

84I

Service Manual

Digital FX Generator
WJ-AVE3



REF.NO.	PART NO.	DESCRIPTION
C50	ECEA1HKN010	Electrolytic 1 μ F 50V
C52	ECEA1EKN4R7	Electrolytic 4.7 μ F 25V
C54-57	ECEA1HKN010	Electrolytic 1 μ F 50V
C58	EP05X682MA	Ceramic 6800 pF
C59	EP05X332MA	Ceramic 3300 pF
C60	ECEA1EKN100	Electrolytic 10 μ F 25V
C64-66	ECEA1AKN220	Electrolytic 22 μ F 10V
C67	ECEA1CKS101	Electrolytic 100 μ F 16V
C68	YWUP05F104ZA	Ceramic 0.1 μ F
C69,70	ECEA1EKN100	Electrolytic 10 μ F 25V
C71,72	ECEA1AKN220	Electrolytic 22 μ F 10V
C81-84	ECEA1CKS101	Electrolytic 100 μ F 16V
C85	YWUP05F104ZA	Ceramic 0.1 μ F
C86	ECEA1EKN100	Electrolytic 10 μ F 25V
L1	ELESE220KA	Coil 22 μ H
SW1-5	EVQQTU05R	Push Switch
SW7-11	EVQQTU05R	Push Switch
SW14-37	EVQQTU05R	Push Switch
CN1	YWF795P010LA	10-pin Connector
CN2	YWF795P030LA	30-pin Connector
CN4	YWF795P034LA	Connector
CN3	YW530150510	Connector
M15	YWA2NA0257A4	Spacer

REF.NO.	PART NO.	DESCRIPTION
ACCESSORY PARTS/PACKAGING PARTS		
M31	YVV8QA2580AN	Operating Instructions
M35	XZB26X40C05	Polyethylene Bag
M36	XZB55X71C1	Polyethylene Bag
M37	YVV9CA1697AN	Packaging Assy for WJ-AVE3/A
	YVV9CB1697AN	Packaging Assy for WJ-AVE3/B
	YVV9CC1697AN	Packaging Assy for WJ-AVE3/C
	YVV9CD1697AN	Packaging Assy for WJ-AVE3/G

SPECIFICATIONS

- Source Input :
Video Input : 1.0 Vp-p/75 ohms PAL composite signal, BNC connector
Y/C Input : Y signal : 1Vp-p, C signal : 0.3 Vp-p, 75 ohms, Mini DIN 4 pin connector
-10 dBV/47 kohms, pin jack (Left and Right) x 1
- Superimpose Input :
Video Input : 1.0 Vp-p/75 ohms PAL composite signal, BNC connector
Y/C Input : Y signal : 1Vp-p, C signal : 0.3 Vp-p, 75 ohms, Mini DIN 4 pin connector x 1
- External Sound Input :
Mic Input (mono) : -60 dB/600 ohms, unbalanced, pin jack x 1
AUX Input : -10 dBV/47 kohms, pin jacks (Left and Right) x 1
- Character (TITLE) Input : 10 pin connector x 1 for optional Character Generator WJ-TTL5
- Recording Output :
Video Output : 1.0 Vp-p/75 ohms PAL composite signal, BNC connector
Y/C Output : Y signal : 1Vp-p, C signal : 0.3 Vp-p, 75 ohms, Mini DIN 4 pin connector x 1
0.5 dBV at fader maximum, pin jack (Left and Right)
-80 dBV - 0 dBV (8 ohms to 100 ohms), pin jack x 1
- Effects :
Video : Still, Strobe, Mosaic, Paint, Art, Negative, Fade-in/out, Superimpose, Squeeze, Position, A/V Synchro
Audio : Mix, Fade
Back Colours : White, Yellow, Cyan, Green, Magenta, Red, Blue, Black
Others : Graduation, Colour Correction
Gain : Unity (Video)
Signal-to-noise Ratio : Video : 46 dB (Composite), 46 dB (Y/C)
Power Source : Audio : 60 dB
220V AC - 240V AC, 50 Hz : WJ-AVE3/A, WJ-AVE3/B, WJ-AVE3/C, WJ-AVE3/G
Power Consumption : 8 W

Panasonic

Ambient Temperature : 0° - 40°C
 Ambient Humidity : Less than 90%
 Dimensions : 460 (W) x 71 (H) x 280 (D) mm
 Weight : 2.2 kg

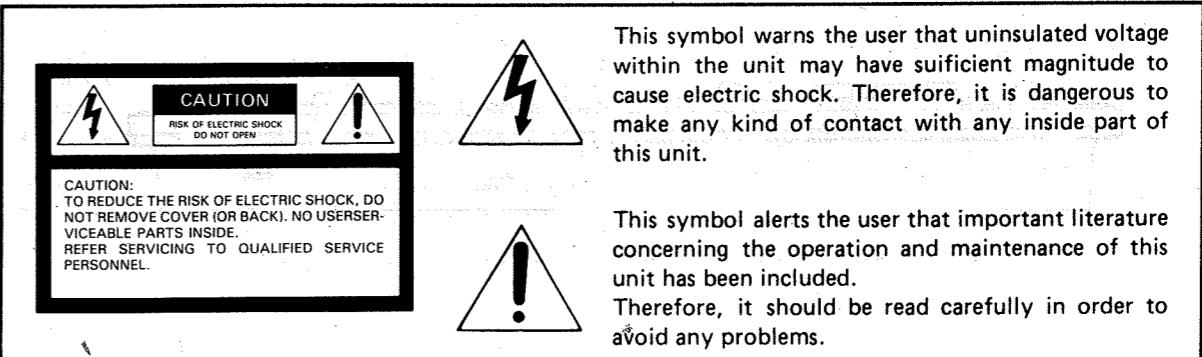
Weight and dimensions indicated are approximate.
 Specifications are subject to change without notice.

OPTIONAL ACCESSORY

Character Generator WJ-TTL5

CONTENTS

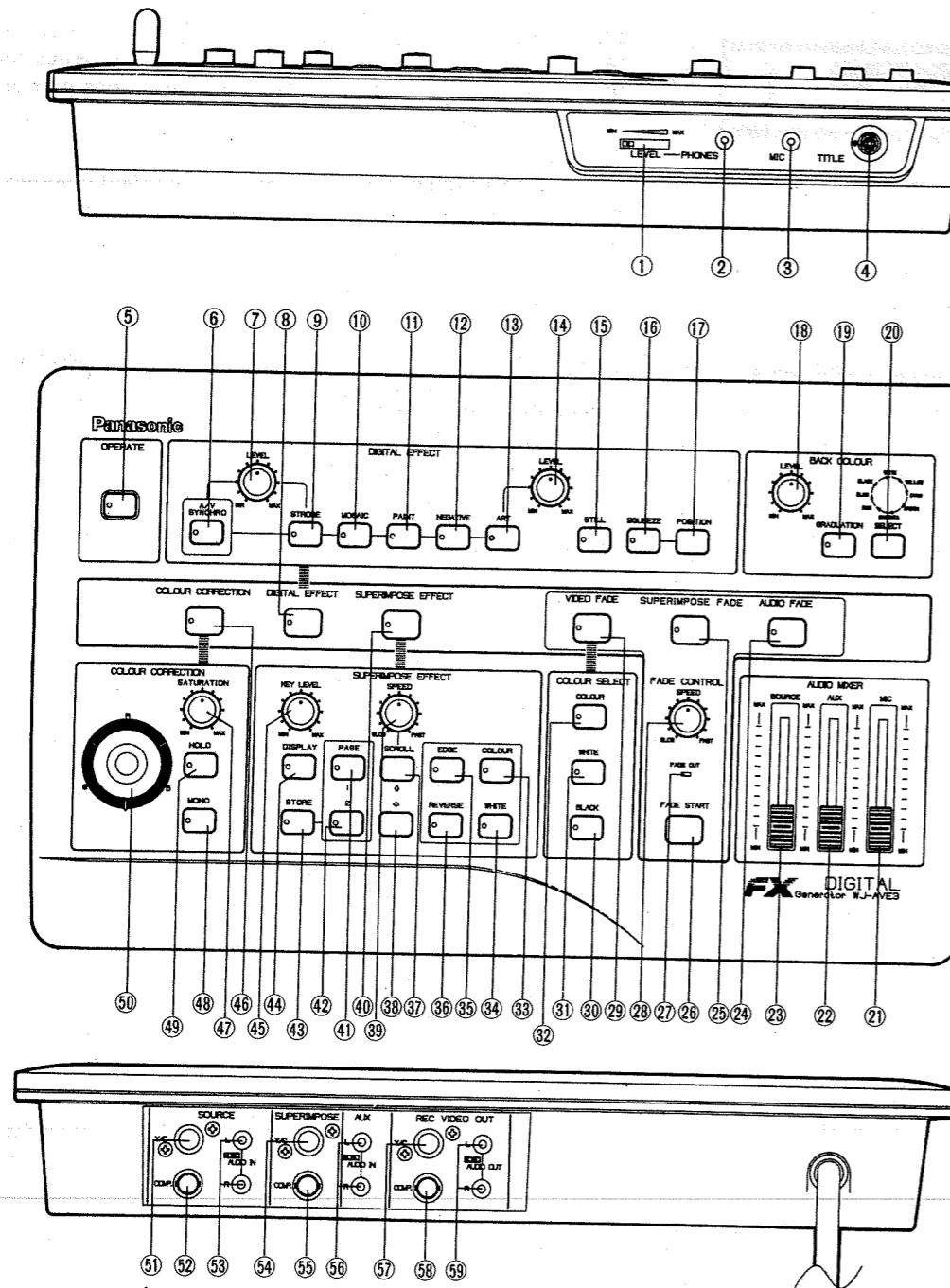
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IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are shaded on the schematic diagram and on the replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire, or other hazards. Do not modify the original design without permission of manufacturer.

MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS



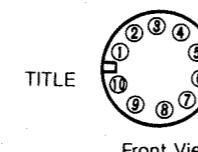
1. Headphone Level Control (LEVEL-PHONES)
Adjust the audio level of the head phone with this control.

2. Headphone Output Jack (PHONES)
Connect the Headphone (optional) having a 3.5 mm plug.

3. Microphone Input Jack (MIC)
Connect the Microphone (optional) having a 3.5 mm plug.

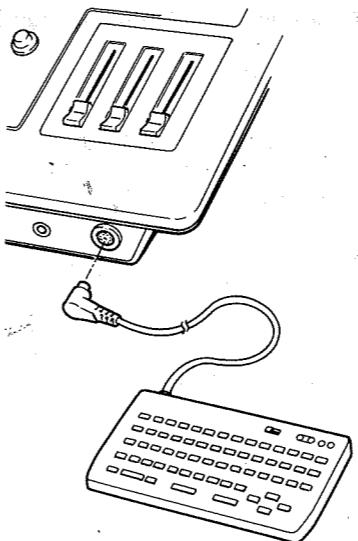
4. Title Input Connector (TITLE)
This connector is used to connect the optional Character Generator WJ-TTL5.

- (1) : Character IN
- (2) : Not used
- (3) : Ground
- (4) : Not used
- (5) : Sync out
- (6) : Not used
- (7) : Ground
- (8) : +9V OUT
- (9) : Ground
- (10) : Ground



Notes :

- During scrolling of titles in the smallest character size using WJ-TTL5, the point where new lines of character appear will gradually move up from the bottom of the screen to the middle of the screen.
- Connect the cable of the WJ-TTL5 to the Title Input Connector (4) as shown below.



5. Operation ON/OFF Button (OPERATE)

Press this button to turn on the power. The LED on this button lights. Also the LED's of the Digital Effect ON/OFF Button (8), the Black Fade Button (30) and the Colour Superimpose Button (33) light and their functions are selected automatically when the Operation ON/OFF Button is pressed.

Digital Effect

It is necessary to press the Digital Effect ON/OFF Button (8) to perform the functions from item-6 to item-17.

6. A/V Synchro Button (A/V SYNCHRO)

Any combination of 5 of the digital effects (Strobe, Mosaic, Paint, Negative or Art) can be synchronized to the pulse with certain levels of accompanying music or sound supplied to the Source Audio Input Jack (53), Auxiliary Audio Input Jacks (56) or Microphone Input Jack (3). The A/V Synchro functions for 0.5 seconds after being triggered. The LED on this button lights up when this button is pressed.

7. A/V Synchro Trigger/Strobe Interval Control (LEVEL, MIN/MAX)

This control has 2 functions. One is the control for the trigger sensitivity of the A/V Synchro. When this control is turned to the MAX position, the A/V Synchro will be triggered by higher level sounds. When this control is turned to the MIN position, the A/V Synchro will be triggered by low level sounds. The other function this control has is the Strobe Interval Control. The strobe interval can be changed by this control, when the Strobe Button (9) is selected, from 0.1 seconds (at MIN position) to 2.0 seconds (at MAX position). The strobe interval can not be changed when the A/V Synchro function is ON.

8. Digital Effect ON/OFF Button (DIGITAL EFFECT)

This is the Digital Effect on/off button. Only when this button is pressed (LED lights), the digital effects are functional.

9. Strobe Button (STROBE)

The video frames can be frozen intermittently, to achieve a strobe effect, by pressing this button (LED lights). The strobe interval can be adjusted by the A/V Synchro Trigger/Strobe Interval Control (7).

Note :

When the A/V Synchro function is ON, the strobe interval is fixed to 0.5 seconds.

10. Mosaic Button (MOSAIC)

By adding small squares in mosaic-like patterns a design or blurred image can be created. The size of the mosaic squares can be changed in 4 steps by pressing this button repeatedly (LED lights during 4 steps).

11. Paint Button (PAINT)

For a highly artistic effect, images can be transformed to resemble an oil painting of the video scene by pressing this button. The graduation of the paint effect can be changed in 4 steps by pressing this button repeatedly (LED lights during 4 steps).

12. Negative Button (NEGATIVE)

The on-screen image can be transposed to look like a negative of the image by pressing this button (LED lights).

13. Art Button (ART)

Any one of 8 colours can be added by pressing this button (LED lights) to the brightest portions of the on-screen picture. The key level is adjustable by the Art Level Control (14). Press the Back Colour Selection Button (20) to obtain the desired colour.

14. Art Level Control (LEVEL)

This control adjusts the key level of the Art function.

15. Still Button (STILL)

An instant still or frozen image of the video can be obtained by pressing this button (LED lights).

16. Squeeze Button (SQUEEZE)

A smaller version (approximately 1/4 the original size) of the full-size screen can be produced by pressing this button (LED lights).

17. Position Selector (POSITION)

This selector is used to change the position of the squeezed images in any one of 9 positions on the screen's black background by pressing this button repeatedly.

18. Back Colour Level Control (LEVEL)

This control adjusts the level of the colour which is selected by the Back Colour Selector (20).

19. Graduation Button (GRADUATION)

When this button is pressed, the LED lights up, the back colour of the upper portion on the screen is less intense and gradually increases to the lower portion of the screen.

20. Back Colour Selector (SELECT)

Any one of 8 back colours can be selected one after another by pressing this button repeatedly.

21. Microphone Audio Fader (MIC)

This fader adjusts the audio level of the microphone connected to the Microphone Input Jack (3).

22. Auxiliary Audio Fader (AUX)

This fader adjusts the audio level of the auxiliary audio input connected to the Auxiliary Audio Input Jack (56).

23. Source Audio Fader (SOURCE)

This fader adjusts the audio level of the source audio input connected to the Source Audio Input Jack (53).

24. Audio Fade Button (AUDIO FADE)

This is an automatic Audio Signal Fade on/off button. The audio signals on the Audio Mixer will be fading-in/out by pressing the Fade Start Button (26) when the Audio Fade function is ON (LED is lit).

25. Superimpose Fade Button (SUPERIMPOSE FADE)

This is an automatic Superimposed Video Fade on/off button. The superimposed images will be fading-in/out by pressing the Fade Start Button (26) when the Superimpose Fade function is ON (LED is lit).

26. Fade Start Button (FADE START)

This button is used to start the automatic synchronized fading of the Video Fade, Superimpose Fade and Audio Fade together, or in any combination.

27. Fade Out Indicator (FADE OUT)

When the fade-out is completed, this LED indicator blinks. When the fade-in starts after pressing the Fade Start Button (26) again, this LED indicator goes off.

28. Fade Speed Control (FADE CONTROL)

This control adjusts the automatic fading speed from 0.6 seconds (FAST) to 8.1 seconds (SLOW).

29. Video Fade Button (VIDEO FADE)

This is an automatic Source Video Fade on/off button. The source video signal will be fading-in/out by pressing the Fade Start Button (26) while Video Fade function is ON (LED is lit).

30. Black Fade Button (BLACK)

When this button is pressed, the LED lights. When a video fade is performed the video will fade to black.

31. White Fade Button (WHITE)

When this button is pressed, the LED lights. When a video fade is performed the video will fade to white.

32. Colour Fade Button (COLOUR)

When this button is pressed, the LED lights. When a video fade is performed the video will fade to any one of 8 colours, solid or graded selected by the Graduation Button (19) and the Back Colour Selector (20).

Superimpose Effects

It is necessary to press the Superimpose Effect ON/OFF Button (40) to perform the functions from item-33 to item-45.

33. Colour Superimpose Button (COLOUR)

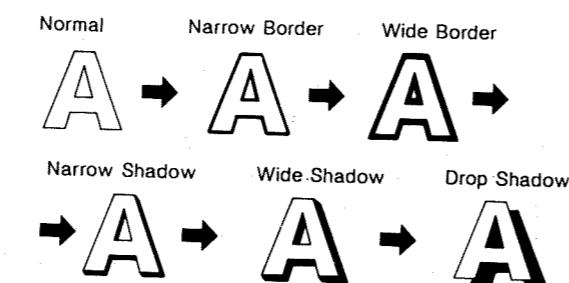
This button is used to colour the superimposed images (LED lights). You can select any one of 8 colours, solid or graded by pressing the Graduation Button (19) and the Back Colour Selector (20).

34. White Superimpose Button (WHITE)

When this button is pressed, the LED lights, the white superimposed images will be obtained.

35. Edge Selector (EDGE)

Two types (shadow, border) and five kinds of edges are available by this selector as shown. The LED lights when one of edges is selected.

**Notes :**

1. When the superimposed images are white, you can colour the edge to any one of 8 colours, solid or graded by pressing the Graduation Button (19) and the Back Colour Selector (20).
2. When the coloured superimposed images are used, the edge colour is always black.

36. Reverse Button (REVERSE)

The superimposed images and background can be reversed by pressing this button (LED lights). However, the stored superimposed images can not be reversed.

37. Scroll Up Button (SCROLL ↑)

The stored superimposed images can be scrolled up the screen and removed from the screen by pressing this button. To return the images on the screen again, press this button one more time.

38. Scroll Left Button (SCROLL ←)

The stored superimposed images can be scrolled to the left on the screen and removed from the screen by pressing this button. To return the images on the screen again, press this button one more time.

39. Scroll Speed Control (SPEED)

This control adjusts the scrolling speed from 0.6 seconds to 8.1 seconds.

40. Superimpose Effect ON/OFF Button (SUPERIMPOSE EFFECT)

This is the Superimpose Effect on/off button. Only when this button is lit, the overall superimpose effects become available.

41. Memory Page 1 Button (PAGE 1)

This button has 2 functions. One is to memorize the superimposed image into the memory page 1, the other one is to recall the image from it.

42. Memory Page 2 Button (PAGE 2)

This button has 2 functions. One is to memorize the superimposed image into the memory page 2, the other one is to recall the image from it.

43. Store Button (STORE)

It is necessary to press this button to enter an image into memory. This button should be pressed before the Memory Page 1 Button (41) or the Memory Page 2 Button (42).

44. Display Button (DISPLAY)

The superimpose video signal supplied to the Superimpose Input Connector/Jack on the rear panel will be displayed on the screen by pressing this button (LED lights). The Superimpose Effect ON/OFF Button (40) should be pressed at this time to perform the Display function.

45. Superimpose Key Level Control (KEY LEVEL)

This control adjusts the key level of the superimpose video signal.

Colour Correction

It is necessary to press the Colour Correction ON/OFF Button (46) to perform the functions from item-46 to item-50.

46. Colour Correction ON/OFF Button (COLOUR CORRECTION)

This is the Colour Correction on/off button. Only when this button is pressed (LED lights), the overall colour correction becomes available.

47. Colour Saturation Control (SATURATION)

This control adjusts the colour level of the images of the Source Video Signal. When this control is set to the MAX position, it generates the equal colour level to the Source Video Signal.

48. Mono Colour Selector (MONO)

When this button is pressed, the LED lights. The Source Video Signal becomes a single colour. The RGB Joystick is used to select the colour. Placing the joystick in the center makes the video signal Black and white.

49. Colour Hold Button (HOLD)

The colour selected by the RGB Joystick (50) can be held by pressing this button (LED lights).

50. RGB Joystick (R/G/B)

This Joystick permits you to balance or change the tint of the images of the Source Video Signal by moving its position. When this Joystick is positioned at center, it generates the original colour of the Source Video Signal.

Inputs/Outputs**51. Y/C Source Input Connector (SOURCE Y/C)**

This source input connector is for use with S-VHS products. Use a S-Video Cable (4 pin) to feed the S-Video Signal to this connector.

52. Composite Video Source Input Connector (SOURCE COMP.)

This source input connector is for use with standard video connections. Use shielded video cable (75 ohms) to feed the video signal to this connector.

53. Source Audio Input Jacks (SOURCE AUDIO IN)

A stereo audio signal can be used for these jacks. When monaural audio is to be used, connect it to the L-channel. The monaural audio output can be obtained at both R-channel and L-channel Audio Output Jacks (59).

54. Y/C Superimpose Input Connector (SUPERIMPOSE Y/C)

This superimpose input connector is for a S-VHS type camera. Use a S-Video Cable (4 pin) to feed the S-Video Signal to this connector.

55. Camera Superimpose Input Connector (SUPERIMPOSE COMP.)

This superimpose input connector is for a video signal from a standard camera. Use a shielded cable (75 ohms) to feed the video signal to this connector.

56. Auxiliary Audio Input Jacks (AUX AUDIO IN)

A stereo audio signal can be used for these jacks. When monaural audio is to be used, connect it to the L-channel. The monaural audio output can be obtained at both R-channel and L-channel Audio Output Jacks (59).

57. Y/C Video Output Connector (REC VIDEO OUT Y/C)

This is the recording output connector for the S-VHS VTR. Use a S-Video Cable (4 pin) to supply the S-Video Signal to the S-VHS VTR.

58. Composite Video Output Connector (REC VIDEO OUT COMP.)

This is the recording output connector for the standard VTR. Use a shielded video cable (75 ohms) to supply the video signal to the VTR.

59. Audio Output Jacks (AUDIO OUT)

The stereo audio signal can be obtained at these connectors for recording.

CIRCUIT DESCRIPTION

1. POWER BOARD

This board receives AC power through the power cord and regulates +5V DC, +12V DC and -12V DC voltage.

AC power is rectified by D1, DC appears at cathodes side of D1, therefore supplying current through R2 and R9 turns the switching transistor Q1 ON.

As a result, the voltage is applied to the primary winding (connecting between pins P2 and P1) of T1 and the bias voltage is generated at the bias coil (connecting between pins V2 and V1) of T1 due to induction.

2. SWITCH BOARD

This board contains the key scanning section and the audio signal control/mixing section.

2-1 Key Scanning Section

This circuit sends out all control signals to the Main board by pressing the switches on this board. At the same time, LEDs light by pressing the switches.

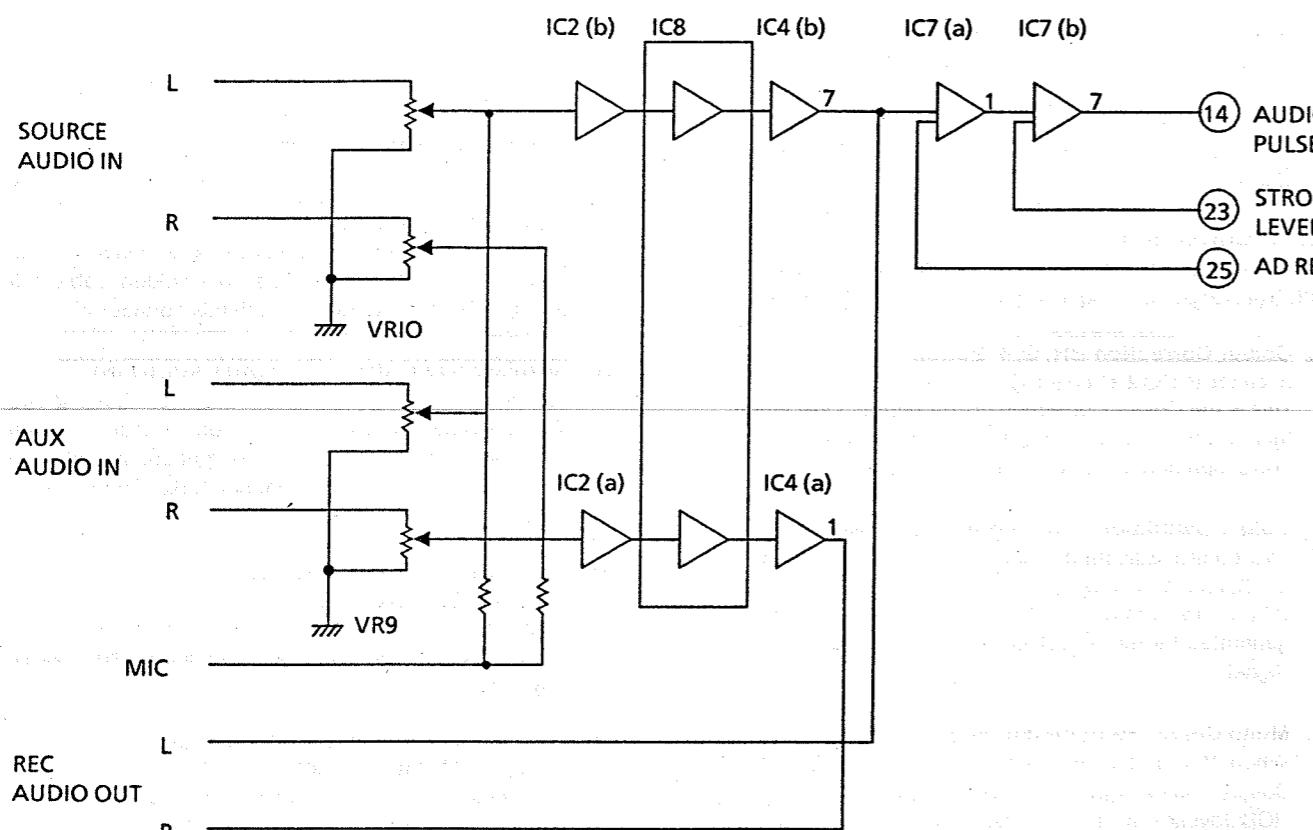


Fig. 3-1 A/V Synchro Block

2-2 Audio Signal Section

The audio amplifier circuit mixes the SOURCE AUDIO IN (L/R) and AUX AUDIO IN (L/R) signals and obtains the REC AUDIO OUT (L/R) on the rear panel and the HEADPHONE OUT on the front panel.

3. MAIN BOARD

3-1 A/V synchro circuit

The audio signal from SOURCE AUDIO IN (L/R) or AUX AUDIO IN (L/R) are fed through VR9, VR10, IC2 (b), IC8 and IC4 (b).

The audio signal obtained at pin 7 of IC4 (b) is fed though IC7 (a) to IC7 (b) and this audio synchro slice level is compared with A/V synchro strobe level from pin 23 of E4.

The obtained audio pulse from pin 7 of IC7 is fed though Q21 to pin 14 of E4 and supplied to pin 25 of IC21.

This audio pulse controls the IC21 (MICON) for A/V synchro.

3-2 Audio fade circuit

The Audio fade control voltage from pin 15 of E4 is fed to pin 5 and pin 10 of IC8 on the switch board.

This control signal controls the audio output signal from pin 2 and pin 13 of IC8.

3-3 Analog Signal Section

3-3-1 A/D Converter Circuit

This circuit consisting of IC1, IC2, IC12, IC13, IC14, Q34, IC17, Q35, IC18 and IC19 and convert the analog Y and C (R-Y, B-Y) signal into 7 bits digital signal.

The R-Y & B-Y signals are selected alternately by 2.4 MHz (156fH) Pulse fed to pin 10 of IC11 so that the R-Y and B-Y signals are chopped into 128 bits per line.

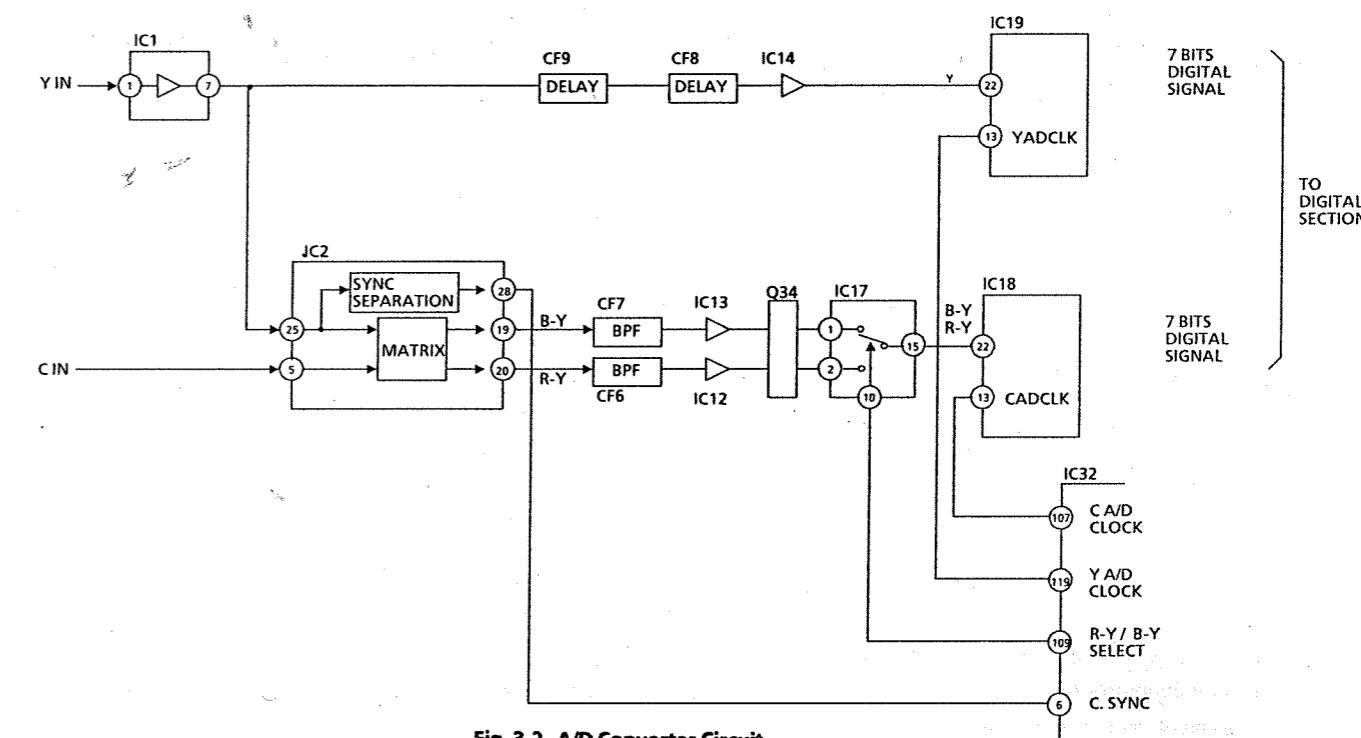


Fig. 3-2 A/D Converter Circuit

The R-Y & B-Y signal is then fed to pin 22 of A/D converter IC18 and converted into 7 bits digital signal (CAD1-CAD7) fed to pins 99-105 of Memory write control gate array IC32.

The Y signal is also fed to the other A/D converter IC19 in order to convert Y signal into 7 bits digital signal and 512 bits per line.

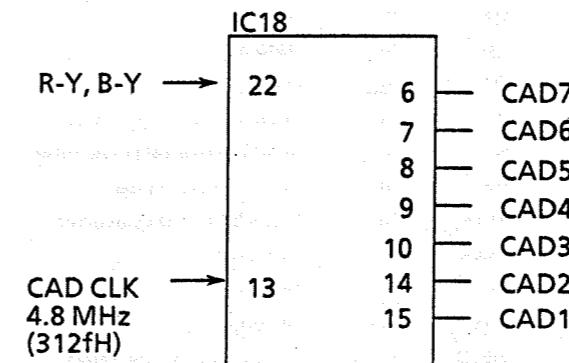


Fig. 3-3 Chroma A/D Conversion

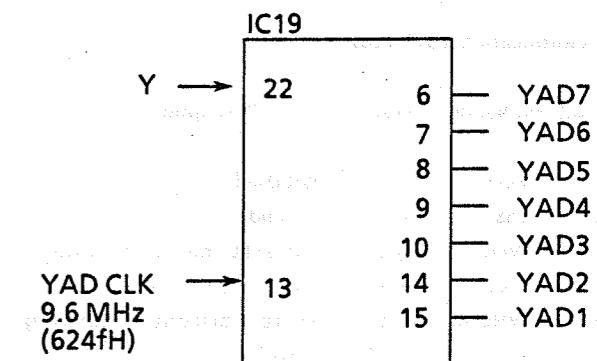


Fig. 3-4 Luminance A/D Conversion

3-1-2 D/A Converter Circuit

This circuit is consisting of IC37, C4, IC6, RA1 and RA3 and convert the 8 bit digital signals of Y, R-Y, B-Y signals into pin identification of IC37.

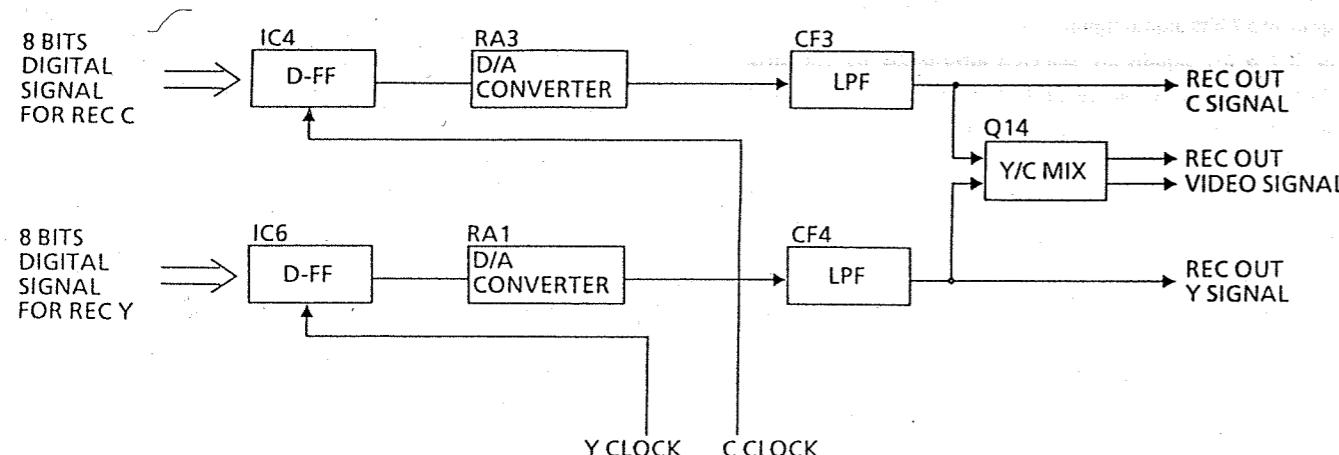


Fig. 3-5 D/A Converter Circuit

4 Digital Signal Section

This circuit consisting of the following IC's and their functions are as follows.

4-1 Memory Control IC

Memory Control IC (MN53040LVX3) has the following functions and generators inside it.

- (a) Clock Pulse Generator for A/D Converter
- (b) Clamp Pulse Generator for A/D Converter
- (c) Blanking Signal Generator for Decoder
- (d) Control Pulse Generator for Memory IC (M5M4C500L)
- (e) Picture in Picture Function
- Mosaic Function
- Still Function
- Strobe control Function
- Squeeze Function
- Paint Function

Pin identification is as follows.

Pin No.	Pin Name	In/Out	Description
1	VCO	—	Not Used
2	VSS	—	Ground
3	WPC	Out	Write PLL Phase Comparator
4	WCLMP	Out	Write Clamp Pulse
5	WHBLK	Out	Write Horizontal Blanking Pulse
6	EXSYNC	In	External Sync from Sync Separator
7	ST	In	Strobe Pulse for Data Latch Gate
8	REG0	In	Register 0
9	REG1	In	Register 1
10	REG2	In	Register 2
11	REG3	In	Register 3
12	D0	In	Data 0
13	D1	In	Data 1
14	BS	In	B ch/A ch Select (H : B ch, L : A ch)
15	VDD	In	+5V DC Power
16	HIGH	In	Resolution High/Low Control (H : 14.3MHz, L : 9.6MHz)
17	VSS	—	Ground
18	D2	In	Data 2
19	D3	In	Data 3
20	D4	In	Data 4
21	D5	In	Data 5
22	D6	In	Data 6
23	D7	In	Data 7
24	V	In	Read Vertical Drive Pulse
25	H	In	Read Horizontal Drive Pulse
26	HS	In	Read H. Reset Pulse
27	YCLK	In	Y Clock for A/D Converter
28	YCLK	—	Not Used
29	RCLK	—	Not Used
30	VSS	—	Ground
31	FIELD	In	Field/Frame Mode Select (H : Field, L : Frame)
32	RST	In	Reset for Initialize
33	ANOTH	Out	Picture in Picture Pulse

34	YCD7	Out	Y. Chroma Data 7	87	CTM3	Out	Chroma Data 3
35	YCD6	Out	Y. Chroma Data 6	88	CTM2	Out	Chroma Data 2
36	YCD5	Out	Y. Chroma Data 5	89	CTM1	Out	Chroma Data 1
37	YCD4	Out	Y. Chroma Data 4	90	CTM0	Out	Chroma Data 0
38	YCD3	Out	Y. Chroma Data 3	91	YTM7	Out	Y Data 7
39	YCD2	Out	Y. Chroma Data 2	92	YTM6	Out	Y Data 6
40	YCD1	Out	Y. Chroma Data 1	93	YTM5	Out	Y Data 5
41	YCD0	Out	Y. Chroma Data 0	94	YTM4	Out	Y Data 4
42	MC3	In	Memory Chroma Data 3	95	YTM3	Out	Y Data 3
43	MC2	In	Memory Chroma Data 2	96	YTM2	Out	Y Data 2
44	MC1	In	Memory Chroma Data 1	97	YTM1	Out	Y Data 1
45	MC0	In	Memory Chroma Data 0	98	YTM0	Out	Y Data 0
46	VSS	—	Ground	99	CAD7	In	A/D Chroma Data 7
47	PAL	In	NTSC or PAL (H : PAL, L : NTSC)	100	CAD6	In	A/D Chroma Data 6
48	VDD	In	+5V DC Power	101	CAD5	In	A/D Chroma Data 5
49	MY7	In	Memory Y Data 7	102	CAD4	In	A/D Chroma Data 4
50	MY6	In	Memory Y Data 6	103	CAD3	In	A/D Chroma Data 3
51	MY5	In	Memory Y Data 5	104	CAD2	In	A/D Chroma Data 2
52	MY4	In	Memory Y Data 4	105	CAD1	In	A/D Chroma Data 1
53	MY3	In	Memory Y Data 3	106	CAD0	In	A/D Chroma Data 0
54	MY2	In	Memory Y Data 2	107	CADCK	Out	Clock for Chroma A/D Converter
55	MY1	In	Memory Y Data 1	108	VDD	In	+5V DC Power
56	MY0	In	Memory Y Data 0	109	CSL	Out	Clock for R-Y, B-Y Switching
57	VSS	—	Ground	110	VSS	—	Ground
58	VDD	In	+5V DC Power	111	YAD7	In	A/D Y Data 7
59	OEFP3	Out	Output Enable 3 (Positive)	112	YAD6	In	A/D Y Data 6
60	OEFP2	Out	Not used	113	YAD5	In	A/D Y Data 5
61	OEFP1	Out	Output Enable 1 (Positive)	114	YAD4	In	A/D Y Data 4
62	OEFN3	Out	Output Enable 3 (Negative)	115	YAD3	In	A/D Y Data 3
63	OEFN2	Out	Not used	116	YAD2	In	A/D Y Data 2
64	OEFN1	Out	Output Enable 1 (Negative)	117	YAD1	In	A/D Y Data 1
65	SOC3	Out	Serial Output Clock 3	118	YAD0	In	A/D Y Data 0
66	SOC2	Out	Serial Output Clock 2	119	YADCK	Out	Clock for Y A/D Converter
67	SOC1	Out	Serial Output Clock 1	120	WHR	—	Not Used
68	VSS	—	Ground	121	2S	—	Not Used
69	VDD	In	+5V DC Power	122	SOR	—	Not Used
70	SIC3	—	Not Used	123	VDD	In	+5V DC Power
71	SIC2	Out	Serial Input Clock 2	124	VCO	In	Voltage Controlled Oscillator for Write Clock
72	SIC1	Out	Serial Input Clock 1				
73	RAS	Out	Row Address Set Pulse				
74	CAS	Out	Column Address Set Pulse				
75	A0	Out	Address 0				
76	A1	Out	Address 1				
77	VSS	—	Ground				
78	TEST	In	Ground				
79	VDD	In	+5V DC Power				
80	A2	Out	Address 2				
81	A3P	—	Not used				
82	A3N	Out	Address 3 (Negative)				
83	A4	Out	Address 4				
84	A5	Out	Address 5				
85	A6	Out	Address 6				
86	A7	Out	Address 7				

4-2 Memory IC

The capacity of Memory IC (YWM5M4C500L) is
6(Graduation) x 256(Horizontal) x 320(Scanning line) (Max)
= 491520 bits/chip.

The assignment of 8 memories is as follows.

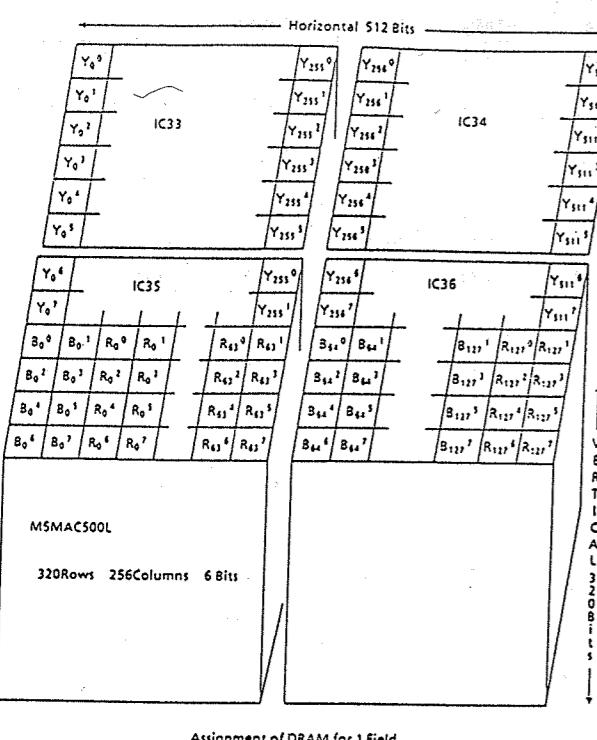


Fig. 4-1 Assignment of Memory IC

Pin identification is as follows.

Pin No.	Pin Name	In/Out	Description
1	VSS	---	Ground
2	SID1	In	Data 1
3	SID2	In	Data 2
4	SID3	In	Data 3
5	SOD1	Out	Memory Data 1
6	SOD2	Out	Memory Data 2
7	SOD3	Out	Memory Data 3
8	SOD4	Out	Memory Data 4
9	SOD5	Out	Memory Data 5
10	SOD6	Out	Memory Data 6
11	SID4	In	Data 4
12	SID5	In	Data 5
13	SID6	In	Data 6
14	IR7/A7	In	Address 7
15	IR6/A6	In	Address 6
16	IR5/A5	In	Address 5
17	IR4/A4	In	Address 4
18	IR3/A3	In	Address 3

19	IR2/A2	In	Address 2
20	IR1/A1	In	Address 1
21	A8/A0	In	Address 0
22	IRS/CAS	In	Column Address Set Pulse
23	RAS/IRE	In	Row Address Set Pulse
24	SIC	In	Serial Input Clock
25	SOC	In	Serial Output Clock
26	SIE	---	Ground
27	SOE	In	Output Enable-1 (Positive)
28	VCC	In	+ 5V DC Power

34	DATA2	In	Data 2
35	DATA1	In	Data 1
36	DATA0	In	Data 0
37	VSS	---	Ground
38	REG2	In	Register 2
39	VDD	In	+ 5V DC power
40	REG1	In	Register 1
41	REG0	In	Register 0
42	ST	In	Strobe Pulse for Data Latch Gate
43	TIN1	In	Ground
44	TIN2	In	Ground
45	CSEL	In	
46	PCO	Out	Phase comparitor
47	SVDD	In	+ 5V DC power
48	SVSS	---	Ground
49	OSCI	In	
50	---	---	Not used
51	VSS	---	Ground
52	OSCO	Out	
53	SVSS	---	Ground
54	CLK9	Out	
55	SVDD	In	+ 5V DC power
56	RCLK	Out	
57	SVSS	---	Ground
58	MCKA19	Out	
59	SVDD	In	+ 5V DC power
60	SVSS	---	Ground
61	EDGE	Out	Edge
62	SVSS	---	Ground
63	CHR	Out	Character
64	SVDD	In	+ 5V DC power
65	TIN4	In	Ground
66	VGRA7	Out	
67	VGRA6	Out	
68	VGRA5	Out	
69	VGRA4	Out	
70	VGRA3	Out	
71	VGRA2	Out	
72	VGRA1	Out	
73	SVDD	In	+ 5V DC power
74	TIN3	In	Ground
75	PAL	In	Ground
76	VSS	---	Ground
77	HRST	Out	
78	HREF	Out	Not used
79	V	In	Vertical Drive Pulse
80	H	In	Horizontal Drive Pulse
81	CH1	In	Character 1H
82	CH2	In	+ 5V DC power
83	TITLE	In	Title
84	TEST0	Out	Not used
85	TEST1	Out	Not used
86	TEST2	Out	Not used

87	VDD	In	+ 5V DC power
88	RST	In	+ 5V DC power
89	VSS	---	Ground
90	TEST3	Out	Not used
91	TEST4	Out	Not used
92	TEST5	Out	Not used
93	TEST6	Out	Not used
94	TEST7	Out	Not used
95	TEST8	Out	Not used
96	TEST9	Out	Not used
97	CK	In	Not used
98	SUDD	In	+ 5V DC power
99	MCLK19	Out	clock
100	---	---	Not used

4-3 Title Memory/Edge/Scroll

This IC (MN53020LBQ2) has the following functions inside it.

- Title Memory Function
- Edge Selector Function
- Scroll Function

Pin No. Pin Name In/Out Description

1	VSS	---	Ground
2	RASWN	Out	RASWN
3	LM4H	In	Line memory 4
4	LM3H	In	Line memory 3
5	LM2H	In	Line memory 2
6	LM1H	In	Line memory 1
7	LM0H	In	Line memory 0
8	ADD9	Out	Address 9
9	SVSS	---	Ground
10	CAS	Out	Column address strove
11	SVDD	In	+ 5V DC power
12	RAMD0	Out	RAM Data Out
13	RAMD1	In	RAM Data In
14	SVSS	---	Ground
15	WEN	Out	Write Enable
16	RAS	Out	Road Address strove
17	ADD0	Out	Address 0
18	ADD1	Out	Address 1
19	ADD2	Out	Address 2
20	ADD3	Out	Address 3
21	ADD4	Out	Address 4
22	ADD5	Out	Address 5
23	ADD6	Out	Address 6
24	ADD7	Out	Address 7
25	ADD8	Out	Address 8
26	VSS	---	Ground
27	TSEL1	In	Ground
28	TSEL2	In	Ground
29	DATA7	In	Data 7
30	DATA6	In	Data 6
31	DATA5	In	Data 5
32	DATA4	In	Data 4
33	DATA3	In	Data 3

4-4 Back Color/Art/Colorcorrect/Superimpose/Negative/Fade control IC

This IC (MN53080LBR1) has the following functions inside it.

- Back color control Function
- Art control Function
- Color correct Function
- Superimpose Function
- Negative Function
- Fade control Function

Pin No. Pin Name In/Out Description

1	VSS	---	Ground
2	VI	In	Read Vertical Drive pulse
3	F4SCI	In	F4 SC1
4	BSCI	In	B SCI
5	BLKI	In	Blanking I
6	BFPI	In	Burst Flag Pulse
7	LSWI	---	L switch I
8	TSELOI	---	Ground
9	TSEL1I	---	Ground
10	TSEL2I	---	Ground
11	NC11	---	Ground
12	GRA0I	In	+ 5V DC Power
13	GRA1I	In	Gra 1I
14	SVDD	In	+ 5V DC Power
15	VDD	In	+ 5V DC Power
16	TESTYI	---	Ground
17	VSS	---	Ground
18	GRA2I	In	Gra 2I
19	GRA3I	In	Gra 3I
20	GRA4I	In	Gra 4I
21	GRA5I	In	Gra 5I
22	GRA6I	In	Gra 6I
23	GRA7I	In	Gra 7I
24	CHRI	In	Chr I
25	BLCHRI	In	Edge I
26	SVDD	In	+ 5V DC Power

27	S VSS	---	Ground	SDV	Out	Not used
28	YCLK21	---	Yclk 21			
29	YCLKI	In	Ground	Y clock for A/D Converter		
30	RCLKI	In	Ground	R clock for A/D Converter		
31	VDD	In	Ground	+ 5V DC Power		
32	VSS	---	Ground			
33	DATA7I	---	Data 7I			
34	DATA6I	---	Data 6I			
35	DATA5I	---	Data 5I			
36	DATA4I	---	Data 4I			
37	DATA3I	---	Data 3I			
38	DATA2I	---	Data 2I			
39	DATA1I	---	Data 1I			
40	DATA0I	---	Data 0I			
41	REG3I	---	Reg 3I			
42	REG2I	---	Reg 2I			
43	REG1I	---	Reg 1I			
44	REG0I	---	Reg 0I			
45	STI	---	ST 2I			
46	VSS	---	Ground			
47	PALI	In	+	+ 5V DC Power		
48	VDD	In	+	+ 5V DC Power		
49	TCK1I	---	Ground			
50	TCK2I	---	Ground			
51	TD15I	---	Ground			
52	TD14I	---	Ground			
53	TD13I	---	Ground			
54	VIDEO1I	In	Video 0I			
55	VIDEO11I	In	Video 1I			
56	VIDEO2I	In	Video 2I			
57	VIDEO3I	In	Video 3I			
58	VIDEO4I	In	Video 4I			
59	VIDEO5I	In	Video 5I			
60	VIDEO6I	In	Video 6I			
61	VIDEO7I	In	Video 7I			
62	VDD	In	+	+ 5V DC Power		
63	VSS	---	Ground			
64	TD12I	---	Ground			
65	TD11I	---	Ground			
66	TD10I	---	Ground			
67	TD9I	---	Ground			
68	TD8I	---	Ground			
69	TD7I	---	Ground			
70	TD6I	---	Ground			
71	TD5I	---	Ground			
72	TD4I	---	Ground			
73	TD3I	---	Ground			
74	TD2I	---	Ground			
75	TD1I	---	Ground			
76	TD0I	---	Ground			
77	VSS	---	Ground			
78	TESTZI	---	Ground			
79	VDD	In	+	+ 5V DC Power		
80	TEST150	Out	Not used			

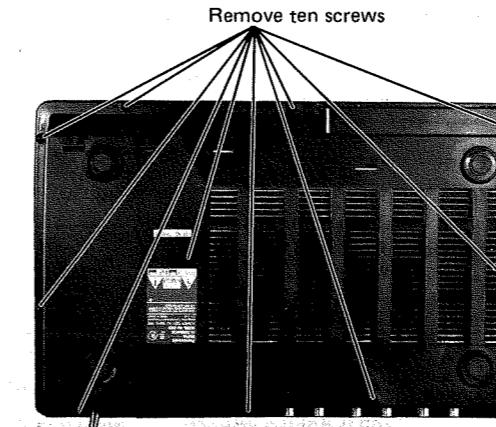
ADJUSTMENT PROCEDURE

1. Test Equipment Required

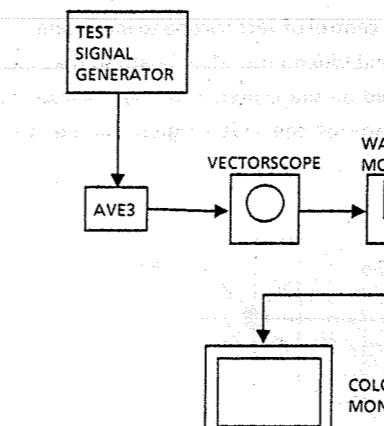
- Oscilloscope (Dual trace, Delayed sweep, 50MHz bandwidth)
- Digital voltmeter
- Frequency counter (More than 7 digits)
- Underscanned color video monitor
- Test signal generator (Color bar and Cross hatch signals)
- Waveform monitor
- Vectorscope
- Audio generator

2. Disassembling Procedure for adjustment

- Remove ten screws holding the edge of top cover and open the top cover.
- Remove the top shield cover.



3. Connection



- Connect the coaxial cable between the REC VIDEO OUT connector on the rear panel of WJ-AVE3 and the VIDEO IN connector of the waveform monitor.

- Connect the coaxial cable between the other VIDEO IN connector of the waveform monitor and the VIDEO IN connector of the vectorscope.
- Terminate the other VIDEO IN connector of the vectorscope with the 75-ohm terminator.
- Connect the coaxial cable between the VIDEO OUT connector of the waveform monitor and the VIDEO IN connector of the color video monitor.
- Terminate the other VIDEO IN connector of the color video monitor with 75 ohms.

4. Adjustment Procedure

- Refer to LOCATION OF TEST POINTS AND ADJUSTING CONTROLS.

(1) +5V adjustment

Test point: TP26 (+5V) Main board
Adjust: VR1 (+5V ADJ) Power board

- Connect the digital voltmeter to TP26 on the Main board.
- Adjust VR1 on the Power board for $5.0V \pm 0.02V$.

(2) FSC adjustment

Test point: TP20 (FSC) Main board
Adjust: VR10 (FSC) Main board

- Connect the frequency counter to TP20 on the Main board.
- Adjust VR10 on the Main board for $4.433619 \text{ MHz} \pm 5\text{Hz}$ (PAL).

(3) Read Voltage Controlled Oscillator (VCO R) adjustment

Test point: TP21 (R VCO) Main board
Adjust: L16 (R VCO) Main board

- Connect the digital voltmeter to TP21 on the Main board.
- Adjust L16 on the Main board for $2.8V \pm 0.1V$.

(4) Write Voltage Controlled Oscillator (VCO W) adjustment

Test points: TP22 (W VCO) Main board
Adjusts: L20 (W VCO) Main board

- Connect the coaxial cable between the VIDEO OUT connector of the test signal generator and the SOURCE COMP connector on the rear panel of the mixer.
- Supply the composite color bar signal to the mixer from the test signal generator.
- Connect the digital voltmeter to TP22 on the Main board.
- Adjust L20 on the Main board for $2.8V \pm 0.1V$.

(5) Video fade white Level adjustment

Test point: REC VIDEO OUT (COMP)
connector Rear Panel
Adjust: VR4 (REC Y GAIN) Main board

- Press the VIDEO FADE button on the Fade control section.
- Press the WHITE button on the COLOR SELECT section.
- Press the FADE START button.
- While observing the waveform monitor, adjust VR4 on the Main board so that White level becomes 81 IRE (580mV) \pm 2.8 IRE (20mV) (PAL).

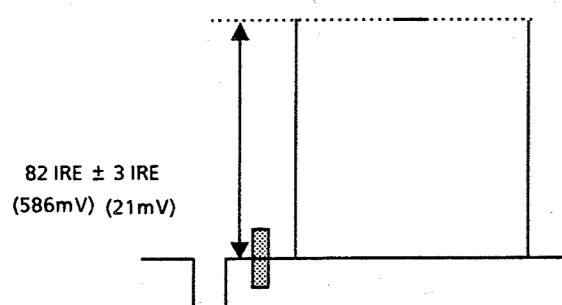


Fig. 4-1

(6) REC OUT C gain adjustment

Test point: REC VIDEO OUT (COMP)
connector Rear Panel
Adjust: VR3 (REC C GAIN) Main board

- Keep the connection and condition for step (5).
- While observing the waveform monitor, adjust VR3 on the Main board so that the burst level becomes 42 IRE (300mV) (PAL).

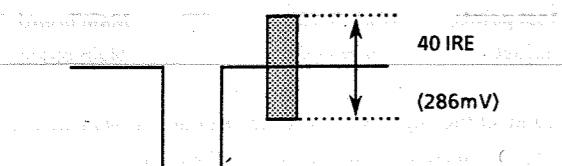


Fig. 4-2

(7) APC adjustment

Test points: TP1 (APC)
Adjust: CT1 (APC) Main board

- Disconnect the coaxial cable from the SOURCE COMP connector on the rear panel.
- Connect the frequency counter to TP1 on the Main board.
- Adjust CT1 on the Main board for 4.433619 MHz \pm 10Hz (PAL).

After adjustment, connect the coaxial cable to the SOURCE COMP connector on the rear panel.

(8) Burst gate pulse (BGP) width adjustment

Test points: TP2 (BFG)
Adjust: VR1 (BURST GATE) Main board

- Connect the coaxial cable between the VIDEO OUT connector of the test signal generator and the SOURCE COMP connector on the rear panel of the mixer.
- Supply the composite color bar signal to the mixer from the test signal generator.
- Connect the oscilloscope to TP2 on the Main board.
- Connect the external trigger input of oscilloscope to TP25 on the Main board and set the oscilloscope to H rate and expand the horizontal blanking period.
- Set the oscilloscope by delaying the sweep to 1 μ s/DIV.
- Adjust VR1 on the Main board so that the duty of waveform at TP2 becomes 7.8 μ sec \pm 0.1 μ sec.

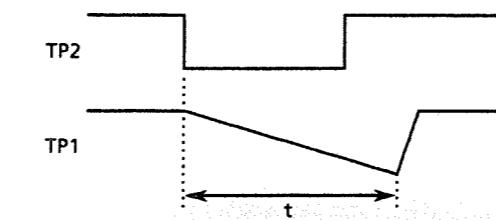


Fig 4-3

(9) Carrier balance adjustment

Test point: REC VIDEO OUT (COMP)
connector Rear panel
Adjusts: VR5 (CARRIER BAL -1)
VR6 (CARRIER BAL -2) Main board

- Supply the composite color bar signal to SOURCE COMP connector.
- Set the GAIN control of vectorscope to maximum.
- Adjust VR5 and VR6 on the Main board so that the vector are positioned on the center of the vectorscope and the carrier leakage of the video signal on the waveform monitor becomes minimized.

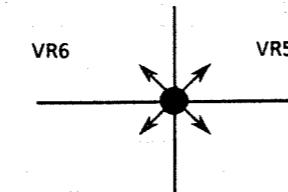


Fig 4-4

(10) Pedestal adjustment

Test point: REC VIDEO OUT (COMP)
connector Rear panel
Adjust: VR7 (PEDESTAL) Main board

- Supply the composite color bar signal to the SOURCE COMP connector.
- While observing the waveform monitor, adjust VR7 on the Main board so that the black level becomes 0 \pm 2 IRE (0 \pm 14 mV).

CAUTION : Even if VR7 is turned too much, the black bar will be touched to the blanking level. It therefore should be adjusted for just touching to the blanking level.

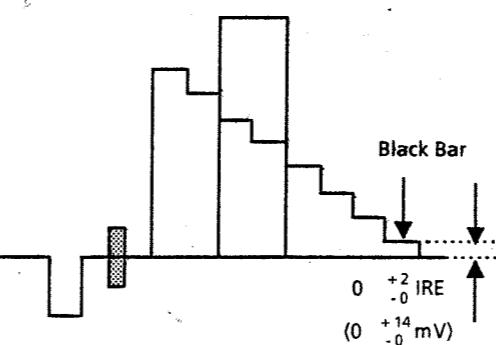


Fig 4-5

CAUTION : When VR9 is turned too much, the black and white bar will be suppressed.

(12) Tint, chroma gain and B-Y gain adjustment

Test point: REC VIDEO OUT (COMP)
connector Rear panel
Adjusts: VR12 (TINT) Main board
VR2 (CHROMA GAIN) Main board
VR8 (B-Y GAIN) Main board

- Supply the composite color bar signal to the SOURCE COMP connector.
- While observing the vectorscope, adjust VR12, VR2 and VR8 on the Main board so that the all vectors fall into their respective boxes.

Effect of controls

VR2 -- Chroma Gain (R-Y Gain)
VR12 -- Tint
VR8 -- B-Y Gain

(13) Chroma separation adjustment

Test point: TP24(CHROMA SEP) Main board
Adjust: VR11(CHROMA SEP) Main board

- Supply the linearity signal with carrier component to SOURCE COMP connector.
- Connect the oscilloscope to TP24 on the Main board.
- Connect the external trigger input of oscilloscope to TP25 on the Main board and set the oscilloscope to H rate.
- While observing the oscilloscope, adjust VR11 on the Main board so that the carrier component becomes minimum.

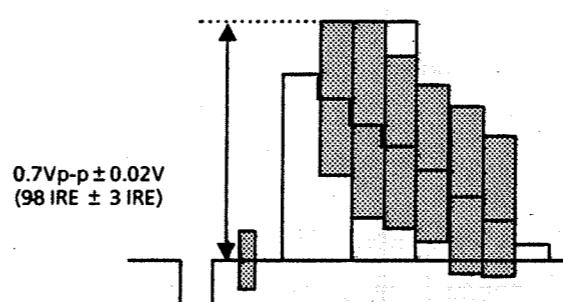
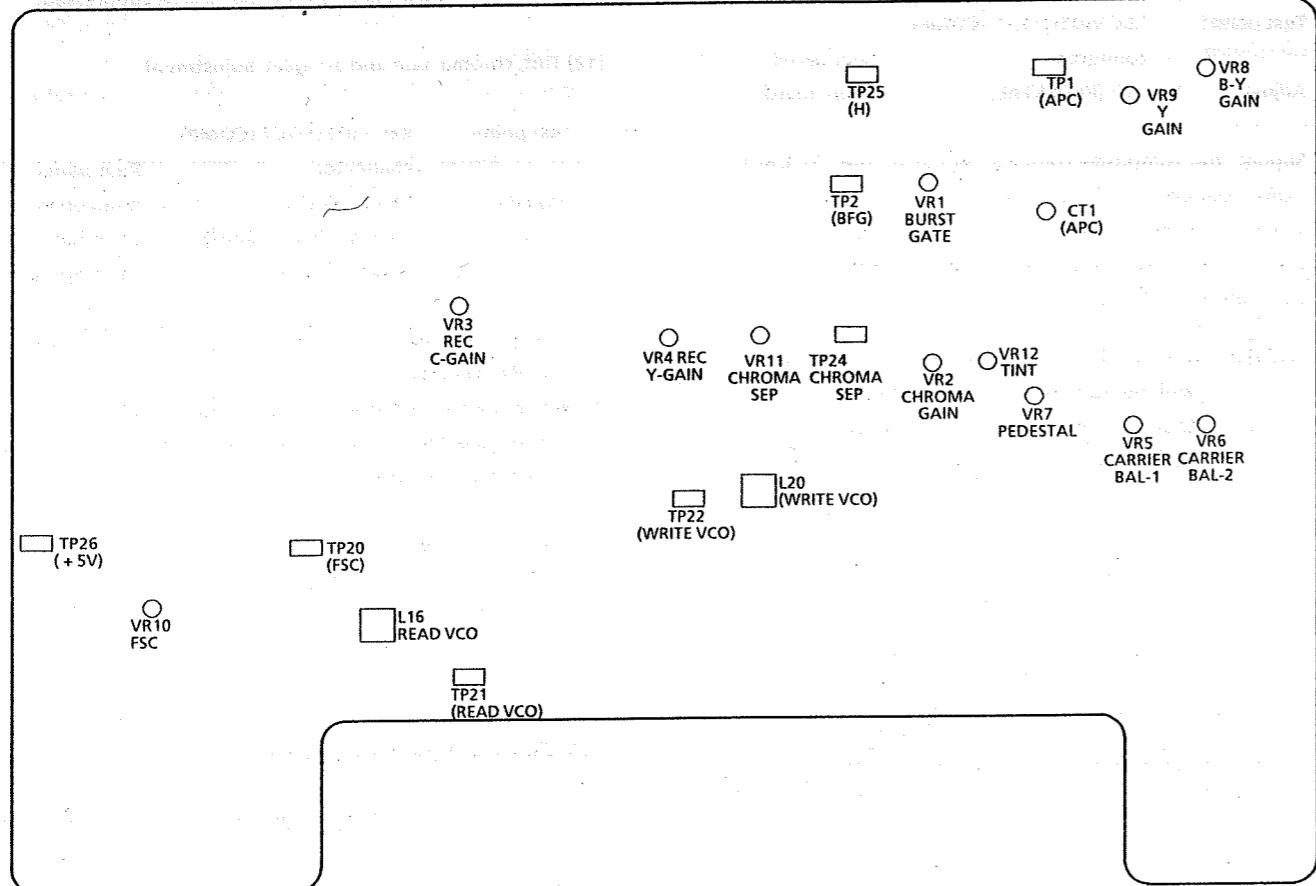


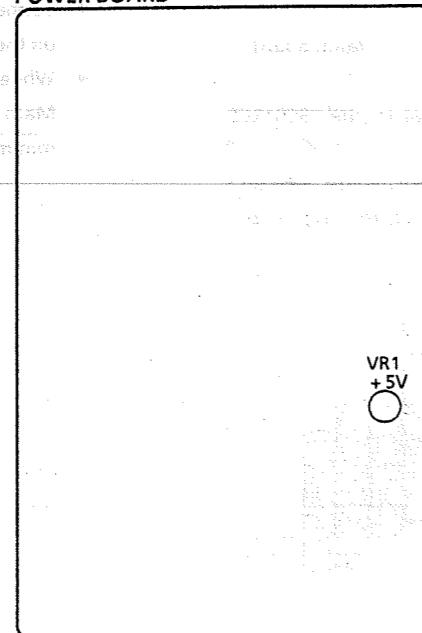
Fig 4-6

LOCATION OF TEST POINTS AND ADJUSTING CONTROLS

MAIN BOARD



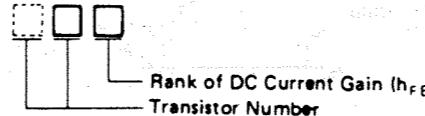
POWER BOARD



CHIP COMPONENTS

1. Chip Transistor

The transistor number is indicated on the top surface of the chip transistor using two alphabet letters or one numerical and two alphabet letters.



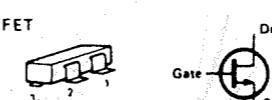
Transistor Number

Letter	Transistor No.	Letter	Transistor No.
A	2SB709	X	2SD602A
B	2SB709A	Y	2SD601
C	2SB710	Z	2SD601A
D	2SB710A	1Z	2SD1030
E	2SA1022	1N	2SK199
F	2SA1034	1O	2SK198
H	2SA1035	1A	2SB799
I	2SB792	1B	2SB814
K	2SC2778	1C	2SB902
P	2SD814	1F	2SK321
Q	2SD813	1L	2SK247
R	2SC2480	1K	2SK316
S	2SC2405	1M	2SB84
T	2SC2406	1T	2SC3077
U	2SC2404	1X	2SC2845
V	2SC2295	2B	2SK374
W	2SD602	2C	2SK116

Example

WQ → 2SD602 – Q
YO → 2SD601 – Q
1BS → 2SB814 – S

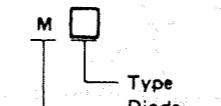
Appearance and Symbols



Transistor	1	2	3
Except 2SK199	Drain	Source	Gate
2SK199	Gate	Drain	Source

2. Chip Diode

The diode number is indicated on the top surface of the chip diode using Two alphabet letters.



Diode Number

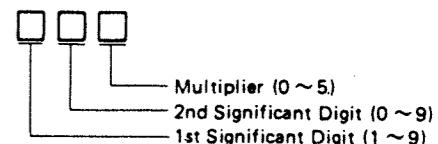
Letter	Diode No.	Letter	Diode No.
MA	MA151A	MI	MA152K
MB	MA152A	MK	MA28W-B
MC	MA153	ML	MA28T-A
MD	MA28-A	MN	MA151WA
ME	MA28-B	MO	MA152WA
MF	MA28W-A	MT	MA151WK
MH	MA151K	MU	MA152WK

Appearance and Symbols

	1	2	3
MA28/28W/28T	—	Anode	Cathode
MA151K/152K	—	Anode	Cathode
MA151A/152A	—	Cathode	Anode
MA151WK/MA152WK	Anode	Anode	Cathode
MA151WA/MA152WA	Cathode	Cathode	Anode
MA153	Cathode	Anode	Common

3. Chip Resistor

The resistor value is indicated on the bottom surface of the chip resistor using three digit numbers.



EXAMPLE:

330 → $33 \times 10^0 = 33$ ohms
561 → $56 \times 10^1 = 560$ ohms
123 → $12 \times 10^3 = 12$ kohms

Note: Zero ohm resistor (jumper chip) is colored red or green.

4. Chip Capacitor

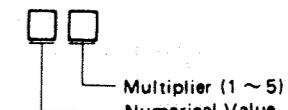
The capacitive value of replacement chip capacitors is indicated on the bottom surface of the chip capacitor using three digit numbers. Original parts do not have value indication.

If the capacitive value is less than 100 pF, the value will be indicated by one or two digit number expressing the capacity directly in pF.

EXAMPLE:

0.5 → 0.5 pF 2.5 → 2.5 pF
75 → 0.75 pF 33 → 33 pF
1 → 1 pF 82 → 82 pF

If the capacitive value is 100 pF or greater, the value will be indicated by an alpha-numeric code. The letter precedes the number and expresses a numerical value to be multiplied by the number which follows.



Numerical Value

Letter	Value	Letter	Value
A	10	N	33
B	11	P	36
C	12	Q	39
D	13	R	43
E	15	S	47
F	16	T	51
G	18	U	56
H	20	V	62
J	22	W	68
K	24	X	75
L	27	Y	82
M	30	Z	91

* Letters I and O are not used

EXAMPLE:

$$A1 \rightarrow 10 \times 10^1 = 100 \text{ pF}$$

$$N2 \rightarrow 33 \times 10^2 = 3300 \text{ pF}$$

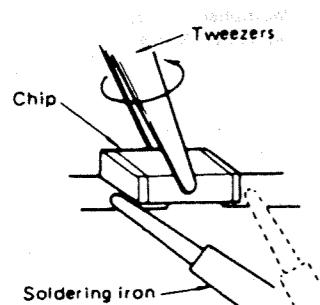
$$S3 \rightarrow 47 \times 10^3 = 47000 \text{ pF}$$

5. Precautions in replacing the chip component

1. Make sure that the unit is turned OFF when replacing the chip.
2. Use tweezers to prevent any damage to the chip surface.
3. Do not re-use the chips after removal
4. Do not rub the electrode of chips
5. Do not subject the chips to excessive stress
6. It is recommended that a pencil-type soldering iron to be used
7. The solder whose diameter is less than 0.5 mm is recommended
8. Do not heat the chip beyond 3 seconds
9. Maintain temperature control under 260°C (500°F) when soldering

5.1 Removal (Transistor, Diode, Resistor and Capacitor)

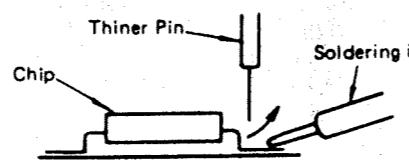
1. Add the solder to both ends of the chip (three leads for chip transistor).
2. While attaching the soldering iron to both ends of the chip (three leads for chip transistor) as shown below, remove the chip by turning it with tweezers
Note: Be careful not to damage other chips

**5.2 Removal (IC)**

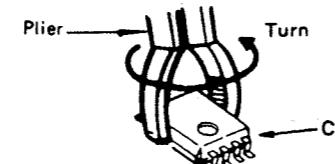
1. Add the solder wick and solder iron to each lead of the IC and remove solder.



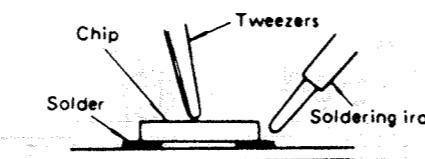
2. Add the solder iron to each lead of the IC and left each lead of the IC using thinner pin.



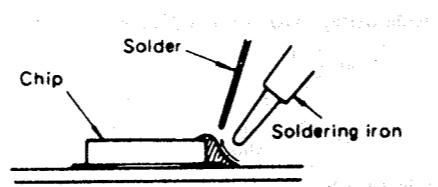
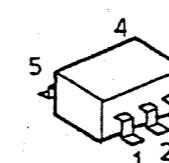
3. Remove IC turning it with plier.

**5.3 Mounting**

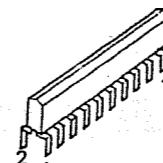
1. Place the solder thinly on the chip mounting foil
2. Solder the chip temporarily while holding the chip with the tweezers



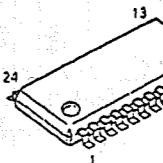
3. Solder both ends of chip (three leads for chip transistor)

YWSC7S08FER
YWSC7S04FER

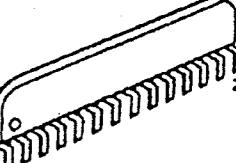
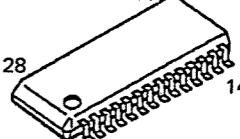
M511000A7Z



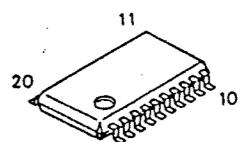
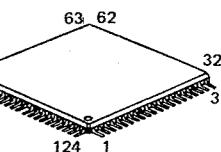
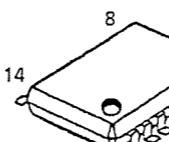
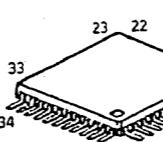
UPD42102G3



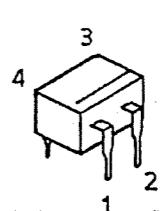
M5M4C500AL

NJM79L12A
M51951ASL
NJM78L05A
NJM78L09AYWM51271FP
MN676021PPS
MN676011NPS

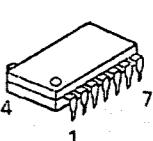
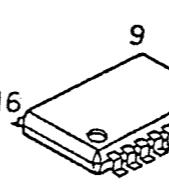
MN53007LVW1

YWMC74HC374F
MN53040LVX3
MN53080LBR1YWNJM3403AM
NJM319MYWNJM2246M
YWLM1881M
NJM2904M

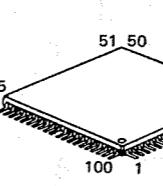
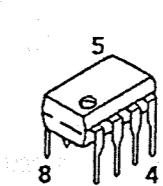
S1WBA60



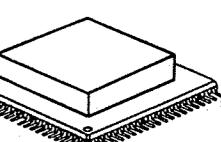
M5206P

MN4528BS
MN74HC4053F

MN53020LBQ2

NJM2043D
NJM2068DD
M5216P

MN188166CC



WIRING DIAGRAM

SWITCH BOARD

CN2			
30	NOT USED	29	NOT USED
28	MIC	27	MIC GND
26	VR OUT GND	25	VR OUT R
24	VR OUT L	23	VR IN GND
22	VR IN R	21	VR IN L
20	PHONE L	19	PHONE L GND
18	PHONE R	17	PHONE R GND
16	NOT USED	15	NOT USED
14	NOT USED	13	NOT USED
12	REC AUDIO R	11	GND
10	REC AUDIO L	9	GND
8	GND	7	AUX R
6	GND	5	AUX L
4	GND	3	A IN R
2	GND	1	A IN L

REAR BOARD

CN1			
15	NOT USED	16	NOT USED
13	NOT USED	14	NOT USED
11	GND	12	REC AUDIO R
9	GND	10	REC AUDIO L
7	AUX R	8	GND
5	AUX L	6	GND
3	A IN R	4	GND
1	A IN L	2	GND

CN2

CN2			
19	NOT USED	20	NOT USED
17	EXT VIDEO	18	GND
15	GND	16	BIAS 2
13	GND	14	EXT Y
11	BIAS 1	12	VIDEO IN
9	Y IN	10	GND
7	C IN	8	GND
5	REC VIDEO	6	GND
3	REC Y	4	GND
1	REC C	2	GND

CN4

34	KEY 7	33	KEY 6
32	KEY 5	31	KEY 4
30	KEY 3	29	KEY 2
28	KEY 1	27	KEY 0
26	KEY LEVEL	25	AD REF -
24	ART LEVEL	23	STROBE LEVEL
22	FADE SPEED	21	SCROLL SPEED
20	B-Y POS	19	R-Y POS
18	CORT LEVEL	17	BACK LEVEL
16	AD REF +	15	AUDIO FADE
14	AUDIO PULSE	13	SCAN 0
12	SCAN 1	11	SCAN 2
10	SCAN 3	9	SCAN 4
8	LED 0	7	LED 1
6	LED 2	5	LED 3
4	LED 4	3	LED 5
2	LED 6	1	LED 7

CN1

10	NOT USED	9	-12V
8	NOT USED	7	VR GND
6	GND	5	+12V
4	GND	3	ANALOG 5V
2	DIGITAL 5V	1	GND

5	UPPER
4	LOWER
3	R-Y POS
2	B-Y POS
1	VR GND

POSITIONER BOARD

5	UPPER
4	LOWER
3	R-Y POS
2	B-Y POS
1	VR GND

MAIN BOARD

12	MIC
11	MIC GND
10	VR OUT GND
9	VR OUT R
8	VR OUT L
7	VR IN GND
6	VR IN R
5	VR IN L
4	PHONE L
3	PHONE R
2	PHONE R GND
1	PHONE L GND

7	GND
6	GND
5	-5V
4	GND
3	SYNC
2	GND
1	CHAR IN

CN101
TITLE INPUT
CONNECTOR

MIC BOARD

1	PHONE R GND
2	PHONE R
3	PHONE L GND
4	PHONE L
5	VR IN L
6	VR IN R
7	VR IN GND
8	VR OUT L
9	VR OUT R
10	VR OUT GND
11	MIC GND
12	MIC

14	NOT USED
12	MIC GND
10	VR OUT R
9	VR OUT GND
8	VR IN GND
7	VR OUT L
6	VR IN L
5	VR IN R
4	PHONE L GND
3	PHONE L
2	PHONE R GND
1	PHONE R

20	NOT USED
18	EXT VIDEO
16	GND
14	BIAS 2
12	EXT Y
10	BIAS 1
9	VIDEO IN
8	GND
6	REC VIDEO
5	REC Y
4	REC C
3	GND
2	GND

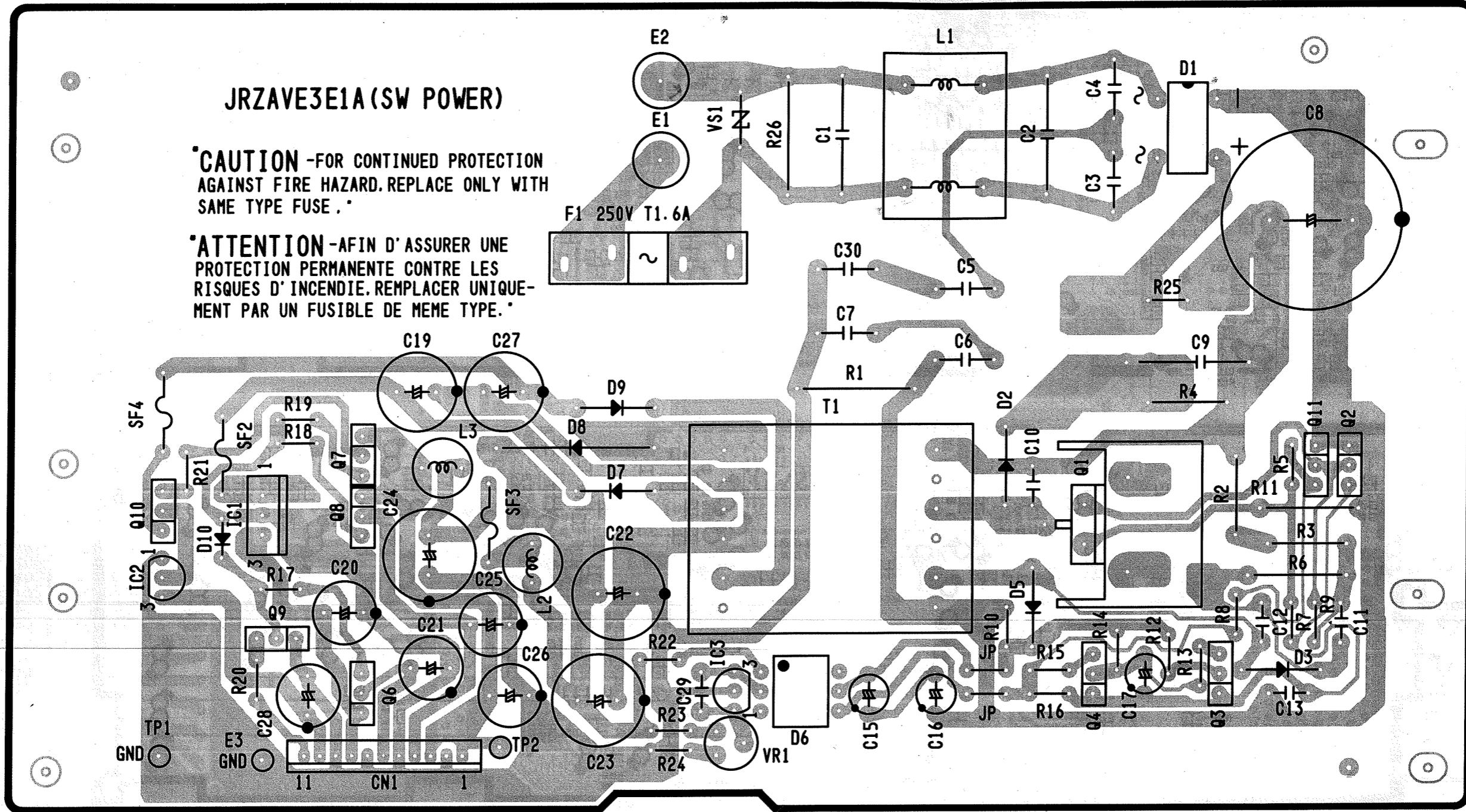
34	KEY 6
32	KEY 4
30	KEY 2
28	KEY 0
26	AD REF -
24	STROBE LEVEL
22	SCROLL SPEED
20	R-Y POS
18	BACK LEVEL
16	AUDIO FADE
14	SCAN 0
12	SCAN 2
10	SCAN 4
8	LED 1
6	LED 3
4	LED 5
2	LED 7

10	-12V
8	VR GND
6	+12V
4	ANALOG 5V
2	GND

1	S +5V
2	GND
3	D 5V
4	A 5V
5	GND
6	+12V
7	GND
8	S +12V
9	GND
10	-12V
11	STANDBY

CONDUCTOR VIEW OF POWER BOARD

POWER BOARD



<Address>

IC1	B1
IC2	A1
IC3	A3
Q1	B4
Q2	B5
Q3	A4
Q4	A4
Q5	A2
Q6	B2
Q7	B2
Q8	B2
Q9	A1
Q10	B1
Q11	B5
D1	C4
D2	B4
D3	A5
D4	A4
D5	A3
D6	B3
D7	B2
D8	B3
D9	B3
D10	B1

C
AC IN

SCHEMATIC DIAGRAM OF POWER BOARD

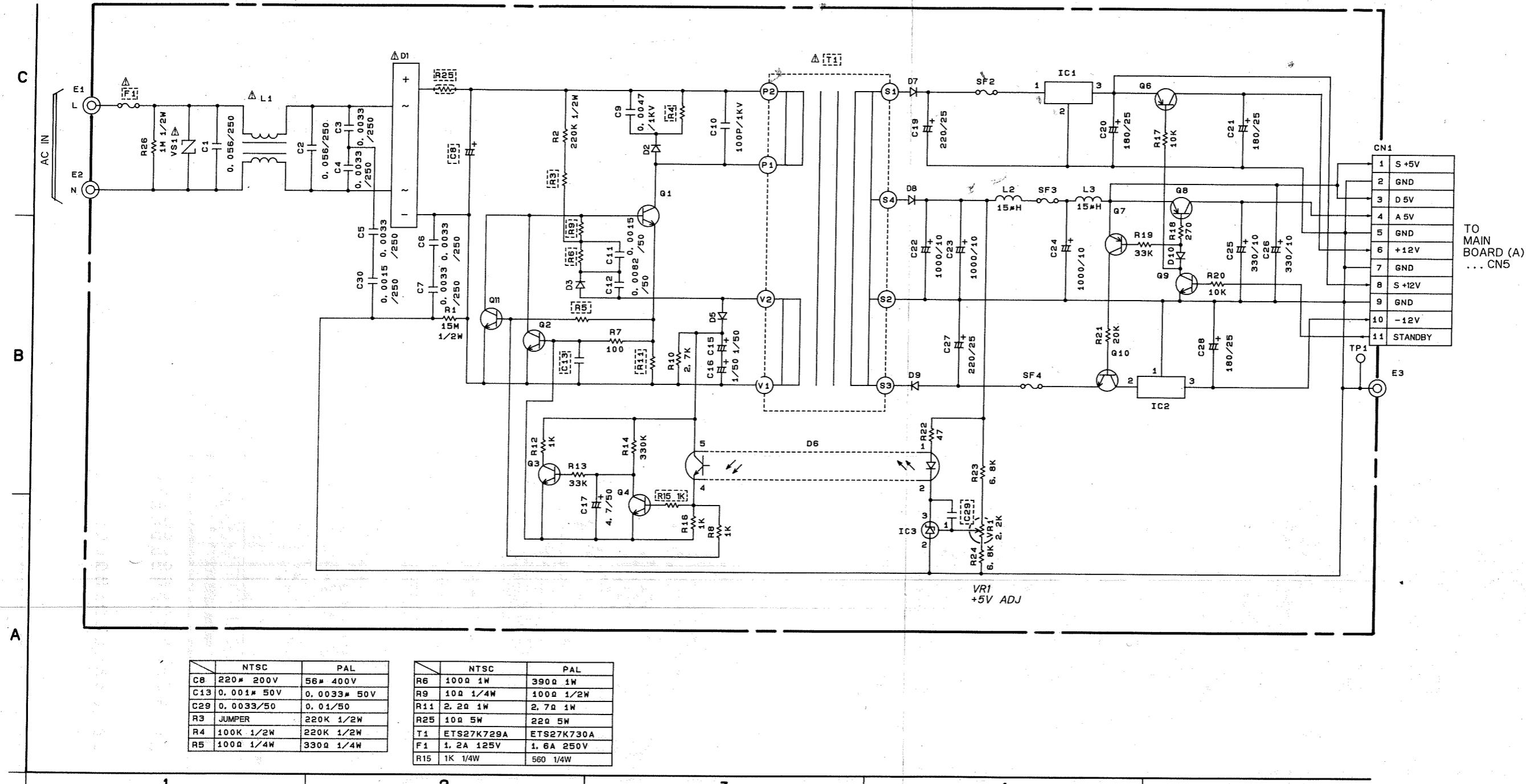
Address >

B1
A1
A3
B4
B5
A4
A4
A2
B2
A1
B1
B5
C4
B4
A5
A4
A3
B3
B2
B3
B1

<Address >

IC1 C4
IC2 B5
IC3 A4
Q1 C3
Q2 B2
Q3 B2
Q4 A3
Q6 C5
Q7 B4
Q8 C5
Q9 B5
Q10 B4
Q11 B2
D1 C2
D2 C3
D3 B2
D5 B3
D6 B3
D7 C4
D8 C4
D9 B4
D10 B5

POWER BOARD



POWER BOARD

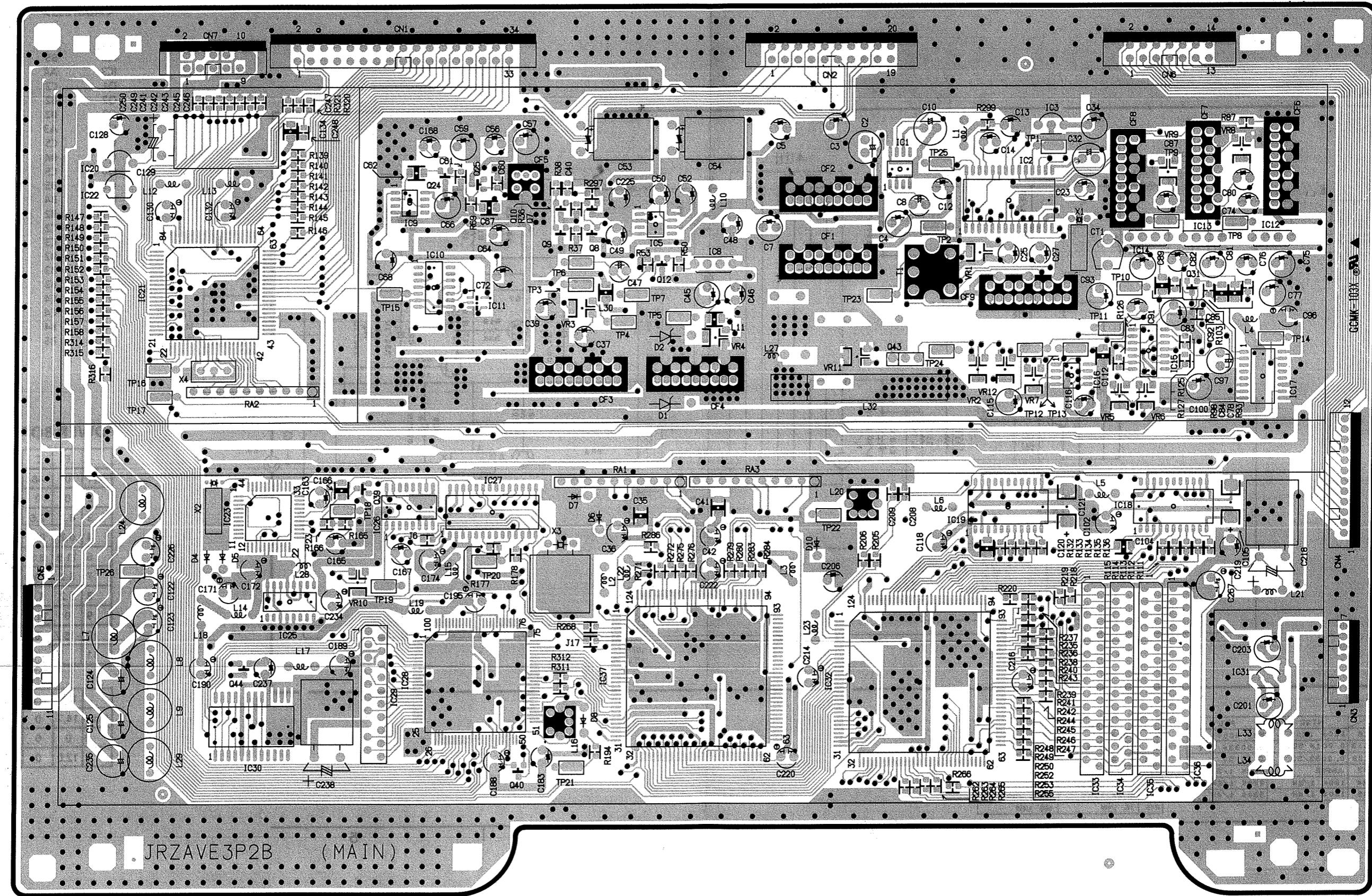
	E	C	B
Q1	0	48	0
2	0	0	0.2
3	0.2	2.6	0.2
4	0.2	0.2	0.4
6	11.9	8.5	11.4
7	5.2	-14.0	4.8
8	5.2	5.2	4.8
9	0	11.5	-0.7
10	-15.7	0	-14.0
11			

	IC1	IC2	IC3
Pin 1	14.7	0	2.5
2	0	0	0
3	12.0	0	3.9

MAIN BOARD

(COMPONENT SIDE VIEW)

<Address>



JRZAVE3P2B (MAIN)

1 _____ 2 _____ 3 _____ 4 _____ 5 _____

CTOR VIEW OF MAIN BOARD

WJ-AVE3

WJ-AVE3

MAIN BOARD

(PATTERN SIDE VIEW)

<Address>

D

<Component Side>

C

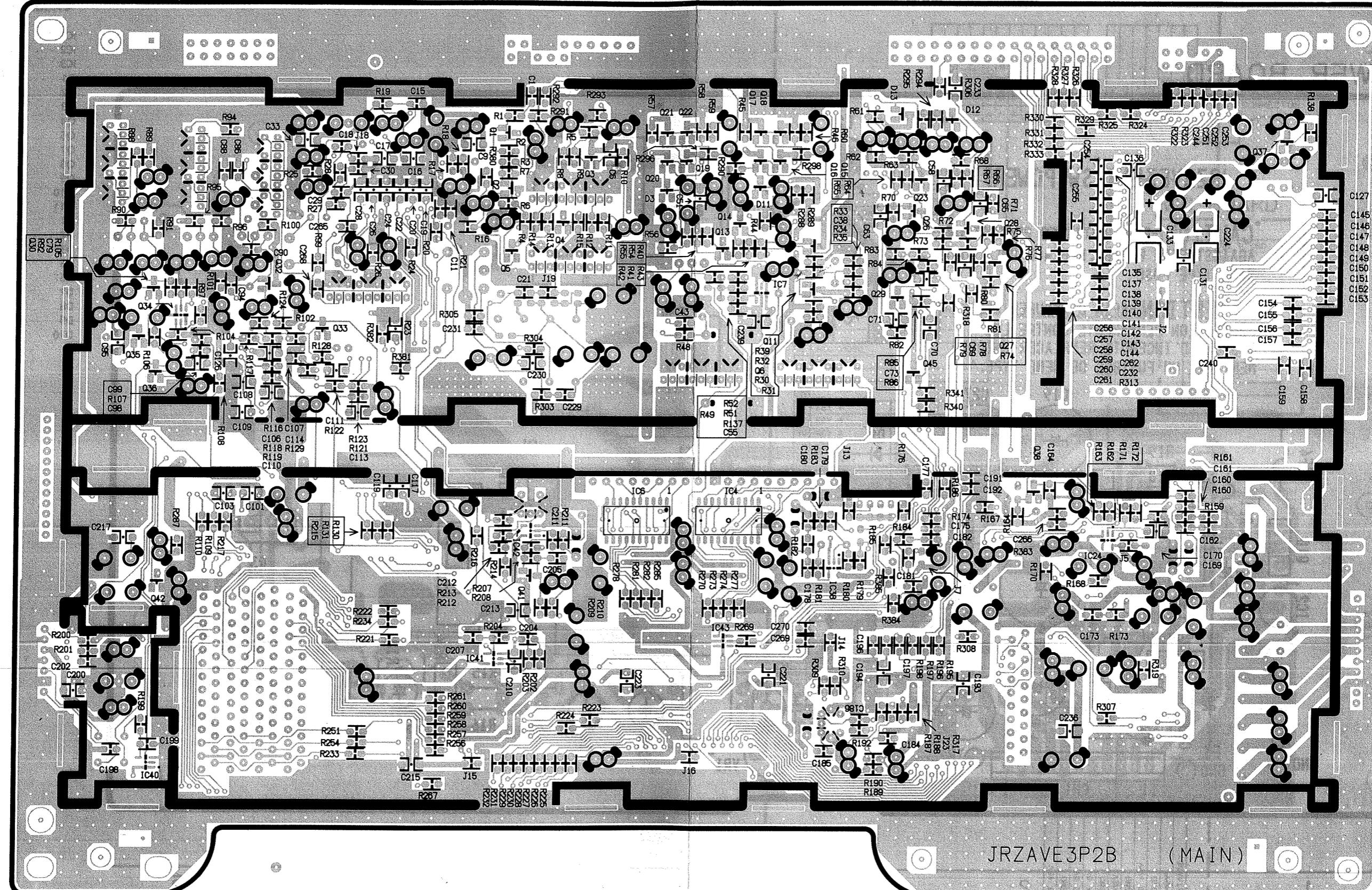
<Pattern Side>

B

<Address>

A

<Component Side>



<Address>

<Component Side>

<Pattern Side>

IC4 B3

IC6 B3

IC7 C4

IC24 B5

IC38 B4

IC40 A1

IC41 B3

IC42 B3

IC43 B3

Q1 D3

Q2 C3

Q3 D3

Q4 C3

Q5 C4

Q6 C4

Q11 C4

Q13 C3

Q14 C3

Q15 D4

Q16 D4

Q17 D4

Q18 D4

Q19 D3

Q20 D3

Q21 D3

Q22 D3

Q23 C4

Q26 C4

Q27 C4

Q28 C4

Q29 C4

Q30 C1

Q32 C2

Q33 C2

Q34 C1

Q35 C1

Q36 C1

Q37 D6

Q38 B5

Q41 B3

Q42 B1

Q45 C4

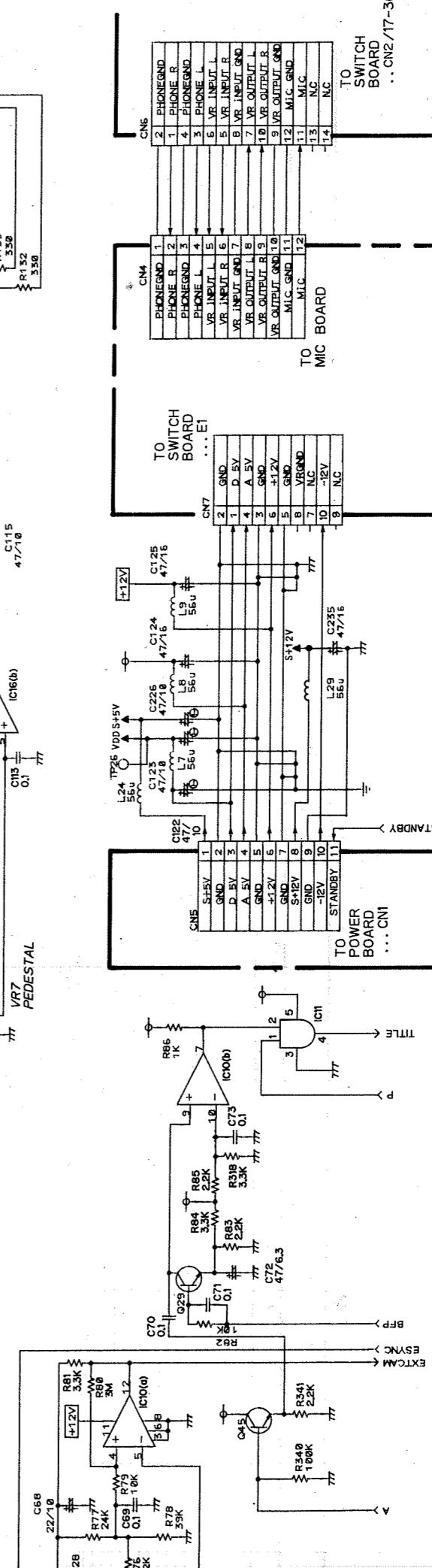
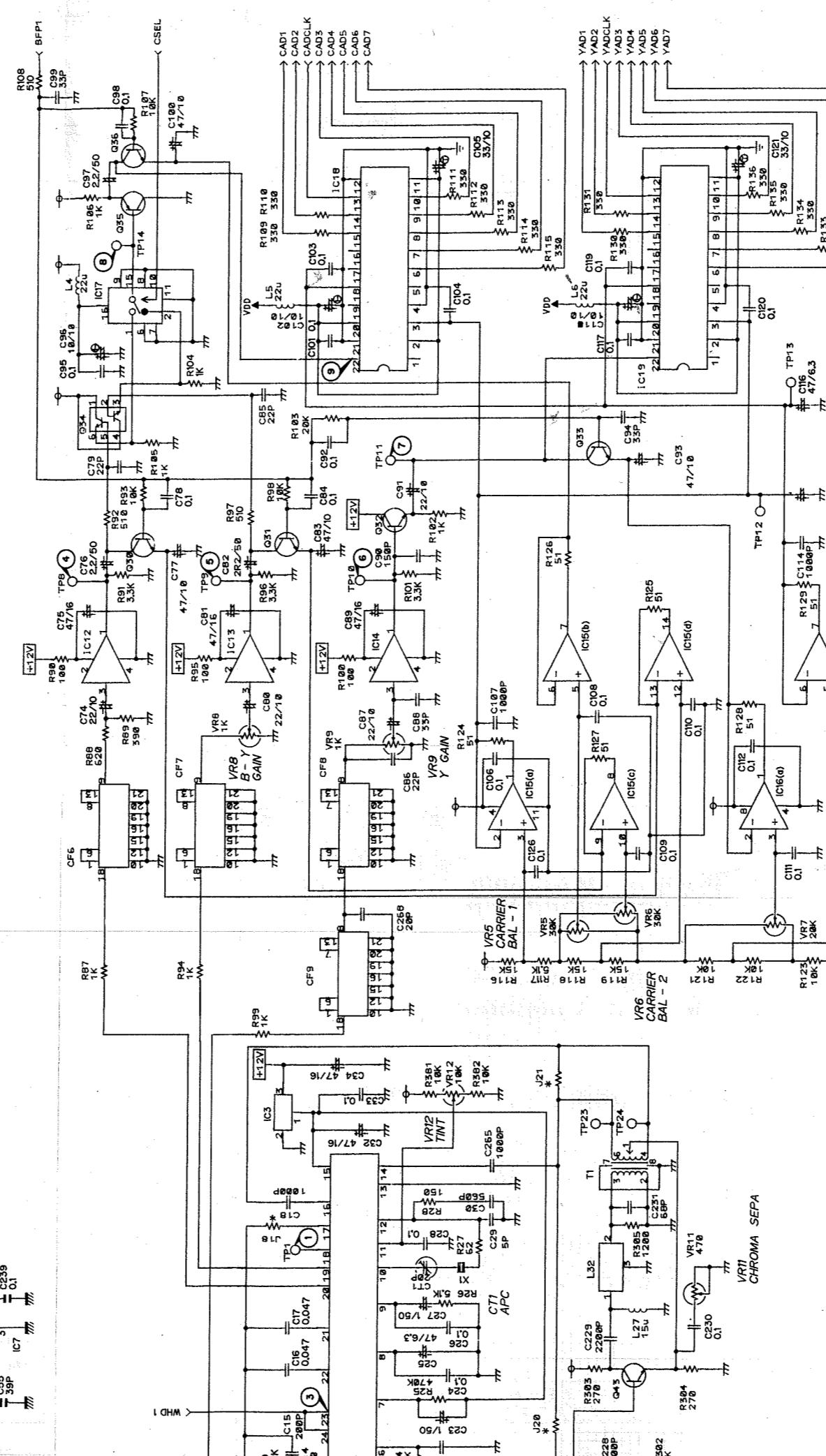
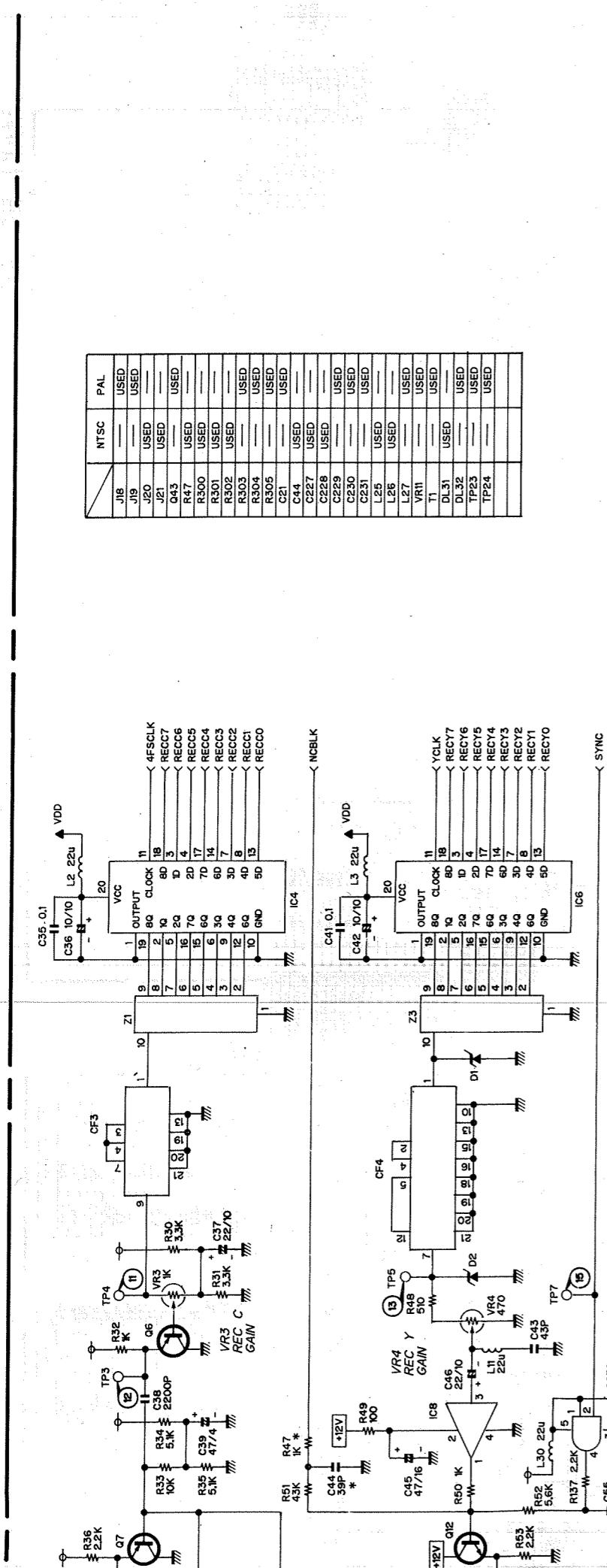
D3 C3

D11 C4

D12 D4

D13 D4

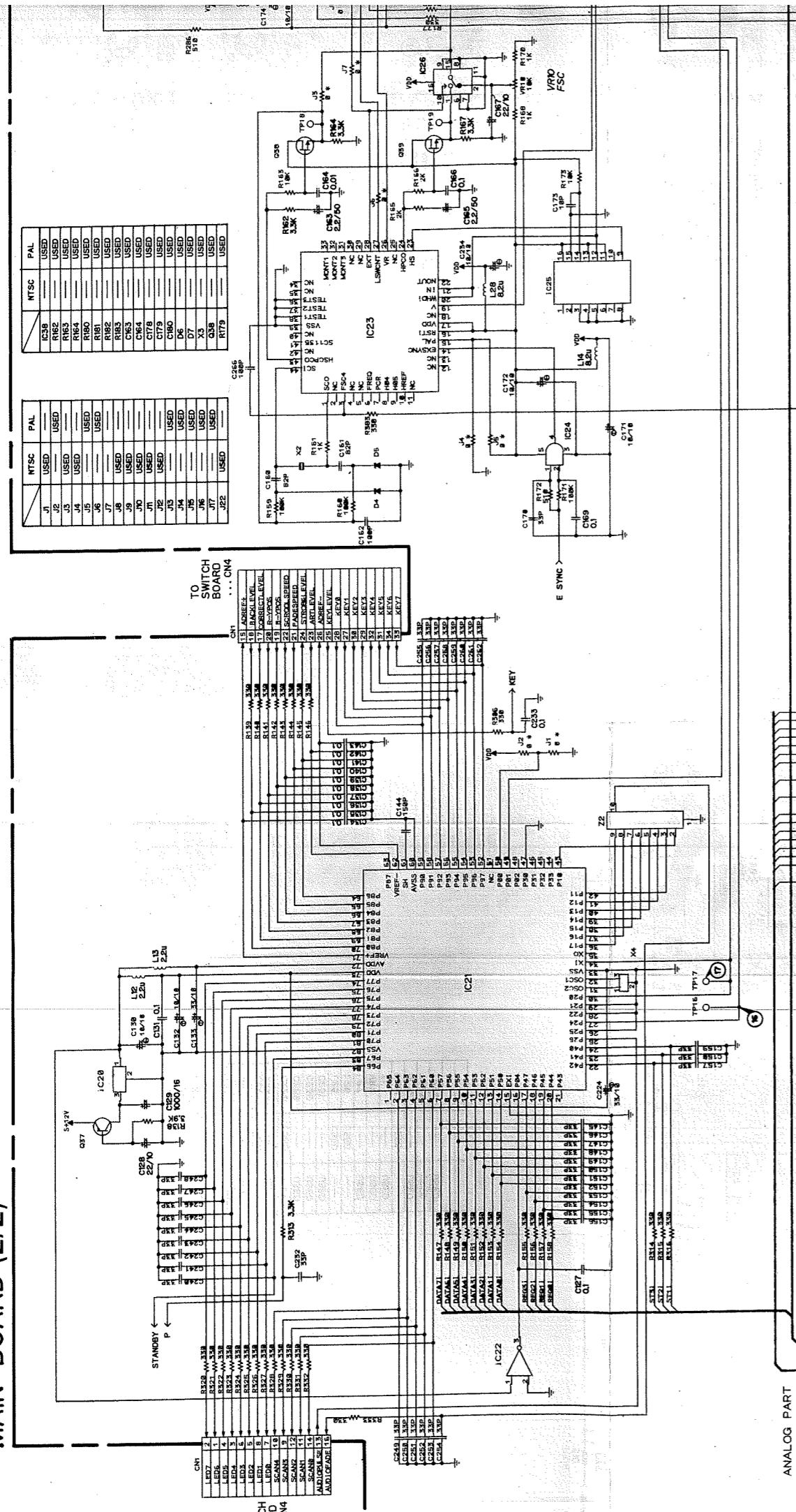
DIAGRAM OF MAIN BOARD (1/2)



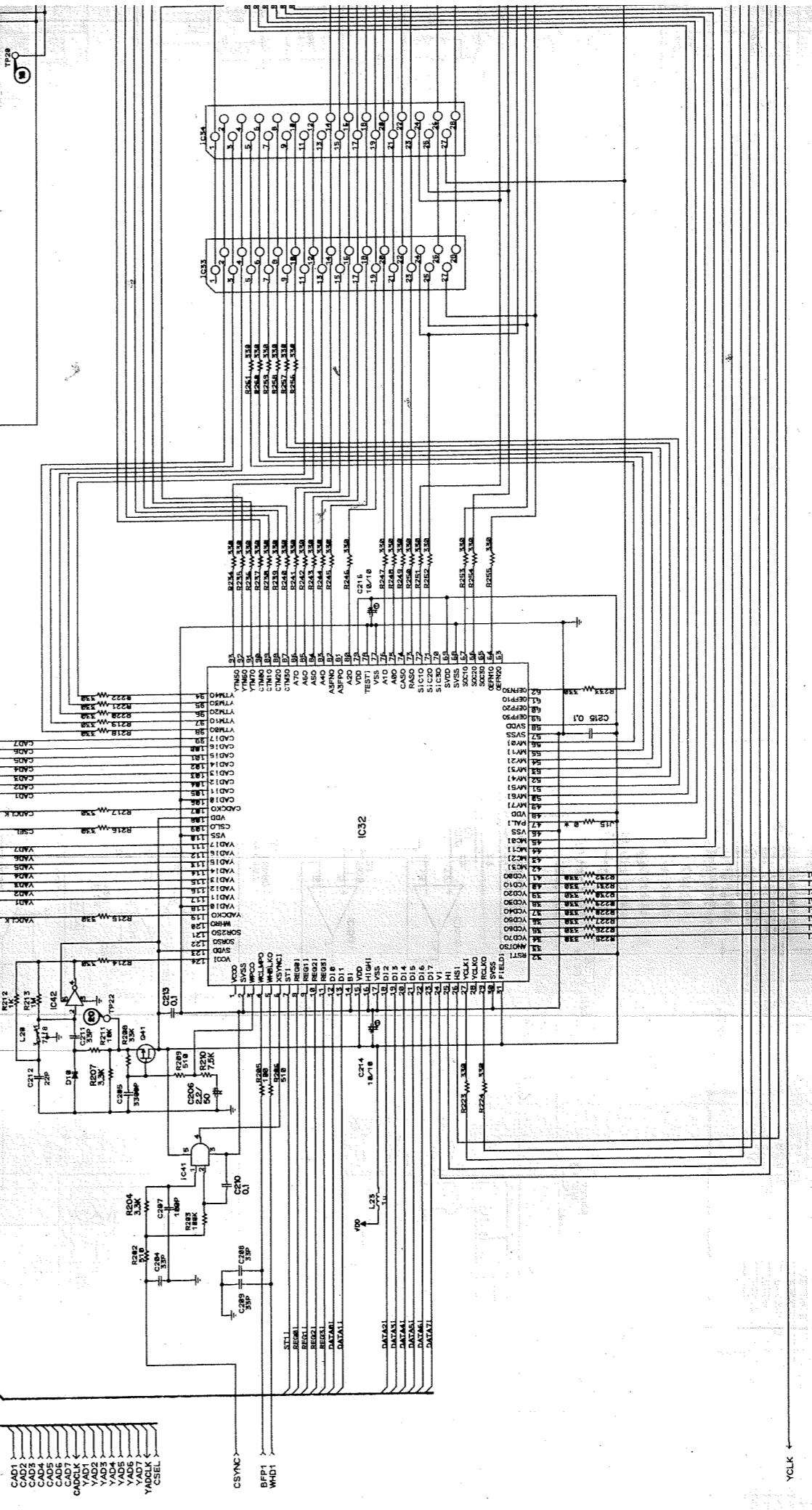
5

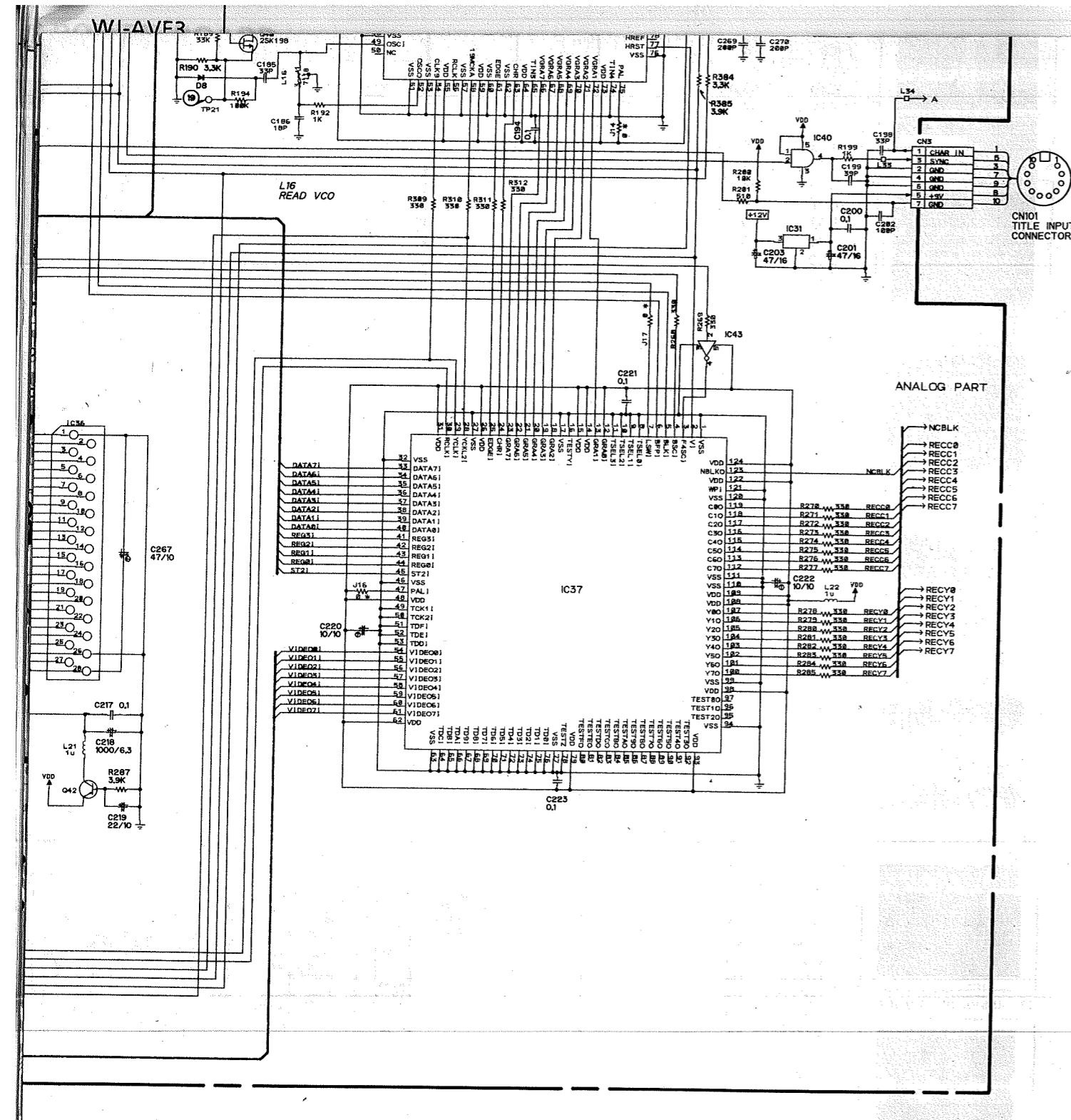
SCHEMATIC DIAGRAM OF MAIN BOARD

MAIN BOARD (2/2)



ANALOG PART





6

7

8

D4 D4
D5 D4
D8 C6
D10 C2

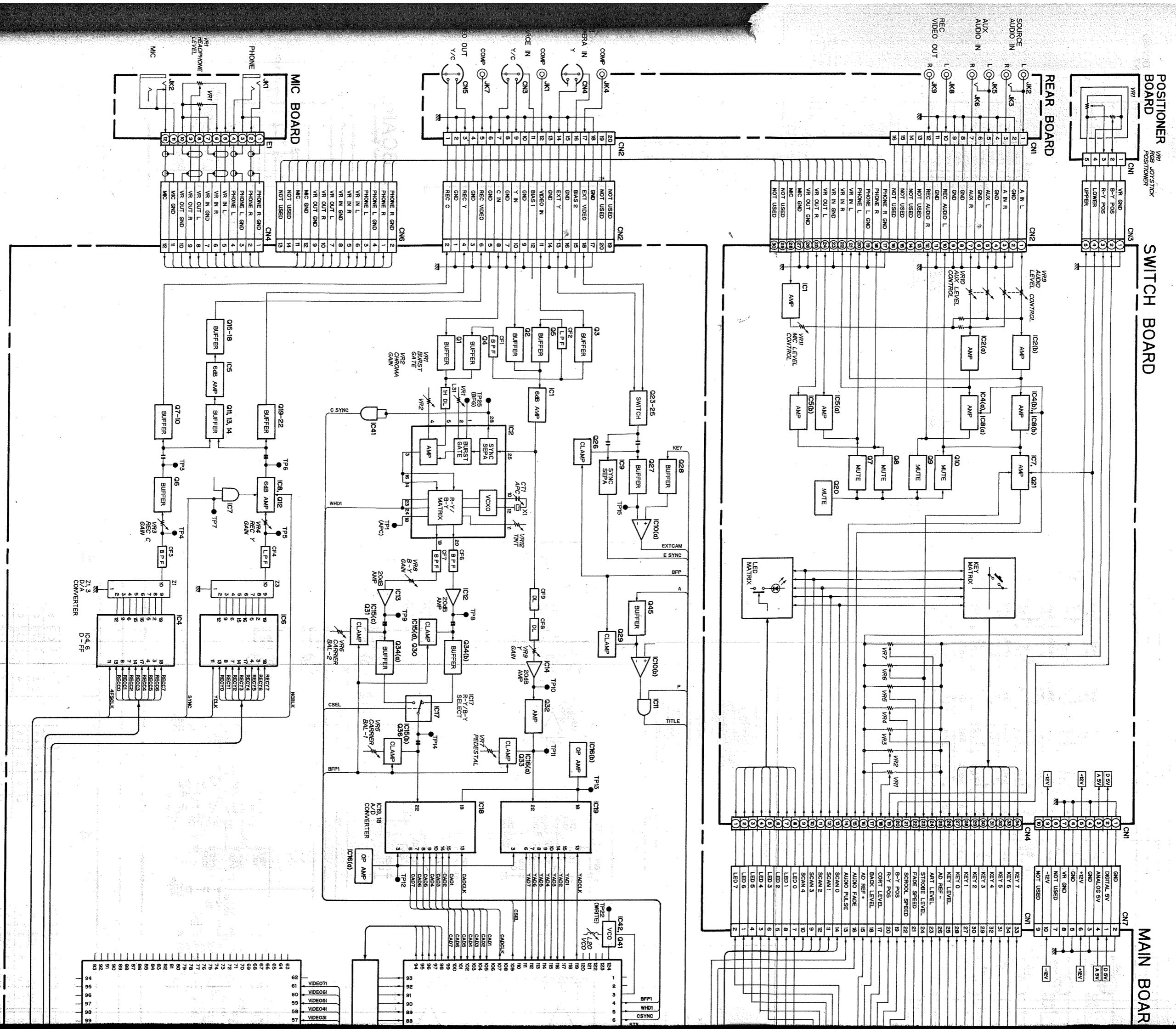
MAIN BOARD

	IC1	IC2	IC3	IC4	IC5	IC6	IC7	IC8	IC9	IC10	IC11	IC12	IC13
Pin 1	0	0.2	4.9	0	2.3	0	0.6	6.6	0	0	4.0	6.5	6.6
2	0	2.7	11.8	2.1	0	0	1.3	11.2	1.5	0	0.3	11.1	11.1
3	2.3	2.2	0	1.9	2.4	0	0	2.6	0	0	2.5	2.5	
4	0	2.4		1.9	0	0	0.3	0	0	1.9	0	0	0
5	2.5	2.9		2.0	2.4	0	0.6		5.0	1.9	5.0		
6	5.0	2.9		2.0	5.0	0			1.3	0			
7	0	4.6		2.0	2.0	0			0	0.3			
8	0	0		2.5	0	0			5.1	0			
9	2.8			2.7	0				1.4				
10	2.8			0	0				3.0				
11	2.4			2.4	2.4				11.8				
12	3.2			2.1	0				0.2				
13	0			2.0	0				0				
14	2.8			1.4	0				0				
15	4.9			2.0	0								
16	2.8			2.0	0								
17	0.8			1.9	0								
18	4.0			3.0	0								
19	2.0			3.2	0								
20	2.0			5.1	5.1								
21	0												
22	2.7												
23	4.4												
24	4.4												
25	2.8												
26	2.4												
27	2.4												
28	0.1												

	B	C	E		B	C	E		Q34	
Q1	0.2	0.3	0		Q31	0.1	2.6	2.6	Pin 1	0.4
2	0.2	0.6	0		32	0	0.5	0.1	2	1.0
3	0.5	0.6	0		33	0.2	1.1	1.2	3	0.6
4	0.5	0.6	0		35	0.4	0	0	4	0.4
5	0.5	0.6	0		36	-0.3	1.1	1.2	5	1.0
6	0.3	0	0.4		37	11.2	0	0	6	0.6
7	2.4	0	3.1		39	0.4	0	5.1		
8	2.4	5.1	1.8		40	2.4	2.2	0.1		
9	1.8	0	2.4		41	4.9	4.8	0		
10	3.0	5.1	2.4		42	4.3	0	0		
11	0.3	0	0		44	4.3	5.0	5.1		
12	6.3	1.8	5.8		51	0	5.1	2.9		
13	0.3	0.6	0							
14	0	0	0							
15	0	0	0.3							
16	0	0.6	0							
17	0.6	0	0.4							
18	0	0	0.4							
19	0.3	0	0.6							
20	0	0.6	0							
21	0.6	0.6	0.4							
22	0	0	0.4							
23	0.5	0.6	0							
24	2.0	5.1	2.9							
25										
26	-0.3	0.5	0.5							
27	0.1	0.6	0							
28	0	0	0							
29	-0.5	0	0							
30	-0.3	1.0	1.2							

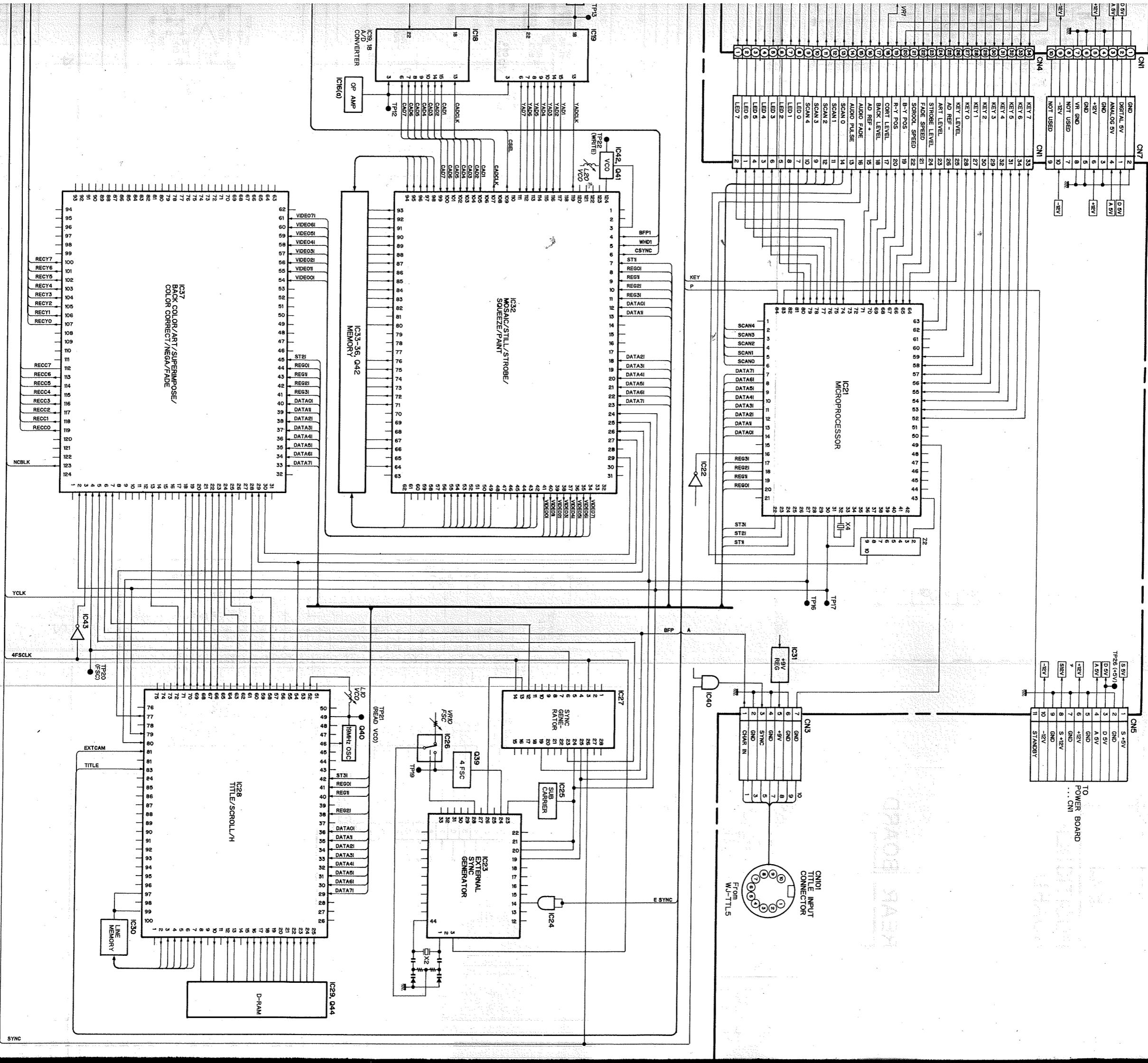
	IC14	IC15	IC16	IC17	IC18	IC19	IC20	IC22	IC23	IC25	IC26	IC27	IC29
Pin 1	6.4	4.0	1.4	2.0	0	0	5.0	5.0	2.5	0	1.0	5.1	2.1
2	11.1	3.6	1.4	2.0	5.0	5.0	11.8	5.0	0	0.3	2.0	0	-
3	2.6	0	1.4	0.4	3.6	3.6	0	0	-0.3	0	0.3	2.3	-11.1
4	0	5.0	0	0.3	0	0				0	0	0.3	0
5	2.5	1.5	0.3	0	0					0	0	0.2	5.1
6	2.5	1.5	0	0.3	0					-23.3	0	0	2.5
7	2.5	1.2	0	-2.4	0					0	5.0	0	-5.2
8	2.6	5.0	0	-2.7	0					1.9	0	0	5.0
9	2.6	0	-2.7	0						4.9	5.0	0	0
10	2.6	2.4	0							2.9	0	0	5.1
11	0	0	5.0	5.0						0	5.0	0	-9.5
12	2.6	0.3	0	0						0	0.8	0	-22.3
13	2.6	0.4	2.4	2.8						0	5.0	2.5	-12.2
14	2.6	0.3	1.2	0						0	5.0	2.6	0
15	2.0	-2.3	0							0	0	2.5	5.1
16	5.0	0	5.0							5.1	5.0	2.0	5.1
17		0	0.1							5.1	5.0	1.2	
18		1.5	1.5							5.1	1.9		
19		0	0							0.1	0.2	2.3	
20		5.0	5.0							0	3.4	2.4	
21		0	0							0.8	0.2		
22		2.5	1										

BLOCK DIAGRAM



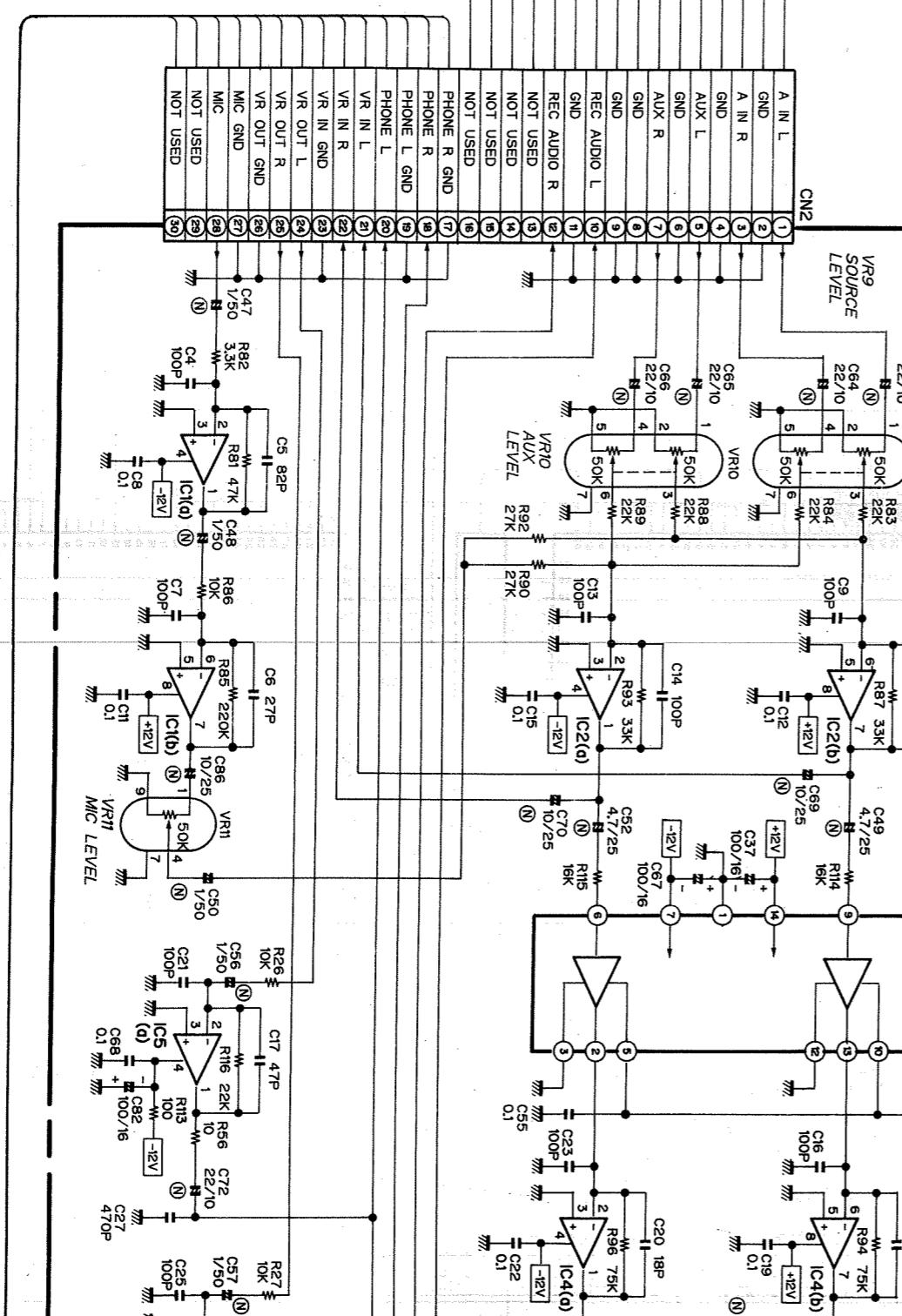
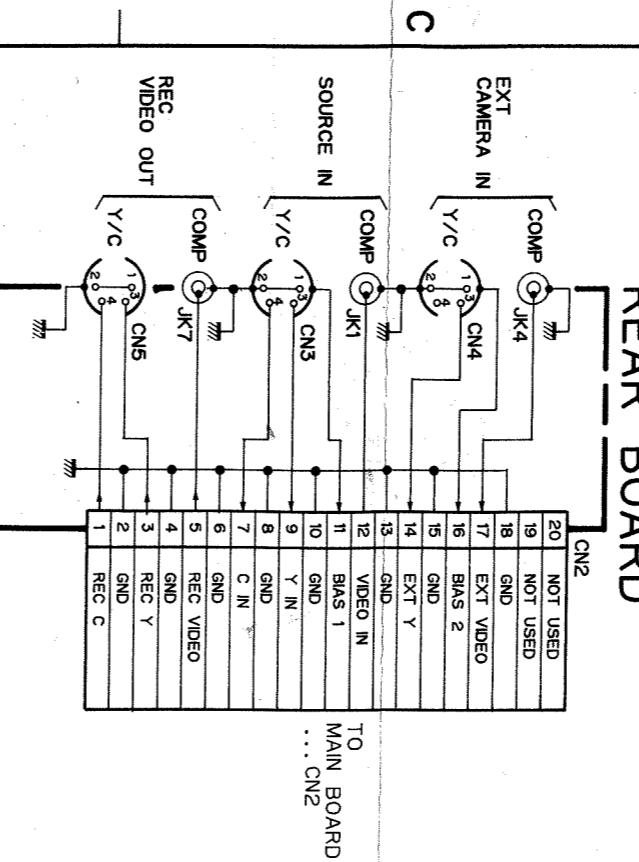
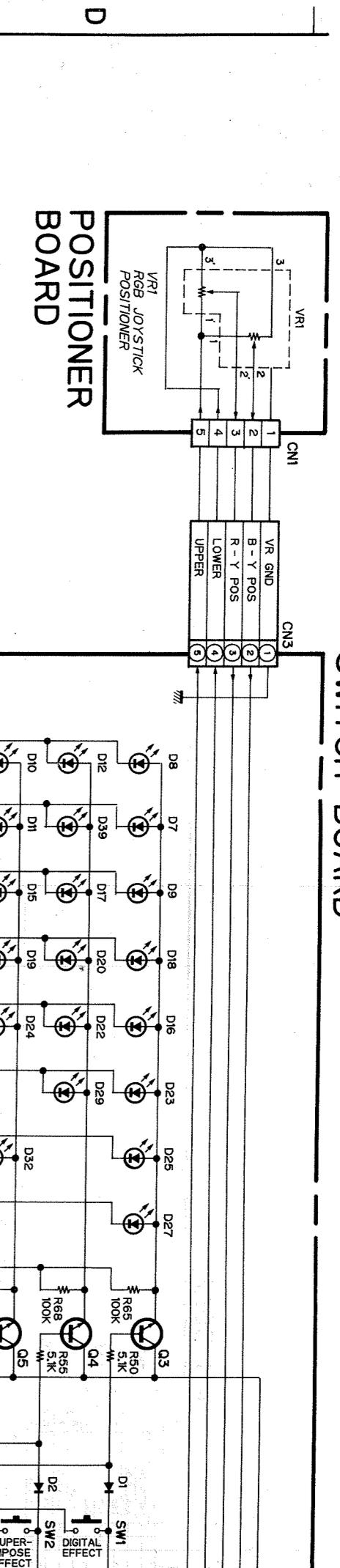
BLOCK DIAGRAM

MAIN BOARD



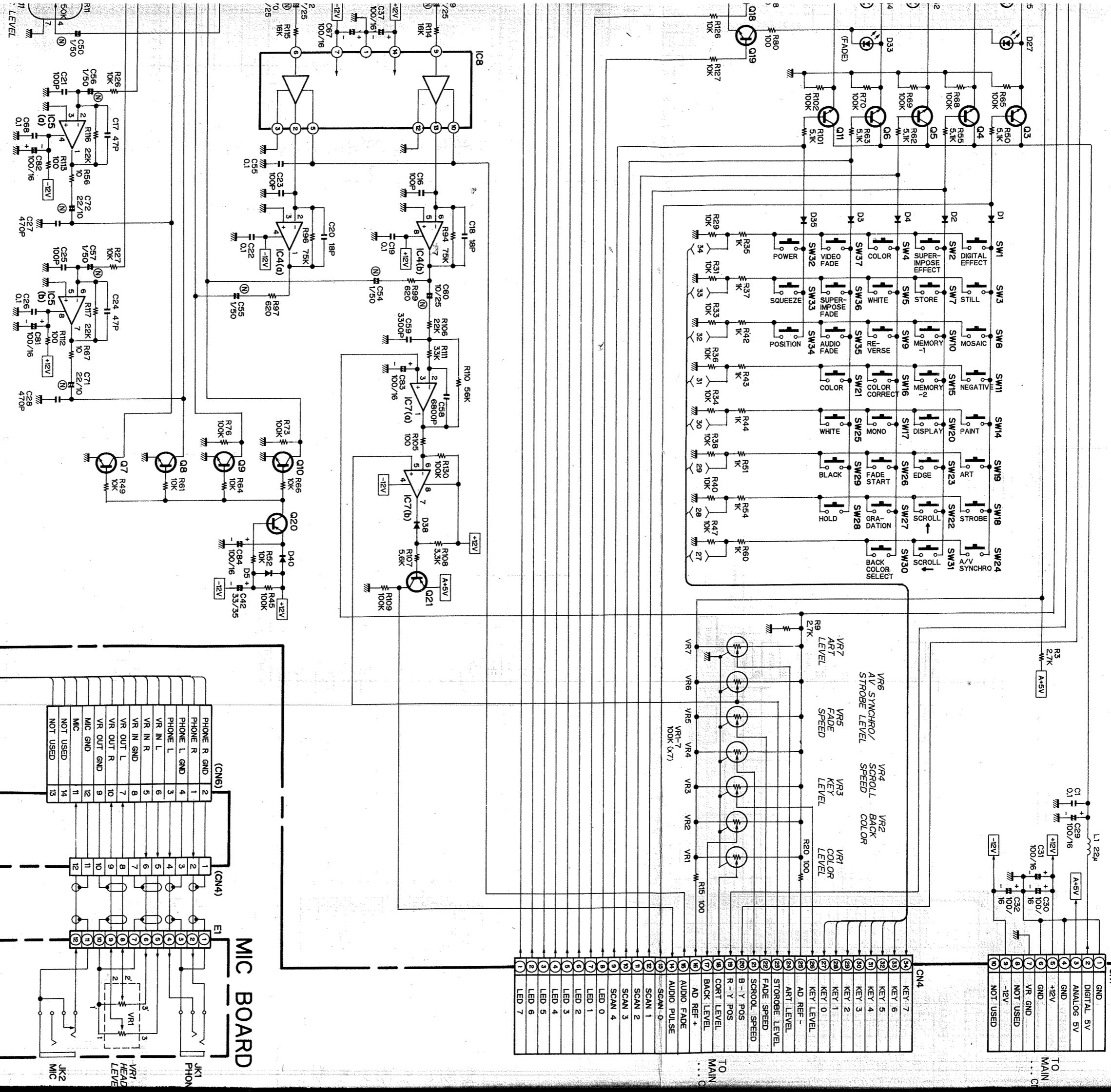
SCHEMATIC DIAGRAM OF SWITCH

SWITCH BOARD



<Address>									
I1	A2,A3	Q7	A5	Q17	G3	D7	D2	D17	D2
I2	B3	Q8	A5	Q18	G3	D8	D2	D18	D3
I3	B4	Q9	A5	Q19	C3	D9	D2	D19	D3
I4	A3,A4	Q10	B5	Q20	D10	D2	D20	D3	D30
I5	B4,B5	Q11	B5	Q21	D11	D2	D21	D3	D32
I6	Q3	Q12	C2	D12	D2	D2	D22	D3	D33
I7	D3	Q13	C2	D13	D2	D2	D23	D3	D34
I8	Q14	C2	D14	D2	D2	D2	D24	D3	D35
I9	D3	Q15	C2	D15	D2	D2	D25	D3	D36
I10	Q16	C2	D16	D2	D2	D2	D26	D3	D37

DIAGRAM OF SWITCH BOARD



4

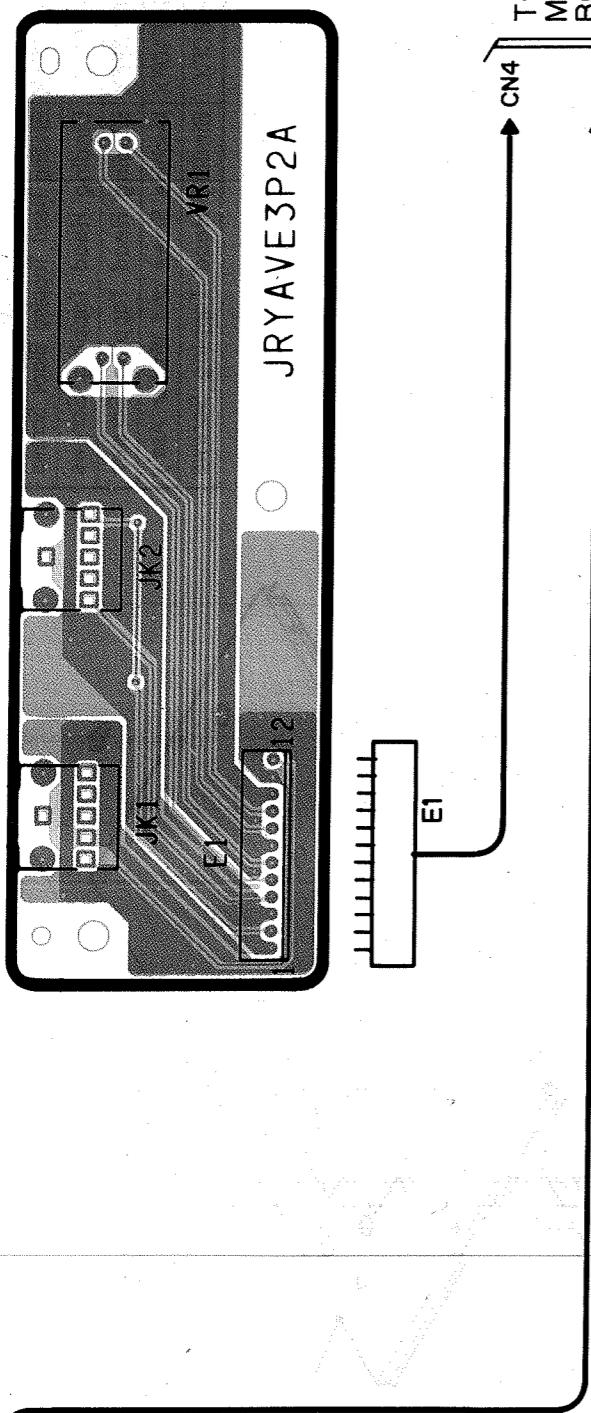
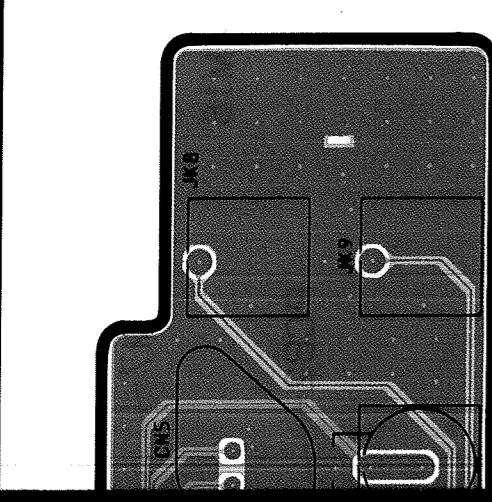
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6

	I _{C1}	I _{C2}	I _{C4}	I _{C5}	I _{C7}	I _{C8}
Pin 1	0	-0.5	-0.1	0	1.5	0
2	0	7.5	0	1.5	0	
3	0	7.6	0	0	1.5	0
4	-12.0	-12.0	-12.0	-12.0	0.1	
5	0	0	0	3.7	5.0	
6	0	0	0	1.5	0	
7	0	0	-0.1	0	11.9	-12.0
8	11.9	11.9	11.5	11.9	0	
9	0	0	0	-0.5	0	
10	0	0	-0.5	0	11.7	-0.5
11	0	0	5.0	0	11.7	0
12	0	1.5	0.4	0	11.7	0.4

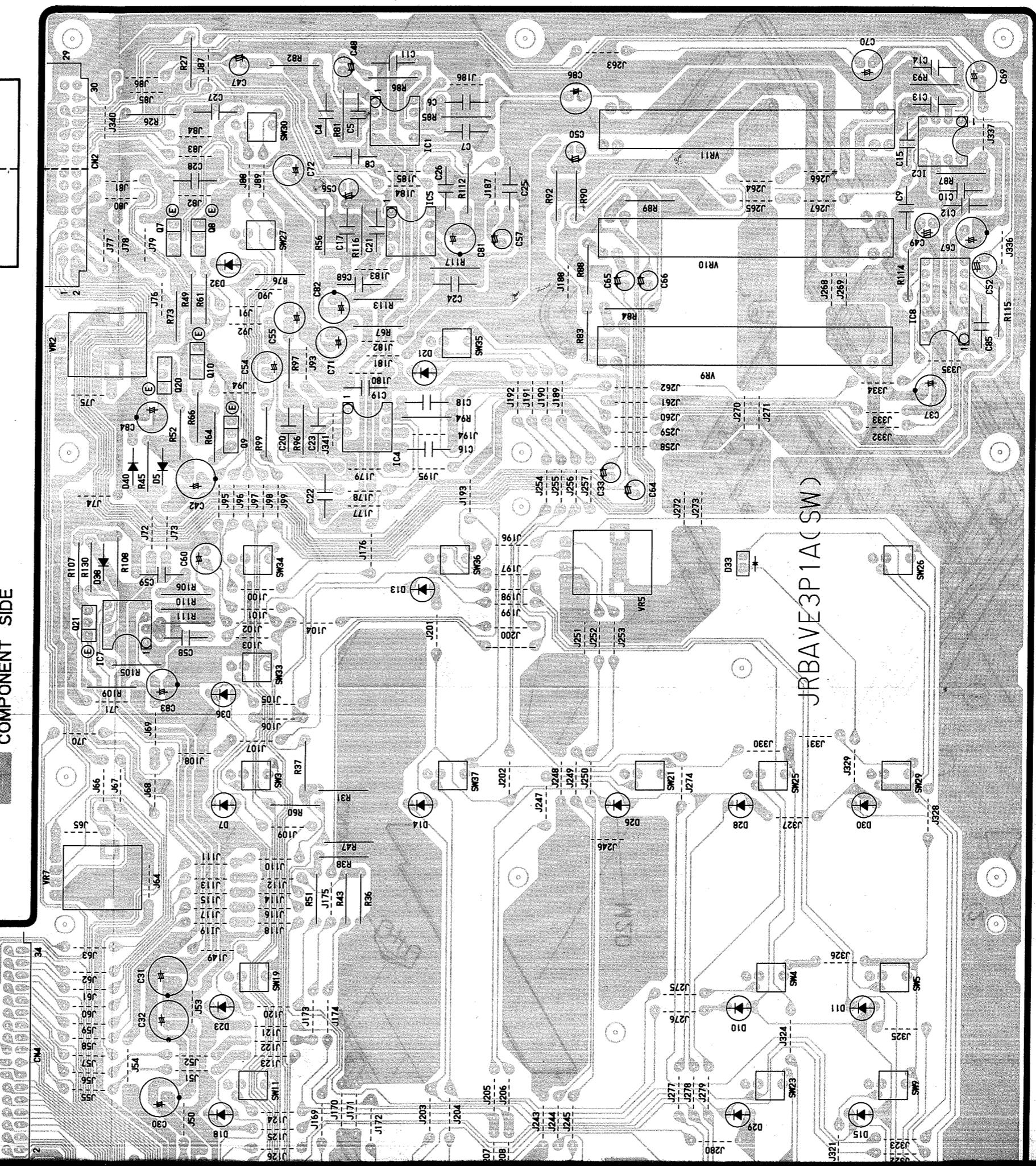
VIEW OF SWITCH BOARD

MIC BOARD



PATTERN SIDE

COMPONENT SIDE

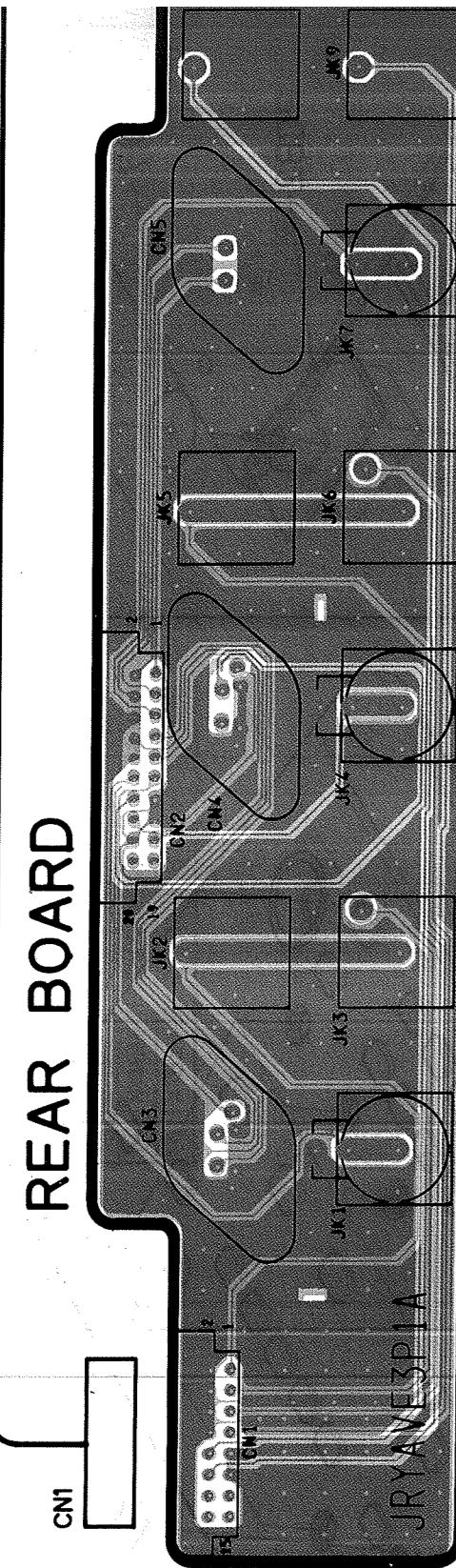


CONDUCTOR VIEW OF

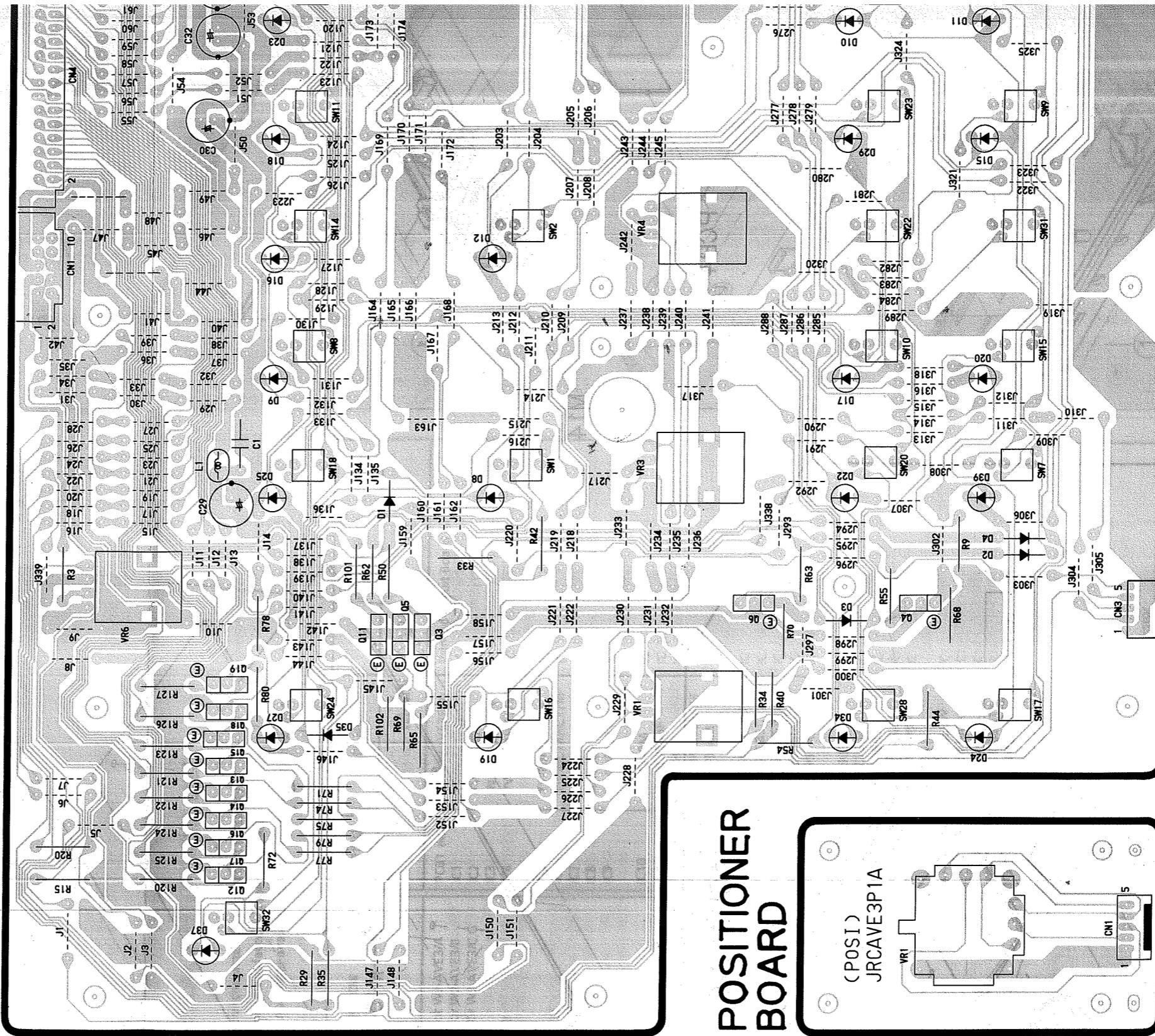
<Address>

B5	A5
I1	I4
I2	B4
I5	B5
I7	C4
I8	A5
Q3	B2
Q4	A2
Q5	C2
Q6	B2
Q7	C5
Q8	C4
Q9	C5
Q10	C4
Q11	C2
Q12	C2
Q13	C5
Q14	C1
Q15	C1
Q16	C1
Q17	C1
Q18	C1
Q19	C1
Q20	C5
Q21	D1
D2	D2
D3	A2
D4	A2
D5	C4
D6	C4
D7	C4
D8	B2
D9	C2
D10	A3
D11	A3
D12	B2
D13	B4
D14	B4
D15	A3
D16	C2
D17	A2
D18	C3
D19	B1
D20	A2
D21	B5
D22	A2
D23	C3
D24	A1
D25	C2
D26	B4
D27	C1
D28	A4
D29	A3
D30	A4
D32	C5
D33	A4
D34	A1
D35	C1
D36	C4
D37	C1
D38	C4
D39	A2
D40	C4

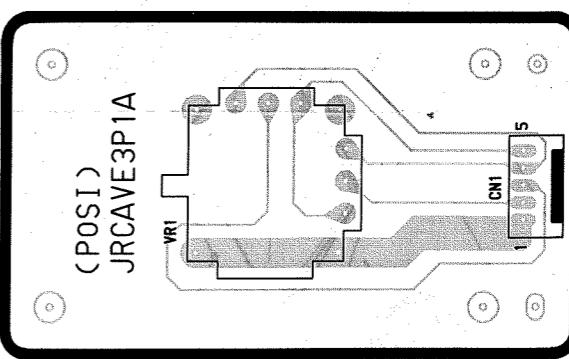
REAR BOARD



SWITCH BOARD



POSITIONER
BOARD



CN3

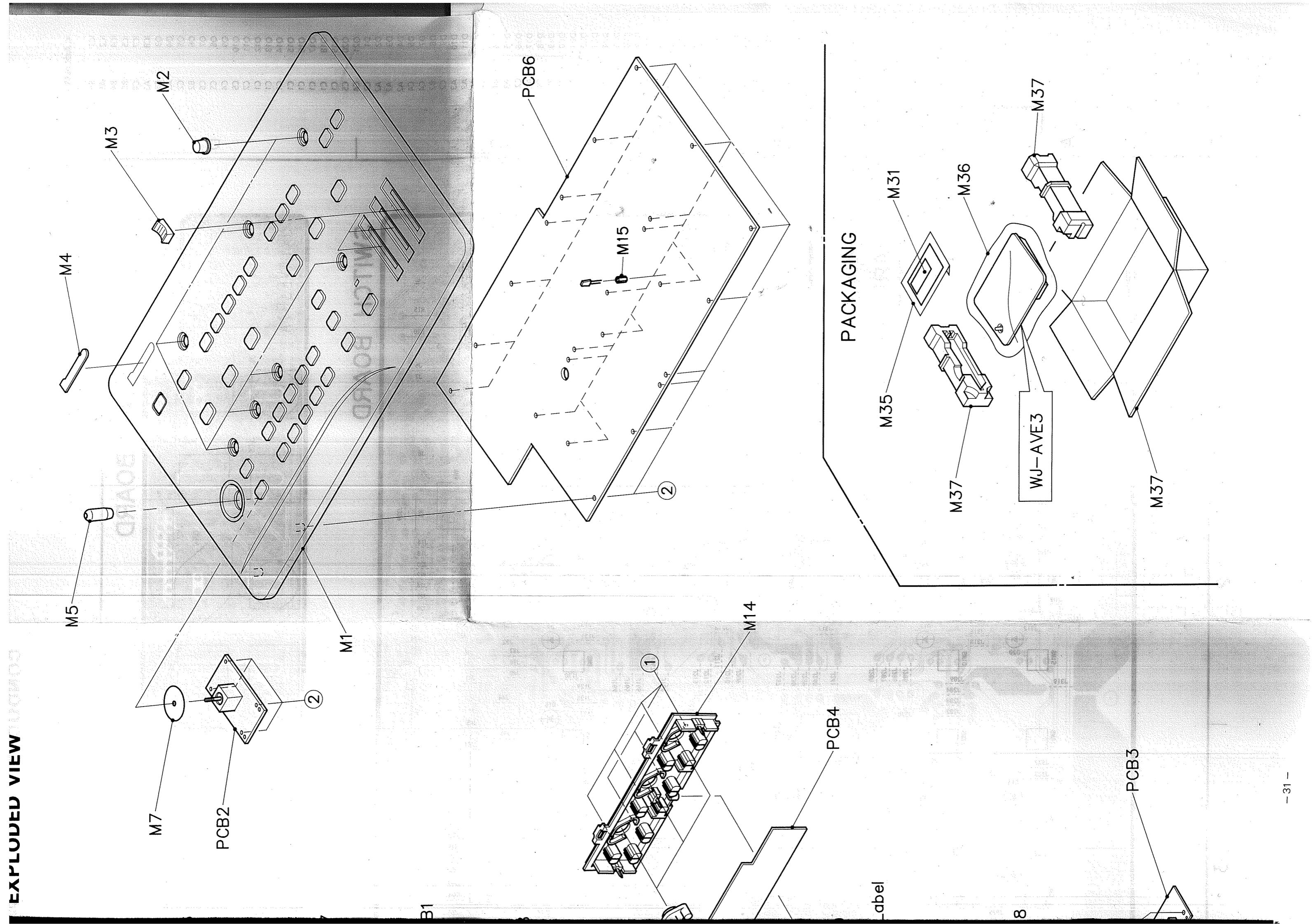
CN1

2

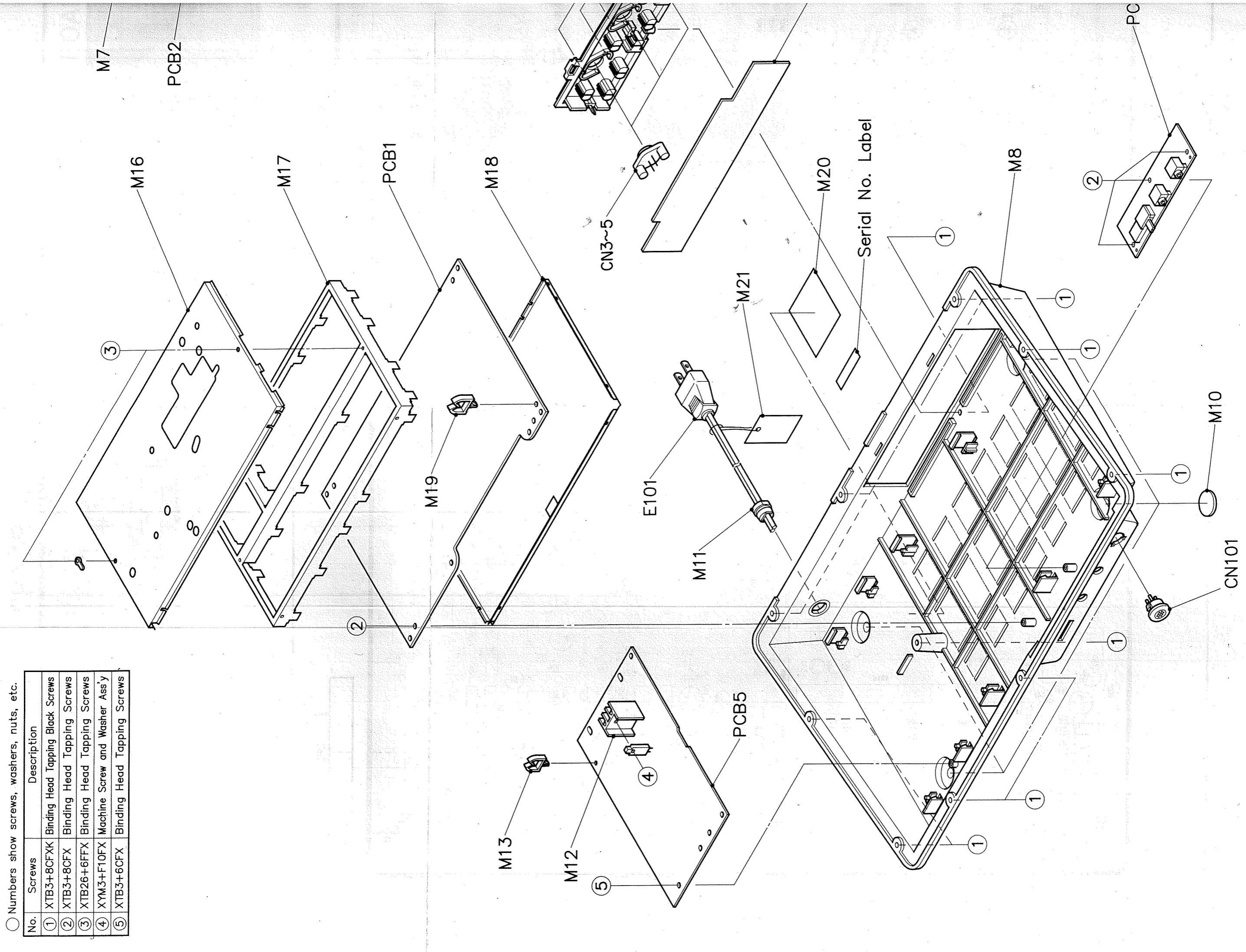
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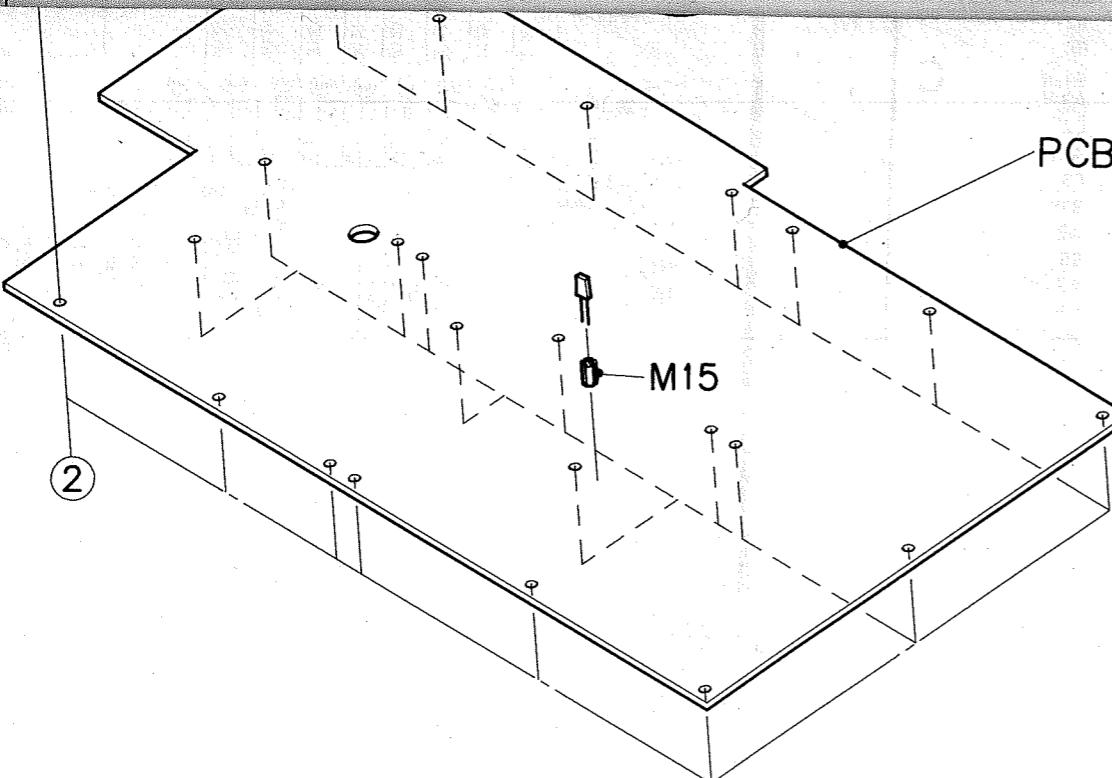
3

EXPLODED VIEW



EXPLODED VI





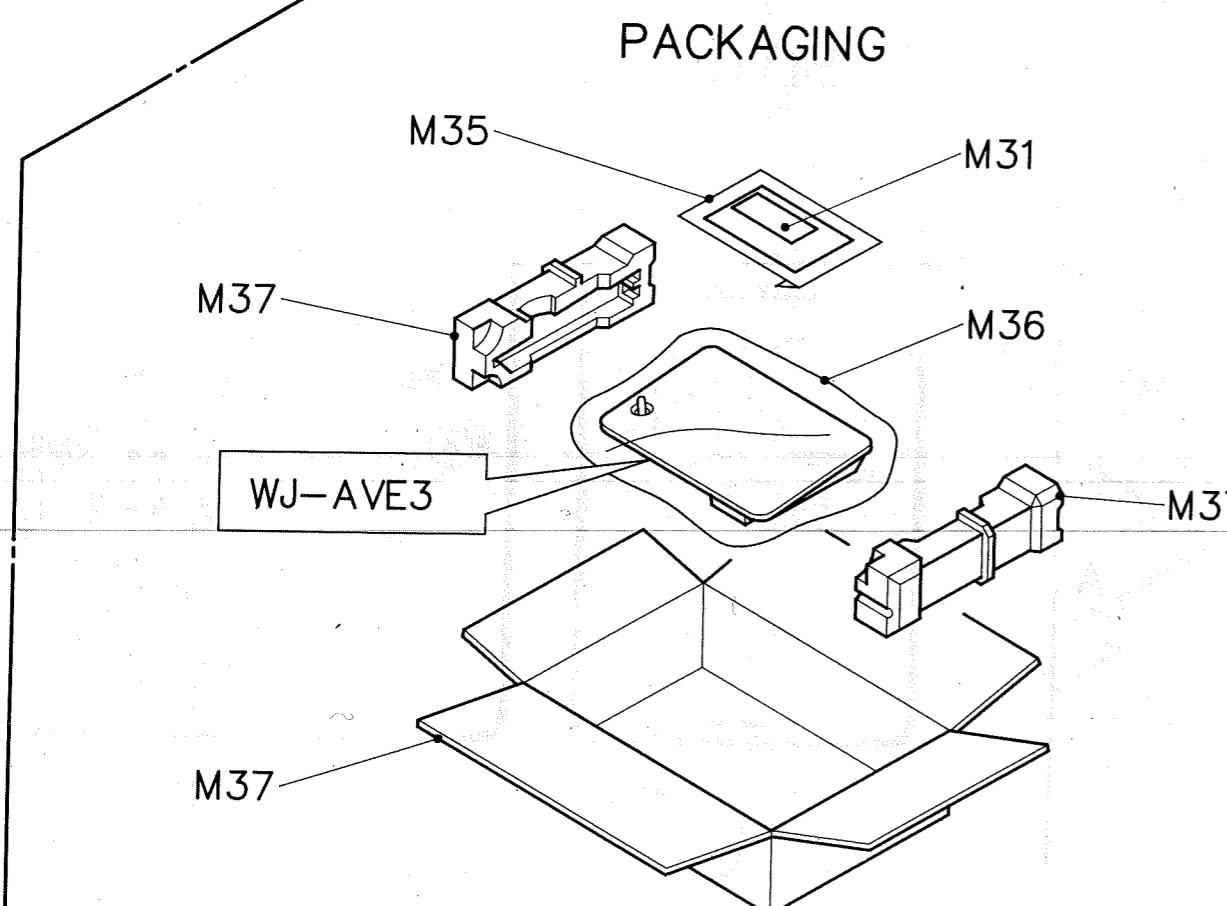
REPLACEMENT PARTS LIST

Important Notice

1. Components identified by "▲" mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

2. Printed circuit board assembly with mark (NLA) is no longer available after production discontinuation of the complete set.

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
MISCELLANEOUS					
E101 ▲	YWKP56LT2F22 YWGTS2F YWKP4192F22 YWD0111N619 YVW0MA0101AN	AC Power Cord for WJ-AVE3/A AC Power Cord for WJ-AVE3/B AC Power Cord for WJ-AVE3/C,G ALC Connector Upper Cover Assy	PCB1 (NLA)	YWJKZAVE3E2A	Printed Circuit Board Assy
CN101			IC1	YWNJM2246M	IC
M1			IC2	YWM51271FP	IC
M2	YVV5RA0333B3	Knob (X7)	IC3	-NJM78L05AT3	IC
M3	YVV5RA0335A3	Sled VR Knob (X3)	IC4	YWMC74HC374F	IC
M4	YVW7PA0093A3	Panasonic Badge	IC5	YWNJM2246M	IC
M5	YVV5RA0334A3	Color Correcter Knob	IC6	YWMC74HC374F	IC
M7	YVW2VA0038A4	Barrier	IC7	YWSC7S08F	IC
M8	YVW9AA0711AN	Bottom Cover Assy	IC8	AN608P	IC
M10	YVW5LB0036A4	Rubber Foot	IC9	YWLML1881M	IC
M11	YWSR4K4	Cord Clamp	IC10	NJM319M	IC
M13	UAMS-07-V0	Cord Clamp Assy	IC11	YWSC7S08F	IC
M14	YVW9AB0709AN	Rear Panel Assy	IC12-14	AN608P	IC
M16	YVW2HA0998A2	Shield Parts	IC15	YWNJM3403AM	IC
M19	YVUAMS09V0	Cord Clamp B	IC16	NJM2904M	IC
M20 ▲	YVW7QA2664A4 YVW7QA2665A4 YVW7QA2666A4	Main Label for WJ-AVE3/A Main Label for WJ-AVE3/B Main Label for WJ-AVE3/C	IC17	MC74HC4053F	IC
M21	YVW7QA2667A4 YVW7MA0395A4	Main Label for WJ-AVE3/G Safety Label for Power Cord	IC18,19	MN6550BS	IC
			IC20	-NJM78L05AT3	IC
			IC21	MN188166CUB	IC
			IC22	M51951ASL	IC
			IC23	MN53007LVW1	IC
			IC24	YWSC7S08F	IC
			IC25	MN4528BS	IC
			IC26	MC74HC4053F	IC
			IC27	MN676021PPS	IC
			IC28	MN53020LBW	IC
			IC29	YWM511000A7Z	IC
			IC30	YWPUD42102G3	IC
			IC31	-NJM78L09AT3	IC
			IC32	MN53040LVX3	IC
			IC33-36	YWM5M4C500AL	IC
			IC37	MN53080LBR1	IC
			IC38	YWSC7SU04F	IC
			IC40,41	YWSC7S08F	IC
			IC42,43	YWSC7SU04F	IC
			Q1-5	2SD601-RS	Transistor
			Q6,7	2SB709-QRS	Transistor
			Q8	2SD601-RS	Transistor
			Q9	2SB709-QRS	Transistor
			Q10-13	2SD601-RS	Transistor
			Q14,15	2SB709-QRS	Transistor
			Q16,17	2SD601-RS	Transistor
			Q18,19	2SB709-QRS	Transistor
			Q20,21	2SD601-RS	Transistor
			Q22	2SB709-QRS	Transistor



REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
Q23-25	2SD601-RS	Transistor	R44	YF2116474JT	Carbon 470K ohms 1/16W
Q26	2SD1328-RS	Transistor	R45,46	YF2116102GT	Carbon 1K ohms 1/16W
Q27	2SD601-RS	Transistor	R48	YF2116511JT	Carbon 510 ohms 1/16W
Q28-31	2SD1328-RS	Transistor	R49	YF2116101JT	Carbon 100 ohms 1/10W
Q32	2SD601-RS	Transistor	R50	YF2116102GT	Carbon 1K ohms 1/16W
Q33	2SD1328-RS	Transistor	R51	YF2116433GT	Carbon 43K ohms 1/16W
Q34	XN4501	Transistor	R52	YF2116562JT	Carbon 5.6K ohms 1/16W
Q35	2SB709-QRS	Transistor	R53	YF2116222GT	Carbon 2.2K ohms 1/16W
Q36	2SD1328-RS	Transistor	R54	YF2116474JT	Carbon 470K ohms 1/16W
Q37	2SB709-QRS	Transistor	R55	YF211632J	Carbon 3.3K ohms 1/16W
Q38-41	2SK198-Q	FET	R56-58	YF2116222GT	Carbon 2.2K ohms 1/16W
Q42	2SB709-QRS	Transistor	R59,60	YF2116680JT	Carbon 68 ohms 1/16W
Q43	2SD636-QRS	Transistor	R61	YF2116511JT	Carbon 510 ohms 1/16W
Q44	2SB709-QRS	Transistor	R62	YF2116392JT	Carbon 3.9K ohms 1/16W
Q45	2SD601-RS	Transistor	R63	YF2116223JT	Carbon 22K ohms 1/16W
D1,2	1SS99	Diode	R64,65	YF2116102GT	Carbon 1K ohms 1/16W
D3	MA151K	Diode	R66	YF211632J	Carbon 3.3K ohms 1/16W
D4-8	1SV153	Diode	R67	YF2116222GT	Carbon 2.2K ohms 1/16W
D10	1SV153	Diode	R68	YF2116223JT	Carbon 22K ohms 1/16W
D11-13	MA151K	Diode	R69	YF2116102GT	Carbon 1K ohms 1/16W
R1	YF2116202JT	Carbon 2K ohms 1/16W	R70	YF2116103JT	Carbon 10K ohms 1/16W
R2,3	YF2116202JT	Carbon 2K ohms 1/16W	R71	YF2116684JT	Carbon 680K ohms 1/16W
R4	YF211632J	Carbon 3.3K ohms 1/16W	R72,73	YF2116103JT	Carbon 10K ohms 1/16W
R5	YF2116102GT	Carbon 1K ohms 1/16W	R74	YF2116512JT	Carbon 5.1K ohms 1/16W
R6	YF2116222GT	Carbon 2.2K ohms 1/16W	R75	YF2116102GT	Carbon 1K ohms 1/16W
R7	YF2116202JT	Carbon 2K ohms 1/16W	R76	YF2116123JT	Carbon 12K ohms 1/16W
R8	YF2116392JT	Carbon 3.9K ohms 1/16W	R77	YF2116243JT	Carbon 24K ohms 1/16W
R9	YF2116223JT	Carbon 22K ohms 1/16W	R78	YF2116393GT	Carbon 39K ohms 1/16W
R10	YF2116332JT	Carbon 3.3K ohms 1/16W	R79	YF2116103JT	Carbon 10K ohms 1/16W
R11-16	YF2116102GT	Carbon 1K ohms 1/16W	R80	YW2116305JT	Carbon 3M ohms 1/16W
R17	YF2116433GT	Carbon 43K ohms 1/16W	R81	YF211632J	Carbon 3.3K ohms 1/16W
R18	YF2116122JT	Carbon 1.2K ohms 1/16W	R82	YF2116103JT	Carbon 10K ohms 1/16W
R19	YF2116222GT	Carbon 2.2K ohms 1/16W	R83	YF2116222GT	Carbon 2.2K ohms 1/16W
R20	YF2116754JT	Carbon 750K ohms 1/16W	R84	YF211632J	Carbon 3.3K ohms 1/16W
R21	YF2116223JT	Carbon 22K ohms 1/16W	R85	YF2116222GT	Carbon 2.2K ohms 1/16W
R23	L311J103J32	Carbon 3.3K ohms	R86,87	YF2116102GT	Carbon 1K ohms 1/16W
R24	YF2116103JT	Carbon 10K ohms 1/16W	R88	YF2116621JT	Carbon 620 ohms 1/16W
R25	YF2116474JT	Carbon 470K ohms 1/16W	R89	YF2116391JT	Carbon 390 ohms 1/16W
R26	YF2116512JT	Carbon 5.1K ohms 1/16W	R90	YF2116101JT	Carbon 100 ohms 1/10W
			R91	YF211632J	Carbon 3.3K ohms 1/16W
R27	YW2116620JT	Carbon 62 ohms 1/16W	R92	YF2116511JT	Carbon 510 ohms 1/16W
R28	YF2116151JT	Carbon 150 ohms 1/16W	R93	YF2116103JT	Carbon 10K ohms 1/16W
R30,31	YF211632J	Carbon 3.3K ohms 1/16W	R94	YF2116102GT	Carbon 1K ohms 1/16W
R32	YF2116102GT	Carbon 1K ohms 1/16W	R95	YF2116101JT	Carbon 100 ohms 1/10W
R33	YF2116103JT	Carbon 10K ohms 1/16W	R96	YF211632J	Carbon 3.3K ohms 1/16W
R34,35	YF2116512JT	Carbon 5.1K ohms 1/16W	R97	YF2116511JT	Carbon 510 ohms 1/16W
R36,37	YF2116222GT	Carbon 2.2K ohms 1/16W	R98	YF2116103JT	Carbon 10K ohms 1/16W
R38	YF2116680JT	Carbon 68 ohms 1/16W	R99	YF2116102GT	Carbon 1K ohms 1/16W
R39-42	YF2116102GT	Carbon 1K ohms 1/16W	R100	YF2116101JT	Carbon 100 ohms 1/10W
R43	YF2116222GT	Carbon 2.2K ohms 1/16W	R101	YF211632J	Carbon 3.3K ohms 1/16W
			R102	YF2116102GT	Carbon 1K ohms 1/16W
			R103	YF2116203JT	Carbon 20K ohms 1/16W
			R104-106	YF2116102GT	Carbon 1K ohms 1/16W
			R107	YF2116103JT	Carbon 10K ohms 1/16W
			R108	YF2116511JT	Carbon 510 ohms 1/16W

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
R109-115	YF2116331JT	Carbon 330 ohms 1/16W	R289	YF211632JT	Carbon 3.3K ohms 1/16W
R116	YF2116153JT	Carbon 15K ohms 1/16W	R290	YF2116474JT	Carbon 470K ohms 1/16W
R117	YF2116512JT	Carbon 5.1K ohms 1/16W	R291-295	YF2116750JT	Carbon 75 ohms 1/16W
R118,119	YF2116153JT	Carbon 15K ohms 1/16W	R296-298	YF2116104JT	Carbon 100K ohms 1/16W
R121-123	YF2116103JT	Carbon 10K ohms 1/16W	R299	YF2116393GT	Carbon 39K ohms 1/16W
R124-129	YF2116510JT	Carbon 51 ohms 1/16W	R303,304	YF2116271JT	Carbon 270 ohms 1/16W
R130-136	YF211631JT	Carbon 330 ohms 1/16W	R305	YF2116122JT	Carbon 1.2K ohms 1/16W
R137	YF2116222JT	Carbon 2.2K ohms 1/16W	R306-312	YF2116331JT	Carbon 330 ohms 1/16W
R138	YF2116392JT	Carbon 3.9K ohms 1/16W	R313	YF2116332JT	Carbon 3.3K ohms 1/16W
R139-158	YF2116331JT	Carbon 330 ohms 1/16W	R314-316	YF2116331JT	Carbon 330 ohms 1/16W
R159,160	YF2116104JT	Carbon 100K ohms 1/16W	R317	YF2116102GT	Carbon 1K ohms 1/16W
R161	YF2116102GT	Carbon 1K ohms 1/16W	R318	YF211632JT	Carbon 3.3K ohms 1/16W
R162	YF2116332JT	Carbon 3.3K ohms 1/16W	R319	YF2116392JT	Carbon 3.9K ohms 1/16W
R163	YF2116103JT	Carbon 10K ohms 1/16W	R320-333	YF2116331JT	Carbon 330 ohms 1/16W
R164	YF2116332JT	Carbon 3.3K ohms 1/16W	R340	YF2116104JT	Carbon 100K ohms 1/16W
R165,166	YF2116202JT	Carbon 2K ohms 1/16W	R341	YF2116222GT	Carbon 2.2K ohms 1/16W
R167	YF211632JT	Carbon 3.3K ohms 1/16W	R380	YF2116474JT	Carbon 470K ohms 1/16W
R168,170	YF2116102GT	Carbon 1K ohms 1/16W	R381,382	YF2116103JT	Carbon 10K ohms 1/16W
R171	YF2116104JT	Carbon 100K ohms 1/16W	R383	YF2116331JT	Carbon 330 ohms 1/16W
R172	YF2116511JT	Carbon 510 ohms 1/16W	R384	YF211632JT	Carbon 3.3K ohms 1/16W
R173	YF2116103JT	Carbon 10K ohms 1/16W	R385	YF2116392JT	Carbon 3.9K ohms 1/16W
R174	YF211632JT	Carbon 3.3K ohms 1/16W	VR1	EVM1DSW30B54	Variable Resistor 50K ohms
R176	YF2116511JT	Carbon 510 ohms 1/16W	VR2	EVM1DSW30B24	Variable Resistor 20K ohms
R177	YF2116331JT	Carbon 330 ohms 1/16W	VR3	EVM1DSW30B13	Variable Resistor 1K ohms
R178	YF2116101JT	Carbon 100 ohms 1/10W	VR4	EVM1DSW30BQ2	Variable Resistor 470 ohms
R179	YF2116331JT	Carbon 330 ohms 1/16W	VR5,6	EVM1DSW30B34	Variable Resistor 30K ohms
R180	YW2116105JT	Carbon 1M ohms 1/16W	VR7	EVM1DSW30B24	Variable Resistor 20K ohms
R181	YF2116102GT	Carbon 1K ohms 1/16W	VR8,9	EVM1DSW30B13	Variable Resistor 1K ohms
R182,183	YF2116104JT	Carbon 100K ohms 1/16W	VR10	EVM1DSW30B14	Variable Resistor 10K ohms
R184-186	YF2116511JT	Carbon 510 ohms 1/16W	VR11	EVM1DSW30BQ2	Variable Resistor 470 ohms
R187	YF2116752JT	Carbon 7.5K ohms 1/16W	VR12	EVM1DSW30B14	Variable Resistor 10K ohms
R188	YF2116511JT	Carbon 510 ohms 1/16W	Z1	YWRKM10L102F	Block Resistor
R189	YF2116333GT	Carbon 33K ohms 1/16W	Z2	YWRKM10L503F	Block Resistor
R190	YF2116332JT	Carbon 3.3K ohms 1/16W			

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
C25	ECEA0JKA470	Electrolytic 47 μF 6.3V	C90	YF400151SLKT	Ceramic 150 pF
C26	YWT316B104MT	Ceramic 0.1 μF	C91	ECEA1AKA220	Electrolytic 22 μF 10V
C27	ECEA1HKA010	Electrolytic 1 μF 50V	C92	YWT316B104MT	Ceramic 0.1 μF
C28	YWT316B104MT	Ceramic 0.1 μF	C93	ECEA1AKA470	Electrolytic 47 μF 10V
C29	YW400050CHJT	Ceramic 5 pF	C94	YF400330CHJT	Ceramic 33 pF
C30	YF400561CHJT	Ceramic 560 pF	C95	YWT316B104MT	Ceramic 0.1 μF
C32	ECEA1CKA470	Electrolytic 47 μF 16V	C96	YWS21A106T	Electrolytic 10 μF 10V
C33	YWT316B104MT	Ceramic 0.1 μF	C97	ECEA1HSN2R2	Electrolytic 2.2 μF 50V
C34	ECEA1CKA470	Electrolytic 47 μF 16V	C98	YWT316B104MT	Ceramic 0.1 μF
C35	YWT316B104MT	Ceramic 0.1 μF	C99	YF400330CHJT	Ceramic 33 pF
C36	YWS21A106T	Electrolytic 10 μF 10V	C100	ECEA1AKA470	Electrolytic 47 μF 10V
C37	ECEA1AKA220	Electrolytic 22 μF 10V	C101	YWT316B104MT	Ceramic 0.1 μF
C38	YF400222XKT	Ceramic 2200 pF	C102	YWS21A106T	Electrolytic 10 μF 10V
C39	ECEA0GKA470	Electrolytic 47 μF 4V	C103,104	YWT316B104MT	Ceramic 0.1 μF
C40	YF400222XKT	Ceramic 2200 pF	C105	ECST1AD336ZR	Tantalum 33 μF 10V
C41	YWT316B104MT	Ceramic 0.1 μF	C106	YWT316B104MT	Ceramic 0.1 μF
C42	YWS21A106T	Electrolytic 10 μF 10V	C107	YF400102XKT	Ceramic 1000 pF
C43	YF400430CHJT	Ceramic 43 pF	C108-113	YWT316B104MT	Ceramic 0.1 μF
C45	ECEA1CKA470	Electrolytic 47 μF 16V	C114	YF400102XKT	Ceramic 1000 pF
C46	ECEA1AKA220	Electrolytic 22 μF 10V	C115	ECEA1AKA470	Electrolytic 47 μF 10V
C47	ECEA1CKN4R7	Electrolytic 4.7 μF 16V	C116	ECEA0JKA470	Electrolytic 47 μF 6.3V
C48-50	ECEA0GKA470	Electrolytic 47 μF 4V	C117	YWT316B104MT	Ceramic 0.1 μF
C51	YWT316B104MT	Ceramic 0.1 μF	C118	YWS21A106T	Electrolytic 10 μF
C52	ECEA1AKA220	Electrolytic 22 μF 10V	C119,120	YWT316B104MT	Ceramic 0.1 μF
C53,54	ECEA0JU471	Electrolytic 470 μF 6.3V	C121	ECST1AD336ZR	Tantalum 33 μF 10V
C55	YF400390CHJT	Ceramic 39 pF	C122,123	YWS21A476T	Electrolytic 47 μF
C56	ECEA1AKA220	Electrolytic 22 μF 10V	C124,125	ECEA1CKA470	Electrolytic 47 μF 16V
C57	ECEA1AKA470	Electrolytic 47 μF 10V	C126,127	YWT316B104MT	Ceramic 0.1 μF
C58	YWT316B473MT	Ceramic 0.047 μF	C128	ECEA1AKA220	Electrolytic 22 μF 10V
C59	ECEA1AKA470	Electrolytic 47 μF 10V	C129	ECEA1CU102	Electrolytic 1000 μF 16V
C60,61	YF400220CHJT	Ceramic 22 pF	C130	YWS21A106T	Electrolytic 10 μF 10V
C62,63	YWT316B104MT	Ceramic 0.1 F	C131	YWT316B104MT	Ceramic 0.1 μF
C64	ECEA0JKA470	Electrolytic 47 μF 6.3V	C132	YWS21A106T	Electrolytic 10 μF 10V
C65	YWT316B104MT	Ceramic 0.1 μF	C133	ECST1AD336ZR	Tantalum 33 μF 10V
C66	ECEA1AKA470	Electrolytic 47 μF 10V	C134-143	YWT316B104MT	Ceramic 0.1 μF
C67	YWT316B104MT	Ceramic 0.1 μF	C144	YF400151SLKT	Ceramic 150 pF
C68	ECEA1AKA220	Electrolytic 22 μF 10V	C145-159	YF400330CHJT	Ceramic 33 pF
C69-71	YWT316B104MT	Ceramic 0.1 μF	C160,161	YF400820CHJT	Ceramic 82 pF
C72	ECEA0JKA470	Electrolytic 47 μF 6.3V	C162	YF400101SLKT	Ceramic 100 pF
C73	YWT316B104MT	Ceramic 0.1 μF	C163	ECEA1HKA2R2	Electrolytic 2.2 μF 50V
C74	ECEA1AKA220	Electrolytic 22 μF 10V	C164	YF400103XMT	Ceramic 0.01 μF
C75	ECEA1CKA470	Electrolytic 47 μF 16V	C165	ECEA1HKA2R2	Electrolytic 2.2 μF 50V
C76	ECEA1HKA2R2	Electrolytic 2.2 μF 50V	C166	YWT316B104MT	Ceramic 0.1 μF
C77	ECEA1AKA470	Electrolytic 47 μF 10V	C167,168	ECEA1AKA220	Electrolytic 22 μF 10V
C78	YWT316B104MT	Ceramic 0.1 μF	C169	YWT316B104MT	Ceramic 0.1 μF
C79	YF400220CHJT	Ceramic 22 pF	C170	YF400330CHJT	Ceramic 33 pF
C80	ECEA1AKA220	Electrolytic 22 μF 10V	C171,172	YWS21A106T	Electrolytic 10 μF 10V
C81	ECEA1CKA470	Electrolytic 47 μF 16V	C173	YF400100CHDT	Ceramic 10 pF
C82	ECEA1HKA2R2	Electrolytic 2.2 μF 50V	C174	YWS21A106T	Electrolytic 10 μF 10V
C83	ECEA1AKA470	Electrolytic 47 μF 10V	C175	YF400201CHJT	Ceramic 200 pF
C84	YWT316B104MT	Ceramic 0.1 μF	C177	YF400330CHJT	Ceramic 33 pF
C85,86	YF400220CHJT	Ceramic 22 pF	C178,179	YF400470CHJT	Ceramic 47 pF
C87	ECEA1AKA220	Electrolytic 22 μF 10V	C180	YF400201CHJT	Ceramic 200 pF
C88	YF400330CHJT	Ceramic 33 pF	C181,182	YF400330CHJT	Ceramic 33 pF
C89	YWS21A476T	Electrolytic 47 μF 10V	C183	ECEA1HKA2R2	Electrolytic 2.2 μF 50V

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
C184	YF400332XKT	Ceramic 3300 pF	L10	ELESE220KA	Coil 22 μH
C185	YF400330CHJT	Ceramic 33 pF	L11	YWF3216C220K	Coil 22 μH
C186	YF400180CHJT	Ceramic 18 pF	L12,13	ELESN2R2MA	Coil 2.2 μH
C188-190	YWS21A106T	Electrolytic 10 μF 10V	L14	ELESE8R2KA	Coil 8.2 μH
C191,192	YF400330CHJT	Ceramic 33 pF	L15	YWELESN1R0MA	Coil 1 μH
C193,194	YWT316B104MT	Ceramic 0.1 μF	L16	YWS5LE0381	Coil
C195	YWS21A106T	Electrolytic 10 μF 10V	L17-19	YWELESN1R0MA	Coil 1 μH
C196-198	YF400330CHJT	Ceramic 33 pF	L20	YWS5LE0381	Coil
C199	YF400390CHJT	Ceramic 39 pF	L21-23	YWELESN1R0MA	Coil 1 μH
C200	YWT316B104MT	Ceramic 0.1 μF	L24	ELC08D082	Coil 56 μH
C201	ECEA1CKA470	Electrolytic 47 μF 16V	L27	ELESE150KA	Coil 15 μH
C202	YF400101SLKT	Ceramic 100 pF	L28	ELESE8R2KA	Coil 8.2 μH
C203	ECEA1CKA470	Electrolytic 47 μF 16V	L29	ELC08D082	Coil 56 μH
C204	YF400330CHJT	Ceramic 33 pF	L30	YWF3216C220K	Coil 22 μH
C205	YF400332XKT	Ceramic 3300 pF	L32	EFDVN645A41E	Delay Line
C206	ECEA1HKA2R2	Electrolytic 2.2 μF 50V	L33,34	YFBL02RN2R62	Coil
C207	YF400101SLKT	Ceramic 100 pF	T1	YW29188EG	High Freq Transformer
C208,209	YF400330CHJT	Ceramic 33 pF	X1,2	YFMS30917M10	Crystal Oscillator
C210	YWT316B104MT	Ceramic 0.1 μF	X3	YWN8R4R40625	Crystal Oscillator
C211	YF400330CHJT	Ceramic 33 pF	X4	EF0GC8004A4	Oscillator
C212	YF400220CHJT	Ceramic 22 pF	CF1	YWYS30383	Filter
C213	YWT316B104MT	Ceramic 0.1 μF	CF2	YWYS30389	Filter
C214	YWS21A106T	Electrolytic 10 μF 10V	CF3	YWYS30484	Filter
C215	YWT316B104MT	Ceramic 0.1 μF	CF4	YWYS30386A	Filter
C216	YWS21A106T	Electrolytic 10 μF 10V	CF5	YWY5G0382	Filter
C217	YWT316B104MT	Ceramic 0.1 μF	CF6,7	YWYS30384	Filter
C218	ECEA0JU102	Electrolytic 1000 μF 6.3V	CF8,9	YWYS30387	Filter
C219	ECEA1AKA220	Electrolytic 22 μF 10V	CN1	YWF794P034LA	34-pin Connector
C220	YWS21A106T	Electrolytic 10 μF 10V	CN2	YWF794P020LA	20-pin Connector
C221	YWT316B104MT	Ceramic 0.1 μF	CN3	YW530140710	7-pin Connector
C222	YWS21A106T	Electrolytic 10 μF 10V	CN4	YW530141210	12-pin Connector
C223	YWT316B104MT	Ceramic 0.1 μF	CN5	YW530141110	11-pin Connector
C224	ECST1AD336ZR	Electrolytic 33 μF 10V	CN6	YWF794P014LA	14-pin Connector
C225	ECEA0GKA470	Electrolytic 47 μF 4V	CN7	YWF794P010LA	10-pin Connector
C226	YWS21A476T	Electrolytic 47 μF 10V	TP1-26	YWRCS3216TPV	Test Point
C229	YF400222XKT	Ceramic 2200 pF	M17	YVW2HA0999A1	Shield Cover A
C230	YWT316B104MT	Ceramic 0.1 μF	M18	YVW2HA1000A2	Shield Cover B
C231	YF400680CHJT	Ceramic 68 pF 10V			
C232	YF400330CHJT	Ceramic 33 pF			

REF.NO.	PART NO.	DESCRIPTION
MIC BOARD		
PCB3 (NLA)	YWJKYAVE3P2A	Printed circuit Board Assy
VR1	YWS152KGDI0	Variable Resistor
JK1	YWHSJ0912020	Jack
JK2	YWHSJ0912040	Jack
CN1	YW530141210	12-pin Connector
REAR BOARD		
PCB4 (NLA)	YWJKYAVE3P1A	Printed Circuit Board Assy
CN1	YWF795P016LA	16-pin Connector
CN2	YWF795P020LA	20-pin Connector
CN3-5	YWM1824	4-pin Connector
POWER BOARD		
PCB5 (NLA)	YWJKZAVE3E1A	Printed Circuit Board Assy
IC1	YWNJM78M12FA	IC
IC2	YWNJM79L12A	IC
IC3	YWT76431S	IC
Q1	2SC3866	Transistor
Q2	2SD973-QRS	Transistor
Q3,4	2SD1199-ST	Transistor
Q6	2SB1050	Transistor
Q7	2SB641-QR	Transistor
Q8	2SB1050	Transistor
Q9,10	2SD636-QRS	Transistor
Q11	2SD973-QRS	Transistor
D1	S1WBA60	Diode
D2	YWERA34-10	Diode
D3	EM01Z	Diode
D5	YFERA22-02	Diode
D6	YWPC111	Diode
D7	YWERA84009	Diode
D8	ERC81-004	Diode
D9	YWERA84009	Diode
D10	MA165	Diode
VS1	ERZC07DK471U	ZNR
R1	ERC12ZGM156	Solid Resistor
R2-4	ERD50FJ224	15M ohms 1/2W
R5	ERDS2TJ331	Carbon
R6	220K ohms 1/2W	
R7	330 ohms 1/4W	
R8	ERG1SJ391	Metal
R9	ERDS2TJ101	390 ohms 1W
R10	ERDS2TJ102	Carbon
	ERDS1VJ101	100 ohms 1/4W
	ERDS2TJ272	1K ohms 1/4W
		100 ohms 1/2W
		2.7K ohms 1/4W

REF.NO.	PART NO.	DESCRIPTION
SWITCH BOARD		
PCB6 (NLA)	YWJKBAVE3P1A	Printed Circuit Board Assy
IC1,2	YWNJM206DD	IC
IC4	YWNJM206DD	IC
IC5	YWM5216P	IC
IC7	NJM2043D	IC
IC8	YWM5206P	IC
Q3-19	2SD1992A	Transistor
Q20,21	2SB1320A	Transistor
D1-5	MA165	Diode
D7-30	YWSLH34DT90T	Diode
D32	YWSLH34DT90T	Diode
D33	LN210RP	LED
D34	YWSLH34DT90T	Diode
D35	MA165	Diode
D36	YWSLH34DT90T	Diode
D37	-SLR34VR90T	Diode
D38	MA165	Diode
D39	YWSLH34DT90T	Diode
D40	MA165	Diode
R3,9	ERDS2TJ272	Carbon
R15,20	ERDS2TJ101	Carbon
R26,27	EROS2CKF1002	Metal
R29,31	ERDS2TJ103	Carbon
R33,34	ERDS2TJ103	Carbon
R35	ERDS2TJ102	Carbon
R36	ERDS2TJ103	Carbon
R37	ERDS2TJ102	Carbon
R38,40	ERDS2TJ103	Carbon
R42-44	ERDS2TJ102	Carbon
R45	ERDS2TJ104	Carbon
R47,49	ERDS2TJ103	Carbon
R50	ERDS2TJ512	Carbon
R51	ERDS2TJ102	Carbon
R52	ERDS2TJ103	Carbon
R54	ERDS2TJ102	Carbon
R55	ERDS2TJ512	Carbon
R56	EROS2CKF10R0	Metal
R60	ERDS2TJ102	Carbon
R61	ERDS2TJ103	Carbon
R62,63	ERDS2TJ512	Carbon
R64	ERDS2TJ103	Carbon
R65	ERDS2TJ104	Carbon
R66	ERDS2TJ103	Carbon
R67	EROS2CKF10R0	Metal
R68-70	ERDS2TJ104	Carbon
R71,72	ERDS2TJ101	Carbon
R73	ERDS2TJ104	Carbon
R74,75	ERDS2TJ101	Carbon
R76	ERDS2TJ104	Carbon
R77-80	ERDS2TJ101	Carbon
R81	EROS2CKF4702	Metal
R82	EROS2CKF3301	Metal
R83,84	EROS2CKF2202	Metal
R85	EROS2CKF2203	Metal
R86	EROS2CKF1002	Metal
R87	EROS2CKF3302	Metal
R88,89	EROS2CKF2202	Metal
R90,92	EROS2CKF2702	Metal
R93	EROS2CKF3302	Metal
R94,96	EROS2CKF7502	Metal
R97,99	EROS2CKF6200	Metal
R101	ERDS2TJ512	Carbon
R102	ERDS2TJ104	Carbon
R105	ERDS2TJ101	Carbon
R106	ERDS2TJ223	Carbon
R107	ERDS2TJ562	Carbon
R108	ERDS2TJ332	Carbon
R109	ERDS2TJ104	Carbon
R110	EROS2CKF5602	Metal
R111	EROS2CKF3302	Metal
R112,113	EROS2CKF1000	Metal
R114,115	ERDS2TJ163	Carbon
R116,117	EROS2CKF2202	Metal
R120-127	ERDS2TJ103	Carbon
R130	ERDS2TJ104	Carbon
VR1-7	EVJ02AF20B15	Variable Resistor
VR9,10	EWAPA1X05C54	Variable Resistor
VR11	EWAPFEX05C54	Variable Resistor
C1	YWUP05F104ZA	Ceramic
C4	YWUP05B101KN	Ceramic
C5	YWUP05B820KN	Ceramic
C6	YWUP05S270JN	Ceramic
C7	YWUP05B101KN	Ceramic
C8	YWUP05F104ZA	Ceramic
C9,10	YWUP05B101KN	Ceramic
C11,12	YWUP05F104ZA	Ceramic
C13,14	YWUP05B101KN	Ceramic
C15	YWUP05F104ZA	Ceramic
C16	YWUP05B101KN	Ceramic
C17	YWUP05S470JN	Ceramic
C18	YWUP05C180JN	Ceramic
C19	YWUP05F104ZA	Ceramic
C20	YWUP05C180JN	Ceramic
C21	YWUP05B101KN	Ceramic
C22	YWUP05F104ZA	Ceramic
C23	YWUP05B101KN	Ceramic
C24	YWUP05S470JN	Ceramic
C25	YWUP05B101KN	Ceramic
C26	YWUP05F104ZA	Ceramic
C27,28	YWUP05B471KN	Ceramic
C29-32	ECEA1CKS101	Electrolytic
C33	ECEA1AKN220	Electrolytic
C37	ECEA1CKS101	Electrolytic
C42	ECEA1VKA330	Electrolytic
C47,48	ECEA1HKN010	Electrolytic
C49	ECEA1EKN4R7	Electrolytic

REF.NO.	PART NO.	DESCRIPTION
C50	ECEA1HKN010	Electrolytic 1 µF 50V
C52	ECEA1EKN4R7	Electrolytic 4.7 µF 25V
C54-57	ECEA1HKN010	Electrolytic 1 µF 50V
C58	EP05X682MA	Ceramic 6800 pF
C59	EP05X332MA	Ceramic 3300 pF
C60	ECEA1EKN100	Electrolytic 10 µF 25V
C64-66	ECEA1AKN220	Electrolytic 22 µF 10V
C67	ECEA1CKS101	Electrolytic 100 µF 16V
C68	YWUP05F104ZA	Ceramic 0.1 µF
C69,70	ECEA1EKN100	Electrolytic 10 µF 25V
C71,72	ECEA1AKN220	Electrolytic 22 µF 10V
C81-84	ECEA1CKS101	Electrolytic 100 µF 16V
C85	YWUP05F104ZA	Ceramic 0.1 µF
C86	ECEA1EKN100	Electrolytic 10 µF 25V
L1	ELESE220KA	Coil 22 µH
SW1-5	EVQQTU05R	Push Switch
SW7-11	EVQQTU05R	Push Switch
SW14-37	EVQQTU05R	Push Switch
CN1	YWF795P010LA	10-pin Connector
CN2	YWF795P030LA	30-pin Connector
CN4	YWF795P034LA	Connector
CN3	YW530150510	Connector
M15	YWA2NA0257A4	Spacer

REF.NO.	PART NO.	DESCRIPTION
ACCESSORY PARTS/PACKAGING PARTS		
M31	YWV8QA2580AN	Operating Instructions
M35	XZB26X40C05	Polyethylene Bag
M36	XZB55X71C1	Polyethylene Bag
M37	YWV9CA1697AN	Packaging Assyfor WJ-AVE3/A
	YWV9CB1697AN	Packaging Assyfor WJ-AVE3/B
	YWV9CC1697AN	Packaging Assyfor WJ-AVE3/C
	YWV9CD1697AN	Packaging Assyfor WJ-AVE3/G