

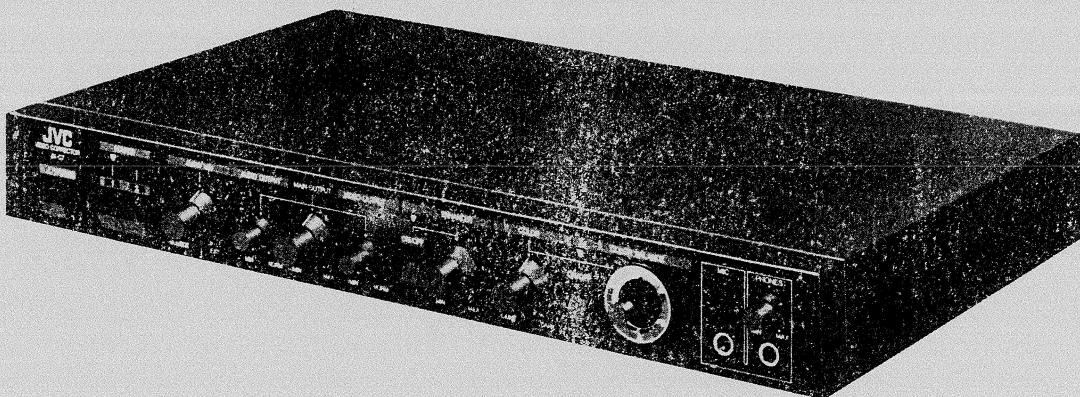
JVC

SERVICE MANUAL

VIDEO COLOR CORRECTOR

MODEL **JX-C7**

PAL



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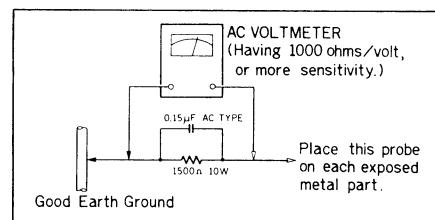
Safety Precautions

- 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.
- Alterations of the design or circuitry of the product 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.
- Many electrical and mechanical parts in the product 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 in Service manual may create shock, fire, or other hazards.
- The leads in the products are routed and dressed with ties, clamps, tubings, barriers and/or the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard.
- When service is required, the original lead routing and dress should be observed, and they should be confirmed to be returned to normal, after re-assembling.

1. Features

- Color density and tint can easily be adjusted using the incorporated color corrector circuit.
- Enhancer circuit with noise filter switch to compensate for the deterioration of the picture on dubbing.
- Picture and sound can be faded in and out.
- 2-pairs of input/output lines facilitate dubbing.
- All audio circuits accept stereo signals for Hi-Fi VCRs.
- Separate external and microphone input terminals enable mixing or over-dubbing.
- Headphone jack is provided for monitoring the sound.

- Leakage current check**
(Safety for electrical shock hazard)
After re-assembling the product, always perform an isolation check on the exposed metal parts of the Products (antenna terminals, knobs, metal cabinet, screw heads, earphone jack, control shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.
Do not use a line isolation transformer during this check.
 - Plug the AC line cord directly into the AC outlet. 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 0.5 mA AC (r.m.s.).
 - Alternate check method
Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1500 Ω 10 W resistor paralleled by a 0.15 μF 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 0.75 V AC (r.m.s.). This corresponds to 0.5 mA AC (r.m.s.).

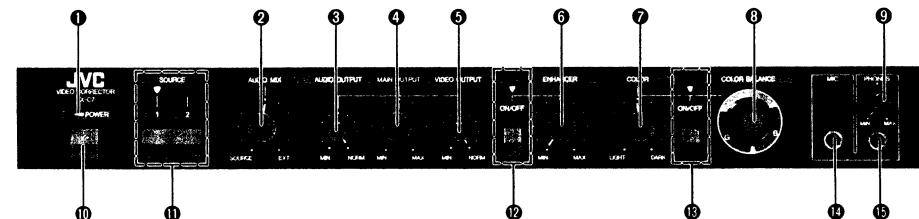


2. Specifications

Video signal format	: Conforming to PAL format	Audio crosstalk	: 60 dB or more (1 kHz)
Video input	: 2 lines	Microphone jack	: 6.3 mm dia. monaural phone jack
Reference signal level	: 1 Vp-p	Microphone input sensitivity	: -65 dBV (approx. 0.56 mV) with ALC (Automatic Level Control)
Impedance	: 75 ohms, unbalanced	Headphones jack	: 6.3 mm dia. stereo phone jack
Video output	: 2 lines	Optimum load impedance	: 32 ohms
Optimum load impedance	: 75 ohms, unbalanced	Power source	: AC 220 V, 50 Hz (E), (EB) AC 240 V, 50 Hz (EK)
Crosstalk	: 45 dB or more (4.43 MHz)	Power consumption	: 14 W (power on), 1 W (power off)
Signal-to-noise ratio	: 45 dB or more	Dimensions (W x H x D)	: 435 x 56 x 275 mm
Audio input	: 3 lines (stereo)	Weight	: 3.0 kg
Impedance	: 47 kohms	Design and specifications subject to change without notice.	
Reference level	: -10 dBV (VCR-1, VCR-2) -15 dBV (EXT)		
Audio output	: 2 lines (stereo)		
Reference level	: -10 dBV		
Impedance	: 1 kohm		
Audio frequency response	: 20 – 20,000 Hz ±2dB (VCR-1, VCR-2)		
Audio dynamic range	: 100 dB (VCR-1, VCR-2)		

3. Names of Parts and Their Functions

Front panel



① POWER indicator

This indicator lights when the POWER button is pressed.

② AUDIO MIX adjustment knob

Adjust the balance of mixing level between the sound from the selected source (VCR-1 or VCR-2) and the sound from the equipment connected to rear panel EXT (audio) input terminals (or microphone) with this knob. In this case, both L and R channel signals from the SOURCE and EXT inputs will be adjusted simultaneously.

③ VIDEO OUTPUT adjustment knob

Audio output of the signal controlled by the AUDIO MIX knob can be adjusted to the appropriate level with this knob. And fade-in or fade-out of audio signal is also possible with this knob. Usually set to NORM position.

④ MAIN OUTPUT adjustment knob

The audio and video output level from this unit can be adjusted with this knob. And the fade-in or fade-out of master level is also possible. When the picture is too dark, turn this knob clockwise to get a brighter picture. Usually set to center click position.

⑤ VIDEO OUTPUT adjustment knob

The output level of the video signal selected by the SOURCE button can be adjusted with this knob. And fade-in or fade-out of the video signal is also possible with this. Usually set to NORM position.

⑥ ENHANCER adjustment knob

Correct the detail of a video image with this knob to reduce signal loss on dubbing. This circuit effects the signals output from both MONITOR output and REC output terminals on the rear panel.

4. Main Parts Locations

⑦ COLOR adjustment knob

Adjust the color intensity of video image with this knob. Turn clockwise to increase the color intensity and counterclockwise to decrease it. Usually set it to the center click position.

⑧ COLOR BALANCE adjustment knob

Correct poor color balance (tint) with this knob. While watching the monitor screen, make adjustments until the purest white is achieved.

⑨ Headphones level adjustment knob

Adjust the headphone volume level when monitoring with headphones.

⑩ POWER button

Press this button to turn the power on or off.

⑪ SOURCE select buttons and indicators

Press to select the source from VCR-1 or VCR-2 when dubbing or monitoring. They correspond to the equipment connected to the rear panel terminals; selected source indicator lights.

⑫ ENHANCER ON/OFF button and indicator

Press this button to activate the enhancer circuit; the indicator lights. To release this function, press it again; the indicator goes off.

⑬ COLOR and COLOR BALANCE ON/OFF button and indicator

Press to activate the color intensity and tint (white balance) adjustments. When this button is pressed, the indicator lights.

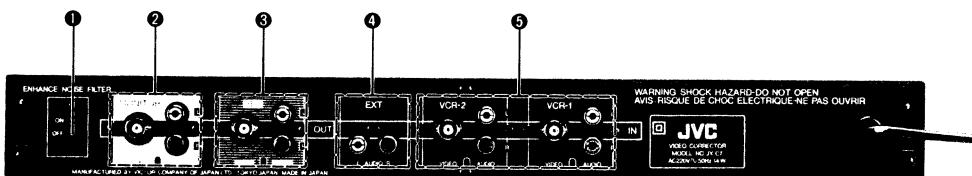
⑭ MIC (microphone) jack

Connect the microphone to this jack when over-dubbing or mixing. In this case, the EXT input signal is switched off automatically.

⑮ PHONES (headphones) jack

Headphones can be connected to this jack to monitor the sound output from the MONITOR output or REC output terminals.

Rear panel



① ENHANCE NOISE FILTER switch

Set this switch to ON to reduce the noise level which is increased on the dark image when the enhancer circuit is activated.

② MONITOR output terminals

Connect the monitor TV to these terminals. These are also connected to the input terminals of the VCR.

③ REC output terminals

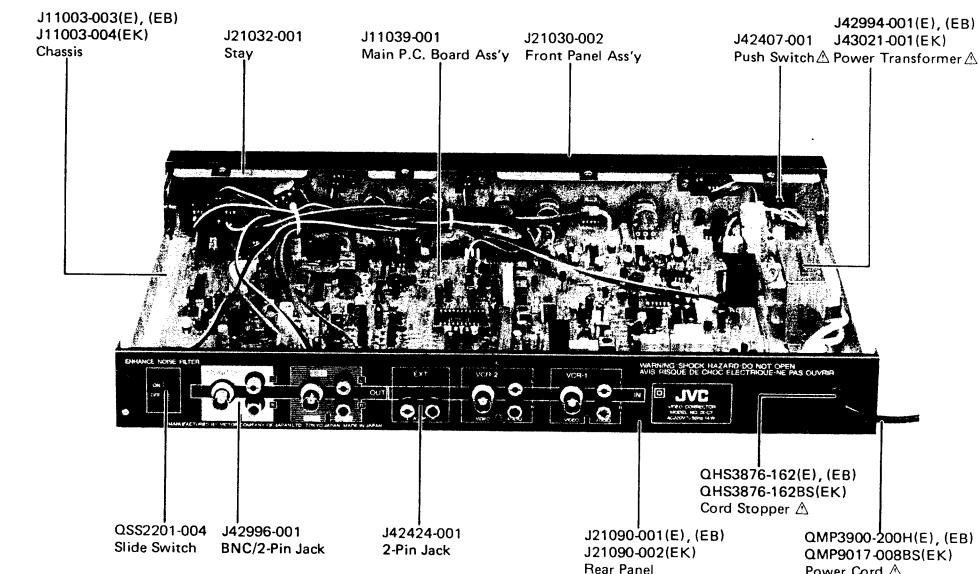
Connect the input terminals of the VCR to these terminals to dub from this unit.

④ EXT input terminals

Connect audio equipment to these terminals to mix or edit with the external sound source. When a microphone is inserted into MIC jack on the front panel, the signal input from these terminals is switched off automatically.

⑤ VCR-1 and VCR-2 input terminals

Connect the output terminals of VCRs to these terminals to be selected by the SOURCE select buttons on the front panel.



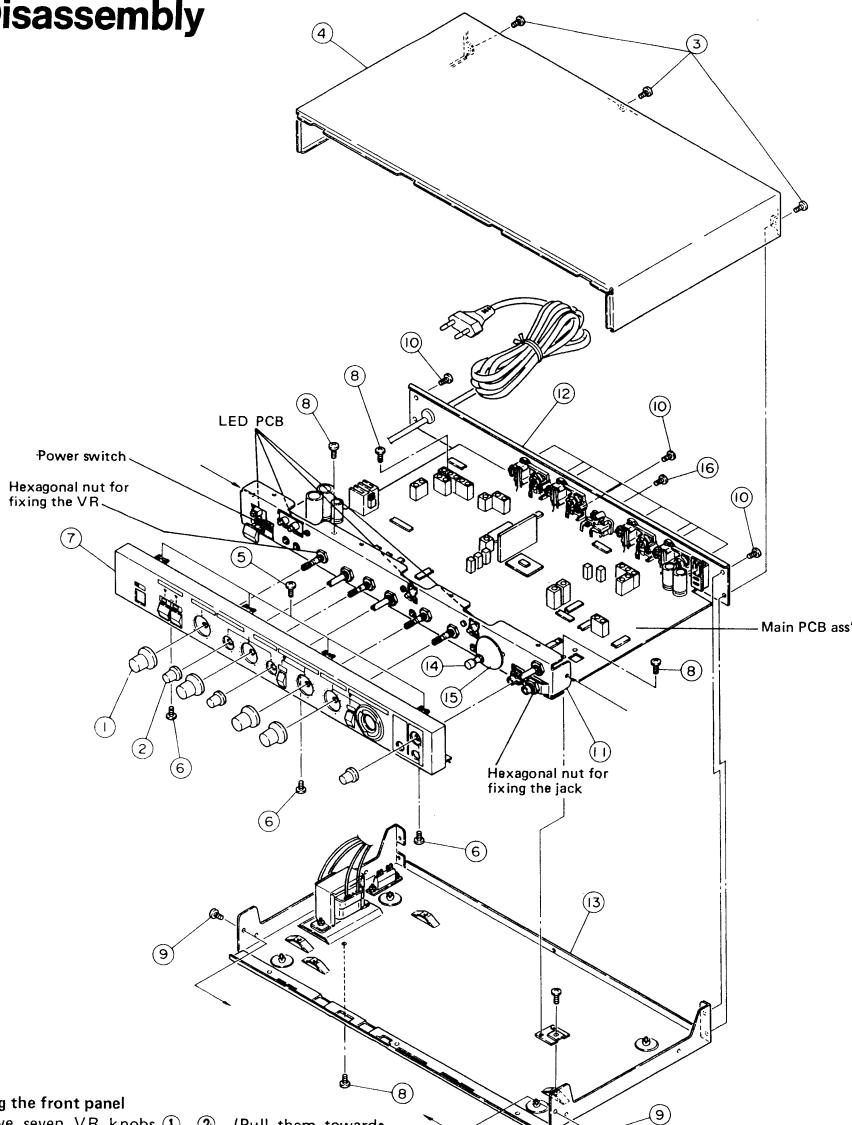
The Marks for Designated Areas

(EK) U.K.

(EB) Norway, Sweden, Finland, Denmark, Switzerland

(E) Europe (other countries)

5. Disassembly



Removing the front panel

1. Remove seven VR knobs (1, 2). (Pull them towards you.)
2. Remove three tapping screws (3) and remove the top cover (4).
3. Remove four (5) and three (6) tapping screws.
4. Remove front panel (7) by pulling it towards you.

Removing the main PCB ass'y

(This operation should be performed after the work in the previous section is finished.)

1. Remove five screws (8) fixing the main PCB ass'y, two stay fixing screws (9) and three screws (10) fixing

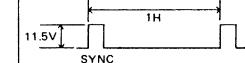
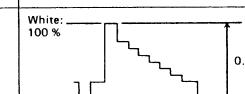
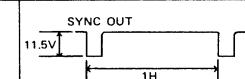
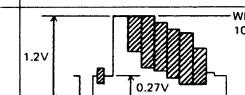
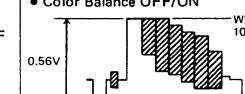
the rear panel. Then the main PCB ass'y with stay (11) and rear panel (12) can be removed from chassis (13).

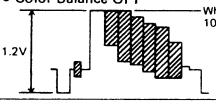
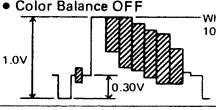
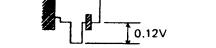
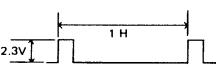
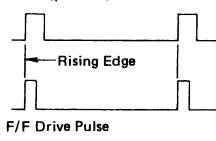
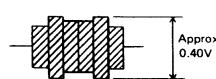
2. Remove the hexagonal nuts retaining each VR and jack and remove the LED PC boards, power switch, stick knob (14) and cap (15), and stay (11) can be removed.
3. Remove nine screws (16) holding the pin jacks, and rear panel (12) can be removed.

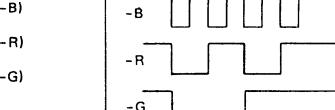
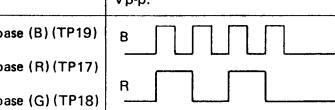
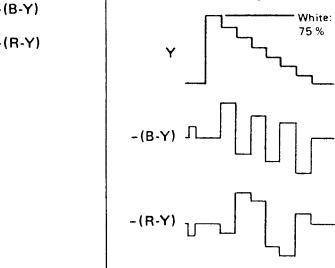
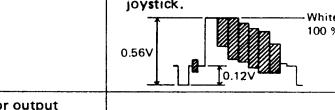
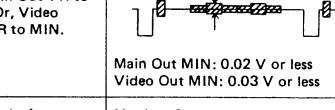
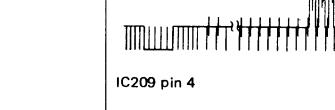
6. Troubleshooting

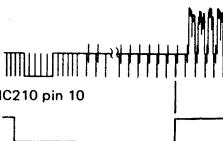
Video Circuit

- Notes: 1. The waveform is the output waveform when the full-field color bar is input.
 2. NO: When the normal voltage and waveform are not present.
 YES: Normal

Symptom	Check point	Normal voltage and waveform	Defective point/Adjustment point
1. No picture and sound.	① Pin on the secondary side of power transformer.	• AC 16.5 V	NO: Power cord or power transformer is short-circuited. YES: Check ②.
	② IC9 in/out pins	• IN side: DC 17.0 V • OUT side: DC 12.0 V	NO: Check the rectifier circuit or vicinity of power switch, or IC9 is defective. YES: Check ③.
	③ IC201 pin 14	• DC 12.0 V	NO: Check pattern to IC201. YES: Check ④.
	④ IC201 pins 5, 13	• When input-1 is ON (S3), pin 13 is DC11.5 V. • When input-2 is ON (S2), pin 5 is DC11.5 V.	NO: Check ⑤. (LED is not lit.) YES: Check Q201, Q202 and the vicinity of input terminals. Or, IC201 is defective.
	⑤ IC214 pins 10, 11	• When input-1 is ON (S3), pin 10 is DC11.5 V. • When input-2 is ON (S2), pin 11 is DC11.8 V.	NO: Check S2, S3 and the parts associated with IC214 input. YES: Check the pattern from IC214 pins 10, 11 to IC201 pins 5, 13.
	⑥ IC209 pin 12		NO: Check ②. YES: Check "Adjustment Procedure" (page 12) item 1, and check ④.
2. Only the picture is not present.	② IC202 pin 16		NO: Check each voltage and waveform of Q204, DLT601, Q210 – 216 and 224. YES: Check ③.
	③ IC202 pin 3		NO: IC202 is defective, or check pattern from IC202 pin 3 to R300, IC602 pin 5. YES: Check the pattern to IC212 pins 5 – 6 and to IC209 pin 12.
	④ Q223 emitter		NO: Check "Adjustment Procedure" (page 14) item 3 – ①, and check DL5 to IC205 pin 5. Check the pulse of BFP, BL. YES: Check ⑤.
	⑤ IC202 pin 15 (TP6)	• Same waveform as ④ when Color Balance is OFF. • Same waveform as ② when Color Balance is ON	NO: Check the vicinity of IC201 pin 6 (H when OFF), pin 12 (H when ON) and Q225. YES: Check ⑥.
	⑥ Q262 emitter	• Color Balance OFF/ON 	NO: Check the vicinity of IC211 pin 5 (H when OFF), pin 6 (H when ON) and Q262. YES: Check ⑦.
		(When the white balance is misadjusted, the waveform is different from above.)	* If no video output only when Color Balance is ON, check item 4. (page 8).

Symptom	Check point	Normal voltage and waveform	Defective point/Adjustment point
	⑦ Q266 emitter	● Color Balance OFF  White: 100 %	NO: Check "Adjustment Procedure" item 3 – ①, ②, and check the vicinity of IC206 pin 5 (input) and pin 7 (output). Check each voltage of the fader circuit Q269 - 271. YES: Check ⑧.
	⑧ Monitor Output terminals	● Color Balance OFF  White: 100 %	NO: Check the vicinity of IC207, Q267 and 268. Check the output terminals. (Loaded 75 ohms)
3. Synchronizing is incorrect.	① Re-adjust according to "Adjustment Procedure" item ① .	● Refer to the waveforms and voltages in each item on "Adjustment Procedure".	NO: Check the parts in the vicinity of IC209, 210. Or check the pattern. YES: Check ② .
	② Re-adjust according to "Adjustment Procedure" item 3 – ① .	● Refer to the waveforms and voltages in each item on "Adjustment Procedure". (Defective only when Color Balance is OFF.)	NO: Check the BL operation (IC206 pin 2) and clamping operation (Q220). Check each voltage. YES: Check ③ .
	③ Re-adjust according to "Adjustment Procedure" item 5 – ⑥ .	● Refer to the waveforms and voltages in each item on "Adjustment Procedure". (Defective only when Color Balance is ON.)	NO: Check the voltages at IC208 pins 11 and 13. Check VR413 and 416. (Defective only when Color Balance is ON.) YES: Check ④ .
	④ Q260 emitter	● Color Balance ON  (Defective only when Color Balance is ON.)	NO: Check that the sync signal is present at IC212 pins 3, 4. YES: Check ⑤ .
	⑤ Re-adjust according to "Adjustment Procedure" item 3 – ② .	● Refer to the waveform and voltage on "Adjustment Procedure".	NO: Check the BL operation by IC206 (pin 2) and clamping operation (Q263), and check the voltage at each point.
4. No color or abnormal color when the Color Balance switch is ON.	① IC601 pin 8		NO: Check the pattern from IC202 pin 4 to IC601 pin 8. YES: Check ② .
	② IC601 pin 18	SYNC (positive)  Trigger with H sync pulse.	NO: Check "Adjustment Procedure" item 1 – ⑤ ~ ⑦ . Check the vicinity of IC602, 603 and 604. YES: Check ③ .
	③ IC601 pin 2	● Approx. DC 5.0 V (Set the Color VR to center.)	NO: Check the Color VR (R305) and the pattern to IC601 pin 2. YES: Check ④ .
	④ IC601 pin 24 (TP9)	 Approx. 0.40V	NO: Check that approx. 0.24 Vp-p chroma signal is input to IC601 pin 29. Check "Adjustment Procedure" item 2 – ① , ② . YES: Check ⑤ .

Symptom	Check point	Normal voltage and waveform	Defective point/Adjustment point
	⑤ C253 (-B) C254 (-R) C255 (-G)	 The amplitude of each signal is 0.25 Vp-p.	NO: Check "adjustment Procedure" item 2 – ③ to ⑧ . Check each voltage and waveform of IC601. Check each voltage and waveform of Q233 – 241. YES: Check ⑥ .
	⑥ Q245 base (B) (TP19) Q244 base (R) (TP17) Q243 base (G) (TP18)	 (Or, jumper wires of each R, G and B indication.) Note: Set the color Balance joystick to center. The amplitude of each signal is 0.80 Vp-p.	NO: Check "Adjustment Procedure" item 5 – ① . Check each voltage of IC204. Check wires, etc. from the joystick control VR (R362) to IC204. YES: Check ⑦ .
	⑦ C269 (Y) C271 -(B-Y) C272 -(R-Y)	 ● When white balance is corrected with Color Balance joystick.	NO: Check each voltage and waveform of Q243 – 258. Re-adjust "Adjustment Procedure" item 5 . YES: Check each voltage and waveform of Q602 – 604, IC605. Check pattern in the vicinity of DL9, DL10. Check ⑧ .
	⑧ Q260 emitter	 ● When the white balance is corrected with the Color Balance joystick.	NO: Check each voltage and waveform of IC208, Q260, 261. Check input/output waveforms of BPF (T7).
5. Picture remains even when faded out.	① Monitor output Set Main Out VR to MIN. Or, Video Out VR to MIN.	 Main Out MIN: 0.02 V or less Video Out MIN: 0.03 V or less	NO: Check "Adjustment Procedure" item 3 again. Check each voltage and waveform of IC206. Check each voltage and waveform of Q269 – 271, Main-Out VR (R466) and Video Out VR (R286).
6. Picture remains at the upper screen or left and right ends of the screen when faded out.	① IC209 pin 4 (Picture remains in the upper screen.)	 Monitor Out IC209 pin 4 Trigger with V sync.	NO: Check the vicinity of Q272, R467, 468 and C299. YES: Check ② .

Symptom	Check point	Normal voltage and waveform	Defective point/Adjustment point
	② IC210 pin 10 (TP1)		NO: Check the output of IC209 pin 7 to IC210 pin 13. Check "Adjustment Procedure" item 1 - ③, ④ again.
	③ IC210 pin 10 (TP1)		NO: Check waveform in the vicinity of IC209, 210. Check "Adjustment Procedure" item 1 - ③, ④ again.
7. Synchronizing is incorrect when activated.	① Q218 emitter (TP5)		NO: Check "Adjustment Procedure" item 4. Check each voltage and waveform of Q214 - 218.
8. Enhancer function is abnormal.	① IC213 pin 1	• Enhancer ON: DC11.5 V	NO: Check the vicinity of Enhancer switch (S4) and IC213. YES: Check ②.
	② IC202 pin 13	• When varied with Enhancer VR with Enhancer switch ON. DC1.4V - 4.7V	NO: Check the vicinity of Enhancer VR (R493), and Q605. Check that the edge signal (the waveform in item 7 - ① above.) is input to IC202 pin 12.

Audio Circuit

Notes:

- Concerning part numbers, if IC4 is for the left channel, for example, IC104 is for the right channel.
- The input level is a -10 dBV sine wave if not specified.

Symptom	Check point	Normal voltage and waveform	Defective point/Adjusting point
1. No output • Input (Source) 1 or 2	① IC1 pin 7 (input-1), pin (input-2)	AC -10 dBV (approx. 0.32 V)	NO → Check input terminals, voltage at IC4 (IC104 for the right) vicinal circuit. YES → Check ②.
	② Q1 emitter	AC -10 dBV (approx. 9.29 V)	NO → Check the operation of IC2 (analog switch). YES → Check ③.
	③ IC3 pin 1	AC -9 dBV (approx. 0.35 V)	NO → Check the voltage at IC3 and peripheral circuit, and Audio Mix VR, and shield wire (W195). YES → Check ④.
	④ IC3 pin 7	AC -10 dBV (approx. 0.32 V)	NO → Check the Main output and Audio output VR. Check the shielded wires (W196, 199). Check Q3, 4 used for the muting. Note: Muting is performed for 2 - 4, seconds from when Power is turned on and Q3's base becomes approx. 11.5 V. YES → Check ⑤.
	⑤ Monitor output	AC -10 dBV ± 3 dB (approx. 0.32 V ± 3 dB)	NO → Check the patterns to the output terminals.

Symptom	Check point	Normal voltage and waveform	Defective point/Adjusting point
2. No headphone output. (The monitor output is normal.)	① IC8 pins 3, 4 (right) pins 11, 12 (left)	AC -19 dBV (approx. 0.11 V) at the headphones volume in MAX	NO → Check the flat cable (FJ10, 12). check the operation of the headphone volume R37. YES → Check ②.
	② IC8 pin 6 (R) pin 9 (L)	AC +5.5 dBV (approx. 1.9 V) at the headphone volume in MAX	NO → Check the voltages at IC8 and parts associated with it. YES → Check ③.
	③ Headphone terminal Load impedance of 32 ohms	AC -2.0 dBV (approx. 0.8 V)	NO → Check between IC8 pins 6, 9 and the headphone terminal. Check flat cable (FJ11) and the headphone terminal.
3. No output from the external input terminal.	① IC6 pin 7 (L) pin 1 (R)	AC -10 dBV (approx. 0.32 V)	NO → Check the voltage at IC6 and its associated circuit. YES → Check ②.
	② Q5 (L), Q105 (R) emitter	AC -11 dBV (approx. 0.29 V)	NO → Check the operation of IC7 ⇒ Check if the voltage at pins 12, 13 is 11.5 V. ⇒ NO → Check ③. YES → Check ④.
	③ IC215 pins 10, 12	Pin 10: 11.5 V Pin 12: 0 V	NO → Check if the voltage at IC215 pin 13 is 12 V. Note: When the microphone is plugged into the MIC jack, IC215 pin 13 is grounded by the reed switch in the terminal. YES → Check the patterns to IC7 pins 12, 13.
	④ IC3, IC103 pin 1	AC -9 dBV (approx. 0.35 V)	NO → Check the Audio Mix VR (R20), and shielded wire (W195).
4. No output from the MIC terminal. (MIC input: -65 dBV)	① IC5 pin 1	AC -10 dBV (approx. 0.32 V)	NO → Check the voltage at IC5 and its peripheral parts. Check the line between the MIC terminal and the input terminal pin 2 of IC4. YES → Check the operation in item 3 - ③ (Note).
5. AGC operation is abnormal.	① IC4 pin 4	MIC input level is: DC 0.8 V at -65 dBV DC 1.3 V at -30 dBV	NO → Check according to the "Adjustment procedure" AGC adjustment. Check the diodes D1, D2. ⇒ NO → Check ②. YES → Check the operation of IC4.
	② IC5 pin 7	AC -7.0 dBV (approx. 0.42 V)	NO → Check the voltage at IC5 and associated parts. YES → Check the diodes D1, D2 and its associated parts.

7. Adjustment Procedure

- Input signal: Video: Full-field color bar signal (with 100 % white level)
Audio: -10 dBV, 1 kHz signal
- Measuring point: Each test point or the Monitor Output terminals (loaded 75 ohms for video and 47 kohms for audio)
- Set each switch and control to the following reference positions unless specified:
 1. INPUT (SOURCE) switch 1 (VCR-1)
 2. AUDIO MIX control Center
 3. AUDIO OUTPUT control NORM (Max)
 4. MAIN OUTPUT control Center
 5. VIDEO OUTPUT control NORM (Max)
 6. ENHANCE ON/OFF switch OFF
 7. ENHANCER control MIN
 8. COLOR BALANCE ON/OFF switch OFF
 9. COLOR control Center
 10. COLOR BALANCE joystick Center
 11. ENHANCE NOISE FILTER (rear panel) OFF

1. Related to the sync signal

	Test point No.	Measuring point	Adjusting point	Description	Adjusting method
①		IC209 pin 9	R472	50 µs SET	
②		IC212 pin 10	R474 R479	BURST SET 3 µs SET	<p>Monitor output waveform • Confirm by turning Color Balance switch ON/OFF.</p> <p>BURST SET: 0.5 ~ 0.8 µs 3 µs SET: 2.6 ~ 3.0 µs</p>
③	TP1	IC212 pin 10	R476	H-BLK	<p>Monitor output waveform • Adjust so that the interval between ① and ② is the horizontal blanking period with the Color Balance switch ON/OFF. • ② is related to the adjustment in item 2.</p>
④	TP1	IC212 pin 10	R471	V-BLK	<p>Trigger with V sync pulse. Monitor Output</p> <p>• Adjust so that the leading edge ① is before the first 1H of the video signal.</p>
⑤	TP51	IC608 pin 15	R674	H-FREQ	<p>64.0 µs</p> <p>• Cut the input signal and adjust the free-running frequency of IC608 to 15.625 kHz (T = 640 µs).</p>

	Test point No.	Measuring point	Adjusting point	Description	Adjusting method
⑥	TP52	IC602 pin 9	R635	12 µs SET	
⑦	TP53	IC604 pin 4	R631	F/F D.P. SET	<p>TP50 (SYNC)</p> <p>TP53</p> <p>• Watching the sync pulse at TP50, match the rising edge of the waveform with the rising edge of the waveform at TP53.</p>

2. Decoder circuit adjustment (Set the COLOR switch to ON.)

- Be sure to perform after the adjustments in item 1 are completed.

	Test point No.	Measuring point	Adjusting point	Description	Adjusting method
①	TP14	C637	C610	Carrier frequency	<ul style="list-style-type: none"> • Set the frequency counter to 4.4336 MHz.
②	TP9	IC601 pin 24	L607	BURST CLEANING	<p>Approx. 0.40V</p> <ul style="list-style-type: none"> • Adjust so that the amplitude becomes minimum.
③	TP8	IC601 pin 17	L608	φ SHIFT	<p>Approx. 0.14V</p> <ul style="list-style-type: none"> • Adjust so that the amplitude becomes maximum.
④	TP7	Q230 emitter	R296	SYNC CUT	<p>Bring into sync</p>
⑤		Q233 emitter Q236 emitter	T1 R629	<p>B-Y waveform (negative)</p> <p>Q233</p> <p>Approx. 0.90V</p> <p>R-Y waveform (negative)</p> <p>Q236</p> <p>Approx. 0.63V</p> <ul style="list-style-type: none"> • When V, U switches are provided with the color bar generator, turn them ON/OFF alternately. V: ON, U: OFF -- B-Y output is 0. V: OFF, U: ON -- R-Y output is 0. Adjust by rotating T1 and R629 alternately. • When V, U switches are not provided, adjust so that the rough waveforms are obtained, and then re-adjust for (6), (7). 	

Test point No.	Measuring point	Adjusting point	Description	Adjusting method
⑥	C253 (-)	R624 R284	C. LEVEL Y. LEVEL	<p>-B output waveform</p> <p>• Adjust R624 and R284 alternately so that the waveform becomes flat and the amplitude becomes 0.25 Vp-p.</p>
⑦	TP15 TP16	C254 (-) C255 (-)	R344 R347	<p>-R output waveform</p> <p>-G output waveform</p> <p>• Adjust so that each waveform becomes flat. Note: When the flat waveforms are not obtained through ⑥, ⑦, perform adjustment ⑤ again.</p>

3. Adjustment when the COLOR BALANCE is OFF.

- Be sure to perform after the adjustments in item 1 and 2 are completed.

Test point	Measuring point	Adjusting point	Description	Adjusting method
①	TP6	Q225 emitter R269 R276	BLK SET SYNC LEVEL	<p>• Adjust R269 so that the set-up level is 0 V. • Adjust R276 so that the sync signal level is approx. 0.27 V. Note: Confirm that the sync signal is $0.30 \text{ V} \pm 0.06 \text{ V}$ in the adjustment item 3-3.</p>
②	TP24	Monitor Output (75 ohms loaded) R461 R445	FADER BAL SET UP	<p>• Adjust R461 so that the video signal at ④ becomes minimum (20 mVp-p or less) with the Main Out VR set to MIN, and Video Out VR set to MAX. • In the above condition, adjust R445 so that ④ becomes 0 V (falt).</p>
③	TP24	Monitor Output R299	VIDEO LEVEL	<p>• Re-adjust the adjustment ① when the sync signal level is not correct. Note: This adjustment should be performed after that in item 2-(⑥). This is related to the adjustment of R284.</p>

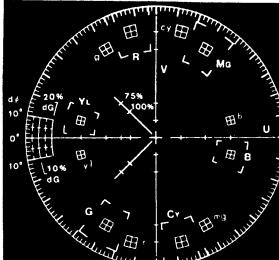
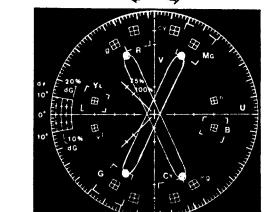
4. Enhancer adjustment

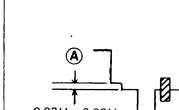
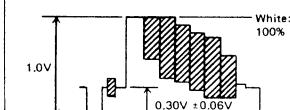
	Test point No.	Measuring point	Adjusting point	Description	Adjusting method
①	TP5	Q218 emitter	R255	ENH BAL	
②	TP24	Monitor Output (COLOR BALANCE is OFF)	R304		<p>• Adjust so that the edge signal ④ becomes $0.6 \text{ V} \pm 0.2 \text{ V}$ with 100 % white level at the rising or falling edge.</p>

5. Adjustment when the COLOR BALANCE is ON

- Be sure to perform after the adjustments in item 1 to 3 are completed.

	Test point	Measuring point	Adjusting point	Description	Adjusting method
①	TP19	C264	R353	B	<p>B output waveform</p>
	TP17	C263	R351	R	<p>R output waveform</p>
	TP18	C262	R352	G	<p>G output waveform</p> <p>Note: Adjust again using the vectorscope at the monitor output.</p>
②	TP24	Monitor Output	R413 R414	CAL. BAL CAL. BAL	<p>• Adjust them alternately so that the carrier signal disappears from the "black" level ④ and becomes as the "line". • Or, using the vectorscope, adjust the "black" point is at the origin.</p>
③	TP24	Monitor Output (Using a vector-scope)	R426 R420 R408	CHROMA LEVEL BURST LEVEL BURST PHASE	<p>• Adjust R426 so that each color point comes in the vicinity of ④ on the vectorscope. • Adjust them so that the burst point comes in the vicinity of the 75 % scale on the burst scale. Note: It's O.K. to adjust roughly.</p>
④	TP24	Monitor Output (Using a vector-scope)	R353 R351 R352	B R G	<p>• Set the Color Balance knob to the center, and adjust each VR so that the "white" point comes to the origin of the vector-scope.</p>

Test point No.	Measuring point	Adjusting point	Description	Adjusting method
⑤	TP24 Monitor Output (Using a vector-scope)	C638 C639 C640	90° 270° 180°	 <p>● Adjust the color phase of each color (to the direction of "■") while turning C638-640 alternately. Note: At this time, match the relative phase of each color regardless of the burst phase.</p> <p>Adjust so that the relative phase of each color comes within ±5° to the reference phase.</p> <p>When using the "U", "V" patterns</p> <ul style="list-style-type: none"> When a pattern generator having the U, V ON/OFF switches is used, it is better to adjust in the following manner. <p>When only "V" is ON.</p>  <p>When only "U" is ON.</p>  <p>● Set the "V" switch to ON, and adjust C638, C639 so that the traces on the vectorscope shown in the figure on the left are superimposed on each other. ● Adjust C640 so that the trace with "U" switch set ON only (shown in the figure on the right) and the trace with the "V" switch set ON only cross at right angles. ● Repeat these adjustments 2 or 3 times. ● Confirm that the color phase of each color faces in the direction of "■" with the "U" and "V" switches set to ON.</p>

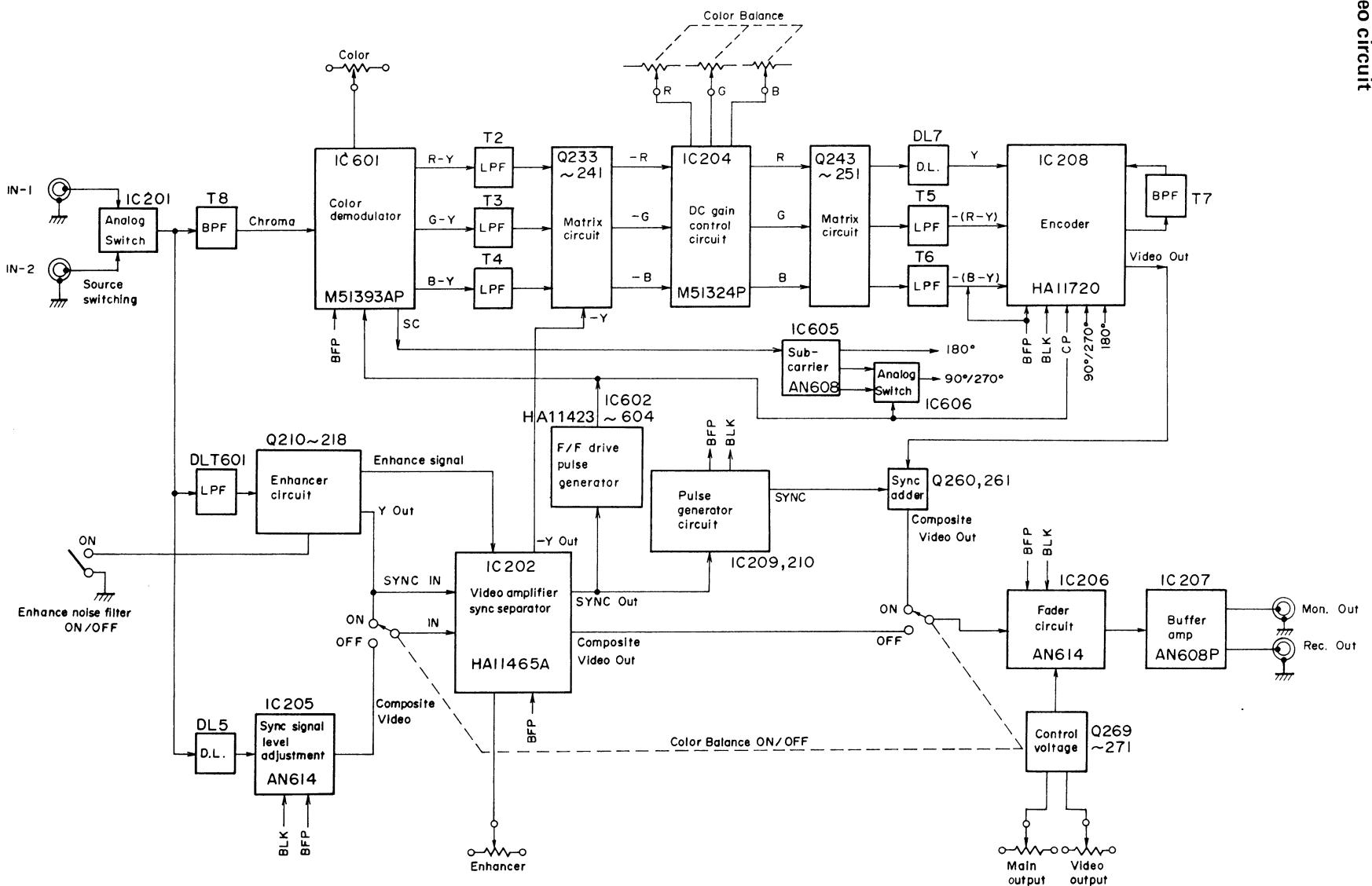
	Test point No.	Measuring point	Adjusting point	Description	Adjusting method
⑥	TP24	Monitor Output (Using a vector-scope)	R426 R411 R420 R408	CHROMA LEVEL R-Y LEVEL BURST LEVEL BURST PHASE	<ul style="list-style-type: none"> ● Rotate R426 and R411 to adjust so that the points of each color comes into the mark "■" on the vectorscope. ● To adjust the level of 90° burst phase, adjust them alternately so that the burst points comes on the 75 % level of the burst scale.
⑦	TP24	Monitor Output	R422 R423	WHT CLIP BLK CLIP	 <ul style="list-style-type: none"> ● Adjust R422 so that the level of the waveform becomes maximum, and then adjust R423 so that (A) is 0.03 ~ 0.08 V. ● Turn the Color Balance switch ON/OFF and confirm that difference of brightness is small at the dark portions of screen.
⑧	TP24	Monitor Output	R397	Y LEVEL	 <ul style="list-style-type: none"> ● Adjust R397 so that the height of the waveform becomes 1.0 Vp-p.

6. Audio circuit adjustment

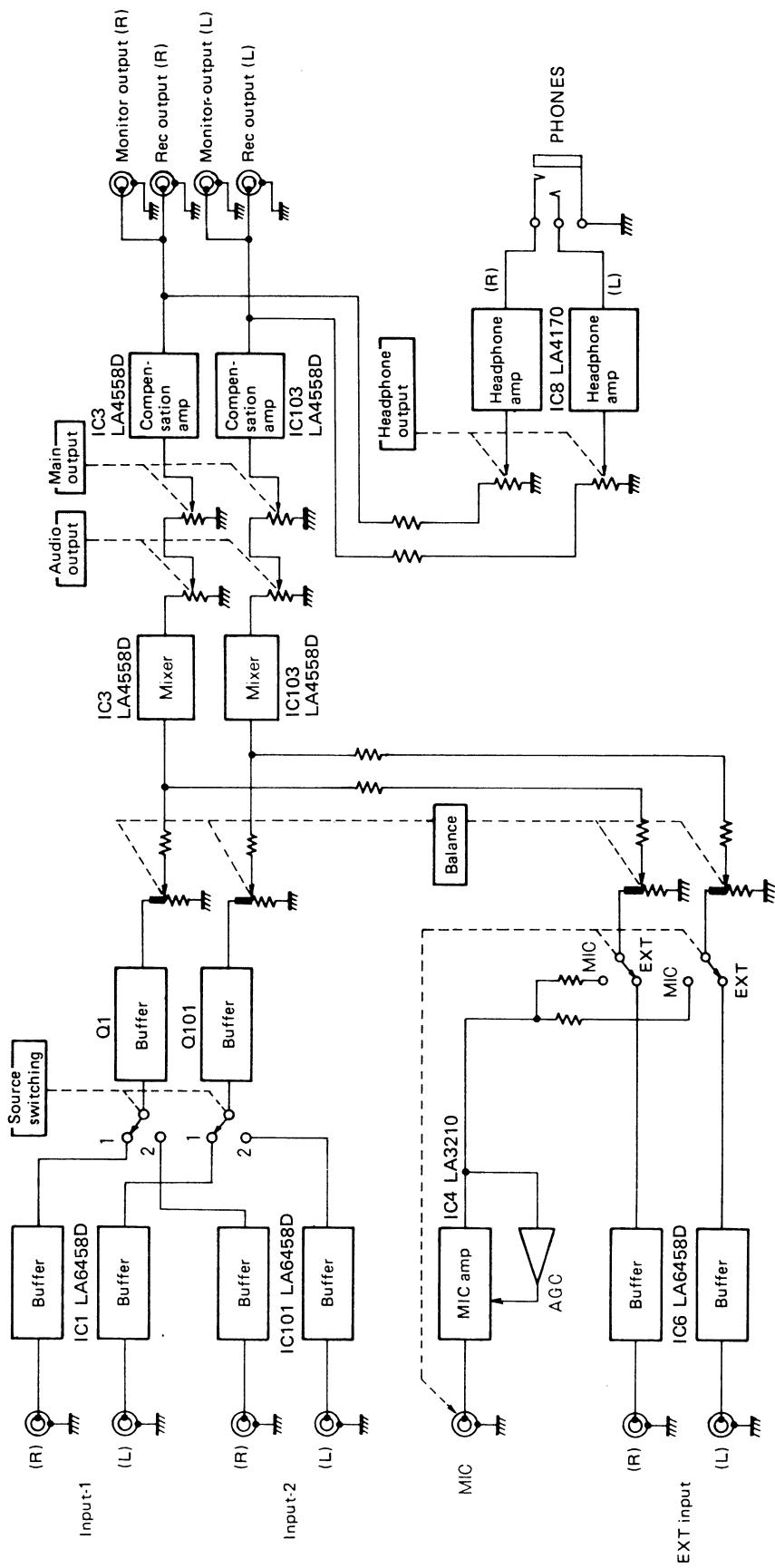
	Test point	Measuring point	Adjusting point	Description	Adjusting method
①	TP37, 38	Monitor Output	R54	ALC	<ul style="list-style-type: none"> ● Input -65 dBV (0.56 mV), 1 kHz signal to the MIC jack, and adjust so that the -10 dBV (326 mV) signal is present at the Monitor Output terminals. ● Then input -35 dBV (17.8 mV) to MIC jack, and confirm that the monitor output level is less than -7 dBV (447 mV).

8. Block Diagram

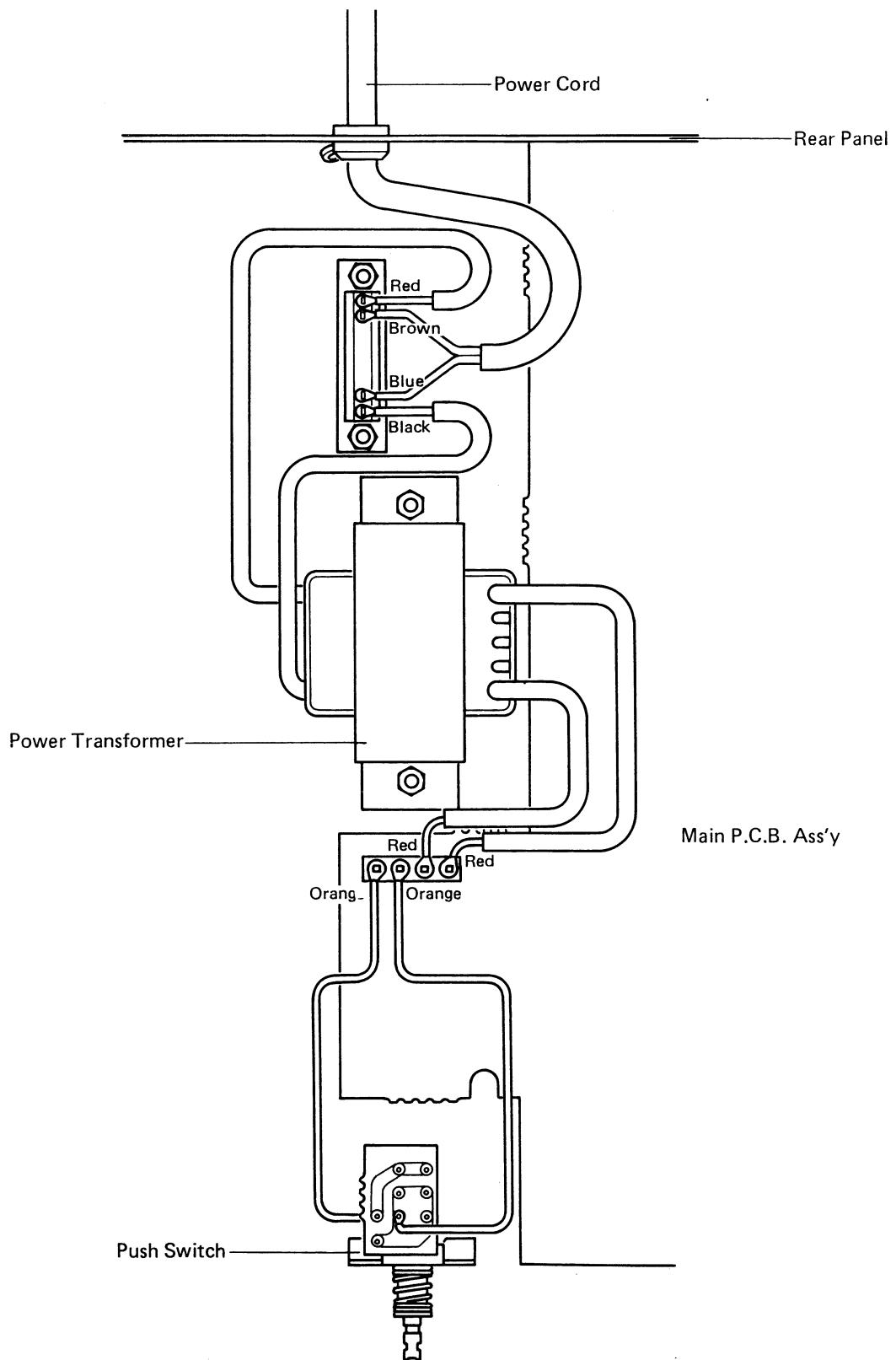
1. Video circuit



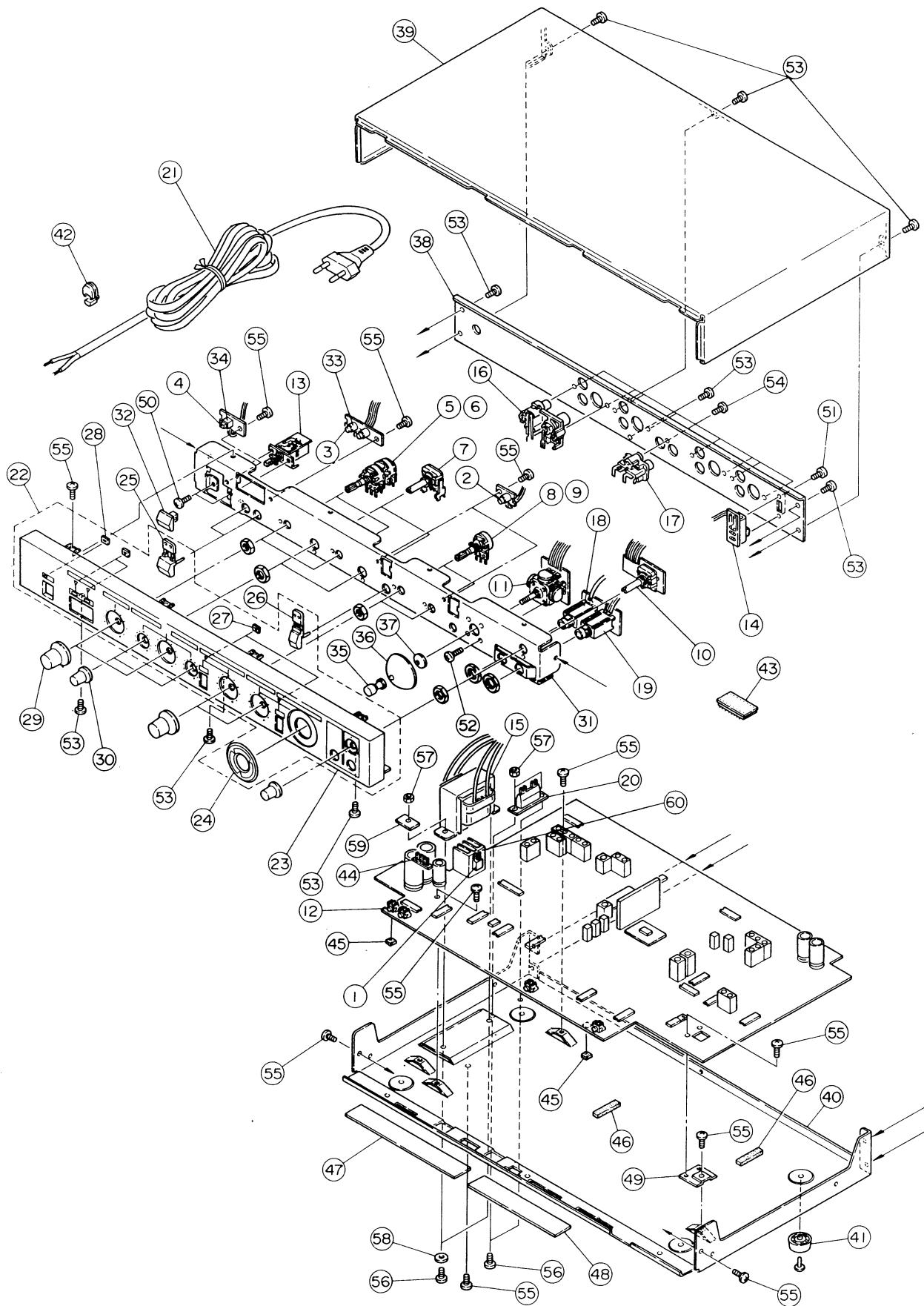
2. Audio circuit



9. Wiring Diagram



10. Exploded View



11. Parts List

Electric Parts List

Item No.	Symbol No.	Part Number	Description	Q'ty	Remarks
△ 1	IC208	HA11720	IC	1	Hitachi
	IC202	HA11465A	IC	1	Hitachi
	IC601	M51393AP	IC	1	Mitsubishi
	IC204	M51324P	IC	1	Mitsubishi
	IC205, 206	AN614	IC	2	Matsushita
	IC207, 605	AN608P	IC	2	Matsushita
	IC4	LA3210	IC	1	Sanyo
	IC8	LA4170	IC	1	Sanyo
	IC1, 3, 5, 6, 101, 103	LA6458D or NJM4558DD	IC	6	Sanyo
	IC604	TC4001BP	IC	1	Toshiba
	IC214	TC4011BP	IC	1	Toshiba
	IC607	TC4013BP	IC	1	Toshiba
	IC213	TC4027BP	IC	1	Toshiba
	IC2, 7, 201, 211, 606	TC4066BP	IC	5	Toshiba
	IC209, 210, 602	TC4538BP	IC	3	Toshiba
	IC212, 215	TC4584BP	IC	2	Toshiba
	IC608	HA11423	IC	1	Hitachi
	IC9	TA78012AP	IC	1	Toshiba (3-pin Regulator)
△ 2	Q1, 2, 5, 101, 102, 105, 201~204, 210, 214, 215, 218, 221, 222, 223, 225, 229, 230, 233~241, 243~253, 255~258, 260, 262, 264~271, 601~604, 605	2SC1815(Y, GR) or 2SC828(Q, R)	Transistor	59	Toshiba
	Q4, 104, 211, 212, 216, 217, 219, 224, 228, 242, 254, 261	2SA1015 (Y, GR) or 2SA564 (Q, R)	Transistor	12	Toshiba
	Q20, 263	2SC752(O, Y)	Transistor	2	Toshiba
	Q3, 103	2SD655(E, F)	Transistor	2	Hitachi
	Q213, 272~277	DTC114ES	Transistor	7	Rohm
	D3~6	S5277B	Diode	4	Toshiba
	D1, 2, 201, 206,	ISS133-T77 or IS2076	Diode	4	Rohm
	D207, 602	MTZ9.1B-T77 or 0529.1 or RD9.1EB3	Zener Diode	2	Rohm
	D204, 205	TLR147	LED	2	Toshiba
	D202, 203	TLG147	LED	2	Toshiba
	D7	SEL1121R	LED	1	Senken
5	R20	J42400-001	V. Resistor	1	Audio Mix
6	R466	J42401-001	V. Resistor	1	Main Output
7	R25, 286	J42402-001	V. Resistor	2	Audio/Video Outputs
8	R493	J42403-001	V. Resistor	1	Enhancer
9	R305	J42404-001	V. Resistor	1	Color
10	R37	J42405-001	V. Resistor	1	Headphones
11	R362	J42408-002	Stick Controller	1	Color Balance
12	S2~5	J42406-001	Tact Switch	4	
13	S1	J42407-001	Push Switch	1	
14	S6	QSS201-004	Slide Switch	1	
△ 13	DL5-A, DL7-A	J42426-001A	Delay Line	2	001A, 001B 2 parts in 1 set
	DL5-B, DL7-B	J42426-001B	Delay Line	2	
	DL3, 4	J42427-001	Delay Line	2	
	DL1	J43002-001	1 H Delay Line	1	
	DL9	J43003-001	Delay Line	1	70 μs
	DL10	J43004-001	Delay Line	1	110 μs
△ 15	T1	J42948-001	Phase Transformer	1	
	T2~6	J42428-001	1 MHz LPF	5	
	T7, 8	J42949-001	4.43 MHz BPF	2	
	L607, 608	J42947-001	Ident. Transformer	2	
	DLT601	J43005-001	LPF	1	
△ 15	PT1	J42994-001	Power Transformer	1	for (E), (EB) models
	PT1	J43021-001	Power Transformer	1	for (EK) models
△ 15	C233	QEE41VM-474	Electrolytic Capacitor	1	0.47 μF/35 V (Tantalum)
	C223, 606	QEN41HM-105	Electrolytic Capacitor	2	1 μF/50 V (Non-polarity)
	C286	QEN41HM-225	Electrolytic Capacitor	1	2.2 μF/50V (Non-polarity)
	C290	QEN41CM-106	Electrolytic Capacitor	1	22 μF/16 V (Non-polarity)
	C622	QEK1HM-224	Electrolytic Capacitor	1	0.22 μF/50 V
	C621	QET41HM-474	Electrolytic Capacitor	1	0.47 μF/50 V
	C27, 229, 604	QET41HM-105	Electrolytic Capacitor	4	1 μF/50 V
	C234, 603	QET41HM-335	Electrolytic Capacitor	2	3.3 μF/50 V

Item No.	Symbol No.	Part Number	Description	Q'ty	Remarks
△ 1	C1, 2, 13, 30, 101, 102, 113, 130	QET41HM-475	Electrolytic Capacitor	10	4.7 μF/50V
	C5, 7, 8, 9, 14, 19, 25, 31, 105, 107, 108, 109, 114, 131, 227, 274, 312, 615, 616, 618, 668	QET41CM-106	Electrolytic Capacitor	21	10 μF/16 V
	C17	QET41CM-336	Electrolytic Capacitor	1	33 μF/16 V
△ 2	C3, 4, 6, 12, 20, 22, 24, 28, 29, 36~38, 103, 104, 112, 136, 201~203, 213~216, 221, 225, 226, 228, 237, 253~257, 261~264, 266, 277, 279, 280, 285, 288, 289, 296, 298, 309, 313, 320, 324, 325~327, 331, 331, 634, 659, 675	QET41CM-476	Electrolytic Capacitor	58	47 μF/16 V
	C15, 18, 23, 115, 265, 267, 291, 626	QET41CM-107	Electrolytic Capacitor	8	100 μF/16 V
	C317	QET41CM-227	Electrolytic Capacitor	1	220 μF/16 V
	C32, 292, 293	QET41CM-108	Electrolytic Capacitor	3	1000 μF/16 V
	C34, 35	QET41CM-228	Electrolytic Capacitor	2	2200 μF/16 V
	C609, 613, 614	QCT26CH-150A	Ceramic Capacitor	3	CH 15 pF
	C661	QCT26CH-300A	Ceramic Capacitor	1	CH 30 pF
	C601, 611	QCT26CH-390A	Ceramic Capacitor	2	CH 39 pF
	C608	QCT26CH-680A	Ceramic Capacitor	1	CH 68 pF
	C303, 304, 306	QCT26CH-101A	Ceramic Capacitor	3	CH 100 pF
	C316	QCT26CH-221A	Ceramic Capacitor	1	CH 220 pF
△ 3	C329	QCS21HJ-270	Ceramic Capacitor	1	27 pF
	C224, 287	QCS21HJ-330	Ceramic Capacitor	2	33 pF
	C21, 268	QCS21HJ-470	Ceramic Capacitor	2	47 pF
	C230	QCS21HJ-560	Ceramic Capacitor	1	56 pF
	C10, 110, 671	QCS21HJ-680	Ceramic Capacitor	3	68 pF
	C322	QCS21HJ-101	Ceramic Capacitor	1	100 pF
	C220, 617	QCS21HJ-221	Ceramic Capacitor	2	220 pF
	C632, 667	QCS21HJ-471	Ceramic Capacitor	2	470 pF
	C222, 301, 629, 664	QCF21HP-103	Ceramic Capacitor	4	0.01 μF
	C669, 670	QCF21HP-153	Ceramic Capacitor	2	0.015 μF
△ 4	C236, 310, 311	QCF21HP-223	Ceramic Capacitor	3	0.022 μF
	C39, 235, 269, 270, 271, 272, 275, 276, 278, 308, 323, 633, 660	QCF21HP-473	Ceramic Capacitor	13	0.047 μF
	C33, 635, 637, 643	QCF21HP-104	Ceramic Capacitor	4	0.1 μF
	C302, 305	QFM41HJ-332	Mylar Capacitor	2	0.0033 μF
	C631	QFM41HJ-472	Mylar Capacitor	1	0.0047 μF
△ 5	C673	QFM41HJ-562	Mylar Capacitor	1	0.0056 μF
	C672	QFM41HJ-682	Mylar Capacitor	1	0.0068 μF
	C630, 628	QFM41HJ-822	Mylar Capacitor	2	0.0082 μF
	C16, 116, 258~260, 301, 602, 605, 607, 612, 619, 620, 623, 624, 627	QCM41HJ-103	Mylar Capacitor	15	0.01 μF
	C294, 295	QFM41HJ-223	Mylar Capacitor	2	0.022 μF
	C299	QFM41HJ-273	Mylar Capacitor	1	0.027 μF
△ 6	C610, 638, 639, 640	QAT3001-450	Trimmer Capacitor	4	45 pF
	R500	QRD125J-101	Carbon Resistor	1	100 Ω 1/2W
	R453, 454, 648, 658	QRD161J-560	Carbon Resistor	4	56 Ω 1/6W
	R201, 208, 456, 457	QRD161J-750	Carbon Resistor	4	75 Ω 1/6W
	R406, 290, 668	QRD161J-101	Carbon Resistor	3	100 Ω 1/6W
	R643	QRD161J-181	Carbon Resistor	1	180 Ω 1/6W
	R9, 40, 58, 109, 140, 300, 450, 645	QRD161J-221	Carbon Resistor	8	220 Ω 1/6W
	R292	QRD161J-271	Carbon Resistor	1	270 Ω 1/6W
	R243, 302	QRD161J-331	Carbon Resistor	2	330 Ω 1/6W
	R213, 241, 253, 288	QRD161J-471	Carbon Resistor	4	470 Ω 1/6W
△ 7	R644	QRD161J-511	Carbon Resistor	1	510 Ω 1/6W
	R628, 663	QRD161J-391	Carbon Resistor	2	390 Ω 1/6W
	R73, 173, 250, 299, 403	QRD161J-561	Carbon Resistor	5	560 Ω 1/6W
	R613	QRD161J-621	Carbon Resistor	1	620 Ω 1/6W
	R32, 33, 46, 132, 133, 404	QRD161J-681	Carbon Resistor	6	680 Ω 1/6W

Item No.	Symbol No.	Part Number	Description	Q'ty	Remarks
	R255, 293, 296, 426 R269, 347, 422, 423, 445 R276, 461, 629, 639, 633, 674 R284, 304, 351~353, 397, 411, 413, 414, 420, 472, 476, 479, 619, 344, 631, 635 R54, 408, 471, 474, 624	J42141-102 J42141-222 J42141-472 J42141-103	Semi-fixed Resistor Semi-fixed Resistor Semi-fixed Resistor Semi-fixed Resistor	4 5 6 17	1 kΩ 2.2 kΩ 4.7 kΩ 10 kΩ
		J42141-473	Semi-fixed Resistor	5	47 kΩ
	L601 L209, 214 L212, 215, 602 L603	J42469-8R2 J42469-390 J42469-101 J42469-681	Inductor Inductor Inductor Inductor	1 2 3 1	8.2 μH 39 μH 100 μH 680 μH
16 17 18 19 △ 20 △ 21 △ 21	X1 J3, 4, 6, 7 J5 J1 J2	J43006-001 J42996-001 J42424-001 J42473-001 J42474-001 J42997-001 QMP3900-200H QMP9017-008BS	Crystel BNC/2 Pin Jacks 2 Pin Jacks Mic Jack Headphones Jack Terminal Power Cord Power Cord	1 4 1 1 1 1 1 1	4.4336 MHz for (E), (EB) models for (EK) models
	FJ1 FJ3 FJ4 FJ5 FJ6 FJ7 FJ17, 18 FJ10, 11 FJ12	EWR33B-15TK EWR32B-48TK EWR35B-30KK EWR35B-28KK EWR34B-25KK EWR32B-12KK EWR32B-12TK EWR33B-20KK EWR33B-35KK	Flat Wire Flat Wire Flat Wire Flat Wire Flat Wire Flat Wire Flat Wire Flat Wire Flat Wire Flat Wire	1 1 1 1 1 1 1 2 2	3-conductor 2-conductor 5-conductor 5-conductor 4-conductor 2-conductor 2-conductor 3-conductor 3-conductor
		J11039-001 J11041-001 J43026-001 J43007-001	Main PCB Ass'y Circuit Board Sub PC Board Circuit Board	1 1 1 1	

△ : Safety Parts

The Marks for Designated Areas

(EK) U.K.
(EB) Norway, Sweden, Finland, Denmark, Switzerland
(E) Europe (other countries)

Item No.	Symbol No.	Part Number	Description	Q'ty	Remarks
	R72, 259, 490~492, 496 R17, 24, 29, 30, 117, 124, 129, 130, 204, 210, 240, 245, 246, 248, 249, 251, 254, 256, 262, 263, 268, 270, 291, 301, 303, 325, 326, 332, 333, 339, 340, 348, 373~378, 389~395, 425, 429, 442, 443, 452, 455, 603, 606, 630, 637, 646, 649, 652, 653, 654, 655, 656, 657, 632, 636, 660, 661, 669	QRD161J-821 QRD161J-102	Carbon Resistor Carbon Resistor	6 68	820 Ω 1/6W 1 kΩ 1/6W
	R345, 383, 428, 449 R366, 382, 402 R282, 343, 357, 368, 387, 427, 512 R615, 616 R41, 327, 328, 334, 335, 341, 342, 350, 396, 398, 399, 409, 410, 415, 459, 650, 664	QRD161J-122 QRD161J-152 QRD161J-182 QRD161J-202 QRD161J-222	Carbon Resistor Carbon Resistor Carbon Resistor Carbon Resistor Carbon Resistor	4 3 7 2 16	1.2 kΩ 1/6W 1.5 kΩ 1/6W 1.8 kΩ 1/6W 2 kΩ 1/6W 2.2 kΩ 1/6W
	R258, 260, 285, 329, 330, 349, 379, 380, 381, 385, 386, 418, 601, 602, 622 R247, 336, 361, 386, 634 R207, 252, 257, 261, 264, 266, 272, 277, 279, 280, 294, 295, 331, 338, 346, 369, 400, 401, 405, 412, 419, 431, 438, 440, 446, 451, 462, 464, 611, 647	QRD161J-272 QRD161J-332 QRD161J-392	Carbon Resistor Carbon Resistor Carbon Resistor	15 5 31	2.7 kΩ 1/6W 3.3 kΩ 1/6W 3.9 kΩ 1/6W
	R5, 6, 16, 18, 19, 56, 57, 67, 105, 116, 167, 205, 212, 271, 273, 275, 283, 363, 364, 365, 421, 434, 444, 448, 481, 506, 507, 626, 671 R238, 337, 358~360, 384, 612 R625, 281, 670, 675 R267, 367, 441, 607	QRD161J-472 QRD161J-562 QRD161J-682 QRD161J-822	Carbon Resistor Carbon Resistor Carbon Resistor	30 7 4 4	4.7 kΩ 1/6W 5.6 kΩ 1/6W 6.8 kΩ 1/6W 8.2 kΩ 1/6W
	R7, 10, 12, 14, 27, 34, 35, 38, 42, 47, 50, 52, 53, 62, 64, 65, 71, 107, 110, 112, 114, 127, 134, 135, 138, 162, 164, 165, 265, 439, 460, 468, 469, 473, 477, 478, 480, 482, 483~485, 488, 489, 495, 498, 614, 618, 640, 662, 666, 673	QRD161J-103	Carbon Resistor	52	10 kΩ 1/6W
	R620 R48 R36, 136, 297, 388, 467	QRD161J-113 QRD161J-123 QRD161J-153	Carbon Resistor Carbon Resistor Carbon Resistor	1 1 5	11 kΩ 1/6W 12 kΩ 1/6W 15 kΩ 1/6W
	R475, 609, 610, 623 R22, 31, 122, 131, 370~372, 416, 417, 237 R49, 617, 641, 642 R21, 121, 465, 621 R28, 128, 168, 458, 463, 470, 508~511, 672	QRD161J-183 QRD161J-223 QRD161J-273 QRD161J-333 QRD161J-473	Carbon Resistor Carbon Resistor Carbon Resistor Carbon Resistor Carbon Resistor	4 10 4 4 11	18 kΩ 1/6W 22 kΩ 1/6W 27 kΩ 1/6W 33 kΩ 1/6W 47 kΩ 1/6W
	R43, 44, 55, 355, 430 R667 R298 R1~4, 8, 11, 15, 59~61, 63, 66, 70, 101~104, 108, 111, 115, 159~161, 163, 166, 274, 407, 447, 486, 487, 494, 497	QRD161J-563 QRD161J-683 QRD161J-823 QRD161J-104	Carbon Resistor Carbon Resistor Carbon Resistor Carbon Resistor	5 1 1 32	56 kΩ 1/6W 68 kΩ 1/6W 82 kΩ 1/6W 100 kΩ 1/6W
	R23, 123, 202, 203, 209, 211, 651 R499, 354, 356 R51 R45, 627 R206, 278, 437 R39, 68, 139, 168	QRD161J-124 QRD161J-154 QRD161J-224 QRD161J-334 QRD161J-474 QRD161J-390	Carbon Resistor Carbon Resistor Carbon Resistor Carbon Resistor Carbon Resistor Carbon Resistor	7 3 1 2 3 4	120 kΩ 1/6W 150 kΩ 1/6W 220 kΩ 1/6W 330 kΩ 1/6W 470 kΩ 1/6W 39 Ω 1/6W

12. Packing Materials and Parts Numbers

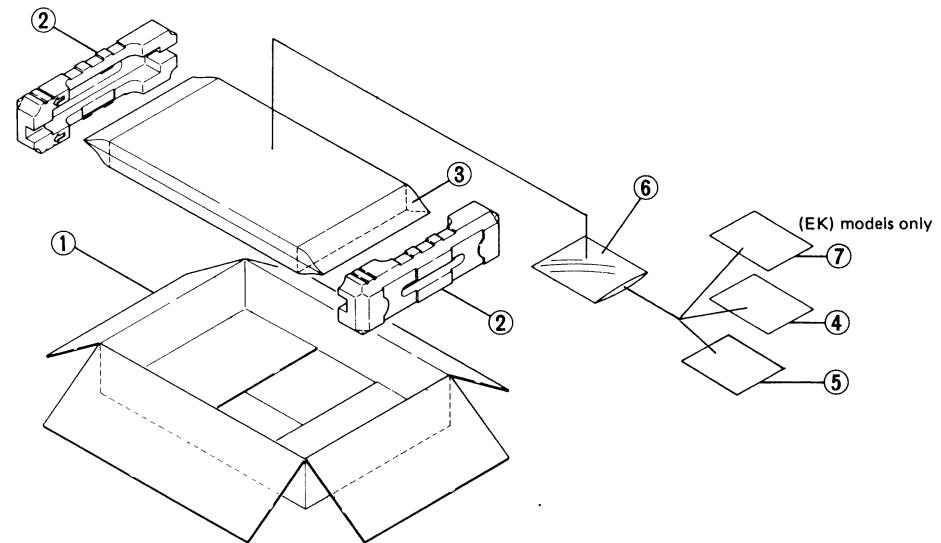
Mechanical Parts List

Item No.	Part Number	Part Name	Q'ty	Remarks
22	J21030-002	Front Panel Ass'y	1	
23	J21031-002	Front Panel	1	
24	J31180-001	Color Ring	1	
25	J42476-001	Push Button B	2	
26	J42477-001	Push Button C	2	Thermally bonded to the front panel Thermally bonded to the front panel
27	J42478-001	LED Lens A	4	Adhered to the front panel
28	J42479-001	LED Lens B	1	Adhered to the front panel
29	J42480-001	VR Knob A	4	
30	J42481-001	VR Knob B	3	
31	J21032-001	Stay	1	
32	J42482-001	Push Button A	1	
33	J42483-001	LED Holder A	4	
34	J42484-001	LED Holder B	1	
35	J42457-001	Stick Knob	1	
36	J42485-001	Cap	1	
37	J42486-001	Cap Holder	1	
38	J21090-001	Rear Panel	1	for (E), (EB) models
38	J21090-002	Rear Panel	1	for (EK) models
39	J21025-001	Top Cover	1	
40	J11003-003	Chassis	1	for (E), (EB) models
40	J11003-004	Chassis	1	for (EK) models
41	J42249-001	Foot	4	
△ 42	QHS3876-162	Cord Stopper	1	for (E), (EB) models
△ 42	QHS3876-162BS	Cord Stopper	1	for (EK) models
43	J42539-001	IC Mount Ass'y	1	Not including IC M51324P
44	J42489-001	Connector	1	
45	J42490-001	Cushion A	2	
46	J42526-001	Cushion B	2	
47	J42528-001	Vinyl Chloride Sheet B	1	Adhered to the chassis
48	J42529-001	Vinyl Chloride Sheet C	1	Adhered to the chassis
49	J42509-001	Adapter	1	
50	SPSP3006Z	Screw	2	For push switch, φ3 x 6
51	SPSP2604M	Screw	2	For slide switch, φ2.6 x 4 (black)
52	SPSP2608M	Screw	2	For stick controller, φ2.6 x 8 (black)
53	SDSF3006M	Tapping Screw	9	⊕ Binding, P-tight, φ3 x 6 (black)
54	SDSF3008M	Tapping Screw	9	⊕ Binding, P-tight, φ3 x 8 (black)
55	SDSF3006Z	Tapping Screw	16	⊕ Binding, P-tight, φ3 x 6
56	SDST3010Z	Tapping Screw	4	⊕ Binding, C-tight, φ3 x 10
57	NNS3000Z	Nut	4	M3
58	WNS4000Z	Washer	2	
59	J42621-001	Rectangular Washer	2	
△ 60	J43019-001	Heat Sink	1	
	J43020-001	Heat Sink Holder	1	

△ : Safety Parts

The Marks for Designated Areas

(EK) U.K.
 (EB) Norway, Sweden, Finnland, Denmark, Switzerland
 (E) Europe (other countries)



Item No.	Part Number	Part Name	Q'ty	Remarks
1	PK-JXC7E	Packing Case	1	J11004-004 for (E) models
1	PK-JXC7EB	Packing Case	1	J11004-005 for (EB) models
1	PK-JXC7EK	Packing Case	1	J11004-006 for (EK) models
2	J31181-001	Packing Pad	2	
3	OPGA040-05505	Envelope	1	for Main Unit, (E), (EB) models
3	J43018-001	Envelope	1	for Main Unit, (EK) models

13. Accessories List

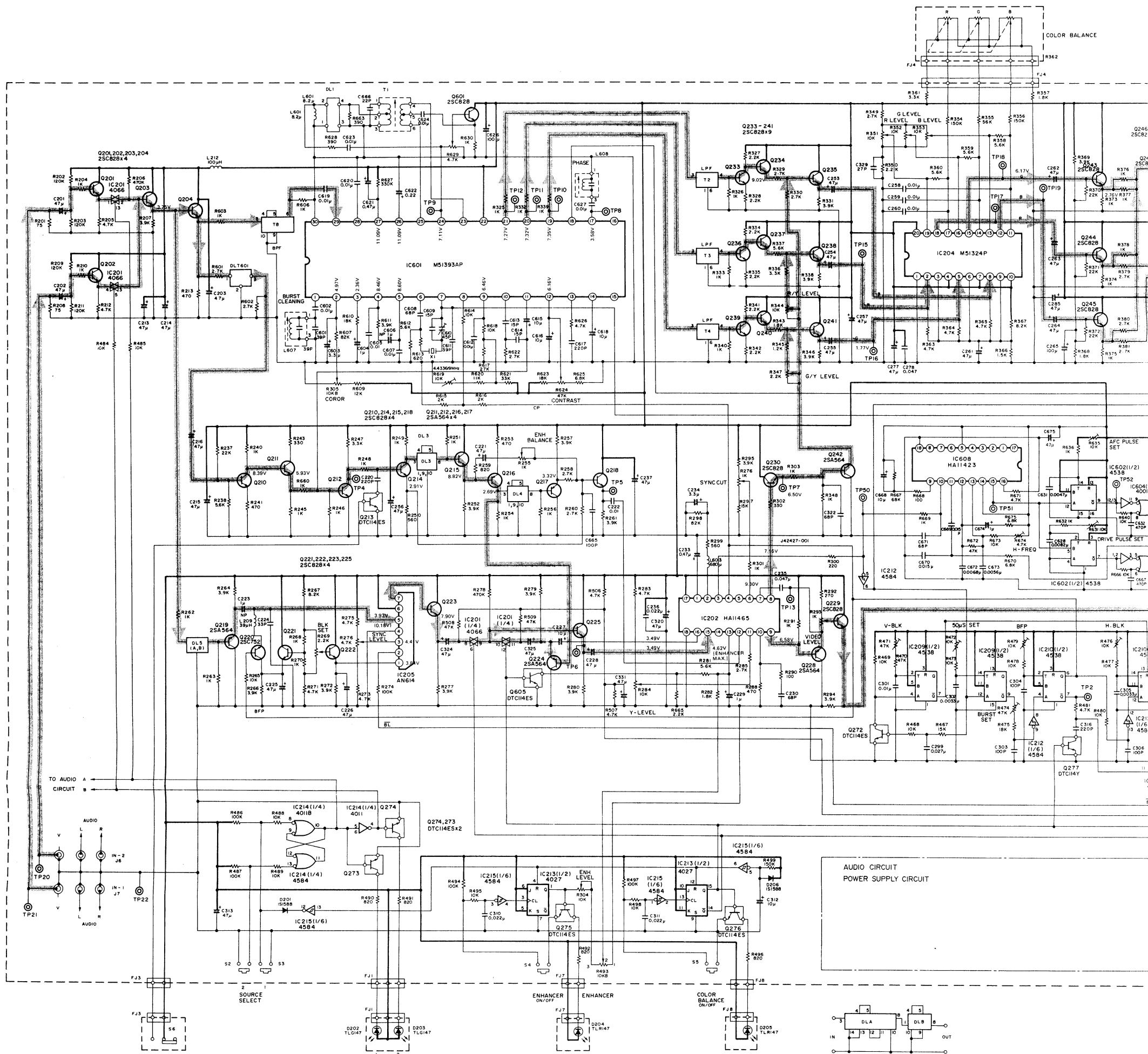
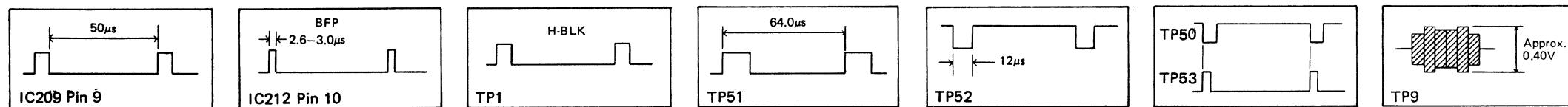
Item No.	Part Number	Part Name	Q'ty	Remarks
4	J5500-022A	Instruction Book	1	for (E), (EB) models
4	J5500-022B	Instruction Book	1	for (EK) models
5	BT20066	EEC Agency	1	
6	OPGA025-03505	Envelope	1	for Accessories, (E), (EB) models
6	E300196-010B	Envelope	1	for Accessories, (EK) models
7	BT20060	Warranty Card	1	(EK) models only

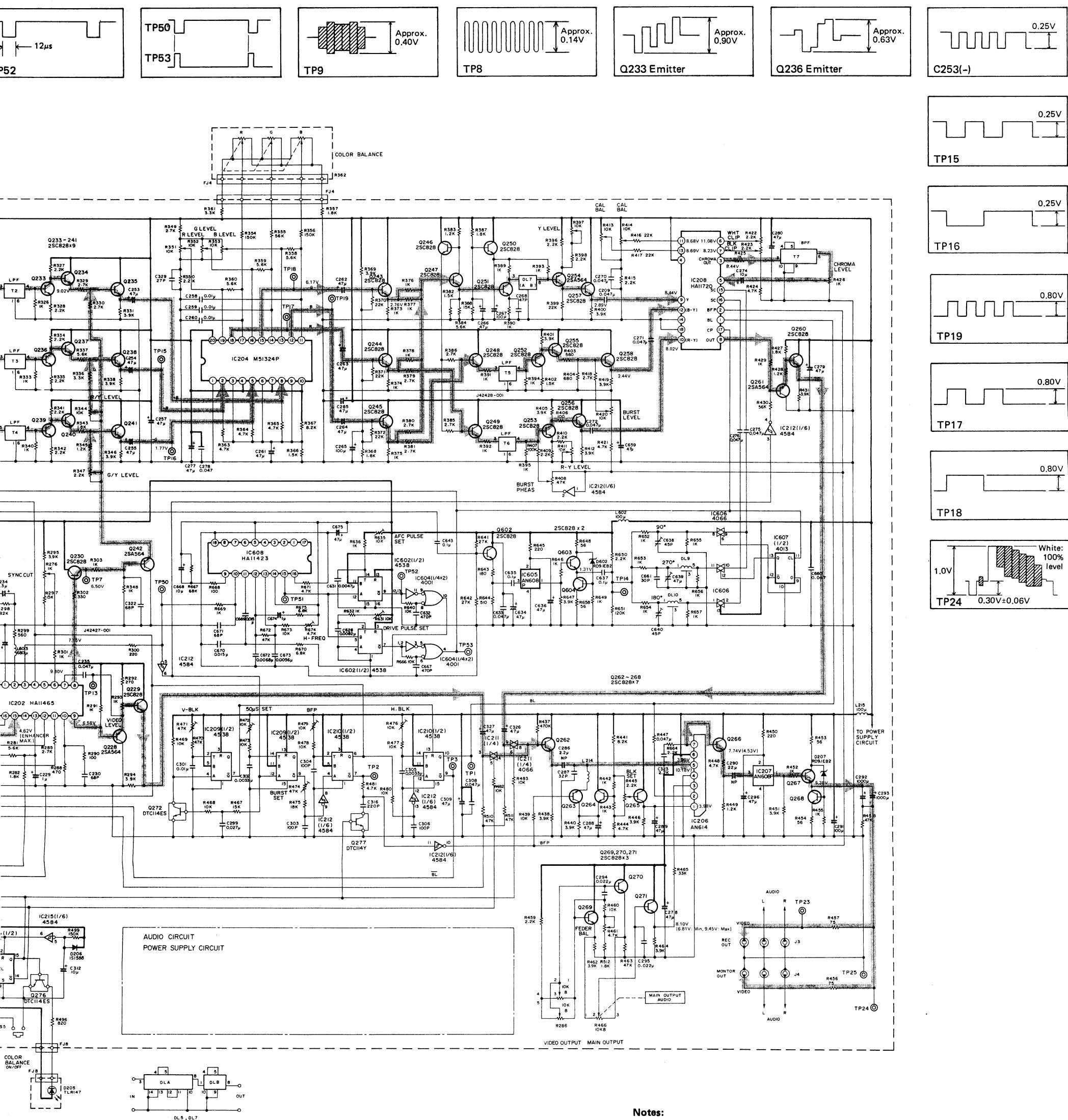
The Marks for Designated Areas

(EK) U.K.
 (EB) Norway, Sweden, Finnland, Denmark, Switzerland
 (E) Europe (other countries)

14. Schematic Diagram

Video Circuit 1. The voltage value in bracket () shows when there is no input.

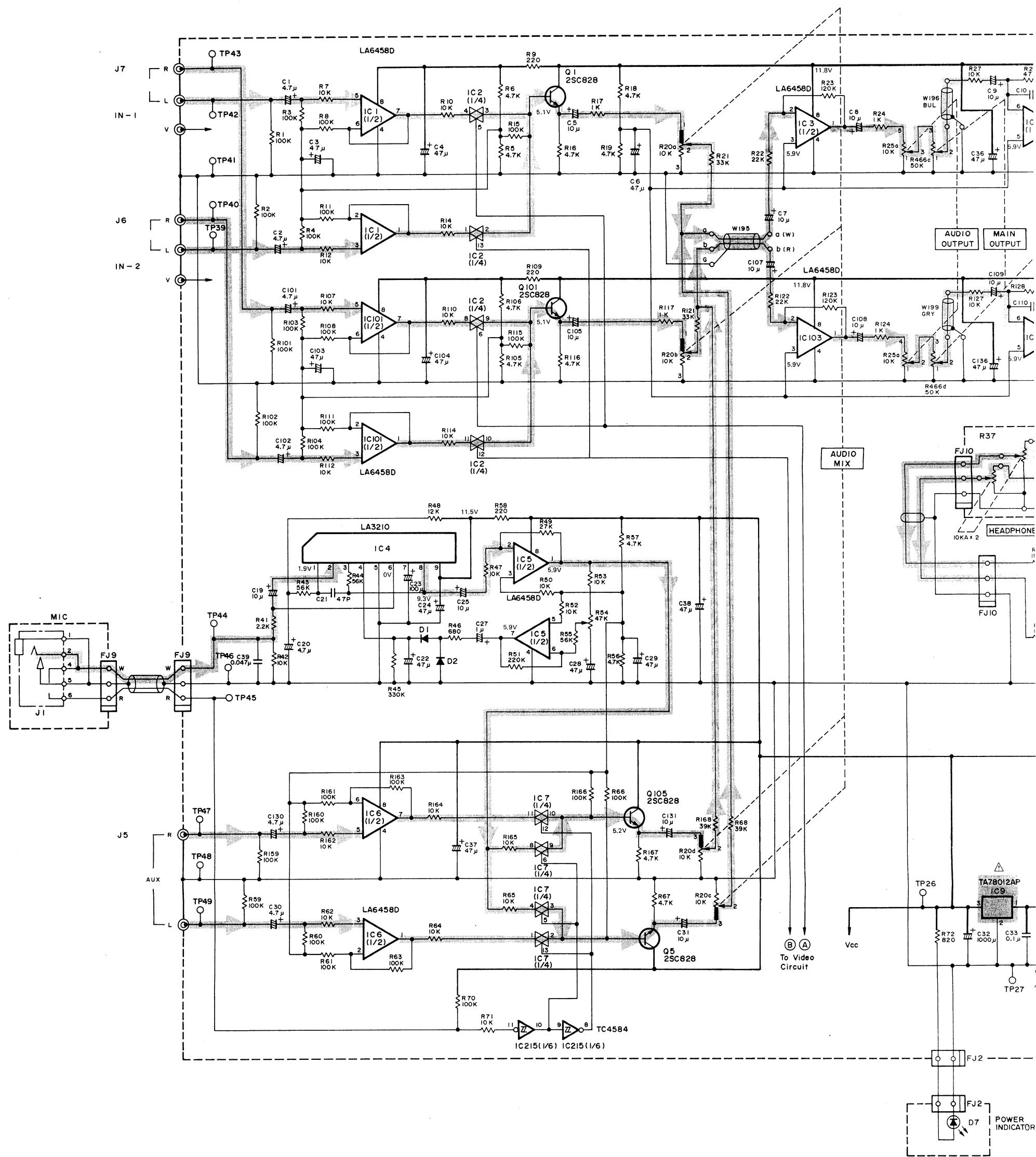


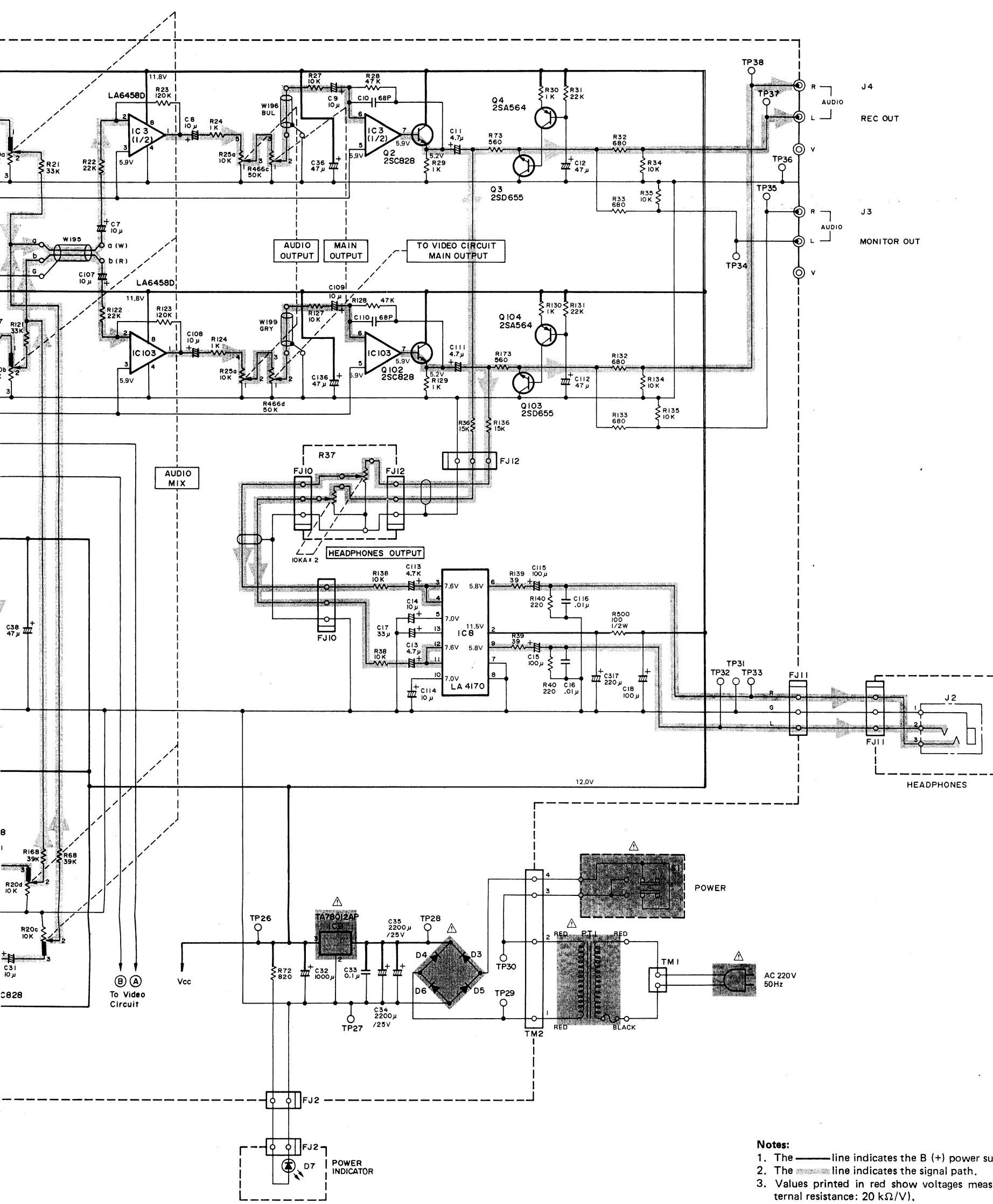
**Notes:**

1. The — line indicates the B (+) power supply.
2. The — line indicates the signal path.
3. Values printed in red show voltages measured with the tester (internal resistance: 20 kΩ/V).
4. When replacing parts in the shaded areas (■) marked △, be sure to use only the designated parts to ensure safety.
5. This is a standard circuit diagram.

Design and contents are subject to change without notice.

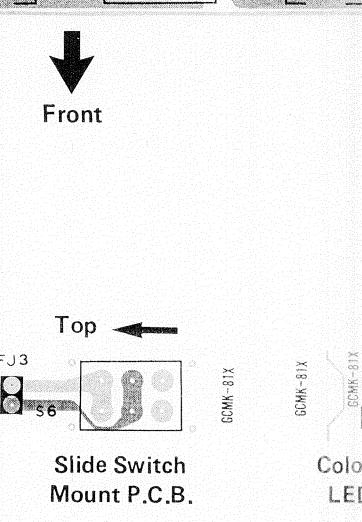
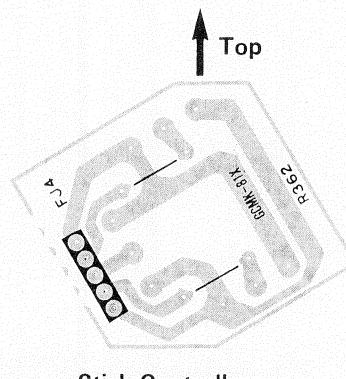
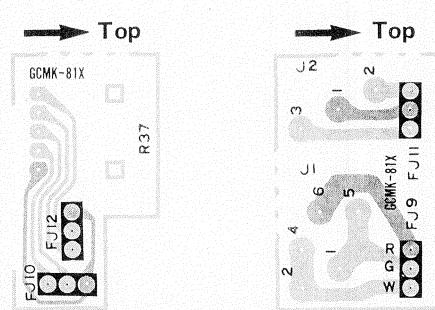
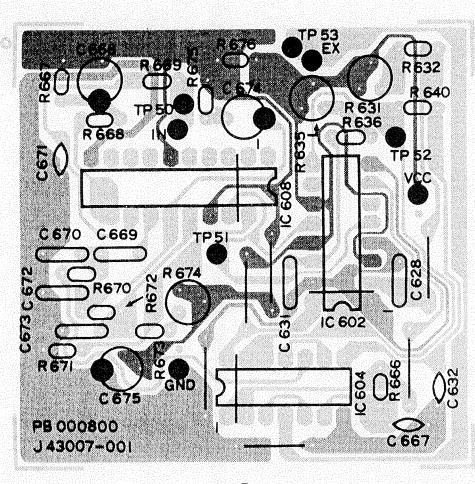
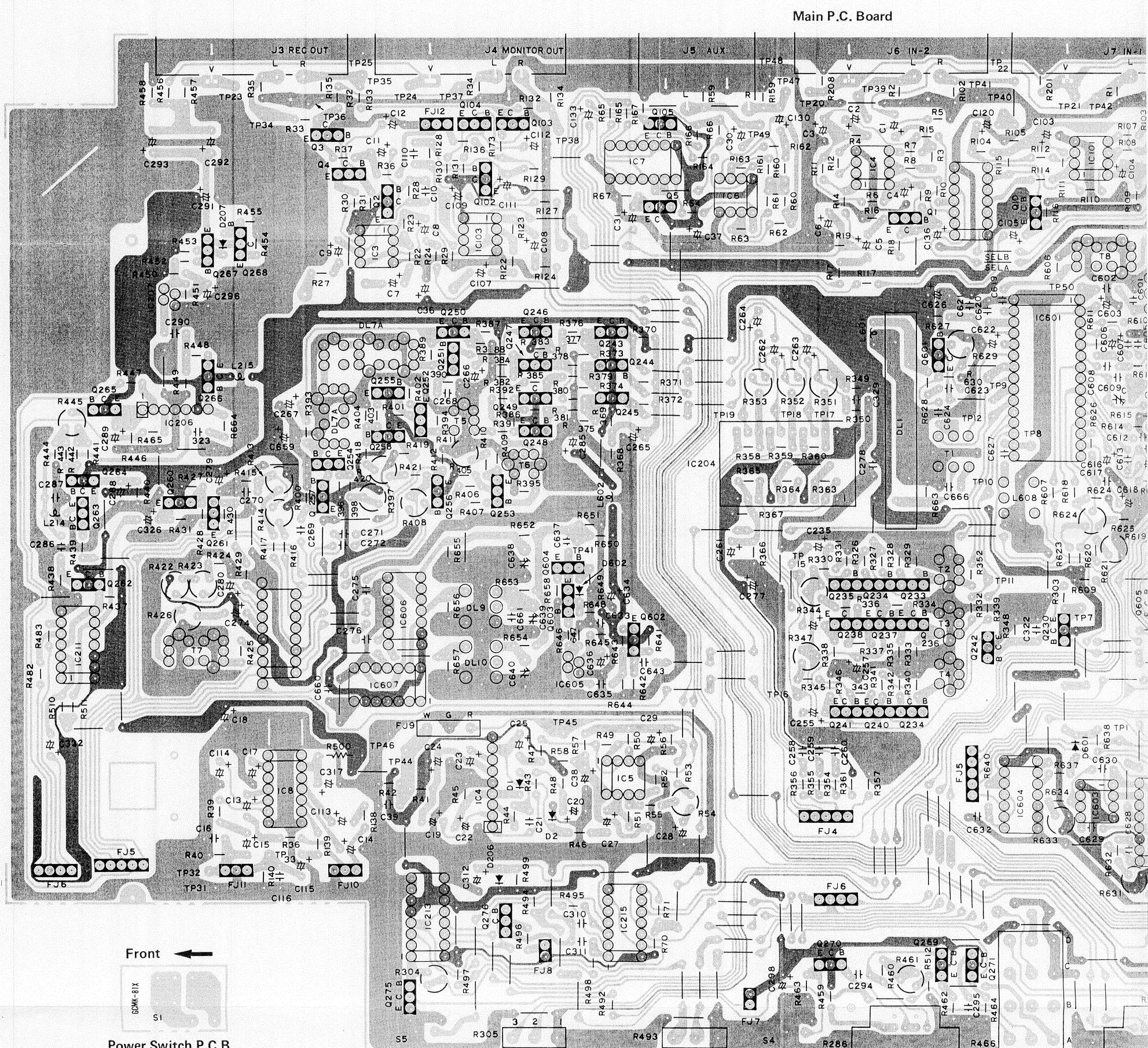
Audio Circuit



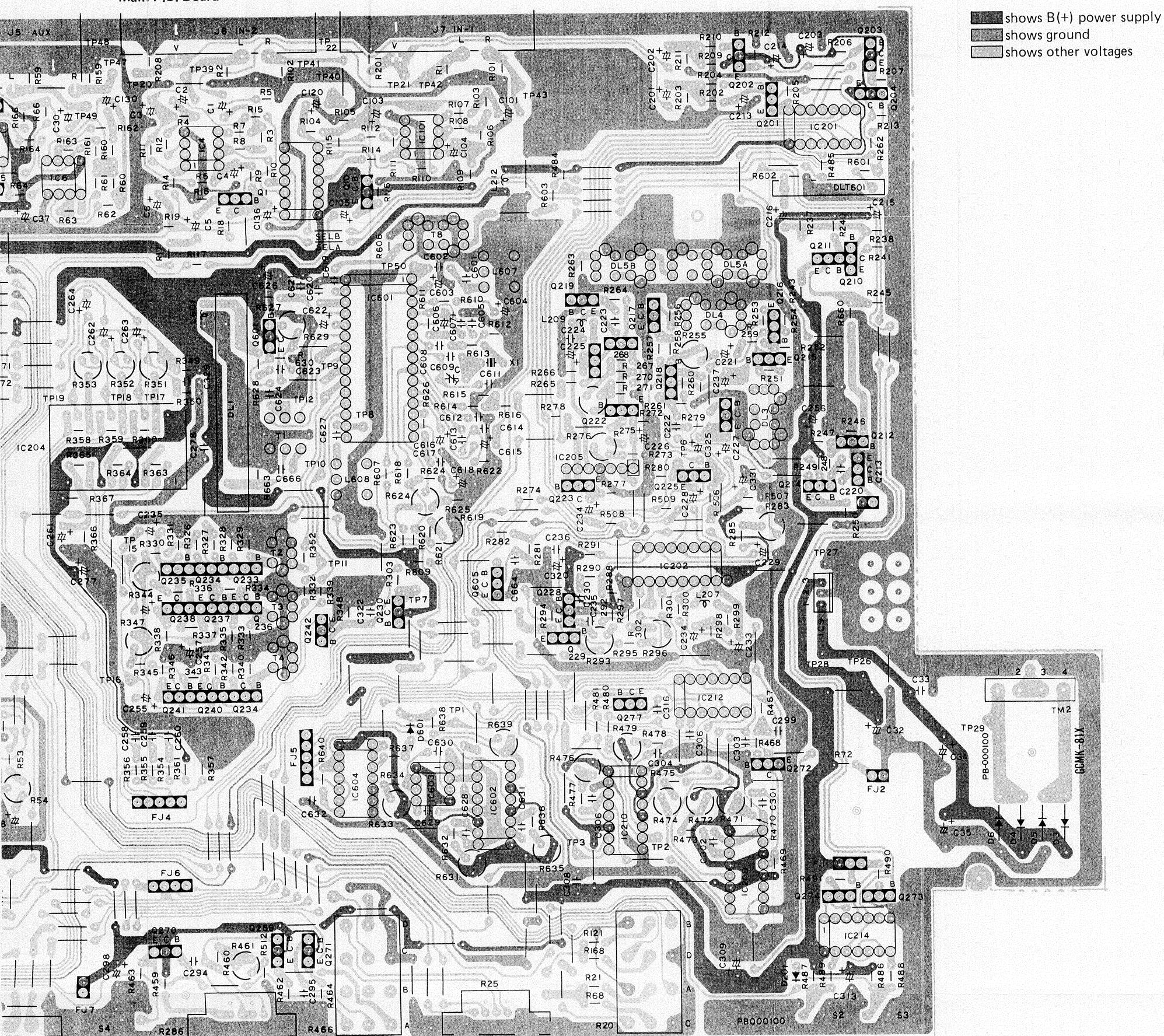
**Notes:**

1. The —— line indicates the B (+) power supply.
 2. The line indicates the signal path.
 3. Values printed in red show voltages measured with the tester (internal resistance: 20 kΩ/V).
 4. When replacing parts in the shaded areas (■■■■) marked △, be sure to use only the designated parts to ensure safety.
 5. This is a standard circuit diagram.
- Design and contents are subject to change without notice.

15. Printed Circuit Board (Real size)

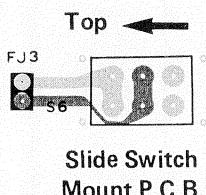
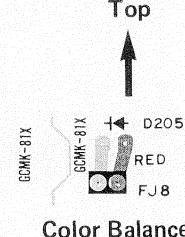
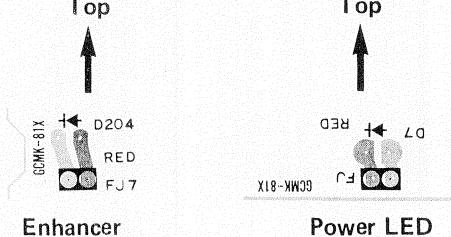
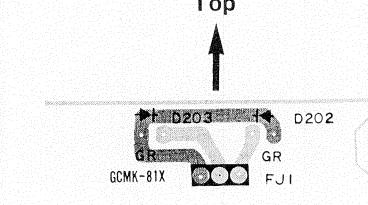


Main P.C. Board



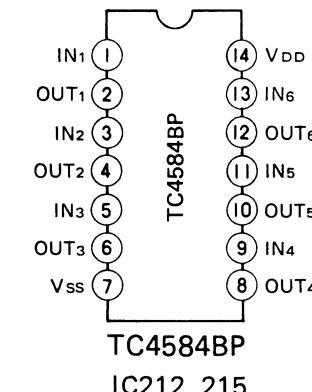
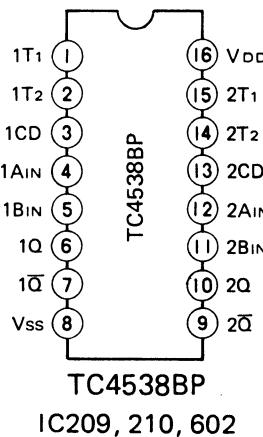
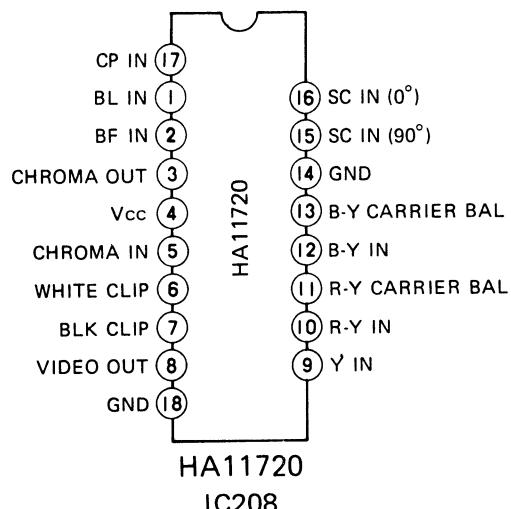
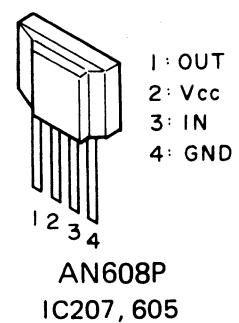
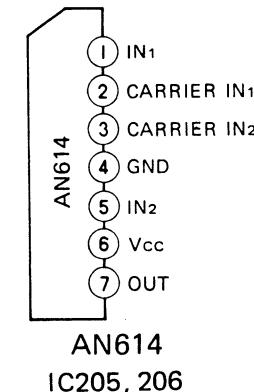
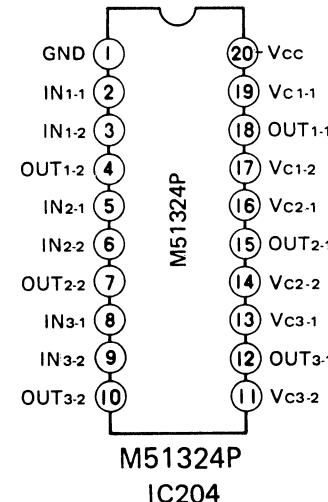
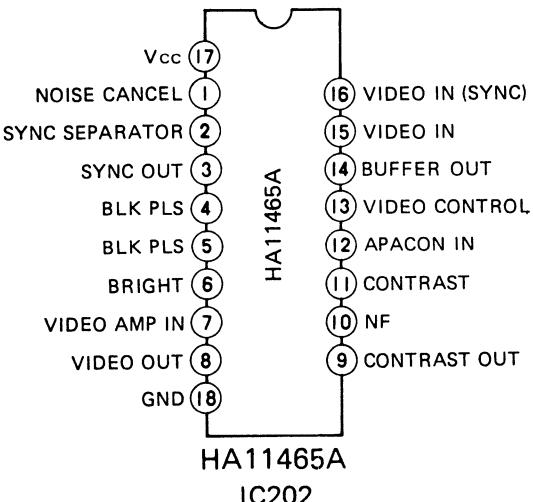
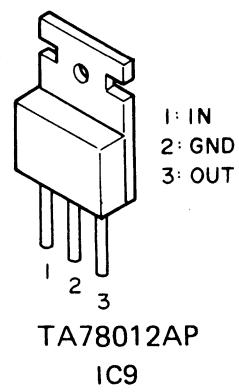
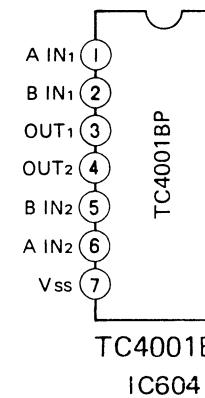
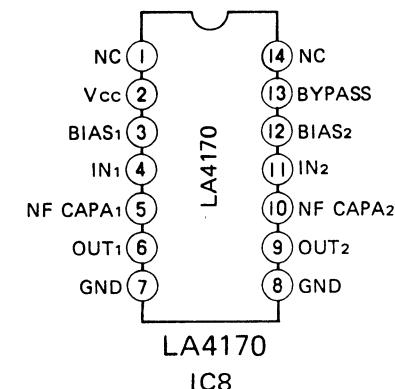
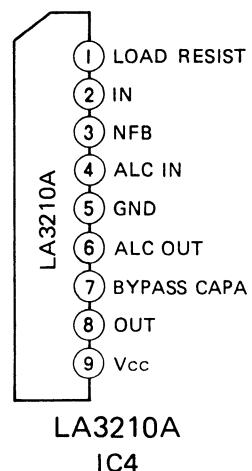
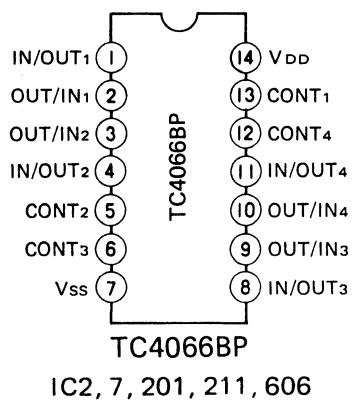
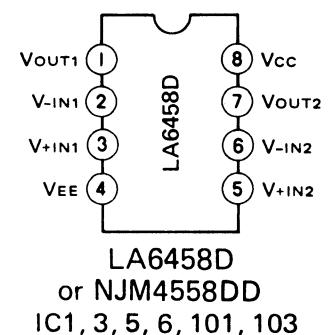
Front

Top

Slide Switch
Mount P.C.B.Color Balance
LED P.C.B.Enhancer
LED P.C.B.Power LED
P.C.B.Stick Controller
Mount P.C.B.

16. Pin Names of IC, etc.

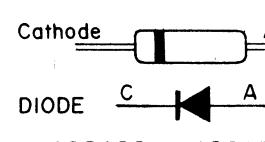
ICs



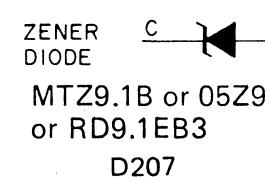
TRANSISTORS



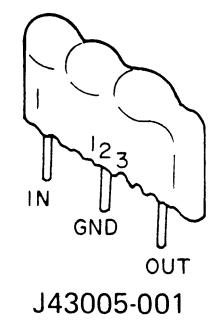
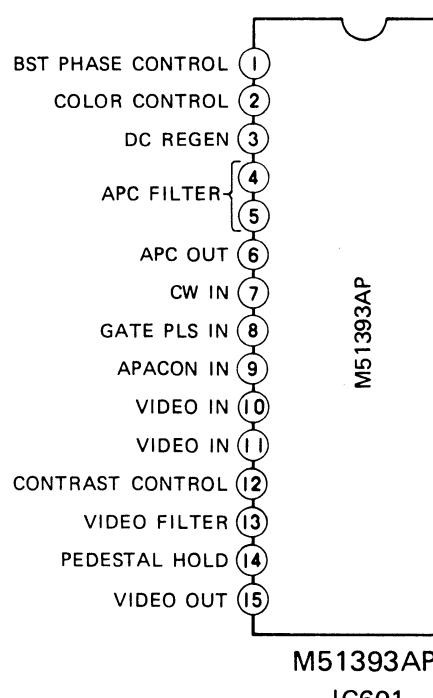
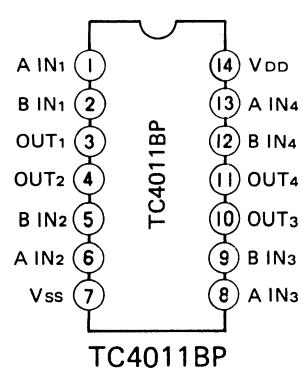
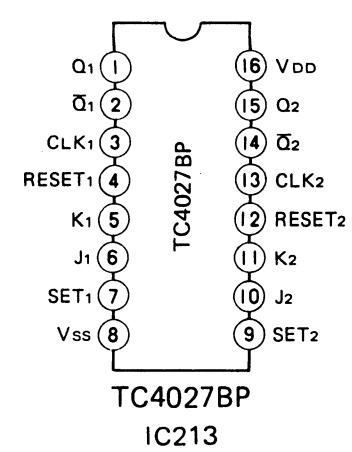
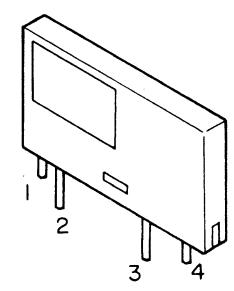
DIODES

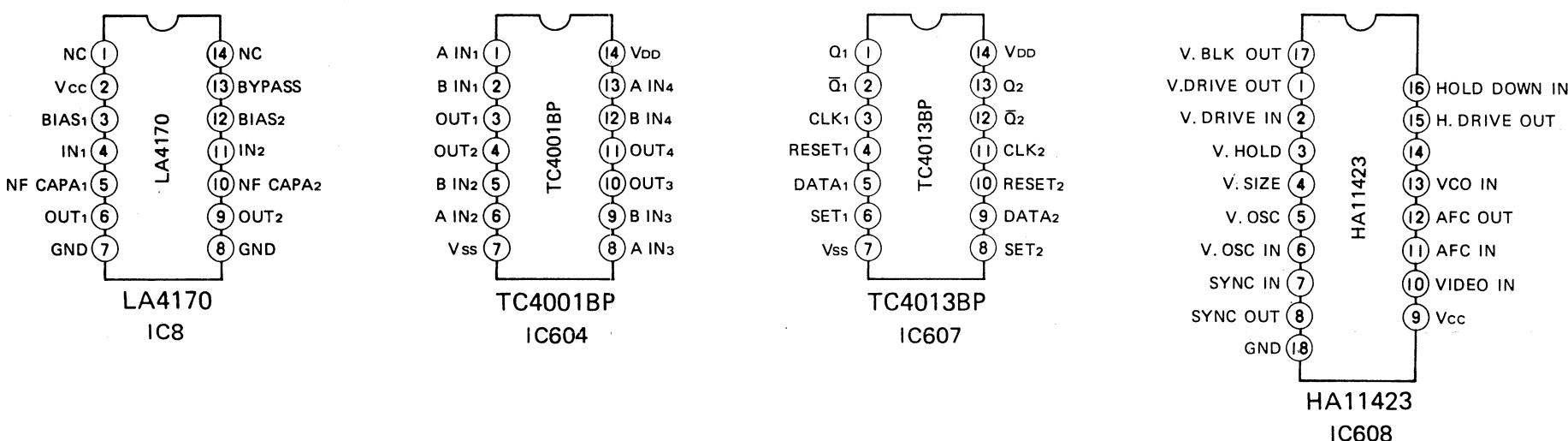
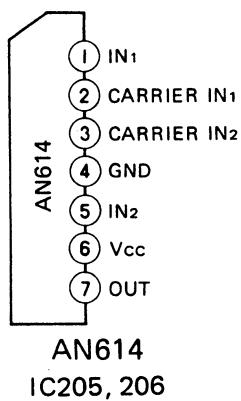


1SS133 or 1S207
D1, 2, 201, 206



TRANSFORMERS



**TRANSISTORS**

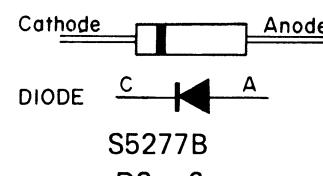
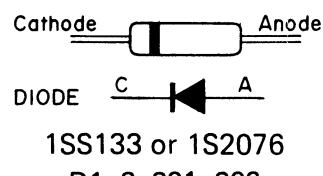
2SC1815(Y, GR) or 2SC828(Q, R)
Q1, 2, 5, 101, 102, 105, 201 ~ 204, 210,
214, 215, 218, 221 ~ 223, 225, 229,
230, 233 ~ 214, 243 ~ 253, 255 ~ 258,
260, 262, 264 ~ 271, 601 ~ 605

2SA1015(Y, GR) or 2SA564(Q, R)
Q4, 104, 211, 212, 216, 217, 219, 224,
228, 242, 254, 261

2SC752(O, Y)
Q220, 263

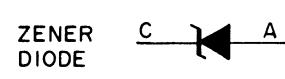
2SD655(E, F)
Q3, 103

DTC114ES
Q213, 272 ~ 277

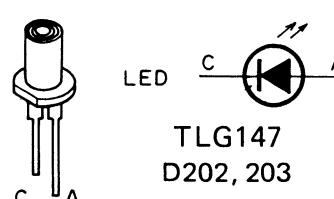
DIODES

1SS133 or 1S2076
D1, 2, 201, 206

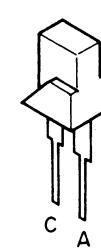
S5277B
D3 ~ 6



MTZ9.1B or 05Z9.1
or RD9.1EB3
D207

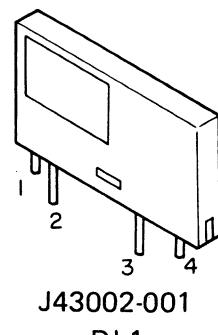


TLG147
D202, 203

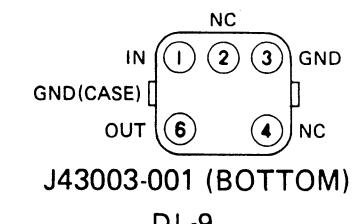
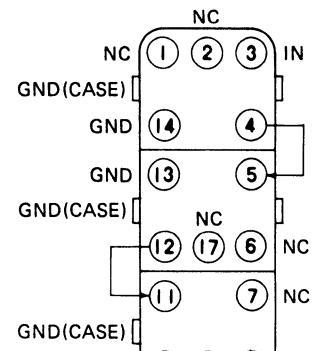
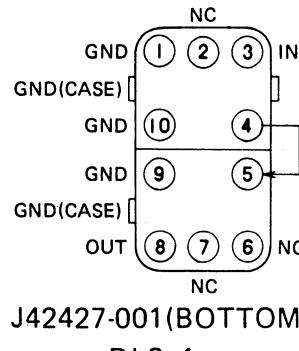


SEL1121R
D7

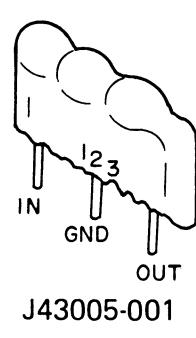
TLG147
D204, 205

TRANSFORMERS

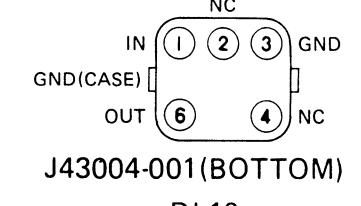
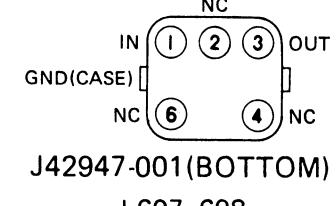
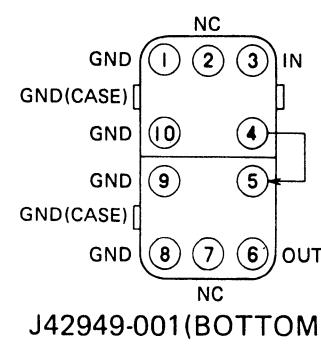
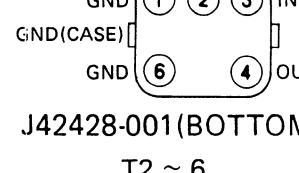
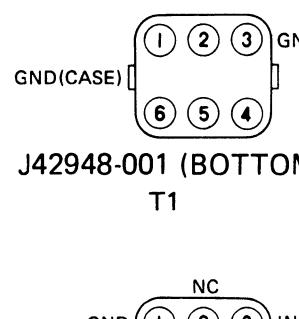
J43002-001
DL1



J42426-001B(BOTTOM)
DL5-B, DL7-B



J43005-001
DLT601



- 30 GND
- 29 CHROMA IN
- 28 BYPASS
- 27 ACC FILTER
- 26 KILLER/IDENT FILTER
- 25 B-Y IN
- 24 CHROMA OUT
- 23 R-Y IN
- 22 Vcc
- 21 B-Y OUT
- 20 R-Y OUT
- 19 G-Y OUT
- 18 BLK/FF
- 17 CW PHASE CONTROL
- 16 Y CONTROL