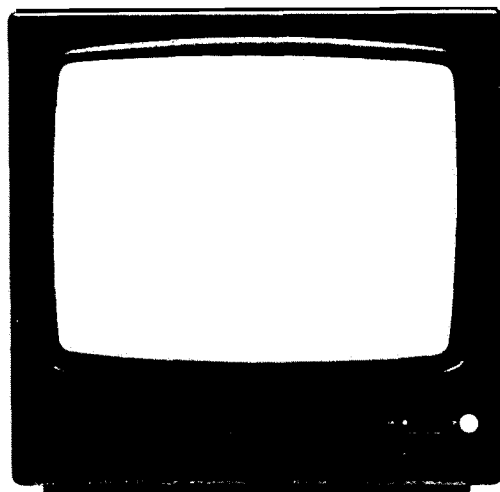


ZANUSSI

SERVICE DEPARTMENT

SETCO/ACF



MODEL 22ZT907

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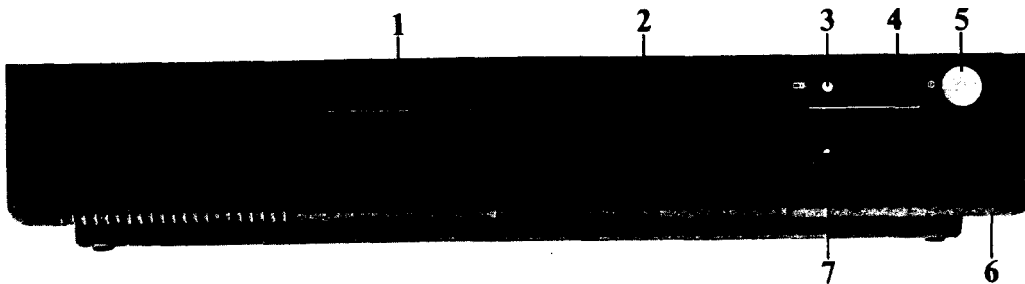
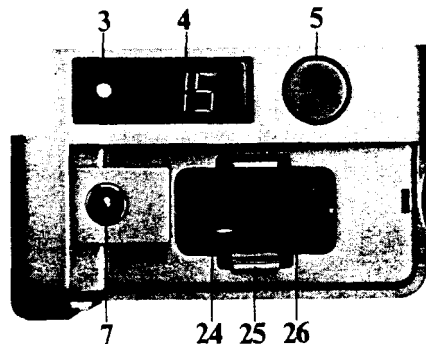
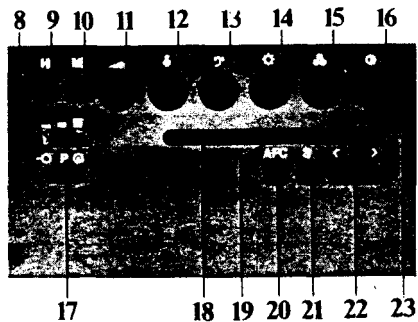
GENERAL FEATURES

CHASSIS	: BS 400.2
PICTURE TUBE	: 22" PIL S 4 - A 56-701 X
POWER SUPPLY	: 240V AC \pm 10% 50 Hz
POWER ABSORBED	: Medium/maximum 110/140 W
EHT	: 24.5 kV
MAX. BEAM CURRENT	: 1.1 mA
ANTENNA INPUT	: 75 Ohm
TUNER	: Varicap integrated type
TUNING SYSTEM	: Electronic (voltage synthesis type)
PRESELECTION	: 16 TV programmes and VCR on programme 16
AFC	: Insertable through pushbutton
REMOTE CONTROL	: IR type. Max. range approx. 8 m
REMOTE CONTROL TRANSMITTER ABSORPTION	{ In stand-by $< 20 \mu\text{A}$ In operation $< 9 \text{mA}$
CLOCK	: Electronic programmable type with digital hours and minutes indication
AUXILIARY OUTPUT JACKS	: Headphones jack 8 Ohm DIN 45327 Tape recorder 47 kOhm DIN 41524 External loudspeaker jack 2.7 Ohm DIN 41529
LOUDSPEAKER	: Lateral woofer and frontal tweeter
AUDIO OUTPUT	: 15 W
STANDARD	: CCIR - I PAL
DEGAUSSING	: Automatic
DIMENSIONS	: 55x55x42 cm
WEIGHT	: 29 kg

CONTROLS ON THE TV RECEIVER

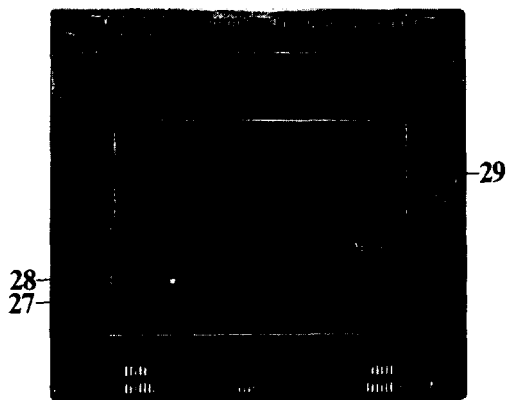
Front controls

1. Electronic clock
2. Control panel cover
3. Switch-ON & programme sequential channel change control
4. Digital programme display
5. Stand-by switch
6. Output jacks recess cover
7. Remove control receiver
8. Clock brightness control
9. Clock reset - hours H
10. Clock reset - minutes M
11. Volume
12. Tone control - treble
13. Tone control - bass
14. Brightness
15. Colour control
16. Contrast
17. Clock programmer
18. UHF band indicator light
19. AFC indicator light
20. AFC pushbutton
21. Station scanning control - S
22. Fine tuning regulation
23. Tuning sequence lights
24. Recording jack
25. Output jacks foldback release
26. Headphones jack



Rear sockets

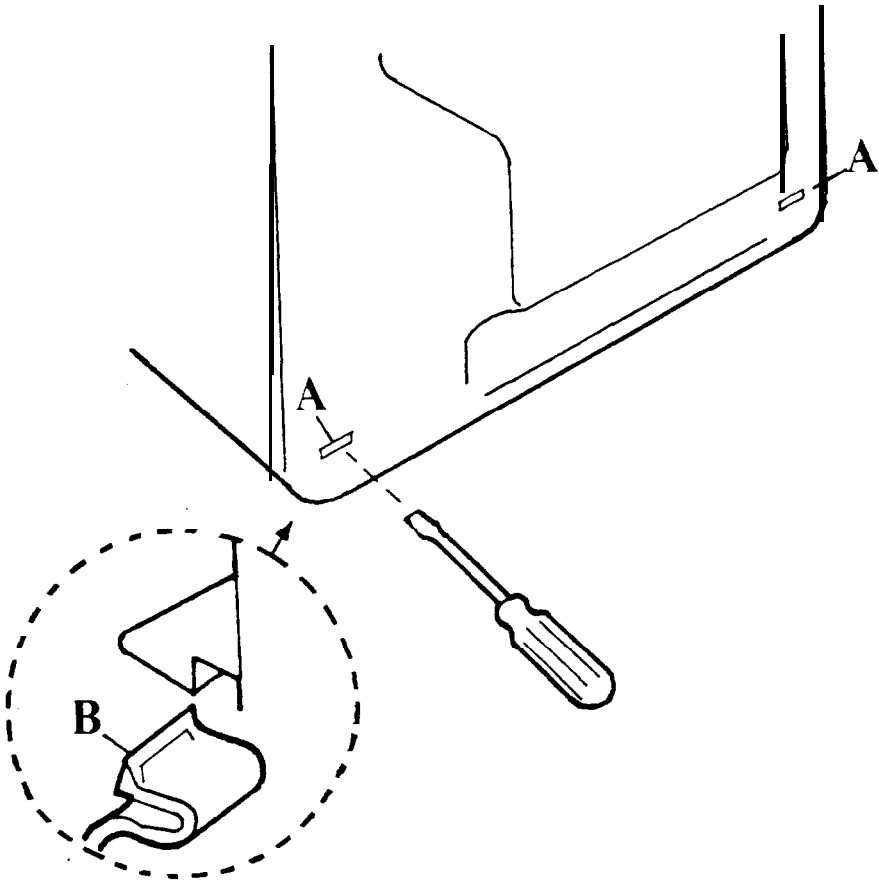
- 27. Auxiliary speaker jack
- 28. Aerial socket
- 29. Clock battery recess



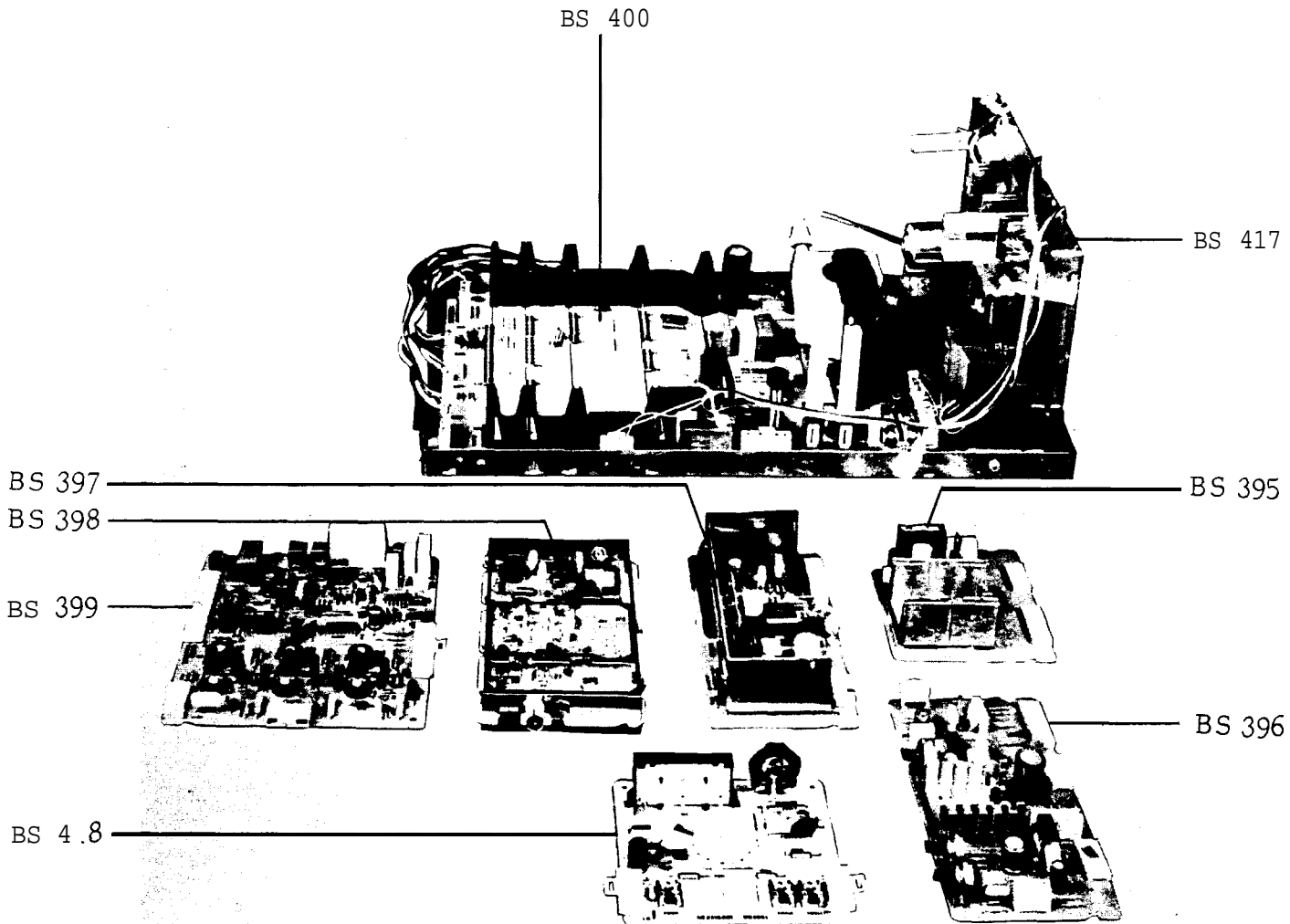
ACCESS TO INTERNAL COMPONENTS

To remove back panel:

1. Insert a blade screwdriver into "A";
2. Push down retaining lug "B";
3. Release bottom part and remove panel.

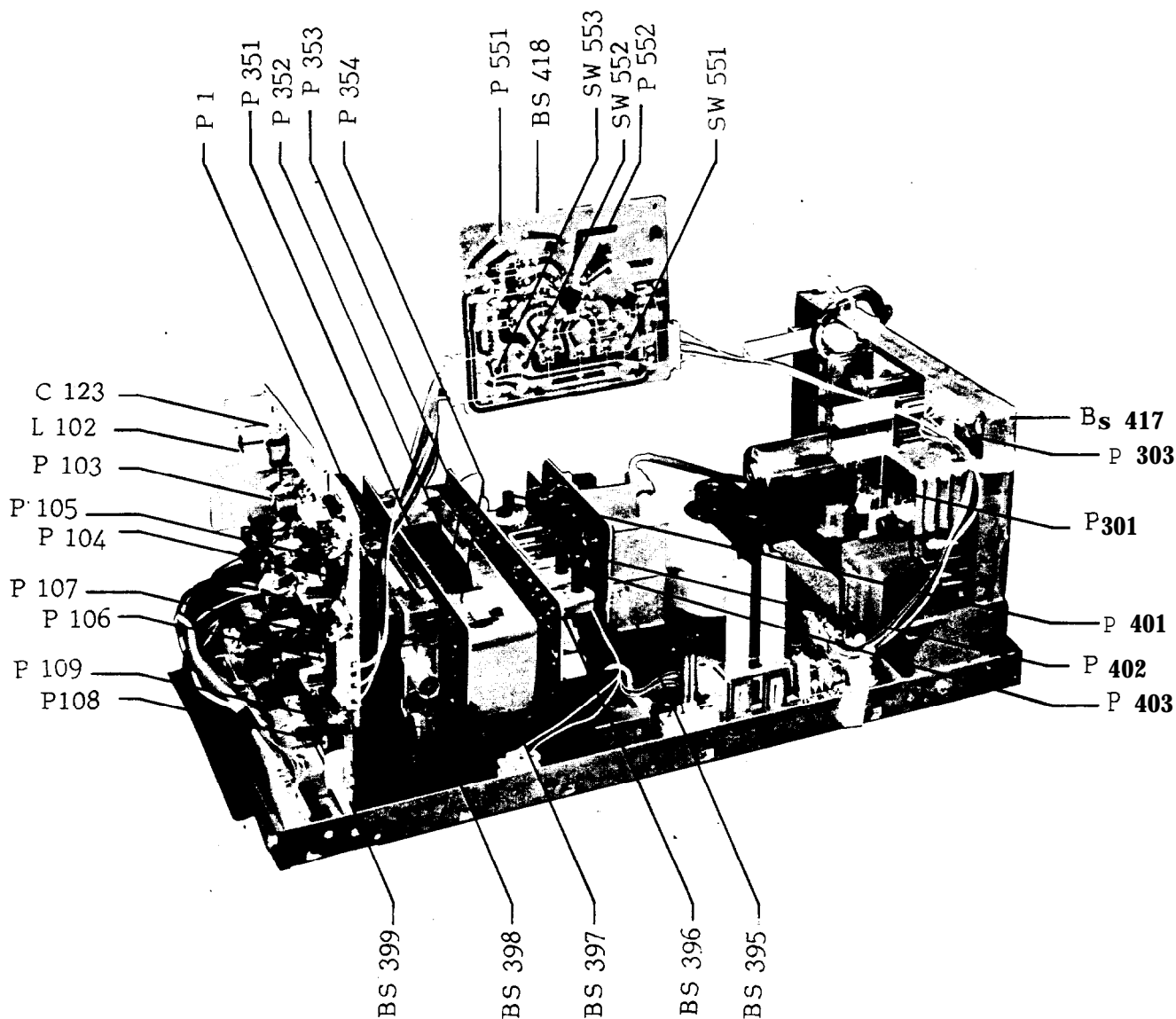


VIEW OF CHASSIS AND OF DISCONNECTED PLUG-IN TYPE P.C.BOARDS



LEGEND

- BS 400.2 Chassis
- BS 417 Power supply p.c.b.
- BS 395 Line output p.c.b.
- BS 396 Synchro. separator and pincushion correction p.c.b.
- BS 418 CRT discharger p.c.b.
- BS 399 Video p.c.b.
- BS 398 IF unit p.c.b.
- BS 397 Vertical deflection p.c.b.



LEGEND

- P 1 AGC adjustment potentiometer
- P 351 Vertical linearity adjustment potentiometer
- P 352 Vertical frequency adjustment potentiometer
- P 353 Vertical amplitude adjustment potentiometer
- P 354 Raster adjustment potentiometer
- P 551 Potentiometer for (grid-2) adjustment of picture tube
- BS 418 CRT discharger p.c.b.
- SW 553 Switch for blue electron gun
- SW 552 Switch for green electron gun
- P 552 Focus adjustment potentiometer
- SW 551 Switch for red electron gun
- BS 417 Power supply p.c.b.
- P 303 Potentiometer for adjustment of +12.6V DC
- P 301 Potentiometer for adjustment of +150V DC
- P 401 Oscillator frequency adjustment potentiometer
- P 402 Pincushion adjustment potentiometer
- P 403 Horizontal amplitude adjustment potentiometer

BS 395 Line output p.c.b.
BS 396 Synchro. separator and pincushion correction p.c.b.
BS 397 Vertical deflection p.c.b.
BS 398 IF unit p.c.b.
BS 399 Video p.c.b.
P **108** Peak-to-peak adjustment potentiometer (blue)
P 109 Black level adjustment potentiometer (blue)
P **106** Peak-to-peak adjustment potentiometer (green)
P **107** Black level adjustment potentiometer (green)
P **104** Peak-to-peak adjustment potentiometer (red)
P **105** Black level adjustment potentiometer (red)
P **103** Potentiometer for adjustment of direct signal level
L **102** Burst phase adjustment coil
C **123** Capacitive trimmer for oscilloscope adjustment

TRANSISTORS

Transistors mounted on chassis and p.c.boards

<u>Transistors</u>	<u>Type</u>	<u>Electronic functions</u>
T 1	BF 479 S	UHF amplifier
T 3	BF 680	Oscillator/convertor UHF
T 4	BF 506	UHF amplifier
T 6	BF 199	IF amplifier
T 7	BC 548 B	Audio amplifier
T 8	BC 548 B	Impedance matcher
T 101	BC 548 B	Automatic control of p.p. luminance signal
T 1 0 2	BC 548 B	Brightness control fixed level setting for adjustment of the output video amplifiers
T 103	BC 548 B	T 101 driver
T 104	BC 548 B	Suppressor of unwanted reflections on the burst signal delay line LR 102 of the chrominance channel
T 105	BF 393	Active load
T 106	BF 758	Video output
T 107	BF 393	Active load
T 108	BF 758	Video output
T 109	BF 393	Active load
T 110	BF 758	Video output
T 261	TIL 78	Optoelectric coupler
T 262	BC 548 B	Amplifier
T 263	BC 548	Switching transistor
T 264	BC 320 B	Switching transistor
T 265	BC 548 B	Driver for optoelectric coupler
T 266	BC 320 B	Driver for optoelectric coupler
T 301	BC 557 B	Amplifier
T 302	BU 326 A	Oscillator
T 303	BC 548 B	Switch for remote control
T 351	BD 135	Switching transistor
T 352	BD 243 A	Vertical parabola amplifier
T 353	BD 244 A	Vertical parabola amplifier
T 354	BC 548 B	Multivibrator for formation of vertical blanking pulse
T 355	BC 548 B	
T 402	BC 548 C	Parabola signal amplifier
T 403	BC 558 B	Parabola signal amplifier
T 404	BD 679	Amplifier
T 451	BF 758	Amplifier switch
T 452	BU 208 A	Line output

TRANSISTORS

Transistors mounted on remote control and tuning unit

<u>Transistors</u>	Type	<u>Electronic functions</u>
T 702	BC 547 B	Driver for DL 651
T 704	BC 547 B	AFC enabler
T 705	BC 547 B	Clipper
T 801	BC 413 C	AGC
T 802	BC 413 C	Amplifier
T 803	BC 413 C	Amplifier
T 804	BC 253 C	Amplifier
T 805	BC 170 C	Square-wave shaping
T 806	BC 320 B	Driver for display's lit spot
T 807	BC 320 B	Driver for display's lit spot
T 808	BC 320 B	Driver for display's lit spot
T 809	BC 548 B	Colour adjustment
T 810	BC 548 B	Volume adjustment
T 811	BC 320 B	Muting
T 812	BC 548 B	Muting
T 813	BC 548	Output impedance matcher
T 814	BC 548	Output impedance matcher
T 815	BC 548	Output impedance matcher

INTEGRATED CIRCUITS

ICs mounted on chassis and p.c.boards

<u>ICs</u>	<u>Type</u>	<u>Electronic functions</u>
CI 1	TDA 2541	IF amplifier. Carrier generator and synchronous detector. Video preamplifier. White peaks inverter stage - AGC - AFC.
CI 2	TBA 120 U	Amplifier/limiter. Coincidence detector. Reference frequency generator for detection. Low frequency audio signal output with insertion of volume adjustment. Low frequency audio signal output without volume adjustment.
CI 101	TDA 2151	Luminance/chrominance signal processing. Brightness, contrast and colour controls. Beam current limiter.
CI 102	TDA 2140	Colour subcarrier regeneration. PAL switching. Identifier. Killer. AFC and automatic phase control. ACC. Burst.
CI 103	TDA 2161	R-Y/B-Y demodulators. G-Y matrix. Luminance matrix.
CI 201	TDA 4290	Continuous path control adjustment of treble, bass and volume.
CI 202	TDA 2030	Audio amplifier.
CI 261	TDD 1618	18V stabilizer.
CI 262	MC 14013	Switch-ON reset. TV start signal 24h clamp pulse.
CI 301	L 200 v	12.6V stabilizer.
CI 351	TDA 1170 S	Square-wave signal generation. Conversion of the square-wave signal into a saw-tooth signal. Saw-tooth signal amplification. Voltage stabilization of all internal circuits.
CI 401	TDA 2593	Synchro. separator. Phase comparator. 15625 Hz oscillator. Phase shift. Generator of the driving pulse for the line output amplifier. Sand-castle generator.

INTEGRATED CIRCUITS

ICs mounted on remote control and tuning unit

<u>ICs</u>	<u>Type</u>	<u>Electronic functions</u>
CI 651	MC 14493 P	It drives DI 651 display
CI 701	MC 14426	Memory for 8 programmes
CI 702	MC 14426	Memory for 8 programmes
CI 703	MC 14429	Control unit
CI 704	UAA 1008	Band decoder. Coincidence detector. Operational amplifier. AFC processing.
CI 705	4071 BE	Two-input OR
CI 706	4049 D	Inverting buffer
CI 707	4013	Double flip-flop
CI 708	SN 16889 P	Tuning indicator
CI 801	SAA 1051	It processes information coming from remote control.
CI 901	SAA 1050	Remote control transmitter

MAIN COMPONENTS

- BS 400.2 Chassis
- It supports the p.c.boards and it supplies voltages for EHT, focusing system and CRT heaters.
- BS 398 Tuner - IF video/audio p.c.b.
- Conversion of the RF signal into an IF signal (video carrier: 39.5MHz; audio carrier: 33.5 MHz).
Detection of the IF signal into low frequency video and audio signals.
- BS 399 Luminance-chrominance and video amplifier p.c.b.
- This p.c.b. processes the complete composite video signal coming from the IF p.c.b. and supplies the R-G-B signals to the picture tube.
- BS 401 Audio p.c.b.
- This p.c.b. receives the audio signal (not adjusted in volume) coming from p.c.b. BS 398, it adjusts it in amplitude and tone, it amplifies it and sends it to drive the two receiver's loudspeakers (tweeter and woofer).
Through jack PR 201 it is possible to connect externally an auxiliary 2.7 Ohm loudspeaker with or without the exclusion of the internal loudspeakers. Furthermore, the p.c.b. transfers the audio signal (not adjusted in volume) to taperecorder and headphone jacks.
- No adjustments needed.
- BS 470 Mains filter p.c.b.
- The p.c.b. includes circuits relevant to: mains filter, degaussing, remote control supply, start remote control.
- No adjustments needed.
- BS 380 Power supply p.c.b.
- It includes circuits for clock supply and for switch-ON programming.
- No adjustments needed.

- BS417 Power supply p.c.b.
- It converts the mains voltage in DC voltage available at five outputs with values of: +200V; +150V; +27V (two outputs); +12.6V. These voltages are stabilized and separated from the mains.
- BS 397 Vertical deflection p.c.b.
- This p.c.b. generates a sawtooth voltage at frame frequency which is used for driving the vertical deflection yoke. It supplies a similar voltage to the "pincushion" section of the synchro. separator p.c.b. to obtain the E/W pincushion correction.
It supplies a frame frequency pulse which is used for the luminance, chrominance and video amplifier p.c.b. blankings. It receives the vertical synchro. from the synchro. separator p.c.b. and receives from the chassis a voltage proportional to the beam current.
- BS 396 Synchro. separator and pincushion correction p.c.b.
- The p.c.b. processes the video signal. Said process consists in separating the horizontal signals from the video composite signal. The "pincushion correction" section receives a sawtooth shaped signal and converts it into a parabolic shape for E/W correction.
- BS 395 Horizontal deflection p.c.b.
- This p.c.b. amplifies the pulse sequence at line frequency and drives a circuit operating as an ON-OFF switch for supplying the deflection current to the horizontal yoke. It also receives the parabolic signal which acts on the diodes modulator for E/W correction.
- No adjustments needed.
- BS 418 CRT p.c.b.
- It includes protection and matching circuits for the three signals (red, green and blue) with relevant voltage dischargers. In series to each signal circuit a switch is provided for black level adjustment.

The p.c.b. includes a cut-OFF circuit which stops the CRT luminous emission during the blanking phase.

BS385 Auxiliary outputs jacks
p.c.b.

- This p.c.b. receives the audio signal (amplified and volume adjusted) and supplies it to an auxiliary jack for private headphone listening. A non-volume-regulated signal is also supplied to a socket for taperecording. The headphones output complies to Standard DIN-45327 and has an impedance of 8 Ohm. The taperecorder output complies to Standard DIN-41524 and has an impedance of 47 kOhm.

No adjustments needed.

BS 387 IR preamplifier p.c.b.

- It converts IR pulses coming from the transmitter into electrical pulses. These are amplified and appropriately clipped.

No adjustments needed.

BS 389 Remote control receiver
p.c.b.

- It receives the command signals coming from the sequential programme pushbutton, it processes them and converts them into control signals. Tone and contrast controls also pass through this p.c.b., said control signals being fed from the control unit and being forwarded to the chassis.

No adjustments needed.

BS 405 Front control unit p.c.b.

- This p.c.b. includes potentiometers for volume, brightness, saturation, contrast, treble and bass. This p.c.b. also includes pushbuttons relevant to sequential control, AFC, automatic search, forward tuning, backward tuning, band and tuning indicating LEDs.

The display indicates the programme selected. Furthermore, this p.c.b. includes all pushbuttons for clock adjustment.

No adjustments needed.

BS 388 Tuning unit p.c.b.

- Automatic searching of a TV station through a start command. Manual searching of a TV station through two commands (increment and decrement). Inclusion-exclusion of the AFC circuit with LED display. Band indication displayed on three LEDs. Tuning level indication with five LEDs. Memorization of 16 selected programmes manually or with remote control.

No adjustments needed.

BS 414 a/b Remote control p.c.b.

- This p.c.b. enables remote control of the following functions: selection of 16 programmes; "+" or "-" volume adjustment; brightness and saturation adjustment; audio silencing; TV receiver ON/OFF switching.

No adjustments needed.

ADJUSTMENT PROCEDURE

PCB BS 398

Denomination : Tuner IF video/IF audio

Adjustment procedure for IF section

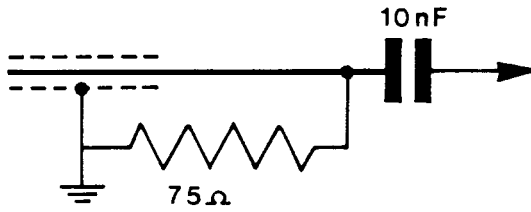
- Instruments used:
- 0 to 30V adjustable power supply.
 - 0 to 12V adjustable power supply.
 - 12.6V - 200 mA power supply.
 - Sweep generator, ≥ 10 MHz and markers at: 31.5, 33.5, 35.1, 36.5, 39.5, 41.5 and 37.1125 MHz for adjustment of output filter.
 - Dual trace oscilloscope - 10 MHz pass-band.
 - IF signal (video carrier 39.5 MHz and audio carrier 33.5 MHz) with 100% standard video modulation, bar modulating signal, 20% white level - 76% black level.
Audio carrier modulated at 1 kHz with ± 50 kHz of deviation at 50 μ s of preemphasis.
 - Voltmeter (15V setting).

Note: See legend of test points (TP) at the end of adjustment procedure.

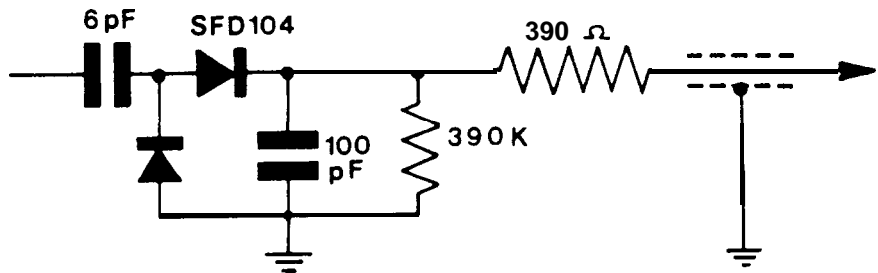
Preliminary operations:

- Supply the p.c.b. with 12.6V at terminal A 9.
- Adjust the varicap voltage to 26V (terminal B 1).
- Position the wipers of P 1 and P 2 towards earth so as to have connected the maximum resistance.

Connect the sweep generator with a probe (see figure below) to TP 1:



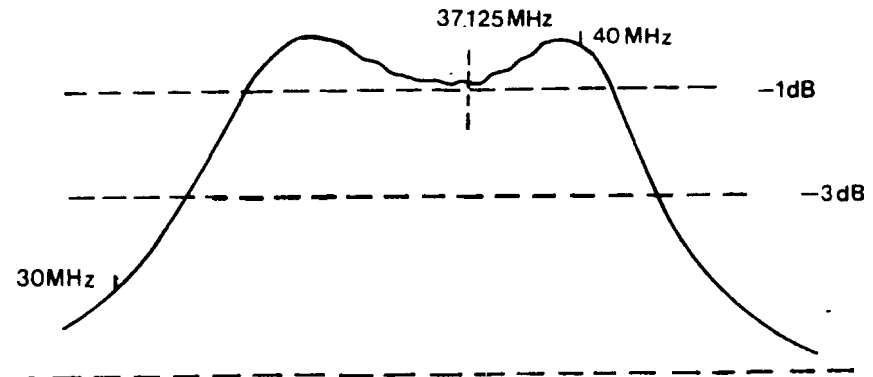
Connect a high impedance detector probe on collector of T6. See figure below:



ADJUSTMENTS

Adjustment of RF unit output filter

- 1 - Adjust L40 and L49 for a curve as that shown in figure, corresponding to best coupling and balancing:



- 2 - Disconnect the probe from collector of T6.

Adjustment of reference circuit

- 1 - Connect the oscilloscope's probe to video output (A 6).
- 2 - Connect the IF signal (complete of modulated audio) at 10 mV level on TP 1.
- 3 - Adjust L44 for minimum amplitude of demodulated signal, corresponding to the best response transients or to 2 T pulse.

Adjust the 6 MHz trap and the audio input filter

- 1 - Adjust L46 and L48 for lowest output of 6 MHz signal present in video signal.

Adjustment of audio quadrature coil

- 1 - Move the oscilloscope's probe to pin 8 TBA 120 U (LF audio output).
- 2 - Give a max. 12V bias to the volume control terminal A 2.
- 3 - Connect a 10 kOhm resistance between pin 13 of TBA 120 U and the +12V and read the DC voltage.
- 4 - Disconnect the 10 kOhm resistance.
- 5 - Adjust L47 until the DC voltage corresponds again to value measured previously.

Audio adjustment

- 1 - **Move** the oscilloscope probe to terminal A 3.
- 2 - Maintain on the TP 1 the IF signal with modulated audio carrier.
- 3 - Adjust P 2 so as to obtain on the A 1 terminal the signal
 $VA\ 3 = 2.2 \pm 0.2\ vpp = 0.78 \pm 0.07\ V\ RMS.$

AFC adjustment

- 1 - Bias the AFC output by means of two 100 kOhm resistances; one towards +12V and the other towards earth.
- 2 - Connect a voltmeter to AFC output pin A 12.
- 3 - Adjust L45 for an intermediate value (approx. 2V) in range of values that go from +12V to 0 V.

Adjustment of the AGC voltage for RF unit

- 1 - Connect a voltmeter to TP 5.
- 2 - With the signal at 15 mV video IF, adjust P 1 until voltage is reduced to 8V.

Correspondence between TP (test point) and wiring diagram

TP 5 = R50 - 51 node
TP 1 = L20 - 24 node

Denomination : Luminance-chrominance and video output amplifier.

Adjustment procedure

Preliminary operations

Check that the p.c.b. is correctly supplied: **+12.6V** \pm 250mV on contact F12; **+200V DC** \pm 10V on contact G5; **+2.2V DC** \pm 100mV on contact F1; 12 Vpp on contact F14; 160 Vpp on contact G2; 11 Vpp on contact F10.

Brightness and contrast controls to maximum (adjustment on remote control when provided).

Colour saturation to minimum.

Grey scale signal in antenna. Correct tuning.

Adjust black-level potentiometers **P105-P107-P109** to max. (clockwise)

Adjust gain potentiometers, **P104-P106-P108** to max. (anticlockwise).

Oscilloscope with attenuated probe on contact F2.

Check that the signal present on this point has a total width of 2.65 Vpp.

Operations

Oscilloscope's probe on red output (H4).

Adjust **P105** to set the reference level (see figure 4) to 170V DC.

Oscilloscope's probe on green output (H2).

Adjust **P107** to set the reference level to 170V DC.

Oscilloscope's probe on blue output (H1).

Adjust **P109** to position the reference level to 170V DC.

Colour bar signal in antenna. Correct tuning. Saturation to max.

Oscilloscope's probe on TP102. Apply a 1 V DC voltage to TP103.

Adjust **L101** for max. amplitude of signal displayed.

Suppress voltage applied to TP103.

Plug in jumper S103. Disconnect **SW102**.

Adjust C123 for minimum bar horizontal drift.

Disconnect S103. Reconnect **SW102**.

Test 3 signal (delay) in antenna.

Oscilloscope's probe on red output (H4).

Adjust **P103** and, if necessary, **L104-L105** so as to perfectly align the bottom portion of the signal displayed.

Test 2 signal (phase) in antenna.

Adjust **L102** for best superimposition of the two wave shapes displayed.

Grey-scale alignment

Grey-scale signal in antenna (or an equivalent signal). Saturation to minimum. Correct tuning. Disconnect **SW501**.

Slowly adjust P551 so as to obtain a horizontal line slightly lit (it's advisable to operate in low environmental lighting conditions). Keeping as reference the colour of the prevailing electron gun of this line, accurately adjust black-level potentiometers of the other two electron guns (P105 for red, P107 for green, P109 for blue) until the horizontal line is perfectly white.

Adjust P551 up to the point in which the white line fades out (cut-OFF).

Reconnect **SW501**.

If a predominance of a colour is noticeable on the screen, eliminate it by re-adjusting the black-level potentiometer of the relevant electron gun involved.

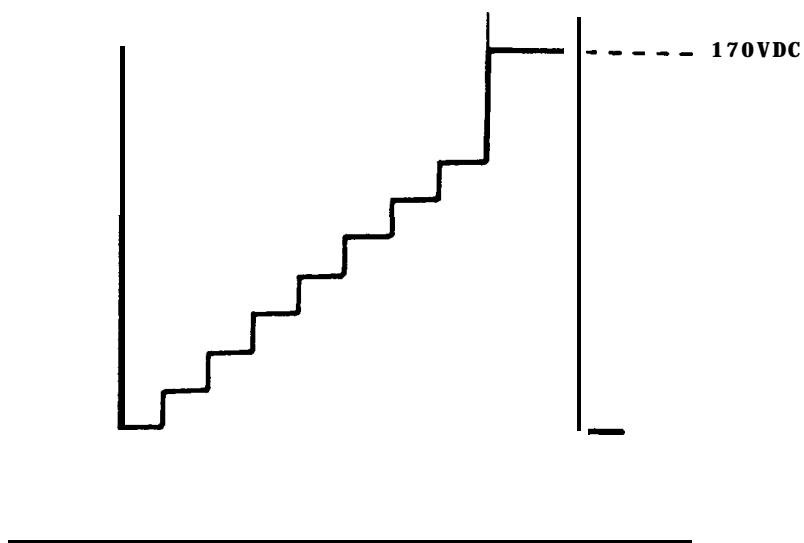


Fig. 4

PCB BS 396

Denomination : Synchro. separator and pin-cushion correction.

Adjustment procedure

Synchro. separator alignment

- With test picture to antenna and a jumper on S 401, adjust P 401 until the picture slowly drifts horizontally.
- Disconnect bridge S 401.

Pincushion alignment

- Adjust P 402 until the external vertical lines of the test picture are straight.
- Adjust P 403 to obtain a correct horizontal amplitude.

PCB BS 393

Denomination : Picture tube

Adjustment procedure

- SW 551-552-553 Switches for exclusion of picture tube electron guns.
- P 551 Grid 2 adjustment of picture tube.
- P 552 Focus adjustment.

PCB BS 417

Denomination : Power supply

Adjustment procedure

Adjust P 301 to obtain +150 V DC at terminal N 5.
Adjust P 303 to obtain +12.6 V DC at terminal N 1.
Make sure that voltage at terminal N 3 and N 4 is +27 V DC \pm 2% and, at terminal N 6, +200 V DC \pm 2%.

PCB BS 397

Denomination

: Vertical deflection

Adjustment procedure

Test signal in antenna.

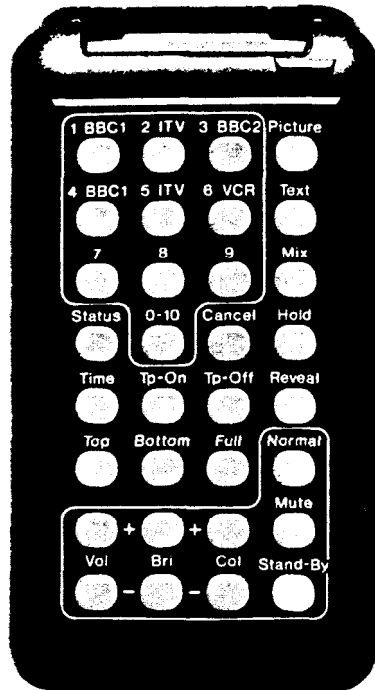
Adjust P 352 to obtain a correct frame synchronization.

Grossly adjust vertical centering (P354), vertical amplitude (P353) and linearity (P 351).

Adjust P 354 for correct picture centering.

Adjust P 353 to obtain a correct vertical amplitude.

Adjust P 351 to obtain the best vertical linearity.



TELETEXT FUNCTIONS

- TEXT - Switches the system into the teletext mode MIX - HOLD - BOTTOM - CANCEL and STATUS become operative. The commands for the brightness, volume, saturation, muting in the Text mode are all operative and this is useful in MIX and CANCEL operations.
- MIX - Superimposes teletext on to normal television programme on the screen.
- REVEAL - This command displays concealed information as long as the button is depressed. (Used for quizzes, puzzles etc.)
- TP-ON - This allows an "Alarm Page" to be received at a predetermined time. Select the page number required and press TP-ON. TO000 will appear at the top right hand corner of the screen. Select the required "Alarm Time" using the numbered keys. The figures will appear in white.

Press the CANCEL button and the normal TV programme will return with the Teletext page Header superimposed for 5 seconds. At the selected alarm time, the alarm page header will re-appear. This page remains stored in the memory until the TP-OFF command is pressed.

TP-OFF - Cancels TP-ON

HOLD - To retain the page selected. Hold will appear written in green at the top right hand side of the screen. To cancel the command press TEXT - MIX - TP-OFF - CANCEL.

TOP - Displays the top half of the page in large characters.

BOTTOM - Displays the bottom half of the page in large characters. Commands TEXT - HOLD - TP-ON - TP-OFF restore the mode into the upper half page.

FULL - Restores the character size to normal.

CANCEL - This command suppresses the TEXT display, restores Video picture while the system remains in Teletext mode, giving the possibility of selecting:

- Pages - using TP-ON

- Alarm pages

- TEXT and MIX will cancel the command.

PICTURE - Returns to TV picture from Teletext mode.

1 -10 - Numbered keys (1-0/10) serve to select pages (3 digits) - time (4 digits). If figures are incorrectly entered, the full sequence must be completed before re-entering correct figures.

STATUS - If in Video mode, the Station identity will be displayed for 5 seconds. In the Teletext mode, the page number is replaced by the station identity for 5 seconds.

Transistors used on teletext p.c.b.

<u>Transistors</u>	Type	<u>Electronic functions</u>
T 1	BC 548 B	Video preamplifier
T 2	BC 548 B	Video preamplifier
T 3	BC 548 B	Video input signal switch
T 4	BC 548 B	T3 switch enabler
T 5	BC 548 B	Teletext synchro. switch
T 6	BC 548 B	Synchro. signal emitter follower
T 7	BC 548 B	Command inverter
T 8	BC 548 B	B signal emitter follower
T 9	BC 548 B	G signal emitter follower
T 10	BC 548 B	R signal emitter follower
T 11	BC 548 B	Blanking signal emitter follower
T 12	BC 548 B	Brightness signal emitter follower

ICs mounted on teletext p.c.b.

<u>ICs</u>	<u>Type</u>	<u>Electronic functions</u>
CI 1	μ A 78 M12 C	12V stabilizer
CI 2	μ A 78 M05 C	5V stabilizer
CI 3	SAA 1272 A	Programmable adaptor for teletext
CI 4	SAA 5030 - VIP	Teletext video processor
CI 5	SAA 5041 - TAC	Teletext acquisition and control circuit
CI 6	SAA 5020 - TIC	Teletext timing chain circuit
CI 7	SN 74 LS02N	Two-input NOR
CI a	SN 74 LS 83 AN	4 bit adder
CI 9	SN 74 LS 161 AN	4 bit synchro. counter
CI 10	SN 74 LS 161 AN	4 bit synchro. counter
CI 11	MCM 21 L 14 C 45	4096 bit static RAM
CI 12	MCM 21 L 14 C 45	4096 bit static RAM
CI 13	SAA 5050 TROM (GB)	Teletext ROM character generator

BS 489 Teletext p.c.b.

This p.c.b. performs the following main functions:

- it receives the teletext information from video signal (digitally transmitted during the vertical blanking interval;
- it decodifies the teletext information and transfers data into memory (CI 11 and CI 12);
- it generates timing signals for displaying and reading data stored in memory (CI **6**);
- It converts data retrieved from memory into video signals to be forwarded to the CRT (CI 13);
- it supplies blanking and synchro. pulses to be forwarded to the TV set synchro. separator when teletext information is displayed. The p.c.b. is supplied with +5V and +12V.

TELETEXT-DECODER ADJUSTMENT

The teletext p.c.b. requires three alignment operations which are all relevant to the video input processor SAA 5030. These alignment operations eliminate influence of tolerances both of video input processor and of its peripheral components. The adjustment procedure need not be repeated any more until no component substitutions are carried out and until the same video input processor is used.

1. Adjustment of the chronological position (phase) of synchro. pulses

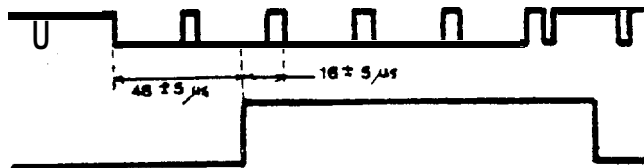
Cronological position (phase) of vertical synchro. pulses supplied by the video input processor SAA 5030 is adjusted through trimmer **P1T**. The video signal phase (**TP8**), and in particular the portion including the vertical synchro. signal must be compared on the oscilloscope against the output signal taken from contact 13 of IC SAA 5030 (**TP 10**).

The trimmer is adjusted so as to delay the leading edge of the video signal pulse (on contact 13) $48 \pm 5 \mu\text{s}$ with reference to the start of the vertical synchro. signal (wide pulses).

This position is shown in Fig. 1.

The leading edge of the vertical synchro. pulse must thus be at $3/4$ of line on line 1 and at a $1/4$ of line on line 314 of video signal.

Video input signal



Vertical synchro. pulse
from contact 13 of
IC SAA 5030

Fig. 1 - Adjustment for correct positioning of vertical synchro. pulse.

2. ADJUSTMENT OF QUARTZ CONTROLLED FREQUENCY

A Method

The free running frequency of the oscillator is adjusted by means of a capacitive trimmer C26T connected in series with the quartz.

The oscillator is free running when pin 1 of SAA 5030 circuit is directly connected to +12 V (jumper between TP1 and TP2) and pin 7 is connected to +12 V via a 5.6 M Ohm resistance (jumper between TP3 and TP4).

Video signal (TP8) on oscillator is compared against sand-castle pulse present on Pin 5 of SAA 5030 (TP 7).

Capacitive trimmer is adjusted so as to maintain ratio between the two signals unchanged (i.e. find the position in which relative shift between the two waves is less emphasized).

Remove again shortcircuiting jumper and 5.6 M Ohm resistance.

Oscillator free running frequency is increased by means of this resistance from approx. 0.5 kHz to over 6 MHz, this assuring that signal quality detector provided in circuit SAA 5030 operates in the best manner.

B Method

For capacitive trimmer adjustment it is also possible to use the same teletext reproduction.

Once again it is necessary to connect the short circuiting jumper and the 5.6 MHz resistance as described above.

By means of remote control the teletext decoder is switched to mixer operation.

Page memory does not necessarily have to be occupied with a teletext page, but it is possible to use randomly selected characters contained in memory which are sufficient for adjustment by means of reproduction on the screen.

Capacitive trimmer is adjusted so that characters occupy a fixed position on the screen.

Remove once again the shortcircuiting jumper and the 5.6 MHz resistance.

If, by means of capacitive trimmer adjustment, characters do not reach a condition of rest, it is sufficient to adjust for minimum character shift.

3. ADJUSTMENT OF OSCILLATING CIRCUIT COIL FOR DATA CLOCK

- A) Tune to a TV station having teletext signals; the signal must be sufficiently strong ($>1\text{mV}$) and free of reflections and interferences of a certain intensity.
Select a teletext page with continuous data renewal and damp signal until a few errors appear.
Adjust L4T so as to make character errors disappear or for the least number of them.
- B) Use a teletext generator having a pseudo-random sequence.
Connect the oscilloscope's probe to pin 18 of SAA 5030 (CLOCK output) and synchronize it externally with clock signal of teletext generator.
Adjust L4T for a stable clock signal.
Final check.
Select page III; check for completeness and exactness of the heading line and of page characters.
Check functions of TELETEXT transmitter.

Testing of teletext p.c.b.

1) Check supplies:

- a) $12\text{V} \pm 5\%$ (TP6); 280 mA
- b) $5\text{V} \pm 5\%$ (TP5); 380 mA

2) Test transcoder and transmitter

Depress in TV mode some programme selecting controls and check exactness on display.
Always in TV mode visually check efficiency of analogical controls (brightness, colour, volume muting, normal setting).
Check in text mode efficiency of all controls.

ADJUSTMENT OF RGB LEVELS ON TELETEXT P.C.B

Adjustment must be carried out before "white adjustment".

- 1) Adjust P4T and P3T on R and G so that characters reach the 100 V DC level.
- 2) Adjust P2T on B so that the character reaches the 110 V DC level.

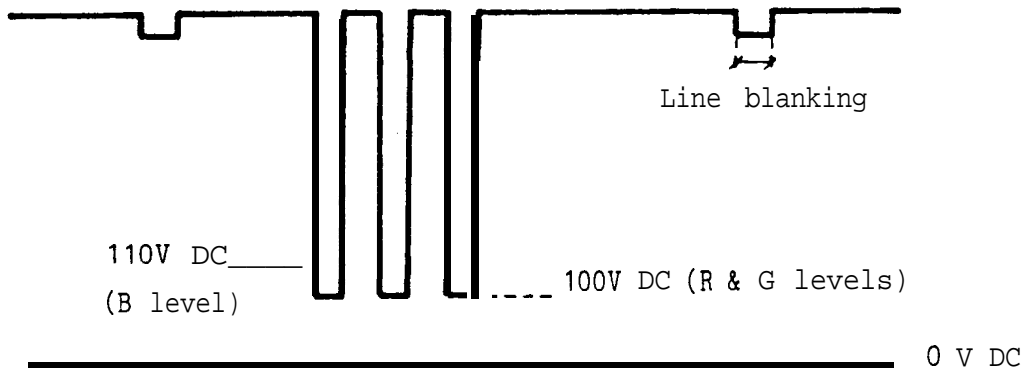


Fig. 2

After white adjustment visually inspect that white characters have correct tint, otherwise, retouch one or two of the potentiometers P2T, P3T and P4T (reducing amplitude of dominant colours) so as to obtain characters having correct white.

PRODUCT SAFETY NOTICE

Although the main chassis is insulated from mains, part of the power supply chassis bears mains voltage. This therefore should not be connected to earth during servicing.

Do not install, remove, or handle the picture tube in any manner unless shatter-proof goggles are worn. People not so equipped should be kept away while picture tubes are handled. Keep picture-tube away from the body while handling.

Before returning a serviced receiver to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the instrument by the manufacturer has become defective, or inadvertently defected during servicing.

Therefore, the following checks are recommended for the continued protection of the customers and service technicians.

INSULATION

Insulation resistance should not be less than 2 MOhm at 500 V DC between the mains poles and any accessible metal parts.

HIGH VOLTAGE

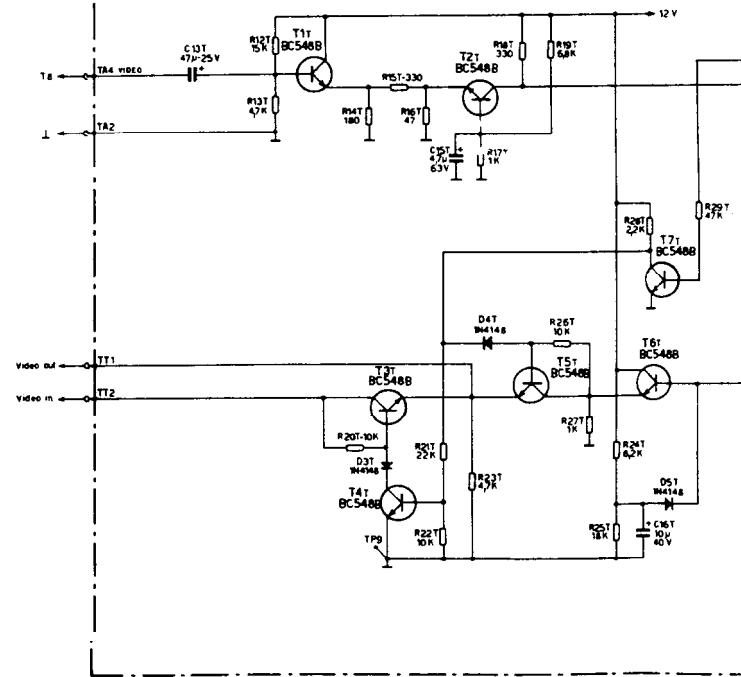
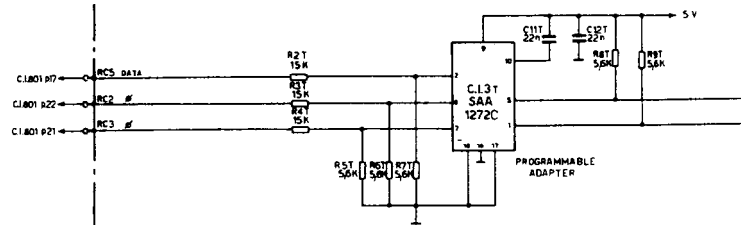
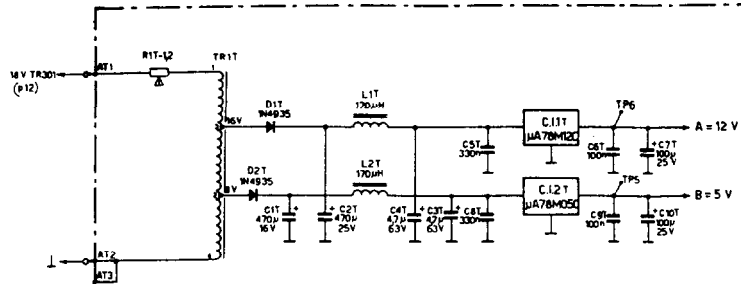
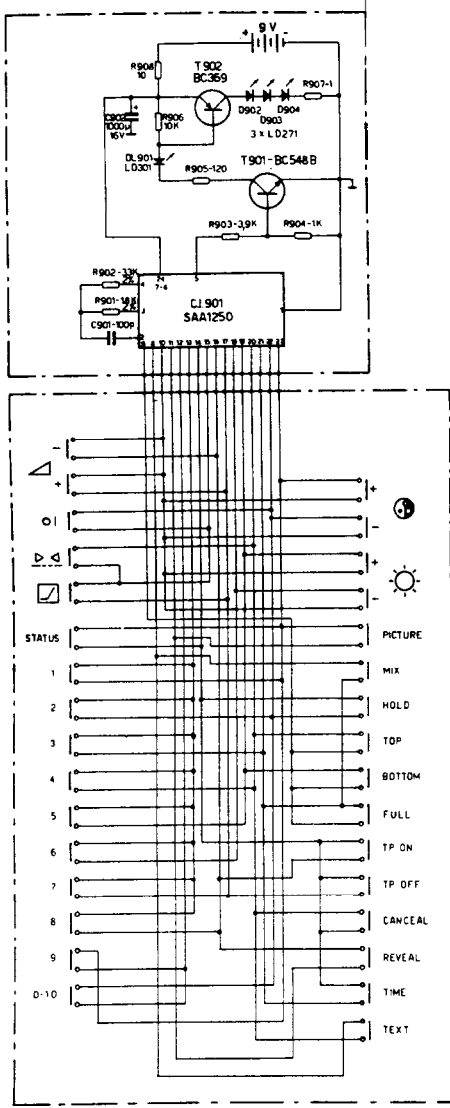
High voltage should always be kept at rated value of the chassis, no higher. Operating at higher voltage may cause a failure of the picture tube or of high voltage supply.

Furthermore, in no case whatsoever must the electrical circuit providing the EHT be altered so as to prevent wrong voltage values from causing ionizing radiations above those allowed by international standards.

REPLACEMENT OF COMPONENTS

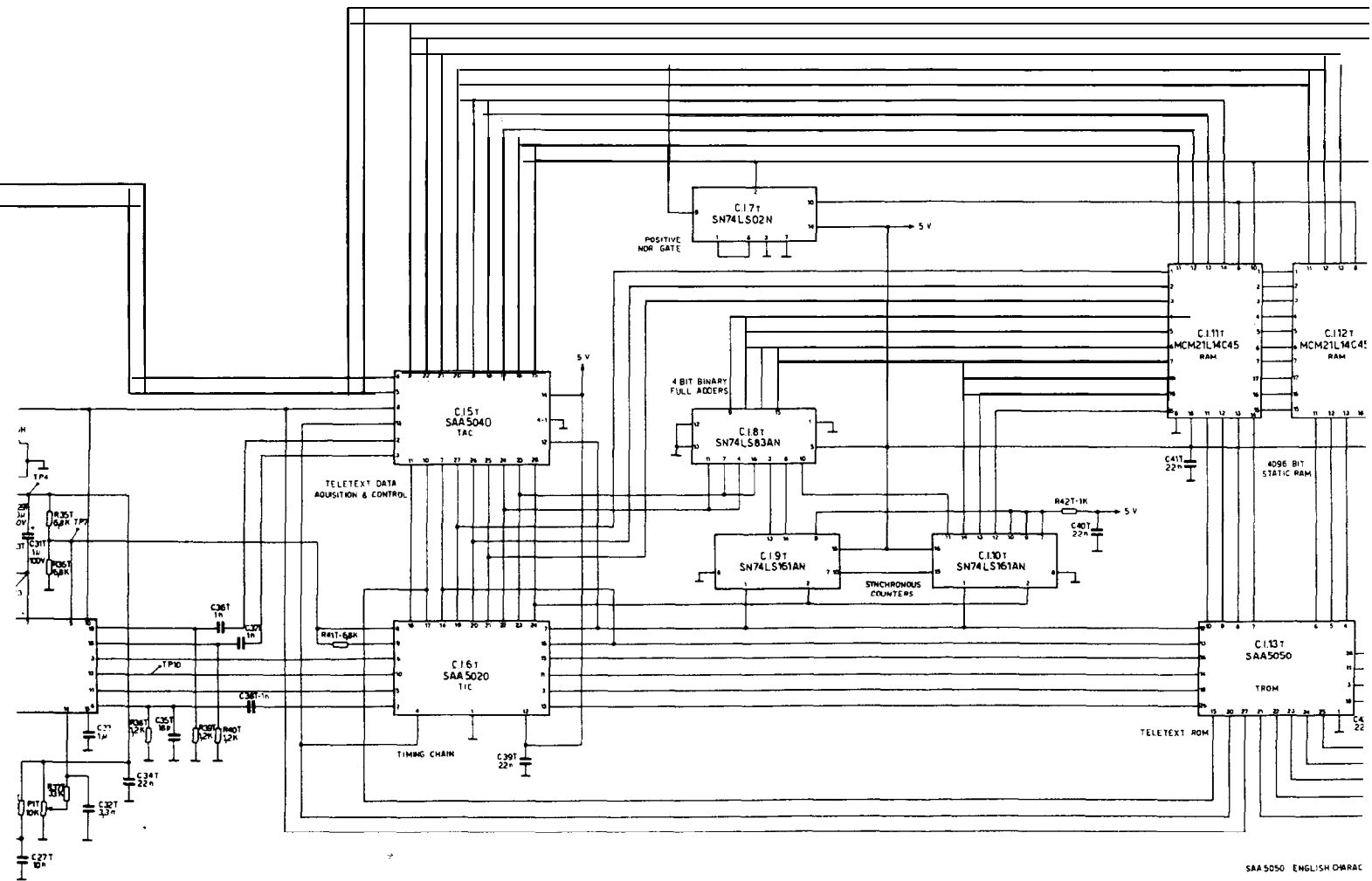
Some electrical components have special safety related characteristics which are indicated on schematic diagram by the "⚠" mark.

Therefore, all components provided with this mark must be replaced with original ones and their assembly must comply with the original assembly.

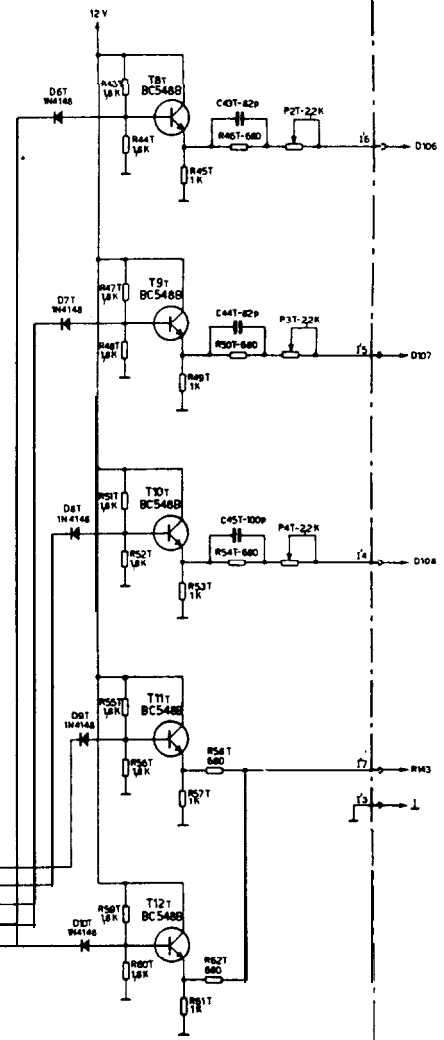
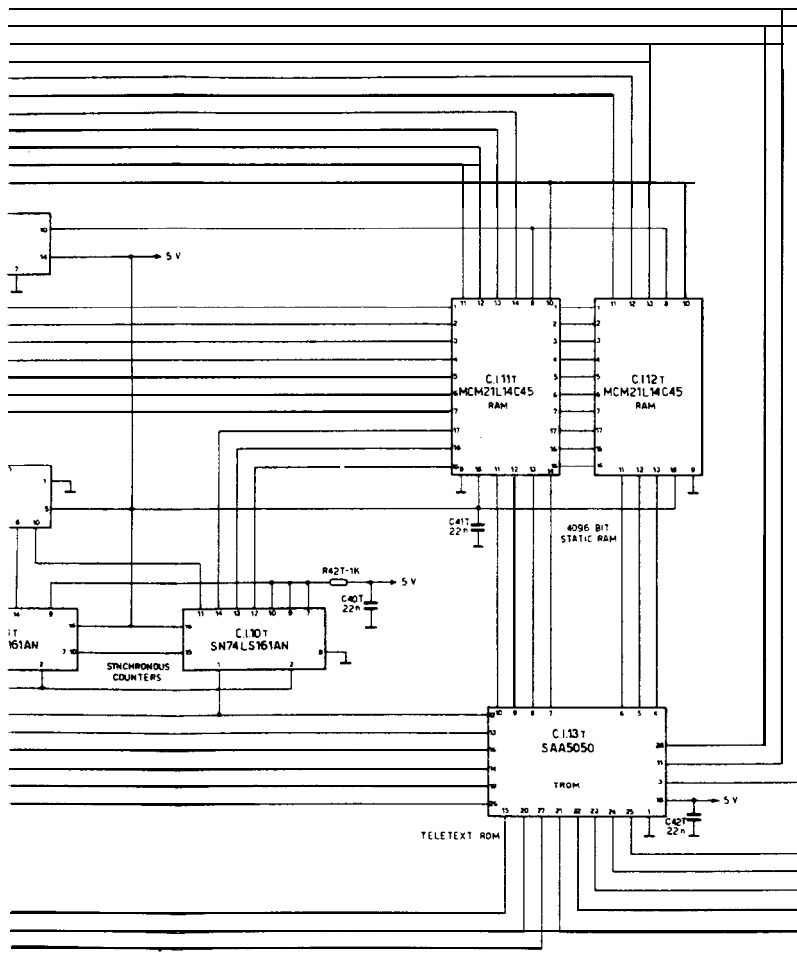


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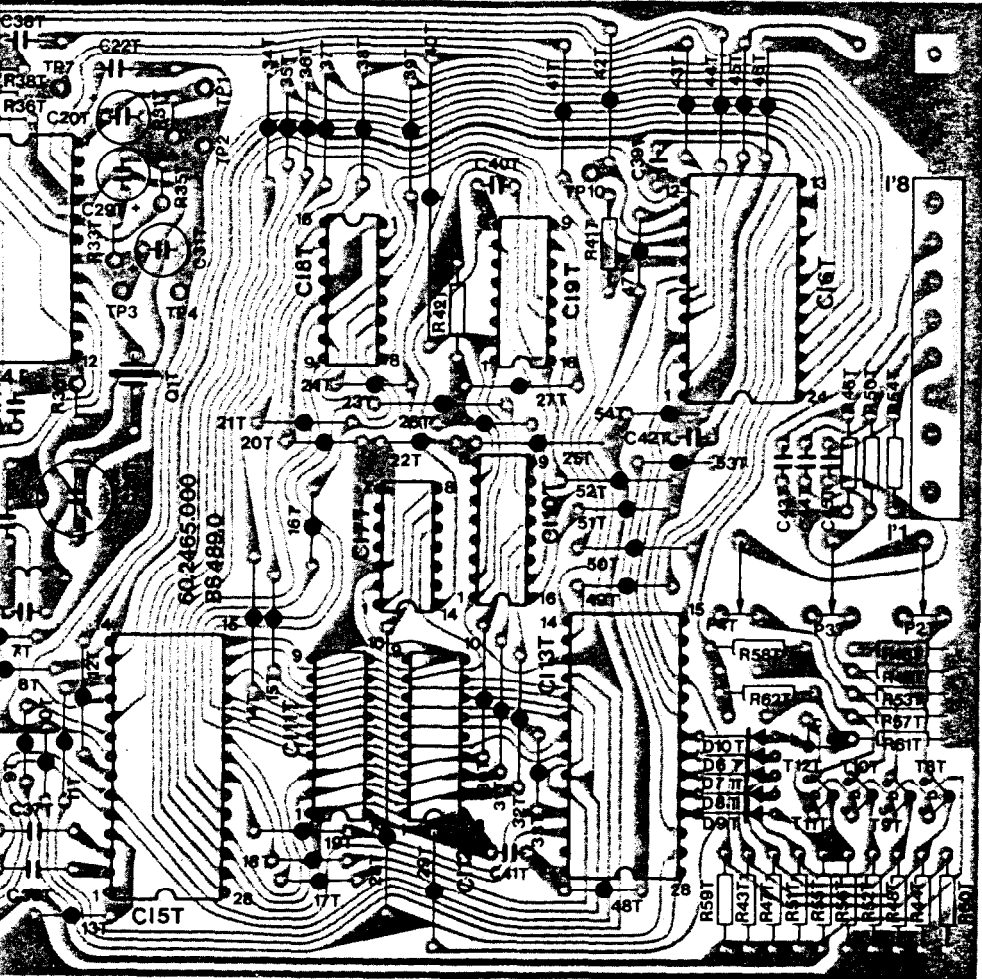
Teletext - printboard

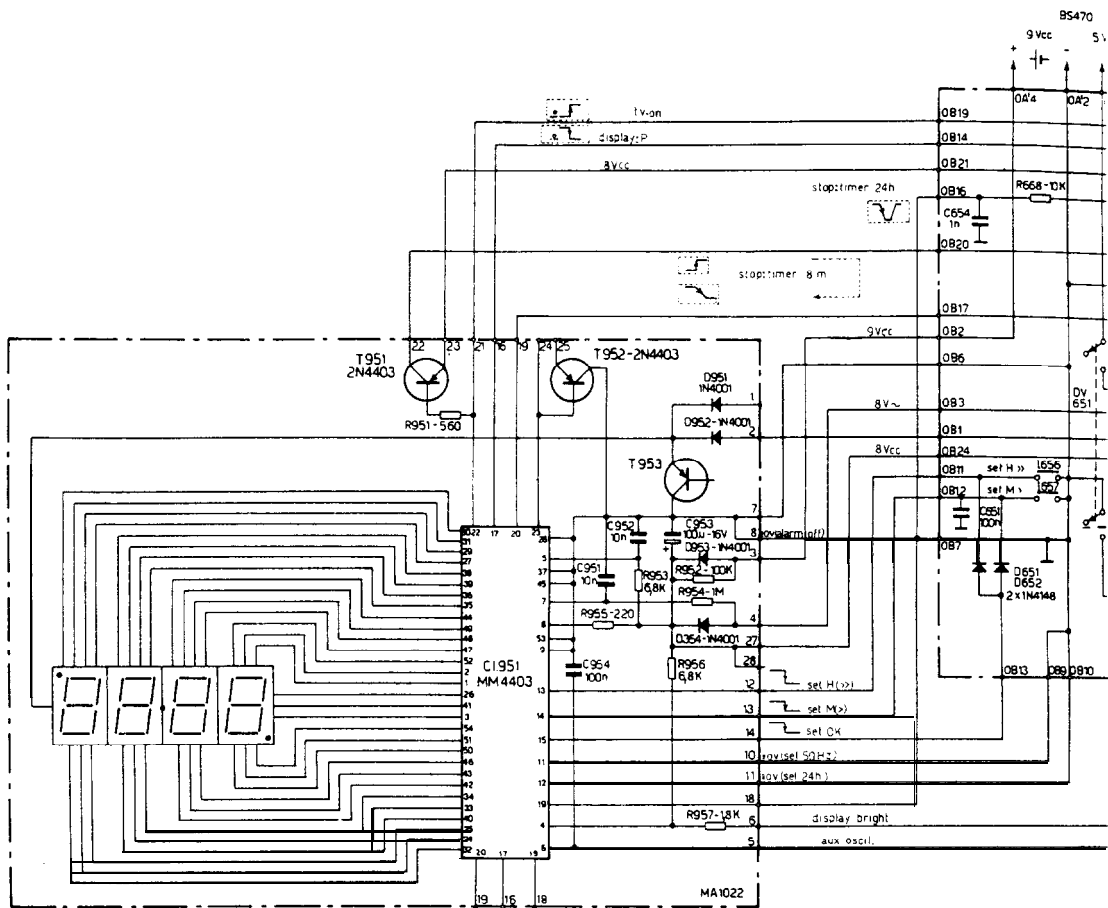


SAA5050 ENGLISH OMRAC
 SAA5051 GERMAN OMRAC
 SAA5052 SWEDISH OMRAC

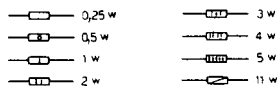


SAA5050 ENGLISH CHARACTER SET
 SAA5051 GERMAN CHARACTER SET
 SAA5052 SWEDISH CHARACTER SET



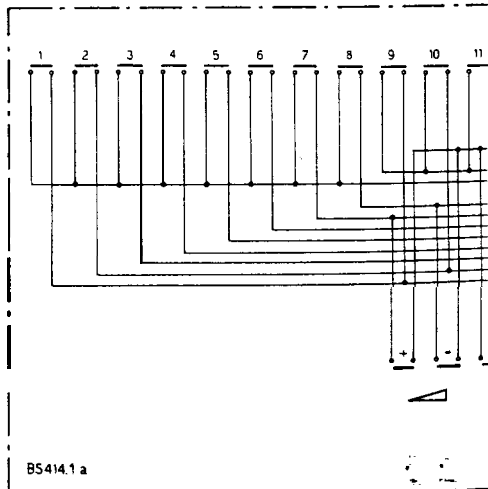


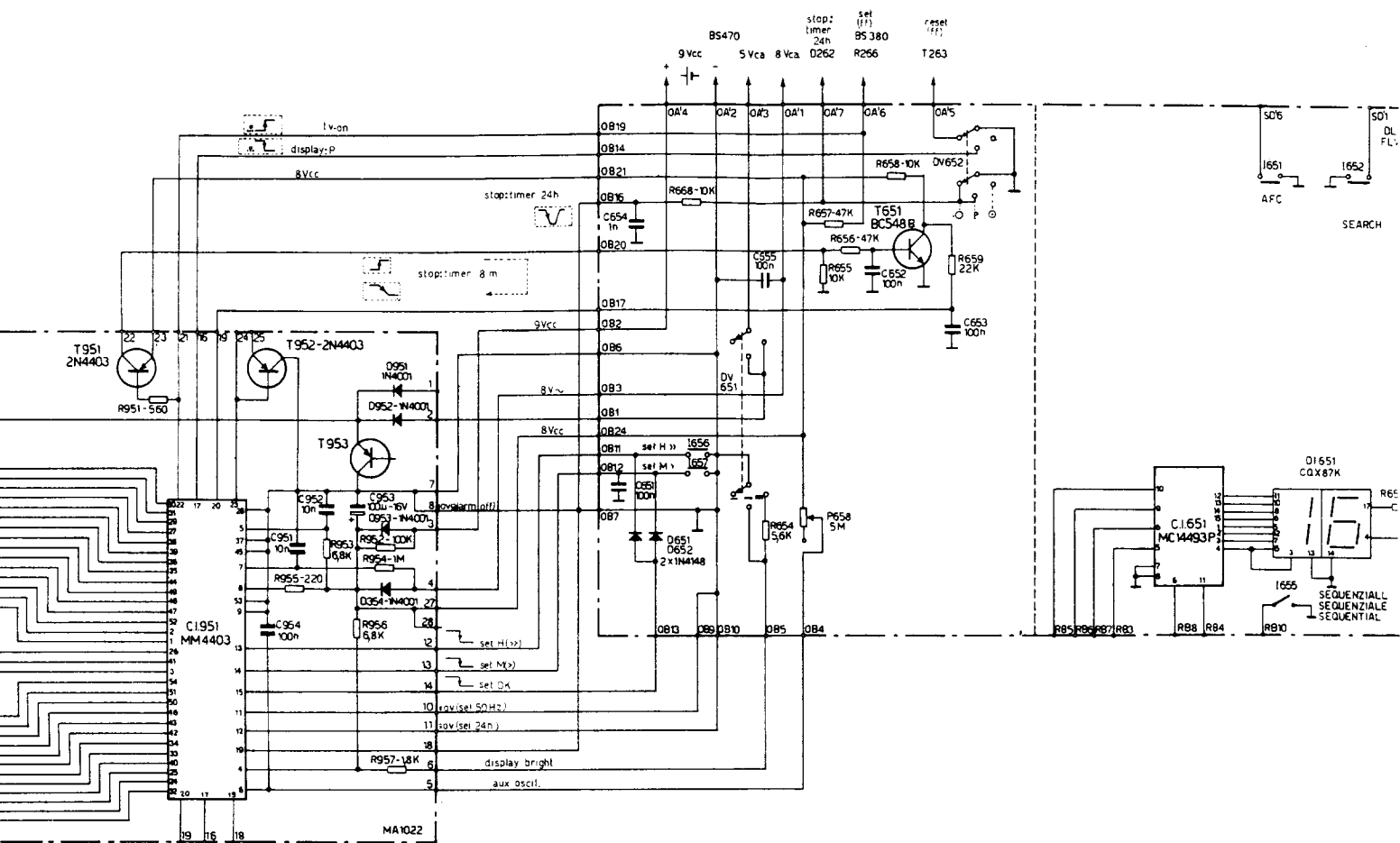
All resistors without marking are 1/4w 5%. All measurements are referred to ground with mains supply 240V, correct picture and a voltmeter of 20000 A/V



Oscillograms in the short dashes lines represent dynamic situations

The components marked by this symbol Δ are essential for reasons of safety and may be replaced only with genuine spare parts. After carrying out a repair make sure that the electrical and mechanical characteristics have not been modified accidentally.



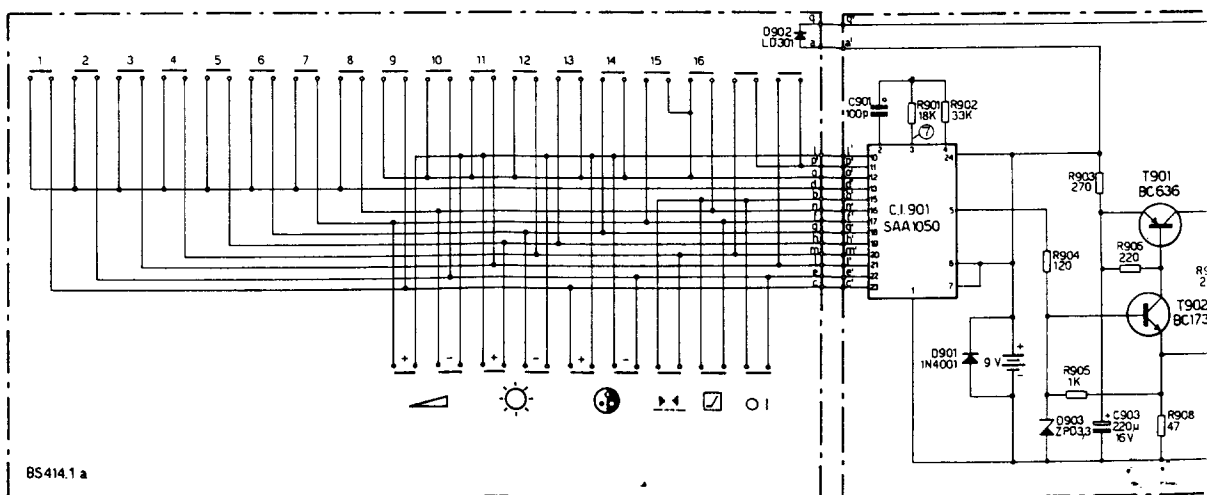


All measurements are referred to ground with
voltage of 20000 A/V.

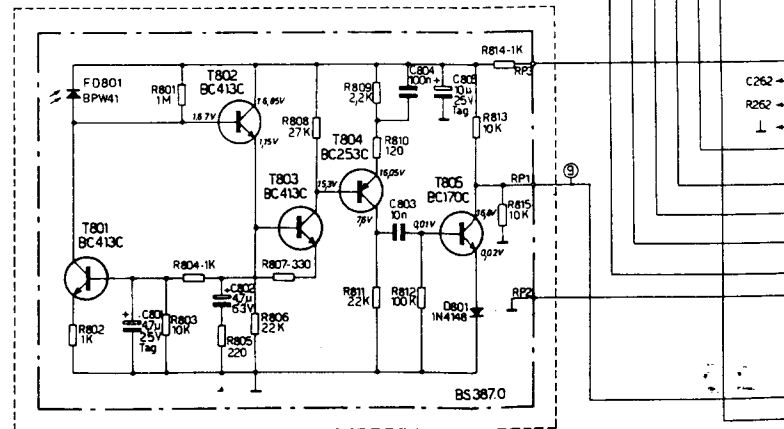
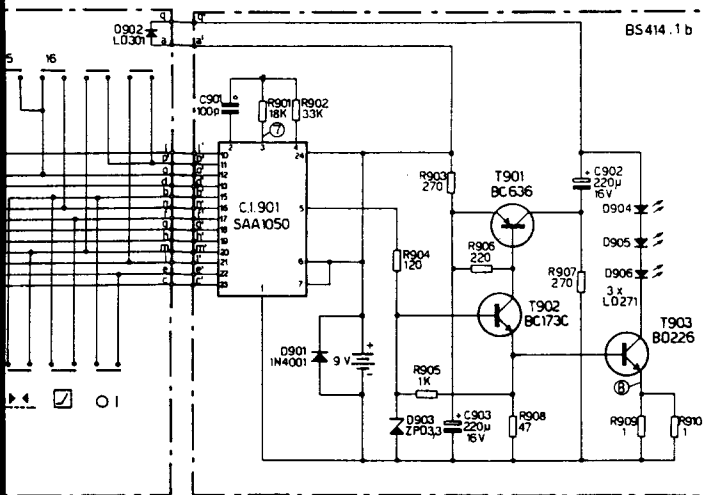
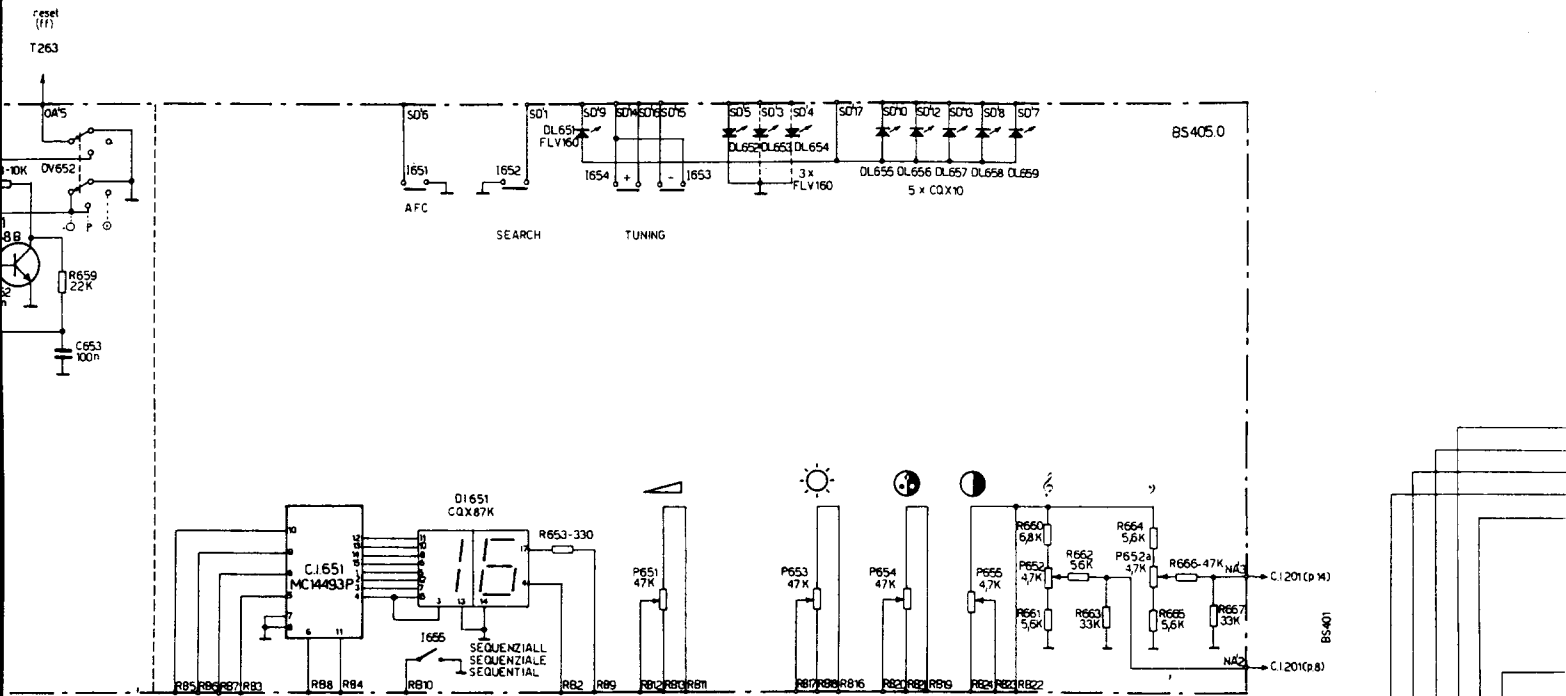


represent dynamic situations

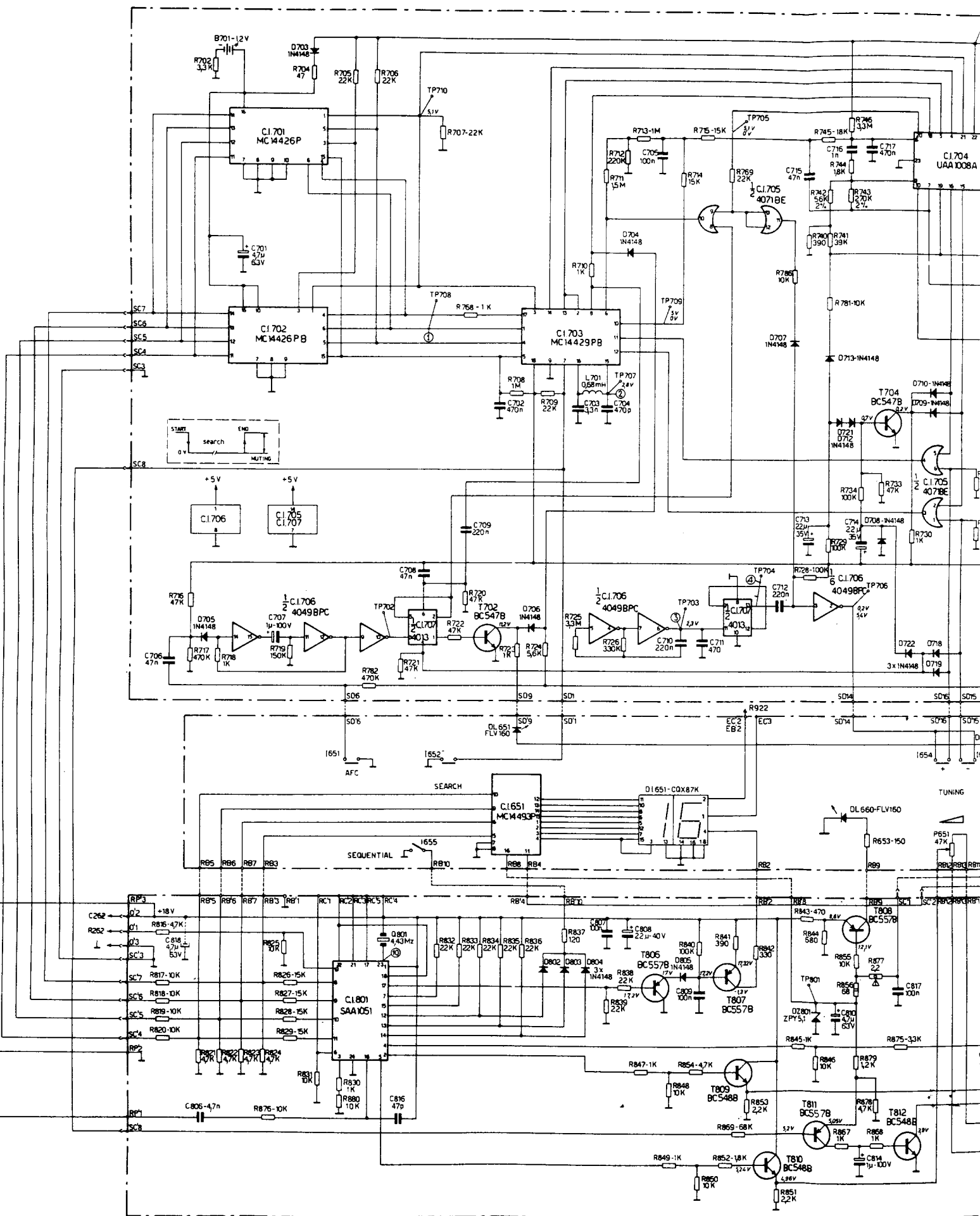
essential for reasons of safety and may be replaced
out a repair make sure that the electrical and mechanical
italy.

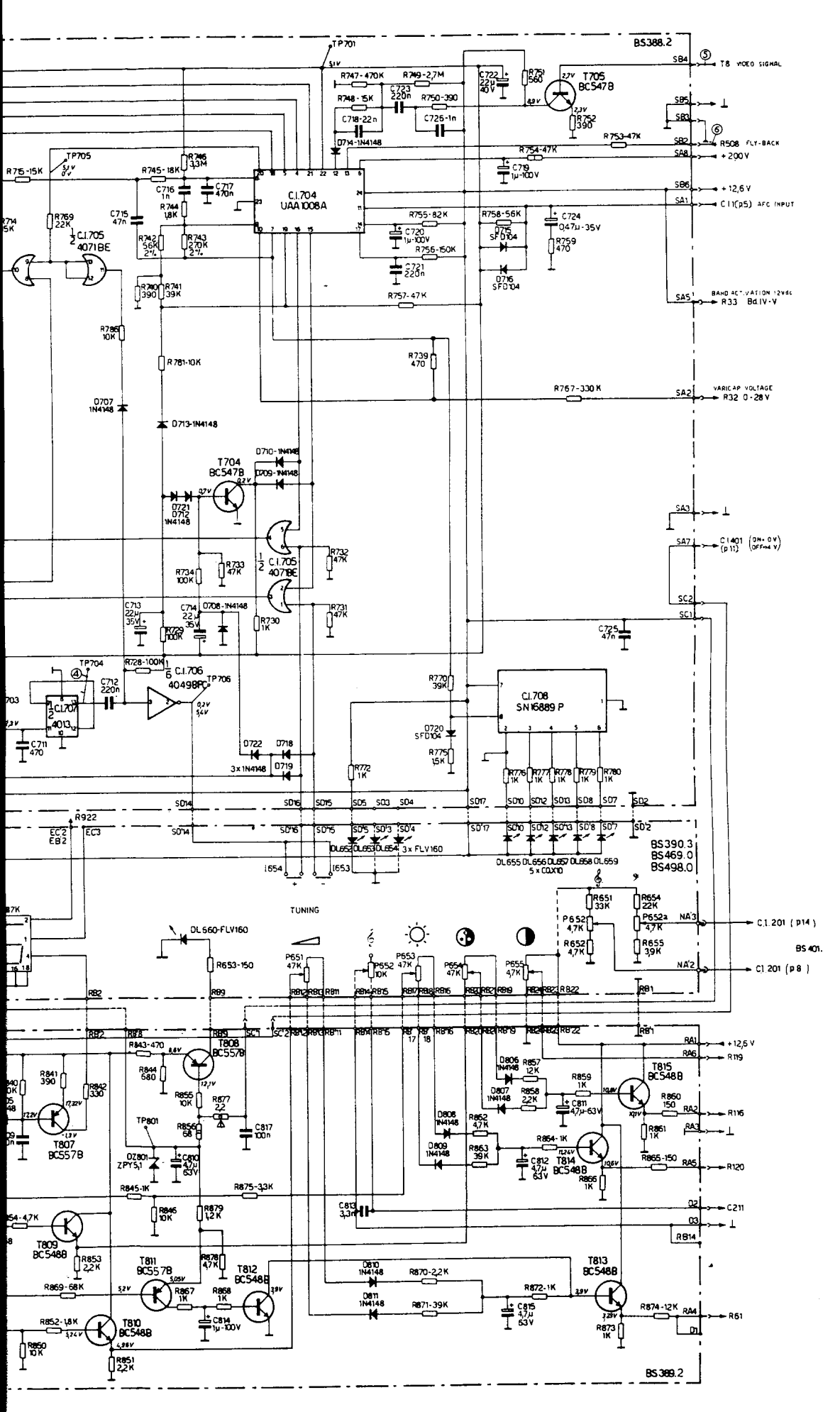


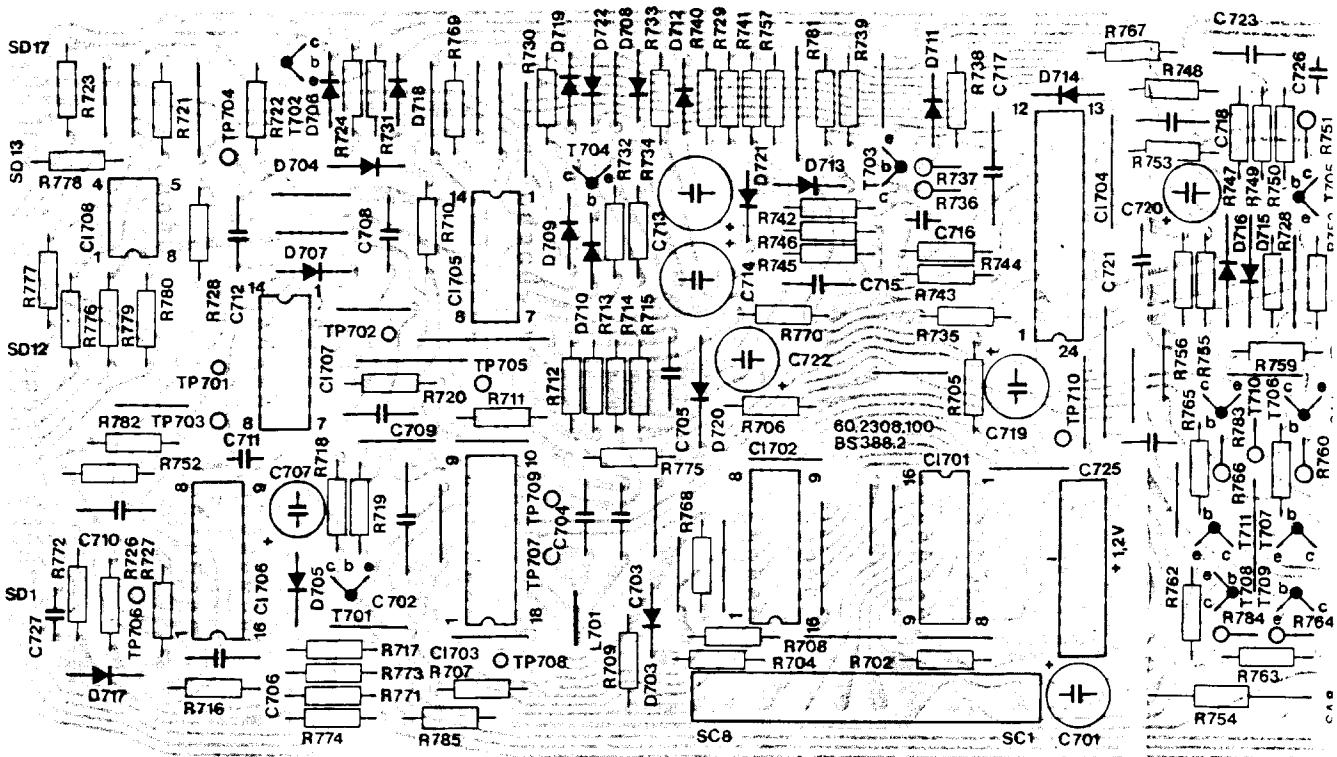
Infrared remote control & electronic tuner



onic tuning

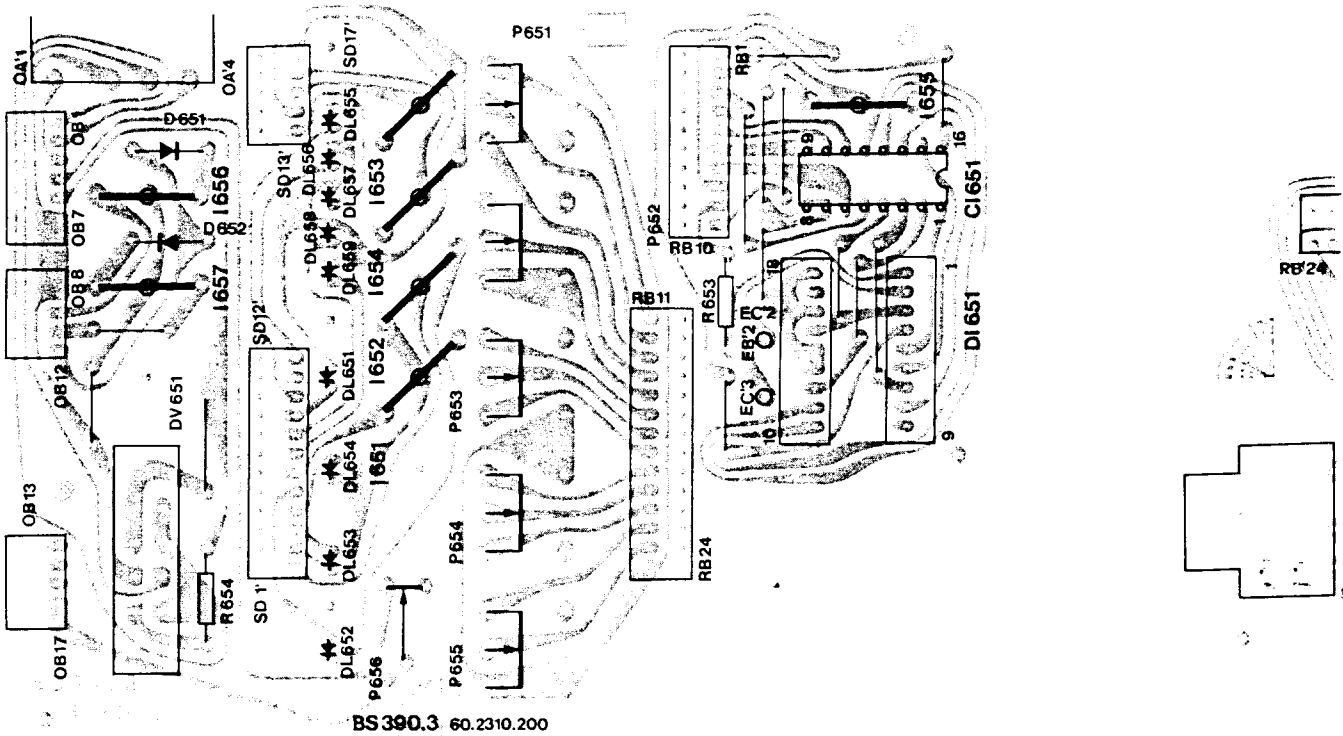


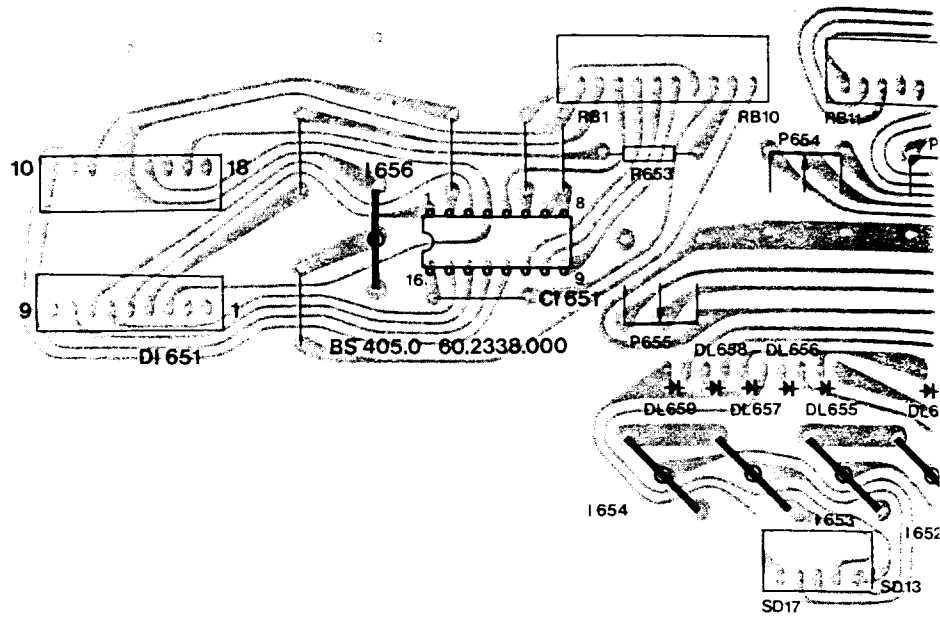
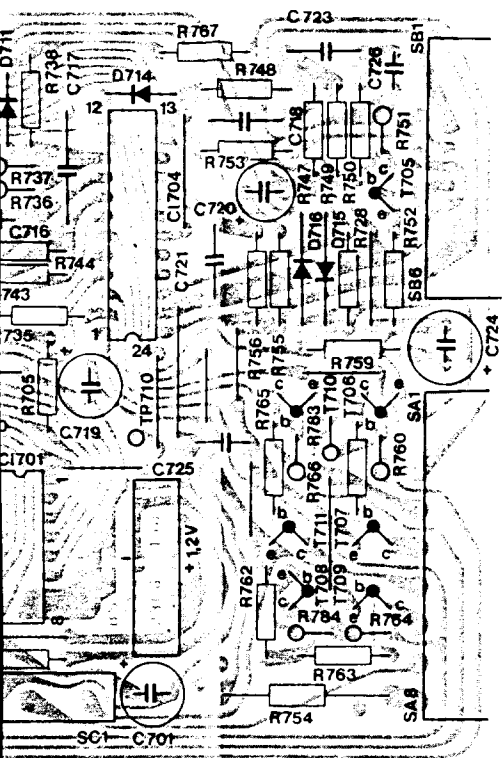




Electronic tuning printboard BS 388.2

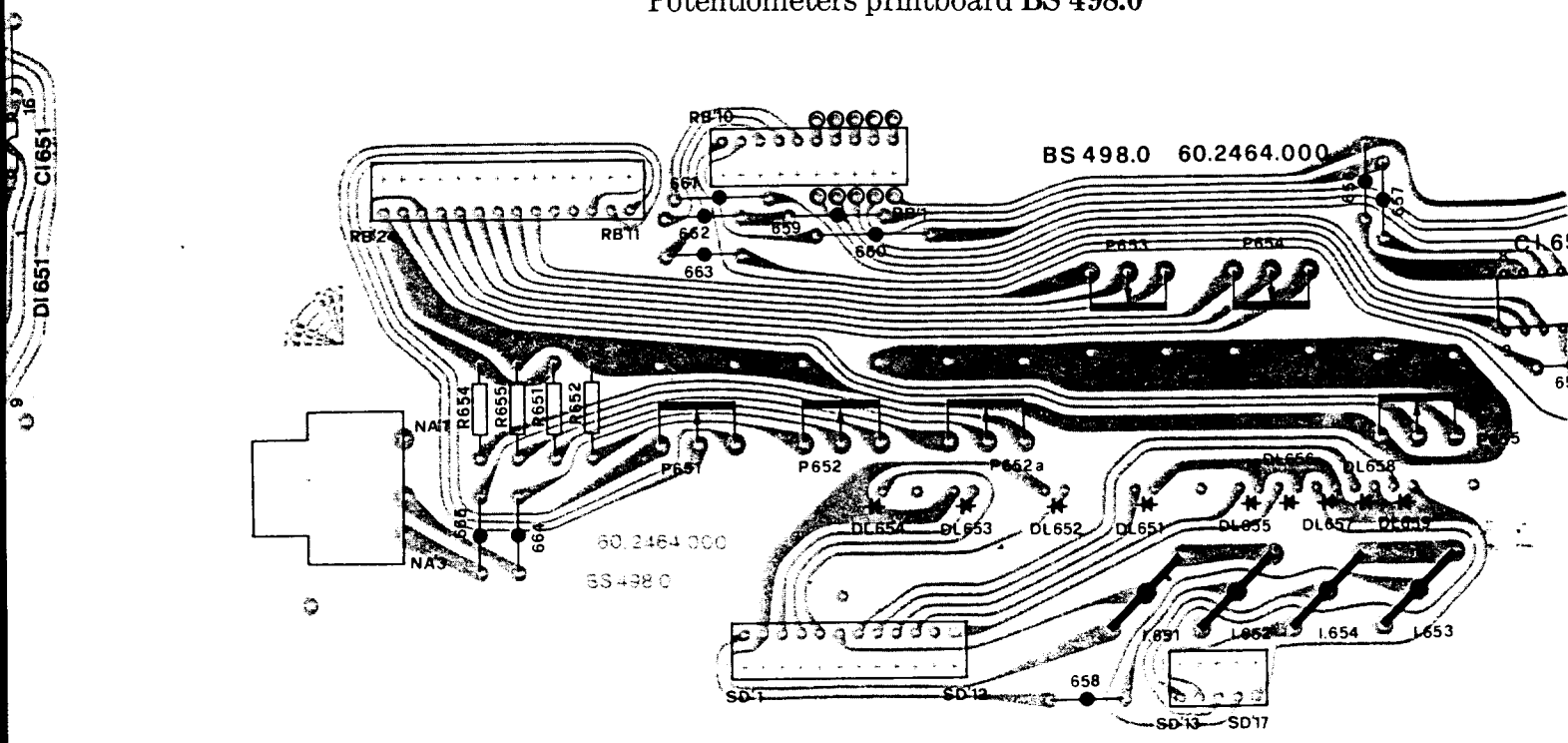
Controls & display printboard BS 390.3

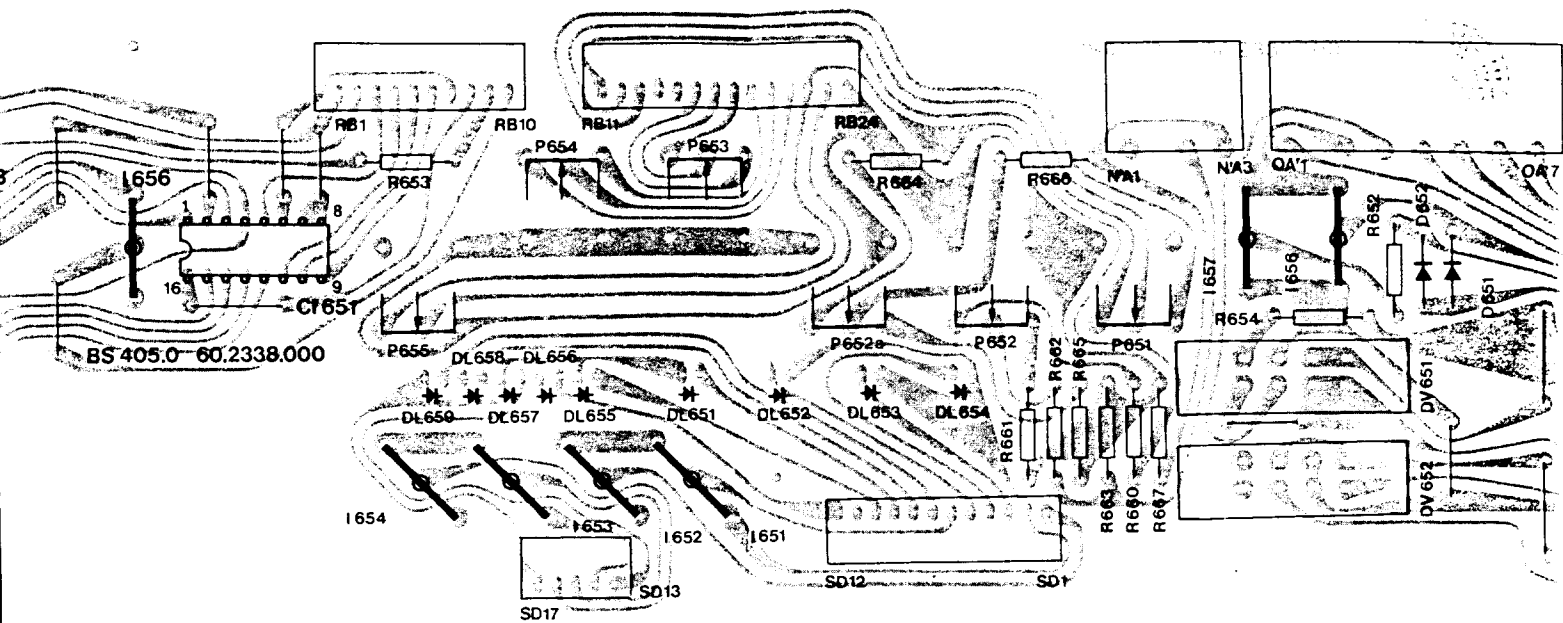




Controls & display printboard BS 405.0

Potentiometers printboard BS 498.0



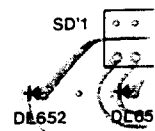
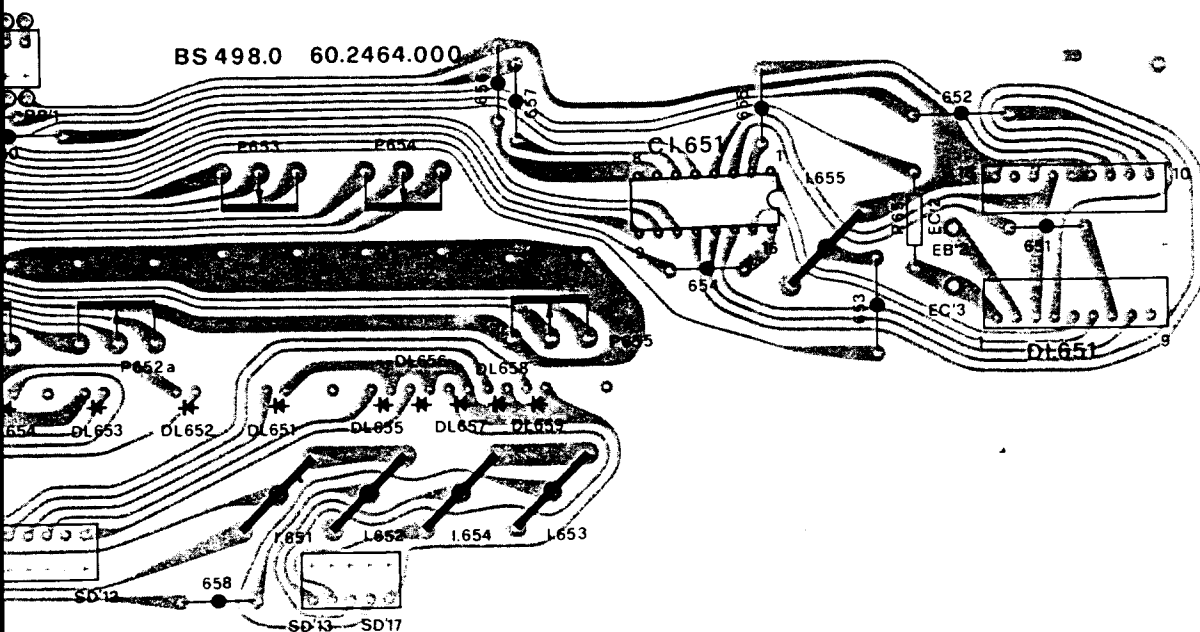


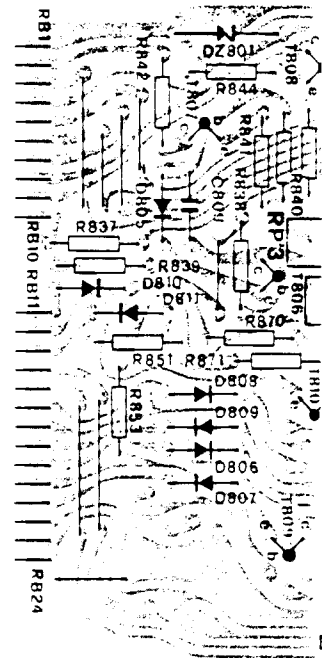
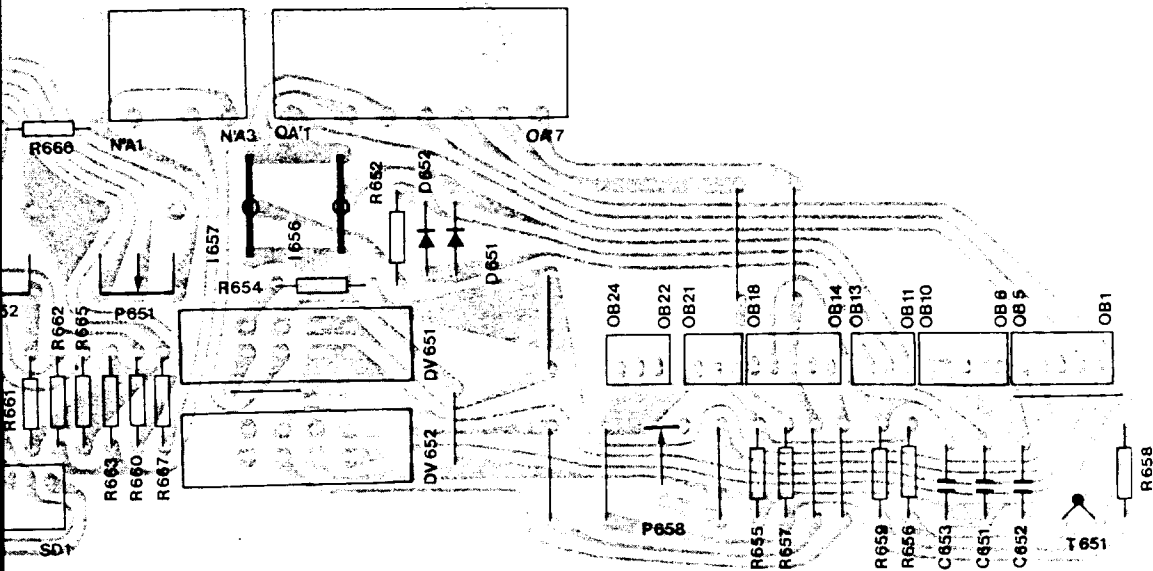
ay printboard BS 405.0

Potentiometer

BS 498.0
60.2418.000

printboard BS 498.0

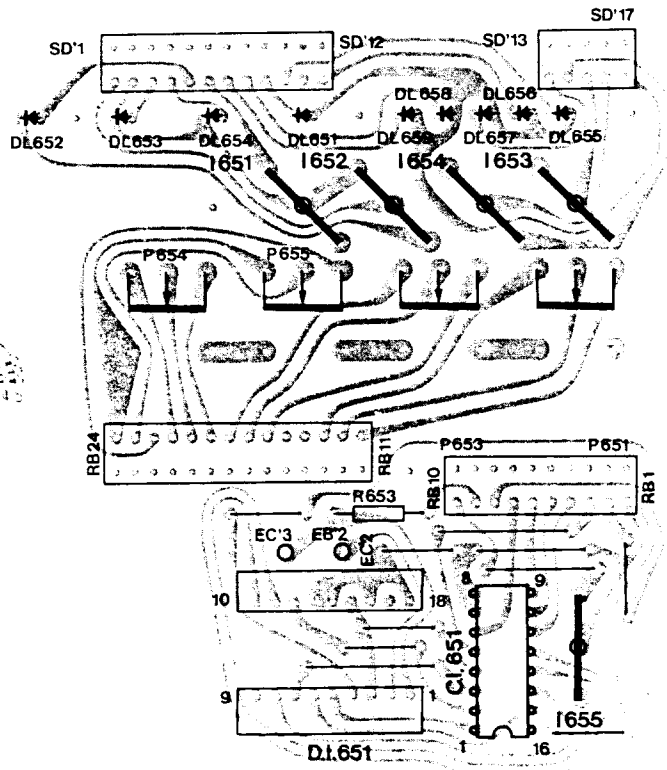




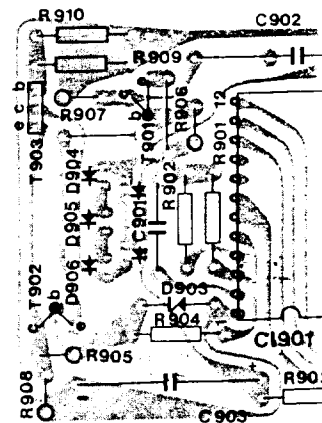
Remote control receiver

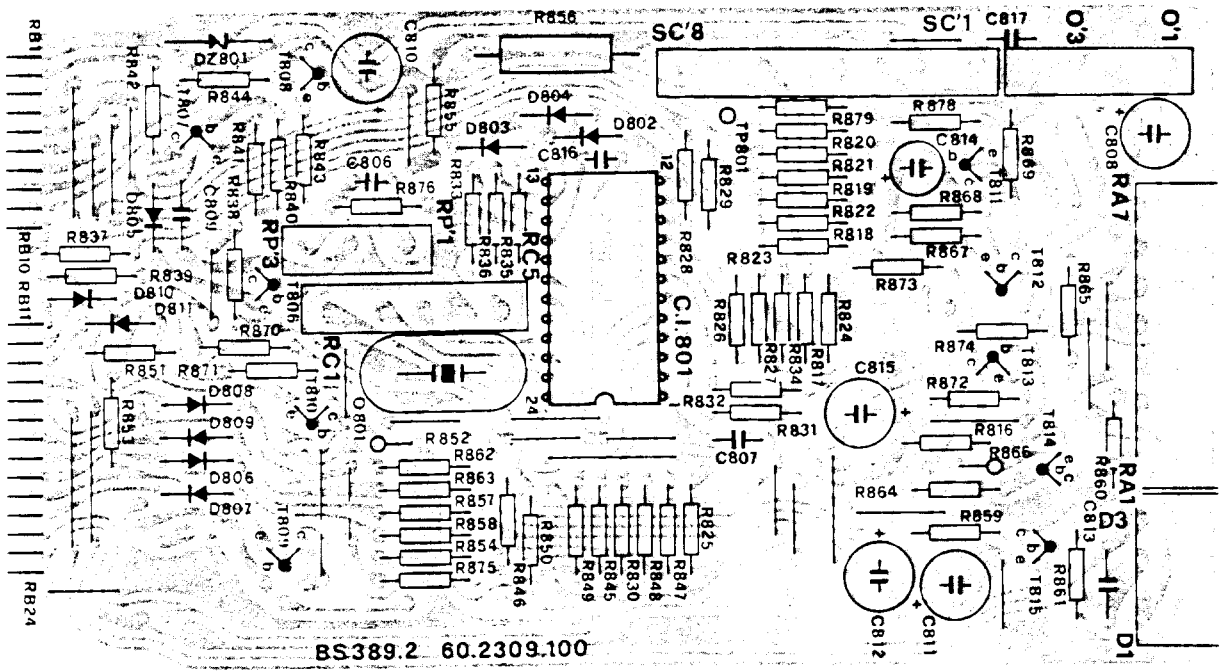
Potentiometers printboard BS 469.0

BS 469.0
60.2418.000



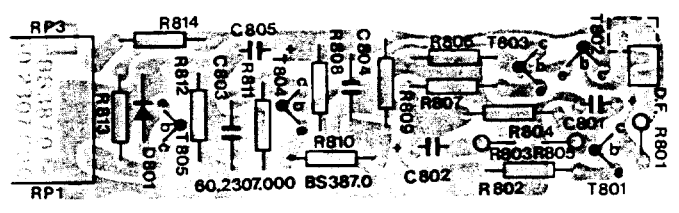
Remote control transr



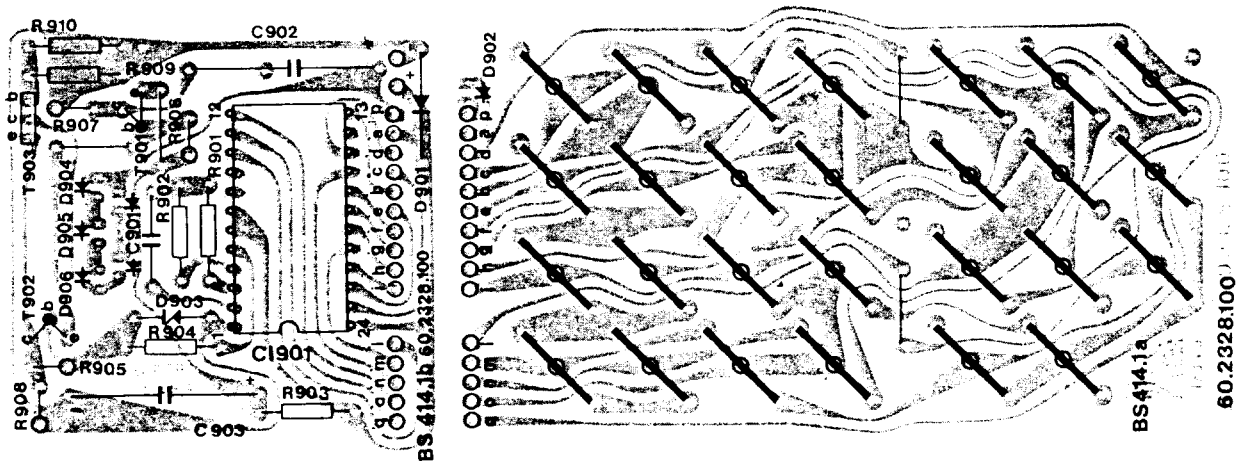


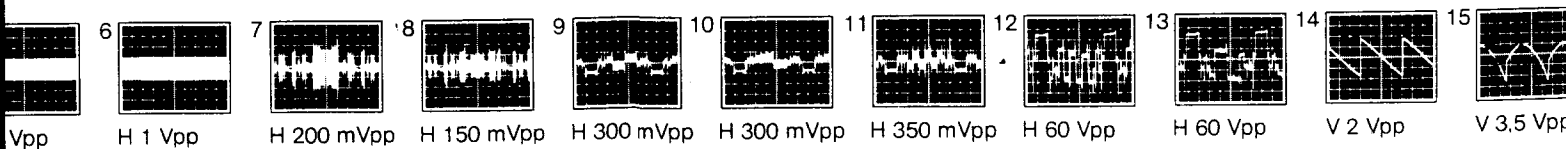
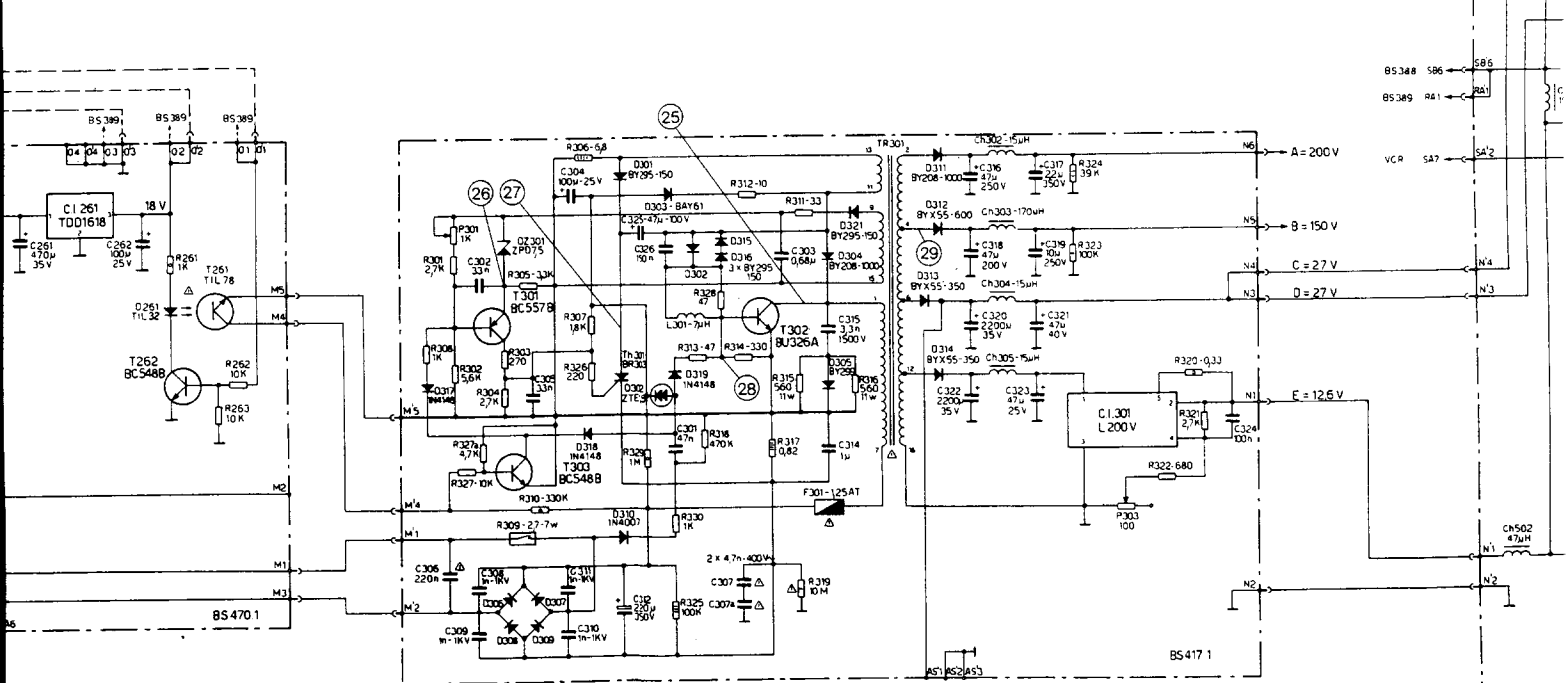
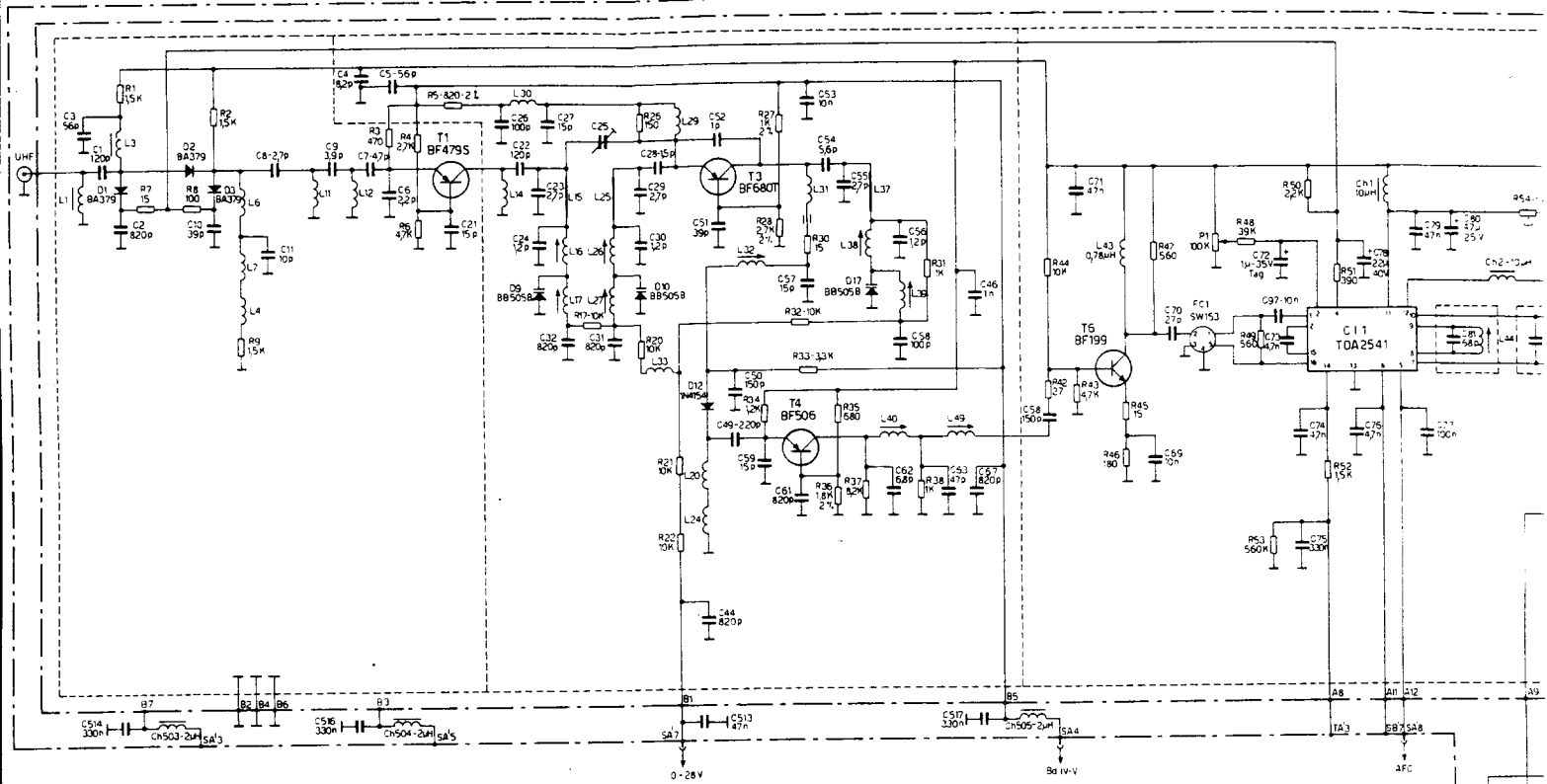
Remote control receiver printboard BS 389.2

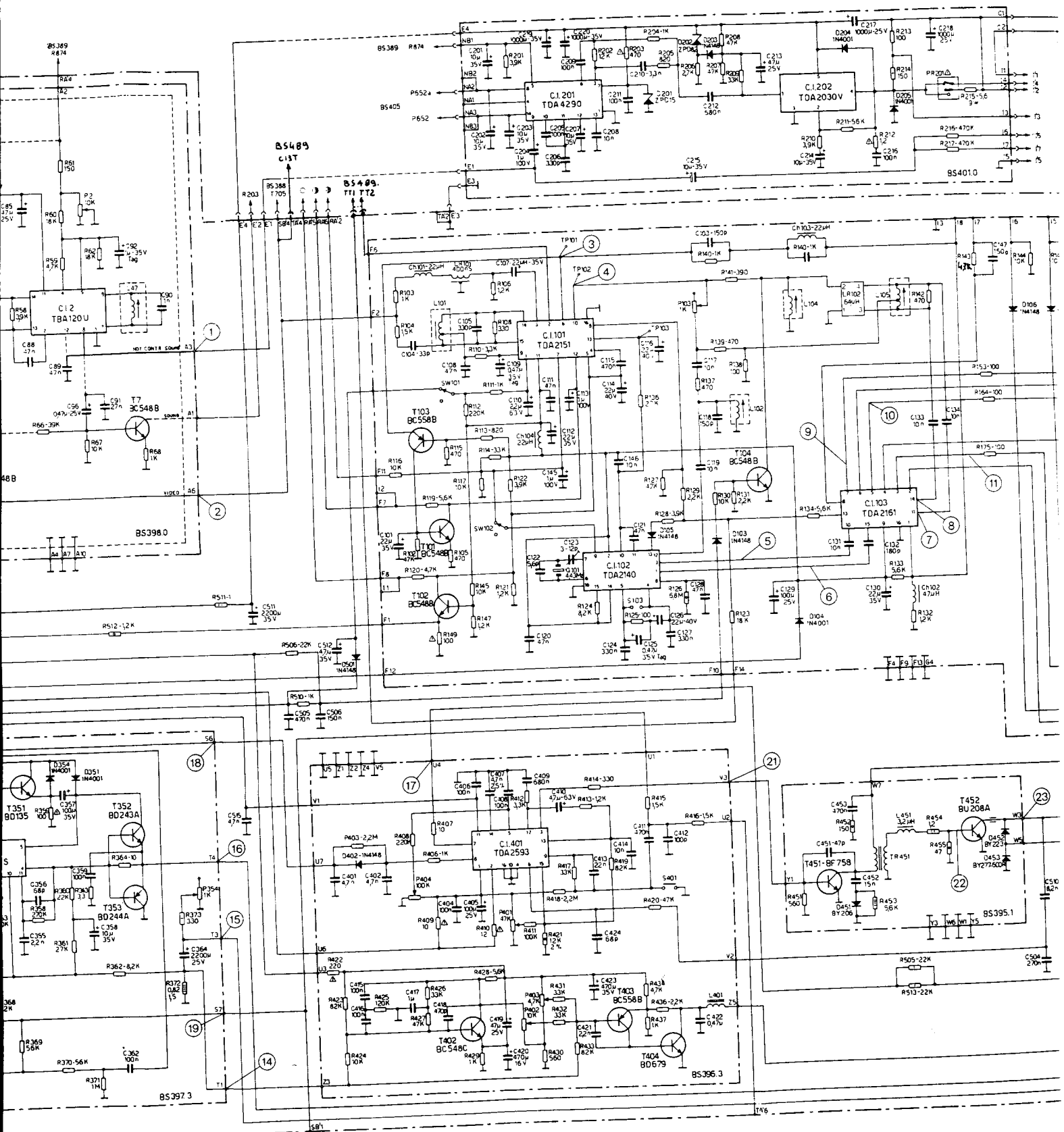
Infrared rays preamplifier module BS 387.0



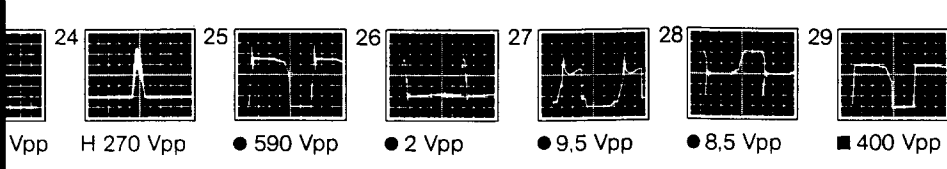
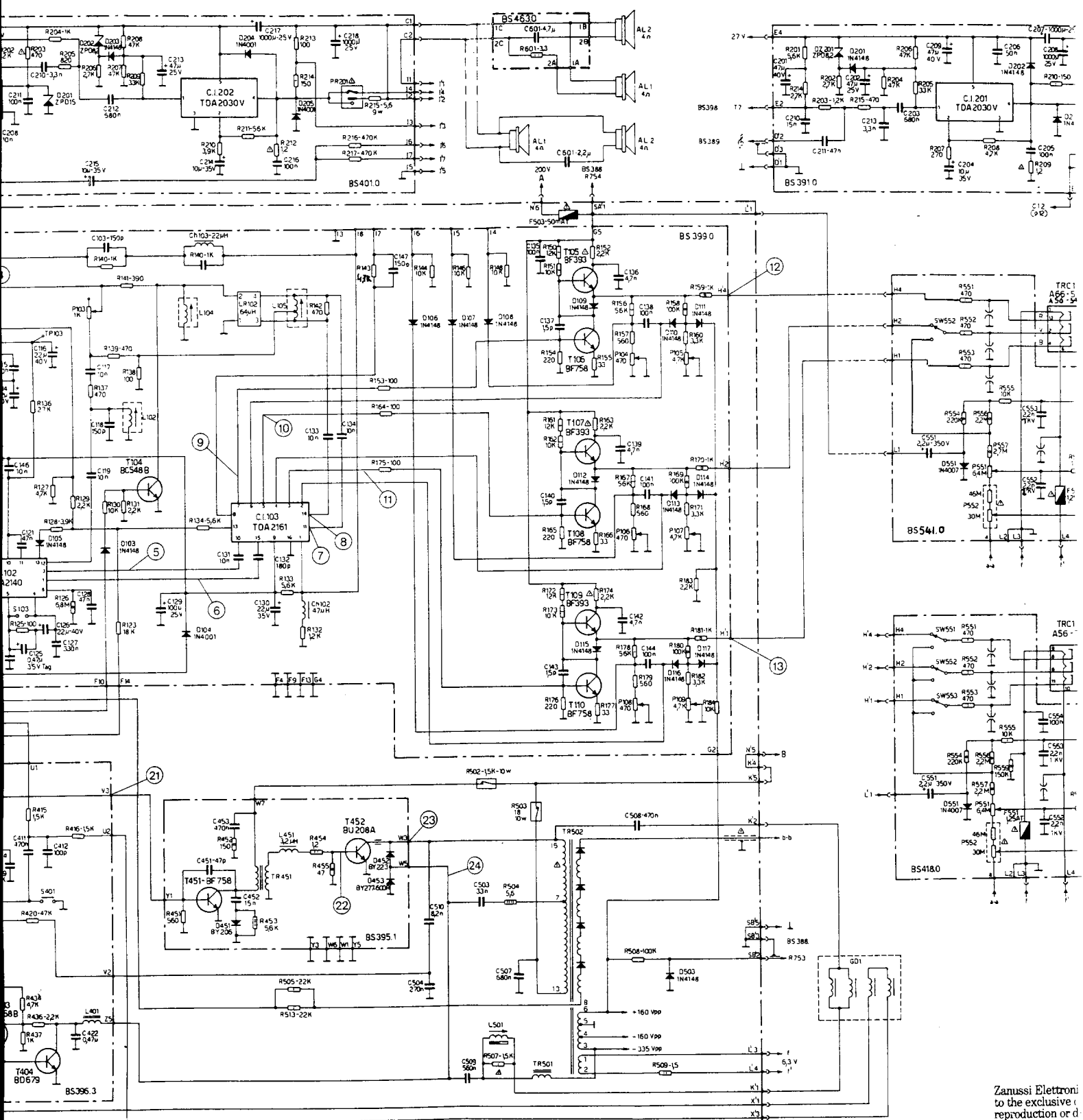
Remote control transmitter BS 414.1 a-b





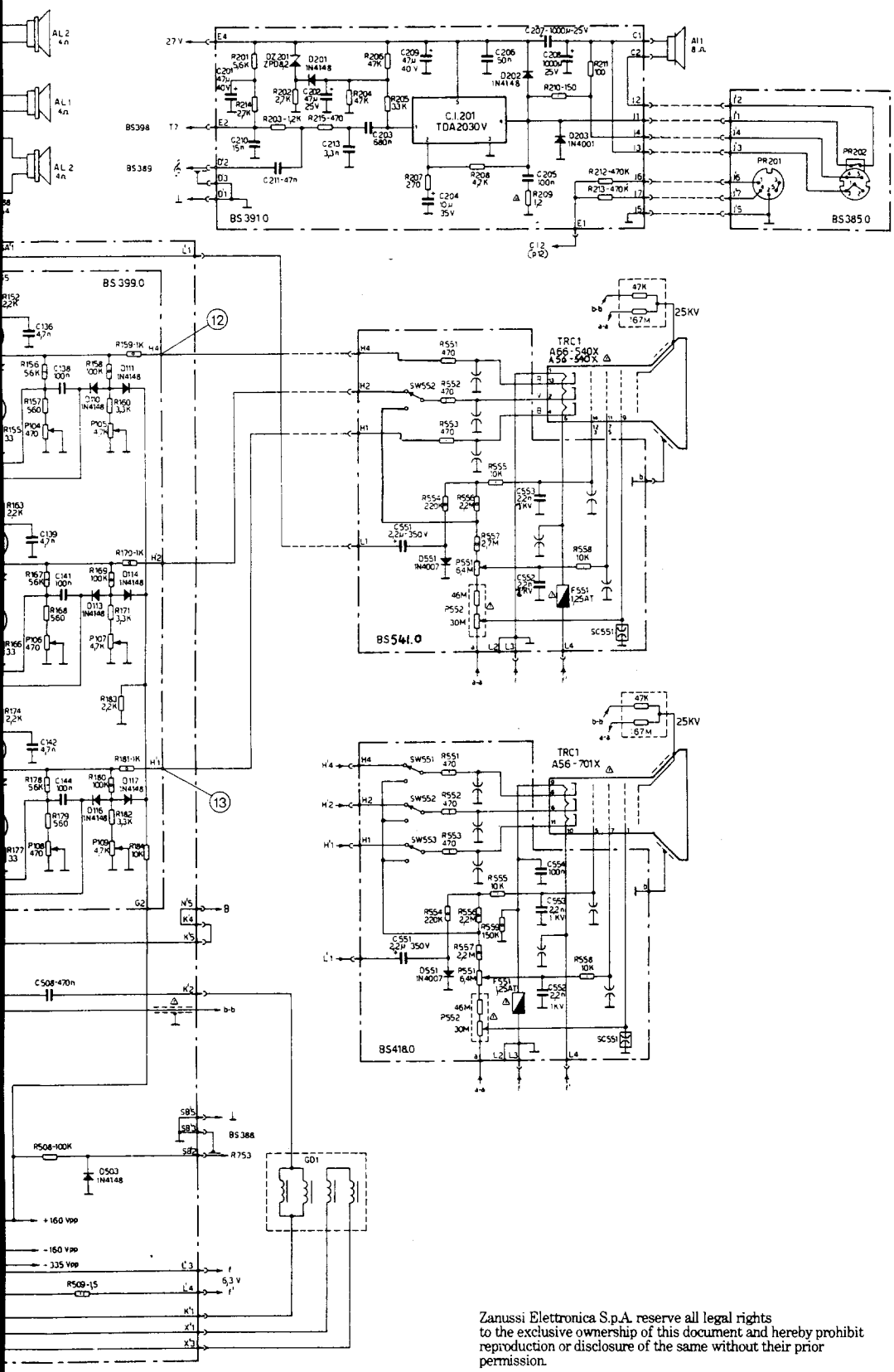


- 18 V 5 Vpp
- 19 V 11 Vpp
- 20 V 25 Vpp
- 21 H 1 Vpp
- 22 H 14 Vpp
- 23 H 1200 Vpp
- 24 H 270 Vpp
- 25 ● 590 Vpp
- 26 ● 2 Vpp
- 27 ● 9.5 Vpp



Ref. M'5 ●
 Ref. N 2 ■

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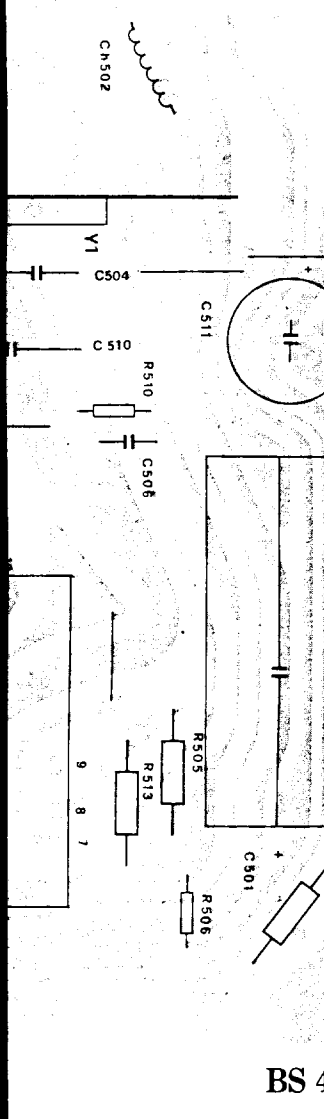
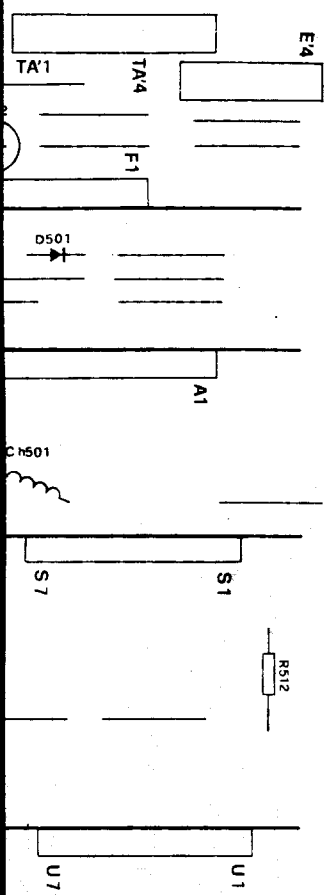


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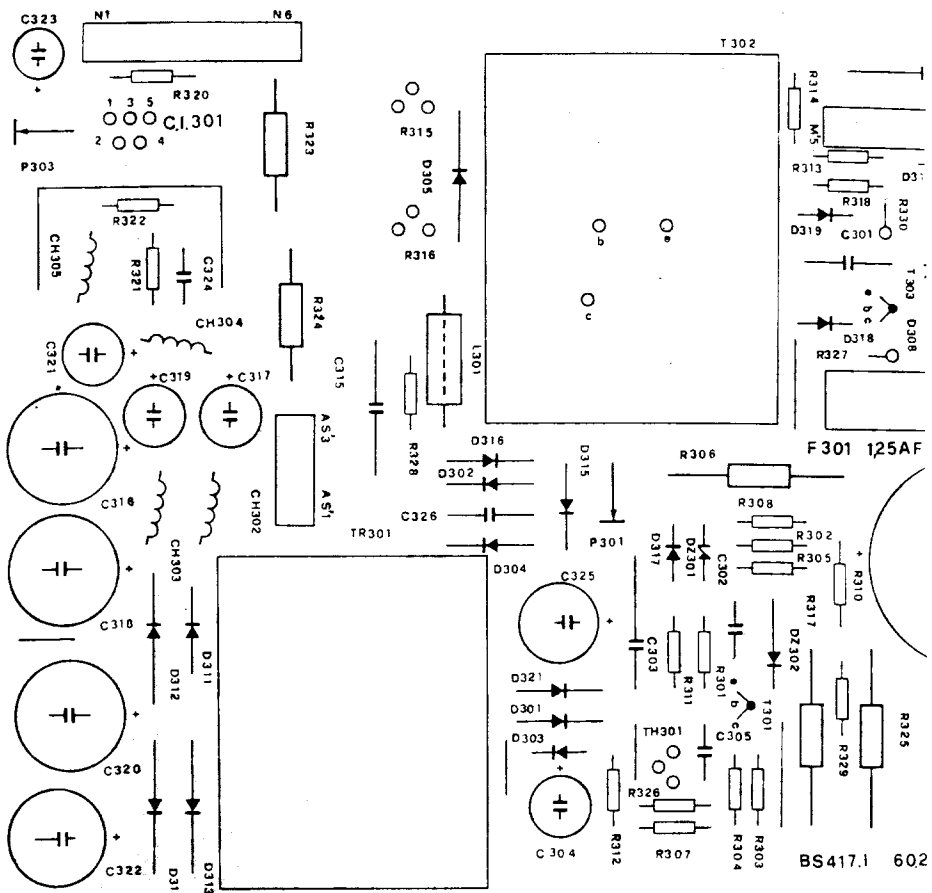
Ref. M'5 ●
 Ref. N 2 ■



0 Vpp

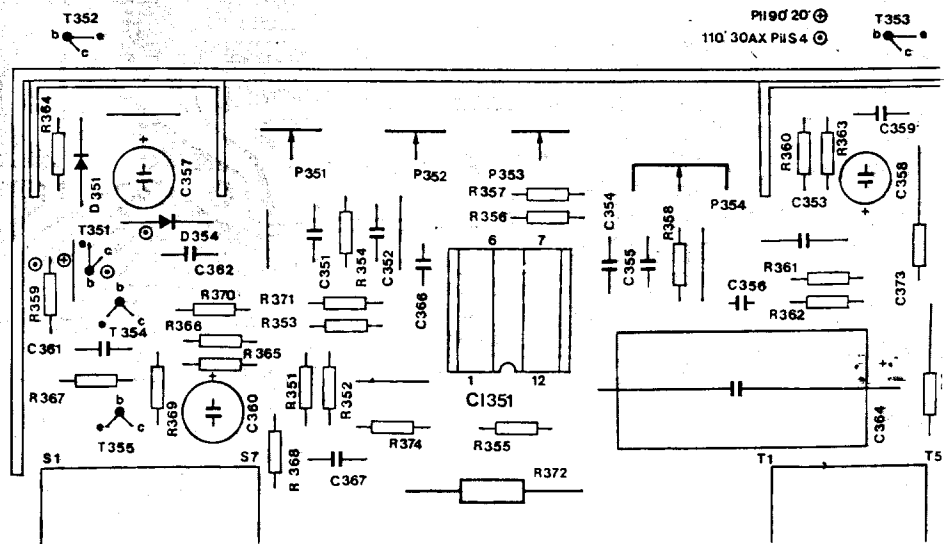


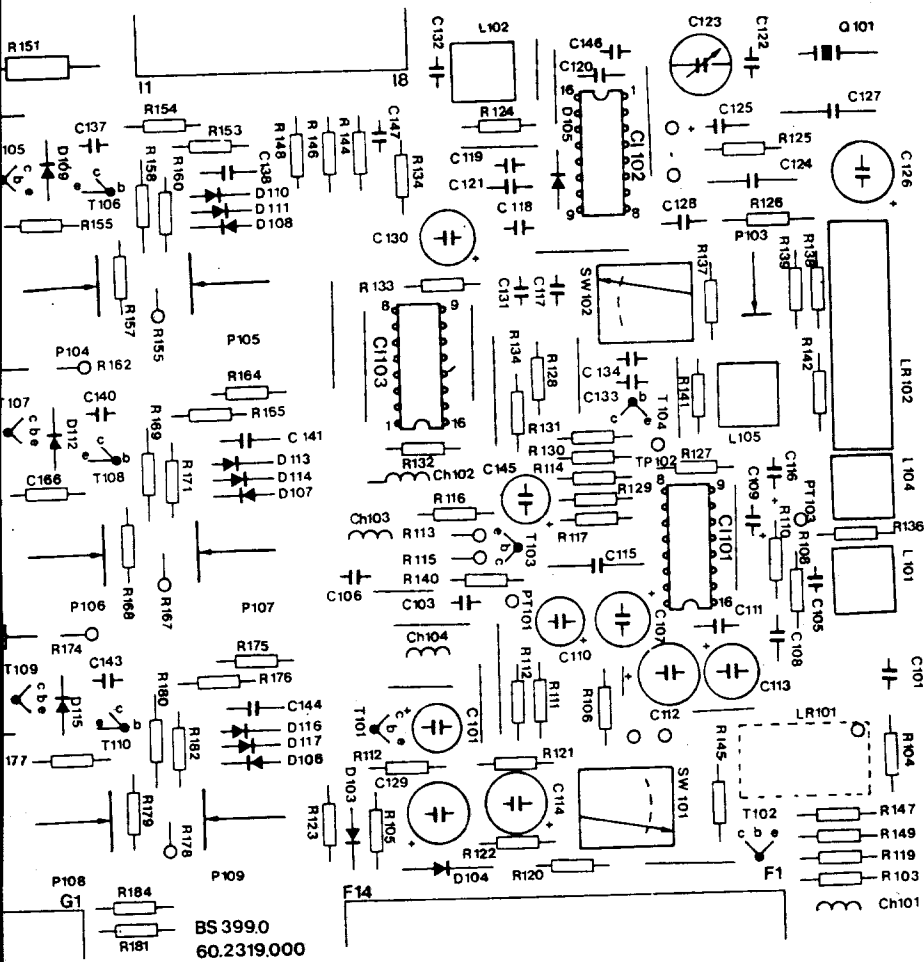
BS 400.2



BS 417.1 Supply module

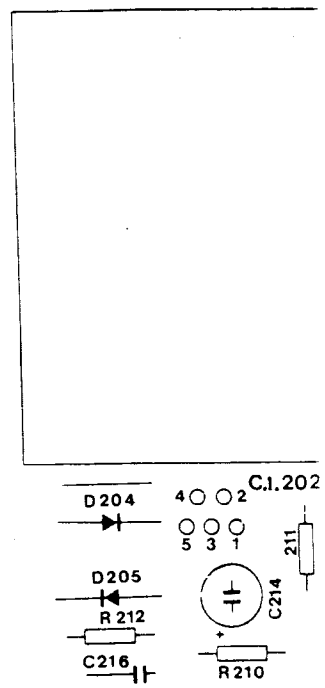
BS 397.3 Vertical deflection printboard





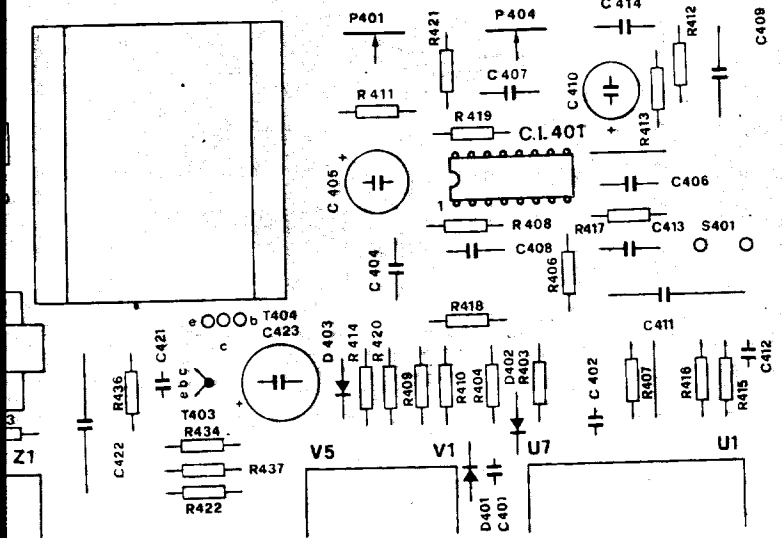
BS 399.0
60.2319.000

0 Luminance-chrominance and video output stage printboard

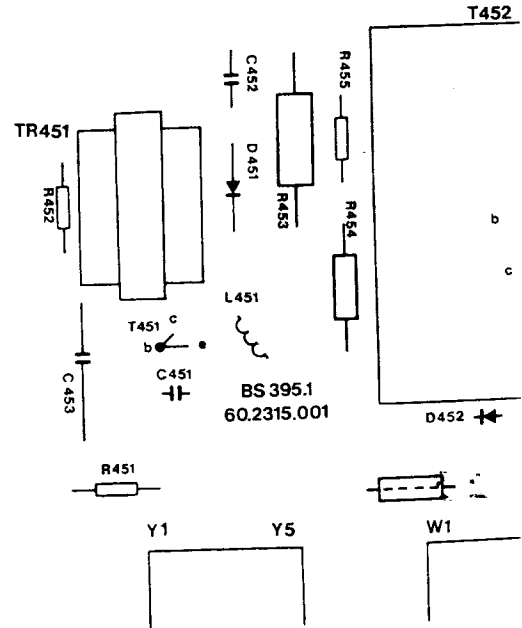


BS 401.0 Audio module

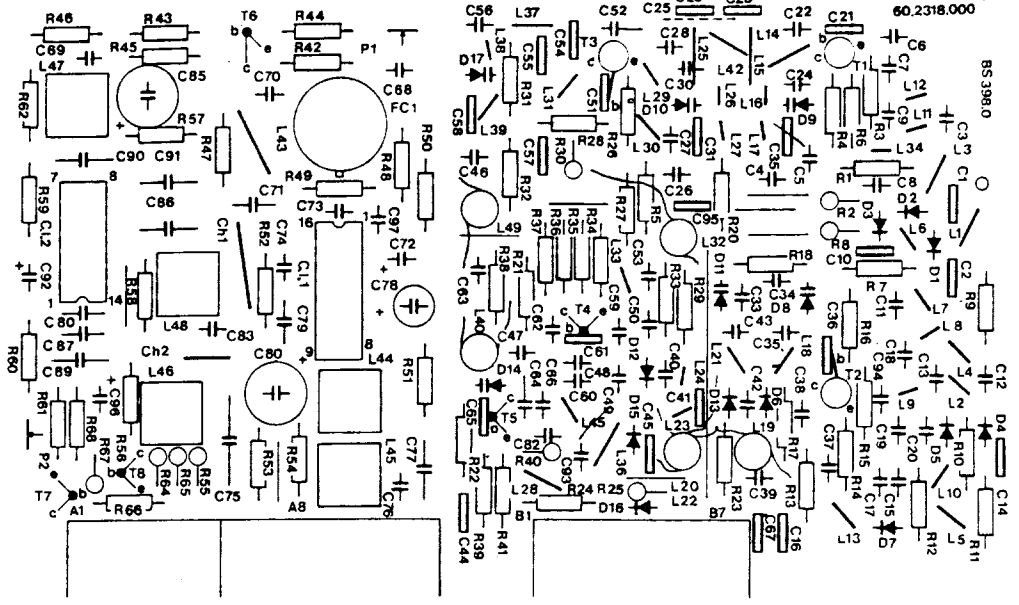
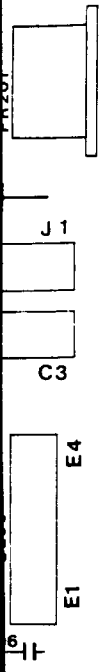
ncushion correction module



BS 395.1 Horiz. deflection module

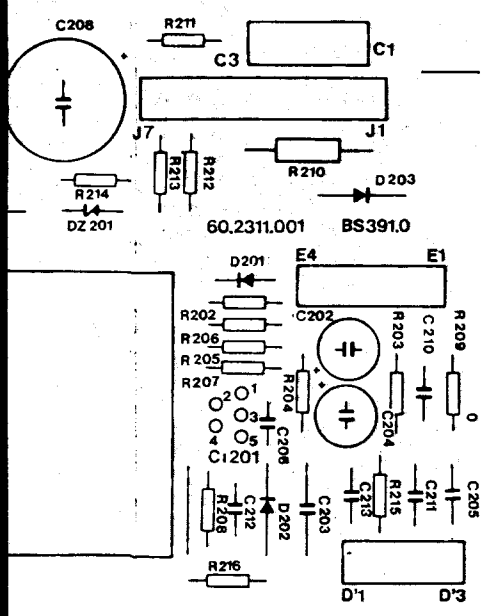


BS 395.1
60.2315.001

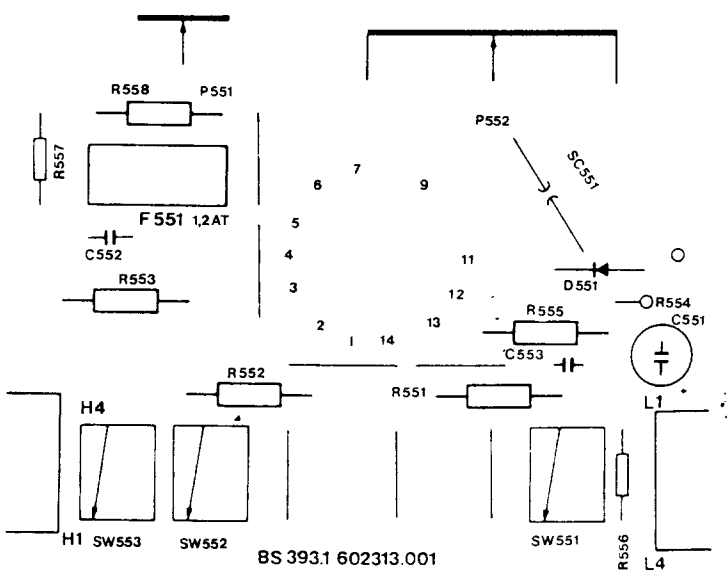


BS 398.0 RF-IF printboard

module



BS 393.1 Picture tube printboard



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