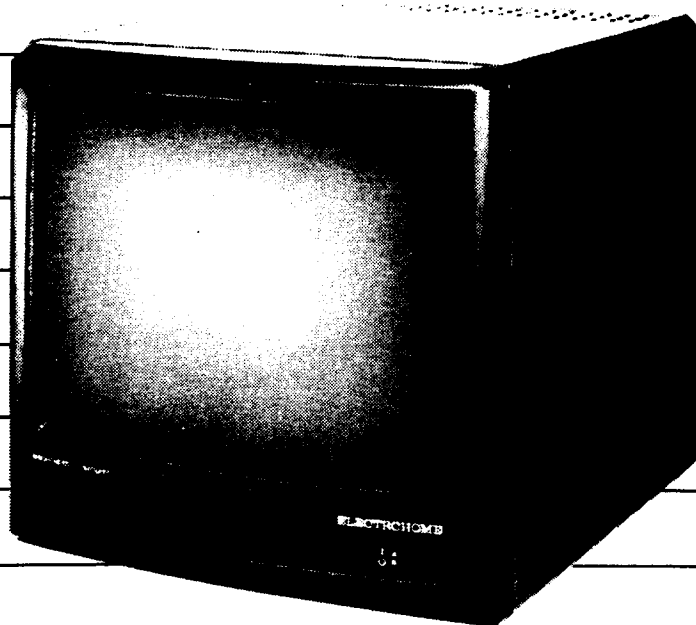




This information is up-to-date as of January 1989

54-7584-01V Issue 1

ELECTROHOME

PRODUCT NAME	MODEL NUMBER
ECM1210U . . .	38-D20ILA-OP
ECM1211U . . .	38-D20ILA-PP

HIGH RESOLUTION COLOR
MONITORS

For Service Manuals
contact
MAURITRON SERVICES
8 Cherry-Tree Road, Chinnor
Oxfordshire, OX9 4QY
Tel (01844) 351694
Fax (01844) 352554

SERVICE & INSTRUCTION MANUAL

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NOTICE

THIS DIGITAL APPARATUS IS TESTED TO AND COMPLIES WITH THE LIMITS FOR A CLASS A DIGITAL APPARATUS PURSUANT TO THE CANADIAN DEPARTMENT OF COMMUNICATIONS RADIO INTERFERENCE REGULATIONS. THE REGULATIONS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE FROM DEVICES OPERATED IN A COMMERCIAL ENVIRONMENT.

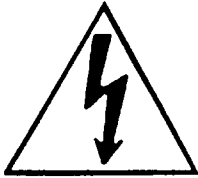
AVIS

CET APPAREIL À AFFICHAGE NUMÉRIQUE A ÉTÉ CONTRÔLÉ. IL EST CONFORME AUX LIMITES DES RÈGLEMENTS DE LA CLASSE A D'APPAREILS À AFFICHAGE NUMÉRIQUE ÉTABLIS PAR LE MINISTÈRE DES COMMUNICATIONS DU CANADA EN CE QUI CONCERNE LES INTERFÉRENCES RADIO. CES RÈGLEMENTS ONT ÉTÉ MIS EN PLACE POUR ASSURER UNE PROTECTION RAISONNABLE CONTRE LES INTERFÉRENCES PRODUITS PAR DES APPAREILS UTILISÉS DANS UN ENVIRONNEMENT COMMERCIAL.

WARNING

THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTIONS MANUAL, MAY CAUSE INTERFERENCE TO RADIO COMMUNICATIONS. IT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A COMPUTING DEVICE PURSUANT TO SUBPART J OF PART 15 OF FCC RULES, WHICH ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE WHEN OPERATED IN A COMMERCIAL ENVIRONMENT. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE INTERFERENCE IN WHICH CASE THE USER AT HIS OR HER OWN EXPENSE WILL BE REQUIRED TO TAKE WHATEVER MEASURES MAY BE REQUIRED TO CORRECT THE INTERFERENCE.

WARNING SAFETY TIPS

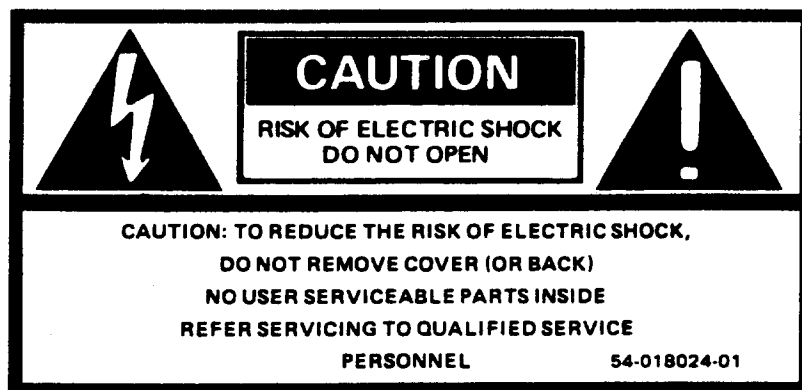


The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

An example of a Warning Label



WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

STANDARD SAFETY TIPS

1. Read all of these instructions.
2. Save these instructions for later use.
3. Unplug this monitor from the wall outlet before cleaning. Do not use liquid cleaner or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use attachments not recommended by Electrohome as they may result in the risk of fire, electric shock, or injury to persons.
5. Do not use this monitor near water – for example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, or the lake.
6. Do not place this monitor on an unstable cart, stand, or table. The monitor may fall, causing serious injury to a child or adult, and serious damage to the appliance. Use only with a cart or stand recommended by the manufacturer, or sold with the monitor. Wall or shelf mounting should follow the manufacturer's instructions, and should use a mounting kit approved by the manufacturer.
7. Slots and openings in the cabinet and the back or bottom are provided for ventilation, and to ensure reliable operation of the monitor and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the monitor on a bed, sofa, rug, or other similar surface. This monitor should never be placed near or over a radiator or heat register. This monitor should not be placed in a built-in installation such as a bookcase unless proper ventilation is provided.
8. This monitor should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supplied, consult your Electrohome dealer or local power company. For monitors designed to operate from battery power, refer to the operating instructions.
9. This monitor is equipped with a three wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding type plug.
10. Do not allow anything to rest on the power cord. Do not locate this monitor where the cord will be abused by persons walking on it.
11. Follow all warnings and instructions marked on the monitors.
12. Do not overload wall outlets and extension cords as this can result in fire or electric shock.
13. Never push objects of any kind into this monitor through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the monitor.
14. Do not attempt to service this monitor yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
15. Unplug this monitor from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - A. When the power cord or plug is damaged or frayed.
 - B. If liquid has been spilled into the monitor.
 - C. If the monitor has been exposed to rain or water.
 - D. If the monitor does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the monitor to normal operation.
 - E. If the monitor has been dropped or the cabinet has been damaged.
 - F. When the monitor exhibits a distinct change in performance this indicates a need for service.
16. When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or injury to persons.
17. Upon completion of any service or repairs to this monitor, ask the service technician to perform routine safety checks to determine that the monitor is in safe operating condition.
18. To prevent fire or shock hazard do not expose the monitor to rain or moisture.

SAFETY PRECAUTION

1. The design of this product contains special hardware, many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Service should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the products should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacturer of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the parts list of Service manual. Electrical components having such features are identified by shading on the schematics and by () on the parts list in Service manual. The use of a substitute replacement which does not have the same safety characteristics as the recommended replacement part shown in the parts list of Service manual may create shock, fire, or other hazards.
4. **Use isolation transformer when hot chassis.**
The chassis and any sub-chassis contained in some products are connected to one side of the AC power line. An isolation transformer of adequate capacity should be inserted between the product and the AC power supply point while performing any service on some products when the HOT chassis is exposed.
5. **Don't short between the LIVE side ground and NEUTRAL side grounding or EARTH side ground when repairing.**
Some model's power circuit is partly different in the GND. The difference of the GND is shown by the LIVE () side GND, the NEUTRAL () side GND and EARTH () side GND. Don't short between the LIVE side GND and NEUTRAL side GND or EARTH side GND and never measure with a measuring apparatus (oscilloscope etc.) the LIVE side GND and NEUTRAL side GND or EARTH side GND at the same time.
If above note will not be kept, a fuse or any parts will be broken.
6. If any repair has been made to the chassis, it is recommended that the B₁ setting should be checked or adjusted (See ADJUSTMENT OF B₁ POWER SUPPLY).
7. The high voltage applied to the picture tube must conform with that specified in Service manual. Excessive high voltage can cause damage, therefore operation under excessive high voltage conditions should be kept to a minimum, or should be prevented. If severe arcing occurs, remove the AC power immediately and determine the cause by visual inspection (incorrect installation, cracked or melted high voltage harness, poor soldering, etc.). To maintain the proper minimum level of soft X-Ray emission, components in the high voltage circuitry including the picture tube must be the exact replacements or alternatives approved by the manufacturer of the complete product.
8. Do not check high voltage by drawing an arc. Use a high voltage meter or a high voltage probe with a VTVM. Discharge the picture tube before attempting meter connection, by connecting a clip lead to the ground frame and connecting the other end of the lead through a 10k Ω 2W resistor to the anode button.
9. When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress in the high voltage circuit area. Where a short circuit has occurred, those components that indicate evidence of overheating should be replaced. Always use the manufacturer's replacement components.
10. **Isolation Check (Safety for Electrical Shock Hazard)**
After re-assembling the product, always perform an isolation check on the exposed metal parts of the cabinet (antenna terminals, video/audio input and output terminals, Control knobs, metal cabinet, screwheads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.

(1) Dielectric Strength Test

The isolation between the AC primary circuit and all metal parts exposed to the user, particularly any exposed metal part having a return path to the chassis should withstand a voltage of 1,100V AC (r.m.s.) for a period of one second.

... Withstand a voltage of 1,100V AC (r.m.s.) to an appliance rated up to 120V, and 3,000V AC (r.m.s.) to an appliance rated 200V or more, for a period of one second.

This method of test requires a test equipment not generally found in the service trade.

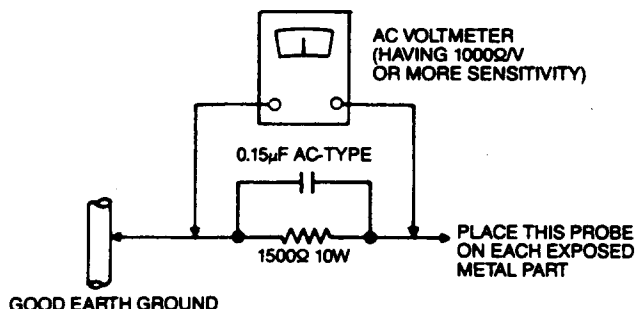
(2) Leakage Current Check

Plug the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Using a "Leakage Current Tester", measure the leakage current from each exposed metal part of the cabinet, particularly any exposed metal part having a return path to the chassis, to a known good earth ground (water pipe, etc.). Any leakage current must not exceed 0.5mA AC (r.m.s.).

• Alternate Check Method

Plus the AC line cord directly into the AC outlet (do not use a line isolation transformer during this check.). Use an AC voltmeter having 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500 Ω 10W resistor paralleled by a 0.15 μ F AC-type capacitor between an exposed metal part and a known good earth ground (water pipe, etc.).

Measure the AC voltage across the resistor with the AC voltmeter. Move the resistor connection to each exposed metal part, particularly any exposed metal part having a return path to the chassis, and measure the AC voltage across the resistor. Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.35V AC (r.m.s.). This corresponds to 0.5mA AC (r.m.s.).



11. High voltage hold down circuit check.

After repair of the high voltage hold down circuit, this circuit shall be checked to operate correctly.
See item "How to check the high voltage hold down circuit".

PRODUCT SPECIFICATIONS

ELECTROHOME ECM 1200 SERIES

Type: Fully Enclosed Colour Display monitor

CRT: In Line 90°, 0.28mm Dot Pitch – Available with Tinted, Anti-Glare Screen and Short or Long Persistence Phosphors

Product Name/Model Number	CRT Type
ECM1210 U/38-D20ILA-OP ECM1210 BIK. U/38-D20ILB-OP	High Resolution, Tinted, Non Glare, Short Persistence Phosphor
ECM1211 U/38-D20ILA-PP ECM1211 BIK. U/38-D20ILB-PP	High Resolution, Tinted, Non Glare, Long Persistence Phosphor

Usable Viewing Area: 220mm (H) × 165mm (V)

Resolution: 720 H × 540 V

Required Power: 100 - 240 VAC/ 50/60 Hz.

Power Consumption 1.6A @ 120 VAC/60 Hz.
0.8A @ 240 VAC/50 Hz.

Input Signal TTL/Analog/PS2 Analog

Input Levels TTL – TTL Levels
Analog – 0.7V PP

Connector Pin Configurations

9 Pin
TTL Input
Connector

PIN	FUNC.	PIN	FUNC.	PIN	FUNC.
1	GND	4	G	7	B''
2	R'	5	B	8	HD
3	R	6	G'/I	9	VD

ANALOG SIGNAL
CONNECTOR
PS2 - 15 PIN

PIN	FUNC.	PIN	FUNC.	PIN	FUNC.
1	R	6	GND.	11	GND.
2	G	7	GND.	12	N/C
3	B	8	GND.	13	VD
4	N/C	9	GND.	14	HD
5	N/C	10	GND.	15	N/C

PRODUCT SPECIFICATIONS

ELECTROHOME ECM 1200 SERIES

Input Impedance: RGB/TTL - 330 R
RGB ANALOG - 75R

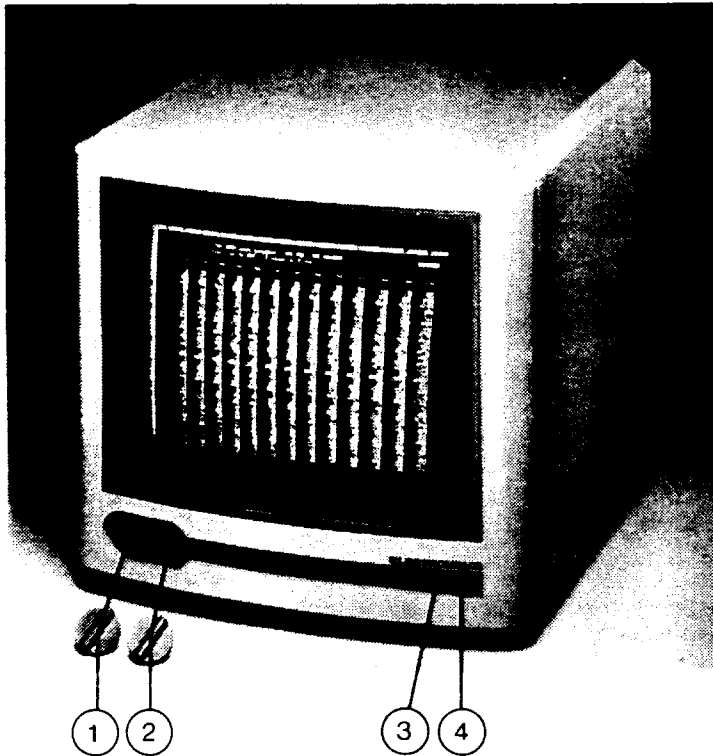
Input Connectors: RGB/TTL - 9 Pin EIA Subminiature "D" (Female)
RGB Analog - BNC or 15 Pin Sub "D" (Female)

Scanning Frequencies:
Horizontal 15.0 - 37.0 KHz.
Vertical 50 - 90 Hz.

Retrace Times:
Horizontal 6 μ S. (max.)
Vertical 700 μ S. (max.)

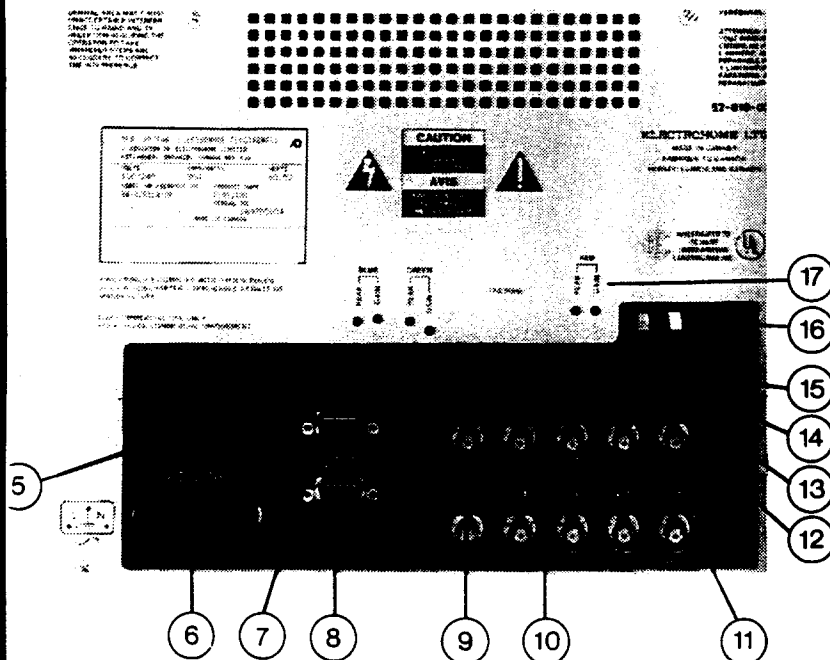
Anode Voltage 23 KV $\pm$ 1 KV

CONTROLS



FRONT

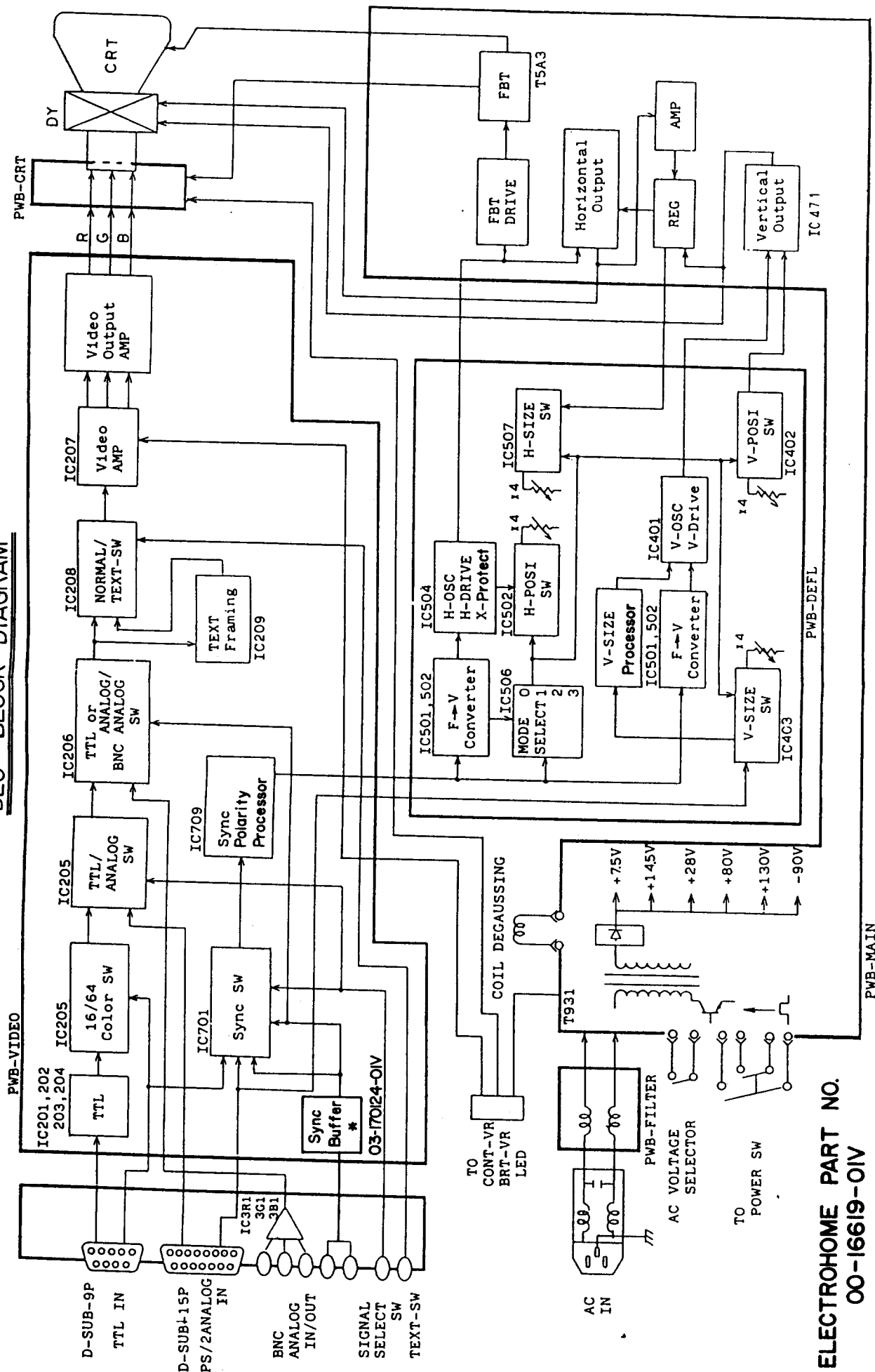
- ① Brightness Control – To Adjust Black Level
- ② Contrast Control – To adjust intensity
- ③ Power Indicator – Lights green when power is applied
- ④ Power Switch – To apply power



REAR

- ⑤ Voltage Selector Switch
- ⑥ Power Input Connector
- ⑦ RGB TTL Input
- ⑧ RGB Analog Input/PS2
- ⑨ RGB BNC Analog Input
- ⑩ Signal Select Switch
- ⑪ 75 Ohm Termination Switches
- ⑫ Horizontal Position Control
- ⑬ Horizontal Size Control
- ⑭ Vertical Position Control
- ⑮ Vertical Size Control
- ⑯ Color Text Switches
- ⑰ RGB Peak and Gain Adjust

D20 BLOCK DIAGRAM

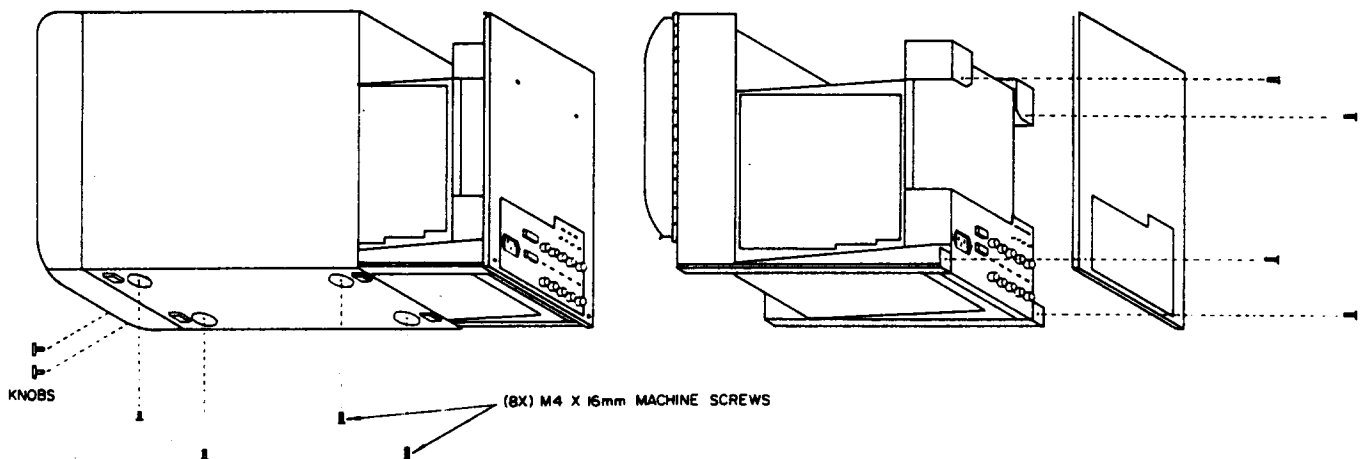


ELECTROHOME PART NO.
00-16619-OIV

ISSUE 1

* SYNC BUFFER MAY NOT BE REQUIRED ON ALL MODELS

How to Remove for Service



00-16620-01V

To Remove Cabinet for Service

- (1) Remove the brightness and contrast knobs by pulling them towards you.
- (2) Remove the four (4) #8-32 screws from beneath the cabinet.
- (3) Gently slide the chassis and CRT frame assembly backwards from the cabinet 5 cm - 7 cm (2-3").
- (4) Unplug the harness from the control PCB and the power switch.
- (5) Continue to slide the CRT and frame assembly backwards until it is free of the cabinet.
- (6) Utilize the monitor side frames for servicing the main PCB assembly.
- (7) If necessary, refer to the above sketch for removal of the rear cover or the signal module.

How to Remove All PWB's & C.R.T.

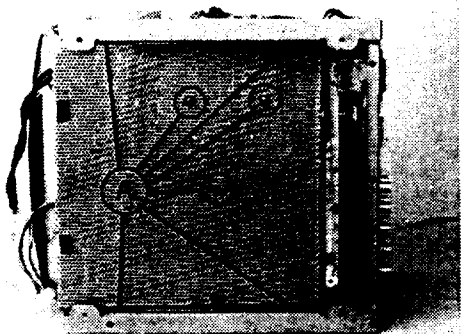


Fig. 1.

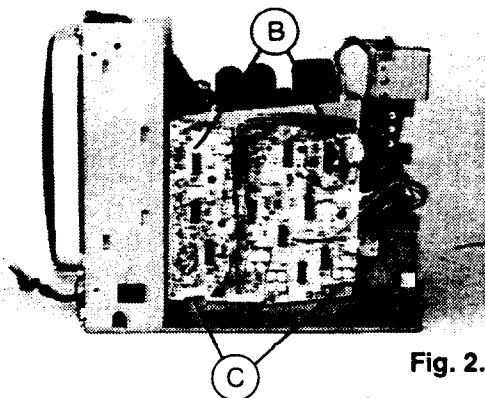


Fig. 2.

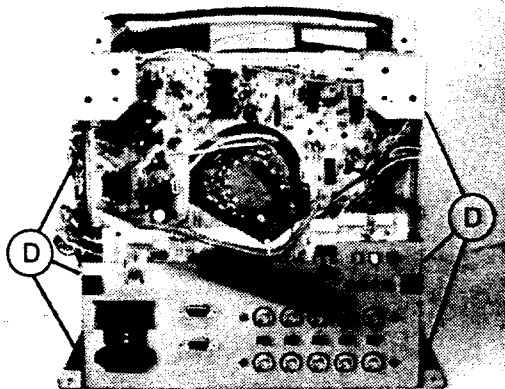


Fig. 3.



Fig. 4.

1. Main PWB

- (a) Remove the (7) screws marked "A" as shown in Fig. 1.
- (b) Remove the bottom perforated shield.
- (c) The solder side of the main PWB is now accessible for servicing.

2. Deflection PWB

- (a) Remove the PWB from the z spacers marked "B" as shown in fig. 2.
- (b) Lift the Def. PWB upwards and release the PWB from the bottom 2 hooks marked "C" as shown in fig. 2. The Def. PWB can be turned for servicing.

3. Video PWB and IO PWB

- (a) Remove the self-adhering black plastic back panel.
- (b) Remove the (6) screws marked "D" as shown in Fig. 3.
- (c) Disconnect connectors marked RO, GO, BO and CRT Ground SA.
- (d) Remove the CRT PWB for servicing if necessary.
- (e) Remove the (4) screws marked "E" as shown in fig. 4.

How to Remove All PWB's & CRT



Fig. 5.

- (f) Unsolder the video shield tabs marked "J" as shown in fig. 5.
- (g) Remove the video shield to service video PWB and IO PWB.

4. Removing the CRT

- (a) Remove the (4) screws marked "K" as shown in fig. 6.
- (b) Disconnect the Def. Yoke connector and remove the CRT PWB as outlined in step 3C.
- (c) Disconnect the degaussing coil connector from the Main PWB and remove the CRT.

NOTE: PWB is a Printed Wire Board similar to a Printed Circuit Board (PCB).

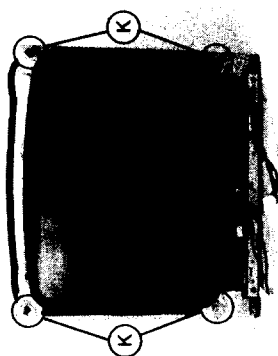


Fig. 6.

SERVICE ADJUSTMENT

1. INSTRUMENT AND EQUIPMENT RECOMMENDED FOR SERVICING AND SET-UP.

- Programmable Video Generator (Make sure to use TTL level and analog level) $f_H = 15\text{KHz} - 37\text{ KHz}$
- Oscilloscope
- DC Voltage meter (0 - 150V DC)
- High Voltage meter (0 - 30KV DC)
- Frequency Counter
- Adjustment Tools
- DC Ampere meter (0 - 1mA DC)
- Scale

2. SETTING UP

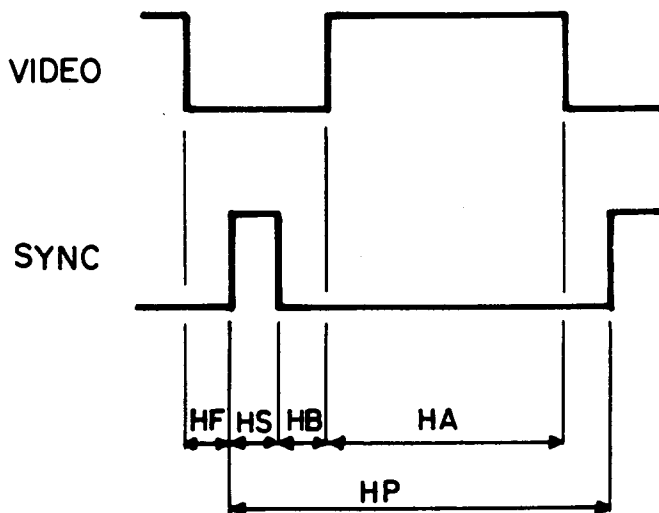
User's control Variable Resistors (VR) and switches (SW) are set up according to the following table;

SYMBOL NO.	CONTROL VR or SW	SETTING POSITION
VR301	HOR-POS1	CENTER
VR301	HOR-SIZE	CENTER
VR301	VERT-POS1	CENTER
VR301	VERT-SIZE	CENTER
S301	TTL/ANALOG - SW	RGB TTL
S3R1	IMPEDANCE - SW	75
S3G1	ditto	ditto
S3B1	ditto	ditto
S3V1	ditto	ditto
S3H1	ditto	ditto
S2R1	TEXT - SW	NON TEXT
R2G1	ditto	ditto
R2B1	ditto	ditto
—	CONTRAST	MAX
—	BRIGHTNESS	CENTER

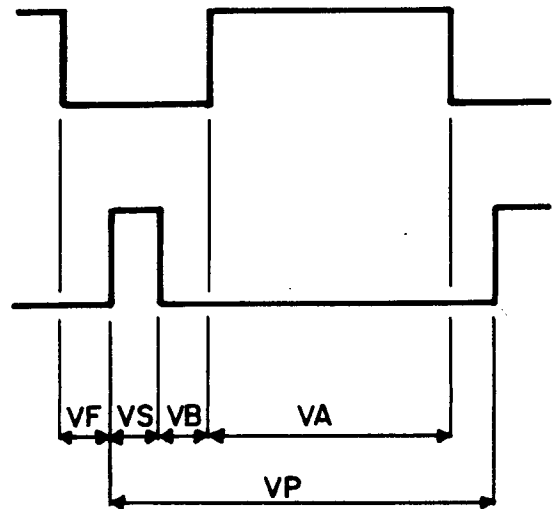
TIMING CHARTS

	fH = 15.7KHz	fH = 21.8KHz	fH = 31.5KHz	fH = 37KHz	fH = 17K	fH = 28K
fH (KHz)	15.7	21.85	31.5	37.0	17.0	28.0
fV (Hz)	60	59.7	60	60	60	60
H-SYNC Polarity	P	P	N	N	P	P
H-SYNC Polarity	P	N	N	N	P	P
COMPSIT SYNC Polarity	—	—	—	—	—	—
HF (μsec)	6.600	-0.185	0.940	0.297	5.05	1.78
HS (μsec)	4.470	4.921	3.77	3.700	8.07	4.82
HB (μsec)	8,102	1.661	1.89	3.17	0.43	0.55
HP (μsec)	63.695	45.765	31.77	27.00	58.82	35.71
HA (μsec)	44.698	39.368	25.17	20.35	46.13	28.56
VF (msec)	1.592	0.046	0.35	0.054	0.058	0.107
VS (msec)	0.191	0.595	0.064	0.054	0.118	0.071
VB (msec)	2.166	0.092	1.02	0.810	0.609	1.254
VP (msec)	16.688	16.750	16.680	16.632	16.650	16.680
VA (msec)	12.739	16.018	15.246	15.714	15.765	15.248
NOTE	CGA	EGA	VGA			

HORIZONTAL



VERTICAL



TIMING CHARTS

	fH = 34.5KHz	fV = 45Hz	fV = 100Hz			
fH (KHz)	34.5	31.5	31.5			
fV (Hz)	60	45	100			
H-SYNC Polarity	N	N	N			
V-SYNC Polarity	N	N	N			
COMPSIT SYNC Polarity	—	—	—			
HF (μsec)	0.50	0.94	0.94			
HS (μsec)	3.98	3.77	3.77			
HB (μsec)	2.61	1.90	1.90			
HP (μsec)	28.99	31.77	31.77			
HA (μsec)	21.90	25.16	25.16			
VF (msec)	0.29	0.158	0.032			
VS (msec)	0.058	0.064	0.064			
VB (msec)	0.666	0.413	0.380			
VP (msec)	16.66	22.239	9.975			
VA (msec)	15.562	21.604	9.499			
NOTE						

NOTES

4. ADJUSTMENTS

4-1 ADJUSTMENT OF B4 VOLTAGE

- 1) $f_H=31.5\text{KHz}$. Display white-raster.
- 2) Connect DC voltage meter between TP-B4 and GND.
- 3) Adjust B4-ADJ. (VR911) and set the level of $130 \pm 0.5\text{V}$.

4-2 ADJUSTMENT OF HIGH VOLTAGE

- 1) POWER-SW OFF
- 2) Connect High voltage meter between ANODE of CRT and GND.
- 3) POWER -SW ON.
- 4) Adjust HV-ADJ (VR5A3) and find the level of $22.5\text{KV} \pm 0.1\text{V}$.
- 5) POWER-SW OFF and take off the High voltage meter.
- 6) Solder VR5A3 after all the adjustments.

NOTE: The following items must be adjusted after having heat-run more than 30 minutes.

4-3 HORIZONTAL CIRCUIT

4-3-1 HORIZONTAL FREE RUNNING FREQUENCY

- 1) Non-Signal condition.
- 2) Connect Frequency Counter between DY red lead and GND.
- 3) Turn H-FREE-RUN (VR507) and set the level of $15.5 \pm 0.1\text{KHz}$.

4-3-2 H-HOLD

- 1) $f_H=15.7\text{KHz}$. Display white-raster.
- 2) Short TP-FH with clip etc.
- 3) Turn H-HOLD-1 (VR515) and Set $15.7 \pm 0.3\text{KHz}$.
- 4) $f_H=37\text{KHz}$. Display white raster.
- 5) Turn H-HOLD-2 (VR505) and set $37 \pm 0.3\text{KHz}$.
- 6) Repeat steps 1 to 5 several times until you find the optimum value for both frequencies.
- 7) Release TP-FH.

4-3-3 HORIZONTAL LINEARITY CORRECTIVE CAPACITANCE

- 1) Input the signal of $f_H=17\text{KHz}$.
- 2) Turn 17K (VR506) to the correct position. Set the position when raster changes.
- 3) Input the signal of $f_H=28\text{KHz}$.
- 4) Turn 28K (VR514) to the correct position. Set the position when raster changes.
- 5) Input the signal of $f_H=34.5\text{KHz}$.
- 6) Turn 34K (VR513) to the correct position. Set the position when raster changes.

4-4 VERTICAL CIRCUIT

4-4-1 V-HOLD

- 1) Input $f_V=60\text{Hz}$ signal.
- 2) Turn V-HOLD (VR402) to the right, and when the raster changes faster, turn it 30° to the left.
- 3) When changing vertical frequency ($f_V=45\text{Hz}$ and $f_V=100\text{Hz}$), if raster is not normal, adjust VR402 slightly.

4-4-2 V-LINEARITY

- 1) Display Cross-hatch: $f_H=31.5\text{KHz}$.
- 2) Adjust V-LIN (VR403) to get optimum linearity.

4-5 SIDE-PCC

- 1) Display Cross-hatch: $f_H=31.5\text{KHz}$.
- 2) Adjust PCC—ADJ (VR512) so as not to get pincushion or barrel distortion of screen.

4-6 POSITION AND SCREEN SIZE

4-6-1 RASTER CENTER

- 1) Set BRIGHT-VR to the MAX.
- 2) Display Cross-hatch: $f_H=31.5\text{KHz}$.
- 3) Turn H-CENT (VR5A1) and set the center of the raster.
- 4) Return BRIGHT-VR to the center.

4-6-2 SIZE AND CENTERING

- 1) Adjust SIZE, CENTER of each frequency.

ITEM/SIGNAL	$f_H=15.7\text{KHz}$	$f_H=21.8\text{KHz}$	$f_H=31.5\text{KHz}$	$f_H=37\text{KHz}$
H-SIZE ($220\pm 2\text{mm}$)	VR503	VR501	VR504	VR502
H-POSITION	VR510	VR508	VR511	VR509
V-SIZE ($165\pm 2\text{mm}$)	VR406	VR406	VR407	VR405
H-POSITION	VR410	VR408	VR411	VR409

4-7 VIDEO

4-7-1 CRT-CUT-OFF

- 1) Switch to PS/2 Analog and receive white raster: $f_H=31.5\text{KHz}$.
- 2) Short TP-SP with a clip etc.
- 3) Adjust screen-VR on the FBT slowly so that either a red, green or blue horizontal line begins to appear.
- 4) Adjust CUT OFF CONTROLS (VR6R1, VR6G1, VR6B1) so that a line appears.
- 5) Remove short from TP-SP.

4-7-2 DRIVE

- 1) Adjust VR2R1, VR2G1, VR2B1, to make line white.
- 2) Display a gray scale and make sure that each gradation is white.
- 3) If you are not able to get the right one, check it again according to the STEP of 4-7-1.

COLOR TEMPERATURE = $6500^{\circ}\pm 7\text{MPCD}$

4-7-3 BEAM

- 1) Plug TTL signal and display white-raster: $f_H=31.5\text{KHz}$
- 2) Connect DC Amperemeter (1mA range) to the + and - polarities of TP-BC.
- 3) Turn SUB-CONT (VR201) and set $370\mu\text{A}$.
- 4) Release DC Amper meter.

4-8 BNC INPUT

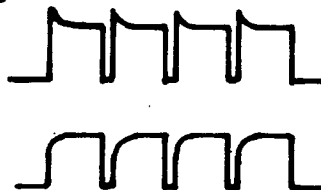
4-8-1

- 1) Plug BNC Analog and Display white raster; $f_H=31.5\text{KHz}$
- 2) Connect DC Amperemeter (1mA range) to the + and - polarities of TP-BC.
- 3) Turn GAIN-VR (VR3R2, VR3G2, VR3B2) and set the values of $370\mu\text{A}$ and $6500^{\circ}\text{K}\pm 7\text{MPCD}$.
- 4) Display Cross-hatch signal reverse-signal: $f_H=31.5\text{KHz}$.
- 5) Check TP-BR, TP-BG and TB-BB with Osilloscope and set PEAK-VR (VR3R1, VR3G1, VR3B1) to obtain flat square wave as shown below.

[GOOD]



[BAD]



4-9 FOCUS

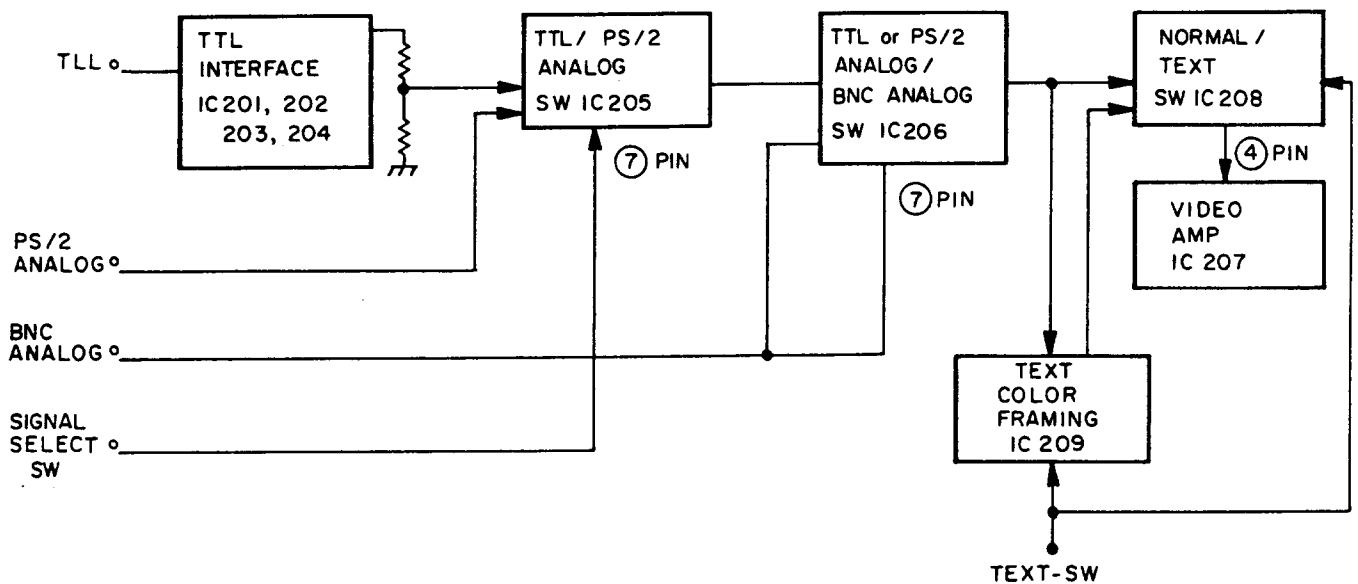
- 1) $f_H=31.5\text{KHz}$. display H-letters
- 2) Adjust Focus-VR on the FBT, to get optimum focus.

CIRCUIT DESCRIPTION

1. VIDEO CIRCUIT

The TTL signal from the 9 pin "D" connector is converted to analog thru the circuit of IC201, 202, 203 and 204. The resultant output is then applied to IC205.

The PS/2 analog signal from the 15 pin "D" connector is applied to IC205 thru capacitors C2R1, C2G1 and C2B1. The BNC analog signal, from the BNC connectors is applied to IC206 thru capacitors C2R3, C2G3 and C2B3. The chosen signal (refer to Table 2-1) is separated into equal R.G.B. levels, thru the combined circuits of IC208, IC209 and Color Text Switch SW25R1, 2SG1 and 2SB1. The resultant output signal is applied to the 3 channel video amplifier IC207.



EACH IC OUTPUT SWITCHING SIGNAL (Table 2-1)

IC205, 206 7 IC208 4	IC205	IC206	IC208
L (=0V)	PS/1 ANALOG	OUTPUT FROM IC205	RGB EQUAL LEVEL
H (=1V)	TTL	BNC ANALOG	OUTPUT FROM IC206

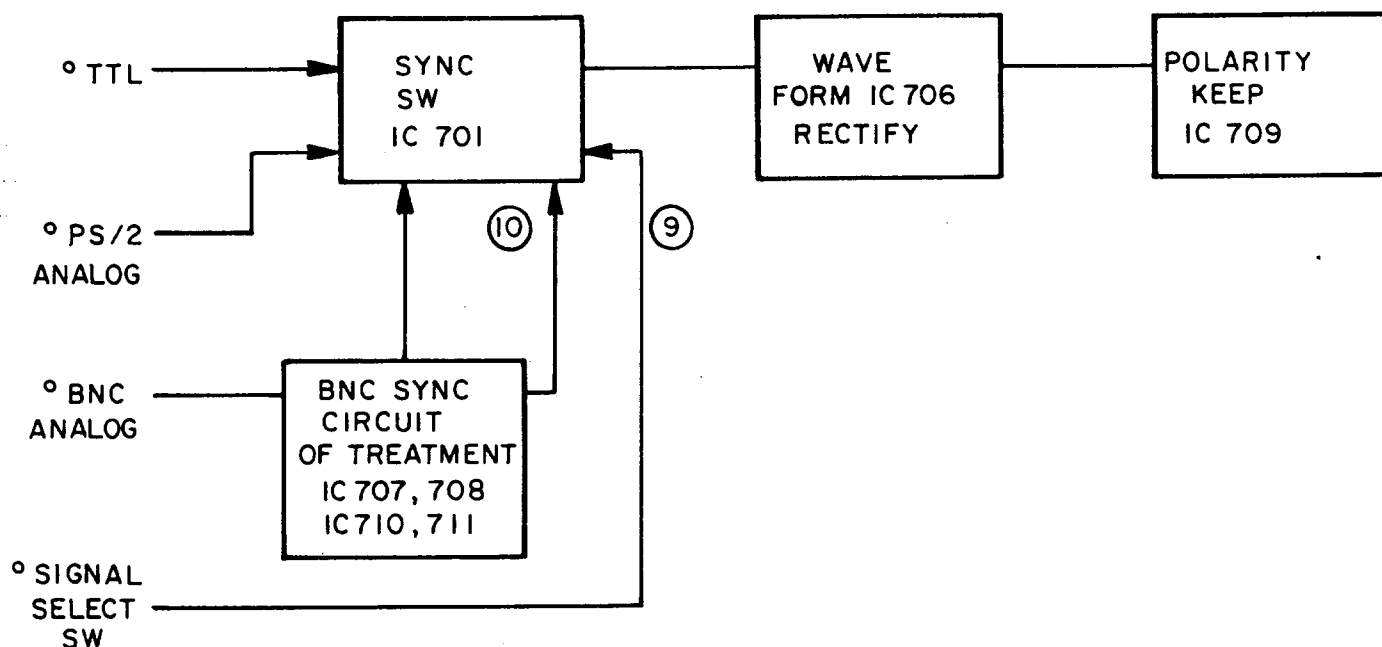
2. VIDEO OUTPUT CIRCUIT

The video signal from IC208 is amplified by IC207, clamped at the input of the video output amplifiers and applied to the individual CRT cathodes.

3. SWITCHING CIRCUIT OF SYNCHRONIZED SIGNAL

All the synchronized signals are processed thru IC701 whose output is controlled by the voltage on pins 9 & 10 (see Table 4-1).

The signal select switch S301 controls the voltage on pin 9 and the BNC analog signal controls the voltage on pin 10. The output from IC701 is rectified by IC706 and a positive polarity is maintained thru IC709 for passage to the deflection circuits.



IC701 SYNC SIGNAL SWITCHING IC (Table 4-1)

9 B	10 A	OUTPUT
L (=0V)	L	PS/2 ANALOG
H (=3V)	L	TTL
L	H	] BNC ANALOG
H	H	

4) OSCILLATED FREQUENCY CONVERSION CIRCUIT

OPE-AMP IC503 amplifies the signal from IC501 and supplies the signal to IC504 Pin #8. The oscillator frequency for 15.7 KHz is adjusted by H-Hold-1 VR515 and by H-Hold-2 VR505 for 37.0 KHz.

5) SWITCHING CIRCUIT

The FV converted signal from IC501 is amplified by IC503 and applied to the OPE-AMP IC505. Frequency switching times are preset 17.0 KHz (VR506), 28.0 KHz (VR514) and 35.0 KHz (VR513). The pre-set signal is applied to the control terminal of decoder IC506. (See chart below)

HORIZONTAL FREQUENCY	15.5 KHz ~ 17.0 KHz	17.0 KHz ~ 28.0 KHz	28.0 KHz ~ 34.5 KHz	34.5 KHz ~ 37.0 KHz
TERMINAL OF IC506 ON	9	11	12	10
H-POS1 ADJUSTMENT	VR503	VR501	VR504	VR502
H-SIZE ADJUSTMENT	VR510	VR508	VR511	VR509
V-POS1 ADJUSTMENT	VR406	VR404	VR407	VR405
V-SIZE ADJUSTMENT	VR410	VR408	VR411	VR409
HIGH VOLTAGE OSCILLATING CONDENSOR	8200p	5634p	5634p	5634p
S-LETTER CORRECTION CONDENSOR	2.35 μ	1.89 μ	0.69 μ	0.47 μ

6) X-RADIATION PROTECTION CIRCUIT

A tap is provided on F.B.T. (T5A3) Pin #4 which provides a pre-set voltage. When the voltage becomes too high, D5A9 is turned on and the voltage at Pin #13 of IC504 increases. When the voltage at Pin #13 of IC504 exceeds 0.6V, thyristor (SCR) is turned on, and the horizontal oscillator is stopped. (See sketch of shut-down CCT).

7) VERTICAL POLARIZING CIRCUIT

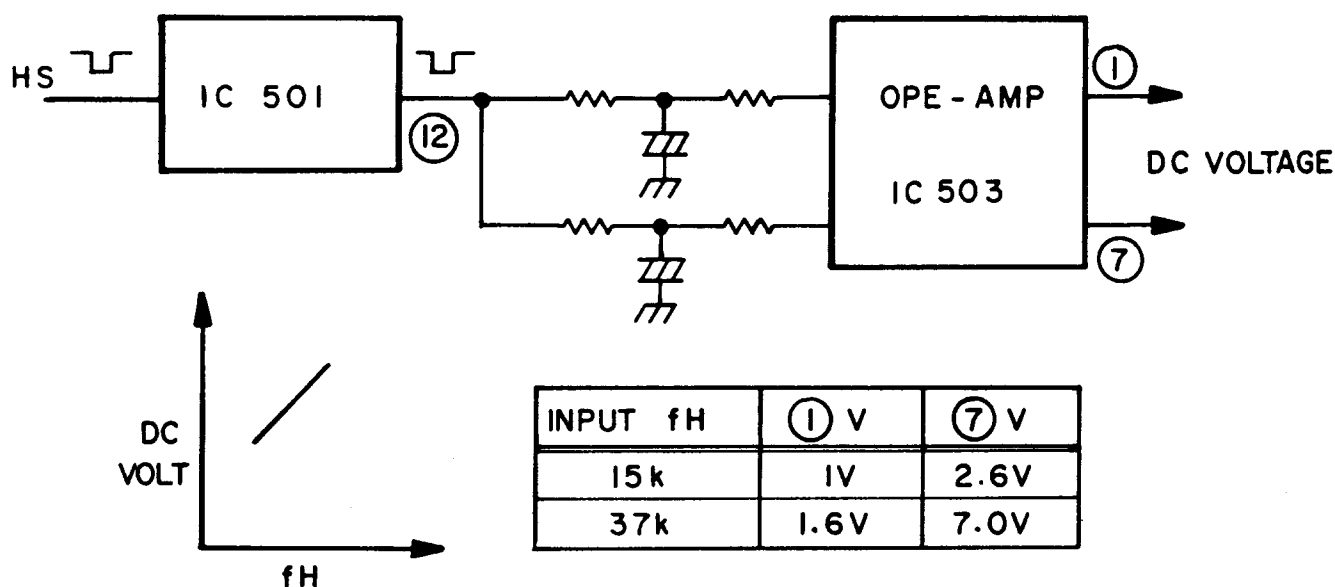
The synchronized vertical signal from IC709 is applied to IC501, 502 for frequency, to voltage conversion, which is then converted to a sawtooth waveform by IC401. The output from IC401 is amplified by IC471 for presentation to the vert. def. coils.

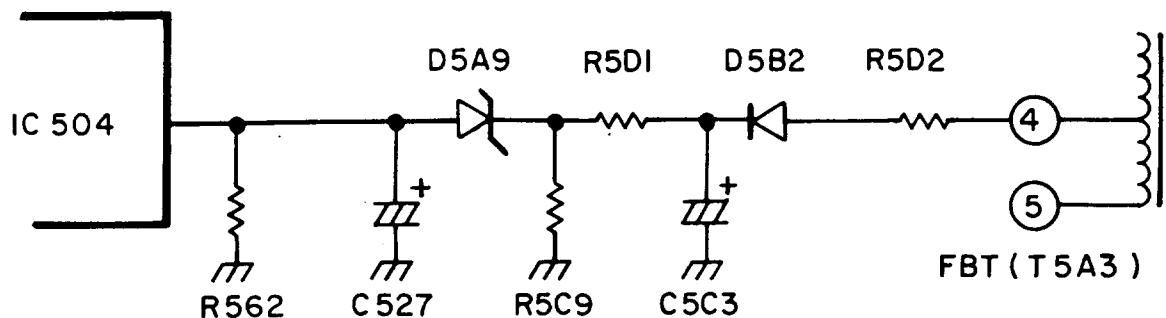
8) HORIZONTAL POLARIZING SIGNAL

The synchronized horizontal signal also from IC709 is applied to IC501, 502 for frequency to voltage conversion, which is then applied to IC504 (H. OSC, H-Drive and X-Ray Protector). The output from IC504 is then presented to the horizontal def. circuits, O/put Xistor Q5A2, F.B.T. and Def. Coils.

FREQ./VOLTAGE CONVERSION CIRCUIT

Pin #12 of IC501 supplies a uniform pulse width of the synchronized signal. The voltage change is in proportion to the input frequency.



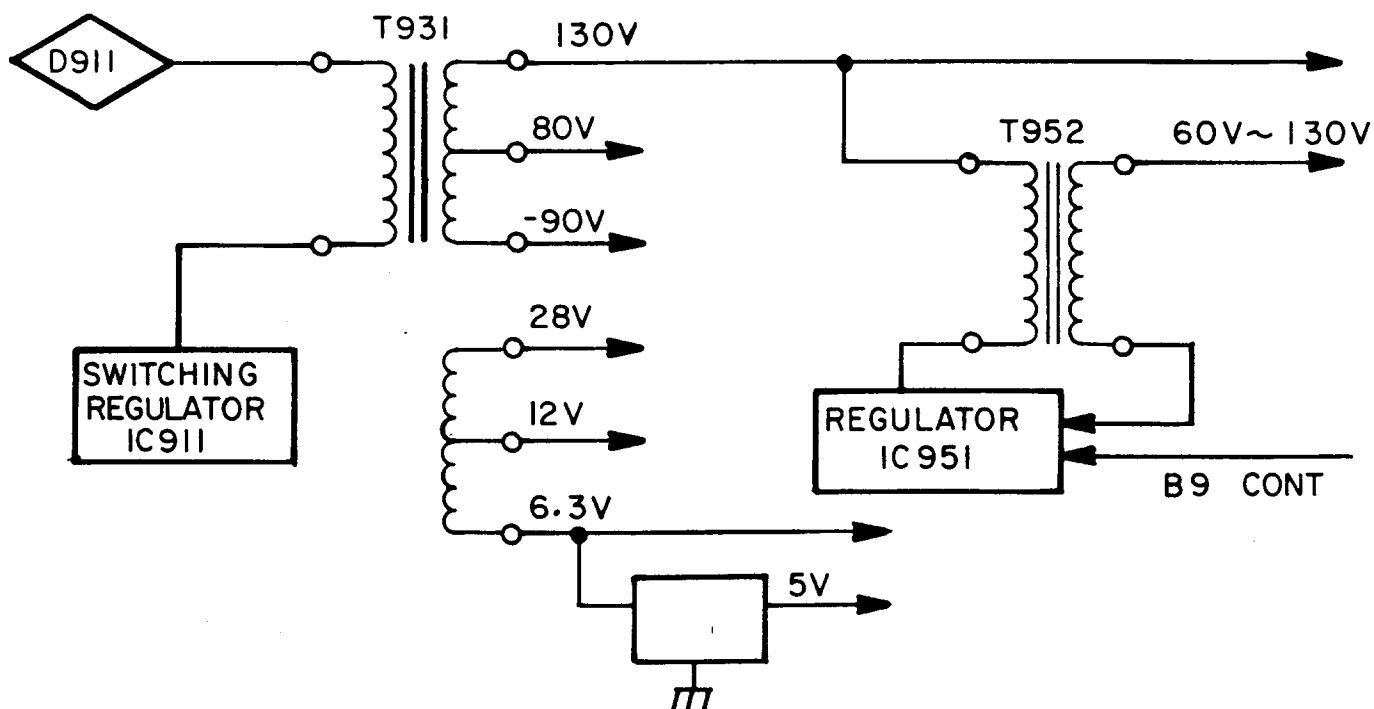


9) HIGH VOLTAGE CIRCUIT

The high voltage output circuit is separated from the synchronized horizontal deflection circuit. The high voltage waveform from the ope-amp is fed back to IC951 to provide a stable image. Any change in frequency, automatically changes the B+ which in turn keeps the high voltage stable.

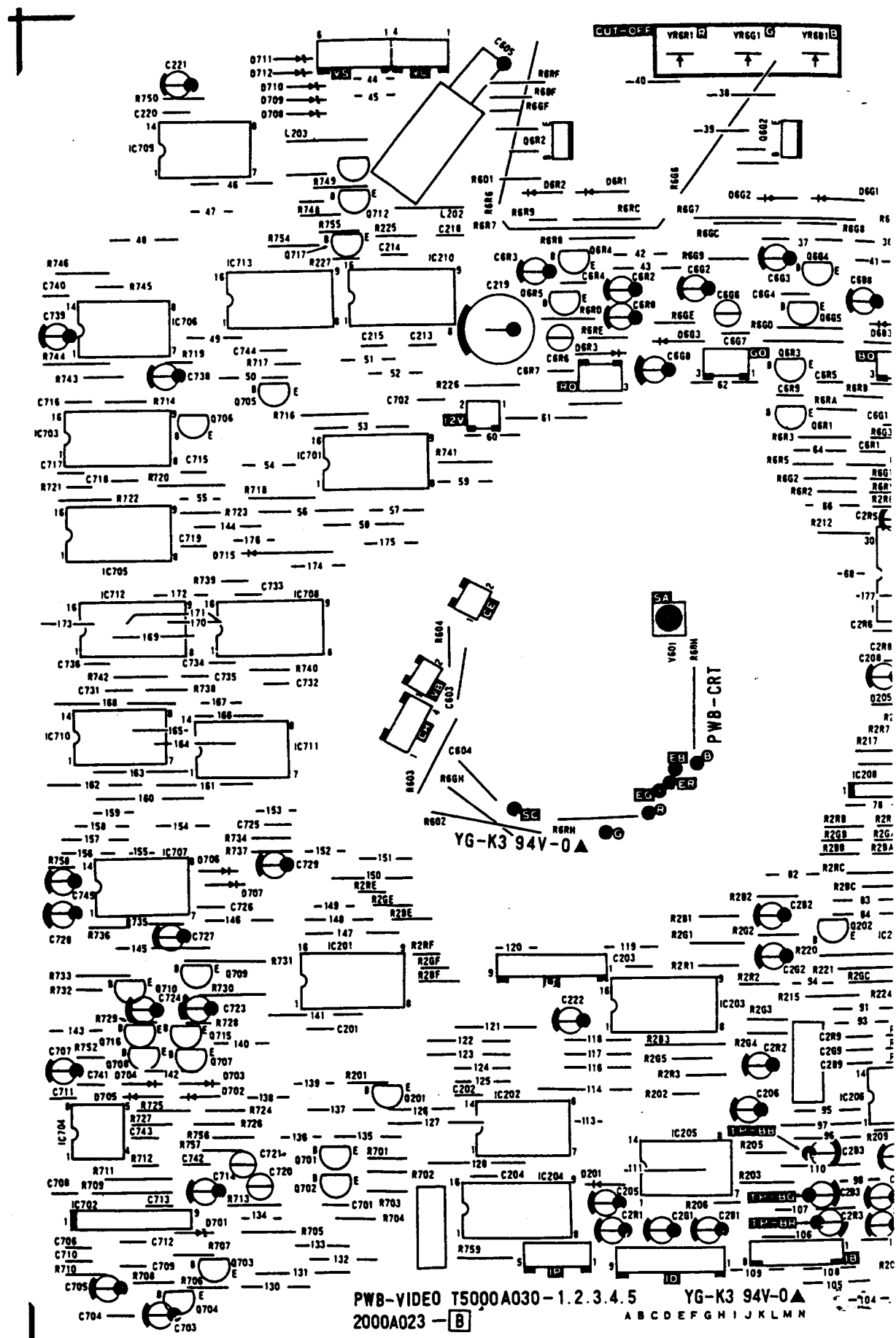
10) LOW VOLTAGE POWER SUPPLY

The AC Voltage is rectified by bridge D911, applied to T931 primary and switching regulator IC911. The secondary of T931 provides 6 values of DC voltages. The "B" voltage can change from 60-130 VDC depending on horizontal frequency. The 130V supplies the horizontal O/put CCT, 80V output supplies the video o/put CCT, 28V output supplies the vertical o/put CCT. The -90V and the 6.8V supplies the C.R.T. G1 and heater. The in-rush current is limited by R911 which is protected by the relay (911) (Refer to Fig. 8-1).



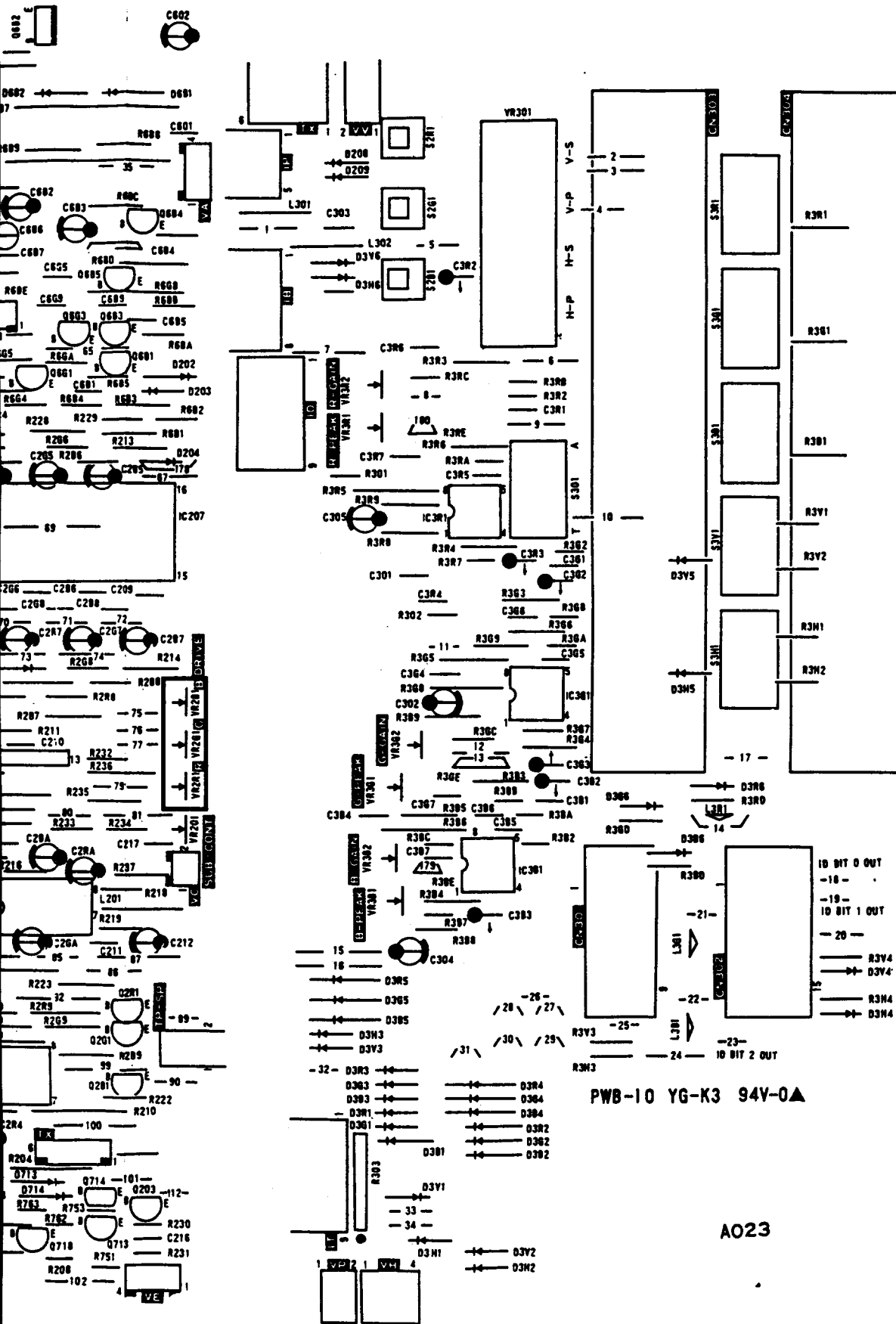
11) DEGAUSSING CIRCUIT

The degaussing coil is activated once the power switch is turned on. The degaussing coil is turned off when the posistor (RP911) reaches a pre-set temperature.



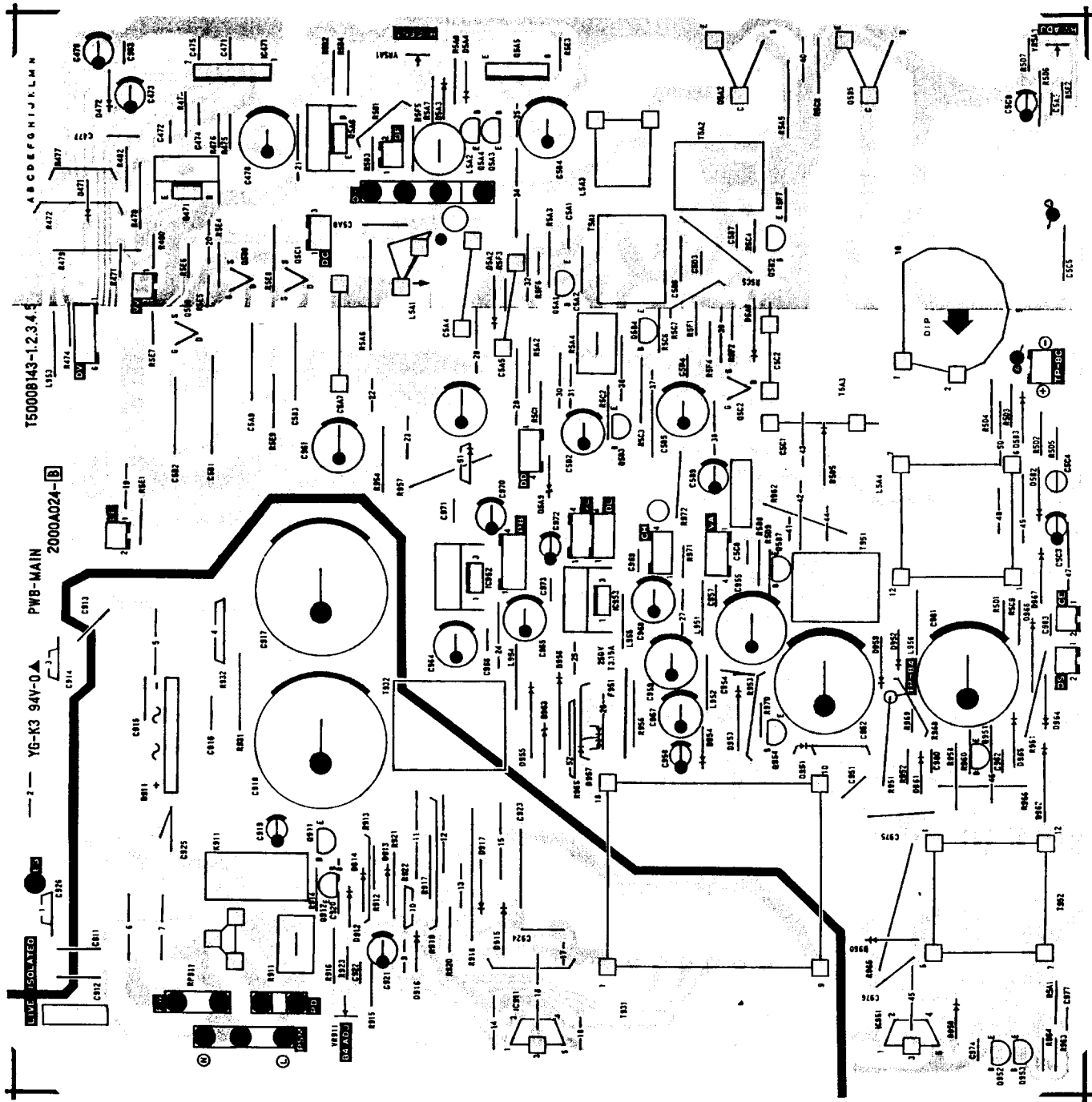


BREAK AWAY

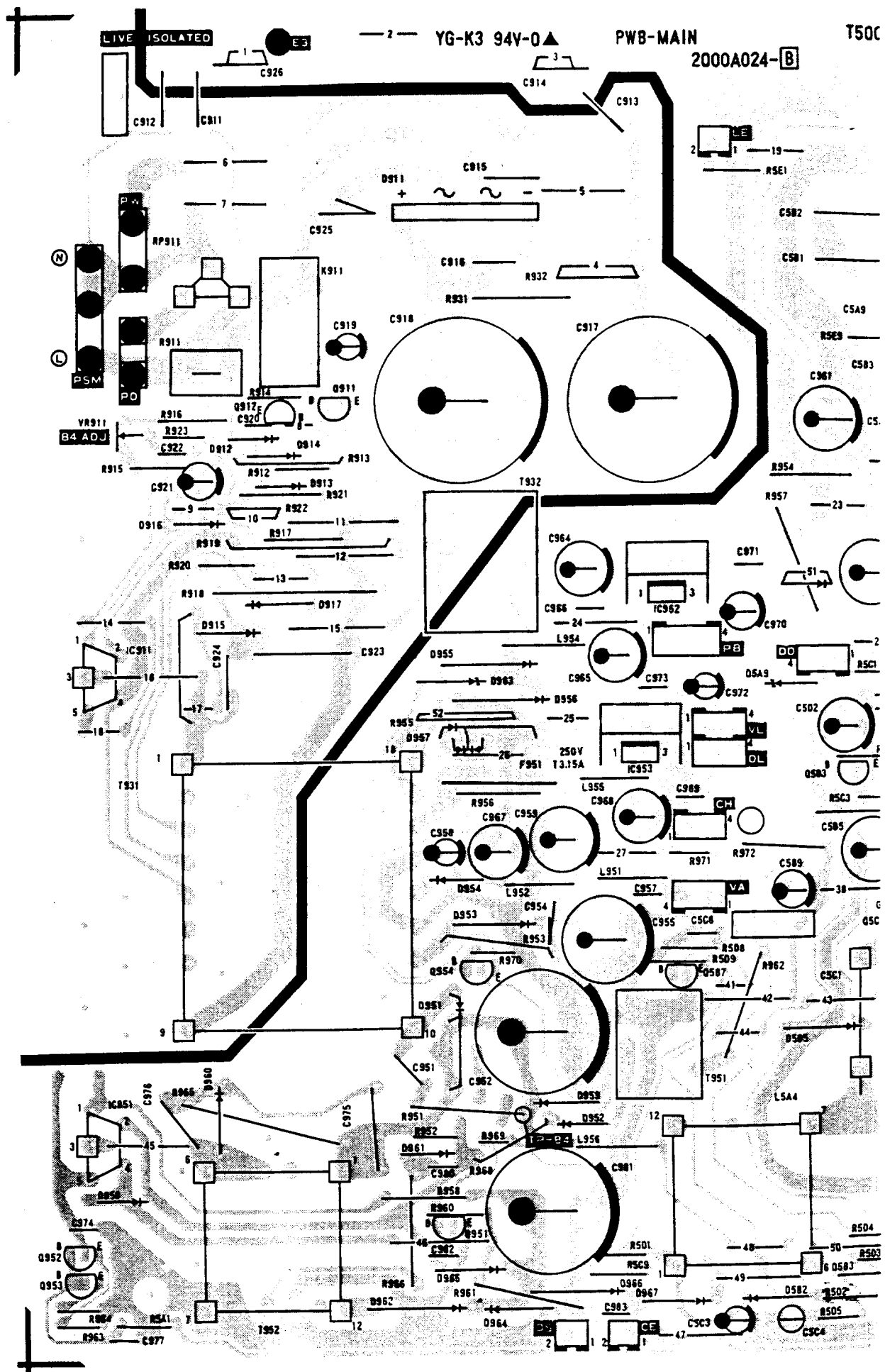


PWB-10 YG-K3 94V-0A

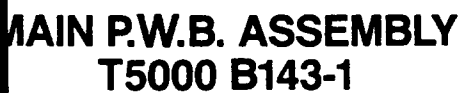
A023



MAIN P.W.B. ASSEMBLY
 T5000 B143-1

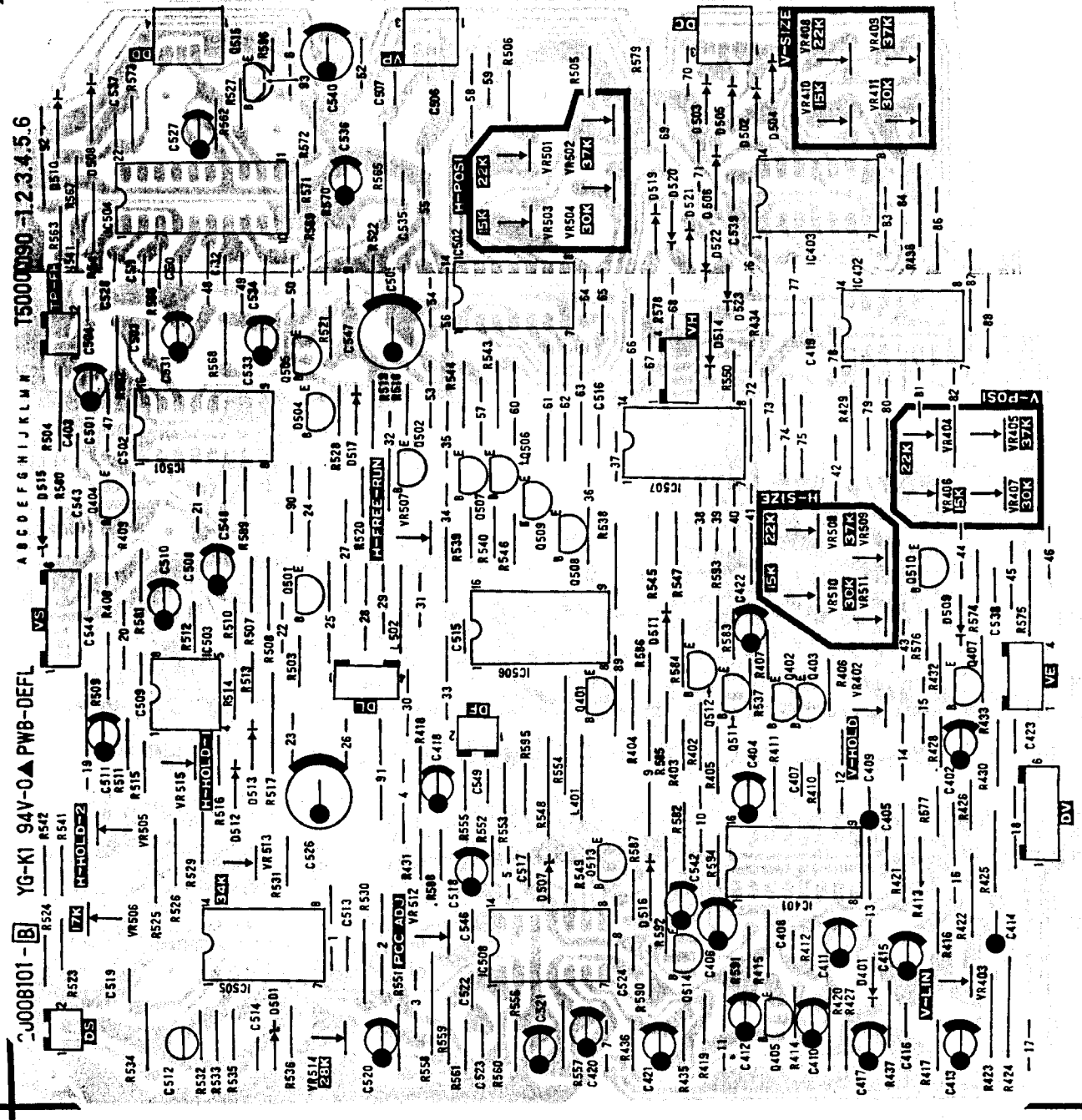
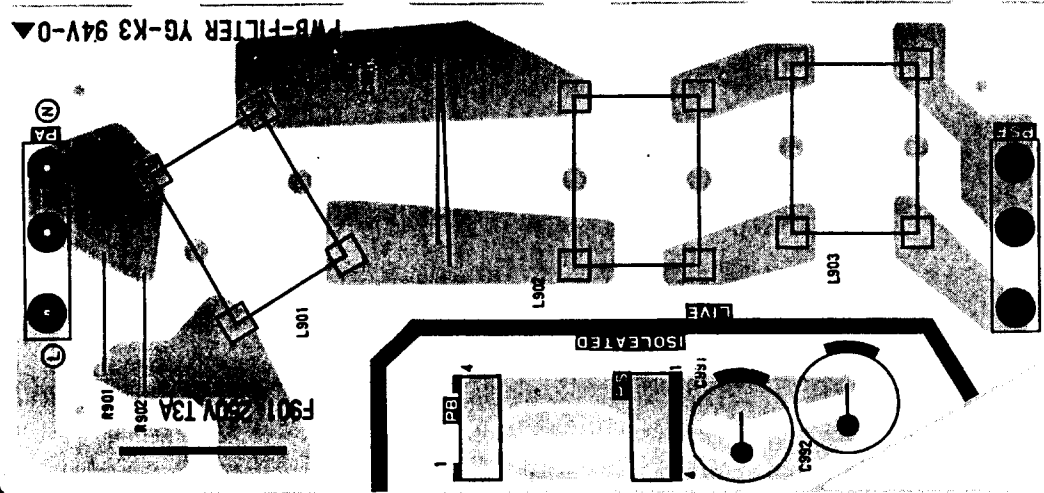


MAIN P.W.B. ASSEMBLY
T5000 B143-1





BREAK AWAY



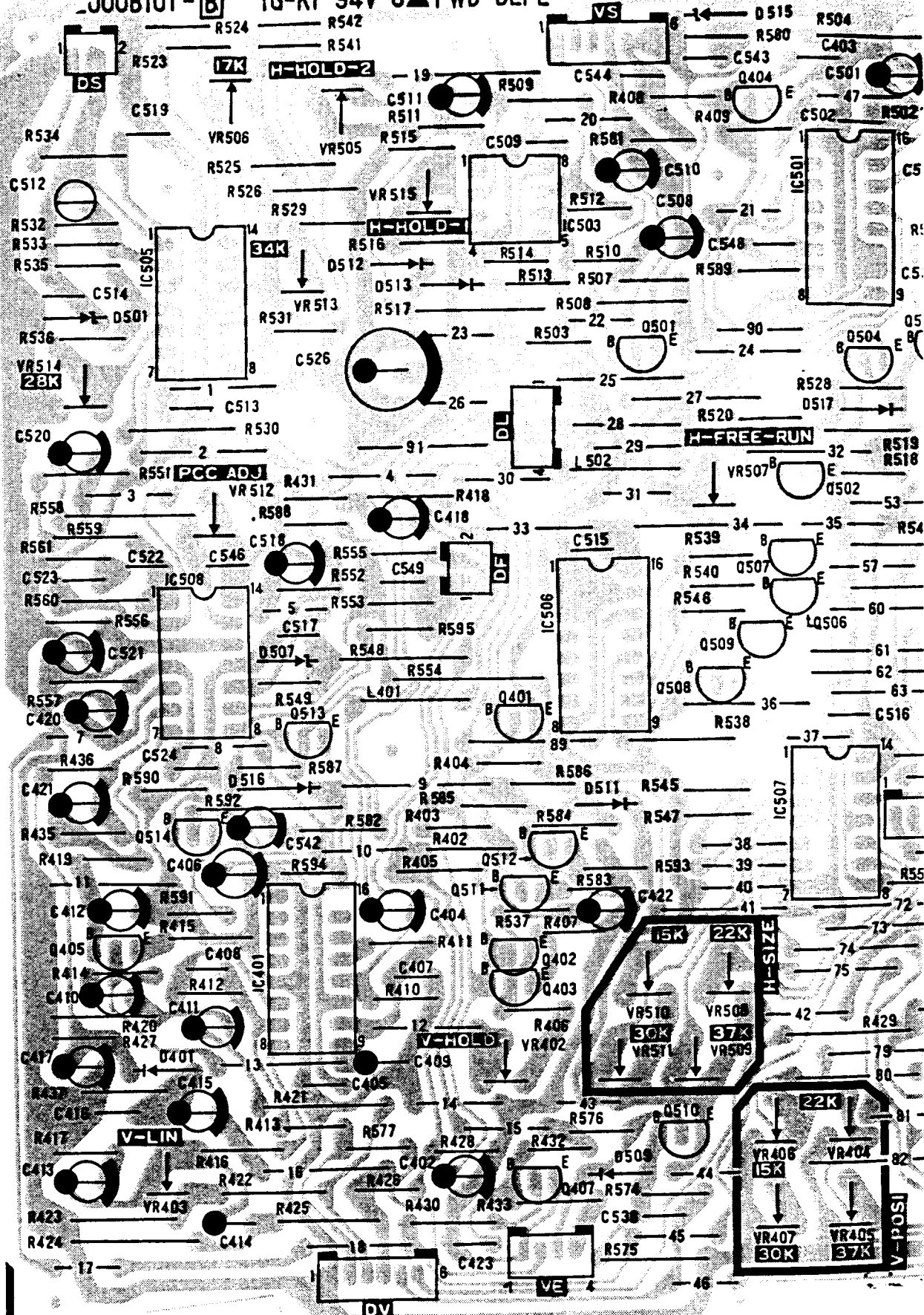
2000A101



DEFLECTION P.W.B. ASSEMBLY
T5000 C090-1

2J008101 - B YG-K1 94V-0▲PWB-DEFL

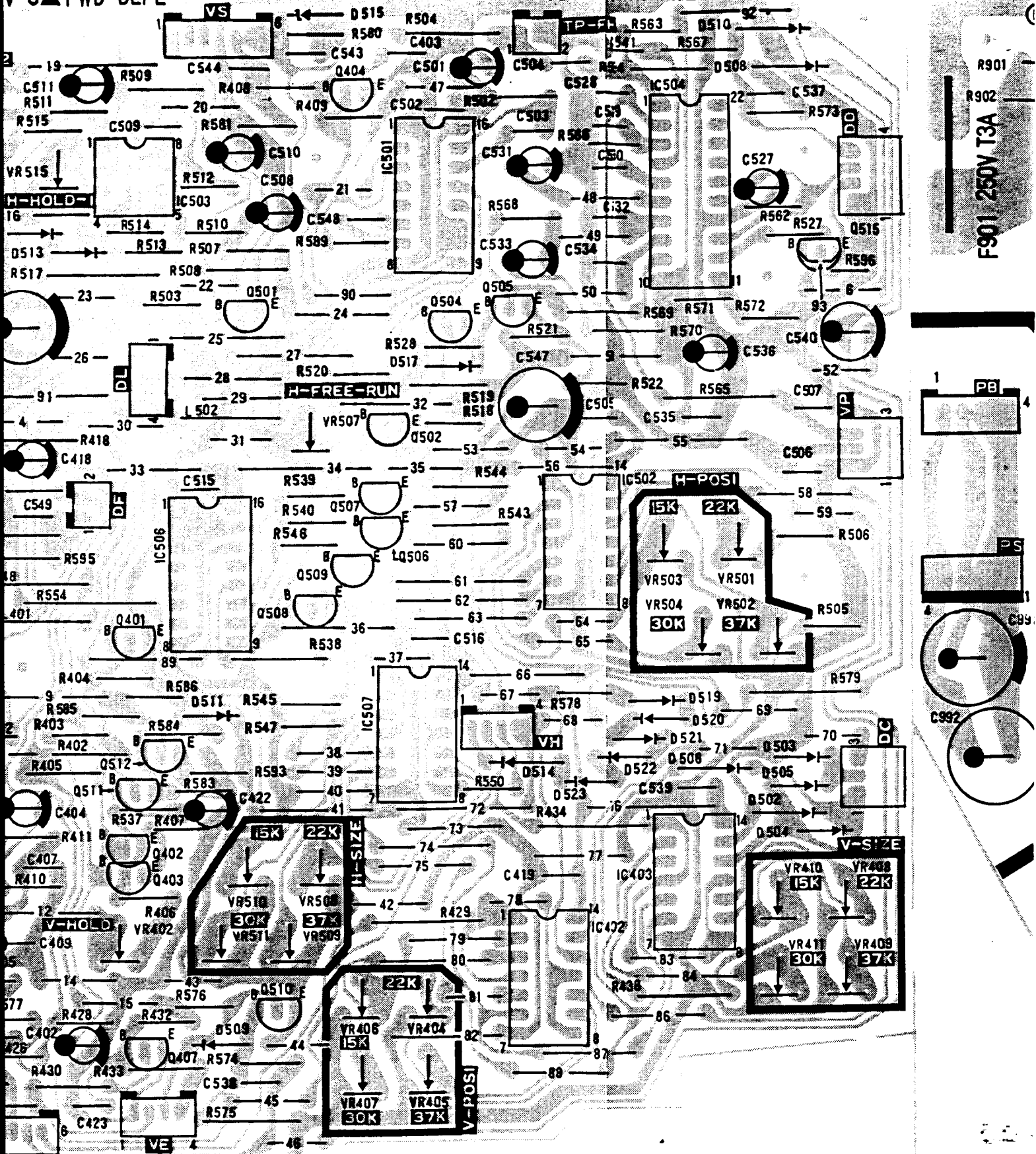
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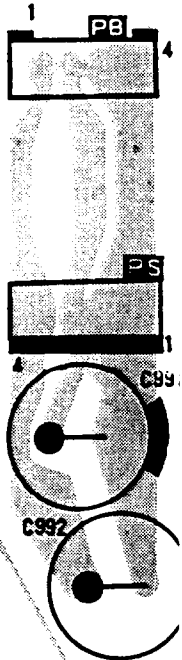
V-0▲PWB-DEFL

A B C D E F G H I J K L M N

T5000 C090 -1.2.3.4.5.6



R901
R902
F901 250V T3A



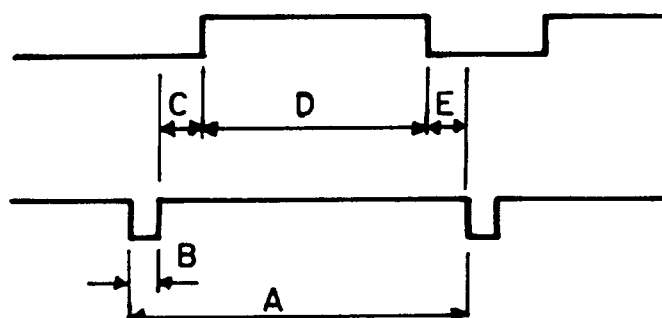
DEFLECTION P.W.B. /
T5000 C090

BEFORE TROUBLESHOOTING

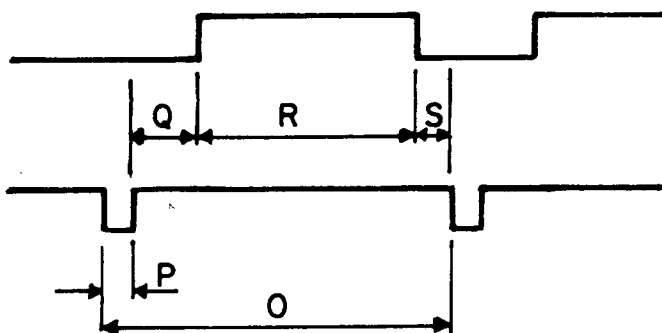
The monitor has been designed to scan automatically horizontal frequencies from 15.5 KHz – 37 KHz and vertical frequencies from 42 Hz – 100 Hz. Depending on the type of input-signal, the center of the image may not appear in the right position of the viewing area on the screen. By using the control located in the rear of the cabinet, the position of the image is adjustable. If the center of the image appears on the right position of the viewing area by the standard signal mentioned below, the monitor is not defective.

SEPARATE SYNC.

HORIZONTAL

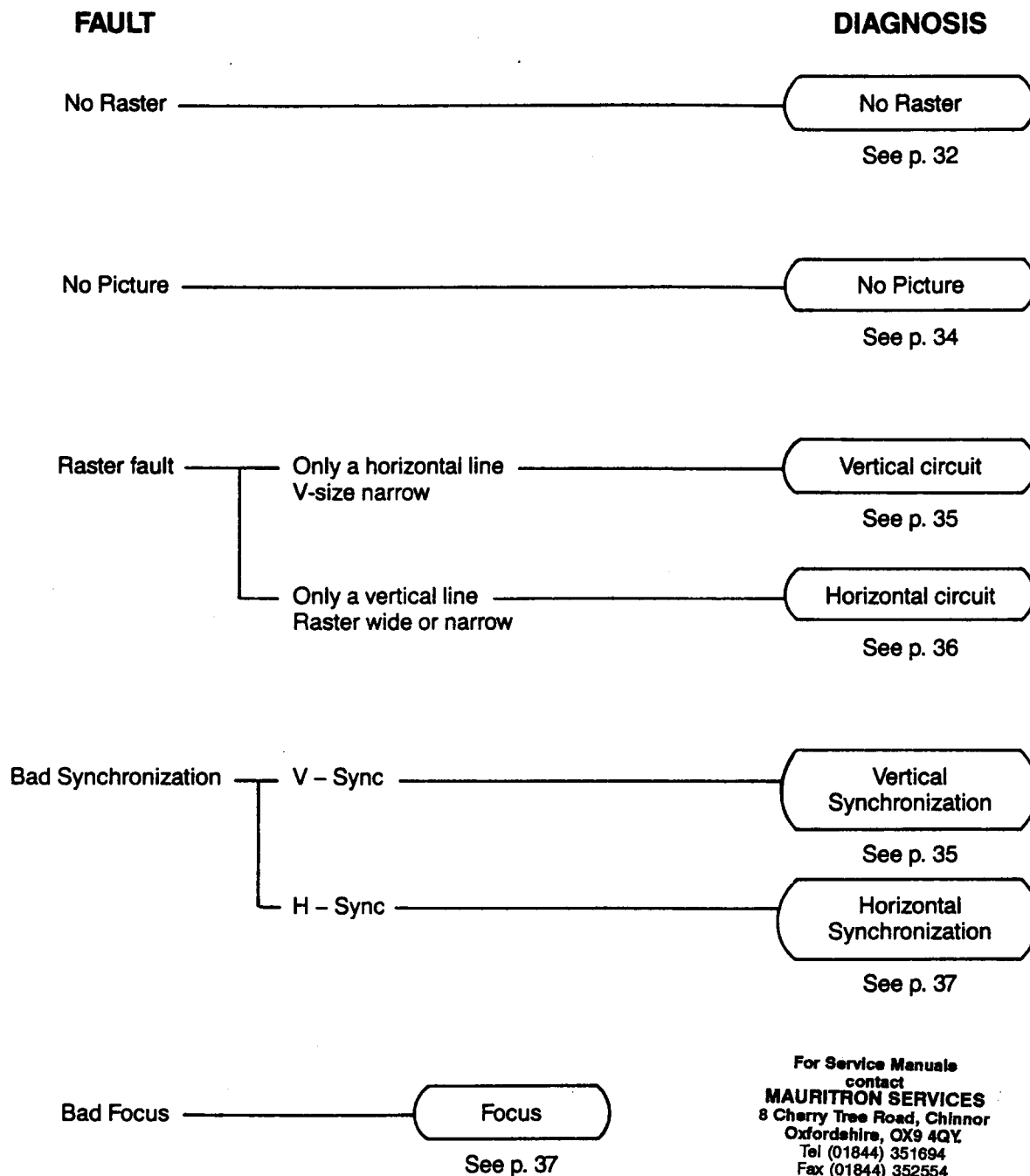


VERTICAL

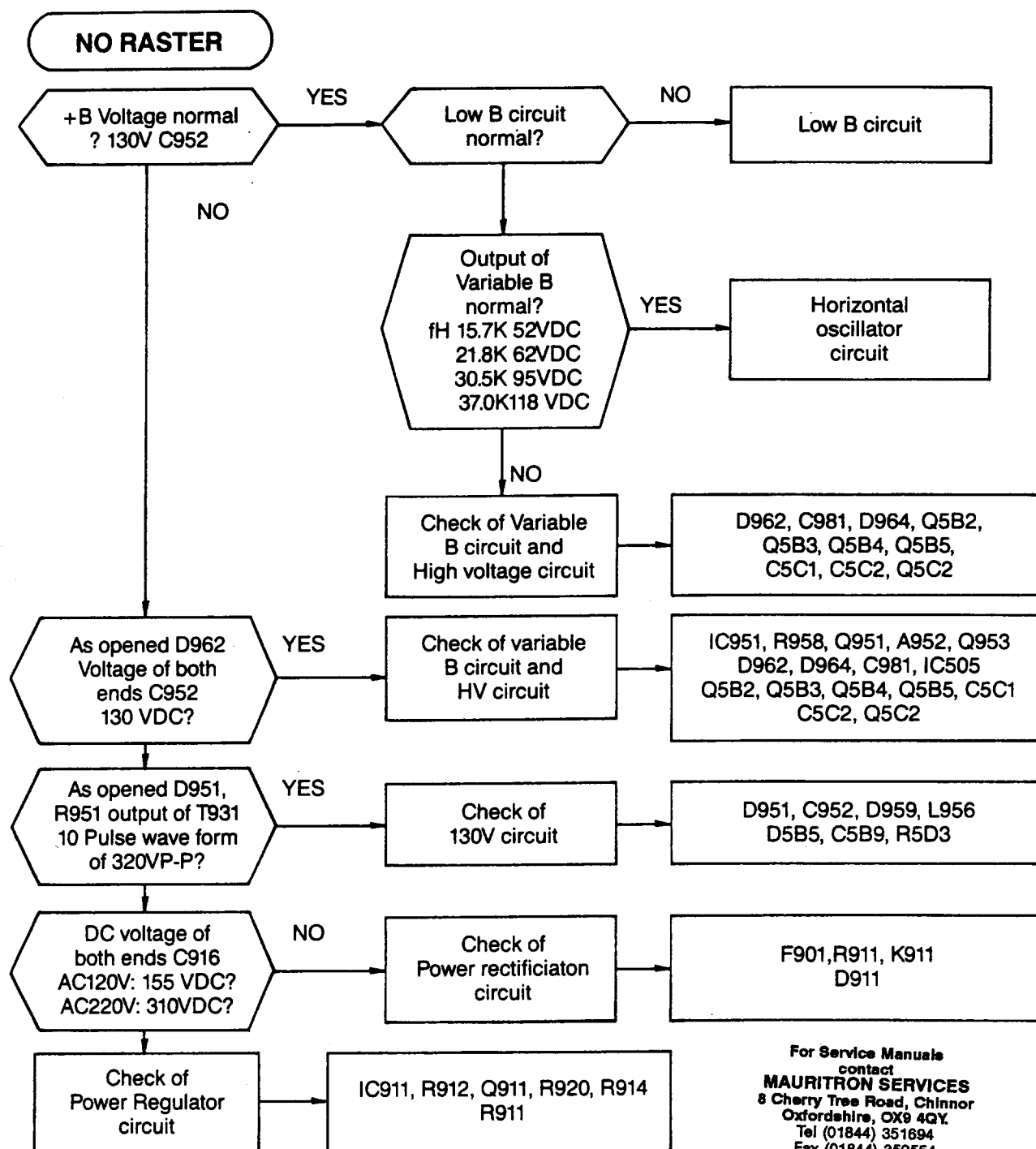


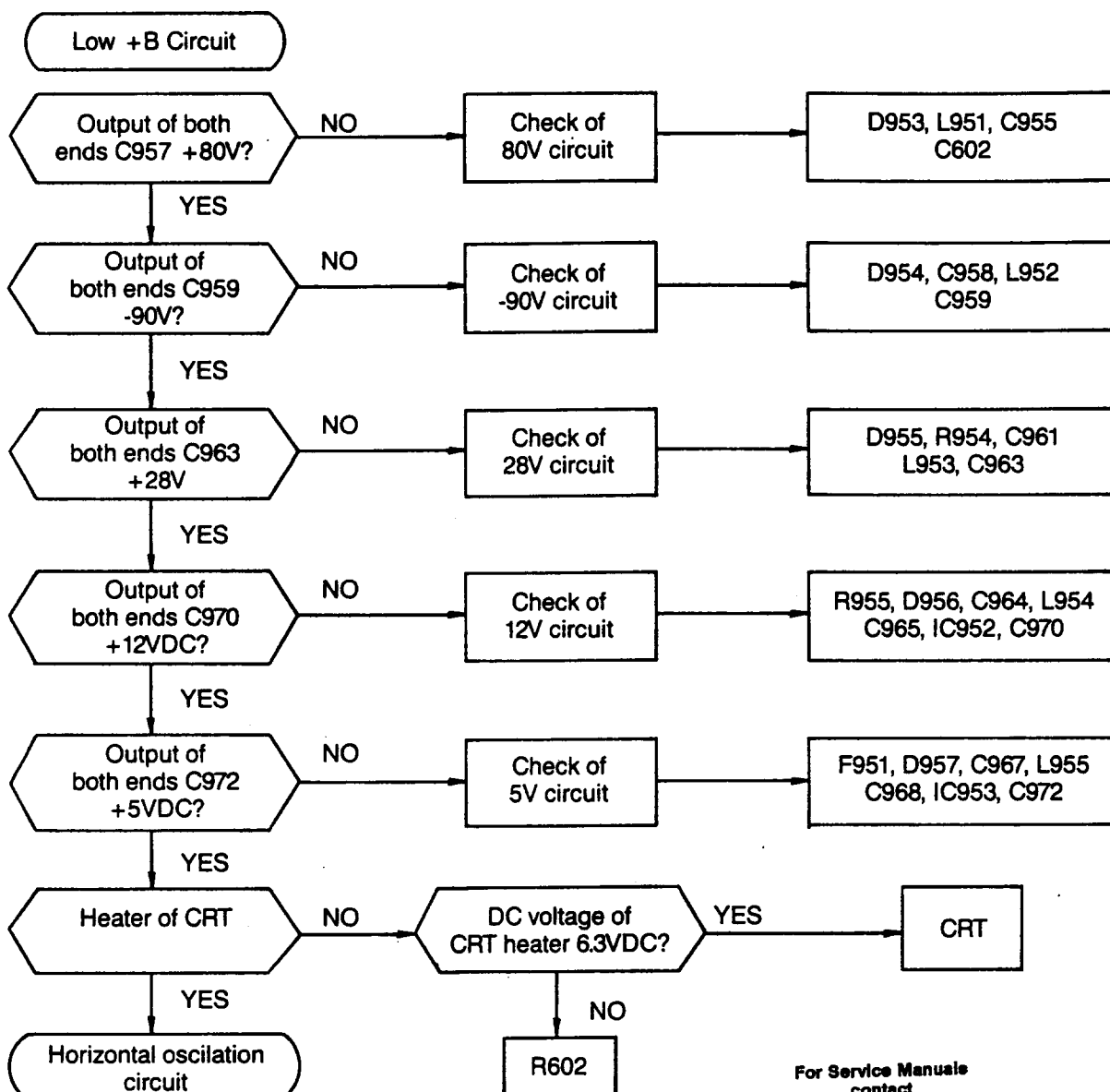
Horizontal					Vertical				
fH	15.70 KHz	21.85 KHz	31.50 KHz	37.00 KHz	fH	15.70 KHz	21.85 KHz	31.50 KHz	37.00 KHz
A (μs)	63.695	45.765	31.770	27.000	O (ms)	16.688	16.750	16.680	19.947
B (μs)	4.470	4.921	3.770	3.700	P (ms)	0.191	0.595	0.065	0.054
C (μs)	8.102	1.661	1.890	2.500	Q (ms)	2.166	0.092	1.02	0.948
D (μs)	44.698	39.368	25.170	21.200	R (ms)	12.739	16.018	15.246	18.835
E (μs)	6.600	0.195	0.940	-1.988	S (ms)	1.592	0.046	0.35	0.054

TROUBLE SHOOTING

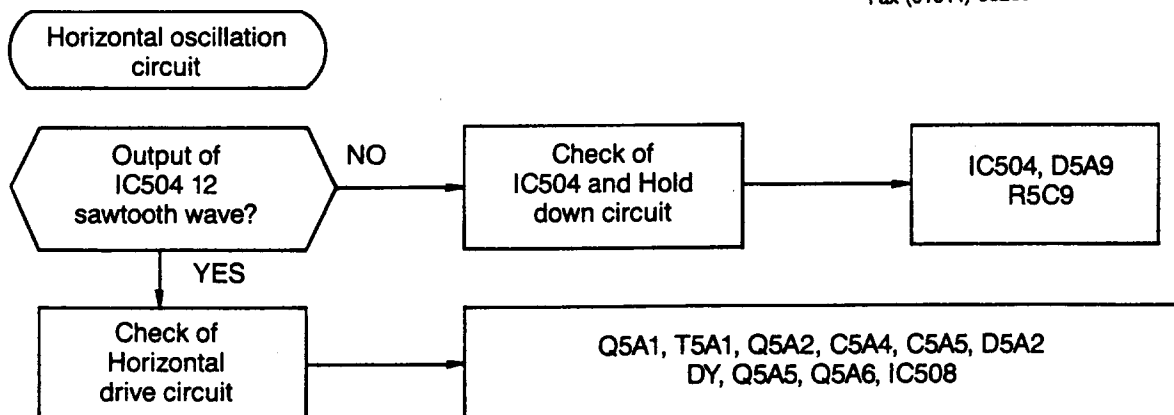


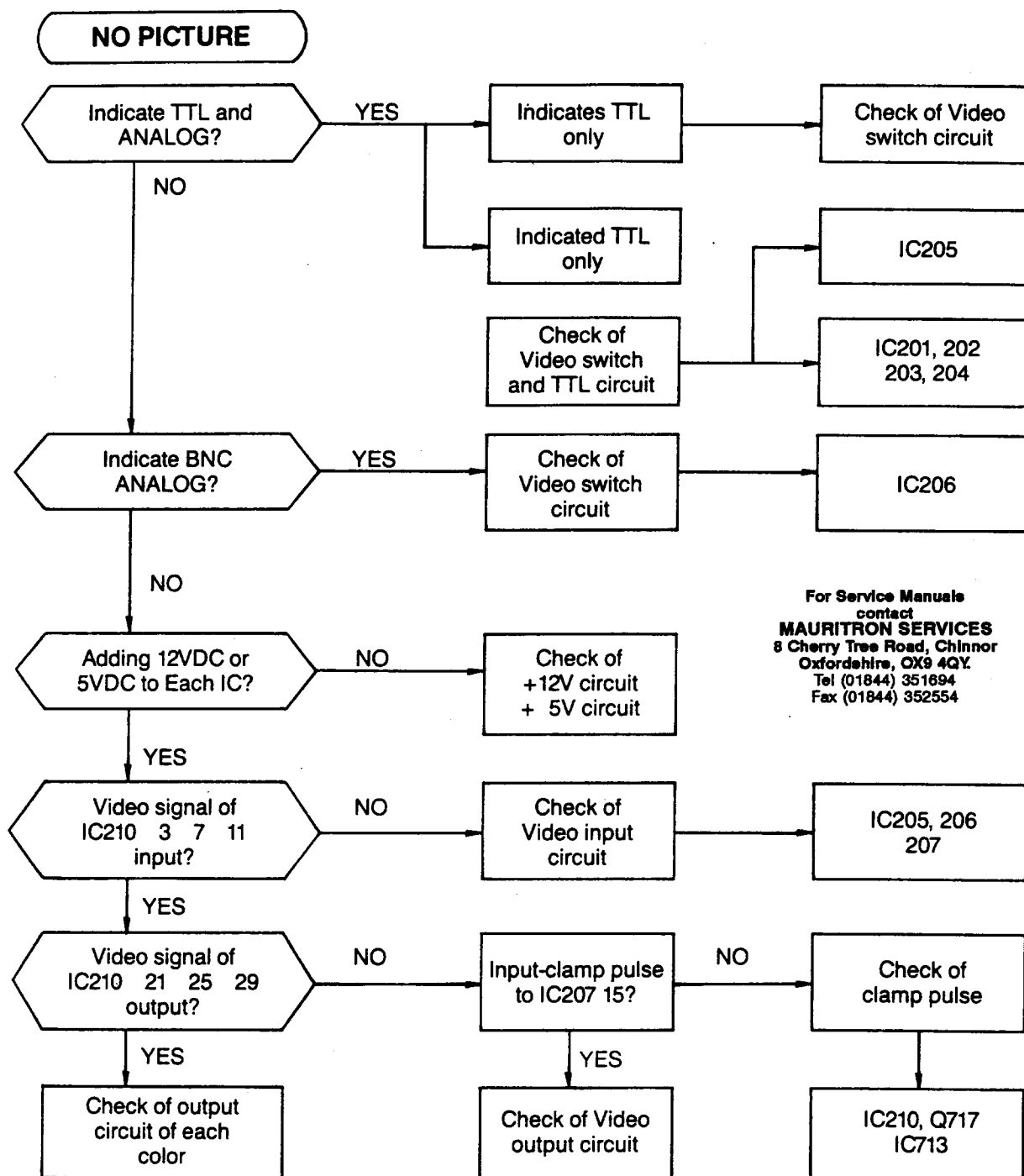
For Service Manuals
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MAURITRON SERVICES
 8 Cherry Tree Road, Chinnor
 Oxfordshire, OX9 4QY
 Tel (01844) 351694
 Fax (01844) 352554



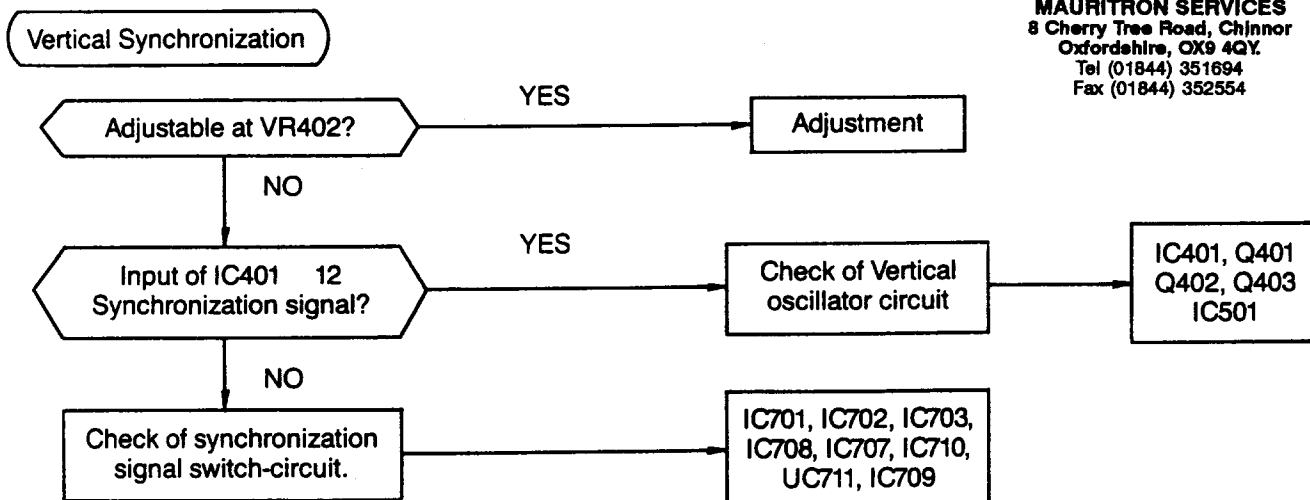
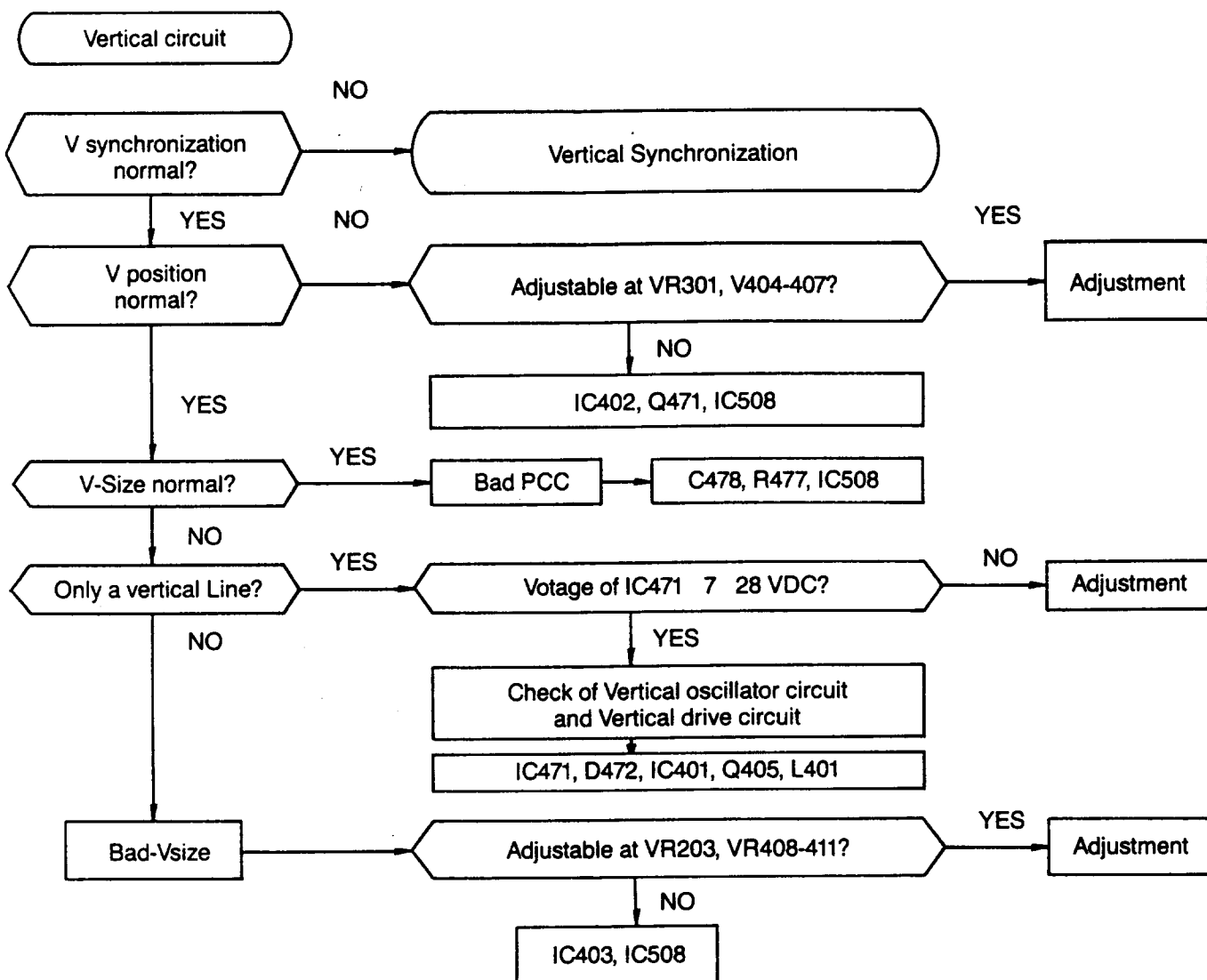


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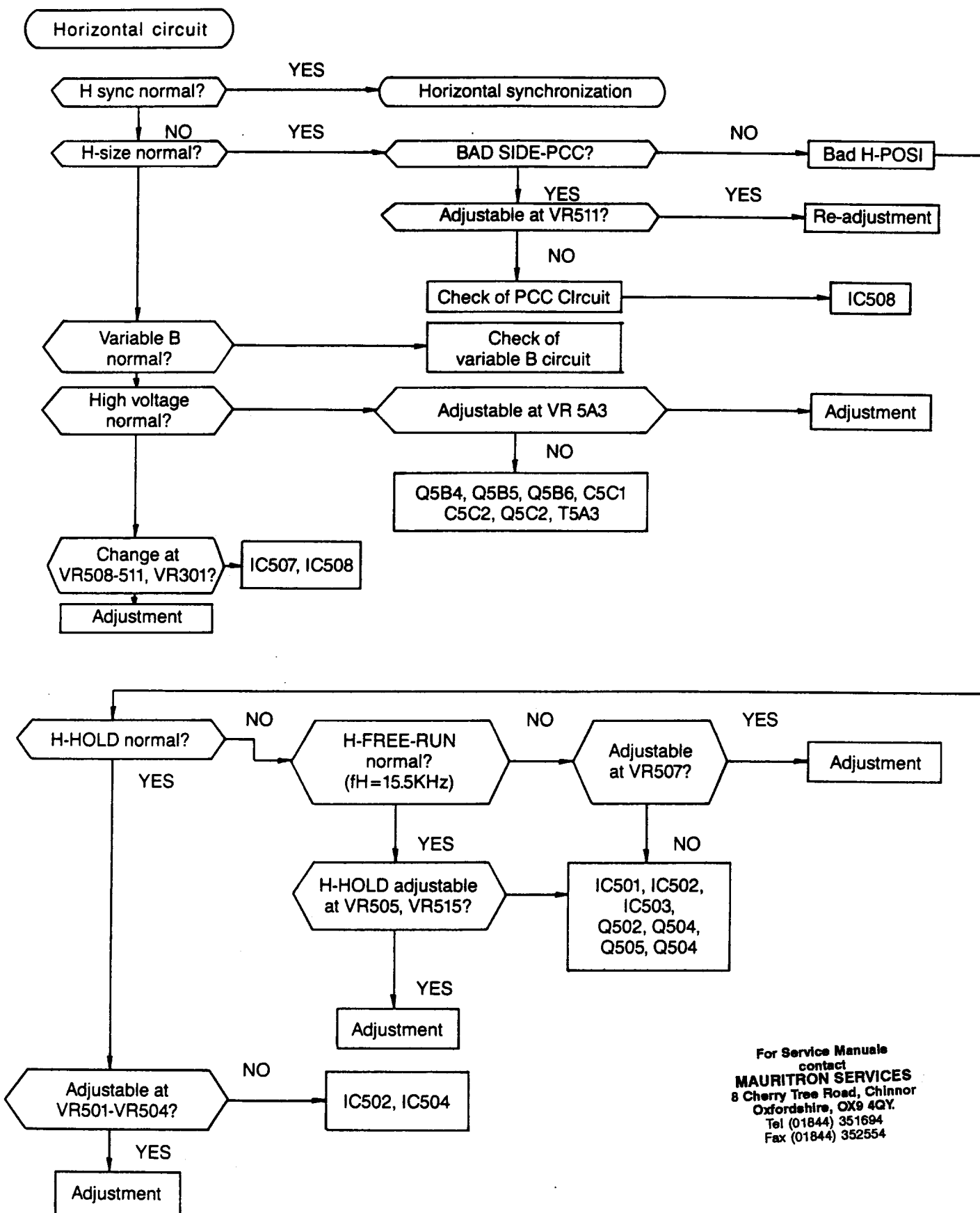




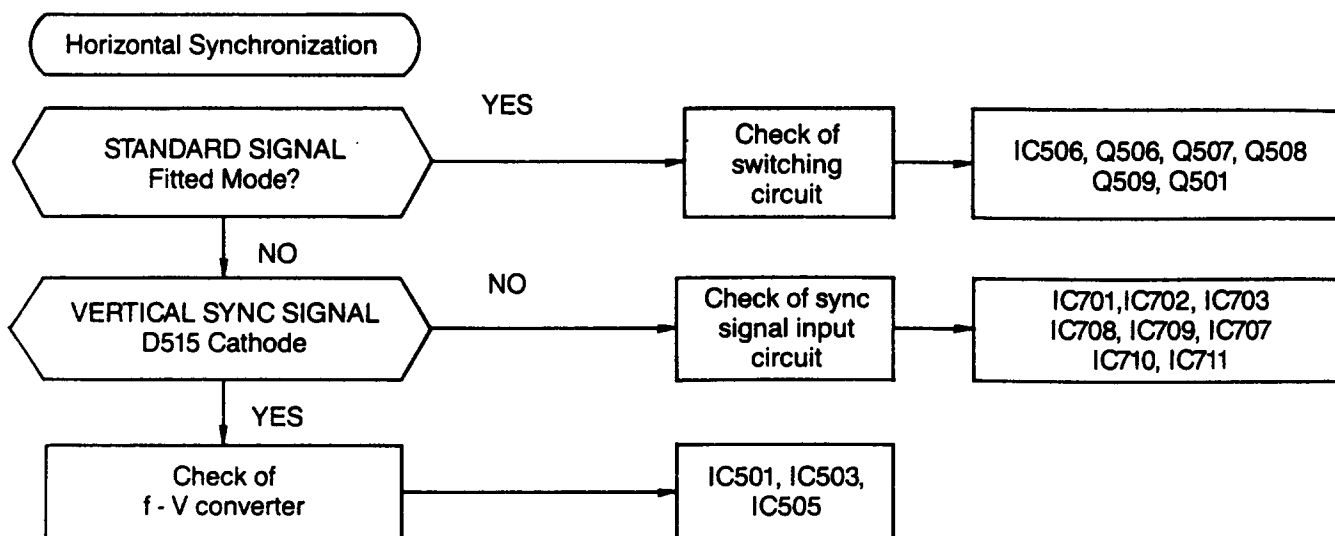
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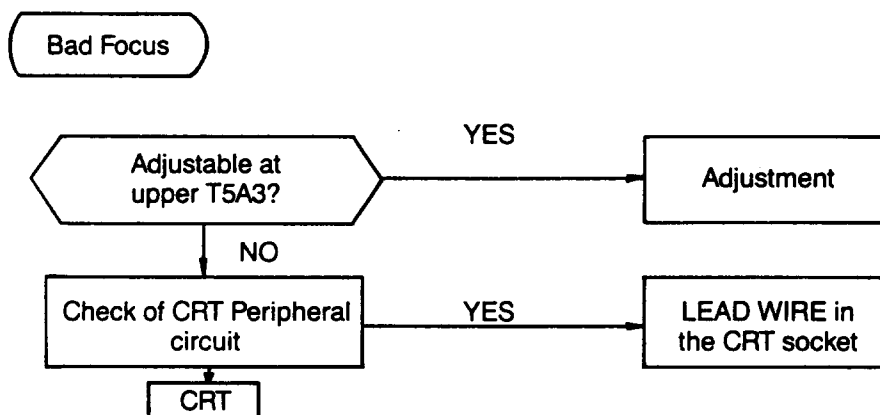
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SERVICE REPLACEMENT PARTS LIST

For:

High Resolution Color Monitors as Follows:

Product Name

Model Number

ECM 1210 U
ECM 1210 BLK U
ECM 1211 U
ECM 1211 BLK U

38-D20ILA-OP
38-D20ILB-OP
38-D20ILA-PP
38-D20ILB-PP



IMPORTANT SAFETY NOTICE

Components identified by the  symbol on the Parts List and shaded areas on the schematic have special characteristics for safety.

These critical safety components are designed to "fail safe" under abnormal conditions. The failure of any one component often causes stress in other components which could lead to smoke or fire or other hazards. Because of this, components are selected and tested under actual fault condition. Replacement with anything other than the identical Electrohome part may present a hazard.

Abbreviations for Resistors and Capacitors

Resistor

CR : Carbon Resistor
Comp. R : Composition Resistor
OM R : Oxide Metal Film Resistor
V R : Variable Resistor
MF R : Metal Film Resistor
CMF R : Coating Metal Film Resistor
UNF R : Nonflammable Resistor
F R : Fusible Resistor
CH MG R : Chip Metal Glaze Resistor

Capacitor

C Cap. : Ceramic Capacitor
M Cap. : Mylar Capacitor
E Cap. : Electrolytic Capacitor
BP E Cap. : Bi-Polar (or Non-Polar)
Electrolytic Capacitor
MM Cap. : Metalized Mylar Capacitor
PP Cap. : Polypropylene Capacitor
MPP Cap. : Metalized PP Capacitor
PS Cap. : Polystyrol Capacitor
Tan. Cap. : Tantal Capacitor
CN C Cap. : Chip Ceramic Capacitor

WHEN ORDERING REPLACEMENT PARTS
ALWAYS STATE PART NUMBER, DESCRIPTION,
PRODUCT NAME & MODEL NUMBER TO ENSURE
FAST DELIVERY & CORRECT REPLACEMENT.

CAPACITORS

SYMBOL NO.	MATERIAL	VALUE	VOLTAGE (V)	TOLERANCE (%)
△ C5A4	PP Cap	4700 pH	2000	± 10
C5A5	PP Cap	0.068 μ F	630	± 10
C5A7	PP Cap	0.47 μ F	400	± 10
C5A8	PP Cap	4700 pH	630	± 10
C5A9	PP Cap	0.22 μ F	200	± 5
C5B1	PP Cap	1.2 μ F	200	± 5
C5B3	PP Cap	0.56 μ F	200	± 5
△ C5C1	PP Cap	8200 pF	2000	± 5
△ C5C2	PP Cap	0.018 μ F	800	± 5
C5C5	PP Cap	0.1 μ F	200	± 5
△ C901	PP Cap	0.1 μ F	250	± 10
△ C911	C Cap	4700 pF	400	± 20
△ C912	C Cap	4700 pH	400	± 20
△ C913	C Cap	4700 pH	400	± 20
△ C914	C Cap	4700 pH	400	± 20
△ C915	C Cap	2200 pH	400	± 20
△ C925	C Cap	2200 pH	400	± 20
△ C926	C Cap	4700 pH	400	± 20

RESISTORS

SYMBOL NO.	MATERIAL	VALUE (Ω)	WATTAGE (W)	TOLERANCE (%)
△ R211	FR	22	$\frac{1}{4}$	± 5
R303	CR	330 $\times$ 6	$\frac{1}{8}$	± 5
R6R6	OMR	560	3	± 5
R6G6	OMR	560	3	± 5
R6B6	OMR	560	3	± 5
R6R7	OMR	560	3	± 5
R6G7	OMR	560	3	± 5
R6B7	OMR	560	3	± 5
△ R6RC	FR	100	$\frac{1}{4}$	± 5
△ R6GC	FR	100	$\frac{1}{4}$	± 5
△ R6BC	FR	100	$\frac{1}{4}$	± 5
△ R6RD	FR	100	$\frac{1}{4}$	± 5
△ R6GD	FR	100	$\frac{1}{4}$	± 5
△ R6BD	FR	100	$\frac{1}{4}$	± 5
△ R602	FR	2.7	2	± 5
R472	OMR	100	2	± 5
R477	OMR	2.2	1	± 5
R478	OMR	33	1	± 5
R479	OMR	330	2	± 5
△ R482	FR	4.7	$\frac{1}{4}$	± 5
R5A4	OMR	8.2k	5	± 5

RESISTORS

SYMBOL NO.	MATERIAL	VALUE (Ω)	WATTAGE (W)	TOLERANCE (%)	ELECTROHOME PART NUMBER
△ R5A6	FR	470	2	± 5	
R5B1	OMR	10 k	1	± 5	
R5C3	OMR	68 k	1	± 5	
R5C5	OMR	8.2 k	2	± 5	
R5C7	OMR	2.2 k	1	± 5	
△ R5D2	FR	2.2	1/4	± 10	
△ R5D4	FR	2.2	1/4	± 10	
△ R5F5	FR	10	1/4	± 5	ZA-114-03V
R901	Comp R	470 k	1/2	± 10	
△ R911	FR	15	5	± 5	ZA-114-01V
△ R912	FR	2.2	1/4	± 10	
R913	OMR	120	1/4	± 5	
R918	OMR	47 k	3	± 5	
R919	OMR	0.39	3	± 5	ZA-95-01V
△ R920	FR	39	1/4	± 10	
R921	OMR	4.7	1	± 5	
△ R924	FR	220	2	± 5	ZA-114-02V
R951	OMR	15	2	± 5	
R953	OMR	15	2	± 5	
△ R954	FR	0.22	1/4	± 10	
△ R955	FR	0.47	1/4	± 10	
R957	OMR	560	2	± 5	
△ R958	FR	2.2	1/4	± 10	
R961	OMR	0.39	2	± 5	
R962	OMR	560	2	± 5	
R965	OMR	33 k	3	± 5	
R966	OMR	33	2	± 5	
R968	OMR	3.9	1	± 5	
R972	OMR	22 k	1	± 5	
△ R5C9	OMR	10 k	1/4	± 1	
△ R5D1	OMR	5.6 k	1/4	± 1	

DIODES

SYMBOL NO.	DESCRIPTION
D501	ZD HZ5C3
D507	ZD HZ6C2
D510	D ES-1
D515	ZD HZ7B2
D205	D EM01Z
D6R3	D ES-1
D6G3	D ES-1
R6B3	D ES-1
D701	ZD HZ9B2
D708	ZD HZ7B2
D709	ZD HZ7B2

DIODES

SYMBOL NO.		DESCRIPTION	ELECTROHOME PART NUMBER
D501	ZD	HZ5C3	
D507	ZD	HZ6C2	
D510	D	ES-1	
D515	ZD	HZ7B2	
D205	C	EM01Z	
D6R3	D	ES-1	
D6G3	D	ES-1	
D6B3	D	ES-1	
D701	AC	HZ9B2	
D708	ZD	HZ7B2	
D709	ZD	HZ7B2	
D710	ZD	HZ7B2	
D711	ZD	HZ7B2	
D712	ZD	HZ7B2	
D472	D	EM01Z	
D5A2	D	ES-1	
△ D5A9	ZD	HZT-33-01	ZA-127-01V
D5B3	D	EM01Z	
D5B5	D	EM01Z	
△ D911	D	RBV406	ZA-127-02V
D912	D	EG-01	
D913	D	ES-1	
D914	D	EU02	
D915	D	EG01C	
D916	D	EU02	
D917	D	EU02	
D951	D	RU4AM LF-K1	
D952	D	EU02	
D953	D	RU3AM	
R954	U	EG01C	
D955	D	RU4M LF-K1/RU4AM LF-K1	
D956	D	RL4Z LFK1	
D957	D	ESAC82M-004	
D958	D	EG-01	
△ D959	D	R2KN	ZA-127-03V
D960	D	RG1C	
D961	D	EU02	
D962	D	RU3AM	
D963	ZD	HZ6C1	
△ D964	D	R2KN	ZA-127-03V
D965	D	ES-1	
D966	D	RM2	
D967	D	RM2	

ICS

SYMBOL NO.	DESCRIPTION		ELECTROHOME PART NUMBER
△ IC401	TA 7609	VERTICAL OSC	ZA-184-06V
IC402	4066	C-MOS	
IC403	4066	C-MOS	
IC501	74LS123	TTL	
IC502	4066	C-MOS	
IC503	4558	C-MOS	
△ IC504	LA7850	HORIZONTAL OSC	ZA-184-05
IC505	LM324N	OPE AMP	
IC506	4555	C-MOS	
IC507	4066	C-MOS	
IC508	LM324N	OPE AMP	
IC201	74LS367	TTL	
IC202	4066	C-MOS	
IC203	74LS367	TTL	
IC204	74LS138	TTL	
IC205	AN5860	ANALOG SWITCH	ZA-184-03V
IC206	AN5860	ANALOG SWITCH	ZA-184-03V
IC207	M51387	3-CH VIDEO AMP	ZA-184-04V
IC208	AN5862K	ANALOG SWITCH	ZA-184-02V
IC209	4066	C-MOS	
IC210	74LS123	TTL	
IC3R1	TL592P	VIDEO AMP	
IC3G1	TL592P	VIDEO AMP	
IC3B1	TL592P	VIDEO AMP	
IC701	4052	C-MOS	
IC702	TA7347P	SYNC-SEPARATOR	
IC706	74LS14	TTL	
IC707	74HC86	C-MOS	
IC708	4538	C-MOS	
IC709	74LS86	TTL	
IC710	74HC04	C-MOS	
IC711	4066	C-MOS	
IC713	4052	C-MOS	
△ IC471	AN5521	VERTICAL OUT	ZA-184-01V
△ IC911	STR54041	VOLTAGE REGULATOR	ZA-183-01V
△ IC951	STR45111	VOLTAGE REGULATOR	ZA-183-02V
IC952	7812	VOLTAGE REGULATOR	
IC953	7805	VOLTAGE REGULATOR	

COILS

SYMBOL NO.	DESCRIPTION	
L401	COIL, FIXED INDUCTOR	22μH
L501	COIL, FIXED INDUCTOR	22μH
L201	COIL, LEAD-FERRITE	EBA04HA900KE-00
L202	COIL, FIXED INDUCTOR	22μH
L203	COIL, FIXED INDUCTOR	22μH
L301	COIL, FIXED INDUCTOR	22μH
L302	COIL, FIXED INDUCTOR	22μH
L5A1	COIL, LINEARITY	D067-330
L5A2	COIL	1mH
△ L5A3	COIL	6.8mH
△ L5A4	COIL	750uH

COIL

SYMBOL NO.	DESCRIPTION	
L901	COIL, LINE-FILTER	ELF-18D850Z
L902	COIL, LINE-FILTER	ELF-18D850Z
L903	COIL, LINE-FILTER	ELF-18D850Z
L951	COIL-FIXED INDUCTOR	22 μ H
L952	COIL-FIXED INDUCTOR	22 μ H
L953	COIL-FIXED INDUCTOR	22 μ H
L954	COIL-FIXED INDUCTOR	22 μ H
L955	COIL-FIXED INDUCTOR	22 μ H
L956	COIL-FIXED INDUCTOR	22 μ H

TRANSISTORS

SYMBOL NO.	DESCRIPTION	ELECTROHOME PART NUMBER
Q6R2	2SC3853	
Q6G2	2SC3953	
Q6B2	2SC3953	
Q6R3	2SC3504	
Q6G3	2SC3504	
Q6B3	2SC3504	
Q6R4	2SC3467	
Q6G4	2SC3467	
Q6B4	2SC3467	
Q6R5	2SA1371	
Q6G5	2SA1371	
Q6B5	2SA1371	
Q515	2SC2236	
Q471	2SC2481	
Q5A1	2SC2482	
△ Q5A2	2SC4123-RG	ZA-2SC4123-RG
Q5A3	2SD763	
Q5A4	2SD763	
Q5A5	2SA1265	
Q5A6	2SC2688	
Q5B2	2SC2482	
Q5B3	2SC2230	
Q5B4	2SA1320	
△ Q5B5	2SC1555-LB, MBS-K1	ZA-2SC1555
Q588	FET 2SK754 LV/ 2SK1088 F19	
Q5B9	FET 2SK754 LV/ 2SK1088 F19	
Q5C1	FET 2SK754 LV/ 2SK1088 F19	
Q5C2	FET 2SK950 F19	
Q911	2SC 2655-Y	ZA-2SC2655Y
Q912	2SA 1382	ZA-2SA1382
Q951	2SC 2655-Y	ZA-2SC2655V
Q952	2SC 2230	
Q953	2SC 2230	

TRANSFORMERS

SYMBOL NO.	DESCRIPTION	ELECTROHOME PART NUMBER
△ T5A1	HORIZONTAL DRIVE	ZA-113-01V
△ T5A2	HORIZONTAL DRIVE	ZA-113-01V
△ T5A3	FLY BACK	ZA-113-02V
△ T931	POWER	ZA-113-03V
△ T932	TRIGGER	ZA-113-05V
△ T951	TRIGGER	ZA-113-05V
△ T952	POWER	ZA-113-04V

SWITCHES

SYMBOL NO.	DESCRIPTION	
S2R1	TEXT	ESB649
S2G1	TEXT	ESB749
S2B1	TEXT	ESB749
S3R1	INPUT IMPEDANCE	ESD 32223
S3G1	INPUT IMPEDANCE	ESD 32223
S3B1	INPUT IMPEDANCE	ESD 32223
S3V1	INPUT IMPEDANCE	ESD 32223
S3H1	INPUT IMPEDANCE	ESD 32223
S301	SIGNAL-SELECT	ESD 32223

VARIABLE RESISTORS

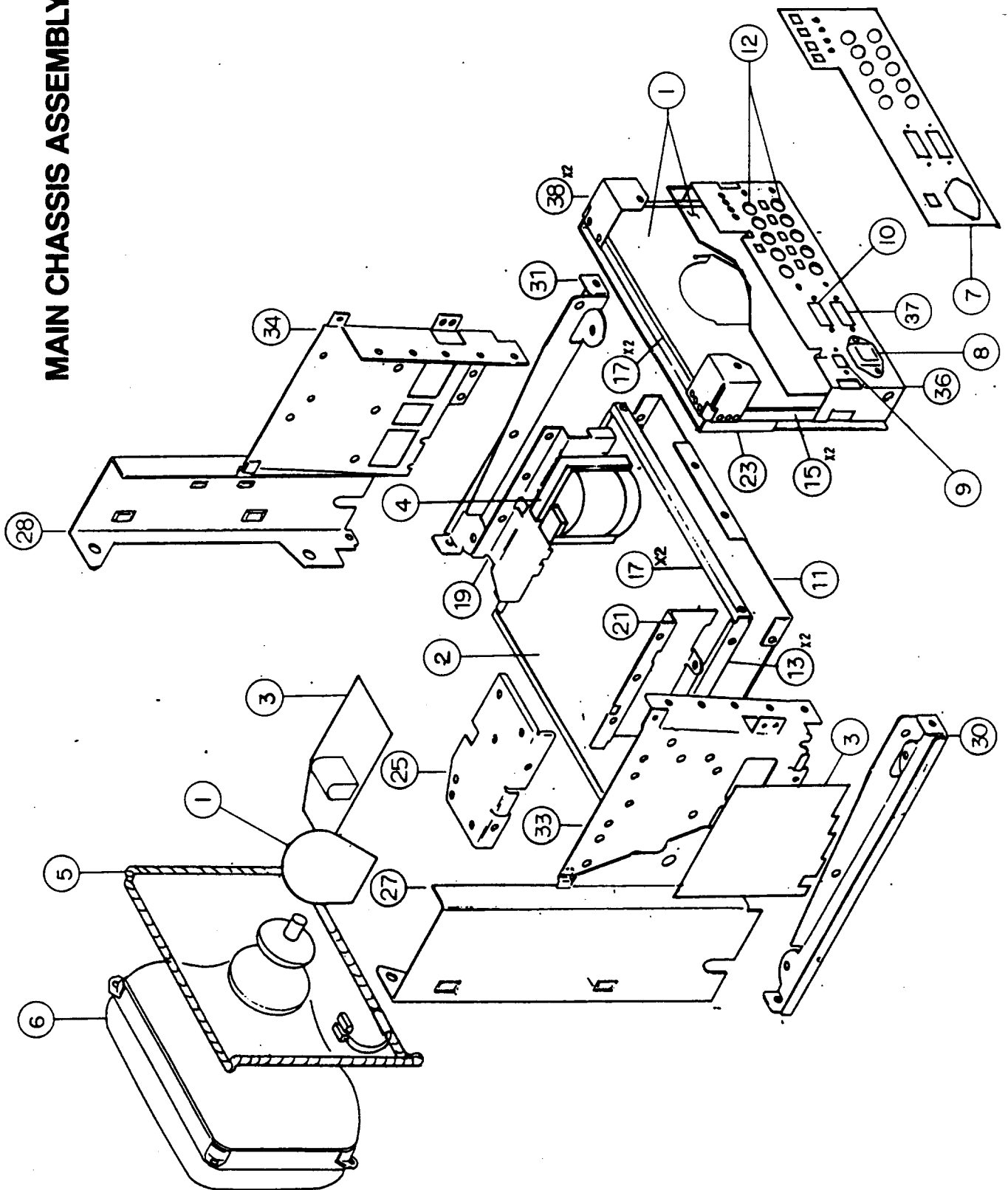
SYMBOL NO.	DESCRIPTION
VR402	SEMIFIED 1/10 W B-100K
VR403	SEMIFIED 1/10 W B-50K
VR404	SEMIFIED 1/10 W B-10K
VR405	SEMIFIED 1/10 W B-10K
VR406	SEMIFIED 1/10 W B-10K
VR407	SEMIFIED 1/10 W B-10K
VR408	SEMIFIED 1/10 W B-2K
VR409	SEMIFIED 1/10 W B-2K
VR410	SEMIFIED 1/10 W B-3K
VR411	SEMIFIED 1/10 W B-2K
VR501	SEMIFIED 1/10 W B-10K
VR502	SEMIFIED 1/10 W B-5K
VR503	SEMIFIED 1/10 W B-10K
VR504	SEMIFIED 1/10 W B-5K
VR505	SEMIFIED 1/10 W B-10K
VR506	SEMIFIED 1/10 W B-3K
VR507	SEMIFIED 1/10 W B-1K
VR508	SEMIFIED 1/10 W B-5K
VR509	SEMIFIED 1/10 W B-2K
VR510	SEMIFIED 1/10 W B-5K
VR511	SEMIFIED 1/10 W B-2K
VR512	SEMIFIED 1/10 W B-100K
VR513	SEMIFIED 1/10 W B-3K
VR514	SEMIFIED 1/10 W B-3K
VR515	SEMIFIED 1/10 W B-1K
VR2R1	SEMIFIED 1/10 W B-20K
VR2G1	SEMIFIED 1/10 W B-20K
VR2B1	SEMIFIED 1/10 W B-20K
VR201	SEMIFIED 1/10 W B-10K

VARIABLE RESISTORS

SYMBOL NO.	DESCRIPTION	ELECTROHOME PART NUMBER
VR3R1	CERMET	1/4W B-5K
VR3G1	CERMET	1/4W B-5K
VR3B1	CERMET	1/4W B-5K
VR3R2	CERMET	1/4W B-500
VR3G2	CERMET	1/4W B-500
VR3B2	CERMET	1/4W B-500
VR301	SEMIFIED	1/10W x 4 VK8PV4R (4)
VR6R1	SEMIFIED	1/10W B-50K
VR6G1	SEMIFIED	1/10W B-50K
VR6B1	SEMIFIED	1/10W B-50K
VR5A1	SEMIFIED	1/10W B-1K
△ VR5A3	CERMET	1/4W B-50K
VR911	SEMIFIED	1/10W B-100K
		ZA-80-01V
		ZA-80-02V

SYMBOL	DESCRIPTION		
△ RP911	POSISTOR	PTH451C141BG180H300	
△ F901	FUSE	250V T3A	ZA-120-01V
△ F951	FUSE	250V T3.15A	ZA-120-02V
△ K911	RELAY	DG5D1-0 (M)	

MAIN CHASSIS ASSEMBLY



MAIN PARTS

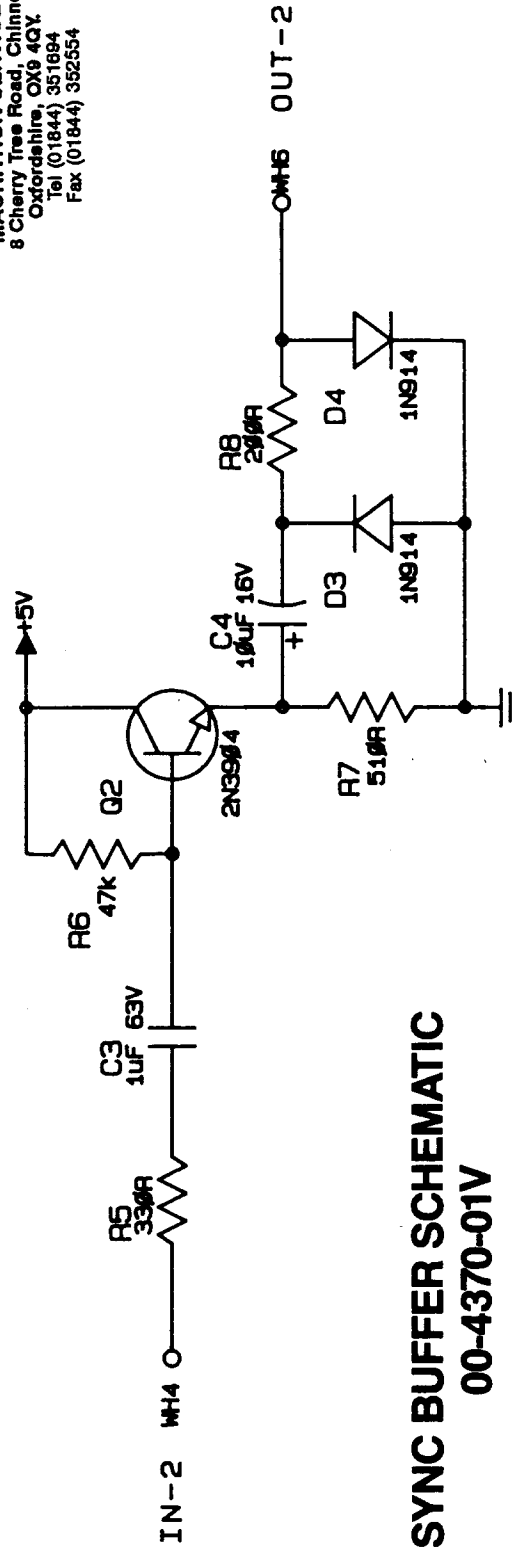
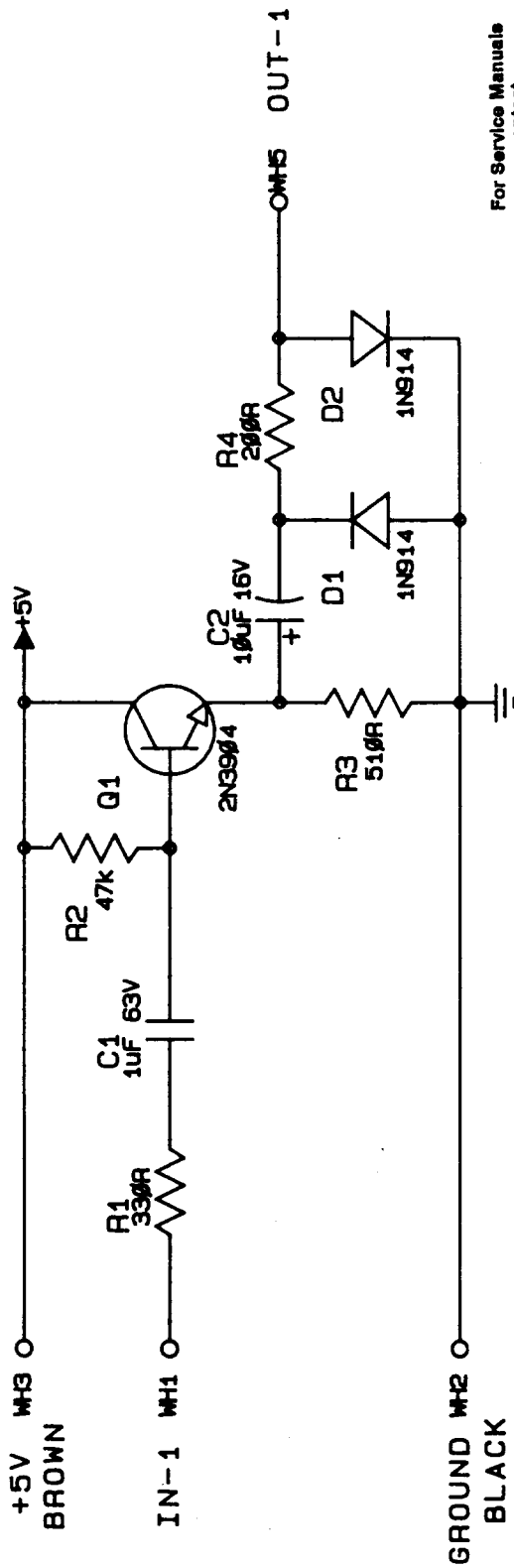
ITEM NO.	DESCRIPTION	REFERENCE NUMBER
△ 1	Video, CRT, IO P.W.B. Assy.	T5000A030
△ 2	Main P.W.B. Assy.	T5000B143
△ 3	Deflection, Filter P.W.B. Assy.	T5000C090
△ 4	Flyback	T5A3
△ 5	Degaussing Coil	DGI-12EB
△ 6	CRT with Deflection Yoke (ITC)	
	Matsushita-short, nonglare, tinted	M29JMN81X06ITC
	Matsushita-long, nonglare, tinted	M29JMN81XA06ITC
△ 6	Alternate CRT with deflection yoke	
	Mitsubishi-short, nonglare, tinted	AT12A9SLB22-A-ITC
	Mitsubishi-long, nonglare, tinted	AT12A9SLBL9-A-ITC
7	Back Label	ZA-185-01
△ 8	AC Inlet	ZA-185-02
△ 9	Voltage-Select Switch	ZA-185-03
10	9 Pin Connector "D" Sub	ZA-185-04
11	Shield-Main P.W.B.-S	4000B176
12	BNC Connectors	GL2030EP1
13	Frame - Side-A	S991
15	Frame - Side-B	CN301
17	Frame - Rear-S	4000 B154
19	Radiator H - Out-S	CN303
21	Radiator IC-S	40000 C257
23	Shield-RGB-S	4000 C258
25	Filter - P.W.B. Holder	4000 C256
27	Holder - CRT	4000 C259
28	Holder - CRT	4000 C260
		4000 B164
		4000 D314
		4000 B163
		4000 B163

MAIN PARTS

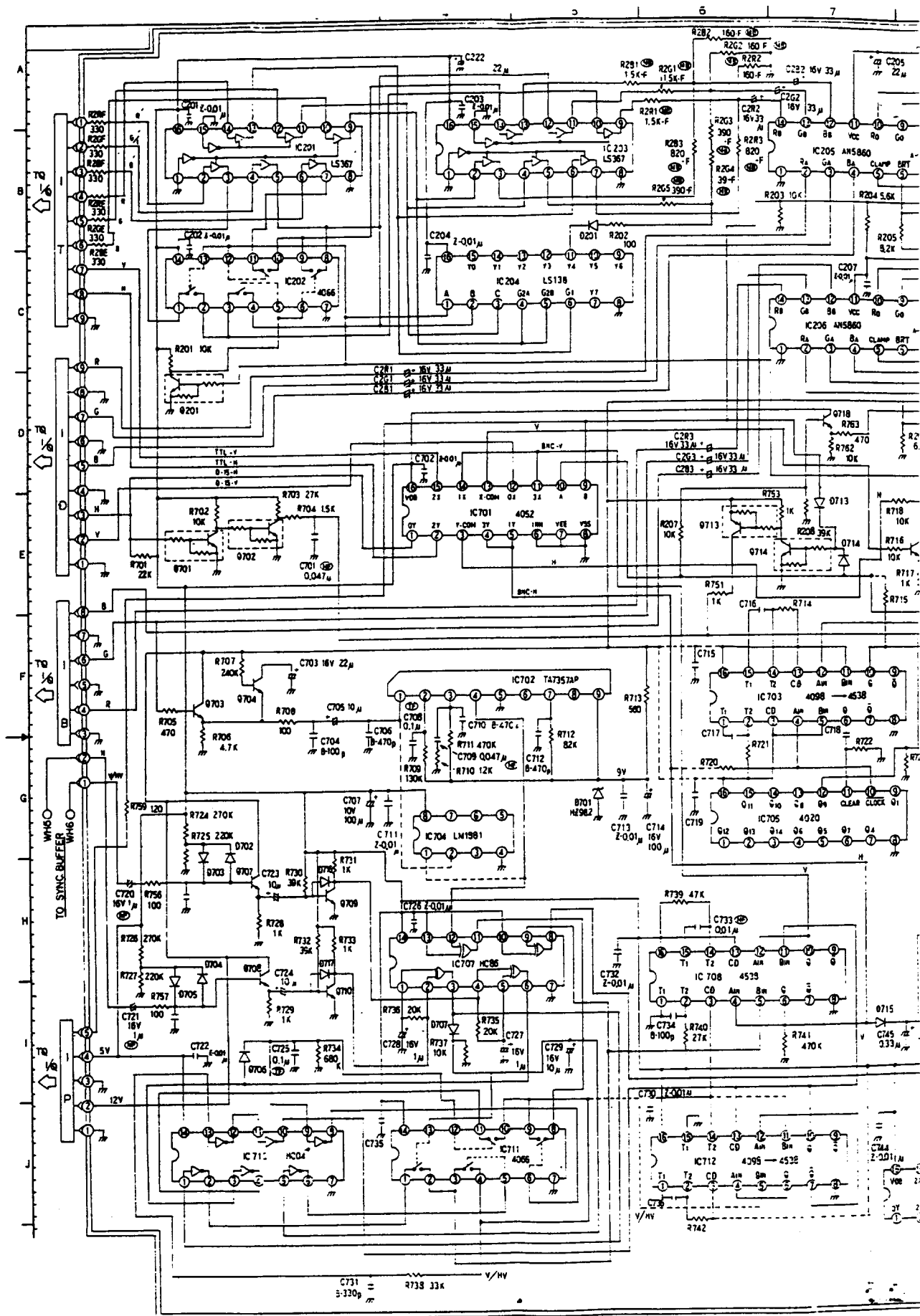
ITEM NO.	DESCRIPTION	REFERENCE NUMBER
30	Bottom-Holder	4000 C302
31	Bottom-Holder	4000 C302
33	Radiator-Power	4000 B149
34	Radiator-Power	4000 B149
36	Panel-Back	4000 B171
37	15 Pin Connector "D" Sub.	CN302
38	Stay-Back Cover	4000 D386

CABINET

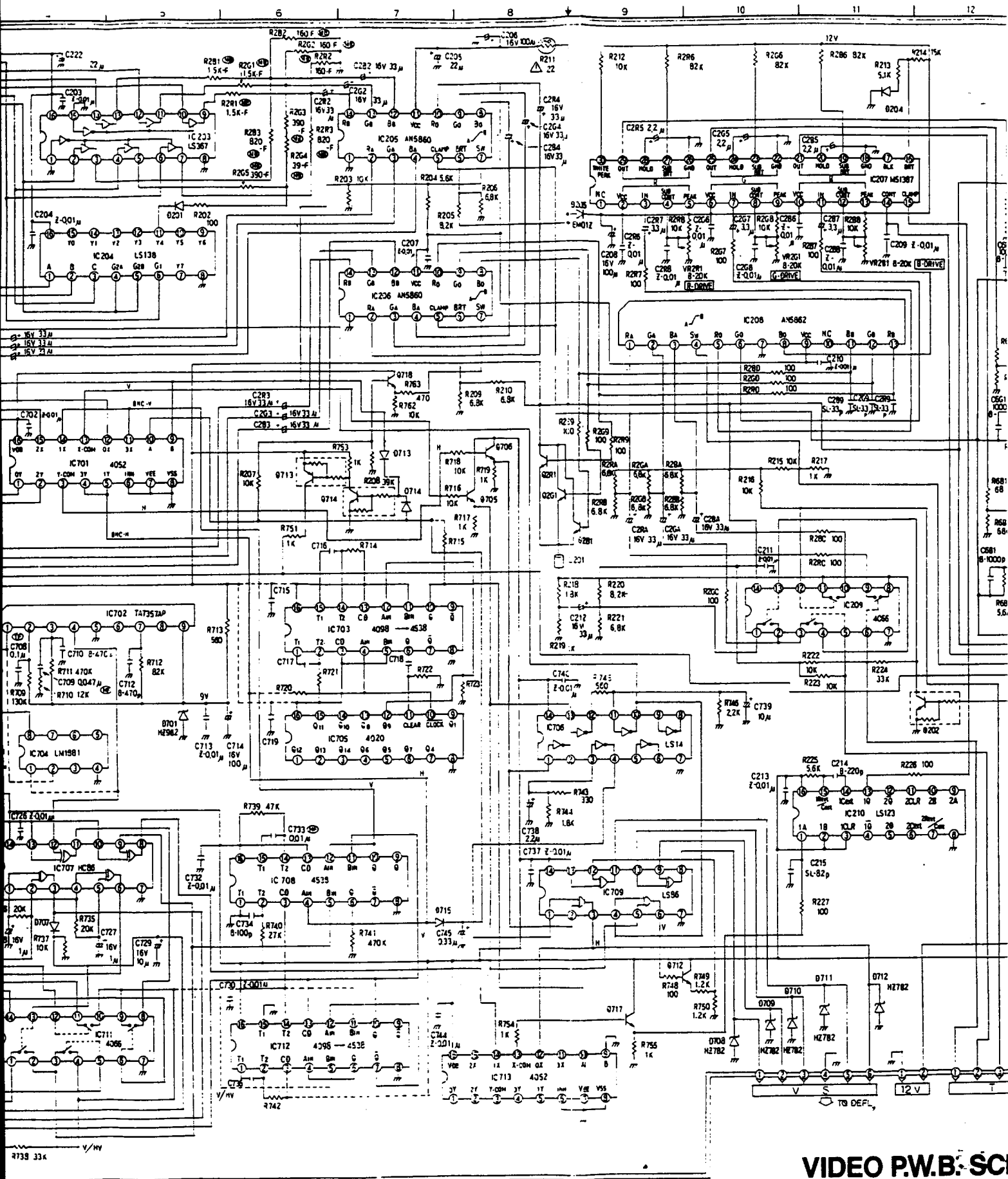
DESCRIPTION	ELECTROHOME PART NUMBER
Cabinet (Beige)	12-100141-03V
Cabinet (Black)	12-100141-05V
Bumper (Feet)	33-000795-01V
Back (Beige)	52-000816-03V
Back (Black)	52-000816-05V
Mask (Beige)	53-001980-02V
Mask (Black)	53-001980-04V
Knob (Beige)	53-001982-01V
Knob (Black)	53-001982-02V
Inlay Control (Beige)	53-001991-01V
Inlay Control (Black)	53-001991-02V
Inlay Mask (Beige)	53-001992-02V
Inlay Mask (Black)	53-001992-04V
Switch On/Off	26-000338-01V



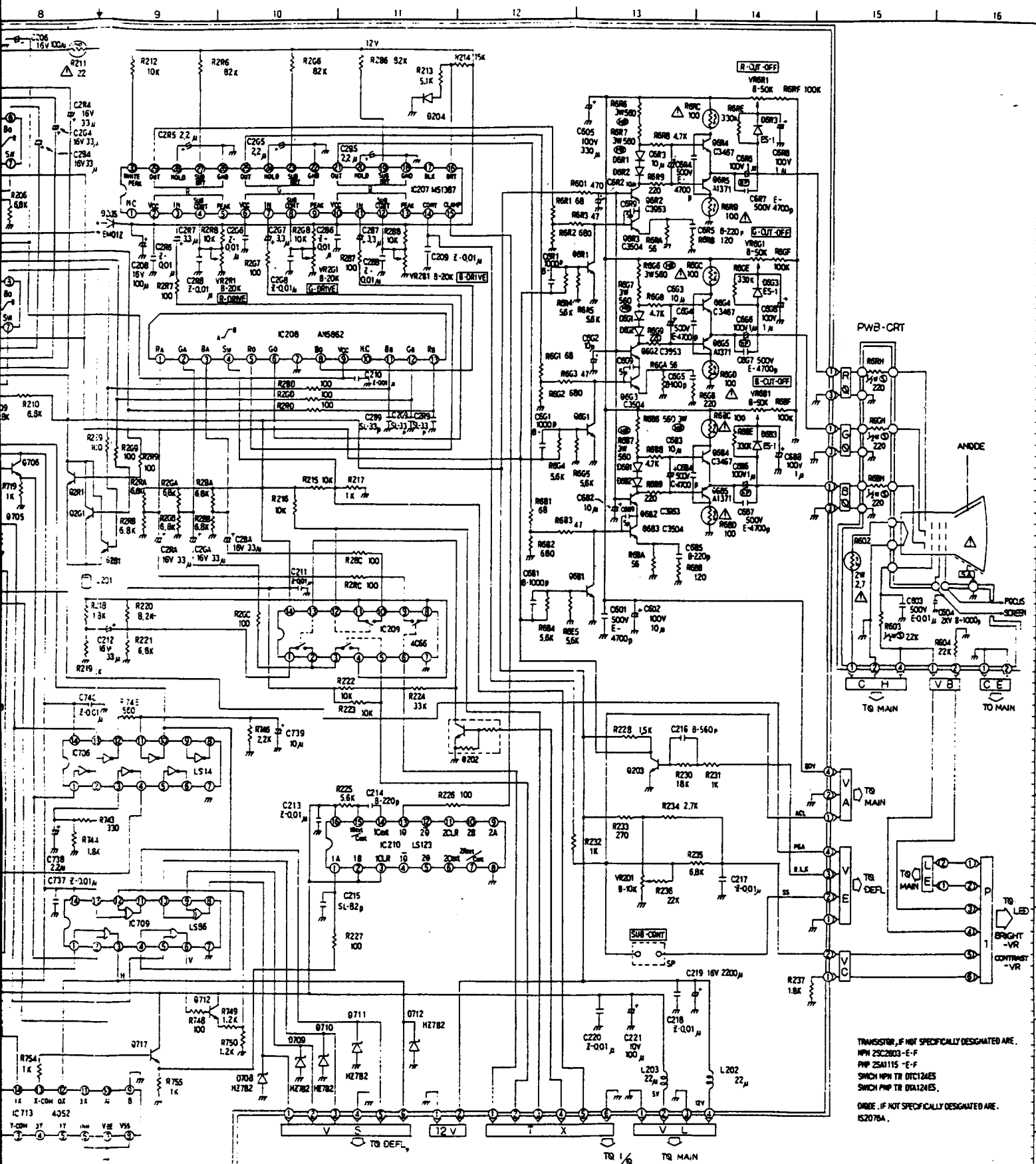
SYNC BUFFER SCHEMATIC
00-4370-01V



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VIDEO P.W.B. SCI
00-4371-0



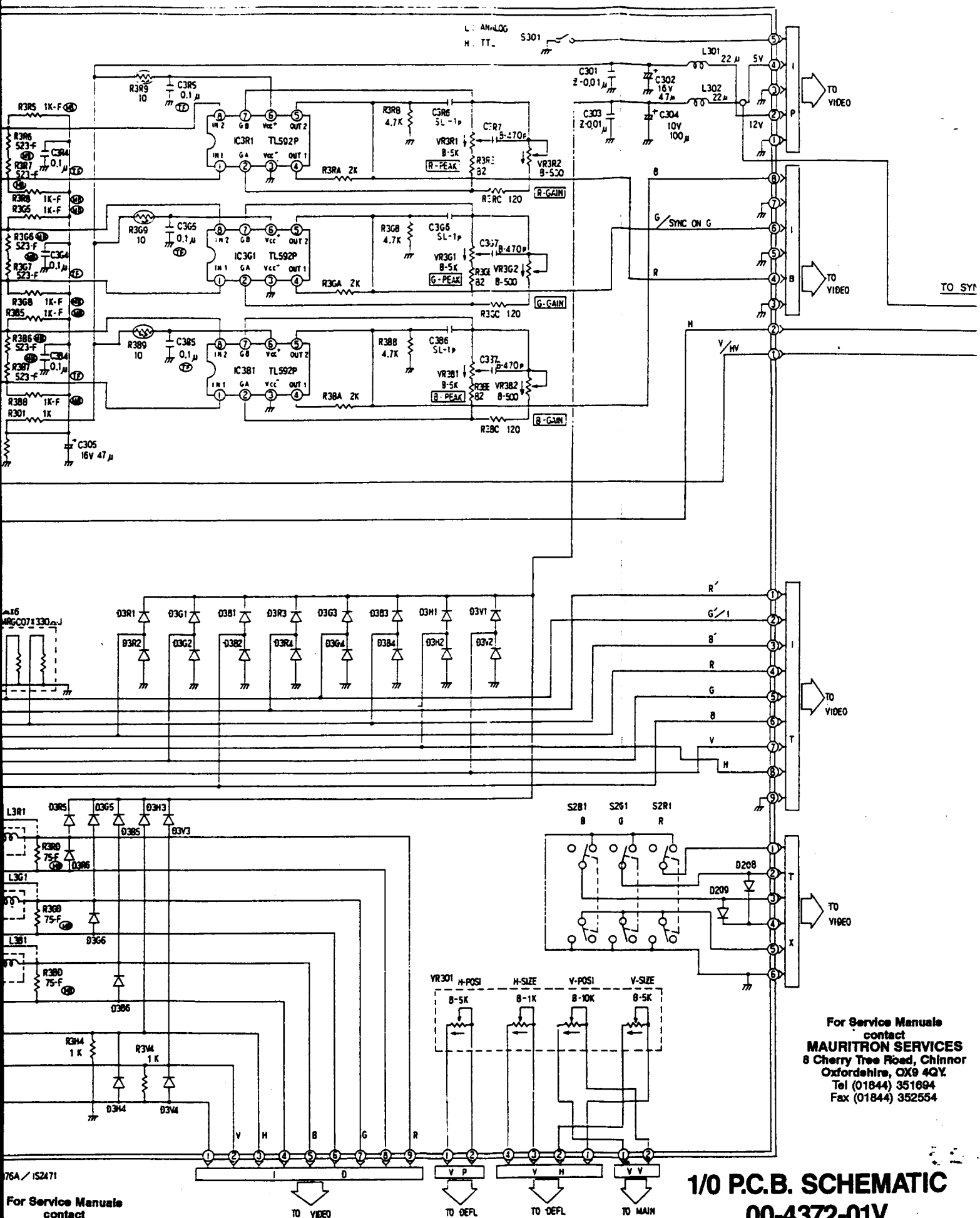
TRANSISTOR, IF NOT SPECIFICALLY DESIGNATED ARE:
 NPN 2SC2803 - E-F
 PNP 2SA1115 - E-F
 SWITCH NPN TR 01C124ES
 SWITCH PNP TR 01A124ES.
 DIODE, IF NOT SPECIFICALLY DESIGNATED ARE:
 1S2078A.

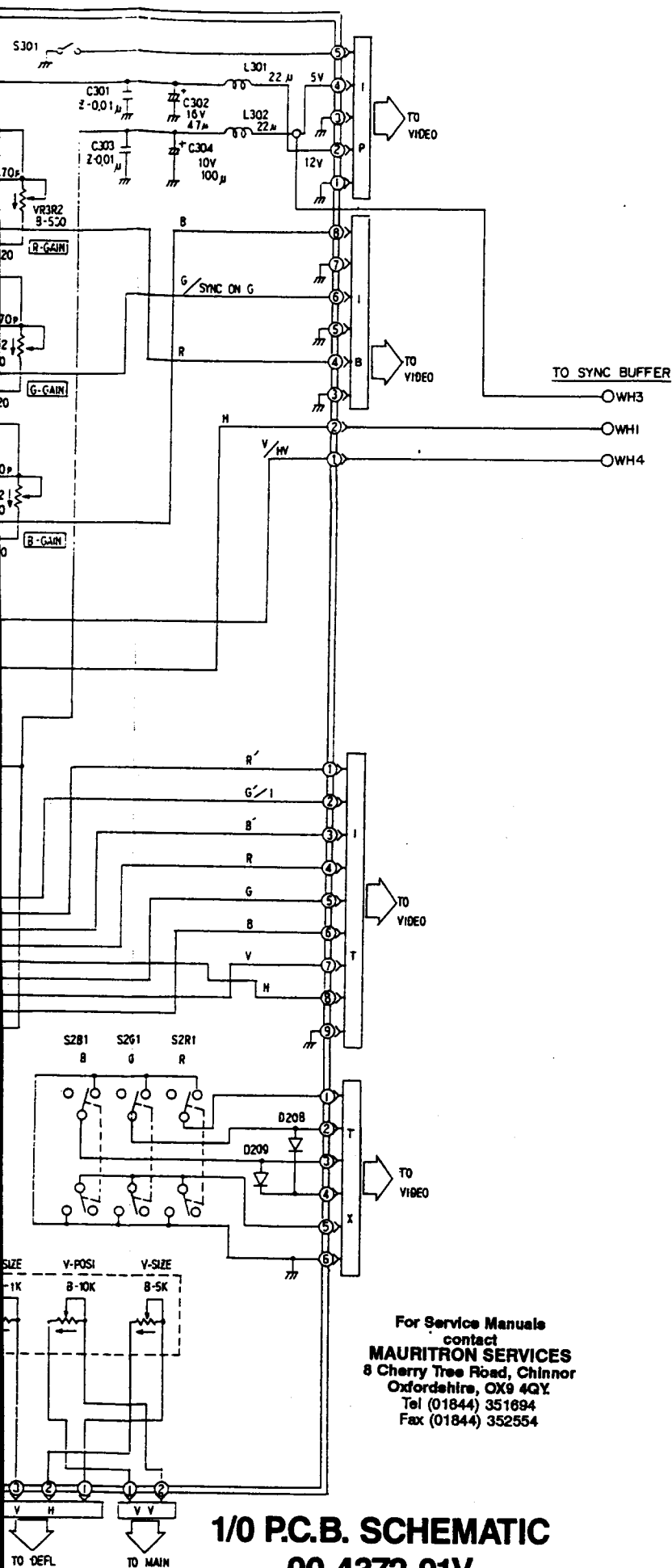
VIDEO P.W.B. SCHEMATIC
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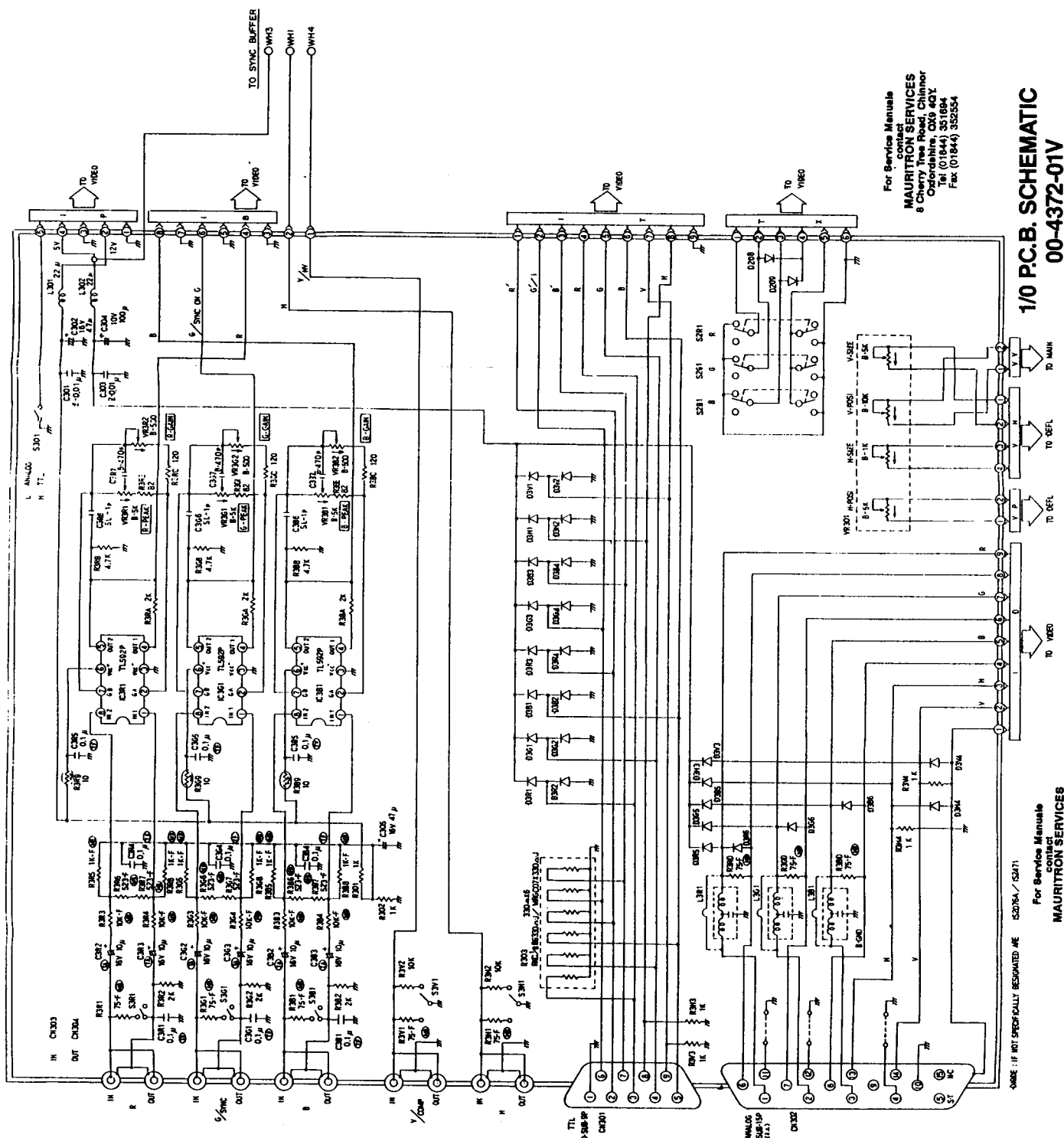
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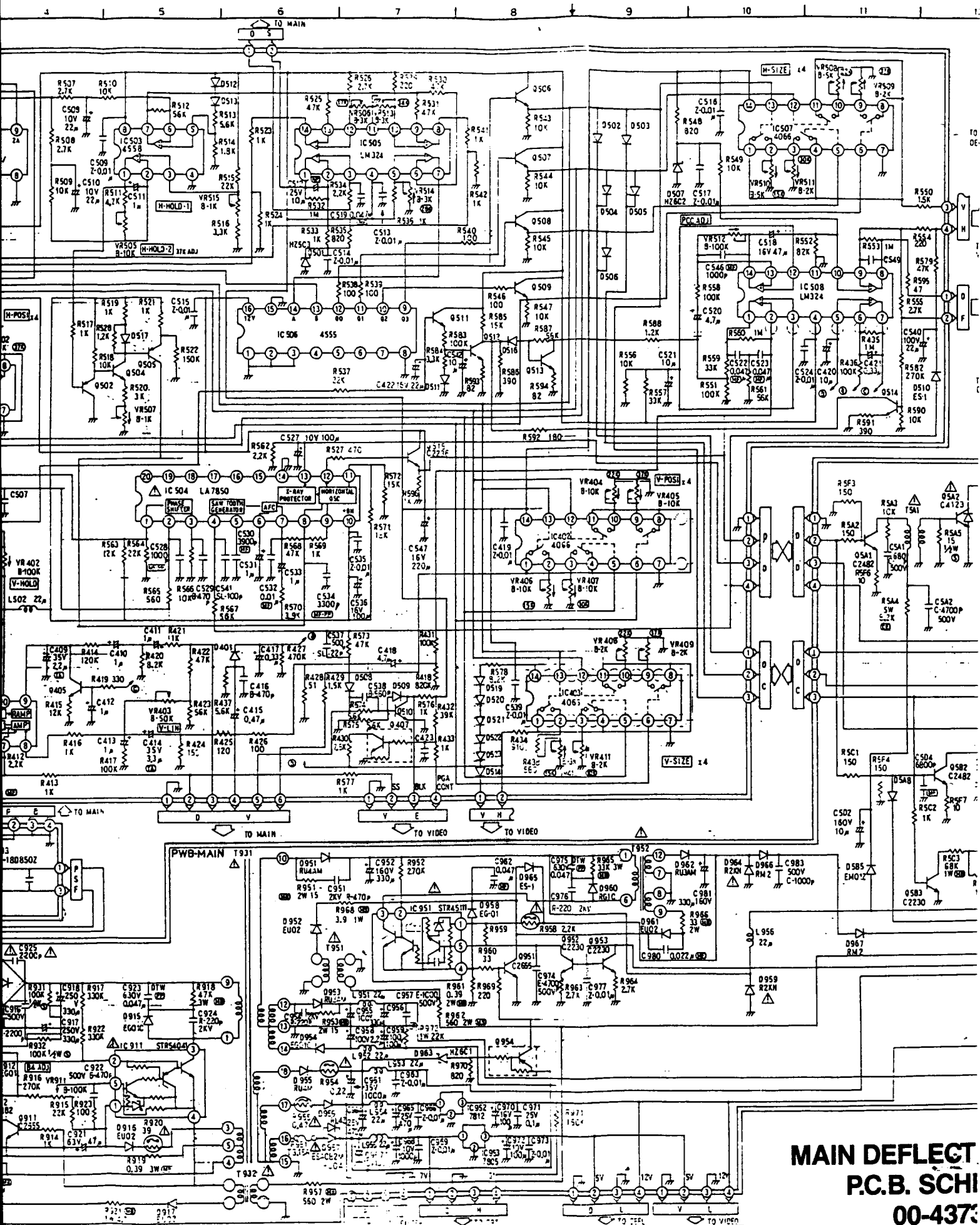


54-7584-01V

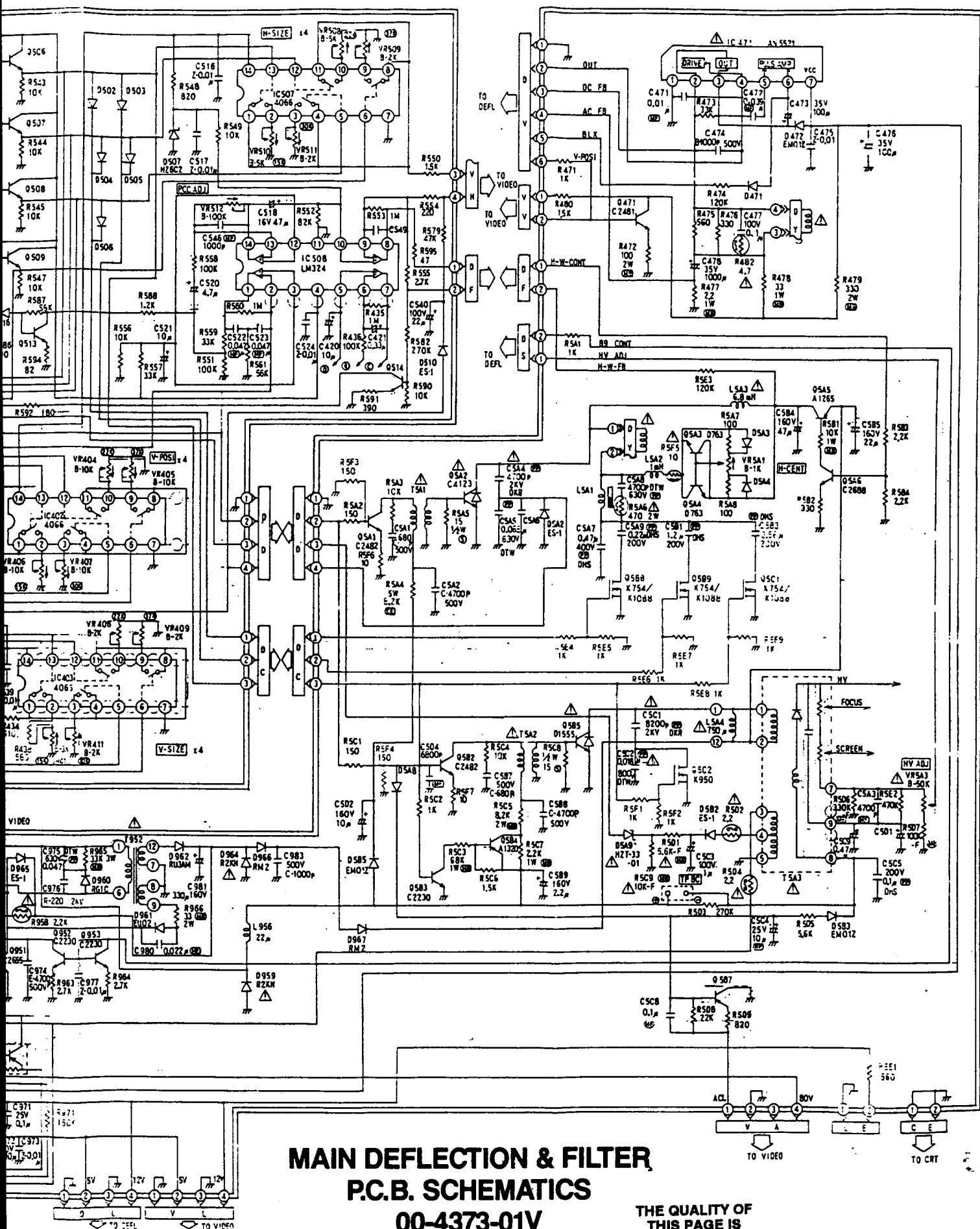


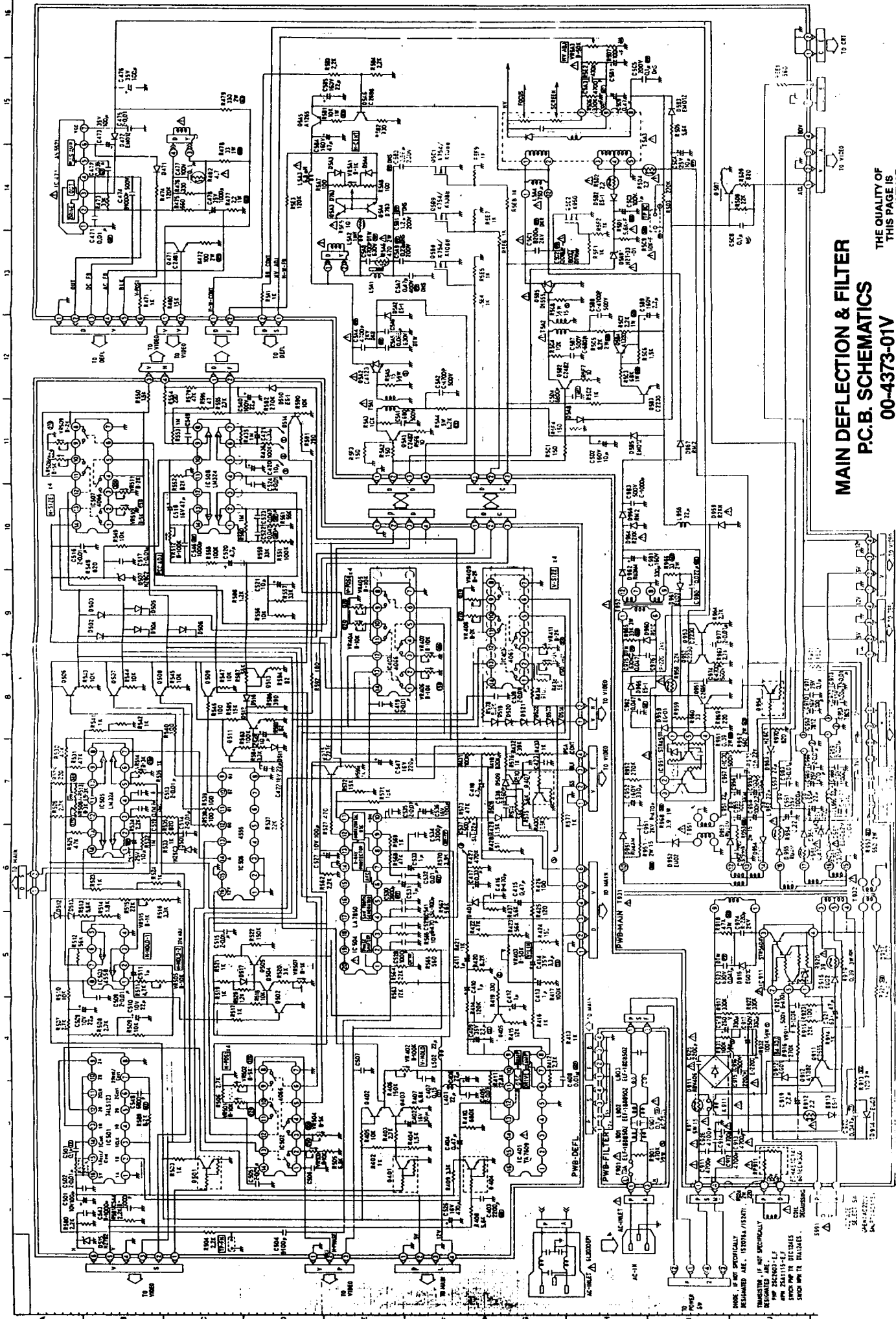






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MAIN DEFLECTION & FILTER P.C.B. SCHEMATICS 00-4373-01V

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