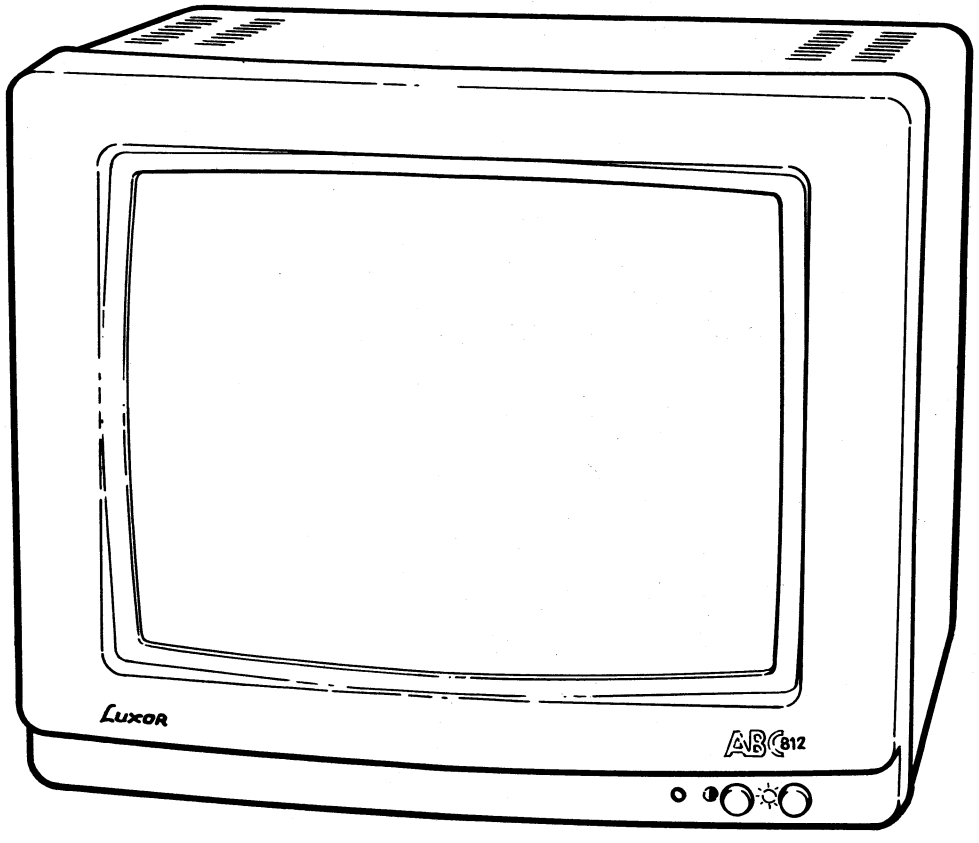
LUXOR
Datorer

Bildskärm ABC 812 230 8812-11

Servicemanual



ABC812

CONTENTS

SPECIFICATION HR-MONITOR
Monitor 14" colour high resolution

Digital RGB, 27 colours

CRT:	1. Gun:	In-line type	
	2. Raster:	Dot screen	
	3. Mask:	Round aperture mask	
	4. Spacing:	0,31 pitch	
Phosphor:	P22 black matrix		
Screen:	Non-glare treatment by direct etching in combination with 50 % glass transmission		
Picture:	1. Usable size:	X	255 mm
		Y	190 mm
	2. Pincushion distorsion:	Upper-lower	Max 2 % (typ 1 %)
		Right-left	Max 1 % (adjustable)
	3. Linearity:	Horisontal	Max 5 %
		Vertical	Max 5 %
	4. Misconvergence:	Centre	Max 0,3 mm
		Corners	Max 0,7 mm
	5. Resolution:	X	720 pixels/line
		Y	800 resolution lines
	6. Size variation:	As function of brightness	Max 4 mm
		As function of mains variation ± 10 %	Max 2 mm
	7. Aspect ratio		3:4
Video amplifier	1. Pulse response:		Rise time 15 ns
	2. Bandwidth:		25 MHz
Timing:	1. Scanning frequency:	Horisontal	15,625 kHz
		Vertical	50 Hz
	2. Time for videoinformation:	Horisontal	Max 50 μs
		Vertical	Max 18,5 ms

Warm-up time:

1. Picture after 5 sec. (quick heat cathode)
2. 15 min. to meet specification

Degaussing

Automaticly when switching on the monitor.

Mains power supply:

1. Power supply of switch-mode type.
2. Alternative power units for 220 V and 110 V.
3. Accepts a mains variation of ± 15 % without essential influence on the picture.
4. External DC-output 24 V/1,5 A available for user (supply for peripheral equipment)
5. Power consumption (from mains): 70 W
   With 1,5 A load on DC-output: 110 W

Controls:

1. Front panel controls: Brightness, contrast
2. Rear panel controls: On/off, analogue/digital switch (only on analogue/digital type)
3. Internal controls: Height, width, linearity, H-frequency, V-frequency, H-phase, centring, pincushion (E-W and tilt), focus, reduced intensity R.G.B.
4. Indicator: On/off indication by LED at front
5. Safety protection: Electronic fuse. Averabe beam current limitation.

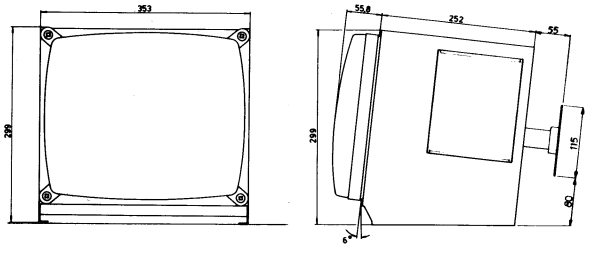
Safety:

1. X-ray radiation: Max 0,5 mR/h (acc. to Jedec 64)
2. Implosion protection: With tension band
3. Electrical safety: Fullfilles requirements acc. to CEE 10

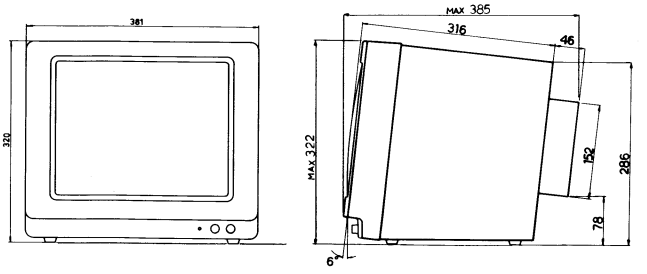
Mechanics:

Weight: 15,7 kg with cabinet
10,7 kg without cabinet

Open frame



Boxed



External connections:

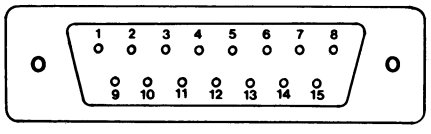
Digital RGB

Input signals:
1. RGB, TTL-level, 390 ohm
2. Composite sync., pos. or neg. TTL-level, 390 ohm
3. Separate H- and V-sync., pos. or neg. TTL-level, 390 ohm
4. Half brightness RGB, pos. TTL-level, 390 ohm

Output signal: DC 24 V/1,5 A

All in- and outputs in a 15-pin male, connector. (See figure 1)

Fig 1 Digital RGB



Outputs

Pin 1: Supply for ext. units +24 V DC or 12 V DC (internally switchable in mains module). Max 1.5 A

Pin 2: Ground (ext. supply)

Inputs

Pin 3–6: No connection

Pin 7: Signal ground

Pin 8: Neg. composite sync. TTL (or only H-sync.). Switchable internally for pos. sync.

Pin 9: B-signal, pos. TTL, 390 ohm

Pin 10: G-signal, pos. TTL, 390 ohm

Pin 11: R-signal, pos. TTL, 390 ohm

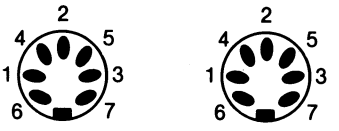
Pin 12: Reduced intensity B pos. TTL, 390 ohm

Pin 13: Reduced intensity G pos. TTL, 390 ohm

Pin 14: Reduced intensity R pos. TTL, 390 ohm

Pin 15: Neg. vertical sync. TTL. Switchable internally for pos. sync.

Keyboard



Input and output signals

1	TxD	Transmit Data
2	GND	Ground
3	RxD	Receive Data
4	TRxC	Clock
5	$\overline{\text{Key down}}$	
6	+12 V	
7	$\overline{\text{Reset}}$	

SERVICING POSITION

REMOVING BACK COVER

Remove all connections.

Remove the five screws in the back cover and lift away the back cover.

REMOVING THE CABINET

Put the set on some soft frame (to avoid damages on the front and screen) and remove the four screws in the bottom of the cabinet. (You do not need to remove the four feets.) Lift away the cabinet and turn set upright again.

REMOVING POWER SUPPLY MODULE

Remove the two screws and the three cables connected in the module and lift it out.

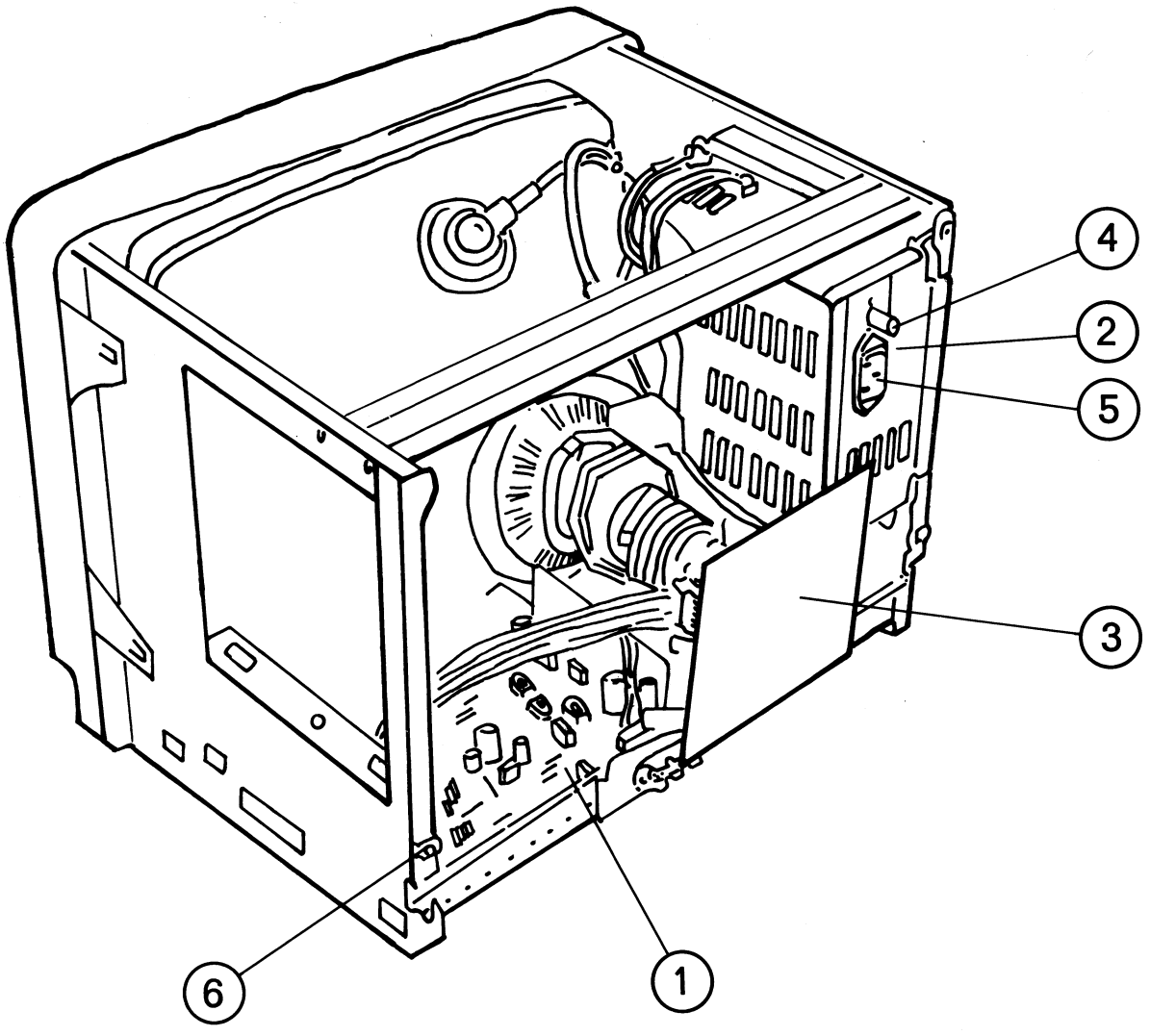
SPARE PARTS LIST

When ordering please always state:

Part No, description, model and series.

Part No	Description
40 09528-02	Front
44 20739-01	Cabinet
44 20718-01	Back cover Digital
42 10028-02	Knob potentiometer
40 89608-01	Foot
43 50039-01	Mains cord
63 00052-01	Picture tube
59 30014-20	Degaussing coil
44 31585-01	Potentiometer module

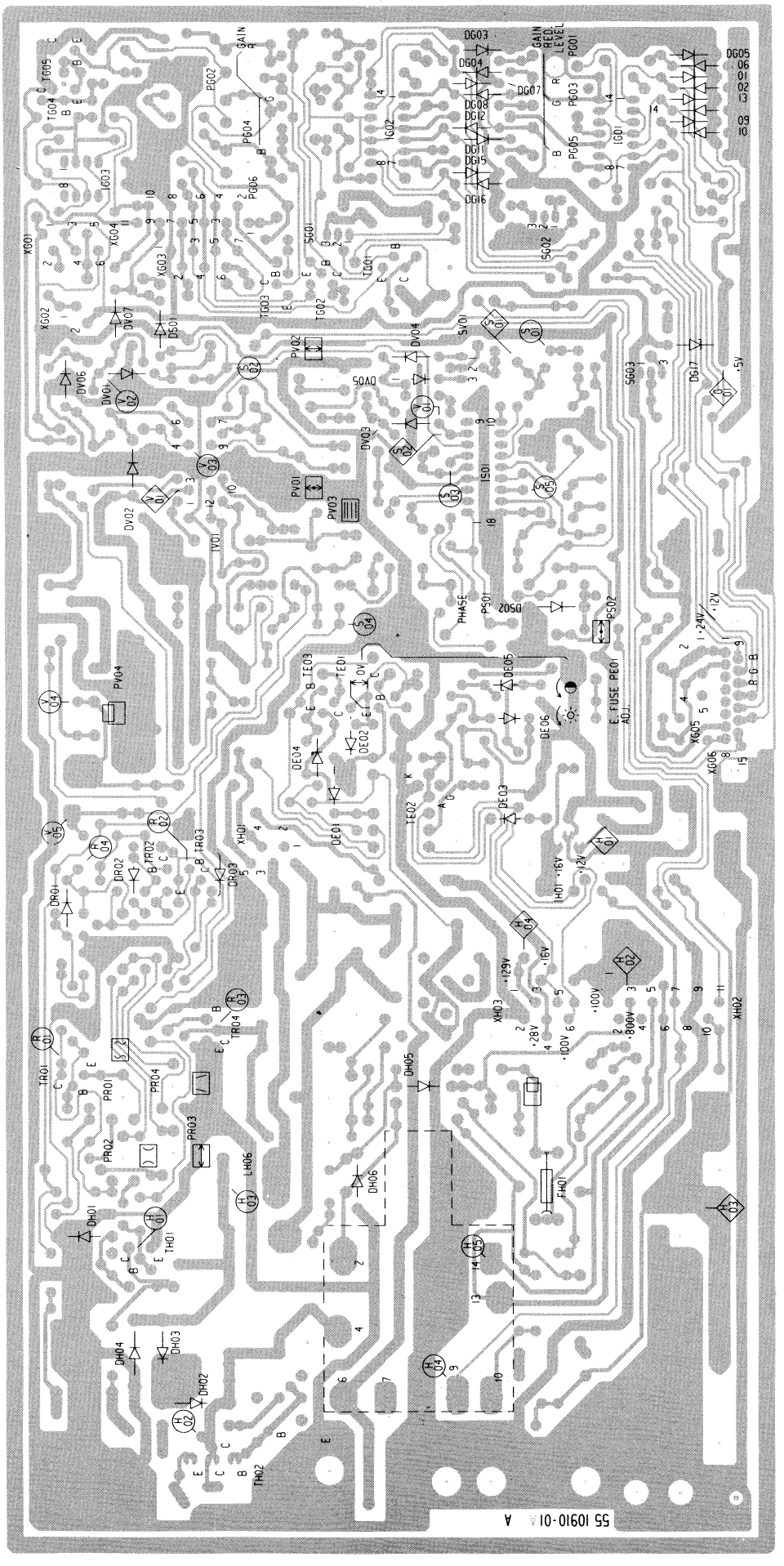
ALL COMPONENTS NOT MENTIONED IN THIS MANUAL CAN BE REPLACED BY STANDARD COMPONENTS.



1. 55 20910-01 Main PC-bord
2. 55 20902-01 Power supply module
3. 55 20904-01 Picture tube connection module
   65 10010-01 Picture tube socket
4. 42 70093-01 Knob main switch
   56 00050-01 Main switch
5. 43 50038-01 Main inlet socket
6. 50 60005-15 Captive nut

MAIN PC-BOARD

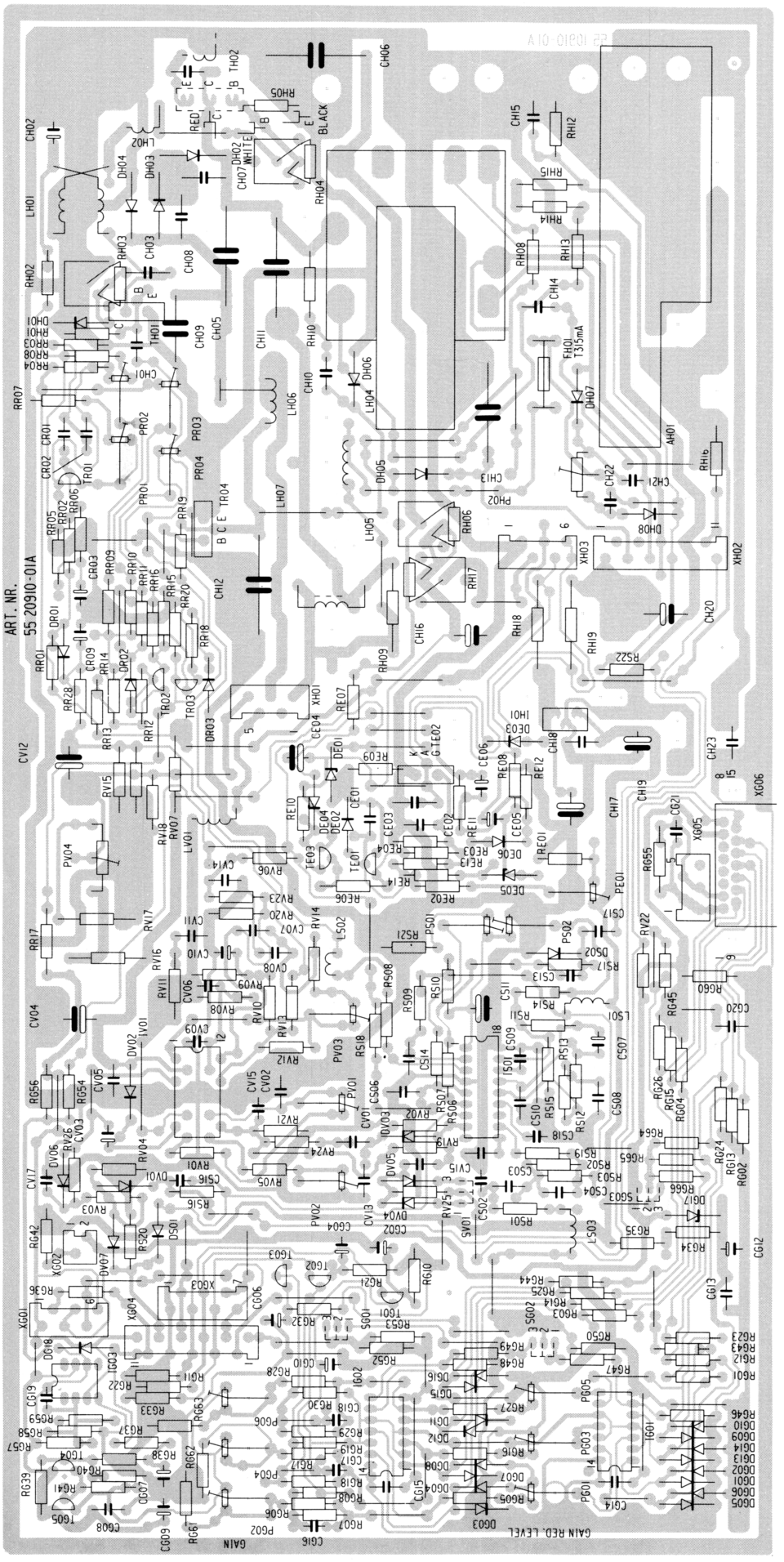
PART NO 55 20910-01



PRINTED SIDE

MAIN PC-BOARD

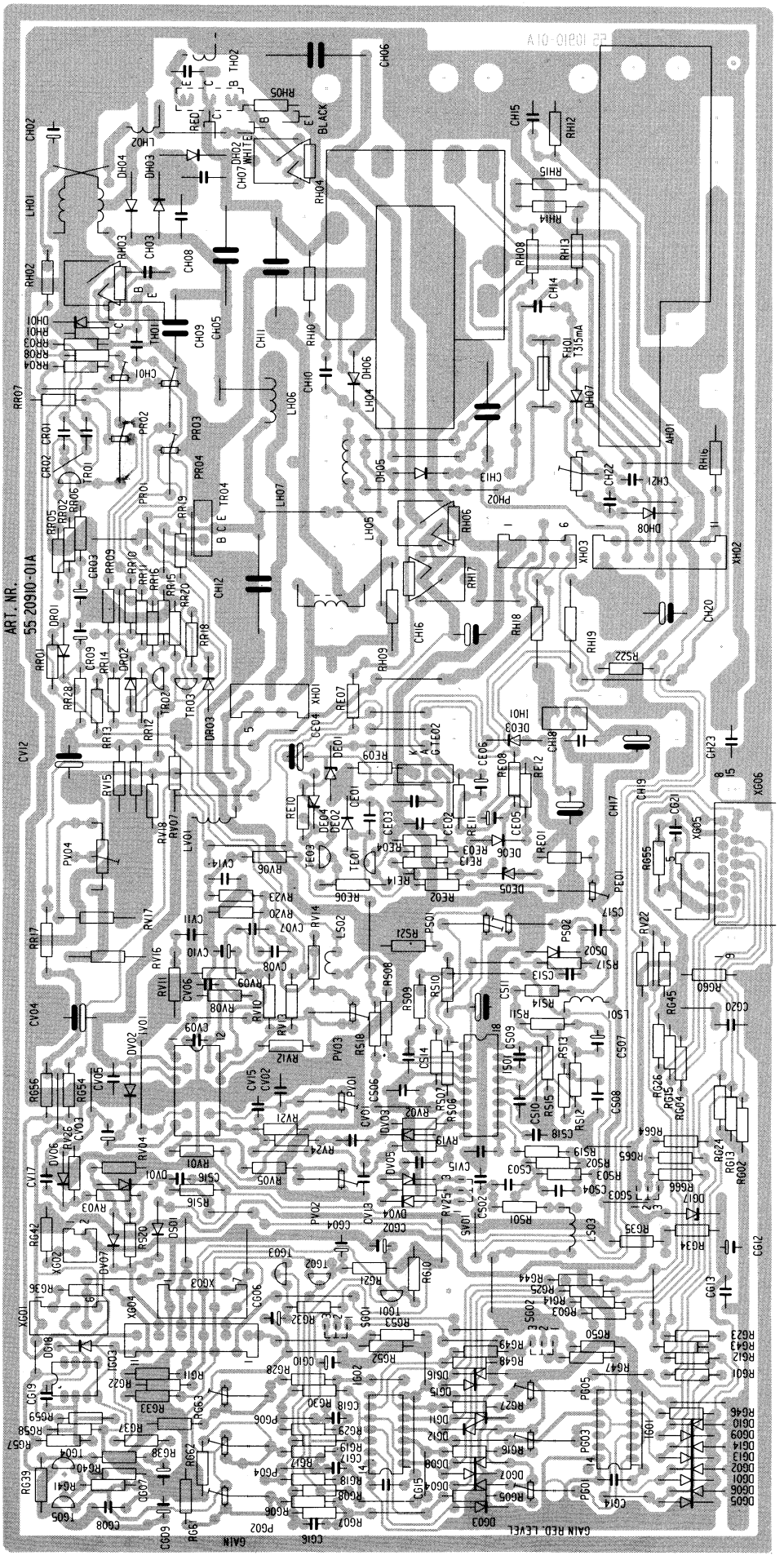
PART NO 55 20910-01



COMPONENT SIDE

MAIN PC-BOARD

PART NO 55 20910-01



COMPONENT SIDE

DE01	BZX83 C6V8	63 40025-01
DE02	1N4148	63 08824-01
DE04	BZX83 C6V8	63 40025-01
DE05	ZPD18	63 40056-01
DE06	1N4148	63 08824-01
DG01-16	1N4148	63 08824-01
DG17	BZX79 C5V1	63 40060-01
DG18	1N4148	63 08824-01
DH01	1N4448	63 40054-01
DH02-04	BY299	63 40080-01
DH05-06	PLR15T	63 40155-01
DR01-03	1N4148	63 08824-01
DS01-02	1N4148	63 08824-01

TE01	BC557B	63 10057-01
TE02	C107D	63 70004-01
TE03	BF423	63 00036-01
TG01-03	2N2369	63 20050-01
TG04-05	BC548C	63 10021-01
TH01	BD419	63 20041-01
TH02	BU208A	63 20070-01

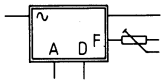
IG01	SN7403	64 40166-01
	SN7409 (in some sets)	64 40167-01
IG02	SN7409	64 40167-01
IG03	uA741	64 90000-01
IH01	MC7812CT	64 50019-01
IS01	TDA2594	64 30015-01
IV01	TDA1170S	64 30008-01

LH01	Drive transformer	58 10083-01
LH02	Choke 4 uH	58 30028-01
LH03	Choke	59 10044-01
LH04	Line output transf.	58 10094-01
LH05	Coil	59 60065-01
LH06	Coil	59 00366-01
LH07	Coil 52,5 mH	59 00332-01
LS01	Choke 5,5 uH	58 35600-01
LS02	Choke 220 uH	59 00237-01
LS03	Choke 5,5 uH	58 35600-01
LV01	Choke 5,5 uH	58 35600-01

RG10	33 ohm 5% 0,25 W Fuse	61 40333-01
RG21	33 ohm 5% 0,25 W Fuse	61 40333-01
RG32	33 ohm 5% 0,25 W Fuse	61 40333-01
RH06	15 ohm 5% 7 W	61 10103-01
RH08	0,22 ohm 10% 0,25 W	61 40026-01
RH09	820 ohm 5% 2 W	61 40132-01
RS10	10 ohm 5% 0,25 W Fuse	61 40123-01
RS15	12 kohm 2% 0,33 W	61 00100-01
RV07	27 ohm 5% 1 W	61 40103-01

CH04	390 pF 10% 2 kV	62 00083-01
CH05	6,8 nF 5% 1,5 kV	62 20137-01
CH07-08	1 nF 20% 1 kV	62 10006-01
CH09	10 nF 5% 630 V	62 20220-01
CH12	6,8 uF 10% 100 V	62 20221-01
CH13	56 nF 5% 1,5 kV	62 20202-01
CH14	1,5 nF 10% 2kV	62 00094-01
CS09	4,7 nF 2,5% 63 V	62 30073-01

PE01	4,7 kohm 0,1 W	61 17960-01
PG01	1 kohm 0,1 W	61 17702-01
PG02	470 ohm 0,1 W	61 17701-01
PG03	1 kohm 0,1 W	61 17702-01
PG04	470 ohm 0,1 W	61 17701-01
PG05	1 kohm 0,1 W	61 17702-01
PG06	470 ohm 0,1 W	61 17701-01
PH02	250 ohm 3 W	61 80018-01
PR01	100 ohm 0,1 W	61 17700-01
PR02	47 kohm 0,1 W	61 17705-01
PR03	22 kohm	61 17704-01
PR04	1 kohm 0,1 W	61 17702-01
PS01-02	47 kohm 0,1 W	61 17705-01
PV01	100 kohm 0,1 W	61 17706-01
PV02	220 kohm 0,1 W	61 17707-01
PV03	100 kohm 0,1 W	61 17706-01
PV04	1 kohm 3 W	61 80004-01

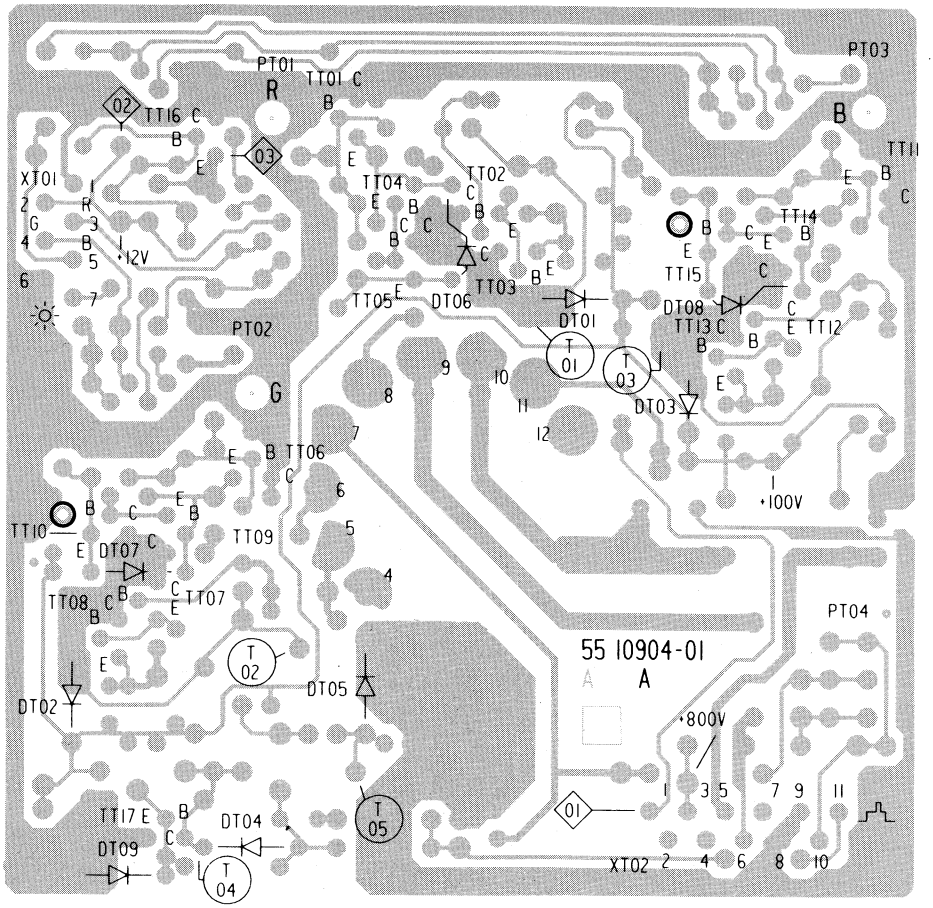


AH01	Tripler with bleeder 7kV	63 60007-01

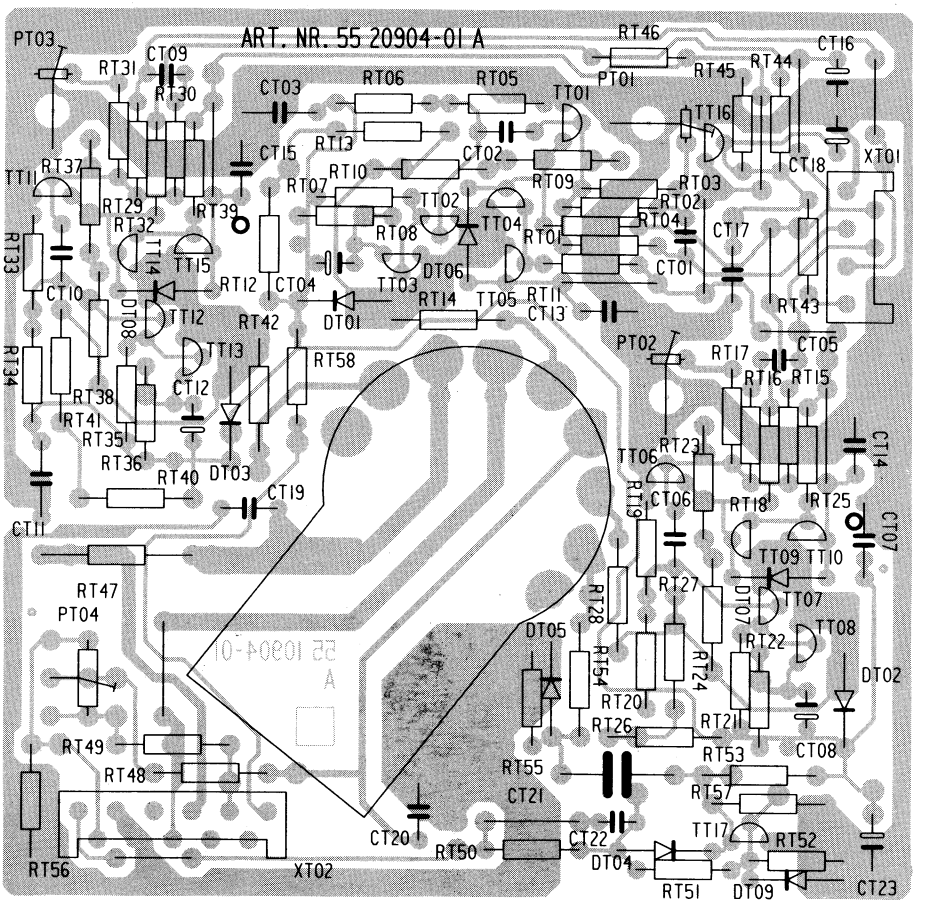
FH01	T 315 mA	65 89382-01

PICTURE TUBE CONNECTION MODULE

PART NO 55 20904-01



PRINTED SIDE



COMPONENT SIDE

SPARE PARTS LIST PICTURE TUBE CONNECTION MODULE

TT01	BC558B	63 10041-01
TT02-03	BC450	63 00070-01
TT04-05	BC449	63 00069-01
TT06	BC558B	63 10041-01
TT07-08	BC450	63 00070-01
TT09-10	BC449	63 00069-01
TT11	BC558B	63 10041-01
TT12-13	BC450	63 00070-01
TT14-15	BC449	63 00069-01
TT16	BC558B	63 10041-01
TT17	BC449	63 00069-01
DT01-03	BA157	63 08822-01
DT04	1N4148	63 08824-01
DT05	BA157	63 08822-01
DT06-09	1N4148	63 08824-01

RT58	33 ohm 5% 0,25 W Fuse	61 40333-01
PT01-03	500 ohm 1 W Cermet	61 17948-01
PT04	1 Mohm 1 W Ceramic	61 82075-01

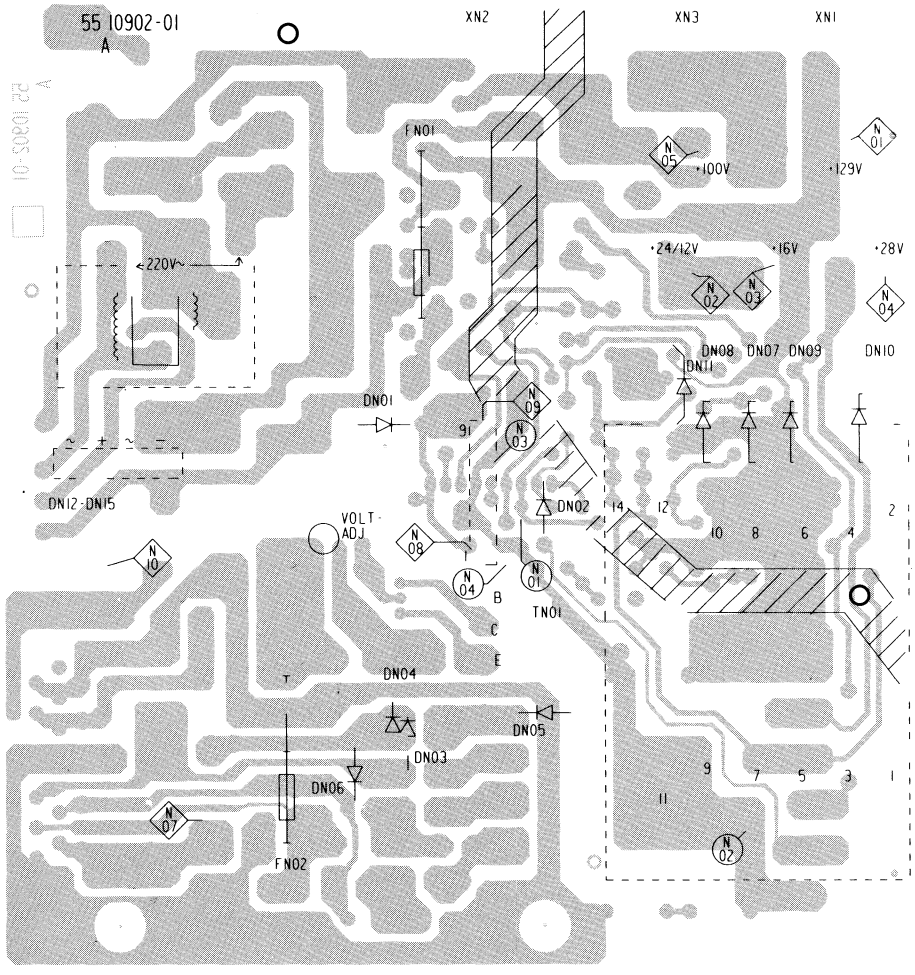
POTENTIOMETER MODULE

PART NO 44 31585-01

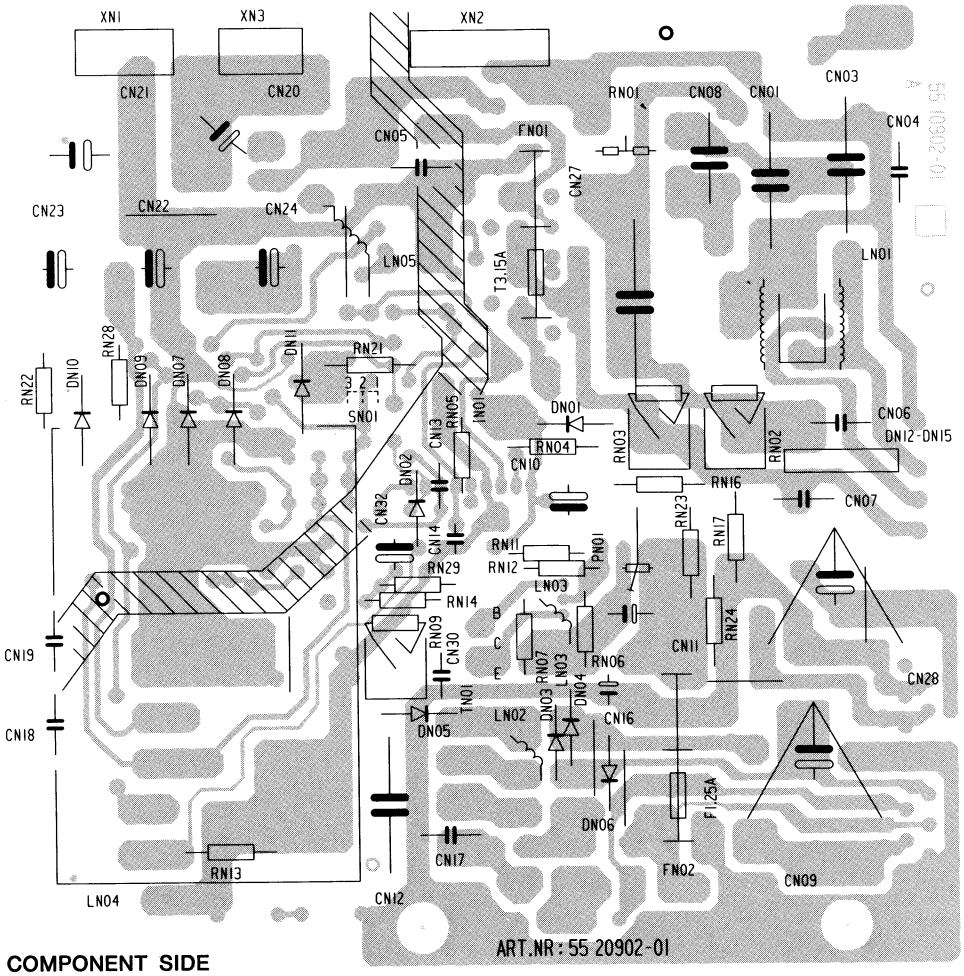
DP01	CQY40L	63 40136-01
PP01-02	10 kohm lin	61 70141-01

POWER SUPPLY MODULE

PART NO 55 20902-01



PRINTED SIDE



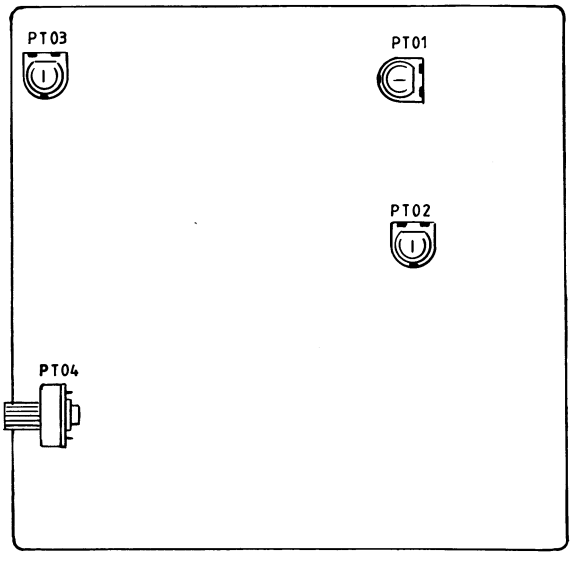
COMPONENT SIDE

SPARE PARTS LIST POWER SUPPLY MODULE

LN01	Choke 2 x 27 mH	58 30062-01
LN02	Choke	59 10044-01
LN03	Choke 4 uH	58 30028-01
LN04	Mains transformer	58 10105-01
LN05	Choke 33,7 uH	59 00340-01
LN08	Ferritpearl	59 70053-01
FN01	T 3,15 A	65 89567-01
FN02	F 1,25 A	65 70019-01
PN01	4,7 kohm 0,1 W	61 17960-01
DN01	1N4005	63 40102-01
DN02	MR812	63 40058-01
DN03-04	EM513	63 40126-01
DN05	BA159	63 08751-01
DN06	MR812	63 40058-01
DN07	BA159	63 08751-01
DN08	BY299	63 40080-01
DN09-11	MR852	63 40074-01
DN12(-15)	B250 C1000/1500	63 40213-01

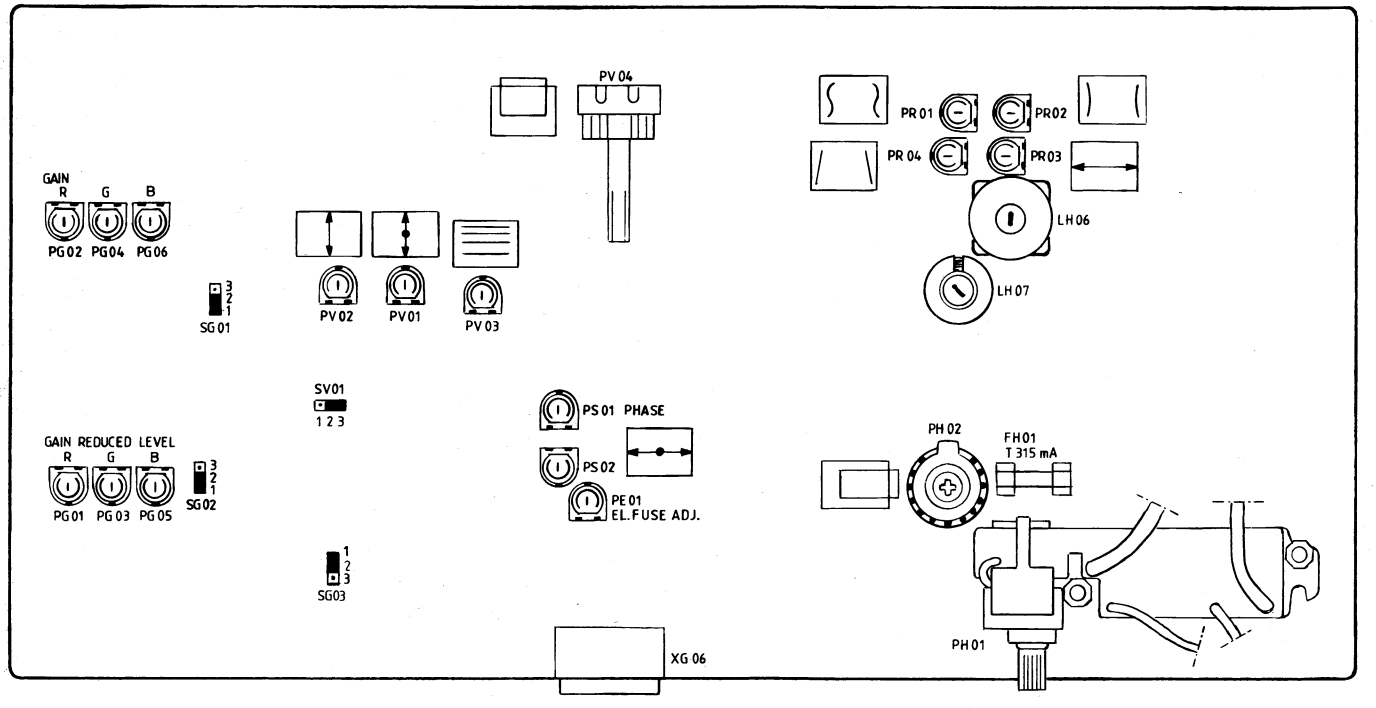
RN01	PTC	61 20012-01
RN02	3,9 ohm 10% 11W	61 10071-01
RN03	10 kohm 5% 7W	61 10119-01
RN09	47 ohm 5% 9W	61 10109-01
RN22	0,22 ohm 10% 0,25W	61 40026-01
RN 28	0,22 ohm 10% 0,25W	61 40026-01
CN01	220 nF 10% 250 VAC X-cap	62 10004-01
CN03	220 nF 10% 250 VAC X-cap	62 10004-01
CN04-05	3,3 nF 20% 250 VAC Y-cap	62 12733-01
CN18-19	4,7 nF 20% 250 VAC Y-cap	62 12629-01
CN27	1 uF 10% 250 VAC X-cap	62 12576-01
CN30	390 pF 10% 2 kV	62 00083-01
CN20-21	47 uF 250 V	62 50034-01
CN22-23	470 uF 40 V	62 50093-01
CN24	470 uF 40 V	62 50201-01
IN01	TDA4600	64 30012-01
TN01	BU208A	63 20070-01

Potentiometers on picture tube connection module



PT01 PT02 PT03	Black level adjustment RGB
PT04	G2-voltage adjustment

Potentiometers and switches on main PC-board



FH01	Fuse T 315 mA
LH06 LH07	Do not need to be adjusted
PE01	Electronic fuse adjustment
PG01 PG03 PG05	Gain adjustment RGB reduced level
PG02 PG04 PG06	Gain adjustment RGB
PH01	Focusing
PH02	Horizontal picture orientation
PR01	East–West phase
PR02	East–West amplitude
PR03	Picture width
PR04	East–West trapezium
PS01	Phase
PS02	Horizontal frequency
PV01	Vertical frequency
PV02	Picture height
PV03	Vertical linearity
PV04	Vertical picture orientation

SG01	Switch TTL – TTL/Analogue Position 1–2: TTL Position 2–3: TTL/Analogue
SG02	Switch positive – negative sync. Position 1–2: Negative sync. Position 2–3: Positive sync.
SG03	Switch IG01 = 7403 – IG01 = 7409 Position 1–2: IG01 = 7403 Position 2–3: IG01 = 7409
SV01	Switch positive – negative sync. Position 1–2: Positive V-sync. Position 2–3: Negative V-sync.

ADJUSTMENT AND ALIGNMENT INSTRUCTIONS

1. SETTING UP

All adjustments and alignments should be carried out with the set runnig on nominal mains supply voltage, and the set should first be allowed to warm up for about 10 minutes.

NOTE: **The chassi is separated from ground on the PC-boards.**

2. DRIVE VOLTAGE, HORIZONTAL DEFLECTION

Turn brightness and contrast down to minimum  .
Connect a digital voltmeter to test point  or  .
Set voltage at +129 V ±0,5 V with potentiometer PN01 in main supply module.

3. FOCUSING

Using a normal adjusted picture adjust potentiometer PH01 to obtain best focusing.

4. ELECTRONIC FUSE

Adjust at zero beam current (min. brightness and contrast)
 . Check that the voltage at test point  is +129 V.
Connect a digital voltmeter between base and emitter on transistor TE01.
Set 0 V with PE01.

5. CHECK THE FUNCTIONING OF THE ELECTRONIC FUSE

At each of the following check connections (a – d) the set should switch off. Remove the connection, switch off the set and switch it on again.

a) Short-circuit RE01, 8,2 kohm.
b) Connect 56 ohm 5 W min. between  and earth.
c) Connect 56 ohm 5 W min. between  and earth.
d) Remove RT58, 33 ohm, on picture tube connection module.
(Must be replaced after the check.)

6. BEAM LIMITER

Connect a signal source and use a white picture. Turn brightness and contrast to maximum . Connect a voltmeter to H 03 and check that the voltage is about −4,5 V when the beam current is limited (not adjustable).

7. SYNCHRONIZATION

Connect a signal to digital or analogue inputs.

7.1 HORIZONTAL FREQUENCY

Short-circuit between S 01 and earth. Set potentiometer PS02 to the correct horizontal frequency (picture upright). Remove short-circuit.

7.2 VERTICAL FREQUENCY

Short-circuit between S 02 and earth. Set potentiometer PV01 to the correct vertical frequency (picture moving upwards 2 pictures/second). Remove short-circuit.

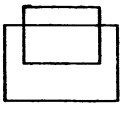
8. RASTER CORRECTION

Preparations

The set should be warmed up for about 10 minutes. Picture with, picture height, horizontal and vertical picture orientation preliminary adjusted.

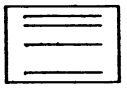
8.1 VERTICAL PICTURE ORIENTATION

Adjust vertical picture position with potentiometer PV04.



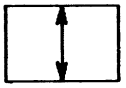
8.2 VERTICAL LINEARITY

Adjust vertical linearity with potentiometer PV03.



8.3 PICTURE HEIGHT

Adjust picture height with potentiometer PV02.



8.4 HORIZONTAL PHASE

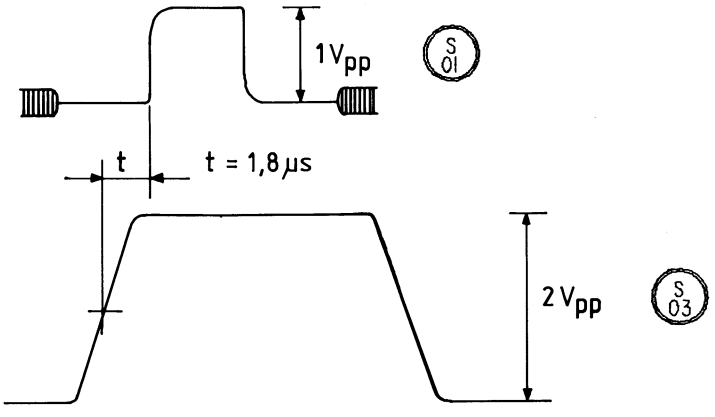
Connect the two probes of a double-beam oscilloscope to the following test points:

Probe 1: Cutted horizontal flyback pulse in test point S 03 .

Probe 2: Synchronization signal in test point S 01 .

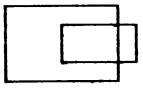
Adjust potentiometer PS01 until the front of the flyback pulse is 1,8 μs before the synchronization pulse. See fig. 1.

Fig. 1 Hor. phase



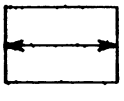
8.5 HORIZONTAL PICTURE ORIENTATION

Adjust horizontal picture position with potentiometer PH02.



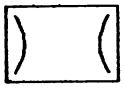
8.6 PICTURE WIDTH

Adjust with potentiometer PR03.



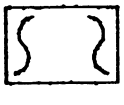
8.7 EAST-WEST AMPLITUDE

Set with PR02.



8.8 EAST-WEST PHASE

Set with PR01.



8.9 ESAT-WEST TRAPEZIUM

Set with PR04.

9. ADJUSTMENT OF AMPLITUDES AND BLACK LEVELS IN RGB OUTPUT STAGES

Turn brightness to minimum and contrast to maximum .
Connect oscilloscope probe to test point T 01.
Adjust the black level on R-output to 60 V with PT01.
Adjust the amplitude on R-output to 35 V black to white with PG02.
Switch to reduced input signal.
Adjust the reduced amplitude on R-output to 25 V black to white with PG01.
Move the oscilloscope probe, in sequence, to test points T 02 and T 03 and do the same adjustings for G-output using potentiometers PT02, PG04, PG03 and for B-output using potentiometers PT03, PG06, PG05.

10. ADJUSTMENT OF G2-VOLTAGE

Turn brightness and contrast controls to middle position.
Adjust potentiometer PT04 until the light in the background just has disappeared.

11. ADJUSTMENT OF THE GREY SCALE

Signal: Picture with dark background and little information.
Dark surrounding. The set correctly adjusted according to points 9 and 10. Brightness and contrast controls in middle position.
Check which colour that dominates the picture. Do not touch the black level potentiometer for that colour.
Adjust the two other black level potentiometers until the background is neutral (PT01 – red, PT02 – green, PT03 – blue).
If dark areas in the picture has changed adjust again with PT04.
Turn contrast to minimum . If necessary adjust again with the same black level potentiometers as before.

12. COLOUR PURITY AND CONVERGENCE

Preparations

Allow the set to warm up for about 20 minutes. The set should be degaussed and coarce settings of picture width, picture height, linearity, H- and V-centring should have been made.

12.1 COLOUR PURITY

The purity has pre-set and should normally not require adjustment if the set is used in the nothern hemisphere. If an adjustment should nevertheless be required, the purity can be set by means of the magnet rings in the multi-pole unit (See fig. 2). This affects the purity in the whole picture area. Use locking lacquer to secure the magnet rings after adjustment.

NOTE: **Under no circumstances the fixed position of the deflection unit must be disturbed.**

12.2 CONVERGENCE

The convergence has been pre-set and should normally not require adjustment. The static convergence can be adjusted by means of the magnet rings of the multi-pole unit (See fig. 2). Use locking lacquer to secure the magnet rings after adjustment.

Fig. 2 Static convergence

NOTE: **The magnet rings may be placed in different order depending on picture tube manufacture. Purity rings are marked with a P on it.**

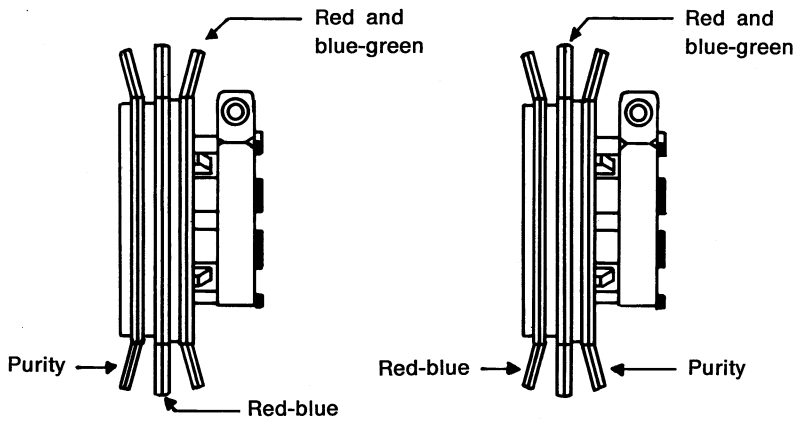
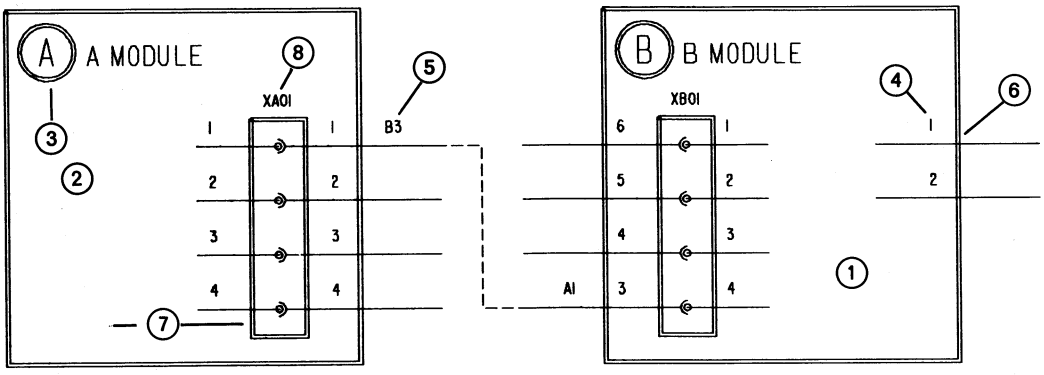


Fig. 2

EXPLANATIONS CONCERNING THE CIRCUIT DIAGRAM



BLOCK (1) – corresponds to an electrical function. Two or more blocks together may constitute a module.

MODULE (2) – a PC-board with one or more electrical functions. The module is in most cases easy to remove. The letter A (3) is the identification of the block or module.

HOME ADDRESSES (4) – in the figure above block B has the home addresses B1, B2, . . . Clockwise numbering starting at B, placed just inside the block frame.

OUTPUT ADDRESSES (5) –indicates the signal route. In the figure above the home address A1 corresponds to the output address B3 – hence A1 is connected to B3 (dashed line).

Output addresses are always placed just outside the frame of the block/module.

INTERCONNECTION SYMBOLS

COPPER FOIL INTERCONNECTION (6) – between blocks on a PC-board.

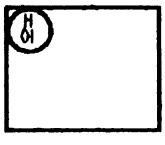
CABLE CONNECTOR (7) – actually a cable-to-board connector.

CONNECTOR NOTATIONS

Cable connectors, both the cable and the PC-board parts, are shown as a component belonging to the block or module which carries the PC-board part of the cable connector. Thus, in the figure above, the connector XA01 (8) is named after the block A.

Connectors are linked to other circuits via addresses. Note that the line numbers are component notations only and **not** addresses.

TEST POINTS

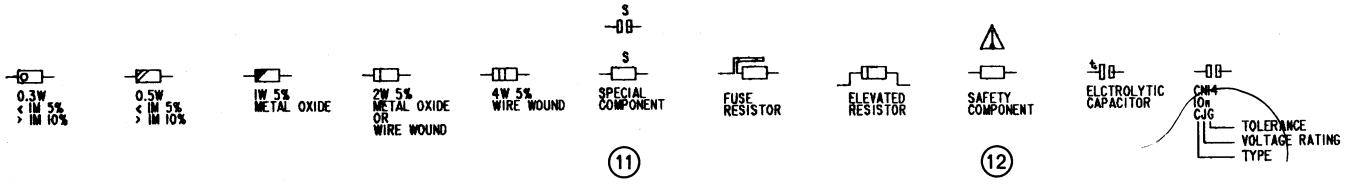


(9)

(10)

PULSE PICTURE (9) – the notation H01 refers to block H. Measure with an oscilloscope, min. 10 MHz bandwith, min. 10 Mohm input impedance.
TEST POINT (10) – recommended test point.

COMPONENT SYMBOLS



CAPACITOR CLASSIFICATION TABLE

TYPE	CODE	VOLTAGE RATING	CODE	VOLTAGE RATING	CODE	TOLERANCE	CODE
POLYESTER	A	3 V	A	250 V	M	1 %	F
POLYCARBONATE	B	6	B	350	N	2	G
CERAMIC	C	10	C	385	O	2.5	H
POLYSTYRENE (STYROLI	D	16	D	400	P	5	J
ELECTROLYTIC	E	25	E	450	R	10	K
POLYPROPYLENE	F	35	F	500	S	20	M
MET. PAPER	P	40	G	630	T	-20+80	Z
TANTALUM	T	50	H	1000	U	-10+50	T
		63	J	1500	W	-10+75	X
		100	K	2000	X		
		160	L				

When replacing standard components (does not apply to (11) and (12)) our approved types and brands are recommended in order to achieve optimum performance and reliability.

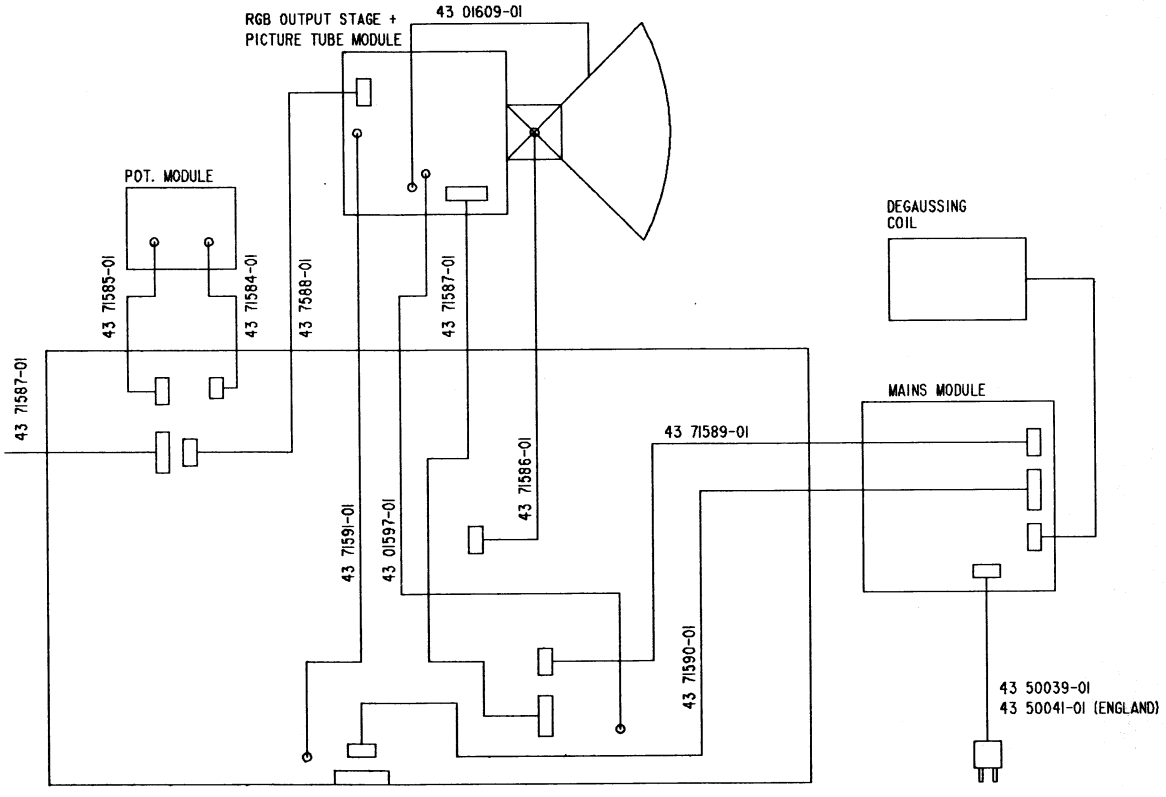
Special components (11) – have no component notation in the circuit diagram – **must** be replaced with original components only. See the module/block descriptions for information of part numbers.

⚠ Safety components (12) – **must** for safety reasons be replaced with our original components only. These components have either received a type approval of a Safety Regulations Commission or they possess special properties from safety points of view.

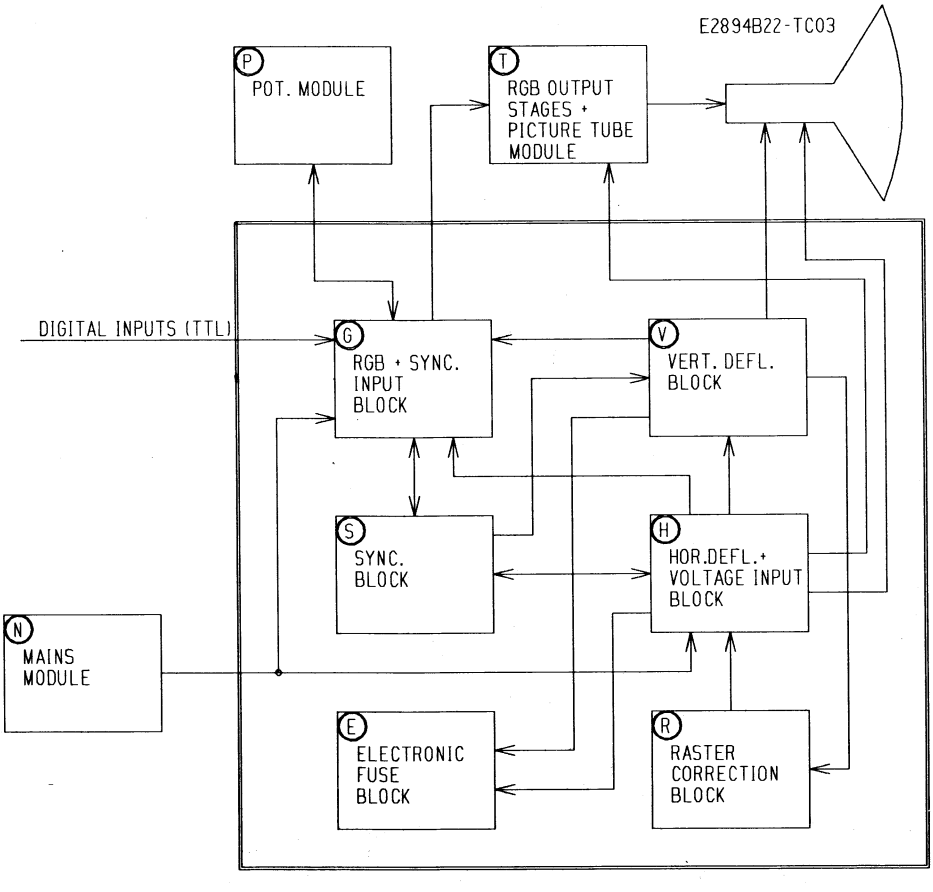
The voltage tolerance is ± 10 %. Greater tolerances can be expected with IC's.

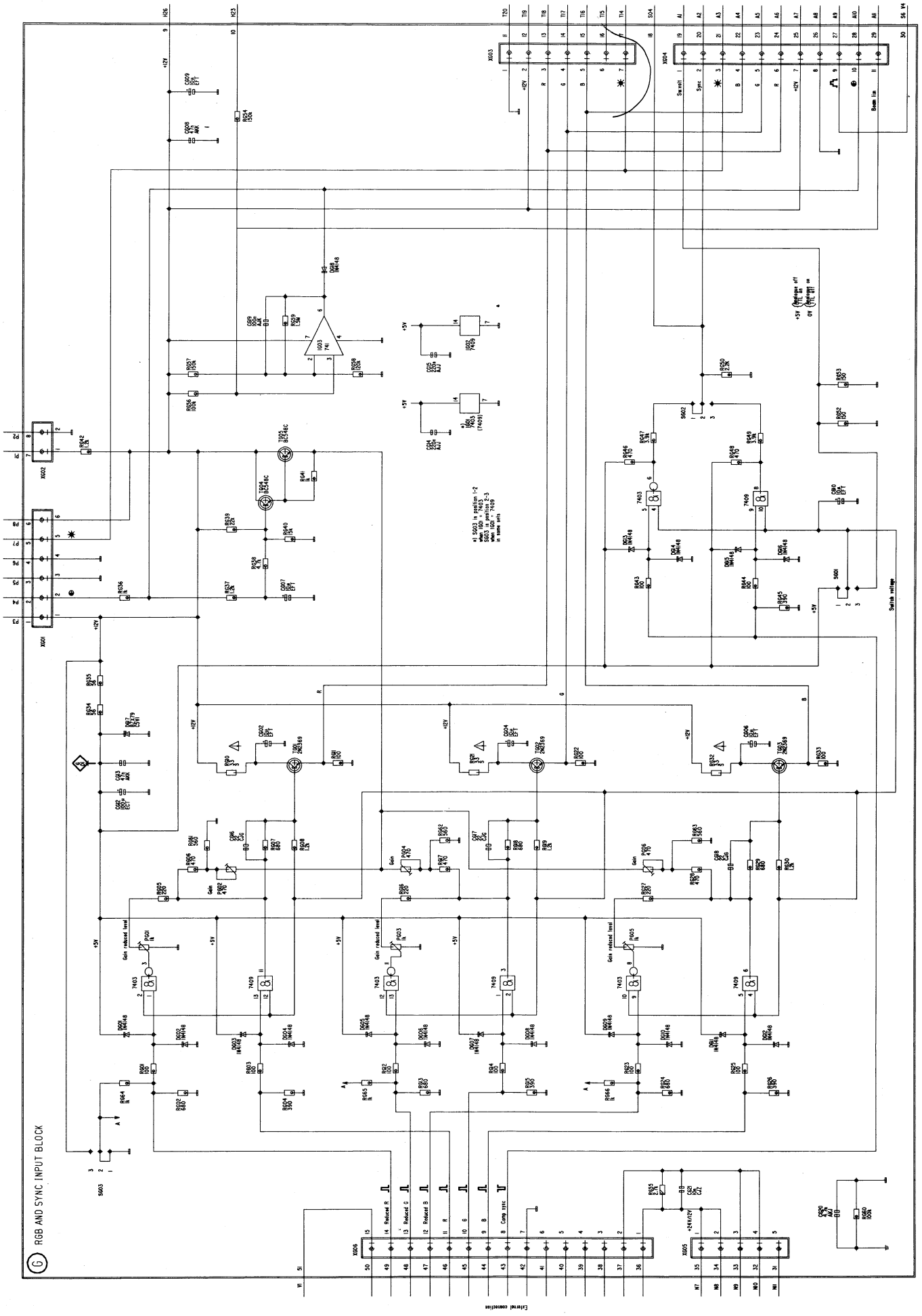
Our original spare parts, as well as standard components, can be ordered from our Spare Parts Department.

LEAD CONNECTION DIAGRAM

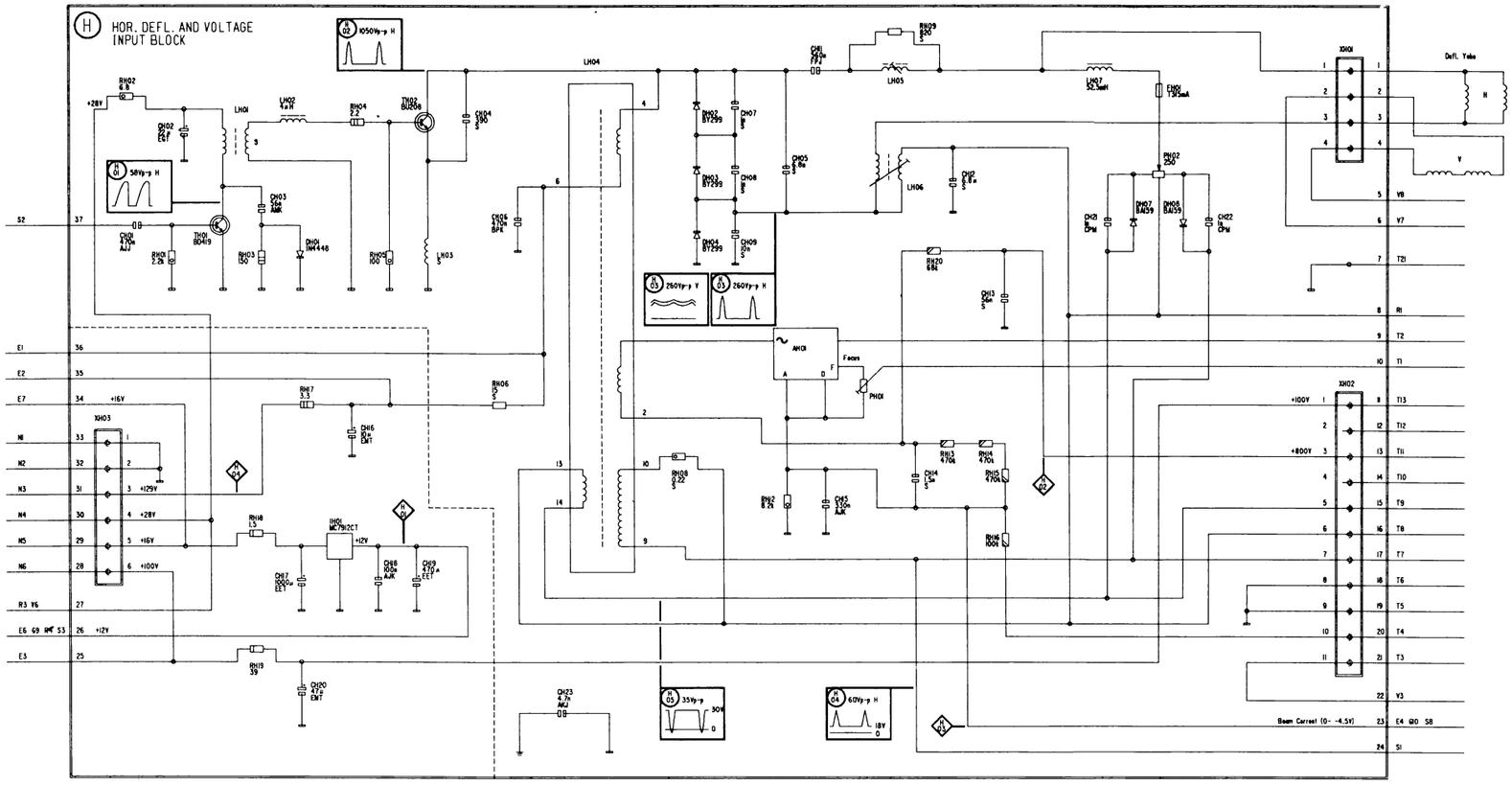


BLOCK DIAGRAM

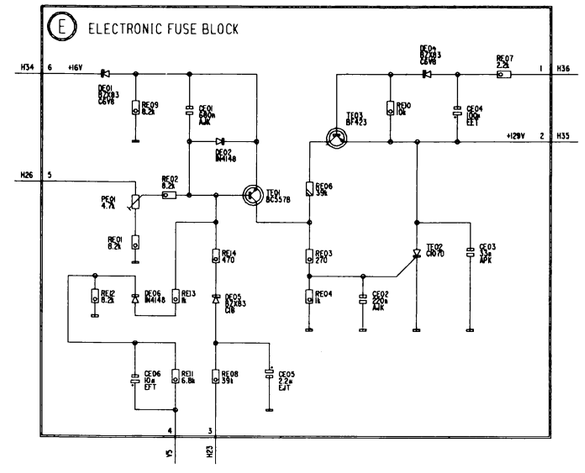



6 RGB AND SYNC INPUT BLOCK

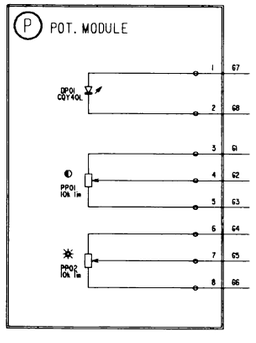
H HOR. DEFL. AND VOLTAGE INPUT BLOCK



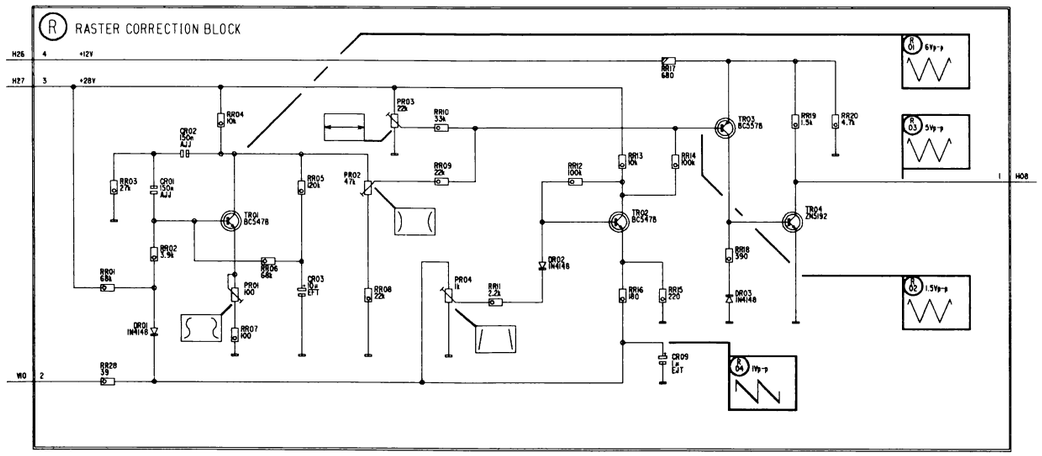
E ELECTRONIC FUSE BLOCK



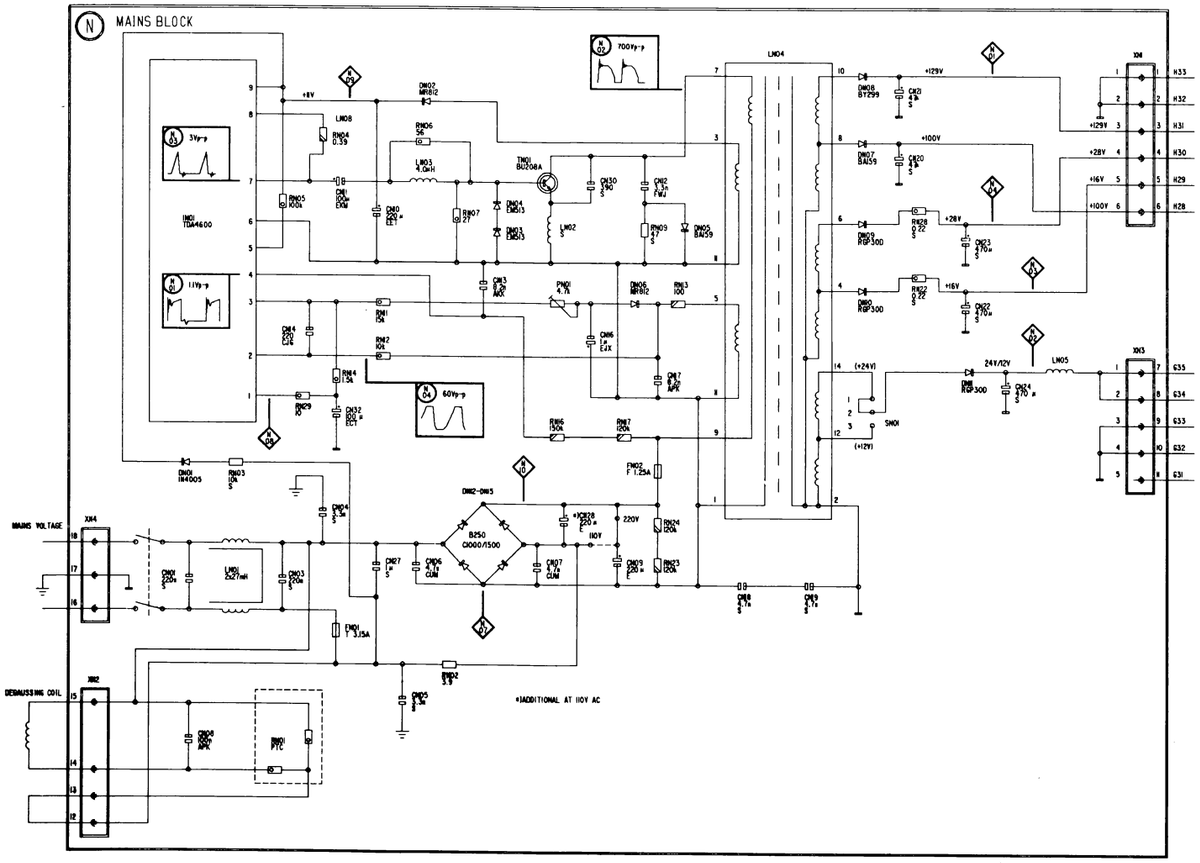
P POT. MODULE

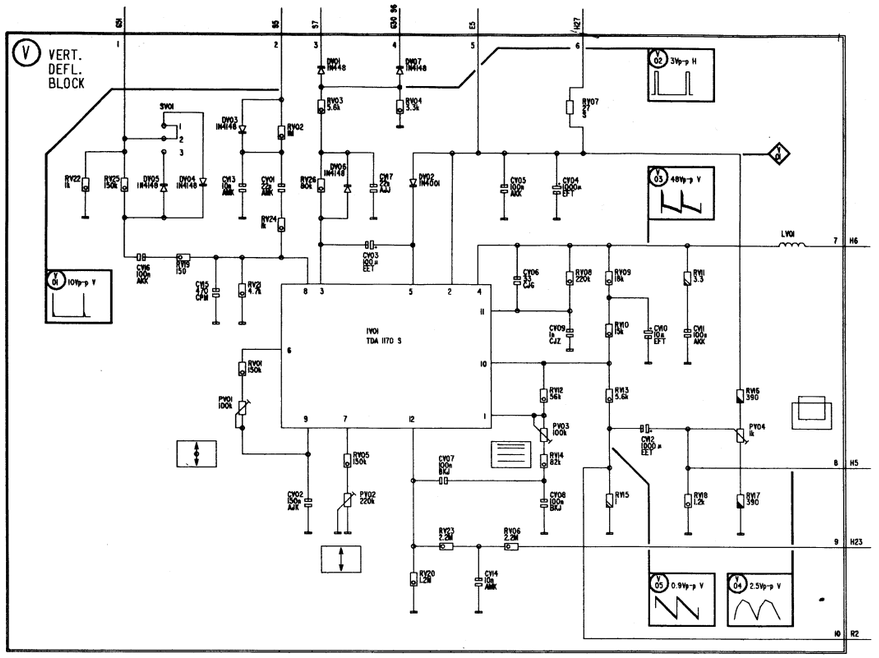


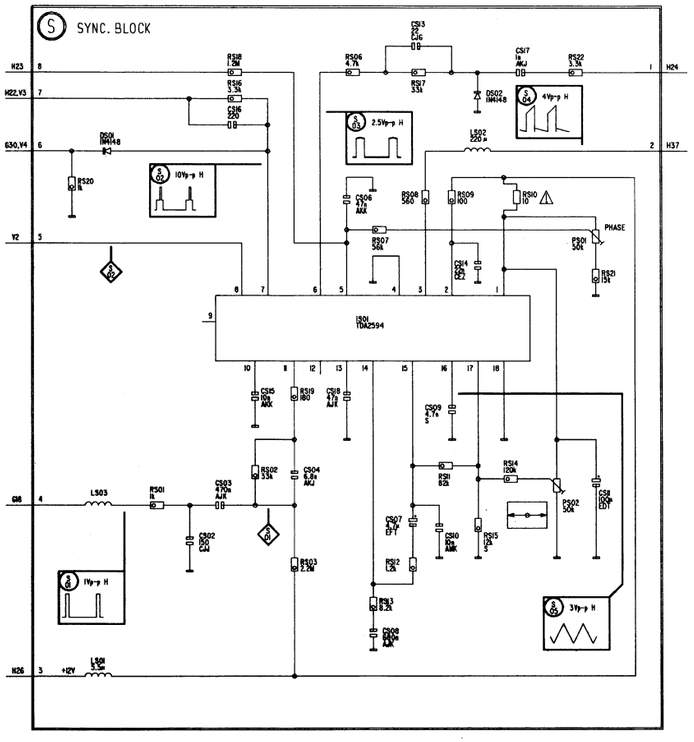
R RASTER CORRECTION BLOCK

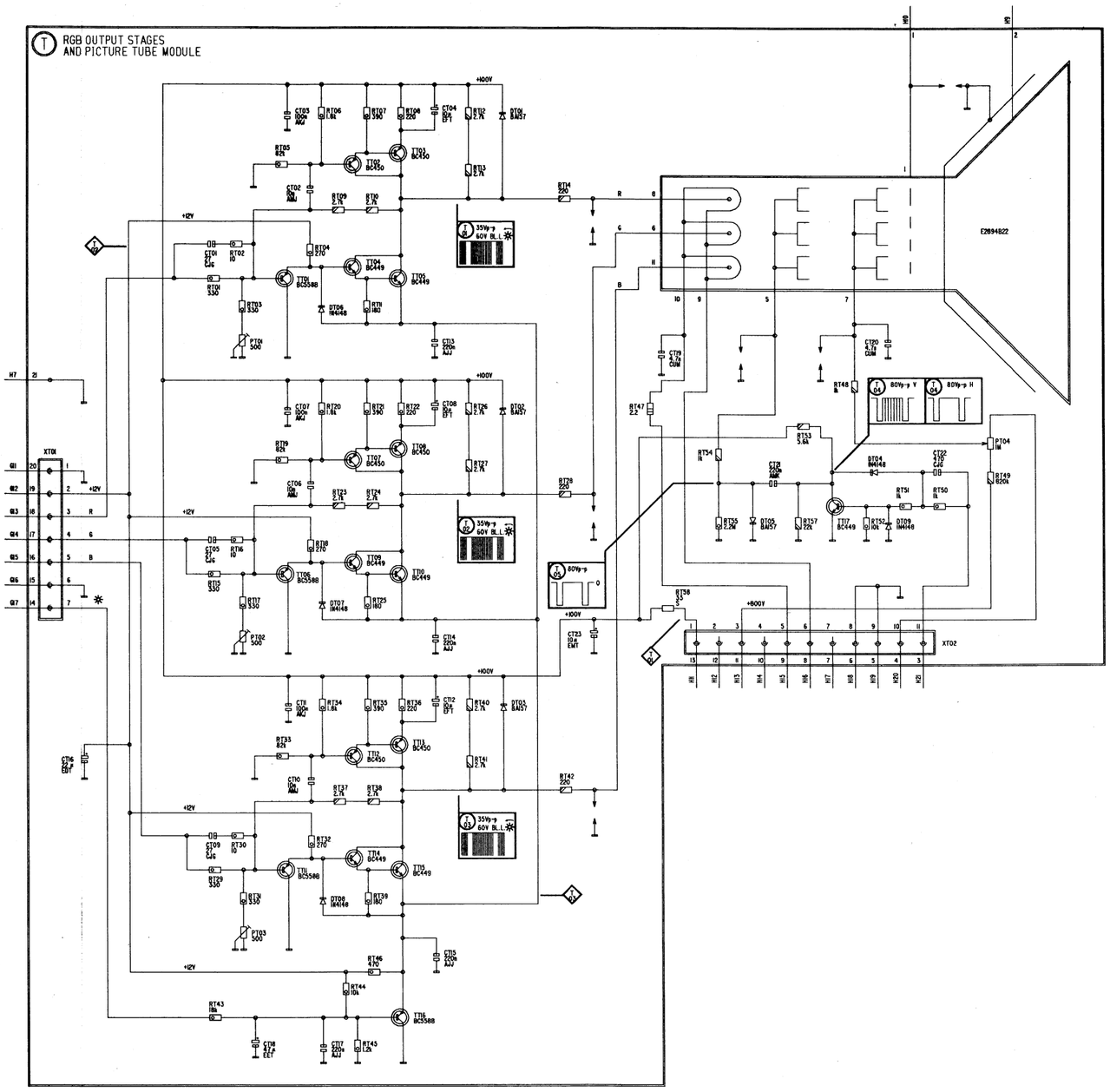


N MAINS BLOCK









Minor deviations from the circuit diagram may occur due to alterations during production.

Notes:

LUXOR
Datorer

MOTALA