425 925)
 C.I. PRISES PERI-TV
 PIASTRA PRESE EURO-AV

Technical Data

Power:	220 V~ ±10 %
Power consumption:	110 W
Receiving areas:	VHF I, channels 2-4 and S1. VHF III, channels 5-12 and S2-S20. UHF, channels 21-69.
TV standards:	B/G standard (CCIR) colour standard PAL. B/G standard (CCIR) colour standard Secam.
Audio output stages:	2x 20 Watts (music power).
Loudspeaker impedance:	4 Ω
Headphones impedance:	4....600 Ω

BLAUPUNKT

BOSCH Gruppe

Chassis FM 500-40

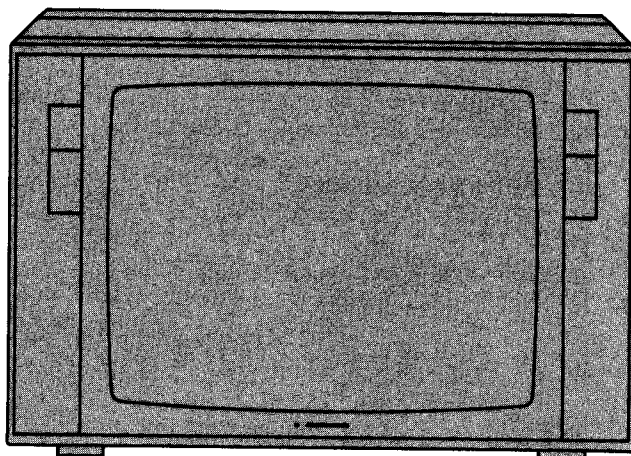
Farbfernseher
Colour TV
Televisore a colori

IS 63-39 VT	7 669 500
IS 63-39 VT NICAM	7 669 510
IS 70-39 VT	7 669 800
IS 70-39 VT NICAM	7 669 810

Kundendienstschrift · Service Manual · Istruzioni di assistenza

D Btx * 30 39 68 #

MC 1/VKD 6 D89 464 011
(845)

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Wichtiger Hinweis!

Nach allen Servicearbeiten ist das Gerät gemäß VDE 0701/Teil 200 zu prüfen!

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Important notice!

After any service work the set has to be checked according to VDE 0701/part 200!

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Importante

Dopo qualsiasi intervento l'apparecchio deve essere controllato secondo le norme VDE 0701 / parte 200.

Service-Einstellungen

Die Service-Einstellungen nur am be-
trieb warmen Gerät vornehmen.

Einstellung Spannung + A = + 159 V
Sender empfangen. Helligkeit auf Mini-
mum einstellen. Röhrenvoltmeter an R
657 und Masse. Mit R 647 (Chassis-
platte) einstellen.

Bildhöhe
Mit R 7044 (Ablenk-Modul) einstellen.

Bildbreite
Mit R 7002 (Ablenk-Modul) einstellen.

Ost-West-Entzerrung
Mit R 7011 (Ablenk-Modul) einstellen.

Trapezfehler
Mit R 7007 (Ablenk-Modul) korrigieren.

Linearität, vertikal
Mit R 7042 (Ablenk-Modul) einstellen.

Bildlage (vertikal)
Mit R 7032 (Ablenk-Modul) einstellen.

Bildlage (horizontal)
Mit R 520 (Chassis-Platte) einstellen.

Schärfe (Fokus)
Mit R 599 (Chassis-Platte) einstellen.

Service Adjustments

The service adjustments may be carried
out at a set warmed up to normal operat-
ing temperature only.

Adjustment voltage + A = + 159 V
Receive transmitter. Set brightness to
minimum, VTVM to R 657 and ground.
With R 647 (Chassis Board) adjust.

Picture height
With R 7044 (Deflection Module) adjust.

Picture width
With R 7002 (Deflection Modul) adjust.

East-West Pin cushion correction
With R 561 (Chassis Board) adjust.

Trapezium correction
With R 7007 adjust.

Vert. Linearity
With R 7042 (Deflection Modul) adjust.

Centering (vertical)
With R 7032 (Deflection Module) adjust.

Centering (horizontal)
With R 520 (Chassis Board) adjust.

Definition (Focus)
With R 599 (Chassis Board) adjust.

Regolazioni di servizio

Le regolazioni di servizio possono ini-
ziarsi solo ad apparecchio caldo.

**Regolazione della tensione + A = +
159 V**

Ricevere una emittente. Luminosità re-
golare per il minimo. Voltmetro elettro-
nico fra massa e R 657. Regolare la ten-
sione con R 647 (Piastra Chassis).

Ampiezza
Regolare con R 7044 (Modulo Defles-
sione)

Larghezza del riquadro
Regolare con R 7002 (Modulo Defles-
sione)

Correzione est-ovest
Regolare con R 561 (Piastra chassis).

Trapezio correzione
Regolare con R 7007.

Linear. verticale
Regolare con R 7042.

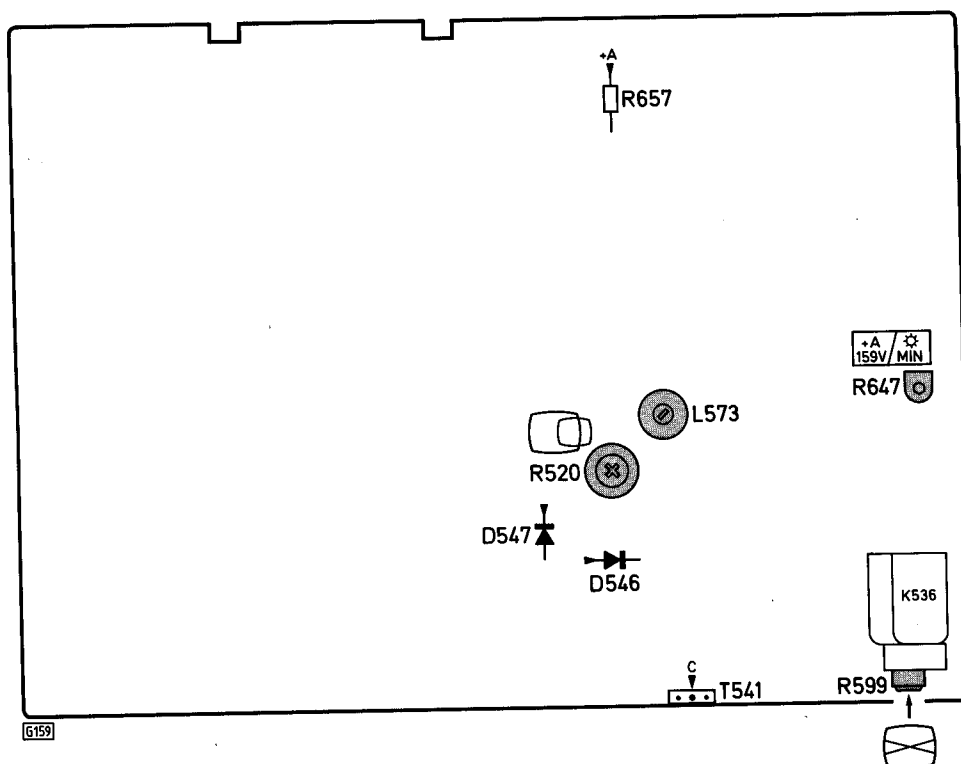
Centratura (verticale)
Regolare con R 7032 (Modulo Defles-
sione).

Centratura (orizzontale)
Regolare con R 520 (Piastra chassis).

Nitidezza (Fuoco)
Regolare con R 599 (Piastra chassis).

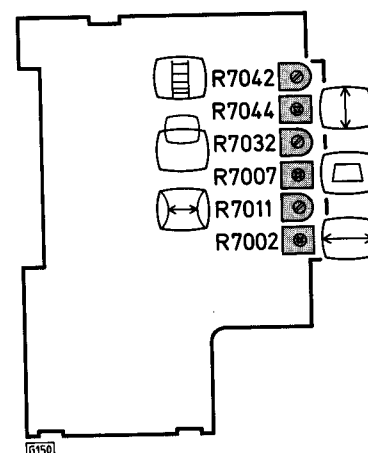
Chassis-Platte

Chassis Board
Piastra chassis



Ablenk-Modul

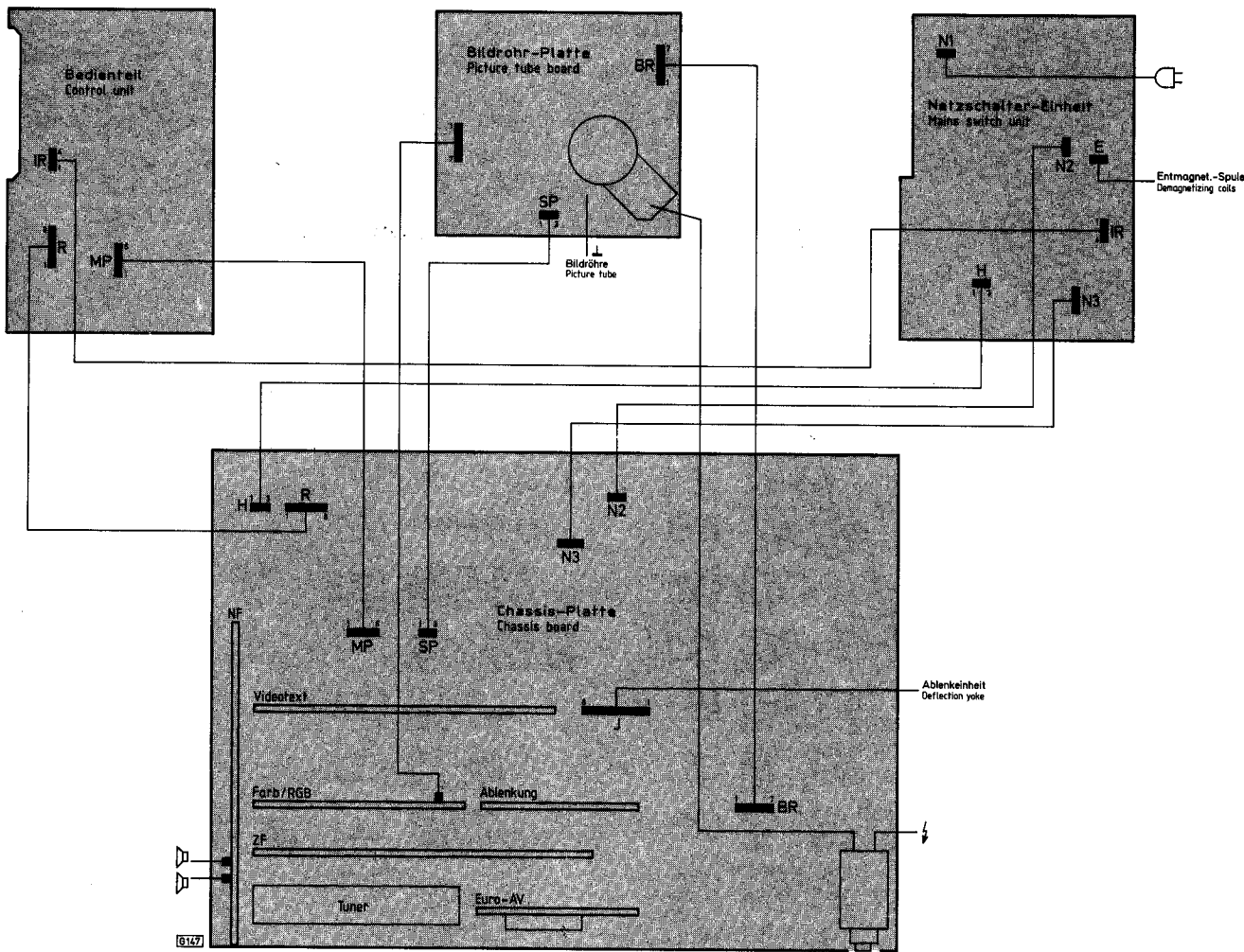
Deflection Module
Modulo Deflessione



Steckverbindungen

Plug Connections

Collegamenti a spine

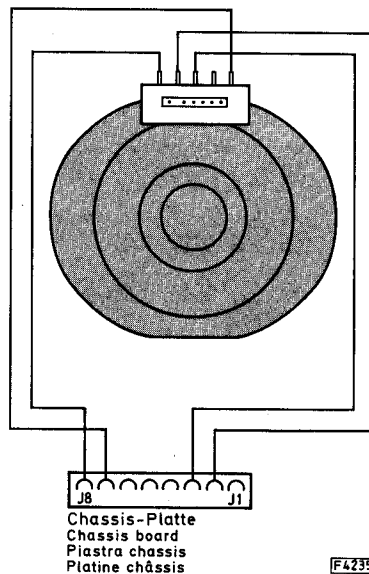


Verdrahtung der Ablenkspulen

Wiring of Deflection Yoke

Impianto elettrico bobine di deviazione

Bildröhre
Picture Tube
Cinnescopio
A 66 EAK 51 X 01
A 59 EAK 01 X 01



F4235

Symbols and their meaning
Simboli e loro significato

	PRGR.		VERT. TASTIMPULS IMP. A CADENZA VERT. IMP. TRAME		HOCHSPANNUNG EHT VOLTAGE ALTA TENS. HAUTE TENS.		ZEILENDREITE LINEA DI TRAMA LARGHEZZA DI RIGA AMPLITUDE HORIZONTAL
	ZWEI-KANALTON TWO-CHANNEL SOUND PER AUDIO BICANALE SON DEUX CANAUX		VERT. PARABEL VERT. PARABOLA PARABOLA VERT. SIGNAL PARABOLIQUE		SCHIRMLOTTERSP. SCREEN-GRID VOLT. TENS. GRIGLIA SCHERMO TENS. GRILLE-ECRAN		EST / WEST AMPLITUDE EAST / WEST AMPLITUDE AMPIEZZA EST / OVEST AMPLITUDE EST / OUEST
	SPEICHERTASTE MEMORY BUTTON TASTO DI MEMORIA TOUCHE MEMOIRE		VERT. SAEGEZAHN VERT. SAW TOOTH DENTE DI SEGA VERT. SIGNAL DENT DE SCIE		TEXT ENABLE		HR. LINEARITAET HR. LINEARITY LINEAR. GRIZZ LINEAR. HORIZONT.
	NORMTASTE TV STANDARD SELECT. BUTTON COMUT. DI NORMA TOUCHE DE NORME		HR. ANSTEUERUNG HORIZ. DRIVE PILOTAGGIO GRIZZ. SYNCHR. LIGNES		I^2 C-CLOCK		BILDLAG HR. HRIZ. PICTURE POSITION POSIZIONE GRIZZ. D'IMMAGINE CADRAGE HORIZONT.
	ÄNDERUNG+ ALTERATION+ MODIFICA+ MODIF+		REF. IMPULS REFERENCE PULSE IMP. DI RIFER. IMP. DE REFER.		VCR-CLOCK		FOKUSREGLER FOCUS CONTROL REGOLAT. DI FOCALIZZ. REGLAGE DE FOCALISATION
	ÄNDERUNG- ALTERATION- MODIFICA- MODIF-		SCHUTZSCHALTUNG CIRCUIT PROTECTION CIRCUITO DI PROTEZIONE CIRCUIT DE SECURITE		I-BUS-CLOCK		BILDLAG VERT. VERT. PICTURE POSITION POSIZ. VERT. D'IMMAGINE CADRAGE VERTICAL
	HELLIGKEIT BRIGHTNESS LUMINOSITA' LUMINOSITE		FARBTON TINT TINTA TEINTE		DATEN DATA DATI DONNEES		BILDAMPLITUDE FIELD AMPLITUDE AMPIEZZA D'IMMAGINE AMPLITUDE VERTICALE
	KONTRAST CONTRAST CONTRASTO CONTRASTE		REF. LAUTSTAERKE VOLUME REF. VOLT. TENS. DI RIF. VOLUME TENS. DE REF. VOL. SONORE		ZF-SIGNAL F SIGNAL SEGNALE F1 SIGNAL F1		TRAPEZ TRAPEZIUM TRAPEZIO TRAPEZE
	FARBKONTRAST CONTRAST COLOUR CONTRASTO COLORE CONTRASTE COULEUR		FBAS-SIGNAL CCVS SIGNAL SEGNALE SVCC SIGNAL VIDEO COMPOSITE		PAL PRIORITAET PAL PRIORITY PRIORITA' PAL PRIORITE PAL		HR. FREQUENZ HR. FREQUENCY FREQ. GRIZZ FREQ. HORIZ.
	LAUTSTAERKE VOLUME VOLUME SONORE		SUPERSANDCASTLE		F-SIGNAL DIREKT F SIGNAL DIRECT SEGNALE F DIRETTO SIGNAL CHROMA DIRECT		VERT. FREQUENZ VERT. FREQUENCY FREQ. VERT.
	FEINABST. FINE TUNING SINT. FINE REGLAGE FIN		STRAHLSTR. BEGR. CURRENT LIM. CORRENTE CATODICA MEDIA LIM. COUR. DE FAISCEAU		FV-SIGNAL FV SIGNAL SEGNALE FV SIGNAL FY		VERT. LINEARITAET VERT. LINEARITY LINEAR. VERT. LINEAR. VERT.
	KANALWAHL CHANNEL SEL. SELEZ. CANALE SELECT. DE CANAUX		SPITZ. STRAHLSTR. BEGR. PEAK BEAM CURRENT LIMITING CORR. CATODICA DI PICCO LIM. DE FAISCEAU CRETE		FU-SIGNAL FU SIGNAL SEGNALE FU SIGNAL FX		FU-SIGNAL FU SIGNAL SEGNALE FU SIGNAL FX
	BALANCE BILANCIAM. BALANCE		ROT-SIGNAL RED SIGNAL SEGNALE ROSSO SIGNAL ROUGE		F-SIGNAL VERZÖGERT F SIGNAL DELAYED SEGNALE F RITARDO SIGNAL CHROMA RETARDE		
	SUCHLAUF SELF-SEEK SINT. AUTOM. RECHERCHE AUTOM.		GRUEN-SIGNAL GREEN SIGNAL SEGNALE VERDE SIGNAL VERT		VERZÖGERUNGSLEITUNG DELAY LINE LINEA DI RITARDO LIGNE A RETARD		
	SCHALTSP. BANDWAHL BAND SEL. SWITCHING VOLTAGE TENS. DI COMUT. SELEZ. BANDA TENS. DE COMUT. SELECT. BANDE		BLAU-SIGNAL BLUE SIGNAL SEGNALE BLU SIGNAL BLEU		SCHALTSP./SCHUTZFUNKTION SWITCHING VOLT. / PROTECTIVE FUNCTION TENS. DI COMUT. / FUNZ. DI PROTEZ. TENS. DE COMUT. / SECURITE		
	SCHALTSP. VHF SWITCHING VOLT. VHF TENS. DI COMUT. VHF TENS. DE COMUT. VHF		Y-SIGNAL SEGNALE Y SIGNAL Y		FBAS/SYNC.-SIGNAL CCVS/SYNC. SIGNAL SEGNALE SINCR. / VIDEO COL. COMPOSITO SIGNAL SYNC./VIDEO COMPOSITE		
	SCHALTSP. UHF SWITCHING VOLT. UHF TENS. DI COMUT. UHF TENS. DE COMUT. UHF		F-SIGNAL CHROMA SIGNAL SEGNALE F SIGNAL CHROMA		SYNC.-SIGNAL SYNC. SIGNAL SEGNALE SINCR. SIGNAL SYNC.		
	SCHALTSP. AFC SWITCHING VOLT. AFC TENS. DI COMUT. AFC TENS. DE COMUT. AFC		SCHWARZWERT BLACK LEVEL LIVELLO DEL NERO NIVEAU DU NOIR		SCHALTSP. 50/60HZ SWITCHING VOLT. 50/60HZ TENS. DI COMUT. 50/60HZ TENS. DE COMUT. 50/60HZ		
	SCHALTSP. AV AV SWITCHING VOLT. TENS. DI COMUT. AV TENS. DE COMUT. AV		AUDIO-SIGNAL SEGNALE AUDIO SIGNAL AUDIO		SCHALTSP. BTX SWITCHING VOLT. BTX (VIEWDATA) TENS. COMUT. VIDEOTEXT TENS. COMUT. VIDEOTEXTE		
	SCHALTSP. NORM SWITCHING VOLT. STANDARD TENS. DI COMUT. NORMA TENS. DE COMUT. STANDARD		AUDIO SIGNAL LINKS AUDIO SIGNAL LEFT SEGNALE AUDIO SINISTRA SIGNAL AUDIO GAUCHE		SYNC. VT SYNC. VT (TELETEXT) SINCR. TELEVIDEO SYNC. TELETEXTE		
	SCHALTSP. KOINC. SWITCHING VOLT. COINC. TENS. DI COMUT. COINC. TENS. DE COMUT. COINC.		AUDIO SIGNAL RECHTS AUDIO SIGNAL RIGHT SEGNALE AUDIO DESTRA SIGNAL AUDIO DROIT		SYNC. BTX SYNC. BTX (VIEWDATA) SINCR. VIDEOTEXT SYNC. VIDEOTEXTE		
	SCHALTSP. EURO-AV SWITCHING VOLT. EURO-AV TENS. DI COMUT. EURO-AV TENS. DE COMUT. NORME FR		VIDEO SIGNAL EURO-AV SEGNALE VIDEO EURO-AV SIGNAL VIDEO NORME FR		SCHALTSP. RESET SWITCHING VOLT. RESET TENS. COMUT. RESET		
	SCHALTSP. VIDEO QUELLE SWITCHING VOLT. VIDEO SOURCE TENS. DI COMUT. SORG. VIDEO TENS. DE COMUT. SOURCE VIDEO		AUDIO SIGNAL EURO-AV RECHTS AUDIO SIGNAL EURO-AV RIGHT SEGNALE AUDIO EURO-AV DESTRA SIGNAL AUDIO NORME FR DROIT		SCHALTSP. STAND BY SWITCHING VOLT. STAND BY TENS. COMUT. STAND BY TENS. COMUT. VEILLE		
	SCHALTSP. DATENBETR. SWITCHING VOLT. DATA MODE TENS. DI COMUT. DATI TENS. DE COMUT. FONCT. DONNEES		AUDIO SIGNAL EURO-AV LINKS AUDIO SIGNAL EURO-AV LEFT SEGNALE VIDEO EURO-AV SINISTRA SIGNAL AUDIO NORME FR GAUCHE		SCHALTSP. HUB SWITCHING VOLT. DEVIATION TENS. COMUT. DEVIATION TENS. COMUT. DEVIATION		
	SCHALTSP. 4,5 MHZ SWITCHING VOLT. 4,5 MHZ TENS. DI COMUT. 4,5 MHZ TENS. DE COMUT. 4,5 MHZ		IR-SIGNAL SEGNALE IR SIGNAL IR		SCHALTSP. DEEM SWITCHING VOLT. DEEMPHASIS TENS. COMUT. DEENFASIS TENS. COMUT. DESACCENT.		
	REGELSP. VERZÖGERT DELAYED CONTR. VOLTAGE TENS. DI CONTR. RITARDO TENS. DE REGUL. RETARDEE		SPG. GITTER 1 VOLTAGE GRID 1 TENS. GRIGLIA 1 TENS. GRILLE G1		SCHALTSP. KAMERA WIEDERG. SWITCHING VOLT. CAMERA PLAYBACK TENS. COMUT. RIPRODUZ. TELECAMERA TENS. COMUT. REPROD. TELECAMERA		
	ABSTIMMSP. TUNER TUNING VOLT. TUNER TENS. DI SINTONIA TUNER TENS. D'ACCORD TUNER		FOKUSSP. FOCUSING VOLTAGE TENS. DI FOCALIZZ. TENS. DE FOCALIS.		SCHALTSP. LED LED SWITCHING VOLT. LED TENS. DI COMUT. LED TENS. DE COMUT. LED		
	REGELSP. AFC AFC CONTROL VOLT. TENS. DI CONTR. AFC TENS. DE REGUL. AFC						
	STUHMISCHALTUNG MUTING SILENZIAMENTO SILENCEUX						
	TASTIMPULS GATING PULSE IMPULSO A CADENZA IMPULS. DE DECLENCHEMENT						

Wichtige Schaltzeichen Important circuit symbols Segni circuitali importanti

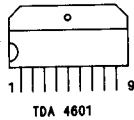


IC'S VON UNTEN GESEHEN
IC'S SEEN FROM BOTTOM
IC'S VISTI DI SOTTO
IC'S VUS DU DESSOUS

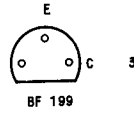
- 3/4W 0617 DIN
- 1/10W 0204 DIN
- 1/4W 0207 DIN
- 1/2W 0411 DIN
- 1W 0411 DIN
- 2W 0617 DIN
- 4W 0922 DIN

**BEI ERSATZ AUS SICHERHEITSGRUENDEN NUR ORIGINALBAUTEILE VERWENDEN.
FOR REASONS OF SAFETY USE ORIGINAL PARTS ONLY WHEN REPLACING.
IN CASO DI SOSTITUZIONE UTILIZZARE PER RAGIONI DI SICUREZZA SOLAMENTE
PEZZI DI RICAMBIO ORIGINALI.
EN CAS DE REMPLACEMENT N'UTILISER, POUR DES RAISONS DE SECURITE,
QUE DES PIECES D'ORIGINE.**

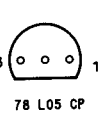
**BEI EINGRIFFEN SCHUTZMASSNAHMEN FUER MOS-BAUTEILE BEACHTEN!
WHEN HANDLING MOS-CIRCUITS, ALWAYS OBSERVE THE MOS PROTECTION MEASURES!
ADOPERANDO COMPONENTI O CIRCUITI MOS OSSERVARNE LE CORRISPONDENTI
MISURE DI PROTEZIONE!
LORS DE LA MANIPULATION DES CIRCUITS MOS, RESPECTER LES
PRESCRIPTIONS MOS!**



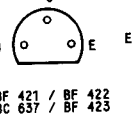
TDA 4601



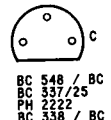
BF 199



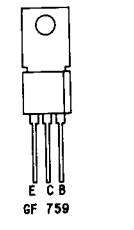
78 L05 CP



BC 421 / BF 422
BC 637 / BF 423



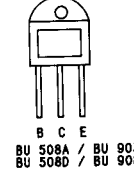
BC 548 / BC 558



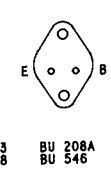
GF 759



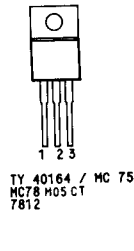
BC 337 / 25



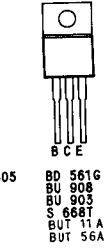
BU 508A / BU 903
BU 508D / BU 908



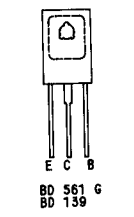
BU 208A
BU 546



TY 40164 / MC 7505
MC78 MOS CT 7812



BD 561G
BU 908
BU 903
S 668T
BUT 11A
BUT 56A



BD 561 G
BD 139

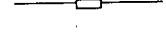


TDA 8170

WIDERSTAND NICHT BRENNBAR
RESISTOR NOT FLAMMABLE
RESISTENZA NON INFIAMMABILE
RESISTANCE ININFLAMMABLE



DRAHTWIDERSTAND
WIRE RESISTOR
RESISTENZA A FILO
RESISTANCE BOBINEE

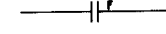


SICHERUNGSWIDERSTAND
SAFETY RESISTOR
RESISTENZA DI SICUREZZA
RESISTANCE DISJONCTABLE

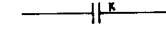


- KONDENSATOR
CAPACITOR
CONDENSATORE
CONDENSATEUR
- 250V-
- 400V-
- 630V-
- 1000V-

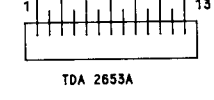
FOLIE
FOLL
A FOLLIA
FOLIO PLASTIQUE



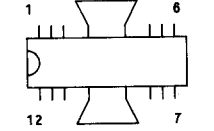
KERAMIK
CERAMIC
CERAMICO
CERAMIQUE



ELEKTROLYTIC
ELECTROLYTIC
ELETTROLITICO
ELECTROLYTIQUE



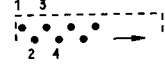
TDA 2653A



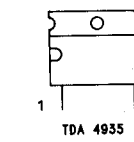
TDA 2655B

- SOT 143
G1 G2
S D
- SOT 23
E B
C
- BF 994
BF 996
- BF 569
BF 579
- B E
C
- BC 847
BC 858

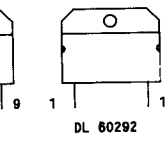
STECKERUNTERTEIL ZAHLRICHTUNG
PLUG BOTTOM PART COUNTING DIRECTION
PARTE INFER. SPINA DIREZ. CONTEGGIO
SENS COMPTAGE PARTIE INFER. CONNECTEUR



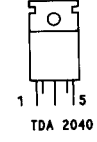
LOETSSEITE
SOLDER SIDE
LATO SALDATURE
COTE SOUDURE



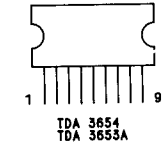
TDA 4955



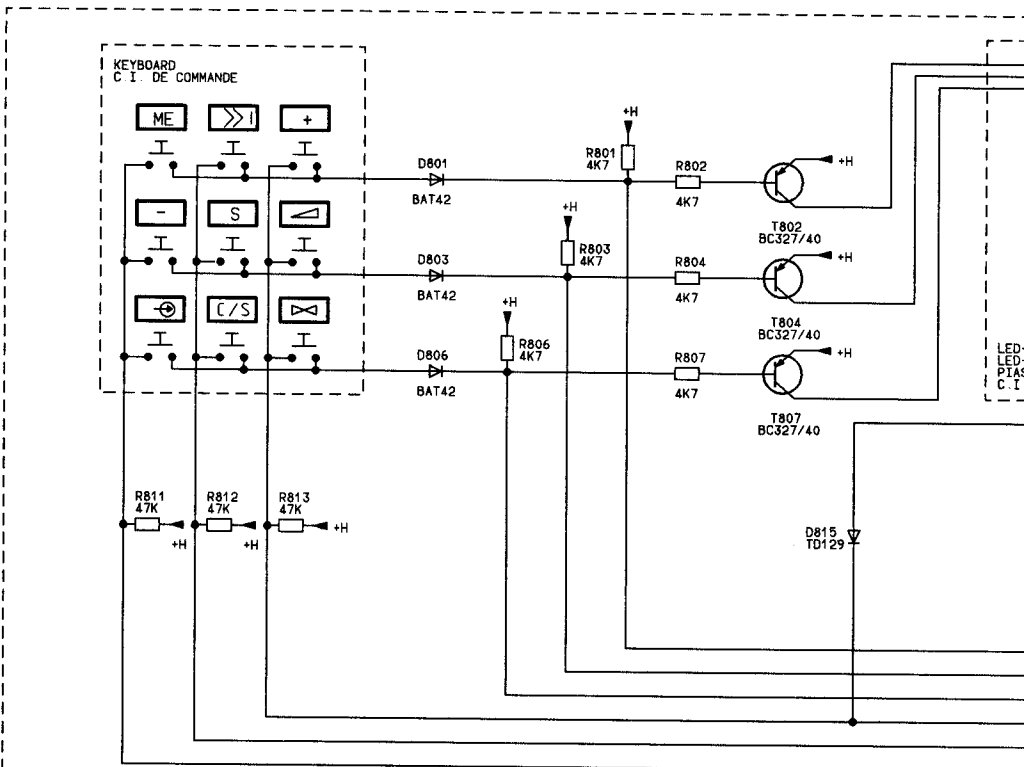
DL 80292



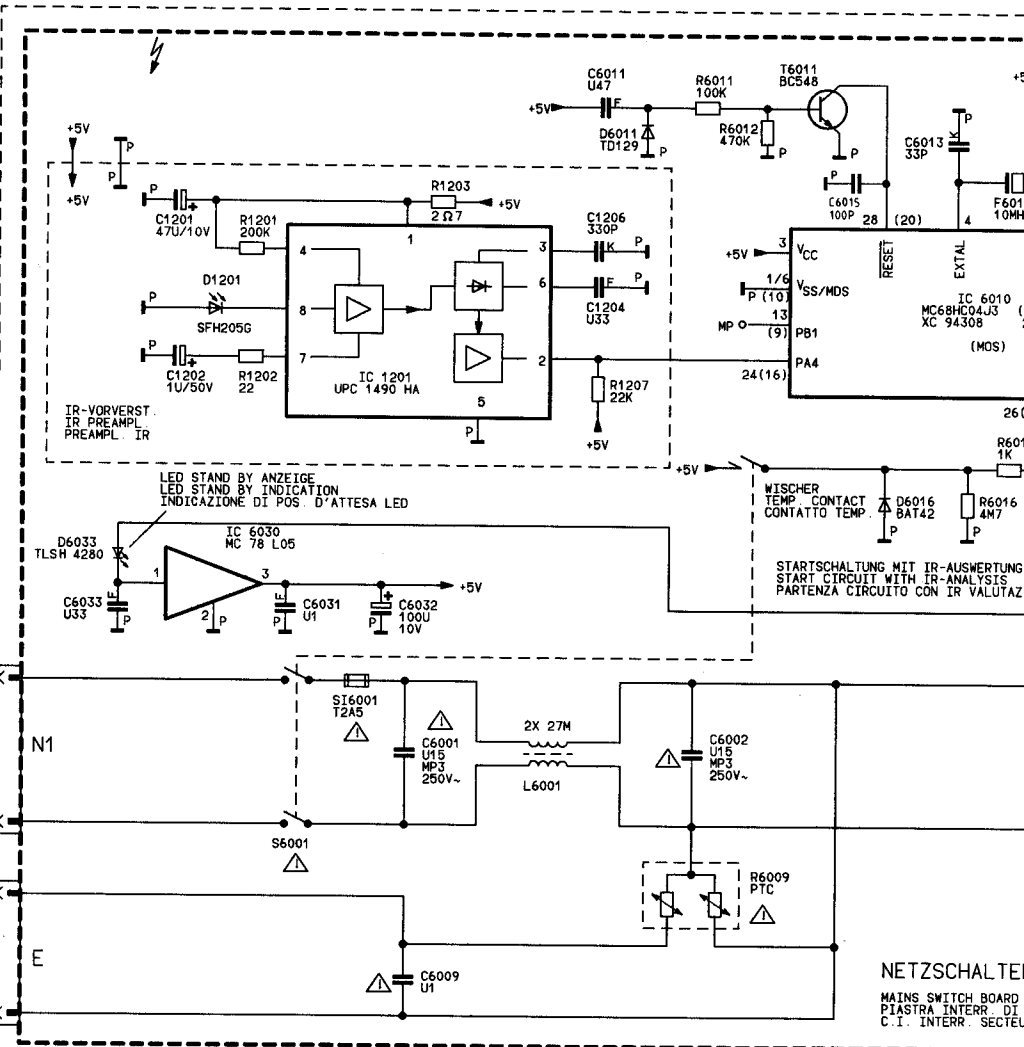
TDA 2040



TDA 3654
TDA 3653A



BED.-EINHEIT 29501-074.11(8669435400)
 CONTROL UNIT
 UNITA DI COMANDO -074.14 NICAM (8669425904)
 UNITE DE COMMANDE

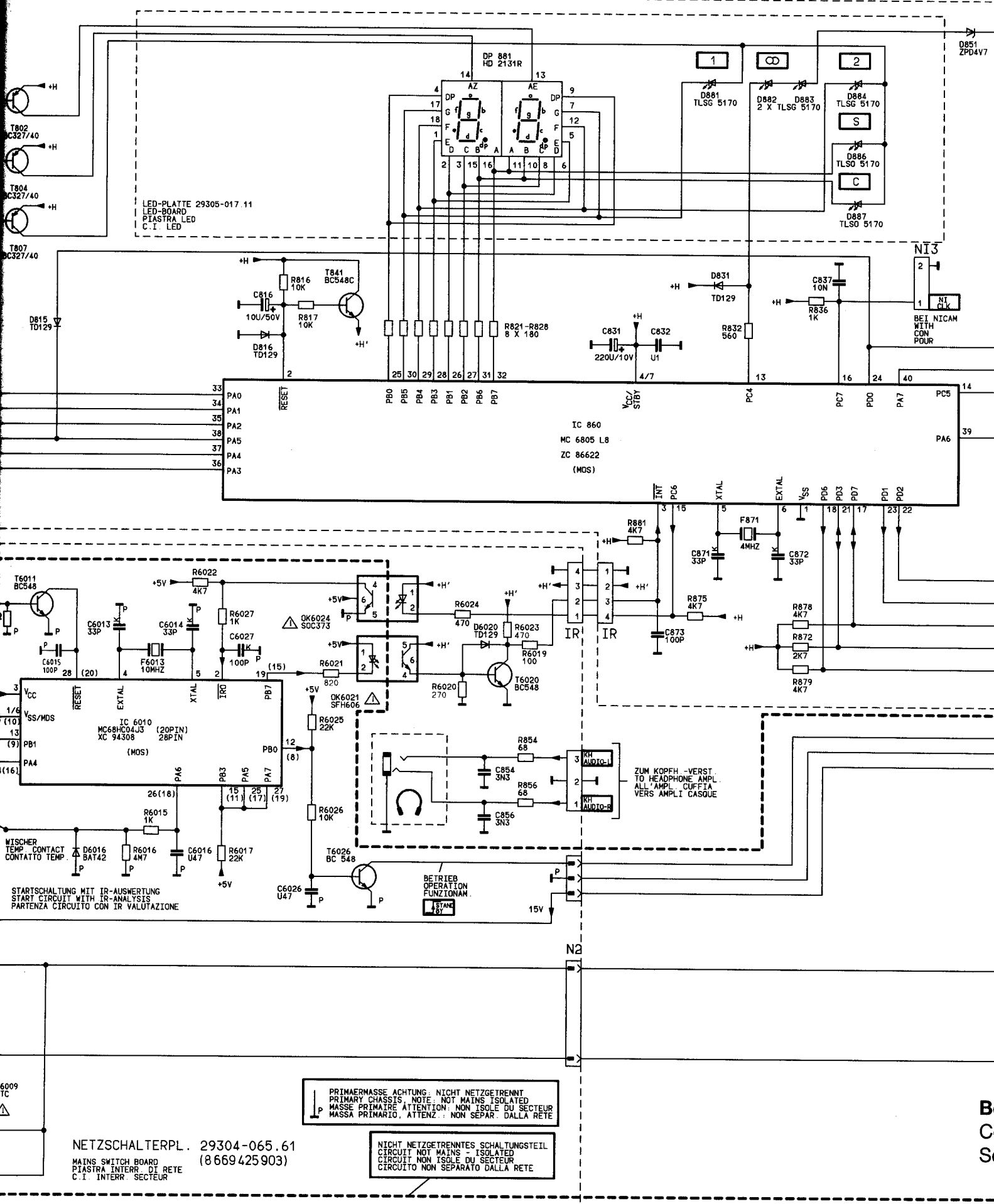


220-240V~
L6000

ENTMAGNETISIERUNG
 DEGAUSSING
 MAGNETIZATION
 DEMAGNETISATION
L6010

NETZSCHALTER
 MAINS SWITCH BOARD
 PIASTRA INTERR. DI
 C.I. INTERR. SECTEUR

G167



LED-PLATTE 29305-017.11
 LED-BOARD
 PIASTRA LED
 C.I. LED

T802
 BC327/40

T804
 BC327/40

T807
 BC327/40

33 PA0
 34 PA1
 35 PA2
 38 PA5
 37 PA4
 36 PA3

IC 860
 MC 6805 L8
 ZC 86622
 (MOS)

T6011
 BC548

IC 6010
 MC68HC04J3
 XC 94308
 (MOS)

WISCHER
 TEMP. CONTACT
 CONTATTO TEMP.

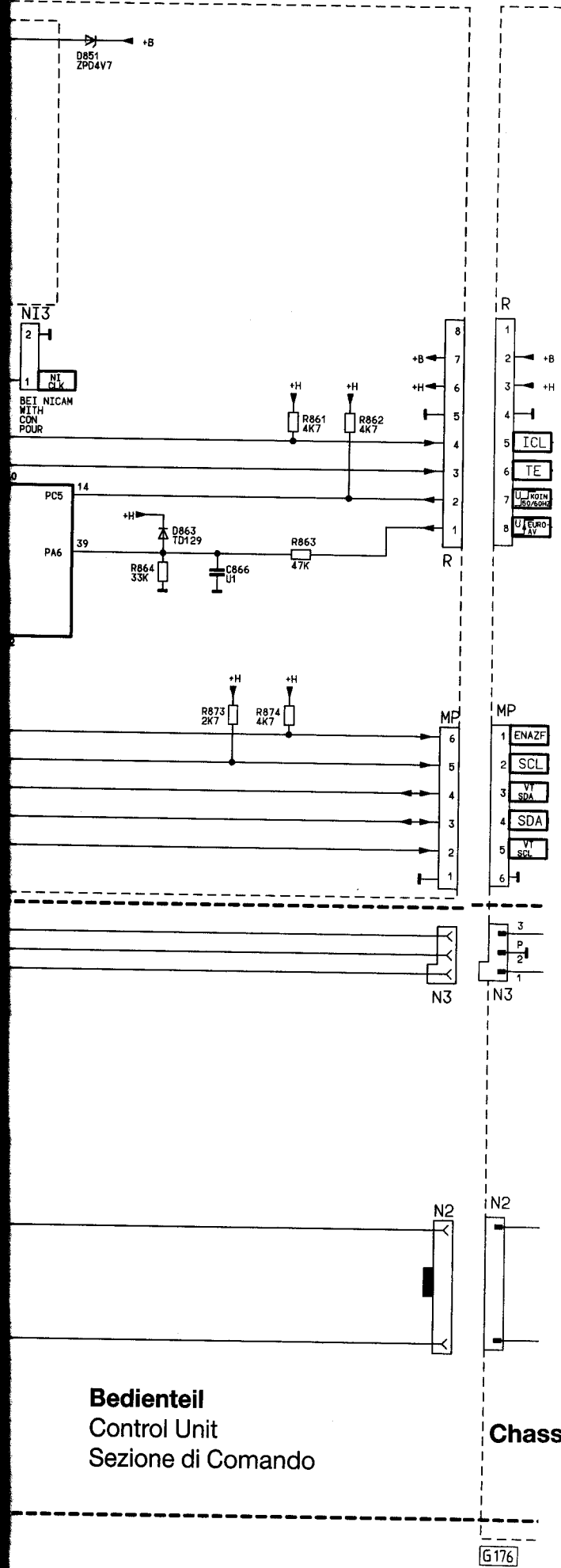
STARTSCHALTUNG MIT IR-AUSWERTUNG
 START CIRCUIT WITH IR-ANALYSIS
 PARTENZA CIRCUITO CON IR VALUTAZIONE

PRIMAERMASSE ACHTUNG: NICHT NETZGETRENNT
 PRIMARY CHASSIS NOTE: NOT MAINS ISOLATED
 MASSE PRIMARE ATTENTION: NON ISOLE DU SECTEUR
 MASSA PRIMARIO, ATTENZ.: NON SEPAR DALLA RETE

NICHT NETZGETRENNTES SCHALTUNGSTEIL
 CIRCUIT NOT MAINS - ISOLATED
 CIRCUITO NON ISOLE DU SECTEUR
 CIRCUITO NON SEPARATO DALLA RETE

NETZSCHALTERPL. 29304-065.61
 MAINS SWITCH BOARD
 PIASTRA INTERR. DI RETE
 C.I. INTERR. SECTEUR
 (8 669 425 903)

Bedieneinheit 8 669 435 400
Bedieneinheit (NICAM) 8 669 425 90
 Control Unit
 Unita di Comando

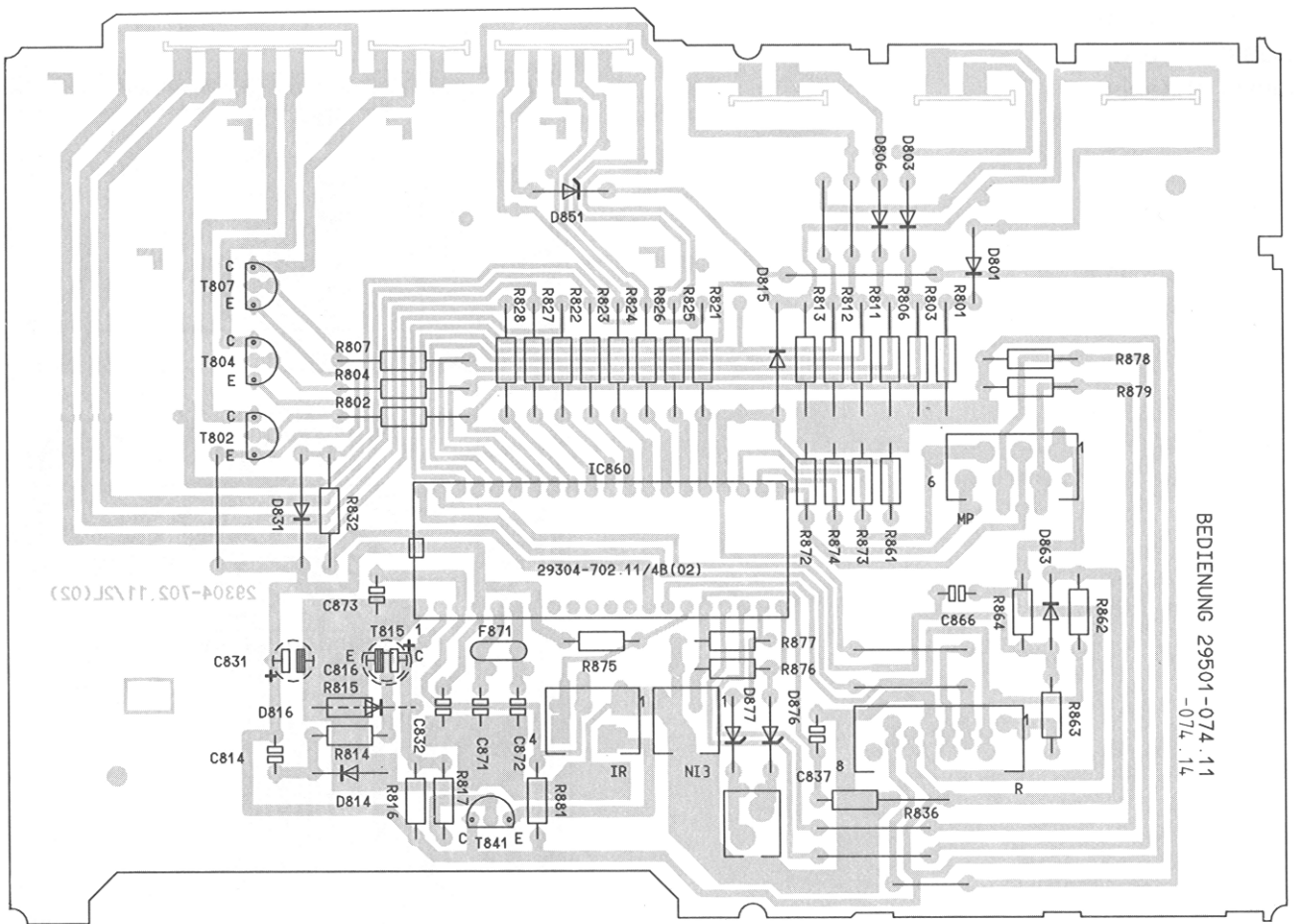


Netzschalter-Platte 8 669 425 90
 Mains Switch Board
 Piastra Interruto

Bedienteil
 Control Unit
 Sezione di Comando

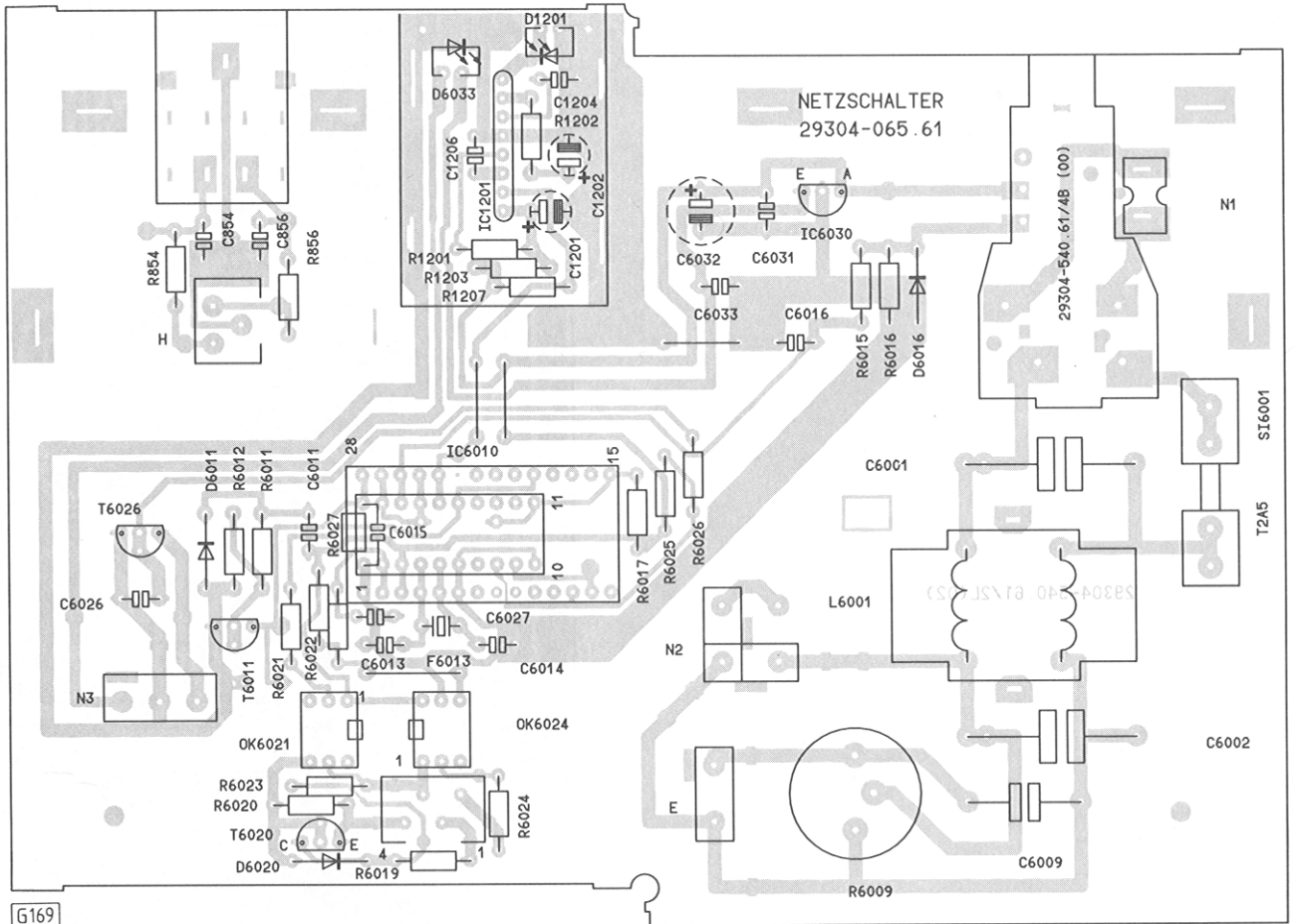
Chassis

G176

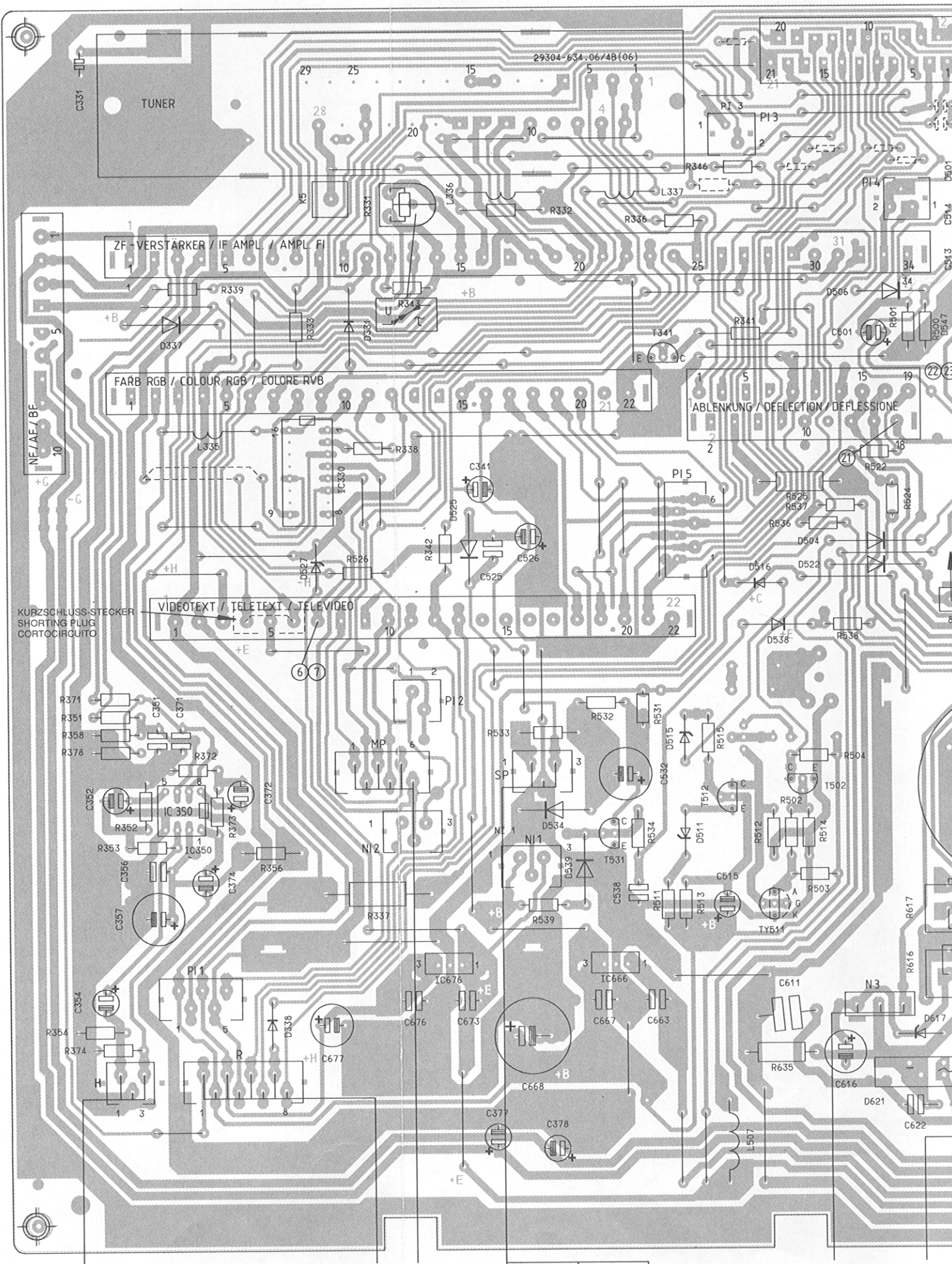


BEDIENUNG 29501-074.11
-074.14

G168



G169



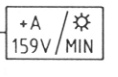
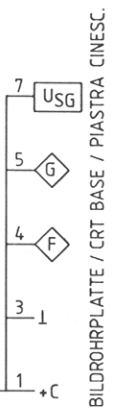
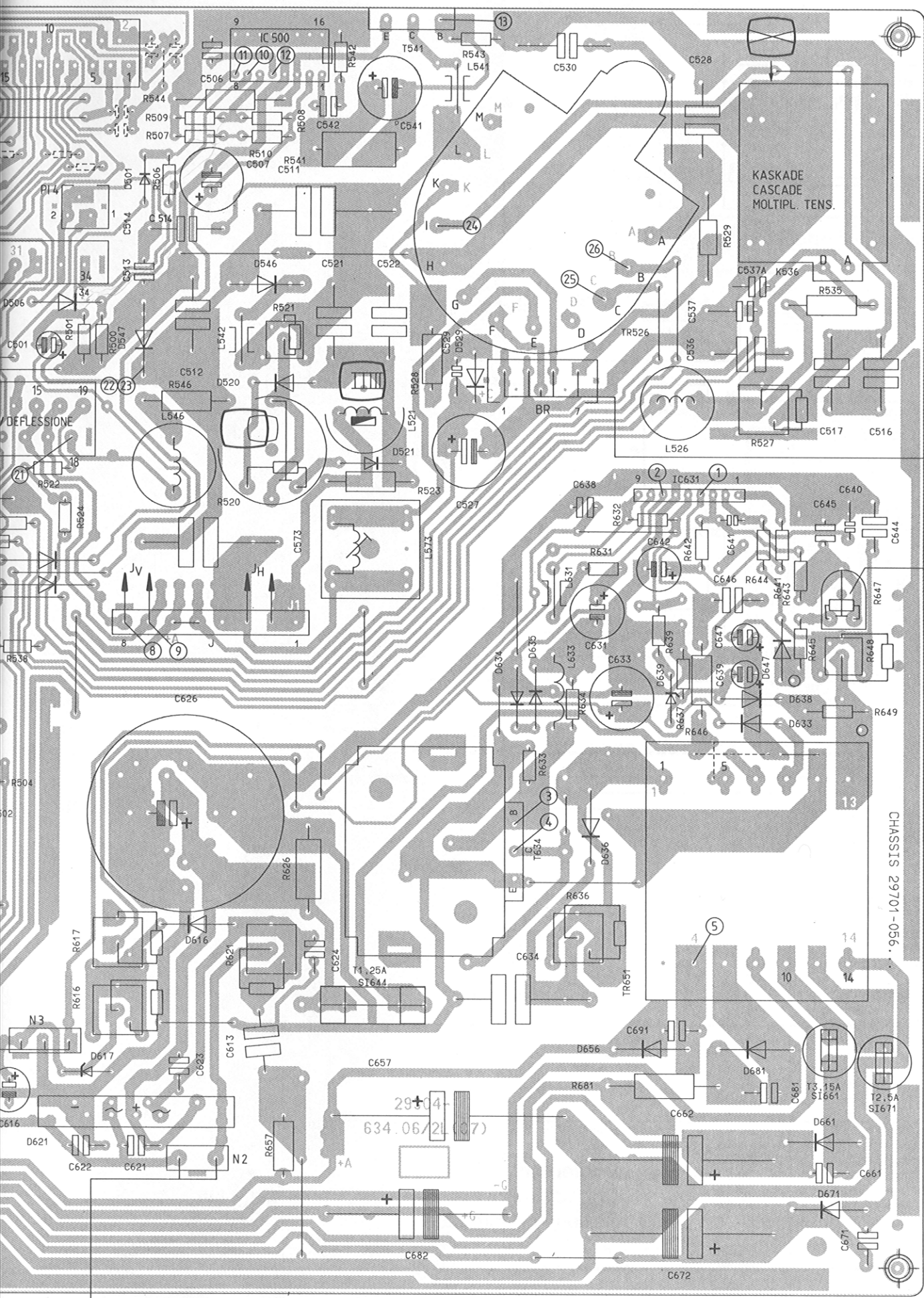
KURZSCHLUS-STECKER
 SHORTING PLUG
 CORTOCIRCUITO

KOPFHÖRERBUCHSE
 HEAD PHONE SOCKET
 PRESA CUFFIA

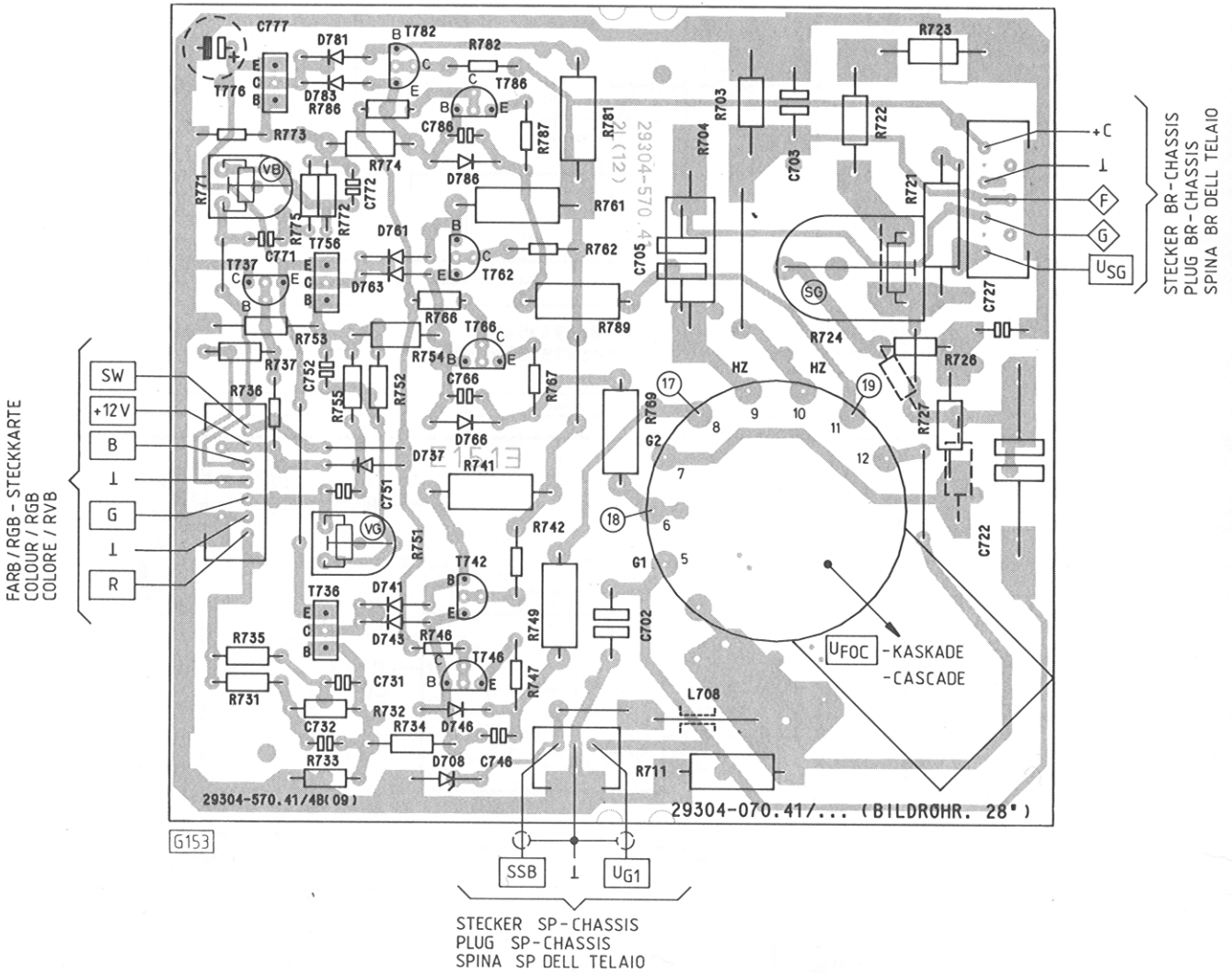
BEDIENEINHEIT
 CONTROL UNIT
 UNITA DI COMANDO

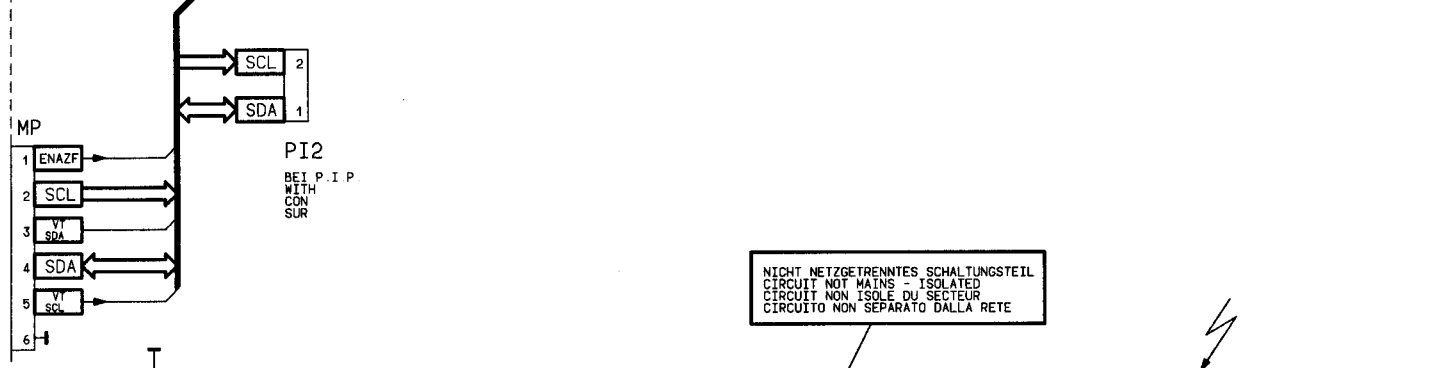
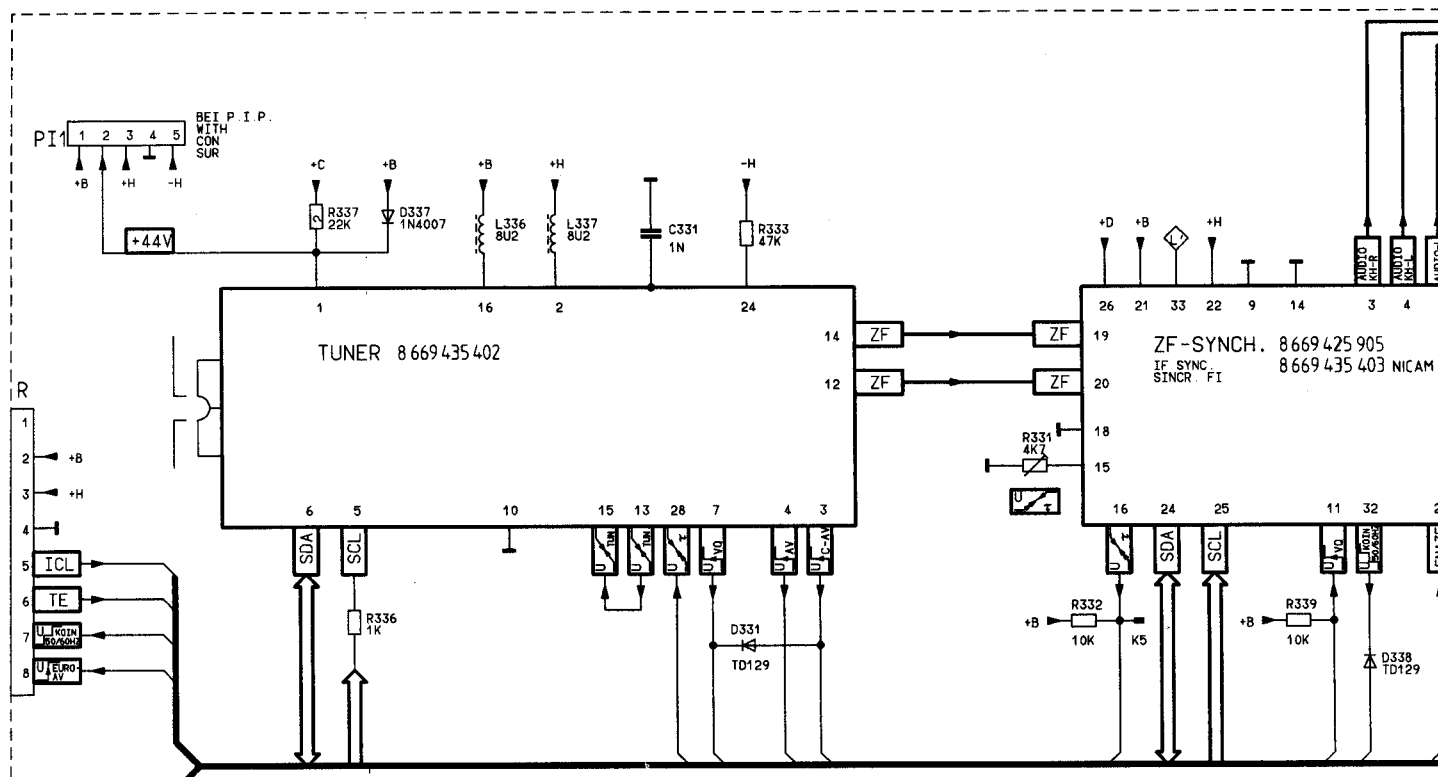
1 UG1 2 1 3 SSB
 BILDROHRPLATTE / CRT BASE / PIASTRA CINESC.

NETZSCHALTEREINHEIT
 MAINS SWITCH UNIT
 UNITA INTERR. DE RETE

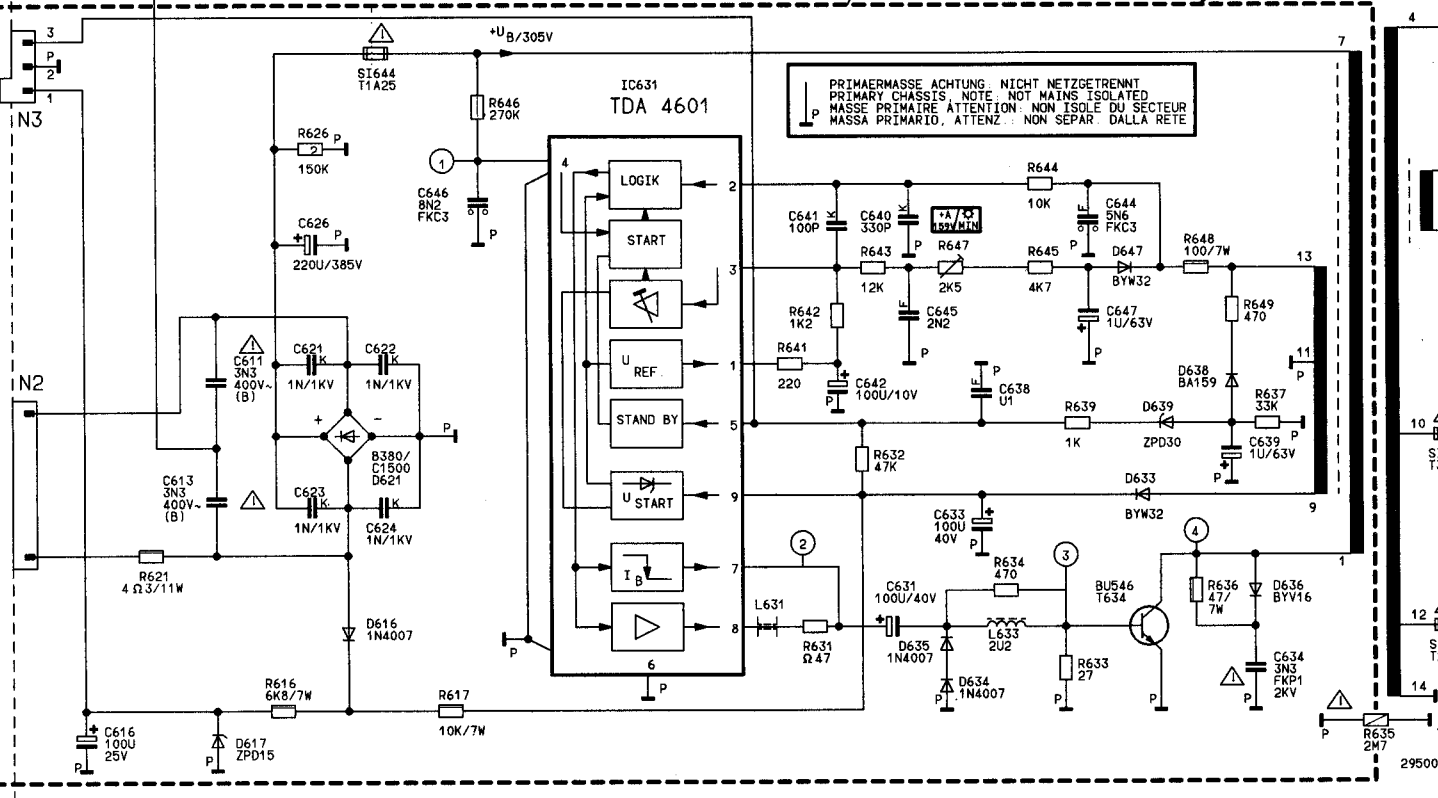


CHASSIS 29701-056

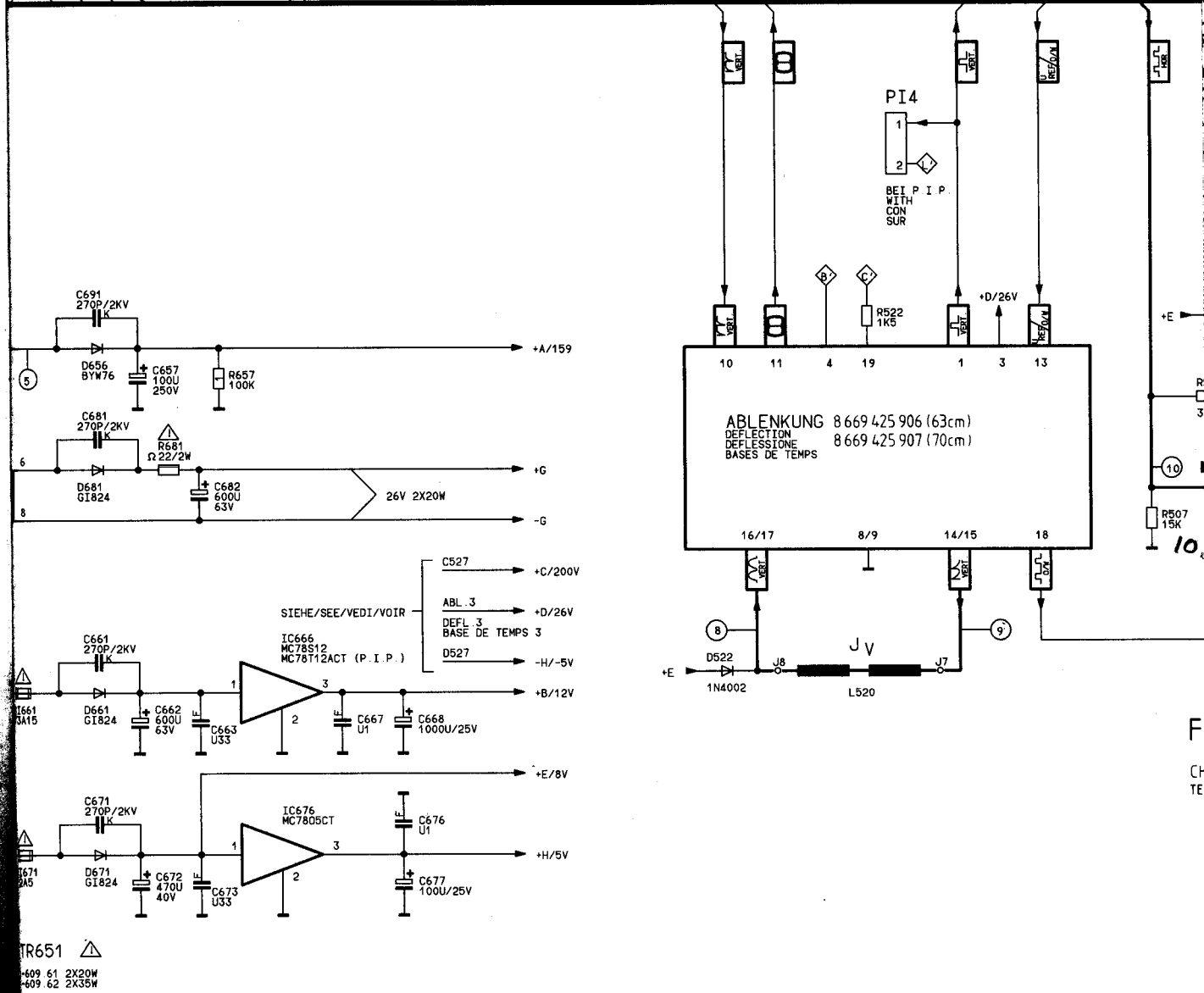
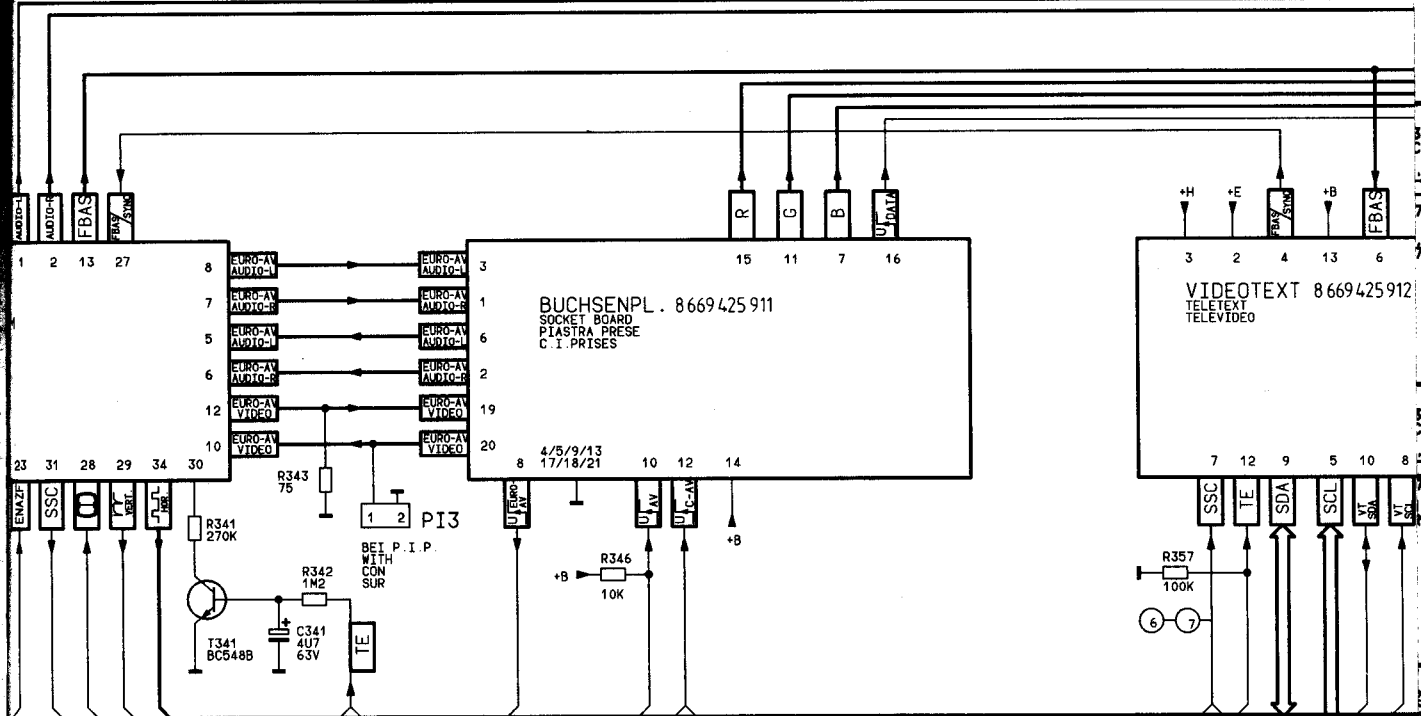




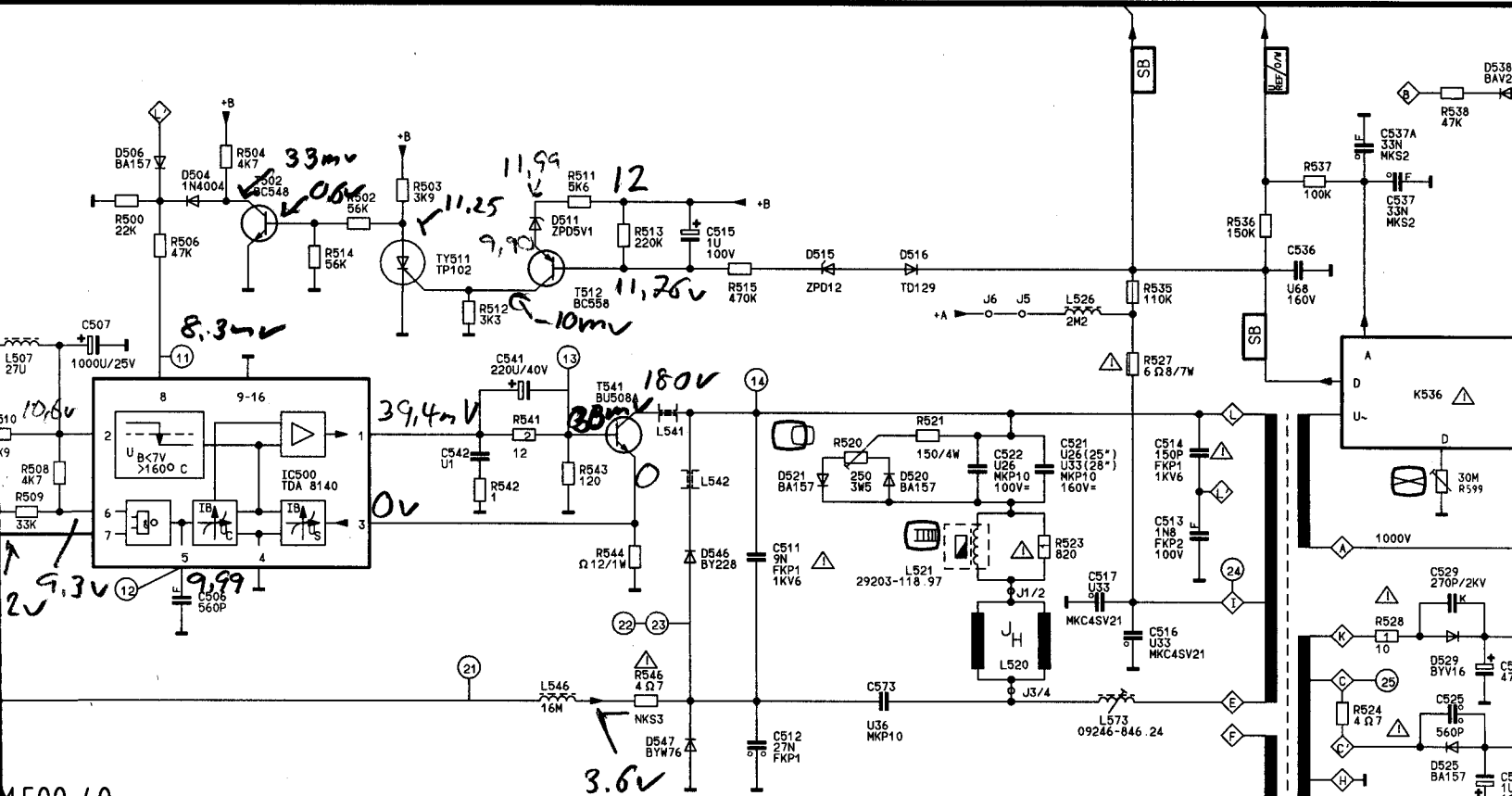
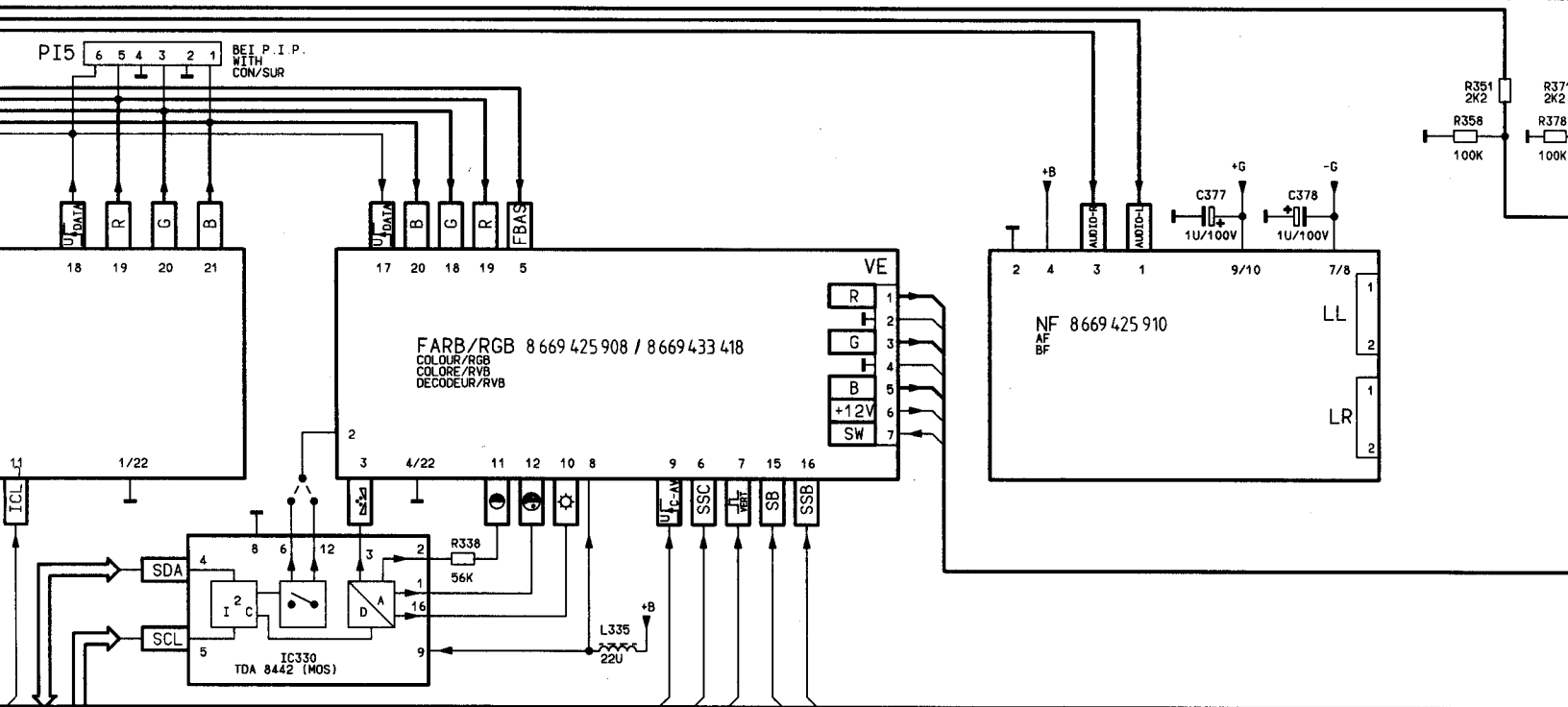
NICHT NETZGETRENNTES SCHALTUNGSTEIL
 CIRCUIT NOT MAINS - ISOLATED
 CIRCUIT NON ISOLE DU SECTEUR
 CIRCUITO NON SEPARATO DALLA RETE



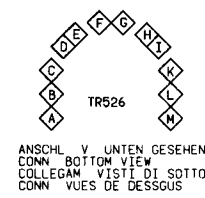
G176

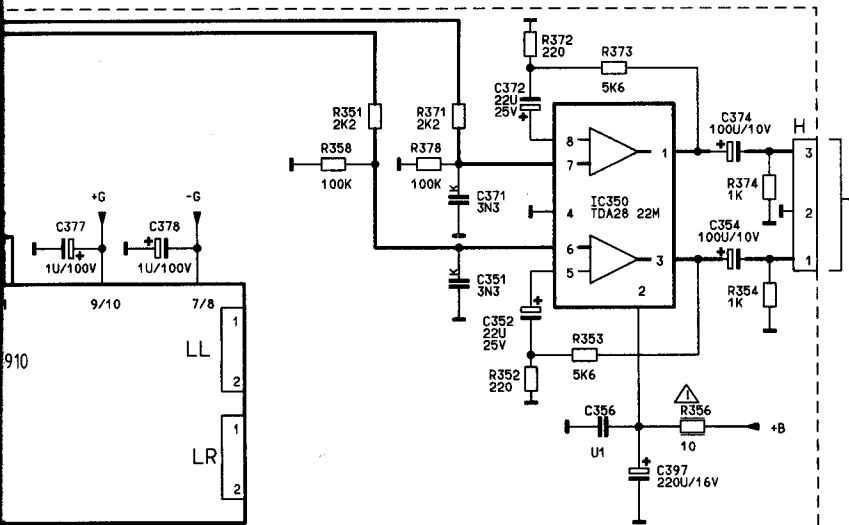


TR651
 409 61 2X20W
 409 62 2X35W

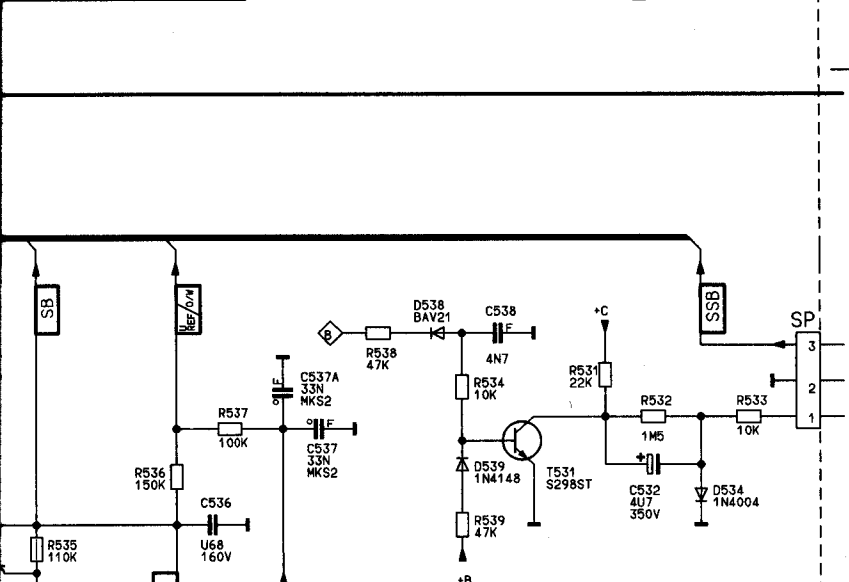


- M 500.40
- ASSIS 29701-056.04 (63cm)
 - AIO -056.07 (70cm)
 - 056.24 NICAM (63cm)
 - 056.29 NICAM (70cm)

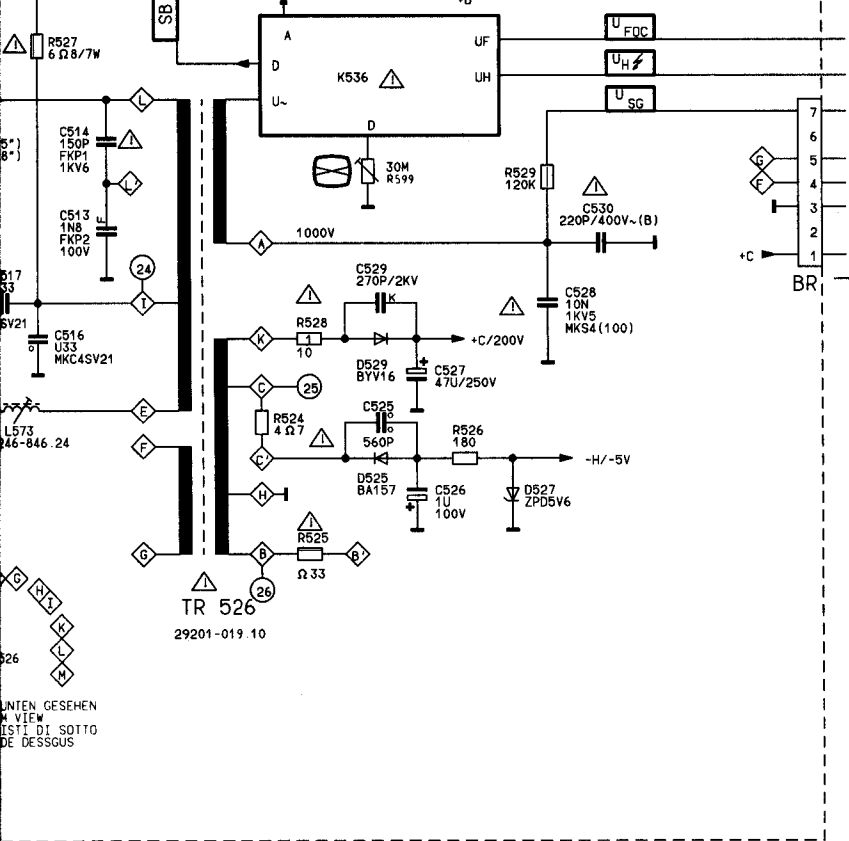




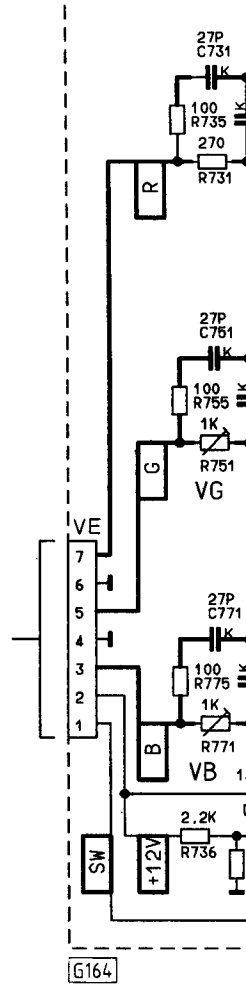
ZUR KOPFH-BUCHSE
TO HEADPHONE SOCKET
ALLA PRESA CUFFIA
VERS. PRISE HP



ZUM FARB/RGB
TO COLOUR/RGB
AL MOD. COLORE RVB
VERS MOD. DECODEUR RVB



BR-PL
CRT BASE
PIASTRA CINESC
C. I. TUBE CATHOD



D
Abgleich der Brückenspule L 573

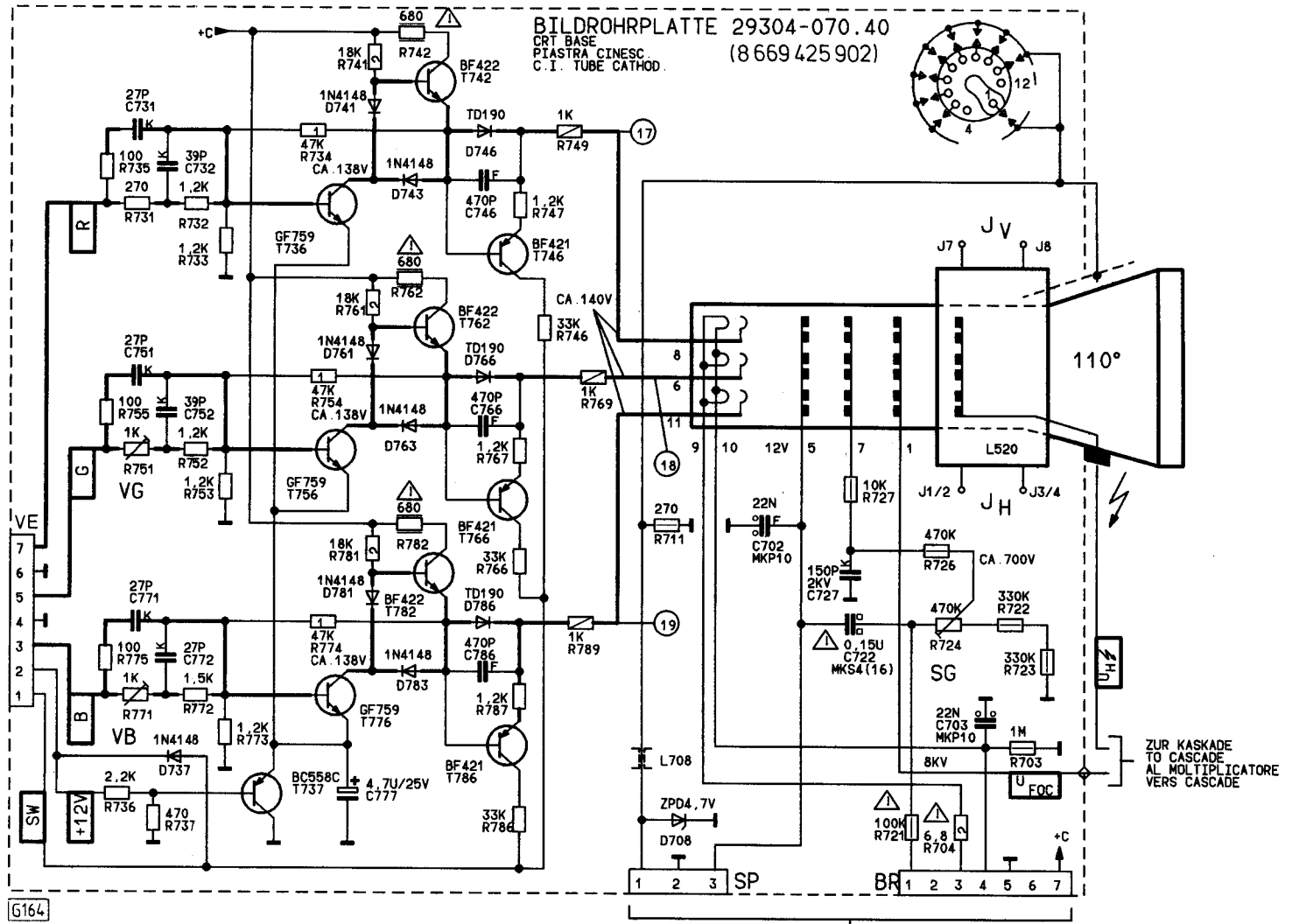
Bildbreite (R 7002, Ablenkmodul) auf Minimum, den Tastkopf eines Oszilloskopes an den Kollektor des Transistors T 541 (BU 508 A) anbringen. Den anderen Tastkopf zwischen den Dioden D 546 und D 547 anbringen. Mit der Spule L 573 beide Oszillogramme auf gleich Impulsbreite einstellen.

GB
Adjustment of the bridge coil L 573

Picture width (R 7002, deflection module) to minimum, then connect beam oscilloscope to the collector of transistor R 541 (BU 508 A). Connect the other test probe to the junction of D 546, D 547. Adjust the coil L 573 so that both oscillograms have the same pulse width.

I
Taratura della bobina a ponte L 573

Portare la larghezza dell'immagine sul minimo (R 7002, modulo di deflessione) collegando una sonda a doppia traccia collegando una sonda al collettore del transistor T 541 (BU 508 A) e l'altra tra i diodi D 546 e D 547. Con la bobina L 573 tarare i due oscillogrammi per la stessa larghezza d'impulso.

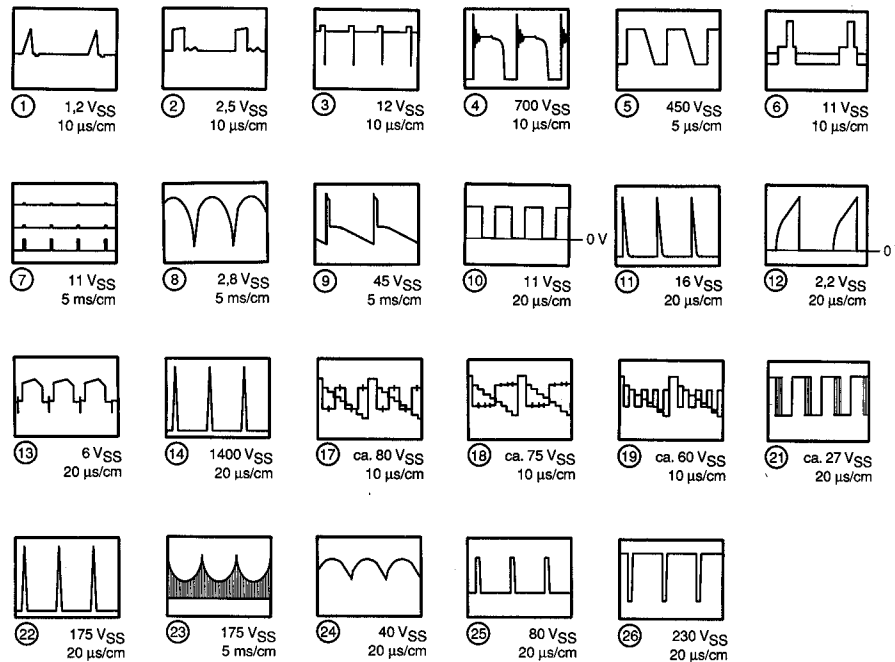


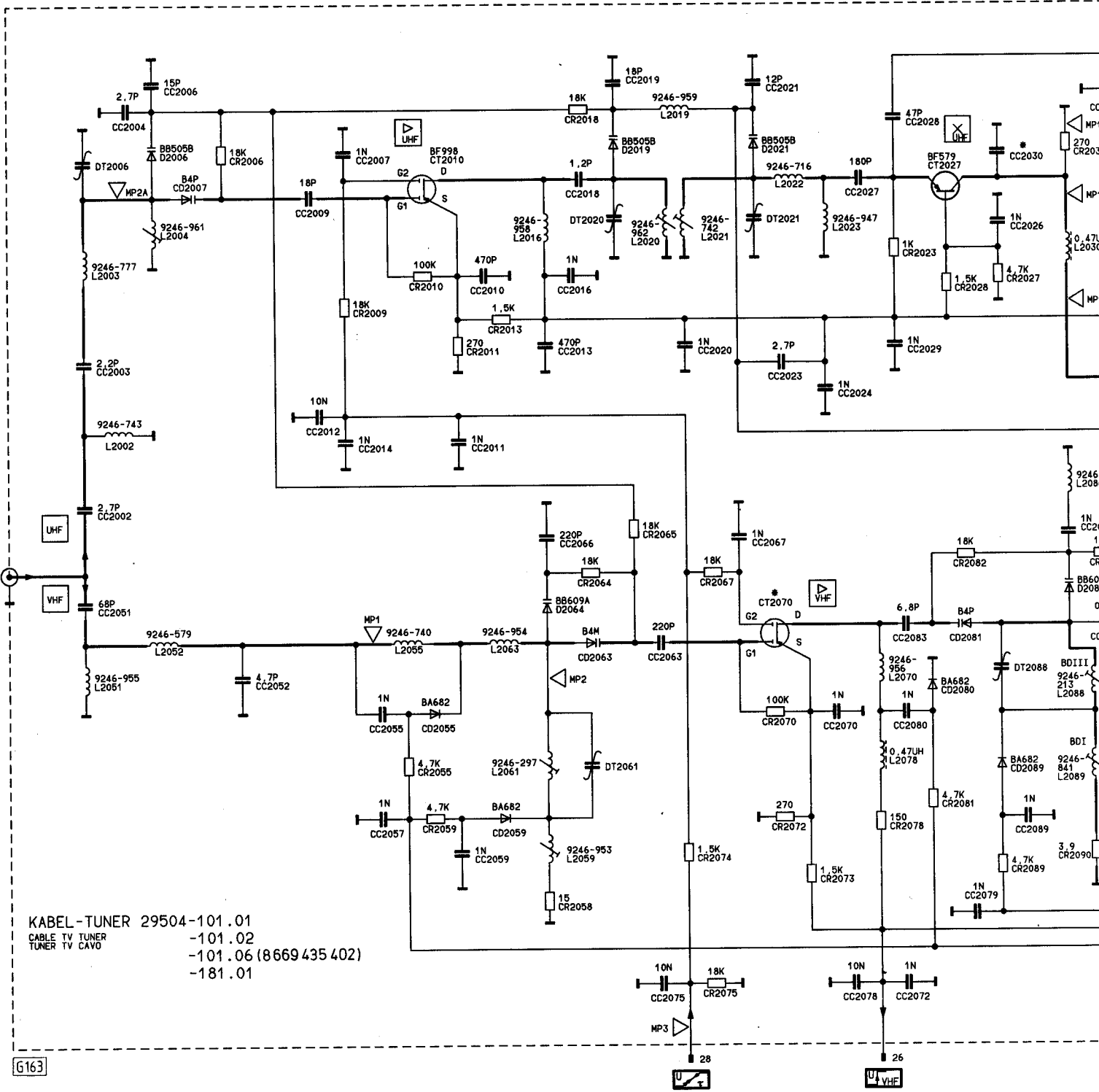
imum, den Tastkopf eines Zweistrahl-
 sistors T 541 (BU 508 A) einhängen.
 den D 546 und D 547 anschließen.
 e auf gleich Impulsbreite abgleichen.

e) to minimum, then connect one test probe of a twin
 ansistor R 541 (BU 508 A).
 on of D 546, D 547.
 grams have the same pulse width.

nimo (R 7002, modulo deflessione) è impiegare un oscilloscopio
 al collettore del transistor T 541 (BU 508 A)

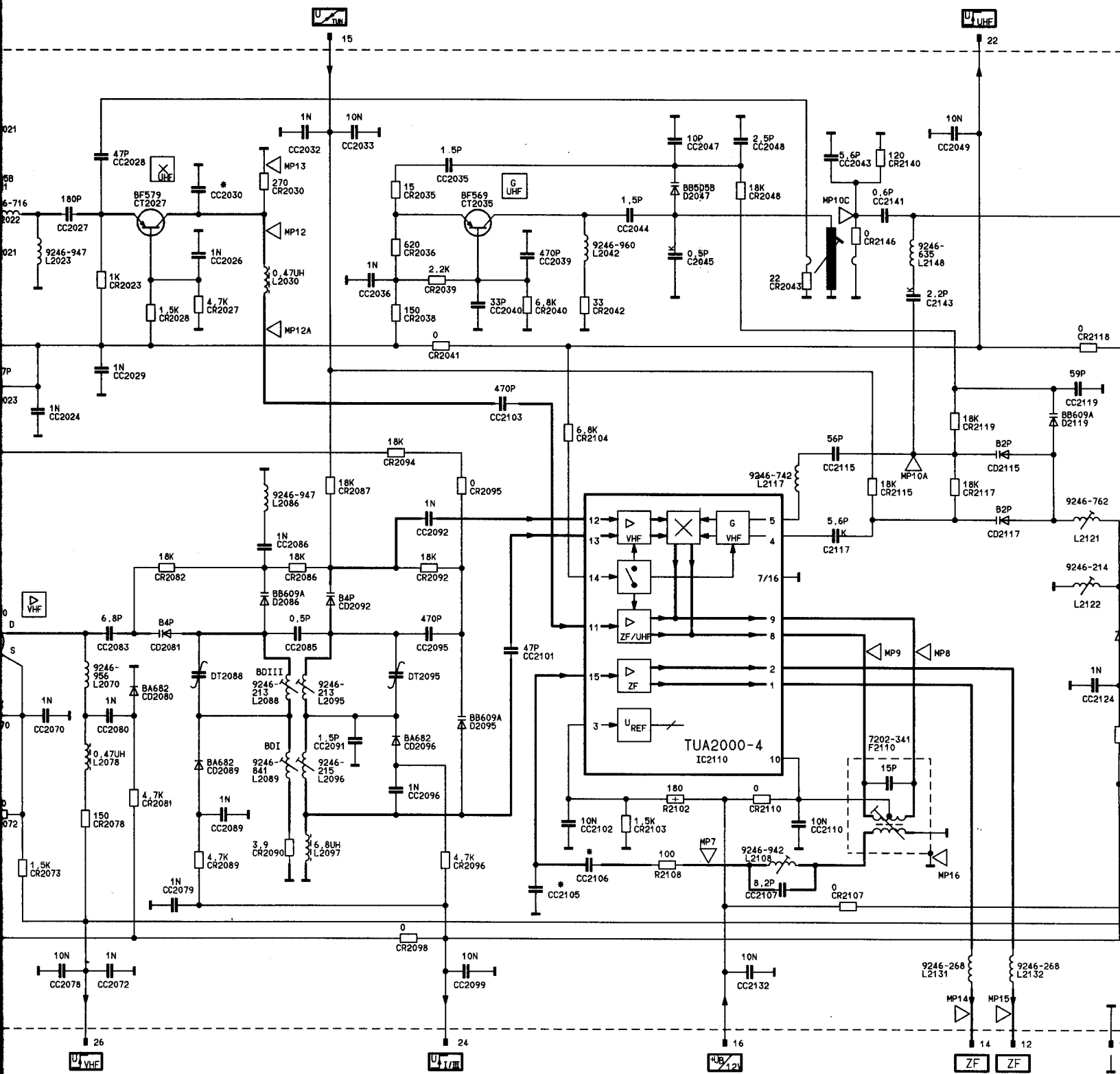
grammi per la stessa larghezza dell'impulso.

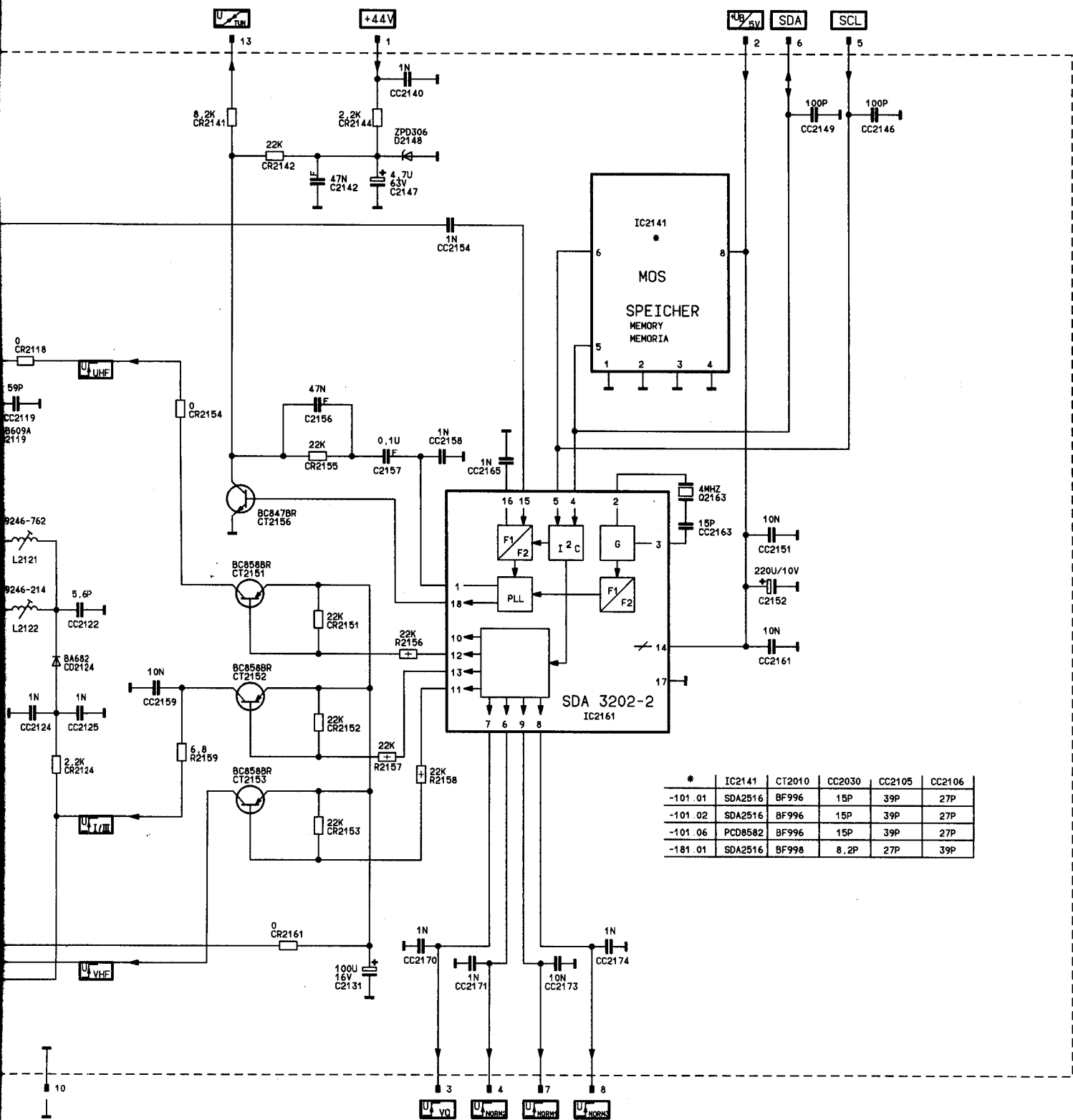


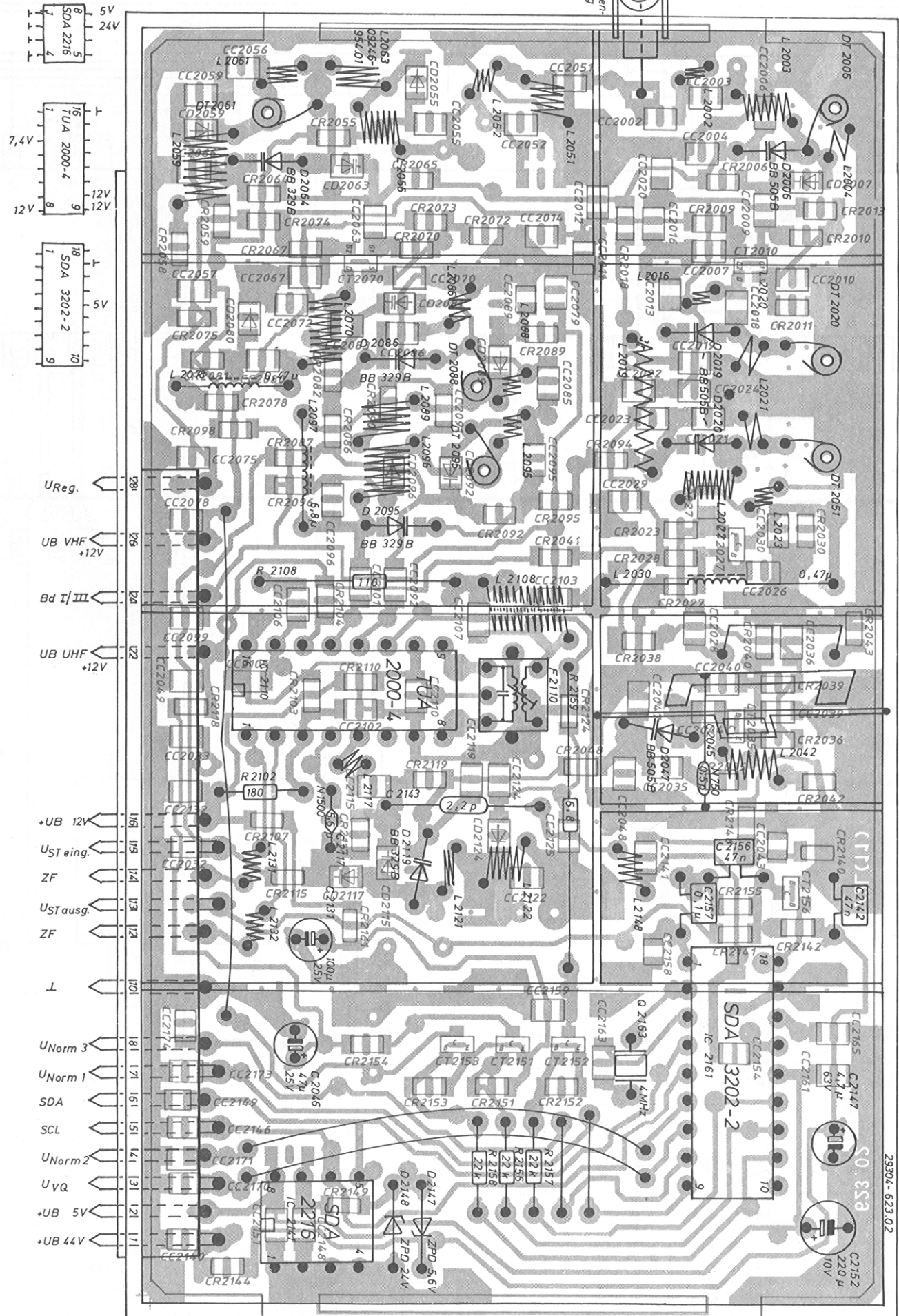


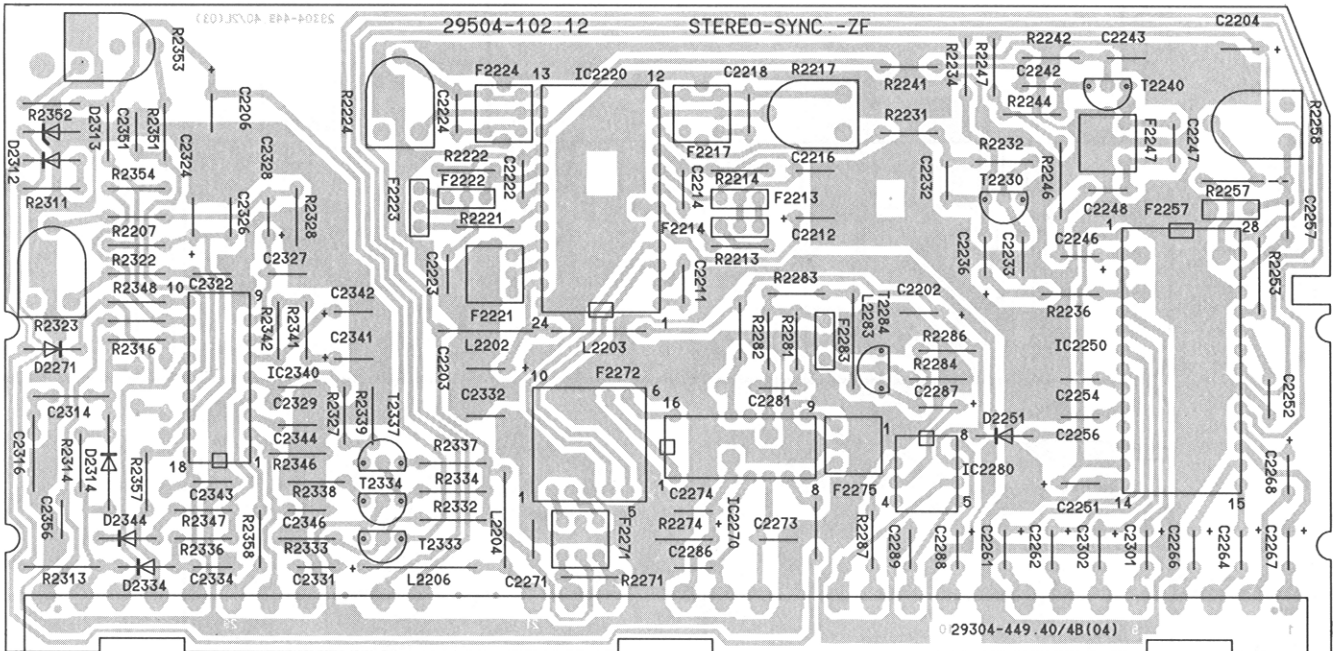
KABEL-TUNER 29504-101.01
 CABLE TV TUNER -101.02
 TUNER TV CAVO -101.06 (8669 435 402)
 -181.01

G163

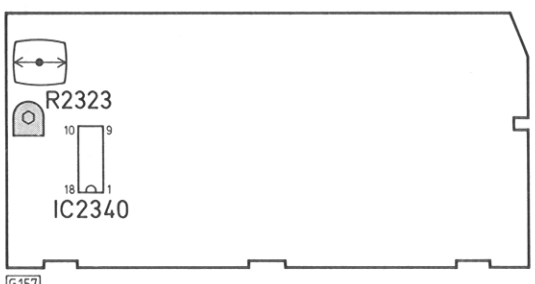


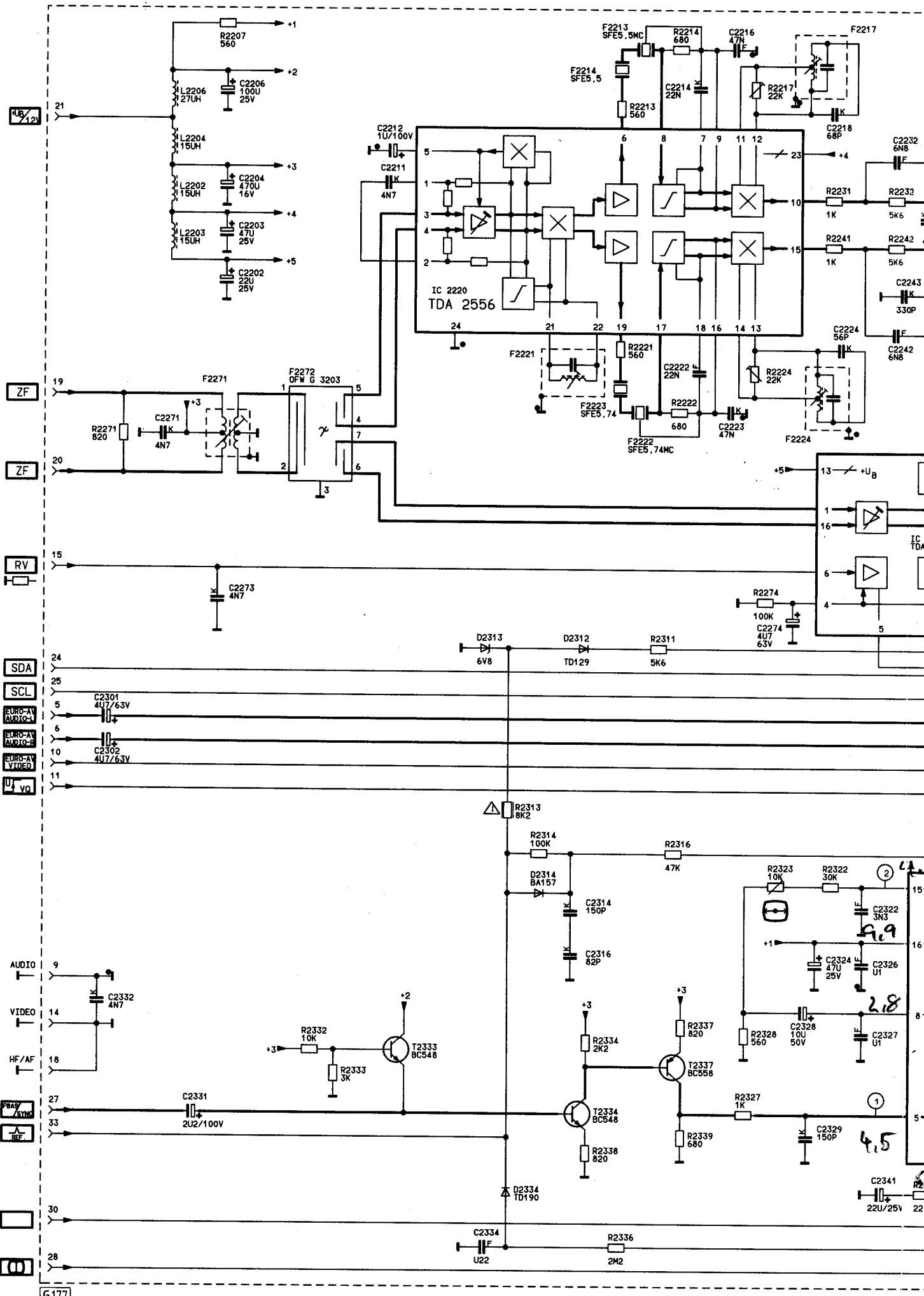




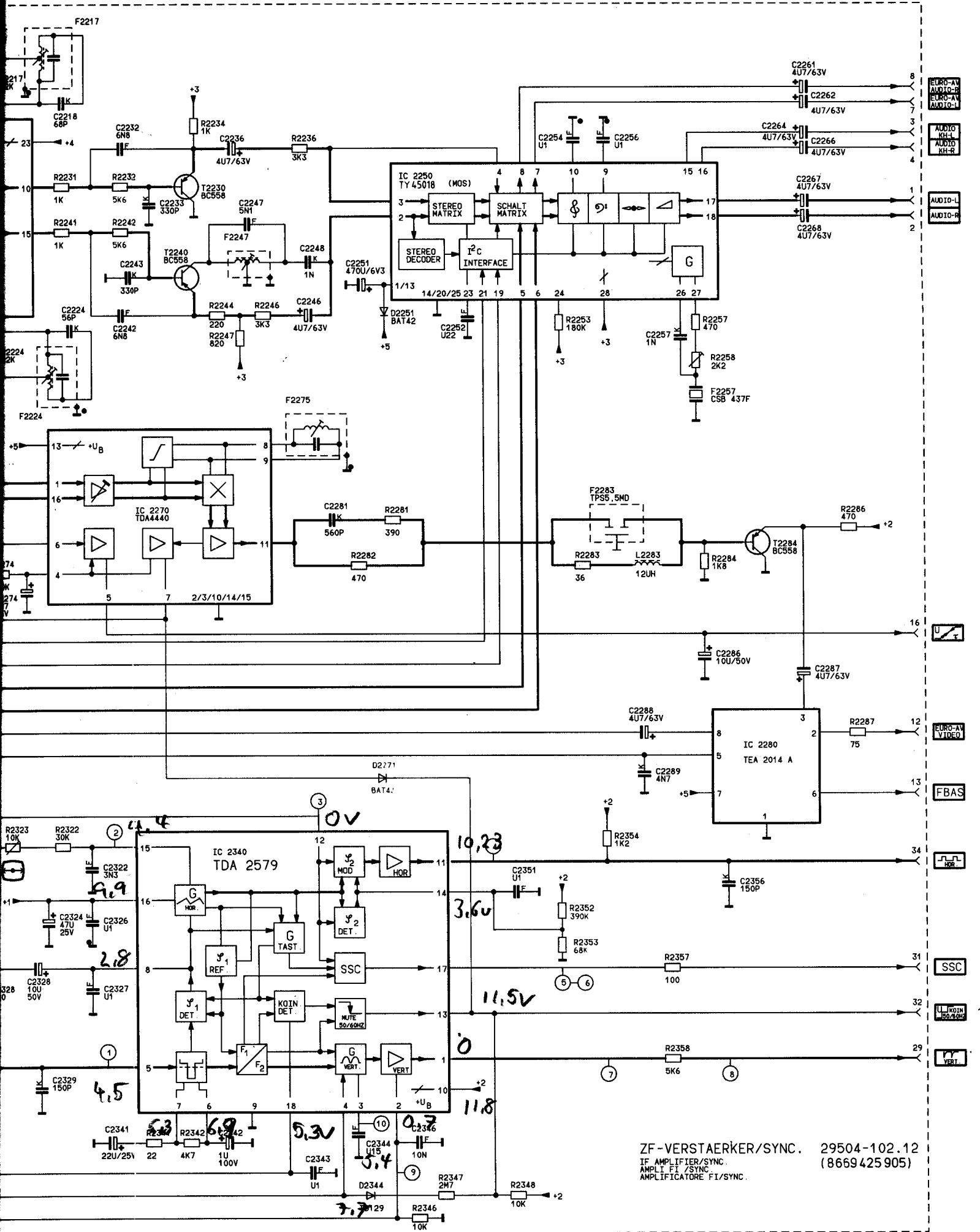


G179





G177

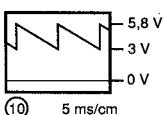
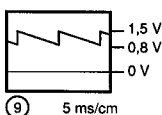
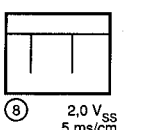
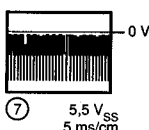
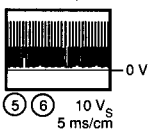
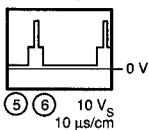
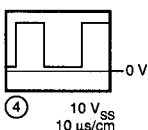
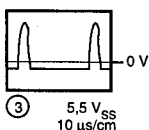
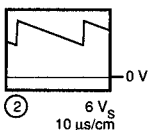
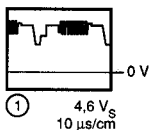


ZF-VERSTÄRKER/SYNC. 29504-102.12
 IF AMPLIFIER/SYNC. (8669 425 905)
 AMPLI FI /SYNC.
 AMPLIFICATORE FI/SYNC.

ADJUSTMENT OF LINE FREQUENCY

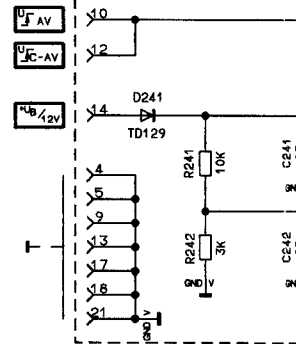
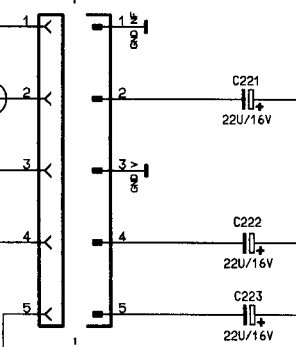
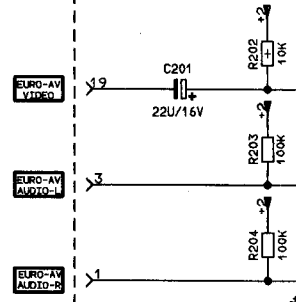
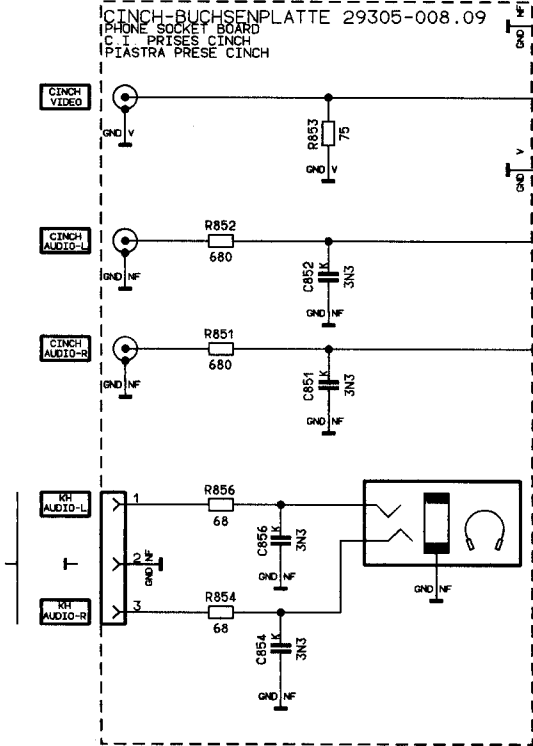
Line Frequency:

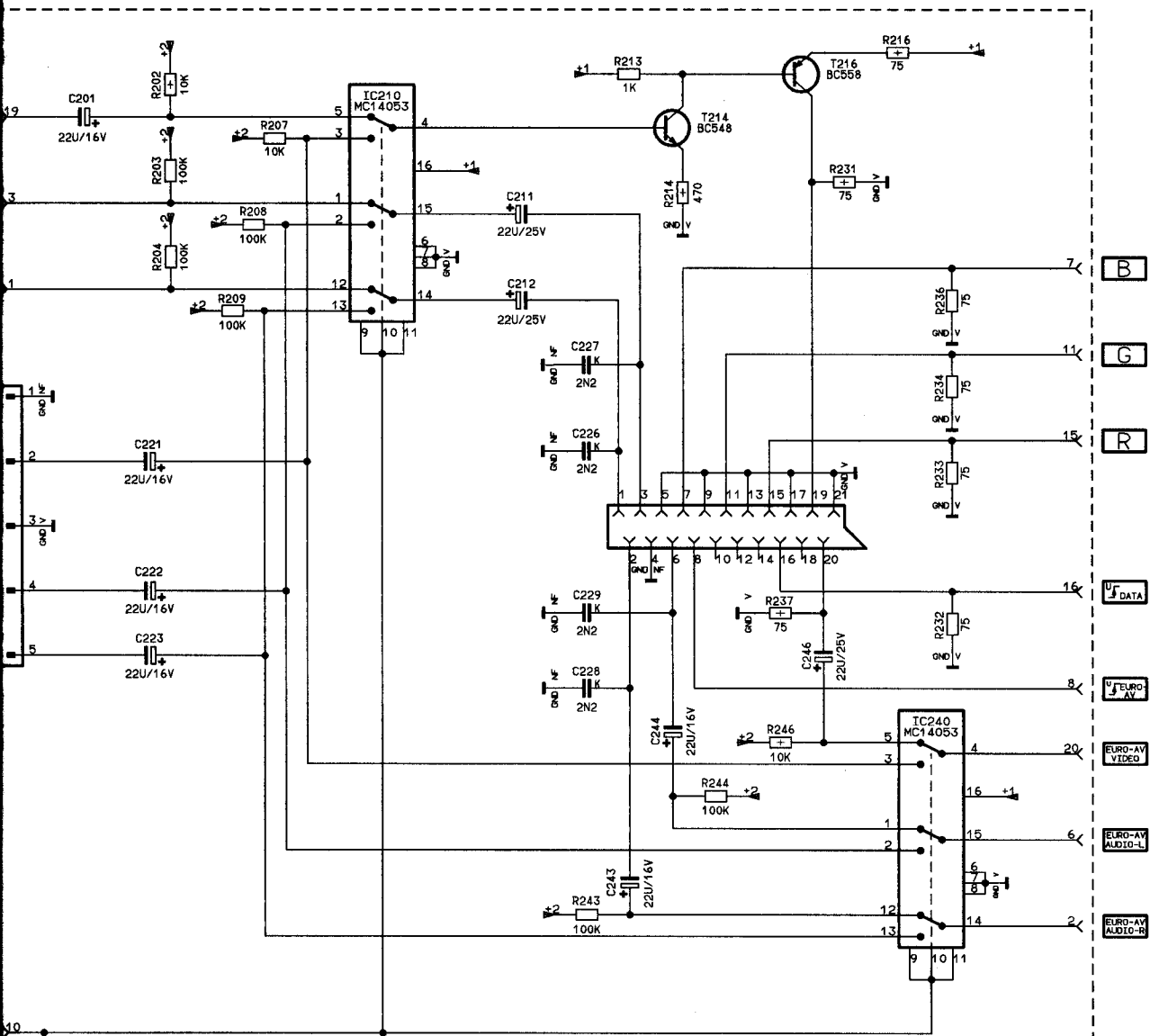
1. Short circuit Pin 5, IC 2340 (TDA 2579) to chassis.
2. With the adjustment control R 2323, adjust so that the picture runs through slowly.
3. Remove the short circuit.



ZUM KOPFHOERERVERSTAERKER
 TO HEADPHONE AMP.
 ALL' AMPLIF. CUFFIA
 VERS. AMPLI. CASQUE

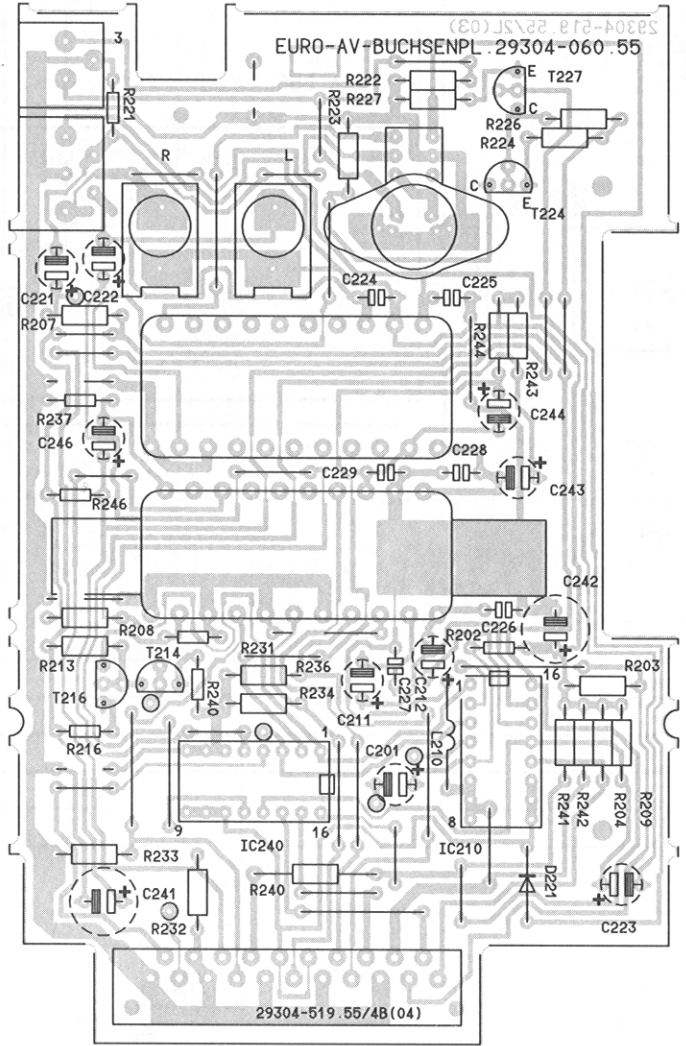
CINCH-BUCHSENPLATTE 29305-008.09
 PHONE SOCKET BOARD
 C.I. PRISE CINCH
 PIASTRA PRESE CINCH





EURO-AV-BUCHSENPLATTE 29304-060.55
 EURO-AV SOCKET BOARD (8 669 425 911)
 C.I. PRISES PERI-TV
 PIASTRA PRESE EURO-AV

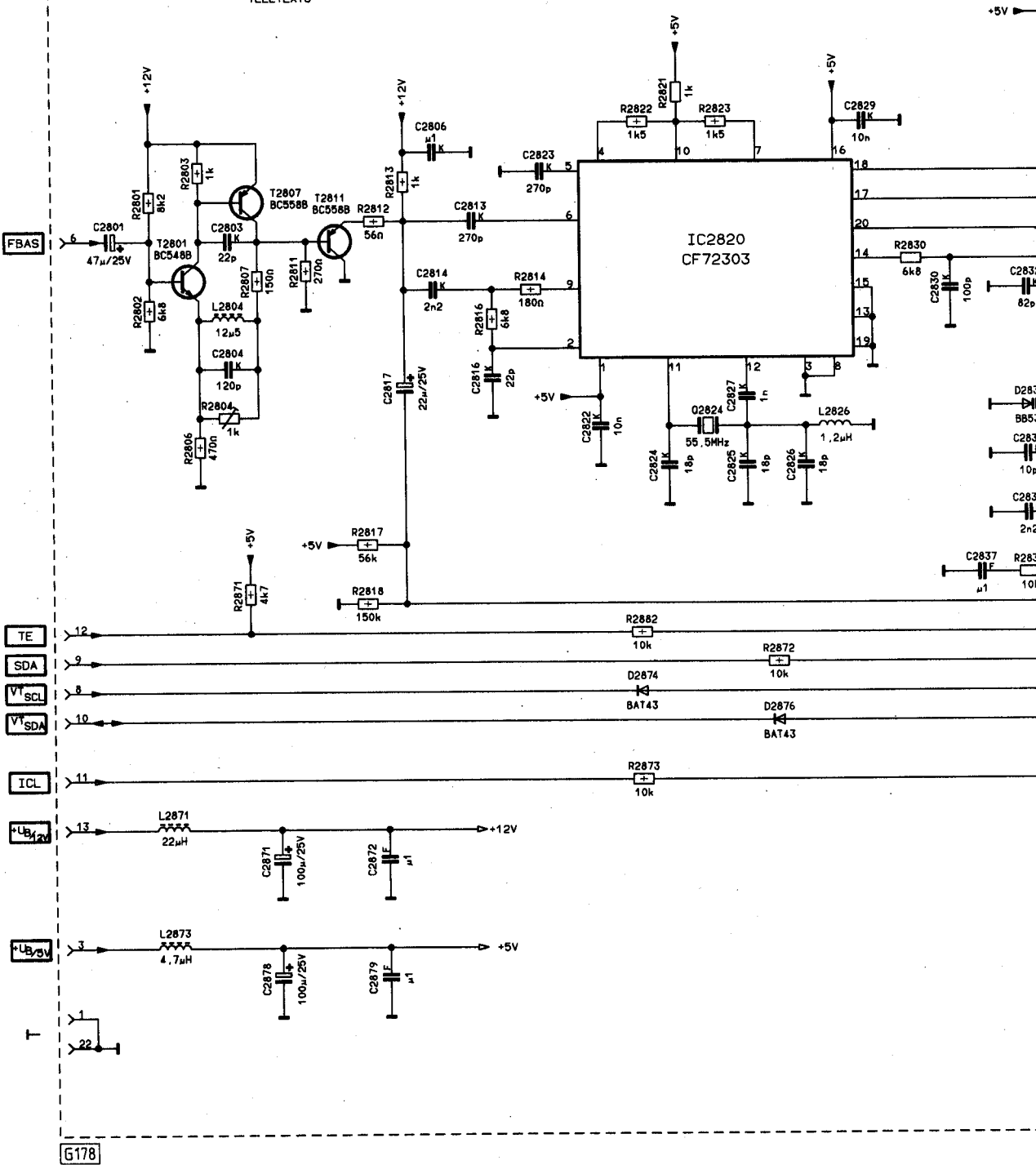
G162



G161

VIDEOTEXT VT4005 29504-108.33 (8669425912)

TELETEXT
TELEVIDEO
TELETEXTO

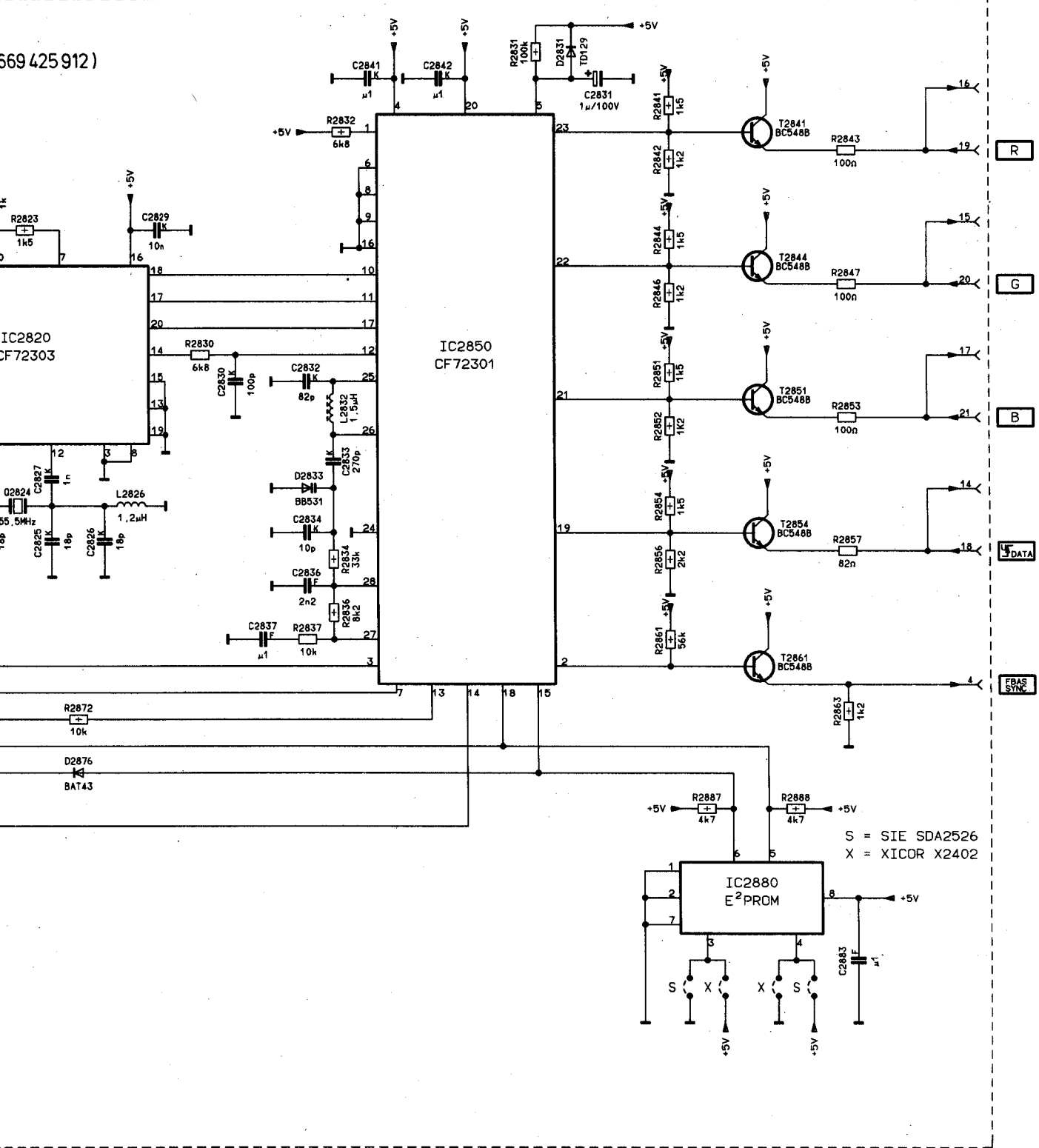


569 425 912)

IC2820
CF72303

IC2850
CF72301

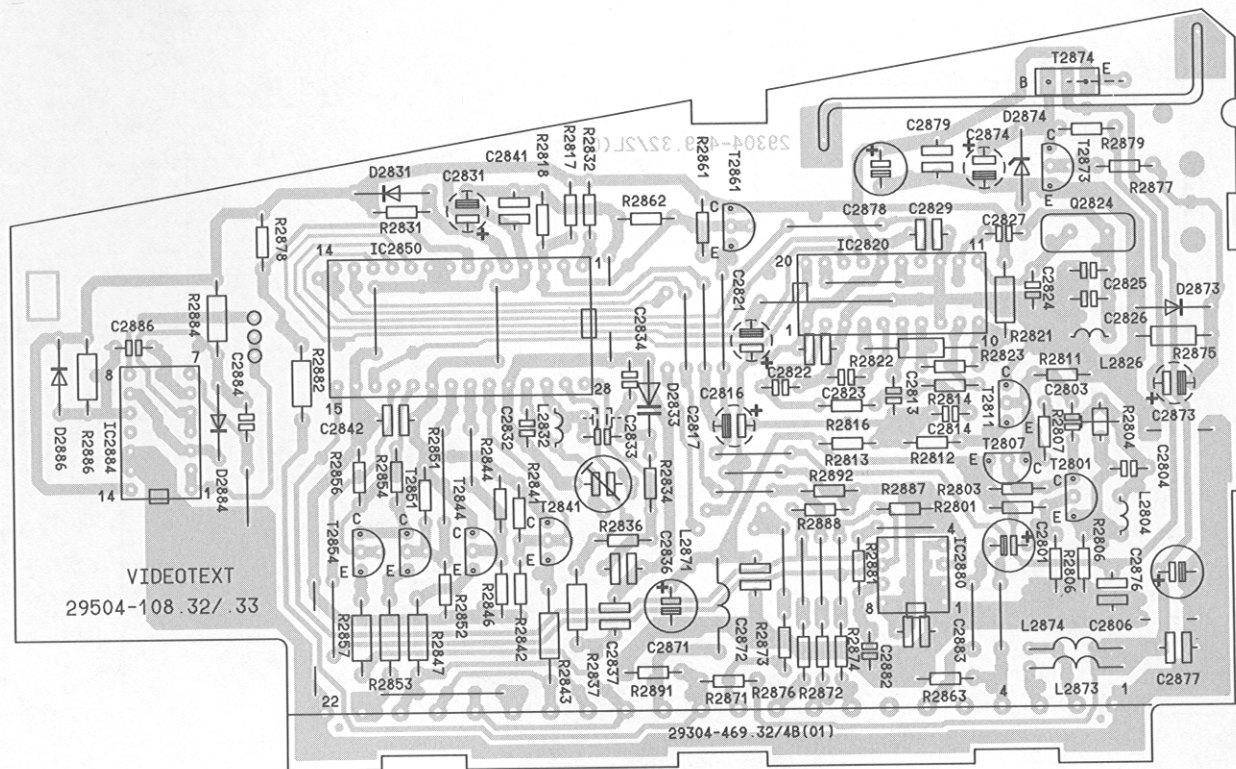
IC2880
E²PROM

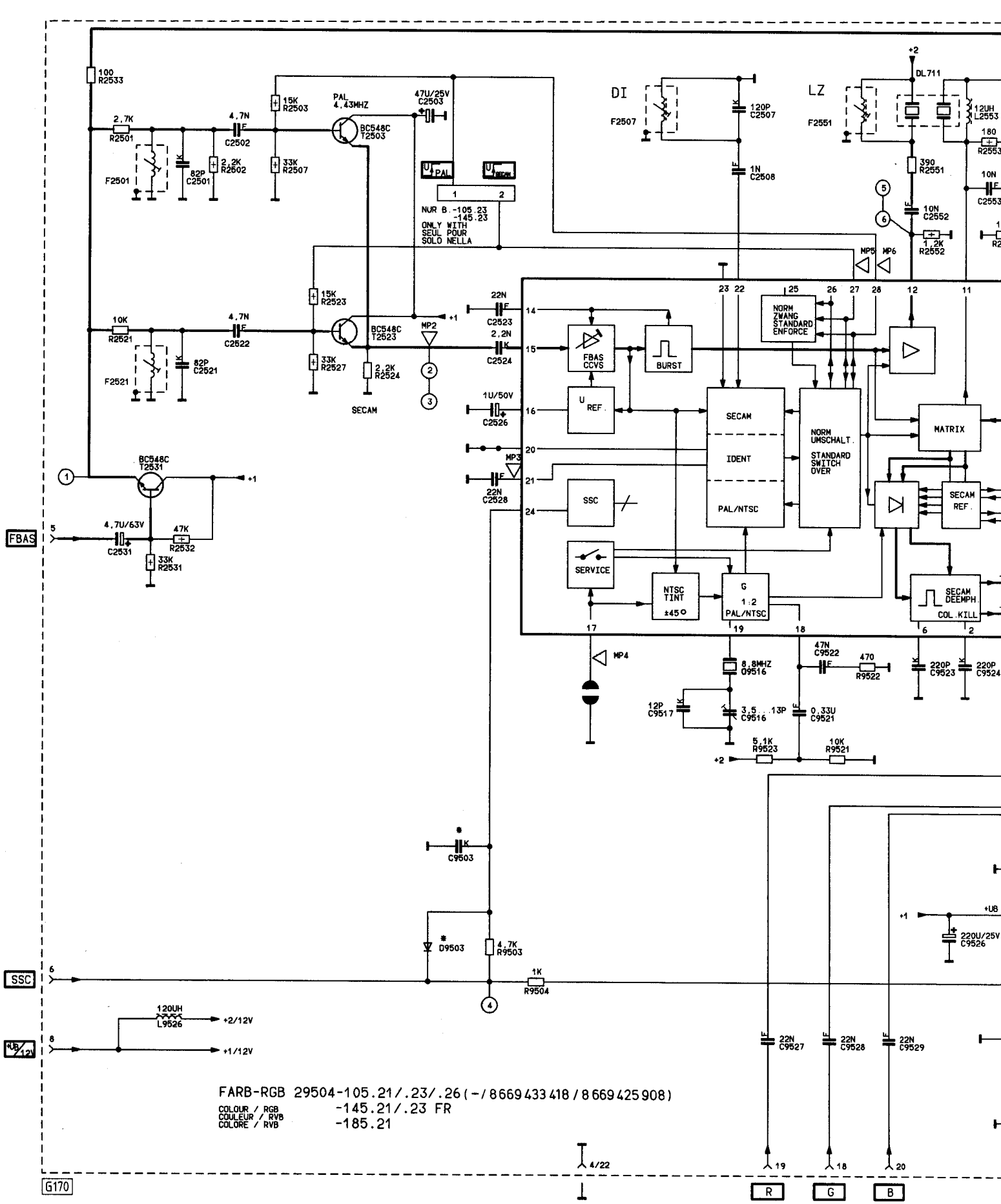


S = SIE SDA2526
X = XICOR X2402

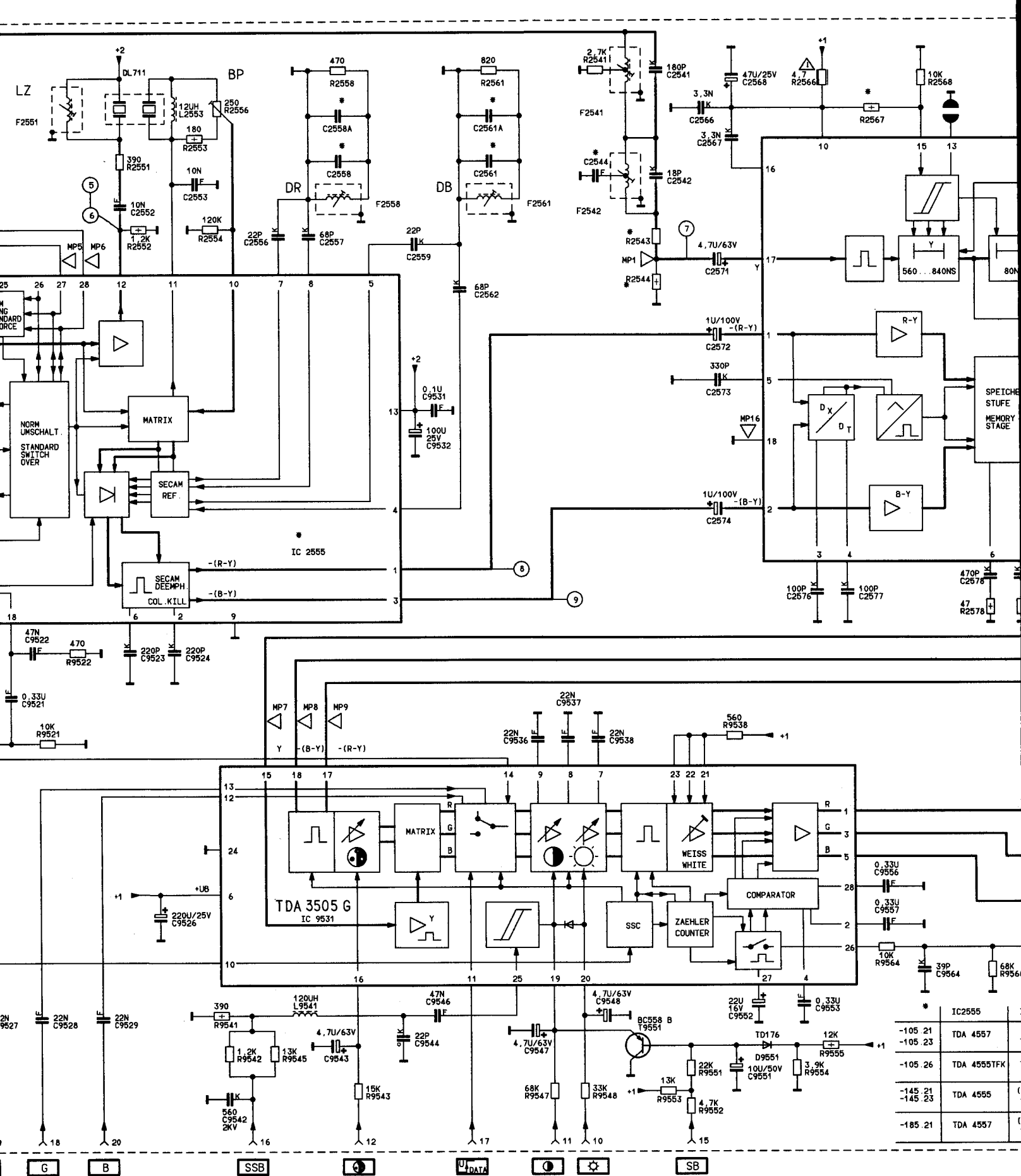
Videotext-Modul 8 669 425 912

Teletext Module
Modulo Teletideo

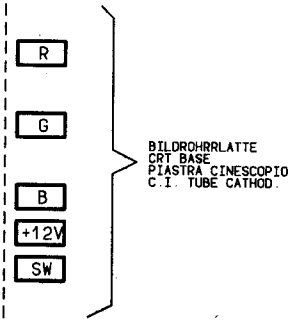
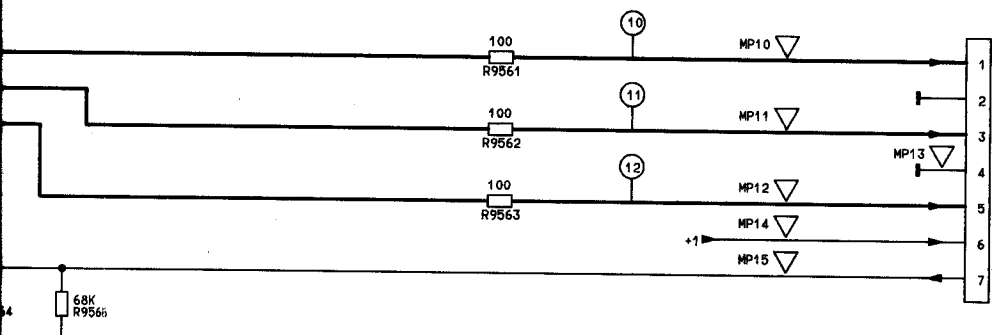
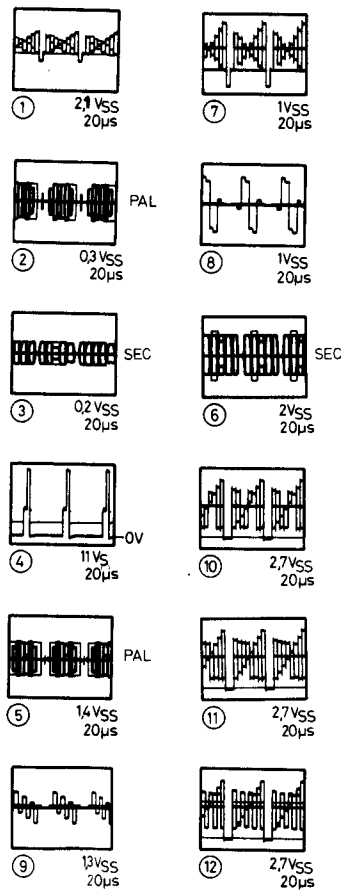
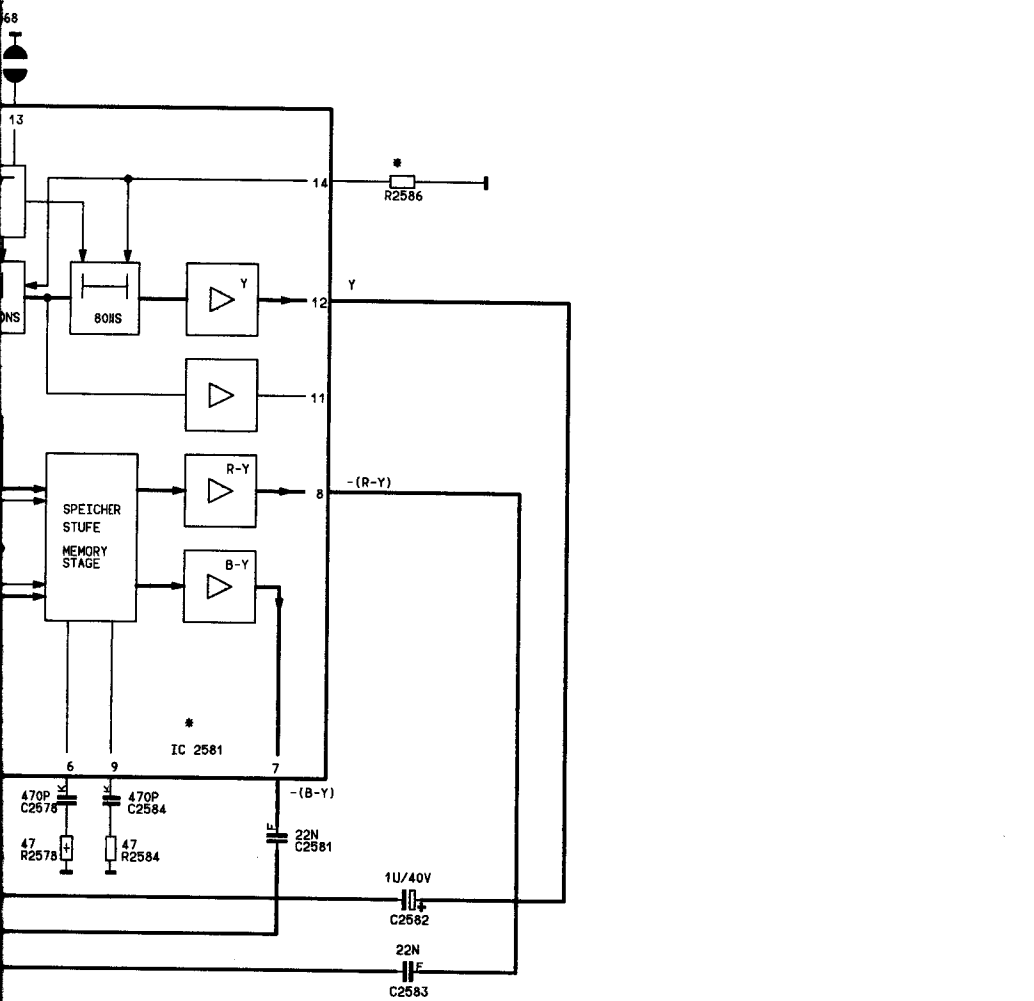




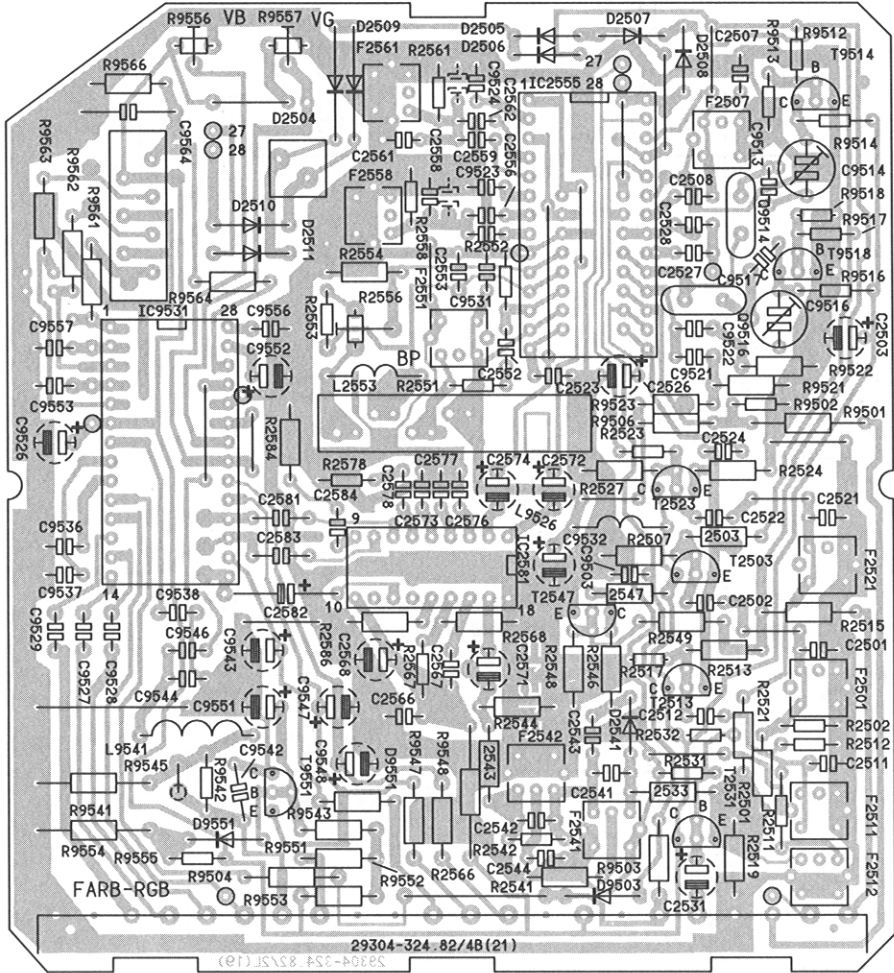
FARB-RGB 29504-105.21/.23/.26 (-/8669433418/8669425908)
 COLOUR / RGB -145.21/.23 FR
 COULEUR / RVB -185.21
 COLORE / RVB



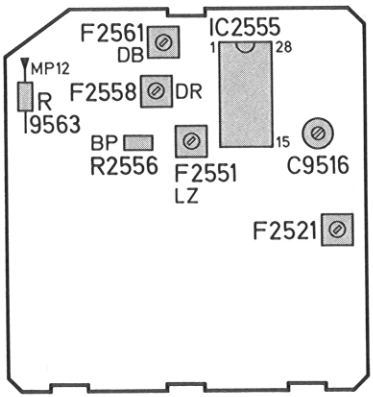
	IC2555
-105 21	TDA 4557
-105 23	TDA 4557FK
-145 21	TDA 4555
-145 23	TDA 4557



C2555	IC 2581	R2586	R2543	R2544	R2567	D9503	C2544	C2558	C2558A	C2561	C2561A	C9503
DA 4557	(TDA 4560) TDA 4565	(1,1K) 1,2K	160	220	18K	—	680P	180P	—	180P	—	—
DA 4555TFK	TDA 4565TFK	1,2K	160	220	—	1N4148	820P	150P	27P	150P	27P	68P
DA 4555	(TDA 4560) TDA 4565	(1,1K) 1,2K	160	220	—	1N4148	680P	180P	—	180P	—	68P
DA 4557	(TDA 4560) TDA 4565	(1,1K) 1,2K	200	180	—	—	680P	180P	—	180P	—	—



G171



G158

Color RGB alignment

1. White level adjustment

- Display colour bar test pattern.
- Set ① to min., ② to nom., ③ to max.
- Adjust presets VG and VB (CTR socket board) so that the picture does not show any colouration.

2. Adjustment of cut-off point

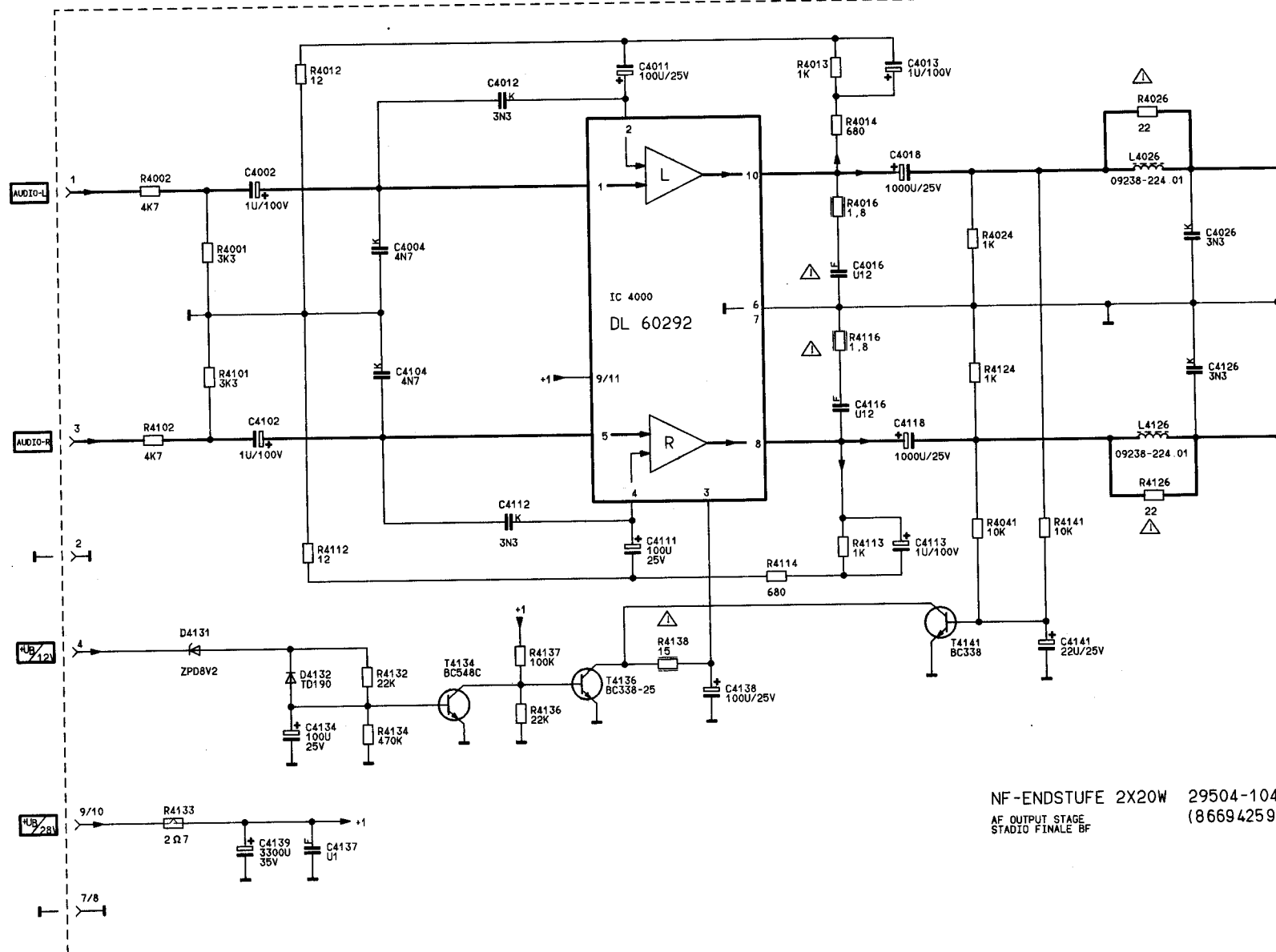
Manual adjustment is not possible, as the circuit board employs an automatic dark current control circuit.

To check cut-off point (oscilloscope required), proceed as follows:

- Display colour bar test pattern.
- Set ① to min., ② to nom., ③ to min
- Connect test probe to collectors of T 736, T 756, T 776 (CRT socket board). The black levels of the three cathode signals should be 140 - 150V.

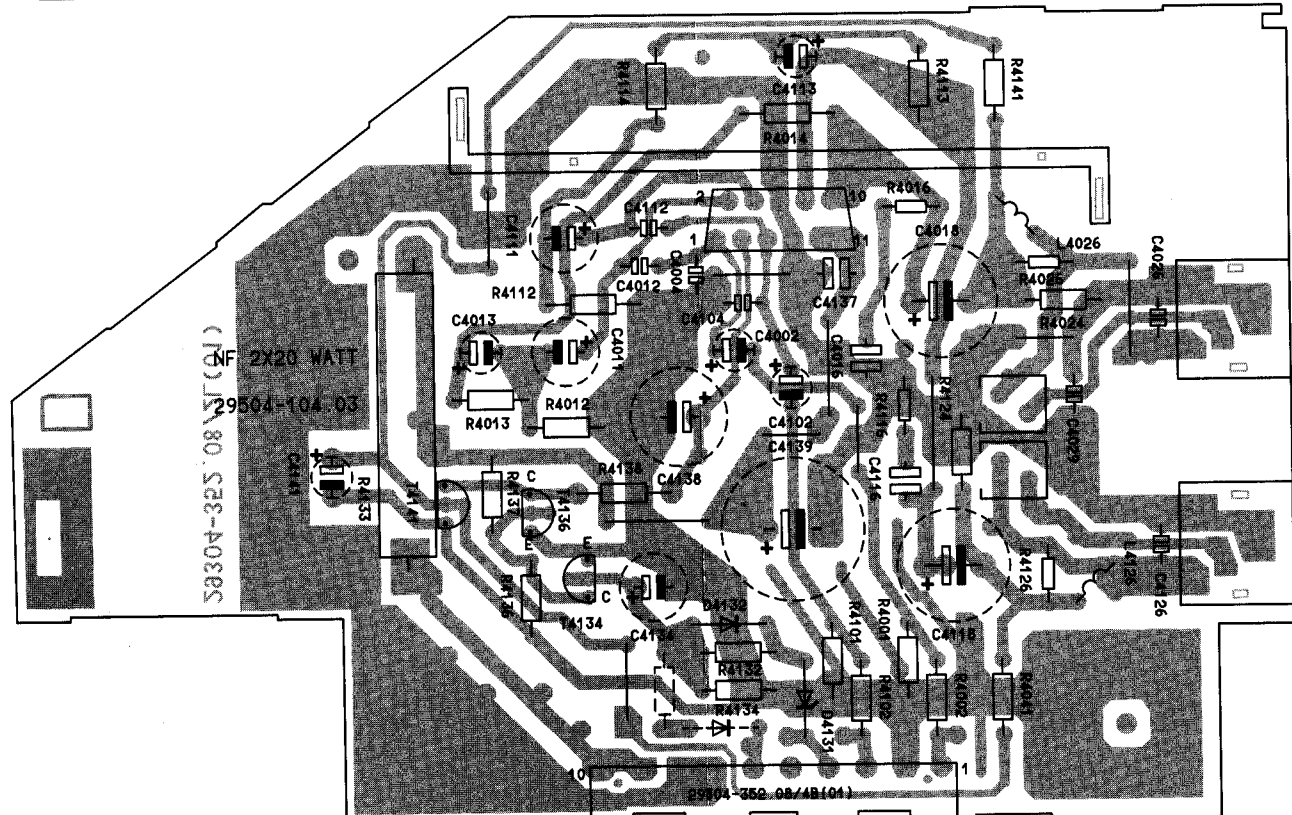
3. Adjustments in chroma channel

- Display PAL test pattern.
- Set ① to nom., ② to nom., ③ to max.
- Connect pin 28 of IC TDA 4557 to +12V supply.
- Connect pin 17 of IC TDA 4557 to chassis.
- Adjust trimmer C 9516 for stationary pattern in colour bars.
- Remove wire links.
- Connect test probe to test point MP 12. Bring the double image produced by the B-signal to coincidence by adjusting the preset BP and the coil LZ.
- Display SECAM test pattern.
- Connect test probe to pin 1 of IC TDA 4557.
- Use coil DR to align zero level of the (R-Y) signal with the line black level.
- Connect test probe to pin 3 of IC TDA 4557.
- Use coil DB to align zero level of the (B-Y) signal with the line black level.
- Adjust coil F 2521 so that the (B-Y) signal is free of overshooting.

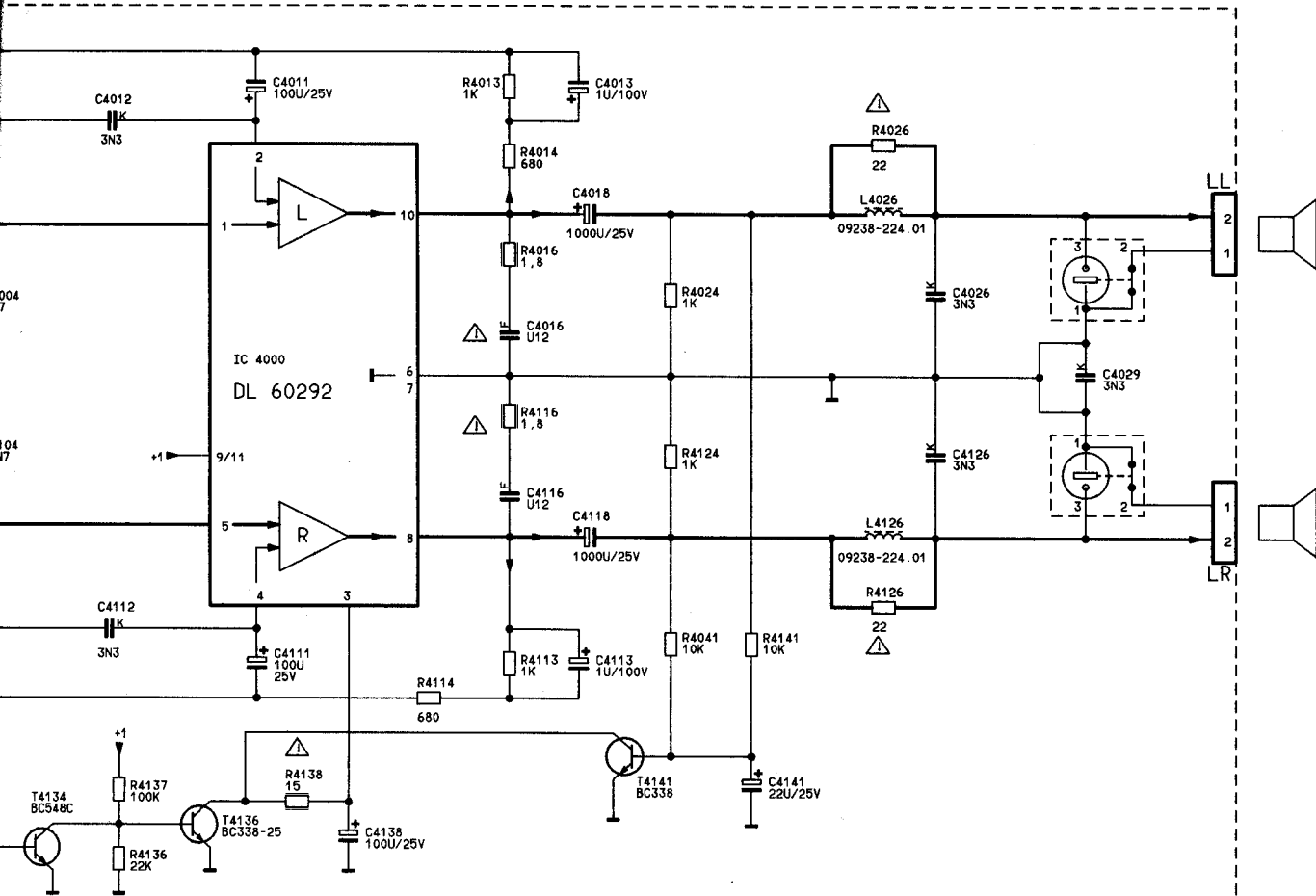


NF-ENDSTUFE 2X20W 29504-104
 AF OUTPUT STAGE STADIO FINALE BF (86694259)

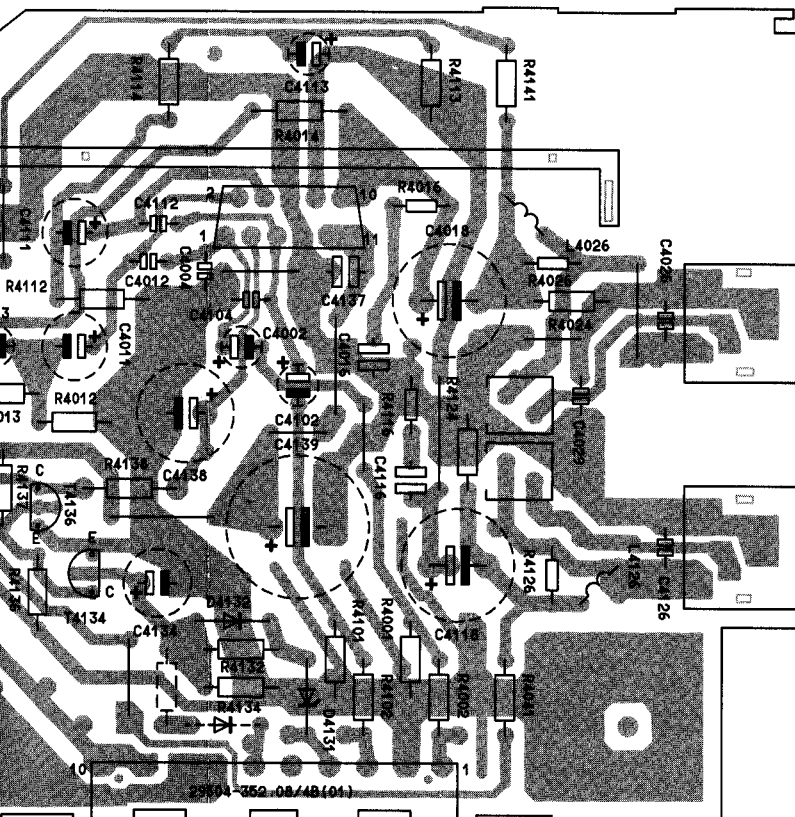
G172

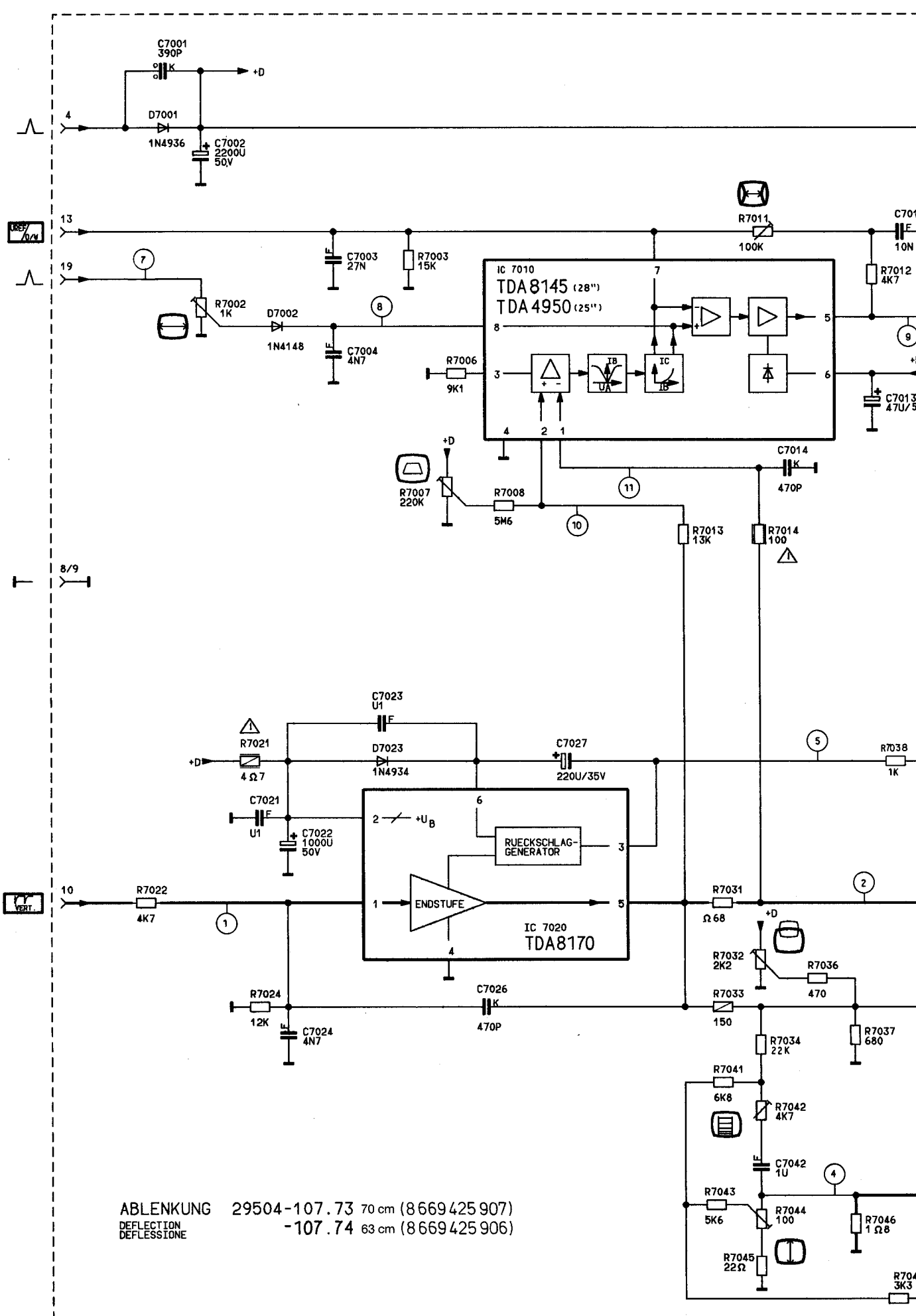


G173



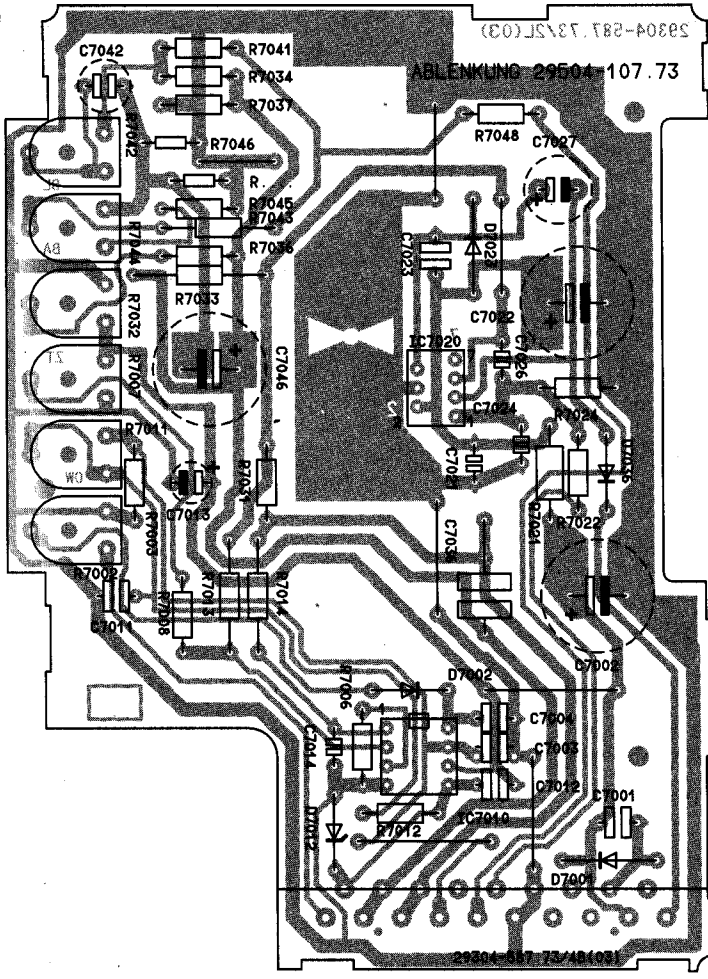
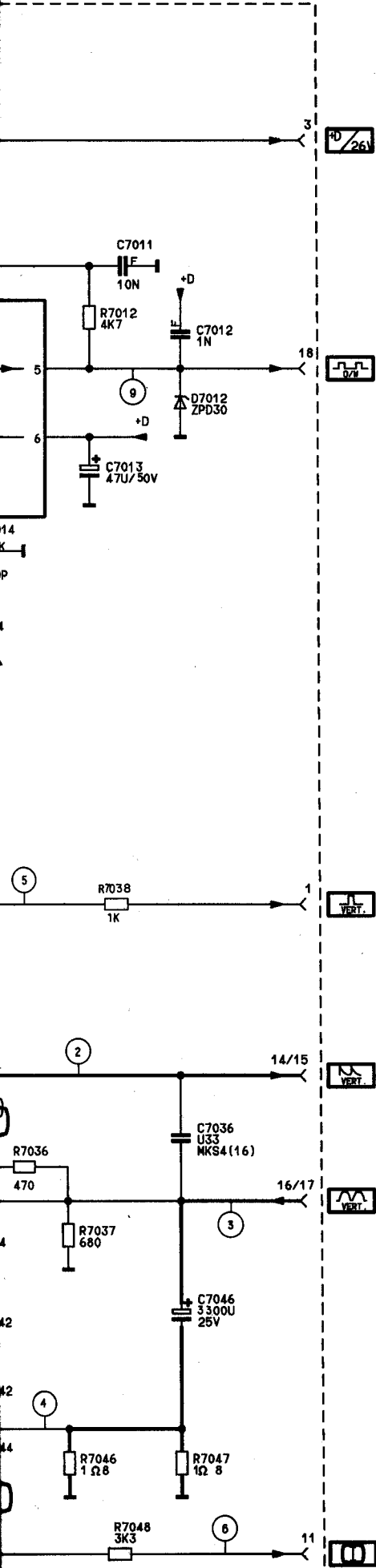
NF-ENDSTUFE 2X20W 29504-104.03
 AF OUTPUT STAGE
 STADIO FINALE BF (8669425910)



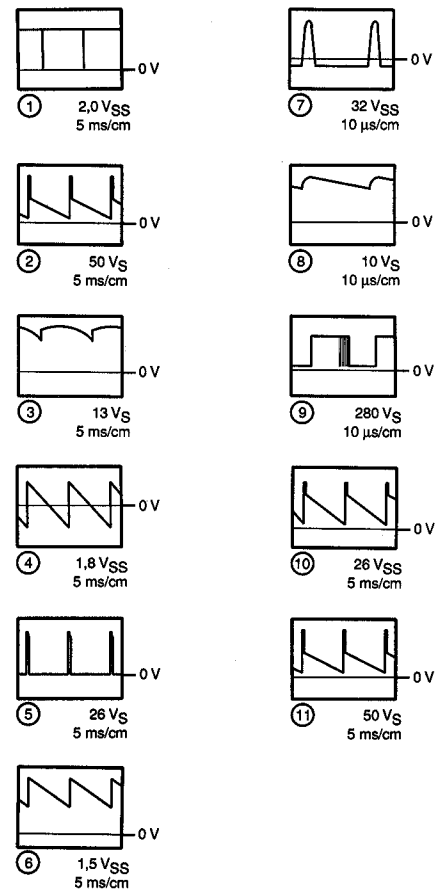


ABLENKUNG 29504-107.73 70 cm (8669425 907)
 DEFLECTION -107.74 63 cm (8669425 906)
 DEFLESSIONE

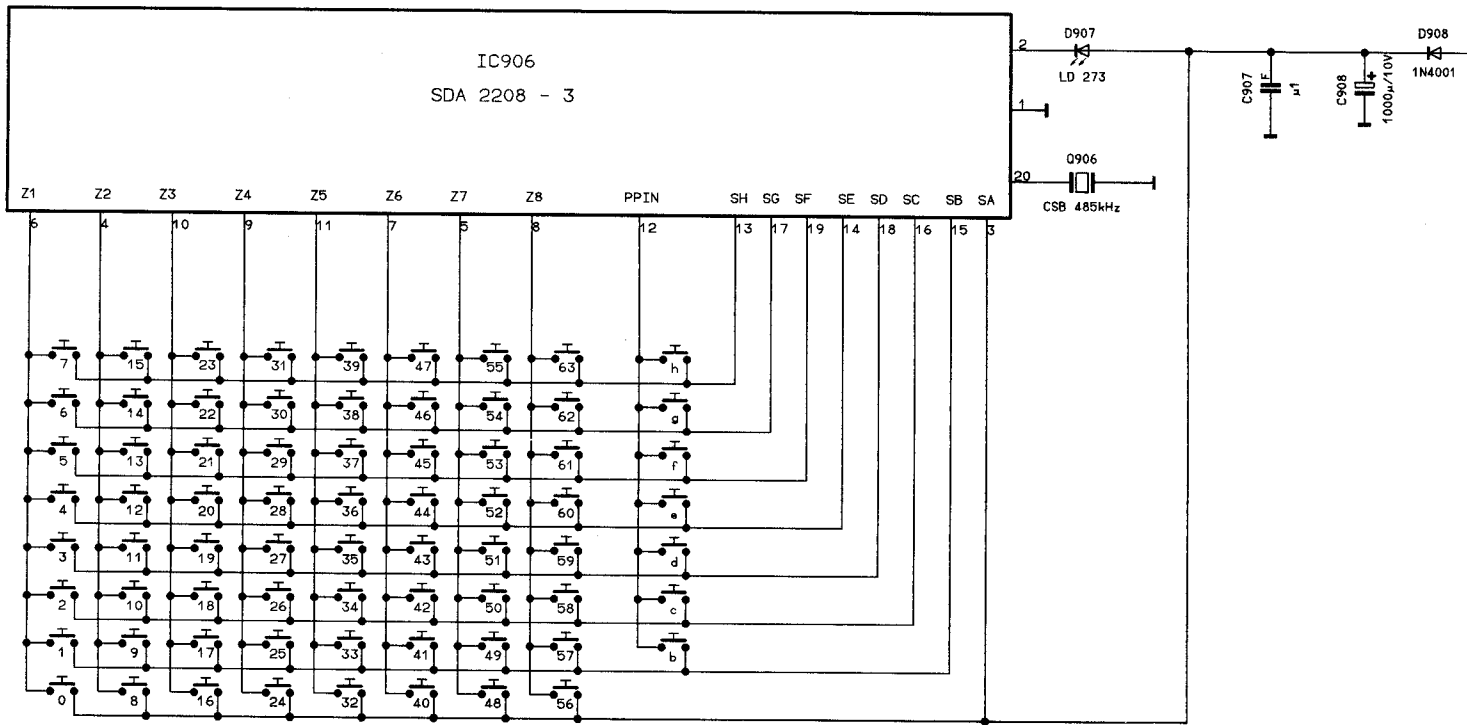
Ablenk-Modul 8 669 425 906/907
 Deflection Module
 Modulo Deflessione



G165



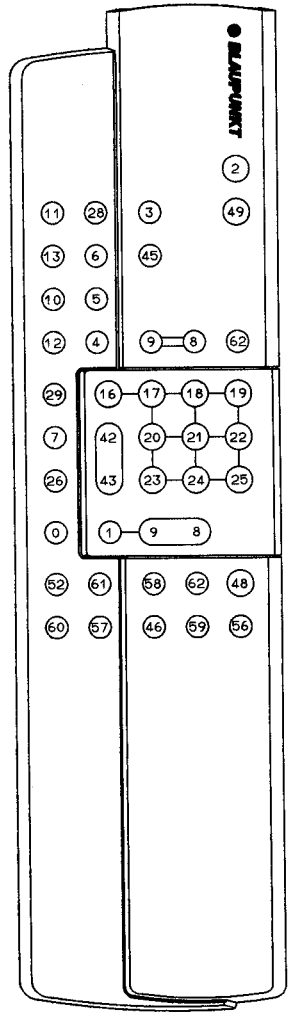
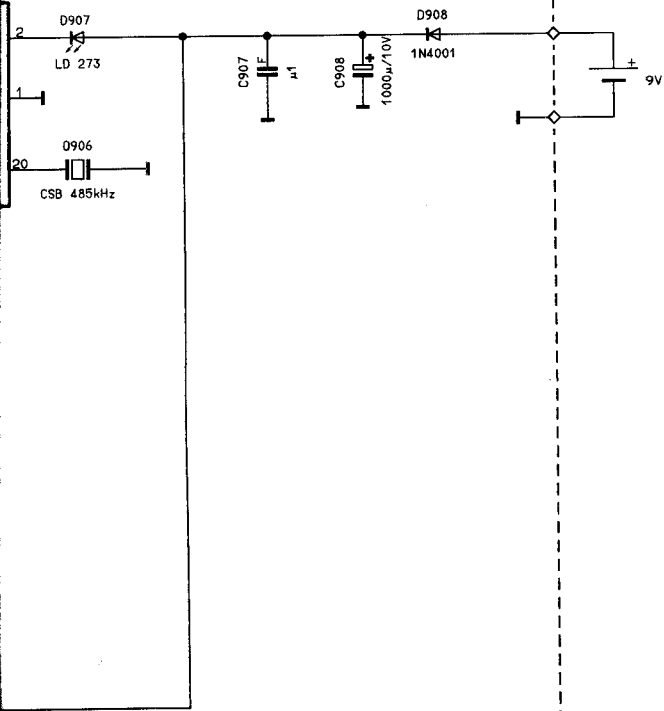
Anpassungsabgleich bei Austausch der Steckkarte
 Matching alignment necessary when replacing the plug board
 Taratura di attamento dopo la sostituzione di una scheda ad innesto



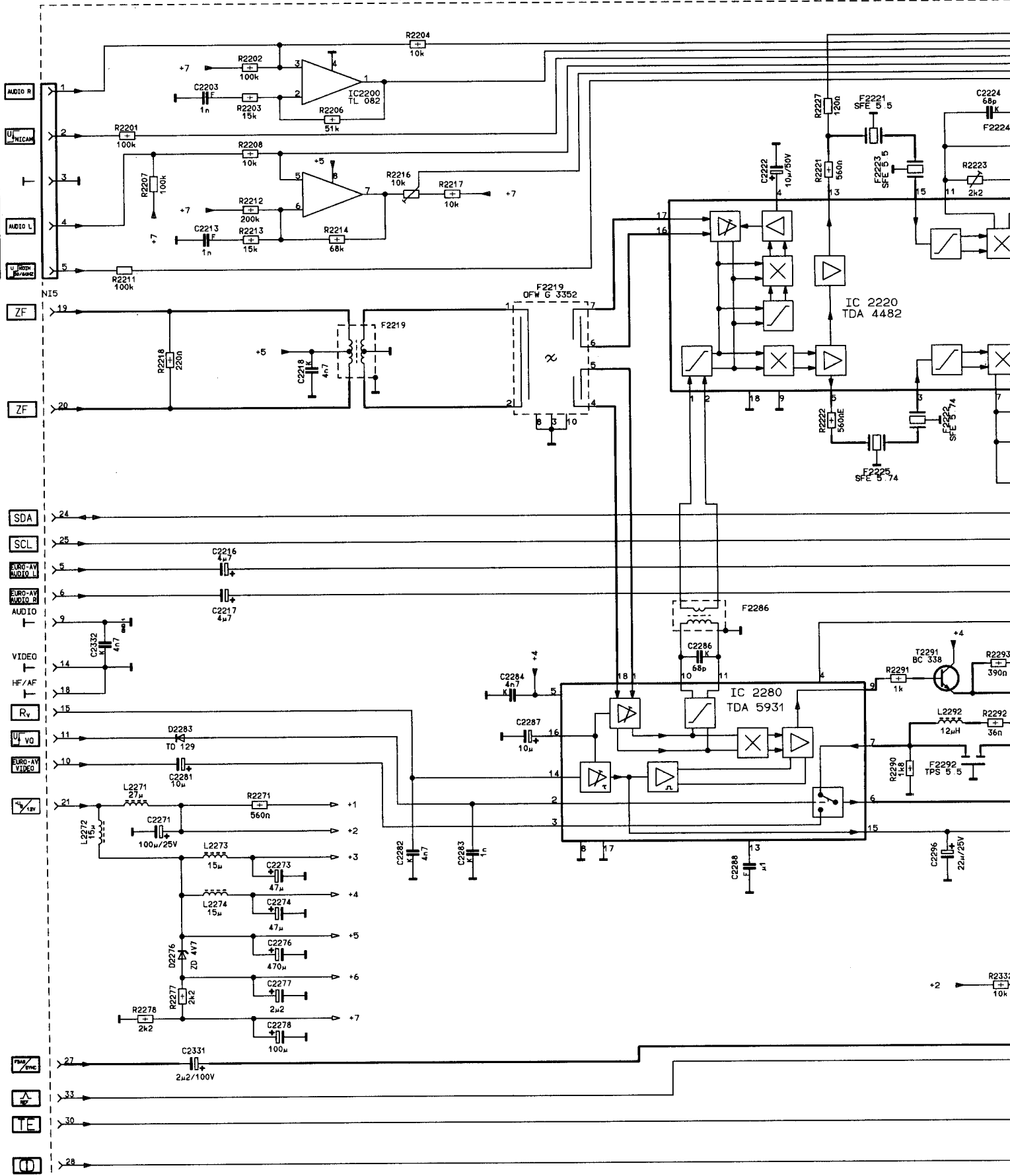
KEYBOARD

6174

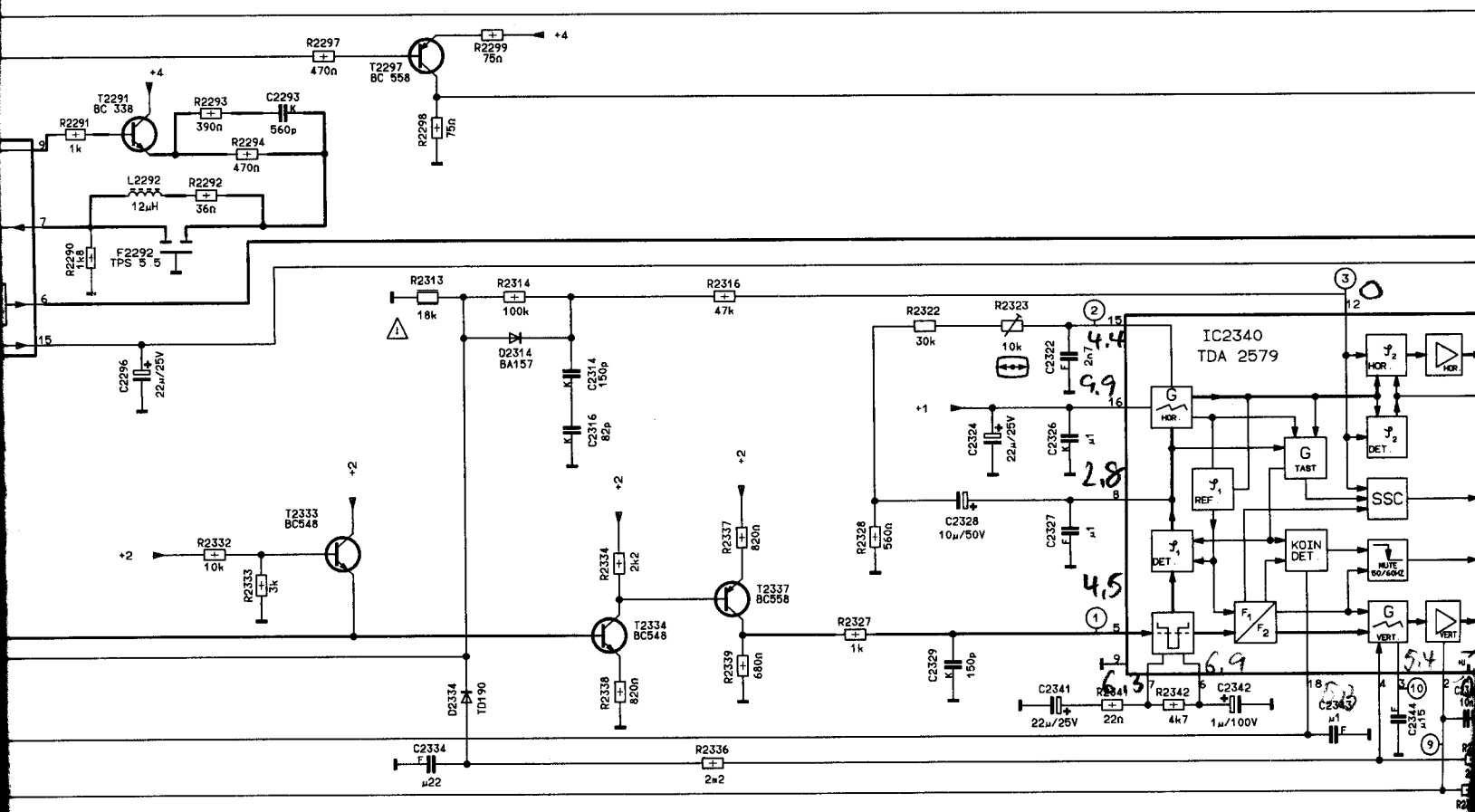
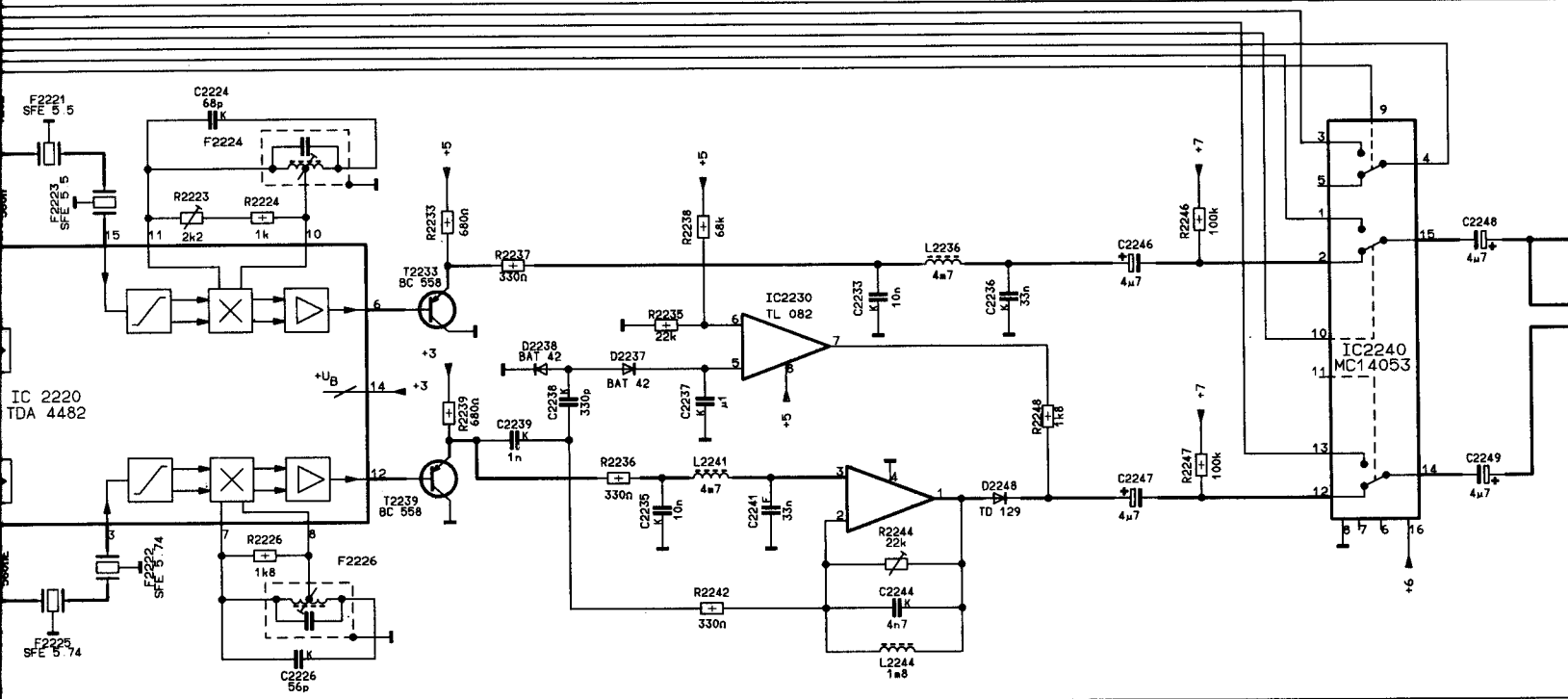
FERNBEDIENUNG 29622-047.21

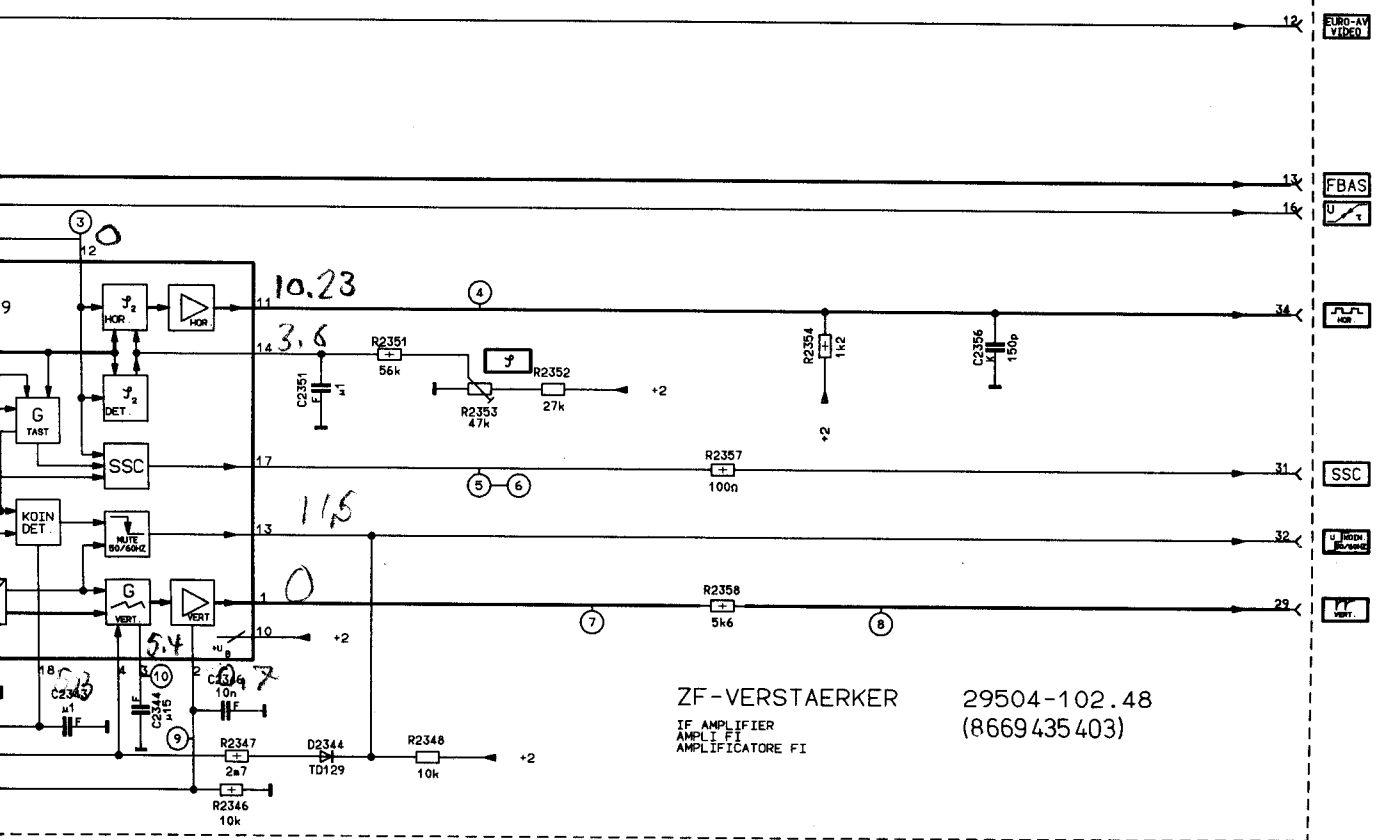
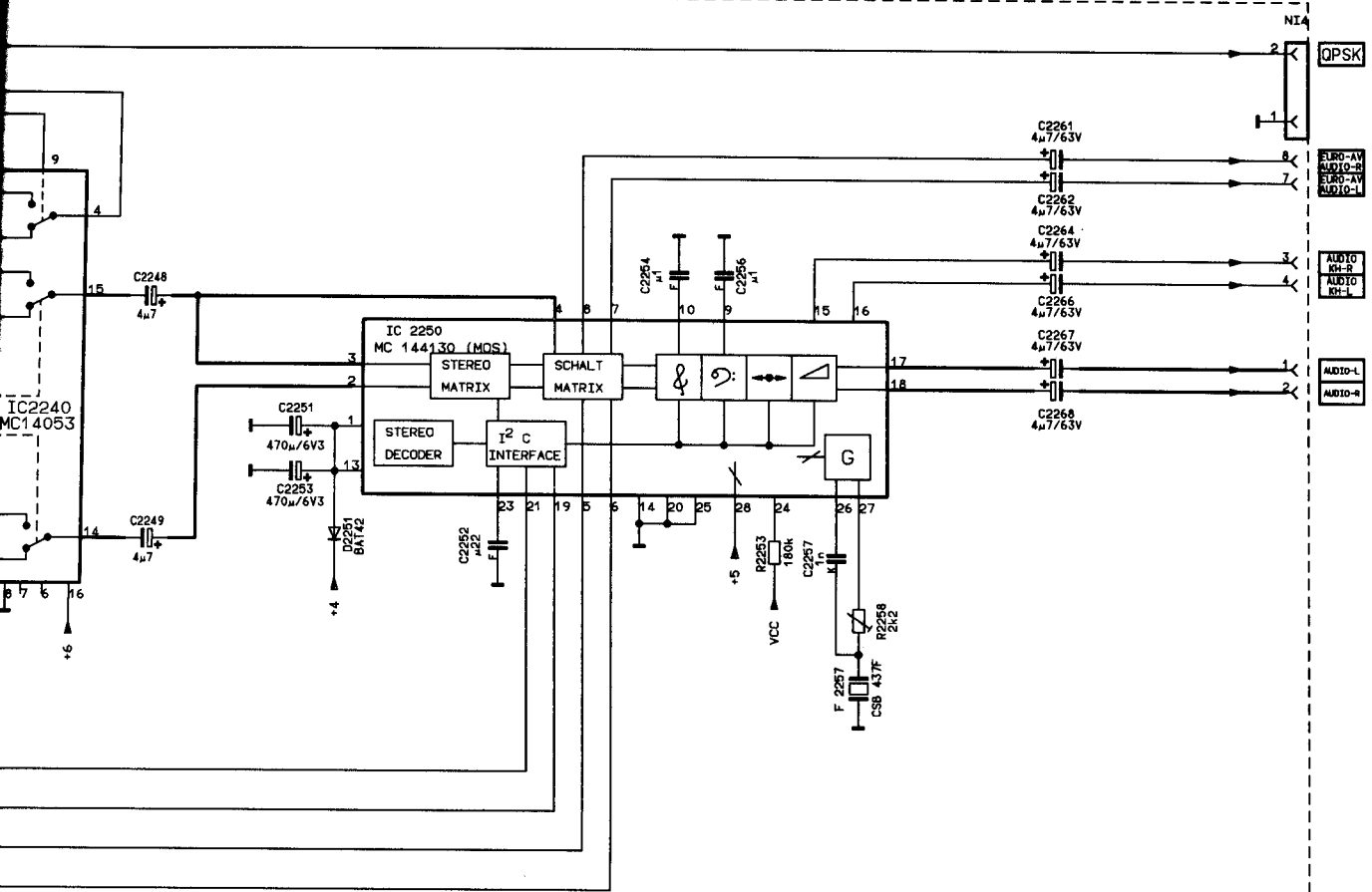


VOM NICAM DECODER



G175

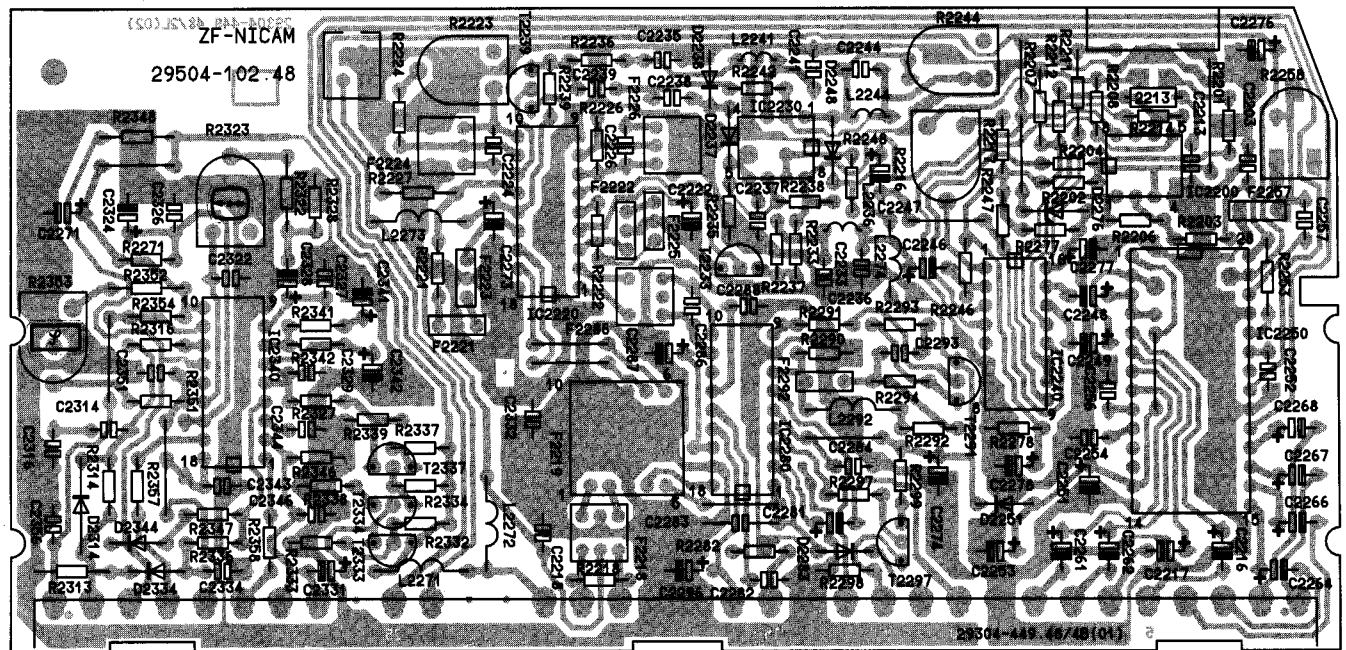




ZF-VERSTAERKER
 IF AMPLIFIER
 AMPLI FI
 AMPLIFICATORE FI

29504-102.48
 (8669435403)

Kein Anpassungsabgleich bei Austausch der Steckkarte notwendig
 When replacing the plug-in board, no alignment is necessary
 Non è necessaria nessuna taratura di adattamento dopo la sostituzione di una scheda ad innesto



G156

D
**ABGLEICH DER ZEILENFRE-
 QUENZ UND -PHASE**

Zeilenfrequenz:

1. Pin 5, IC 2340 (TDA 2579) nach Masse kurzschließen.
2. Mit Einstellregler R 2323 Bild auf langsames Durchlaufen einstellen.
3. Kurschluß entfernen.

Zeilenphase:

1. Den Bildbreitenregler R 7002 (Ablenkbaustein) auf Minimum stellen.
2. Mit dem Einstellregler R 2353 den grauen Bildrand symmetrisch zum rechten und linken Bildraster einstellen.
3. Den Bildbreitenregler wieder nach Testbild einstellen.

GB
**ADJUSTMENT OF LINE FRE-
 QUENCY AND -PHASE**

Line Frequency:

1. Short circuit Pin 5, IC 2340 (TDA 2579) to chassis.
2. With the adjustment control R 2323, adjust so that the picture runs through slowly.
3. Remove the short circuit.

Line Phase:

1. Set the picture width control R 7002 (Deflection Modul) to minimum.
2. With the adjustment control R 2353, set the grey picture edges to be symmetrical within the right and left picture frame.
3. Reset the picture width control to conform with the test pattern.

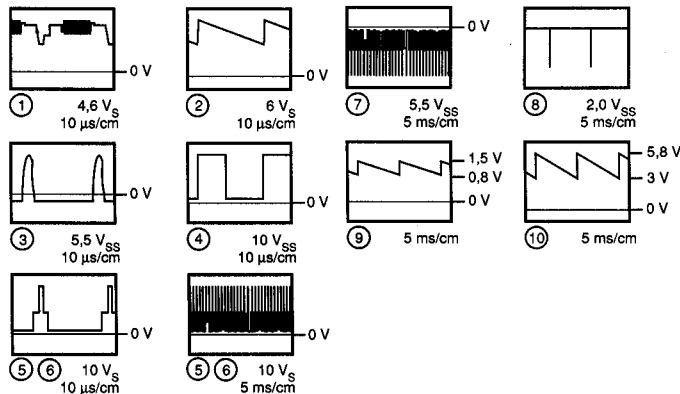
I
**TARATURA DELLA FREQUENZA
 DI RIGA E DELLA FASE**

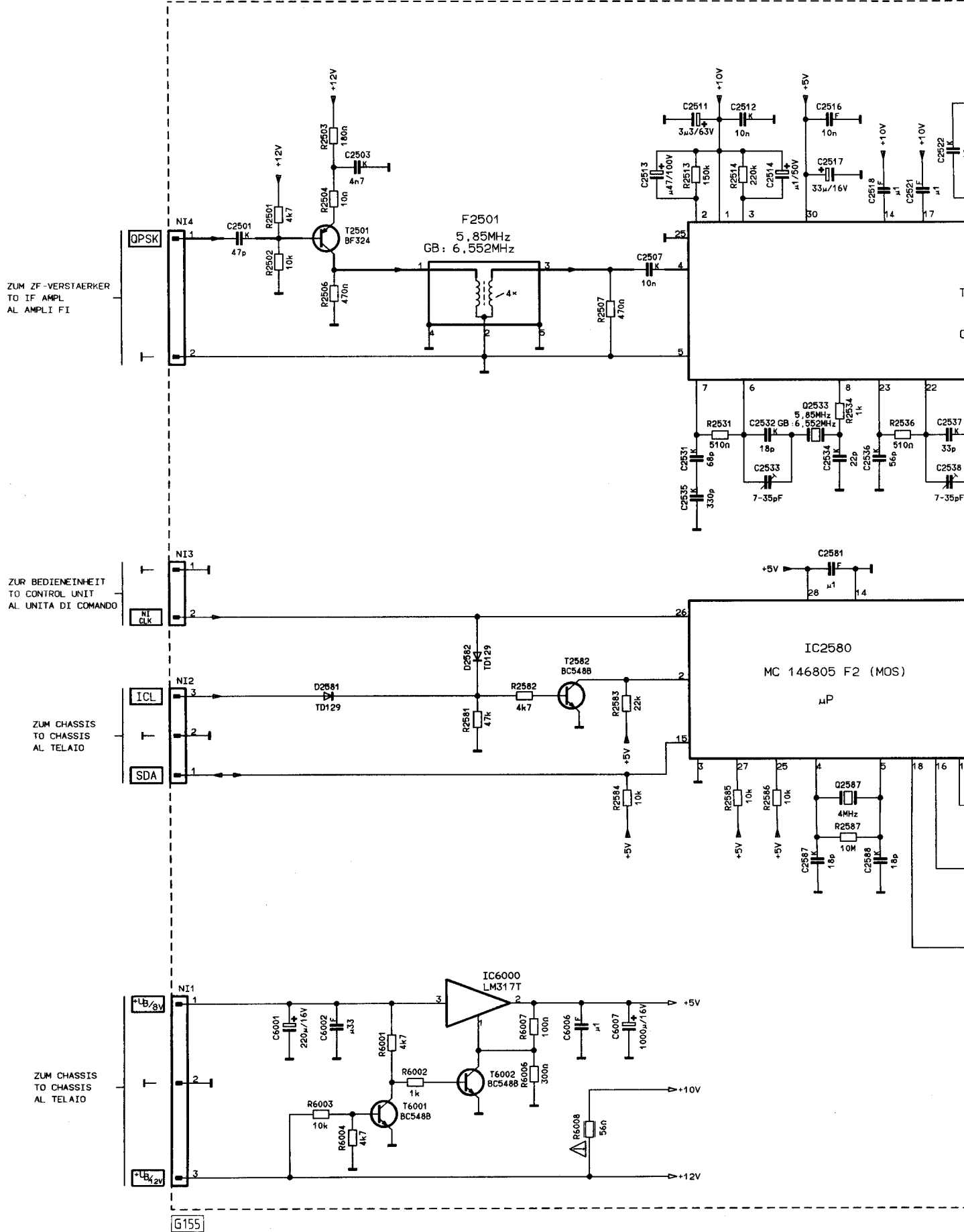
Frequenza di riga:

1. Cortocircuitare verso massa il pin 5, IC 2340 (TDA 2579).
2. Regolare R 2323 finché l'immagine scorre lentamente.
3. Togliere il cortocircuito.

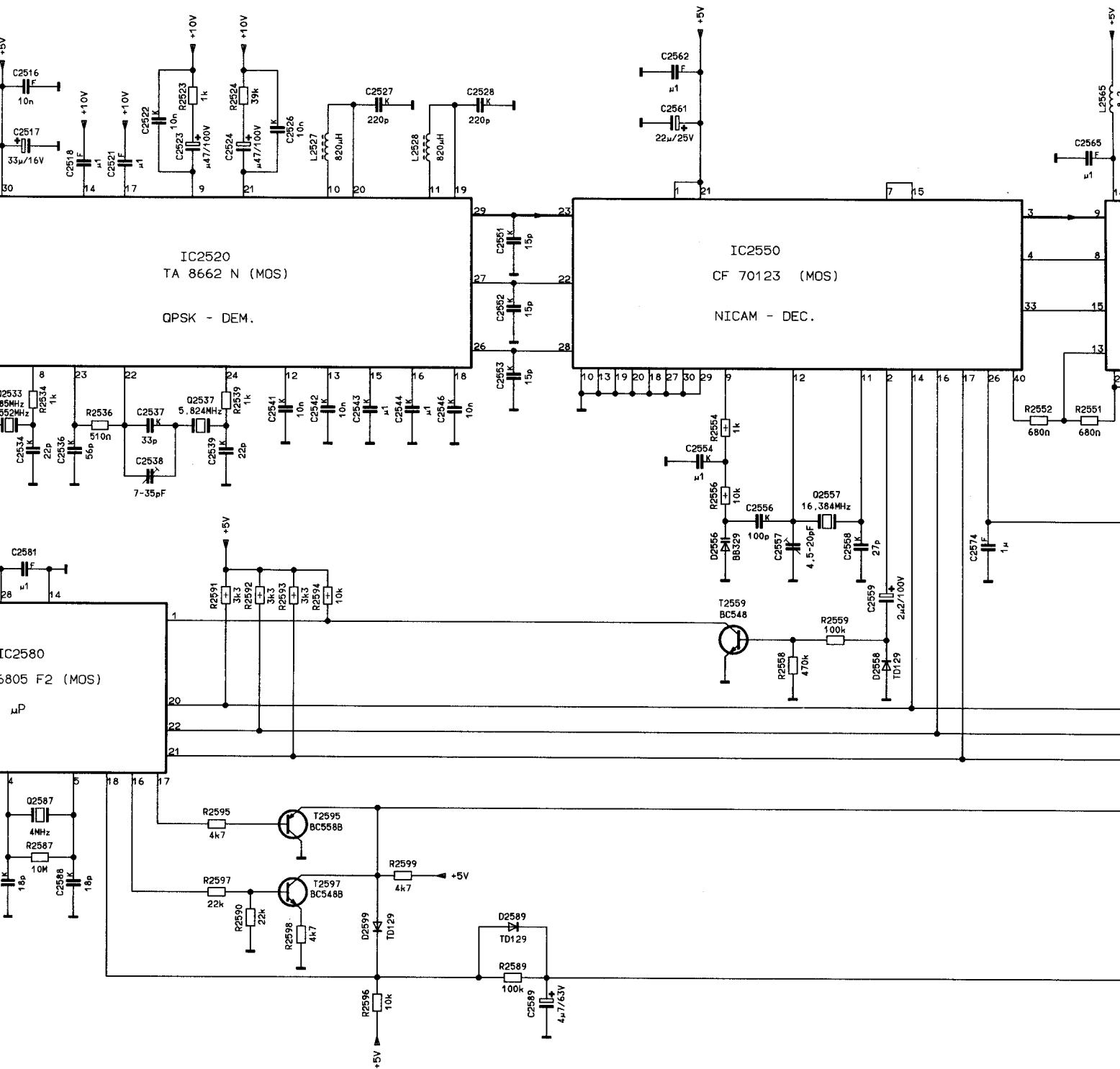
Fase:

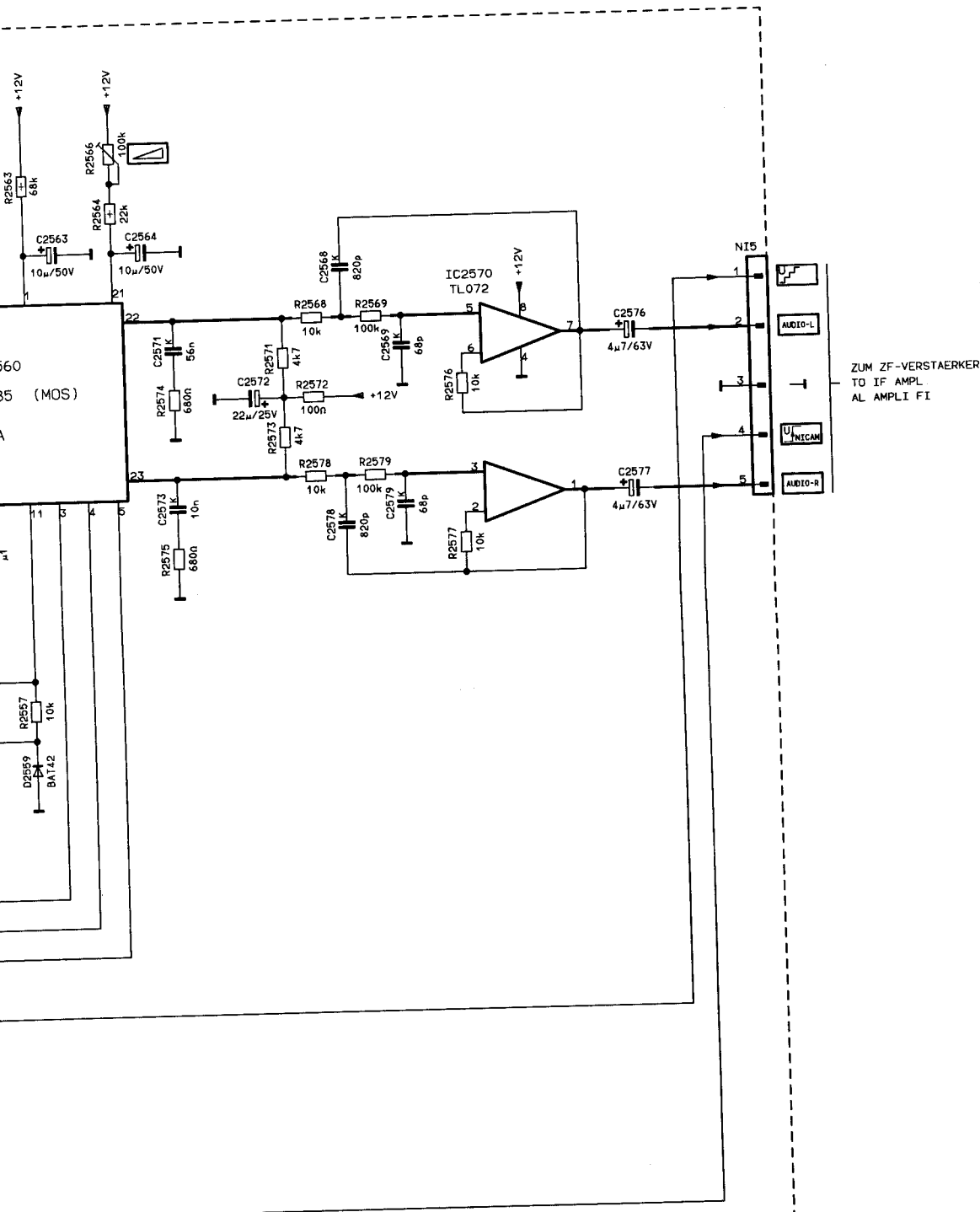
1. Regolare al minimo il regolatore di larghezza R 7002 (Mod. Deflessione).
2. Con R 2353 regolare il bordo grigio dell'immagine simmetricamente al raster d'immagine a destra e a sinistra.
3. Regolare nuovamente in base al monoscopio il regolatore di larghezza.



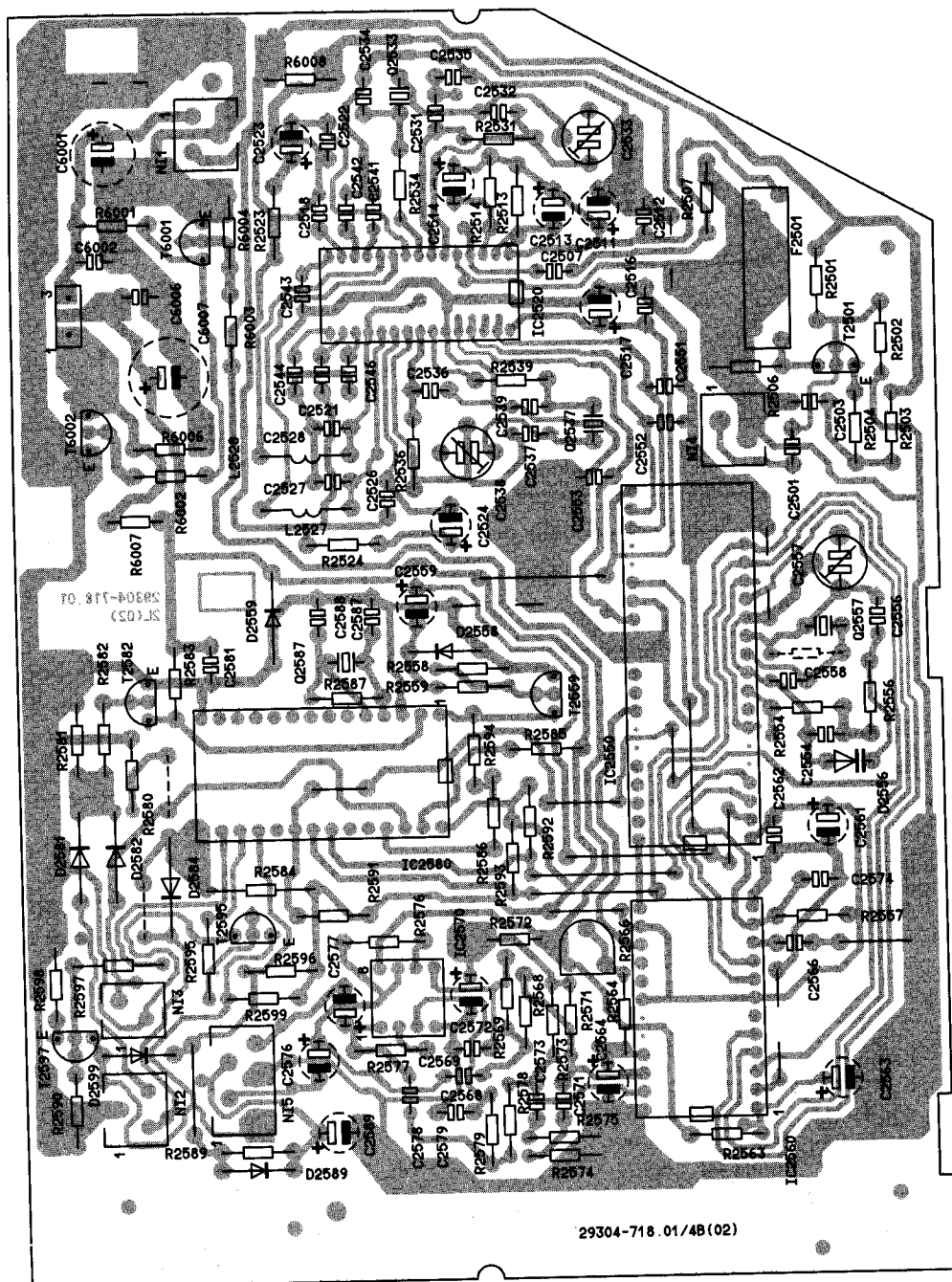


G155





NICAM-DECODER 29305-021.01 (8669434 412)
 -021.03 GB

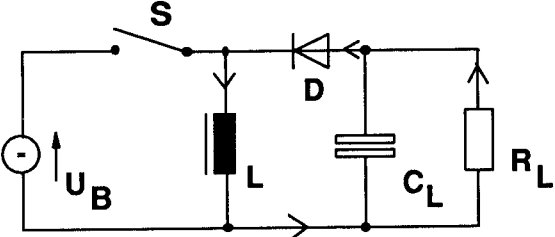


29304-718. 01/4B(02)

G154

SCHALTUNGSBESCHREIBUNG

Die prinzipielle Funktion beruht darauf, Gleichspannung mit einer Frequenz von 15 - 70 kHz zu zerhacken, zu transformieren und den sekundären Lastverhältnissen entsprechend, gleichzurichten.



Über einen mittels eines Regelkreises gesteuerten Schalter (S) liegt die Induktivität (L) an der Gleichspannung (U_B), so daß während der Leitphase des Schalters durch den linear ansteigenden Strom in der Induktivität ein Magnetfeld aufgebaut und Energie gespeichert wird. Die Gleichrichterdiode (D) ist gesperrt und entkoppelt den sekundärseitigen Verbraucher vom Eingangskreis. Nach Öffnen des Schalters, ist die EMK wirksam, schaltet die Diode durch, verbindet Verbraucher und Ladecondensator mit der Induktivität.

Die in den Fernseh-Geräten verwendete erweiterte Grundschaltung:

Hier übernimmt ein Übertrager die Funktion der Spule, der Schalter wird durch den Transistor BU 546 ersetzt. Die Energiezufuhr für die Sekundärseite erfolgt während der Sperrphase des Transistors über die Diode (D). Durch die Variation der Schaltfrequenz und des Tastverhältnisses wird ein hoher Stabilisierungsfaktor erreicht. Grundsätzlich wird die größte Energie bei niedriger Frequenz und geringem Tastverhältnis übertragen. Die jeweiligen oberen bzw. unteren Grenzwerte werden durch die Schaltungs- bzw. physikalischen Gegebenheiten festgelegt.

Funktionsbeschreibung:

Das IC TDA 4601 kontrolliert steuert und schützt den Schalttransistor bei Anlauf-, Normal- und Überlastbetrieb.

Anlaufverhalten:

Es werden drei Betriebszustände durchlaufen, deren Abfolge notwendig ist, die kontrollierte Aufladung des Koppelkondensators (C 631) und damit ein exaktes Schalten des Transistors zu gewährleisten.

1. **Aufbau der internen Referenzspannung**
 Sie versorgt den Spannungsregler und bewirkt die Aufladung des Koppelkondensators (C 631). Bis zu einer Speisespannung von $U_0 \approx 12V$ bleibt die Stromaufnahme $I_0 < 3,2mA$.
2. **Freigabe der internen Spannungsversorgung - Referenzspannung $U_{Pin 1} = 4V$.**
 Diese Spannung wird schlagartig bei $U_{Pin 9} \approx 12V$ eingeschaltet; sie bildet für alle Teile des IC's, bis auf die Steuerlogik, eine stabile und überlastfeste Stromversorgung.
3. **Freigabe der Steuerlogik**
 Unmittelbar mit der Referenzspannung wird die Stromversorgung der Steuerlogik über ein weiteres Stabilisierungsglied eingeschaltet, das IC ist betriebsbereit.

Das Netzteil erhält seine Anlaufspannung von der Wechselspannungsseite des Brückengleichrichters, über D616, R616 an den Pin 9 des TDA 460X. Durch die im Anlauf auf 3,2mA limitierte Stromaufnahme des IC 631 erfolgt das kontrollierte Aufladen des Ansteuerkondensators C631. Nachdem die Spannung an Pin 9 12V erreicht hat, wird an Pin 1 mit $\geq 4V$ eine stabile Referenzspannung aufgebaut. Das betriebsbereite IC schaltet nun über Pin 8 den Schalttransistor T634 durch, somit wird die Primärwicklung an die Gleichspannung des Ladekondensators C626 gelegt ($U_B = 305V$).

Nach Beendigung des Anlaufvorganges bezieht das IC631 seine Betriebsspannung (Pin 9) über die Versorgungswicklung des TR 651, Anschluß 9 und 11, D633, C633. Die Regelgrößen erhält das IC über die Rückkopplungswicklung des TR 651 (Anschluß 11 und 13, über R648 und R644 an Pin 2). Die über Pin 2 ausgewerteten Nulldurchgänge definieren den Start eines neuen Regelzyklus. Über D 647 und C 647 wird eine negative Gleichspannung gewonnen, die in Verbindung mit den Begrenzungswiderständen R 645 und R 643 sowie dem Poti R 647 dem Regelverstärkereingang wird an Pin 3 zugeführt wird. Dieser Regelspannung wird die Referenzgleichspannung von 4V überlagert. Der Einstellwiderstand R 647 dient im Normalbetrieb zur Einstellung der +A-Spannung und damit der Hochspannung.

Als Regelgröße für die Nachregelung des Netzteiles in Frequenz und Tastverhältnis wird die Spannungsänderung am Pin 3 des IC benutzt. Eine Begrenzung der Regelung sowie eine Überlasterkennung wird durch eine sogenannte Kollektorstromnachbildung des Schalttransistors an Pin 4, in Verbindung mit R646 und C646 erreicht. Dabei wird dem Basisstrom ein über das RC-Glied C 646 und R 646 generierter Sägezahn aufaddiert, um bei steigendem Kollektorstrom und damit verbundenem Anstieg des Basisstromes die Kollektor-Emitter-Restspannung niedrig zu halten. Eine niedrige Kollektor-Emitter-Restspannung wird angestrebt, um die Ausräumzeit der Basis kurz zu halten.

Zur Überspannungsabschaltung wird von TR 651 Anschluß 13 über R 649, D 638, D 639, R 639 eine negative Gleichspannung an Pin 5 des IC 631 geführt. Steigt die Speisespannung +A, vergrößert sich der Impuls an Anschluß 13 ebenfalls und schaltet den Pin 5 auf "LOW" (ca. 2,1 V), und damit das Netzteil ab.

Netzteil - "Stand by":

Bei "Stand by" Betrieb wird das Sperrwandler-Netzteil über die "Stand by"-Funktion des IC 631/TDA 4601 (Pin 5/"LOW") vollständig abgeschaltet. Die Basis des Transistors T 6026 liegt auf "HIGH". Es fehlen deshalb alle Sekundärspannungen (+A, +G, -G, +C, +D, -H, +B, +E, +H).

Durch dieses Schaltungskonzept wird die Leistungsaufnahme im "Stand by"-Betrieb auf ca. 5 Wh reduziert.

Um das Telepilot-Empfängerteil (IR-Vorverstärker IC 1201 und Slave-Prozessor IC 6010) betriebsbereit zu halten, wird über D 616, R 616, D 617 und C 616 eine **nicht netzgetrennte** Spannung von +15V erzeugt, und von IC 6030 auf +5V stabilisiert.

Die in Reihe geschaltete LED D 6033 im Display dient als "Stand by" - und Betriebsanzeige.

Das TP-Empfängerteil liegt auf **Netzpotential** und ist auf der Netzschalterplatte angeordnet.

Die notwendige **Netztrennung** für den Datenverkehr zwischen Slave-IC 6010 und Master-IC 860 erfolgt über die Optokoppler OK 6021 und OK 6024.

Schutzschaltung in der Horizontalendstufe:

Bei unzulässig hohem Strahlstrom ($U/D 515 > -12 V$) spricht die Schutzschaltung T 512 und TY 511 an (T 501 an Kollektor "LOW"). Die Ansteuerung der Zeilenendstufe wird über IC 550/Pin 8 abgeschaltet. Zur Ermittlung des Fehlers kann die Schutzschaltung kurzzeitig außer Betrieb gesetzt werden. Hierzu Gerät ausschalten und an TY 511 Gate und Kathode kurzschließen. Dadurch wird die Zeilenendstufe wieder angesteuert.

- Mögliche Ursachen:
- a. bei hellem Bildschirm: RGB Stufen
 - b. bei dunklem Bildschirm: Kaskade oder Bildröhre

Hinweise für nebenstehendes Fluß - diagramm

1. Vor Wechseln des IC 631 oder T 634 ist auf jeden Fall C 626 (Ladeelko) über $R > 10 \text{ k}\Omega$ zu entladen.
2. Nur Überlastungen der Sekundärspannungen +G und +A sind in der Lage, das Netzteil abzuregeln (das Netzteil "taktet"). In diesem Falle ist die jeweilige Diode D656, bzw. D681 kathodenseitig auszulöten, der Sekundärkreis mittels Ohmmeter auf Kurzschlüsse zu untersuchen. Es ist jeweils nur eine Diode auszulöten, um das IC631 nicht durch fehlende Grundlast zu gefährden. Bei Überlastung der anderen Sekundärspannungen fallen die entsprechenden Sicherungen (Si 661, Si 671) aus.
3. **Erklärung des "Taktens "**
Darunter versteht man ein rhythmisches EIN/AUS des Schalt-
netztes, zu messen am Pin 9 des IC631 (Anlaufspannung). Dies ist ein Zeichen dafür, daß sich IC 631 im Zustand "Schutz-
betrieb mit periodischer Abfrage" befindet. Im Störfall ($U_{\text{pin 5}} < 2,1\text{V}$ oder $U_{\text{pin 9}} < 7.4\text{V}$) werden die Ausgangsimpulse Pin 8) gesperrt, d.h. der Basisstromabschalter klemmt Pin 7 auf 1,6V und schaltet somit über den Basisstromverstärker die Ansteuerung T 634 ab, Pin 5 wird intern auf Masse geklemmt. Die Stromaufnahme sinkt auf 14 mA, und $U_{\text{pin 9}}$ unter 5,7V. Unterhalb dieser Spannung schaltet U_{ref} (Pin1) ab. Die Klemmung an Pin 5 wird aufgehoben und $I_{\text{pin 9}}$ sinkt unter 3,2mA. $U_{\text{pin 9}}$ steigt auf $> 12,3 \text{ V}$, U_{ref} wird versuchsweise freigegeben, ebenso Pin 4 (Stand-by Eingang). Bei noch vorliegender Störung wiederholt sich der Vorgang.

4. Spannungen am IC 631 bei verschiedenen Betriebs- zuständen

Normalbetrieb		IC 631 alleine Si 644 unterbr/entnommen	
Pin	Spannung	Pin	Spannung
1	3,0V	1	1,5V
2	0,2V	2	---
3	2,0V	3	1,3V taktet
4	2,1V	4	0,1V taktet
5	Standby	5	6,9V taktet
6	Masse	6	Masse
7	2,1V	7	6,0V taktet
8	2,1V	8	6,0V taktet
9	12,1V	9	9,2V taktet

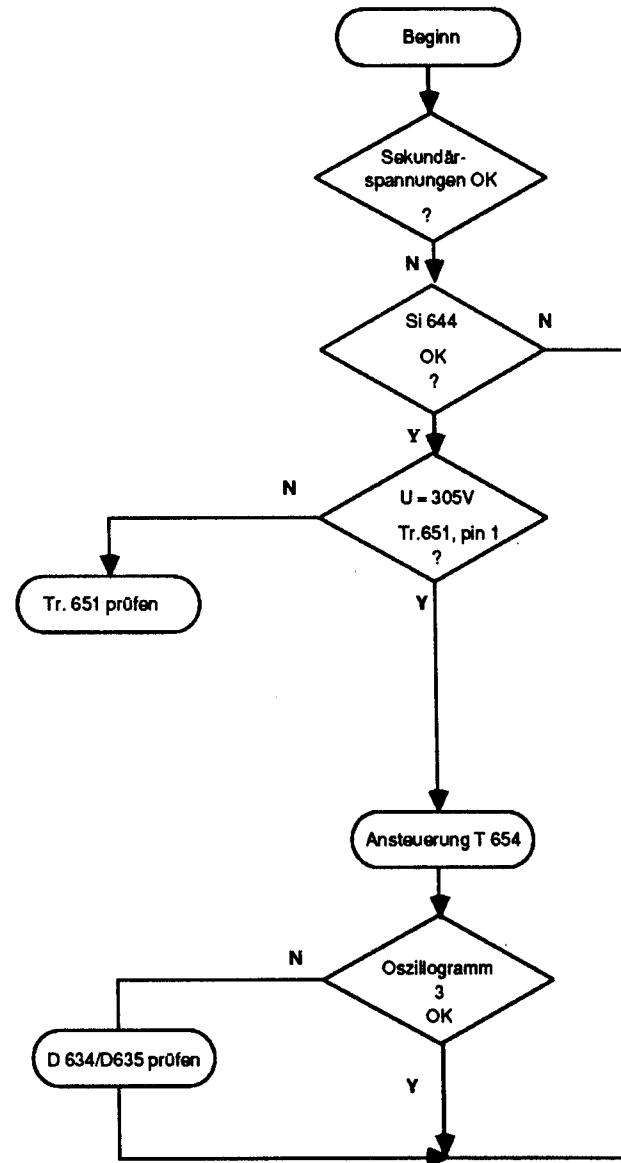
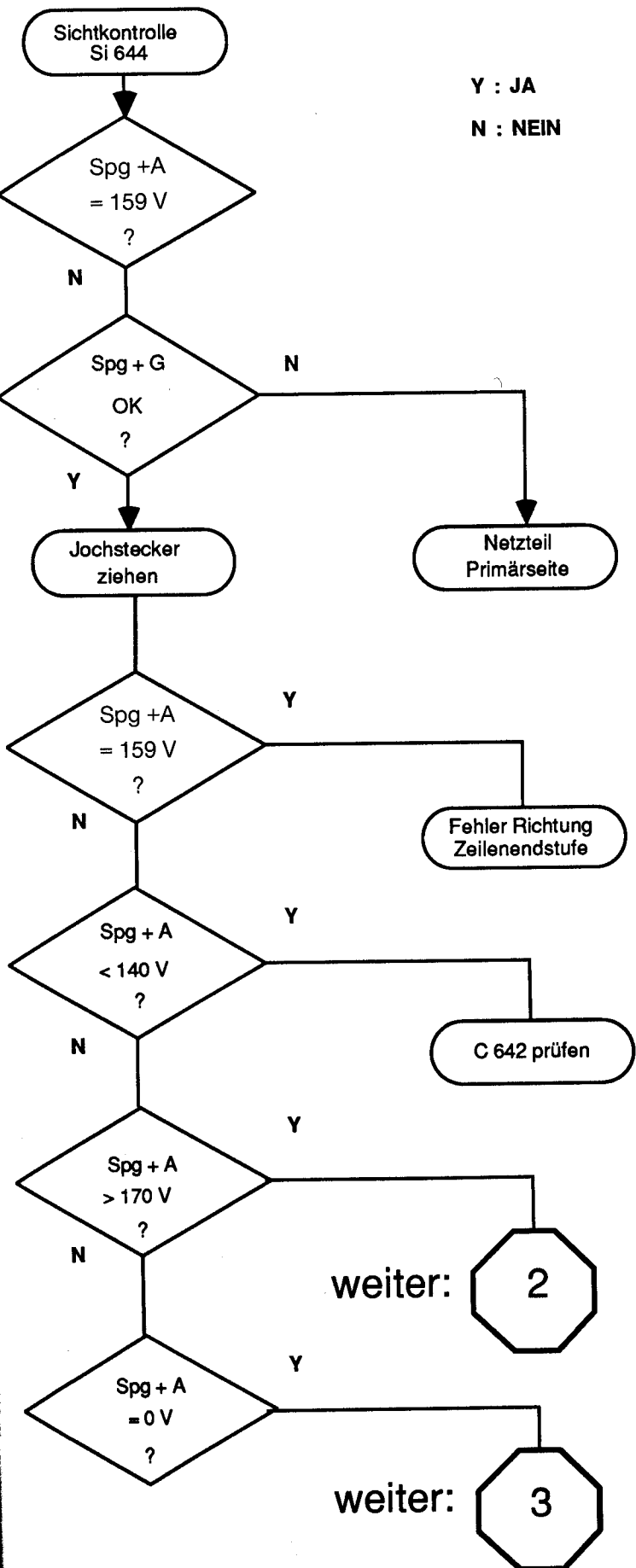
C 657 - Kurzschluß +A		R 647 unterbrochen	
Pin	Spannung	Pin	Spannung
1	3,1V taktet	1	4,1V
2	0V	2	0,2V
3	1,2V taktet	3	2,5V
4	6,5V taktet	4	2V
5	7,0V taktet	5	6,3V taktet
7	2,3V taktet	7	1,8V
8	0,1V taktet	8	1,8V
9	9,5V taktet	9	11,5V

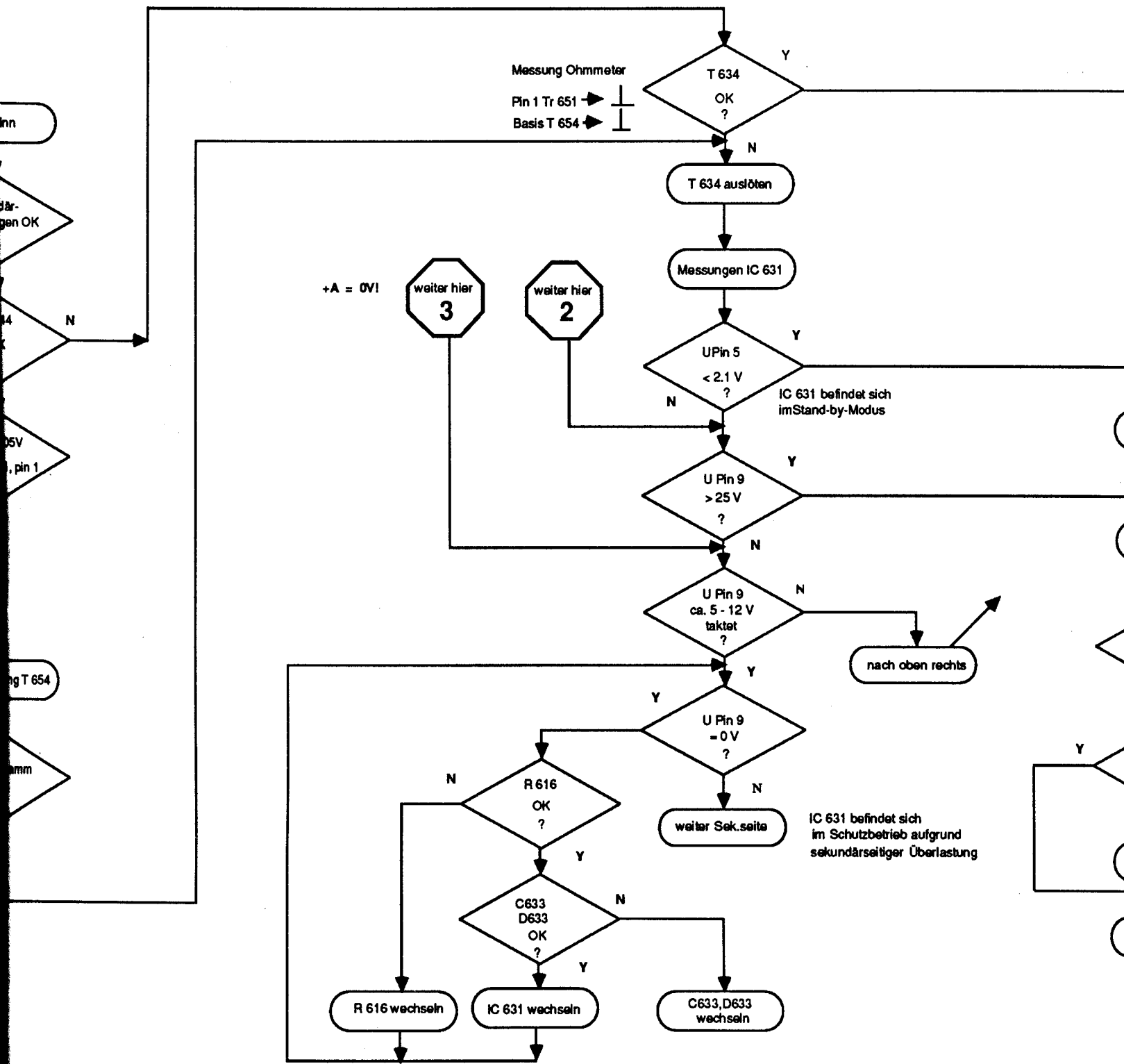
Die Spannungen an Pin5 und Pin 9 takten.

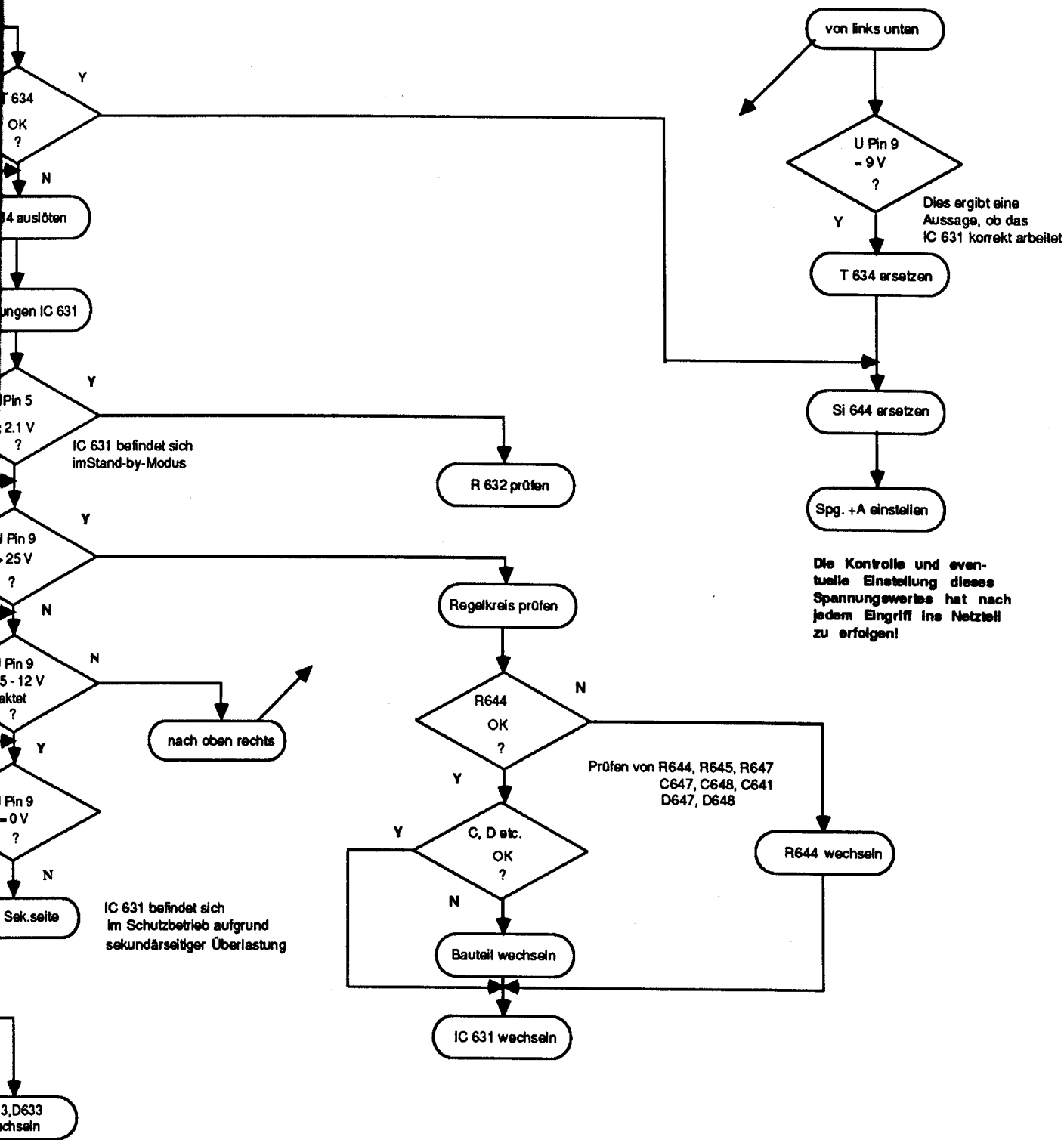
5. **Achtung!** Bei Messungen an Pin 2 und Pin 3: u. U. kann bereits durch den Meßvorgang das IC 631 in Mitleidenschaft gezogen werden. Es wird die Verwendung eines Meßinstruments mit $R_i > 50 \text{ k}\Omega/\text{V}$ und einer Meßspitze von $200 \text{ k}\Omega$ empfohlen. Wird ein Oszilloskop zu Messungen benützt, sollte der Tastkopf teiler auf 1 : 10 stehen, damit eine Gefährdung durch Eingangskapazitäten des Oszilloskops ausgeschlossen werden.

6. Fehlt die Hochspannung, demzufolge die +C-Spannung, so kann ebenfalls eine Unterbrechung des Netzteil-IC-Regelkreises vorliegen. In diesem Fall beträgt die +E-Spannung statt 8V nur 6,5V - 7V. Da aber die minimale Betriebsspannung für den Zeilenendstufentreiber TDA 8140 7V beträgt, schaltet dieser bei Unterschreiten der Spannungsschwelle ab.
7. Bleibt das Gerät im Stand-by-Modus, ist die Spannung am Pin 5 des IC631 zu messen. Ist die Spannung kleiner als 2,1V, genau: $U_{\text{pin 5}} \leq U_{\text{ref}} / 2 - 0,1\text{V}$, läuft das Gerät nicht aus dem Schutzbetrieb / Stand-by-Modus an. Ist die Spannung vorhanden, ist der Fehler in Richtung Abstimmbaustein zu suchen.

Fehlersuchdiagramm

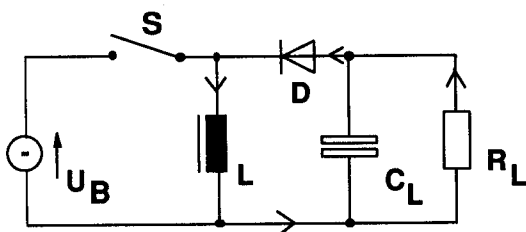






CIRCUIT DESCRIPTION

The principle functions carried out by the circuit are to chop the DC voltage at a frequency of 15-70 kHz, to transform and rectify so that the load relationship is correctly maintained on the secondaries.



The inductance (L) is connected to the DC voltage source (U_1) via a switch (S) activated by a control circuit, so that during the conduction phase of the switch a linear rising current in the inductance causes a magnetic field to build up and for energy to be stored. The rectifying diode (D) is cut off and decouples the secondary load from the input circuit. After the switch is open, the EMF becomes effective, the diode conducts and connects the load and the charging capacitor to the inductance.

The expanded basic circuit as used in the models:

The transformer takes over the function of the coil, the switch is taken over by the transistor BU 546. The energy source for the secondary is during the switch-off phase of the transistor via the diode (D). Due to the variation of the switching frequency and the duty cycle a very high stabilising factor is achieved. Basically the frequency is low when the energy consumption is high and during this the cycle is also low, that means during a long period of current flow a maximum energy storage in the transformer is possible.

The appropriate upper and lower limiting values are fixed by the circuit and by physical values.

Function Description:

The ICs TDA 4601 checks, drives and protects the switching transistor during the start-up normal and overload modes.

Start-up Process:

There are three operating modes carried out during which the sequences is important. The monitoring of the charging of the coupling capacitor (C631) and with it the correct switching of the transistor is realised.

- Building up of the internal reference voltage.**
This operates as a voltage regulator and provides charging of the coupling capacitor (C631). Until the input voltage to $U_g = 12V$, the current consumption $I_g < 3.2mA$.
- Release of the internal voltage supply - Reference voltage $U_1 = 4V$.**
This voltage is present as soon as $U_g = 12V$; this provides, for all stages in the IC up to the control stage, a stable and overload controlled current supply.
- Release of the control logic.**
With the reference voltage present the current supply to the control logic is provided via an additional stabilising circuit simultaneously, the IC is then in operating mode.

The power supply contains a starting voltage from the AC voltage side of the bridge rectifier via D616, R616 to pin 9 of the TDA 4601. Due to the fact that the start circuit provides a limited current consumption of 3.2mA the IC can check the charging of the drive capacitor C631. After the voltage on pin 9 has reached 12V, pin 1 will feed out a stable reference voltage of $\geq 4V$. The IC now in operating mode switches the transistor T634 on via pin 8 so that the primary winding is connected to the DC voltage on the charging capacitor C626 ($U = 305V$).

After completion of the start-up process the IC631 draws operating voltage (pin 9) via the supply winding of Tr651, contact 9 and 11, D633, C633. The control amplitude is obtained for the IC via the feed back winding of Tr651 (contact 11 and 13), via R648 and R644 to pin 2). From pin 2 the control logic defines the zero cross-over and the start of a control cycle. This is evaluated for control purposes. For this a negative DC voltage is obtained from D647 and C647 which in combination with the limiting resistors R649 and R647 and also R647 is connected to the control amplifier input on pin 3. This control voltage is combined with the reference DC voltage of 4V. The adjustment resistor R647 serves for the adjustment of the +A voltage in normal operation and with it also the adjustment for the EHT.

As a control amplitude for the adjustment of the mains stage frequency and duty cycle the current change on pin 3 of the IC is used. The limiting of the control, as well as the overload identification, is obtained from the so called "collector current simulation" of the switching transistor on pin 4 in combination with R646 and C646. To the basis current a saw-tooth current, generated via C646 and R646 is added in order to keep the collector saturation voltage low while collector current and basis current are increasing. A low collector saturation voltage is required to keep the reverse base control time low.

As measurement of overvoltage protection a negative voltage is fed into IC 631 (Pin 5) via Pin 13, R 649, D 638, D 639, R639. If the voltage +A increases, the pulse on Pin 13, IC 631 increases, too and switches pin 5 to "LOW" - level (approx. 2,1 V), this switches the power supply off.

"Stand by" - mode:

On "Stand by" mode the Blocking Oscillator Converter - Mains Stage is completely switched off by the "Stand by" function of IC 631/TDA 4601

(pin 5/"LOW"). The base of Transistor T 6026 is taken to "HIGH". Consequently, all secondary voltages are absent (+A, +G, -G, +C, +D, -H, +B, +E, +H).

Due to this circuit concept the power consumption on "Stand by" mode is reduced to approx. 5 Wh.

To allow the TP-Receiver stages (IR-Pre-amplifier IC 1201 and the Slave-Processor IC 6010) to be in operation, a **Non Isolated Voltage** of +15 V is generated by D 616, R 616, D 617 and C 616 and this is stabilised to +5 V by IC 6030.

The LED D 6033 serves as the "Stand by" and Operating Indicator in the Display.

The TP-Receiver stage operates at **mains potentials** and is located on the mains circuit panel.

The necessary **mains isolation** for the data traffic between the Slave-IC 6010 and the Master-IC 860 is accomplished by the Optocouple OK 6021 and OK 6024.

Protective circuit in the line output stage:

If an undue higher beam current occurs, ($U/D 515 > -12 V$) the protective circuit T 512 and Ty 511 is activated (Collector T 501 goes to "LOW" - Level). The driving pulses of the line output stage are switched off via pin 8/IC 550. The protective circuit can be deactivated for a short period in case of fault search. Switch off the set and shorten gate and cathode of Ty 511. The output stage will be driven again.

Possible reasons:

- if screen of picture tube is bright: RGB stages
- if screen of picture tube is dark: cascade or CRT

HINTS FOR REPAIR FAULT FINDING DIAGRAM.

1. Before replacing the IC631 or T654 the C626 (charging capacitor) must be discharged with a resistor of $R \geq 10k\Omega$ in every case.
2. With operating during a fault with an excess of voltage +A ($\geq 170V$) the capacitor C682 (+G) and IC631 will be damaged. The overvoltage + results in a "stand-by mode" due to a break in the control circuit for IC631. The voltage +A will now rise over the normal value of 170V in stand-by mode.

3. Explanation of "Pulsating".

With this one understands that a rhythmic ON/OFF switching of the switch mode power supply occurs, which can be measured on pin 9 of IC631 (start up voltage). This is an indication, that IC631 is in the "protective mode with periodic scanning" state. In defective cases, ($U_{pin\ 5} < 2.1V$ or $U_{pin\ 9} < 7.4V$) the output pulse pin 8 is switched off as the base current switch clamps pin 7 to 1.6V and T654 is switched off via the base current amplifier. Pin 5 will be clamped to chassis by the internal circuit. The current consumption reduces to approximately 14mA, the voltage $U_{pin\ 9}$ drops below 5.7V, below this voltage the reference voltage U_{ref} (pin 1) is switched off; this lifts the clamping on pin 5. The current consumption $I_{pin\ 9}$ drops below 3.2mA, the voltage $U_{pin\ 9}$ rises $> 12.3V$, the voltage U_{ref} is again released and also pin 5. (Stand-by input). If the defect is still present the process is repeated.

4. Voltages on IC631 with different operating states.

Normal Mode I		IC 631 Alone Si 644 open circuit/ removed	
Pin	Voltage	Pin	Voltage
1	3.0V	1	1.5V
2	0.2V	2	—
3	2.0V	3	1.3V Pulsating
4	2.1V	4	0.1V Pulsating
5	Standby	5	6.5V Pulsating
6	Chassis	6	Chassis
7	2.1V	7	6.0V Pulsating
8	2.1V	8	6.0V Pulsating
9	12.1V	9	9.2V Pulsating

C657 - Short Circuit +A R647 Open Circuit

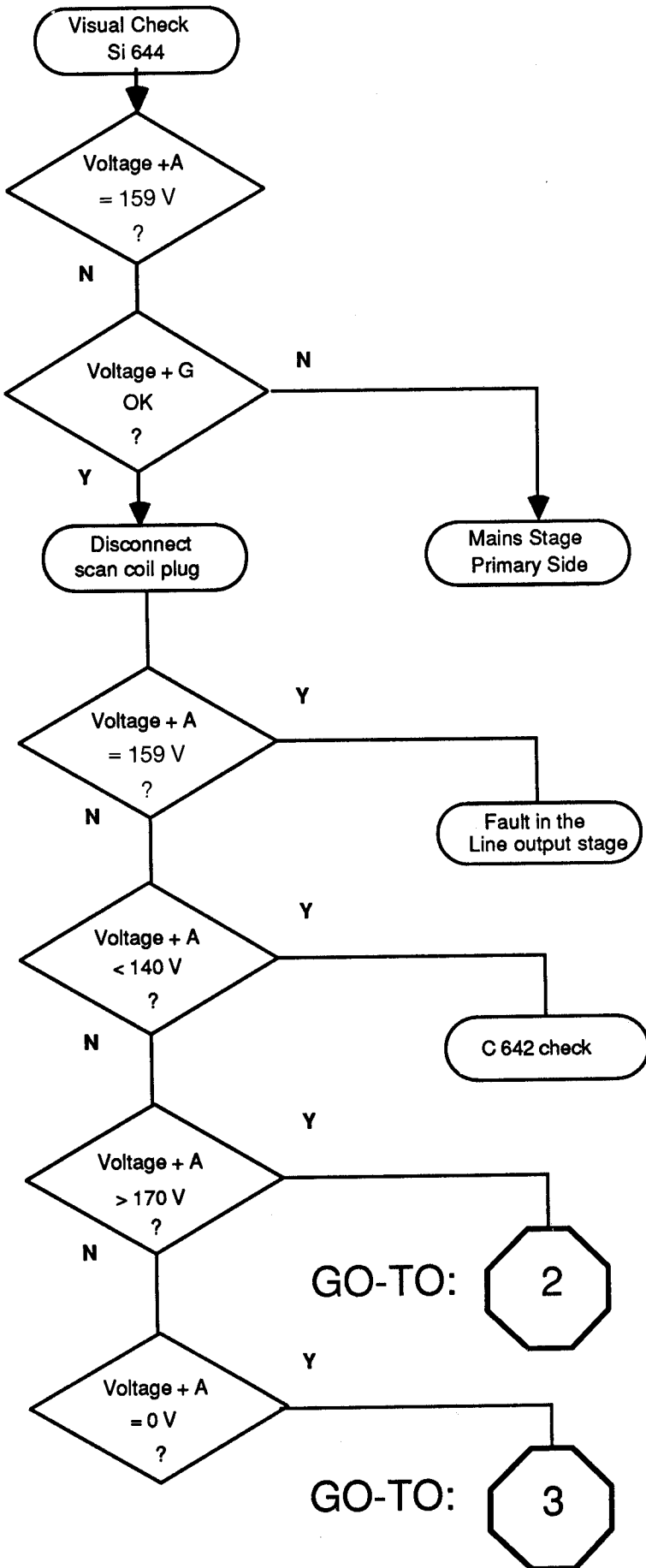
Pin	Voltage	Pin	Voltage
1	3.1V Pulsating	1	4.1V
2	0V	2	0.2V
3	1.2V Pulsating	3	2.5V
4	6.5V Pulsating	4	2V
5	7.0V Pulsating	5	6.3V Pulsating
7	2.3V Pulsating	7	1.8V
8	0.1V Pulsating	8	1.8V
9	9.5V Pulsating	9	11.5V

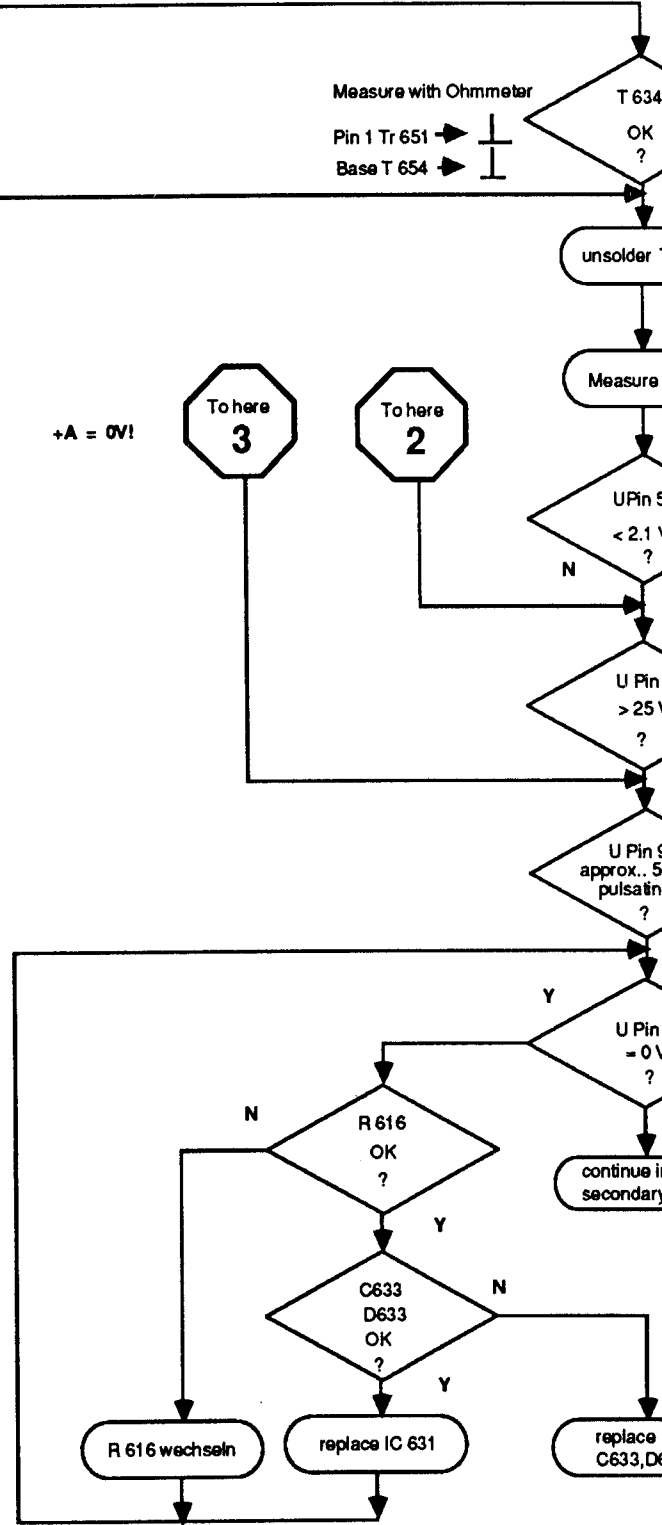
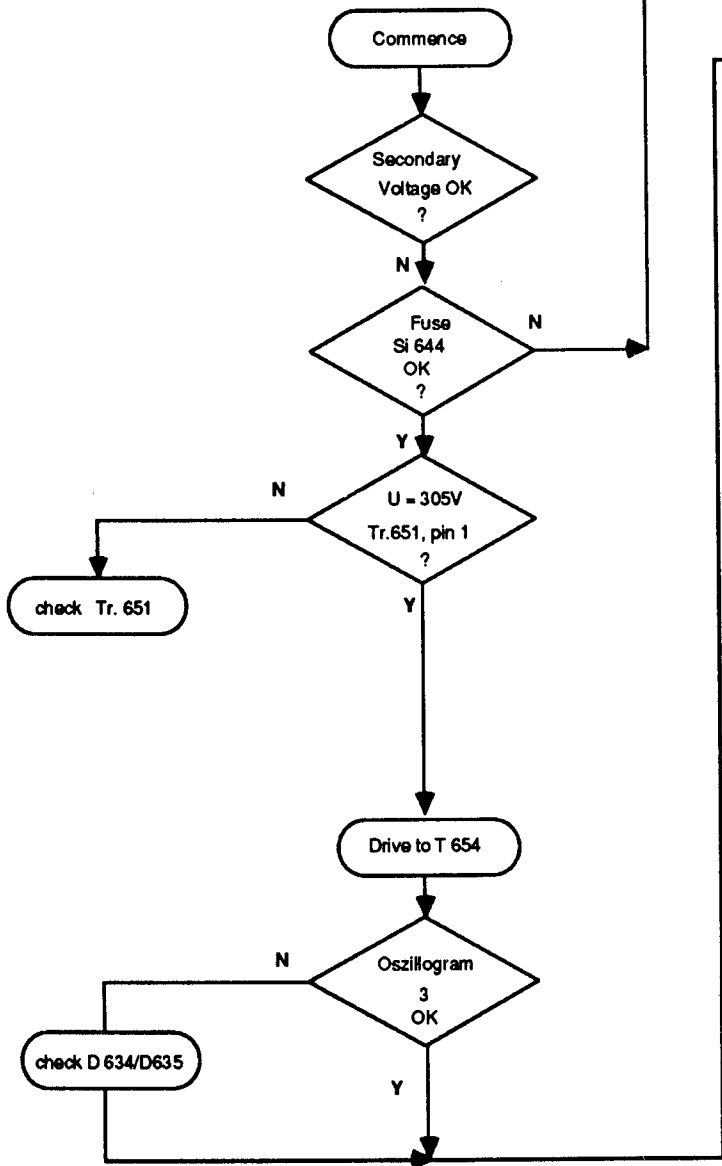
The voltages on pins 5 and 9 pulsates.

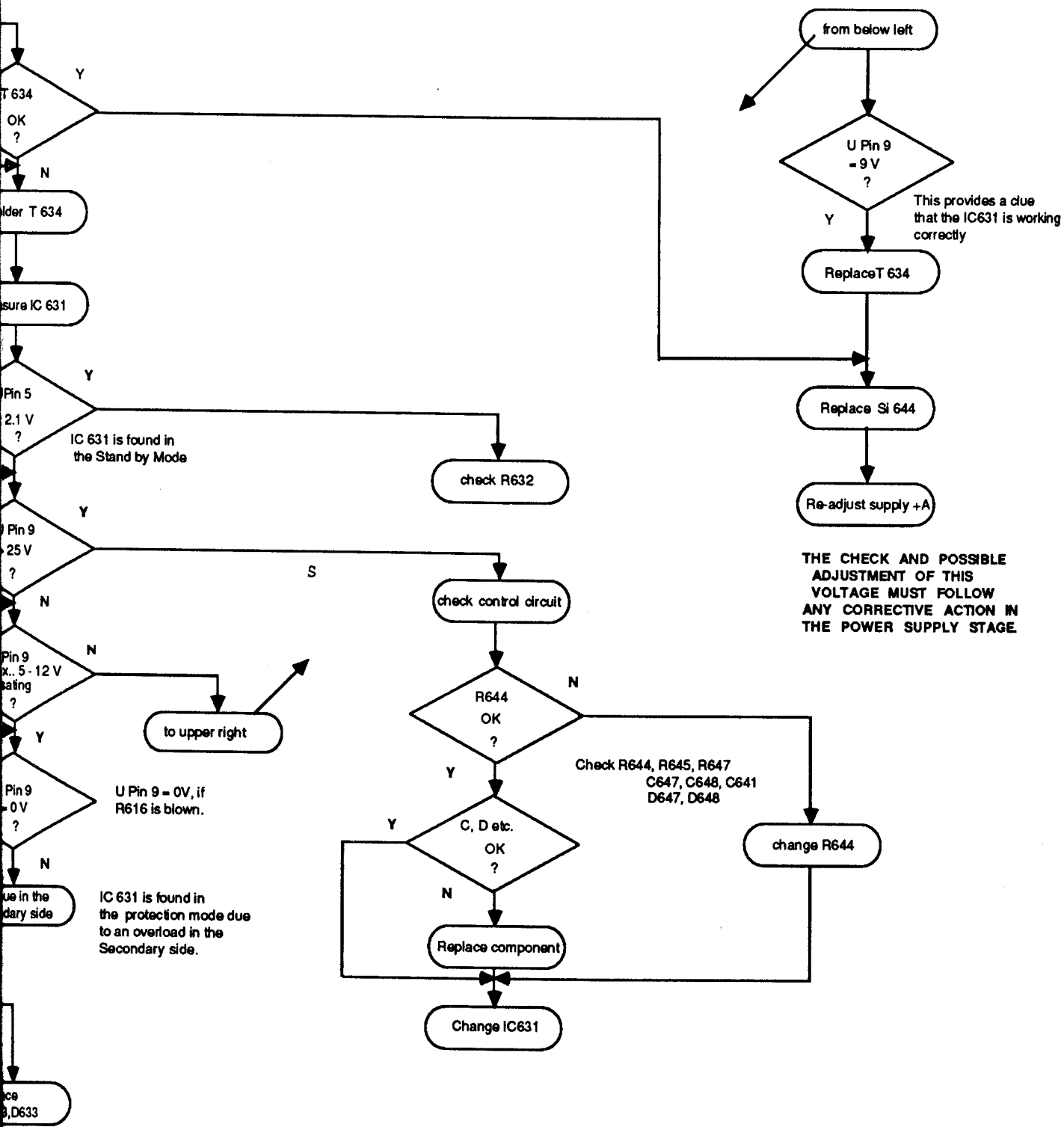
5. **Attention** - When measuring on pin 2 and 3; due to the test procedure readings on the IC631 can be affected. The test instruments used therefore have a probe with built-in protective resistor $> 200k\Omega$. If an oscilloscope is used for measurements, the attenuator probe must be switched to 1:10. This is to protect the circuitry against damages caused by the input capacities of the scope.
6. If the EHT is missing, so will the +C voltage, and from this a break in the mains stage-IC-Control circuit is established. In these cases the +E voltage will be only 6.5V-7.0V instead of 8V. As the minimum operating voltage for the line output stage driver IC TDA 8140 is 7.0V, the IC switches off as the voltage threshold is not obtained.

7. If the receiver remains in stand-by mode, the voltage in pin 5 of IC 631 be measured. If the is less than 2.1V, but is: $U_{pin\ 5} \leq U_{ref}/2 - 0.1V$, the receiver will not switch from the protection mode/standby-mode. If the voltage is present, the fault should be looked for in the area of the tuning module.

FAULT FINDING DIAGRAM







Service checks on the I²C Bus

If faults occur in the set which cannot be attributed to the power supply unit, the EHT or the deflection system, the I²C bus should be checked using Table 1 before further service work is carried using Table 2.

Via the I² bus the microcomputer in the control unit IC 860 supplies control signals for the tuner, IF, Videotext (teletext) and the RGB analog signals.

Note:

When a module is being changed, the set should always be switched off. Modules must not be unplugged even in the "standby" mode. Observe MOS handling precautions.

Table 1

Test	Measured Value	Testpoint	Possible Faults
+5 V	5 V	Pin 4/7, IC 860 Pin 3, IC 6010	D 6033, IC 6030, IC 6010
10 MHz Takt 4 MHz Takt	10 MHz, 3 V _{pp} 4 MHz, 3 V _{pp}	Pin 5, IC 6010 Pin 6, IC 860	F 6013 IC 860
Reset	LOW only at moment of switch on	Pin 2, IC 860 Pin 28, IC 6010	T 815, D 814, IC 860 T 6011, D 6011, IC 6010
I ² C-Bus	5 V _{pp}	Pin 21, 23, IC 860	The I ² C Bus data are even present without input from the remote control or keyboard. If there are no data: Take out the tuner, IF, Videotext plug-in boards successively or unsolder Pins 4,5 of IC 330. If there are still no data replace the control unit.

Table 2

Possible faults due to I²C Bus control which can occur in any part of set.

Fault	Possible Cause	Measured Value	Test Point
No functions accepted by keyboard	+ H, IC 860	5V see table 1	IC 860, Pin 4
Channel No. cannot be changed with remote control	IR preamplifier D 1201, IC 1201,	+5 V	IC 1201, Pin 1
Dark display, no indication	+ H	5 V	Pins 4,16 IC 860
	IC 6010	Output signals LOW	Pins 19,2, IC 6010
	IC 860	LOW output signals LOW 3 V	on the cathodes of the LEDs
Dark display or defective display segments	Short circuit or interruption in CLOCK, DATA, and release lines	ca. 5 V _{pp}	IC 860, Pins 21,22,23 IC 6010, Pins 19,2
No frequency tuning	+C via R 337	ca. 44 V	Tuner Pin 1
	+ B, + H	12 V, 5 V	Tuner Pins 16,2
	Daten (SDA)/Clock (SCL) I ² C Bus	5 V _{pp}	Tuner Pins 6, 5
Noise - infested picture	Variable tuning voltage as function of channel selection	0,2 - 30 V	Tuner Pins 13, 15
Dark screen - no noise	Tuner Pin 3 HIGH	HF 0 V AV > 8 V	Tuner Pin 3
No CCVS at IF module contacts 7/9	+B, +B, +H	12 V, 26 V, 5V	ZF 21, 26, 22
	I ² C Bus, SDA, SCL missing at tuner	5 V _{pp}	Tuner Pins 6, 5
	ZF Pin 11 HIGH		ZF Pin 11

No sound	IF amplifier	approx. 1,5 V _{pp} at max. Volume	IF, Pins 1,2
	Socket board only by Peripherie	“	AV plug, Pins 1,3
	AF plug-in board	“	AF plug, Pins 1,3
	+G and -G	20 W 35 W 26 V 34 V	AF Pins 9,10,7,8
	+ B	12 V	IF, Pin 21
	I ² C Bus, SDA, SCL	5 V _{pp}	IF Pins 25, 24
No analog signals, Brightness Contrast Colour contrast	I ² C bus, IC 330 D/A Converter D/A Converter D/A Converter	5 V _{pp} 1-3 V 2-4 V 2-4 V	IC 330, Pin 4/5 Colour/RGB module: Pin 10 (brightness) Pin 11 (contrast) Pin 12 (col. contrast)
Only in case of remote contr. No Videotext (teletext)	+ B, + E	12 V, 8 V	VT, Pins 13, 2
	I ² C Bus, SDA	5 V _{pp}	VT, Pin 9