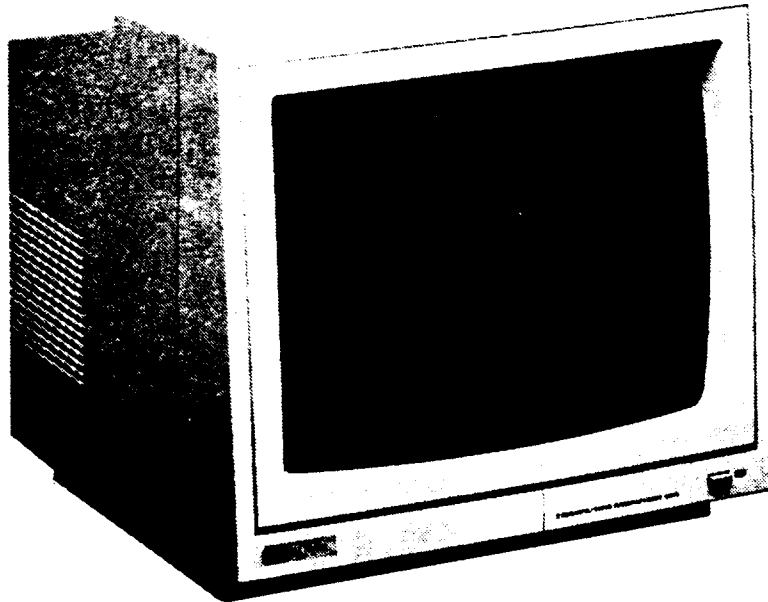


PC 1901 MONOCHROME MONITOR

(NAP - 7BM613)



SPECIFICATIONS

Picture Tube:	12" measured diagonally with glare reducing surface treatment	Video Amp Bandwidth:	20MHz
Deflection Angle:	90°	Horizontal Resolution:	800 lines (BM7513, BM7523) 1,000 lines (7BM613, 7BM623)
Phosphor Type:	P39 Green (BM7513, 7BM613) LA Amber (BM7523, 7BM623)	Character Field:	25 lines of 80 characters (2,000 total)
Video Input Signal:	TTL level digital video, separate horizontal and vertical syncs. (7BM613, 7BM623)	Power Supply:	120Vac ± 10%, 50-60Hz
		Power Consumption:	30 Watts
		Dimensions:	11.9"W x 11.1"D x 10.9"H
			*Subject to Modification

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CAUTION

USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

NAPCEC SAFETY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

Safety Checks

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous servicer may have left an unsafe condition, which could be unknowingly passed on to your customer. Be sure to check all of the following:

Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and from the service shop.
2. Never release a repaired receiver unless all protective devices such as insulators, barriers, covers, strain reliefs, and other hardware have been installed according to the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation (including ac cord). Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout, lead length and dress.
5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with an S by the Ref. No. in the parts list and enclosed within a broken line* along with the safety symbol on the schematics. Replacement parts without the same safety characteristics may create shock, fire or other hazards.
7. When servicing any receiver, always use a separate isolation transformer for the chassis. Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many receivers use a polarized line cord (one wide pin on the plug). Defeating this safety

device may create a potential hazard to the servicer and the user. Extension cords which do not incorporate the polarizing feature should never be used.

9. After re-assembly of the set, always perform an ac leakage test or resistance test from the line cord to all exposed metal parts of the cabinet. Also, check all metal control shafts (with knobs removed), antenna terminals, handles, screws, etc. to be sure the set is safe to operate without danger of electrical shock.

* Broken line: — · — · — · — · — · — ·

Implosion

1. All picture tubes used in current model receivers are equipped with an integral implosion system. Care should always be used, and safety glasses worn, whenever handling any picture tube. Avoid scratching or otherwise damaging the picture tube during installation.
2. Use only replacement tubes as specified by the manufacturer.

X-radiation

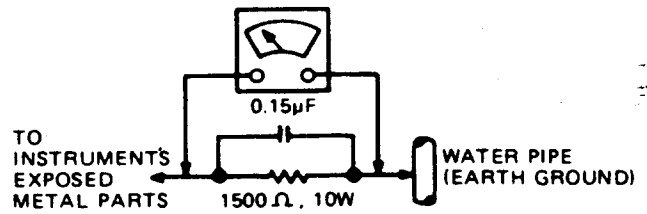
1. Be sure procedures and instructions to all your service personnel cover the subject of X-radiation. Potential sources of X-rays in TV receivers are the picture tube and the high voltage circuits. The basic precaution which must be exercised is to keep the HB at the factory recommended level.
2. To avoid possible exposure to X-radiation and electrical shock, only the manufacturer's specified anode connectors must be used.
3. It is essential that the service technician has available at all times an accurate HV meter. The calibration of this meter should be checked periodically against a reference standard.
4. When the HV circuitry is operating properly there is no possibility of an X-radiation problem. High voltage should always be kept at the manufacturer's rated value—no higher—for optimum performance. Every time a color set is serviced, the brightness should be run up and down while monitoring the HV with a meter to be certain that the HV does not exceed the

specified value and that it is regulated correctly. We suggest that you and your service technicians review test procedures so that HV and HV regulation are always checked as a standard servicing procedure, and the reason for this prudent routine be clearly understood by everyone. It is important to use an accurate and reliable HV meter. It is recommended that the HV reading be recorded on each customers' invoice, which will demonstrate a proper concern for the customers' safety.

5. When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, reduce the line voltage by means of a Variac to bring the HV into acceptable limits while troubleshooting. Do not operate the chassis longer than necessary to locate the cause of the excessive HV.
6. New type picture tubes are specifically designed to withstand higher operating voltages without creating undesirable X-radiation. It is strongly recommended that any shop test fixture which is to be used with the new higher voltage chassis be equipped with one of the new type tubes designed for this service. Addition of a permanently connected HV meter to the shop test fixture is advisable. The CRT types used in these new sets should never be replaced with any other types, as this may result in excessive X-radiation.
7. It is essential to use the specified picture tube to avoid a possible X-radiation problem.
8. Most TV receivers contain some type of emergency "Hold Down" circuit to prevent HV from rising to excessive levels in the presence of a failure mode. These various circuits should be understood by all technicians servicing them, especially since many hold down circuits are inoperative as long as the receiver performs normally.

Leakage Current Cold Check

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.
2. Turn on the power switch.
3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the jumper from the ac line cord.



Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely re-assembled receiver directly into the ac outlet.
2. Connect a 1.5k ohm, 10 watt resistor paralleled by a 0.15uF. capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms/volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5 milliamps. If a measurement is outside the limits specified, there is a possibility of shock hazard. The receiver should be repaired and re-checked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed. (Note: An ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

Picture Tube Replacement

The primary source of X-radiation in this television is the picture tube. The picture tube utilized in this chassis is specially constructed to limit X-radiation emissions. For continued X-radiation protection, the replacement must be the same type as the original, including suffix letter, or an N.A.P. Consumer Electronics Corp. (NAPCEC) approved type.

Parts Replacement

Many electrical and mechanical parts in NAPCEC television sets 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. The use of a substitute part which does not have the same safety characteristics as the NAPCEC recommended replacement part shown in this service manual may create shock, fire or other hazards.

CIRCUIT DESCRIPTION

This monitor can be used as an alphanumeric and graphic display unit for the home and personal computers. The screen is anti-reflecting which means that the legibility of the image is extremely good. The monitor has composite video signal input.

The monitor operates on a supply of 120V, 60Hz ac. The Power Transformer and CRT are mounted internally to the cabinet. The main panel has a Video Preamplifier, Sync Channel, Vertical and Horizontal Sweep Circuitry, Power Supply Horizontal AFC, and Blanking Circuits. The On/Off control Video Gain Control and Brightness Control are mounted on the main panel and extend through the cabinet front. The circuit adjustments are mounted to the main panel.

Power Supply

120 volt, 60Hz ac operation. The ac section of this receiver is designed for operation on 120 volt, 60Hz alternating current only. Never connect power cord to a supply having a different frequency or voltage.

Overload Protection

This receiver incorporates a .5 amp Slow-Blow fuse and a 2 amp fuse in the ac circuit. These fuses provide protection to the chassis against certain electrical overloads.

ADJUSTMENTS

B+ Adjust (R106)

Connect dc voltmeter to the collector of TS101 and allow receiver and test equipment to warm up for 20 minutes. Using a non-metallic tool, adjust R106 to obtain 11Vdc \pm 1% on voltmeter.

Focus (R336)

Adjust Focus Control for best overall detail in the center portion of the picture.

Horizontal Oscillator Adjustment (R513)

Short C503 and R544 to ground. Adjust R513 for horizontal stability of picture. Remove short between C503 and R544.

Vertical Size (R425)

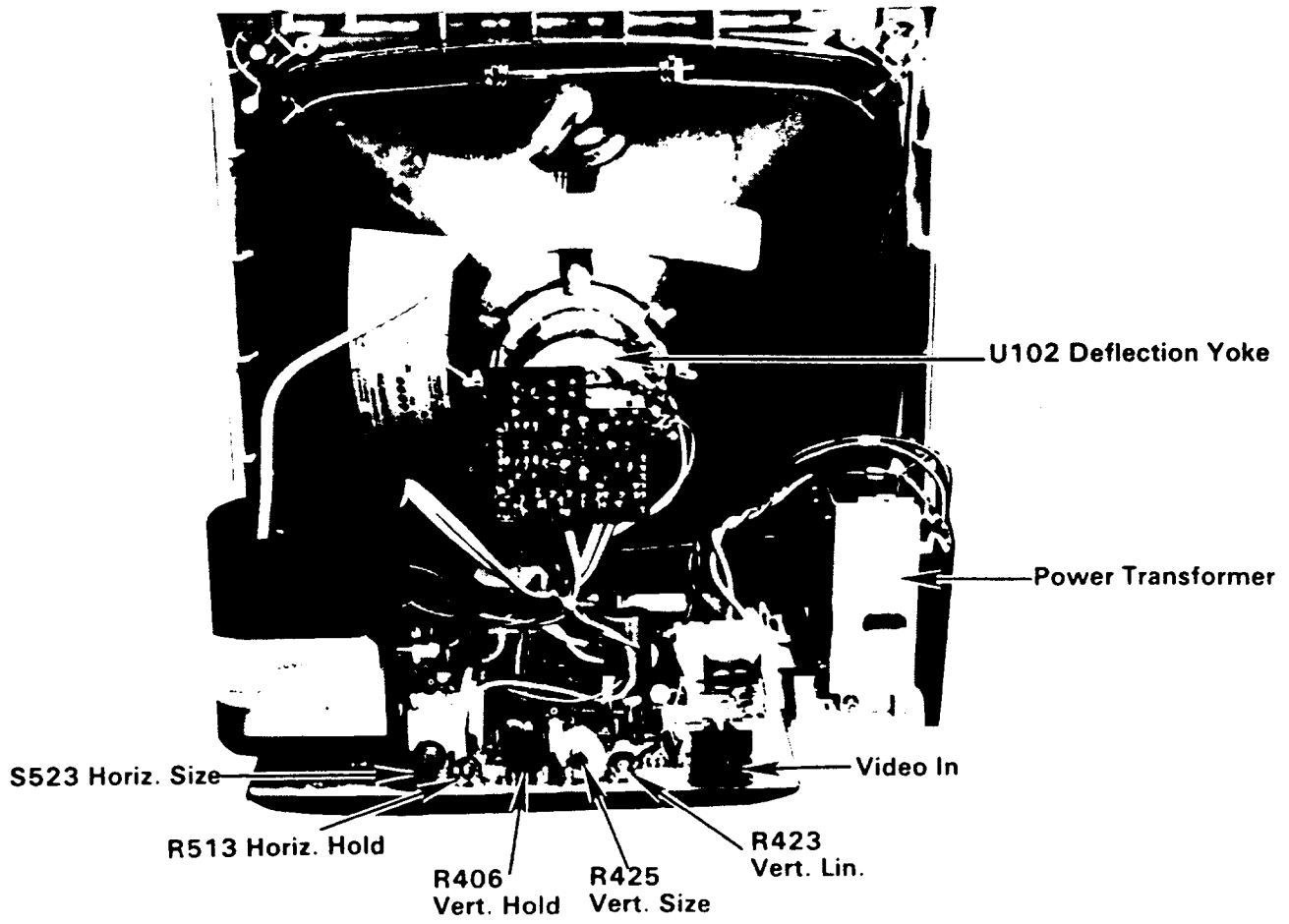
Adjust the Vertical Size control (R425) to fill the screen vertically.

Horizontal Size (S523)

Adjust horizontal size to fill up screen.

Vertical Linearity (R423)

Adjust vertical linearity control for equal spacing of horizontal lines at the upper portion of the center of the screen.



Adjustment Location — Rear View

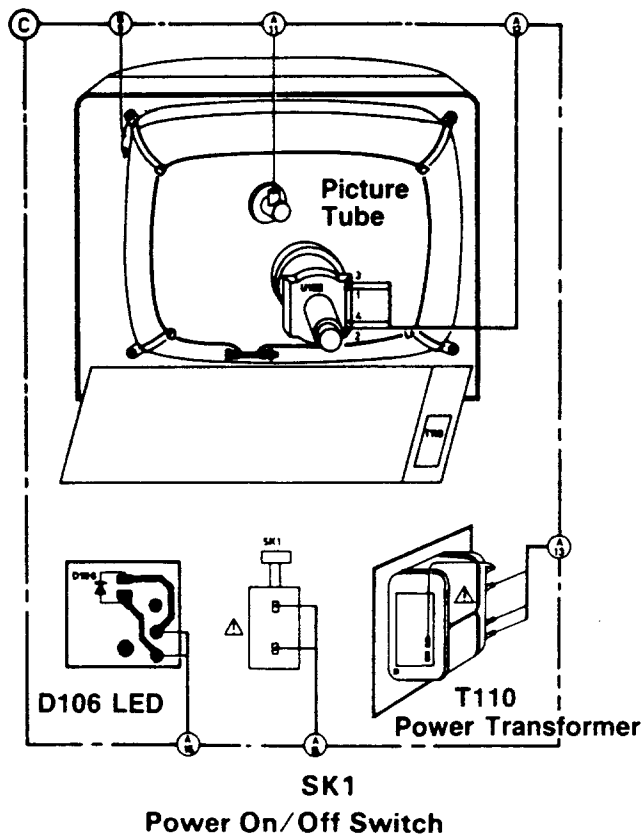
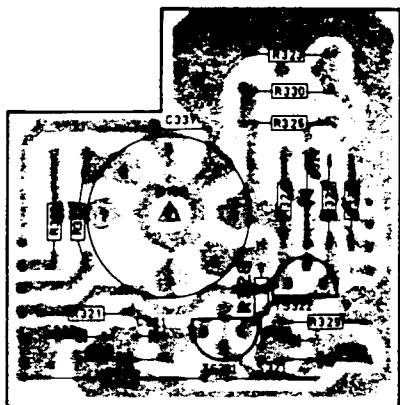
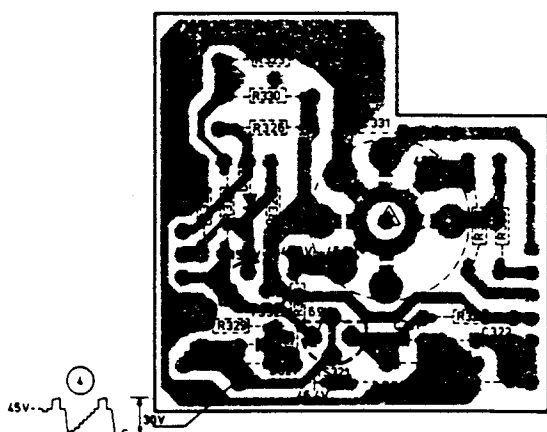
Chassis Removal

1. Remove six (6) screws, four (4) of which are securing cabinet back to cabinet front.
 2. Lay cabinet face down on a soft material to protect picture tube and cabinet finish.
 3. Chassis Removal — Slide printed circuit board assembly to rear as far as leads will allow for servicing.
 4. Place chassis on the heat sink of TS101. In this position the monitor remains stable on the work bench.
 5. Disconnect the picture tube socket and high voltage anode lead at picture tube.
 6. Loosen clamp screw securing deflection yoke to picture tube. Slide the yoke to the rear until clear of the neck of the picture tube.
- Caution: Before removing high voltage lead at picture tube, discharge picture tube high voltage anode to ground only.**
7. To replace components, reserve the above procedure.
 8. **Note: Backcover Replacement - Printed Circuit Board must slide into proper tracks in backcover.**

Picture Tube Removal

1. Disconnect HV anode lead and picture tube socket from picture tube. Loosen clamp screw securing deflection yoke and slide yoke off neck of picture tube.
2. Lay cabinet face down on a soft material so as not to scratch or mar the face of the picture tube or finish on cabinet.
3. Slide printed circuit board assembly out of track.
4. Remove screws from each of four (4) brackets holding picture tube in place. Slip mounting wire over neck of tube.
5. Using goggles and gloves, reach under face of tube and lift from cabinet. **Do not grasp neck of picture tube at any time.**
6. To install picture tube, reverse the preceding steps. Exercise caution not to scratch face of picture tube.

CRT Board



MEASUREMENTS

Important

Read these instructions carefully and observe the conditions noted when taking voltage readings or observing waveforms.

Picture tube high voltage anode may have a potential 10kV. Observe all high voltage precautions when servicing the chassis. Use safety goggles and gloves when handling the picture tube.

Voltage Measurement Conditions Unless Otherwise Specified

1. Voltages measured to chassis using a digital voltmeter.
2. AC power source 120V, 60Hz line.
3. Voltage readings not in brackets taken using a pattern generator (PM5519) as a signal source.
4. Brightness control set at minimum, and contrast control to maximum.
5. Voltage values shown are average readings. Variations may be observed due to normal production tolerances.

Special Voltage Measurement Conditions

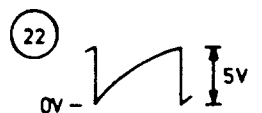
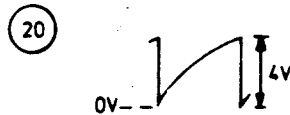
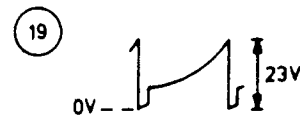
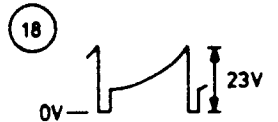
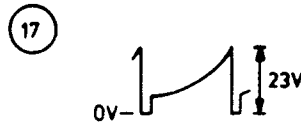
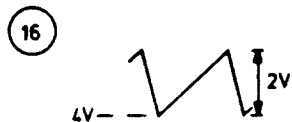
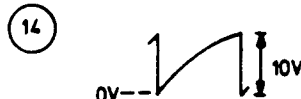
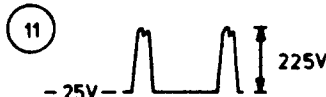
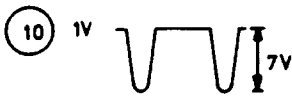
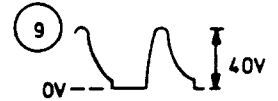
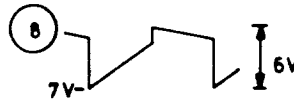
Picture tube anode voltage measured with VTVM high voltage probe at line voltage of 120 volts at 100 μ A beam current.

Waveform Measurement Conditions

1. Waveforms taken using a pattern generator connected to the input plug of the monitor.
2. The video output signal of the generator adjusted to 1 volt.
3. Brightness control and contrast control set at maximum.

General Schematic Notes — See "Notes" on Schematic Diagram

Waveforms



REPLACEMENT PARTS LIST

**TO ENSURE OPTIMUM PERFORMANCE AND RELIABILITY
ALWAYS USE GENUINE FACTORY REPLACEMENT PARTS**

WARNING

Critical components having special safety characteristics are identified with an S by the Ref. No. in the parts list and enclosed within a broken line* along with the safety symbol **▲** on the schematics or exploded views.

Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from the N.A.P. Consumer Electronics Corp. NAPCEC assumes no liability, express or implied, arising out of any unauthorized modification of design. Servicer assumes all liability.

*Broken line:

CAPACITORS (All Ceramic, 50V unless otherwise specified)				CAPACITORS (Continued)			
S	C101	2.2nF., 100V, Cer. Disc.		C512	1.5nF., 100V, Cer. Disc.		
S	C102	2.2nF., 100V, Cer. Disc.	4H12231989	C513	5.6nF., 100V, Polyester		4H12150625
S	C103	2.2nF., 100V, Cer. Disc.	4H12231989	C514	10nF., 250V, Cer. Disc.		
	C104	3300µF., 25V, Electrolytic	4H12421466	C515	100nF., 250V, Cer. Disc.		
	C105	100pF., 50V, Cer. Disc.	4H12232156	C521	47nF., 25V, Electrolytic		
	C106	10nF., 63V, Electrolytic		C522	47nF., 25V, Electrolytic		
	C107	330nF., 16V, Electrolytic		C523	22nF., 63V, Cer. Disc.		
S	C110	47nF., 125V, AC	4H12141348	C524	100nF., 500V, Cer. Disc.		
S	C111	2.2nF., 125V, AC	4H12232194	C525	22nF., 100V, Electrolytic		
S	C112	2.2nF., 125V, AC	4H12232194	C526	560pF., 100V, Cer. Disc.		
	C301	2.2nF., 63V, Electrolytic		C527	4.7µF., 160V, Electrolytic		4H12440387
	C302	470nF., 100V, Cer. Disc.		C528	13nF., 400V, Polyester		4H12142192
	C303	22nF., 63V, Cer. Disc.		C531	10nF., 500V, Foil		4H12142191
	C304	100nF., 25V, Electrolytic		C602	22nF., 63V, Cer. Disc.		
	C305	27pF., 100V, Cer. Disc.		C603	22µF., 16V, Electrolytic		4H12440189
	C321	22nF., 63V, Cer. Disc.		C604	10nF., 100V, Cer. Disc.		
	C322	100nF., 100V, Cer. Disc.		COILS & TRANSFORMERS			
	C323	100nF., 100V, Cer. Disc.	4H12421678	S321	6.8µF., Coil - Choke		4H15751998
	C331	100nF., 400V, Cer. Disc.		S523	Coil - Horizontal Width		4H15751717
	C341	1nF., 63V, Electrolytic		S524	Coil - Linearity		4H15751914
	C342	15nF., 63V, Cer. Disc.		S T110	Transformer - Power		4H14630509
	C343	10nF., 63V, Electrolytic		S T521	Transformer - Horiz. Output		4H15050051
	C401	10nF., 100V, Cer. Disc.		S T522	Transformer - Line Output		4H14010264
	C402	10nF., 100V, Cer. Disc.		CONTROLS & SWITCHES			
	C403	4.7nF., 100V, Cer. Disc.		S SK1	Power Switch - On/Off		4H27611161
	C404	3.3, 100V, Cer. Disc.		R106	4.7k. B+ Adjust		4H10010236
	C405	270pF., 100V, Cer. Disc.		R303	470 ohm, Contrast		4H10020121
	C406	10nF., 400V, Cer. Disc.		R331	1 Meg., Brightness Pre-set		4H10010103
	C421	220nF., 100V, Cer. Disc.		R332	470k, Brightness		4H10020122
	C422	56nF., 100V, Cer. Disc.		R336	2 Meg., Focus		4H10120727
	C423	820pF., 50V, Cer. Disc.	4H12232157	R406	10k, Vertical Hold		4H10110547
	C424	220pF., 100V, Cer. Disc.		R423	47k, Vertical Linearity		4H10010076
	C431	270pF., 100V, Cer. Disc.		R425	330k, Vertical Size		4H10110548
	C432	100pF., 50V, Cer. Disc.	4H12232156	R513	330 ohm, Horizontal Hold		4H10020054
	C433	100nF., 25V, Electrolytic		RESISTORS (unless otherwise specified, all are 5%, 1/4W)			
	C434	220nF., 25V, Electrolytic		R101	150 ohm		
	C435	4.7nF., 100V, Electrolytic		R102	1k		
	C501	2nF., 400V, Cer. Disc.		R103	1.2k		
	C502	680pF., 100V, Cer. Disc.					
	C503	15nF., 400V, Cer. Disc.					
	C504	560pF., 500V, Cer. Disc.					
	C505	4.7nF., 100V, Cer. Disc.					
	C506	10nF., 100V, Cer. Disc.					
	C507	4.7nF., 63V, Electrolytic					
	C508	270pF., 100V, Cer. Disc.					
	C511	1.5nF., 100V, Cer. Disc.					

Commodore Part Numbers are not available at this time.

REPLACEMENT PARTS LIST (Continued)

RESISTORS (Continued)		RESISTORS (Continued)		
R104	27k	R502	150k	
R105	15k	R504	10kR50512k	
R107	15k	R506	2.2k	
R108	1k	R511	560 ohm	
R301	100 ohm	R512	2.7k	4H11652918
R302	680 ohm	R514	2.2k	
R304	47 ohm	R515	8.2k, Metal Film	4H11652865
R305	18k	R516	8.2k	
R306	4.7k	R517	6.8k, Metal Film	4H11653064
R307	100 ohm	R518	18k	
R308	100 ohm	R519	3.9k	
R309	470 ohm	R520	1.2k	
R310	100k	R522	220 ohm	
R311	1k	R523	8.2 ohm, ¼W, Safety Resistor	4H1130506
R312	68k	R524	1.8 ohm	
R313	4.3k	R525	390 ohm	
R314	75 ohm	S R526	1k, ¼W, Safety Resistor	4H11130561
R316	68 ohm	S R527	5.6 ohm, ¼W, Safety Resistor	4H11130502
R317	68 ohm	S R528	100 ohm, ¼W, Safety Resistor	4H11130535
R321	1k (BM7513), (BM7523)	R529	470 ohm	
R321	820 ohm (7BM613), (7BM623)	R601	1k	
R322	680 ohm	R602	1k	
R323	1k	R603	1k	
R324	47k	R604	1k	
R325	18k	R605	1.2k	
R326	2.2k	R606	1.2k	
R327	1k, ¼W, Metal Film	R607	470 ohm	
R328	120 ohm, ½W	R608	560 ohm	
R329	330k	R609	120 ohm	
R330	120 ohm			
R333	390k			
R335	270k			
R337	33k			4H11150482
R338	33k			4H11150482
R341	1.5 Meg.			
R342	2.2k			
R343	1k			
R344	1k			
R345	27k			
R401	6.8k			
R402	15k			
R403	24k			
R404	100k			
R405	27k			
R406	10k			
R407	33k			
R408	560 ohm			
R421	180k			
R422	120k			
R424	270k			
R426	330k			
R427	100k			
R428	430 ohm			
R429	1k			
R431	12k			
R432	10k			
R433	150 ohm			
R434	5.6 ohm			
R435	6.8k			
R436	1k			
R437	4.7 ohm			
R438	330 ohm			
R501	180k			

SEMICONDUCTORS - DIODES		
S D101	Diode - Bridge Rectifier	4H13031174
S D102	Diode - Bridge Rectifier	4H13031174
S D103	Diode - Bridge Rectifier	4H13031173
S D104	Diode - Bridge Rectifier	4H13031173
D105	Diode - Zener	4H13034167
D321	Diode - Zener (BM7513), (BM7523)	4H13034278
D321	Diode - Zener (7BM613), (7BM623)	4H13030861
D322	Diode - Silicon	4H13030847
D323	Diode - Silicone	4H13030621
D331	Diode - Zener	4H13034197
D401	Diode - Zener	4H13034398
D431	Diode - Silicon	4H13030847
D432	Diode - Zener	5H13031931
D441	Diode - Silicon	4H13030621
D501	Diode - Silicon	4H13030847
D502	Diode - Silicon	4H13030847
D511	Diode - Silicon	4H13030847
D512	Diode - Silicon	4H13030847
D513	Diode - Silicon	4H13030621
D521	Diode - Silicon	4H13031168
D522	Diode - Zener	4H13034499
D523	Diode - Silicon	5H13034979
D524	Diode - Silicon	4H13034189
D525	Diode - Silicon	4H13034189
D526	Diode - Silicon	4H13041487
D601	Diode - Zener	4H13034233

SEMICONDUCTORS - TRANSISTORS		
TS101	Transistor - NPN	4H13042239
TS102	Transistor - PNP	4H13044197

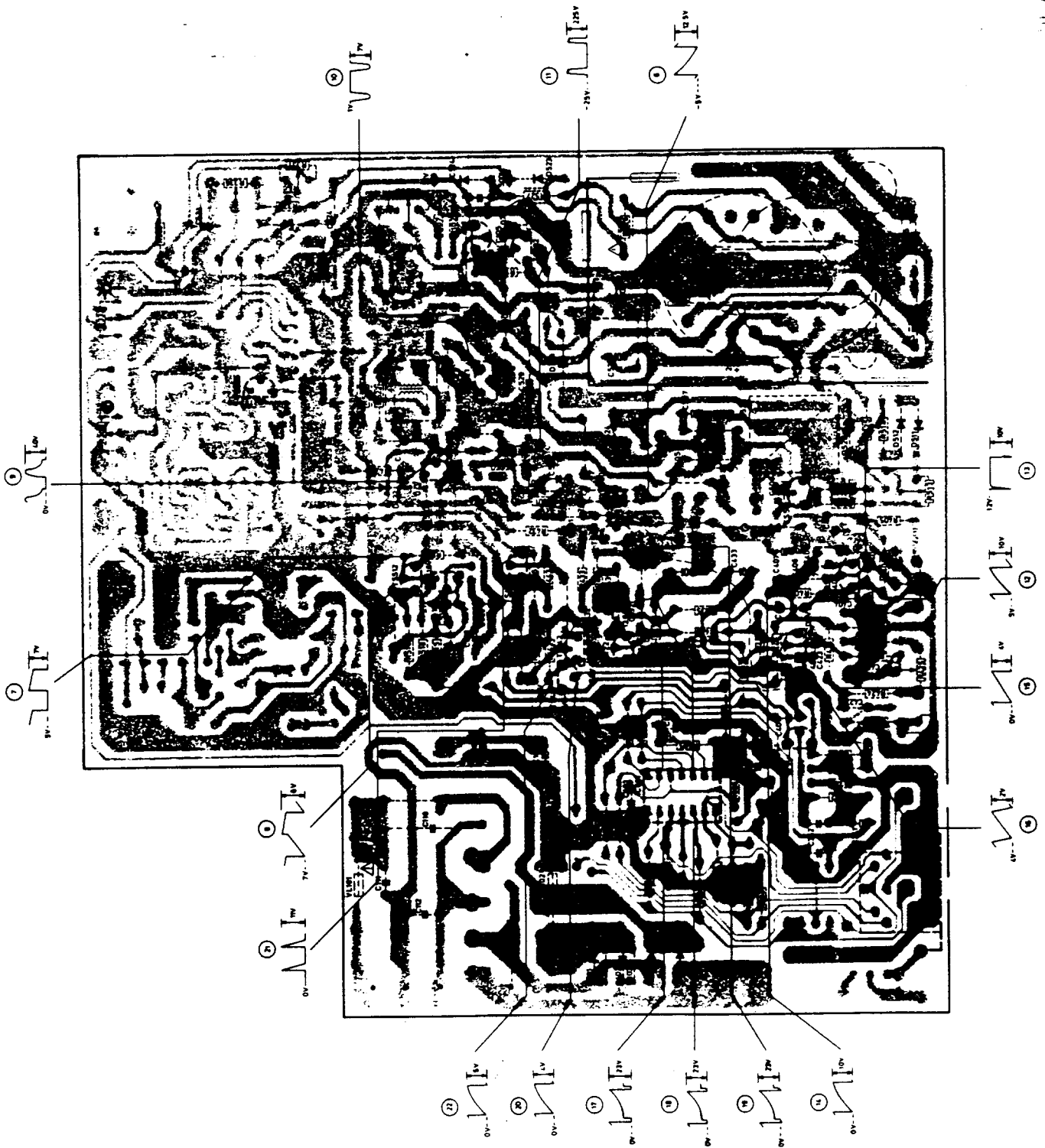
Commodore Part Numbers are not available at this time.

REPLACEMENT PARTS (Continued)

SEMICONDUCTORS - TRANSISTORS			RESISTORS (unless specified, all are 5%, 1/4W)		
TS103	Transistor - NPN	4H13044196	R321	1k (BM7513), (BM7523)	
TS305	Transistor - NPN	4H13044246	R321	820 ohm (7BM613), (7BM623)	
TS321	Transistor - NPN (BM7513), (BM7523)	BF422	R322	680 ohm	
TS321	Transistor - NPN (7BM613), (7BM623)	4H13041589	R323	1k	
TS322	Transistor - NPN	4H13044246	R324	47k	
TS341	Transistor - PNP	4H13044197	R325	18k	
TS401	Transistor - PNP	4H13044197	R326	2.2k	
TS402	Transistor - NPN	4H13044196	R327	1k	
TS421	Transistor - PNP	4H13044358	R329	330k	
TS422	Transistor - NPN	4H13044196	R330	120 ohm	
TS431	Transistor - NPN	5H13044349	R337	33k	4H11150482
TS432	Transistor - PNP	4H13044283	R338	33k	4H11150482
TS441	Transistor - NPN	4H13044196	SEMICONDUCTORS - DIODES		
TS442	Transistor - NPN	4H13044196	D321	Diode - Zener (BM7513), (BM7523)	4H13034278
TS443	Transistor - PNP	4H13044197	D321	Diode - Zener (7BM613), (7BM623)	4H13030861
TS501	Transistor - PNP	4H13044358	D322	Diode - Silicon	4H13030847
TS511	Transistor - PNP	4H13044197	D323	Diode - Silicon	4H13030621
TS512	Transistor - PNP	4H13044197	SEMICONDUCTORS - TRANSISTORS		
TS513	Transistor - PNP	4H13041041	TS321	Transistor - NPN (BM7513), (BM7523)	BF422
TS521	Transistor - NPN	4H13042241	TS321	Transistor - NPN (7BM613), (7BM623)	4H13041589
SEMICONDUCTORS - INTEGRATED CIRCUITS			TS322	Transistor - NPN	4H13044246
IC601		5H20984997	LED BOARD		
MISCELLANEOUS			D106	Diode - LED/Green (7BM613), (BM7513)	4H13042242
S	CRT - Amber (7BM623), (BM7523)	M31344LAPD	D106	Diode - LED/Amber (7BM623), (BM7523)	4H13032341
S	CRT - Green (7BM613), (BM7513)	M31344GRPD	CABINET PARTS		
S	CRT - Socket	4H25570189	Block Retainer f/AC Power Cord		
S U102	Deflection Yoke	4H15010188	Cabinet (7BM613)		
S VL101	Fuse - .5A, 250V (7BM613), (7BM623)	4H25361006	Cabinet (7BM623)		
S VL101	Fuse - .5A, 250V (BM7513), (BM7523)	4H25310059	Cabinet (BM7513)		
S VL102	Fuse - 2A, 250V	4H25310045	Cabinet (BM7523)		
S	Fuse - Thermal	4H25220007	Adjusting Spindle f/Vert. Hold		
	Socket - Jack	4H26720241	Horiz. Width & Vert. Size		
	Plug - Micro - Connector (BM7513), (BM7523)	4H26520235	(3 used)		
	Din Plug (7BM613), (7BM623)	4H26440026	Adjusting Spindle - Horiz. Phase		
S SK1	Power Switch - On/Off	4H27011161	Knob - Volume, Contrast, Brightness		
CAPACITORS (unless specified, all are ceramic, 50V)			(3 used)		
C321	22nF., 63V		Knob - Push Button (7BM613), (7BM623)		
C322	100nF., 100V		Knobs (2 used) (7BM613), (7BM623)		
C323	100nF., 100V	4H12421678	Foot f/Cabinet (7BM613), (7BM623)		
C331	100nF., 500V		Foot f/Cabinet (BM7513), (BM7523)		
			AC Power Supply Cord		
			Owner's Manual (BM7513), (BM7523)		
			Owner's Manual (7BM613), (7BM623)		

Commodore Part Numbers are not available at this time.

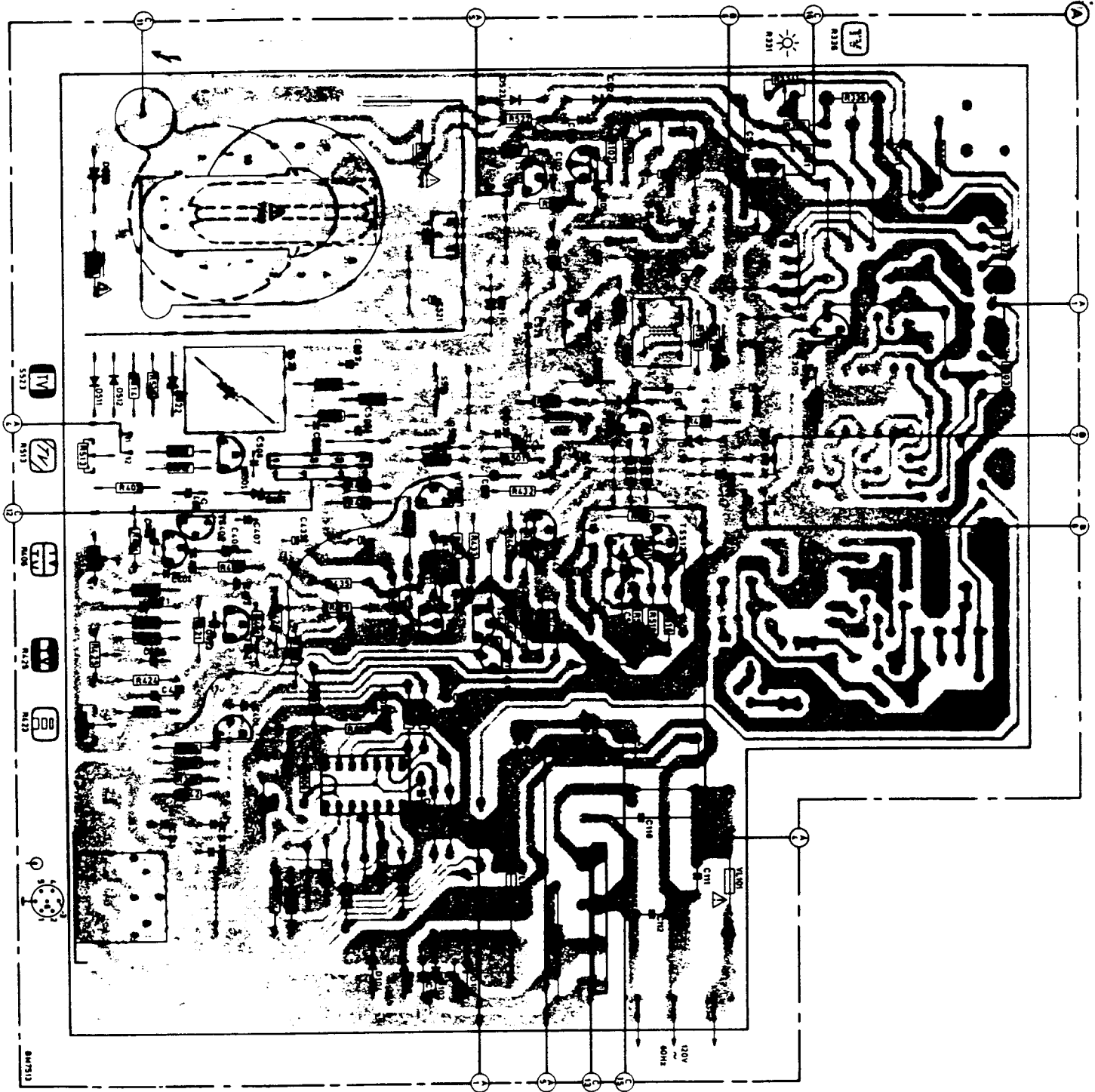
MAIN PANEL ASSEMBLY



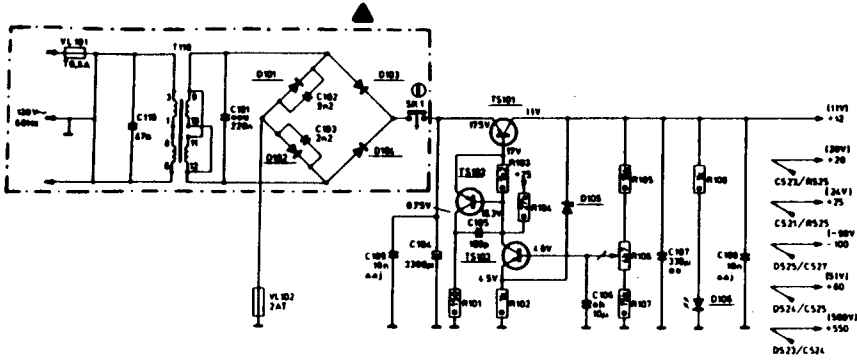
Bottom View

Note: See page 6 for waveforms corresponding to respective waveform numbers.

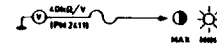
MAIN PANEL ASSEMBLY



Top View

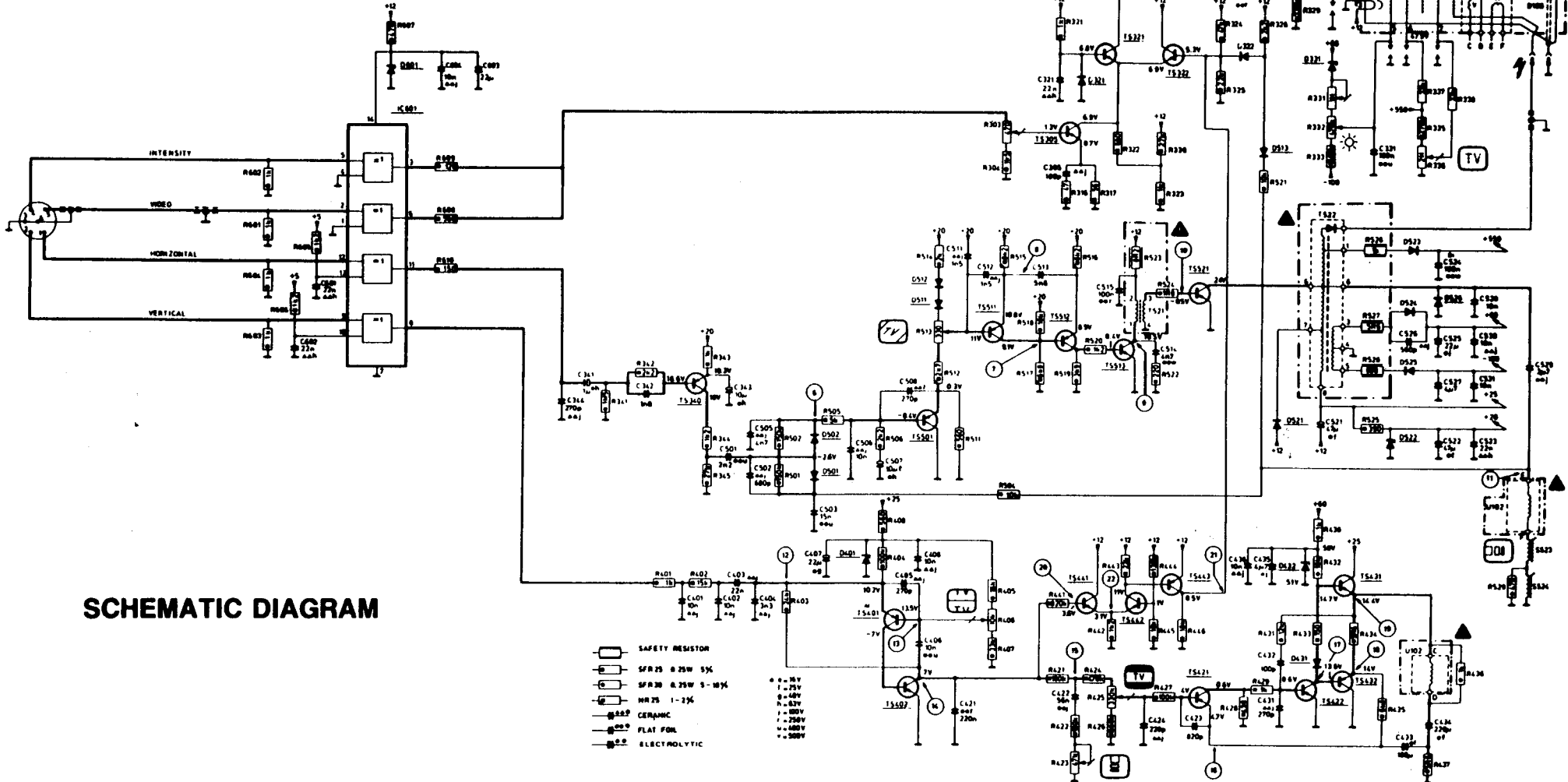
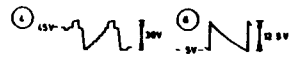


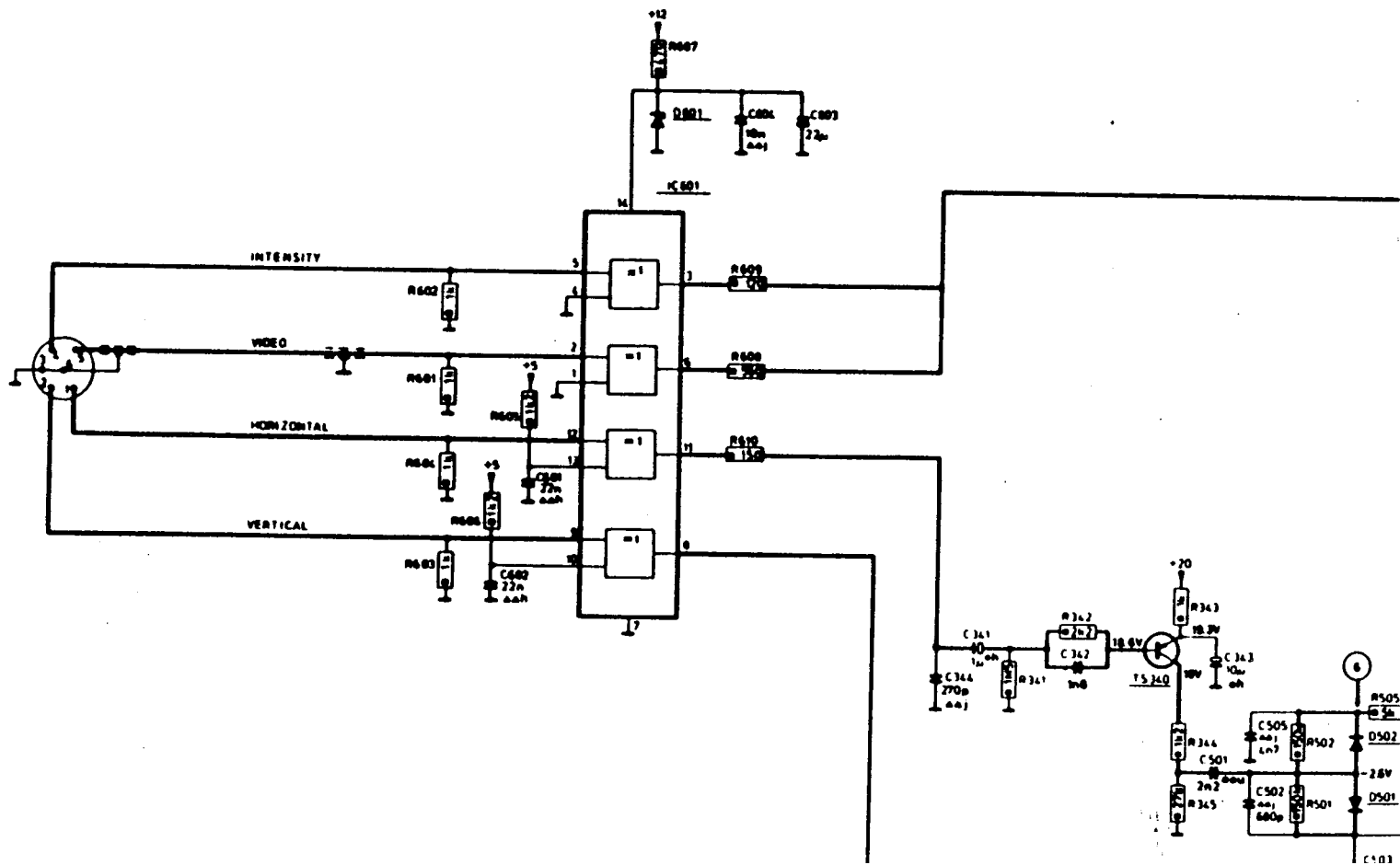
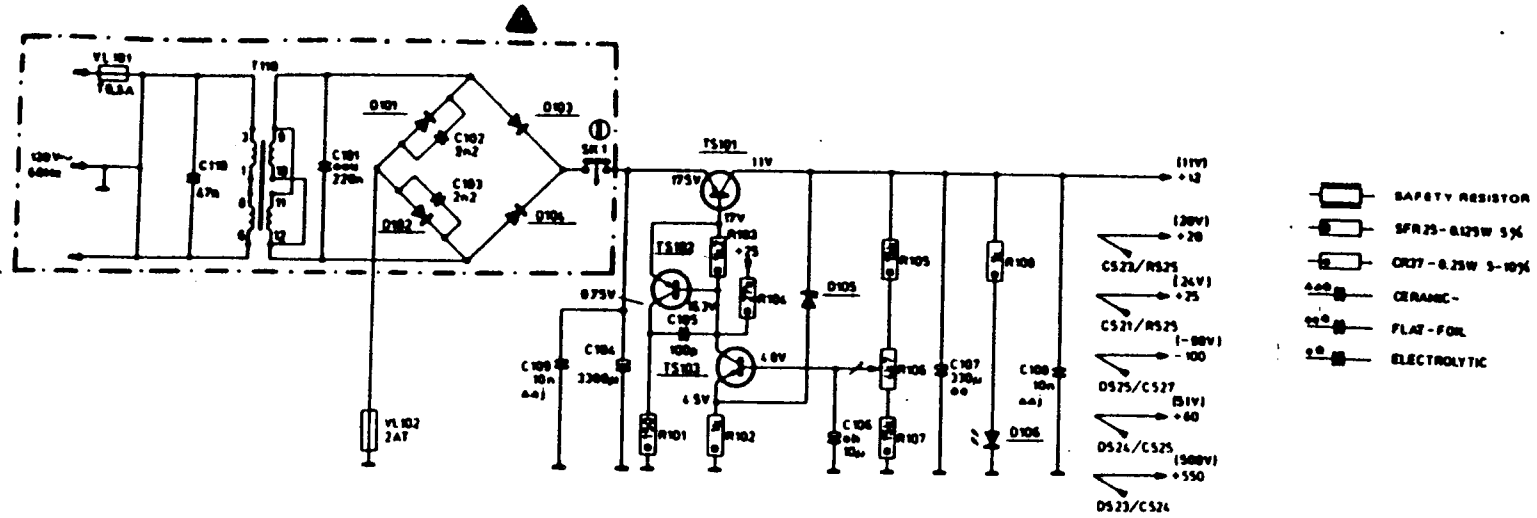
- SAFETY RESISTOR
- SFR25-0.25W 5%
- CR27-0.25W 5-10%
- CERAMIC
- FLAT-FOL
- ELECTROLYTIC



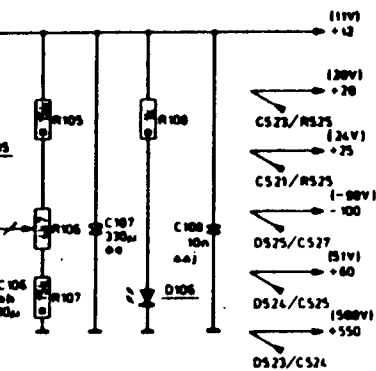
- 0V
 - 25V
 - 50V
 - 100V
 - 250V
 - 500V
- AC
- DC

OSCILLOGRAMS (IMP5501)
GENERATOR ON GREY SCALE AND
VIDEO OUTPUT ADJUST ON 0.4Vpp



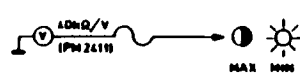


1901 SERVICE MANUAL



- (11V) +12
- (30V) +20
- (24V) +25
- (-80V) -100
- (51V) +60
- (524/CS25) +550
- (523/CS24)

- SAFETY RESISTOR
- SFR25-0.125W 5%
- CR27-0.25W 5-10%
- CERAMIC-
- FLAT-FOIL
- ELECTROLYTIC



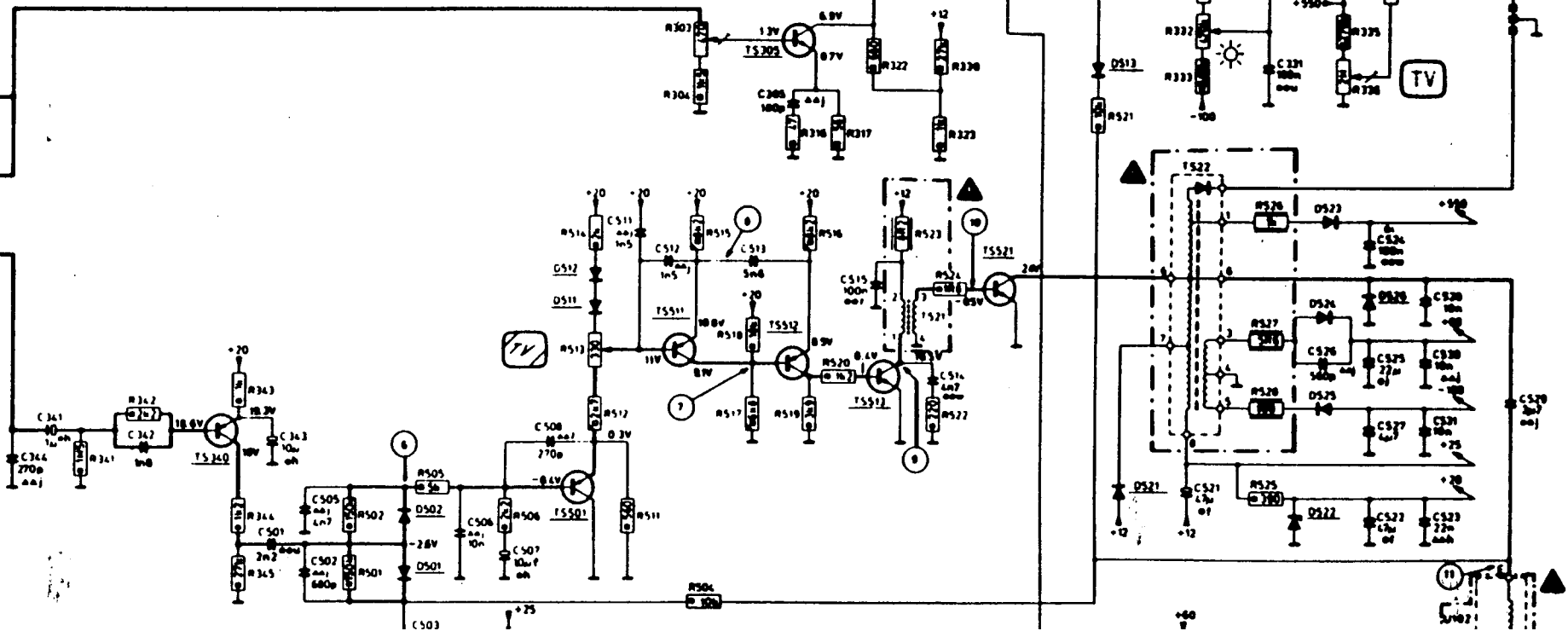
- 0 16V
- 1 25V
- 2 63V
- 3 100V
- 4 250V
- 5 600V

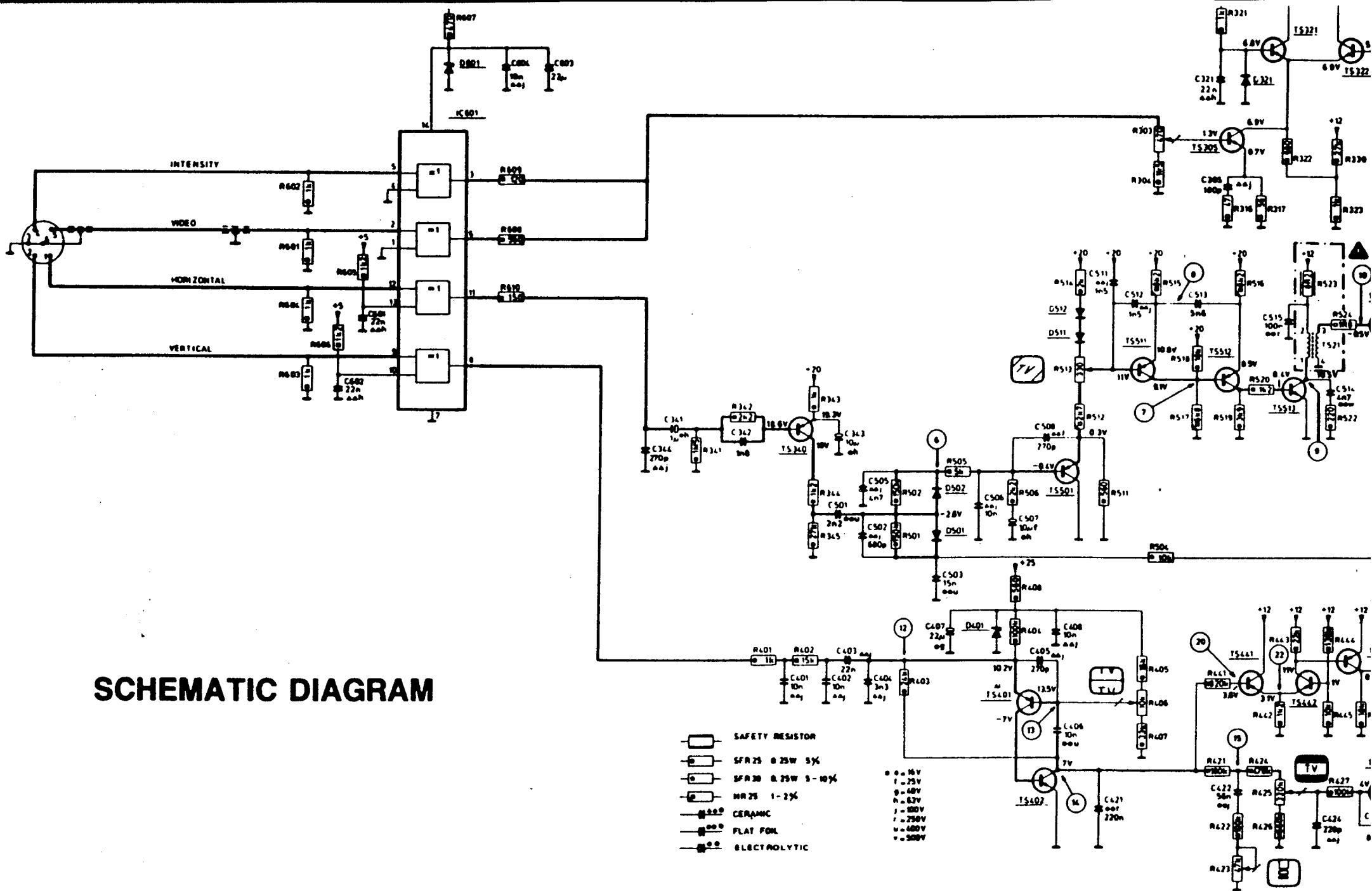
AC

DC

OSCILLOGRAMS (PM5519)
GENERATOR ON GREY SCALE AND
VIDEO OUTPUT ADJUST ON 0.4Vpp

MAX MAX

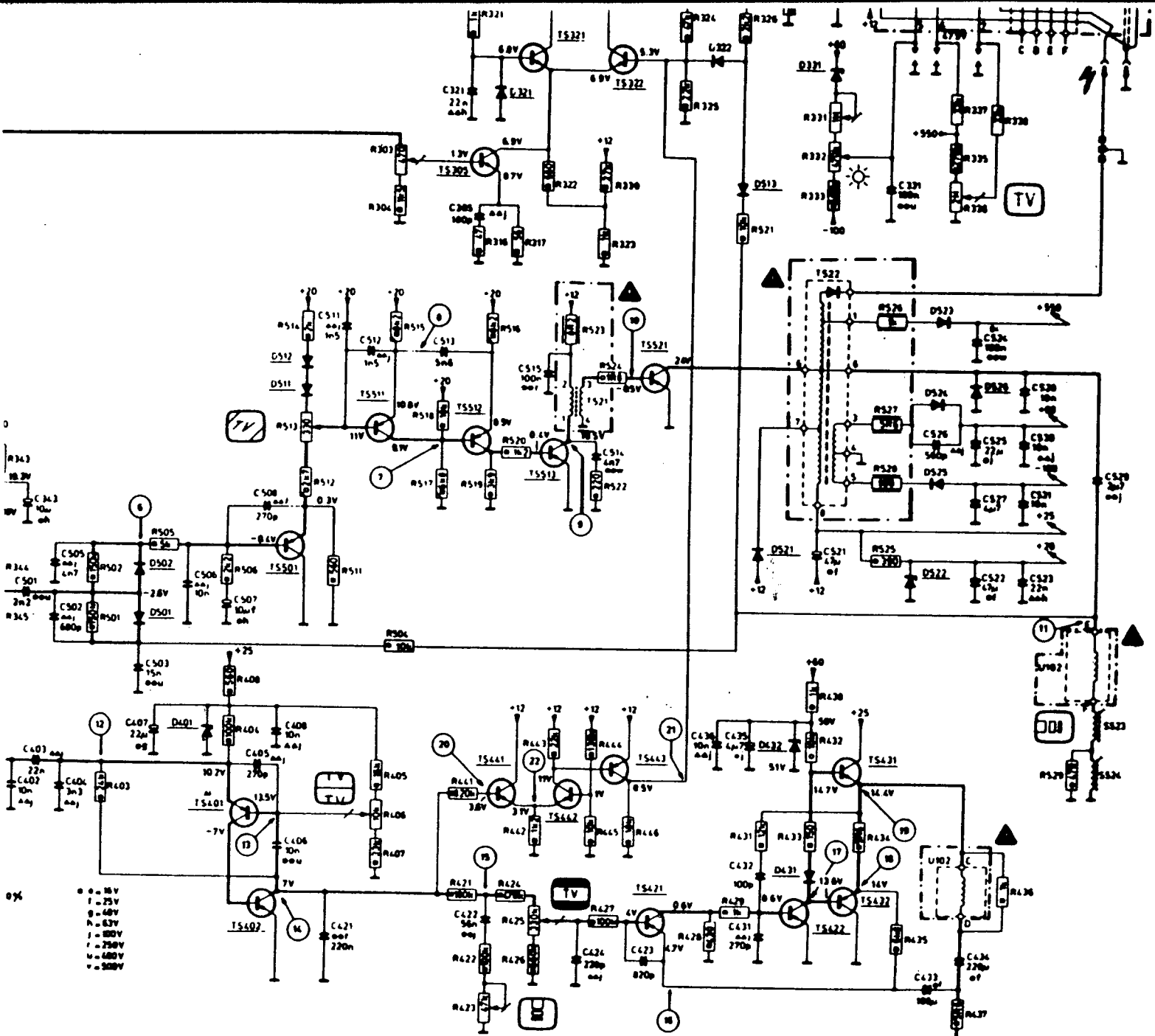


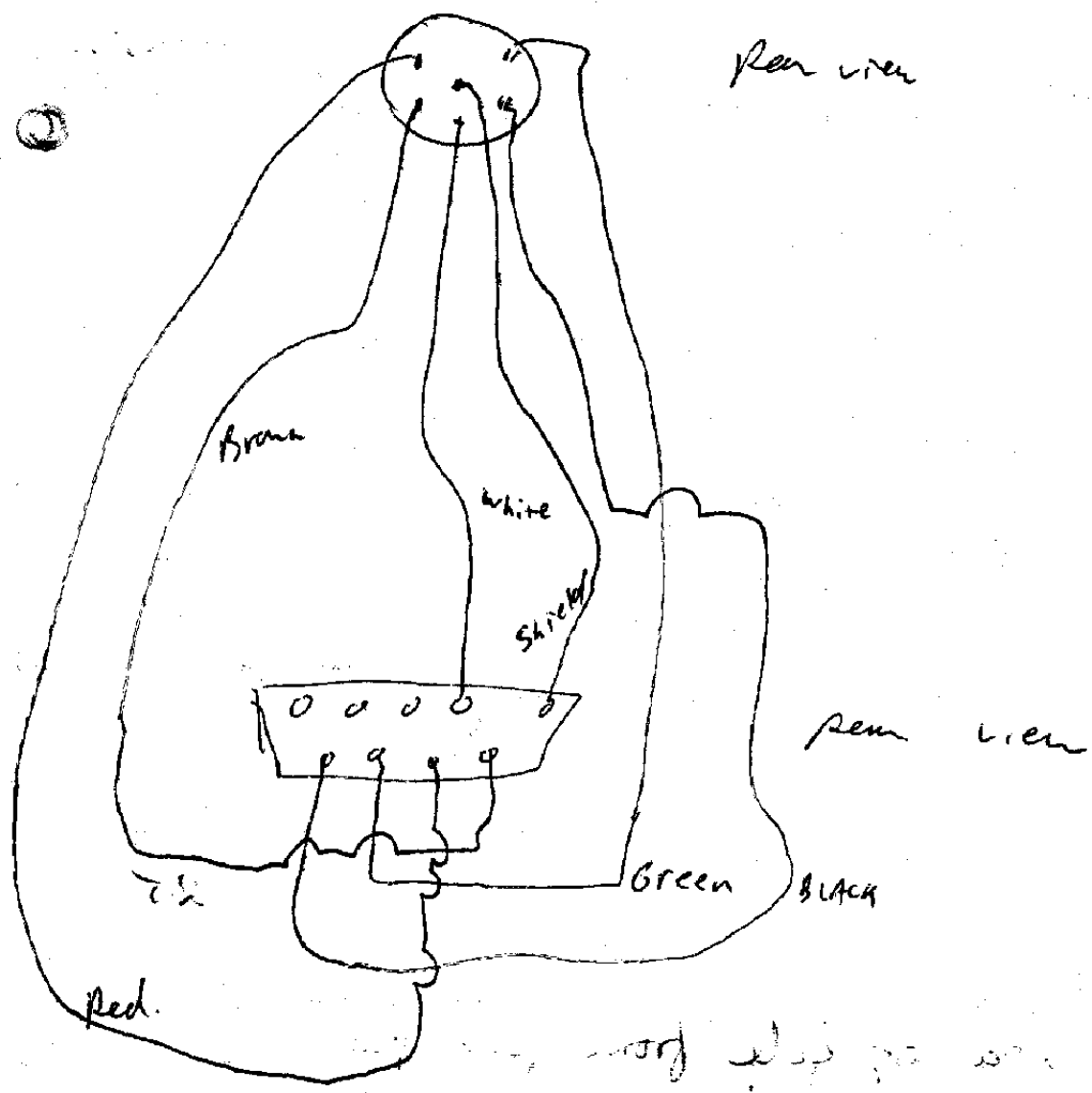


SCHEMATIC DIAGRAM

- SAFETY RESISTOR
- SFR 25 0.25W 5%
- SFR 20 0.25W 1-10%
- MR 25 1-2%
- CERAMIC
- FLAT FOIL
- ELECTROLYTIC

- = 16V
- 1 = 25V
- 9 = 40V
- h = 67V
- 1 = 100V
- 1 = 250V
- u = 400V
- v = 500V





... of ...
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 ...

Commodore 1901 - 1084

75BM13
 Pro

Cable connections
 ...